MS462XX

VECTOR NETWORK MEASUREMENT SYSTEM

PROGRAMMING MANUAL

Volumes I and II

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Part 3 — Programming Reference

Chapter 11 — Command Dictionary

This chapter provides an alphabetically-ordered, dictionary-type listing and description of all MS462XX GPIB programming commands. The listing for each command includes relevant details about the command. *The chapter is in Volume II.*

Chapter 12 — Instrument Data

This chapter provides general (non-command specific) tabular information for the MS462XX. Much of this information is presented in Chapters 5 through 10, but is provided in this chapter for easy access.

Chapter 13 — Error Messages

This chapter provides a list of all Error Messages including those related to remote-only (GPIB) operation of the MS462XX.

Part 4 — Supplemental Data

Appendix A — Introduction to the IEEE 488 Bus

This appendix contains an introduction to the IEEE 488 Bus (GPIB). This material is intended to assist new users in understanding GPIB basics.

Appendix B — GPIB Quick Reference Guide

This appendix provides a quick reference to all MS462XX GPIB commands. Each reference lists the command name, a brief description of the command function, and a reference to the pertinent Chapter in this manual.

Appendix C — Hewlett-Packard 8753D Codes Supported by MS462XX

This appendix provides discussion and a list of HP8753D codes that are supported by the MS462XX.

Part 1
The GPIB Interface

This part consists of four chapters that describe how the IEEE- 488 (GPIB) and Ethernet interfaces are implemented within the MS462XX Vector Network Measurement System and how to perform basic GPIB and Ethernet communications operations.

Chapter 1 – *briefly describes the MS462XX GPIB programming interface and describes the communication to and from the interface during remote-only (GPIB) operation of the MS462XX.*

Chapter 2 – *provides a tutorial for performing basic GPIB operations such as sending and receiving messages, synchronizing instrument operations, setting timeouts, and status checking.*

Chapter 3 – *provides a tutorial for performing basic Ethernet operations such as sending and receiving messages and setting up the MS462XX for Ethernet operations.*

Chapter 4 – *provides sample program elements to familiarize the user with MS462XX programming techniques. They are also useful as an aid in developing MS462XX programs.*

Chapter 1
Series MS462XX GPIB Programming Interface

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Figure 1-1. *Model 462X Vector Network Analyzer*

Chapter 1
Series MS462XX GPIB Programming Interface

1-1 MANUAL SCOPE

The manual is in two volumes. Volume I provides IEEE 488 bus (GPIB) programming information and data for all models of the Series MS462XX Vector Network Measurement System (Figure 1-1). Volume II is the Command Dictionary and provides the entire command set for programming all features. Consequently, not all of the codes documented in this manual apply to all models within the series (MS4622A, MS4622B, MS4622C, MS4623A, MS4623B, MS4623C). The reader needs to be aware of the feature set available within the model for which programming is being written. Feature set information is documented in the operation manual (OM).

1-2 INTRODUCTION

This chapter contains a brief introduction to the MS462XX GPIB interface and programming environment.

1-3 RELATED MANUALS

All models in the MS462XX Series are covered within the same set of manuals. The set consists of an Operating Manual (OM), Part Number: 10410-00203; a Maintenance Manual (MM), Part Number: 10410-00205; this Programming Manual; and a Command Quick Reference Guide (10410-00206).

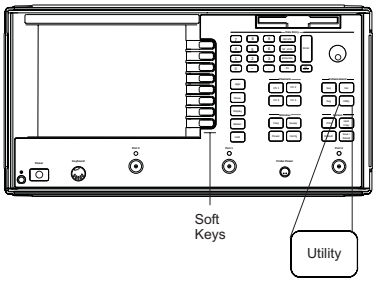
1-4 REMOTE OPERATION INTERFACE

The following paragraphs describe the MS462XX facilities for remote operation.

The MS462XX fully supports the IEEE 488.2–1992 GPIB standard. All MS462XX front panel functions (except Power on/off and GPIB Test) can be controlled remotely using the GPIB commands listed in this manual and an external computer equipped with an IEEE 488 GPIB controller. When in the GPIB operating mode, the MS462XX VNMS functions as both a listener and a talker.

GPIB Setup Menu

The MS462XX VNMS GPIB address defaults to 6. This value may be changed as follows:



Step 1. Press the Utility key (left).

Step 2. Press the **REMOTE INTERFACE** soft key.

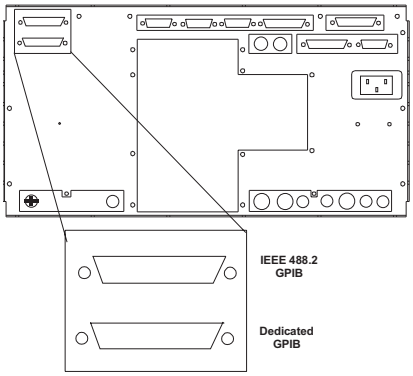
Step 3. Press the **GPIB SETUP** soft key.

Step 4. Press the **IEEE 488.2** soft key and enter a new address number using the Data Entry keypad. Valid address numbers are from 0 to 30.

NOTE

Address zero is usually reserved for the server.

Interface Connection



Connect your external controller to the IEEE 488.2 GPIB interface connector on the rear panel (left). A pinout listing of this connector is contained in Figure 1-2.

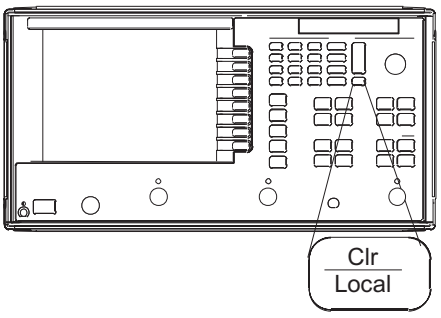
NOTE

Do not connect your external GPIB controller to the "Dedicated GPIB Interface" connector (located below the "IEEE 488.2 GPIB interface" connector (left). This dedicated GPIB port is used by the MS462XX to control external GPIB devices, such as a plotter, second frequency source, frequency counter, or a power meter.

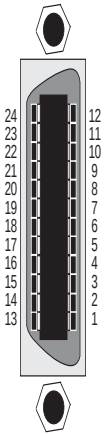
The GPIB system can accommodate up to 15 devices at any one time. To achieve maximum performance on the bus, proper timing and voltage level relationships must be maintained. If either the cable length between separate instruments or the accumulated cable length between all instruments is too long, the data and control lines cannot be driven properly and the system may fail to perform. The following guidelines should be observed:

- No more than 15 instruments may be installed on the bus (including the controller).
- Total accumulative cable length (in meters) may not exceed two times the number of bus instruments or 20 meters—whichever is less.
- Individual cable length should not exceed 4 meters.
- 2/3 of the devices must be powered on.
- Devices should not be powered on while bus is in operation (that is; actively sending or receiving messages, data, etc.).
- Minimize cable lengths to achieve maximum data transfer rates.

Local Operation Key



Press the Clr/Local key (below) to quickly restore the MS462XX to local operation. Local operation will be restored unless the MS462XX is programmed for local lockout.



Pinout Diagram

PIN	NAME	DESCRIPTION
1-4	DIO 1 thru DIO 4	*Data Input/Output.* Bits are HIGH with the data is logical 0 and LOW when the data is logical 1.
5	EOI	*End Or Identify.* A low-true state indicates that the last byte of a multibyte message has been placed on the line.
6	DAV	*Data Valid.* A low-true state indicates that the talker has (1) sensed that NRFD is LOW, (2) placed a byte of data on the bus, and (3) waited an appropriate length of time for the data to settle.
7	NRFD	*Not Ready For Data.* A high-true state indicates that valid data has not yet been accepted by a listener.
8	NDAC	*Not Data Accepted.* A low-true state indicates that the current data byte has been accepted for internal processing by a listener.
9	IFC	*Interface Clear.* A low-true state places all bus instruments in a known state—such as, unaddressed to talk, unaddressed to listen, and service request idle.
10	SRQ	*Service Request.* A low-true state indicates that a bus instrument needs service from the controller.
11	ATN	*Attention.* A low-true state enables the controller to respond to both it's own listen/talk address and to appropriate interface messages — such as, device clear and serial poll.
12	Shield	Ground Point.
13-16	DIO 5 thru DIO 8	*Data Input/Output.* Bits are high with the data is logical 0 and LOW when the data is logical 1.
17	REN	*Remote Enable.* A low-true state enables bus instruments to be operated remotely, when addressed.
18-24	GND	Logic ground.

Figure 1-2. *Pinout Diagram, IEEE 488.2 GPIB Connector*

Audible Indicators

A single beep is issued as follows:
(1) on a GPIB error,
(2) when a user warning is issued (see Chapter 13, Operational Error Messages)
(3) when a test limit line has been exceeded, if the limits testing beep function has been set (see Chapter 7)
(4) on system reset.
(5) any time the user's attention is required, such as at the end of a calibration step.

1-5 GPIB COMMUNICATION

The following paragraphs present a short summary of MS462XX GPIB communication. Subjects covered are program messages, separator/termination characters, status reporting, and GPIB error conditions and corresponding MS462XX responses. Refer to Chapter 8, Remote-Only Operation, for detailed description of these topics.

The primary GPIB messages that effect MS462XX operation consist of two major groups; Bus Interface Function messages, and Instrument Specific messages.

Bus Interface Function Messages

These are low level bus messages defined by IEEE 488.1. A discussion of these messages is beyond the scope of this programming manual. For further information, please refer to your GPIB controller documentation and/or to IEEE 488.1 Standards documents. Also refer to Appendix A at the end of this Programming Manual for a brief primer on the GPIB Interface. Table 1-1 summarizes some of the key Interface Function Messages and the MS462XX response to them.

Table 1-1. *IEEE-488 Interface Function Messages*

Interface Function Message	Message Function	Addressed Command	MS462XX Response
DCL	Device Clear	No	Resets the MS462XX GPIB communication functions.
SDC	Selected Device Clear	Yes	Resets the MS462XX GPIB communication functions.
GTL	Go To Local	Yes	Returns the MS462XX to local (front panel) control.
GET	Group Execute Trigger	Yes	Executes a string of commands defined by the IEEE 488.2 common command *DDT. A GET is also done by using the *TRG command (see Chapter 11, Command Dictionary).
IFC	Interface Clear	No	Stops the MS462XX GPIB from talking/listening.
LLO	Local Lockout	No	Disables the front panel Clr/Local key.
REN	Remote Enable	No	Places the MS462XX in remote when addressed to listen.

MS462XX Specific Messages

The MS462XX specific GPIB messages (also known as commands, queries, and mnemonics) are used to control MS462XX front panel functions. They also provide for remote only operations such as data transfers, status reporting and service request generation, error re-

porting, and instrument-to-application program timing synchronization.

Refer to Chapter 11, "Command Dictionary"; Appendix B, *MS462XX Quick Reference Guide*; and Chapters 5-10 for information on all MS462XX commands. The commands are organized both alphabetically and by command function groups. There are many examples throughout this manual to assist you in learning and using a desired command.

The MS462XX supports over 2000 commands. Examples include: **OM1** (Output Marker 1), **IFV** (input Frequency List), **TRS** (Trigger Sweep), **WFS** (Wait for a Full Sweep), **OFD** (Output Final [display format] Data), and **PFS** (Print Full Screen), **APPHAR** (Harmonic Application Mode.

Also supported is a subset of the Hewlett-Packard 8753D Command Set to assist you in integrating the MS462XX into existing ATE applications. (See Appendix D for details.) In addition, the 37XXX Command Set is supported, except for non-supported measurement applications and fundamental hardware differences. (See Appendix D for details.)

Numeric parameter entry commands *must* be followed by a numeric value. These commands can optionally accept a units or suffix terminator mnemonic. For example, **SRT 2 GHZ** (set start frequency to 2 GHz.)

Query commands, typically ending in a question mark (?), are used to inquire about the state of a particular instrument function. Many MS462XX setup commands have corresponding query commands listed in the same section as the basic setup command. An example is the **MK1?** query. It *outputs* the setting of Marker 1 Frequency, where the **MK1** command *sets* Marker 1 frequency.

IEEE 488.2 Common commands, which always start with the asterisk character (*), are defined by the IEEE 488.2 Standard. They are used to implement many standard instrument GPIB operations such as querying when an operation completes, status reporting, self test, and querying the instrument identification string. These commands are described throughout the Programming Manual in the specific funtional group where they are used. A consolidated listing of these commands can be found in Table 1-2, item 12 below and in Chapter 7. An example IEEE 488.2 Common command is the ***IDN?** query (Output Instrument ID String).

Separator Characters

Separator characters are used to delimit program message elements sent to or received from the MS462XX. The permitted characters: semicolon (;), comma (,), and space ( ) and their usage is shown below.

Character	Used to separate
;	Multiple commands and multiple output response messages.
,	Multiple ASCII data elements for a single command.
Space	A command, its numerical entry value, and suffix mnemonic.

Terminator Character

The only allowed terminator character for MS462XX GPIB messages is the linefeed character (0A, decimal 10).

GPIB Error Conditions

The MS462XX responds to GPIB errors in the following manner:

- A beep is issued.
- An error message is displayed on the screen.
- A bit is set in the Standard Event Status Register, and, if enabled, an SRQ is generated.
- An entry is written into the non-volatile Service Log describing the error condition, along with time and date and, often, details helpful in handling the error. When full, error entries at the bottom of the log are removed to make room for new entries.
- If the error is GPIB related, the error message and the offending program message, if applicable, can be output over the GPIB via a query command. The previous error, if any, is also available via another query.

The bits set in the Standard Event Status Register for GPIB errors are as follows:

Bit 5 - Command Error (CME)
Invalid syntax, unrecognized command or command arguments, separaters or terminators that do not conform to correct IEEEE 488.2 formats. *The MS462XX will ignore the remainder of commands in that program message.*

Bit 4 - Execution Error (EXE)
This bit is set if:
(1) A data entry parameter is out of range or not applicable.
(2) Action is impossible.
(3) Action is not possible in the current context or instrument state, or if a required option is not fitted.

Bit 3 - Device Dependent Error (DDE)
This bit is set if a valid requested action failed due to an instrument specific error condition, such as attempting to access a bad floppy disk.

Bit 2 - Query Error (QYE)
This bit is set if the MS462XX cannot provide the requested data. For example, if an output is attempted when no data has been requested or available, or if the output buffer is cleared due to sending more commands when data from a previous request has not yet been output.

Refer to Chapter 13, Error messages, for a listing of all MS462XX error messages (including GPIB errors).

1-6 IEEE 488.2 DOCUMENTATION SUMMARY

Table 1-2 provides answers to the "Device Documentation Requirements" listed in the IEEE Standard 488.2-1992. It is also a good summary of the GPIB operational characteristics of the MS462XX.

Table 1-2. *MS462XX IEEE 488.2 Standard Documentation Summary (1 of 3)*

Number	Requirement Item	Implementation in VNMS
1	Interface Function Subsets Implemented	SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0, E2.
2	Device behavior when the user (unit) GPIB address is set outside of the 0–30 range	VNMS returns an Out-of-Range error, issues an audible beep, and the entry color on front panel menu display is changed to red. Entered address is not accepted.
3	When is a user address change recognized?	New address is accepted and entry color remains green.
4	Description of settings at power-on	The front panel setup that was in effect prior to power down will be restored, *except:* the MS462XX will be taken out of hold if it was previously set. Periodic IF Cal will be returned to timed operation. **Memories saved:** 1. GPIB address 2. Internal hardware calibration data 3. Information reported via the *IDN? and *OPT? queries. 4. Calibration coefficients 5. Normalized trace data 6. Stored front panel setups **Memories Cleared:** 1. Service Request message. 2. Standard event status register (except the Power-On bit is set) 3. Extended event status register 4. Limit pass/fail status register 5. Enable registers for items 2 thru 4, above. 6. GPIB input and output queues. 7. Trigger action for *TRG and GET reset to null. **Data Transfer:** 1. Data transfer is reset to MSB first for numerical array data transfers. 2. Data transfer format is reset to default, ASCII mode (FMA) for numerical array transfers. 3. Data pair format for OFD/IFD/OM1-OM6 commands is set to default (off) mode. (See command DPR0.) **Menu Displayed:** Setup Menu

Table 1-2. *MS462XX IEEE 488.2 Standard Documentation Summary (2 of 3)*

Number	Requirement Item	Implementation in VNMS
5	Message exchange options	
	a. Size and behavior of input buffer	a. Default size = 3 KByte. Size increases to required amount, as needed, for <Arbitrary Block> transfers. For the <Indefinite Length Arbitrary Block> data elements, the input buffer size for that element is 64 Kbyte. Attempting to program more data than 64 KByte will cause a loss of all data for that element. A DDE error message will be issued to indicate this condition. For <Definite Length Arbitrary Block> data elements, an attempt is made to set the buffer size for that element to the size indicated in the header. If there is insufficient system memory available at the time, all data for that element is lost. A DDE error message will be issued to indicate this condition.
	b. Queries that return more than one <RESPONSE MESSAGE UNIT>	b. None
	c. Queries that generate a response when parsed	c. All
	d. Queries that generate a response when read	d. None
	e. Commands that are coupled	e. None
6	Functional elements used in construction of device-specific commands.	See command descriptions.
7	Buffer size limitations	MS462XX attempts to allocate amount required; sets DDE error if not possible. (See 5a., above)
8	<PROGRAM DATA> elements that may appear within an <expression>	N/A (expressions are not used)
9	Response syntax for queries	See command descriptions.
10	Description of device-to-device message transfer traffic that does not follow the rules for <RESPONSE MESSAGES>	None
11	Size of block data responses	Variable, See command descriptions for details.
12	IEEE.488.2 Common commands and queries that are implemented	*CLS, *DDT, *DDT?, *ESE, *ESE?, *ESR?, *IDN?, *IST?, *OPC, *OPC?, *OPT?, *PRE, *PRE?, *RST, *SRE, *SRE?, *STB?, *TRG, *TST?, *WAI
13	State of VNMS following the successful completion of the Calibration query	Normal State

Table 1-2. *MS462XX IEEE 488.2 Standard Documentation Summary (3 of 3)*

Number	Requirement Item	Implementation in VNMS
14	Maximum length of the block used to define the trigger macro (1.) The method of interpreting *TRG within a *DDT command sequence (2.)	1. 255 characters. 2. On execution, the MS462XX returns a command error and ignores the rest of the string.
15	Maximum length and complexity of macro labels; maximum length of block used to define a macro; and how recursion is handled during macro expansion, if macro commands are implemented.	N/A
16	Response to common query *IDN?.	ANRITSU, <Model>, <SN>, <SW revision>
17	Size of the protected user data storage area, if the *PUD command or *PUD? query are implemented.	N/A
18	Size of resource description, if the *RDT command or *RDT? query are implemented.	N/A
19	States affected by *RST, *LRN?, *RCL, and *SAV.	*RST = default state (see Chapter 11), *LRN, *RCL, *SAV not implemented
20	Scope of the self test performed by *TST? command.	Fully automated internal hardware testing/reporting. Failure results, if any, are written to the internal non-volatile service log for user access.
21	Additional status data structures used in status reporting.	Limits Event Status and Extended Event Status registers; refer to Chapter 8 for details.
22	Statement describing whether each command is overlapped or sequential.	All commands are sequential.
23	Functional criteria that is met when an operation complete message is generated in response to that command.	N/A – No overlapped commands.
24	Descriptions used for infinity and not-a-number.	N/A

Chapter 2
GPIB Programming Basics

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Chapter 2
GPIB Programming Basics

2-1 INTRODUCTION

This chapter contains a brief introduction to GPIB programming techniques and describes procedures to be used when preparing GPIB programs for the MS462XX VNMS. It includes information about equipment requirements and configuration for GPIB control of the MS462XX VNMS, and many programming tips.

Familiarity with manual (front panel) operation of the MS462XX is assumed. (Throughout this section, the MS462XX VNMS is referred to simply as "MS462XX".) A complete description of front panel operation is contained in the MS462XX Operation Manual (Part Number 10410-00203).

2-2 EQUIPMENT AND CONFIGURATION

The programming examples contained in this chapter assume the equipment listed below is present and configured as described.

Required Equipment

The following equipment represents a minimum GPIB controllable MS462XX VNMS system:

- A MS462XX Vector Network Measurement System.
- A computer/controller that supports the IEEE 488 GPIB standard. The examples in this chapter address the IBM compatible computers.
- An IEEE-488 GPIB interface (built in, or add-in peripheral card) with appropriate driver software. The National Instruments GPIB IEEE-488.2 interface is assumed for all examples in this chapter.
- Appropriate software (any of the following):

  Microsoft QuickBASIC, version 4.0 (or later)
  Microsoft "C", version 5.1 or later, or Quick C, version 2.5.
  Any other programming language, or application software, that supports the IEEE 488 GPIB interface (Pascal, Fortran, etc.).

- A GPIB cable (preferably 2 meters long).

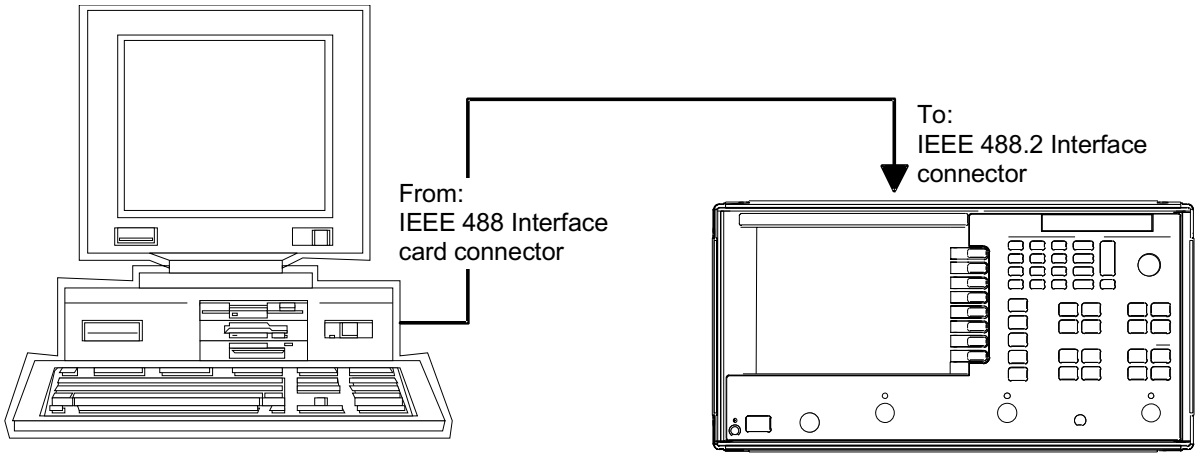
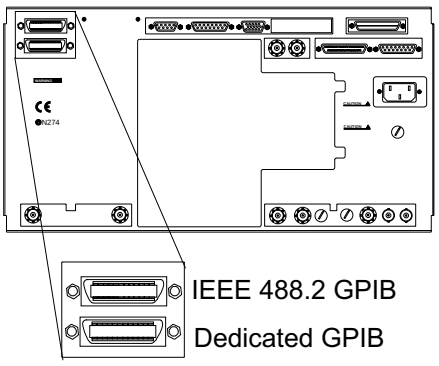


Figure 2-1. *Model MS462XX Shown Connected to an IEEE 488.2 Controller*

NOTE

The IBM PC and National Instruments GPIB interface were chosen for demonstrating the MS462XX GPIB operation in this manual. Any other GPIB controller that conforms to the IEEE 488 standard can be used to interface to the MS462XX.

Configuration



Configure the MS462XX as shown in Figure 2-1. Apply power to the MS462XX and allow the system software to load from disk. Once the software has finished loading and start-up testing is complete, the MS462XX is ready to be remotely controlled via the GPIB. It is important to note that *the MS462XX will not respond to GPIB commands until the MS462XX system software has been loaded.*

Connect a GPIB cable from the computer/controller to the rear panel IEEE 488.2 GPIB connector (left).

Apply power to the computer/controller and load the appropriate programming language software (QuickBASIC, “C”, etc.).

The default GPIB address for the MS462XX (6) is assumed for all examples in this chapter.

2-3 GPIB PROGRAM ELEMENTS

The discussions in this chapter demonstrate basic GPIB programming concepts that are typical elements of most GPIB application programs.

The controller used to demonstrate these concepts is the National Instruments 488.2 GPIB Interface which will be referred to as NI488 throughout this chapter.

NOTE

Regardless of the controller used, consult its documentation and software distribution disks for complete details and examples on setup and use of the controller's hardware and interface software functions.

National Instruments GPIB Interface

Throughout this chapter references will be made to variables, constants, and controller function calls declared in the NI488 file that your application uses to interface to the GPIB controller. This file is **`decl.h`** for C and **`qbdecl.bas`** for QuickBASIC, and it must be included in your GPIB program. Consult your documentation for the files used for other environments.

Including and compiling the appropriate NI488 file when preparing your application is what allows use of the NI488 GPIB interface procedures and function calls in your program. Also, the file named **`gpib.com`** must be installed in memory upon bootup of your computer. Typically, access to this file is through your system configuration file (that is, config.sys for DOS based computers).

The **`gpib.com`** is what allows your GPIB program to physically interface to the installed GPIB controller and to execute GPIB function calls during operation.

NOTE

Consult your controller's documentation for complete details on software and hardware setup, test, and use prior to proceeding with the following discussion. Knowledge of your controller and its operation will be assumed from this point forward.

Definitions

The following definitions apply for the remainder of this chapter:

- board = 0, Active controller board number
- address = 6, GPIB address of the instrument.
- Address List = addresList, list of GPIB addresses terminated with the NI488 constant NOADDR. For our examples the list consists of two elements (6, NOADDR).

2-4 INITIALIZING THE GPIB

Initializing is the process of directing your controller to take control of the bus (become CIC — Controller In Charge) and setting the GPIB software to initial default settings.

NOTE

Default initial installation configuration is assumed for the NI488 hardware and software.

NI488 does this by sending an interface clear to the desired board using:

```
SendIFC(board)
```

The board will become CACS (Active controller). NI488 software allows use of up to 4 controllers. The board specified by the `SendIFC()` function must be designated CIC – Controller In Charge in its setup and configuration. See NI488 config utility in NI488 documentation.

`SendIFC()` is also useful anytime you want to insure that your GPIB controller has control over the bus, the GPIB software is in its default parameters, and GPIB of all instruments on the bus is cleared and in idle state.

The following NI488 functions are also useful when initializing your application.

- To place all instruments in remote state, use:

  ```
  EnableRemote(board, addressList)
  ```

- To clear GPIB operation of all instruments use:

  ```
  DevClearList(board, addressList)
  ```

2-5 SHUTTING DOWN THE GPIB SYSTEM

An important step in quitting a GPIB application is to shut down the GPIB interface. For the NI488 this is done by

- Insuring that you have control over the bus.
- Clearing all instruments' GPIB and placing them in an idle state.
- Releasing the controller GPIB software and hardware.

Implement the above by sending:

```
SendIFC(board)
ibonl(board, 0)
```

2-6 DETECTING GPIB ERRORS

It is important to use error checking code throughout your application program. Error checking usually does not significantly impact the speed of a GPIB application. This is because the GPIB bus operations are I/O operations whose execution time depends on a handshake process. This process is typically much slower than executing (error checking) code in your computer's memory.

Full Error Detection

Full error detection and handling is an invaluable debugging tool that should be used to its fullest during development of your application.

Limited Handling Error Detection

Error detection with at least a limited amount of handling should be used after each GPIB I/O operation in your final program. This will insure predictable operation of your application, proper system control, and accurate data processing.

NI488 Global Variables

The NI488 interface maintains three global variables useful in determining correct GPIB operations. These variables are updated after, and reflect the condition of, the last GPIB call to the interface. The variables are:

- **IBSTA**
  This variable provides the latest bus activity status; that is, errors, completions, time outs, etc.
- **IBERR**
  This variable provides information on the type of error, if an error was reported in IBSTA.
- **IBCNT/IBCNTL**
  The number of data bytes transferred on the bus in the last operation. IBCNTL is the "long integer" version of IBCNT.

Example

Error checking for the NI488 interface is as follows. After each GPIB call, the IBSTA is checked for errors using the NI488 declared constant EERR - in BASIC, or ERR in C. If true, the gpiberr( ) function is called to decode and display the global variables IBSTA, IBERR, and IBCNT. For example, for QuickBASIC, the following code is inserted after a GPIB call:

```
IF IBSTA% AND EERR THEN
  CALL gpiberr (error during GPIB operation)
END IF
```

NOTE

The NI488 disks and documentation contain the source listing of the gpiberr() function. This function should be copied into your code and used after each GPIB function call. Use the example programs provided on the NI488 distribution disks. Note that gpiberr() can also be modified to fit a particular application's requirements.

2-7 SETTING GPIB OPERATION TIME OUT

Setting GPIB time out is necessary to allow for lengthy instrument operations to complete before the application program continues with its processing. (Refer to paragraph 2-11, Waiting for Instrument Operations to Complete.)

Example The NI488 time out is set using the `ibtmo()` interface call, as follows:

```
ibtmo(instrument_handle, timeout_setting)
```

Where:

- `instrument_handle` = The value returned by the `ibfind()` or `ibdev()` interface call for the instrument.
- `timeout_setting` = A value that disables or sets the time out setting. NI488 uses declared constants to represent the allowable time out settings, for example, the T100s constant is 100 seconds, T30ms is 30 milliseconds, TNone is 0, etc. The complete list is in the NI488 include file for your language (**`qbdecl.bas`**, **`decl.h`**).

NOTE

Consult NI488 documentation and distribution disks for information and an example on using `ibtmo()`, `ifbind()`, and `ibdev()`.

2-8 SENDING COMMANDS

GPIB controllers provide for sending GPIB commands in the C language to an instrument (or the controller itself if its address is used). The NI488 uses several commands, the most common is:

```
Send (board, address, buffer, numBytes, eot_mode)
```

Where:

- `board, address` = see paragraph 2-3 for definitions.
- `buffer` = String of one or more instrument specific GPIB commands from the defined list in the instrument's GPIB documentation.
- `buffer` = String of one or more instrument specific GPIB commands from the defined list in the instrument's GPIB documentation.
- `numBytes` = The number of bytes contained in the buffer.
- `eot_mode` = The method used to signal end of transmission. This is typically done using ASCII linefeed character `0A hex` (10 decimal) and then setting EOI state (end of transmission) on the bus. The NI488 defines the following constants for use to setup end of transmission methods:
  - `NLend` - Linefeed with EOI
  - `DABend` - EOI only
  - `NULLend` -Do nothing to mark end of transmission

Example: Send the MS462XX at address 6, the commands "**`CH2;DSP;MAG`**", from controller number 0, using the linefeed with EOI to mark the end of transmission:

```
Send (0, 6, "CH2;DSP;MAG",11,NLend)
```

MS462XX Commands Used The above example uses the following commands defined in the MS462XX command set:

`CH2` - sets active channel to 2,

`DSP` - displays only the active channel on the whole screen,

`MAG` - displays the active channel's data in log magnitude format (dB).

NOTE

The semicolon (;) is used to separate the different commands.

2-9 RECEIVING DATA FROM AN INSTRUMENT

In order to receive data from an instrument over the GPIB, you must first instruct the instrument to output the desired data. You do this by using one of the instrument's defined data output commands and the controller Send() function (see paragraph 2-8, “Sending commands”).

The instrument must then be given permission to start sending data (talk). The NI488 call to do this is:

```
Receive(board, address, buffer, numBytes,
        eod_mode)
```

Where:

- `board, address` = see paragraph 2-3 for definitions.
- `buffer` = The name of the memory address of the buffer where the received data is to be placed. Typically this is an array of type characters (a string). Although, for binary data transfers, the NI488 software will accept an array of almost any type; that is. integer, floating point, etc.
- `numBytes` = The maximum number of bytes to read from the instrument. Insure that “buffer” above is of at least this size.
- `eod_mode` = The method used to signal the controller to stop receiving data. Typically the NI488 constant `STOPend` is used (EOI state – end of transmission – set with the last byte). If you want to stop receiving when a certain transmission terminator character is received, then use the hex value of that character instead of the `STOPend`.

Example: Use the NI488 controller number 0, to send the MS462XX at address 6, the command “ONP” using the line feed with EOI to mark end of transmission:

```
Send(0, 6, “ONP”, 3, NLend)
```

Upon receiving a data output command, the MS462XX will prepare the data requested and wait for the controller to put it in the talk state so it can put the data out on the bus. This is done by:

```
numBytes = 20
Receive(0, 6, buffer, numBytes, STOPend)
```

Error Handling: The number of bytes actually sent on the bus can now be retrieved from the NI488 interface software by immediately storing the value of the `IBCNT` global variable in a program variable as follows:

```
actualReceivedBytes = IBCNT
```

If we expected an exact number of bytes to be received, we can compare the requested number of bytes "numBytes" with the actual received "actualReceievedBytes" and take some corrective action if they do not match. You should do this before continuing to the data processing section of the program:

```
If numBytes ISNOTEQUALTO actualReceivedBytes then
   Call gpiberr("incorrect number of bytes
   received")
END IF
```

NOTE

Consult your programming language syntax for the operator used to check in-equality, to use in place of ISNOTEQUALTO.

MS462XX Commands Used

The above example uses the following commands defined in the MS462XX command set:

- **ONP** – Outputs the number of data points in the current sweep. It will output the number represented in ASCII format.

2-10 SRQ HANDLING

Controllers use a dedicated line on the GPIB to detect if an instrument has requested service. An instrument sets this line when a predetermined set of conditions inside it have been met. These conditions are selected and programmed into the instrument by setting the Service Request Enable Register to a decimal value that corresponds to the bit values which, when true, will generate an SRQ. This is a binary weighted decimal value in the range 0 – 255.

Calculating the Binary Weighted Bit Value

The decimal value of a bit in a register is equal to the number 2 raised to a power equal to the bit number. For example, the decimal value of bit 4 in the Service Request Enable Register is 2 raised to the power 4 which is: $2^4 = 16$. Similarly, the decimal value of bit 0 is: $2^0 = 1$.

Enabling Service Request

To enable service request in the MS462XX, use the command ***SRE** - Service Request Enable, with the desired value.

Example

Command the MS462XX to request service; that is, generate an SRQ, when it has data to send, then output the number of points in the current sweep. We need to enable bit 4 (MAV), Message Available, in the Service Request Enable Register, so a service request will be generated when the data is ready. The decimal value of bit 4 is 16 ($2^4 = 16$).

The NI488 Send() function is used to send the MS462XX at address 6, the commands "*SRE 16;ONP" (12 ASCII bytes), from controller number 0, using the linefeed with EOI to mark end of transmission:

```
Send(0, 6, "*SRE 16;ONP", 12, NLend)
```

Commands Used The above example uses the following commands defined in the MS462XX command set:

***SRE** – Sends a Status Request Enable mask.

ONP – Outputs the number of sweep points.

NI488 SRQ Functions The following NI488 functions are useful in handling SRQ operations. Consult your NI488 documentation for full details.

- To test for occurrence of SRQ:

```
TestSRQ(board, SRQset)
```

Where:

SRQset contains 1 if SRQ is set, or 0 if it is not.

- To wait for occurrence of SRQ and report if it was set:

```
WaitSRQ(board, SRQset)
```

Where:

SRQset contains 1 if SRQ was set within the time out allowed, or 0 if it was not. (See paragraph 2-8, Setting GPIB Operation Time Out.)

- To find out which instrument is requesting service (`set SRQ`), instruct the controller to perform a serial poll and return the results as follows:

```
FindRQS(board, addressList, statusByte)
```

Where:

`statusByte` = The status byte of the first requester found is returned in this variable.
The index in `addressList` that contains the address of the instrument requesting service is returned in the `IBCNT` global variable.

- To read out the SRQ byte from an instrument:

```
ReadStatusByte(board, address, statusByte)
```

- To parallel poll, see the following functions in the NI488 documentation.

```
PPoll()
PPollConfig()
PPollUnconfig()
```

2-11 WAITING FOR INSTRUMENT OPERATIONS TO COMPLETE

Instruments often require a period of time to complete certain operations such as disk I/O, measurement sweep, data preparation, etc.. Your application program must allow the instrument time to complete these operations and be able to detect when operations are completed.

The simplest mechanism for synchronizing operations over the GPIB involve using the ***OPC?** -Operation Complete query and the ***OPC** - Operation Complete command.

Example 1 Command the MS462XX to perform a sweep and hold then place an ASCII "1" in its output buffer (***OPC?**) when done.

The NI488 `Send()` function is used to send the MS462XX at address 6, the commands, **"TRS;WFS;HLD;*OPC?",** from controller number 0, using the linefeed with EOI to mark end of transmission. The `Receive()` function is then used to hold the program from continuing processing until it receives the output of the ***OPC** command (or times out):

```
buffer = "TRS;WFS;HLD;*OPC?"
Send(0, 6, buffer, 17, NLend)
oneByte = 1
Receive(0, 6, buffer, oneByte, STOPend)
```

NOTE

The time out must be set high enough to allow the sweep to complete (see "Setting time outs" in paragraph 2-8).

Example 2 Now we will modify the above example to request service when bit 4 (MAV) in the Status Byte Register is set (***SRE 16**) to let the program know when the ***OPC?** data is ready to be output. This overcomes the time out problem but it does increase program complexity.

```
buffer = "*SRE 16;TRS;WFS;HLD;*OPC?"
Send(0, 6, buffer, 25, NLend)
SRQset = 0
WHILE (SRQset = 0)
    WaitSRQ(board, SRQset)
ReadStatusByte(board, address, statusByte)
oneByte = 1
Receive(0, 6, buffer, oneByte, STOPend)
```

NOTE

`TestSRQ()` can be used instead of `WaitSRQ()` to check for the occurrence of SRQ in the WHILE loop. This would allow your program to perform other tasks while waiting for SRQ inside the WHILE loop.

MS462XX Commands Used

Examples 1 and 2 above used the following commands defined in the MS462XX command set:

***SRE** - sends a Status Request Enable value.

TRS - triggers a sweep

WFS - waits one full sweep

HLD - goes into hold mode

***OPC? -** outputs an ASCII "1" when operation is complete

NOTE

Refer to Chapter 8, Remote Only Operations for more information and examples on status reporting and service request generation.

2-12 OPTIMIZING DUT TESTING SPEED

This section provides some insights into optimizing DUT testing speed. This optimization process involves translating the available flexibility of Scorpion's features into the fastest results for the measurement plan of your DUT, which typically consists of setups, sweeps, data points, speed per point, and data transfer.

NOTES

Option 24 is required to utilize the features of Segmented Sweep, Data Collection, and Cal Data in internal memory.

Additional support for this application can be obtained by contacting Anritsu at Navigator@anritsu.com with a description of your application, your measurement plan, your goals, and your contact information.

Speed Introduction

The following Excel table illustrates a typical measurement plan and some sample calculations to compute overall test time. You may find it useful to create your own table when trying to optimize for speed so you know how the test time is distributed.

Table 2-1. *Measurement Plan with Test Time Calculations*

	Number of Sweeps	Number of Points	Speed per Point (usec)	Time (msec)
Setup 1	4	151	200	121
Recall S1				3000
Data Transfer/GPIB				1
Setup 2	16	51	225	184
Recall S2				3000
Data Transfer/GPIB				1
Setup 3	12	600	300	2160
Recall S3				3000
Data Transfer/GPIB				5
...	**...**	**...**	**...**	**...**
Setup n	i	j	k	i*j*k
Total Time (ms)				8466

With a measurement plan and speed evaluation, you can begin optimizing your test time by minimizing the number of setups in the measurement plan and improving the effectiveness of the corresponding sweeps, data points, and speed per point. The following paragraphs provide suggestions to help you in this optimization process.

Number of Setups

When optimizing for speed, minimize the number of setups you implement for the DUT test. Whenever possible, the setups should be resident in Scorpion's memory to avoid a typical two to three second delay associated with a recall request.

- Try to combine multiple setups into a single setup to avoid save recalls.
- Use Segmented Sweep and consider triggering individual segments. Create a single setup (with less than 1601 points) consisting of the necessary frequency segments so when combined, one setup can replace several setups. For added flexibility, enable and disable individual segments, which provide faster results than recalling setups.
- If only two setups are required, use Alternate Sweep to toggle between the two setups in memory.
- Use Cal Data in internal memory to switch between up to eight setups with identical frequency plans (Scorpion simply swaps cal coefficients of the setups). This approach is very useful when Scorpion is coupled with test sets or switches whereby Scorpion can quickly recall the calibration coefficients associated with each setup.
- Use external SCSI hard drives when larger measurement plans need more storage space within Scorpion. Contact your Anritsu sales representative for ordering information.

NOTE

Transfer of setups and data via the GPIB occurs at the rate of 100 to 150 kBytes/second.

Frequency Sweeps

Once the setups are minimized, it's also important to minimize the number of sweeps in each of the setups that are associated with the calibration in each setup.

- Choose calibrations to minimize sweeps (for example, 2-port calibrations require 4 sweeps whereas 4-port calibrations require 16 sweeps).
- Consider connections to Scorpion as part of the measurement plan since some connections may enable easy switching between 4-port, 3-port, and 2-port calibrations (without recalibrating or recalls).
- Flexible Cal can reduce sweeps depending on which parameters are required.
- Tune Mode can offer flexibility by updating one parameter for a user-defined count, which may be useful when tuning a device.

Measurement Data Points

The overall test time is proportional to the number of data points, so minimize the number of data points within each setup of the measurement plan.

- Consider whether each and every point in the measurement plan is required.
- Discrete Fill offers the flexibility to arbitrarily define the frequency data point distribution. By default, the data point selection is equally distributed.
- Segmented Sweep offers additional flexibility to define IF Bandwidth, Averaging, and Source Power Levels for each segment in a frequency plan.

Speed Per Point

Minimize the measurement time for each point in the measurement plan.

- Select the widest IF Bandwidths as possible (also in conjunction with Segmented Sweeps) and evaluate the trade-offs with dynamic range and high level trace noise.
- In some situations, you may want to try IFBW = 30 kHz and Averaging (this combination disables gain ranging and results in a maximum dynamic range of 80 to 85 dB).
- Avoid band-switch points within Scorpion of:
  - 400 MHz
  - 800 MHz
  - 1600 MHz
  - 3000 MHz
  - 3200 MHz in 6 GHz models
  - 4800 MHz in 9 GHz models
  - 6000 MHz

Data Transfer

Once the measurement speed is optimized for setups, sweeps, and points, it is equally important to optimize the automation protocol so Scorpion is efficiently performing measurements while efficiently transferring and processing the data with the PC.

- It is important to only trigger and process the sweeps required for the measurement plan (in some cases, external trigger provides the best results). Be aware of how Scorpion is being triggered; sometimes TRS is not needed if the measurement has already been performed.
- Although straightforward to implement, ASCII data transfers are four times slower than binary transfers. Whenever possible, implement data transfers using binary formats.

- Changing Channels over the GPIB is very time consuming. Try to output data directly wherever possible. For example, the commands **OS11R**; **OS13R**; **OS14R**; **OS41R** will output raw S_{11}, S_{13}, S_{14}, and S_{41} if they are displayed on the screen. If you have correction on, such as a 4-port correction, you can output up to 16 S-parameters independent of the channel displays. For example, **OS11C**; **OS12C**; **OS24C**; **OS43C** will output the corrected S_{11}, S_{12}, S_{24}, and S_{43} regardless of what is displayed on the screen.
- If calibrations need to be applied, display only a single channel for fastest measurements.
- Advanced features to consider include High Speed Trigger Mode, Data Collection Mode, and Fast CW.
- If the display is not required, toggling the display on and off offers some speed improvements when using High Speed Trigger mode (reference **DD1**/**DD0**).
- In some applications (for example, antenna testing), you may want to trigger and collect all of the measurements as quickly as possible and afterwards transfer the data. In this case, you will want to use Fast CW or Data Collection features.
- In general, you may want to consider using Scorpion to collect the raw measurements and perform post-processing tasks (markers, limit line pass/fail, and even calibration corrections using drivers from Anritsu) on the data once in the PC.
- In most cases, the fastest results are obtained when minimizing the GPIB commands so Scorpion is focused on conducting measurements instead of other tasks. In other words, select an automation strategy such that Scorpion is performing measurements and transferring data the majority of the time and utilize the PC for manipulating and processing data afterwards.
- Both **FMC** and **FMB** output binary data, but **FMC** is usually a better choice for speed since this is a 32-bit format (where **FMB** is a 64-bit format).
- Selecting **LSB** over **MSB** is more efficient so you don't have to flip bits before converting them.
- If you know the exact data size, you can consider removing the header using the **FDH2** command. This prevents having to constantly, and unnecessarily, remove the header information in the measurement loop.
- When using Discrete Fill, use **IFV** commands for the fastest results.

NOTE

Transfer of setups and data via the GPIB occurs at the rate of 100 to 150 kBytes/second.

Data Transfer Sample Code

The following sample code illustrates how the previous speed concepts can be implemented. It is important to optimize the measurement loop, so carefully separate setup and restore commands to optimize for efficient measurement and data transfers.

```
'setup section
CH1   ‘selects channel 1
MAG   ‘changes graph type to magnitude
DSP   ‘single display mode
AOF   ‘turn averaging off
FMA;IFV #2321000000000,2000000000,3000000000
‘set up the discrete frequency list
FMC;LSB  'binary 32 bit - least significant bit
IFBW30K  '30 kHz IFBW
DD0      'data drawing off
FDH2     'remove header (0 length header)
*DDT #211OS31C;OS21C   'this sets the high speed
command buffer
TIBSB;TXX?   'high speed trigger mode -- should
return a 5 for high speed trigger mode

'measurement loop
*TRG   'read and process data...keep repeating

'restore
TIN    'normal trigger mode
FDH0   'Use data header
FMA    'ASCII data transfer
DD1    'Turn data drawing back on
```

Chapter 3
Ethernet Programming Interface With TCP/IP

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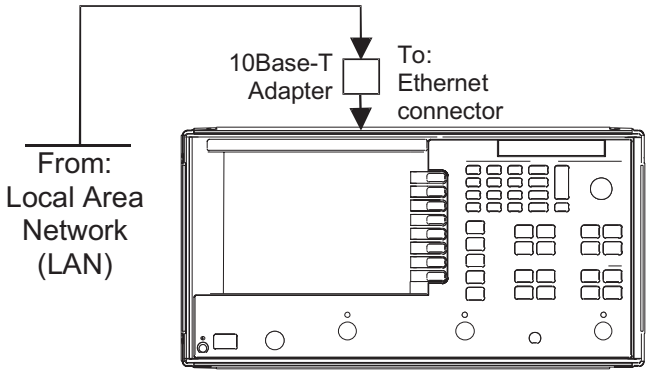
Chapter 3
Ethernet Programming Interface With TCP/IP

3-1 INTRODUCTION

This chapter provides description for use of the Ethernet Programming Interface.

3-2 NETWORK CONNECTIONS

The analyzer supports 10BASE-T. You can use MAU to connect to the AUI port connector on the rear panel (below).



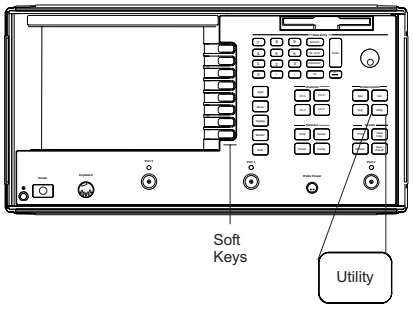
Network Address Setup

You must have an IP (internet protocol) address, subnet mask address, default gateway IP address, and ethernet address in order to have a complete network address setup. The default gateway IP is defined by your system administrator and the ethernet address is specified on a label on the rear panel. Each analyzer should have a unique 32-bit IP address. An example: 172.26.21.10. The following paragraphs illustrate a complete address setup.

IP Address Setup:

To set up an Internet Protocol (IP) address, proceed as follows:

Step 1. Obtain an IP address for the MS462XX from your network administrator.



Step 2. Press the Utility key (left).

Step 3. Press the **REMOTE INTERFACE**soft key.

Step 4. Press the **NETWORK SETUP** soft key.

Step 5. Press the **INSTRUMENT IP** soft key.

Step 6. Enter an IP address, using the Data Entry keypad and X1 key.

Subnet Mask Setup

To set up the subnet mask, proceed as follows:

Step 1. Press the Utility key.

Step 2. Press the **REMOTE INTERFACE** soft key.

Step 3. Press the **NETWORK SETUP** soft key.

Step 4. Press the **SUBNET MAST** soft key.

Step 5. Enter a subnet mask (the format is the same as IP address)using the Data Entry keypad and X1 key.

Default Gateway IP

To set up the Default Gateway IP, proceed as follows:

Step 1. Press the Utility key.

Step 2. Press the **REMOTE INTERFACE** soft key .

Step 3. Press the **NETWORK SETUP** soft key.

Step 4. Press the **DEFAULT GATEWAY IP** soft key.

Step 5. Enter a gateway IP that is defined by your system administrator. Use the Data Entry keypad and X1 key to make this entry.

Ethernet Address

To set up the ethernet address, proceed as follows:

Step 1. Press the Utility key.

Step 2. Press the **REMOTE INTERFACE** soft key .

Step 3. Press the **NETWORK SETUP** soft key.

Step 4. Press the **ETHERNET ADDRESS** soft key.

Step 5. Enter the ethernet address shown on the back panel label. Use the ethernet address editor to make this entry; press DONE when finished.

Programming Interface: Make the network connection after powering up the analyzer.

Step 1. Send GPIB mnemonic over the ethernet as follows:

a. Connect to analyzer with TCP/IP socket port 5000. The connection is successfully made if the message "100 Connection accepted" is received.

b. Send the GPIB program message and receive output of the program message.

NOTE

A C-language program, titled "`demo.c`," for use with Steps **a** and **b** is shown in Figure 3-1.

Step 2. The number of clients supported is one.

Users have to ensure that only one client-connection exists to ensure that the program message will be processed properly. If more than one client exists, the request from the later connection will not be processed until the first one is completed and disconnected.

Step 3. The output data has be received by the client.

If a client hasn't done so, the loss of output data may occur due to the limitation of memory resource.

3-3 ETHERNET OPERATION

The following provide details on how the MS462XX handles ethernet tasks.

- *Input:* All program messages in GPIB format must be terminated with a line feed/carriage return character. The system executes program messages in the order received, regardless of the connection status.
- *Output*: Output data is sent to a client who has sent the program message that has an output. The output will be discarded when this client is disconnected for any reason. No other client can claim this client's output.

  When an output transmission is blocked because the client is not ready to receive it, the output will be queued up-to-160 items. If the output queue is full, the output will be discarded.

  It is recommended that a client should be ready to receive the output immediately after sending a message that has an output. Otherwise, the network buffer may be full and may increase the chance of output data being subsequently blocked.

Notes On Using the Demo Program

As soon as you hit the enter key, the screen will prompt you to "Please enter program message." At this point, you can enter a program message, such as `SRT 20 MHz.` As soon as you hit the Enter key, this program message goes to the analyzer and sets the start frequency to 20 MHz. After this, the program ends.

You can expand this program to send multiple program messages andto receiving output. For the expansion of the client program, please refer to any TCP/IP program reference book.

```
/*
 *  demo.c
 *
 *    Program to send GPIB program messages and receive output from a network
 *    connected instrument.  The program language is ANSI C.
 *
 *    Platform: UNIX Sun workstation.
 *
 *    Usage: demo <hostname> <port number>
 *
 *    Note: client: program name
 *          hostname:  the IP address of the analyzer.
 *          port number:  5000 (mandatory)
 *
 *    Copyright Anritsu Company, 1998.
 */
#include <stdio.h>
#include <time.h>
#include <string.h>
#include <stdlib.h>
#include <sys/types.h>
#include <errno.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netdb.h>

#define BUF_SIZE  1000

int opensocket();

/*****************************************************************/
int main (int argc, char *argv[])
{
  char   portNumber[5] = "5000";
  static int   instrument;  /* socket discriptor */
  static char  pms_buffer[BUF_SIZE];
  static char  output_buffer[BUF_SIZE];
  long         rc = 1;
  int          to_send;
  int          send_buffsize = BUF_SIZE, receive_buffsize = BUF_SIZE;

  /* check command line input count */
  if (argc < 2)
  {
     printf("Usage: %s <hostname>\n", argv[0]);
     exit(1);
  }

  /* open instrument socket connection */
  if ((instrument = opensocket(argv[1], portNumber)) == -1)
  {
     printf("Instrument socket can't be opened\n");
     exit(1);
  }
  printf("Please enter program message:");
  gets(pms_buffer);
  strcat(pms_buffer, "\r\n"); /* required for a complete program message */
```

Figure 3-1. *Ethernet Setup Program (1 of 3)*

```
  if ((rc = send(instrument, pms_buffer, strlen(pms_buffer), 0)) < 0)
  {
     printf("Error on send program message!\n");
     exit(1);
  }
  else
  {
     while (rc > 0)
     {
        if ((rc = recv(instrument, output_buffer, sizeof(receive_buffsize), 0))
<0)
        {
           printf(">Receive error code = %x\n", errno);
        }
        else printf("Received:%s", output_buffer);
     }
  }

  close(instrument);

  return 0;
}

/*************************************************************************/
int opensocket(char* hostname, char* portNumber)
{
  struct hostent *hostPtr;
  struct sockaddr_in peeraddr_in;
  char   sync_chars[80];
  int size = 256;
  unsigned long addr = 0;
  int i, j, port;
  int rc;
  int s;

  memset(&peeraddr_in, 0, sizeof(struct sockaddr));

  peeraddr_in.sin_addr.s_addr = 0;

  /* convert IP address to unsigned long */
  for (i = 0; i < 4; i++)
  {
     addr = 0;
     for (j =0; *hostname != '.' && *hostname != '\0'; j ++)
     {
        addr *= 10;
        addr+= (*hostname ++) - ('0' - 0);
     }
     addr <<= (24 - i * 8);
     hostname++;
     peeraddr_in.sin_addr.s_addr |= addr;
  }

  peeraddr_in.sin_family = AF_INET;

  s= socket(AF_INET, SOCK_STREAM, 0);
```

Figure 3-1. *Ethernet Setup Program (2 of 3)*

```
  peeraddr_in.sin_family = AF_INET;
  port = atoi(portNumber);
  peeraddr_in.sin_port = htons(port);

   /* Try to connect to the remote server at the address in peeraddr_in.  */
  rc = connect(s, &peeraddr_in, sizeof(struct sockaddr_in));
  if (rc == -1)
  {
      close(s);
      perror("CONNECT error");
      printf("Unable to connect to '%s' : %s\n", hostname, "Connection fail\n");
      return -1;
  }

  /* receive a confirmation on connection from server */
  if ((rc = recv(s, sync_chars, 80)) <= 0)
  {
     printf("Connection error\n");
     close(s);
     retun -1;
  }
  else if (strncmp(sync_chars, "100")) != 0)
  {
     close(s);
     s = -1;
  }
  printf("%s\n", sync_chars);
  return s;
}
```

Figure 3-1. *Ethernet Setup Program (3 of 3)*

Chapter 4
Series MS462XX
Programming Examples

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Chapter 4
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Programming Examples

4-1 INTRODUCTION

This chapter contains example programs to familiarize the user with MS462XX programming. Familiarity with manual (front panel) operation of the MS462XX is assumed. (Throughout this section, the MS462XX VNMS is referred to simply as "MS462XX".) A complete description of front panel operation is contained in the MS462XX Vector Network Measurement System Operation Manual.

Also, it is assumed that you have read Chapters 1, 2, and 3 and are familiar with the information they contain. This information describes the various syntax and functions used in the example sequences presented throughout the chapter. This includes: Send, Receive, IBCNT, IBERR, ISNOTEQUALTO, and others.

4-2 MS462XX PROGRAMMING EXAMPLES

The main sequences for five example MS462XX programs are listed and explained in the following pages. In these examples, the NI488 function calls are abbreviated; refer to Chapter 2 and the NI488 documentation for full details. Refer to the MS462XX Command Function groups and the Command listings in this manual for complete details on MS462XX command operations.

NOTE

The functions and procedures called from the example sequences in paragraphs 4-3 through 4-7 are provided at the end of this chapter in paragraphs 4-8 through 4-10.

The intent of these example program sequences is to provide algorithms useful when programming various features of the MS462XX. You are encouraged to study these algorithms, copy them into your programming environment, and tailor them for your language and application.

4-3 EXAMPLE 1: BASIC OPERATIONS

This example sequence lists and explains some common MS462XX operations.

- Setup display and sweep frequencies

```
Send (0,6,"CH2;DSP;MPH;SRT 40 MHZ;STP 2 GHZ",NLend)
```

- Setup markers

```
Send (0,6,"MK1 40 MHZ;MK2 2 GHZ",NLend)
```

- Read and store current instrument setup
  - Request instrument setup string

```
Send (0,6,"OFP",NLend)
```

  - Read instrument setup string

```
Receive(instrSetup, MAXSIZE, STOPend)
```

  - Get number of bytes transferred3

```
sizeInstrSetup = IBCNT
```

NOTE

Program variables *instrSetup* and *sizeInstrSetup* will be used later with the **IFP** command to input the saved setup string.

- Read sweep frequencies
  - Trigger and wait for full sweep then hold

```
Send (0,6,"TRS;WFS;HLD",NLend)
```

  - Wait for operations to complete (See "Wait for Instr()" example, page 4-12.)

```
WaitForInstr()
```

  - Request sweep frequencies (**OFV**):
    Use floating point (64 bit) binary format (**FMB**), Least Significant Byte first ordering (**LSB** for IBM/compatible PCs only).

```
Send (0,6,"LSB;FMB;OFV",NLend)
```

  - Get number of bytes to read:
    See Chapter 7, "Data Transfer" section for details on <Arbitrary Block> data transfers and structure of the header used to precede and give number of bytes in data block. (See "GetNumBytes( )" example, page 4-13.)

```
numBytes = GetNumBytes(address, headerString)
```

  - Read frequencies
    `freqArray` is a floating point double precision array of up to 1601 elements.

```
Receive(freqArray, numBytes, STOPend)
```

- ❑ Check for complete transfer

```
if (numBytes ISNOTEQUALTO IBCNT then
  gpiberr("Could not read freq list correctly")
```

- Reset instrument
  - ❑ Send reset command

```
Send (0,6,"*RST",NLend)
```

  - ❑ Wait for operations to complete (page 4-12)

```
WaitForInstr()
```

- Download and restore a previously saved setup
  - ❑ Command instrument to receive a setup string. Use "NUL-Lend" (see Chapter 2, paragraph 2-9.)

```
Send (0,6,"IFP ",NLend)
```

NOTE

The space after the **IFP** command is needed to separate it from the setup string, which follows.

  - ❑ Send the setup string. Use "NLend" (see Chapter 2, paragraph 2-9.)

```
Send (0,6,(instrSetup, sizeInstrSetup),NLend)
```

  - ❑ Check if all data was sent correctly

```
if (sizeInstrSetup ISNOTEQUALTO IBCNT then
 gpiberr("Error sending setup string")
```

- Select instrument Marker 1 active

```
Send (0,6,"MR1",NLend)
```

- Read measurement trace
  - ❑ Trigger and wait for full sweep then hold

```
Send (0,6,"TRS;WFS;HLD",NLend)
```

  - ❑ Wait for operations to complete (page 4-12)

```
WaitForInstr()
```

  - ❑ Request trace data:
    in final trace graph type values (**OFD**), in floating point (32 bit) binary format (**FMC**). Use Least significant Byte first ordering (**LSB**, for IBM/compatible PCs only)

```
Send (0,6,"LSB;FMC;OFD",NLend)
```

- ❑ Get number of bytes to read (page 4-13)

```
numBytes = GetNumBytes
```

- ❑ Read out the trace data values.

```
Receive(traceData, numBytes, STOPend)
```

- ❑ Check if all data was transferred

```
if (numBytes ISNOTEQUALTO IBCNT then
  gpiberr("Could not receive data.")
```

- ❑ Calculate number of sweep points in data string POINTSIZE is 8 bytes for data transfers using the **FMB** format and 4 bytes if using the **FMC** format. See Chapter 8, "Formatting Commands."

```
numFreqs = numBytes / POINTSIZE
```

- Put instrument(s) in local to allow use of front panel

```
EnableLocal(board, addressList)
```

4-4 EXAMPLE 2: 12 TERM CALIBRATION

This example sequence lists and explains MS462XX commands used for automated 12 Term Calibration.

- Display instructions to operator on computer screen

```
PRINT "Install 33KFKF Phase Equal Insertable on
       Port 1"
PRINT "Install 3670K502 Thru Line female side to
       Port 2"
PRINT "so the new Port 2 is the male end of the
       thru"
PRINT "Shape the end of the thru so it is near
       Port 1"
PRINT "(Press a key when ready)"
```

- Set up calibration parameters

```
Send (0,6,"SCM;LTC;C12;ISN",NLend)
```

- Set up calibration frequencies

```
Send (0,6,"DFC;FRS 100 MHZ;FRI 100 MHZ;FRP 21;FIL;DFD",NLend)
```

- Set up connectors and loads

```
Send (0,6,"P1C;CFK;P2C;CMK;BBL",NLend)
```

- Begin calibration data collection

```
Send (0,6,"BEG",NLend)
```

- Wait for operations to complete (page 4-12)

```
WaitForInstr()
```

- Instruct operator via the controller screen...
  To connect ISOLATION DEVICES between Ports 1 and 2 and wait for him; then measure devices. (See TakeCalData(), pg 4-14).

```
PRINT "Connect ISOLATION DEVICES between
       Ports 1 and 2"
PRINT "Press ENTER when ready"
TakeCalData()
```

- Instruct operator via the controller screen....
  To connect BROADBAND LOADS between Ports 1 and 2 and wait for him; then measure devices.

```
PRINT "Connect BROADBAND LOADS between
       Ports 1 and 2."
PRINT "Press a key when ready"
TakeCalData()
```

- Instruct operator via the controller screen....
  To connect OPEN to Port 1 and SHORT to Port 2 and wait for him; then measure devices.

```
PRINT "Connect OPEN to Port 1 and SHORT
       to Port 2"
PRINT "Press a key when ready"
TakeCalData()
```

- Instruct operator via the controller screen....
  To connect SHORT to Port 1 and OPEN to Port 2 and wait for him; then measure devices.

```
PRINT "Connect SHORT to Port 1 and OPEN
       to Port 2
PRINT "Press a key when ready"
TakeCalData()
```

- Instruct operator via the controller screen....
  To connect Port 1 and Port 2 with the reminder to NOT INSTALL ADDITIONAL THRU LINES/ADAPTERS BETWEEN PORTS, and wait for him; then measure devices.

```
PRINT "Connect Port 1 and Port 2 but
       DO NOT INSTALL ADDITIONAL THRU
       LINES/ADAPTERS BETWEEN PORTS
PRINT "Press a key when ready"
TakeCalData()
```

4-5 EXAMPLE 3: CALIBRATION DATA TRANSFER

This example sequence lists and explains MS462XX commands for transferring calibration error terms/coefficients.

- Setup a Frequency Response Transmission Calibration.
  - Set up calibration parameters

    ```
    Send (0,6,"SCM;LTC;CFT",NLend)
    ```

  - Set up calibration frequencies

    ```
    Send (0,6,"DFC;FRS 100 MHZ;FRI 100 MHZ;FRP 21;FIL;DFD",NLend)
    ```

  - Begin calibration data collection

    ```
    Send (0,6,"BEG",NLend)
    ```

- Wait for operations to complete (page 4-12)

  ```
  WaitForInstr()
  ```

- Instruct operator via the controller screen...
  To connect THRU LINE between Ports 1 and 2 and wait for him.

  ```
  PRINT "Connect THRU LINE between
         Ports 1 and 2"
  PRINT "Press ENTER when ready"
  ```

  - Measure thruline (page 4-12).

    ```
    TakeCalData()
    ```

  - Read Calibration Coefficient Data from instrument and store the 488.2 data transfer header which is useful for sending the same size data array back to the MS462XX later. Also calculate and store the number of frequency points read in.

  - Request the error term/coefficient array (**OC1**) in 64 bit Floating Point format (**FMB**), Least Significant Byte order (**LSB**, for PCs only). See Chapter 8, "Formatting Commands" for the error terms returned by the OCx series commands.

    ```
    Send (0,6,"LSB;FMB;OC1",NLend)
    ```

  - Get number of bytes contained in the data string and store the header read from the MS462XX into calHeader (string of characters). See GetNumBytes(), page 4-13.

    ```
    numBytes = GetNumBytes(address, calHeader)
    ```

  - Read calibration data values
    calData is an 82 element double precision floating point array.

    ```
    Receive(calData, numBytes, STOPend)
    ```

- ❑ Check if all data was transferred

```
if (numBytes ISNOTEQUALTO IBCNT) then
   gpiberr("Could not receive data.")
```

- ❑ Store number of calibration data bytes transferred

```
calDataSize = IBCNT
```

- ❑ Calculate number of frequency points in the data trace if desired. POINTSIZE is 8 bytes for data transfer using the **FMB** format. See Chapter 8, "Formatting Commands." The division by two is because each data point represents a complex data pair (real, imaginary).

```
numFreqs = (CalDataSize / 2) / POINTSIZE
```

■ Send Calibration Coefficient Data to instrument

- ❑ Simulate a Transmission Calibration
  Command the MS462XX to apply transmission calibration coefficients to data (**AFT**), then input the calibration coefficient array for transmission error term (**IC1**), in 64 bit Floating Point format (**FMB**), Least Significant Byte order (**LSB**, for use with PCs only). Use "NULLend" (see Chapter 2, paragraph 2-9.)

```
Send (0,6,"AFT;LSB;FMB;IC1",NLend)
```

NOTE

Note the space after the **IC1** command; it is needed to separate it from the calibration coefficient data array, which follows.

- ❑ Send cal coefficient #1 data transfer header (same one that was received from the **OC1** transfer). Use "NULLend" (see Chapter 2, paragraph 2-9.)

```
calHeaderSize = LENGTHOFSTRING(calHeader)
Send (0,6, (calHeader, calHeaderSize, NULLend),NLend)
```

NOTE

Consult your compiler documentation for a function that returns length of a string.

- ❑ Check for proper transfer

```
if (CalHeaderSize ISNOTEQUALTO IBCNT) then
  gpiberr("Data not sent properly")
```

- ❑ Send cal coefficient #1 data. Use "NLend" (see Chapter 2, paragraph 2-9.)

```
Send (0,6,(calData, calDataSize),NLend)
```

- ❑ Check for proper transfer

```
if (calDataSize ISNOTEQUALTO IBCNTl then
   gpiberr("Data not sent properly")
```

- ❑ Wait for operation to complete (page 4-12)

```
WaitForInstr()
```

- ❑ Turn on/apply error correction

```
Send "CON"
```

4-6 EXAMPLE 4: ASCII STRING TRANSFER

This is an example sequence showing data string input to the MS462XX. The string sent below is used to set hardcopy data output labels.

The MS462XX requires the double quote characters (" ") to delimit ASCII strings being sent to it. That is, to send a string called *mystring* you would actually send *"mystring"*. This presents a problem since programming languages also delimit a character string with double quotes. In order to send the MS462XX a quote (") as a regular character, you must precede it with the backslash (\) character in the C language and with a quote character (″) in BASIC.

NOTE

A MS462XX ASCII string may also be delimited using a single quote character (′) at the beginning and end of the string. In which case, the backslash (\) for C and the double quote (″) in BASIC are not required.

- ■ Define DUT Model in the data label.
  The following command sequence needs to be sent to the MS462XX:

```
LMS "4_8_filter"
```

  - ❑ If using C use this syntax

```
Send (0,6,"LMS \"4_8_filter\"",NLend)
```

  - ❑ If using BASIC use this syntax

```
Send (0,6,"LMS ""4_8_filter""",NLend)
```

  - ❑ Here the same command sequence can be sent with the single quotes (' ') without the need for additional character as above.

```
Send (0,6,"LMS '4_8_filter'",NLend)
```

- ■ If shutting down the GPIB immediately after this series of commands, then you must also make the controller wait for the MS462XX to completely receive this data before shut down.

```
WaitForInstr()
```

4-7 EXAMPLE 5: DISK OPERATIONS

This example sequence lists and explains MS462XX commands for MS462XX internal disk operations.

- Sweep, and store channel 1 trace data to memory

```
Send (0,6,"CH1;S11;CH3;S21;WFS;CH1;STD",NLend)
```

- Store trace memory data to hard disk
  The following command sequence needs to be sent to the MS462XX:

```
Send (0,6,"SAVE 'C:\CH1_S21.NRM'",NLend)
```

- Wait for operations to complete (page 4-12)

```
WaitForInstr()
```

- Output channels 1 Tabular Data to instrument floppy disk

```
Send (0,6,"SAVE 'A:\CH1_S21.DAT'",NLend)
```

- Wait for operations to complete

```
WaitForInstr()
```

- Save Front Panel and Calibration setup to hard disk

```
Send (0,6,"SAVE 'C:\SETUP1.CAL'",NLend)
```

- Wait for operations to complete

```
WaitForInstr()
```

- Reset system to default state

```
Send (0,6,"*RST",NLend)
```

- Recal Front Panel and Calibration setup from hard disk

```
Send (0,6,"RECALL 'C:\SETUP1.CAL'",NLend)
```

- Wait for operations to complete

```
WaitForInstr()
```

- Recall channel trace/noramlization data from hard disk to CH3

```
Send (0,6,"CH3; RECALL 'C:\CH1_S21.NRM'; WFS",NLend)
```

- Wait for operations to complete

```
WaitForInstr()
```

- Delete channel 1 trace/normalization data file from hard disk

```
Send (0,6,"DEL 'C:\CH1_S21.NRM'",NLend)
```

- Wait for operations to complete

```
WaitForInstr()
```

4-8 EXAMPLE PROCEDURE, WaitForInstr()

This example sequence provides coding for the Wait for Instr () procedure used earlier in this chapter's example sequences.

NOTE

Do not use this procedure if the instrument was commanded to output data that has yet to be read by the program since the ***OPC?** query will, in itself, output data (the character "1")when done with previous operation.

- Set GPIB time out limit to insure enough time is allowed for instrument operations to complete. See `ibtmo()` in the NI488 documentation for details.

```
ibtmo(instrument_handle, T1000s)
```

- Send the Operation Complete query

```
Send (0,6,"*OPC?",NLend)
```

- Wait for instrument to output the ASCII character "1"

```
numBytes=1
Receive(buffer, numBytes, STOPend)
```

- Restore default time out limit

```
ibtmo(instrument_handle, T10s)
```

4-9 EXAMPLE FUNCTION, GetNumBytes(address, headerstring)

This example sequence provides coding for the `GetNumBytes()` function used earlier in this chapter's example sequences.

GetNumBytes() reads the MS462XX output buffer and returns the number of data bytes to be transfered in the ensuing <Arbitrary Block> data string (see Chapter 8, "Data Transfers"). It does this by reading out and decoding the string data header. It will copy the header read out of the MS462XX into headerString so the calling program can use it in cases where the same data block will be sent back to the MS462XX, i.e. **`OC1/IC1`**.

NOTE

Consult your programming language documentation for string functions to copy, concatenate, and return value of string.

- Read the first byte in the instrument output buffer. Buffer is a temporary array of characters of size 10.

```
numBytes = 1
Receive(buffer, numBytes, STOPend)
```

- Check to be sure it is the "#" character then copy it to `headerString`

```
if (buffer[0] ISNOTEQUALTO '#') then
  gpiberr("Invalid data string")
else COPY(buffer, headerString)
```

- Read second header byte from the instrument output buffer and append it (concatenate) to `headerString`

```
numBytes = 1
Receive(buffer, numBytes, STOPend)
CONCATENATE(buffer, headerstring)
```

- Save the buffer value as a number...

```
numBytes = VALUEOF(buffer)
```

NOTE

This number is the next set of bytes to read. Those bytes when taken as a number will yield the number of actual data bytes contained in the binary string.

- Read the number of bytes indicated by numBytes and append them (concatenate) to `headerString`

```
Receive(buffer, numBytes, STOPend)
CONCATENATE(buffer, headerString)
```

- Save the buffer value as a number
`numBytes` = VALUEOF(buffer)

NOTE

numBytes is the number of bytes, of actual data requested, waiting in the output buffer of the MS462XX.

- Return number of bytes to calling program

```
Return numBytes
```

NOTE

At this point headerString is exactly the same as the data transfer header output by the MS462XX. Recall that this is useful to the calling program in cases where the same data read out is to be sent back to the instrument.

4-10 EXAMPLE PROCEDURE, TakeCalData()

This example sequence provides coding for the TakeCalData() procedure used earlier in this chapter's example sequences.

The TakeCalData() procedure will wait for the operator to press a key on the computer then measure the cal standard installed.

- Wait for operator to press a key on computer when he is ready

```
WAITUNTIL (key is pressed)
```

NOTE

Consult your compiler documentation for a function that waits for a key to be pressed.

- Take cal data then go on to next calibration step

```
Send (0,6,"TCD;NCS",NLend)
```

- Wait for operation to complete (page 4-12)

```
WaitForInstr()
```

Part 2
GPIB Function Groups

This part consists of six chapters that relate the MS462XX GPIB commands to functional groups. Tables within each group provide command descriptions and relationships to front panel keys and their associated menu functions.

Chapter 5 – *describes the commands and suffix mnemonics that relate to Measurement Functions.*

Chapter 6 – *describes the commands that relate to Calibration Functions.*

Chapter 7 – *describes the commands that relate to Markers and Limits Functions.*

Chapter 8 – *describes the commands that relate to Remote-Only Functions.*

Chapter 9 – *describes the commands that relate to System Functions.*

Chapter 10 – *describes the commands that relate to Special Applications Functions.*

Chapter 5
Measurement Functions

Table of Contents

Chapter 5
Measurement Functions

5-1 INTRODUCTION

This chapter describes the measurement function commands (and suffix mnemonics) that control the channel control, measurement control, display control, and enhancement group functions.

NOTE

See Chapter 10, Special Applications Functions for measurement applications.

5-2 DATA ENTRY SUFFIX CODES

Many MS462XX GPIB commands require a following numeric value (or values) that quantify the MS462XX operational parameters being controlled (i.e., frequency, power, etc). These numeric values are scaled to the following units as appropriate:

DECIBELS	METERS	SECONDS
DEGREES	OHMS	VOLTS
HERTZ		

All numeric data entries can be followed by an optional suffix mnemonic (see example). The suffix mnemonics for the MS462XX are listed in Table 5-1. These mnemonics define a weighting factor that is applied to the associated numeric data value. (They perform the same function as the data entry termination keys on the MS462XX front panel.) Furthermore, suffix mnemonics imply unit type, thus enhancing the readability of application programs.

Example: `"SRT 2 GHz"`

Table 5-1. *Numeric Data Suffix Mnemonics*

Code	Parameter Type	Weighting Factor
DB, DBL, DBM	Power	1.0
DEG	Phase	1.0
RAD	Phase	180 /
HZ	Frequency	1.0
KHZ	Frequency	10E+3
MHZ	Frequency	10E+6
GHZ	Frequency	10E+9
REU	Real	1.0
IMU	Imaginary	1.0
S	Time	1.0
MS	Time	10E-3
US, USC	Time	10E-6
NS, NSC	Time	10E-9
PS, PSC	Time	10E-12
FS	Time	10E-15
M, MTR	Distance	1.0
CM, CMT	Distance	10E-2
MM, MMT	Distance	10E-3
OHM	Impedance	1.0
V, VLT	Voltage	1.0
MV	Voltage	10E-3
K, KS	Temperature	Degrees Kelvin
XM3	Unitless	10E-3
XX1	Unitless	1.0
XX3	Unitless	10E+3

5-3 CHANNELS GROUP

The commands listed in Table 5-2 perform two separate sets of functions:

- Select the currently active channel (CH1–CH4). The active channel is that channel to which any subsequent channel-based commands are applied.
- Select single or multi-channel display mode (commands D13, D14, D24, DSP, T13, and T24). Commands T13 and T24 each produce a single display frame containing overlaid traces for the two channels specified.

NOTE

Flowcharts showing the MS462XX front panel keys and associated menu sequencing are provided in Appendix B.

Table 5-2. *Channel Command Group and Related Commands in Display Group*

Front Panel Key/Function	Command	Description
Ch1 key	CH1	Selects channel 1 as active channel.
Ch2 key	CH2	Selects channel 2 as active channel.
Ch3 key	CH3	Selects channel 3 as active channel.
Ch4 key	CH4	Selects channel 4 as active channel.
	CHX?	Active channel query.
Display Key/menus, Display Mode, Display Mode menus	D13	Selects dual channel display, channels 1 & 3.
	D14	Selects quad display, all four channels.
	D24	Selects dual channel display, channels 2 & 4.
	DSP	Selects single channel display, using the currently active channel.
	DSP?	Channel display mode query.
	T13	Selects overlaid dual channel (1 & 3) display (one display frame).
	T14	Selects overlaid four channel
	T24	Selects overlaid dual channel (2 & 4) display (one display frame).

5-4 DISPLAY KEY

The Display key offers menu selections that provide Display Mode, Trace Memory, Limits, Scale, and Graph Type functions, all of which are described below.

Display Mode Function This function provides selections for the display mode: Single, Dual 1&3, Dual 2&4, Overlay 1&3, Overlay 2&4, or Four Channel overlay.

Trace Memory Function This function provides a sequence of menus that provide memory and math functions. Memory functions allow viewing of Data, Memory, Data & Memory, Data times Memory, Store Memory, and Disk Operations. Math functions provide Add, Substract, Multiply, and Divide operations.

Limits Function This function is closely related to the Marker key functions; therefore, it is described in Chapter 7, along with markers.

Scale Functions This function provides for resolving measurement values. There are selections for Log or Linear Magnitude, Phase, Smith Chart, Group Delay, Real or Imaginary. The operation of these commands are obvious, except for SCL, REF, and OFF.

SCL Command
This command sets the scaling-per-division characteristics of the graph on the active channel. The associated data value determines the resultant scaling factor. The SCL command can also be used to set the scaling on Smith chart type display as follows:

VALUE	SCALING
–3	Sets a 3 dB compressed scale
0	Sets the normal Smith chart scale
10	Sets a 10 dB expanded scale
20	Sets a 20 dB expanded scale
30	Sets a 30 dB expanded scale

REF Command
This command selects the graticule line of the active channel data display on which to place the “REFERENCE LINE.” The Reference Line is the graticule line to which the caret points on the MS462XX display, or graph. (Lines 0, 4, and 8 are the bottom, middle, and top of the graph respectively.)

NOTE
There is no reference line defined for Smith charts, inverted Smith charts, and linear polar or log polar displays.

OFF Command
This command sets the value of the offset associated with the "REFERENCE LINE" in the data graph display.

Changing the scaling-per-division (SCL), the Reference Line position (REF), or the offset value (OFF) in the bottom (secondary) graph of a two graph display is accomplished by using the appropriate suffix mnemonic for that graph, as shown in the table below. For example: to set the scaling value for the phase display of a log/phase type graph, use:

"SCL 20 DEG"

Command	Graph Type		
	Log Mag / Phase	Lin Mag / Phase	Real / Imaginary
SCL / OFF	DEG / RAD	DEG / RAD	IMU
REF	DEG	DEG	IMU

Graph Type Functions

This function provides for selecting any of the various type of display graphs: Log or Linear Magnitude, Phase, Real, Imaginary, Log or Linear Polar, Smith Chart (Impedance), Smith Chart (Admittance), Group Delay, Power Out, SWR, Log Magnitude and Phase, Linear Magnitude and Phase, Real and Imaginary.

The usage of most of these commands is obvious, except SME, ISE, SMC and ISC.

NOTE

All the commands in the Display Group act on the currently selected active channel (see paragraph 5-3, Channels Group).

Both the SME and ISE commands require an associated data value to be included with the command (Table 5-3). The allowable data values for these commands are: 0, 10, 20, and 30. The example below selects a 20 dB expanded Smith chart on the active channel.

Example: **"SME 20 DBL"**

Commands SMC and ISC also require an associated data value to be included with the command. The allowable data values for these commands are 0 and 3. The example below selects a 3 dB compressed Smith chart on the active channel.

Example: **"SMC 3 DBL"**

The Display key commands are listed in Table 5-3.

Table 5-3. *Display Key Commands (1 of 4)*

Command	Function
ADD	Select addition as trace math for active channel
APR	Enter group delay aperture setting on active channel
APR?	Output group delay aperture setting on active channel
ASC	Autoscale the active channel display
ASP	Enter polar stop sweep position angle
ASP?	Output polar stop sweep position angle
AST	Enter polar start sweep position angle
AST?	Output polar start sweep position angle
CHAPR?	Output group delay aperture setting for specified channel
CHDAT?	Output trace memory display mode for specified channel
CHGRF?	Output graph type for specified channel
CHMTH?	Output trace math math type for specified channel
CHOFF2?	Output offset value for the bottom graph for specified channel
CHOFF?	Output offset value for the top graph for specified channel
CHPHO?	Output phase offset for specified channel
CHRDD?	Output reference delay in distance for specified channel
CHRDT?	Output reference delay in time for specified channel
CHREF2?	Output reference line for the bottom graph for specified channel
CHREF?	Output reference line for the top graph for specified channel
CHSCL2?	Output scale resolution for the bottom graph for specified channel
CHSCL?	Output scale resolution for the top graph for specified channel
D13	Display channels 1 & 3
D14	Display all four channels
D24	Select dual channel display with channels 2 & 4
DAT	Display data only on active channel
DAT?	Output trace memory display mode
DD0	Turn data drawing off
DD1	Turn data drawing on
DD1?	Output data drawing on/off status
DIA	Select air as active dielectric
DIE	Enter a dielectric value
DIM	Select microporous teflon as active dielectric
DIP	Select polyethylene as active dielectric
DIT	Select teflon as active dielectric
DIV	Select division as trace math for active channel
DIX?	Output dielectric constant
DLA	Select group delay display for active channel

Table 5-3. *Display Key Commands (2 of 4)*

Command	Function
DNM	Display data normalized to trace memory on active channel
DSP	Select single channel display
DSP?	Output channel display mode
DTM	Display measurement data and trace memory on active channel
EXTIO0	Disable external output I/O
EXTIO1	Enable external output I/O
EXTIOX?	Output external output I/O enable/disable status
GRF?	Output graph type for active channel
GROUP1	Select Group 1 to be active group
GROUP2	Select Group 2 to be active group
GROUP3	Select Group 3 to be active group
GROUP4	Select Group 4 to be active group
GROUP?	Output active group number
ICM0	Turn interchannel math off
ICM1	Turn interchannel math on
ICMX?	Output interchannel math on/off status
ICOP1	Enter interchannel num for operand 1
ICOP1?	Output interchannel num for operand 1
ICOP2	Enter interchannel num for operand 2
ICOP2?	Output interchannel num for operand 2
IMG	Select imaginary display for active channel
ISC	Enter scale and select inverted compressed Smith chart display
ISE	Enter scale and select inverted expanded Smith chart display
ISM	Select normal inverted Smith chart for active channel
LIN	Select linear magnitude display for active channel
LPH	Select linear magnitude and phase display for active channel
MAG	Select log magnitude display for active channel
MD0	Turn mean display off
MD1	Turn mean display on
MDX?	Output mean display status
MEM	Display trace memory on active channel
MIN	Select subtraction as trace math for active channel
MPH	Select log magnitude and phase display for active channel
MTH?	Output trace math math type
MUL	Select multiplication as trace math for active channel
OFF	Enter offset value for top graph of active channel
OFF2	Enter offset value for bottom graph of active channel

Table 5-3. *Display Key Commands (3 of 4)*

Command	Function
OFF2?	Output offset value for bottom graph of active channel
OFF?	Output offset value for top graph of active channel
PCP	Select measurement phase polar chart mode
PCS	Select sweep position polar chart mode
PCX?	Output polar chart mode
PHA	Select phase display for active channel
PHO	Enter phase offset for display channel
PHO?	Output phase offset for display channel
PLG	Select log polar display for active channel
PLR	Select linear polar display for active channel
POSET	Enter phase offset for active channel
POSET?	Output phase offset for active channel
POW	Select power out display for active channel
RDA	Select automatic reference delay calculation
RDD	Enter reference delay in distance for active channel
RDD?	Output reference delay in distance for active channel
RDDS	Enter reference delay in distance for S-Parameters in active channel
RDDS?	Output reference delay in distance for S-Parameters in active channel
RDT	Enter reference delay in time for active channel
RDT?	Output reference delay in time for active channel
RDTS	Enter reference delay in time for S-Parameters in active channel
RDTS?	Output reference delay in time for S-Parameters in active channel
RECALL	Recall a data file from disk to a task
REF	Enter reference line for top graph of active channel
REF2	Enter reference line for bottom graph of active channel
REF2?	Output reference line for bottom graph of active channel
REF?	Output reference line for top graph of active channel
REL	Select real display for active channel
RIM	Select real and imaginary display for active channel
RPPORTNUM	Enter reference plane port number
RPPORTNUM?	Output active reference plane port number
SCL	Enter scale resolution for top graph of active channel
SCL2	Enter scale resolution for bottom graph of active channel
SCL2?	Output scale resolution for bottom graph of active channel
SCL?	Output scale resolution for top graph of active channel
SETBD	Set balanced differential s-param setup to be default setup for all channels
SETCHANKEY	Setup channel keys on front panel to channel keys

Table 5-3. *Display Key Commands (4 of 4)*

Command	Function
SETCHANKEY?	Output channel key setup
SETGRPKEY	Setup channel keys on front panel to group keys
SETSB	Set single ended/balanced differential s-param setup to be default setup for all channels
SETSE	Set single ended s-param setup to be default setup for all channels
SETSPARAM?	Output default S-parameter setup for all channels
SMC	Enter scale and select compressed Smith chart display
SME	Enter scale and select expanded Smith chart display
SMI	Select normal Smith chart for active channel
STD	Store trace to memory on active channel
SWR	Select SWR display for active channel
T13	Select overlaid channel 1 and 3 display
T14	Overlay all four channels (Limited to selected Graph types)
T24	Select overlaid channel 2 and 4 display

5-5 MEAS (MEASUREMENT) KEY

The Meas key provides top-level access the the S-parameter selection functions. These functions are also provided via the Appl key and the **TRANSMISSION AND REFLECTION** menu options. The Meas key commands are listed in Table 5-4.

Table 5-4. *Meas Key Commands (1 of 5)*

Command	Function
CHSXX?	Output parameter or user defined parameter for specified channel
DA1	Select a1 = Ra as denominator for parameter being defined
DA2	Select a2 = Rb as denominator for parameter being defined
DA3	Select a3 = Rc as denominator for parameter being defined
DA4	Select a4 = Rd as denominator for parameter being defined
DB1	Select b1 = Ta as denominator for parameter being defined
DB2	Select b2 = Tb as denominator for parameter being defined
DB3	Select b3 = Tc as denominator for parameter being defined
DB4	Select b4 = Td as denominator for parameter being defined
DE1	Select unity as denominator for parameter being defined
DEN?	Output denominator selection for parameter being defined
EANAIN	Measure EXT. ANALOG IN on active channel
MM1P12	Set the mixed mode 1st balanced port pair to 1:2 for the active channel S-parameter
MM1P13	Set the mixed mode 1st balanced port pair to 1:3 for the active channel S-parameter
MM1P14	Set the mixed mode 1st balanced port pair to 1:4 for the active channel S-parameter
MM1P21	Set the mixed mode 1st balanced port pair to 2:1 for the active channel S-parameter
MM1P23	Set the mixed mode 1st balanced port pair to 2:3 for the active channel S-parameter
MM1P24	Set the mixed mode 1st balanced port pair to 2:4 for the active channel S-parameter
MM1P31	Set the mixed mode 1st balanced port pair to 3:1 for the active channel S-parameter
MM1P32	Set the mixed mode 1st balanced port pair to 3:2 for the active channel S-parameter
MM1P34	Set the mixed mode 1st balanced port pair to 3:4 for the active channel S-parameter
MM1P41	Set the mixed mode 1st balanced port pair to 4:1 for the active channel S-parameter
MM1P42	Set the mixed mode 1st balanced port pair to 4:2 for the active channel S-parameter
MM1P43	Set the mixed mode 1st balanced port pair to 4:3 for the active channel S-parameter
MM1P?	Query the mixed mode 1st balanced port pair for the active channel S-parameter
MM2P12	Set the mixed mode 2nd balanced port pair to 1:2 for the active channel S-parameter
MM2P13	Set the mixed mode 2nd balanced port pair to 1:3 for the active channel S-parameter
MM2P14	Set the mixed mode 2nd balanced port pair to 1:4 for the active channel S-parameter
MM2P21	Set the mixed mode 2nd balanced port pair to 2:1 for the active channel S-parameter
MM2P23	Set the mixed mode 2nd balanced port pair to 2:3 for the active channel S-parameter
MM2P24	Set the mixed mode 2nd balanced port pair to 2:4 for the active channel S-parameter
MM2P31	Set the mixed mode 2nd balanced port pair to 3:1 for the active channel S-parameter
MM2P32	Set the mixed mode 2nd balanced port pair to 3:2 for the active channel S-parameter

Table 5-4. *Meas Key Commands (2 of 5)*

Command	Function
MM2P34	Set the mixed mode 2nd balanced port pair to 3:4 for the active channel S-parameter
MM2P41	Set the mixed mode 2nd balanced port pair to 4:1 for the active channel S-parameter
MM2P42	Set the mixed mode 2nd balanced port pair to 4:2 for the active channel S-parameter
MM2P43	Set the mixed mode 2nd balanced port pair to 4:3 for the active channel S-parameter
MM2P?	Query the mixed mode 2nd balanced port pair for the active channel S-parameter
MMS1	Set the mixed mode single ended port to Port 1 for the active channel S-parameter
MMS2	Set the mixed mode single ended port to Port 2 for the active channel S-parameter
MMS3	Set the mixed mode single ended port to Port 3 for the active channel S-parameter
MMS4	Set the mixed mode single ended port to Port 4 for the active channel S-parameter
MMS?	Query the mixed mode single ended port for the active channel S-parameter
MMSC1C1	Set the S-parameter to mixed mode SC1C1 with the current port pair selections for the active channel
MMSC1C2	Set the S-parameter to mixed mode SC1C2 with the current port pair selections for the active channel
MMSC1D1	Set the S-parameter to mixed mode SC1D1 with the current port pair selections for the active channel
MMSC1D2	Set the S-parameter to mixed mode SC1D2 with the current port pair selections for the active channel
MMSC2C1	Set the S-parameter to mixed mode SC2C1 with the current port pair selections for the active channel
MMSC2C2	Set the S-parameter to mixed mode SC2C2 with the current port pair selections for the active channel
MMSC2D1	Set the S-parameter to mixed mode SC2D1 with the current port pair selections for the active channel
MMSC2D2	Set the S-parameter to mixed mode SC2D2 with the current port pair selections for the active channel
MMSCC	Set the S-parameter to mixed mode SCC with the current port pair/singleton selection for the active channel
MMSCD	Set the S-parameter to mixed mode SCD with the current port pair/singleton selection for the active channel
MMSCS	Set the S-parameter to mixed mode SCS with the current port pair/singleton selection for the active channel
MMSD1C1	Set the S-parameter to mixed mode SD1C1 with the current port pair selections for the active channel
MMSD1C2	Set the S-parameter to mixed mode SD1C2 with the current port pair selections for the active channel
MMSD1D1	Set the S-parameter to mixed mode SD1D1 with the current port pair selections for the active channel
MMSD1D2	Set the S-parameter to mixed mode SD1D2 with the current port pair selections for the active channel
MMSD2C1	Set the S-parameter to mixed mode SD2C1 with the current port pair selections for the active channel
MMSD2C2	Set the S-parameter to mixed mode SD2C2 with the current port pair selections for the active channel
MMSD2D1	Set the S-parameter to mixed mode SD2D1 with the current port pair selections for the active channel
MMSD2D2	Set the S-parameter to mixed mode SD2D2 with the current port pair selections for the active channel
MMSDC	Set the S-parameter to mixed mode SDC with the current port pair/singleton selection for the active channel
MMSDD	Set the S-parameter to mixed mode SDD with the current port pair/singleton selection for the active channel
MMSDS	Set the S-parameter to mixed mode SDS with the current port pair/singleton selection for the active channel

Table 5-4. *Meas Key Commands (3 of 5)*

Command	Function
MMSSC	Set the S-parameter to mixed mode SSC with the current port pair/singleton selection for the active channel
MMSSD	Set the S-parameter to mixed mode SSD with the current port pair/singleton selection for the active channel
MS1C	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1C/SSC for the active channel
MS1D	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1D/SSD for the active channel
MSC1	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SC1/SCS for the active channel
MSC1C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C1 for the active channel
MSC1C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C2 for the active channel
MSC1D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D1 for the active channel
MSC1D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D2 for the active channel
MSC2C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C1 for the active channel
MSC2C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C2 for the active channel
MSC2D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D1 for the active channel
MSC2D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D2 for the active channel
MSCC	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCC for the active channel
MSCD	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCD for the active channel
MSD1	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SD1/SDS for the active channel
MSD1C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C1 for the active channel
MSD1C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C2 for the active channel
MSD1D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D1 for the active channel
MSD1D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D2 for the active channel
MSD2C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C1 for the active channel
MSD2C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C2 for the active channel
MSD2D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D1 for the active channel
MSD2D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D2 for the active channel
MSDC	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDC for the active channel
MSDD	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDD for the active channel

Table 5-4. *Meas Key Commands (4 of 5)*

Command	Function
NA1	Select a1 as numerator for parameter being defined
NA2	Select a2 as numerator for parameter being defined
NA3	Select a3 = Rc as numerator for parameter being defined
NA4	Select a4 = Rd as numerator for parameter being define
NB1	Select b1 as numerator for parameter being defined
NB2	Select b2 as numerator for parameter being defined
NB3	Select b3 = Tc as numerator for parameter being defined
NB4	Select b4 = Td as numerator for parameter being define
NU1	Select unity as numerator for parameter being defined
NUM?	Output numerator selection for parameter being defined
S11	Measure S11 on active channel
S12	Measure S12 on active channel
S13	Measure S13 on active channel
S14	Measure S14 on active channel
S21	Measure S21 on active channel
S22	Measure S22 on active channel
S23	Measure S23 on active channel
S24	Measure S24 on active channel
S31	Measure S31 on active channel
S32	Measure S32 on active channel
S33	Measure S33 on active channel
S34	Measure S34 on active channel
S41	Measure S41 on active channel
S42	Measure S42 on active channel
S43	Measure S43 on active channel
S44	Measure S44 on active channel
SXX?	Output S-parameter or user defined parameter of active channel
UDP11	Select the S11 user defined parameter
UDP12	Select the S12 user defined parameter
UDP13	Select the S13 user defined parameter
UDP14	Select the S14 User Defined parameter
UDP21	Select the S21 user defined parameter
UDP22	Select the S22 user defined parameter
UDP23	Select the S23 user defined parameter
UDP24	Select the S24 User Defined parameter

Table 5-4. *Meas Key Commands (5 of 5)*

Command	Function
UDP31	Select the S31 user defined parameter
UDP32	Select the S32 user defined parameter
UDP33	Select the S33 user defined parameter
UDP34	Select the S34 User Defined parameter
UDP41	Select the S41 User Defined parameter
UDP42	Select the S42 User Defined parameter
UDP43	Select the S43 User Defined parameter
UDP44	Select the S44 User Defined parameter
UDPX?	Output User Defined parameter for active channel
USL	Enter label string for user parameter being defined
USL?	Output label string for the user parameter being defined
USR1	Measure the user parameter 1 on active channel
USR10	Measure user parameter 10 on active channel
USR11	Measure user parameter 11 on active channel
USR12	Measure user parameter 12 on active channel
USR13	Measure user parameter 13 on active channel
USR14	Measure user parameter 14 on active channel
USR15	Measure user parameter 15 on active channel
USR16	Measure user parameter 16 on active channel
USR2	Measure user parameter 2 on active channel
USR3	Measure user parameter 3 on active channel
USR4	Measure user parameter 4 on active channel
USR5	Measure user parameter 5 on active channel
USR6	Measure user parameter 6 on active channel
USR7	Measure user parameter 7 on active channel
USR8	Measure user parameter 8 on active channel
USR9	Measure user parameter 9 on active channel

5-6 ENHANCEMENT GROUP

The Enhancement Group commands control the data enhancement functions of the MS462XX, which include Sequence (Seq), Utility, and Averaging (Avg) operations. The operations associated with the Cal key are detailed in Chapter 6, "S-Parameter Calibration Functions.

Seq (Sequence) Key Functions

Sequence enables users to automate a repetitive testing task. The Sequence key is described in Section 10-9.

Utility Key Functions

This function (Table 5-5) provides Instrument State Parameters; Remote, Color, and Clock setup operations; and Real Panel, Diagnostics, and General Disk Utilities functions. It also provides for AutoCal characterization.

Table 5-5. *Utility Key Commands (1 of 1)*

Command	Description
ADDGP?	Output instrument GPIB address
ADDIP?	Output instrument network IP address
ADDPLT	Enter plotter GPIB address
ADDPLT?	Output plotter GPIB address
ADDPM	Enter power meter GPIB address
ADDPM?	Output power meter GPIB address

Avg (Average) Key Functions

This function (Table 5-6) provides for averaging the measurement trace and for selecting IF bandwidth values.

Table 5-6. *Avg Key Commands (1 of 1)*

Command	Function
AOF	Turn averaging off
AOF?	Output averaging on/off status
AON	Turn averaging on
AVG	Enter averaging count and turn it on
AVG?	Output averaging count
AVGCNT?	Output the current Sweep-by-Sweep average sweep count
IF1	Select 10 Hz IF bandwidth
IF2	Select 100 Hz IF bandwidth
IF3	Select 1 kHz IF bandwidth
IF4	Select 10 kHz IF bandwidth
IFA	Select 30 kHz IF bandwidth
IFBW10	Select 10 Hz IF bandwidth
IFBW100	Select 100 Hz IF bandwidth
IFBW10K	Select 10 kHz IF bandwidth
IFBW1K	Select 1 kHz IF bandwidth
IFBW30	Select 30 Hz IF bandwidth
IFBW300	Select 300 Hz IF bandwidth
IFBW30K	Select 30 kHz IF bandwidth
IFBW3K	Select 3 kHz IF bandwidth
IFBWX?	Output IF bandwidth (10-30000)
IFM	Select 10 Hz IF bandwidth
IFN	Select 1 kHz IF bandwidth
IFR	Select 100 Hz IF bandwidth
IFX?	Output IF bandwidth (1-4)
NFAVEC	Enter noise figure averaging count
NFAVEC?	Output noise figure averaging count
PTAVG	Set the averaging type to Point-by-Point averaging
RSTAVG	Reset the Sweep-by-Sweep averaging sweep count
SOF	Turn off smoothing
SOF?	Output smoothing on/off status
SON	Enter smoothing value and turn on
SON?	Output smoothing value
SPTS?	Output the number of smoothing points
SWAVG	Set the averaging type to Sweep-by-Sweep averaging
SWAVG?	Output the averaging type of Point-by-Point or Sweep-by-Sweep

5-7 STIMULUS GROUP

This key group provides control for a stimulus, such as a frequency source. It provides frequency, sweep, power, and configuration functions.

Freq (Frequency) Key

This key provides for entering frequency, CW, marker sweep, and discrete fill information. Table 5-7 lists the frequency commands; Table 5-8 lists the discrete fill commands.

Table 5-7. *Freq Key Commands (1 of 1)*

Command	Function
CNTR	Enter center frequency
CNTR?	Output center frequency
CWF	Enter CW frequency and turn CW on
CWF?	Output CW frequency
CWON	Turn CW on at current CW frequency
CWON?	Output CW on/off status
SETUP	Display frequency menu
SPAN	Enter frequency span
SPAN?	Output frequency span
SRT	Enter start frequency
SRT?	Output start frequency
STP	Enter stop frequency
STP?	Output stop frequency
SWP	Return to normal sweep mode
SWP?	Output sweep mode

Table 5-8. *Freq Key, Discrete Fill Commands (1 of 1)*

Command	Function
DFD	Done specifying discrete frequency ranges
DFQ	Enter single discrete frequency
DFQ?	Output discrete fill single discrete frequency
FIL	Fill defined discrete frequency range
FRC	Clear all defined discrete frequency ranges
FRI	Enter discrete fill increment frequency
FRI?	Output discrete fill increment frequency
FRP	Enter discrete fill number of points
FRP?	Output discrete fill number of points
FRS	Enter discrete fill start frequency
FRS?	Output discrete fill start frequency

Sweep Key This function provides for entering frequency sweeep values and sweep triggering iinformation. Table 5-9 lists the Sweep commands; Table 5-10 lists the Segmented Sweep commands.

Table 5-9. *Sweep Key Commands (1 of 2)*

Command	Function
ALTS0	Turn alternate sweep mode off
ALTS1	Turn alternate sweep mode on
ALTSX?	Output alternate sweep mode on/off status
CHOPMODE?	Output chop mode type status
FLICK0	Turn flickering off
FLICK1	Turn flickering on
FLICKX?	Output flickering on/off status
FSWP	Select frequency sweep
HC0	Disable internal IF calibration
HC1	Enable internal IF calibration and trigger an IF calibration
HCT	Trigger an IF calibration
HCX?	Output internal IF calibration enable/disable status
PERPORT	Select per port as chop mode type
RSTFSWP	Restore full sweep
SPA0	Spur avoidance mode off
SPA1	Spur avoidance mode on
SPARAM	Select All S-params as chop mode type
SPAX?	Output spur avoidance mode on/off status
SWPC0	Turn off chop sweep mode
SWPC1	Turn on chop sweep mode
SWPCX?	Output chop sweep mode on/off
SWPT	Enter sweep time
SWPT0	Turn off sweep time measurement
SWPT1	Turn on sweep time measurement
SWPT?	Output sweep time
SWPTMA	Set auto sweep time mode
SWPTMM	Set manual sweep time mode
SWPTMX?	Output sweep time mode
SWPTX?	Output sweep time measurement on/off status
SWPX?	Output sweep type selection
TEB	Select external trigger executes *DDT definition
TEX	Select external measurement triggering
TEXS	Select external measurement sweep triggering
TEXSB	Select external measurement sweep triggering and execute trigger buffer

Table 5-9. *Sweep Key Commands (2 of 2)*

Command	Function
TIB	Select GPIB measurement triggering
TIBS	Select GPIB measurement sweep triggering
TIBSB	Select GPIB measurement sweep triggering and execute trigger buffer
TIN	Select internal measurement triggering
TUNE0	Turn tune mode off
TUNE1	Turn tune mode on
TUNESWP	Enter number of sweeps in tune mode
TUNESWP?	Output number of sweeps in tune mode
TUNEX?	Output tune mode on/off status
TXX?	Output trigger source

Table 5-10. *Sweep Key, Segmented Sweep Commands (1 of 2)*

Command	Function
ADDNDSG	Add the next defined segment or go to the next segment
CLRDSG	Clear all the defined segments of the segmented sweep
DELLDSG	Delete the last defined segment of the segmented sweep
DSG?	Output the active defined segment flag ON/OFF status
DSGAVG	Enter the averaging count for the active defined segment
DSGAVG?	Output the averaging count of the active defined segment
DSGDFD	Done specifying discrete frequency ranges for the active discrete segment
DSGDFQ	Enter a single discrete frequency for the active discrete segment
DSGDFQ?	Output the discrete fill single discrete frequency for the active discrete segment
DSGFIL	Fill the defined discrete frequency range for the active discrete segment
DSGFRC	Clear all of the defined discrete frequency ranges for the active discrete segment
DSGFRI	Enter the segmented sweep discrete fill increment frequency for the active discrete segment
DSGFRI?	Output the segmented sweep discrete fill increment frequency for the active discrete segment
DSGFRP	Enter the segmented sweep discrete fill number of points for the active discrete segment
DSGFRP?	Output the discrete fill number of points for the active discrete segment
DSGFRS	Enter the discrete fill start frequency for the active discrete segment
DSGFRS?	Output the discrete fill start frequency for the active discrete segment
DSGIFBW10	Set the IFBW to 10 Hz for the active defined segment in the segmented sweep
DSGIFBW100	Set the IFBW to 100 Hz for the active defined segment in the segmented sweep
DSGIFBW10K	Set the IFBW to 10 kHz for the active defined segment in the segmented sweep
DSGIFBW1K	Set the IFBW to 1 kHz for the active defined segment in the segmented sweep
DSGIFBW30	Set the IFBW to 30 Hz for the active defined segment in the segmented sweep
DSGIFBW300	Set the IFBW to 300 Hz for the active defined segment in the segmented sweep
DSGIFBW30K	Set the IFBW to 30 kHz for the active defined segment in the segmented sweep
DSGIFBW3K	Set the IFBW to 3 kHz for the active defined segment in the segmented sweep
DSGIFBWX?	Output the active defined segment IF bandwidth in the segmented sweep
DSGNO	Set the active defined segment number for the segmented sweep
DSGNO?	Output the active defined segment number for the segmented sweep
DSGOFF	Turn the active defined segment flag OFF

Table 5-10. *Sweep Key, Segmented Sweep Commands (2 of 2)*

Command	Function
DSGON	Turn the active define segment flag ON
DSGONDF	Output the number of discrete frequencies
DSGPTS	Enter the number of points for the active defined segment for the segmented sweep
DSGPTS?	Output the number of points of the active defined segment for the segmented sweep
DSGPWR1	Enter the Source 1 power level for the active segment
DSGPWR1?	Output the Source 1 power level of the active segment
DSGPWR2	Enter the Source 2 power level for the active segment
DSGPWR2?	Output the Source 2 power level of the active segment
DSGSTP	Enter the stop frequency of the active defined segment for the segmented sweep
DSGSTP?	Output the start frequency of the active defined segment for the segmented sweep
DSGSTRT	Enter the start frequency of the active defined segment for the segmented sweep
DSGSTRT?	Output the start frequency of the active define segment for the segmented sweep
OSGLOG	Output the current segmented sweep log
PSGLOG	Print the current segmented sweep log
SG?	Output the segmented sweep flag on/off status
SGAPL	Apply the current define definition of the segmented sweep
SGMODE?	Query the segmented sweep define mode
SGOFF	Turn the segmented sweep flag OFF
SGON	Turn the segmented sweep flag ON
SGPTS?	Output the total number of points of all of the applied segments
SGSTP?	Output the stop frequency of the last applied segment
SGSTRT?	Output the start frequency of the first applied segment

Power Key This function provides for entering Source 1 through 4 power values, flat test port power values, receiver setup values, and power sweep values. Table 5-11 lists the source power commands, Table 5-12 lists the receiver calibration commands, and Table 5-13 lists the power sweep commands.

Table 5-11. *Power Key, Source Power Commands (1 of 1)*

Command	Function
FTP1	Enter the target frequency for linear power correction
FTP1?	Output the target frequency for linear power correction
FTP3	Enter the target frequency for linear power correction
FTP3?	Output the target frequency for linear power correction
P1P?	Output approximate power level at port 1
P3P?	Output approximate power level at port 3
PW2	Enter source 2 power level
PW2?	Output source 2 power level
PW3	Enter external source 3 power level
PW3?	Output external source 3 power level
PW4	Enter external source 4 power level
PW4?	Output external source 4 power level
PWR	Enter internal source power level
PWR?	Output internal source power level
SA1	Enter port 1 source attenuator value
SA1?	Output port 1 source attenuator value
SA3	Enter port 3 source attenuator value
SA3?	Output port 3 source attenuator value

Table 5-12. *Power Key, Receiver Calibration Commands (1 of 2)*

Command	Function
BEGR	Begin receiver calibration
EXRCALP1	Select Port 1 as the extended receiver port
EXRCALP2	Select Port 2 as the extended receiver port
EXRCALP3	Select Port 3 as the extended receiver port
EXRCALPX?	Output the extended receiver port selection
EXRCALTYPE?	Output the receiver type for extended receiver operation
EXRRCALTYPE	Select the receiver type REFERENCE for the extended receiver operation
EXTRCALTYPE	Select the receiver type TEST for extended receiver operation
EXTRCLR	Clear all of the extended receiver calibrations
RCALLOG	Output the receiver calibration log

Table 5-12. *Power Key, Receiver Calibration Commands (2 of 2)*

Command	Function
RCALP10	Turn off port 1receiver calibration for receiver type TEST
RCALP11	Turn on port 1 receiver calibration for receiver type TEST
RCALP1DONE?	Output port 1 receiver calibration done status for receiver type TEST
RCALP1X?	Output port 1 receiver calibration on/off status for receiver type TEST
RCALP20	Turn off port 2 receiver calibration for receiver type TEST
RCALP21	Turn on port 2 receiver calibration for receiver type TEST
RCALP2DONE?	Output port 2 receiver calibration done status for receiver type TEST
RCALP2X?	Output port 2 receiver calibration on/off status for receiver type TEST
RCALP30	Turn off port 3 receiver calibration for receiver type TEST
RCALP31	Turn on port 3 receiver calibration for receiver type TEST
RCALP3DONE?	Output port 3 receiver calibration done status for receiver type TEST
RCALP3X?	Output port 3 receiver calibration on/off status for receiver type TEST
RCALRP1	Set receiver calibration receive to port 1
RCALRP2	Set receiver calibration receive to port 2
RCALRP3	Set receiver calibration receive to port 3
RCALRPX?	Output receiver calibration receive port
RCALSP1	Set receiver calibration source to port 1
RCALSP2	Set receiver calibration source to port 2
RCALSP3	Set receiver calibration source to port 3
RCALSPX?	Output receiver calibration source port
RCALTYPE?	Output the receiver type
RRCALP10	Turn Off the Port 1 receiver calibration for the receiver type REFERENCE
RRCALP11	Turn On the Port 1 receiver calibration for the receiver type REFERENCE
RRCALP1DONE?	Output the Port 1 receiver calibration Done status for the receiver type REFERENCE
RRCALP1X?	Output the Port 1 receiver calibration On/Off status for the receiver type REFERENCE
RRCALP20	Turn Off the Port 2 receiver calibration for the receiver type REFERENCE
RRCALP21	Turn On the Port 2 receiver calibration for the receiver type REFERENCE
RRCALP2DONE?	Output the Port 2 receiver calibration Done status for the receiver type REFERENCE
RRCALP2X?	Output the Port 2 receiver calibration On/Off status for the receiver type REFERENCE
RRCALP30	Turn Off the Port 3 receiver calibration for the receiver type REFERENCE
RRCALP31	Turn On the Port 3 receiver calibration for the receiver type REFERENCE
RRCALP3DONE?	Output the Port 3 receiver calibration Done status for the receiver type REFERENCE
RRCALP3X?	Output the Port 3 receiver calibration On/Off status for the receiver type REFERENCE
RRCALTYPE	Select the receiver type REFERENCE
TRCALTYPE	Select the receiver type TEST

Table 5-13. *Power Key, Power Sweep Commands (1 of 2)*

Command	Function
P1CW0	Turn off port 1 CW mode in linear cal
P1CW1	Turn on port 1 CW mode in linear cal
P1CW?	Output port 1 CW mode in linear cal on/off status
P1LCOR0	Turn off port 1 linear cal correction
P1LCOR1	Turn on port 1 linear cal correction
P1LCOR?	Output port 1 linear cal correction on/off status
P1LDONE?	Output port 1 linear power correction Done status
P3CW0	Turn off port 3 CW mode in linear cal
P3CW1	Turn on port 3 CW mode in linear cal
P3CW?	Output port 3 CW mode in linear cal on/off status
P3LCOR0	Turn off port 3 linear cal correction
P3LCOR1	Turn on port 3 linear cal correction
P3LCOR?	Output port 3 linear cal correction on/off status
P3LDONE?	Output port 1 linear power correction done status
PSDP	Enter number of points drawn in power sweep mode
PSDP?	Output number of points drawn in power sweep
PSFP1	Enter number of frequency points to be skipped during linear power correction for source 1
PSFP1?	Output number of frequency points to be skipped during linear power correction for source 1
PSFP3	Enter number of frequency points to be skipped during linear power correction for source 2
PSFP3?	Output number of frequency points to be skipped during linear power correction for source 2
PSLC	Perform power sweep linearity calibration
PSLCP10	Turn power sweep linearity calibration off
PSLCP11	Turn power sweep linearity calibration on
PSLCP1DONE?	Output power sweep linearity calibration done status
PSLCP1X?	Output power sweep linearity calibration on/off status
PSLCP30	Turn power sweep linearity calibration off
PSLCP31	Turn power sweep linearity calibration on
PSLCP3DONE?	Output power sweep linearity calibration done status
PSLCP3X?	Output power sweep linearity calibration on/off status
PSNOP1	Enter port 1 nominal offset in power sweep mode
PSNOP1?	Output port 1 nominal offset in power sweep mode
PSNOP3	Enter port 3 nominal offset in power sweep mode
PSNOP3?	Output port 3 nominal offset in power sweep mode
PSWP	Select power sweep
SINP	Enter single power
SINP0	Turn off single power mode

Table 5-13. *Power Key, Power Sweep Commands (2 of 2)*

Command	Function
SINP1	Turn on single power mode
SINP?	Output single power
SINPX?	Output single power mode on/off status
STEPP	Enter power step
STEPP?	Output power step
STOPP	Enter stop power
STOPP?	Output stop power
STRTP	Enter start power
STRTP?	Output start power

Flat Power Functions

Signal source power correction data produced during this type of MS462X calibration is used to flatten the signal power output from the test set port(s) over a specified frequency range. This feature is used to provide flat test stimulus signals to the device-under-test while performing normal measurements.

This process requires operator intervention. The system operator is guided through a sequence of operations and measurements that make up the flat test port calibration sequence. Before attempting to write a GPIB controlled program to produce this calibration sequence, first become thoroughly familiar with the manual procedure.

Flat test port calibrations require considerable time to perform. The time required is dependent upon the number of points selected; For these calibrations, the GPIB timeout value must be increased accordingly, or the control program must generate an appropriate time delay before executing subsequent commands. See the documentation for your GPIB controller for timeout-setting procedures. Table 5-14 lists the flat test power commands.

Table 5-14. *Power Key, Flat Power Commands (1 of 1)*

Command	Function
FP0	Turn flat power correction off
FP1	Turn flat power correction on
FP1DONE?	Output port 1 flat power correction done status
FP30	Turn port 3 flat power correction off
FP31	Turn port 3 flat power correction on
FP3DONE?	Output port 3 flat power correction done status
FP3X?	Output port 3 flat power correction on/off status
FPX?	Output flat power correction on/off status
PTP	Enter the target power for flat power correction
PTP3	Enter the target power for flat power correction for source 2
PTP3?	Output the target power for flat power correction for
PTP?	Output the target power for flat power correction
PTS	Enter number of points to be skipped during flat power correction
PTS3	Enter number of points to be skipped during flat power correction for source 2
PTS3?	Output number of points to be skipped during flat power correction for source 2
SFC	Perform flat test port calibration
TP1	Select port 1 for flat power correction
TP3	Select port 3 for flat power correction
TPX?	Output selected port for flat power correction

Config (Configuration) Key Functions

This function provides control for the Source(s), values for data points, and settings for measurement hold operations. Table 5-15 lists the source function commands and Table 5-16 lists the multiple source function commands.

Table 5-15. *Config Key Commands (1 of 4)*

Command	Function
ADDSRC2	Enter external source 2 GPIB address
ADDSRC2?	Output external source 2 GPIB address
ADDSRC3	Enter external source 3 GPIB address
ADDSRC3?	Output external source 3 GPIB address
ADDSRC4	Enter external source 4 GPIB address
ADDSRC4?	Output external source 4 GPIB address
AH0	Turn automatic DUT protection off
AH1	Turn automatic DUT protection on
AHX?	Output automatic DUT protection on/off status
BH0	Turn bias off while in hold
BH1	Turn bias on while in hold
BHX?	Output bias on/off during hold status
CWP	Enter number of points drawn in CW
CWP?	Output number of points drawn in CW
EDADD	Select add on to network for embedding/de-embedding
EDADD?	Output Add on to Network or Modify Last Network for embedding/de-embedding
EDE0	Turn Embedding/De-embedding Mode off
EDE1	Turn Embedding/De-embedding Mode on
EDE?	Output Embedding/De-embedding Mode status
EDEAIR	Select air as dielectric type for T-line section
EDEAPP	Apply Embedding/De-embedding Network
EDECAP	Enter capacitance for LC circuit
EDECAP4P1	Enter capacitance 1 for circuit topology in four port embedding/de-embedding
EDECAP4P1?	Output capacitance 1 for circuit topology in four port embedding/de-embedding
EDECAP4P2	Enter capacitance 2 for circuit topology in four port embedding/de-embedding
EDECAP4P2?	Output capacitance 2 for circuit topology in four port embedding/de-embedding
EDECAP?	Output capacitance for LC circuit
EDECKT?	Output embedding/de-embedding network generation method selection
EDECPLS	Select C(P)-L(S) as LC circuit type
EDECSCP	Select C(S)-L(P) as LC circuit type
EDECSLP	Select C(S)-L(P) as LC circuit type

Table 5-15. *Config Key Commands (2 of 4)*

Command	Function
EDECSLP4P	Select C(S)-L(P) as the LC circuit type for the 4-port circuit
EDED	Select de-embedding as embedding/de-embedding method
EDEDEF	Define embedding/de-embedding network
EDEDEF?	Output apply or define embedding/de-embedding network
EDEDIEL	Enter relative dielectric for T-line section
EDEDIEL?	Output relative dielectric for T-line section
EDEDT?	Output dielectric type for T-line section
EDEDUT2	Select 2 port test device for embedding/de-embedding
EDEDUT3	Select 3 port test device for embedding/de-embedding
EDEDUT4	Select 4 port test device for embedding/de-embedding
EDEDUT?	Output device type selection for embedding/de-embeddin
EDEE	Select embedding as embedding/de-embedding method
EDEED?	Output embedding/de-embedding method selection
EDEIMP	Enter impedance for T-line section
EDEIMP?	Output impedance for T-line section
EDEIND	Enter inductance for LC circuit
EDEIND4P	Enter inductance for circuit topology in four port embedding/de-embedding
EDEIND4P?	Output inductance for circuit topology in four port embedding/de-embedding
EDEIND4P2	Enter Inductance 2 for the circuit topology in four-port embedding/de-embedding
EDEIND4P2?	Output Inductance 2 for the circuit topology in four-port embedding/de-embedding
EDEIND?	Output inductance for LC circuit
EDELC	Select LC circuit as embedding/de-embedding network generation method
EDELC?	Output LC circuit type selection
EDELC4P?	Outputs the four-port LC circuit type selection
EDELEN	Enter length for T-line section
EDELEN?	Output length for T-line section
EDELOS	Enter loss for T-line section
EDELOS?	Output loss for T-line section
EDELPCS	Select L(P)-C(S) as LC circuit type
EDELSCP	Select L(S)-C(P) as LC circuit type
EDELSCP4P	Select L(S)-C(P) as the LC circuit type for the four-port circuit
EDEMIC	Select microporous teflon as dielectric type for T-line
EDEMODIFY	Select Modify Last Network for embedding/de-embedding
EDEOTH	Select Other as dielectric type for T-line section
EDEPOLY	Select Polyethylene as dielectric type for T-line section
EDEPORT1	Select port 1 for embedding/de-embedding

Table 5-15. *Config Key Commands (3 of 4)*

Command	Function
EDEPORT12	Select port 1 and port 2 for embedding/de-embedding
EDEPORT2	Select port 2 for embedding/de-embedding
EDEPORT23	Select port 2 and port 3 for embedding/de-embedding
EDEPORT3	Select port 3 for embedding/de-embedding
EDEPORT34	Select port 3 and port 4 for embedding/de-embedding
EDEPORT4	Select port 4 for embedding/de-embedding
EDEPORT?	Output active port number for embedding/de-embedding
EDERST	Reset all ports reference plane for embedding/de-embedding
EDETEF	Select teflon as dielectric type for T-line section
EDETIME	Enter time for T-line section
EDETIME?	Output time for T-line section
EDETLINE	Select T-line section as embedding/de-embedding network
FHI	Set data points to 1601
FLO	Set data points to 101
FME	Set data points to 401
FOF	Blank frequency information
FON	Display frequency information
FOX?	Output frequency information on/off status
IMPCOMPU?	Output computation method selection for impedance transformation
IMPPORT	Enter port number as active for impedance transformation
IMPPORT?	Output active port number for impedance transformation
IMPPOWER	Select power-wave as computation method for impedance transformation
IMPPSEUDO	Select pseudo-wave as computation method for impedance transformation
IMPREACT	Enter reactive term for impedance transformation
IMPREACT?	Output reactiv term for impedance transformation
IMPRESIST	Enter resistive term for impedance transformation
IMPRESIST?	Output resistive term for impedance transformation
IMPTS0	Turn impedance transformation mode off
IMPTS1	Turn impedance transformation mode on
IMPTS?	Output impedance transformation mode status

Table 5-15. *Config Key Commands (4 of 4)*

Command	Function
NP101	Set data points to 101
NP15	Set data points to 15
NP1601	Set data points to 1601
NP201	Set data points to 201
NP3	Set data points to 3
NP401	Set data points to 401
NP51	Set data points to 51
NP801	Set data points to 801
OEDELOG	Output current EDE log
ONP	Output number of points currently being measured
PEDELOG	Print current EDE log
RH0	Select RF off in hold mode
RH1	Select RF on in hold
RHX?	Output RF on/off during hold status
RT0	Turn ripples testing off
RT1	Turn ripples testing on
RT?	Output ripples testing enable status
RTVAL?	Output ripples testing value
SIS0	Turn off simultaneous internal sources mode
SIS1	Turn on simultaneous internal sources mode
SIS2CWF	Enter internal source 2 CW frequency and turn CW on
SIS2CWF?	Output internal source 2 CW frequency
SIS2CWOFF	Turn internal source 2 CW off
SIS2CWON	Turn internal source 2 CW on at current CW frequency
SIS2CWON?	Output internal source 2 CW on/off status
SIS2OFF	Enter internal source 2 offset from source 1 frequency
SIS2OFF?	Output internal source 2 offset from source 1 frequency
SISX?	Output simultaneous internal sources mode on/off
SRC1AC?	Output source 1 active/inactive status

Table 5-16. *Config Key, Multiple Source Commands (1 of 2)*

Command	Function
BD1	Select band 1 for definition
BD2	Select band 2 for definition
BD3	Select band 3 for definition
BD4	Select band 4 for definition
BD5	Select band 5 for definition
BNDRCW?	Output multiple source band receiver CW flag for specified band
BNDRDIV?	Output multiple source band receiver divisor for specified band
BNDRMUL?	Output multiple source band receiver multiplier for specified band
BNDROFF?	Output multiple source band receiver offset for specified band
BNDRSCW?	Output multiple source band receiver source CW flag
BNDRSDIV?	Output multiple source band receiver source divisor
BNDRSMUL?	Output multiple source band receiver source multiplier
BNDRSOFF?	Output multiple source band receiver source offset
BNDS1CW?	Output multiple source band source 1 CW flag for specified band
BNDS1DIV?	Output multiple source band source 1 divisor for specified band
BNDS1MUL?	Output multiple source band source 1 multiplier for specified band
BNDS1OFF?	Output multiple source band source 1 offset for specified band
BNDS2CW?	Output multiple source band source 2 CW flag for specified band
BNDS2DIV?	Output multiple source band source 2 divisor for specified band
BNDS2MUL?	Output multiple source band source 2 multiplier for specified band
BNDS2OFF?	Output multiple source band source 2 offset for specified band
BNDS3CW?	Output multiple source band source 3 CW flag
BNDS3DIV?	Output multiple source band source 3 divisor
BNDS3MUL?	Output multiple source band source 3 multiplier
BNDS3OFF?	Output multiple source band source 3 offset
BNDS4CW?	Output multiple source band source 4 CW flag
BNDS4DIV?	Output multiple source band source 4 divisor
BNDS4MUL?	Output multiple source band source 4 multiplier
BNDS4OFF?	Output multiple source band source 4 offset
BNDSRT?	Output multiple source band start frequency for specified band
BNDSTP?	Output multiple source band stop frequency for specified band
BSP	Enter band stop frequency
BSP?	Output band stop frequency

Table 5-16. *Config Key, Multiple Source Commands (2 of 2)*

Command	Function
BST	Enter band start frequency
BST?	Output band start frequency
CLB	Clear all multiple source band definitions
ECW	Select CW operation for component being edited
ED1	Edit source 1 equation
ED2	Edit source 2 equation
ED3	Edit source 3 equation
ED4	Edit source 4 equation
EDR	Edit receiver equation
EDRS	Edit receiver source equation
EDV	Enter divisor value for equation being edited
EDV?	Output the divisor value for the equation being edited
EDX?	Output equation being edited
EML	Enter multiplier value for equation being edited
EML?	Output multiplier value for equation being edited
EOS	Enter offset frequency for equation being edited
EOS?	Output offset frequency for equation being edited
ESW	Select sweep operation for component being edited
EXW?	Output multiple source sweep flag for equation being edited
LTRD	Output response data from the dedicated GPIB bus
LTWRT	Send program data to the dedicated GPIB bus
MS0	Turn multiple source mode off
MS1	Turn multiple source mode on
MSD	Select multiple source define mode
MSX?	Output multiple source mode on/off/define
PSRC	Enter power source as active
PSRC?	Output active power source
SVB	Save current band definitions

5-8 HOLD KEY

This key holds the measurement trace and prevents it from updating, so that measurement results may be more easily interpreted. Table 5-17 lists the Hold key commands.

Table 5-17. *Hold Key Commands (1 of 1)*

Command	Function
CTN	Continue sweeping from current point
HLD	Put sweep into hold mode
HLD?	Output the sweep hold status

5-9 DEFAULT KEY

This key resets the MS462XX to its factory settings. Table 5-18 lists the Default key commands.

Table 5-18. *Default Key Commands (1 of 1)*

Command	Function
RST	Instrument reset (same as *RST)
RST0	Reset instrument front panel memories and reserved parameters
RST1	Reset instrument and front panel memories

Chapter 6
S-Parameter Calibration Functions

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Chapter 6
S-Parameter Calibration Functions

6-1 INTRODUCTION

This chapter describes the MS462XX S-Paremter error correction (calibration) functions. It describes the commands used to perform the following:

- Specify the calibration method, type, standards, and parameters
- Control the calibration data-taking process

NOTES

See Measurement/Test Signals Group for a description of the flat test port power calibration commands

The MS462XX calibration functions require operator intervention. However, it is possible to use the external controller to guide the operator through the calibration process using a suitable program containing the calibration commands described in this chapter

6-2 RELATED COMMANDS

Related, non-calibration commands used during the calibration process are described in Table 6-1. The use of these commands, in relation to calibration activities, is described throughout this chapter, where appropriate. These command sets are fully described in their respective chapters as indicated in Table 6-1.

NOTE

See **ICx** and **OCx** series commands in the Data Transfer group (Chapter 8) for information on inputting and outputting calibration terms coefficients (error terms).

Table 6-1. *Related Commands*

Command	Command Function Group
FHI, FLO, FME NP3–NP1601	Measurement Group, Data Points (Ch 5)
SRT, STP, CWF, DFQ, DFD, FRS, FRI, FRP, FIL, FRC	Measurement Group, Frequency (Ch 5)
IFV, ICx, OCx	Data Tranfer Group (Ch 8)
*OPC, *OPC?	IEEE 488.2 Group, Synchronization (Ch 8)
All	Measurement, Test Signals (Ch 5)
All	Display, Graph Type (Ch 5)
All	Display, Scaling (Ch 5)
AVG, AOF. AON	Enhancement, Averaging (Ch 5)
IFBW10, IFBW100, IFBW1K, IFBW10K, IFBW30, IFBW300, IFBW3K, IFBW30K, IFA, IFN, IFR, IFM, IF1–IF4	Enhancement, Video IF Bandwidth (Ch 5)
CH1–CH4	Channels Group (Ch 5)

6-3 REQUIRED COMMAND SEQUENCE

A program used to control the calibration process *must* follow a specific order for the GPIB calibration commands that are used. Table 6-2 lists this acceptable order.

Table 6-2. *Calibration Command Ordering*

Order	Item	Typical Commands Used
1	Calibration Type	C12, C8R, C8T, CRB, CRF, CRR, CBT, CFT, CRT, CXX?
2	Calibration Method	SCM, OCM, LCM, TCM, CMX?, SOLT, TRX, CM3PX?, 2PATH3PORT, SOLT4P, TRX4P
3	Line Type	LTC, LTW, LTU, LTX?
4	Isolation Usage	ISN, ISF, ISX?
5	Data Points	NOC, DFC, TDC, CWC, SSC
6	Frequency:*	
	Sweep	SRT, STP
	Discrete Fill	DFQ, DFD, FRS, FRI, FRP, FIL, FRC,
	User Defined List**	IFV
	CW	
7	Test Port Connector	P1C, P2C, P3C
	Connector Type	CMS, CFS, CMK, CFK, CMV, CFV, CMC, CFC, CM2, CF2, CMN, CFN, CM3, CF3, CNG, CMN75, CFN75, CMSP, CFSP
	User Defined Connector	CND, COO, COS, CC0, CC1, CC2, CC3, CL0, CL1, CL2, CL3
	Offset-Short Values	SH1, SH2
8	Reflection Pairing	MAT, MIX, MIX?
9	Load Type/Parameters	SLD, BBL, BBZ, BBZL, BBX?, SLD3P, BBL3P
10	Through Parameters	TOL, TLZ, TOLP3, TOLP23, TOLP14, TOLP24, TOLP34, TRP12OL, TRP13OL, TRP14OL, TRP23OL, TRP24OL, TRP34OL
11	LRL Band	LR2, LR3, LRX?
12	LRL Parameters	RM1, RRP, LL1, LL2, LL3, LM2, LM3, BPF, ROL, RLZ, RGZ, ROLP3, RXZ?, LX3?, RMX?, LX2?, LLIP3, LL2P3
13	Reference Impedance	LLZ
14	Test Signals*	PWR, SA1, SA3, PW2, PW3, PW4
15	Flat Test Port Calibration *	PTP, PTS, SFC, FP0, FP1, FP30, FP31, TP1, TP3, TPX?, FPX?, FP3X?
16	Microstrip Parameters	U10, U15, U25, USW, SBT, SBD, USE, USZ, UTFD, UTFX?
17	Waveguide Param's	WKI, WKD, WCO, WSH1, WSH2, WWX?
18	Begin Calibration (Data Collection)	BEG, BEG3P, BEG4P
19	Take Cal Data	TCD, TC1, TC2
20	Next Cal Step	NCS

* Refer to Chapter 5, "Measurement Group" for details on these commands.
** See Chapter 8, Measurement Points Data Transfer Commands) CWF

6-4 FUNCTIONAL COMMANDS LISTING

Commands used for special types of calibrations are described in Table 6-3. The commands are used to invoke options and non-standard calibration procedures, and to simulate a calibration process.

Table 6-3. *Functional Commands Listing (1 of 2)*

Command	Function	Description
CWC	Specify CW Calibration	This command sets up a continuous wave (CW) calibration. Use CWF to input CW frequency.
DFC	Specify Discrete Frequency Calibration	This command sets up a calibration at discrete frequencies only. Use discrete fill commands to input frequency list for calibration. Refer to Chapter 5, Measurement Functions, paragraph 5-4. Alternatively, the IFV command allows for a frequency list input of calibration frequencies. Refer to "Data Transfer Commands Group (Chapter 8)," for more details.
NOC	Specify Normal Sweep Calibration	This command sets up a normal frequency range calibration.
SSC	Segmented Sweep Calibration	This command selects the segmented sweep calibration data points.
TDC	Time Domain Harmonic Frequency Calibration	This command selects the time domain harmonic frequency calibration data points. Required for low pass time/distance domain measurements. The resulting frequency sweep will consist of harmonic multiples of the start frequency. The Stop frequency is the start frequency times the number of data points selected up to the maximum instrument frequency.
P1C, P2C	Set up to Specify Port 1 (PIC) or Port 2 (P2C) Standards	This command specifies Port 1 or Port 2 as the port to which subsequent connector-related commands will apply. Example: **"P1C;CFK;P2C;CMK"** This sequence of commands sets up a female K connector for port 1 **(P1C CFK)** and a male K connector for port 2 **(P2C CMK).**
CND	Other Connector Specification	This command allows a non-standard connector to be specified. This is the same as selecting OTHER from the front panel menu. When specifying the CND command, the connector offset for the open and/or short device and the capacitance coefficients for the open device also need to be entered to characterize the connector.
SLD, BBL	Specify Sliding Load or Broad Band Load for Calibration	The SLD command specifies a sliding load. The data-taking process for the load includes six slide positions. If any frequencies are below 2 GHz, you must also use a broadband load.
LM2, LM3		These commands are used to select a match for the second or the third device, respectively, during a LRM type calibration.

Table 6-3. *Functional Commands Listing (2 of 2)*

Command	Function	Description
A3P, A12, A8T, A8R, ARF, AFT, ARB, ARR, ABT, ART, A40, A4P, A24	Calibration simulation	These commands simulate the completion of a calibration. The Axx series commands must be followed with the corresponding calibration error term coefficients using the ICx commands (see Chapter 8). The Axx series commands match up with corresponding calibration type commands. For example, A12 simulates C12, A8T simulates C8T, etc. **NOTE** If you attempt to apply a calibration without first having entered calibration coefficient data, the error correction may not be applied (as indicated by the Apply Cal LED being momentarily turned on, then off).
CON3P, CON4P, CON, COF	Turn on/off vector error correction	These commands are not used during calibration. They are used during normal measurements to apply the current calibration error correction to the measured data (CON) or to turn off error correction calibration (COF).
BEG3P, BEG4P, BEG, TC1, TC2, TCD, NCS, KEC, RPC	Calibration Sequencing and Control commands	These commands are used to start and control the data-taking process. KEC will keep existing calibration error corrections and return to the measurement mode. Command TC1 takes calibration data for the current (calibration) standard for port 1 using a separate forward measurement sweep. Command TC2 performs the same function for port 2 using a separate (reverse) sweep. (Note that command TCD performs these identical operations, using consecutive forward and reverse measurement sweeps.) Using the TC1 and TC2 commands allows one calibration standard of each type to be used for both ports.
U10, U15, U25	Calibration Kit selection commands	These commands are used to select 10, 15, or 25 mil UTF calibration kits respectively. These calibration kits are used to perform a MS462XX calibration for microstrip device measurements.
MAT, MIX	Load match for Reflection devices measurement sequences	The MAT (MATched) command changes the measurement sequence for the standard 12 term, coaxial, two-channel calibration so that the “open” measurements are performed in sequence, followed by the “short” measurements. The MIX (MIXed) command returns to the normal sequence for a two-channel 12 term calibration.

6-5 EXAMPLE PROGRAM

The following is an example of how to set up a calibration sequence for the MS462XX VNMS:

```
"SCM;LTC;C12;DFC;FRS 100 MHZ;FRI 100 MHZ;FRP 21 XX1;
FIL;DFD;P1C;CFK;P2C;CMK;BBL;BEG"
```

This example code sets up a calibration using standard calibration mode (**SCM**), coax cable media (**LTC**), and 12-term calibration type (**C12**). A discrete set of points is defined for frequency operation starting at 1 GHz (**FRS 100 MHZ**), spaced 100 MHz apart (**FRI 100 MHZ**), at 21 consecutive points (**FRP 21 XX1**). This range is confirmed or "filled" (**FIL**), then completed (**DFD**).

The Port 1 test port connector is defined as a female type K connector (**P1C CFK**) and the Port 2 test port connector is defined as a male K type connector (**P2C CMK**). Broadband loads are selected as the default load type (**BBL**). The **BEG** command instructs the MS462XX to begin the calibration-data-taking-process.

The calibration control program should contain commands to control the data-collection portion of the calibration process. Typical commands used for this process are:

- Take Calibration Data for Current Standard (**TCD**, or **TC1**, or **TC2**)
- Go on to the Next Calibration Step **(NCS**)
- Averaging On and Set to Value (**AVG**)
- Set IF Bandwidth to 10 Hz (**IF1**)
- Set IF Bandwidth to 100 Hz (**IF2**)
- Set IF Bandwidth to 1 KHz (**IF3**)
- Set IF Bandwidth to 10 KHz (**IF4**)
- Any Graph Type Specification or Scaling Change
- Active Channel Specification (**CH1–CH4**)

The TCD (or **TC1**, or **TC2**) and **NCS** commands control the data-taking process. Commands **AVG, IFN, IFR, IFA**, and **IFM** control the data-enhancement function used for a particular measurement (refer to Chapter 3, paragraph 6-6, Enhancement Commands).

Before the **TCD** (or **TC1**, or **TC2**) and **NCS** commands are invoked in the program, the system operator must be instructed to perform the *exact* steps necessary to setup the calibration sequence for the type of MS462XX calibration to be used. An example program segment to continue the 12-term calibration started in the previous example is shown on the next page. This example program segment is written in HP-BASIC.

The calibration control program should determine if the MS462XX is ready for the next step of the calibration sequence before prompting the system operator to connect new calibration standards to the test ports. This can be done by monitoring the status byte of the MS462XX or by waiting for the operation to complete after executing the **NCS** command.

For example, the commands in the following example instruct the MS462XX to take calibration data (**TCD**), go to the next calibration step (**NCS**), then output the number "1" (***OPC?**). When the controller is able to read the number "1" from the MS462XX, the calibration step is complete.

```
260 OUTPUT 706;"TCD;NCS;*OPC?"
270 ENTER 706; N$ ! READ AND DISCARD ASCII '1' WHEN
STEP IS COMPLETE
280 DISP "CALIBRATION STEP COMPLETE"
```

6-6 CALIBRATION COMMANDS, LISTING

Table 6-5 provides a listing of the commands used to perform measurement calibrations.

Table 6-5. *Calibration Commands (1 of 9)*

Command	Description
2PATH3PORT	Select 2-path 3-port calibration method
A12	Simulate 12-term calibration
A120	Simulate 12-term calibration and initialize all 2-port correction coefficients
A24	Simulate 3-port calibration
A3P	Simulate 3-port calibration
A3P0	Simulate 3-port calibration and initialize all 3-port correction coefficients
A40	Simulate 4-port calibration
A4P	Simulate 4-port calibration
A4P0	Simulate 4-port calibration and initialize all 4-port correction coefficients
A8R	Simulate 1-path 2-port calibration reverse path
A8T	Simulate 1-path 2-port calibration forward path
ABORTCAL	Abort calibration and keep existing calibration data
ABT	Simulate translation frequency response calibration forward and reverse
ADPL	Enter electrical length for adapter removal
ADPL?	Output electrical length for adapter removal
AFT	Simulate transmission frequency response calibration forward path
ALCERRS1?	Output source 1 ALC calibration error
ALCERRS2?	Output source 2 ALC calibration error
APPC12T?	Output 12 Term calibration done status
APPC3P?	Output 3-port calibration done status
APPC4P?	Output 4-port calibration done status
APRXSTP	Enter approximate stop frequency
APRXSTP?	Output approximate stop frequency
ARB	Simulate reflection only calibration both ports
ARF	Simulate reflection only calibration port 1
ARR	Simulate reflection only calibration port 2
ART	Simulate translation frequency response calibration reverse path
BBL	Select broadband load for calibration
BBLP3	Select broadband load for 3-port calibration
BBLP4	Select broadband load for 4-port calibration
BBX?	Output load type for calibration broadband/sliding load
BBXP3?	Output load type for 3-port calibration broadband/sliding load
BBXP4?	Output load type for 4-port calibration broadband/sliding load
BBZ	Enter broadband load impedance for calibration
BBZ?	Output broadband load impedance for calibration

Table 6-5. *Calibration Commands (2 of 9)*

Command	Description
BBZL	Enter broadband load inductance for calibration
BBZL?	Output broadband load inductance for calibration
BEG	Begin taking calibration data
BEG3P	Begin taking 3-port calibration data
BEG4P	Begin taking 4-port calibration data
BPF	Enter break point frequency for 3 line LRL calibration
BPF?	Output break point frequency for 3 line LRL calibration
C12	Select 12 term calibration
C8R	Select 1-path 2-port calibration reverse path
C8T	Select 1-path 2-port calibration forward path
CBT	Select translation frequency response calibration forward and reverse
CC0	Enter capacitance coefficient 0 for open
CC0?	Output capacitance coefficient 0 for open
CC1	Enter capacitance coefficient 1 for open
CC1?	Output capacitance coefficient 1 for open
CC2	Enter capacitance coefficient 2 for open
CC2?	Output capacitance coefficient 2 for open
CC3	Enter capacitance coefficient 3 for open
CC3?	Output capacitance coefficient 3 for open
CDATTN0?	Output port 1 attenuation of power sweep mode from selected cal memory
CDATTN2?	Output port 3 attenuation of power sweep mode from selected cal memory
CDCALTP?	Output 2-port cal type from selected cal memory
CDCON?	Output port 1 connector from selected cal memory
CDCWF?	Output cw mode frequency from selected cal memory
CDEND1?	Output end power for power source 1 or end frequency from selected cal memory
CDEND2?	Output end power for power source 2 from selected cal memory
CDEND3?	Output end power for power source 3 from selected cal memory
CDEND4?	Output end power for power source 4 from selected cal memory
CDFREQ?	Output cal data freq list from selected cal memory
CDFSW?	Output sweep type from selected cal memory
CDLNTP?	Output line type from selected cal memory
CDNOP1?	Output port 1 nominal offset of power sweep mode from selected cal memory
CDNOP3?	Output port 3 nominal offset of power sweep mode from selected cal memory
CDNUM?	Output data number of power/frequency from selected cal memory
CDP2CON?	Output port 2 connector from selected cal memory
CDP3CALTP?	Output 3-port cal type from selected cal memory
CDP3CON?	Output port 3 connector from selected cal memory
CDP4CALTP?	Output 4-port cal type from selected cal memory
CDP4CON?	Output port 4 connector from selected cal memory

Table 6-5. *Calibration Commands (3 of 9)*

Command	Description
CDPTS?	Output cal data points from selected cal memory
CDPTSPWR?	Output cal data point of power sweep mode from selected cal memory
CDSRC2PWR?	Output power in power source 2 from selected cal memory
CDSRCPWR?	Output power in power source 1 from selected cal memory
CDSTEP?	Output min power/frequency step from selected cal memory
CDSTRT1?	Output start power for power source 1 or start frequency from selected cal memory
CDSTRT2?	Output start power for power source 2 from selected cal memory
CDSTRT3?	Output start power for power source 3 from selected cal memory
CDSTRT4?	Output start power for power source 4 from selected cal memory
CF2	Select female 2.4mm connector for current port
CF3	Select female GPC-3.5 connector for current port
CF716	Select female Type 7/16 connector for current port
CFC	Select female TNC connector for current port
CFK	Select female K Connector for current port
CFN	Select female Type N connector for current port
CFN75	Select female Type N 75-ohm connector for current port
CFS	Select female SMA connector for current port
CFSP	Select special female connector for current port
CFT	Select transmission frequency response calibration forward path
CFV	Select female V Connector for current port
CL0	Enter inductive coefficient 0 for short
CL0?	Output inductive coefficient 0 for short
CL1	Enter inductive coefficient 1 for short
CL1?	Output inductive coefficient 1 for short
CL2	Enter inductive coefficient 2 for short
CL2?	Output inductive coefficient 2 for short
CL3	Enter inductive coefficient 3 for short
CL3?	Output inductive coefficient 3 for short
CM2	Select male 2.4mm connector for current port
CM3	Select male GPC-3.5 connector for current port
CM3PX?	Output calibration method for 3-port cal
CM4PX?	Output calibration method for 4-port calibration
CM716	Select male Type 7/16 connector for current port
CMC	Select male TNC connector for current port
CMK	Select male K Connector for current port
CMN	Select male N connector for current port
CMN75	Select male Type N 75-Ohm connector for current port
CMS	Select male SMA connector for current port
CMSP	Select special male connector for current port

Table 6-5. *Calibration Commands (4 of 9)*

Command	Description
CMV	Select male V Connector for current port
CMX?	Output calibration method
CND	Select user specified connector for current port
CNG	Select GPC-7 connector for current port
COF	Turn 2 and 3-port error correction and Flexible Cal off
CON	Turn 2-port error correction on
CON3P	Turn 3-port error correction on
CON3P?	Output 3-port error correction on/off status
CON4P	Turn 4-port error correction on
CON4P?	Output 4-Port error correction on/off status
CON?	Output 2-port error correction on/off status
CONCC0?	Output capacitance coefficient 0 of open device for specified connector
CONCC1?	Output capacitance coefficient 1 of open device for specified connector
CONCC2?	Output capacitance coefficient 2 of open device for specified connector
CONCC3?	Output capacitance coefficient 3 of open device for specified connector
CONOPOFF?	Output offset of open device for specified connector
CONOPSER?	Output serial number of open device for specified connector
CONSHANG?	Output angle of short device for specified connector
CONSHOFF?	Output offset of short device for specified connector
CONSHSER?	Output serial number of short device for specified connector
COO	Enter offset for open for user specified connector
COO?	Output offset for open for user specified connector
COS	Enter offset for short for user specified connector
COS?	Output offset for short for user specified connector
CRB	Select reflection only calibration both ports
CRF	Select reflection only calibration port 1
CRR	Select reflection only calibration port 2
CRT	Select transmission frequency response calibration reverse path
CSF?	Output calibration start frequency
CSWP?	Output sweep mode for calibration
CTF?	Output calibration stop frequency
CWC	Select CW frequency calibration data points
CXX?	Output calibration type
DFC	Select discrete frequency calibration data points
IARF	Enter adapter removal files from GPIB and calibrate
ISF	Exclude isolation
ISN	Include isolation
ISX?	Output isolation calibration selected true/false
KEC	Keep existing calibration data

Table 6-5. *Calibration Commands (5 of 9)*

Command	Description
LCM	Select LRL calibration method
LDARF	Load adapter removal files from disk and calibrate
LL1	Enter length of line 1 for LRL calibration
LL1?	Output length of line 1 for LRL calibration
LL1P3	Enter length of line 1 for 3-port TRX calibration
LL1P3?	Output length of line 1 for 3-port TRX calibration
LL2	Enter length of line 2 for LRL calibration
LL2?	Output length of line 2 for LRL calibration
LL2P3	Enter length of line 2 for 3-port TRX calibration
LL2P3?	Output length of line 2 for 3-port TRX calibration
LL3	Enter length of line 3 for LRL calibration
LL3?	Output length of line 3 for LRL calibration
LLZ	Enter line impedance for LRL calibration
LLZ?	Output line impedance for LRL calibration
LM2	Select a match for the second device during a LRM type calibration
LM3	Select a match for the third device during a LRM type calibration
LR2	Specify 2 line LRL calibration
LR3	Specify 3 line LRL calibration
LRX?	Output line selection for LRL calibration 2 line/3 line
LTC	Select coaxial transmission line for calibration
LTU	Select microstrip transmission line for calibration
LTW	Select waveguide transmission line for calibration
LTX?	Output line type
LX2?	Output device for line 2 of LRL calibration line/match
LX3?	Output device for line 3 of LRL calibration line/match
MAT	Select matched reflective devices during calibration
MIX	Select mixed reflective devices during calibration
MIX?	Output reflective devices selection during calibration
MIXP3	Set port 3 to be mixer port when source 2 using
MIXP4	Set port 4 to be mixer port when source 2 using
MIXPORT?	Output mixer port when source 2 using
NCS	Go to next calibration step
NOC	Select normal calibration data points
NPX?	Output number of points currently being measured
NUS3P	Select Don't Use existing 3-port calibration
OCM	Select offset short calibration method
P1C	Select port 1 for connector specification
P1C?	Output port 1 connector type
P2C	Select port 2 for connector specification

Table 6-5. *Calibration Commands (6 of 9)*

Command	Description
P2C?	Output port 2 connector type
P3C	Select port 3 for connector specification
P3C?	Output port 3 connector type
P4C	Select port 4 for connector specification
P4C?	Output port 4 connector type
RESTARTCAL	Restart application calibration measurement
RGZ	Select reflective device greater than Z0
RLZ	Select reflective device less than Z0
RM1	Select reference plane at line 1 midpoint
RMX?	Output reference plane location for LRL calibration
ROL	Enter reflective device offset length
ROL?	Output reflective device offset length
ROLP3	Enter reflective device offset length for 3-port TRX calibration
ROLP3?	Output reflective device offset length for 3-port TRX
ROLP4	Enter reflective device offset length for 4-port TRX calibration
ROLP4?	Output reflective device offset length for 4-port TRX calibration
RPC	Repeat previous calibration
RPCHAN	Select Per Channel for reference plane
RPCPX?	Output reference plane Per Channel/Port status
RPPORT	Select Per Port for reference plane
RRP	Select reference plane at reflection plane
RXZ?	Output reflective device type in LRL calibration greater/less than Z0
SBD	Enter substrate dielectric for microstrip calibration
SBD?	Output substrate dielectric for microstrip calibration
SBT	Enter substrate thickness for microstrip calibration
SBT?	Output substrate thickness for microstrip calibration
SCM	Select standard calibration method
SH1	Set offset short 1 or 2 offset length for offset short calibration
SH1?	Output offset short 1 offset length
SH2	Set offset short 1 or 2 offset length for offset short calibration
SH2?	Output offset short 2 offset length
SLD	Select sliding load for calibration
SLDP3	Select sliding load for 3-port calibration
SLDP4	Select sliding load for 4-port calibration
SOLT	Select SOLT calibration method
SOLT4P	Select SOLT calibration method for 4-port calibration
SSC	Select the segmented sweep calibration data points
SYSZ0?	Output system impedance
TC1	Take calibration data for port 1

Table 6-5. *Calibration Commands (7 of 9)*

Command	Description
TC2	Take calibration data for port 2
TCD	Take calibration data on one or both ports as necessary
TCM	Select TRM calibration method
TDC	Select time domain harmonic frequency calibration data points
TENMHZERR?	Output 10 MHz calibration max error
THRU23	Include port 2, 3 thru/reciprocal measurement
THRU23?	Output selection of include or omit port 2, 3 thru/reciprocal measurement
THRU23N	Omit port 2, 3 thru/reciprocal measurement
THRU24	Include port 2, 4 thru/reciprocal measurement
THRU24?	Output selection of include or omit port 2, 4 thru/reciprocal measurement
THRU24N	Omit port 2, 4 thru/reciprocal measurement
THRU34	Include port 3, 4 thru/reciprocal measurement
THRU34?	Output selection of include or omit port 3, 4 thru/reciprocal measurement
THRU34N	Omit port 3, 4 thru/reciprocal measurement
TLZ	Enter thru line impedance for calibration
TLZ?	Output thru line impedance for calibration
TOL	Enter thru offset/reciprocal length for calibration
TOL?	Output thru offset/reciprocal length for calibration
TOLP14	Enter port 1, 4 thru offset/reciprocal length for 4-port calibration
TOLP14?	Output port 1, 4 thru offset/reciprocal length for 4-port calibration
TOLP23	Enter port 2, 3 thru offset/reciprocal length for 3-port calibration
TOLP23?	Output port 2, 3 thru offset/reciprocal length for 3-port calibration
TOLP24	Enter port 2, 4 thru offset/reciprocal length for 4-port calibration
TOLP24?	Output port 2, 4 thru offset/reciprocal length for 4-port calibration
TOLP3	Enter thru offset/reciprocal length for 3-port calibration
TOLP34	Enter port 3, 4 thru offset/reciprocal length for 4-port calibration
TOLP34?	Output port 3, 4 thru offset/reciprocal length for 4-port calibration
TOLP3?	Output thru offsett/reciprocal length for 3-port calibration
TRP12D?	Query the port 1, 2 device type
TRP12DR	Set the port 1, 2 device type to RECIPROCAL
TRP12DT	Set the port 1, 2 device type to THRU
TRP12OL	Enter the thru/reciprocal offset length for port 1, 2
TRP12OL?	Output the thru/reciprocal offset length for port 1, 2
TRP13D?	Query the port 1, 3 device type
TRP13DR	Set the port 1, 3 device type to RECIPROCAL
TRP13DT	Set the port 1, 3 device type to THRU
TRP13I	Include the port 1, 3 thru/reciprocal measurement
TRP13I?	Output the selection of omit or include for the port 1, 3 thru/reciprocal measurement
TRP13O	Omit the port 1, 3 thru/reciprocal measurement

Table 6-5. *Calibration Commands (8 of 9)*

Command	Description
TRP13OL	Enter the thru/reciprocal offset length for port 1, 3
TRP13OL?	Output the thru/reciprocal offset length for port 1, 3
TRP14D?	Query the port 1, 4 device type
TRP14DR	Set the port 1, 4 device type to RECIPROCAL
TRP14DT	Set the port 1, 4 device type to THRU
TRP14I	Include the port 1, 4 thru/reciprocal measurement
TRP14I?	Output the selection of omit or include for the port 1, 4 thru/reciprocal measurement
TRP14O	Omit the port 1, 4 thru/reciprocal measurement
TRP14OL	Enter the thru/reciprocal offset length for port 1, 4
TRP14OL?	Output the thru/reciprocal offset length for port 1, 4
TRP23D?	Query the port 2, 3 device type
TRP23DR	Set the port 2, 3 device type to RECIPROCAL
TRP23DT	Set the port 2, 3 device type to THRU
TRP23I	Include the port 2, 3 thru/reciprocal measurement
TRP23I?	Output the selection of omit or include for the port 2, 3 thru/reciprocal measurement
TRP23O	Omit the port 2, 3 thru/reciprocal measurement
TRP23OL	Enter the thru/reciprocal offset length for port 2, 3
TRP23OL?	Output the thru/reciprocal offset length for port 2, 3
TRP24D?	Query the port 2, 4 device type
TRP24DR	Set the port 2, 4 device type to RECIPROCAL
TRP24DT	Set the port 2, 4 device type to THRU
TRP24I	Include the port 2, 4 thru/reciprocal measurement
TRP24I?	Output the selection of omit or include for the port 2, 4 thru/reciprocal measurement
TRP24O	Omit the port 2, 4 thru/reciprocal measurement
TRP24OL	Enter the thru/reciprocal offset length for port 2, 4
TRP24OL?	Output the thru/reciprocal offset length for port 2, 4
TRP34D?	Query the port 3, 4 device type
TRP34DR	Set the port 3, 4 device type to RECIPROCAL
TRP34DT	Set the port 3, 4 device type to THRU
TRP34I	Include the port 3, 4 thru/reciprocal measurement
TRP34I?	Output the selection of omit or include for the port 3, 4 thru/reciprocal measurement
TRP34O	Omit the port 3, 4 thru/reciprocal measurement
TRP34OL	Enter the thru/reciprocal offset length for port 3, 4
TRP34OL?	Output the thru/reciprocal offset length for port 3, 4
TRX	Select TRX calibration method
TRX4P	Select TRX calibration method for 4-port calibration
U10	Select 10 mil UTF calibration kit
U15	Select 15 mil UTF calibration kit
U25	Select 25 mil UTF calibration kit

Table 6-5. *Calibration Commands (9 of 9)*

Command	Description
US3P	Select use existing 3-port calibration
US3P?	Output selection of use existing 3-port calibration or not
USE	Enter effective dielectric for microstrip calibration
USE?	Output effective dielectric for microstrip calibration
USW	Enter microstrip width for microstrip calibration
USW?	Output microstrip width for microstrip calibration
USZ	Enter microstrip impedance for microstrip calibration
USZ?	Output microstrip impedance for microstrip calibration
UTFD	Select user defined microstrip calibration kit
UTFX?	Output microstrip cal kit selection USER/U10/U15/U25
WCO	Enter waveguide cutoff frequency for user defined kit
WCO?	Output waveguide cutoff frequency for user defined kit
WGCUTOFF?	Output the waveguide cal kit cutoff frequency
WGSER?	Output waveguide cal kit serial number
WGSHOFF1?	Output the waveguide cal kit short 1 offset
WGSHOFF2?	Output the waveguide cal kit short 2 offset
WKD	Select user defined waveguide calibration kit
WKI	Select installed waveguide calibration kit
WKX?	Output waveguide calibration kit selection user/install
WSH1	Enter waveguide short offset 1 for user defined kit
WSH1?	Output waveguide short 1 offset for user defined kit
WSH2	Enter waveguide short offset 2 for user defined kit
WSH2?	Output waveguide short 2 offset for user defined kit

6-7 AUTOCAL® FUNCTION

This function requires an optional AutoCal module that provides an automated method for performing fast, repeatable high-quality calibrations. The AutoCal module is inserted between the VNMS test ports to perform the calibration. The commands for implementing this function remotely are provided in Table 6-6.

Table 6-6. *AutoCal Function Commands (1 of 4)*

Command	Description
AC2PBTYPE	Set AutoCal to 2-port box type
AC4PBTYPE	Set AutoCal to 4-port box type
ACAA	Set AutoCal standard to assurance
ACADIR1	Enter directivity 1 for AutoCal assurance limits
ACADIR1?	Output directivity 1 for AutoCal assurance limits
ACADIR2	Enter directivity 2 for AutoCal assurance limits
ACADIR2?	Output directivity 2 for AutoCal assurance limits
ACADIR3	Enter directivity 3 for AutoCal assurance limits
ACADIR3?	Output directivity 3 for AutoCal assurance limits
ACADPL	Enter adapter length for AutoCal
ACADPL?	Output adapter length for AutoCal
ACADR	Set AutoCal type to adapter removal
ACADTL	Adapter connected to “LEFT” port of the 2-port AutoCal box
ACADTR	Adapter connected to “RIGHT” port of the 2-port AutoCal box
ACADTX?	Output adapter removal port “LEFT” or “RIGHT” in the 2-port AutoCal box that the adapter is connected to
ACAL1R2	Set adapter removal port to ADAPT & L=1 and R=2
ACALM1	Enter load match 1 for AutoCal assurance limits
ACALM1?	Output load match 1 for AutoCal assurance limits
ACALM2	Enter load match 2 for AutoCal assurance limits
ACALM2?	Output load match 2 for AutoCal assurance limits
ACALM3	Enter load match 3 for AutoCal assurance limits
ACALM3?	Output load match 3 for AutoCal assurance limits
ACAP?	Output ports configuration for AutoCal assurance limits
ACAR1L2	Set adapter removal port to ADAPT & R=1 and L=2
ACARET1	Enter reflection tracking 1 for AutoCal assurance limits
ACARET1?	Output reflection tracking 1 for AutoCal assurance limits
ACARET2	Enter reflection tracking 2 for AutoCal assurance limits
ACARET2?	Output reflection tracking 2 for AutoCal assurance limits
ACARP?	Output adapter removal port configuration for AutoCal
ACAS?	Output AutoCal assurance status
ACASRC1	Enter source match 1 for AutoCal assurance limits
ACASRC1?	Output source match 1 for AutoCal assurance limits
ACASRC2	Enter source match 2 for AutoCal assurance limits

Table 6-6. *AutoCal Function Commands (2 of 4)*

Command	Description
ACASRC2?	Output source match 2 for AutoCal assurance limits
ACASRC3	Enter source match 3 for AutoCal assurance limits
ACASRC3?	Output source match 3 for AutoCal assurance limits
ACATRT1	Enter transmission tracking 1 for AutoCal assurance limits
ACATRT1?	Output transmission tracking 1 for AutoCal assurance limits
ACATRT2	Enter transmission tracking 2 for AutoCal assurance limits
ACATRT2?	Output transmission tracking 2 for AutoCal assurance limits
ACAVNA1	Set adapter connected to port 1
ACAVNA2	Set adapter connected to port 2
ACAVNAPX?	Output adapter removal port configuration for AutoCal
ACBTYPE?	Output AutoCal 2-port or 4-port box type
ACDEF	Include isolation
ACF2P?	Output port selection for full 2-port AutoCal
ACF2TC	Set the AutoCal full 2-port Thru type to calibrator
ACF2TT	Set the AutoCal full 2-port Thru type to True Thru
ACF2TX?	Output full 2-port Thru type for AutoCal
ACHFD	Save AutoCal characterization to floppy disk
ACHHD	Save AutoCal characterization to hard disk
ACIAX?	Output AutoCal isolation yes/no setting
ACISO	Enter number of averaging for isolation
ACISO?	Output number of averaging for isolation
ACL1AR2	Set adapter removal port to L=1 and ADAPT & R=2
ACL1R2	Set the AutoCal ports to L=1 and R=2
ACLO	Enter number of averaging for load
ACLO?	Output number of averaging for load
ACLOAD	Set AutoCal standard to load
ACOMIT	Omit isolation
ACOPEN	Set AutoCal standard to open
ACP1?	Output port 1 configuration for AutoCal
ACP2?	Output port 2 configuration for AutoCal
ACP2L	Set the AutoCal port to LEFT for reflection only cal, port 2
ACP2R	Set the AutoCal port 2 to RIGHT for reflection only cal, port 2
ACPA	Select AutoCal port A for reflection only cal
ACPATH?	Output AutoCal connected path
ACPB	Select AutoCal port B for reflection only cal
ACPC	Select AutoCal port C for reflection only cal
ACPCFG	Enter string to setup port configuration for 4 Port AutoCal Box
ACPCFG?	Output port configuration for 4 Port AutoCal Box
ACPL	Set the AutoCal port to LEFT

Table 6-6. *AutoCal Function Commands (3 of 4)*

Command	Description
ACPR	Set the AutoCal port to RIGHT
ACPX	Select AutoCal port X for reflection only cal
ACPX?	Output AutoCal port selected for reflection only cal
ACPXA	Set AutoCal connected path to port X-A
ACPXB	Set AutoCal connected path to port X-B
ACPXC	Set AutoCal connected path to port X-C
ACR1AL2	Set adapter removal port to R=1 and ADAPT & L=2
ACR1L2	Set the AutoCal ports to R=1 and L=2
ACRFL	Enter number of averaging for reflection
ACRFL?	Output number of averaging for reflection
ACS11	Set AutoCal type to S11
ACS11S22	Set AutoCal type to both S11 and S22
ACS22	Set AutoCal type to S22
ACSF2P	Set AutoCal type to full 2-port
ACSF3P	Set AutoCal type to full 3-port
ACSF4P	Set AutoCal type to full 4-port
ACSHORT	Set AutoCal standard to short
ACSTD?	Output AutoCal standard
ACSTMEA	Continue AutoCal Thru update
ACTHRU	Set AutoCal standard to Thru
ACTHRU12T0	Do port 1, 2 thru measurement using AutoCal THRU or omit THRU depending on the port configuration
ACTHRU12T1	Do port 1, 2 thru measurement using TRUE THRU
ACTHRU12X?	Output selection of port 1, 2 thru measurement
ACTHRU13T0	Do port 1, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration
ACTHRU13T1	Do port 1, 3 thru measurement using TRUE THRU
ACTHRU13X?	Output selection of port 1, 3 thru measurement
ACTHRU14T0	Do port 1, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration
ACTHRU14T1	Do port 1, 4 thru measurement using TRUE THRU
ACTHRU14X?	Output selection of port 1, 4 thru measurement
ACTHRU23T0	Do port 2, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration
ACTHRU23T1	Do port 2, 3 thru measurement using TRUE THRU
ACTHRU23X?	Output selection of port 2, 3 thru measurement
ACTHRU24T0	Do port 2, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration
ACTHRU24T1	Do port 2, 4 thru measurement using TRUE THRU
ACTHRU24X?	Output selection of port 2, 4 thru measurement
ACTHRU34T0	Do port 3, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration

Table 6-6. *AutoCal Function Commands (4 of 4)*

Command	Description
ACTHRU34T1	Do port 3, 4 thru measurement using TRUE THRU
ACTHRU34X?	Output selection of port 3, 4 thru measurement
ACTOLP12	Enter port 1, 2 thru line length for AutoCal
ACTOLP12?	Output port 1, 2 thru offset length for AutoCal
ACTOLP13	Enter port 1, 3 thru line length for AutoCal
ACTOLP13?	Output port 1, 3 thru offset length for AutoCal
ACTOLP14	Enter port 1, 4 thru line length for AutoCal
ACTOLP14?	Output port 1, 4 thru offset length for AutoCal
ACTOLP23	Enter port 2, 3 thru line length for AutoCal
ACTOLP23?	Output port 2, 3 thru offset length for AutoCal
ACTOLP24	Enter port 2, 4 thru line length for AutoCal
ACTOLP24?	Output port 2, 4 thru offset length for AutoCal
ACTOLP34	Enter port 3, 4 thru line length for AutoCal
ACTOLP34?	Output port 3, 4 thru offset length for AutoCal
ACTUAVG	Enter number of averaging for AutoCal Thru update
ACTUAVG?	Output number of averaging for AutoCal Thru update
ACTULS	Apply last Thru update calibration setup
ACX?	Output AutoCal type
BEGAC	Initialize an AutoCal measurement
BEGACA	Start AutoCal assurance
BEGCH	Start AutoCal characterization
BEGTU	Start AutoCal Thru update
IACCHAR	Input AutoCal characterization data from the GPIB
OACCHAR	Output AutoCal characterization data to the GPIB
OACCSER2P	Output the AutoCal characterization serial number for 2-port AutoCal
OACCSER4P	Output the AutoCal characterization serial number for 4-port AutoCal
OACSER	Output AutoCal box serial number
OACTYPE	Output AutoCal box type

6-8 FLEXIBLE CALIBRATION

Table 6-7 provides a listing of the commands used to perform Flexible Calibrations.

Table 6-7. *Flexible Cal Function Commands (1 of 3)*

Command	Description
CDFXCALTP?	Output Flexible Cal calibration type
CFFX?	Query Flexible Cal define mode
CFXI?	Output Flexible Cal input method
CFXICU	Select Flexible Customize Cal
CFXIFU	Select Flexible Full Term Cal
CFXIRF	Select Flexible Reflection Cal
CONFX	Turn flexible error correction on
CONFX?	Output flexible error correction on/off status
EX2RF0	Turn external source 2 RF off
EX2RF1	Turn external source 2 RF on
EX3RF0	Turn external source 3 RF off
EX3RF1	Turn external source 3 RF on
EX4RF0	Turn external source 4 RF off
EX4RF1	Turn external source 4 RF on
FXAPL	Apply Flexible Cal
FXP1T0	Turns off Port 1 selection. Do not apply correction to any S-parameter involving port 1
FXP1T1	Turns on Port 1 selection. Correct S11, If in full term cal input method
FXP1T?	Query Port 1 selection for Flexible Cal
FXP2T0	Turns off Port 2 selection. Do not apply correction to any S-parameter involving port 2
FXP2T1	Turns on Port 2 selection. Correct S22, If in full term cal input method
FXP2T?	Query Port 2 selection for Flexible Cal.
FXP3T0	Turns off Port 3 selection. Do not apply correction to any S-parameter involving port 3
FXP3T1	Turns on Port 3 selection. Correct S33, If in full term cal input method
FXP3T?	Query Port 3 selection for Flexible Cal
FXP4T0	Turns off Port 4 selection. Do not apply correction to any S-parameter involving port 4
FXP4T1	Turns on Port 4 selection. Correct S44, If in full term cal input method
FXP4T?	Query Port 4 selection for Flexible Cal
FXS11T0	Turn off S11 selection for Flexible Cal
FXS11T1	Turn on S11 selection for Flexible Cal
FXS11T?	Output S11 selection on/off
FXS12T0	Turn off S12 selection for Flexible Cal
FXS12T1	Turn on S12 selection for Flexible Cal
FXS12T?	Output S12 selection on/off
FXS13T0	Turn off S13 selection for Flexible Cal
FXS13T1	Turn on S13 selection for Flexible Cal
FXS13T?	Output S13 selection on/off

Table 6-7. *Flexible Cal Function Commands (2 of 3)*

Command	Description
FXS14T0	Turn off S14 selection for Flexible Cal
FXS14T1	Turn on S14 selection for Flexible Cal
FXS14T?	Output S14 selection on/off
FXS21T0	Turn off S21 selection for Flexible Cal
FXS21T1	Turn on S21 selection for Flexible Cal
FXS21T?	Output S21 selection on/off
FXS22T0	Turn off S22 selection for Flexible Cal
FXS22T1	Turn on S22 selection for Flexible Cal
FXS22T?	Output S22 selection on/off
FXS23T0	Turn off S23 selection for Flexible Cal
FXS23T1	Turn on S23 selection for Flexible Cal
FXS23T?	Output S23 selection on/off
FXS24T0	Turn off S24 selection for Flexible Cal
FXS24T1	Turn on S24 selection for Flexible Cal
FXS24T?	Output S24 selection on/off
FXS31T0	Turn off S31 selection for Flexible Cal
FXS31T1	Turn on S31 selection for Flexible Cal
FXS31T?	Output S31 selection on/off
FXS32T0	Turn off S32 selection for Flexible Cal
FXS32T1	Turn on S32 selection for Flexible Cal
FXS32T?	Output S32 selection on/off
FXS33T0	Turn off S33 selection for Flexible Cal
FXS33T1	Turn on S33 selection for Flexible Cal
FXS33T?	Output S33 selection on/off
FXS34T0	Turn off S34 selection for Flexible Cal
FXS34T1	Turn on S34 selection for Flexible Cal
FXS34T?	Output S34 selection on/off
FXS41T0	Turn off S41 selection for Flexible Cal
FXS41T1	Turn on S41 selection for Flexible Cal
FXS41T?	Output S41 selection on/off
FXS42T0	Turn off S42 selection for Flexible Cal
FXS42T1	Turn on S42 selection for Flexible Cal
FXS42T?	Output S42 selection on/off
FXS43T0	Turn off S43 selection for Flexible Cal
FXS43T1	Turn on S43 selection for Flexible Cal
FXS43T?	Output S43 selection on/off
FXS44T0	Turn off S44 selection for Flexible Cal
FXS44T1	Turn on S44 selection for Flexible Cal
FXS44T?	Output S44 selection on/off

Table 6-7. *Flexible Cal Function Commands (3 of 3)*

Command	Description
FXSOFF	Turn off all the S-parameters when Flexible Cal is being applied
FXSON	Turn on all the S-parameters when Flexible Cal is being applied

Chapter 7
Markers and Limits Functions

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Chapter 7
Markers and Limits Functions

7-1 INTRODUCTION

This chapter describes markers and limits commands.

7-2 MARKERS

The commands listed in Table 7-1 (next page) control the location and display of the markers and the functions related to the markers. A full description of each command mnemonic is contained in Chapter 11, Command Dictionary.

A marker is turned on whenever any of the following conditions occur:

- When the marker is set to a value.

  Example: **"MK2 2 GHZ"**

- When the marker is selected for readout.

  Example: **"MR2"**

- When the marker is selected as the delta reference marker (left).

  Example: **"DR2 2.5632 GHZ"**

MMN and MMX Commands — The MMN and MMX commands move the active marker to the minimum and maximum trace values on the active channel, respectively. There must be an active marker selected for these command to execute.

Example: **"WFS;MR1;MMX"**

This code instructs the MS462XX to:

- Wait for a full sweep of data to be present (WFS).
- Turn on marker 1 and select it for readout (MR1).
- Move marker 1 to the maximum value of the trace on the active channel (MMX).

Table 7-1. *Marker Commands (1 of 5)*

Command	Description
AMKR	Select active marker on all channels marker mode
BWL3	Set bandwidth loss value to 3 dB
BWLS	Enter bandwidth loss value
BWLS?	Output bandwidth loss value
DR1	Select Marker 1 as delta reference marker
DR10	Select Marker 10 as delta reference marker
DR11	Select Marker 11 as delta reference marker
DR12	Select Marker 12 as delta reference marker
DR2	Select Marker 2 as delta reference marker
DR3	Select Marker 3 as delta reference marker
DR4	Select Marker 4 as delta reference marker
DR5	Select Marker 5 as delta reference marker
DR6	Select Marker 6 as delta reference marker
DR7	Select Marker 7 as delta reference marker
DR8	Select Marker 8 as delta reference marker
DR9	Select Marker 9 as delta reference marker
DRF	Turn delta reference mode on
DRO	Turn delta reference mode off
DRO?	Output delta reference mode on/off status
DRX?	Output delta reference marker number
DSF0	Disable filter shape factor calculation
DSF1	Enable filter shape factor calculation
DSFX?	Output filter shape factor calculation enable/disable status
DSQ0	Disable filter Q calculation
DSQ1	Enable filter Q calculation
DSQX?	Output filter Q calculation enable/disable status
FLTBW?	Output filter bandwidth
FLTC?	Output filter center frequency
FLTL?	Output filter loss at reference value
FLTQ?	Output filter Q
FLTS?	Output filter shape factor
FMKR	Select filter parameters marker mode
M10C	Set CW mode at marker 10 frequency
M10E	Set sweep/zoom end to marker 10 frequency distance or time
M10S	Set sweep/zoom start to marker 10 frequency distance or time
M11C	Set CW mode at marker 11 frequency
M11E	Set sweep/zoom end to marker 11 frequency distance or time

Table 7-1. *Marker Commands (2 of 5)*

Command	Description
M11S	Set sweep/zoom start to marker 11 frequency distance or time
M12C	Set CW mode at marker 12 frequency
M12E	Set sweep/zoom end to marker 12 frequency distance or time
M12S	Set sweep/zoom start to marker 12 frequency distance or time
M1C	Set CW mode at marker 1 frequency
M1E	Set sweep/zoom end to marker 1 frequency distance or time
M1S	Set sweep/zoom start to marker 1 frequency distance or time
M2C	Set CW mode at marker 2 frequency
M2E	Set sweep/zoom end to marker 2 frequency distance or time
M2S	Set sweep/zoom start to marker 2 frequency distance or time
M3C	Set CW mode at marker 3 frequency
M3E	Set sweep/zoom end to marker 3 frequency distance or time
M3S	Set sweep/zoom start to marker 3 frequency distance or time
M4C	Set CW mode at marker 4 frequency
M4E	Set sweep/zoom end to marker 4 frequency distance or time
M4S	Set sweep/zoom start to marker 4 frequency distance or time
M5C	Set CW mode at marker 5 frequency
M5E	Set sweep/zoom end to marker 5 frequency distance or time
M5S	Set sweep/zoom start to marker 5 frequency distance or time
M6C	Set CW mode at marker 6 frequency
M6E	Set sweep/zoom end to marker 6 frequency distance or time
M6S	Set sweep/zoom start to marker 6 frequency distance or time
M7C	Set CW mode at marker 7 frequency
M7E	Set sweep/zoom end to marker 7 frequency distance or time
M7S	Set sweep/zoom start to marker 7 frequency distance or time
M8C	Set CW mode at marker 8 frequency
M8E	Set sweep/zoom end to marker 8 frequency distance or time
M8S	Set sweep/zoom start to marker 8 frequency distance or time
M9C	Set CW mode at marker 9 frequency
M9E	Set sweep/zoom end to marker 9 frequency distance or time
M9S	Set sweep/zoom start to marker 9 frequency distance or time
MK1	Enter marker 1 frequency distance or time and turn on
MK10	Enter marker 10 frequency distance or time and turn on
MK10?	Output marker 10 frequency distance or time
MK11	Enter marker 11 frequency distance or time and turn on
MK11?	Output marker 11 frequency distance or time
MK12	Enter marker 12 frequency distance or time and turn on
MK12?	Output marker 12 frequency distance or time

Table 7-1. *Marker Commands (3 of 5)*

Command	Description
MK1?	Output marker 1 frequency distance or time
MK2	Enter marker 2 frequency distance or time and turn on
MK2?	Output marker 2 frequency distance or time
MK3	Enter marker 3 frequency distance or time and turn on
MK3?	Output marker 3 frequency distance or time
MK4	Enter marker 4 frequency distance or time and turn on
MK4?	Output marker 4 frequency distance or time
MK5	Enter marker 5 frequency distance or time and turn on
MK5?	Output marker 5 frequency distance or time
MK6	Enter marker 6 frequency distance or time and turn on
MK6?	Output marker 6 frequency distance or time
MK7	Enter marker 7 frequency distance or time and turn on
MK7?	Output marker 7 frequency distance or time
MK8	Enter marker 8 frequency distance or time and turn on
MK8?	Output marker 8 frequency distance or time
MK9	Enter marker 9 frequency distance or time and turn on
MK9?	Output marker 9 frequency distance or time
MKRC	Select interpolated marker functionality
MKRD	Select discrete marker functionality
MKRX?	Output interpolated/discrete marker functionality
MKSL	Marker search left
MKSR	Marker search right
MKT0	Turn marker tracking off
MKT1	Turn marker tracking on
MKTX?	Output marker tracking on/off status
MMN	Move active marker to minimum trace value
MMX	Move active marker to maximum trace value
MO1	Turn off marker 1
MO10	Turn off marker 10
MO11	Turn off marker 11
MO12	Turn off marker 12
MO2	Turn off marker 2
MO3	Turn off marker 3
MO4	Turn off marker 4
MO5	Turn off marker 5
MO6	Turn off marker 6
MO7	Turn off marker 7
MO8	Turn off marker 8

Table 7-1. *Marker Commands (4 of 5)*

Command	Description
MO9	Turn off marker 9
MOF	Turn marker display off
MON	Turn marker display on
MON?	Output marker display on/off status
MR1	Turn marker 1 on and make it the active marker
MR10	Turn marker 10 on and make it the active marker
MR10?	Output marker 10 on/off status
MR11	Turn marker 11 on and make it the active marker
MR11?	Output marker 11 on/off status
MR12	Turn marker 12 on and make it the active marker
MR12?	Output marker 12 on/off status
MR1?	Output marker 1 on/off status
MR2	Turn marker 2 on and make it the active marker
MR2?	Output marker 2 on/off status
MR3	Turn marker 3 on and make it the active marker
MR3?	Output marker 3 on/off status
MR4	Turn marker 4 on and make it the active marker
MR4?	Output marker 4 on/off status
MR5	Turn marker 5 on and make it the active marker
MR5?	Output marker 5 on/off status
MR6	Turn marker 6 on and make it the active marker
MR6?	Output marker 6 on/off status
MR7	Turn marker 7 on and make it the active marker
MR7?	Output marker 7 on/off status
MR8	Turn marker 8 on and make it the active marker
MR8?	Output marker 8 on/off status
MR9	Turn marker 9 on and make it the active marker
MR9?	Output marker 9 on/off status
MRM	Display the Marker Readout menu
MRX?	Output active marker number
MSFH	Enter high loss value for shape factor calculation
MSFH?	Output high loss value for shape factor calculation
MSFL	Enter low loss value for shape factor calculation
MSFL?	Output low loss value for shape factor calculation
MSR0	Select 0 as reference for marker search and bandwidth calculation
MSRD	Select delta reference marker as reference for marker search and bandwidth calculation
MSRM	Select maximum as reference for marker search and bandwidth calculation
MSRMIN	Select min as ref for marker search and bandwidth calculation

Table 7-1. *Marker Commands (5 of 5)*

Command	Description
MSRX?	Output reference selection for marker search and bandwidth calculation
NMKR	Select normal markers on active channel marker mode
OAM1	Output channel 1 active marker value
OAM2	Output channel 2 active marker value
OAM3	Output channel 3 active marker value
OAM4	Output channel 4 active marker value
SD0	Turn marker screen display off
SD1	Turn marker screen display on
SDP0	Turn the power sweep marker screen display OFF
SDP1	Turn the power sweep marker screen display ON
SDPX?	Output the power sweep marker screen display status
SDX?	Output marker screen display status
SMKR	Select marker search marker mode
SMKRMAX	Select marker search maximum
SMKRMIN	Select marker search minimum
SMKRX	Select the marker search x-axis marker mode
SRCH	Enter marker search value
SRCH?	Output marker search value
SRCHFX?	Output the marker search x-value in GHz and the marker failure status
SRCHFXP?	Output the marker search x-value in dBm and the marker failure status in the power sweep mode
SRCHP	Enter marker search value in power sweep mode
SRCHP?	Output marker search value in power sweep mode
SRCHX?	Output the marker search x-value
SRCHXP?	Output the marker search x-value in the power sweep mode
XMKR?	Output marker mode
XMKRP?	Output the power sweep marker mode

7-3 LIMITS

The Limits commands perform the functions that are available via the Display key and Limits menus. Figure 7-1 shows the relationship between the major limits commands and the single and segmented limits displays. The various limit-types are described below and the limits commands are listed in Table 7-2.

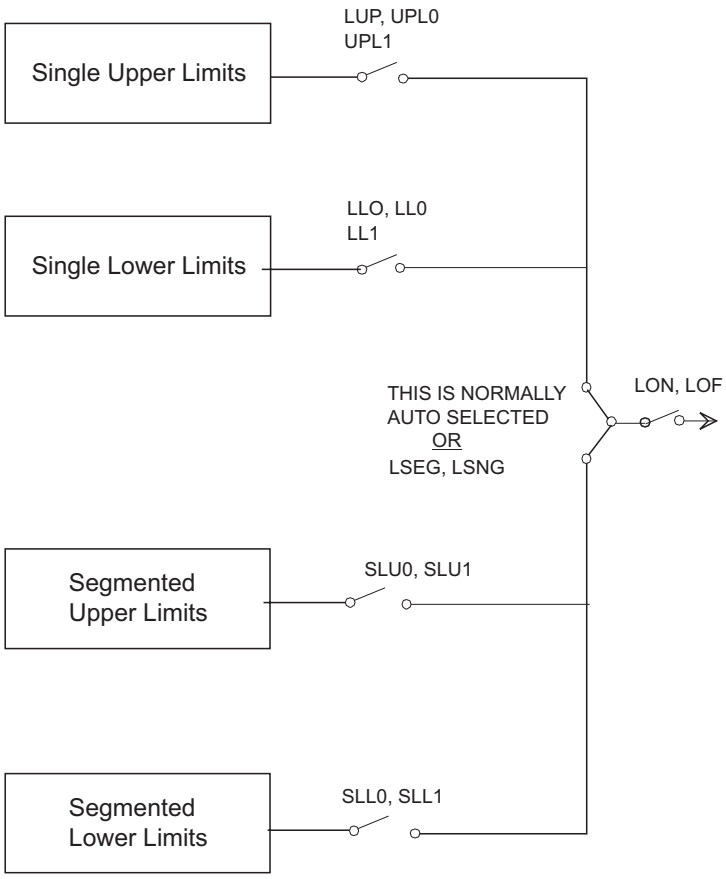

Figure 7-1. *Relationship Between Limits Commands and Limits Displays*

Single (Non-Segmented) Limits

The Non-Segmented Limits Commands do the following:

- Set up the upper and lower limit values for the active channel.
- Set the limit delta for the limit frequency readout function. The range of values and allowable terminator mnemonics are dependent on the graph type of the active channel, much like the SCL and REF commands.

The LFR, LFP, and LFD commands that define limit frequency readouts, are only available on the following graph types: log magni-

tude (MAG), log magnitude and phase (MPH), phase (PHA), linear magnitude (LIN), linear magnitude and phase (LPH), standing wave ratio (SWR), and group delay (DLA). The active channel must be a frequency domain channel. The LFP command can be used to select phase limit frequency readouts on log magnitude and phase and linear magnitude and phase graph types.

To change values for the LFD, LLO, and LUP commands for the bottom graph of two graph display, use the appropriate suffix mnemonic as shown below:

Graph Type	Appropriate Suffix Mneumonic
Log Mag / Phase	DEG / RAD
Lin Mag / Phase	DEG / RAD
Real / Imag	IMU

Segmented Limits Segmented limits (Table 7-4) allow different upper and lower limit values to be set at up to ten segments across the measurement range.

Limits Pass/FailTesting Limits pass/fail testing commands are listed in Table 7-5. These commands are used to produce a beep and/or a TTL voltage at the rear panel External I/O connector when a measurement exceeds any of the set limits (refer to the MS462XX Operation Manual).

NOTE

Pass/fail testing, when turned on, will generate an SRQ (if enabled) whenever a test failure occurs. Refer to Chapter 7, "Status Reporting" for details.

Table 7-2. *Limit Commands (1 of 3)*

Command	Description
ATTN	Attach next segment and make it the active segment
BEGN	Begin next segment and make it the active segment
CAS	Clear active segmented limit vertical/horizontal definitions
CHLFD2?	Output limit frequency readout delta value for bottom graph for specified channel
CHLFD?	Output limit frequency readout delta value for top graph for specified channel
CHLLO2?	Output lower limit value for bottom graph for specified channel
CHLLO?	Output lower limit value for top graph for specified channel
CHLON?	Output limits display on/off status for specified channel
CHLUP2?	Output upper limit value for bottom graph for specified channel
CHLUP?	Output upper limit value for top graph for specified channel
CHSLH?	Output segmented limits horizontal offset for specified channel
CHSLLX?	Output lower segmented limits display on/off status for specified channel
CHSLUX?	Output upper segmented limits display on/off status for specified channel
CHSLV?	Output segmented limits vertical offset for specified channel
DIS	Display active segmented limit
DIS?	Output active segmented limit on/off status
HID	Hide active segmented limit
LB0	Turn limits testing beep on failure off
LB1	Turn limits testing beep on failure on
LBX?	Output limits testing beeper enable status
LFD	Enter limit frequency readout delta value
LFD2	Enter limit frequency readout delta value for bottom graph
LFD2?	Output limit frequency readout delta value for bottom graph
LFD?	Output limit frequency readout delta value
LFP	Select limit frequency readout for phase displays
LFR	Select limit frequency readout for active channel
LLM?	Output limit line display mode single or segmented
LLO	Enter lower limit value for top graph on active channel
LLO2	Enter lower limit value for bottom graph on active channel
LLO2?	Output lower limit value for bottom graph on active channel
LLO?	Output lower limit value for top graph on active channel
LOF	Limits display off
LOL0	Turn lower limit off
LOL1	Turn lower limit on at current value
LOL20	Turn lower limit off for bottom graph
LOL21	Turn lower limit on at current value for bottom graph
LOL2X?	Output lower limit on/off status for bottom graph
LOLX?	Output lower limit on/off status

Table 7-2. *Limit Commands (2 of 3)*

Command	Description
LON	Limits display on
LON?	Output limits display on/off status
LPF1?	Output limit test failure status on channel 1
LPF2?	Output limit test failure status on channel 2
LPF3?	Output limit test failure status on channel 3
LPF4?	Output limit test failure status on channel 4
LPF?	Output limit test failure status all channels
LS1	Set lower segmented limit 1 as the active segment
LS10	Select lower segmented limit 10 as the active segment
LS2	Select lower segmented limit 2 as the active segment
LS3	Select lower segmented limit 3 as the active segment
LS4	Select lower segmented limit 4 as the active segment
LS5	Select lower segmented limit 5 as the active segment
LS6	Select lower segmented limit 6 as the active segment
LS7	Select lower segmented limit 7 as the active segment
LS8	Select lower segmented limit 8 as the active segment
LS9	Select lower segmented limit 9 as the active segment
LSEG	Select segmented limit line display mode
LSNG	Select single limit line display mode
LSX?	Output active segmented limit
LT0	Turn limits testing off
LT1	Turn limits testing on
LT1?	Output limits testing enable status
LTST	Display the limits testing menu
LUP	Enter upper limit value for top graph on active channel
LUP2	Enter upper limit value for bottom graph on active channel
LUP2?	Output upper limit value for bottom graph on active channel
LUP?	Output upper limit value for top graph on active channel
LVH	Select high as limits testing TTL level
LVL	Select low as limits testing TTL level
LVX?	Output limits testing TTL level status
SLC	Clear all segmented limits definitions
SLH	Enter segmented limits horizontal offset
SLH?	Output segmented limits horizontal offset
SLL0	Turn lower segmented limits display off
SLL1	Turn lower segmented limits display on
SLLX?	Output lower segmented limits display on/off status

Table 7-2. *Limit Commands (3 of 3)*

Command	Description
SLU0	Turn upper segmented limits display off
SLU1	Turn upper segmented limits display on
SLUX?	Output upper segmented limits display on/off status
SLV	Enter segmented limits vertical offset
SLV?	Output segmented limits vertical offset
SPH	Enter active segmented limit horizontal stop position
SPH?	Output active segmented limit horizontal stop position
SPV	Enter active segmented limit vertical stop position
SPV?	Output active segmented limit vertical stop position
STH	Enter active segmented limit horizontal start position
STH?	Output active segmented limit horizontal start position
STV	Enter active segmented limit vertical start position
STV?	Output active segmented limit vertical start position
UPL0	Turn upper limit off
UPL1	Turn upper limit on at current value
UPL20	Turn upper limit off for bottom graph
UPL21	Turn upper limit on at current value for bottom graph
UPL2X?	Output upper limit on/off status for bottom graph
UPLX?	Output upper limit on/off status
US1	Select upper segmented limit 1 as the active segment
US10	Select upper segmented limit 10 as the active segment
US2	Select upper segmented limit 2 as the active segment
US3	Select upper segmented limit 3 as the active segment
US4	Select upper segmented limit 4 as the active segment
US5	Select upper segmented limit 5 as the active segment
US6	Select upper segmented limit 6 as the active segment
US7	Select upper segmented limit 7 as the active segment
US8	Select upper segmented limit 8 as the active segment
US9	Select upper segmented limit 9 as the active segment

Chapter 8
Remote-Only Functions

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Table of Contents (Continued)

Chapter 8 Remote-Only Functions

8-1 INTRODUCTION

This chapter describes MS462XX GPIB functions that support operations typically required when in remote mode:

- Data transfers (paragraphs 8-2 through 8-9)
- Error reporting, including the Service Log (paragraphs 8-10 through 8-12)
- Status reporting (paragraphs 8-13, 8-14)
- IEEE 488.2 Common commands (paragraph 8-15)
- Synchronization, Setup, High Speed Trigger Mode, User Message, and Miscellaneous commands (paragraph 8-16 through 8-20).

8-2 DATA TRANSFER PROTOCOL BASICS

There are several basic ideas associated with transferring data between your controller and the MS462XX. This paragraph introduces data transfer terminology, message terminator and separator characters, and data transfer methods (protocols) used by the MS462XX.

GPIB Messages

A GPIB message is any information sent over GPIB to a device. This includes instrument commands or data that you send to or receive from the MS462XX.

Program Message (PM)

This is the message string that your controller *sends to* the MS462XX.

The message can contain commands, queries (or other requests for data transfer), and data strings.

Response Message

This is the data your controller *receives from* the MS462XX.

The data can contain ASCII or binary represented numerical values, character strings or other arbitrary ASCII data, and MS462XX internally represented binary strings.

Separation and Termination Methods

Termination and separation protocols of messages transmitted over the GPIB are specified by the IEEE 488.2 GPIB Standard. The MS462XX conforms to those specifications as described below.

Message Elements Separator

A program or response message can consist of one or more elements, called units. Units are separated with the semi-colon (;) character.

Units in a program message are complete valid MS462XX commands or queries. For example, "**CH1;PHA;SRT 2 GHZ;SRT?**" consist of four commands or queries that make channel 1 active, set it to phase display, sets start frequency to 2 GHz, then outputs the start frequency.

A single unit in a response message is the complete data output in response to a single command. For example, the command sequence "**ONP;CHX?**" Output Number of Points and Output Currently Active Channel, will output a response message that contains two units separated by a semi-colon (;). The first unit of data is the response to the **ONP** command. The second unit of data is the response to the **CHX?** query.

Message Unit Data Separator

The comma (,) character separates multiple ASCII data elements of a single command or response message unit. For example, the command **OM1** Output Marker 1 Value, will output a complex data value (two values, that is, dB and degrees) representing the measurement data at the marker. The two values in the complex data will be separated with a comma.

Message Terminator

A complete program or response message is terminated by sending the linefeed character (0A, or decimal 10) at the same time (concurrent with) setting the EOI state on the GPIB. The notation <0A^END> will be used throughout this Programming Manual to reference the message terminator. Simply put, the message terminator signals the end of transmission.

NOTE

EOI is the GPIB End of Transmission state that is set by the controller, or an instrument, when it is done "talking," i.e. done sending a message on the GPIB and therefore releasing the GPIB for use by another device.

Separation and Termination Example

The following example shows how a program message with multiple units is sent to the MS462XX. Also shown is the response message the MS462XX will send back to the controller.

PROGRAM MESSAGE (to MS462XX):

```
"CH2;LPH;MK6 2.5 GHZ;OM6;OFV".
```

This program message makes channel 2 active (**CH2**), sets it to linear magnitude and phase display (**LPH**), activates and sets marker 6 to 2.5 GHz (**MK6 2.5 GHZ**), outputs its value (**OM6**), then outputs the list of current sweep frequencies (**OFV**).

Response message elements:

<marker 6 dB value>**,**<marker 6 degrees value>**;**<frequency list header> <frequency 1>**,**<frequency 2>**,...,**<frequency 101><0A^EOI>

NOTE

The (< >) characters in the message elements list are not actually transmitted in the response message; they are shown here in the text to distinguish the various data fields from each other.

A representative response from a Model MS4622A:

```
1.00620877743E+00,-3.65609092712E+01;#418
174.00000000000E+7,1.74600000000E+08,...
...,1.35000000000E+100A
```

Response Description:

OM6 outputs 2 ASCII data items (dB,degrees). They are sent separated with a comma (**,**).

The output of **OM6** and **OFV** is separated with a semicolon (**;**). This was done because the external controller requested two outputs before reading the first one from the MS462XX.

NOTE:

Note that certain data transfer commands require that you read their output before another data output command is sent [see <Arbitrary ASCII> format and <Arbitrary Block> format (Example 3), in paragraph 8-3].

The **OFV** command outputs data using the <Arbitrary Block> format (see description in paragraph 8-3). The frequency values are preceded by a <frequency list header> (#41817). This is an ASCII text string that is encoded with the number of 8-bit bytes to follow. This data transmission method, used by the **OFV** and other MS462XX block data transfer commands, allows you to prepare an appropriate size memory block to receive the data in your application.

The first frequency value (2.00000000000E+7) is then transmitted immediately after the header followed by a comma. This continues until all 101 frequency values are transmitted.

NOTE:

The commas are used because the values are in ASCII format. If binary format was selected (see **FMA**, **FMB**, **FMC** format commands, paragraph 8-5), the frequency values would have been sent without commas.

The linefeed character (**0A**) signals the end of transmission at the end of the response message. The end of transmission **(EOI)** is set by the MS462XX at the same time the linefeed is sent and thus the GPIB is released for use by another device.

8-3 DATA TRANSMISSION METHODS

Data transmissions to and from the MS462XX conform to the protocols specified by the IEEE 488.2 GPIB Standard. The 488.2 Standard specifies how any data, such as ASCII numbers, strings, or blocks of data bytes, will be transmitted over the GPIB. This paragraph describes the various transmission methods in use by the MS462XX.

The transmission method names described below (also called notations) will be used throughout the Programming Manual when describing specific MS462XX data transfer commands.

Data transmission notations are easily distinguished in text as they are always shown surrounded by the “less than” and the “greater than” characters (< >). The transmission type notations used in describing various MS462XX data transmissions are:

For ASCII numbers, the notations are:

<NR1>, <NR2>, <NR3>, or <NRf>

For ASCII strings (printable characters and print formatting codes), the notation is:

<ASCII String>

For generic (8-bit) ASCII characters, the notation is:

<ASCII Block>.

For generic binary bytes, (i.e. 8-bit ASCII or binary), the notation is:

<Arbitrary Block>

<NR1>

This notation represents ASCII integer values. A comma (,) is used to separate multiple values sent in a single command's input or output string.

Examples of values that can be represented by <NR1> notation:

1
0
-29,179

<NR2>

This notation represents ASCII floating point values in decimal point format. A comma (,) is used to separate multiple values sent in a single command's input or output string.

Examples of values that can be represented by <NR2> notation:

1.0
-0.00015
12.743,-180.07

<NR3>

This notation represents ASCII floating point values in exponential format (scientific notation). A comma (,) is used to separate multiple values sent in a single command's input or output string.

Examples of values that can be represented by <NR3> notation:

1.0E9
-7.056E3
9.0E-2,3.42E2

<NRf>

This notation is used to signify that data can be in either <NR1>, <NR2>, or <NR3> format as described above.

Examples of values that can be represented by <NRf> notation:

1.0E-9
10.005
-83,4.5E2,-234.9901

<String>

This notation represents a string of 8-bit ASCII characters (including non-printable characters) that is delimited (surrounded) with either single quotes (' ') or double quotes (""). The string can include text formatting characters such as linefeed, space, or carriage return.

Note that if a double quote character must be sent as part of the string, then it must be followed by an additional double quote. Alternatively, the string can be sent using single quotes (See "cal_file" example below).

Examples of data represented by <String> notation:

"1/15/98"
"Save ""cal_file"" now."
'Save "cal_file" now.'

<Arbitrary ASCII>

This notation represents undelimited 8-bit ASCII text. The end of the text must be terminated with the 0A character (decimal 10) and concurrent setting (^) of the GPIB End of Transmission State (EOI). This requirement makes it necessary for <Arbitrary ASCII> text to be transmitted only at the end of a program or response message, i.e. at the end of a multiple input or output statement.

Example of data represented by <Arbitrary ASCII> notation:

ANRITSU,MS4622A,123456,1.0<0A^EOI>

The example shows a sample response from the *IDN?, 488.2 common query. In the example, the instrument identifies itself as a ANRITSU MS4622A, with serial number 123456, and software version 1.0 installed. Note that decimal 10 (0A character) must be sent with the EOI to signal end of transmission

<Arbitrary Block>

This notation represents data that is transmitted as 8-bit data bytes (00–FF hex, 0–255 decimal, notation is <DAB>). This is useful for transmitting large blocks of formatted ASCII or binary data or unformatted binary data. The data stream is immediately preceded by a variable length ASCII header that is encoded with the number of data bytes to be sent. The header always starts with the pound (#) character. Figure 8-1 below describes the header and the transmitted data messages.

#nm$_{1..m_n}$<DAB>$_{1..<DAB>m}$

Where:

# = The pound sign character. Required for binary data transfer.
n = Number of digits to follow ($m_1..m_n$) that make up the number m.
$m_1..m_n$ = Taken together, this makes up the number m which is the number of data bytes to follow that constitute the requested data.
<DAB> = An 8 bit binary data byte. This is the data (or information) being sent.

NOTE

If n = 0, then m is omitted, and transmission end is signaled by sending the linefeed character (0A, or decimal 10) and concurrent setting (^) of the GPIB End Of Transmission State (EOI) immediately following the last <DAB>.

Figure 8-1. *<Arbitrary Block> Data Format*

EXAMPLE 1 : #3204<DAB_1>...<DAB_{204}>

Example 1 shows how 204 8-bit bytes are transmitted using the proper header. The header in this example is comprised of 5 characters (#3204). It begins with the pound character (#). The next character (3) indicates there are 3 digits to follow that indicate the number of bytes being transmitted (204). The next three characters (204) indicate the number of data bytes being transmitted immediately after the header. Next comes the actual data bytes, or information, being transmitted (<DAB_1>...<DAB_{204}>).

EXAMPLE 2: #512808<DAB_1>...<DAB_{12808}>

Example 2 shows how 12808 8-bit bytes are transmitted using the proper header. The header in this example is comprised of 7 characters (#512808). It begins with the pound character (#). The next character (5) indicates there are 5 digits to follow that indicate the number of bytes being transmitted (12808). The next five characters (12808) indicate the number of data bytes being transmitted immediately after the header. Next comes the actual data bytes, or information, being transmitted (<DAB_1>...<DAB_{12808}>).

NOTE:

Examples 1 and 2 above demonstrate the <Arbitrary Block> form referred to as <*Definite* Length Arbitrary Block>. It is so called because the number of data bytes being transmitted is *known* from the encoded header.

EXAMPLE 3: #0<DAB_1>...<DAB_n><0A^EOI>

Example 3 shows how an *unknown* number of 8-bit bytes are transmitted using the proper header. The header in this example is comprised of 2 characters (#0). As usual, the header begins with the pound character (#). The next character (0) indicates there is an unknown number of data bytes being transmitted immediately after the header. Next comes the actual data bytes being transmitted (<DAB_1>...<DAB_n>). The end of the data stream is signaled by sending the linefeed character (0A, or decimal 10) and concurrent setting (^) of the GPIB End of Transmission State (EOI).

NOTES:

Example 3, above, demonstrates a special form of the <Arbitrary Block> referred to as the <*Indefinite* Length Arbitrary Block>. It is so called because the number of data bytes being transmitted is unknown, and therefore can not be encoded in the header. Instead, the header *always* consists of the pound and zero characters (#0) and end of the data stream is *always* signaled by sending the linefeed character (0A, or decimal 10) and concurrent setting (^) of the GPIB End of Transmission State (EOI). This requirement makes it necessary for <*Indefinite* Length Arbitrary Block> text to be transmitted only at the end of a program or response message, i.e. at the end of a multiple input or output statement.

When using this method to input data you must not exceed the MS462XX input buffer size (refer to Chapter 1, Table 1-2.)

Use of indefinite lenght arbitary blocks may result in arbitary memory allocation errors when the blocks are being sent to the instrument. If possible calculate the length and build the header then send it. If it is not feasible to calculate the block lenght use the "WaitForInstr()t" example in chapter 4 (Page 4-12) in between each block.

Three commands are provided to alter the way the arbitrary block header for output data is formed.

FDH0: Specifies that the length of the arbitrary block header will be minimized; that is, the byte count section will not contain leading zeros, thus its length is indeterminate. This means that a program must decode the header in order to skip over it.

FDH1: Specifies that the length of the arbitrary block header will be fixed at 11 characters. This is accomplished by forcing leading zeros as required in the byte count section. This means that a program can skip over the arbitrary block header by skipping 11 characters.

FDH2: Specifies that no arbitrary block header will be sent with the next transmission. This mode is not in compliance with IEEE 488.2 specifications.

FDHX?: FDH mode query.

8-4 SELECTING ASCII OR BINARY DATA FORMATS

The following paragraphs discuss the various data output formats.

- Data transfers *involving* numerical data arrays.
- Data transfers *not involving* numerical data arrays.
- Enhanced ASCII formatting.

Non-Array Data

The formats used for data transfers *not* involving numerical data arrays are preset. They always occur in either binary format or ASCII format, depending on the data.

These data transfers include a variety of information. Examples include: instrument setup strings, marker data, queries, and disk directory listings. See the desired data transfer command description for its applicable data transfer format.

Numerical Data Arrays

Numerical data array transfers are used to transfer the following types of data:

- Measurement data
- Calibration data
- Sweep frequency, time, or distance values.

Each of these data transfer types are individually explained in following paragraphs.

You can select either binary or ASCII format for data transfers involving numerical data arrays. The five commands described below will select and keep the format for all subsequent transfers (these commands are also listed and described in Table 8-1).

ASCII Format:

FMA: ASCII formatted values represented in <NR1>, <NR2>, <NR3>, or <NRf> formats as described in paragraph 8-3. The MS462XX will accept any of the above formats as input. It will *always* output values using <NR3> exponential format with each value represented using 18 characters, plus a comma to separate multiple values.

Binary Format:

FMB: Each *eight* consecutive data bytes represent one floating point value in IEEE 754 64-bit format (double precision, 8 byte, floating point value).

FMC: Each *four* consecutive data bytes represent one floating point value in IEEE 754 32-bit format (single precision, 4 byte, floating point value).

FMX?: FMA, FMB, FMC format selection query.

MSB: Byte ordering is *most* significant byte first. For use only with FMB and FMC. This the default byte ordering mode for the MS462XX.

LSB: Byte ordering is *least* significant byte first. For use with FMB and FMC. This is required for transferring data to/from Intel/IBM based computers.

XSB?: MSB, LSB format selection query.

FMT0: Turn ASCII enhancement off (normal default mode).

FMT1: Turn ASCII enhancement on.

FMTX?: ASCII enhancement ON/OFF status query.

Enhanced ASCII Formatting

Enhanced ASCII formatting can be applied to both non-array ASCII data and numerical data arrays in the FMA format when this data is output within an <arbitrary block> format. The format selectively replaces comma data element separators with a line feeds (ASCII 10) in order to enhance the visual effect. Figure 8-2 provides two examples of this enhanced structure.

8-5 DATA TRANSFER COMMANDS

Data transfer commands are grouped into the following catagories: Formatting, Calibration Coefficient, Measured Points, Measured Data, Error and Status Reporting. The formatting commands are shown in Table 8-1; the remaining commands are described and listed elsewhere in this chapter.

A Note On Query Commands

Query commands are a special form of data transfer commands. They are used to query (or output) a variety of MS462XX setup parameters. For example, **SRT?** will output the current sweep start frequency. Query command mnemonics typically closely resemble the corresponding setup command mnemonic but with an added question mark (?). For example, **CH1** is used to set the active channel to channel 1, **CHX?** is used to query the currently active channel setting. Query commands are listed in their respective Command Function Group chapter. For example, since **SRT?** queries a Measurement Function, it will be listed in Chapter 5, Measurement Group.

Error And Status Reporting Commands Commands associated with transferring error and status reporting data are described in detail in paragraphs 8-10 and 8-13 respectively.

An unenhanced directory listing

```
#9000000392Directory of  C:\   1-30-96  13:03,UTIL         <DIR>        1-25-96  12:58,PLOT
     BMB      38462   1-22-96  14:41,PLOT     BMC     307446   1-22-96  14:41,TTT      CAL
           44174   1-22-96  17:02,TTT2     CAL      44174   1-22-96  17:16,PLOT1    DAT
             10323   1-22-96  14:03,PLOT1    HGL      19899   1-22-96  14:02,PLOT2    HGL
                 38462   1-25-96  13:16,8 Files          502940 Bytes
```

An enhanced directory listing

```
#9000000392
Directory of  C:\   1-30-96  13:03
UTIL         <DIR>        1-25-96  12:58
PLOT     BMB      38462   1-22-96  14:41
PLOT     BMC     307446   1-22-96  14:41
TTT      CAL      44174   1-22-96  17:02
TTT2     CAL      44174   1-22-96  17:16
PLOT1    DAT      10323   1-22-96  14:03
PLOT1    HGL      19899   1-22-96  14:02
PLOT2    HGL      38462   1-25-96  13:16
8 Files          502940 Bytes
```

An unenhanced response to OCD

```
#9000000189-9.99750733376E-01, 3.21409821510E-01, 3.60706359148E-01, 9.82860028744E-01, 7.7
6742696762E-01,-5.06587028503E-01,-5.07535457611E-01,-8.45697641373E-01,-6.10321164131E-01,
 6.05827927589E-01
```

An enhanced response to OCD

```
#9000000189
-9.99750733376E-01, 3.21409821510E-01
 3.60706359148E-01, 9.82860028744E-01
 7.76742696762E-01,-5.06587028503E-01
-5.07535457611E-01,-8.45697641373E-01
-6.10321164131E-01, 6.05827927589E-01
```

Figure 8-2. *Examples of Enhanced ASCII Formatting*

8-6 FORMATTING COMMANDS

The formatting commands describe specific ASCII and binary data formats. They are discussed in pagraph 8-4 and listed in Table 8-1.

Table 8-1. *Formatting Commands*

Command	Description
FDH0	Select variable length arbitrary block headers
FDH1	Select fixed length arbitrary block headers
FDH2	Select zero length arbitrary block headers
FDHX?	Output arbitrary block header length selection
FMA	Select ASCII data transfer format
FMB	Select IEEE754 64 bit data transfer format
FMC	Select IEEE754 32 bit data transfer format
FMT0	Select normal ASCII data element delimiting
FMT1	Select enhanced ASCII data element delimiting
FMTX?	Output ASCII data element delimiting mode
FMX?	Output data output mode FMA FMB or FMC
LSB	Select least significant byte first binary transfer
MSB	Select most significant byte first binary transfer
XSB?	Output byte order for output data LSB or MSB

8-7 MEASURED POINTS DATA COMMANDS

The Measured Points Data commands are listed in Table 8-2. These commands are described in the following paragraphs.

The OFV command

Output Frequency Values, will output the current sweep measurement frequencies.

The OTV command

Output Time Values, and the **ODV** command - Output Distance Values, will output the current time domain sweep measurement points.

The IFV command

Used to input a user defined set of frequencies for measurement or calibration.

NOTE

The **IFV** command will delete the existing sweep frequency list and replace it with the newly input list. Therefore all existing calibration data will be lost.

The ONP command

Output Number of Points, can be used to allocate enough memory in your program to receive the measurement frequencies. For example, sending "**ONP**;**OFV**" to the MS462XX when a 401 data point sweep is in progress will output the ASCII value 401. This value can now be used to set up an array of the correct size to receive the output of the **OFV** command.

Table 8-2. *Sweep Measurement Points Data Transfer Commands*

Command	Description
ODV	Output distance values for time domain
OFV	Output frequency values
OGCFV	Output gain compression frequency values to GPIB
ONDF	Output number of discrete frequencies
ONPV	Output the number of power sweep power values
OTV	Output time values for time domain

Sweep Measurement Points Data Transfer Example

The following is an example of Sweep Measurement Points Data Transfer commands usage:

```
"NP101;FMB;LSB;OFV"
```

These commands will perform the following functions:

NP101 will set up a 101 point sweep.

FMB will output data using 64-bit (eight bytes) floating-point format.

LSB causes data bytes to be output least significant byte first. This is for compatibility with INTEL/IBM based computer/controllers. If using other types of controllers that represent data in most significant byte format, then use the **MSB** command.

OFV uses the <Arbitrary Block> format. It will output the current list of measurement frequencies, f_1 thru f_{101}, using eight bytes each, in the example shown. The ASCII header (#3808), which shows that 808 data bytes follow, precedes the frequency values. The linefeed character (0A, decimal 10) signals the end of the data block.

EXAMPLE:

#3808<f_1, 8 bytes>...<f_{101}, 8 bytes>0A

NOTE:
The (< >) characters are not output from the MS462XXX. They are used in the text above to distinguish each frequency's 8 byte segments.

8-8 CALIBRATION COEFFICIENTS DATA TRANSFER

The Calibration Coefficients Data Transfer commands are listed in Table 8-3. These commands are described in the following paragraphs.

The **OCx** and **ICx** commands provide for outputting and inputting calibration error terms (coefficients). The **ONCT** command outputs the number of error terms available for the currently set calibration. For example, **ONCT** would output the number 12 for a 12-Term calibration and 2 for a Transmission Frequency Response calibration. The ordering of the calibration error terms for the various calibration types is shown in Chapter 12, Table 12-3. For example, to output the ETF error term from a 12-Term calibration use the **OC4** command.

The **ICx** commands are used to input user defined calibration error terms. The MS462XX must be prepared to accept the appropriate calibration error terms using the Simulate Calibration commands, such as **A12**, **A8T**, etc.. These commands use the same mnemonic syntax as their related calibration selection commands (which are used to actually perform a calibration), except they start with the letter "A" instead of "C". For example, the **A12** command is used to simulate a 12-Term calibration where as the command **C12** is used to actually perform a 12-Term calibration. Similarly, the **A8T** command is used to simulate a 1 Path 2 Port FWD calibration where as the command **C8T** is used to actually perform a 1 Path 2 Port FWD calibration. Refer to Chapter 12, Table 12-3 and to Chapter 6, “Calibration Functions” for more information about calibration coefficients, and performing calibrations).

Calibration error terms (coefficients) are output, or expected as input, only for the currently defined set of sweep frequencies. If data points are not at the maximum values set during calibration and/or the frequency range has been zoomed-in (with error correction turned on), not all calibration coefficients will be output or used as input. Refer to paragraph 8-6, “Measurement Points Data Commands,” for details on outputting the current sweep measurement points.

If an attempt is made to transfer an unavailable calibration error term, that is, the EXR term from a Reflection Only calibration, the MS462XX will issue an Execution Error (refer to paragraph 8-10, “The MS462XX Error Reporting System”).

Calibration Coefficients Data Transfer Example

The following is an example usage of Calibration Coefficients Data Transfer commands:

```
"NP101;ONCT;FMB;LSB;OC1"
```

These commands will perform the following functions:

NP101 will set up a 101 point sweep. This is only allowed if the calibration was done with at least 101 points in the sweep.

ONCT will output the number 12, since there are 12 error terms in a 12-term calibration.

The MS462XX will then output a semi-colon (**;**) to separate the **ONCT** output data from the oncoming **OC1** data.

FMB will output the calibration data using 64-bit (eight bytes) floating-point format.

LSB causes data bytes to be output least significant byte first. This is for compatibility with INTEL/IBM based computer/controllers. If using other types of controllers that represent data in most significant byte format, then use the **MSB** command.

OC1 uses the <Arbitrary Block> format. It will output 101 real and imaginary data pairs (202 values). Each two consecutive values, 8 bytes each, represent the error term EDF at each measurement point. The total number of bytes expected (1616) is encoded in the ASCII header (#41616). The linefeed character (0A, decimal 10) signals the end of the data block.

EXAMPLE:

12**;**#41616<f_1 EDF real, 8 bytes> <f_1, EDF imaginary, 8 bytes> <f_2 EDF real, 8 bytes> <f_2, EDF imaginary, 8 bytes>...
....<f_{101}, EDF real, 8 bytes> <f_{101}, EDF imaginary, 8 bytes>**0A**

NOTES:

The (< >) characters shown in the example are not output from the MS462XX. They are used in the text above to distinguish each 8 byte data segments.

Note the number 12, output in response to the **ONCT** command, and the semi-colon separator, that precede the EDF data output.

Your program can now iteratively issue and output the remaining 11 error terms using the commands **OC2**, **OC3**, ..., **OC12**.

Table 8-3. *Calibration Coefficients Data Transfer Commands (1 of 3)*

Command	Description
IC1	Enter calibration coefficient 1
IC10	Enter calibration coefficient 10
IC11	Enter calibration coefficient 11
IC12	Enter calibration coefficient 12
IC13	Enter calibration coefficient 13
IC14	Enter calibration coefficient 14
IC15	Enter calibration coefficient 15
IC16	Enter calibration coefficient 16
IC17	Enter calibration coefficient 17
IC18	Enter calibration coefficient 18
IC19	Enter calibration coefficient 19
IC2	Enter calibration coefficient 2
IC20	Enter calibration coefficient 20
IC21	Enter calibration coefficient 21
IC22	Enter calibration coefficient 22
IC23	Enter calibration coefficient 23
IC24	Enter calibration coefficient 24
IC3	Enter calibration coefficient 3
IC4	Enter calibration coefficient 4
IC5	Enter calibration coefficient 5
IC6	Enter calibration coefficient 6
IC7	Enter calibration coefficient 7
IC8	Enter calibration coefficient 8
IC9	Enter calibration coefficient 9
ICA	Enter calibration coefficient 10
ICB	Enter calibration coefficient 11
ICC	Enter calibration coefficient 12
ICL	Enter all applicable calibration coefficients for cal type
OC1	Output calibration coefficients 1
OC10	Output calibration coefficients 10
OC11	Output calibration coefficients 11
OC12	Output calibration coefficients 12
OC13	Output calibration coefficients 13
OC14	Output calibration coefficients 14
OC15	Output calibration coefficients 15
OC16	Output calibration coefficients 16
OC17	Output calibration coefficients 17

Table 8-3. *Calibration Coefficients Data Transfer Commands (2 of 3)*

Command	Description
OC18	Output calibration coefficients 18
OC19	Output calibration coefficients 19
OC2	Output calibration coefficients 2
OC20	Output calibration coefficients 20
OC21	Output calibration coefficients 21
OC22	Output calibration coefficients 22
OC23	Output calibration coefficients 23
OC24	Output calibration coefficients 24
OC3	Output calibration coefficients 3
OC4	Output calibration coefficients 4
OC5	Output calibration coefficients 5
OC6	Output calibration coefficients 6
OC7	Output calibration coefficients 7
OC8	Output calibration coefficients 8
OC9	Output calibration coefficients 9
OCA	Output calibration coefficient 10
OCB	Output calibration coefficient 11
OCC	Output calibration coefficient 12
OCL	Output all applicable calibration coefficients for calibration type
ONCP	Output number of points for current calibration
ONCT	Output number of calibration terms for current calibration
ICL3P	Enter additional 12 calibration coefficients for 3 port
OCL3P	Output additional 12 calibration coefficients for 3 port
IC25	Enter calibration coefficient 25
IC26	Enter calibration coefficient 26
IC27	Enter calibration coefficient 27
IC28	Enter calibration coefficient 28
IC29	Enter calibration coefficient 29
IC30	Enter calibration coefficient 30
IC31	Enter calibration coefficient 31
IC32	Enter calibration coefficient 32
IC33	Enter calibration coefficient 33
IC34	Enter calibration coefficient 34
IC35	Enter calibration coefficient 35
IC36	Enter calibration coefficient 36
IC37	Enter calibration coefficient 37
IC38	Enter calibration coefficient 38
IC39	Enter calibration coefficient 39

Table 8-3. *Calibration Coefficients Data Transfer Commands (3 of 3)*

Command	Description
IC40	Enter calibration coefficient 40
OC25	Output calibration coefficient 25
OC26	Output calibration coefficient 26
OC27	Output calibration coefficient 27
OC28	Output calibration coefficient 28
OC29	Output calibration coefficient 29
OC30	Output calibration coefficient 30
OC31	Output calibration coefficient 31
OC32	Output calibration coefficient 32
OC33	Output calibration coefficient 33
OC34	Output calibration coefficient 34
OC35	Output calibration coefficient 35
OC36	Output calibration coefficient 36
OC37	Output calibration coefficient 37
OC38	Output calibration coefficient 38
OC39	Output calibration coefficient 39
OC40	Output calibration coefficient 40

8-9 MEASURED DATA COMMANDS

The Measured Data commands are listed in Table 8-4 . These commands are described in the following paragraphs.

The measurement data transfer commands are used to transfer S-parameter values to or from the currently active channel. Only the currently set number of measurement points will be output or expected as input. Refer to paragraph 8-7, “Sweep Measured Points Data Transfer,” for details on outputting the current sweep measurement points.

The **OAM1-OAM4, OFD/IFD** and **OM1-OM12** commands - Output/Input Final Display Formatted Data or marker value, transfer data values in the currently selected graph type units. If a dual graph type is displayed, such as Log Magnitude and Phase, the data for each measurement point will be a pair of values. In the case of Log Magnitude and Phase, the data pair would be (dB value, degrees value). If a single graph type is displayed, such as Log Magnitude only, the data for each measurement point will be a single value, in this case (dB value).

The **DPR1** command - Data Pair Format On, modifies the **OAM1-OAM4, OFD/IFD** and **OM1-OM12** commands to transfer a complex data pair *when in a single graph type* display (that is, Phase only). Necessarily though, since it was not an actually measured value, the additional value will be set to zero. The output values for each graph type selection for both the DPRx modes are listed in Table 8-5.

NOTE:
The **DPR1** format will remain in effect until the MS462XX receives the **DPR0** command that is, Data Pair Format Off. This mode is the default data transfer format.

For example, if the current graph type is Phase only, "**DPR1;OFD**" would output data pairs in the same format as if Magnitude and Phase dual graph type was currently displayed, but with the magnitude value set to zero (0, degrees value). Similarly, if the current graph type is Log Magnitude only, "**DPR1;OFD**" would output data pairs in the same format as if the Magnitude and Phase dual graph type was currently selected, but with the phase value set to zero (dB value, 0).

The **DPR1** functionality is useful in developing a single data transfer procedure in your application program for processing all data output commands; since they mostly transfer a data pair. This includes the **OAM1-OAM4, OFD**, **IFD**, and **OM1-OM12** measurement data transfer commands discussed here, and the **ICx** and **OCx** series commands (refer to paragraph 8-8, "Calibration Coefficient Data Transfer").

NOTE

Use the **MK1?-MK6?** queries to output the marker frequency. Refer to Chapter 7 for full details on Markers.

The **ORD** command - Output Raw Data, and the **OCD**/**ICD** commands Output/Input Corrected Data all transfer data in real and imaginary pairs (real value, imag value). Raw data is uncorrected measurement data from a sweep without a calibration applied. Corrected data is measurement data which has been corrected according to the currently applied calibration type.

When S-parameter data input to the MS462XX is complete (**ICD** and **IFD**) the MS462XX redraws the parameter on the active channel using this data.

NOTE:

Always place the MS462XX in hold (**HLD**) prior to inputting data using the **IFD** or **ICD** commands. This is to prevent the newly input data from being overwritten by subsequent sweeps.

Measurement Data Transfer Example

The following is an example usage of Measurement Data Transfer commands:

```
"NP101;CH2;MAG;TRS;WFS;HLD;FMC;LSB;OFD"
```

NP101 will set up a 101 point sweep. If a calibration is applied, this will only be allowed if the calibration was done with at least 101 points.

CH2 makes channel 2 the active channel for all subsequent channel specific commands.

MAG displays S-parameter data in Log Magnitude format on the active channel.

TRS triggers a new sweep.

WFS waits for a full sweep to ensure the data is valid. A full sweep is a complete forward sweep and a complete reverse sweep when a 12-term calibration is applied. It also includes time/distance data processing time if in time domain mode.

NOTES:

You must wait for two full consecutive sweeps after first connecting a device, and prior to outputting data, when a 12-term calibration is applied, that is, "**WFS;WFS**".

Set your controller's time out value high enough to allow the sweep to complete. Refer to Chapter 2 for more details.

HLD places the MS462XX in hold.

NOTE

Prior to being placed in HOLD, a channel must be displayed on the MS462XX — if calibration is not applied, and if you wish to output data from that channel.

FMC will output data using 32-bit (four bytes) floating-point format. The measurement data can be read directly into a floating point array dimensioned to 101 elements.

LSB causes data bytes to be output least significant byte first. This is for compatibility with INTEL/IBM based computer/controllers. If using other types of controllers that represent data in most significant byte format, then use the **MSB** command.

NOTE

It is good practice to always preface a data transfer command with the desired format command(s) every time it is used, that is, `"FMC;LSB;OFD"`, even if they were already set. This will help make your program more readable and easier to maintain and update in the future.

OFD uses the <Arbitrary Block> format. It will output 101 final measurement data values using the active channel's displayed graph units (dB). Each measurement value is represented using 4 bytes. The ASASCII header (#3404), which shows that 404 data bytes follow, precedes the measurement values. The linefeed character (0A, decimal 10) signals the end of the data block.
EXAMPLE:

#3404<f_1, dB, 4 bytes> <f_2, dB, 4 bytes>....
....<f_{101}, dB value, 4 bytes>0A

NOTE:
The (< >) characters are not output from the MS462XXX. They are used in the text above to distinguish each 8 byte data segment.

The following shows the data stream if "**FMA;DPR0;OFD**" had been sent instead of "**FMC;LSB;OFD**". This produces the data in ASCII format. The **DPR0** is default mode, but it is sent anyway to insure previous data transfers did not change the setting. Note the header is now #41892, signifying that 1892 data bytes follow. EXAMPLE:

#418921.611913055E+01,5.22284173965E+01,..
....,4.74120521545E+010A.

The following response shows the data output if "**FMA;DPR1;OFD**" had been sent instead of "**FMC;LSB;OFD**". Note that inclusion of **DPR1** while in a single graph type display (**MAG**, magnitude in this case) will double the array size, by sending data pairs for each measurement point. Note also that the additional value is set to zero since the data for it was not measured. Refer to text above for complete details. Note the header is now #43731, signifying that 3731 data bytes follow. EXAMPLE:

#437311.611913055E+01,0.00000000000E+00,5.22284173965E+01,
0.00000000000E+00,.....,4.74120521545E+01,0.00000000000E+000A

Table 8-4. *Measured Data Commands (1 of 2)*

Command	Description
DPR0	Visible data only OFD format
DPR1	Data pair always OFD format
DPRX?	Output data pair mode visible only or pair always
ICD	Enter corrected data for active channel parameter
IFD	Enter final data for active channel parameter
INRM	Enter normalization data from GPIB
OCD	Output corrected data for active channel parameter
OCFEDE	Output the front panel setup, calibration, and EDE data
OCFSG	Output the segmented sweep data
ODAT	Output hard copy tabular data to GPIB
OFD	Output final data for active channel parameter
OGCFD	Output gain compression final data to GPIB
OGCTXT	Output text format gain compression data to GPIB
OM1	Output marker 1 value
OM10	Output marker 10 value
OM11	Output marker 11 value
OM12	Output marker 12 value
OM2	Output marker 2 value
OM3	Output marker 3 value
OM3P	Output M3P format data to GPIB with M3P setup set to (2:3)1
OM4	Output marker 4 value
OM4P	Output M4P format data to GPIB with M4P setup set to (1:2)(3:4)
OM5	Output marker 5 value
OM6	Output marker 6 value
OM7	Output marker 7 value
OM8	Output marker 8 value
OM9	Output marker 9 value
ONRM	Output stored normalization data to GPIB
OPSV	Output power sweep power values
ORD	Output raw data for active channel parameter
OS11C	Output corrected S11 data
OS11R	Output raw S11 data
OS12C	Output corrected S12 data
OS12R	Output raw S12 data
OS13C	Output corrected S13 data
OS13R	Output raw S13 data
OS14C	Output corrected S14 data
OS14R	Output raw S14 data

Table 8-4. *Measured Data Commands (2 of 2)*

Command	Description
OS1P4	Output S1P4 format data to GPIB
OS21C	Output corrected S21 data
OS21R	Output raw S21 data
OS22C	Output corrected S22 data
OS22R	Output raw S22 data
OS23C	Output corrected S23 data
OS23R	Output raw S23 data
OS24C	Output corrected S24 data
OS24R	Output raw S24 data
OS31C	Output corrected S31 data
OS31R	Output raw S31 data
OS32C	Output corrected S32 data
OS32R	Output raw S32 data
OS33C	Output corrected S33 data
OS33R	Output raw S33 data
OS34C	Output corrected S34 data
OS34R	Output raw S34 data
OS41C	Output corrected S41 data
OS41R	Output raw S41 data
OS42C	Output corrected S42 data
OS42R	Output raw S42 data
OS43C	Output corrected S43 data
OS43R	Output raw S43 data
OS44C	Output corrected S44 data
OS44R	Output raw S44 data
OTXT	Output text format data to GPIB

Table 8-5. *Output Value vs Graph Display Types*

Graph Display Type	Data Units and Ordering	
	w/DPR0	**w/DPR1**
Log magnitude	dB	dB, 0
Phase	degrees	0, degrees
Log mag & phase	dB, degrees	dB, degrees
Linear magnitude	Rho or Tau, degrees	Rho or Tau, 0
Linear mag & phase	Rho or Tau, degrees	Rho or Tau, degrees
Smith chart	Ohms	Ohms, j-Ohms
Inverted Smith	Siemens	Siemens, j-Siemens
Group delay	Seconds	Seconds, 0
Log polar	dB, degrees	dB, degrees
Linear polar	Rho or Tau, degrees	Rho or Tau, degrees
Real	Real	Real, 0
Imaginary	Imag	0, imag
Real & Imaginary	Real, imag	Real, imag
SWR	SWR	SWR, 0

8-10 INTERNAL BUFFER

NOTE
The Internal Buffer Data Collection features are not available on instruments without Option 24.

Internal Buffer Data Collection provides for saving active channel measurement data from multiple sweeps without having to synchronize and collect data at the end of each sweep. The instrument can store up to 20,000 data point measurements; each one consisting of two IEEE 754 4-byte floating point numbers.

The internal buffer data collection mnemonics are listed in Table 8-6. The mnemonic CFD initializes the collection process. Once initialized, the collection process can be started by issuing the mnemonic DCCTN.

Before changing instrument parameters, temporarily suspend the collection process with the mnemonic DCHLD. After changes are completed, restart with DCCTN.

Sections of collected data can be delimited using the mnemonic DCMRK, which puts user specified values into the data buffer in real time.

The mnemonic OCS will output the data and reset the data collection buffer. The output format is fixed at FMC and DPR1. The user may, however, specify MSB or LSB. As is the case with all binary data transfers, the data will be encapsulated with an Arbitrary Block header. The size of the output data is 2 X 4 X number of data points collected. The absolute maximum number of data points that can be collected is 20,000. If the internal buffer becomes completely filled, subsequent data is discarded. The CBF bit of the Extended Event Status Register will also be set.

Table 8-6. Internal Buffer Data Collection Mnemonics

Command	Description
CFD	Collect final data in an internal buffer
CXD?	Output internal buffer data collection mode
DCCTN	Resume internal buffer data collection
DCCTN?	Output internal buffer data collection resume/suspend status
DCHLD	Suspend internal buffer data collection
DCMRK	Inserts the mark value into the internal buffer
DCOFF	Turn internal buffer data collection mode off
DCPCUR?	Outputs the current point count in the collect buffer
DCPMAX?	Outputs the maximum number of points that can be collected in the collect buffer
OCS	Output internal buffer collected data

8-11 ERROR REPORTING SYSTEM

The MS462XX implements a number of error reporting tools to assist you in detecting, reporting, and handling errors and other events in your application program. These tools will also prove invaluable to you during development of your application program. The tools are summarized below:

- Status Registers that you set to trigger an interrupt (or service request - SRQ) on many events such as GPIB errors, measurement data pass/fail testing, and end of calibration process. Refer to paragraph 8-14, “Status Reporting,” for complete details.
- A time ordered Service Log that stores errors and other important system information in non-volatile memory. The Service Log can easily be accessed via GPIB and from the front panel.
- A GPIB error message structure that contains the last two GPIB errors encountered. This includes details on the program message element that caused the error.

Error Reporting Actions

The following summarizes the actions taken by the MS462XX when it detects an error:

An audible beep is issued to attract the operators attention.

An error message temporarily appears on the display.

An error message, with date and time and other details, is written in the Service Log (refer to paragraph 8-12 for details.) This is *non-volatile* storage, meaning it will survive a power down of the MS462XX.

An error message string will also be saved internally in the GPIB software's Error Structures (refer to paragraph 8-13 for details.) This is *volatile* memory storage, meaning it will be lost when the MS462XX is powered down.

The appropriate bit in the Standard Events Status Register is set, and if enabled, a Service Request (SRQ) will be generated (refer to paragraph 8-14 for details.)

GPIB Error Messages

Refer to Chapter 11 for a complete list of MS462XX error messages and their descriptions.

MS462XX errors reported in the Service Log include four errors which are detected by the internal GPIB Parser software during remote operation:

7204 GPIB Command Error

7205 GPIB Execution Error

7206 GPIB Device Specific Error

7207 GPIB Query Error

These errors are typically generated as a result of incorrectly programming the MS462XX. A detailed description of the errors and the data they provide in the Service Log and the GPIB Error Structures follows.

NOTE

Use the MS462XX error reporting mechanisms to effectively detect and handle error conditions, both during development and when preparing your finished application program .

Each of the GPIB errors will further provide a more precise submessage of the specific condition that caused the error. Refer to Chapter 13, Table 13-3 for a complete list of these sub-messages and their descriptions.

"**7204 GPIB Command Error**"

These are errors in the syntactical correctness of a command, its numeric data entry element, or its data entry terminator code (or suffix mnemonic). As the internal GPIB command parser synchronization can be lost with this type of error, execution of the remainder of the program message is aborted.

If the command error was detected while executing a defined device trigger command sequence (refer to ***DDT** command, Chapter 10), execution of the remainder of the defined device trigger sequence will be aborted.

"**7205 GPIB Execution Error**"

These errors occur when a syntactically correct command fails to execute properly due to the command's parameters being out of range or not appropriate for the current instrument state.

"**7206 GPIB Device Specific Error**"

These errors occur when a command that is free of command and execution errors, fails to execute due to some unexpected instrument condition such as running out of memory.

"**7207 GPIB Query Error**"

These errors occur when the external controller attempts to read data from the MS462XX output buffer when either no data is available or data in the output buffer is lost.

8-12 SERVICE LOG

The MS462XX implements a non-volatile record of errors detected during front panel and GPIB operation in a Service Log. The log contains error messages along with the date and time and additional details about the error.

The Service Log can be viewed from the front panel Enhancement key group. Press the Option Menu key, then select DIAGNOSTICS and READ SERVICE LOG soft menus.

Refer to Chapter 8, "System Functions," for details on Service Log action commands such as printing, clearing, and saving it to disk.

Service Log Output Commands

Service Log data can be output via GPIB in two ways depending on the degree of detail desired about the errors. The commands listed in Table 8-7 will output all types of error messages. Refer to paragraph 8-13 for outputting *only* GPIB errors and their related details.

Table 8-7. *Error Reporting Commands*

Command	Description
OEL	Output error list
OGE	Output extended description of current GPIB error
OGL	Output extended description of previous GPIB error
ONE	Output number of lines in the error list

NOTE:
The Service Log error messages will remain stored, that is, they will not be deleted, when output via GPIB commands.

The **ONE** command - Output Number of Errors, can be used to periodically check if the MS462XX detected a new error without having to use SRQ interrupts. The **OEL** command - Output Error List can then be used to output all the error messages in the Service Log. This is an ASCII text, comma separated list of all the error messages in the Service Log. The output is in <Arbitrary Block> format (refer to paragraph 8-3, Data Transfer Protocol Basics, for details.) In the example below, the list is preceded by the output header (#42960), the words ERROR LOG, the current date and time, then the error list.

EXAMPLE:

```
#42960ERROR LOG 01/23/95 19:18,
7205 GPIB EXECUTION ERROR, .....
```

The **OSL** command - Output Service Log, is used to output the complete contents of the Service Log. The output is in ASCII text format, so it can be saved directly to a file for later viewing and analysis. The Service Log output includes:

System identity information such as model, serial number, and software version

System statistics such as total operational hours, initial turn on date and time, and current date and time

List of all error messages with date and time of occurrence and other pertinent information.

The Service Log output will look similar to the Service Log as viewed from the front panel menus (Utility key, **DIAGNOSTICS, SERVICE LOG**, then **DISPLAY LOG** soft keys). The only difference is each line of text in the Log as output via **OSL**, will be comma separated from the other lines of text.

GPIB Error Entries Description

This paragraph describes details of Service Log GPIB error entries. Use this information to assist in application program development and to handle GPIB errors in your program.

There are two types of service log entries made in response to GPIB errors (errors 7204, 7205, 7206, 7207):

- The first type is 4 lines long and is made when a program message is currently being parsed and executed (the error can then be associated with a particular command within the message).
- The second type is only 3 lines long and is made when there is no currently active program message.

Service Log entries, description:

LINE 1:

The type of error, i.e.

7204 GPIB COMMAND ERROR

7205 GPIB EXECUTION ERROR

7206 GPIB DEVICE DEPENDENT ERROR

7207 GPIB QUERY ERROR

LINE 2:

The date and time of the error:

11/14/95 09:26

LINE 3:

For a 3 line service log entry

This line contains only a verbal description of the error:

No response data available

For a 4 line service log entry

The description is followed by an index number which is used to interpret line 4:

Faulty program mnemonic syntax, 13

LINE 4:

This line (approximately 47 characters long) will contain as much of the currently active program message as is possible. The index number from line 3 represents the position of the parser's command pointer when the error occurred. (1 is the first character).

For example, the program message below generated a command error when the parser reached the beginning of the faulty mnemonic CH5 (only **CH1-CH4** are valid). The parser index is placed at position 13 to indicate the the location of the faulty command referenced to the beginning of the line.

```
CH1;WFS;ASC;CH5;WFS;ASC
1            13
```

If the program message is longer than 47 characters, then, as much as possible of the message segment that contained the error will be displayed. The index number in line 3 will be adjusted automatically such that 1 always refers to the first displayed character.

If the error was detected while executing a defined device trigger command sequence (refer to ***DDT** command, Chapter 10), then line 4 will contain as much of the command sequence as possible.

If the error was detected while parsing and converting numeric fields within an <Arbitrary Block> program data element (refer to <Arbitrary Block> in paragraph 8-3), then line 4 will contain as much of the data as possible.

8-13 GPIB ERROR STRUCTURES

The MS462XX internal GPIB software task (Parser) maintains a list of the current and the previous GPIB errors that it generated. These two errors along with pertinent details can be output over the GPIB.

Refer to paragraph 8-12, "Service Log," if you wish to output all MS462XX errors, including GPIB errors.

NOTE:
Error messages will remain stored, that is, they will not be deleted, when output via the GPIB. Use the ***CLS** or **CSB** to clear the errors reported via the **OGE** and **OGL** commands.

The commands **OGE** - Output Current GPIB Error, and **OGL** - Output Previous GPIB Error (Table 8-7) , will output a message in <Arbitrary ASCII> data format (refer to paragraph 8-3 for details.) The data output will contain either 2 or 4 ASCII text fields separated with commas as follows:

<Error Type>,<Error Description>

or,

<Error Type>,<Error Description>,<Index Number>,
<Program Message>

The <Error Type> field will be one of the following:

Command Error

Device Error

Execution Error

Query Error

No errors

The <Error Description> field will contain the same message as reported in LINE 3 of the Service Log GPIB error entry.

The <Index Number> and <Program Message> fields are also included if there is a currently active program message which can be associated with the occurrence of the error. These fields will contain the Index Number and Program Message (refer to LINE 3 and LINE 4 of the Service Log GPIB Error Entry, paragraph 8-15.)

Error Reporting Data Output Example

The following is an example usage of Error Reporting Data Output commands:

```
"*TST?;ONE;OEL;OGE"
```

These commands will perform the following functions:

***TST?** will perform a self test and output the pass/fail status (0=pass, 1=fail). If any tests failed, the test number and error message will be written to the Service Log.

ONE will output the number of errors in the Service Log. The **OEL** will output the error message strings. **OSL** will output the complete Service Log text. If the **ONE** indicates there are errors in the Log, you could use the **OSL** command to output a complete copy of the Service Log to file on your computer for later investigation. This is especially useful during a long un-monitored test, where you may want to save all data for failure analysis.

Investigate any errors prior to proceeding with your application program task. If the error is critical, you should contact a qualified Service Person. Note that you can also output and view the Service Log from the front panel (refer to paragraph 8-12, “Service Log.”)

NOTE

Errors in the Service Log include certain user errors that may not be actual MS462XX system failures or errors.

For example, some DISK related errors may have been caused by a bad floppy or a floppy of the wrong media type.

Another example is RF POWER UNLEVELED and RF OVERLOAD errors (see Chapter 13), which are produced if the system reset power is exceeded to a point where the system becomes unleveled. This is normal behavior (the MS462XX allows you to set power above reset power to accommodate special needs (refer to **OID** command, Chapter 11, “Command Dictionary”).

In fact, the **ONE**, **OEL**, **PWR**, **PW2, PEP?** and **P1P?** commands can be used together to check for these errors if you are attempting to find the maximum leveled power setting for a specific frequency range. Refer to Chapter 11, Command Dictionary for command details.

OGE (and **OGL**) can be used to output the GPIB error number, or "No errors" message, if none occurred. This is useful while debugging your application during development for displaying the error on your computer's screen for example. Note that by definition, these errors should not occur on a finished application program or they may be indicative of an error prone application.

Table 8-8. *Status Reporting Commands*

Command	Description
CSB	Clear status bytes and structures (same as *CLS)
IEM	Enter extended status byte mask
ILM	Enter limits status byte mask
IPM	Enter the 488.2 service request enable mask
OEB	Output extended status byte
OEM	Output extended status byte mask
OLB	Output limits status byte
OLM	Output limits status byte mask
OPB	Output the 488.2 status byte value (same as *STB?)

8-14 STATUS REPORTING

The following paragraphs describe the MS462XX service request and status reporting model. The MS462XX model implements all mandated and many optional status reporting features specified by the IEEE 488.2 Standard. These include the Standard Event Status Register and two additional event status registers, Service Request Enable Register, and Parallel Poll Enable Register. The MS462XX implements full status and enable registers query capability. A diagram of theMS462XX Status Reporting Model is shown in Figure 8-3; the Status Reporting Commands are listed in Table 8-7.

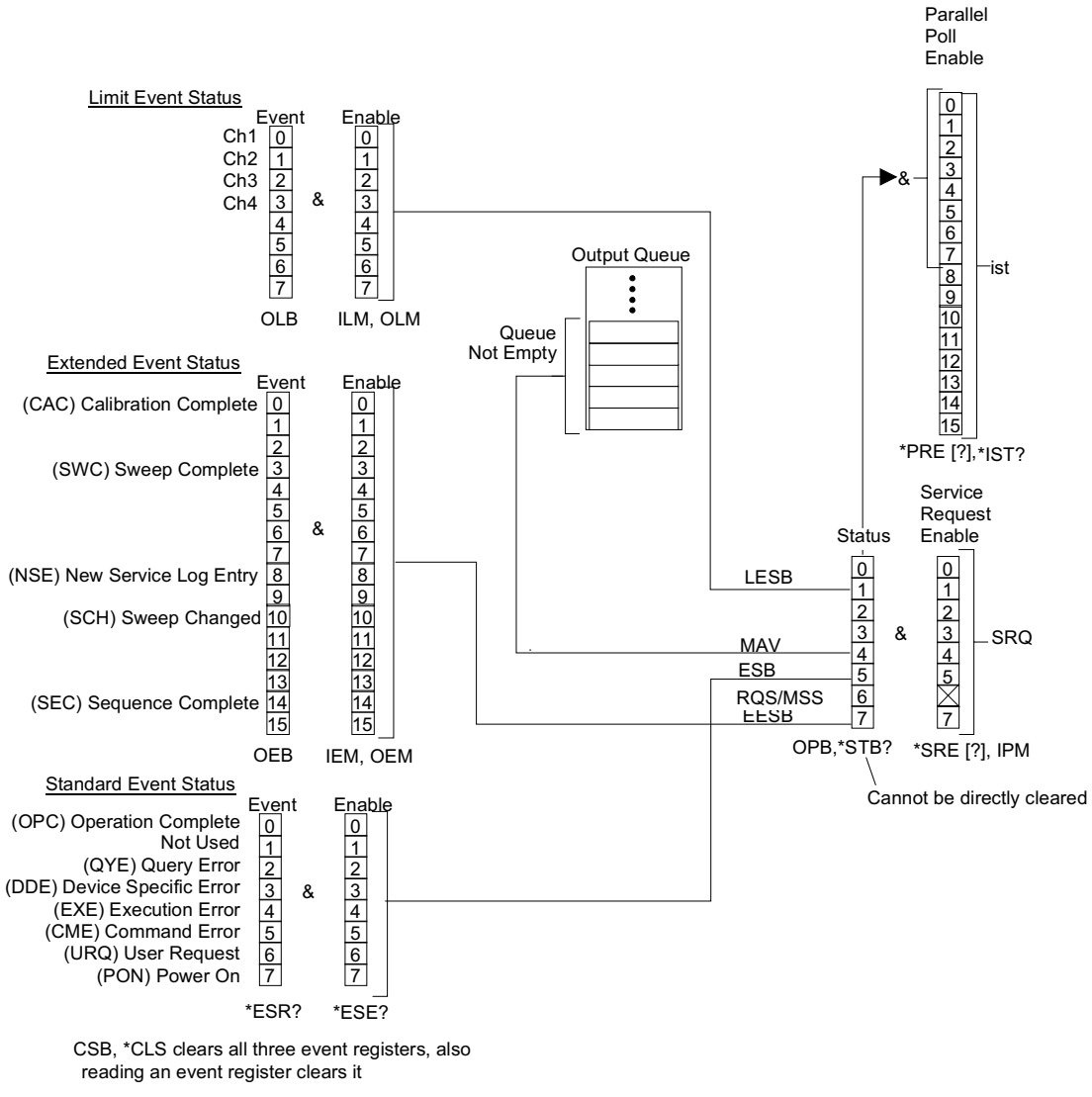

Figure 8-3. *MS462XXX Status Reporting Model*

Event Status Registers

The MS462XXXA implements three *Event Status Registers* (ESRs). These are:

Standard Event Status Register (Standard ESR)

Extended Event Status Register (Extended ESR)

Limits Event Status Register (Limits ESR)

ESR bits always reflect the status of their specified MS462XXXA events (refer to paragraph 8-15, "Status Events Description.") The registers are cleared (reset) when output by their respective query or output commands: ***ESR?** - Standard ESR Query, **OEB** - Output Extended ESR, **OLB** - Output Limits ESR. ESRs can also be cleared at any time via the Clear Status commands (***CLS** or **CSB**).

The overall summary status of each ESR (that is, whether or not any of its enabled events have occurred), is reported in the Status Byte Register.

Selecting Events for Status Reporting

The MS462XX *Event Status Enable Registers* (ESERs) allow you to select the specific event, or events, that you want summarized in the Status Byte Register.

The selection of a specific event, or events is done by enabling the desired event's bit. This is done by sending the appropriate ESER command with a binary weighted decimal value of the desired bit pattern.

The following commands are used to set and query ESER values:

***ESE**, ***ESE?** used to set and query the value of the *Standard* ESER

IEM, **OEM** – used to input and output the value of the Extended ESER

ILM, **OLM** used to input and output the value of the Limits ESER

Output Queue

The MS462XX Output Queue holds data which was requested by your application program. At any one time, the status of this queue is either empty (no data bytes available), or not-empty (at least one data byte is available.)

The Output Queue status is always reported in the MS462XX Status Byte Register. The Output Queue status bit is automatically set and cleared. The Output Queue is emptied when the last data byte it contains is output to the external controller or when the MS462XX detects a Query Error.

The Status Byte Register

The Status Byte Register is the summary status register of the overall MS462XX status. It can be directly queried for its value. It is also the basis for generating service requests, serial polling operations, and parallel polling operations. The Status Byte Register consists of a single 8-bit byte comprised of:

The Status Byte (bits 0-5, and bit 7), and

The MSS message or the RQS message (bit 6).

The Status Byte (bits 0-5, and bit 7) contains the overall status of the MS462XX. This includes the Output Queue status and the summary status of enabled bits in each event register. Once all enabled bits in an event register are cleared, or the Output Queue is emptied, the corresponding summary bit in the Status Byte Register will be reset.

The Master Summary Status (MSS) message is a single bit summary of the Status Byte (bits 0-5, and bit 7). This means bit 6 will be true if any of the other bits in the Status Byte Register are true, otherwise it will be false. The MSS message is sent in bit 6 when querying the status byte register and when generating the *IST message for parallel polling.*

The Requesting Service (RQS) message is true if the MS462XX has generated an SRQ, that is, it requested service. This message is reset automatically when the MS462XX is serial polled. The RQS message is sent in bit 6 if a serial poll is used to output the contents of the Status Byte Register.

Querying the Status Byte Register

The ****STB?*** Status Byte Register Query, allows you to output the contents of the Status Byte Register without having to do a serial poll. When output in this manner, the Status Byte Register will contain the MSS message in bit 6 and the normal Status Byte in bits 0-5, and bit 7.

The ****STB?*** query will not change; that is, reset, the value of the Status Byte (bits 0-5, and bit 7) and the MSS message (bit 6).

Serial Polling the Status Byte Register

Serial Polling the MS462XX can also be used to output the contents of the Status Byte Register. The output will still contain the normal Status Byte in bits 0-5 and 7. The difference is this time the RQS message will be output in bit 6 instead of the MSS message.

It is important to note that serial polling will reset the RQS message in bit 6. This allows the MS462XX to again set the RQS bit true if it has a new reason for requesting service. The value of the Status Byte (bits 0-5, and bit 7) will not be reset or otherwise changed by a serial poll.

SRQ/Service Requests Generation

The MS462XX can be made to request service; that is. generate an SRQ interrupt, when any of the defined events occur. This is a two step process:

First, you need to enable the desired event (refer to Enabling Status Events)

Second, you need to enable the event's register bit in the Service Request Enable Register.

The ***SRE** and ***SRE?** commands are used to set and query the Service Request Enable Register. Sending "***SRE 0**" to the MS462XX will disable the MS462XX service request.

Parallel Polling the MS462XX

The Parallel Poll Enable Register is used to set the value of the MS462XX parallel poll status bit. This bit corresponds to the MS462XX individual status message (***ist***). The ist message can be output without a parallel poll operation using the *IST? query.

The *ist* message is set true when both of the following are true:

a bit is set true in the Status Byte Register, and,

the corresponding bit is enabled in the Parallel Poll Enable Register.

NOTE:
The MSS message is used in bit 6 of the Status Byte Register (refer to Status Byte Register above.)

The ***PRE** and ***PRE?** commands are used to set and query the Parallel Poll Enable Register. Sending "***PRE 0**" to the MS462XX will set the MS462XX ist message, and therefore the parallel poll status bit, to false, that is, 0.

Binary Weighted Decimal Values

All the enable commands or query commands described above for status reporting take or return a single argument. This is a binary weighted decimal value representing the sum of all the true (or set) bits in the register.

The binary weighted decimal value of a bit in a register is calculated by raising the number 2 to a power equal to the bit position.

For example, the binary weighted decimal value of bit 4 is arrived at by raising the number 2 to the 4^{th} power ($2^4 = 16$). Similarly, the decimal value of bit 0 is the number 2 raised to the 0 power ($2^0 = 1$).

The total decimal value of a register is the sum of the individual binary weighted decimal values of all enabled, or true bits. In the above example, this would be 16 + 1 = 17.

Status Reporting Commands Example

Following are example usages of Status Reporting commands:

EXAMPLE 1:

```
"*CLS;TRS;WFS;OEB"
```

These commands will perform the following functions:

***CLS** will clear all four event status registers.

TRS will trigger a new sweep.

WFS will set bit 4 (SWC) in the Extended Event Status Register when a full sweep is complete.

OEB will output the decimal value of the Extended Event Status Register. This will be the number 8 ($2^4 = 8$).

When a 12-term calibration is applied, a "full sweep" includes a complete forward sweep and a complete reverse sweep. It also includes time/distance data processing time if in time domain mode.

> Set your controller's time out value high enough to allow the sweep to complete. Refer to Chapter 2 for more details.

EXAMPLE 2:

```
"*CLS;IEM 8;*SRE 128;TRS;WFS"
```

These commands will perform the following functions:

***CLS** will clear all four event status registers.

IEM 8 will enable bit 4 (SWC) in the Extended Event Status Register (Extended ESR). This will set bit 7 (the summary status bit for the Extended ESR) in the Status Byte Register when the SWC bit gets set true.

***SRE 128** will cause the MS462XX to issue a service request (SRQ) when the enabled bit in the Extended Event Status Register gets set true.

TRS will trigger a new sweep.

WFS will set bit 4 (SWC) in the Extended Event Status Register when a full sweep is complete. Because of the **IEM** and ***SRE** that were issued, this will cause the MS462XX to issue a service request (SRQ).

8-15 STATUS EVENT DESCRIPTIONS

The following paragraphs describe the MS462XX status events functions. Refer to Figure 8-3, MS462XX Status Reporting Model (page 8-41) for the definition of bits in each of the three event registers described below. (Refer to paragraph 8-14, "Status Reporting," for an operational description of the MS462XX reporting model.)

Standard Event Status Register

This register reports on the following events:

Bit 0: The Operation Complete bit (OPC) is set true when all pending operations are completed after the ***OPC** command is issued. This is used for synchronization of your application program with MS462XX operations.

Bit 1: Not used.

Bit 2: The Query Error bit (QYE) is set true when the MS462XX detects an error when attempting to execute an output or query command. Typically, this is due to requesting output when the Output Queue is empty or if the MS462XX emptied the queue due to an error situation.

The MS462XX will clear (empty) the Output Queue and issue a query error if it receives a program message while data requested by a previous command still remains in the Output Queue.

Bit 3: The Device Specific Error bit (DDE) is set true when the MS462XX detects an error during execution of a valid MS462XX command and it is not able to complete its execution. An example of this is trying to access a bad floppy disk for read or write.

Bit 4: The Execution Error bit (EXE) is set true when a valid command's argument is out of the MS462XX range or operational capabilities. This bit is also set when a valid command cannot be executed due to some MS462XX condition such as an option not installed or invalid state for the command.

Bit 5: The Command Error bit (CME) is set true when the MS462XX Parser detects an invalid command. This is often generated due to unrecognized or invalid command syntax and incorrect use of separators and terminators.

Bit 6: The User Request bit (URQ) is set true when a front panel key or control is invoked.

Bit 7: The Power On bit (PON) is set true when the MS462XX is turned on.

Extended Event Status Register

This register reports on the following events:

Bit 0: The Calibration Complete bit (CAC) is set true when all the steps of an Error Correction Calibration are complete after issuing the **BEG** or **RPC** commands.

Bits 1,2: Not used.

Bit 3: The Sweep Complete bit (SWC) is set true when a full sweep is completed after issuing the **WFS** command.

Bits 4-7: Not used.

Bit 8: The new service log entry bit (NSE) is set whenever a new error is entered in the service log. It can be used to detect lock failure and unleveled conditions.

Bit 9: Not used.

Bit 10: Sweep Changed (SCH).

Bits 11-13: Not used.

Bit 14: Sequence Complete (SEC).

Bit 15: Not used.

Limits Event Status Register

This register reports on the following events:

Bit 0: The Channel 1 bit (CH1) is set true when a limit line has been exceeded on channel 1 after the **LT1** command has been issued.

Bit 1: The Channel 2 bit (CH2) is set true when a limit line has been exceeded on channel 2 after the **LT1** command has been issued.

Bit 2: The Channel 3 bit (CH3) is set true when a limit line has been exceeded on channel 3 after the **LT1** command has been issued.

Bit 3: The Channel 4 bit (CH4) is set true when a limit line has been exceeded on channel 4 after the **LT1** command has been issued.

Bit 4: The search failure bitr (SCF) is set TRUE when a marker search command (MKSL or MKSE) was issued but the target value was not found.

Bits 5-7: Not used.

Status Byte Register This register reports on the following events:

Bit 0: Not used.

Bit 1: The Limits Event Status Bit (LESB) is set true if any of the enabled events in the Limits Event Status Register are true.

Bits 2, 3: Not used.

Bit 4: The Message Available bit (MAV) is set true if the Output Queue contains at least one byte of data. refer to related *OPC?, Operation Complete Query.

Bit 5: The Standard Event Status Bit (ESB) is set true if any of the enabled events in the Standard Event Status Register are true.

Bit 6: This bit contains either the Master Summary Status message (MSS) or the Request Service message (RQS), depending on how the Status Byte Register contents are output or used.

Refer to Status Byte Register description in paragraph 8-14.

Bit 7: The Extended Event Status Bit (EESB) is set true if any of the enabled events in the Extended Event Status Register are true.

8-16 IEEE 488.2 COMMON COMMANDS

The IEEE 488.2 GPIB Standard specifies a common set of commands to support many standard instrument operations. The mandated and optional common commands implemented in the MS462XX are shown in Table 8-9 below.

These commands are fully described in Chapter 11, Command Dictionary. Further, the commands for status reporting are also described in paragraphs 8-14 and 8-15.

Table 8-9. *IEEE 488.2 Commands*

Command	Description
*CLS	Clear status bytes and structures
*DDT	Enter the 488.2 define device trigger command string
*ESE	Enter the 488.2 standard event status enable mask
*ESE?	Output the 488.2 standard event status enable mask
*ESR?	Output the 488.2 standard event status register value
*IDN?	Output the 488.2 instrument identification string
*IST?	Output the value of the *ist* message
*OPC	Initiate the 488.2 operation complete sequence
*OPC?	Initiate the 488.2 operation complete query sequence
*OPT?	Output the 488.2 options installed string
*PRE	Enter the 488.2 parallel poll register enable mask
*PRE?	Output the 488.2 parallel poll register enable mask
*RST	Resets the instrument
*SRE	Enter the 488.2 service request enable mask
*SRE?	Output the 488.2 service request enable mask
*STB?	Output the 488.2 status byte value
*TRG	Initiate a group execute trigger sequence
*TST?	Perform self test and output status
*WAI	Wait to continue
TST	Perform self test and output status (same as *TST?)

8-17 SYNCHRONIZATION COMMANDS

The MS462XX operation can be synchronized with your application program operations using the commands listed in Table 8-10 below. These commands are from various functional groups in the MS462XX GPIB command set. Refer to the appropriate references listed in the table and to Chapter 11, “Command Dictionary,” for more details.

These commands are helpful in many operations related to outputting data, waiting for the sweep and the display to be updated, and many others. Where applicable, these commands are referenced and shown used in examples throughout the Programming Manual.

Table 8-10. *MS462XXX Synchronization Operations Commands*

Command	Description
REBOOT	Reboots the instrument
SWPDIR?	Output instantaneous sweep direction forward/reverse
WFS	Wait full sweep until all display data is valid

8-18 SETUP COMMANDS

The setup commands provide for codes for front panel setups. They are listed in Table 8-11.

Table 8-11. *MS462XX System Setup Commands (1 of 1)*

Command	Description
ICF	Enter front panel setup and calibration data
ICFEDE	Enter the front panel setup, calibration, and EDE data
ICFSG	Enter the segmented sweep data
IFP	Enter current front panel setup
IS1	Enter front panel setup 1
IS10	Enter front panel setup 10
IS2	Enter front panel setup 2
IS3	Enter front panel setup 3
IS4	Enter front panel setup 4
IS5	Enter front panel setup 5
IS6	Enter front panel setup 6
IS7	Enter front panel setup 7
IS8	Enter front panel setup 8
IS9	Enter front panel setup 9
OCF	Output front panel setup and calibration data
OFP	Output current front panel setup
OS1	Output front panel setup number 1
OS10	Output front panel setup number 10
OS2	Output front panel setup number 2
OS3	Output front panel setup number 3
OS4	Output front panel setup number 4
OS5	Output front panel setup number 5
OS6	Output front panel setup number 6
OS7	Output front panel setup number 7
OS8	Output front panel setup number 8
OS9	Output front panel setup number 9

8-19 HIGH SPEED TRIGGER MODE

The MS462XX is equipped with a triggering mode that significantly increases data throughput. It is recommended that all test programs written for the MS462XX use this mode of sweep triggering, as significant increases in speed are obtained, and the method of implementation is no more difficult than prior modes of operation.

Essentially this mode of operation allows the user to pre-load the GPIB command string buffer while allowing the instrument to pre-parse the command string to save even more time. Parsing is the process of taking GPIB commands and sending them to the correct section of the program for execution. To use this mode, proceed as follows:

NOTE
There is NO space between the 0 and subsequent characters.

Step1. Set the instrument for triggering type
"*DDT#0" + data output commands

Step2. Set up the fast trigger mode
"TIBSB; FMC; LSB; TXX?"

Step3. Perform a read to synchronize events

Step4. Trigger the sweep
"*TRG"

Step5. Read the data

Step6. Return the instrument back to normal trigger mode
"TIN"

Example An example for writing a program in Visual Basic using this mode is shown below.

```
Call Send(0, address&, "*DDT #0OS11C; OS21C;", NLend)
Call Send(0, address&, "TIBSB;FMC;LSB;TXX?", NLend)
Call Receive(0, address&, dataBuffer$, STOPend)
dataBuffer$ = Space(10000)
Call Send(0, address&, "*TRG", NLend)
Call Receive(0, address&, dataBuffer$, STOPend)
Call Send(0, address&, "TIN", NLend)
```

NOTES

In the previous example, the controller's address is set to 0.

This example uses binary data transfer for highest efficiency. The user must parse the binary block of data into ASCII for further processing by the PC.

8-20 MISCELLANEOUS COMMANDS

The remote-only commands that do not fall into any of the other listed groups are classified as miscellaneous and are listed in Table 8-12.

Table 8-12. *Miscellaneous Commands*

Command	Description
HIGHF?	Output the highest frequency
IHDW	Enter hardware cal data from GPIB
IKIT	Enter calkit data from GPIB
NOP	No operation
OBMP	Output the display as a bitmap
ODR	Output directory listing of the floppy drive
ODRH	Output directory listing of the hard drive
OHDR	Output hard copy header information to GPIB
OHDW	Output hardware cal data to GPIB
OHGL	Output HPGL format data to GPIB
OI	Output instrument identification string with serial number
OID	Output instrument identification string
OMOD	Output instrument model number
OSER	Output instrument serial number
RK?	Output RK mode on/off status
RKOFF	Turn off RK mode
RKON	Turn on RK mode

8-21 USER MESSAGE COMMANDS

The User Message Commands (Table 8-13 let users display messages on the MS462XX screen under external GPIB control. These messages are user defined.

Table 8-13. *User Message Commands (1 of 1)*

Command	Description
UMDIS0	Turn off user message display
UMDIS1	Turn on user message display
UMDISX?	Output user message display on/off status
UMRST	Reset all user message display parameters
UMSTR	Enter the user message display string
UMSTR?	Output the user message display string
UMXLOC	Enter the user message display starting X location
UMXLOC?	Output the user message display starting X location
UMYLOC	Enter the user message display starting Y location
UMYLOC?	Output the user message display starting Y location

Chapter 9
System Functions

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Chapter 9
System Functions

9-1 INTRODUCTION

This chapter describes the commands used to implement certain system functions. They consist of hard copy commands, system state commands, save/recall commands, disk function commands, and diagnostics commands. For certain functions, tables of commands are identified as being obsolete. This means they are no longer favored for new development. They were written for earlier product versions of the 37XXX VNA, from which this command set is derived. They still remain to provide backward compatability, and should not be used when developing new program code.

9-2 RELATED COMMANDS

Table 9-1 provides a list of commands related to those used for system diagnostics. Refer to Chapter 8, paragraphs 8-9 through 8-11 for further information.

Table 9-1. *Related Commands*

Command	Description
OGE	Outputs extended description of current GPIB error.
OGL	Outputs extended description of previous GPIB error.
OEL	Outputs error messages from Service Log.
ONE	Output number of error messages stored in service log.
OSL	Output service log.

9-3 HARD COPY COMMANDS

The commands concerned with hard copy output are listed in Table 9-2; obsolete Hard Copy commands are listed in Table 9-3. These commands are straightforward with the exception of commands PT0–PT9. The PT0 – PT9 commands are used to:

- Specify the density of tabular data points output to the printer when using the PTB and PMT commands
- Specify the number of data points included in the disk file created with the SAVE command for tabular data

The value implicit in the PT0 – PT9 commands (0 – 9) specifies the number of points that are *skipped* during printing. Therefore, PT0 selects the *densest* printing mode while PT9 gives the *fewest* number of data points. The HD0 command disables headers and page formatting for tabular printouts. The HD1 command enables headers and page formatting.

The hard copy output commands consist of two categories: *action* and *setup:*

- *Action* commands actually initiate a print/plot for the subset of the display specified by the setup commands
- *Setup* commands are those that specify the desired size and location of the print/plot and the pen numbers for each element of the plot

The LOC, LMS, LID, and LNM commands require a string of characters to be sent over the GPIB along with the command. A string input to the MS462XX *must* have the double quote characters ("") or single quote characters (′) surrounding the desired input.

The SAVE and RECALL commands enable the user to store tabular data to the disk and recall it for output to the printer with the tabular printout points controlled by commands PT0 – PT9. Other types of hard copy data can also be saved, but not recalled.

Text format hard copy data is formatted for *Microsoft Excel**. Before a user defined logo can be printed, the data file for that logo must exist on the hard drive in the "UTIL" subdirectory. See paragraph 10-6 for the data file names. These files can be created by the ANRITSU MS462XX LOGO editor, a Windows* based program for your PC.

Bitmapped hard copy data is formatted as a Windows 3.0 (and later) Device Independent Bitmap. The size is 640 by 480, and if color bitmap is selected, it is in a 256-bit color format. The user can select either black on white, color on white, or true color for the bitmaps.

HPGL format hard copy data is the file of HPGL commands and data normally sent to a plotter connected to the dedicated GPIB port. Microsoft Word has the capability to load and print this file type. It may also be sent to a GPIB plotter.

* Windows and Excel are both trademarks of Microsoft Corp.

Table 9-2. *Hard Copy Commands (1 of 4)*

Command	Function
BMPB	Select black on white as bitmap type
BMPC	Select color on white as bitmap type
BMPT	Select true color as bitmap type
BMPX?	Output bitmap type
DPN	Enter pen number for data
DPN?	Output pen number for data
FFD	Send form feed to printer and stop print/plot
GENS2P	Generate S2P files in hard disk with default name (ntwk_p1.s2p, ..., ntwk_p4.s2p) from disk and calibrate
GPN	Enter pen number for graticule
GPN?	Output pen number for graticule
HD0	Turn off tabular data headers and page formatting
HD1	Turn on tabular data headers and page formatting
HDX?	Output tabular data headers and page formatting on/off status
HPN	Enter pen number for header
HPN?	Output pen number for header
LAND	Select landscape mode for output plot
LCM0	Disable printing comment information
LCM1	Enable printing comment information
LDT0	Disable printing date/time
LDT1	Enable printing date/time
LDV0	Disable printing device ID
LDV1	Enable printing device ID
LID	Enter string for DUT identity
LID?	Output string for DUT identity
LMD0	Disable printing model information
LMD1	Enable printing model information
LMS	Enter string for DUT model/serial number
LMS?	Output string for DUT model/serial number
LNM	Enter string for operator name
LNM?	Output string for operator name
LOC	Enter string for operator comment
LOC?	Output string for operator comment
LOGO0	Turn hard copy logo off
LOGO1	Turn hard copy logo on
LOGO?	Output hard copy logo selection standard/user defined
LOGOS	Select standard hard copy logo
LOGOU	Select user defined hard copy logo
LOGOX?	Output hard copy logo on/off status

Table 9-2. *Hard Copy Commands (2 of 4)*

Command	Function
LOP0	Disable printing operator information
LOP1	Enable printing operator information
M3P1?	Query the mixed mode 1st balanced port pair for the M3P setup
M3P1P12	Set the mixed mode 1st balanced port pair to 1:2 for the M3P setup
M3P1P13	Set the mixed mode 1st balanced port pair to 1:3 for the M3P setup
M3P1P14	Set the mixed mode 1st balanced port pair to 1:4 for the M3P setup
M3P1P21	Set the mixed mode 1st balanced port pair to 2:1 for the M3P setup
M3P1P23	Set the mixed mode 1st balanced port pair to 2:3 for the M3P setup
M3P1P24	Set the mixed mode 1st balanced port pair to 2:4 for the M3P setup
M3P1P31	Set the mixed mode 1st balanced port pair to 3:1 for the M3P setup
M3P1P32	Set the mixed mode 1st balanced port pair to 3:2 for the M3P setup
M3P1P34	Set the mixed mode 1st balanced port pair to 3:4 for the M3P setup
M3P1P41	Set the mixed mode 1st balanced port pair to 4:1 for the M3P setup
M3P1P42	Set the mixed mode 1st balanced port pair to 4:2 for the M3P setup
M3P1P43	Set the mixed mode 1st balanced port pair to 4:3 for the M3P setup
M3PS1	Set the mixed mode single ended port to port 1 for the M3P setup
M3PS2	Set the mixed mode single ended port to port 2 for the M3P setup
M3PS3	Set the mixed mode single ended port to port 3 for the M3P setup
M3PS4	Set the mixed mode single ended port to port 4 for the M3P setup
M3PS?	Query the mixed mode singled ended port for the M3P setup
M4P1?	Query the mixed mode 1st balanced port pair for the M4P setup
M4P1P12	Set the mixed mode 1st balanced port pair to 1:2 for the M4P setup
M4P1P13	Set the mixed mode 1st balanced port pair to 1:3 for the M4P setup
M4P1P14	Set the mixed mode 1st balanced port pair to 1:4 for the M4P setup
M4P1P21	Set the mixed mode 1st balanced port pair to 2:1 for the M4P setup
M4P1P23	Set the mixed mode 1st balanced port pair to 2:3 for the M4P setup
M4P1P24	Set the mixed mode 1st balanced port pair to 2:4 for the M4P setup
M4P1P31	Set the mixed mode 1st balanced port pair to 3:1 for the M4P setup
M4P1P32	Set the mixed mode 1st balanced port pair to 3:2 for the M4P setup
M4P1P34	Set the mixed mode 1st balanced port pair to 3:4 for the M4P setup
M4P1P41	Set the mixed mode 1st balanced port pair to 4:1 for the M4P setup
M4P1P42	Set the mixed mode 1st balanced port pair to 4:2 for the M4P setup
M4P1P43	Set the mixed mode 1st balanced port pair to 4:3 for the M4P setup
M4P2?	Query the mixed mode 2nd balanced port pair for the M4P setup
M4P2P12	Set the mixed mode 2nd balanced port pair to 1:2 for the M4P setup
M4P2P13	Set the mixed mode 2nd balanced port pair to 1:3 for the M4P setup
M4P2P14	Set the mixed mode 2nd balanced port pair to 1:4 for the M4P setup

Table 9-2. *Hard Copy Commands (3 of 4)*

Command	Function
M4P2P21	Set the mixed mode 2nd balanced port pair to 2:1 for the M4P setup
M4P2P23	Set the mixed mode 2nd balanced port pair to 2:3 for the M4P setup
M4P2P24	Set the mixed mode 2nd balanced port pair to 2:4 for the M4P setup
M4P2P31	Set the mixed mode 2nd balanced port pair to 3:1 for the M4P setup
M4P2P32	Set the mixed mode 2nd balanced port pair to 3:2 for the M4P setup
M4P2P34	Set the mixed mode 2nd balanced port pair to 3:4 for the M4P setup
M4P2P41	Set the mixed mode 2nd balanced port pair to 4:1 for the M4P setup
M4P2P42	Set the mixed mode 2nd balanced port pair to 4:2 for the M4P setup
M4P2P43	Set the mixed mode 2nd balanced port pair to 4:3 for the M4P setup
MPN	Enter pen number for markers and limits
MPN?	Output pen number for markers and limits
OMM3P	Output the M3P format data to the GPIB with the current M3P setup
OMM4P	Output the M4P format data to the GPIB with the current M4P setup
OS1P1	Output S1P1 format data to GPIB
OS1P2	Output S1P2 format data to GPIB
OS1P3	Output S1P3 format data to GPIB
OS2P	Output S2P format data to GPIB
OS3P	Output S3P format data to GPIB
OS4P	Output S4P format data to GPIB
PBL	Select 1/4 size plot bottom left corner
PBR	Select 1/4 size plot bottom right corner
PFL	Select full-size plot
PFS	Print full screen image
PGR	Print graph area screen image
PGT	Plot graticule
PLD	Plot data area only
PLH	Plot header
PLM	Plot markers and limits
PLO?	Output plot mode portrait or landscape
PLS	Plot entire screen
PLT	Plot data traces only
PMK	Print tabular data for Markers
PMN	Plot menu
PMT	Print tabular data for traces and markers
PORT	Select portrait mode for output plot
PRNTYPDJ	Select HP Deskjet printer
PRNTYPEP	Select Epson FX printer

Table 9-2. *Hard Copy Commands (4 of 4)*

Command	Function
PRNTYPLJ	Select HP Laserjet printer
PRNTYPTJ	Select HP Thinkjet printer
PRNTYPX?	Output printer type
PST	Stop print/plot
PT0	Set tabular printout points skipped to 0
PT1	Set tabular printout points skipped to 1
PT2	Set tabular printout points skipped to 2
PT3	Set tabular printout points skipped to 3
PT4	Set tabular printout points skipped to 4
PT5	Set tabular printout points skipped to 5
PT6	Set tabular printout points skipped to 6
PT7	Set tabular printout points skipped to 7
PT8	Set tabular printout points skipped to 8
PT9	Set tabular printout points skipped to 9
PTB	Print tabular data for traces
PTL	Select 1/4 size plot top left corner
PTR	Select 1/4 size plot top right corner
PTX?	Output tabular printout points skipped
PXX?	Output plot location
SEQOP0	Turn off sequence operator message
SEQOP1	Turn on sequence operator message
SEQOP?	Output sequence operator message mode on/off
SNPDB	Select log magnitude and phase as SnP output format
SNPFMTX?	Output SnP output format selection
SNPGHZ	Select GHz as SnP frequency units
SNPHZ	Select Hz as SnP frequency units
SNPKHZ	Select KHz as SnP frequency units
SNPMA	Select linear magnitude and phase as SnP output format
SNPMHZ	Select MHz as SnP frequency units
SNPRI	Select real and imaginary as SnP output format
SNPUNITX?	Output SnP frequency units selection
SPD	Enter pen speed percentage
SPD?	Output pen speed percentage
TPN	Enter pen number for trace overlay data
TPN?	Output pen number for trace overlay data

Table 9-3. *Obsolete Hard Copy Commands*

Command	Description
LDT	Enter string for test date/time (obsolete)
LDT?	Output string for test date/time (obsolete)

9-4 UTILITY COMMANDS

Table 9-4 lists the utility commands. These commands are used to specify CRT display parameters, information display format, and other parameters that control the operation of the system. The function of approximately half of these commands is to display connector type information on the system screen. Table 9-5 list obsolete commands that remain for backward compatibility.

Table 9-4. *Utility Commands (1 of 2)*

Command	Description
ANNCOL	Enter the color number for annotation and menu text
ANNCOL?	Output the color number for annotation and menu text
BC0	Turn LCD display off (disabled)
BC1	Turn LCD display on (enabled)
BCKCOL	Enter the color number for background
BCKCOL?	Output the color number for background
BCX?	Output LCD display on/off status
BEEP0	Disable the instrument beeper on GPIB errors
BEEP1	Enable the instrument beeper on GPIB errors
BEEPX?	Output GPIB beep on error enable/disable status
DAC	Enter DAC number of 10 MHz calibration
DAC?	Output DAC number of 10 MHz calibration
DATCOL	Enter the color number for data
DATCOL?	Output the color number for data
DATE	Enter the system date
DATE?	Output the system date
DC1	Display channel 1 and 2 operating parameters
DC3	Display channel 3 and 4 operating parameters
DCP	Display calibration parameters 1st page
DCP1	Display calibration parameters 1st page
DF2	Display 2.4mm female connector information
DF3	Display GPC-3.5 female connector information
DF716	Display 7/16 female connector information
DFK	Display K female connector information
DFN	Display N female connector information
DFN75	Display N Female 75-Ohm connector information
DFP	Display front panel instrument state
DFS	Display SMA female connector information
DFSP	Display special female connector information
DFT	Display TNC female connector information
DFV	Display female V Connector information
DG7	Display GPC-7 male connector information
DGS	Display GPIB status information
DM2	Display 2.4mm male connector information

Table 9-4. *Utility Commands (2 of 2)*

Command	Description
DM3	Display GPC-3.5 male connector information
DM716	Display 7/16 male connector information
DMK	Display K male connector information
DMN	Display N male connector information
DMN75	Display N Male 75-Ohm connector information
DMS	Display SMA male connector information
DMSP	Display Special Male connector information
DMT	Display TNC male connector information
DMV	Display V male connector information
DWG	Display waveguide parameters
GRTCOL	Enter the color number for the graticule
GRTCOL?	Output the color number for the graticule
LANG	Enable the specified language support
LANG?	Query the current language support
LAYCOL	Enter the color number for overlay data
LAYCOL?	Output the color number for overlay data
MKRCOL	Enter the color number for the markers
MKRCOL?	Output the color number for the markers
MNUCOL	Enter the color number for the menu headers
MNUCOL?	Output the color number for the menu headers
RSTCOL	Reset color configuration to default
RSTDAC	Restore frequency from 10 MHz calibration and not save DAC number into BBRAM
TIME	Enter the system time
TIME?	Output the system time
TRCCOL	Enter the color number for memory data
TRCCOL?	Output the color number for memory data
WIDE	Use entire display width for graphs

Table 9-5. *Obsolete Utility Commands*

Command	Description
BLU	Select blue as third plane color
CYN	Select cyan as third plane color

9-5 SAVE/RECALL COMMANDS

The Save/Recall commands listed in Table 9-6 allow the system user to save and recall front panel setup data to and- from internal memory, calibration and front panel setup data to/from the disk.

Table 9-6. *Front Panel Memory Save/Recall Commands (1 of 2)*

Command	Description
RC1	Recall front panel setup number 1 from memory
RC10	Recall front panel setup number 10 from memory
RC2	Recall front panel setup number 2 from memory
RC3	Recall front panel setup number 3 from memory
RC4	Recall front panel setup number 4 from memory
RC5	Recall front panel setup number 5 from memory
RC6	Recall front panel setup number 6 from memory
RC7	Recall front panel setup number 7 from memory
RC8	Recall front panel setup number 8 from memory
RC9	Recall front panel setup number 9 from memory
RCCM1	Fast recall cal data from memory 1
RCCM2	Fast recall cal data from memory 2
RCCM3	Fast recall cal data from memory 3
RCCM4	Fast recall cal data from memory 4
RCCM5	Fast recall cal data from memory 5
RCCM6	Fast recall cal data from memory 6
RCCM7	Fast recall cal data from memory 7
RCCM8	Fast recall cal data from memory 8
SAVDAC	Save 10 MHz DAC number into BBRAM
SAVE	Save a data file to disk
SV1	Save front panel setup number 1 to memory
SV10	Save front panel setup number 10 to memory
SV2	Save front panel setup number 2 to memory
SV3	Save front panel setup number 3 to memory
SV4	Save front panel setup number 4 to memory
SV5	Save front panel setup number 5 to memory
SV6	Save front panel setup number 6 to memory
SV7	Save front panel setup number 7 to memory
SV8	Save front panel setup number 8 to memory
SV9	Save front panel setup number 9 to memory
SVCM1	Save cal data in internal memory 1
SVCM2	Save cal data in internal memory 2
SVCM3	Save cal data in internal memory 3
SVCM4	Save cal data in internal memory 4

Table 9-6. *Front Panel Memory Save/Recall Commands (2 of 2)*

Command	Description
SVCM5	Save cal data in internal memory 5
SVCM6	Save cal data in internal memory 6
SVCM7	Save cal data in internal memory 7
SVCM8	Save cal data in internal memory 8

9-6 DISK FUNCTION COMMANDS

The Disk Function commands perform the same functions as the Hard Copy key group Menu key selections. These commands are listed in Table 9-7. They are used for the following:

- Copying files between disks
- Deleting files from disk
- Saving files to a disk
- Recalling files from a disk
- Creating, changing to and deleting disk directories
- Outputting files to the GPIB
- Inputting files from the GPIB
- Loading cal kit files
- Formatting a floppy disk
- Outputting a disk directory listing to the GPIB
- Printing a disk directory listing

Most of the file handling commands require a filename as an argument. The filename needs to be enclosed in quotes and listed complete with extention. You may include a path before the filename that may include a drive letter. If a path is not included, the file will be assumed to be in the current default drive and directory.

Drive Letters

Drive letters follow standard MS-DOS conventions:

- A:\for the floppy drive
- C:\ for the hard drive

Subdirectory Naming Conventions

Subdirectory naming conventions are as follows:

- Can have at most 11 characters
- The allowable characters are 1 thru 0, all letters, the period (.) and underscore (_)

File Naming Conventions

File naming conventions are as follows:

- The main portion of the filename can have at most 8 characters
- The extention portion of the filename can have at most 3 characters
- The filename must start with a letter
- The allowable characters are 1 thru 0, all letters and the underscore (_)

List of the Current MS462XXX File Types A list of current filetypes is shown in Table 9-8 (page 9-15).

Supported Commands for Backward Capability A listing of commands supported for compatibility with ANRITSU 360 and 37000 series VNAs are listed in Table 9-9 (page 9-16).

Table 9-7. *Disk Function Commands (1 of 1)*

Command	Description
ADRIVE	Select the floppy drive as the default drive
CD	Change default directory
CDRIVE	Select the hard disk as the default drive
COPY	Copy a files contents to another file
CPYALLFH	Copy combined hardware cal file from floppy to hard disk
CPYALLHF	Copy combined hardware cal file from hard to floppy disk
CWD?	Output current working directory string
DEL	Delete a file from disk
DELALL	Delete combined hardware cal file from floppy disk
DELALLH	Delete combined hardware cal file from hard disk
DIR	Output a directory listing to the GPIB
DISKRD	Output disk file data to the GPIB
DISKWR	Write GPIB data to a disk file
EXISTD?	Output directory existence information
EXISTF?	Output file existence information
INT	Initialize (format) floppy disk
LKT	Load calibration kit information from floppy disk
MD	Create a new disk directory
PDR	Print directory listing of the floppy drive
PDRH	Print directory listing of the hard drive
RCLALL	Recall combined hardware calibration file from floppy disk
RCLALLH	Recall combined hardware calibration file from hard disk
RD	Remove a disk directory
SAVALL	Save combined hardware cal to floppy disk
SAVALLH	Save combined hardware cal to hard disk
SAVEGC	Save text format gain compression data to disk

Table 9-8. *MS462XX File Types* ***(1 of 2)***

Filename	File type
<user defined>.ACD	AutoCal characterization data.
<user defined>.BMP	Screen dump in Windows bit map format (version 2.19)
<user defined>.CAL	Front panel and calibration data
<user defined>.DAT	Hard copy tabular data
<user defined>.EDE	Embedding/deembedding file
<user defined>.EDL	Embedding/deembedding log file
<user defined>.ENR	Noise source data
<user defined>.EXT	Noise source extension data
<user defined>.HGL	Plotter dump in HPGL format
<user defined>.LIN	Linear calibration file
<user defined>.LOG	Service log listing
<user defined>.M3P	Tabular data listing in M3P format
<user defined>.M4P	Tabular data listing in M4P format
<user defined>.NRM	Trace memory data
<user defined>.S1P	Tabular data listing in S1P format
<user defined>.S2P	Tabular data listing in S2P format
<user defined>.S3P	Tabular data listing in S3P format
<user defined>.S4P	Tabular data listing in S4P format
<user defined>.SEQ	Sequence data file
<user defined>.SG	Segmented sweep setup file
<user defined>.SGL	Segmented sweep log listing
<user defined>.TXT	Tabular data listing in *Microsoft Excel* format
<user defined>.XRC	Receiver calibration data file
HW_CAL.ALC	ALC calibration data
HW_CAL.ALL	Contains all hardware calibration data elements
HW_CAL.BNF	Backend NF attenuator data
KIT_INFO.[xyz]	A data file for a connector type from a Cal Kit floppy disk Letter x 2 — 2.4 mm Connector 3 — GPC 3.5 Connector G —GPC 7 Connector K —K Connector N —N connector S — SMA Connector T — TNC connector V — V connector W — Waveguide Letter y A — Waveguide F — Female M — Male N — GPC 7 connector Letter z O — Open S — Short V — Waveguide

Table 9-10. *MS462XX File Types* ***(2 of 2)***

Filename	File type
LOGO.EPS	User defined logo file for use on an Epson type printer
LOGO.HP	User defined logo file for use on an HP type printer
LOGO.PLT	User defined logo file for use on a plotter

Table 9-9. Obsolete Disk Function Commands (Retained for backwards compatibiality) (1 of 2)

Command	Description
CPYALCFH	Copy ALC cal file from floppy to hard disk
CPYALCHF	Copy ALC cal file from hard to floppy disk
CPYCALFH	Copy calibration/front panel setup from floppy to hard disk
CPYCALHF	Copy calibration/front panel setup from hard to floppy disk
CPYDATFH	Copy tabular data file from floppy to hard disk
CPYDATHF	Copy tabular data file from hard to floppy disk
CPYELGFH	Copy error list file from floppy to hard disk
CPYELGHF	Copy error list file from hard to floppy disk
CPYLOGFH	Copy service log file from floppy to hard disk
CPYLOGHF	Copy service log file from hard to floppy disk
CPYNRMFH	Copy trace memory file from floppy to hard disk
CPYNRMHF	Copy trace memory file from hard to floppy disk
DEC	Delete calibration/front panel setup from floppy disk
DECH	Delete calibration/front panel setup from hard disk
DED	Delete tabular data file from floppy disk
DEDH	Delete tabular data file from hard disk
DELALC	Delete ALC cal file from floppy disk
DELALCH	Delete ALC cal file from hard disk
DELCAL	Delete calibration/front panel setup from floppy disk
DELCALH	Delete calibration/front panel setup from hard disk
DELDAT	Delete tabular data file from floppy disk
DELDATH	Delete tabular data file from hard disk
DELELG	Delete error list file from floppy disk
DELELGH	Delete error list file from hard disk
DELLOG	Delete service log file from floppy disk
DELLOGH	Delete service log file from hard disk
DELNRM	Delete trace memory file from floppy disk
DELNRMH	Delete trace memory file from hard disk
DEN	Delete trace memory file from floppy disk
DENH	Delete trace memory file from hard disk

Table 9-9. Obsolete Disk Function Commands (Retained for backwards compatibiality) (2 of 2)

Command	Description
RCK	Recall trace memory file from floppy disk
RCKH	Recall trace memory file from hard disk
RCLALC	Recall ALC calibration file from floppy disk
RCLALCH	Recall ALC calibration file from hard disk
RCLCAL	Recall calibration/front panel setup from floppy disk
RCLCALH	Recall calibration/front panel setup from hard disk
RCLDAT	Recall tabular data file from floppy disk to printer
RCLDATH	Recall tabular data file from hard disk to printer
RCLELG	Recall error list file from floppy disk to printer
RCLELGH	Recall error list file from hard disk to printer
RCLLOG	Recall service log file from floppy disk to printer
RCLLOGH	Recall service log file from hard disk to printer
RCLNRM	Recall trace memory file from floppy disk
RCLNRMH	Recall trace memory file from hard disk
RLD	Recall calibration/front panel setup from floppy disk
RLDH	Recall calibration/front panel setup from hard disk
RTB	Recall tabular data file from floppy disk to printer
RTBH	Recall tabular data file from hard disk to printer
SAVALC	Save ALC cal to floppy disk
SAVALCH	Save ALC cal to hard disk
SAVCAL	Save calibration/front panel setup to floppy disk
SAVCALH	Save calibration/front panel setup to hard disk
SAVDAT	Save tabular data to floppy disk
SAVDATH	Save tabular data to hard disk
SAVELG	Save error list to floppy disk
SAVELGH	Save error list to hard disk
SAVLOG	Save service log to floppy disk
SAVLOGH	Save service log to hard disk
SAVNRM	Save trace memory to floppy disk
SAVNRMH	Save trace memory to hard disk
SDK	Save trace memory to floppy disk
SDKH	Save trace memory to hard disk
STO	Save calibration/front panel setup to floppy disk
STOH	Save calibration/front panel setup to hard disk
TDD	Save tabular data to floppy disk
TDDH	Save tabular data to hard disk

9-7 DIAGNOSTICS COMMANDS

The commands listed in Table 9-10 are used to provide diagnostics help in localizing system malfunctions, performing calibration of internal circuits, testing system functions, and managing error reporting and the service log.

NOTE

The diagnostics commands in Table 9-10 are intended for use only by ANRITSU certified service engineers.

Table 9-10. *Diagnostics Commands (1 of 2)*

Command	Description
ALC	Perform ALC loop internal calibration
BAC	Perform backend attenuator calibration
DGT	Display first LCD test pattern
DGT1	Display first LCD test pattern
DGT2	Display second LCD test pattern
DGT3	Display third LCD test pattern
DRL	Diagnostic read latch
DVM	Enter DVM channel number
DWL	Diagnostic write latch
EDG	End diagnostics mode
EKT	Select external keyboard testing
EXD	Display external A/D input
FPT	Select front panel keypad testing
NFV	Start noise figure verification
NFVNB?	Output noise figure verification NB data
NFVNC?	Output noise figure verification NC data
NFVND?	Output noise figure verification ND data
NFVSB?	Output noise figure verification SB data
NFVSC?	Output noise figure verification SC data
NFVSD?	Output noise figure verification SD data
PRT?	Perform printer test and output status
SDG	Start diagnostics mode
TSALCMS1	Source 1 ALC modulator drive voltage
TSALCMS2	Source 2 ALC modulator drive voltage
TSALCS1	Select source 1 for ALC verification
TSALCS2	Select source 2 for ALC verification
TSALCV	Start source ALC verification
TSBEG	Start diagnostics mode - same as SDG
TSDDSS1	Source 1 reference DDS voltage
TSDDSS2	Source 2 reference DDS voltage
TSDRAM	Start DRAM test

Table 9-10. *Diagnostics Commands (2 of 2)*

Command	Description
TSDSPSRAM	Start DSP SRAM test
TSDVMC	Enter DVM channel number - same as DVM
TSEFMEM	Start extended FLASH memory test
TSEND	End diagnostics mode - same as EDG
TSEXTI	Display external A/D input - same as EXD
TSFMEM	Start FLASH memory test
TSGDRAM	Start graphic DRAM test
TSGVRAM	Start graphic VRAM test
TSHETO	Het oscillator voltage
TSLATR?	Diagnostic read latch - same as DRL
TSLATW	Diagnostic write latch - same as DWL
TSLEVAS1	Source 1 level amplifier voltage
TSLEVAS2	Source 2 level amplifier voltage
TSLOGAS1	Source 1 logarithmic amplifier voltage
TSLOGAS2	Source 2 logarithmic amplifier voltage
TSMAIVLO1	LO1 main VCO voltage
TSMAIVS1	Source 1 main VCO voltage
TSMAIVS2	Source 2 main VCO voltage
TSMCOO0	Common offset mode off
TSMCOO1	Common offset mode on
TSMHAR0	Harmonic mode off
TSMHAR1	Harmonic mode on
TSMSPA0	Spur avoidance mode off
TSMSPA1	Spur avoidance mode on
TSMSPU0	Speed up circuit mode off
TSMSPU1	Speed up circuit mode on
TSOFFVLO1	LO1 offset VCO voltage
TSOFFVS1	Source 1 offset VCO voltage
TSOFFVS2	Source 2 offset VCO voltage
TSPWRLS1	Source 1 power level DAC voltage
TSPWRLS2	Source 2 power level DAC voltage
TSSRAM	Start SRAM test
TSSRAMD	Start SRAM disk test
TSTRENF	Noise figure measurement

9-8 SERVICE LOG ACCESS COMMANDS

Commands used to access and control the Service Log functions via the GPIB are listed in Table 9-11.

Table 9-11. *Service Log Commands (1 of 1)*

Command	Description
CSL	Clear service log
OSL	Output service log
PEL	Print the error list
PSL	Print the service log

9-9 CLR/LOCAL KEY COMMANDS

The commands associated with the Clr/Local key are shown in Table 9-12.

Table 9-12. *Clr/Local Key Commands (1 of 1)*

Command	Description
RTL	Return to local

Chapter 10
Special Applications Functions

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Chapter 10
Special Applications Functions

10-1 INTRODUCTION

This chapter describes commands used to implement special measurement functions. They are mainly associated with the functions controlled by the Appl key (paragraph 10-2). Additionally, applications in this chapter include multiple source control commands, rear panel output control commands, receiver mode commands, and adapter removal commands.

10-2 APPL KEY COMMANDS

The Appl key provides entry to measurement functions consisting of the following:

- Transmission and Reflection
- Swept Power Gain Compression
- Swept Frequency Gain Compression
- Intermodulation Distortion (IMD)
- Harmonic
- Noise Figure
- Time Domain

The GPIB commands used to implement and control measurement applications typically begin with with the letters “APP.” They are listed in Table 10-1.

Table 10-1. *Applications Commands (1 of 1)*

Command	Description
ABSPHASE0	Turn absolute phase OFF
ABSPHASE1	Turn absolute phase ON
ABSPHASE?	Output the absolute phase ON/OFF status
APPDEVM	Select mixer device type for application
APPDEVS	Select standard device type for application
APPDEVX?	Output device type for application
APPENTC	Set application entry state to current state
APPENTP	Set application entry state to previous state
APPENTX?	Output application entry state
APPGCF	Select swept frequency gain compression application type
APPGCP	Select swept power gain compression application type
APPHAR	Select harmonic application type
APPIMD	Select IMD application type
APPLORCW0	Turn off LO CW mode
APPLORCW1	Turn on LO CW mode
APPLORCWF	Enter LO CW frequency
APPLORCWF?	Output LO CW frequency
APPLORCWX?	Output LO CW on/off status
APPLOROFF	Enter LO offset frequency
APPLOROFF?	Output LO offset frequency
APPLORRCD	Select receiver down conversion
APPLORRCN	Select receiver no conversion
APPLORRCU	Select receiver up conversion
APPLORRCX?	Output receiver conversion type
APPLORS2	Select source 2 for LO
APPLORS3	Select source 3 for LO
APPLORS4	Select source 4 for LO
APPLORSX?	Output LO source number
APPNF	Select noise figure application type
APPSWPC	Set application sweep mode to CW receiver
APPSWPS	Set application sweep mode to source sweep
APPSWPX?	Output application sweep mode
APPTR	Select transmission and reflection application type
APPX?	Output application type
EDE	Edit ENR source equation
HELP0	Turn off help display
HELP1	Turn on help display
HELPX?	Output help display on/off status
IFV	Enter frequency values

10-3 TRANSMISSION AND REFLECTION COMMANDS

The commands that provide transmission and reflection measurements deal primarily with measurement calibration; they are convered in detail in Chapter 6.

10-4 GAIN COMPRESSION COMMANDS

The MS462X uses two gain compression methods for amplifier testing: swept power and swept frequency. The gain compression commands are listed in Table 10-2 on the following page.

Swept Power Gain Compression

The Swept Power Gain Compression Application lets users see the gain compression of an amplifier-under-test (AUT) at up to 10 continuous wave (CW) frequencies and sweeping power over a predefined range and stepsize.

The displays are in power out and normalized S21. Marker search is used to automatically find the gain compression point. There are actually two types of tests in this application. They are:

- *The swept power gain compression test*. In this test, the frequency is constant at one of the 10 CW frequencies programmed previously, and the power is swept over the power range. Users can change the frequency and observe the gain compression point at that frequency.

- *The multiple frequency swept power gain compression test*. This is an all encompassing test which automatically measures the gain compression at all of the preselected frequencies and graphs the results. It is the results of this test that are referred to by the commands OGCFD, OGCTXT and SAVEGC.

Before using these commands, become thoroughly familiar with the manual procedure and instructions.

This application makes use of the Discrete Fill command set to program the test frequencies. The commands will not be relisted here.

Swept Frequency Gain Compression

The Swept frequency gain compression application lets users see the gain compression of an amplifier-under-test (AUT) over the full operating frequency range by creating two calibrated displays. The top display shows power out and the bottom in normalized gain. While sweeping the frequency range the user may vary the input power and observe any change in gain on the bottom graph. The user should become thoroughly familiar with the manual procedure and instructions before attempting to control the application from the GPIB.

The Gain Compression application makes use of a Flat Test Port Power calibration to achieve a higher degree of accuracy. The commands for this calibration are not re-listed here.

Table 10-2. *Gain Compression Commands (1 of 2)*

Command	Description
CALR	Perform receiver calibration for gain compression testing
GCFS?	Output the multiple gain compression fixed scale flag ON/OFF status
GCFSOFF	Turn the multiple gain compression fixed scale flag OFF
GCFSON	Turn the multiple gain compression fixed scale flag ON
GCMP	Enter gain compression point search value
GCMP?	Output gain compression point search value
GCSNS210	Turn self normalization of S21 off
GCSNS211	Turn self normalization of S21 on
GCSNS21?	Output self normalization of S21 status
GCYSP	Enter the Y-stop power level for multiple frequency gain compression
GCYSP?	Output the Y-stop power level for multiple frequency gain compression
GCYST	Enter the Y-start power level for multiple frequency gain compression
GCYST?	Output the Y-start power level for multiple frequency gain compression
MFGCT	Start multiple frequency swept power gain compression test
NOFST	Enter nominal offset value for external gain
NOFST?	Output nominal offset value for external gain
NRMS	Normalize S21 for gain compression testing
PSET	Enter target power for gain compression receiver calibration
PSET?	Output target power for gain compression receiver calibration
PSF	Enter swept power frequency
PSF?	Output swept power frequency
PSTEP	Enter power sweep step size
PSTEP?	Output power sweep step size
PSTOP	Enter power sweep stop power
PSTOP?	Output power sweep stop power
PSTRT	Enter power sweep start power
PSTRT?	Output power sweep start power
PSWC	Perform power sweep linearity calibration
PSWC0	Turn power sweep linearity calibration off
PSWC1	Turn power sweep linearity calibration on
PSWCDONE?	Output power sweep linearity cal done status
PSWCX?	Output power sweep linearity calibration on/off status
PSWP0	Turn power sweep off
PSWP1	Turn power sweep on
PSWPX?	Output power sweep on/off status
RSTGC	Reset gain compression parameters to default

Table 10-2. *Gain Compression Commands (2 of 2)*

Command	Description
SFGCA	Select swept frequency gain compression application
SFGCT	Start swept frequency gain compression test
SPGCA	Select swept power gain compression application
SPGCT	Start swept power gain compression test
UNDOGC	Exit gain compression and undo changes

10-5 HARMONIC COMMANDS

This paragraph provides a listing and descriptions of the commands that control Harmonic measurements. These commands are listed in Table 10-3.

Table 10-3. *Harmonic Commands*

Command	Description
BEGEN	Begin taking harmonic enhancement calibration data
BEGHAR	Begin taking both harmonic enhancement and phase calibration
BEGPH	Begin taking harmonic phase calibration data
HAR1	Select 1st harmonic (fundamental) frequency
HAR2	Select 2nd harmonic frequency
HAR3	Select 3rd harmonic frequency
HAR4	Select 4th harmonic frequency
HAR5	Select 5th harmonic frequency
HAR6	Select 6th harmonic frequency
HAR7	Select 7th harmonic frequency
HAR8	Select 8th harmonic frequency
HAR9	Select 9th harmonic frequency
HARCE	Select harmonic enhancement correction
HARCEDONE?	Output harmonic enhancement cal done status
HARCEP	Select harmonic enhancement and Phase correction
HARCEPDONE?	Output harmonic enhancement and Phase cal done status
HARCN	Select No harmonic correction
HARCPDONE?	Output harmonic phase cal done status
HARCX?	Output harmonic correction setting
HARDOF	Select harmonic display relative to output fundamental frequency
HARDSF	Select harmonic display relative to source fundamental frequency
HARDSH	Select harmonic display relative to source harmonic frequency
HARDX?	Output harmonic display setting
HARP12	Select ports 1 and 2
HARP13	Select ports 1 and 3
HARPX?	Output ports 1 and 2 or 1 and 3 setting
HARX?	Output harmonic frequency number

10-6 NOISE FIGURE COMMANDS

This paragraph provides a listing and descriptions of the command- that control Noise Figure measurements. These commands are listed in Table 10-4.

Table 10-4. *Noise Figure Commands (1 of 2)*

Command	Description
BEGNF	Begin taking noise figure calibration data
BEGNFRF	Begin taking noise figure with RF calibration data
BNDNFCW?	Output multiple source band Noise Figure ENR source CW flag
BNDNFDIV?	Output multiple source band Noise Figure ENR source divisor
BNDNFMUL?	Output multiple source band Noise Figure ENR source multiplier
BNDNFOFF?	Output multiple source band Noise Figure ENR source offset
NFALCK0	Turn off the lock down
NFALCK1	Lock down the front end attenuator
NFALCK?	Output lock or unlock down status for the front end attenuator setting
NFAOF	Turn noise figure measurement averaging off
NFAON	Turn noise figure measurement averaging on
NFAON?	Noise figure averaging on/off query
NFASET	Lock down the front end attenuator and set it to 0, 1, 2, 3, or 4
NFBATTN	Output the backend attenuator setting
NFBCAL	Output NF backend calibration table
NFBW	Enter noise figure bandwidth correction
NFBW?	Output noise figure bandwidth correction
NFBWC0	Turn off noise figure bandwidth correction
NFBWC1	Turn on noise figure bandwidth correction
NFBWCX?	Output noise figure bandwidth correction on/off status
NFC0	Turn off noise figure correction
NFC1	Turn on noise figure correction
NFC12TDONE?	Output noise figure with 12 term cal done status
NFC2	Turn on noise figure with 12-term correction
NFCDONE?	Output noise figure cal done status
NFCOLD	Output corrected data for cold noise power
NFCT	Enter noise figure cold temperature
NFCT?	Output noise figure cold temperature
NFCX?	Output noise figure correction on/off status
NFDAG	Display available gain
NFDATA	Output the cold data, the hot data, the front end attenuator
NFDBWN	Select narrow DUT BW
NFDBWW	Select wide DUT BW
NFDBWX?	Output DUT BW setting
NFDENT	Display equivalent noise temperature

Table 10-4. *Noise Figure Commands (2 of 2)*

Command	Description
NFDIG	Display insertion gain
NFDNF	Display noise figure
NFDX?	Output noise figure display selection
NFDYF	Display Y-factor
NFFATTN	Output the front end attenuator setting
NFHOT	Output corrected data for hot noise power
NFLA	Enter noise figure loss after DUT
NFLA?	Output noise figure loss after DUT
NFLB	Enter noise figure loss before DUT
NFLB?	Output noise figure loss before DUT
NFLENR	Load ENR file from floppy disk
NFLENRH	Load ENR file from hard disk
NFLENRX	Load ENR extension correction file from floppy disk
NFLENRXH	Load ENR extension correction file from hard disk
NFLNFX	Load ENR external extension correction file from floppy disk
NFLNFXH	Load ENR external extension correction file from hard disk
NFOL	Output noise figure overload status
NFSRCE	Select external noise source
NFSRCI	Select internal noise source
NFSRCX?	Output noise source selection
NFSSBC0	Turn off noise figure single sideband correction
NFSSBC1	Turn on noise figure single sideband correction
NFSSBCX?	Output noise figure single sideband correction on/off
NFXENR0	Turn off ENR extension table
NFXENR1	Turn on ENR extension table
NFXENRX?	Query on/off status of ENR extension table
NS0	Turn noise source off
NS1	Turn noise source on

10-7 INTERMODULATION DISTORTION (IMD) COMMANDS

This paragraph provides a listing and descriptions of the commands that control Intermodulation Distortion (IMD) measurements. These commands are listed in Table 10-5.

Table 10-5. *Intermodulation Distortion (IMD) Commands (1 of 2)*

Command	Description
BEGIMD	Begin taking IMD calibration data
IMD3	Select 3rd order intermodulation products
IMD5	Select 5th order intermodulation products
IMD7	Select 7th order intermodulation products
IMD9	Select 9th order intermodulation products
IMDC0	Turn off IMD correction
IMDC1	Turn on IMD correction
IMDCDONE?	Output IMD cal done status
IMDCX?	Output IMD correction on/off status
IMDDI	Display IMD intercept
IMDDP	Display IMD product
IMDDX?	Output IMD display selection
IMDLOS2	Select source 2 for IMD LO
IMDLOS3	Select source 3 for IMD LO
IMDLOS4	Select source 4 for IMD LO
IMDLOSX?	Output IMD tone 1 source number
IMDMRI	Select Input as measurement reference for IMD
IMDMRO	Select Output as measurement reference for IMD
IMDMRX?	Output measurement reference for IMD
IMDOX?	Output IMD ORDER selection
IMDRT1	Select IMD relative to tone 1
IMDRT2	Select IMD relative to tone 2
IMDRTX?	Output IMD display relative to tone number selection
IMDSSMA	Select source selection apply mode
IMDSSMD	Select source selection define mode
IMDSSMX?	Output source selection mode
IMDT1S1	Select source 1 for IMD tone 1
IMDT1S2	Select source 2 for IMD tone 1
IMDT1S3	Select source 3 for IMD tone 1
IMDT1S4	Select source 4 for IMD tone 1
IMDT1SX?	Output IMD tone 1 source number
IMDT2OFF	Enter IMD tone 2 offset
IMDT2OFF?	Output IMD tone 2 offset
IMDT2S1	Select source 1 for IMD tone 2
IMDT2S2	Select source 2 for IMD tone 2

Table 10-6. *Intermodulation Distortion (IMD) Commands (2 of 2)*

Command	Description
IMDT2S3	Select source 3 for IMD tone 2
IMDT2S4	Select source 4 for IMD tone 2
IMDT2SX?	Output IMD tone 2 source number

10-8 TIME DOMAIN COMMANDS

The time domain commands for the MS462XX are listed below in Table 10-7. Option 2 (High-Speed Time Domain [Distance] Software option) adds these commands to the MS462XX software.

The time domain commands specify the domain of a channel and the set up operating modes and parameters.

Table 10-7. *Time Domain Commands (1 of 2)*

Command	Description
CHDDX?	Output domain parameter frequency/distance/time for specified channel
CHGOF?	Output the time domain gating mode on/off/display for specified channel
CHLPSX?	Output the time domain impulse/step response for specified channel
CHTDDIST?	Output the time domain parameter distance/time for specified channel
CHTDPIX?	Output the time domain phasor impulse on/off status for specified channel
CHTDX?	Output domain mode for specified channel
DBP	Select distance bandpass mode for active channel
DCA	Select automatic DC term calculation for lowpass
DCO	Select open for DC term for lowpass
DCREFC?	Output reflection coefficient for lowpass
DCS	Select short for DC term for lowpass
DCV	Enter value for DC term for lowpass
DCV?	Output lowpass DC term value
DCX?	Output lowpass DC term selection
DCZ	Select line impedance for DC term for lowpass
DDX?	Output active channel domain parameter frequency distance or time
DLP	Select distance lowpass mode for active channel
DPI	Select distance phasor impulse mode for active channel
FGT	Select frequency with time gate for active channel
FQD	Select frequency domain for active channel
GCT	Enter gate center value distance or time
GCT?	Output gate center value
GDS	Gate symbols displayed on active channel
GLS	Select low sidelobe gate shape
GMS	Select minimum sidelobe gate shape
GNM	Select nominal gate shape
GOF	Turn off gating on active channel
GOF?	Output gating mode on active channel
GON	Turn on gating on active channel
GRT	Select Rectangular gate shape
GSN	Enter gate span value distance or time
GSN?	Output gate span value
GSP	Enter gate stop value distance or time

Table 10-7. *Time Domain Commands (2 of 2)*

Command	Description
GSP?	Output gate stop value
GST	Enter gate start value distance or time
GST?	Output gate start value
GSX?	Output Gate Shape setting
LPI	Select lowpass impulse response for active channel
LPS	Select lowpass step response for active channel
LPSX?	Output lowpass response for active channel impulse or step
MRR	Restore original marker range
TBP	Select time bandpass mode for active channel
TDDIST	Set time domain parameter to distance for active channel
TDDIST?	Output active channel time domain parameter distance or time
TDPI0	Turn phasor impulse response off for active channel
TDPI1	Turn phasor impulse response on for active channel
TDPIX?	Output phasor impulse on/off status for active channel
TDTIME	Set time domain parameter to time for active channel
TDX?	Output domain mode for active channel
TLP	Select time lowpass mode for active channel
TPI	Select time phasor impulse mode for active channel
VELO?	Output relative velocity for lowpass distance
WLS	Select low sidelobe window shape
WMS	Select minimum sidelobe window shape
WNM	Select nominal window shape
WRT	Select rectangular window shape
WSX?	Output window shape
ZCT	Enter zoom range center value time or distance
ZCT?	Output zoom range center value
ZSN	Enter zoom range span value time or distance
ZSN?	Output zoom range span value
ZSP	Enter zoom range stop value time or distance
ZSP?	Output zoom range stop value
ZST	Enter zoom range start value time or distance
ZST?	Output zoom range start value

10-9 SEQUENCE COMMANDS

Sequence enables users to automate a repetitive testing task. A sequence is created by recording a series of keystrokes. After a sequence is created, users can execute these keystrokes by pressing a single key. Sequence also offers subroutine and sequence flow control mechanisms to increase the flexibility of test sequences. The sequence feature is fully described in the MS462XX Operation Manual, Appendix A. The commands for implemting sequence operations remotely are listed in Table 10-8.

Table 10-8. *SEQ Key Commands (1 of 3)*

Command	Description
POP	Enter parallel output port 8-bit decimal word (0-255)
POP?	Output parallel output port 8-bit decimal word (0-255)
POPBC0	Clear parallel output port bit 0
POPBC1	Clear parallel output port bit 1
POPBC2	Clear parallel output port bit 2
POPBC3	Clear parallel output port bit 3
POPBC4	Clear parallel output port bit 4
POPBC5	Clear parallel output port bit 5
POPBC6	Clear parallel output port bit 6
POPBC7	Clear parallel output port bit 7
POPBS0	Set parallel output port bit 0
POPBS1	Set parallel output port bit 1
POPBS2	Set parallel output port bit 2
POPBS3	Set parallel output port bit 3
POPBS4	Set parallel output port bit 4
POPBS5	Set parallel output port bit 5
POPBS6	Set parallel output port bit 6
POPBS7	Set parallel output port bit 7
SEQDEL1	Delete sequence 1
SEQDEL2	Delete sequence 2
SEQDEL3	Delete sequence 3
SEQDEL4	Delete sequence 4
SEQDEL5	Delete sequence 5
SEQDEL6	Delete sequence 6
SEQDEL7	Delete sequence 7
SEQDGMSG0	Turn saving sequence display message to service log off
SEQDGMSG1	Turn saving sequence display message to service log on
SEQDGMSG?	Output saving sequence display message to service log status
SEQEXE1	Execute sequence 1
SEQEXE2	Execute sequence 2
SEQEXE3	Execute sequence 3

Table 10-8. *SEQ Key Commands (2 of 3)*

Command	Description
SEQEXE4	Execute sequence 4
SEQEXE5	Execute sequence 5
SEQEXE6	Execute sequence 6
SEQEXE7	Execute sequence 7
SEQHELP0	Turn off sequence help message
SEQHELP1	Turn on sequence help message
SEQHELP?	Output sequence help message mode on/off
SEQLOA1	Recall sequence 1 from floppy disk
SEQLOA2	Recall sequence 2 from floppy disk
SEQLOA3	Recall sequence 3 from floppy disk
SEQLOA4	Recall sequence 4 from floppy disk
SEQLOA5	Recall sequence 5 from floppy disk
SEQLOA6	Recall sequence 6 from floppy disk
SEQLOA7	Recall sequence 7 from floppy disk
SEQLOAH1	Recall sequence 1 from hard disk
SEQLOAH2	Recall sequence 2 from hard disk
SEQLOAH3	Recall sequence 3 from hard disk
SEQLOAH4	Recall sequence 4 from hard disk
SEQLOAH5	Recall sequence 5 from hard disk
SEQLOAH6	Recall sequence 6 from hard disk
SEQLOAH7	Recall sequence 7 from hard disk
SEQNAM1	Enter sequence 1 name
SEQNAM1?	Output sequence 1 name
SEQNAM2	Enter sequence 2 name
SEQNAM2?	Output sequence 2 name
SEQNAM3	Enter sequence 3 name
SEQNAM3?	Output sequence 3 name
SEQNAM4	Enter sequence 4 name
SEQNAM4?	Output sequence 4 name
SEQNAM5	Enter sequence 5 name
SEQNAM5?	Output sequence 5 name
SEQNAM6	Enter sequence 6 name
SEQNAM6?	Output sequence 6 name
SEQNAM7	Enter sequence 7 name
SEQNAM7?	Output sequence 7 name
SEQSAV1	Save sequence 1 to floppy disk
SEQSAV2	Save sequence 2 to floppy disk
SEQSAV3	Save sequence 3 to floppy disk

Table 10-8. *SEQ Key Commands (3 of 3)*

Command	Description
SEQSAV4	Save sequence 4 to floppy disk
SEQSAV5	Save sequence 5 to floppy disk
SEQSAV6	Save sequence 6 to floppy disk
SEQSAV7	Save sequence 7 to floppy disk
SEQSAVH1	Save sequence 1 to hard disk
SEQSAVH2	Save sequence 2 to hard disk
SEQSAVH3	Save sequence 3 to hard disk
SEQSAVH4	Save sequence 4 to hard disk
SEQSAVH5	Save sequence 5 to hard disk
SEQSAVH6	Save sequence 6 to hard disk
SEQSAVH7	Save sequence 7 to hard disk
SEQSAVT1	Save sequence 1 text to floppy disk
SEQSAVT2	Save sequence 2 text to floppy disk
SEQSAVT3	Save sequence 3 text to floppy disk
SEQSAVT4	Save sequence 4 text to floppy disk
SEQSAVT5	Save sequence 5 text to floppy disk
SEQSAVT6	Save sequence 6 text to floppy disk
SEQSAVT7	Save sequence 7 text to floppy disk
SEQSAVTH1	Save sequence 1 text to hard disk
SEQSAVTH2	Save sequence 2 text to hard disk
SEQSAVTH3	Save sequence 3 text to hard disk
SEQSAVTH4	Save sequence 4 text to hard disk
SEQSAVTH5	Save sequence 5 text to hard disk
SEQSAVTH6	Save sequence 6 text to hard disk
SEQSAVTH7	Save sequence 7 text to hard disk

10-10 REAR PANEL CONTROL COMMANDS

Table 10-9 lists the commands for controlling the rear-panel voltage output of the MS462XXX. The RV1 command enables the output and command RV0 disables it. The orientation of the output can be set to either horizontal (RVH), vertical (RVV), lock direction (RVL), or DC value (RVD).

In the horizontal mode, the voltage output is a digital ramp starting at the voltage start value set by command VST and ending at the voltage stop value set by command VSP. The start value corresponds to the first point of the sweep and the stop value corresponds to last point of the sweep. In the vertical mode, the output voltage is a measure of the instantaneous data point value. The output voltage is related to the scaling of the graph for channel 1. The reference line corresponds to the zero volt value and each graticle line is equal to a ±1 volt value span. The values set by the VST and VSP commands have no effect in the vertical mode.

In the lock direction mode, the start voltage value is output for forward sweeps (lock to Ra). The stop voltage value is output for reverse sweeps (lock to Rb).In the DC value mode, the rear panel output voltage is set to the DC value programmed with the RPO command.

Table 10-9. *Rear Panel Output Control Commands (1 of 2)*

Command	Description
FREFE	Select external frequency reference
FREFI	Select internal frequency reference
FREFX?	Output frequency reference internal/external setting
RPO	Enter rear panel DC voltage value
RPO?	Output rear panel DC voltage value
RV0	Turn rear panel output voltage off
RV1	Turn rear panel output voltage on
RV1?	Output rear panel output voltage on/off status
RVA1	Enter rear panel output voltage value when port 1 is driving
RVA1?	Output rear panel output voltage value when port 1 is driving
RVA2	Enter rear panel output voltage value when port 2 is driving
RVA2?	Output rear panel output voltage value when port 2 is driving
RVA3	Enter rear panel output voltage value when port 3 is driving
RVA3?	Output rear panel output voltage value when port 3 is driving
RVA4	Enter rear panel output voltage value when Port 4 is driving
RVA4?	Output rear panel output voltage value when Port 4 is driving
RVD	Set rear panel output mode to dc value
RVH	Set rear panel output mode to horizontal
RVL	Set rear panel output mode to lock direction

Table 10-9. *Rear Panel Output Control Commands (2 of 2)*

Command	Description
RVP	Set rear panel output mode to driven port
RVSP	Enter rear panel stop voltage value
RVSP?	Output rear panel stop voltage value
RVST	Enter rear panel start voltage value
RVST?	Output rear panel start voltage value
RVT	Set rear panel output mode to TTL
RVTP1	Select port 1 for TTL rear panel output voltage
RVTP1HL	Set TTL rear panel output voltage type to TTL active high level
RVTP1HP	Set TTL rear panel output voltage type to TTL active high pulse
RVTP1LL	Set TTL rear panel output voltage type to TTL active low level
RVTP1LP	Set TTL rear panel output voltage type to TTL active low pulse
RVTP1X?	Output TTL rear panel output voltage type
RVTP2	Select port 2 for TTL rear panel output voltage
RVTP2HL	Set TTL rear panel output voltage type on port 2 to TTL active high level.
RVTP2HP	Set TTL rear panel output voltage type on port 2 to TTL active high pulse.
RVTP2LL	Set TTL rear panel output voltage type on port 2 to TTL active low level.
RVTP2LP	Set TTL rear panel output voltage type on port 2 to TTL active low pulse.
RVTP2X?	Output TTL rear panel output voltage type on port 2.
RVTP3	Select port 3 for TTL rear panel output voltage
RVTP3HL	Set TTL rear panel output voltage type on port 3 to TTL active high level.
RVTP3HP	Set TTL rear panel output voltage type on port 3 to TTL active high pulse.
RVTP3LL	Set TTL rear panel output voltage type on port 3 to TTL active low level.
RVTP3LP	Set TTL rear panel output voltage type on port 3 to TTL active low pulse.
RVTP3X?	Output TTL rear panel output voltage type on port 3.
RVTP4	Select Port 4 for TTL rear panel output voltage.
RVTP4HL	Set TTL rear panel output voltage type on port 4 to TTL active high level
RVTP4HP	Set TTL rear panel output voltage type on port 4 to TTL active high pulse
RVTP4LL	Set TTL rear panel output voltage type on port 4 to TTL active low level
RVTP4LP	Set TTL rear panel output voltage type on port 4 to TTL active low pulse
RVTP4X?	Output TTL rear panel output voltage type on port 4
RVTPX?	Output TTL rear panel output voltage type
RVV	Set rear panel output mode to vertical
RVX?	Output rear panel output mode
VSP	Enter rear panel stop voltage value
VSP?	Output rear panel stop voltage value
VST	Enter rear panel start voltage value
VST?	Output rear panel start voltage value

10-11 FREQUENCY TRANSLATION GROUP DELAY

The frequency translation group delay commands are listed in Table 10-10, below.

Table 10-10. *Frequency Translation Group Delay Commands*

Command	Description
APPFTGD	Select frequency translation group delay application type
BEGFTGD	Start frequency translation group delay calibration
FTGDC0	Turn off frequency translation group delay correction
FTGDC1	Turn on frequency translation group delay correction
FTGDCDONE?	Output frequency translation group delay cal done status
FTGDCX?	Output frequency translation group delay correction on/off status

Part 3 Programming Reference

This part consists of three chapters that provide programming reference information for the MS462XX VNA.

Chapter 11 – *provides a list of all GPIB commands for the MS462XX. The listing for each command (mnemonic) includes relevant details about the command.* ***This chaper appears in Volume II.***

Chapter 12 – *provides general (non-command specific) tabular information for the MS462XX. Much of this information is presented in Chapters 5 through 11, but is provided in this chapter for easy access.*

Chapter 13 – *provides a list of all Error Messages related to remote- only (GPIB) operation of the MS462XX.*

Chapter 11
Command Dictionary

The GPIB Mnemonic Command Dictionary is Located in Volume II

MS462XX

VECTOR NETWORK MEASUREMENT SYSTEM

PROGRAMMING MANUAL

Volume II
Command Dictionary

490 JARVIS DRIVE | MORGAN HILL, CA 95037-2809

P/N: 10410-00204
REVISION: J
PRINTED: JULY 2004

Chapter 11
Command Dictionary

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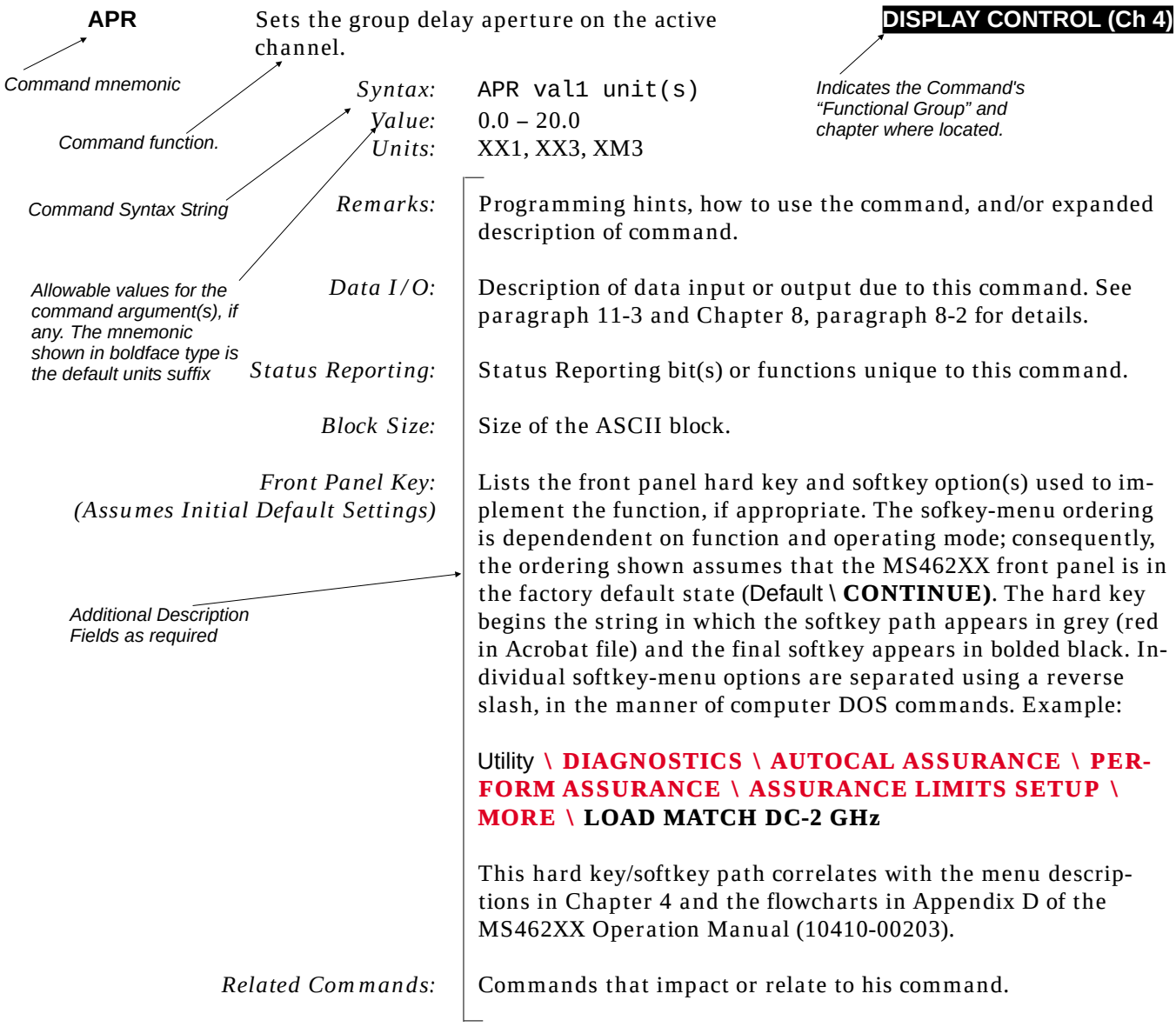

Figure 11-1. *Typographic Conventions for the Command Listings*

Chapter 11
Command Dictionary

11-1 INTRODUCTION

This chapter provides a listing of GPIB programming commands (mnemonics) used with the Model MS462XX Vector Network Analyzer.

11-2 TYPOGRAPHIC CONVENTIONS

The typographic conventions, abbreviations, and syntax legend used throughout this chapter to define the GPIB commands are described in Figure 11-1 (opposite page).

11-3 DATA I/O FORMATS AND TEMPLATES

The data input and output formats and templates, referred to throughout this chapter, are delimited with the less-than and greater-than characters (< >). These characters are not part of the data; they are only used in this text to distinguish the data elements they represent. See Chapter 8, Remote Only Operations, "Data Transfer" for complete details.

MS462XX data formats are summarized below:

<NR1>
This notation represents ASCII integer values. A comma (,) is used to separate multiple values sent in a single command's input or output string.

Examples of values that can be represented by <NR1> notation:

1
0
-29,179

<NR2>
This notation represents ASCII floating point values in decimal point format. A comma (,) is used to separate multiple values sent in a single command's input or output string.

Examples of values that can be represented by <NR2> notation:

1.0
-0.00015
12.743,-180.07

<NR3>
This notation represents ASCII floating point values in exponential format (scientific notation). A comma (,) is used to separate multiple values sent in a single command's input or output string.

Examples of values that can be represented by <NR3> notation:

1.0E9
7.056E3
9.0E2,3.42E2

<NRf>
This notation is used to signify that data can be in either <NR1>, <NR2>, or <NR3> format as described above.

Examples of values that can be represented by <NRf> notation:

1.0E9
10.005
83,4.5E2,234.9901

<String>
This notation represents a string of 7-bit ASCII characters (including nonprintable characters) that is delimited (surrounded) with either single quotes (‘ ‘) or double quotes (“ ”). The string can include text formatting characters such as linefeed, space, or carriage return.

Note that if a double quote character must be sent as part of the string, then it must be followed by an additional double quote. Alternatively, the string can be sent using single quotes (See “cal_file” example below.)

Examples of data represented by <String> notation:

“1/15/98"
”Save" “cal_file” “now.”
‘Save" “cal_file” now.’

<Arbitrary ASCII>
This notation represents undelimited 7-bit ASCII text. The end of the text must be terminated with the 0A character (decimal 10) and concurrent setting (^) of the GPIB End of Transmission State (EOI). This requirement makes it necessary for <Arbitrary ASCII> text to be transmitted only at the end of a program or response message, i.e. at the end of a multiple input or output statement.

Example of data represented by <Arbitrary ASCII> notation:

ANRITSU,37247A,123456,1.0<0A^EOI>

The example shows a sample response from the *IDN?, 488.2 common query. In the example, the instrument identifies itself as a ANRITSU MS4623A, with serial number 123456, and software version 1.0 installed. Note that decimal 10 (0A character) must be sent with the EOI to signal end of transmission.

<Arbitrary Block>
This notation represents data that is transmitted as 8-bit data bytes (00-FF hex, 0-255 decimal, notation is <DAB>). This is useful for transmitting large blocks of formatted ASCII or binary data or unformatted binary data. The data stream is immediately preceded by a variable length ASCII header that is encoded with the number of data bytes to be sent. The header always starts with the pound (#) character. Figure 11-2 below describes the header and the transmitted data messages.

#nm$_1$...m$_n$<DAB>$_1$...<DAB>$_m$

Where:
# = The pound sign character. Required for binary data transfer.
n = Number of digits to follow (m$_1$...m$_n$). The number n is always a one-digit number (0 to 9).
m$_1$...m$_n$ = The number m, which is the number of data bytes to follow that constitute the requested data. The number m may be a one to nine-digit number (1 to 999999999).
<DAB> = An 8-bit binary data byte. This is the data (or information) being sent.

Example: #3256<DAB>$_1$...<DAB>$_{256}$
Specifies a block of 256 data bytes.

NOTE

If n = 0, then m is omitted and transmission end is signaled by sending the linefeed character (0A, or decimal 10) and concurrent setting (^) of the GPIB End Of Transmission State (EOI) immediately following the last <DAB>.

Figure 11-2. *<Arbitrary Block> Data Format*

11-4 FUNCTIONAL GROUPS

Throughout this chapter, the distinctive, white on black text, in the upper corner of each command's description area, is the functional group (see Figure 11-1, page 11-2). These groups are described in Chapters 5 through 10; they provide descriptive details and tabular data that apply to the group as a whole. Where applicable, the group name is prefaced with the front panel key name (e.g., APPL-IMD). The command is associated with the Appl key.

11-5 RELEVANT TABLES

Data referenced in many places within this chapter is located in Chapter 12 "Instrument Data."

11-6 COMMANDS

The remaining pages in this chapter provide an alphabetical listing of the commands (mnemonics) used to program the Model MS462XX Vector Network Measurement System.

***CLS** Clear status bytes and structures **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*CLS`

Status Reporting: Clears the Standard Event Status Register, the Extended Event Status Register, and the Limits Status Register. Also clears the Operation Complete Command and Query states by setting them to idle state, i.e. no operations pending. Also clears the GPIB error message buffers (see OGE, OGL).

***DDT** Enter the 488.2 define device trigger command string **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*DDT Value`
Value: Valid MS462XX GPIB command sequence in <Arbitrary Block> format

Remarks: Clears the Standard Event Status Register, the Extended Event Status Register, and the Limits Status Register. Also clears the Operation Complete Command and Query states by setting them to idle state, i.e. no operations pending. Also clears the GPIB error message buffers (see OGE, OGL).

Related Commands: *TRG

***ESE** Enter the 488.2 standard event status enable mask **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*ESE Value`
Value: 0 to 255

Remarks: Sets the bits of the Standard Event Status Enable Register to the binary weighted bit pattern of the decimal value entered. The register is cleared by sending a value of 0.

Data I/O: The value is input in ASCII <NRf> format.

***ESE?** Output the 488.2 standard event status enable mask **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*ESE?`

Remarks: Returns the decimal value of the bit pattern of the Standard Event Status Enable Register. The value is 0-255.

Data I/O: Outputs value in ASCII <NR1> format.

***ESR?** Output the 488.2 standard event status register value **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*ESR?`

Remarks: Returns the decimal value of the bit pattern of the Standard Event Status Register and clears it. The value is 0-255.

Data I/O: Outputs value in ASCII <NR1> format.

***IDN?** Output the 488.2 instrument identification string **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*IDN?`

Remarks: Returns the MS462XX identification string. The string consists of four comma separated fields as follows:

Anritsu, Model, Serial #, Software Revision.

The actual model number, serial number, and software revision of the MS462XX queried will be passed. The maximum length of the string is 72 characters.

Data I/O: Outputs the 488.2 instrument identification string using an <Arbitrary ASCII> format.

Related Commands: OID, *OPT?

***IST?** Output the value of the *ist* message **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*IST?`

Remarks: The *ist* is the status bit sent by the MS462XX in response to a parallel poll. The *IST? query outputs the value of the *ist* without having to perform a parallel poll. The output value is 1 if *ist* is TRUE, 0 if it is FALSE.

Data I/O: Outputs value in ASCII <NR1> format.

Related Commands: *PRE, *PRE?

***OPC** Initiate the 488.2 operation complete sequence **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*OPC`

Status Reporting: Sets the Operation Complete bit 0 in the Standard Event Status Register after all pending operations are complete.

Related Commands: *OPC?

***OPC?** Initiate the 488.2 operation complete query sequence **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*OPC?`

Remarks: Ouputs an ASCII “1" after all pending operations are complete.

Data I/O: Outputs value in ASCII <NR1> format.

Related Commands: *OPC

***OPT?** Output the 488.2 options installed string **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*OPT?`

Remarks: Returns the installed, reportable MS462XX options identification string. The string consists of comma separated fields containing the option numbers or a 0 if none are installed. The maximum length of the string is 255 characters. A list of options appears in Table 11-4, at the end of this chapter.

Data I/O: Outputs an <Arbitrary ASCII> format.

Related Commands: OID, *IDN?

Front Panel Key: Utility **\ DIAGNOSTICS \ INSTALLED OPTIONS**

***PRE** Enter the 488.2 parallel poll register enable mask **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*PRE Value`
Value: 0 to 65535

Remarks: Sets the bits of the Parallel Poll Enable Register to the binary weighted bit pattern of the decimal value entered. The register is cleared by sending a value of 0.

Data I/O: The value is input in ASCII <NRf> format.

***PRE?** Output the 488.2 parallel poll register enable mask **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*PRE?`

Remarks: Returns the decimal value of the bit pattern of the Parallel Poll Enable Register.

Data I/O: Outputs the 488.2 Parallel Poll Register Enable mask using ASCII <NR1> format.

Related Commands: *IST?

***RST** Resets the instrument **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*RST`

Remarks: Resets the MS462XX to default state with all user programmable parameters set to their default values. Default state settings are listed in Chapter 12. This command does not affect the Output Queue, any Status or Parallel Poll Registers, or the MS462XX GPIB address setting.

Related Commands: RST, RST0, RST1

Front Panel Key: Default \ **CONTINUE**

***SRE** Enter the 488.2 service request enable mask **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*SRE Value`
Value: 0 to 55

Remarks: Sets the bits of the Service Request Enable Register to the binary weighted bit pattern of the decimal value entered. The register is cleared by sending a value of 0. Note that the Master Summary Status (MSS) bit 6 (decimal 64) will be ignored since it represents the summary of all enabled status bits (bits 0-5, 7).

Data I/O: The value is input in ASCII <NRf> format.

***SRE?** Output the 488.2 service request enable mask **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*SRE?`

Remarks: Returns the decimal value of the bit pattern of the Service Request Enable Register. The value will be 0 to 63, or 128 to 191, with the MSS bit 6 (decimal 64) zeroed out (See *SRE).

Data I/O: Outputs the 488.2 Service Request Enable mask using ASCII <NR1> format.

***STB?** Output the 488.2 status byte value **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*STB?`

Remarks: Returns the decimal value of the bit pattern of the Status Byte and the Master Summary Status bit 6. The value will be 0 to 255.

Data I/O: Outputs value in ASCII <NR1> format.

***TRG** Initiate a group execute trigger sequence **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*TRG`

Remarks: The previously defined trigger action using the *DDT command will be placed in the GPIB input buffer, parsed, and executed. This is the instrument specific equivalent of the 488.1 GET, Group Execute Trigger message.

Related Commands: *DDT, *DDT?

***TST?** Perform self test and output status **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*TST?`

Remarks: Causes the MS462XX to perform an extensive, fully automated internal circuits self test. Detailed error messages indicating self test failures, if any, are placed in the service log in the order they occur. The query returns a “1" if any part of the self test failed, or a ”0" when passed. NOTE: When commands TST or *TST? are sent to the MS462XX, the VNMS output power is momentarily set to the model-dependent rated power level during the self test. Ensure that any equipment connected to Port 1 or Port 2 will not be damaged by this power level.

Data I/O: Returns a value in ASCII <NR1> format.

Related Commands: ONE, OEL, OSL, PSL, TST

Front Panel Key: Utility **\ DIAGNOSTICS \ START SELF TEST**

***WAI** Wait to continue **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `*WAI`

Remarks: Suspends the execution of any further commands or queries until all pending operations are completed. Note that this command is required by the 488.2 Standard but has no effect on MS462XX operation. The MS462XX executes all commands sequentially. That is, it will always wait for commands and queries to finish executing prior to processing new commands.

Related Commands: *OPC, *OPC?

2PATH3PORT Select 2-path 3-port calibration method **CAL (Ch 6)**

Syntax: `2PATH3PORT`

A12 Simulate 12-term calibration **CAL (Ch 6)**

Syntax: `A12`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1-IC12, ICL, CON. Also see C12, OC1-OC12, OCL

A120 Simulate 12-term calibration and initialize all 2-port correction coefficients **CAL (Ch 6)**

Syntax: `A12`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: A12, A3P, A4P, IC1-IC24, ICL3P, CON3P. Also see OC1-OC24, OCL3P

A24 Simulate 3-port calibration **CAL (Ch 6)**

Syntax: `A24`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON3P command to turn on correction.

Related Commands: A3P, A4P, IC1-IC24, ICL3P, CON3P. Also see OC1-OC24, OCL3P.

A3P Simulate 3-port calibration **CAL (Ch 6)**

Syntax: `A3P`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON3P command to turn on correction.

Related Commands: A24, A4P, IC1-IC24, ICL3P, CON3P. Also see OC1-OC24, OCL3P.

A3P0 Simulate 3-port calibration and initialize all 3-port correction coefficients **CAL (Ch 6)**

Syntax: `A3P`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON3P command to turn on correction.

Related Commands: A3P, A24, A4P, IC1-IC24, ICL3P, CON3P. Also see OC1-OC24, OCL3P

A40 Simulate 4-port calibration **CAL (Ch 6)**

Syntax: `A40`

Related Commands: A24, A3P, A4P, A4P0

A4P Simulate 4-port calibration **CAL (Ch 6)**

Syntax: `A4P`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON4P command to turn on the correction.

Related Commands: A3P, A40, A4P0, CON4P, IC1-IC40. Also see OC10OC40.

A4P0 Simulate 4-port calibration and initialize all 4-port correction coefficients **CAL (Ch 6)**

Syntax: `A4P0`

Remarks: All etxy terms are set to (1+0j); all other terms are set to 0.

Related Commands: A3P, A40, A4P, CON4P, IC1-IC40. Also see OC10OC40.

A8R Simulate 1-path 2-port calibration reverse path **CAL (Ch 6)**

Syntax: `A8R`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1-IC5, CON. Also see C8R, OC1-OC5

A8T Simulate 1-path 2-port calibration forward path **CAL (Ch 6)**

Syntax: A8T

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1-IC5, CON. Also see C8R, OC1-OC5

ABORTCAL Abort calibration and keep existing calibration data **CAL (Ch 6)**

Syntax: ABORTCAL

Related Commands: KEC

Front Panel Key: Power \ **SOURCE 1 (SOURCE 2)** \ **FLAT TEST PORT POWER CAL** \ **BEGIN CAL** \ **PRESS <CLEAR> TO ABORT** or **RECEIVER CAL** \ **RECEIVER CAL** \ **BEGIN CAL** \ **ABORT**

ABSPHASE0 Turn absolute phase OFF **APPL (Ch 10)**

Syntax: ABSPHASE0

Related Commands: ABSPHASE1, ABSPHASE?

Front Panel Key: Appl \ **MEASUREMENT TYPE** \ **FREQUENCY TRANSLATION** **GROUP DELAY** \ **ABSOLUTE PHASE**

ABSPHASE1 Turn absolute phase ON **APPL (Ch 10)**

Syntax: ABSPHASE1

Related Commands: ABSPHASE0, ABSPHASE?

Front Panel Key: Appl \ **MEASUREMENT TYPE** \ **FREQUENCY TRANSLATION** **GROUP DELAY** \ **ABSOLUTE PHASE**

ABSPHASE? Output the absolute phase ON/OFF status **APPL (Ch 10)**

Syntax: ABSPHASE?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: ABSPHASE0, ABSPHASE1

Front Panel Key: Appl \ **MEASUREMENT TYPE** \ **FREQUENCY TRANSLATION GROUP DELAY**

ABT Simulate translation frequency response calibration forward and reverse **CAL (Ch 6)**

Syntax: ABT

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1-IC2, CON. Also see CBT, OC1-OC2

AC2PBTYPE Set AutoCal to 2-port box type **CAL - AUTOCAL (Ch 6)**

Syntax: AC2PBTYPE

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT BOX TYPE** or Utility \ **AUTOCAL CHARACTERIZATION \ SELECT BOX TYPE** or Cal \ **AUTOCAL \ SELECT BOX TYPE**

AC4PBTYPE Set AutoCal to 4-port box type **CAL - AUTOCAL (Ch 6)**

Syntax: AC4PBTYPE

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT BOX TYPE** or Utility \ **AUTOCAL CHARACTERIZATION \ SELECT BOX TYPE** or Cal \ **AUTOCAL \ SELECT BOX TYPE**

ACAA Set AutoCal standard to assurance **CAL - AUTOCAL (Ch 6)**

Syntax: `ACAA`

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT CAL STANDARD \ ASSURANCE**

ACADIR1 Enter directivity 1 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACADIR1 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ DIRECTIVITY DC-3 GHz**

ACADIR1? Output directivity 1 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACADIR1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ DIRECTIVITY DC-3 GHz**

ACADIR2 Enter directivity 2 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACADIR2 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR1, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ DIRECTIVITY 3-6 GHz**

ACADIR2? Output directivity 2 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACADIR2?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ DIRECTIVITY 3-6 GHz**

ACADIR3 Enter directivity 3 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACADIR3 Value Units`
Value: 0.0 - 999.999
Units: DB

Related Commands: ACADIR3?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ DIRECTIVITY 6-9 GHz**

ACADIR3? Output directivity 3 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: ACADIR3?

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACADIR3

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ DIRECTIVITY 6-9 GHz**

ACADPL Enter adapter length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: ACADPL Value Units
Value: ASCII <NRf> number
Units: DB, XX1, XX3, XM3

Related Commands: ACADPL?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ ADAPTER REMOVAL \ ISOLATION AVERAGING \ OMIT \ RETURN \ RETURN \ RETURN \ START CAL \ MEASURE DEVICES \ MEASURE DEVICES \ ADAPTER LENGTH**

ACADPL? Output adapter length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: ACADPL?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: ACADPL

Front Panel Key: Cal **\ AUTOCAL \ CHANGE CAL SETUP \ ADAPTER REMOVAL \ ISOLATION AVERAGING \ OMIT \ RETURN \ RETURN \ RETURN \ START CAL \ MEASURE DEVICES \ MEASURE DEVICES \ ADAPTER LENGTH**

ACADR Set AutoCal type to adapter removal **CAL - AUTOCAL (Ch 6)**

Syntax: ACADR

Front Panel Key: Cal **\ AUTOCAL \ SELECT CAL TYPE \ ADAPTER REMOVAL\ REMOVE ADAPTER**

ACADTL Adapter connected to "LEFT" port of the 2-port AutoCal box

CAL - AUTOCAL (Ch 6)

Syntax: ACADTL

Related Commands: ACADTR, ACADTX?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP ADAPTER CONNECTED TO AUTOCAL PORT LEFT**

ACADTR Adapter connected to "RIGHT" port of the 2-port AutoCal box

CAL - AUTOCAL (Ch 6)

Syntax: ACADTR

Related Commands: ACADTL, ACADTX?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP ADAPTER CONNECTED TO AUTOCAL PORT RIGHT**

ACADTX? Output adapter removal port "LEFT" or "RIGHT" in the 2-port AutoCal box that the adapter is connected to

CAL - AUTOCAL (Ch 6)

Syntax: ACADTX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for LEFT PORT
2 for RIGHT PORT

Related Commands: ACADTR, ACADTL

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP ADAPTER CONNECTED TO AUTOCAL PORT**

ACAL1R2 Set adapter removal port to ADAPT & L=1 and R=2

CAL - AUTOCAL (Ch 6)

Syntax: ACAL1R2

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG**

ACALM1 Enter load match 1 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACALM1 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ MORE \ LOAD MATCH DC-2 GHz**

ACALM1? Output load match 1 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACALM1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ MORE \ LOAD MATCH DC-2 GHz**

ACALM2 Enter load match 2 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACALM2 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ 2-6 GHz**

ACALM2? Output load match 2 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: ACALM2?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ 2-6 GHz**

ACALM3 Enter load match 3 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: ACALM3

Related Commands: ACALM3?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ 6-9 GHz**

ACALM3? Output load match 3 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: ACALM3?

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACALM3

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ 6-9 GHz**

ACAP? Output ports configuration for AutoCal assurance limits — **CAL - AUTOCAL (Ch 6)**

Syntax: `ACAP?`

Data I/O: Outputs data using ASCII <NR1> floating point values in exponential format as follows:
1 for R1, L2
0 for L1, R2

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ PORT CONFIGR=2** or
Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG PORT CONFIG**

ACAR1L2 Set adapter removal port to ADAPT & R=1 and L=2 — **CAL - AUTOCAL (Ch 6)**

Syntax: `ACAR1L2`

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG**

ACARET1 Enter reflection tracking 1 for AutoCal assurance limits — **CAL - AUTOCAL (Ch 6)**

Syntax: `ACARET1 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ REFLECTION TRACKING DC-3 GHz**

ACARET1? Output reflection tracking 1 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACARET1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ REFLECTION TRACKING DC-3 GHz**

ACARET2 Enter reflection tracking 2 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACARET2 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ REFLECTION TRACKING 3-6 GHz**

ACARET2? Output reflection tracking 2 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACARET2?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ REFLECTION TRACKING 3-6 GHz**

ACARP? Output adapter removal port configuration for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACARP?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
5 for ADAPT & L=1, R=2
6 for L=1, ADAPT & R=2
7 for ADAPT & R=1, L=2
8 for R=1, ADAPT & L=2

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG**

ACAS? Output AutoCal assurance status **CAL - AUTOCAL (Ch 6)**

Syntax: `ACAS?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for ASSURANCE FAILED
1 for ASSURANCE PASSED
2 for ASSURANCE N/A

Related Commands: ACADIR1?, ACADIR2?, ACADIR3?, ACALM1?, ACALM2?, ACALM3?, ACARET1?, ACARET2?, ACASRC1?, ACASRC2?, ACASRC3?, ACATRT1?, ACATRT2?, BEGACA

ACASRC1 Enter source match 1 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACASRC1 Value Units`
Value: Frequency
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ SOURCE MATCH DC-3 GHz**

ACASRC1? Output source match 1 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACASRC1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ SOURCE MATCH DC-3 GHz**

ACASRC2 Enter source match 2 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACASRC2 Value Units`
Value: Frequency
Units: DB, XX1, XX3, XM3

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ SOURCE MATCH 3-6 GHz**

ACASRC2? Output source match 2 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACASRC2?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ SOURCE MATCH 3-6 GHz**

ACASRC3 Enter source match 3 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACASRC3`

Related Commands: ACASRC3?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ SOURCE MATCH 6-9 GHz**

ACASRC3? Output source match 3 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACASRC3?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACASRC3

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ SOURCE MATCH 6-9 GHz**

ACATRT1 Enter transmission tracking 1 for AutoCal assurance limits **CAL - AUTOCAL (Ch 6)**

Syntax: `ACATRT1 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ MORE \ TRANSMISSION TRACKING DC-3 GHz**

ACATRT1? Output transmission tracking 1 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACATRT1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT2, ACATRT2?

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ TRANSMISSION TRACKING DC-3 GHz**

ACATRT2 Enter transmission tracking 2 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACATRT2 Value Units`
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ MORE \ TRANSMISSION TRACKING 3-6 GHz**

ACATRT2? Output transmission tracking 2 for AutoCal assurance limits

CAL - AUTOCAL (Ch 6)

Syntax: `ACATRT2?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ACADIR1, ACADIR1?, ACADIR2, ACADIR2?, ACASRC1, ACASRC1?, ACASRC2, ACASRC2?, ACARET1, ACARET1?, ACARET2, ACARET2?, ACALM1, ACALM1?, ACALM2, ACALM2?, ACATRT1, ACATRT1?, ACATRT2

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ PERFORM ASSURANCE \ ASSURANCE LIMITS SETUP \ MORE \ TRANSMISSION TRACKING 3-6 GHz**

ACAVNA1 Set adapter connected to port 1 **CAL - AUTOCAL (Ch 6)**

Syntax: ACAVNA1

Related Commands: ACAVNA2, ACAVNAPX?

Front Panel Key: Cal \ **AUTOCAL** \ **CHANGE SETUP** **ADAPTER CONNECTED TO VNA PORT 1**

ACAVNA2 Set adapter connected to port 2 **CAL - AUTOCAL (Ch 6)**

Syntax: ACAVNA2

Related Commands: ACAVNA1, ACAVNAPX?

Front Panel Key: Cal \ **AUTOCAL** \ **CHANGE SETUP** **ADAPTER CONNECTED TO VNA PORT 2**

ACAVNAPX? Output adapter removal port configuration for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: ACAVNAPX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for CONNECTED TO PORT 1
2 for CONNECTED TO PORT 2

Related Commands: ACAVNA1, ACAVNA2

Front Panel Key: Cal \ **AUTOCAL** \ **CHANGE SETUP** **ADAPTER CONNECTED TO VNA PORT 1**

ACBTYPE? Output AutoCal 2-port or 4-port box type **CAL - AUTOCAL (Ch 6)**

Syntax: ACBTYPE?

Front Panel Key: Utility \ **DIAGNOSTICS** \ **AUTOCAL ASSURANCE** \ **SELECT BOX TYPE** or Utility \ **AUTOCAL CHARACTERIZATION** \ **SELECT BOX TYPE** or Cal \ **AUTOCAL** \ **SELECT BOX TYPE**

ACDEF Include isolation **CAL - AUTOCAL (Ch 6)**

Syntax: ACDEF

Front Panel Key: Cal \ **AUTOCAL** \ **CHANGE SETUP** \ **AVERAGING** \ **INCLUDE ISOALTION**

ACF2P? Output port selection for full 2-port AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACF2P?`

Data I/O: Outputs data using <NR1> integer values as follows:
3 for L=1, R=2
4 for R=1, L=2

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG** or
Utility **\ AUTOCAL CHARACTERIZATION \ PORT CONFIG.**

ACF2TC Set the AutoCal full 2-port Thru type to calibrator **CAL - AUTOCAL (Ch 6)**

Syntax: `ACF2TC`

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACF2TT Set the AutoCal full 2-port Thru type to True Thru **CAL - AUTOCAL (Ch 6)**

Syntax: `ACF2TT`

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACF2TX? Output full 2-port Thru type for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACF2TX?`

Data I/O: Outputs value using ASCII <NR1> format as follows:
1 for CAL THRU
2 for TRUE THRU

Related Commands: ACF2TC, ACF2TT

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACHFD Save AutoCal characterization to floppy disk **CAL - AUTOCAL (Ch 6)**

Syntax: `ACHFD`

Front Panel Key: Utility **\ AUTOCAL CHARACTERIZATION \ CONTINUE \ SAVE TO FLOPPY DISK**

ACHHD Save AutoCal characterization to hard disk — **CAL - AUTOCAL (Ch 6)**

Syntax: ACHHD

Front Panel Key: Utility \ **AUTOCAL CHARACTERIZATION \ CONTINUE \ SAVE TO HARD DISK**

ACIAX? Output AutoCal isolation yes/no setting — **CAL - AUTOCAL (Ch 6)**

Syntax: ACIAX?

Data I/O: Outputs value using ASCII <NR1> format as follows:
1 is OMIT ISOLATION (no)
2 is INCLUDE ISOLATION (yes)

Related Commands: ACOMIT, ACDEF

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ INCLUDE ISOALTION**

ACISO Enter number of averaging for isolation — **CAL - AUTOCAL (Ch 6)**

Syntax: ACISO Value Units
Value: ASCII <NRf> number
Units: XX1

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ ISOLATION**

ACISO? Output number of averaging for isolation — **CAL - AUTOCAL (Ch 6)**

Syntax: ACISO?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ ISOLATION**

ACL1AR2 Set adapter removal port to L=1 and ADAPT & R=2 — **CAL - AUTOCAL (Ch 6)**

Syntax: ACL1AR2

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG**

ACL1R2 Set the AutoCal ports to L=1 and R=2 **CAL - AUTOCAL (Ch 6)**

Syntax: ACL1R2

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG** or
Utility \ **AUTOCAL CHARACTERIZATION \ PORT CONFIG.**

ACLO Enter number of averaging for load **CAL - AUTOCAL (Ch 6)**

Syntax: ACLO Value Units
Value: ASCII <NRf> number
Units: XX1

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ LOAD**

ACLO? Output number of averaging for load **CAL - AUTOCAL (Ch 6)**

Syntax: ACLO?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ LOAD**

ACLOAD Set AutoCal standard to load **CAL - AUTOCAL (Ch 6)**

Syntax: ACLOAD

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT CAL STANDARD \ LOAD**

ACOMIT Omit isolation **CAL - AUTOCAL (Ch 6)**

Syntax: ACOMIT

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ Set THRU to OMIT**

ACOPEN Set AutoCal standard to open **CAL - AUTOCAL (Ch 6)**

Syntax: ACOPEN

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT CAL STANDARD \ OPEN**

ACP1? Output port 1 configuration for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACP1?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for LEFT
2 for RIGHT

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACP2? Output port 2 configuration for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACP2?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for LEFT
2 for RIGHT

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACP2L Set the AutoCal port to LEFT for reflection only cal, port 2 **CAL - AUTOCAL (Ch 6)**

Syntax: `ACP2L`

Remarks: Select AutoCal port to LEFT.

Related Commands: ACP2R, ACPA, ACPB, ACPC, ACPX, ACPX?

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACP2R Set the AutoCal port 2 to RIGHT for reflection only cal, port 2 **CAL - AUTOCAL (Ch 6)**

Syntax: `ACP2R`

Remarks: Select AutoCal port to RIGHT.

Related Commands: ACP2L, ACPA, ACPB, ACPC, ACPX, ACPX?

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPA Select AutoCal port A for reflection only cal **CAL - AUTOCAL (Ch 6)**

Syntax: ACPA

Remarks: For REFLECTION ONLY calibration, 1 port (S11 or S22).

Related Commands: ACP2L, ACP2R, ACPB, ACPC, ACPX, ACPX?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPATH? Output AutoCal connected path **CAL - AUTOCAL (Ch 6)**

Syntax: ACPATH?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
12 for AutoCal Port 1 to VNA Port 2
13 for AutoCal Port 1 to VNA Port 3
14 for AutoCal Port 1 to VNA Port 4

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT PATH**

ACPB Select AutoCal port B for reflection only cal **CAL - AUTOCAL (Ch 6)**

Syntax: ACPB

Remarks: For REFLECTION ONLY calibration, 1 port (S11 or S22).

Related Commands: ACP2L, ACP2R, ACPA, ACPC, ACPX, ACPX?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPC Select AutoCal port C for reflection only cal **CAL - AUTOCAL (Ch 6)**

Syntax: ACPC

Remarks: For REFLECTION ONLY calibration, 1 port (S11 or S22).

Related Commands: ACP2L, ACP2R, ACPA, ACPB, ACPX, ACPX?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPCFG Enter string to setup port configuration for 4 Port AutoCal Box

CAL - AUTOCAL (Ch 6)

Syntax: `ACPCFG Value`
Value: See Remarks

Remarks: Input the AutoCal port configuration. With a full 2-port calibration/reflection only on both ports (adapter removal) the same command is used for full 3 and 4-port calibrations with a 4-port AutoCal box.

Data I/O: Use one of the following strings:
1X2A, 1X2B, 1X2C, 1A2X, 1B2X, 1C2X, 1X2A3B, 1X2A3C, 1X2B3A, 1X2B3C, 1X2C3A, 1X2C3B, 1A2X3B, 1A2X3C, 1B2X3A, 1B2X3C, 1C2X3A, 1C2X3B, 1A2B3X, 1A2C3X, 1B2A3X, 1B2C3X, 1C2A3X, 1C2B3X, 1X2A3B4C, 1X2A3C4B, 1X2B3A4C, 1X2B3C4A

Related Commands: ACPCFG?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG** or
Utility **\ AUTOCAL CHARACTERIZATION \ PORT CONFIG.**

ACPCFG? Output port configuration for 4 Port AutoCal Box

CAL - AUTOCAL (Ch 6)

Syntax: `ACPCFG?`

Remarks: Output AutoCal configuration for full 2-port, full 3-port, or full 4-port calibration/reflection only on both ports (adapter removal) with a 4-port AutoCal box.

Data I/O: Output string is the same as for the input string for the command ACPCFG.

Related Commands: ACPCFG

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG** or
Utility **\ AUTOCAL CHARACTERIZATION \ PORT CONFIG.**

ACPL Set the AutoCal port to LEFT

CAL - AUTOCAL (Ch 6)

Syntax: `ACPL`

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPR Set the AutoCal port to RIGHT **CAL - AUTOCAL (Ch 6)**

Syntax: ACPR

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPX Select AutoCal port X for reflection only cal **CAL - AUTOCAL (Ch 6)**

Syntax: ACPX

Remarks: For REFLECTION ONLY calibration, 1 port (S11 or S22).

Related Commands: ACP2L, ACP2R, ACPA, ACPB, ACPC, ACPX?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPX? Output AutoCal port selected for reflection only cal **CAL - AUTOCAL (Ch 6)**

Syntax: ACPX?

Remarks: For REFLECTION ONLY calibration, 1 port (S11 or S22).

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for AutoCal port-X
2 for AutoCal port-A
3 for AutoCal port-B
4 for AutoCal port-C

Related Commands: ACP2L, ACP2R, ACPA, ACPB, ACPC, ACPX

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ SELECT AUTOCAL PORT FOR VNA PORT**

ACPXA Set AutoCal connected path to port X-A **CAL - AUTOCAL (Ch 6)**

Syntax: ACPXA

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT PATH**

ACPXB Set AutoCal connected path to port X-B **CAL - AUTOCAL (Ch 6)**

Syntax: ACPXB

Front Panel Key: Utility **\ DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT PATH**

ACPXC Set AutoCal connected path to port X-C **CAL - AUTOCAL (Ch 6)**

Syntax: ACPXC

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT PATH**

ACR1AL2 Set adapter removal port to R=1 and ADAPT & L=2 **CAL - AUTOCAL (Ch 6)**

Syntax: ACR1AL2

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ ADAPTER REMOVAL \ SELECT PORTS \ R=1, ADAPT & L=2**

ACR1L2 Set the AutoCal ports to R=1 and L=2 **CAL - AUTOCAL (Ch 6)**

Syntax: ACR1L2

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ PORT CONFIG \ PORT CONFIG** or
Utility \ **AUTOCAL CHARACTERIZATION \ PORT CONFIG.**

ACRFL Enter number of averaging for reflection **CAL - AUTOCAL (Ch 6)**

Syntax: ACRFL Value Units
Value: ASCII <NRf> number
Units: XX1

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ REFLECTION**

ACRFL? Output number of averaging for reflection **CAL - AUTOCAL (Ch 6)**

Syntax: ACRFL?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ REFLECTION**

ACS11 Set AutoCal type to S11 **CAL - AUTOCAL (Ch 6)**

Syntax: `ACS11`

Related Commands: ACS11S22, ACS22

Front Panel Key: Cal **\ AUTOCAL \ SELECT CAL TYPE \ S11 REFL**

ACS11S22 Set AutoCal type to both S11 and S22 **CAL - AUTOCAL (Ch 6)**

Syntax: `ACS11S22`

Related Commands: ACS11, ACS22

Front Panel Key: Cal **\ AUTOCAL \ SELECT CAL TYPE \ 2 PORT REFL**

ACS22 Set AutoCal type to S22 **CAL - AUTOCAL (Ch 6)**

Syntax: `ACS22`

Related Commands: ACS11S22, ACS11

Front Panel Key: Cal **\ AUTOCAL \ SELECT CAL TYPE \ S22 REFL**

ACSF2P Set AutoCal type to full 2-port **CAL - AUTOCAL (Ch 6)**

Syntax: `ACSF2P`

Front Panel Key: Cal **\ AUTOCAL \ SELECT CAL TYPE \ FULL 2-PORT**

ACSF3P Set AutoCal type to full 3-port **CAL - AUTOCAL (Ch 6)**

Syntax: `ACSF3P`

Front Panel Key: Cal **\ AUTOCAL \ SELECT CAL TYPE \ FULL 3-PORT**

ACSF4P Set AutoCal type to full 4-port **CAL - AUTOCAL (Ch 6)**

Syntax: `ACSF4P`

Front Panel Key: Cal **\ AUTOCAL \ SELECT CAL TYPE \ FULL 4-PORT**

ACSHORT Set AutoCal standard to short **CAL - AUTOCAL (Ch 6)**

Syntax: ACSHORT

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT CAL STANDARD \ SHORT**

ACSTD? Output AutoCal standard **CAL - AUTOCAL (Ch 6)**

Syntax: ACSTD?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for OPEN
2 for SHORT
3 for LOAD
4 for THRU
5 for ASSURANCE

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT CAL STANDARD**

ACSTMEA Continue AutoCal Thru update **CAL - AUTOCAL (Ch 6)**

Syntax: ACSTMEA

Front Panel Key: Cal \ **AUTOCAL \ THRU UPDATE START THRU UPDATE \ MEASURE DEVICES**

ACTHRU Set AutoCal standard to Thru **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU

Front Panel Key: Utility \ **DIAGNOSTICS \ AUTOCAL ASSURANCE \ SELECT CAL STANDARD \ THRU**

ACTHRU12T0 Do port 1, 2 thru measurement using AutoCal THRU or omit THRU depending on the port configuration **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU12T0

Related Commands: ACTHRU12T1, ACTHRU12X?

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU12T1 Do port 1, 2 thru measurement using TRUE THRU **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU12T1

Related Commands: ACTHRU12T0, ACTHRU12X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU12X? Output selection of port 1, 2 thru measurement **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU12TX?

Data I/O: Outputs data using ASCII <NR1> integer values as follow:
0 for use AutoCal THRU for THRU measurement
1 for use TRUE THRU for THRU measurement
2 for omit THRU measurement

Related Commands: ACTHRU12T0, ACTHRU12T1

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU13T0 Do port 1, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU13T0

Related Commands: ACTHRU13T1, ACTHRU13X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU13T1 Do port 1, 3 thru measurement using TRUE THRU **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU13T1

Related Commands: ACTHRU13T0, ACTHRU13X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU13X? Output selection of port 1, 3 thru measurement **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU13TX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for use AutoCal THRU for THRU measurement
1 for use TRUE THRU for THRU measurement
2 for omit THRU measurement

Related Commands: ACTHRU13T0, ACTHRU13T1

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU14T0 Do port 1, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU14T0

Related Commands: ACTHRU14T1, ACTHRU14X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU14T1 Do port 1, 4 thru measurement using TRUE THRU **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU14T1

Related Commands: ACTHRU14T0, ACTHRU14X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU14X? Output selection of port 1, 4 thru measurement **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU14TX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for use AutoCal THRU for THRU measurement
1 for use TRUE THRU for THRU measurement
2 for omit THRU measurement

Related Commands: ACTHRU14T0, ACTHRU14T1

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTHRU23T0 Do port 2, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration

CAL - AUTOCAL (Ch 6)

Syntax: `ACTHRU23T0`

Related Commands: ACTHRU23T1, ACTHRU23X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU23T1 Do port 2, 3 thru measurement using TRUE THRU

CAL - AUTOCAL (Ch 6)

Syntax: `ACTHRU23T1`

Related Commands: ACTHRU23T0, ACTHRU23X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU23X? Output selection of port 2, 3 thru measurement

CAL - AUTOCAL (Ch 6)

Syntax: `ACTHRU23TX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for use AutoCal THRU for THRU measurement
1 for use TRUE THRU for THRU measurement
2 for omit THRU measurement

Related Commands: ACTHRU23T0, ACTHRU23T1

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU24T0 Do port 2, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration

CAL - AUTOCAL (Ch 6)

Syntax: `ACTHRU24T0`

Related Commands: ACTHRU24T1, ACTHRU24X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU24T1 Do port 2, 4 thru measurement using TRUE THRU **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTHRU24T1`

Related Commands: ACTHRU24T0, ACTHRU24X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU24X? Output selection of port 2, 4 thru measurement **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTHRU24TX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for use AutoCal THRU for THRU measurement
1 for use TRUE THRU for THRU measurement
2 for omit THRU measurement

Related Commands: ACTHRU24T0, ACTHRU24T1

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU34T0 Do port 3, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTHRU34T0`

Related Commands: ACTHRU34T1, ACTHRU34X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU34T1 Do port 3, 4 thru measurement using TRUE THRU **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTHRU34T1`

Related Commands: ACTHRU34T0, ACTHRU34X?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTHRU34X? Output selection of port 3, 4 thru measurement **CAL - AUTOCAL (Ch 6)**

Syntax: ACTHRU34TX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for use AutoCal THRU for THRU measurement
1 for use TRUE THRU for THRU measurement
2 for omit THRU measurement

Related Commands: ACTHRU34T0, ACTHRU34T1

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTOLP12 Enter port 1, 2 thru line length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: ACTOLP12 Value Units
Value: 0.0 - 9999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: ACTOLP12?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTOLP12? Output port 1, 2 thru offset length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: ACTOLP12?

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACTOLP12

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTOLP13 Enter port 1, 3 thru line length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP13 Value Units`
Value: 0.0 - 9999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: ACTOLP13?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTOLP13? Output port 1, 3 thru offset length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP13?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACTOLP13

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTOLP14 Enter port 1, 4 thru line length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP14 Value Units`
Value: 0.0 - 9999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: ACTOLP14?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTOLP14? Output port 1, 4 thru offset length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP14?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACTOLP14

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ AUTOCAL/THRU LINE LENGTH**

ACTOLP23 Enter port 2, 3 thru line length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP23 Value Units`
Value: 0.0 - 9999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: ACTOLP23?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTOLP23? Output port 2, 3 thru offset length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP23?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACTOLP23

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTOLP24 Enter port 2, 4 thru line length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP24 Value Units`
Value: 0.0 - 9999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: ACTOLP24?

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTOLP24? Output port 2, 4 thru offset length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP24?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACTOLP24

Front Panel Key: Cal **\ AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTOLP34 Enter port 3, 4 thru line length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP34 Value Units`
Value: 0.0 - 9999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: ACTOLP34?

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTOLP34? Output port 3, 4 thru offset length for AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTOLP34?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: ACTOLP34

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ THRU ASSIGNMENT \ OMIT/THRU LINE LENGTH**

ACTUAVG Enter number of averaging for AutoCal Thru update **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTUAVG Value Units`
Value: ASCII <NRf> number
Units: XX1

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ THRU** or Cal \ **AUTOCAL \ THRU UPDATE \ NUMBER OF THRU AVERAGES**

ACTUAVG? Output number of averaging for AutoCal Thru update **CAL - AUTOCAL (Ch 6)**

Syntax: `ACTUAVG?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal \ **AUTOCAL \ CHANGE SETUP \ AVERAGING \ THRU** or Cal \ **AUTOCAL \ THRU UPDATE \ NUMBER OF THRU AVERAGES**

ACTULS Apply last Thru update calibration setup **CAL - AUTOCAL (Ch 6)**

Syntax: ACTULS

ACX? Output AutoCal type **CAL - AUTOCAL (Ch 6)**

Syntax: ACX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for S11
2 for S22
3 for FULL 2 PORT
4 for ADAPTER REMOVAL
5 for FULL 3 PORT
6 for FULL 4 PORT
7 for BOTH S11 and S22

Front Panel Key: Cal \ **AUTOCAL** \ **SELECT CAL TYPE**

ADD Select addition as trace math for active channel **DISPLAY (Ch 5)**

Syntax: ADD

Remarks: Store trace data to memory. Issue this command then normalize the trace to display the complex addition result of measured data and memory data.

Related Commands: CH1-CH4, STD, DNM

Front Panel Key: Display \ **TRACE MEMORY** \ **SELECT TRACE MATH** \ **ADD (+)**

ADDGP? Output instrument GPIB address **UTILITY (Ch 5)**

Syntax: ADDGP?

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Utility \ **REMOTE INTERFACE** \ **GPIB SETUP** \ **IEEE-488.2**

ADDIP? Output instrument network IP address **UTILITY (Ch 5)**

Syntax: ADDIP?

Data I/O: Outputs data using undelimited 7-bit ASCII text.

Front Panel Key: Utility \ **REMOTE INTERFACE** \ **NETWORK SETUP** \ **INSTRUMENT IP**

ADDNDSG Add the next defined segment or go to the next segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `ADDNDSG`

Related Commands: DSGNO, DSGNO?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ ADD NEXT SEGMENT**

ADDPLT Enter plotter GPIB address **UTILITY (Ch 5)**

Syntax: `ADDPLT Value Units`
Value: 0-31
Units: XX1

Front Panel Key: Utility \ **REMOTE INTERFACE \ GPIB SETUP \ PLOTTER**

ADDPLT? Output plotter GPIB address **UTILITY (Ch 5)**

Syntax: `ADDPLT?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Utility \ **REMOTE INTERFACE \ GPIB SETUP \ PLOTTER**

ADDPM Enter power meter GPIB address **UTILITY (Ch 5)**

Syntax: `ADDPM Value Units`
Value: 0-31
Units: XX1

Front Panel Key: Utility \ **REMOTE INTERFACE \ GPIB SETUP \ POWER METER**

ADDPM? Output power meter GPIB address **UTILITY (Ch 5)**

Syntax: `ADDPM?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Utility \ **REMOTE INTERFACE \ GPIB SETUP \ POWER METER**

ADDSRC2 Enter external source 2 GPIB address **CONFIG (Ch 5)**

Syntax: `ADDSRC2 Value Units`
Value: 0-31
Units: XX1

Data I/O: Input data using an ASCII <NRf> number.

Front Panel Key: Config \ **SOURCE** \ **SOURCE 2** \ **GPIB ADDRESS**

ADDSRC2? Output external source 2 GPIB address **CONFIG (Ch 5)**

Syntax: `ADDSRC2?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Config \ **SOURCE** \ **SOURCE 2** \ **GPIB ADDRESS**

ADDSRC3 Enter external source 3 GPIB address **CONFIG (Ch 5)**

Syntax: `ADDSRC3 Value Units`
Value: 0-31
Units: XX1

Data I/O: Input data using an ASCII <NRf> number.

Front Panel Key: Config \ **SOURCE** \ **SOURCE 3** \ **GPIB ADDRESS** or
Utility \ **REMOTE INTERFACE** \ **GPIB SETUP** \ **EXTERNAL SOURCE 3**

ADDSRC3? Output external source 3 GPIB address **CONFIG (Ch 5)**

Syntax: `ADDSRC3?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Config \ **SOURCE** \ **SOURCE 3** \ **GPIB ADDRESS** or
Utility \ **REMOTE INTERFACE** \ **GPIB SETUP** \ **EXTERNAL SOURCE 3**

ADDSRC4 Enter external source 4 GPIB address **CONFIG (Ch 5)**

Syntax: `ADDSRC4 Value Units`
Value: 0-31
Units: XX1

Data I/O: Input data using an ASCII <NRf> number.

Front Panel Key: Config **\ SOURCE \ SOURCE 4 \ GPIB ADDRESS** or Utility **\ REMOTE INTERFACE \ GPIB SETUP \ EXTERNAL SOURCE 4**

ADDSRC4? Output external source 4 GPIB address **CONFIG (Ch 5)**

Syntax: `ADDSRC4?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Config **\ SOURCE \ SOURCE 4 \ GPIB ADDRESS** or Utility **\ REMOTE INTERFACE \ GPIB SETUP \ EXTERNAL SOURCE 4**

ADPL Enter electrical length for adapter removal **CAL (Ch 6)**

Syntax: `ADPL Value Units`
Value: A number in ASCII <NRF> format
Units: Units of time: S, MS, US, PS

Front Panel Key: Cal **\ MORE \ PERFORM ADAPTER REMOVAL \ ELECTRICAL LENGTH OF THE ADAPTER**

ADPL? Output electrical length for adapter removal **CAL (Ch 6)**

Syntax: `ADPL?`

Data I/O: Outputs electrical length for adapter removal using ASCII <NR3> format.

Front Panel Key: Cal **\ MORE \ PERFORM ADAPTER REMOVAL \ ELECTRICAL LENGTH OF THE ADAPTER**

ADRIVE Select the floppy drive as the default drive **UTILITY - DISK (Ch 9)**

Syntax: `ADRIVE`

Remarks: All disk operations which do not specify a drive will be performed on the floppy drive.

Related Commands: CDRIVE, CD, CWD?

AFT Simulate transmission frequency response calibration forward path **CAL (Ch 6)**

Syntax: `AFT`

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1, CON. Also see CFT, OC1

AH0 Turn automatic DUT protection off **CONFIG (Ch 5)**

Syntax: `AH0`

Related Commands: AH1, AHX?

Front Panel Key: Config \ **HOLD** \ **DUT/AUT PROTECTION OFF**

AH1 Turn automatic DUT protection on **CONFIG (Ch 5)**

Syntax: `AH1`

Related Commands: AH0, AHX?

Front Panel Key: Config \ **HOLD** \ **DUT/AUT PROTECTION ON**

AHX? Output automatic DUT protection on/off status **CONFIG (Ch 5)**

Syntax: `AHX?`

Data I/O: Outputs automatic DUT protection on/off status using ASCII <NR1> format as follows:
0 for Automatic DUT Protection is OFF
1 for Automatic DUT Protection is ON

Related Commands: AH0, AH1

Front Panel Key: Config \ **HOLD** \ **DUT/AUT PROTECTION**

ALC Perform ALC loop internal calibration **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `ALC`

Remarks: For service use only.

Front Panel Key: Utility \ **DIAGNOSTICS** \ **HARDWARE CAL** \ **SOURCE ALC CAL** \ **START CAL**

ALCERRS1? Output source 1 ALC calibration error **CAL (Ch 6)**

Syntax: `ALCERRS1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ALCERRS2?

ALCERRS2? Output source 2 ALC calibration error **CAL (Ch 6)**

Syntax: `ALCERRS2?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: ALCERRS1?

ALTS0 Turn alternate sweep mode off **SWEEP (Ch 5)**

Syntax: `ALTS0`

Front Panel Key: Sweep \ **ALTERNATE SWEEP OFF**

ALTS1 Turn alternate sweep mode on **SWEEP (Ch 5)**

Syntax: `ALTS1`

Front Panel Key: Sweep \ **ALTERNATE SWEEP ON**

ALTSX? Output alternate sweep mode on/off status **SWEEP (Ch 5)**

Syntax: `ALTSX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Sweep \ **ALTERNATE SWEEP**

AMKR Select active marker on all channels marker mode **MARKER (Ch 7)**

Syntax: `AMKR`

Related Commands: FMKR, NMKR, SMKR, XMKR?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **ACTIVE MARKER ON ALL CHANNELS**

ANNCOL Enter the color number for annotation and menu text **UTILITY (Ch 9)**

Syntax: `ANNCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 at the end of this chapter.

Related Commands: DATCOL, GRTCOL, LAYCOL, MKRCOL, MNUCOL, TRCCOL, ANNCOL?

Front Panel Key: Utility \ **COLOR SETUP** \ **ANNOTATION AND MENU XX COLOR NAME**

ANNCOL? Output the color number for annotation and menu text **UTILITY (Ch 9)**

Syntax: ANNCOL?

Data I/O: Outputs the color palette number in ASCII <NR1> format.

Related Commands: DATCOL?, GRTCOL?, LAYCOL?, MKRCOL?, MNUCOL?, TRCCOL?, ANNCOL

Front Panel Key: Utility \ **COLOR SETUP** \ **ANNOTATION AND MENU XX COLOR NAME**

AOF Turn averaging off **AVG (Ch 5)**

Syntax: AOF

Remarks: Restarts the sweep. Does not change the currently set number.

Related Commands: AVG, WFS

Front Panel Key: Avg \ **AVERAGE OFF**

AOF? Output averaging on/off status **AVG (Ch 5)**

Syntax: AOF?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: AOF, AVG

Front Panel Key: Avg \ **AVERAGE**

AON Turn averaging on **AVG (Ch 5)**

Syntax: AON

Remarks: Restarts the sweep, but does not change the averaging value that is currently set.

Related Commands: AVG, AOF, WFS

Front Panel Key: Avg \ **AVERAGE ON**

APPC12T? Output 12 Term calibration done status **CAL (Ch 6)**

Syntax: APPC12T?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL**

APPC3P? Output 3-port calibration done status **CAL (Ch 6)**

Syntax: APPC3P?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL**

APPC4P? Output 4-port calibration done status **CAL (Ch 6)**

Syntax: APPC4P?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL**

APPDEVM Select mixer device type for application **APPL (Ch 10)**

Syntax: APPDEVM

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **DEVICE TYPE MIXER**

APPDEVS Select standard device type for application **APPL (Ch 10)**

Syntax: APPDEVS

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **DEVICE TYPE STANDARD**

APPDEVX? Output device type for application **APPL (Ch 10)**

Syntax: APPDEVX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for MIXER
2 for DIPLEXER
3 for TWO PORT
4 for THREE PORT

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **DEVICE TYPE STANDARD**

APPENTC Set application entry state to current state **APPL (Ch 10)**

Syntax: APPENTC

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **ENTRY STATE CURRENT**

APPENTP Set application entry state to previous state **APPL (Ch 10)**

Syntax: APPENTP

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **ENTRY STATE PREVIOUS**

APPENTX? Output application entry state **APPL (Ch 10)**

Syntax: APPENTX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for CURRENT
2 for PREVIOUS

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **ENTRY STATE**

APPFTGD Select frequency translation group delay application type **APPL - FTGD (Ch 10)**

Syntax: APPFTGD

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **FREQUENCY TRANSLATION GROUP DELAY**

APPGCF Select swept frequency gain compression application type **APPL (Ch 10)**

Syntax: APPGCF

Remarks: Must be in TR mode first. Automatically switches out of Mixer device type upon entry and restores device type upon exit.

Front Panel Key: Appl \ **SWEPT FREQUENCY GAIN COMPRESSION**

APPGCP Select swept power gain compression application type **APPL (Ch 10)**

Syntax: APPGCP

Remarks: Must be in TR mode first. Automatically switches out of Mixer device type upon entry and restores device type upon exit.

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION**

APPHAR Select harmonic application type **APPL (Ch 10)**

Syntax: APPHAR

Remarks: Non-mixer only

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)**

APPIMD Select IMD application type **APPL (Ch 10)**

Syntax: APPIMD

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD**

APPLORCW0 Turn off LO CW mode **APPL (Ch 10)**

Syntax: APPLORCW0

Front Panel Key: Appl\ **CHANGE APPLICATION SETUP \ 3DEVICE TYPE MIXER \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ LO CW MODE OFF**

APPLORCW1 Turn on LO CW mode **APPL (Ch 10)**

Syntax: APPLORCW1

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ LO CW MODE ON**

APPLORCWF Enter LO CW frequency **APPL (Ch 10)**

Syntax: APPLORCWF Value Units
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ NOISE FIGURE \ LO/RCVR SETUP \ LO CW MODE ON \ LO CW FREQUENCY**

APPLORCWF? Output LO CW frequency **APPL (Ch 10)**

Syntax: APPLORCWF?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ LO CW MODE ON \ LO CW FREQUENCY**

APPLORCWX? Output LO CW on/off status **APPL (Ch 10)**

Syntax: APPLORCWX?

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ LO CW MODE ON/OFF**

APPLOROFF Enter LO offset frequency **APPL (Ch 10)**

Syntax: APPLOROFF Value Units
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ LO CW MODE OFF \ LO OFFSET FROM RF**

APPLOROFF? Output LO offset frequency **APPL (Ch 10)**

Syntax: APPLOROFF? Value Units
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ LO CW MODE OFF \ LO OFFSET FROM RF**

APPLORRCD Select receiver down conversion **APPL (Ch 10)**

Syntax: APPLORRCD

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ NOISE FIGURE \ LO/RCVR SETUP \ RCVR CONVERSION \ DOWN**

APPLORRCN Select receiver no conversion **APPL (Ch 10)**

Syntax: APPLORRCN

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ NOISE FIGURE \ LO/RCVR SETUP \ RCVR CONVERSION \ NONE**

APPLORRCU Select receiver up conversion **APPL (Ch 10)**

Syntax: APPLORRCU

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ NOISE FIGURE \ LO/RCVR SETUP \ RCVR CONVERSION \ UP**

APPLORRCX? Output receiver conversion type **APPL (Ch 10)**

Syntax: APPLORRCX?

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for NO CONVERSION
1 for UP
2 for DOWN

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ NOISE FIGURE \ LO/RCVR SETUP \ RCVR CONVERSION**

APPLORS2 Select source 2 for LO **APPL (Ch 10)**

Syntax: APPLORS2

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ IMD \ LO/RECEIVER SETUP \ LO IS SOURCE 2**

APPLORS3 Select source 3 for LO **APPL (Ch 10)**

Syntax: APPLORS3

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ IMD \ LO/RECEIVER SETUP \ LO IS SOURCE 3**

APPLORS4 Select source 4 for LO **APPL (Ch 10)**

Syntax: APPLORS4

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ IMD \ LO/RECEIVER SETUP \ LO IS SOURCE 4**

APPLORSX? Output LO source number **APPL (Ch 10)**

Syntax: APPLORSX?

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE MIXER \ MEASUREMENT TYPE \ IMD \ LO/RECEIVER SETUP \ LO IS SOURCE (X)**

APPNF Select noise figure application type **APPL (Ch 10)**

Syntax: APPNF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE**

APPSWPC Set application sweep mode to CW receiver **APPL (Ch 10)**

Syntax: APPSWPC

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ SWEEP MODE CW RCVR** or \ **IMD \ SWEEP MODE CW RCVR**

APPSWPS Set application sweep mode to source sweep **APPL (Ch 10)**

Syntax: APPSWPS

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)\ SWEEP MODE SOURCE** or \ **IMD \ SWEEP MODE SOURCE**

APPSWPX? Output application sweep mode **APPL (Ch 10)**

Syntax: APPSWPX?

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for FREQUENCY
2 for CW RCVR.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ SWEEP MODE** or \ **IMD \ SWEEP MODE**

APPTR Select transmission and reflection application type **APPL (Ch 10)**

Syntax: APPTR

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION**

APPX? Output application type **APPL (Ch 10)**

Syntax: APPX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for GROUP DELAY CALIBRATION
2 for TRANSMISSION AND REFLECTION APPICATION
3 for SWEPT POWER GAIN APPLICATION
4 for SWEPT FREQUENCY GAIN APPLICATION
5 for TOI APPLICATION
6 for HARMONIC APPLICATION
7 for NOISE FIGURE APPLICATION
8 for MIXER CONVERSION LOSS APPLICATION

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE**

APR Enter group delay aperture setting on active channel **DISPLAY (Ch 5)**

Syntax: APR Value Units
Value: 0.0 to 20.0
Units: XX1, XX3, XM3

Related Commands: CH1-CH4, DLA

Front Panel Key: Display \ **GRAPH TYPE \ GROUP DELAY** then **\ SCALE \ APERATURE X.X PERCENT OF SWEEP**

APR? Output group delay aperture setting on active channel **DISPLAY (Ch 5)**

Syntax: APR?

Data I/O: Outputs value in ASCII <NR3 > format.

Front Panel Key: Display \ **GRAPH TYPE \ GROUP DELAY** then **\ SCALE \ APERATURE X.X PERCENT OF SWEEP**

APRXSTP Enter approximate stop frequency **CAL (Ch 6)**

Syntax: APRXSTP

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR3>.

Related Commands: APRXSTP?

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ TIME DOMAIN (HARMONIC) \ APPROXIMATE STOP**

APRXSTP? Output approximate stop frequency **CAL (Ch 6)**

Syntax: APRXSTP?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ TIME DOMAIN (HARMONIC) \ APPROXIMATE STOP**

ARB Simulate reflection only calibration both ports **CAL (Ch 6)**

Syntax: ARB

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1-IC6, CON. Also see CRB, OC1-OC6.

ARF Simulate reflection only calibration port 1 **CAL (Ch 6)**

Syntax: ARF

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1-IC6, CON. Also see CRB, OC1-OC6.

ARR Simulate reflection only calibration port 2 **CAL (Ch 6)**

Syntax: ARR

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1-IC3, CON. Also see CRR, OC1-OC3

ART Simulate translation frequency response calibration reverse path **CAL (Ch 6)**

Syntax: ART

Remarks: Sets the error correction type you wish to simulate; the command does not perform a calibration. After issuing this command, input the calibration data arrays you wish to apply to the measured data then issue the CON command to turn on correction.

Related Commands: IC1, CON. Also see CRT, OC1

ASC Autoscale the active channel display **DISPLAY (Ch 5)**

Syntax: ASC

Remarks: For best results, wait for a full sweep before issuing command.

Related Commands: CH1-CH4, WFS

Front Panel Key: Display \ **AUTOSCALE**

ASP Enter polar stop sweep position angle **DISPLAY (Ch 5)**

Syntax: ASP Value Units
Value: -360.00 to 360.00
Units: DEG

Related Commands: CH1-CH4, PCP, PCS, AST

Front Panel Key: Display **\GRAPH TYPE \ (LINEAR POLAR) (LOG POLAR)** then **\ SCALE \ SELECT POLAR CHART MODE \ SET SWEEP POSITION BOUNDARIES STOP ANGLE**

ASP? Output polar stop sweep position angle **DISPLAY (Ch 5)**

Syntax: `ASP?`

Data I/O: Outputs value in ASCII <NR3> format.

Front Panel Key: Display **\GRAPH TYPE \ (LINEAR POLAR) (LOG POLAR)** then **\ SCALE \ SELECT POLAR CHART MODE \ SET SWEEP POSITION BOUNDARIES STOP ANGLE**

AST Enter polar start sweep position angle **DISPLAY (Ch 5)**

Syntax: `AST Value Units`
Value: -360.00 to 360.00
Units: DEG

Related Commands: CH1-CH4, PCP, PCS, ASP

Front Panel Key: Display **\GRAPH TYPE \ (LINEAR POLAR) (LOG POLAR)** then **\ SCALE \ SELECT POLAR CHART MODE \ SET SWEEP POSITION BOUNDARIES START ANGLE**

AST? Output polar start sweep position angle **DISPLAY (Ch 5)**

Syntax: `AST?`

Data I/O: Outputs value in ASCII <NR3> format.

Front Panel Key: Display **\GRAPH TYPE \ (LINEAR POLAR) (LOG POLAR)** then **\ SCALE \ SELECT POLAR CHART MODE \ SET SWEEP POSITION BOUNDARIES START ANGLE**

ATTN Attach next segment and make it the active segment **DISPLAY - LIMITS (Ch 7)**

Syntax: `ATTN`

Related Commands: CH1-CH4, L01-L10, U01-U10, DIS, BEGN

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ ATTACH NEXT**

AVG Enter averaging count and turn it on **AVG (Ch 5)**

Syntax: `AVG Value Units`
Value: 1 to 4095
Units: XX1, XX3, XM3

Remarks: Restarts the sweep.

Related Commands: AOF

Front Panel Key: Avg \ **DATA AVERAGE**

AVG? Output averaging count **AVG (Ch 5)**

Syntax: `AVG?`

Data I/O: Outputs a value in ASCII <NR1> format.

Front Panel Key: Avg \ **DATA AVERAGE**

AVGCNT? Output the current Sweep-by-Sweep average sweep count **AVG (Ch 5)**

Syntax: `AVGCNT?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: RSTAVG

Front Panel Key: Avg \ **AVERAGING TYPE**

BAC Perform backend attenuator calibration **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `BAC`

Front Panel Key: Utility \ **DIAGNOSTICS \ HARDWARE CAL \ BACKEND ATTENUATOR CAL \ START CAL \ CALIBRATING BACKEND ATTENUATOR**

BBL Select broadband load for calibration **CAL (Ch 6)**

Syntax: `BBL`

Related Commands: SLD

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LOAD TYPE \ BROADBAND FIXED LOAD**

BBLP3 Select broadband load for 3-port calibration **CAL (Ch 6)**

Syntax: `BBLP3`

Related Commands: BBLP4

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ LOAD TYPE**

BBLP4 Select broadband load for 4-port calibration **CAL (Ch 6)**

Syntax: `BBLP4`

Related Commands: BBLP3

BBX? Output load type for calibration broadband/sliding load **CAL (Ch 6)**

Syntax: `BBX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for BROADBAND LOAD
1 for SLIDING LOAD

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LOAD TYPE**

BBXP3? Output load type for 3-port calibration broadband/sliding load **CAL (Ch 6)**

Syntax: `BBXP3?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for BROADBAND LOAD
1 for SLIDING LOAD

Related Commands: BBLP3, SLDP3

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ LOAD TYPE**

BBXP4? Output load type for 4-port calibration broadband/sliding load **CAL (Ch 6)**

Syntax: `BBXP4?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for BROADBAND LOAD
1 for SLIDING LOAD

Related Commands: BBLP4, SLDP4

BBZ Enter broadband load impedance for calibration **CAL (Ch 6)**

Syntax: `BBZ Value Units`
Value: 1.0 to 9999.99
Units: XX1, OHM

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LOAD TYPE \ BROADBAND FIXED LOAD \ IMPEDANCE**

BBZ? Output broadband load impedance for calibration **CAL (Ch 6)**

Syntax: `BBZ?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LOAD TYPE \ BROADBAND FIXED LOAD \ IMPEDANCE**

BBZL Enter broadband load inductance for calibration **CAL (Ch 6)**

Syntax: `BBZL Value Units`
Value: Inductance value
Units: XX1

Data I/O: Inductance value in ASCII <NRF> format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LOAD TYPE \ BROADBAND FIXED LOAD \ INDUCTANCE**

BBZL? Output broadband load inductance for calibration **CAL (Ch 6)**

Syntax: `BBZL?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LOAD TYPE \ BROADBAND FIXED LOAD \ INDUCTANCE**

BC0 Turn LCD display off (disabled) **UTILITY (Ch 9)**

Syntax: `BC0`

Related Commands: BC1, BCX?

BC1 Turn LCD display on (enabled) **UTILITY (Ch 9)**

Syntax: `BC1`

Related Commands: BC0, BCX?

BCKCOL Enter the color number for background **UTILITY (Ch 9)**

Syntax: `BCKCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 at the end of this chapter.

Related Commands: ANNCOL, DATCOL, GRTCOL, LAYCOL, MKRCOL, MNUCOL, TRCCOL, BCKCOL?

Front Panel Key: Utility **\ COLOR SETUP \ BACKGROUND XX COLOR NAME**

BCKCOL? Output the color number for background **UTILITY (Ch 9)**

Syntax: `BCKCOL?`

Data I/O: Outputs the color palette number in ASCII <NR1> format.

Related Commands: ANNCOL, DATCOL?, GRTCOL?, LAYCOL, MKRCOL?, MNUCOL?, TRCCOL?, BCKCOL

Front Panel Key: Utility **\ COLOR SETUP \ BACKGROUND XX COLOR NAME**

BCX? Output LCD display on/off status **UTILITY (Ch 9)**

Syntax: `BCX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: BC0, BC1

BD1 Select band 1 for definition **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BD1`

Remarks: Only commands in Multiple Source group may be issued between BDX and SVB command pairs.

Related Commands: SVB, CLB

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND 1**

BD2 Select band 2 for definition **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BD2`

Remarks: Only commands in Multiple Source group may be issued between BDX and SVB command pairs.

Related Commands: SVB, CLB

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND 2**

BD3 Select band 3 for definition **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BD3`

Remarks: Only commands in Multiple Source group may be issued between BDX and SVB command pairs.

Related Commands: SVB, CLB

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND 3**

BD4 Select band 4 for definition **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BD4`

Remarks: Only commands in Multiple Source group may be issued between BDX and SVB command pairs.

Related Commands: SVB, CLB

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND 4**

BD5 Select band 5 for definition **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BD5`

Remarks: Only commands in Multiple Source group may be issued between BDX and SVB command pairs.

Related Commands: SVB, CLB

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND 5**

BEEP0 Disable the instrument beeper on GPIB errors **UTILITY (Ch 9)**

Syntax: `BEEP0`

Related Commands: BEEP1, BEEPX?

BEEP1 Enable the instrument beeper on GPIB errors **UTILITY (Ch 9)**

Syntax: `BEEP1`

Related Commands: BEEP0, BEEPX?

BEEPX? Output GPIB beep on error enable/disable status **UTILITY (Ch 9)**

Syntax: `BEEPX?`

Data I/O: Outputs a value using ASCII <NR1> format as follows:
0 for BEEP DISABLED
1 for BEEP ENABLED

Related Commands: BEEP0, BEEP1

BEG Begin taking calibration data **CAL (Ch 6)**

Syntax: `BEG`

Remarks: After calibration parameters are configured (see CALIBRATION group), use this command to start measuring calibration standards (data-collection process). The prompt to connect the first standard will be displayed. After the prompt's action is carried out, issue commands to take calibration data for that standard and then go to next calibration step.

Status Reporting: Extended Event Status Register bit 0 will be set when all calibration standards have been measured and the entire calibration process is complete.

Related Commands: TC1, TC2, TCD, NCS, RPC, KEC

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ START CAL**

BEG3P Begin taking 3-port calibration data **CAL (Ch 6)**

Syntax: BEG3P

Related Commands: BEG4P

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL** \ **NEXT CAL STEP** \ **START CAL**

BEG4P Begin taking 4-port calibration data **CAL (Ch 6)**

Syntax: BEG4P

Related Commands: BEG3P

BEGAC Initialize an AutoCal measurement **CAL - AUTOCAL (Ch 6)**

Syntax: BEGAC

Remarks: Use the TCD command to begin the actual measurement.

Front Panel Key: Cal \ **AUTOCAL**

BEGACA Start AutoCal assurance **CAL - AUTOCAL (Ch 6)**

Syntax: BEGACA

Front Panel Key: Utility \ **DIAGNOSTICS** \ **AUTOCAL ASSURANCE** \ **PERFORM ASSURANCE**

BEGCH Start AutoCal characterization **CAL - AUTOCAL (Ch 6)**

Syntax: BEGCH

Front Panel Key: Utility \ **AUTOCAL CHARACTERIZATION** \ **CONTINUE**

BEGEN Begin taking harmonic enhancement calibration data **APPL - HARMONIC (Ch 10)**

Syntax: BEGEN

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC (NON-MIXER ONLY)** then Cal \ **CALIBRATE** \ **ENHANCEMENT CAL**

BEGFTGD Start frequency translation group delay calibration **APPL - FTGD (Ch 10)**

Syntax: BEGFTGD

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY** then Cal \ **PERFORM CAL**

BEGHAR Begin taking both harmonic enhancement and phase calibration **APPL - HARMONIC (Ch 10)**

Syntax: BEGHAR

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **CALIBRATE \ ENHANCEMENT & PHASE CAL**

BEGIMD Begin taking IMD calibration data **APPL - IMD (Ch 10)**

Syntax: BEGIMD

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD** then Cal \ **PERFORM CAL \ IMD CAL**

BEGN Begin next segment and make it the active segment **DISPLAY - LIMITS (Ch 7)**

Syntax: BEGN

Related Commands: ATTN

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then \ **LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ BEGIN NEXT**

BEGNF Begin taking noise figure calibration data **APPL - NOISE FIGURE (Ch 10)**

Syntax: BEGNF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Cal \ **PERFORM CAL NOISE FIGURE ONLY**

BEGNFRF Begin taking noise figure with RF calibration data **APPL - NOISE FIGURE (Ch 10)**

Syntax: BEGNFRF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** then Cal \ **PERFORM CAL NOISE FIGURE WITH 12 TERM**

BEGPH Begin taking harmonic phase calibration data **APPL - HARMONIC (Ch 10)**

Syntax: BEGPH

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC (NON-MIXER ONLY)** then Cal \ **CALIBRATE** \ **PHASE CAL**

BEGR Begin receiver calibration **POWER - RECEIVER CAL (Ch 5)**

Syntax: BEGR

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **BEGIN CAL** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **PERFORM CAL** \ **RECEIVER CAL** \ **BEGIN CAL** or Appl \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **BEGIN CAL**

BEGTU Start AutoCal Thru update **CAL - AUTOCAL (Ch 6)**

Syntax: BEGTU

Front Panel Key: Cal \ **AUTOCAL** \ **THRU UPDATE** \ **START THRU UPDATE**

BH0 Turn bias off while in hold **CONFIG (Ch 5)**

Syntax: BH0

Related Commands: BH1, BHX?, HLD

Front Panel Key: Config \ **HOLD** \ **HOLD CONDITIONS BIAS OFF**

BH1 Turn bias on while in hold **CONFIG (Ch 5)**

Syntax: BH1

Related Commands: BH0, BHX?, HLD

Front Panel Key: Config \ **HOLD** \ **HOLD CONDITIONS BIAS ON**

BHX? Output bias on/off during hold status **CONFIG (Ch 5)**

Syntax: BHX?

Data I/O: Outputs bias on/off during hold status using ASCII <NR1> format as follows:
1 for ON
0 for OFF

Related Commands: BH0, BH1

Front Panel Key: Config \ **HOLD** \ **HOLD CONDITIONS BIAS**

BMPB Select black on white as bitmap type **HARD COPY (Ch 9)**

Syntax: BMPB

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT GRAPHICAL DATA** \ **BITMAP FILE OUTPUT OPTIONS BLACK ON WHITE BACKGROUND**

BMPC Select color on white as bitmap type **HARD COPY (Ch 9)**

Syntax: BMPC

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT GRAPHICAL DATA** \ **BITMAP FILE OUTPUT OPTIONS COLOR ON WHITE BACKGROUND**

BMPT Select true color as bitmap type **HARD COPY (Ch 9)**

Syntax: BMPT

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT GRAPHICAL DATA** \ **BITMAP FILE OUTPUT OPTIONS TRUE COLOR**

BMPX? Output bitmap type **HARD COPY (Ch 9)**

Syntax: BMPX?

Data I/O: Outputs value using ASCII <NR1> format as follows:
1 is BLACK ON WHITE
2 is COLOR ON WHITE
3 is TRUE COLOR

Related Commands: BMPB, BMPC, BMPT

Front Panel Key: Hard Copy **\ OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT GRAPHICAL DATA \ BITMAP FILE OUTPUT OPTIONS**

BNDNFCW? Output multiple source band Noise Figure ENR source CW flag **APPL - NOISE FIGURE (Ch 10)**

Syntax: BNDNFCW?

Data I/O: The value is input in ASCII <NRf> format and output using ASCII <NR1> format.

BNDNFDIV? Output multiple source band Noise Figure ENR source divisor **APPL - NOISE FIGURE (Ch 10)**

Syntax: BNDNFDIV?

Data I/O: The value is input in ASCII <NRf> format and output using ASCII <NR3> format.

BNDNFMUL? Output multiple source band Noise Figure ENR source multiplier **APPL - NOISE FIGURE (Ch 10)**

Syntax: BNDNFMUL?

Data I/O: The value is input in ASCII <NRf> format and output using ASCII <NR3> format.

BNDNFOFF? Output multiple source band Noise Figure ENR source offset **APPL - NOISE FIGURE (Ch 10)**

Syntax: BNDNFOFF?

Data I/O: The value is input in ASCII <NRf> format and output using ASCII <NR3> format.

BNDRCW? Output multiple source band receiver CW flag for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDRCW? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ RECEIVER \ C.W.**

BNDRDIV? Output multiple source band receiver divisor for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDRDIV? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ RECEIVER \ DIVISOR**

BNDRMUL? Output multiple source band receiver multiplier for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDRMUL? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ RECEIVER \ MULTIPLIER**

BNDROFF? Output multiple source band receiver offset for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDROFF? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ RECEIVER \ OFFSET FREQ**

BNDRSCW? Output multiple source band receiver source CW flag **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDRSCW? Value`
Value: See Data I/O below.

Data I/O: Input data using an ASCII <NRf> number. Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON
Default value is OFF

Related Commands: BNDRSDIV?, BNDRSMUL?, BNDRSOFF?

BNDRSDIV? Output multiple source band receiver source divisor **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDRSDIV? Value`
Value: See Data I/O below.

Data I/O: Input data using an ASCII <NRf> number; outputs a value in ASCII <NR3> format. Default value is 1.0.

Related Commands: BNDRSCW?, BNDRSMUL?, BNDRSOFF?

BNDRSMUL? Output multiple source band receiver source multiplier **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDRSMUL? Value`
Value: See Data I/O below.

Data I/O: Input data using an ASCII <NRf> number; outputs a value in ASCII <NR3> format. Default value is 1.0.

Related Commands: BNDRSCW?, BNDRSDIV?, BNDRSOFF?

BNDRSOFF? Output multiple source band receiver source offset **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDRSOFF? Value`
Value: See Data I/O below.

Data I/O: Input data using an ASCII <NRf> number; outputs a value in ASCII <NR3> format. Default value is 0.0.

Related Commands: BNDRSCW?, BNDRSDIV?, BNDRSMUL?

BNDS1CW? Output multiple source band source 1 CW flag for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDS1CW? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 \ C.W.**

BNDS1DIV? Output multiple source band source 1 divisor for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDS1DIV? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 \ DIVISOR**

BNDS1MUL? Output multiple source band source 1 multiplier for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDS1MUL? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 \ MULTIPLIER**

BNDS1OFF? Output multiple source band source 1 offset for specified band

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `BNDS1OFF? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 \ OFFSET FREQ**

BNDS2CW? Output multiple source band source 2 CW flag for specified band **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS2CW? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 2 \ C.W.**

BNDS2DIV? Output multiple source band source 2 divisor for specified band **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS2DIV? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 2 \ DIVISOR**

BNDS2MUL? Output multiple source band source 2 multiplier for specified band **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS2MUL? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 2 \ MULTIPLIER**

BNDS2OFF? Output multiple source band source 2 offset for specified band **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS2OFF? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 2 \ OFFSET FREQ**

BNDS3CW? Output multiple source band source 3 CW flag **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS3CW? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR1>.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 3 \ C.W.**

BNDS3DIV? Output multiple source band source 3 divisor **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS3DIV? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR3>.

Related Commands: BNDS3MUL?, BNDS3OFF?, BNDS4CW?, BNDS4DIV?, BNDS4MUL?, BNDS4OFF?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 3 \ DIVISOR**

BNDS3MUL? Output multiple source band source 3 multiplier **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS3MUL? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR3>.

Related Commands: BNDS3DIV?, BNDS3OFF?, BNDS4CW?, BNDS4DIV?, BNDS4MUL?, BNDS4OFF?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 3 \ MULTIPLIER**

BNDS3OFF? Output multiple source band source 3 offset **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS3OFF? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR3>.

Related Commands: BNDS3DIV?, BNDS3MUL?, BNDS4CW?, BNDS4DIV?, BNDS4MUL?, BNDS4OFF?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 3 \ OFFSET FREQ**

BNDS4CW? Output multiple source band source 4 CW flag **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS4CW? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR1>.

Related Commands: BNDS3DIV?, BNDS3MUL?, BNDS3OFF?, BNDS4DIV?, BNDS4MUL?, BNDS4OFF?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 4 \ C.W.**

BNDS4DIV? Output multiple source band source 4 divisor **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS4DIV? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR3>.

Related Commands: BNDS3DIV?, BNDS3MUL?, BNDS3OFF?, BNDS4CW?, BNDS4MUL?, BNDS4OFF?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 4 \ DIVISOR**

BNDS4MUL? Output multiple source band source 4 multiplier **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS4MUL? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR3>.

Related Commands: BNDS3DIV?, BNDS3MUL?, BNDS3OFF?, BNDS4CW?, BNDS4DIV?, BNDS4OFF?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 4 \ MULTIPLIER**

BNDS4OFF? Output multiple source band source 4 offset **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDS4OFF? Value`
Value: <band number>

Data I/O: Input data using an ASCII <NRf> number; outputs data using ASCII <NR1>.

Related Commands: BNDS3DIV?, BNDS3MUL?, BNDS3OFF?, BNDS4CW?, BNDS4DIV?, BNDS4MUL?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 4 \ OFFSET FREQ**

BNDSRT? Output multiple source band start frequency for specified band **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDSRT? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND START FREQ**

BNDSTP? Output multiple source band stop frequency for specified band **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BNDSTP? Value`
Value: <band number>

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Config \ **MULTIPLE SOURCE \ DEFINE BANDS \ BAND STOP FREQ**

BPF Enter break point frequency for 3 line LRL calibration **CAL (Ch 6)**

Syntax: `BPF Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ NEXT CAL STEP \ NUMBER OF BANDS USED TWO BANDS \ BREAKPOINT**

BPF? Output break point frequency for 3 line LRL calibration **CAL (Ch 6)**

Syntax: `BPF?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ NEXT CAL STEP \ NUMBER OF BANDS USED TWO BANDS \ BREAKPOINT**

BSP Enter band stop frequency **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BSP Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: Except for band 1, only band stop frequencies can be set. Band start frequencies are automatically set to the previous band's end frequency.

Related Commands: BST, BSP?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND STOP FREQ**

BSP? Output band stop frequency **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BSP?`

Data I/O: Outputs band stop frequency using ASCII <NR3> format.

Related Commands: BST, BSP

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND STOP FREQ**

BST Enter band start frequency **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BST Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: Only band 1 start frequency can be set. Bands 2-5 automatically start at the end of the previous band.

Related Commands: BSP

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND START FREQ**

BST? Output band start frequency **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `BST?`

Data I/O: Outputs value in ASCII <NR3> format.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ BAND START FREQ**

BWL3 Set bandwidth loss value to 3 dB **MARKER (Ch 7)**

Syntax: `BWL3`

Related Commands: FMKR, BWLS, BWLS?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ BANDWIDTH LOSS VALUE**

BWLS Enter bandwidth loss value **MARKER (Ch 7)**

Syntax: `BWLS`

Remarks: Input depends on graph type; refer to Table 11-2 at the end of this chapter.

Related Commands: FMKR, BWL3, BWLS?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ BANDWIDTH LOSS VALUE**

BWLS? Output bandwidth loss value **MARKER (Ch 7)**

Syntax: `BWLS?`

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: BWL3, BWLS

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ FILTER PARAMETER \ FILTER SETUP \ BANDWIDTH LOSS VALUE**

C12 Select 12 term calibration **CAL (Ch 6)**

Syntax: `C12`

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM**

C8R Select 1-path 2-port calibration reverse path **CAL (Ch 6)**

Syntax: `C8R`

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ 1 PATH/2 PORT \ REVERSE PATH (S22, S12)**

C8T Select 1-path 2-port calibration forward path **CAL (Ch 6)**

Syntax: C8T

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ 1 PATH/2 PORT \ FORWARD PATH (S11, S21)**

CALR Perform receiver calibration for gain compression testing **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: CALR

Remarks: A receiver calibration is one of the required steps in both swept frequency and swept power gain compression testing.

Related Commands: SFGCA, SPGCA, NRMS, UNDOGC

Front Panel Key: Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

CAS Clear active segmented limit vertical/horizontal definitions **DISPLAY - LIMITS (Ch 7)**

Syntax: CAS

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then \ **LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ CLEAR SEGMENT**

CBT Select translation frequency response calibration forward and reverse **CAL (Ch 6)**

Syntax: CBT

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ TRANSMISSION FREQ RESPONSE \ BOTH PATHS (S21, S12)**

CC0 Enter capacitance coefficient 0 for open **CAL (Ch 6)**

Syntax: `CC0 Value Units`
Value: -9999.99 to 9999.99
Units: XX1

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 1-C0** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 1-C0**

CC0? Output capacitance coefficient 0 for open **CAL (Ch 6)**

Syntax: `CC0?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 1-C0** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 1-C0**

CC1 Enter capacitance coefficient 1 for open **CAL (Ch 6)**

Syntax: `CC1 Value Units`
Value: -9999.99 to 9999.99
Units: XX1

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 2-C1** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 2-C1**

CC1? Output capacitance coefficient 1 for open **CAL (Ch 6)**

Syntax: `CC1?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 2-C1** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 2-C1**

CC2 Enter capacitance coefficient 2 for open **CAL (Ch 6)**

Syntax: `CC2 Value Units`
Value: -9999.99 to 9999.99
Units: XX1

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 3-C2** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 3-C2**

CC2? Output capacitance coefficient 2 for open **CAL (Ch 6)**

Syntax: `CC2?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 3-C2** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 3-C2**

CC3 Enter capacitance coefficient 3 for open **CAL (Ch 6)**

Syntax: `CC3 Value Units`
Value: -9999.99 to 9999.99
Units: XX1

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 4-C3** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 4-C3**

CC3? Output capacitance coefficient 3 for open **CAL (Ch 6)**

Syntax: `CC3?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ TERM 4-C3** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ TERM 4-C3**

CD Change default directory **UTILITY - DISK (Ch 9)**

Syntax: `CD Pathspec`
Value: "Pathspec" is a combination of letters, numbers, \ characters and underscores which spell out the pathspec to the subdirectory in question

Related Commands: ADRIVE, CDRIVE, CWD?

CDATTN0? Output port 1 attenuation of power sweep mode from selected cal memory **CAL (Ch 6)**

Syntax: `CDATTN0? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDATTN2? Output port 3 attenuation of power sweep mode from selected cal memory **CAL (Ch 6)**

Syntax: `CDATTN2? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDCALTP? Output 2-port cal type from selected cal memory **CAL (Ch 6)**

Syntax: `CDCALTP? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NONE
1 for REFLECTION FWD
2 for TRANSMISSION REV
4 for TRANSMISSION FWD
5 for 8 TERM FWD
6 for TRANSMISSION FWD & REV
8 for REFLECTION REV
9 for REFLECTION FWD & REV
10 for 8 TERM REV
15 for 12 TERM

CDCON? Output port 1 connector from selected cal memory **CAL (Ch 6)**

Syntax: `CDCON? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for SMA male; 1 for SMA female
2 for K male; 3 for K female
4 for Type N male; 5 for Type N female
6 for GPC 3.5 male; 7 for GPC 3.5 female
8 for GPC 7
9 for other & user specified
10 for V male; 11 for V female
12 for TNC male; 13 for TNC female
14 for 2.4 mm male; 15 for 2.4 mm female
16 for Type 75 male; 17 for Type N 75 female
18 for Special male; 19 for Special female
20 for Type 7/16 male; 21 for Type 7/16 female

CDCWF? Output cw mode frequency from selected cal memory **CAL (Ch 6)**

Syntax: `CDCWF? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDEND1? Output end power for power source 1 or end frequency from selected cal memory **CAL (Ch 6)**

Syntax: `CDEND1? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDEND2? Output end power for power source 2 from selected cal memory **CAL (Ch 6)**

Syntax: `CDEND2? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDEND3? Output end power for power source 3 from selected cal memory **CAL (Ch 6)**

Syntax: `CDEND3? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDEND4? Output end power for power source 4 from selected cal memory **CAL (Ch 6)**

Syntax: `CDEND4? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDFREQ? Output cal data freq list from selected cal memory **CAL (Ch 6)**

Syntax: `CDFREQ? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDFSW? Output sweep type from selected cal memory **CAL (Ch 6)**

Syntax: `CDFSW? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDFXCALTP? Output Flexible Cal calibration type **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `CDFXCALTP?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for no input method
1 for full term calibrations
2 for reflection calibrations
3 for customize calibrations.

Related Commands: CFXI?

Front Panel Key: Cal \ **FLEXIBLE CAL**

CDLNTP? Output line type from selected cal memory **CAL (Ch 6)**

Syntax: `CDLNTP? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
67 for COAXIAL
87 for WAVEGUIDE
77 for MICROSTRIP.

CDNOP1? Output port 1 nominal offset of power sweep mode from selected cal memory **CAL (Ch 6)**

Syntax: `CDNOP1? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDNOP3? Output port 3 nominal offset of power sweep mode from selected cal memory **CAL (Ch 6)**

Syntax: `CDNOP3? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDNUM? Output data number of power/frequency from selected cal memory **CAL (Ch 6)**

Syntax: `CDNUM? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDP2CON? Output port 2 connector from selected cal memory **CAL (Ch 6)**

Syntax: `CDP2CON? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for SMA male; 1 for SMA female
2 for K male; 3 for K female
4 for Type N male; 5 for Type N female
6 for GPC 3.5 male; 7 for GPC 3.5 female
8 for GPC 7
9 for other & user specified
10 for V male; 11 for V female
12 for TNC male; 13 for TNC female
14 for 2.4 mm male; 15 for 2.4 mm female
16 for Type N 75 male; 17 for Type N 75 female
18 for Special male; 19 for Special female
20 for Type 7/16 male; 21 for Type 7/16 female

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL**

CDP3CALTP? Output 3-port cal type from selected cal memory **CAL (Ch 6)**

Syntax: `CDP3CALTP? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
69 for 19 TERM
511 for 24 TERM.

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL**

CDP3CON? Output port 3 connector from selected cal memory **CAL (Ch 6)**

Syntax: `CDP3CON? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for SMA male; 1 for SMA female
2 for K male; 3 for K female
4 for Type N male; 5 for Type N female
6 for GPC 3.5 male; 7 for GPC 3.5 female
8 for GPC 7
9 for other & user specified
10 for V male; 11 for V female
12 for TNC male; 13 for TNC female
14 for 2.4 mm male; 15 for 2.4 mm female
16 for Type N 75 male; 17 for Type N 75 female
18 for Special male; 19 for Special female
20 for Type 7/16 male; 21 for Type 7/16 female

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL**

CDP4CALTP? Output 4-port cal type from selected cal memory **CAL (Ch 6)**

Syntax: `CDP4CALTP? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
65535 for 40 TERM

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL**

CDP4CON? Output port 4 connector from selected cal memory **CAL (Ch 6)**

Syntax: `CDP4CON? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for SMA male; 1 for SMA female
2 for K male; 3 for K female
4 for Type N male; 5 for Type N female
6 for GPC 3.5 male; 7 for GPC 3.5 female
8 for GPC 7
9 for other & user specified
10 for V male; 11 for V female
12 for TNC male; 13 for TNC female
14 for 2.4 mm male; 15 for 2.4 mm female
16 for Type N 75 male; 17 for Type N 75 female
18 for Special male; 19 for Special female
20 for Type 7/16 male; 21 for Type 7/16 female

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL**

CDPTS? Output cal data points from selected cal memory **CAL (Ch 6)**

Syntax: `CDPTS? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NORMAL
1 for CW FREQUENCY CALIBRATION
2 for DISCRETE FREQUENCY
3 for TIME DOMAIN HARMONIC FREQUENCY CALIBRATION

CDPTSPWR? Output cal data point of power sweep mode from selected cal memory **CAL (Ch 6)**

Syntax: `CDPTSPWR? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NORMAL
1 for CW FREQUENCY CALIBRATION

CDRIVE Select the hard disk as the default drive **UTILITY - DISK (Ch 9)**

Syntax: `CDRIVE`

Remarks: All disk operations which do not specify a drive will be performed on the hard drive.

Related Commands: ADRIVE, CD, CWD?

CDSRC2PWR? Output power in power source 2 from selected cal memory **CAL (Ch 6)**

Syntax: `CDSRC2PWR? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDSRCPWR? Output power in power source 1 from selected cal memory **CAL (Ch 6)**

Syntax: `CDSRCPWR? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDSTEP? Output min power/frequency step from selected cal memory **CAL (Ch 6)**

Syntax: `CDSTEP? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDSTRT1? Output start power for power source 1 or start frequency from selected cal memory **CAL (Ch 6)**

Syntax: `CDSTRT1? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDSTRT2? Output start power for power source 2 from selected cal memory **CAL (Ch 6)**

Syntax: `CDSTRT2? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDSTRT3? Output start power for power source 3 from selected cal memory **CAL (Ch 6)**

Syntax: `CDSTRT3? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CDSTRT4? Output start power for power source 4 from selected cal memory **CAL (Ch 6)**

Syntax: `CDSTRT4? Value`
Value: Selected cal memory num

Data I/O: Outputs data using ASCII <NR1> integer values.

CF2 Select female 2.4mm connector for current port **CAL (Ch 6)**

Syntax: `CF2`

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ 2.4 mm (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ 2.4 mm (F)**

CF3 Select female GPC-3.5 connector for current port **CAL (Ch 6)**

Syntax: `CF3`

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ GPC 3.5 (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ GPC 3.5 (F)**

CF716 Select female Type 7/16 connector for current port **CAL (Ch 6)**

Syntax: CF716

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ 7/16 (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ 7/16 (F)** or **\ PERFORM CAL MANUAL CAL \ 4 PORT \ NEXT CAL STEP \ PORT 4 CONN \ 7/16 (F)**

CFC Select female TNC connector for current port **CAL (Ch 6)**

Syntax: CFC

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ TNC (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ TNC (F)**

CFD Collect final data in an internal buffer **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: CFD

Related Commands: CXD?

CFFX? Query Flexible Cal define mode **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: CFFX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for apply
1 for define

Front Panel Key: Cal **\ FLEXIBLE CAL **

CFK Select female K Connector for current port **CAL (Ch 6)**

Syntax: CFK

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ K-CONN (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ K-CONN (F)**

CFN Select female Type N connector for current port **CAL (Ch 6)**

Syntax: CFN

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ TYPE N (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ TYPE N (F)**

CFN75 Select female Type N 75-ohm connector for current port **CAL (Ch 6)**

Syntax: CFN75

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ TYPE N 75(F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ TYPE N 75(F)**

CFS Select female SMA connector for current port **CAL (Ch 6)**

Syntax: `CFS`

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ SMA (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ SMA (F)**

CFSP Select special female connector for current port **CAL (Ch 6)**

Syntax: `CFSP`

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ SPECIAL (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ SPECIAL (F)**

CFT Select transmission frequency response calibration forward path **CAL (Ch 6)**

Syntax: `CFT`

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ TRANSMISSION FREQ RESPONSE \ FORWARD PATH (S21)**

CFV Select female V Connector for current port **CAL (Ch 6)**

Syntax: `CFV`

Related Commands: P1C, P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ V-CONN (F)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ V-CONN (F)**

CFXI? Output Flexible Cal input method **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `CFXI?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for no input method
1 for full term calibrations
2 for reflection calibrations
3 for customize calibrations

Related Commands: CDFXCALTP?

Front Panel Key: Cal \ **FLEXIBLE CAL** \

CFXICU Select Flexible Customize Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `CFXICU`

Front Panel Key: Cal \ **FLEXIBLE CAL**

CFXIFU Select Flexible Full Term Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `CFXIFU`

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS**

CFXIRF Select Flexible Reflection Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `CFXIRF`

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **REFLECTION ONLY**

CH1 Make channel 1 the active channel **CH (Ch 5)**

Syntax: `CH1`

Remarks: If channel to be activated is not currently displayed, the sweep will be re-started with the requested active channel displayed. The channel display mode (single, dual, dual overlaid, or quad), however, will be maintained.

Related Commands: CHX?, WFS

Front Panel Key: Ch 1 then Display \ **TRACE MEMORY** \ **DISK OPERATIONS** \ **CHANNEL 1**

CH2 Make channel 2 the active channel **CH (Ch 5)**

Syntax: `CH2`

Remarks: If channel to be activated is not currently displayed, the sweep will be restarted with the requested active channel displayed. The channel display mode (single, dual, dual overlaid, or quad), however, will be maintained.

Related Commands: CHX?, WFS

Front Panel Key: Ch 2 then Display **\ TRACE MEMORY \ DISK OPERATIONS \ CHANNEL 2**

CH3 Make channel 3 the active channel **CH (Ch 5)**

Syntax: `CH3`

Remarks: If channel to be activated is not currently displayed, the sweep will be restarted with the requested active channel displayed. The channel display mode (single, dual, dual overlaid, or quad), however, will be maintained.

Related Commands: CHX?, WFS

Front Panel Key: Ch 3 then Display **\ TRACE MEMORY \ DISK OPERATIONS \ CHANNEL 3**

CH4 Make channel 4 the active channel **CH (Ch 5)**

Syntax: `CH4`

Remarks: If channel to be activated is not currently displayed, the sweep will be restarted with the requested active channel displayed. The channel display mode however, (single, dual, dual overlaid, or quad), will be maintained.

Related Commands: CHX?, WFS

Front Panel Key: Ch 4 then Display **\ TRACE MEMORY \ DISK OPERATIONS \ CHANNEL 4**

CHAPR? Output group delay aperture setting for specified channel **DISPLAY (Ch 5)**

Syntax: `CHAPR? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> format for the requested channel.

CHDAT? Output trace memory display mode for specified channel **DISPLAY (Ch 5)**

Syntax: `CHDAT? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHDDX? Output domain parameter frequency/distance/time for specified channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `CHDDX? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHGOF? Output the time domain gating mode on/off/display for specified channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `CHGOF? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHGRF? Output graph type for specified channel **DISPLAY (Ch 5)**

Syntax: `CHGRF? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHLFD2? Output limit frequency readout delta value for bottom graph for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHLFD2? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHLFD? Output limit frequency readout delta value for top graph for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHLFD? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHLLO2? Output lower limit value for bottom graph for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHLLO2? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHLLO? Output lower limit value for top graph for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHLLO? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHLON? Output limits display on/off status for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHLON? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHLPSX? Output the time domain impulse/step response for specified channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `CHLPSX? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHLUP2? Output upper limit value for bottom graph for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHLUP2? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHLUP? Output upper limit value for top graph for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHLUP? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHMTH? Output trace math math type for specified channel **DISPLAY (Ch 5)**

Syntax: `CHMTH? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHOFF2? Output offset value for the bottom graph for specified channel **DISPLAY (Ch 5)**

Syntax: `CHOFF2? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHOFF? Output offset value for the top graph for specified channel **DISPLAY (Ch 5)**

Syntax: `CHOFF? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHOPMODE? Output chop mode type status **SWEEP (Ch 5)**

Syntax: `CHOPMODE?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for ALL S-PARAMS
1 for PERPORT

Front Panel Key: Sweep \ **MORE \ MEASUREMENT ENHANCEMENT \ PER PORT and ALL PARAMS**

CHPHO? Output phase offset for specified channel **DISPLAY (Ch 5)**

Syntax: `CHPHO? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHRDD? Output reference delay in distance for specified channel **DISPLAY (Ch 5)**

Syntax: `CHRDD? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHRDT? Output reference delay in time for specified channel **DISPLAY (Ch 5)**

Syntax: `CHRDT? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHREF2? Output reference line for the bottom graph for specified channel **DISPLAY (Ch 5)**

Syntax: `CHREF2? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHREF? Output reference line for the top graph for specified channel **DISPLAY (Ch 5)**

Syntax: `CHREF? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHSCL2? Output scale resolution for the bottom graph for specified channel **DISPLAY (Ch 5)**

Syntax: `CHSCL2? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHSCL? Output scale resolution for the top graph for specified channel **DISPLAY (Ch 5)**

Syntax: `CHSCL? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHSLH? Output segmented limits horizontal offset for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHSLH? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHSLLX? Output lower segmented limits display on/off status for specified channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `CHSLLX? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHSLUX? Output upper segmented limits display on/off status for specified channel

DISPLAY - LIMITS (Ch 7)

Syntax: `CHSLUX? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHSLV? Output segmented limits vertical offset for specified channel

DISPLAY - LIMITS (Ch 7)

Syntax: `CHSLV? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CHSXX? Output parameter or user defined parameter for specified channel

MEAS (Ch 5)

Syntax: `CHSXX? Value`
Value: Channel number

Data I/O: Outputs data using <NR1> integer values as follows:
(in S-parameter mode)
13 for S13, 23 for S23; 31 for S31; 32 for S32; 33 for S33; 14 for S14; 24 for S24; 41 for S41; 42 for S42; 34 for S34; 43 for S43; 44 for S44; 101 for S1d; 102 for Sd1; 103 for Sdd; 104 for S1c; 105 for Sc1; 106 for Scc; 107 for Sdc; 108 for Scd; 109 for Sd1d1; 110 for Sd1d2; 111 for Sd2d1; 112 for Sd2d2; 113 for Sc1c1; 114 for Sc1c2; 115 for Sc2c1; 116 for Sc2c2; 117 for Sd1c1; 118 for Sd1c2; 119 for Sd2c1; 120 for Sd2c2; 121 for Sc1d1; 122 for Sc1d2; 123 for Sc2d1; 124 for Sc2d2

(in user defined S-parameter mode)
1 for USER 1; 2 for USER 2; 3 for USER 3; 4 for USER 4; 5 for USER 5; 6 for USER 6; 7 for USER 7; 8 for USER 8; 9 for USER 9; 10 for USER 10; 11 for USER 11; 12 for USER 12; 13 for USER 13; 14 for USER 14; 15 for USER 15; 16 for USER 16

CHTDDIST? Output the time domain parameter distance/time for specified channel

APPL - TIME DOMAIN (Ch 10)

Syntax: `CHTDDIST? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHTDPIX? Output the time domain phasor impulse on/off status for specified channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `CHTDPIX? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHTDX? Output domain mode for specified channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `CHTDX? Value`
Value: Channel number

Data I/O: Outputs data using ASCII <NR1> integer values.

CHX? Output active channel number **CH (Ch 5)**

Syntax: `CHX?`

Data I/O: Outputs value in ASCII <NR1> format.

Front Panel Key: Ch x then Display **\ TRACE MEMORY \ DISK OPERATIONS \ CHANNEL X**

CL0 Enter inductive coefficient 0 for short **CAL (Ch 6)**

Syntax: `CL0 Value Units`
Value: Coefficient number
Units: XX1

Remarks: The coefficient is that number which when multiplied by 1.0*E02 yields the inductance value.

Data I/O: Enter the coefficient in ASCII <NRF> format.

CL0? Output inductive coefficient 0 for short **CAL (Ch 6)**

Syntax: `CL0?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CL1 Enter inductive coefficient 1 for short **CAL (Ch 6)**

Syntax: `CL1 Value Units`
Value: Coefficient number
Units: XX1

Remarks: The coefficient is that number which when multiplied by 1.0*E-24 yields the inductance value.

Data I/O: Enter the coefficient in ASCII <NRF> format.

CL1? Output inductive coefficient 1 for short **CAL (Ch 6)**

Syntax: `CL1?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CL2 Enter inductive coefficient 2 for short **CAL (Ch 6)**

Syntax: `CL2 Value Units`
Value: Coefficient number
Units: XX1

Remarks: The coefficient is that number which when multiplied by 1.0*E-33 yields the inductance value.

Data I/O: Enter the coefficient in ASCII <NRF> format.

CL2? Output inductive coefficient 2 for short **CAL (Ch 6)**

Syntax: `CL2?`

Data I/O: Outputs idata using ASCII <NR3> floating point values in exponential format.

CL3 Enter inductive coefficient 3 for short **CAL (Ch 6)**

Syntax: `CL3 Value Units`
Value: Coefficient number
Units: XX1

Remarks: The coefficient is that number which when multiplied by 1.0*E-42 yields the inductance value.

Data I/O: Enter the coefficient in ASCII <NRF> format.

CL3? Output inductive coefficient 3 for short **CAL (Ch 6)**

Syntax: CL3?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CLB Clear all multiple source band definitions **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: CLB

Front Panel Key: Config \ **MULTIPLE SOURCE \ DEFINE BANDS \ CLEAR ALL DEFINITIONS**

CLRDSG Clear all the defined segments of the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: CLRDSG

Related Commands: DELLDSG

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ CLEAR ALL SEGMENTS \ CONTINUE**

CM Suffix sets distance data type and scales by 1E-2 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: CM

Related Commands: CMT

CM2 Select male 2.4mm connector for current port **CAL (Ch 6)**

Syntax: CM2

Related Commands: P1C, P2C

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ 2.4 mm (M)** or \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ 2.4 mm (M)**

CM3 Select male GPC-3.5 connector for current port **CAL (Ch 6)**

Syntax: CM3

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ GPC 3.5 (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ GPC 3.5 (M)**

CM3PX? Output calibration method for 3-port cal **CAL (Ch 6)**

Syntax: CM3PX?

Data I/O: Outputs calibration method using ASCII <NR1> format as follows:
1 for STANDARD OSL
2 for TRX
3 for 2 PATH 3 PORT

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ CAL METHOD**

CM4PX? Output calibration method for 4-port calibration **CAL (Ch 6)**

Syntax: CM4PX?

Data I/O: Outputs calibration method using ASCII <NR1> format as follows:
1 for STANDARD OSL
2 for TRX

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4 PORT CAL \ CAL METHOD**

CM716 Select male Type 7/16 connector for current port **CAL (Ch 6)**

Syntax: CM716

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ 7/16 (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ 7/16 (M)** or **\ PERFORM CAL MANUAL CAL \ 4 PORT \ NEXT CAL STEP \ PORT 4 CONN \ 7/16 (M)**

CMC Select male TNC connector for current port **CAL (Ch 6)**

Syntax: CMC

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ TNC (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ TNC (M)**

CMK Select male K Connector for current port **CAL (Ch 6)**

Syntax: CMK

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ K-CONN (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ K-CONN (M)**

CMN Select male N connector for current port **CAL (Ch 6)**

Syntax: CMN

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ TYPE N (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ TYPE N (M)**

CMN75 Select male Type N 75-Ohm connector for current port

CAL (Ch 6)

Syntax: CMN75

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ TYPE N 75(M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ TYPE N 75(M)**

CMS Select male SMA connector for current port

CAL (Ch 6)

Syntax: CMS

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ SMA (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ SMA (M)**

CMSP Select special male connector for current port

CAL (Ch 6)

Syntax: CMSP

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ SPECIAL (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ SPECIAL (M)**

CMT Suffix sets distance data type and scales by 1E-2

DATA ENTRY SUFFIXES (Ch 5)

Syntax: CMT

Related Commands: CM

CMV Select male V Connector for current port **CAL (Ch 6)**

Syntax: CMV

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ V-CONN (M)** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ V-CONN (M)**

CMX? Output calibration method **CAL (Ch 6)**

Syntax: CMX?

Data I/O: Outputs calibration method using ASCII <NR1> format as follows:
1 for STANDARD OSL
2 for OFFSET-SHORT
3 for LRL/LRM
4 for TRM

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD**

CND Select user specified connector for current port **CAL (Ch 6)**

Syntax: CND

Remarks: Enter specifications of the standard devices to be used during the calibration.

Related Commands: P1C, P2C, CC0-CC3, COO, COS

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED** or **\ PERFORM CAL 3 PORT CAL \ CAL METHOD: SOLT \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED**

CNG Select GPC-7 connector for current port **CAL (Ch 6)**

Syntax: `CNG`

Related Commands: P1C, P2C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ GPC-7** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ GPC-7**

CNTR Enter center frequency **FREQ (Ch 5)**

Syntax: `CNTR Value Units`
Value: Can be any frequency from the low frequency limit to the high frequency limit of the MS462XX
Units: HZ, KHZ, MHZ, GHZ

Related Commands: CNTR?, SPAN, SPAN?, SRT, SRT?, STP, STP?

Front Panel Key: Freq **\ SET CENTER/SPAN \ CENTER** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ SET CENTER/SPAN \ CENTER**

CNTR? Output center frequency **FREQ (Ch 5)**

Syntax: `CNTR?`

Data I/O: Outputs center frequency using ASCII <NR3> format.

Related Commands: CNTR, SPAN, SPAN?, SRT, SRT?, STP, STP?

Front Panel Key: Freq **\ SET CENTER/SPAN \ CENTER** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ SET CENTER/SPAN \ CENTER**

COF Turn 2 and 3-port error correction and Flexible Cal off **CAL (Ch 6)**

Syntax: `COF`

Remarks: Restarts the sweep.

Related Commands: CON

Front Panel Key: Cal \ **NONE**

CON Turn 2-port error correction on **CAL (Ch 6)**

Syntax: `CON`

Remarks: Restarts the sweep.

Related Commands: CON

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL**

CON3P Turn 3-port error correction on **CAL (Ch 6)**

Syntax: `CON3P`

Related Commands: CON4P

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL**

CON3P? Output 3-port error correction on/off status **CAL (Ch 6)**

Syntax: `CON3P?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL**

CON4P Turn 4-port error correction on **CAL (Ch 6)**

Syntax: `CON4P`

Related Commands: CON3P

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL**

CON4P? Output 4-Port error correction on/off status **CAL (Ch 6)**

Syntax: `CON4P?`

Data I/O: Outputs data using ASCII <NR1> format.

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL**

CON? Output 2-port error correction on/off status **CAL (Ch 6)**

Syntax: `CON?`

Data I/O: Outputs error correction on/off status using ASCII <NR1> format as follows:
1 for ON
0 for OFF

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL**

CONCC0? Output capacitance coefficient 0 of open device for specified connector **CAL (Ch 6)**

Syntax: `CONCC0? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CONCC1? Output capacitance coefficient 1 of open device for specified connector **CAL (Ch 6)**

Syntax: `CONCC1? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CONCC2? Output capacitance coefficient 2 of open device for specified connector **CAL (Ch 6)**

Syntax: `CONCC2? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CONCC3? Output capacitance coefficient 3 of open device for specified connector **CAL (Ch 6)**

Syntax: `CONCC3? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CONFX Turn flexible error correction on **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `CONFX`

Related Commands: CONFX?

Front Panel Key: Cal \ **FLEXIBLE CAL**

CONFX? Output flexible error correction on/off status **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `CONFX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: CONFX

Front Panel Key: Cal \ **FLEXIBLE CAL**

CONOPOFF? Output offset of open device for specified connector **CAL (Ch 6)**

Syntax: `CONOPOFF? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CONOPSER? Output serial number of open device for specified connector **CAL (Ch 6)**

Syntax: `CONOPSER? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using undelimited 7-bit ASCII text.

CONSHANG? Output angle of short device for specified connector **CAL (Ch 6)**

Syntax: `CONSHANG? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Output angle using ASCII <NR3> floating point values in exponential format.

CONSHOFF? Output offset of short device for specified connector **CAL (Ch 6)**

Syntax: `CONSHOFF? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

CONSHSER? Output serial number of short device for specified connector **CAL (Ch 6)**

Syntax: `CONSHSER? Value`
Value: Connector ID (see Table 11-5 at end of chapter)

Data I/O: Outputs data using undelimited 7-bit ASCII text.

COO Enter offset for open for user specified connector **CAL (Ch 6)**

Syntax: `COO Value Units`
Value: -999.9999 to 999.9999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ OFFSET LENGTH** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ OFFSET LENGTH**

COO? Output offset for open for user specified connector **CAL (Ch 6)**

Syntax: `COO?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ OFFSET LENGTH** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ OFFSET LENGTH**

COPY Copy a files contents to another file **UTILITY - DISK (Ch 9)**

Syntax: `COPY Sourcename Targetname`
Value: "Sourcename" specifies the filespec for the source file. "Targetname" specifies the filespec for the target file. If the names contain extensions, then the extensions must be included. May contain drive letters, paths and/or wildcards.

Data I/O: Input uses <String> data.

Related Commands: DEL

Front Panel Key: Utility **\ GENERAL DISK UTILITIES \ COPY FILES TO FLOPPY DISK** or **GENERAL DISK UTILITIES \ FLOPPY DISK UTILITIES \ COPY FILES TO HARD DISK**

COS Enter offset for short for user specified connector **CAL (Ch 6)**

Syntax: `COS Value Units`
Value: -999.999to 999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ OFFSET LENGTH** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ OFFSET LENGTH**

COS? Output offset for short for user specified connector **CAL (Ch 6)**

Syntax: COS?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 (2) CONN \ USER DEFINED \ OFFSET LENGTH** or **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN \ USER DEFINED \ OFFSET LENGTH**

CPYALLFH Copy combined hardware cal file from floppy to hard disk **UTILITY - DISK (Ch 9)**

Syntax: CPYALLFH

Remarks: The Combined Hardware file has the fixed name “HW_CAL.ALL.”

Related Commands: CPYALLHF

CPYALLHF Copy combined hardware cal file from hard to floppy disk **UTILITY - DISK (Ch 9)**

Syntax: CPYALLHF

Remarks: The Combined Hardware file has the fixed name “HW_CAL.ALL.”

Related Commands: CPYALLFH

CRB Select reflection only calibration both ports **CAL (Ch 6)**

Syntax: CRB

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ REFLECTION ONLY \ BOTH PATHS (S21, S22)**

CRF Select reflection only calibration port 1 **CAL (Ch 6)**

Syntax: CRF

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ REFLECTION ONLY \ PORT 2 ONLY (S22)**

CRR Select reflection only calibration port 2 **CAL (Ch 6)**

Syntax: `CRR`

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ REFLECTION ONLY \ PORT 1 ONLY (S11)**

CRT Select transmission frequency response calibration reverse path **CAL (Ch 6)**

Syntax: `CRT`

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ TRANSMISSION FREQ RESPONSE \ REVERSE PATH (S12)**

CSB Clear status bytes and structures (same as *CLS **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: `CSB`

Related Commands: *CLS

CSF? Output calibration start frequency **CAL (Ch 6)**

Syntax: `CSF?`

Data I/O: Outputs value in ASCII <NR3> format.

CSL Clear service log **UTILITY - SERVICE LOG (Ch 9)**

Syntax: `CSL`

Remarks: Erases permanently any error messages in the service log. Typically for service use only.

Related Commands: OEL, OSL, SSL, PSL, ONE

Front Panel Key: Utility **\ DIAGNOSTICS \ SERVICE LOG \ CLEAR LOG**

CSWP? Output sweep mode for calibration **CAL (Ch 6)**

Syntax: CSWP?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for CW FREQUENCY CALIBRATION
2 for DISCRETE FREQUENCY
3 for NORMAL
4 for TIME DOMAIN HARMONIC FREQUENCY CALIBRATION

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION**

CTF? Output calibration stop frequency **CAL (Ch 6)**

Syntax: CTF?

Data I/O: Outputs value in ASCII <NR3> format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ EXCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ STOP**

CTN Continue sweeping from current point **HOLD (Ch 5)**

Syntax: CTN

Remarks: Takes the instrument out of hold mode and continues sweeping from the current frequency.

Related Commands: HLD, TRS

Front Panel Key: Config **\ HOLD \ HOLD FUNCTION CONTINUE**

CWC Select CW frequency calibration data points **CAL (Ch 6)**

Syntax: CWC

Related Commands: CWF, NOC, TDC, DFC

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ C.W. (1 POINT)**

CWD? Output current working directory string **UTILITY - DISK (Ch 9)**

Syntax: `CWD?`

Data I/O: Outputs a string in <Arbitrary ASCII> format which contains the complete path including the drive letter.

Related Commands: ADRIVE, CDRIVE, CD

CWF Enter CW frequency and turn CW on **FREQ (Ch 5)**

Syntax: `CWF Value Units`
Value: CW frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: Restarts the sweep.

Related Commands: WFS, SWP, SRT, STP

Front Panel Key: Freq \ **C.W. MODE ON** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ C.W. (1 POINT) \ C.W. FREQ**

CWF? Output CW frequency **FREQ (Ch 5)**

Syntax: `CWF?`

Data I/O: Outputs value in ASCII <NR3> format.

Front Panel Key: Freq \ **C.W. MODE ON** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ C.W. (1 POINT) \ C.W. FREQ**

CWON Turn CW on at current CW frequency **FREQ (Ch 5)**

Syntax: `CWON`

Remarks: Restarts the sweep.

Related Commands: CWF

Front Panel Key: Freq \ **C.W. MODE ON**

CWON? Output CW on/off status **FREQ (Ch 5)**

Syntax: CWON?

Data I/O: Outputs CW on/off status using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Freq \ **C.W. MODE ON**

CWP Enter number of points drawn in CW **CONFIG (Ch 5)**

Syntax: CWP Value Units
Value: 1 to 1601
Units: XX1

Remarks: This is a CW "sweep" mode where the data trace represents consecutive measurements at the same CW frequency. Restarts the sweep.

Related Commands: WFS, DD0, DD1, CWF, SWP

Front Panel Key: Freq \ **CW MODE ON** then Config \ **DATA POINTS** \ **POINTS DRAWN IN C.W.**

CWP? Output number of points drawn in CW **CONFIG (Ch 5)**

Syntax: CWP?

Data I/O: Outputs value in ASCII <NR1> format.

Front Panel Key: Freq \ **CW MODE ON** then Config \ **DATA POINTS** \ **POINTS DRAWN IN C.W.**

CXD? Output internal buffer data collection mode **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: CXD?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for COLLECT NONE
1 for COLLECT RAW
2 for COLLECT CORRECTED
3 for COLLECT FINAL
Default value is COLLECT NONE

Related Commands: CFD

CXX? Output calibration type **CAL (Ch 6)**

Syntax: `CXX?`

Data I/O: Outputs calibration type using ASCII <NR1> format as follows:
0 for NONE
1 for 12 TERM
2 for 8 TERM FWD
3 for 8 TERM REV
4 for TRANSMISSION FWD
5 for TRANSMISSION REV
6 for TRANSMISSION FWD & REV
7 for REFLECTION FWD
8 for REFLECTION REV
9 for REFLECTION FWD & REV

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **1 PATH 2 PORT**

D13 Display channels 1 & 3 **DISPLAY (Ch 5)**

Syntax: `D13`

Remarks: Restarts the sweep.

Related Commands: WFS, T13

Front Panel Key: Display \ **DISPLAY MODE** \ **DUAL CHANNELS 1&3**

D14 Display all four channels **DISPLAY (Ch 5)**

Syntax: `D14`

Remarks: Restarts the sweep.

Related Commands: WFS

Front Panel Key: Display \ **DISPLAY MODE** \ **FOUR CHANNEL**

D24 Select dual channel display with channels 2 & 4 **DISPLAY (Ch 5)**

Syntax: D24

Remarks: Restarts the sweep.

Related Commands: WFS, T24

Front Panel Key: Display \ **DISPLAY MODE** \ **DUAL CHANNELS 2&4**

DA1 Select a1 = Ra as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: DA1

Related Commands: DA2, DA3, DA4, DB1, DB2, DB3, DB4, DE1, DEN?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a1 (Ra)**

DA2 Select a2 = Rb as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: DA2

Related Commands: DA1, DA3, DA4, DB1, DB2, DB3, DB4, DE1, DEN?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a2 (Rb)**

DA3 Select a3 = Rc as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: DA3

Related Commands: DA1, DA2, DA4, DB1, DB2, DB3, DB4, DE1, DEN?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a3 (Rc)**

DA4 Select a4 = Rd as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: DA4

Related Commands: DA1, DA2, DA3, DB1, DB2, DB3, DB4, DE1, DEN?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a4 (Rd)**

DAC Enter DAC number of 10 MHz calibration **UTILITY (Ch 9)**

Syntax: DAC

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Utility \ **DIAGNOSTICS \ HARDWARE CAL (SERVICE USE ONLY) \ 10 MHz CAL \ MANUAL \ DAC NUMBER**

DAC? Output DAC number of 10 MHz calibration **UTILITY (Ch 9)**

Syntax: DAC?

Data I/O: Outputs data using ASCII <NR1> format.

Front Panel Key: Utility \ **DIAGNOSTICS \ HARDWARE CAL (SERVICE USE ONLY) \ 10 MHz CAL \ MANUAL \ DAC NUMBER**

DAT Display data only on active channel **DISPLAY (Ch 5)**

Syntax: DAT

Related Commands: DNM

Front Panel Key: Display \ **TRACE MEMORY \ VIEW: DATA**

DAT? Output trace memory display mode **DISPLAY (Ch 5)**

Syntax: DAT?

Data I/O: Output trace memory display mode using ASCII <NR1> format as follows:
1 for DATA 2 for MEMORY
3 for DATA & MEMORY
4 for DATA WITH MEMORY MATHEMATICALLY COMBINED

Related Commands: MTH?

Front Panel Key: Display \ **TRACE MEMORY \ VIEW: DATA**

DATCOL Enter the color number for data **UTILITY (Ch 9)**

Syntax: `DATCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 at the end of this chapter.

Related Commands: ANNCOL, GRTCOL, LAYCOL, MKRCOL, MNUCOL, TRCCOL, DATCOL?

Front Panel Key: Utility **\ COLOR SETUP \ DATA XX COLOR NAME**

DATCOL? Output the color number for data **UTILITY (Ch 9)**

Syntax: `DATCOL?`

Data I/O: Outputs the color palette number in ASCII <NR1> format.

Related Commands: ANNCOL?, GRTCOL?, LAYCOL?, MKRCOL?, MNUCOL?, TRCCOL?, DATCOL

Front Panel Key: Utility **\ COLOR SETUP \ DATA XX COLOR NAME**

DATE Enter the system date **UTILITY (Ch 9)**

Syntax: `DATE Value`
Value: Date

Remarks: Term *value1* is the month (1 - 12), *value2* is the day (1 - 31) and *value3* is the year (0 - 99). Notice the comma separators. This modifies the system date stored on the processor board.

Data I/O: Value1, Value2, and Value3 are in ASCII <NRF> format.

Related Commands: DATE?, TIME, TIME?

Front Panel Key: Utility **\ CLOCK SETUP \ YEAR (MONTH) (DAY)**

DATE? Output the system date **UTILITY (Ch 9)**

Syntax: `DATE?`

Data I/O: The date is output using ASCII <NR1> format. It uses three numbers separated by commas. The first is the month (1 - 12), the second is the day (1 - 31), and the third is the year (0 - 99).

Related Commands: DATE, TIME, TIME?

Front Panel Key: Utility **\ CLOCK SETUP \ YEAR (MONTH) (DAY)**

DB Suffix sets power data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `DB`

Related Commands: DBL, DBM

DB1 Select b1 = Ta as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: `DB1`

Related Commands: DA1, DA2, DA3, DA4, DB2, DB3, DB4, DE1, DEN?

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ b1 (Ta)**

DB2 Select b2 = Tb as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: `DB2`

Related Commands: DA1, DA2, DA3, DA4, DB1, DB3, DB4, DE1, DEN?

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ b2 (Tb)**

DB3 Select b3 = Tc as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: `DB3`

Related Commands: DA1, DA2, DA3, DA4, DB1, DB2, DB4, DE1, DEN?

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ b3 (Tc)**

DB4 Select b4 = Td as denominator for parameter being defined — **MEAS (Ch 5)**

Syntax: DB4

Related Commands: DA1, DA2, DA3, DA4, DB1, DB2, DB3, DE1, DEN?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **b4 (Td)**

DBL Suffix sets power data type — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: DBL

Related Commands: DB, DBM

DBM Suffix sets power data type — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: DBM

Related Commands: DB, DBL

DBP Select distance bandpass mode for active channel — **APPL - TIME DOMAIN (Ch 10)**

Syntax: DBP

DC1 Display channel 1 and 2 operating parameters — **UTILITY (Ch 9)**

Syntax: DC1

Front Panel Key: Utility \ **INSTRUMENT STATE PARAMETERS** \ **CHANNEL 1&2**

DC3 Display channel 3 and 4 operating parameters — **UTILITY (Ch 9)**

Syntax: DC3

Front Panel Key: Utility \ **INSTRUMENT STATE PARAMETERS** \ **CHANNEL 3&4**

DCA Select automatic DC term calculation for lowpass — **APPL - TIME DOMAIN (Ch 10)**

Syntax: DCA

Front Panel Key: Appl \ **DOMAIN** \ **TIME, LOWPASS** \ **DISPLAY, DISTANCE (TIME)** \ **SETUP** \ **RANGE SETUP** \ **MORE** \ **DC TERM** \ **AUTO EXTRAPOLATE**

DCCTN Resume internal buffer data collection **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: DCCTN

Related Commands: DCHLDDCCTN?

DCCTN? Output internal buffer data collection resume/suspend status **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: DCCTN?

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for SUSPEND
1 for RESUME

Related Commands: DCCTN, DCHLD

DCHLD Suspend internal buffer data collection **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: DCHLD

Related Commands: DCCTN, DCCTN?

DCMRK Insert the mark value into the internal buffer **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: DCMRK Value
Value: See Remarks below.

Remarks: Accepts a floating value, inserts it into the real part, and sets the imaginary part to zero.

Data I/O: Input data using an ASCII <NRf> number.

DCO Select open for DC term for lowpass **APPL - TIME DOMAIN (Ch 10)**

Syntax: DCO

Front Panel Key: Appl **\ DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ DC TERM \ OPEN**

DCOFF Turn internal buffer data collection mode off **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: DCOFF

Related Commands: DCHLD

DCP Display calibration parameters 1st page **UTILITY (Ch 9)**

Syntax: DCP

Front Panel Key: Utility \ **INSTRUMENT STATE PARAMETERS** \ **CALIBRATION**

DCP1 Display calibration parameters 1st page **UTILITY (Ch 9)**

Syntax: DCP1

DCPCUR? Output data collection buffer current point count **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: DCPCUR?

Data I/O: Outputs data using ASCII <NR1> integer values. Current maximum is 20,000 points.

Related Commands: DCPMAX?

DCPMAX? Output data collection buffer maximum number o **REMOTE - INTERNAL BUFFER (Ch 8)** points

Syntax: DCPMAX?

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: DCPCUR?

DCREFC? Output reflection coefficient for lowpass **APPL - TIME DOMAIN (Ch 10)**

Syntax: DCREFC?

Data I/O: Outputs reflection coefficient value using ASCII <NR3> format.

DCS Select short for DC term for lowpass **APPL - TIME DOMAIN (Ch 10)**

Syntax: DCS

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ DC TERM \ SHORT**

DCV Enter value for DC term for lowpass **APPL - TIME DOMAIN (Ch 10)**

Syntax: `DCV Value Units`
Value: -999.999 to 999.999
Units: XX1, XX3, XM3

Related Commands: DCV

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ DC TERM \ OPEN**

DCV? Output lowpass DC term value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `DCV?`

Data I/O: Outputs the value in ASCII <NR3> format.

Related Commands: DCV

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ DC TERM \ OPEN**

DCX? Output lowpass DC term selection **APPL - TIME DOMAIN (Ch 10)**

Syntax: `DCX?`

Data I/O: Outputs lowpass DC term selection using ASCII <NR3> format as follows:
0 for VALUE
1 for AUTO
2 for LINE IMPEDANCE
3 for OPEN
4 for SHORT

Related Commands: DCA, DCO, DCS, DCV, DCZ

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ DC TERM \ REFLECTION COEFFICIENT**

DCZ Select line impedance for DC term for lowpass **APPL - TIME DOMAIN (Ch 10)**

Syntax: `DCZ`

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ DC TERM \ LINE IMPEDANCE**

DD0 Turn data drawing off **DISPLAY (Ch 5)**

Syntax: DD0

Front Panel Key: Sweep \ **MORE** \ **DATA DRAWING OFF**

DD1 Turn data drawing on **DISPLAY (Ch 5)**

Syntax: DD1

Front Panel Key: Sweep \ **MORE** \ **DATA DRAWING OFF**

DD1? Output data drawing on/off status **DISPLAY (Ch 5)**

Syntax: DD1?

Data I/O: Outputs data drawing on/off status using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Sweep \ **MORE** \ **DATA DRAWING OFF**

DDX? Output active channel domain parameter frequency distance or time **APPL - TIME DOMAIN (Ch 10)**

Syntax: DDX?

Data I/O: Outputs selection value in ASCII <NR3> format as follows:
0 for FREQUENCY
1 for TIME
2 for DISTANCE

Related Commands: TDDIST, TDTIME, TDDIST?

DE1 Select unity as denominator for parameter being defined **MEAS (Ch 5)**

Syntax: DE1

Related Commands: DA1, DA2, DB1, DB2, DEN?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **1 (UNITY)**

DEG Suffix sets phase data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: DEG

DEL Delete a file from disk **UTILITY - DISK (Ch 9)**

Syntax: `DEL Filename`

Value: "Filename" is the name of the file to be deleted, complete with the extension. It may include a drive letter, path and wildcards.

Related Commands: COPY

Front Panel Key: Utility **\ GENERAL DISK UTILITIES \ DELETE FILES** or **GENERAL DISK UTILITIES \ FLOPPY DISK UTILITIES \ DELETE FILES**

DELALL Delete combined hardware cal file from floppy disk **UTILITY - DISK (Ch 9)**

Syntax: `DELALL`

Remarks: The Combined Hardware Cal file has the fixed name "HW_CAL.ALL."

Related Commands: DELALLH

DELALLH Delete combined hardware cal file from hard disk **UTILITY - DISK (Ch 9)**

Syntax: `DELALLH`

Remarks: The Combined Hardware Cal file has the fixed name "HW_CAL.ALL."

Related Commands: DELALL

DELLDSG Delete the last defined segment of the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DELLDSG`

Related Commands: CLRDSG

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ DELETE LAST SEGMENT**

DEN? Output denominator selection for parameter being defined **MEAS (Ch 5)**

Syntax: DEN?

Data I/O: Outputs its value using ASCII <NR1> format as follows:
1 for Unity
2 for a1
3 for a2
4 for b1
5 for b2
6 for a3, 7 for b3
8 for a4
9 for b4

Related Commands: DA1, DA2, DB1, DB2, DE1

DF2 Display 2.4mm female connector information **UTILITY (Ch 9)**

Syntax: DF2

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ 2.4 mm (F)**

DF3 Display GPC-3.5 female connector information **UTILITY (Ch 9)**

Syntax: DF3

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ GPC 3.5 (F)**

DF716 Display 7/16 female connector information **UTILITY (Ch 9)**

Syntax: DF716

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ 7/16 (F)**

DFC Select discrete frequency calibration data points **CAL (Ch 6)**

Syntax: `DFC`

Related Commands: CWC, TDC, NOC, IFV, Discrete frequency list commands in MEASUREMENT group: DFQ, DFD, FRS, FRI, FRP, FIL, FRC.DFD, FRS, FRI, FRP, FIL, FRC.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS)**

DFD Done specifying discrete frequency ranges **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `DFD`

Remarks: Requires at least two points to have been entered. See MEASUREMENT/DISCRETE FREQUENCY LIST description.

Front Panel Key: Freq **\ DISCRETE FILL \ RETURN**

DFK Display K female connector information **UTILITY (Ch 9)**

Syntax: `DFK`

Front Panel Key: Cal **\ MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ K-CONN (F)**

DFN Display N female connector information **UTILITY (Ch 9)**

Syntax: `DFN`

Front Panel Key: Cal **\ MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ TYPE N (F)**

DFN75 Display N Female 75-Ohm connector information **UTILITY (Ch 9)**

Syntax: `DFN75`

Front Panel Key: Cal **\ MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ TYPE N 75(F)**

DFP Display front panel instrument state **UTILITY (Ch 9)**

Syntax: `DFP`

Front Panel Key: Utility \ **INSTRUMENT STATE PARAMETERS** \ **OPERATION**

DFQ Enter single discrete frequency **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `DFQ Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: The frequency must be within start sweep freqency and stop sweep frequency.

Front Panel Key: Freq \ **DISCRETE FILL** \ **INDIVIDUAL FREQ INSERT** \ **NEXT FREQENCY** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **N-DISCRETE FREQUENCIES (2 TO 1601 POINTS)** \ **INDIVIDUAL FREQ INSERT** \ **INSERT NEXT FREQENCY**

DFQ? Output discrete fill single discrete frequency **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `DFQ?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Freq \ **DISCRETE FILL** \ **INDIVIDUAL FREQ INSERT** \ **NEXT FREQENCY** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **N-DISCRETE FREQUENCIES (2 TO 1601 POINTS)** \ **INDIVIDUAL FREQ INSERT** \ **INSERT NEXT FREQENCY**

DFS Display SMA female connector information **UTILITY (Ch 9)**

Syntax: `DFS`

Front Panel Key: Cal \ **MORE** \ **COMPONENTS UTILITY** \ **DISPLAY COAXIAL INFORMATION** \ **SMA (F)**

DFSP Display special female connector information **UTILITY (Ch 9)**

Syntax: DFSP

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ SPECIAL (F)**

DFT Display TNC female connector information **UTILITY (Ch 9)**

Syntax: DFT

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ TNC (F)**

DFV Display female V Connector information **UTILITY (Ch 9)**

Syntax: DFV

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ V-CONN (F)**

DG7 Display GPC-7 male connector information **UTILITY (Ch 9)**

Syntax: DG7

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ GPC-7**

DGS Display GPIB status information **UTILITY (Ch 9)**

Syntax: DGS

Front Panel Key: Utility \ **INSTRUMENT STATE PARAMETERS \ SYSTEM**

DGT Display first LCD test pattern **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: DGT

Remarks: For service use only (same as DGT1).

DGT1 Display first LCD test pattern — **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `DGT1`

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ PERIPHERAL TEST \ LCD DISPLAY**

DGT2 Display second LCD test pattern — **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `DGT2`

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ PERIPHERAL TEST \ LCD DISPLAY**

DGT3 Display third LCD test pattern — **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `DGT3`

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ PERIPHERAL TEST \ LCD DISPLAY**

DIA Select air as active dielectric — **DISPLAY (Ch 5)**

Syntax: `DIA`

Remarks: Sets value to air dielectric value (1.000649). Value Impacts time domain distance calculations and reference plane position settings.

Front Panel Key: Display **\ REFERENCE PLANE \ SET DIELECTRIC \ AIR**

DIE Enter a dielectric value — **DISPLAY (Ch 5)**

Syntax: `DIE Value Units`
Value: 1 to 999.999
Units: XX1, XX3, XM3

Remarks: Impacts time domain distance calculations and reference plane position settings.

Front Panel Key: Display **\ REFERENCE PLANE \ SET DIELECTRIC** or **\ SET DIELECTRIC \ OTHER**

DIM Select microporous teflon as active dielectric **DISPLAY (Ch 5)**

Syntax: `DIM`

Remarks: Sets value to microporous teflon dielectric value (1.69). Value impacts time domain distance calculations and reference plane position settings.

Front Panel Key: Display \ **REFERENCE PLANE \ SET DIELECTRIC \ MICROPOROUS TEFLON**

DIP Select polyethylene as active dielectric **DISPLAY (Ch 5)**

Syntax: `DIP`

Remarks: Sets value to polyethylene dielectric value (2.26). Value impacts time domain distance calculations and reference plane position settings.

Front Panel Key: Display \ **REFERENCE PLANE \ SET DIELECTRIC \ POLYETHYLENE**

DIR Output a directory listing to the GPIB **UTILITY - DISK (Ch 9)**

Syntax: `DIR Path`
Value: "Path" to the directory in question and a filename filter, if desired. May contain a drive letter and wildcards.

Data I/O: Outputs data in an <Arbitrary Block> format containing a heavily formatted ASCII listing similar to one obtained from a DOS-based machine.

Related Commands: ADRIVE, CDRIVE, CD, CWD?, FMT1

Front Panel Key: Utility \ **GENERAL DISK UTILITIES \ DISPLAY DIRECTORY** or **GENERAL DISK UTILITIES \ FLOPPY DISK UTILITIES \ DISPLAY DIRECTORY**

DIS Display active segmented limit **DISPLAY - LIMITS (Ch 7)**

Syntax: `DIS`

Remarks: Displays the active segmented limit. Requires SLA or SLL, as appropriate.

DIS? Output active segmented limit on/off status **DISPLAY - LIMITS (Ch 7)**

Syntax: `DIS?`

Data I/O: Outputs active segmented limit on/off status using <NR1> format as follows:
0 for OFF
1 for ON

DISKRD Output disk file data to the GPIB **UTILITY - DISK (Ch 9)**

Syntax: `DISKRD Filespec`
Value: "Filespec" is a string containing the filename and optional drive letter and path. If the file has an extension, it must be included in the filespec string. Wildcards are not allowed.

Data I/O: Outputs an <Arbitrary Block> containing the contents of the file.

Related Commands: DISKWR

DISKWR Write GPIB data to a disk file **UTILITY - DISK (Ch 9)**

Syntax: `DISKWR Filename`
Value: "Filename" and extension, if desired.

Remarks: If the extension is desired on the filename, it must be included in *value*.

Data I/O: Enter filename/file extension as an <Arbitrary Block>.

Related Commands: DISKRD

DIT Select teflon as active dielectric **DISPLAY (Ch 5)**

Syntax: `DIT`

Remarks: Impacts time domain distance calculations and reference plane position settings.

Front Panel Key: Display **\ REFERENCE PLANE \ SET DIELECTRIC \ TEFLON**

DIV Select division as trace math for active channel **DISPLAY (Ch 5)**

Syntax: `DIV`

Remarks: Selects division as trace math for the active channel.

Related Commands: DNM, CH1-CH4

Front Panel Key: Display \ **SELECT TRACE MATH** \ **DIVIDE (/)**

DIX? Output dielectric constant **DISPLAY (Ch 5)**

Syntax: `DIX?`

Data I/O: Outputs an ASCII value in <NR3 > format.

DLA Select group delay display for active channel **DISPLAY (Ch 5)**

Syntax: `DLA`

Related Commands: CH1-CH4, IMG, ISC, ISE, ISM, IMG, LIN, MAG, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **GROUP DELAY**

DLP Select distance lowpass mode for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `DLP`

DM2 Display 2.4mm male connector information **UTILITY (Ch 9)**

Syntax: `DM2`

Front Panel Key: Cal \ **MORE** \ **COMPONENTS UTILITY** \ **DISPLAY COAXIAL INFORMATION** \ **2.4 mm (M)**

DM3 Display GPC-3.5 male connector information **UTILITY (Ch 9)**

Syntax: `DM3`

Front Panel Key: Cal \ **MORE** \ **COMPONENTS UTILITY** \ **DISPLAY COAXIAL INFORMATION** \ **GPC 3.5 (M)**

DM716 Display 7/16 male connector information **UTILITY (Ch 9)**

Syntax: DM716

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ 7/16 (M)**

DMK Display K male connector information **UTILITY (Ch 9)**

Syntax: DMK

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ K-CONN (M)**

DMN Display N male connector information **UTILITY (Ch 9)**

Syntax: DMN

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ TYPE N (M)**

DMN75 Display N Male 75-Ohm connector information **UTILITY (Ch 9)**

Syntax: DMN75

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ TYPE N 75(M)**

DMS Display SMA male connector information **UTILITY (Ch 9)**

Syntax: DMS

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ SMA (M)**

DMSP Display Special Male connector information **UTILITY (Ch 9)**

Syntax: DMSP

Front Panel Key: Cal \ **MORE \ COMPONENTS UTILITY \ DISPLAY COAXIAL INFORMATION \ SPECIAL (M)**

DMT Display TNC male connector information — **UTILITY (Ch 9)**

Syntax: DMT

Front Panel Key: Cal \ **MORE** \ **COMPONENTS UTILITY** \ **DISPLAY COAXIAL INFORMATION** \ **TNC (M)**

DMV Display V male connector information — **UTILITY (Ch 9)**

Syntax: DMV

Front Panel Key: Cal \ **MORE** \ **COMPONENTS UTILITY** \ **DISPLAY COAXIAL INFORMATION** \ **V-CONN (M)**

DNM Display data normalized to trace memory on active channel — **DISPLAY (Ch 5)**

Syntax: DNM

Remarks: Stores data from selected channel to memory (STD command), before using this command to view a trace with trace memory active.

Related Commands: DIV, MUL, ADD, MIN, CH1-CH4, STD, WFS

Front Panel Key: Display \ **TRACE MEMORY** \ **VIEW: DATA (X) MEMORY**

DPI Select distance phasor impulse mode for active channel — **APPL - TIME DOMAIN (Ch 10)**

Syntax: DPI

Related Commands: CH1-CH4

DPN Enter pen number for data — **HARD COPY (Ch 9)**

Syntax: DPN Value Units
Value: 1 to 8
Units: XX1

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **PLOT FORMAT** \ **PEN COLORS** \ **DATA**

DPN? Output pen number for data **HARD COPY (Ch 9)**

Syntax: DPN?

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: DPN, TPN, TPN?

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ PEN COLORS \ DATA**

DPR0 Visible data only OFD format **REMOTE - MEASURED DATA (Ch 8)**

Syntax: DPR0

Remarks: See DPR1 for details.

DPR1 Data pair always OFD format **REMOTE - MEASURED DATA (Ch 8)**

Syntax: DPR1

Remarks: This is a data formatting command for the OFD/IFD and OM1-OM6 commands that allows for sending complex data pairs (i.e., mag/phase or real/imaginary) while using single graph displays (i.e. log mag or real), as if the related dual graph type was selected.

The data element not currently measured on the single display will be zeroed out. For example: If the log mag graph type is selected for the active channel and “DPR1; OFD” is issued, the data will be sent out in the same format as if the log mag/phase graph type was active (dB, degrees).

The only difference is the phase value will be zeroed out (dB, 0). Similarly, if “DPR1;OFD” is issued while a phase display is selected for the active channel, the data will be output as if the log mag/phase display was selected, except that the magnitude value will be zeroed out (0, degrees). See Chapter 8, Table 8-1 for data output format information for all display types.

This command is useful in developing a standard data transfer routine in your application program, but it will impact throughput speed (for single displays only).

Related Commands: DPR0, OFD, IFD, OM1-OM12

DPRX? Output data pair mode visible only or pair always **REMOTE - MEASURED DATA (Ch 8)**

Syntax: DPRX?

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for VISIBLE ONLY
1 for DATA PAIR ALWAYS

Related Commands: DPR0, DPR1

DR1 Select Marker 1 as delta reference marker **MARKER (Ch 7)**

Syntax: DR1

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 1**

DR10 Select Marker 10 as delta reference marker **MARKER (Ch 7)**

Syntax: DR10

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 10**

DR11 Select Marker 11 as delta reference marker **MARKER (Ch 7)**

Syntax: DR11

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 11**

DR12 Select Marker 12 as delta reference marker **MARKER (Ch 7)**

Syntax: DR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 12**

DR2 Select Marker 2 as delta reference marker **MARKER (Ch 7)**

Syntax: DR2

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 2**

DR3 Select Marker 3 as delta reference marker **MARKER (Ch 7)**

Syntax: DR3

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 3**

DR4 Select Marker 4 as delta reference marker **MARKER (Ch 7)**

Syntax: DR4

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 4**

DR5 Select Marker 5 as delta reference marker **MARKER (Ch 7)**

Syntax: DR5

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 5**

DR6 Select Marker 6 as delta reference marker **MARKER (Ch 7)**

Syntax: DR6

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 6**

DR7 Select Marker 7 as delta reference marker **MARKER (Ch 7)**

Syntax: DR7

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 7**

DR8 Select Marker 8 as delta reference marker **MARKER (Ch 7)**

Syntax: DR8

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 8**

DR9 Select Marker 9 as delta reference marker **MARKER (Ch 7)**

Syntax: DR9

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ 9**

DRF Turn delta reference mode on **MARKER (Ch 7)**

Syntax: DRF

Related Commands: DR1-DR12

Front Panel Key: Marker \ **REF MODE OFF**

DRL Diagnostic read latch **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: DRL

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ TRIGGER READ \ READ DATA**

DRO Turn delta reference mode off **MARKER (Ch 7)**

Syntax: DRO

Front Panel Key: Marker \ **REF MODE ON**

DRO? Output delta reference mode on/off status **MARKER (Ch 7)**

Syntax: DRO?

Data I/O: Outputs delta reference mode on/off status using ASCII <NR1 > format as follows:
1 for ON
0 for OFF

Front Panel Key: Marker \ **REF MODE**

DRX? Output delta reference marker number **MARKER (Ch 7)**

Syntax: DRX?

Data I/O: Outputs delta reference marker number using ASCII value in <NR1> format.

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT REF FREQ**

DSF0 Disable filter shape factor calculation **MARKER (Ch 7)**

Syntax: DSF0

Related Commands: DSF1, DSFX?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SHAPE FACTOR OFF**

DSF1 Enable filter shape factor calculation **MARKER (Ch 7)**

Syntax: DSF1

Related Commands: DSF0, DSFX?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SHAPE FACTOR ON**

DSFX? Output filter shape factor calculation enable/disable status **MARKER (Ch 7)**

Syntax: DSFX?

Data I/O: Outputs its value using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: DSF0, DSF1

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SHAPE FACTOR**

DSG? Output the active defined segment flag ON/OFF status **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSG?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: DSGON, DSGOFF

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE** or Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ SEGMENT**

DSGAVG Enter the averaging count for the active defined segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGAVG Value Units`
Value: 1 to 4096
Units: XX1

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGAVG?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DATA AVERAGE**

DSGAVG? Output the averaging count of the active defined segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGAVG?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: DSGAVG

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DATA AVERAGE**

DSGDFD Done specifying discrete frequency ranges for the active discrete segment

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGDFD

Related Commands: DSGDFQ, DSGDFQ?, DSGONDF

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ RETURN**

DSGDFQ Enter a single discrete frequency for the active discrete segment

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGDFQ Value Units
Value: Frequency range of the MS462XX
Units: HZ, KHZ, MHZ, GHZ

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGDFD, DSGDFQ?, DSGONDF

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ INDIVIDUAL FREQ INSERT \ NEXT FREQUENCY or INSERT NEXT FREQUENCY**

DSGDFQ? Output the discrete fill single discrete frequency for the active discrete segment

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGDFQ?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: DSGDFD, DSGDFQ, DSGONDF

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ INDIVIDUAL FREQ INSERT \ NEXT FREQUENCY**

DSGFIL Fill the defined discrete frequency range for the active discrete segment

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGFIL

Related Commands: DSGFRC

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ FILL THE RANGE**

DSGFRC Clear all of the defined discrete frequency ranges for the active discrete segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGFRC`

Related Commands: DSGFIL

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ CLEAR ALL**

DSGFRI Enter the segmented sweep discrete fill incremen frequency for the active discrete segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGFRI Value Units`
Value: Frequency range of the MS462XX
Units: HZ, KHZ, MHZ, GHZ

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGFRI?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ INCREMENT**

DSGFRI? Output the segmented sweep discrete fill increment frequency for the active discrete segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGFRI?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: DSGFRI

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ INCREMENT**

DSGFRP Enter the segmented sweep discrete fill number o **SWEEP - SEGMENTED SWEEP (Ch 5)**
points for the active discrete segment

Syntax: `DSGFRP Value Units`
Value: 1 to 1601
Units: XX1

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGFRP?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ NUMBER OF POINTS**

DSGFRP? Output the discrete fill number of points for the a **SWEEP - SEGMENTED SWEEP (Ch 5)**
tive discrete segment

Syntax: `DSGFRP?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: DSGFRP?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ NUMBER OF POINTS**

DSGFRS Enter the discrete fill start frequency for the activ **SWEEP - SEGMENTED SWEEP (Ch 5)**
discrete segment

Syntax: `DSGFRS Value Units`
Value: Frequency range of the MS462XX
Units: HZ, KHZ, MHZ, GHZ

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGFRS?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ START FREQ**

DSGFRS? Output the discrete fill start frequency for the active discrete segment

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGFRS?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: DSGNO?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ DISCRETE FILL \ START FREQ**

DSGIFBW10 Set the IFBW to 10 Hz for the active defined segment in the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGIFBW10

Related Commands: DSGIFBWX?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 10 Hz**

DSGIFBW100 Set the IFBW to 100 Hz for the active defined segment in the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGIFBW100

Related Commands: DSGIFBWX?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 100 Hz**

DSGIFBW10K Set the IFBW to 10 kHz for the active defined segment in the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGIFBW10K

Related Commands: DSGIFBWX?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 10 kHz**

DSGIFBW1K Set the IFBW to 1 kHz for the active defined segment in the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGIFBW1K

Related Commands: DSGIFBWX?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 1 kHz**

DSGIFBW30 Set the IFBW to 30 Hz for the active defined segment in the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGIFBW30

Related Commands: DSGIFBWX?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 30 Hz**

DSGIFBW300 Set the IFBW to 300 Hz for the active defined segment in the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGIFBW300

Related Commands: DSGIFBWX?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 300 Hz**

DSGIFBW30K Set the IFBW to 30 kHz for the active defined segment in the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGIFBW30K

Related Commands: DSGIFBWX?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 300 kHz**

DSGIFBW3K Set the IFBW to 3 kHz for the active defined segment in the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGIFBW3K

Related Commands: DSGIFBWX?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ DEFINE \ MORE \ SELECT I.F.BW \ I.F.BW 3 kHz**

DSGIFBWX? Output the active defined segment IF bandwidth in the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGIFBWX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
10 for an IFBW of 10 Hz
30 for an IFBW of 30 Hz
100 for an IFBW of 100 Hz
300 for an IFBW of 300 Hz
1000 for an IFBW of 1 kHz
3000 for an IFBW of 3 kHz
10000 for an IFBW of 10 kHz
30000 for an IFBW of 30 kHz

Related Commands: DSGIFBW10, DSGIFBW100, DSGIFBW10K, DSGIFBW1K, DSGIFBW30, DSGIFBW300, DSGIFBW30K, DSGIFBW3K

DSGNO Set the active defined segment number for the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGNO Value Units
Value: 1 to 16
Units: XX1

Data I/O: The value is input using an ASCII <NRf> number.

Related Commands: DSGNO?

DSGNO? Output the active defined segment number for the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGNO?

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: DSGNO

DSGOFF Turn the active defined segment flag OFF **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGOFF

Related Commands: DSG?, DSGON

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ SEGMENT** or Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ SEGMENT**

DSGON Turn the active define segment flag ON **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGON

Related Commands: DSG?, DSGOFF

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ SEGMENT** or Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ SEGMENT**

DSGONDF Output the number of discrete frequencies **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGONDF

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: DSGDFD, DSGDFQ, DSGDFQ?

DSGPTS Enter the number of points for the active defined segment for the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGPTS Value Units
Value: 1 to 1601
Units: XX1

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGPTS?

Front Panel Key: Freq \ **POINT(S)** or Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ DATA POINTS**

DSGPTS? Output the number of points of the active defined segment for the segmented sweep

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGPTS?

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: DSGPTS

Front Panel Key: Freq \ **POINT(S)**

DSGPWR1 Enter the Source 1 power level for the active segment

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGPWR1 Value Units
Value: Power level range of the MS462XX
Units: DB, XX1, XX3, XM3

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGPWR1?, DSGPWR2, DSGPWR2?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ SOURCE 1 POWER**

DSGPWR1? Output the Source 1 power level of the active segment

SWEEP - SEGMENTED SWEEP (Ch 5)

Syntax: DSGPWR1?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: DSGPWR1, DSGPWR2, DSGPWR2?

Front Panel Key: Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ SOURCE 1 POWER**

DSGPWR2 Enter the Source 2 power level for the active segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGPWR2 Value Units`
Value: Power level range of the MS462XX
Units: DB, XX1, XX3, XM3

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGPWR1, DSGPWR1?, DSGPWR2?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ SOURCE 2 POWER**

DSGPWR2? Output the Source 2 power level of the active segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGPWR2?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: DSGPWR1, DSGPWR1?, DSGPWR2

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ MORE \ SOURCE 2 POWER**

DSGSTP Enter the stop frequency of the active defined segment for the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `DSGSTP Value Units`
Value: Frequency range of the MS462XX
Units: HZ, KHZ, MHZ, GHZ

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGSTP?, DSGSTRT, DSGSTRT?

Front Panel Key: Freq **\ STOP** or Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ STOP**

DSGSTP? Output the start frequency of the active defined segment for the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGSTP?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: DSGSTP, DSGSTRT, DSGSTRT?

Front Panel Key: Freq \ **STOP** or Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ STOP**

DSGSTRT Enter the start frequency of the active defined segment for the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGSTRT Value Units
Value: Frequency range of the MS462XX
Units: HZ, KHZ, MHZ, GHZ

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: DSGSTP, DSGSTP?, DSGSTRT?

Front Panel Key: Freq \ **START** or Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ START**

DSGSTRT? Output the start frequency of the active define segment for the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: DSGSTRT?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: DSGSTP, DSGSTP?, DSGSTRT

Front Panel Key: Freq \ **START** or Sweep \ **MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ SEGMENT**

DSP Select single channel display **DISPLAY (Ch 5)**

Syntax: DSP

Related Commands: CH1-CH4

Front Panel Key: Display \ **DISPLAY MODE \ SINGLE CHANNEL**

DSP? Output channel display mode **DISPLAY (Ch 5)**

Syntax: DSP?

Data I/O: Outputs channel display mode using ASCII <NR1> format as follows:
1 for Single
13 for Dual 1&3
24 for Dual 2&4
4 for Quad
130 for Dual Overaly 1&3
240 for Dual Overlay 2&4

Related Commands: CH1-CH4

Front Panel Key: Display \ **DISPLAY MODE** \ **SINGLE CHANNEL**

DSQ0 Disable filter Q calculation **MARKER (Ch 7)**

Syntax: DSQ0

Related Commands: DSQ1, DSQX?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **FILTER PARAMETERS** \ **FILTER SETUP** \ **Q OFF**

DSQ1 Enable filter Q calculation **MARKER (Ch 7)**

Syntax: DSQ1

Related Commands: DSQ0, DSQX?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **FILTER PARAMETERS** \ **FILTER SETUP** \ **Q ON**

DSQX? Output filter Q calculation enable/disable status **MARKER (Ch 7)**

Syntax: DSQX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: DSQ0, DSQ1

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **FILTER PARAMETERS** \ **FILTER SETUP** \ **Q**

DTM Display measurement data and trace memory on active channel — **DISPLAY (Ch 5)**

Syntax: `DTM`

Remarks: Store data from selected channel to memory (STD command), before using this command to view a trace with trace memory active.

Related Commands: STD

Front Panel Key: Display \ **TRACE MEMORY** \ **VIEW: DATA AND MEMORY**

DVM Enter DVM channel number — **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `DVM Value`
Value: 0 to 128

Remarks: For service use only.

Front Panel Key: Utility \ **DIAGNOSTICS** \ **TROUBLESHOOTING (SERVICE USE ONLY)** \ **DVM CHANNEL**

DWG Display waveguide parameters — **UTILITY (Ch 9)**

Syntax: `DWG`

Front Panel Key: Cal \ **MORE** \ **COMPONENT UTILITY** \ **DISPLAY WAVEGUIDE INFORMATION**

DWL Diagnostic write latch — **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `DWL`

Remarks: For service use only.

Front Panel Key: Utility \ **DIAGNOSTICS** \ **TROUBLESHOOTING (SERVICE USE ONLY)** \ **LATCH ADDRESS** or **WRITE DATA** or **TRIGGER WRITE**

EANAIN Measure EXT. ANALOG IN on active channel — **MEAS (Ch 5)**

Syntax: `EANAIN`

Front Panel Key: Meas \ **EXT ANALOG IN**

ECW Select CW operation for component being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `ECW`

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ C.W. ON**

ED1 Edit source 1 equation **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `ED1`

Remarks: See Chapter 10, paragraph 10-3.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (SOURCE X/RECEIVER)**

ED2 Edit source 2 equation **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `ED2`

Remarks: See Chapter 10, paragraph 10-3.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 2 (SOURCE X/RECEIVER)**

ED3 Edit source 3 equation **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `ED3`

Related Commands: ED1, ED2, ED4, EDR, EDX?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 3 (SOURCE X/RECEIVER)**

ED4 Edit source 4 equation **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `ED4`

Related Commands: ED1, ED2, ED3, EDR, EDX?

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 4 (SOURCE X/RECEIVER)**

EDADD Select add on to network for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDADD

Front Panel Key: Config \ **NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE \ 2 PORT \ CONTINUE \ ADD TO NTWK**

EDADD? Output Add on to Network or Modify Last Network for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDADD?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for ADD NETWORK
2 for MODIFY NETWORK

Front Panel Key: Config \ **NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE \ 2 PORT \ CONTINUE \ ADD TO NTWK**

EDE Edit ENR source equation **APPL (Ch 10)**

Syntax: EDE

EDE0 Turn Embedding/De-embedding Mode off **CONFIG (Ch 5)**

Syntax: EDE0

Related Commands: EDE1

Front Panel Key: Config \ **NTWK EMBEDDING/DE-EMBEDDING \ EMBEDDING/DE-EMBEDDING OFF**

EDE1 Turn Embedding/De-embedding Mode on **CONFIG (Ch 5)**

Syntax: EDE1

Related Commands: EDE0

Front Panel Key: Config \ **NTWK EMBEDDING/DE-EMBEDDING \ EMBEDDING/DE-EMBEDDING ON**

EDE? Output Embedding/De-embedding Mode status **CONFIG (Ch 5)**

Syntax: EDE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ EMBEDDING/DE-EMBEDDING**

EDEAIR Select air as dielectric type for T-line section **CONFIG (Ch 5)**

Syntax: EDEAIR

EDEAPP Apply Embedding/De-embedding Network **CONFIG (Ch 5)**

Syntax: EDEAPP

EDECAP Enter capacitance for LC circuit **CONFIG (Ch 5)**

Syntax: EDECAP

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Config **\NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ CAPACITANCE**

EDECAP4P1 Enter capacitance 1 for circuit topology in four port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDECAP4P1

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Config **\NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ CAPACITANCE 1**

EDECAP4P1? Output capacitance 1 for circuit topology in four port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDECAP4P1?

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Config **\NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ CAPACITANCE 1**

EDECAP4P2 Enter capacitance 2 for circuit topology in four port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDECAP4P2

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ CAPACITANCE 2**

EDECAP4P2? Output capacitance 2 for circuit topology in four port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDECAP4P2?

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ CAPACITANCE 2**

EDECAP? Output capacitance for LC circuit **CONFIG (Ch 5)**

Syntax: EDECAP?

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ CAPACITANCE**

EDECKT? Output embedding/de-embedding network generation method selection **CONFIG (Ch 5)**

Syntax: EDECKT?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for LC CIRCUIT
2 for T-LINE SECTION

EDECPLS Select C(P)-L(S) as LC circuit type **CONFIG (Ch 5)**

Syntax: EDECPLS

Related Commands: EDECSCP, EDECSLP

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ APPLY DEFINE \ C(P)-L(S)**

EDECSCP Select C(S)-L(P) as LC circuit type **CONFIG (Ch 5)**

Syntax: EDECSCP

Related Commands: EDECPLS, EDECSLP

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ APPLY DEFINE \ C(S)-L(P)**

EDECSLP Select C(S)-L(P) as LC circuit type **CONFIG (Ch 5)**

Syntax: EDECSLP

Related Commands: EDECPLS, EDECSCP

EDECSLP4P Select C(S)-L(P) as the LC circuit type for the 4-port circuit **CONFIG (Ch 5)**

Syntax: EDECSLP4P

Related Commands: EDEIND4P2, EDEIND4P2?, EDELC4P?, EDELSCP4P

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ SELECT LC CIRCUIT TYPE \ C(S)-L(P)**

EDED Select de-embedding as embedding/de-embedding method **CONFIG (Ch 5)**

Syntax: EDED

Related Commands: EDEDEF

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT METHOD EMBEDDING/DE-EMBEDDING**

EDEDEF Define embedding/de-embedding network **CONFIG (Ch 5)**

Syntax: EDEDEF

Related Commands: EDED

EDEDEF? Output apply or define embedding/de-embedding network **CONFIG (Ch 5)**

Syntax: EDEDEF?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for APPLY
1 for DEFINE

EDEDIEL Enter relative dielectric for T-line section **CONFIG (Ch 5)**

Syntax: EDEDIEL

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

EDEDIEL? Output relative dielectric for T-line section **CONFIG (Ch 5)**

Syntax: EDEDIEL?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: EDEDIEL, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

EDEDT? Output dielectric type for T-line section **CONFIG (Ch 5)**

Syntax: EDEDT?

Data I/O: Outputs data using ASCII <NR3> format as follows:
0 for AIR
1 for POLYETHYLENE
3 for MICROPOROUS
4 for OTHER

Related Commands: EDEDIEL, EDEDIEL?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

EDEDUT2 Select 2-port test device for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEDUT2

Related Commands: EDEDUT3, EDEDUT4

EDEDUT3 Select 3-port test device for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEDUT3

Related Commands: EDEDUT2, EDEDUT4

EDEDUT4 Select 4-port test device for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEDUT4

Related Commands: EDEDUT2, EDEDUT3

EDEDUT? Output device type selection for embedding/de-embeddin **CONFIG (Ch 5)**

Syntax: EDEDUT?

Data I/O: Outputs data using ASCII <NR1> format as follows:
2 for 2 PORT DUT
3 for 3 PORT DUT
4 for 4 PORT DUT

EDEE Select embedding as embedding/de-embedding method **CONFIG (Ch 5)**

Syntax: EDEE

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT METHOD EMBEDDING/DE-EMBEDDING**

EDEED? Output embedding/de-embedding method selection **CONFIG (Ch 5)**

Syntax: EDEED?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for EMBEDDING
2 for DE-EMBEDDING

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT METHOD EMBEDDING/DE-EMBEDDING**

EDEIMP Enter impedance for T-line section **CONFIG (Ch 5)**

Syntax: EDEIMP

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \ IMPEDANCE**

EDEIMP? Output impedance for T-line section **CONFIG (Ch 5)**

Syntax: `EDEIMP?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \ IMPEDANCE**

EDEIND Enter inductance for LC circuit **CONFIG (Ch 5)**

Syntax: `EDEIND`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ INDUCTANCE**

EDEIND4P Enter inductance for circuit topology in four port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: `EDEIND4P`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ INDUCTANCE**

EDEIND4P2 Enter Inductance 2 for the circuit topology in four-port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: `EDEIND4P2 Value Units`
Value: Inductance value
Units: XX1

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: EDECSLP4P, EDEIND4P2?, EDELC4P?, EDELSCP4P

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ INDUCTANCE 2**

EDEIND4P2? Output Inductance 2 for the circuit topology in four-port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: `EDEIND4P2?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: EDECSLP4P, EDEIND4P2, EDELC4P?, EDELSCP4P

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ INDUCTANCE 2**

EDEIND4P? Output inductance for circuit topology in four port embedding/de-embedding **CONFIG (Ch 5)**

Syntax: `EDEIND4P?`

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ INDUCTANCE**

EDEIND? Output inductance for LC circuit **CONFIG (Ch 5)**

Syntax: EDEIND?

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Config \ **NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE X PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ INDUCTANCE**

EDELC Select LC circuit as embedding/de-embedding network generation method **CONFIG (Ch 5)**

Syntax: EDELC

Front Panel Key: Config \ **NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ SELECT LC CIRCUIT TYPE**

EDELC4P? Outputs the four-port LC circuit type selection **CONFIG (Ch 5)**

Syntax: EDELC4P?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for L_SERIAL_C_PARALLEL
2 for C_SERIAL_L_PARALLEL
3 for C_PARALLEL_L_SERIAL
4 for L_PARALLEL_C_SERIAL

Related Commands: EDECSLP4P, EDEIND4P2, EDEIND4P2?, EDELSCP4P

Front Panel Key: Config \ **NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ SELECT LC CIRCUIT TYPE**

EDELC? Output LC circuit type selection **CONFIG (Ch 5)**

Syntax: EDELC?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for L(S) – C(P)
2 for C(S) – L(P)
3 for C(P) – L(S)
4 for L(P) – C(S)

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ SELECT LC CIRCUIT TYPE**

EDELEN Enter length for T-line section **CONFIG (Ch 5)**

Syntax: EDELEN

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \ LENGTH**

EDELEN? Output length for T-line section **CONFIG (Ch 5)**

Syntax: EDELEN?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \ LENGTH**

EDELOS Enter loss for T-line section **CONFIG (Ch 5)**

Syntax: EDELOS

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \ LOSS**

EDELOS? Output loss for T-line section **CONFIG (Ch 5)**

Syntax: EDELOS?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \ LOSS**

EDELPCS Select L(P)-C(S) as LC circuit type **CONFIG (Ch 5)**

Syntax: EDELPCS

Related Commands: EDELSCP

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ APPLY DEFINE \ L(P)-C(S)**

EDELSCP Select L(S)-C(P) as LC circuit type **CONFIG (Ch 5)**

Syntax: EDELSCP

Related Commands: EDELPCS

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY LC CIRCUIT \ APPLY DEFINE \ L(P)-C(S)**

EDELSCP4P Select L(S)-C(P) as the LC circuit type for the four-port circuit **CONFIG (Ch 5)**

Syntax: EDELSCP4P

Related Commands: EDECSLP4P, EDEIND4P2, EDEIND4P2?, EDELC4P?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ CIRCUIT TOPOLOGY \ SELECT LC CIRCUIT TYPE \ L(S)-C(P)**

EDEMIC Select microporous teflon as dielectric type for T-line **CONFIG (Ch 5)**

Syntax: EDEMIC

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

EDEMODIFY Select Modify Last Network for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEMODIFY

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE \ 2 PORT \ CONTINUE \ MODIFY LAST NTWK**

EDEOTH Select Other as dielectric type for T-line section **CONFIG (Ch 5)**

Syntax: EDEOTH

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEPOLY, EDETEF, EDETIME, EDETIME?

EDEPOLY Select Polyethylene as dielectric type for T-line section **CONFIG (Ch 5)**

Syntax: EDEPOLY

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDETEF, EDETIME, EDETIME?

EDEPORT1 Select port 1 for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT1

Related Commands: EDEPORT12, EDEPORT2, EDEPORT23, EDEPORT3, EDEPORT34, EDEPORT4, EDEPORT?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE (2) (3) (4) PORT \ CONTINUE \ SELECT PORT P1**

EDEPORT12 Select port 1 and port 2 for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT12

Related Commands: EDEPORT1, EDEPORT2, EDEPORT23, EDEPORT3, EDEPORT34, EDEPORT4, EDEPORT?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE (2) (3) (4) PORT \ CONTINUE \ SELECT PORT P1/P2**

EDEPORT2 Select port 2 for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT2

Related Commands: EDEPORT1, EDEPORT12, EDEPORT23, EDEPORT3, EDEPORT34, EDEPORT4, EDEPORT?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \SELECT PORT P2**

EDEPORT23 Select port 2 and port 3 for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT23

Related Commands: EDEPORT1, EDEPORT12, EDEPORT2, EDEPORT3, EDEPORT34, EDEPORT4, EDEPORT?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE (2) (3) PORT \ CONTINUE \SELECT PORT P2/P3**

EDEPORT3 Select port 3 for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT3

Related Commands: EDEPORT1, EDEPORT12, EDEPORT2, EDEPORT23, EDEPORT34, EDEPORT4, EDEPORT?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 3 PORT \ CONTINUE \SELECT PORT P3**

EDEPORT34 Select port 3 and port 4 for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT34

Related Commands: EDEPORT1, EDEPORT12, EDEPORT2, EDEPORT23, EDEPORT3, EDEPORT4, EDEPORT?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE (3) (4) PORT \ CONTINUE \ SELECT PORT P3/P4**

EDEPORT4 Select port 4 for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT4

Related Commands: EDEPORT1, EDEPORT12, EDEPORT2, EDEPORT23, EDEPORT3, EDEPORT34, EDEPORT?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 4 PORT \ CONTINUE \ SELECT PORT P4**

EDEPORT? Output active port number for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDEPORT?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for PORT 1
2 for PORT 2
3 for PORT 3
4 for PORT 4
12 for PORT 1-2
23 for PORT 2-3
34 for PORT 3-4

Related Commands: EDEPORT1, EDEPORT12, EDEPORT2, EDEPORT23, EDEPORT3, EDEPORT34, EDEPORT4

EDERST Reset all ports reference plane for embedding/de-embedding **CONFIG (Ch 5)**

Syntax: EDERST

EDETEF Select teflon as dielectric type for T-line section **CONFIG (Ch 5)**

Syntax: EDETEF

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETIME, EDETIME?

EDETIME Enter time for T-line section **CONFIG (Ch 5)**

Syntax: EDETIME

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF,EDETIME?

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \TIME**

EDETIME? Output time for T-line section **CONFIG (Ch 5)**

Syntax: EDETIME?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE 2 PORT \ CONTINUE \ SELECT NTWK GENERATION METHOD \ T-LINE SECTION \TIME**

EDETLINE Select T-line section as embedding/de-embedding network **CONFIG (Ch 5)**

Syntax: EDETLINE

Related Commands: EDEDIEL, EDEDIEL?, EDEDT?, EDEIMP, EDEIMP?, EDELEN, EDELEN?, EDELOS, EDELOS?, EDEMIC, EDEOTH, EDEPOLY, EDETEF, EDETIME, EDETIME?

EDG End diagnostics mode **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: EDG

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ FINISHED, RECOVER FROM TROUBLESHOOTING**

EDR Edit receiver equation **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: EDR

Remarks: See Chapter 10, paragraph 10-3.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ RECEIVER (SOURCE X/RECEIVER)**

EDRS Edit receiver source equation **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: EDRS

EDV Enter divisor value for equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `EDV Value Units`
Value: 099 to 0, 1 to 199
Units: XX1, XX3, XM3

Remarks: See Chapter 10, paragraph 10-3.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ DIVISOR**

EDV? Output the divisor value for the equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `EDV?`

Data I/O: Outputs its value using ASCII <NR3 > format. See Chapter 10, paragraph 10-3.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ DIVISOR**

EDX? Output equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `EDX?`

Data I/O: Outputs value using ASCII <NR1> format as follows:
1 is SOURCE 1
2 is SOURCE 2
3 is SOURCE 3
4 is SOURCE 4
5 is RECEIVER
6 for ENR SOURCE

Related Commands: ED1, ED2, ED3, ED4, EDR

Front Panel Key: Config **\ \ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE X (SOURCE X/RECEIVER)**

EKT Select external keyboard testing **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `EKT`

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ PERIPHERAL TEST \ EXTERNAL KEYBOARD**

EML Enter multiplier value for equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `EML Value Units`
Value: 099 to 0, 1 to 199
Units: XX1, XX3, XM3

Remarks: See Chapter 10, paragraph 10-8.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ MULTIPLIER**

EML? Output multiplier value for equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `EML?`

Data I/O: Outputs its value using ASCII <NR3 > format. See Chapter 10, paragraph 10-3.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ MULTIPLIER**

EOS Enter offset frequency for equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `EOS Value Units`
Value: -999.9999 GHz to 999.9999 GHz
Units: HZ, KHZ, MHZ, GHZ

Remarks: See Chapter 10, paragraph 10-8.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ OFFSET FREQ**

EOS? Output offset frequency for equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `EOS?`

Data I/O: Outputs its value using ASCII <NR3 > format. See Chapter 10, paragraph 10-3.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ OFFSET FREQ**

ESW Select sweep operation for component being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `ESW`

Remarks: See Chapter 10, paragraph 10-8.

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ C.W. OFF**

EX2RF0 Turn external source 2 rf off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `EX2RF0`

Related Commands: EX2RF1

EX2RF1 Turn external source 2 rf on **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `EX2RF1`

Related Commands: EX2RF0

EX3RF0 Turn external source 3 rf off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `EX3RF0`

Related Commands: EX3RF1

EX3RF1 Turn external source 3 rf on **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `EX3RF1`

Related Commands: EX3RF0

EX4RF0 Turn external source 4 rf off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `EX4RF0`

Related Commands: EX4RF1

EX4RF1 Turn external source 4 rf on **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `EX4RF1`

Related Commands: EX4RF0

EXD Display external A/D input **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `EXD`

Remarks: For service use only.

EXISTD? Output directory existence information **UTILITY - DISK (Ch 9)**

Syntax: `EXISTD? Pathspec`
Value: "Pathspec" is the path to the directory in question. It may contain a drive letter.

Data I/O: Output directory existence information using ASCII <NR1> format as follows:
0 for DIRECTORY DOES NOT EXIST
1 for DIRECTORY EXISTS.

Related Commands: EXISTF?

EXISTF? Output file existence information **UTILITY - DISK (Ch 9)**

Syntax: `EXISTF? Filespec`
Value: "Filespec" is a string containing the filename to check. It may contain a drive letter and path.

Data I/O: Outputs file existence information using ASCII <NR1> format as follows:
0 for FILE DOES NOT EXIST
1 for FILE EXISTS.

Related Commands: EXISTD?

EXRCALP1 Select Port 1 as the extended receiver port **POWER - RECEIVER CAL (Ch 5)**

Syntax: `EXRCALP1`

Related Commands: EXRCALP2, EXRCALP3, EXRCALPX?

Front Panel Key: POWER \ **RECEIVER CAL** \ **EXTD. RCVR TABLE OPERATION** \ **SELECT RECEIVER PORT** or
POWER \ **SINGLE POWER** \ **RECEIVER CAL** \ **EXTD. RCVR TABLE OPERATION** \ **SELECT RECEIVER PORT**

EXRCALP2 Select Port 2 as the extended receiver port **POWER - RECEIVER CAL (Ch 5)**

Syntax: EXRCALP2

Related Commands: EXRCALP1, EXRCALP3, EXRCALPX?

Front Panel Key: POWER \ **RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ SELECT RECEIVER PORT** or
POWER \ **SINGLE POWER \ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ SELECT RECEIVER PORT**

EXRCALP3 Select Port 3 as the extended receiver port **POWER - RECEIVER CAL (Ch 5)**

Syntax: EXRCALP3

Related Commands: EXRCALP1, EXRCALP2, EXRCALPX?

Front Panel Key: POWER \ **RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ SELECT RECEIVER PORT** or
POWER \ **SINGLE POWER \ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ SELECT RECEIVER PORT**

EXRCALPX? Output the extended receiver port selection **POWER - RECEIVER CAL (Ch 5)**

Syntax: EXRCALPX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for EXTD RCVR P1
2 for EXTD RCVR P2
3 for EXTD RCVR P3
Default is EXTD RCVR P1

Related Commands: EXRCALP1, EXRCALP2, EXRCALP3

Front Panel Key: POWER \ **RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ SELECT RECEIVER PORT** or
POWER \ **SINGLE POWER \ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ SELECT RECEIVER PORT**

EXRCALTYPE? Output the receiver type for extended receiver operation **POWER - RECEIVER CAL (Ch 5)**

Syntax: EXRCALTYPE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for TEST PORT
1 for REFERENCE PORT
Default is TEST PORT

Related Commands: EXRRCALTYPE, EXTRCALTYPE

Front Panel Key: POWER **\ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ RECEIVER TYPE** or
POWER **\ SINGLE POWER \ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ RECEIVER TYPE**

EXRRCALTYPE Select the receiver type REFERENCE for the extended receiver operation **POWER - RECEIVER CAL (Ch 5)**

Syntax: EXRRCALTYPE

Related Commands: EXTRCALTYPE, EXRCALTYPE?

Front Panel Key: POWER **\ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ RECEIVER TYPE** or
POWER **\ SINGLE POWER \ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ RECEIVER TYPE**

EXTIO0 Disable external output I/O **DISPLAY (Ch 5)**

Syntax: EXTIO0

Related Commands: EXTIO1, EXTIOX?

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE) TEST LIMITS \ EXT I/O OUTPUT OFF**

EXTIO1 Enable external output I/O **DISPLAY (Ch 5)**

Syntax: EXTIO1

Related Commands: EXTIO0, EXTIOX?

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE) TEST LIMITS \ EXT I/O OUTPUT ON**

EXTIOX? Output external output I/O enable/disable status **DISPLAY (Ch 5)**

Syntax: EXTIOX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for DISABLE
1 for ENABLE

Related Commands: EXTIO0, EXTIO1

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE) TEST LIMITS \ EXT I/O OUTPUT**

EXTRCALTYPE Select the receiver type TEST for extended receiver operation **POWER - RECEIVER CAL (Ch 5)**

Syntax: EXTRCALTYPE

Related Commands: EXRRCALTYPE, EXRCALTYPE?

Front Panel Key: POWER **\ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ RECEIVER TYPE** or
POWER **\ SINGLE POWER \ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ RECEIVER TYPE**

EXTRCLR Clear all of the extended receiver calibrations **POWER - RECEIVER CAL (Ch 5)**

Syntax: EXTRCLR

Front Panel Key: POWER **\ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ CLEAR ALL EXTD. RCVR CAL \ CONTINUE** or
POWER **\ SINGLE POWER \ RECEIVER CAL \ EXTD. RCVR TABLE OPERATION \ CLEAR ALL EXTD. RCVR CAL\ CONTINUE**

EXW? Output multiple source sweep flag for equation being edited **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: EXW?

Data I/O: Outputs its value using ASCII <NR1> format as follows:
0 for sweep
1 for CW

Front Panel Key: Config **\ MULTIPLE SOURCE \ DEFINE BANDS \ EDIT SYSTEM EQUATIONS \ SOURCE 1 (2, 3, 4, RECEIVER) \ C.W.**

F Suffix sets farad data type and scales by 1E0 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `F`

FCW0 Turn fast CW measurement mode off **SWEEP (Ch 5)**

Syntax: `FCW0`

FCW1 Turn fast CW measurement mode 1 on **SWEEP (Ch 5)**

Syntax: `FCW1`

FCWX? Output fast CW measurement mode **SWEEP (Ch 5)**

Syntax: `FCWX?`

Data I/O: Outputs values using ASCII <NR1> format as follows:
0 for OFF
1 for ON

FDH0 Select variable length arbitrary block headers **REMOTE - FORMATTING (Ch 8)**

Syntax: `FDH0`

Remarks: This is the default mode.

Related Commands: FDH1, FDH2, FDHX?

FDH1 Select fixed length arbitrary block headers **REMOTE - FORMATTING (Ch 8)**

Syntax: `FDH1`

Remarks: The block size portion of the arbitrary block header will be padded with leading zeros as necessary to cause the overall length to be 11 characters. For example, the fixed length header shown below would precede a data block containings 123 bytes: #9000000123

Related Commands: FDH0, FDH2, FDHX?

FDH2 Select zero length arbitrary block headers **REMOTE - FORMATTING (Ch 8)**

Syntax: `FDH2`

Remarks: Reverts to the FDH1 mode after completion of the current program message.

Related Commands: FDH0, FDH1, FDHX?

FDHX? Output arbitrary block header length selection **REMOTE - FORMATTING (Ch 8)**

Syntax: `FDHX?`

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for VARIABLE LENGTH ARBITRARY BLOCK HEADERS
1 for FIXED LENGTH ARBITRARY BLOCK HEADERS
2 for NO ARBITRARY BLOCK HEADERS

Related Commands: FDH0, FDH1, FDH2

FFD Send form feed to printer and stop print/plot **HARD COPY (Ch 9)**

Syntax: `FFD`

Front Panel Key: Hard Copy \ **STOP PRINT**

FGT Select frequency with time gate for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `FGT`

Remarks: Selects frequency with time gate mode for active channel.

Related Commands: CH1-CH4, OPC

Front Panel Key: Appl \ **DOMAIN** \ **FREQUENCY, WITH TIME GATE**

FHI Set data points to 1601 **CONFIG (Ch 5)**

Syntax: `FHI`

Related Commands: WFS, OPC, NP1601, FME, FLO

Front Panel Key: Config \ **DATA POINTS** \ **1601 MAX POINTS** or
Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINT** \ **1601 MAX POINTS**

FIL Fill defined discrete frequency range **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `FIL`

Remarks: Can also be used to specify frequencies inside of a calibration setup sequence. Note: Using this command causes prior calibration data to be destroyed.

Front Panel Key: Freq **\ DISCRETE FILL \ FILL THE RANGE** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS) \ FILL THE RANGE**

FLICK0 Turn flickering off **SWEEP (Ch 5)**

Syntax: `FLICK0`

Related Commands: FLICK1, FLICKX?

Front Panel Key: Sweep **\ MORE \ FLICKERING OFF**

FLICK1 Turn flickering on **SWEEP (Ch 5)**

Syntax: `FLICK1`

Related Commands: FLICK0, FLICKX?

Front Panel Key: Sweep **\ MORE \ FLICKERING ON**

FLICKX? Output flickering on/off status **SWEEP (Ch 5)**

Syntax: `FLICKX?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: FLICK0, FLICK1

Front Panel Key: Sweep **\ MORE \ FLICKERING**

FLO Set data points to 101 **CONFIG (Ch 5)**

Syntax: FLO

Related Commands: WFS, OPC, NP101, FME, FHI

Front Panel Key: Config \ **DATA POINTS** \ **101 MAX POINTS** or
Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINT** \ **101 MAX POINTS**

FLTBW? Output filter bandwidth **MARKER (Ch 7)**

Syntax: FLTBW?

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: BWL3, BWLS,

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **FILTER PARAMETERS** \ **BANDWIDTH**

FLTC? Output filter center frequency **MARKER (Ch 7)**

Syntax: FLTC?

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: BWL3, BWLS

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **FILTER PARAMETERS** \ **CENTER FREQ**

FLTL? Output filter loss at reference value **MARKER (Ch 7)**

Syntax: FLTL?

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: MSR0, MSRD, MSRM

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **FILTER PARAMETERS** \ **LOSS AT REF**

FLTQ? Output filter Q **MARKER (Ch 7)**

Syntax: `FLTQ?`

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: DSQ0, DSQ1

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ READOUTS: Q ON \ RETURN \ Q**

FLTS? Output filter shape factor **MARKER (Ch 7)**

Syntax: `FLTS?`

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: DSF0, DSF1

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ READOUTS: SHAPE FACTOR ON \ RETURN \ SHAPE FACTOR**

FMA Select ASCII data transfer format **REMOTE - FORMATTING (Ch 8)**

Syntax: `FMA`

Remarks: Selects ASCII <NR3> as appropiate for succeeding data transfer commands. The ASCII format will stay in effect until either the FMB or FMC (binary format) commands are issued. This command will have no effect on data transfer commands that cannot be output in ASCII format. See the specific command's description to determine formats supported.

Related Commands: FMB, FMC

FMB Select IEEE754 64 bit data transfer format **REMOTE - FORMATTING (Ch 8)**

Syntax: `FMB`

Remarks: Selects IEEE-754 64-bit (double precision, 8 bytes) binary data transfer format for succeeding data transfer commands. The 64-bit format will stay in effect until either the FMA (ASCII) or FMC (32-bit binary) commands are issued.

This command has no effect on data transfer commands that cannot be output in 64-bit format. See the specific command's description to determine formats supported.

Related Commands: FMA, FMC, LSB, MSB

FMC Select IEEE754 32 bit data transfer format **REMOTE - FORMATTING (Ch 8)**

Syntax: `FMC`

Remarks: Selects IEEE-754 32-bit (single precision, 4 bytes) binary data transfer format for succeeding data transfer commands. The 32-bit format will stay in effect until either the FMA (ASCII) or FMB (64-bit binary) commands are issued.

This command has no effect on data transfer commands that cannot be output in 32-bit format. See the specific command's description to determine formats supported.

Related Commands: FMA, FMB, LSB, MSB

FME Set data points to 401 **CONFIG (Ch 5)**

Syntax: `FME`

Related Commands: WFS, OPC, NP401, FHI, FLO

Front Panel Key: Config **\ DATA POINTS \ 401 MAX POINTS** or
Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ DATA POINT \ 401 MAX POINTS**

FMKR Select filter parameters marker mode **MARKER (Ch 7)**

Syntax: `FMKR`

Related Commands: AMKR, NMKR, SMKR, XMKR?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **FILTER PARAMETERS**

FMT0 Select normal ASCII data element delimiting **REMOTE - FORMATTING (Ch 8)**

Syntax: `FMT0`

Remarks: When data values are output with the FMA mode, each value is separated with a comma. This is also true for listing type outputs such as for the service log or disk directory. This is the default mode.

Related Commands: FMT1, FMTX?, FMA

FMT1 Select enhanced ASCII data element delimiting **REMOTE - FORMATTING (Ch 8)**

Syntax: `FMT1`

Remarks: When data values are output with the FMA mode, each data pair is separated with a line feed. Each element within the pair is separated with a comma. If there is no data pair, each element is separated with a line feed. Each line in the service log listing or the disk directory listing is separated with a line feed.

Related Commands: FMT0, FMTX?, FMA

FMTX? Output ASCII data element delimiting mode **REMOTE - FORMATTING (Ch 8)**

Syntax: `FMTX?`

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for NORMAL DELIMITING
1 for ENHANCED DELIMITING

Related Commands: FMT0, FMT1, FMA

FMX? Output data output mode FMA FMB or FMC **REMOTE - FORMATTING (Ch 8)**

Syntax: FMX?

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for FMA
1 for FMB
2 for FMC

Related Commands: FMA, FMB, FMC

FOF Blank frequency information **CONFIG (Ch 5)**

Syntax: FOF

Remarks: Blanks any frequency information from the screen and any hard copy output. This command is useful for security reasons since the instrument cannot display frequency data again without the FON command being issued or a reset is invoked.

Related Commands: FON

Front Panel Key: Config \ **CONFIGURATION** \ **BLANK FREQUENCY INFO OFF**

FON Display frequency information **CONFIG (Ch 5)**

Syntax: FON

Remarks: See FOF for more information.

Related Commands: FOF

Front Panel Key: Config \ **CONFIGURATION** \ **BLANK FREQUENCY INFO ON**

FOX? Output frequency information on/off status **CONFIG (Ch 5)**

Syntax: FOX?

Data I/O: Outputs its value in ASCII <NR1 > format as follows:
0 for OFF
1 for ON

Front Panel Key: Config \ **CONFIGURATION** \ **BLANK FREQUENCY INFO**

FP0 Turn flat power correction off **POWER - FLAT POWER (Ch 5)**

Syntax: FP0

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **FLATNESS CORRECTION OFF** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **GAIN COMPRESSION CALIBRATION** \ **FLATNESS CORRECTION OFF** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 1 FLATNESS CORRECTION OFF** or Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **FLATNESS CORRECTION OFF**

FP1 Turn flat power correction on **POWER - FLAT POWER (Ch 5)**

Syntax: FP1

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **FLATNESS CORRECTION ON** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **GAIN COMPRESSION CALIBRATION** \ **FLATNESS CORRECTION ON** or

Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 1 FLATNESS CORRECTION ON** or Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **FLATNESS CORRECTION ON**

FP1DONE? Output port 1 flat power correction done status **POWER - FLAT POWER (Ch 5)**

Syntax: FP1DONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NOT DONE
1 for DONE

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **FLATNESS CORRECTION** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **GAIN COMPRESSION CALIBRATION** \ **FLATNESS CORRECTION** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 1 FLATNESS CORRECTION** or Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **FLATNESS CORRECTION**

FP30 Turn port 3 flat power correction off **POWER - FLAT POWER (Ch 5)**

Syntax: `FP30`

Front Panel Key: Power \ **SOURCE 2 SETUP** \ **FLATNESS CORRECTION OFF** or
Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 2 FLATNESS CORRECTION OFF**

FP31 Turn port 3 flat power correction on **POWER - FLAT POWER (Ch 5)**

Syntax: `FP31`

Front Panel Key: Power \ **SOURCE 2 SETUP** \ **FLATNESS CORRECTION ON** or
Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 2 FLATNESS CORRECTION ON**

FP3DONE? Output port 3 flat power correction done status **POWER - FLAT POWER (Ch 5)**

Syntax: `FP3DONE?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NOT DONE
1 for DONE

Front Panel Key: Power \ **SOURCE 2 SETUP** \ **FLATNESS CORRECTION** or
Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 2 FLATNESS CORRECTION**

FP3X? Output port 3 flat power correction on/off status **POWER - FLAT POWER (Ch 5)**

Syntax: `FP3X?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 when OFF
1 when ON

Front Panel Key: Power \ **SOURCE 2 SETUP** \ **FLATNESS CORRECTION OFF** or
Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 2 FLATNESS CORRECTION OFF**

FPT Select front panel keypad testing **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: FPT

Remarks: For service use only.

Front Panel Key: Utility \ **DIAGNOSTICS** \ **PERIPHERAL TEST** \ **FRONT PANEL**

FPX? Output flat power correction on/off status **POWER - FLAT POWER (Ch 5)**

Syntax: FPX?

Remarks: For service use only.

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **FLATNESS CORRECTION** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **GAIN COMPRESSION CALIBRATION** \ **FLATNESS CORRECTION** or
Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **SOURCE 1 FLATNESS CORRECTION** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **FLATNESS CORRECTION**

FQD Select frequency domain for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: FQD

Related Commands: WFS, OPC

Front Panel Key: Appl \ **DOMAIN** \ **FREQUENCY, NO TIME GATE**

FRC Clear all defined discrete frequency ranges **FREQ - DISCRETE FILL (Ch 5)**

Syntax: FRC

Remarks: See command's function group.

Front Panel Key: Freq \ **DISCRETE FILL** \ **CLEAR ALL** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **N-DISCRETE FREQUENCIES (2 TO 1601 POINTS)** \ **CLEAR ALL**

FREFE Select external frequency reference **UTILITY - REAR PANEL (Ch 10)**

Syntax: FREFE

Related Commands: FREFI, FREFX?

FREFI Select internal frequency reference **UTILITY - REAR PANEL (Ch 10)**

Syntax: FREFI

Related Commands: FREFE, FREFX?

FREFX? Output frequency reference internal/external setting **UTILITY - REAR PANEL (Ch 10)**

Syntax: FREFX?

Data I/O: Outputs value using ASCII <NR1> format as follows:
1 is INTERNAL
2 is EXTERNAL.

Related Commands: FREFE, FREFI

FRI Enter discrete fill increment frequency **FREQ - DISCRETE FILL (Ch 5)**

Syntax: FRI Value Units
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: *Value* must be within MS462XX start- and stop-sweep frequencies. This command can also be used to specify frequencies inside of a calibration setup sequence. Note: Using this command causes prior calibration data to be destroyed.

Front Panel Key: Freq **\ DISCRETE FILL \ INCREMENT** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS) \ INCREMENT**

FRI? Output discrete fill increment frequency **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `FRI?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Freq **\ DISCRETE FILL \ INCREMENT** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS) \ INCREMENT**

FRP Enter discrete fill number of points **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `FRP Value Units`
Value: 1 to current number of points, 1601 max
Units: XX1, XX3, XM3

Remarks: Can also be used to specify frequencies inside of a calibration setup sequence. Note: Using this command causes prior calibration data to be destroyed.

Front Panel Key: Freq **\ DISCRETE FILL \ NUMBER OF POINTS** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS) \ NUMBER OF POINTS**

FRP? Output discrete fill number of points **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `FRP?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Freq **\ DISCRETE FILL \ NUMBER OF POINTS** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS) \ NUMBER OF POINTS**

FRS Enter discrete fill start frequency **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `FRS Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: *Value* must be within MS462XX start- and stop-sweep frequencies. See the command's function group.
This command can also be used to specify frequencies inside of a calibration setup sequence. Note: Using this command causes prior calibration data to be destroyed.

Front Panel Key: Freq **\ DISCRETE FILL \ START FREQ** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS) \ START FREQ**

FRS? Output discrete fill start frequency **FREQ - DISCRETE FILL (Ch 5)**

Syntax: `FRS?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Freq **\ DISCRETE FILL \ START FREQ** or
Cal **\ PERFORM CAL 2-PORT CAL \FULL 12-TERM \ INCLUDE ISOLATION \ N-DISCRETE FREQUENCIES (2 TO 1601 POINTS) \ START FREQ**

FS Suffix sets time data type and scales by 1E-15 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `FS`

FSWP Select frequency sweep **SWEEP (Ch 5)**

Syntax: `FSWP`

Related Commands: PSWP, SWPX?

Front Panel Key: Sweep **\ SWEEP TYPE FREQUENCY \ SWEEP**

FTGDC0 Turn off frequency translation group delay correction **APPL - FTGD (Ch 10)**

Syntax: `FTGDC0`

Related Commands: FTGDC1, FTGDCX?, FTGDCDONE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **FREQUENCY TRANSLATION GROUP DELAY** then Cal \ **APPLY CAL OFF**

FTGDC1 Turn on frequency translation group delay correction **APPL - FTGD (Ch 10)**

Syntax: `FTGDC1`

Related Commands: FTGDC0, FTGDCX?, FTGDCDONE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **FREQUENCY TRANSLATION GROUP DELAY** then Cal \ **APPLY CAL ON**

FTGDCDONE? Output frequency translation group delay cal done status **APPL - FTGD (Ch 10)**

Syntax: `FTGDCDONE?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: FTGDC0, FTGDC1, FTGDCX?

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **FREQUENCY TRANSLATION GROUP DELAY** then Cal \ **APPLY CAL**

FTGDCX? Output frequency translation group delay correction on/off status

APPL - FTGD (Ch 10)

Syntax: `FTGDCX?`

Data I/O: Outputs on/off status using ASCII <NR1> format as follows:
0 is OFF
1 is ON

Related Commands: FTGDC0, FTGDC1, FTGDCDONE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ FREQUENCY TRANSLATION GROUP DELAY** then Cal \ **APPLY CAL**

FTP1 Enter the target frequency for linear power correction

POWER (Ch 5)

Syntax: `FTP1`

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: FTP1?, FTP3, FTP3?

FTP1? Output the target frequency for linear power correction

POWER (Ch 5)

Syntax: `FTP1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: FTP1, FTP3, FTP3?

FTP3 Enter the target frequency for linear power correction

POWER (Ch 5)

Syntax: `FTP3`

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: FTP1, FTP1?, FTP3?

FTP3? Output the target frequency for linear power correction

POWER (Ch 5)

Syntax: FTP3?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: FTP1, FTP1?, FTP3

FXAPL Apply Flexible Cal

CAL - FLEXIBLE CAL (Ch 6)

Syntax: FXAPL

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **APPLY**

FXP1T0 Turns off Port 1 selection. Do not apply correction to any S-parameter involving port 1

CAL - FLEXIBLE CAL (Ch 6)

Syntax: FXP1T0

Related Commands: FXP1T1, FXP1T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 1**

FXP1T1 Turns on Port 1 selection. Correct S11. If in full term cal input method

CAL - FLEXIBLE CAL (Ch 6)

Syntax: FXP1T1

Related Commands: FXP1T0, FXP1T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 1**

FXP1T? Query Port 1 selection for Flexible Cal

CAL - FLEXIBLE CAL (Ch 6)

Syntax: FXP1T?

Related Commands: FXP1T0, FXP1T1

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 1**

FXP2T0 Turns off Port 2 selection. Do not apply correction to any S-parameter involving port 2

CAL - FLEXIBLE CAL (Ch 6)

Syntax: `FXP2T0`

Related Commands: FXP2T1, FXP2T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 2**

FXP2T1 Turns on Port 2 selection. Correct S22. If in full term cal input method

CAL - FLEXIBLE CAL (Ch 6)

Syntax: `FXP2T1`

Related Commands: FXP2T0, FXP2T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 2**

FXP2T? Query Port 2 selection for Flexible Cal.

CAL - FLEXIBLE CAL (Ch 6)

Syntax: `FXP2T?`

Related Commands: FXP2T0, FXP2T1

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 2**

FXP3T0 Turns off Port 3 selection. Do not apply correction to any S-parameter involving port 3

CAL - FLEXIBLE CAL (Ch 6)

Syntax: `FXP3T0`

Related Commands: FXP3T1, FXP3T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 3**

FXP3T1 Turns on Port 3 selection. Correct S33. If in full term cal input method

CAL - FLEXIBLE CAL (Ch 6)

Syntax: `FXP3T1`

Related Commands: FXP3T0, FXP3T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 3**

FXP3T? Query Port 3 selection for Flexible Cal — **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXP3T?`

Related Commands: FXP3T0, FXP3T1

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 3**

FXP4T0 Turns off Port 4 selection. Do not apply correction to any S-parameter involving port 4 — **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXP4T0`

Related Commands: FXP4T1, FXP4T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 4**

FXP4T1 Turns on Port 4 selection. Correct S44. If in full term cal input method — **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXP4T1`

Related Commands: FXP4T0, FXP4T?

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 4**

FXP4T? Query Port 4 selection for Flexible Cal — **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXP4T?`

Related Commands: FXP4T0, FXP4T1

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **FULL TERM CALS** \ **PORT 4**

FXS11T0 Turn off S11 selection for Flexible Cal — **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS11T0`

Related Commands: FXS11T1, FXS11T?, FXSON, FXSOFF

Front Panel Key: Cal \ **FLEXIBLE CAL** \ **CUSTOMIZE CAL** **S11, REFL**

FXS11T1 Turn on S11 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS11T1`

Related Commands: FXS11T0, FXS11T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S11, REFL**

FXS11T? Output S11 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS11T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS11T0, FXS11T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S11, REFL**

FXS12T0 Turn off S12 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS12T0`

Related Commands: FXS12T1, FXS12T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S12,TRANS**

FXS12T1 Turn on S12 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS12T1`

Related Commands: FXS12T0, FXS12T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S12,TRANS**

FXS12T? Output S12 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS12T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS12T0, FXS12T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S12,TRANS**

FXS13T0 Turn off S13 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS13T0`

Related Commands: FXS13T1, FXS13T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS13T1 Turn on S13 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS13T1`

Related Commands: FXS13T0, FXS13T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS13T? Output S13 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS13T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS13T0, FXS13T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS14T0 Turn off S14 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS14T0`

Related Commands: FXS14T1, FXS14T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS14T1 Turn on S14 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS14T1`

Related Commands: FXS14T0, FXS14T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS14T? Output S14 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS14T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS14T0, FXS14T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS21T0 Turn off S21 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS21T0`

Related Commands: FXS21T1, FXS21T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S21,TRANS**

FXS21T1 Turn on S21 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS21T1`

Related Commands: FXS21T0, FXS21T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S21,TRANS**

FXS21T? Output S21 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS21T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS21T0, FXS21T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S21,TRANS**

FXS22T0 Turn off S22 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS22T0`

Related Commands: FXS22T1, FXS22T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS22T1 Turn on S22 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS22T1`

Related Commands: FXS22T0, FXS22T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS22T? Output S22 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS22T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS22T0, FXS22T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S22, REFL**

FXS23T0 Turn off S23 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS23T0`

Related Commands: FXS23T1, FXS23T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S23, TRANS**

FXS23T1 Turn on S23 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS23T1`

Related Commands: FXS23T0, FXS23T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S23, TRANS**

FXS23T? Output S23 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS23T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS23T0, FXS23T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S23, TRANS**

FXS24T0 Turn off S24 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS24T0`

Related Commands: FXS24T1, FXS24T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S24, TRANS**

FXS24T1 Turn on S24 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS24T1`

Related Commands: FXS24T0, FXS24T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S24, TRANS**

FXS24T? Output S24 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS24T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS24T0, FXS24T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S24, TRANS**

FXS31T0 Turn off S31 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS31T0`

Related Commands: FXS31T1, FXS31T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S31, TRANS**

FXS31T1 Turn on S31 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS31T1`

Related Commands: FXS31T0, FXS31T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S31, TRANS**

FXS31T? Output S31 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS31T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS31T0, FXS31T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S31, TRANS**

FXS32T0 Turn off S32 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS32T0`

Related Commands: FXS32T1, FXS32T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S32, TRANS**

FXS32T1 Turn on S32 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS32T1`

Related Commands: FXS32T0, FXS32T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S32, TRANS**

FXS32T? Output S32 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS32T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS32T0, FXS32T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S32, TRANS**

FXS33T0 Turn off S33 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS33T0`

Related Commands: FXS33T1, FXS33T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S33, REFL**

FXS33T1 Turn on S33 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS33T1`

Related Commands: FXS33T0, FXS33T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S33, REFL**

FXS33T? Output S33 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS33T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS33T0, FXS33T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S33, REFL**

FXS34T0 Turn off S34 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS34T0`

Related Commands: FXS34T1, FXS34T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S34, TRANS**

FXS34T1 Turn on S34 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS34T1`

Related Commands: FXS34T0, FXS34T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S34, TRANS**

FXS34T? Output S34 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS34T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS34T0, FXS34T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S34, TRANS**

FXS41T0 Turn off S41 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS41T0`

Related Commands: FXS41T1, FXS41T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S41, TRANS**

FXS41T1 Turn on S41 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS41T1`

Related Commands: FXS41T0, FXS41T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S41, TRANS**

FXS41T? Output S41 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS41T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS41T0, FXS41T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S41, TRANS**

FXS42T0 Turn off S42 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS42T0`

Related Commands: FXS42T1, FXS42T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S42, TRANS**

FXS42T1 Turn on S42 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS42T1`

Related Commands: FXS42T0, FXS42T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S42, TRANS**

FXS42T? Output S42 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS42T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS42T0, FXS42T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S42, TRANS**

FXS43T0 Turn off S43 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS43T0`

Related Commands: FXS43T1, FXS43T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S43, TRANS**

FXS43T1 Turn on S43 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS43T1`

Related Commands: FXS43T0, FXS43T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S43, TRANS**

FXS43T? Output S43 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS43T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS43T0, FXS43T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S43, TRANS**

FXS44T0 Turn off S44 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS44T0`

Related Commands: FXS44T1, FXS44T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S44, REFL**

FXS44T1 Turn on S44 selection for Flexible Cal **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS44T1`

Related Commands: FXS44T0, FXS44T?, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S44, REFL**

FXS44T? Output S44 selection on/off **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXS44T?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: FXS44T0, FXS44T1, FXSON, FXSOFF

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL S44, REFL**

FXSOFF Turn off all the S-parameters when Flexible Cal is being applied **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXSOFF`

Related Commands: FXSON, FXS11T? Through FXS44T1

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL SET ALL OFF**

FXSON Turn on all the S-parameters when Flexible Cal is being applied **CAL - FLEXIBLE CAL (Ch 6)**

Syntax: `FXSON`

Related Commands: FXSOFF, FXS11T? Through FXS44T1

Front Panel Key: Cal **\ FLEXIBLE CAL \ CUSTOMIZE CAL SET ALL ON**

GCFS? Output the multiple gain compression fixed scale flag ON/OFF status **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: GCFS?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: GCFSOFF, GCFSON

Front Panel Key: Freq \ **MULTIPLE FREQ GAIN COMPRESSION** or Appl \ **MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION \ SWEPT POWER GAIN COMPRESSION \ MULTIPLE FREQ GAIN COMPRESSION**

GCFSOFF Turn the multiple gain compression fixed scale fla OFF **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: GCFSOFF

Related Commands: GCFSON, GCFS?

Front Panel Key: Freq \ **MULTIPLE FREQ GAIN COMPRESSION \ FIXED SCALE** or Appl \ **MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION \ SWEPT POWER GAIN COMPRESSION \ MULTIPLE FREQ GAIN**

GCFSON Turn the multiple gain compression fixed scale fla ON **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: GCFSON

Related Commands: GCFSON, GCFS?

Front Panel Key: Freq \ **MULTIPLE FREQ GAIN COMPRESSION \ FIXED SCALE** or Appl \ **MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION \ SWEPT POWER GAIN COMPRESSION \ MULTIPLE FREQ GAIN**

GCMP Enter gain compression point search value **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `GCMP Value Units`
Value: Number
Units: DB

Remarks: To search for the 1 dB gain compression point, enter a search value of 1 dB.

Data I/O: Enter the search value in ASCII <NRF> format.

Related Commands: SPGCA, GCMP?

Front Panel Key: Appl \ **SWEPT FREQUENCY GAIN COMPRESSION \ GAIN COMPRESSION POINT**

GCMP? Output gain compression point search value **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `GCMP?`

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: SPGCA, GCMP

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ GAIN COMPRESSION POINT (MAX REF)**

GCSNS210 Turn self normalization of S21 off **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `GCSNS210`

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET NORMALIZATION OF S21**

GCSNS211 Turn self normalization of S21 on **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `GCSNS211`

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET NORMALIZATION OF S21**

GCSNS21? Output self normalization of S21 status **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: GCSNS21?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET NORMALIZATION OF S21**

GCT Enter gate center value distance or time **APPL - TIME DOMAIN (Ch 10)**

Syntax: GCT Value Units
Value: -999.999 to 999.999 ms
Units: time = S, MS, USC, PS, PSC, NS, NSC; distance = M, MTR, MM, MMT, CM, CMT

Remarks: The *Value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x10 / SQROOT of dielectric constant

Use the query command DIX? to output the value. If the time domain parameter is time, *value* is assumed to be a time value.
If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ CENTER**

GCT? Output gate center value **APPL - TIME DOMAIN (Ch 10)**

Syntax: GCT?

Data I/O: Outputs value in ASCII <NR3> format.

Related Commands: GCT

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ CENTER**

GCYSP Enter the Y-stop power level for multiple frequenc **APPL - GAIN COMPRESSION (Ch 10)**
gain compression

Syntax: `GCYSP Value Units`
Value: Power level range of the MS462XX
Units: DB, XX1, XX3, XM3

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: GCYSP?, GCYST, GCYST?

Front Panel Key: Freq \ **MULTIPLE FREQ GAIN COMPRESSION \ Y STOP** or Appl \ **MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION \ SWEPT POWER GAIN COMPRESSION \ Y STOP**

GCYSP? Output the Y-stop power level for multiple fre- **APPL - GAIN COMPRESSION (Ch 10)**
quency gain compression

Syntax: `GCYSP?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: GCYSP, GCYST, GCYST?

Front Panel Key: Freq \ **MULTIPLE FREQ GAIN COMPRESSION** or Appl \ **MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION \ SWEPT POWER GAIN COMPRESSION**

GCYST Enter the Y-start power level for multiple fre- **APPL - GAIN COMPRESSION (Ch 10)**
quency gain compression

Syntax: `GCYST Value Units`
Value: Power level range of the MS462XX
Units: DB, XX1, XX3, XM3

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: GCYSP, GCYSP?, GCYST?

Front Panel Key: Freq \ **MULTIPLE FREQ GAIN COMPRESSION \ Y START** or Appl \ **MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION \ SWEPT POWER GAIN COMPRESSION \ Y START**

GCYST? Output the Y-start power level for multiple frequency gain compression — **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: GCYST?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: GCYSP, GCYSP?, GCYST

Front Panel Key: Freq \ **MULTIPLE FREQ GAIN COMPRESSION** or Appl \ **MEASUREMENT TYPE \ TRANSMISSION AND REFLECTION \ SWEPT POWER GAIN COMPRESSION**

GDS Gate symbols displayed on active channel — **APPL - TIME DOMAIN (Ch 10)**

Syntax: GDS

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE DISP**

GENS2P Generate S2P files in hard disk with default name (ntwk_p1.s2p, ..., ntwk_p4.s2p) from disk and calibrate — **HARD COPY (Ch 9)**

Syntax: GENS2P Filename1 Filename2
Value: See Remarks

Remarks: *Filename1.cal* and *Filename2.cal* are calibration files. They do not have to be the same file, but they have to be same port cal file. For example, if *Filename1.cal* is a 3-port cal file, then *Filename2.cal* has to be 3-port cal file also. Two 3-port cal files will generate three S2P files. They will be named as NTWK_P1.S2P, NTWK_P2.S2P, and NTWK_P3.S2P.

Data I/O: Input uses <String> data.

GHZ Suffix sets frequency data type and scales by 1E9 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: GHZ

GLS Select low sidelobe gate shape — **APPL - TIME DOMAIN (Ch 10)**

Syntax: GLS

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE SHAPE \ LOW SIDELOBE**

GMS Select minimum sidelobe gate shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: GMS

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE SHAPE \ MIN SIDELOBE**

GNM Select nominal gate shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: GNM

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE SHAPE \ NOMINAL**

GOF Turn off gating on active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: GOF

Related Commands: GOF?

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE OFF**

GOF? Output gating mode on active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: GOF?

Data I/O: Outputs its value using ASCII <NR1> format as follows:
0 for OFF
1 for ON
2 for DISPLAY gate symbols

Related Commands: GOF

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE**

GON Turn on gating on active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: GON

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE ON**

GPN Enter pen number for graticule **HARD COPY (Ch 9)**

Syntax: `GPN Value Units`
Value: 1 to 8
Units: XX1

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ PEN COLORS \ GRATICULE**

GPN? Output pen number for graticule **HARD COPY (Ch 9)**

Syntax: `GPN?`

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: GPN

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ PEN COLORS \ GRATICULE**

GRF? Output graph type for active channel **DISPLAY (Ch 5)**

Syntax: `GRF?`

Data I/O: Outputs its value using ASCII <NR1> format as follows:
1 for LOG MAG
2 for PHASE
3 for LOG MAG & PHASE
4 for SMITH-IMPEDANCE
5 for SWR
6 for GROUP DELAY
7 for SMITH-ADMITTANCE
8 for LIN POLAR
9 for LOG POLAR
10 for LIN MAG
11 for LIN MAG & PHASE
12 for REAL
13 for IMAGINARY
14 for REAL & IMAGINARY
15 for POWER OUT

Front Panel Key: Display \ **GRAPH TYPE**

GROUP1 Select Group 1 to be active group **DISPLAY (Ch 5)**

Syntax: GROUP1

Related Commands: GROUP?, GROUP2-GROUP4

Front Panel Key: Display \ **DISPLAY MODE** \ **SETUP DISPLAY GROUP** \ **GROUP 1**

GROUP2 Select Group 2 to be active group **DISPLAY (Ch 5)**

Syntax: GROUP2

Related Commands: GROUP?, GROUP1, GROUP3, GROUP4

Front Panel Key: Display \ **DISPLAY MODE** \ **SETUP DISPLAY GROUP** \ **GROUP 2**

GROUP3 Select Group 3 to be active group **DISPLAY (Ch 5)**

Syntax: GROUP3

Related Commands: GROUP?, GROUP1, GROUP2, GROUP4

Front Panel Key: Display \ **DISPLAY MODE** \ **SETUP DISPLAY GROUP** \ **GROUP 3**

GROUP4 Select Group 4 to be active group **DISPLAY (Ch 5)**

Syntax: GROUP4

Related Commands: GROUP?, GROUP1, GROUP2, GROUP4

Front Panel Key: Display \ **DISPLAY MODE** \ **SETUP DISPLAY GROUP** \ **GROUP 4**

GROUP? Output active group number **DISPLAY (Ch 5)**

Syntax: GROUP?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for GROUP 1
2 for GROUP 2
3 for GROUP 3
4 for GROUP 4

Related Commands: GROUP1-GROUP4

Front Panel Key: Display \ **DISPLAY MODE** \ **SETUP DISPLAY GROUP** \ **GROUP**

GRT Select Rectangular gate shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GRT`

Front Panel Key: Appl **\ DOMAIN \ SETUP \ GATE SETUP \ GATE SHAPE \ RECTANGULAR**

GRTCOL Enter the color number for the graticule **UTILITY (Ch 9)**

Syntax: `GRTCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 at the end of this chapter.

Related Commands: ANNCOL, GRTCOL, LAYCOL, MKRCOL, MNUCOL, TRCCOL, GRTCOL?

Front Panel Key: Utility **\ COLOR SETUP \ GRATICULE XX COLOR NAME**

GRTCOL? Output the color number for the graticule **UTILITY (Ch 9)**

Syntax: `GRTCOL?`

Data I/O: Outputs the color palette numbers in ASCII <NR1> format.

Related Commands: ANNCOL?, GRTCOL?, LAYCOL?, MKRCOL?, MNUCOL?, TRCCOL?, GRTCOL

Front Panel Key: Utility **\ COLOR SETUP \ GRATICULE XX COLOR NAME**

GSN Enter gate span value distance or time **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GSN Value Units`
Value: 0.0000 to 999.999 ms
Units: time = S, MS, USC, PS, PSC, NS, NSC; distance = M, MTR, MM, MMT, CM, CMT

Remarks: The *value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x10 / SQROOT of dielectric constant

Use the query command DIX? to output the value for dielectric constant. If the time domain parameter is time, *value* is assumed to be a time value. If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?

Front Panel Key: Appl **\ DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ SPAN**

GSN? Output gate span value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GSN?`

Data I/O: Outputs its value using ASCII <NR3> format.

Related Commands: GSN

Front Panel Key: Appl **\ DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ SPAN**

GSP Enter gate stop value distance or time **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GSP Value Units`
Value: -99.9999 to +999.9999 ms
Units: S, MS, USC, PS, PSC, NS, NSC

Remarks: The *value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x10 / SQROOT of dielectric constant

Use the query command DIX? to output the value for dielectric constant. If the time domain parameter is time, *value* is assumed to be a time value. If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?, GSP?

Front Panel Key: Appl **\ DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ STOP**

GSP? Output gate stop value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GSP?`

Data I/O: Outputs value using ASCII <NR3> format.

Related Commands: GSP

Front Panel Key: Appl **\ DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ STOP**

GST Enter gate start value distance or time **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GST Value Units`
Value: -99.9999 to +999.9999 ms
Units: S, MS, USC, PS, PSC, NS, NSC

Remarks: The *value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x10 / SQROOT of dielectric constant

Use the query command DIX? to output the value for dielectric constant. If the time domain parameter is time, *value* is assumed to be a time value. If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ START**

GST? Output gate start value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GST?`

Data I/O: Outputs value using ASCII <NR3> format.

Related Commands: GST

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ START**

GSX? Output Gate Shape setting **APPL - TIME DOMAIN (Ch 10)**

Syntax: `GSX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for RECTANGULAR
2 for NOMINAL
3 for LOW SIDELOBE
4 for MINIMUM SIDELOBE

Front Panel Key: Appl \ **DOMAIN \ SETUP \ GATE SETUP \ GATE SHAPE**

H Suffix sets farad data type and scales by 1E0 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `H`

HAR1 Select 1st harmonic (fundamental) frequency **APPL - HARMONIC (Ch 10)**

Syntax: `HAR1`

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (1)**

HAR2 Select 2nd harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: `HAR2`

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (2)**

HAR3 Select 3rd harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: `HAR3`

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (3)**

HAR4 Select 4th harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: `HAR4`

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (4)**

HAR5 Select 5th harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: `HAR5`

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (5)**

HAR6 Select 6th harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: HAR6

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (6)**

HAR7 Select 7th harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: HAR7

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (7)**

HAR8 Select 8th harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: HAR8

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (8)**

HAR9 Select 9th harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: HAR9

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ HARMONIC (9)**

HARCE Select harmonic enhancement correction **APPL - HARMONIC (Ch 10)**

Syntax: HARCE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **APPLY CAL ENHANCEMENT ONLY**

HARCEDONE? Output harmonic enhancement cal done status **APPL - HARMONIC (Ch 10)**

Syntax: HARCEDONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **CALIBRATE \ ENHANCEMENT CAL**

HARCEP Select harmonic enhancement and Phase correction **APPL - HARMONIC (Ch 10)**

Syntax: HARCEP

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **APPLY CAL ENHANCEMENT AND PHASE**

HARCEPDONE? Output harmonic enhancement and Phase cal done status **APPL - HARMONIC (Ch 10)**

Syntax: HARCEPDONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **CALIBRATE \ ENHANCEMENT & PHASE CAL**

HARCN Select No harmonic correction **APPL - HARMONIC (Ch 10)**

Syntax: HARCN

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **APPLY CAL NONE**

HARCPDONE? Output harmonic phase cal done status **APPL - HARMONIC (Ch 10)**

Syntax: HARCPDONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **CALIBRATE \ PHASE CAL**

HARCX? Output harmonic correction setting **APPL - HARMONIC (Ch 10)**

Syntax: HARCX?

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for NO CORRECTION
1 for ENHANCEMENT CORRECTION
2 for ENHANCEMENT AND PHASE CORRECTION

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY)** then Cal \ **APPLY CAL ENHANCEMENT ONLY**

HARDOF Select harmonic display relative to output fundamental frequency **APPL - HARMONIC (Ch 10)**

Syntax: HARDOF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ DISPLAY OUTPUT RELATIVE TO: OUTPUT FUNDAMENTAL**

HARDSF Select harmonic display relative to source fundamental frequency **APPL - HARMONIC (Ch 10)**

Syntax: HARDSF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ DISPLAY OUTPUT RELATIVE TO: SOURCE FUNDAMENTAL**

HARDSH Select harmonic display relative to source harmonic frequency **APPL - HARMONIC (Ch 10)**

Syntax: `HARDSH`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ DISPLAY OUTPUT RELATIVE TO: SOURCE HARMONIC**

HARDX? Output harmonic display setting **APPL - HARMONIC (Ch 10)**

Syntax: `HARDX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for RELATIVE TO SOURCE HARMONIC FREQUENCY
2 for RELATIVE TO SOURCE FUNDAMENTAL FREQUENCY
3 RELATIVE TO OUTPUT FUNDAMENTAL FREQUENCY

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ HARMONIC SETUP \ DISPLAY OUTPUT RELATIVE TO: SOURCE HARMONIC**

HARP12 Select ports 1 and 2 **APPL - HARMONIC (Ch 10)**

Syntax: `HARP12`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ PORTS 1,2**

HARP13 Select ports 1 and 3 **APPL - HARMONIC (Ch 10)**

Syntax: `HARP13`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ PORTS 1,3**

HARPX? Output ports 1 and 2 or 1 and 3 setting **APPL - HARMONIC (Ch 10)**

Syntax: `HARPX?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
12 for PORTS 1_2 and 13 for PORTS 1_3.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ HARMONIC (NON-MIXER ONLY) \ PORTS**

HARX? Output harmonic frequency number **APPL - HARMONIC (Ch 10)**

Syntax: HARX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NONE
1 for HARMONIC ENHANCEMENT CAL
2 for HARMONIC ENHANCEMENT AND PHASE CAL

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC (NON-MIXER ONLY)** \ **HARMONIC SETUP** \ **HARMONIC**

HC0 Disable internal IF calibration **SWEEP (Ch 5)**

Syntax: HC0

Remarks: Prevents VNMS from periodically and automatically performing the internal calibration, to allow for synchronization between the MS462XX and a physical activity such as antenna rotation. Turn on IF Cal as soon as measurement is complete to retain maximum measurement accuracy.

Related Commands: HC1, HCX?, HCT

Front Panel Key: Sweep \ **MORE** \ **TRIGGERS** \ **I.F. CALIBRATION AUTOMATIC OFF**

HC1 Enable internal IF calibration and trigger an IF calibration **SWEEP (Ch 5)**

Syntax: HC1

Related Commands: HC0, HCX?, HCT

Front Panel Key: Sweep \ **MORE** \ **TRIGGERS** \ **I.F. CALIBRATION AUTOMATIC ON**

HCT Trigger an IF calibration **SWEEP (Ch 5)**

Syntax: HCT

Related Commands: HC0, HC1

Front Panel Key: Sweep \ **MORE** \ **TRIGGERS** \ **TRIGGER IF CAL**

HCX? Output internal IF calibration enable/disable status **SWEEP (Ch 5)**

Syntax: HCX?

Data I/O: Outputs its value using ASCII <NR1> format as follows:
0 for DISABLED
1 for ENABLED

Front Panel Key: Sweep \ **MORE** \ **TRIGGERS** \ **I.F. CALIBRATION AUTOMATIC**

HD0 Turn off tabular data headers and page formatting **HARD COPY (Ch 9)**

Syntax: HD0

Remarks: Turns off the tabular data headers and page formatting from tabular data printing or disk saves.

Related Commands: HD1

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT GRAPHICAL DATA** \ **HEADER OFF**

HD1 Turn on tabular data headers and page formatting **HARD COPY (Ch 9)**

Syntax: HD1

Remarks: Turns on the tabular data headers and page formatting from tabular data printing or disk saves.

Related Commands: HD0

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT GRAPHICAL DATA** \ **HEADER ON**

HDX? Output tabular data headers and page formatting on/off status **HARD COPY (Ch 9)**

Syntax: HDX?

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: HD0, HD1

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT GRAPHICAL DATA** \ **HEADER**

HELP0 Turn off help display **APPL (Ch 10)**

Syntax: `HELP0`

HELP1 Turn on help display **APPL (Ch 10)**

Syntax: `HELP1`

HELPX? Output help display on/off status **APPL (Ch 10)**

Syntax: `HELPX?`

Data I/O: Outputs Help display on/off status using ASCII <NR1> integer values as follows:
0 when OFF
1 when ON

HID Hide active segmented limit **DISPLAY - LIMITS (Ch 7)**

Syntax: `HID`

Related Commands: DIS, CH1-CH4

HIGHF? Output the highest frequency **REMOTE - MISC (Ch 8)**

Syntax: `HIGHF?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

HLD Put sweep into hold mode **HOLD (Ch 5)**

Syntax: `HLD`

Related Commands: CTN, BH0, BH1, RH0, RH1

Front Panel Key: Config **\ HOLD \ HOLD FUNCTION HOLD (SINGLE SWEEP AND HOLD)**

HLD? Output the sweep hold status **HOLD (Ch 5)**

Syntax: HLD?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: HLD, CTN

Front Panel Key: Config \ **HOLD** \ **HOLD FUNCTION**

HPN Enter pen number for header **HARD COPY (Ch 9)**

Syntax: HPN Value Units
Value: 1 to 8
Units: XX1

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **PLOT FORMAT** \ **PEN COLORS** \ **HEADER**

HPN? Output pen number for header **HARD COPY (Ch 9)**

Syntax: HPN?

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: HPN

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **PLOT FORMAT** \ **PEN COLORS** \ **HEADER**

HZ Suffix sets frequency data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: HZ

IACCHAR Input AutoCal characterization data from the GPIB **CAL - AUTOCAL (Ch 6)**

Syntax: IACCHAR

Data I/O: Outputs an <Arbitrary ASCII> format

Related Commands: OACCHAR, OACSER, OACTYPE

IARF Enter adapter removal files from GPIB and calibrate **CAL (Ch 6)**

Syntax: `IARF Value1 Value2`
Value: See "Remarks"

Remarks: Term *Value1* is the XX front panel and calibration file data and *Value2* is the YY front panel and cal file data. See the Adapter Removal application for details.

Data I/O: Each of the blocks, *Value1* and *Value2* are in <Arbitrary Block> format. Notice the comma separator.

Related Commands: OCD, DISKWR, LDARF

Front Panel Key: Cal **\ MORE \ PERFORM ADAPTER REMOVAL \ REMOVE ADAPTER**

IC1 Enter calibration coefficient 1 **REMOTE - CAL (Ch 8)**

Syntax: `IC1 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC10 Enter calibration coefficient 10 **REMOTE - CAL (Ch 8)**

Syntax: `IC10 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC11 Enter calibration coefficient 11 **REMOTE - CAL (Ch 8)**

Syntax: `IC11 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC12 Enter calibration coefficient 12 **REMOTE - CAL (Ch 8)**

Syntax: `IC12 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC13 Enter calibration coefficient 13 **REMOTE - CAL (Ch 8)**

Syntax: `IC13 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC14 Enter calibration coefficient 14 **REMOTE - CAL (Ch 8)**

Syntax: `IC14 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC15 Enter calibration coefficient 15 **REMOTE - CAL (Ch 8)**

Syntax: `IC15 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC16 Enter calibration coefficient 16 **REMOTE - CAL (Ch 8)**

Syntax: `IC16 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC17 Enter calibration coefficient 17 **REMOTE - CAL (Ch 8)**

Syntax: `IC17 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC18 Enter calibration coefficient 18 **REMOTE - CAL (Ch 8)**

Syntax: `IC18 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC19 Enter calibration coefficient 19 **REMOTE - CAL (Ch 8)**

Syntax: `IC19 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC2 Enter calibration coefficient 2 **REMOTE - CAL (Ch 8)**

Syntax: `IC2 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC20 Enter calibration coefficient 20 **REMOTE - CAL (Ch 8)**

Syntax: `IC20 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC21 Enter calibration coefficient 21 **REMOTE - CAL (Ch 8)**

Syntax: `IC21 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC22 Enter calibration coefficient 22 **REMOTE - CAL (Ch 8)**

Syntax: `IC22 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC23 Enter calibration coefficient 23 **REMOTE - CAL (Ch 8)**

Syntax: `IC23 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC24 Enter calibration coefficient 24 **REMOTE - CAL (Ch 8)**

Syntax: `IC24 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC25 Enter calibration coefficient 25 **REMOTE - CAL (Ch 8)**

Syntax: `IC25`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC26 Enter calibration coefficient 26 **REMOTE - CAL (Ch 8)**

Syntax: `IC26`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC27 Enter calibration coefficient 27 **REMOTE - CAL (Ch 8)**

Syntax: `IC27`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC28 Enter calibration coefficient 28 **REMOTE - CAL (Ch 8)**

Syntax: `IC28`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC29 Enter calibration coefficient 29 **REMOTE - CAL (Ch 8)**

Syntax: `IC29`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC3 Enter calibration coefficient 3 **REMOTE - CAL (Ch 8)**

Syntax: `IC3 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC30 Enter calibration coefficient 30 **REMOTE - CAL (Ch 8)**

Syntax: `IC30`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC31 Enter calibration coefficient 31 **REMOTE - CAL (Ch 8)**

Syntax: `IC31`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC32 Enter calibration coefficient 32 **REMOTE - CAL (Ch 8)**

Syntax: `IC32`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC33 Enter calibration coefficient 33 **REMOTE - CAL (Ch 8)**

Syntax: `IC33`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC34 Enter calibration coefficient 34 **REMOTE - CAL (Ch 8)**

Syntax: `IC34`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC35 Enter calibration coefficient 35 **REMOTE - CAL (Ch 8)**

Syntax: `IC35`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC36 Enter calibration coefficient 36 **REMOTE - CAL (Ch 8)**

Syntax: `IC36`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4D

IC37 Enter calibration coefficient 37 **REMOTE - CAL (Ch 8)**

Syntax: `IC37`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC38 Enter calibration coefficient 38 **REMOTE - CAL (Ch 8)**

Syntax: `IC38`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC39 Enter calibration coefficient 39 **REMOTE - CAL (Ch 8)**

Syntax: `IC39`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC4 Enter calibration coefficient 4 **REMOTE - CAL (Ch 8)**

Syntax: `IC4 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC40 Enter calibration coefficient 40 **REMOTE - CAL (Ch 8)**

Syntax: `IC40`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC5 Enter calibration coefficient 5 **REMOTE - CAL (Ch 8)**

Syntax: `IC5 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC6 Enter calibration coefficient 6 **REMOTE - CAL (Ch 8)**

Syntax: `IC6 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC7 Enter calibration coefficient 7 **REMOTE - CAL (Ch 8)**

Syntax: `IC7 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC8 Enter calibration coefficient 8 **REMOTE - CAL (Ch 8)**

Syntax: `IC8 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

IC9 Enter calibration coefficient 9 **REMOTE - CAL (Ch 8)**

Syntax: `IC9 Value`
Value: <Arbitrary Block>

Remarks: Allows entry of the user defined error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter. Prior to entering error terms, set the desired calibration type simulation with the matching Axx series calibration command (see Calibration Group). After inputting the error coefficients, turn on error correction with the CON command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

ICA Enter calibration coefficient 10 **REMOTE - CAL (Ch 8)**

Syntax: `ICA Value`
Value: <Arbitrary Block>

Remarks: ICA, ICB, and ICC are equivalents of IC10, IC11, and IC12 comands respectively.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

ICB Enter calibration coefficient 11 **REMOTE - CAL (Ch 8)**

Syntax: `ICB Value`
Value: <Arbitrary Block>

Remarks: Same as ICA

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

ICC Enter calibration coefficient 12 **REMOTE - CAL (Ch 8)**

Syntax: `ICC Value`
Value: <Arbitrary Block>

Remarks: Same as ICA.

Related Commands: IFMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

ICD Enter corrected data for active channel parameter **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `ICD Value`
Value: <Arbitrary Block>

Remarks: Data correction is for normalization and electrical length and, if applicable, time domain. Place the MS462XX in hold (HLD) then issue the ICD command.

Data I/O: Inputs a floating point array whose size is equal to twice the number of points in the current sweep (real and imaginary data pairs for each point). The ICD command inputs an <Arbitrary Block>.

Related Commands: FMA, FMB, FMC, LSB, MSB, IFD, OCD, ONP, HLD, WFS, CH1, CH4

ICF Enter front panel setup and calibration data **REMOTE - SETUP (Ch 8)**

Syntax: `ICF Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OCF command. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OCF, IFP

ICFEDE Enter the front panel setup, calibration, and EDE data **REMOTE - SETUP (Ch 8)**

Syntax: `ICFEDE Value`
Value: See Data I/O below.

Data I/O: Enter data as an <Arbitrary Block>.

Related Commands: OCFEDE

ICFSG Enter the segmented sweep data **REMOTE - SETUP (Ch 8)**

Syntax: `ICFSG Value`
Value: See Data I/O below.

Data I/O: Enter data as an <Arbitrary Block>.

Related Commands: OCFSG

ICL Enter all applicable calibration coefficients for cal type — **REMOTE - CAL (Ch 8)**

Syntax: `ICL Value`
Value: <Arbitrary Block>

Remarks: Enter all error correction coefficients applicable to the current calibration type; see Table 11-1 at the end of this chapter. Prior to entering error terms, set the calibration type simulation with the corresponding Axx series calibration command (see Calibration Group). After inputting the error coefficients, apply error coeficients to measurement data with the CON command.

Data I/O: Inputs a floating point array whose size is equal to the currently set number of data points. The ICL command inputs an <Arbitrary Block> containing either ASCII or binary formatted data depending on currently selected format (see format selector commands FMA, FMB, FMC).

Related Commands: FMA, FMB, FMC, OCL, IC1-IC12, CON

ICL3P Enter additional 12 calibration coefficients for 3-port — **REMOTE - CAL (Ch 8)**

Syntax: `ICL3P Value`
Value: <Arbitrary Block>

ICM0 Turn interchannel math off — **DISPLAY (Ch 5)**

Syntax: `ICM0`

Front Panel Key: Display \ **INTERCHANNEL MATH** \ **INTERCHANNEL MATH OFF**

ICM1 Turn interchannel math on — **DISPLAY (Ch 5)**

Syntax: `ICM1`

Front Panel Key: Display \ **INTERCHANNEL MATH** \ **INTERCHANNEL MATH ON**

ICMX? Output interchannel math on/off status — **DISPLAY (Ch 5)**

Syntax: `ICMX?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Front Panel Key: Display \ **INTERCHANNEL MATH** \ **INTERCHANNEL MATH**

ICOP1 Enter interchannel num for operand 1 **DISPLAY (Ch 5)**

Syntax: `ICOP1`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Display \ **INTERCHANNEL MATH** \ **CHANNEL NUM FOR OPERAND 1**

ICOP1? Output interchannel num for operand 1 **DISPLAY (Ch 5)**

Syntax: `ICOP1?`

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Display \ **INTERCHANNEL MATH** \ **CHANNEL NUM FOR OPERAND 1**

ICOP2 Enter interchannel num for operand 2 **DISPLAY (Ch 5)**

Syntax: `ICOP2`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Display \ **INTERCHANNEL MATH** \ **CHANNEL NUM FOR OPERAND 2**

ICOP2? Output interchannel num for operand 2 **DISPLAY (Ch 5)**

Syntax: `ICOP2?`

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Display \ **INTERCHANNEL MATH** \ **CHANNEL NUM FOR OPERAND 2**

IEM Enter extended status byte mask **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: `IEM Value`
Value: 0 to 32767

Remarks: Sets the bits of the Standard Event Status Enable Register to the binary weighted bit pattern of the decimal value entered. The register is cleared by sending a value of 0.

Related Commands: OEM, OEB

IF1 Select 10 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IF1`

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 10 Hz**

IF2 Select 100 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IF2`

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 100 Hz**

IF3 Select 1 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IF3`

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 1 kHz**

IF4 Select 10 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IF4`

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 10 kHz**

IFA Select 30 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IFA`

Remarks: Same as IF4.

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 30 kHz**

IFBW10 Select 10 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW10`

Related Commands: IFBWX?

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 10 Hz**

IFBW100 Select 100 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW100`

Related Commands: IFBWX?

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 100 Hz**

IFBW10K Select 10 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW10K`

Related Commands: IFBWX?

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 10 kHz**

IFBW1K Select 1 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW1K`

Related Commands: IFBWX?

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 1 kHz**

IFBW30 Select 30 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW30`

Related Commands: IFBWX?

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 30 Hz**

IFBW300 Select 300 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW300`

Related Commands: IFBWX?

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 300 Hz**

IFBW30K Select 30 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW30K`

Related Commands: IFBWX?

Front Panel Key: Avg **\ SELECT I.F. BANDWIDTH \ I.F BW 30 kHz**

IFBW3K Select 3 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IFBW3K`

Related Commands: IFBWX?

Front Panel Key: Avg **\ SELECT I.F. BANDWIDTH \ I.F BW 3 kHz**

IFBWX? Output IF bandwidth (10-30000) **AVG (Ch 5)**

Syntax: `IFBWX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
10 for 10 Hz
30 for 30 Hz
100 for 100 Hz
300 for 300 Hz
1000 for 1 kHz
3000 for 3 kHz
10000 for 10 kHz
30000 for 30 kHz

Related Commands: IFBW10, IFBW100, IFBW10K, IFBW1K, IFBW30, IFBW300, IFBW30K, IFBW3K

Front Panel Key: Avg **\ SELECT I.F. BANDWIDTH \ I.F BW**

IFD Enter final data for active channel parameter **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `IFD Value`
Value: <Arbitrary Block>

Remarks: Places the MS462XX in hold (HLD); then issues the IFD command. Data must match the current graph type as shown in Table 11-2 at the end of this chapter.

Data I/O: Inputs a floating point array whose size is equal to the number of points in the current sweep (the arrary size is doubled for dual graph displays, i.e., log mag/phase). The IFD command inputs an <Arbitrary Block> containing either ASCII or binary formatted data depending on currently selected format (see format selector commands FMA, FMB, FMC).

Related Commands: ICD, OFD, FMA, FMB, FMC, LSB, MSB, DPR0, DPR1, HLD, ONP, CH1-CH4

IFM Select 10 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IFM`

Remarks: Same as IF1.

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 10 Hz**

IFN Select 1 kHz IF bandwidth **AVG (Ch 5)**

Syntax: `IFN`

Remarks: Same as IF3.

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 1 kHz**

IFP Enter current front panel setup **REMOTE - SETUP (Ch 8)**

Syntax: `IFP Value`
Value: <Arbitrary Block>

Remarks: The VNMS will validate then change to the new setup.

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OFP command. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OFP, ICF

IFR Select 100 Hz IF bandwidth **AVG (Ch 5)**

Syntax: `IFR`

Remarks: Same as IF2.

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW 100 Hz**

IFV Enter frequency values **APPL (Ch 10)**

Syntax: `IFV Value`
Value: <Arbitrary Block>

Remarks: Inputs a list of frequencies for use as current sweep or for calibration setup. NOTE: IFV will reset (delete) existing calibration sweep and data.

Data I/O: An array of from 2 to 1601 floating point values containing frequencies within the MS462XX range. The IFV command inputs an <Arbitrary Block> containing either ASCII or binary formatted data depending on currently selected format (see format selector commands FMA, FMB, FMC).

Related Commands: FMA, FMB, FMC, LSB, MSB, DFC, ONP, WFS

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **SWEPT POWER GAIN COMPRESSION** \ **SET FREQUENCIES**

IFX? Output IF bandwidth (1-4) **AVG (Ch 5)**

Syntax: `IFX?`

Data I/O: Outputs its value in ASCII <NR1> format as follows:
1 for 10 Hz
2 for 100 Hz
3 for 1 kHz
4 for 10 kHz

Front Panel Key: Avg \ **SELECT I.F. BANDWIDTH** \ **I.F BW**

IHDW Enter hardware cal data from GPIB **REMOTE - MISC (Ch 8)**

Syntax: `IHDW Value`
Value: See "Remarks"

Remarks: *Value* is the hardware calibration data previously output using the command OHDW.

Data I/O: The data is expected in <Ararbitrary Block> format. Notice that it is not necessary to specify the type of hardware cal data as this information is contained within the data itself.

Related Commands: OHDW, DISKWR, RECALL

IKIT Enter calkit data from GPIB **REMOTE - MISC (Ch 8)**

Syntax: `IKIT Value1 Value2`
Value: See "Remarks"

Remarks: *Value1* is a three-letter string which indicates the type of calibration kit data file. *Value2* is the actual calibration kit data. Notice the comma separator. Calibration kit data files can be found on the data floppy disks that come with the calibration kits. The type string is the 3 character extension of the data file.

Data I/O: The data, *value*, is encapsulated in an <Arbitrary Block> format.

Related Commands: LKT, DISKWR, RECALL

ILM Enter limits status byte mask **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: `ILM Value`
Value: 0 to 255

Remarks: Sets the bits of the Standard Event Status Enable Register to the binary weighted bit pattern of the decimal value entered. The register is cleared by sending a value of 0. NOTE: The Limits Testing feature must be turned on (LT1) for the MS462XX to report a limits pass/fail status.

Related Commands: OLM, OLB, LT1

IMD3 Select 3rd order intermodulation products **APPL - IMD (Ch 10)**

Syntax: `IMD3`

Related Commands: IMD5, IMD7, IMD9, IMDOX?

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **IMD ORDER 3**

IMD5 Select 5th order intermodulation products **APPL - IMD (Ch 10)**

Syntax: `IMD5`

Related Commands: IMD3, IMD7, IMD9, IMDOX?

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **IMD ORDER 5**

IMD7 Select 7th order intermodulation products **APPL - IMD (Ch 10)**

Syntax: `IMD7`

Related Commands: IMD3, IMD5, IMD9, IMDOX?

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **IMD ORDER 7**

IMD9 Select 9th order intermodulation products **APPL - IMD (Ch 10)**

Syntax: `IMD9`

Related Commands: IMD3, IMD5, IMD7, IMDOX?

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **IMD ORDER 9**

IMDC0 Turn off IMD correction **APPL - IMD (Ch 10)**

Syntax: `IMDC0`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **IMD CORRECTION OFF**

IMDC1 Turn on IMD correction **APPL - IMD (Ch 10)**

Syntax: IMDC1

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **IMD CORRECTION ON**

IMDCDONE? Output IMD cal done status **APPL - IMD (Ch 10)**

Syntax: IMDCDONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **IMD CORRECTION DONE**

IMDCX? Output IMD correction on/off status **APPL - IMD (Ch 10)**

Syntax: IMDCX?

Data I/O: Outputs delta reference mode on/off status using ASCII <NR1 > format as follows:
1 for ON
0 for OFF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** then Cal \ **IMD CORRECTION**

IMDDI Display IMD intercept **APPL - IMD (Ch 10)**

Syntax: IMDDI

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **DISPLAY SELECTION** \ **THIRD ORDER INTERMODULATION INTERCEPT**

IMDDP Display IMD product **APPL - IMD (Ch 10)**

Syntax: IMDDP

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **DISPLAY SELECTION** \ **THIRD ORDER INTERMODULATION PRODUCT**

IMDDX? Output IMD display selection **APPL - IMD (Ch 10)**

Syntax: IMDDX?

Data I/O: Outputs delta reference mode on/off status using ASCII <NR1 > format as follows:
1 for INTERCEPT
2 for PRODUCT

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ DISPLAY SELECTION \ THIRD ORDER INTERMODULATION**

IMDLOS2 Select source 2 for IMD LO **APPL - IMD (Ch 10)**

Syntax: IMDLOS2

IMDLOS3 Select source 3 for IMD LO **APPL - IMD (Ch 10)**

Syntax: IMDLOS3

IMDLOS4 Select source 4 for IMD LO **APPL - IMD (Ch 10)**

Syntax: IMDLOS4

IMDLOSX? Output IMD tone 1 source number **APPL - IMD (Ch 10)**

Syntax: IMDLOSX?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

IMDMRI Select Input as measurement reference for IMD **APPL - IMD (Ch 10)**

Syntax: IMDMRI

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ DISPLAY SELECTION \ MEAS. REFERENCE INPUT**

IMDMRO Select Output as measurement reference for IMD **APPL - IMD (Ch 10)**

Syntax: `IMDMRO`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ DISPLAY SELECTION \ MEAS. REFERENCE OUTPUT**

IMDMRX? Output measurement reference for IMD **APPL - IMD (Ch 10)**

Syntax: `IMDMRX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for RF INPUT POWER
2 for RF OUTPUT POWER

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ DISPLAY SELECTION \ MEAS. REFERENCE**

IMDOX? Output IMD ORDER selection **APPL - IMD (Ch 10)**

Syntax: `IMDOX?`

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: IMD3, IMD5, IMD7, IMD9

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ IMD ORDER**

IMDRT1 Select IMD relative to tone 1 **APPL - IMD (Ch 10)**

Syntax: `IMDRT1`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ DISPLAY SELECTION \ MEASURE RELATIVE TO TONE 1**

IMDRT2 Select IMD relative to tone 2 **APPL - IMD (Ch 10)**

Syntax: `IMDRT2`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ DISPLAY SELECTION \ MEASURE RELATIVE TO TONE 2**

IMDRTX? Output IMD display relative to tone number selection **APPL - IMD (Ch 10)**

Syntax: IMDRTX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for TRUE
2 for FALSE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ DISPLAY SELECTION \ MEASURE RELATIVE TO**

IMDSSMA Select source selection apply mode **APPL - IMD (Ch 10)**

Syntax: IMDSSMA

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ SELECTION MODE: APPLY**

IMDSSMD Select source selection define mode **APPL - IMD (Ch 10)**

Syntax: IMDSSMD

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ SELECTION MODE: DEFINE**

IMDSSMX? Output source selection mode **APPL - IMD (Ch 10)**

Syntax: IMDSSMX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for TRUE
2 for FALSE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ SELECTION MODE**

IMDT1S1 Select source 1 for IMD tone 1 **APPL - IMD (Ch 10)**

Syntax: IMDT1S1

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ TONE 1 IS SOURCE (1)**

IMDT1S2 Select source 2 for IMD tone 1 **APPL - IMD (Ch 10)**

Syntax: `IMDT1S2`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ TONE 1 IS SOURCE 2**

IMDT1S3 Select source 3 for IMD tone 1 **APPL - IMD (Ch 10)**

Syntax: `IMDT1S3`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ TONE 1 IS SOURCE 3**

IMDT1S4 Select source 4 for IMD tone 1 **APPL - IMD (Ch 10)**

Syntax: `IMDT1S4`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ TONE 1 IS SOURCE 4**

IMDT1SX? Output IMD tone 1 source number **APPL - IMD (Ch 10)**

Syntax: `IMDT1SX?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ TONE 1 IS SOURCE**

IMDT2OFF Enter IMD tone 2 offset **APPL - IMD (Ch 10)**

Syntax: `IMDT2OFF Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ IMD \ TONE 2 OFFSET**

IMDT2OFF? Output IMD tone 2 offset **APPL - IMD (Ch 10)**

Syntax: `IMDT2OFF?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **TONE 2 OFFSET**

IMDT2S1 Select source 1 for IMD tone 2 **APPL - IMD (Ch 10)**

Syntax: `IMDT2S1`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **SOURCE SELECTION** \ **TONE 2 IS SOURCE (1)**

IMDT2S2 Select source 2 for IMD tone 2 **APPL - IMD (Ch 10)**

Syntax: `IMDT2S2`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **SOURCE SELECTION** \ **TONE 2 IS SOURCE (2)**

IMDT2S3 Select source 3 for IMD tone 2 **APPL - IMD (Ch 10)**

Syntax: `IMDT2S3`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **SOURCE SELECTION** \ **TONE 2 IS SOURCE (3)**

IMDT2S4 Select source 4 for IMD tone 2 **APPL - IMD (Ch 10)**

Syntax: `IMDT2S4`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **SOURCE SELECTION** \ **TONE 2 IS SOURCE (4)**

IMDT2SX? Output IMD tone 2 source number **APPL - IMD (Ch 10)**

Syntax: IMDT2SX?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **IMD** \ **SOURCE SELECTION** \ **TONE 2 IS SOURCE**

IMG Select imaginary display for active channel **DISPLAY (Ch 5)**

Syntax: IMG

Related Commands: DLA, CH1-CH4, ISC, ISE, ISM, IMG, LIN, MAG, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **MORE** \ **MORE** \ **IMAGINARY**

IMPCOMPU? Output computation method selection for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPCOMPU?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for POWER
2 for PSEUDO

Related Commands: IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **COMPUTATION METHOD** \ **POWER WAVE**

IMPPORT Enter port number as active for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPPORT

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: IMPCOMPU?, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **PORT X**

IMPPORT? Output active port number for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPPORT?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: IMPCOMPU?, IMPPORT, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **PORT X**

IMPPOWER Select power-wave as computation method for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPPOWER

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **COMPUTATION METHOD** \ **POWER WAVE**

IMPPSEUDO Select pseudo-wave as computation method for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPPSEUDO

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **COMPUTATION METHOD** \ **PSUEDO WAVE**

IMPREACT Enter reactive term for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPREACT

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **REACTIVE TERM**

IMPREACT? Output reactiv term for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPREACT?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config **\ IMPEDANCE TRANSFORMATION \ REACTIVE TERM**

IMPRESIST Enter resistive term for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPRESIST

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST?, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config **\ IMPEDANCE TRANSFORMATION \ RESISTIVE TERM**

IMPRESIST? Output resistive term for impedance transformation **CONFIG (Ch 5)**

Syntax: IMPRESIST?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPTS?, IMPTS0, IMPTS1

Front Panel Key: Config **\ IMPEDANCE TRANSFORMATION \ RESISTIVE TERM**

IMPTS0 Turn impedance transformation mode off **CONFIG (Ch 5)**

Syntax: IMPTS0

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS1

Front Panel Key: Config **\ IMPEDANCE TRANSFORMATION \ IMPEDANCE TRANSFORMATION ON**

IMPTS1 Turn impedance transformation mode on **CONFIG (Ch 5)**

Syntax: `IMPTS1`

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS?, IMPTS0

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **IMPEDANCE TRANSFORMATION OFF**

IMPTS? Output impedance transformation mode status **CONFIG (Ch 5)**

Syntax: `IMPTS?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: IMPCOMPU?, IMPPORT, IMPPORT?, IMPPOWER, IMPPSEUDO, IMPREACT, IMPREACT?, IMPRESIST, IMPRESIST?, IMPTS0, IMPTS1

Front Panel Key: Config \ **IMPEDANCE TRANSFORMATION** \ **IMPEDANCE TRANSFORMATION**

IMU Suffix sets imaginary data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `IMU`

INRM Enter normalization data from GPIB **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `INRM Value`
Value: See "Remarks"

Remarks: *Value* is the normalization data encapsulated in an <Arbitrary Block> format. The normalization data is that which was gotten previously by reading a normalization data file (*.NRM) or by using the command ONRM.

Related Commands: ONRM, DISKWR, RECALL

INT Initialize (format) floppy disk **UTILITY - DISK (Ch 9)**

Syntax: `INT`

Remarks: Initializes (formats) floppy disk in floppy drive to IBM/DOS 1.44 MB format. Command can take up to five minutes to complete format. NOTE: All data on floppy disk will be erased immediately upon execution of this command.

Related Commands: *OPC, *OPC?

Front Panel Key: Utility **\ GENERAL DISK UTILITIES \ FORMAT HARD DISK** or **GENERAL DISK UTILITIES \ FLOPPY DISK UTILITIES \ FORMAT FLOPPY DISK**

IPM Enter the 488.2 service request enable mask **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: `IPM Value`
Value: 0 to 55

Remarks: Behaves exactly the same as the *SRE, 488.2 common command. It sets the bits of the Service Request Enable Register to the binary weighted bit pattern of the decimal value entered. The register is cleared by sending a value of 0. Note that the Master Summary Status (MSS) bit 6 (decimal 64) will be ignored since it represents the summary of all enabled status bits (bits 0-5, 7). This command is same as *SRE.

IS1 Enter front panel setup 1 **REMOTE - SETUP (Ch 8)**

Syntax: `IS1 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS10 Enter front panel setup 10 **REMOTE - SETUP (Ch 8)**

Syntax: `IS10 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS2 Enter front panel setup 2 **REMOTE - SETUP (Ch 8)**

Syntax: `IS2 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS3 Enter front panel setup 3 **REMOTE - SETUP (Ch 8)**

Syntax: `IS3 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS4 Enter front panel setup 4 **REMOTE - SETUP (Ch 8)**

Syntax: `IS4 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS5 Enter front panel setup 5 **REMOTE - SETUP (Ch 8)**

Syntax: `IS5 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS6 Enter front panel setup 6 **REMOTE - SETUP (Ch 8)**

Syntax: `IS6 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS7 Enter front panel setup 7 **REMOTE - SETUP (Ch 8)**

Syntax: `IS7 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS8 Enter front panel setup 8 **REMOTE - SETUP (Ch 8)**

Syntax: `IS8 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

IS9 Enter front panel setup 9 **REMOTE - SETUP (Ch 8)**

Syntax: `IS9 Value`
Value: <Arbitrary Block>

Data I/O: Outputs <Arbitrary Block> formatted data previously output using the OS1-OS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Related Commands: OS1-S10

ISC Enter scale and select inverted compressed Smith chart display — **DISPLAY (Ch 5)**

Syntax: `ISC Value Units`
Value: 0
Units: DBL, XX1

Related Commands: DLA, CH1-CH4, IMG, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **SMITH CHART (ADMITTANCE)** then \ **SCALE** \ **COMPRESS 3 dB**

ISE Enter scale and select inverted expanded Smith chart display — **DISPLAY (Ch 5)**

Syntax: `ISE Value Units`
Value: -3, 0, 10, 20, 30
Units: DBL, XX1

Related Commands: DLA, CH1-CH4, IMG, ISC, ISM, LIN, MAG, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **SMITH CHART (ADMITTANCE)** then \ **SCALE** \ **EXPAND**

ISF Exclude isolation — **CAL (Ch 6)**

Syntax: `ISF`

Related Commands: ISN, C12, C8T, C8R

Front Panel Key: Cal \ **PERFORM CAL** \ **2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **EXCLUDE ISOLATION**

ISM Select normal inverted Smith chart for active channel — **DISPLAY (Ch 5)**

Syntax: `ISM`

Related Commands: DLA, CH1-CH4, ISC, ISE, LIN, MAG, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **SMITH CHART (ADMITTANCE)** then \ **SCALE** \ **NORMAL SMITH**

ISN Include isolation — **CAL (Ch 6)**

Syntax: ISN

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION**

ISX? Output isolation calibration selected true/false — **CAL (Ch 6)**

Syntax: ISX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for TRUE
1 for FALSE

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION**

K Suffix sets degrees Kelvin data type — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: K

KEC Keep existing calibration data — **CAL (Ch 6)**

Syntax: KEC

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **KEEP EXISTING CAL DATA**

KEL Suffix sets degrees Kelvin data type — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: KEL

KHZ Suffix sets frequency data type and scales by 1E3 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: KHZ

LAND Select landscape mode for output plot — **HARD COPY (Ch 9)**

Syntax: LAND

Related Commands: PORT

Front Panel Key: Hard Copy \ **PAGE ORIENTATION/LANDSCAPE**

LANG Enable the specified language support **UTILITY (Ch 9)**

Syntax: `LANG Value`
Value: Language name string (5 or 6 characters)

Data I/O: The string input is 8753D or NATIVE.

Related Commands: LANG?, IDN

Front Panel Key: Utility **\ REMOTE INTERFACE \ SELECT LANGUAGE**

LANG? Query the current language support **UTILITY (Ch 9)**

Syntax: `LANG?`

Data I/O: Returns the current language mode:
8753D or NATIVE.

Related Commands: LANG, IDN

Front Panel Key: Utility **\ REMOTE INTERFACE \ SELECT LANGUAGE**

LAYCOL Enter the color number for overlay data **UTILITY (Ch 9)**

Syntax: `LAYCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 at the end of this chapter.

Related Commands: ANNCOL, GRTCOL, LAYCOL, MKRCOL, MNUCOL, TRCCOL, LAYCOL?

Front Panel Key: Utility **\ COLOR SETUP \ ALTERNATE SWEEP & OVERLAY DATA XX COLOR NAME**

LAYCOL? Output the color number for overlay data **UTILITY (Ch 9)**

Syntax: `LAYCOL?`

Data I/O: Outputs the color palette number using ASCII <NR1> format.

Related Commands: DATCOL?, GRTCOL?, LAYCOL?, MKRCOL?, MNUCOL?, TRCCOL?, LAYCOL

Front Panel Key: Utility **\ COLOR SETUP \ ALTERNATE SWEEP & OVERLAY DATA XX COLOR NAME**

LB0 Turn limits testing beep on failure off **DISPLAY - LIMITS (Ch 7)**

Syntax: `LB0`

Related Commands: LB0, LT0, LBX?

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE) TEST LIMITS \ BEEP ON FAILURE OFF**

LB1 Turn limits testing beep on failure on **DISPLAY - LIMITS (Ch 7)**

Syntax: `LB1`

Remarks: Issues an audible beep if a set limit is exceeded.

Related Commands: LB0, LT0, LBX?

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE) TEST LIMITS \ BEEP ON FAILURE ON**

LBX? Output limits testing beeper enable status **DISPLAY - LIMITS (Ch 7)**

Syntax: `LBX?`

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for DISABLED
1 for ENABLED

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE) TEST LIMITS \ BEEP ON FAILURE ON**

LCM Select LRL calibration method **CAL (Ch 6)**

Syntax: `LCM`

Related Commands: SCM, OCM

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CHANGE CAL METHOD \ LRL/LRM**

LCM0 Disable printing comment information **HARD COPY (Ch 9)**

Syntax: `LCM0`

Related Commands: LCM1

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ COMMENT OFF**

LCM1 Enable printing comment information **HARD COPY (Ch 9)**

Syntax: `LCM1`

Related Commands: LCM0

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ COMMENT ON**

LDARF Load adapter removal files from disk and calibrate **CAL (Ch 6)**

Syntax: `LDARF Filespecxx Filespecyy`
Value: See "Remarks"

Remarks: "Filespecxx" is the filename and path to the XX front panel and calibration file. "Filespecyy" is the filename and path to the YY front panel and cal file. Refer to the adapter removal description for more details. Notice the comma separator.

Data I/O: Input uses <String> data.

Front Panel Key: Cal **\ MORE \ PERFORM ADAPTER REMOVAL \ REMOVE ADAPTER**

LDT0 Disable printing date/time **HARD COPY (Ch 9)**

Syntax: `LDT0`

Related Commands: LDT1

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ MORE \ DATE OFF**

LDT1 Enable printing date/time **HARD COPY (Ch 9)**

Syntax: `LDT1`

Related Commands: LDT0

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ MORE \ DATE ON**

LDV0 Disable printing device ID **HARD COPY (Ch 9)**

Syntax: `LDV0`

Related Commands: LDV1

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ DEVICE ID OFF**

LDV1 Enable printing device ID **HARD COPY (Ch 9)**

Syntax: `LDV1`

Related Commands: LDV0

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ DEVICE ID ON**

LFD Enter limit frequency readout delta value **DISPLAY - LIMITS (Ch 7)**

Syntax: `LFD Value Units`
Value: Depends on graph type
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Remarks: Enter the value to offset Limit 2 from the currently set value of Limit 1. Both limits must be on to use this command. The values and suffixes are as appropriate for the graph type displayed.

Related Commands: LFP, CH1-CH4, LFD?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ LIMIT DIFFERENCE (UPPER-LOWER)**

LFD2 Enter limit frequency readout delta value for bottom graph — **DISPLAY - LIMITS (Ch 7)**

Syntax: `LFD2 Value Units`
Value: Depends on graph type
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Remarks: Enter the value to offset Limit 2 from the currently set value of Limit 1. Both limits must be on to use this command. The values and suffixes are as appropriate for the graph type displayed.

Related Commands: LFP, CH1-CH4, LFD2?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ LIMIT DIFFERENCE (UPPER-LOWER)**

LFD2? Output limit frequency readout delta value for bottom graph — **DISPLAY - LIMITS (Ch 7)**

Syntax: `LFD2?`

Data I/O: Outputs its value in ASCII <NR3> format.

Related Commands: LFD2

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ LIMIT DIFFERENCE (UPPER-LOWER)**

LFD? Output limit frequency readout delta value — **DISPLAY - LIMITS (Ch 7)**

Syntax: `LFD?`

Data I/O: Outputs its value in ASCII <NR3> format.

Related Commands: LFD

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ LIMIT DIFFERENCE (UPPER-LOWER)**

LFP Select limit frequency readout for phase displays **DISPLAY - LIMITS (Ch 7)**

Syntax: `LFP`

Remarks: Phase displays, which appears on a dual graph type like log magnitude and phase, are set using this command.

Related Commands: LFD, CH1-CH4

LFR Select limit frequency readout for active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LFR`

Related Commands: LFD, LFP

LID Enter string for DUT identity **HARD COPY (Ch 9)**

Syntax: `LID Value`
Value: String of up to 15 valid characters

Related Commands: LDT, LMS, LNM, LID?

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **EDIT** \ **DEVICE ID ON**

LID? Output string for DUT identity **HARD COPY (Ch 9)**

Syntax: `LID?`

Data I/O: Outputs its string in <Arbitrary ASCII> format.

Related Commands: LID

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **EDIT** \ **DEVICE ID**

LIN Select linear magnitude display for active channel **DISPLAY (Ch 5)**

Syntax: `LIN`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, MAG, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **MORE** \ **LINEAR MAGNITUDE**

LKT Load calibration kit information from floppy disk **UTILITY - DISK (Ch 9)**

Syntax: `LKT`

Front Panel Key: Cal **\ MORE \ COMPONENT UTILITY \ INSTALL KIT INFO FROM FLOPPY DISK**

LL1 Enter length of line 1 for LRL calibration **CAL (Ch 6)**

Syntax: `LL1 Value Units`
Value: 0 to +999.9999
Units: M, MTR, MM, MMT, CM, CMT

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ DEVICE 1 LINE 1 (REF)**

LL1? Output length of line 1 for LRL calibration **CAL (Ch 6)**

Syntax: `LL1?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ DEVICE 1 LINE 1 (REF)**

LL1P3 Enter length of line 1 for 3-port TRX calibration **CAL (Ch 6)**

Syntax: `LL1P3 Value Units`
Value: 0 to +999.9999
Units: M, MTR, MM, MMT, CM, CMT

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ CAL METHOD: TRX \ CHANGE PARAMETERS \ DEVICE 1 P3-P1 LINE LENGTH**

LL1P3? Output length of line 1 for 3-port TRX calibration **CAL (Ch 6)**

Syntax: `LL1P3?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ CAL METHOD: TRX \ CHANGE PARAMETERS \ DEVICE 1 P3-P1 LINE LENGTH**

LL2 Enter length of line 2 for LRL calibration **CAL (Ch 6)**

Syntax: `LL2 Value Units`
Value: 0 to +999.9999
Units: M, MTR, MM, MMT, CM, CMT

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ DEVICE 2 LINE OR MATCH**

LL2? Output length of line 2 for LRL calibration **CAL (Ch 6)**

Syntax: `LL2?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ DEVICE 2 LINE OR MATCH**

LL2P3 Enter length of line 2 for 3-port TRX calibration **CAL (Ch 6)**

Syntax: `LL2P3 Value Units`
Value: 0 to +999.9999
Units: M, MTR, MM, MMT, CM, CMT

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ CAL METHOD: TRX \ CHANGE PARAMETERS \ DEVICE 2 P3-P2 LINE LENGTH**

LL2P3? Output length of line 2 for 3-port TRX calibration **CAL (Ch 6)**

Syntax: `LL2P3?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ CAL METHOD: TRX \ CHANGE PARAMETERS \ DEVICE 2 P3-P2 LINE LENGTH**

LL3 Enter length of line 3 for LRL calibration **CAL (Ch 6)**

Syntax: `LL3 Value Units`
Value: 0 to +999.9999
Units: M, MTR, MM, MMT, CM, CMT

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \TWO BANDS \ NEXT CAL STEP \ DEVICE 3 LINE**

LL3? Output length of line 3 for LRL calibration **CAL (Ch 6)**

Syntax: `LL3?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ TWO BANDS \ NEXT CAL STEP \ DEVICE 3 LINE**

LLM? Output limit line display mode single or segmented **DISPLAY - LIMITS (Ch 7)**

Syntax: `LLM?`

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for single
1 for segmented

LLO Enter lower limit value for top graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LLO Value Units`
Value: Depends on graph type (see DISPLAY group)
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Related Commands: LUP, CH1-CH4

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ LOWER LIMIT (REF)**

LLO2 Enter lower limit value for bottom graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LLO2 Value Units`
Value: Depends on graph type (see DISPLAY group)
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Related Commands: LFD2, LOL20, LOL21, LUP2, UPL20, UPL21

LLO2? Output lower limit value for bottom graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LLO2?`

Data I/O: Outputs its value using ASCII <NR3 > format.

Related Commands: LLO2

LLO? Output lower limit value for top graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LLO?`

Data I/O: Outputs its value using ASCII <NR3 > format.

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ LOWER LIMIT (REF)**

LLZ Enter line impedance for LRL calibration **CAL (Ch 6)**

Syntax: `LLZ Value Units`
Value: 0.001 to 1x10E+3
Units: XX1 XX3, XM3, OHM

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ REFERENCE IMPEDANCE \ REFERENCE IMPEDANCE**

LLZ? Output line impedance for LRL calibration **CAL (Ch 6)**

Syntax: `LLZ?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ REFERENCE IMPEDANCE \ REFERENCE IMPEDANCE**

LM2 Select a match for the second device during a LRM type calibration **CAL (Ch 6)**

Syntax: `LM2`

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ DEVICE 2 MATCH**

LM3 Select a match for the third device during a LRM type calibration **CAL (Ch 6)**

Syntax: `LM3`

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ TWO BANDS \ NEXT CAL STEP \ DEVICE 3 MATCH**

LMD0 Disable printing model information **HARD COPY (Ch 9)**

Syntax: `LMD0`

Related Commands: LMD1

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **MODEL OFF**

LMD1 Enable printing model information **HARD COPY (Ch 9)**

Syntax: `LMD1`

Related Commands: LMD0

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **MODEL ON**

LMS Enter string for DUT model/serial number **HARD COPY (Ch 9)**

Syntax: `LMS Value`
Value: String up to 15 characters long

Related Commands: LMS

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **EDIT** \ **MODEL ON**

LMS? Output string for DUT model/serial number **HARD COPY (Ch 9)**

Syntax: `LMS?`

Data I/O: Outputs string in <Arbitrary ASCII> format.

Related Commands: LMS

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **EDIT** \ **MODEL**

LNM Enter string for operator name **HARD COPY (Ch 9)**

Syntax: `LNM Value`
Value: String up to 15 characters long

Related Commands: LDT, LID, LMS

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **OPERATOR ON**

LNM? Output string for operator name **HARD COPY (Ch 9)**

Syntax: `LNM?`

Data I/O: Outputs its string in <Arbitrary ASCII> format.

Related Commands: LNM

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **OPERATOR**

LOC Enter string for operator comment **HARD COPY (Ch 9)**

Syntax: `LOC Value`
Value: String up to 79 characters long

Related Commands: LDT, LID, LNM, LMS

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **EDIT** \ **COMMENT ON**

LOC? Output string for operator comment **HARD COPY (Ch 9)**

Syntax: `LOC?`

Data I/O: Outputs string in <Arbitrary ASCII> format.

Related Commands: LOC

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **EDIT** \ **COMMENT**

LOF Limits display off **DISPLAY - LIMITS (Ch 7)**

Syntax: `LOF`

Related Commands: LON

Front Panel Key: Display \ **GRAPH TYPE** \ **Any** then \ **LIMITS** \ **DISPLAY LIMITS OFF**

LOGO0 Turn hard copy logo off **HARD COPY (Ch 9)**

Syntax: LOGO0

Remarks: After mnemonic is issued, printer and plotter will not form the logo portion of the printout or plot.

Related Commands: LOGO1, LOGOX?

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **LOGO SETUP** \ **LOGO OFF**

LOGO1 Turn hard copy logo on **HARD COPY (Ch 9)**

Syntax: LOGO1

Remarks: After mnemonic is issued, printer and plotter will form a logo when printing or plotting.

Related Commands: LOGO0, LOGOX?

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **LOGO SETUP** \ **LOGO ON**

LOGO? Output hard copy logo selection standard/user defined **HARD COPY (Ch 9)**

Syntax: LOGO?

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for STANDARD ANRITSU LIMIT
1 for USER DEFINED LOGO

Related Commands: LOGOS, LOGOU

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **LOGO SETUP** \ **LOGO**

LOGOS Select standard hard copy logo **HARD COPY (Ch 9)**

Syntax: LOGOS

Related Commands: LOGOU, LOGO?

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **LOGO SETUP** \ **LOGO TYPE STANDARD**

LOGOU Select user defined hard copy logo **HARD COPY (Ch 9)**

Syntax: LOGOU

Remarks: For the user-defined logo to function, the following files must be present in the C:\UTIL subdirectory: LOGO.EPS for Epson type printers LOGO.HP for HP type printers and LOGO.PLT for plotters. If the required file is not found, the standard Anritsu logo will be used.

Related Commands: LOGOS, LOGO?

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ LOGO SETUP \ LOGO TYPE USER**

LOGOX? Output hard copy logo on/off status **HARD COPY (Ch 9)**

Syntax: LOGOX?

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for logo OFF
1 for logo ON

Related Commands: LOGO0, LOGO1

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ LOGO SETUP \ LOGO TYPE**

LOL0 Turn lower limit off **DISPLAY - LIMITS (Ch 7)**

Syntax: LOL0

Related Commands: LON, LOF, LOL1, LLO

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ LOWER LIMIT OFF**

LOL1 Turn lower limit on at current value **DISPLAY - LIMITS (Ch 7)**

Syntax: LOL1

Related Commands: LON, LOF, LOL0, LLO

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ LOWER LIMIT ON**

LOL20 Turn lower limit off for bottom graph **DISPLAY - LIMITS (Ch 7)**

Syntax: `LOL20`

Related Commands: LON, LOF, LOL21, LLO2

LOL21 Turn lower limit on at current value for bottom graph **DISPLAY - LIMITS (Ch 7)**

Syntax: `LOL21`

Related Commands: LON, LOF, LOL20, LLO2

LOL2X? Output lower limit on/off status for bottom graph **DISPLAY - LIMITS (Ch 7)**

Syntax: `LOL2X?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for limit OFF
1 for limit ON

Related Commands: LOL20, LOL21

LOLX? Output lower limit on/off status **DISPLAY - LIMITS (Ch 7)**

Syntax: `LOLX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ LOWER LIMITS**

LON Limits display on **DISPLAY - LIMITS (Ch 7)**

Syntax: `LON`

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ DISPLAY LIMITS ON**

LON? Output limits display on/off status **DISPLAY - LIMITS (Ch 7)**

Syntax: `LON?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for limit OFF
1 for limit ON

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ DISPLAY LIMITS**

LOP0 Disable printing operator information **HARD COPY (Ch 9)**

Syntax: `LOP0`

Related Commands: LOP1

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ OPERATOR OFF**

LOP1 Enable printing operator information **HARD COPY (Ch 9)**

Syntax: `LOP1`

Related Commands: LOP0

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ OPERATOR ON**

LPF1? Output limit test failure status on channel 1 **DISPLAY - LIMITS (Ch 7)**

Syntax: `LPF1?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for limit OFF
1 for limit ON

LPF2? Output limit test failure status on channel 2 **DISPLAY - LIMITS (Ch 7)**

Syntax: `LPF2?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for limit OFF
1 for limit ON

LPF3? Output limit test failure status on channel 3 **DISPLAY - LIMITS (Ch 7)**

Syntax: `LPF3?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for limit OFF
1 for limit ON

LPF4? Output limit test failure status on channel 4 **DISPLAY - LIMITS (Ch 7)**

Syntax: `LPF4?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for limit OFF
1 for limit ON

LPF? Output limit test failure status all channels **DISPLAY - LIMITS (Ch 7)**

Syntax: `LPF?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for limit OFF
1 for limit ON

LPH Select linear magnitude and phase display for active channel **DISPLAY (Ch 5)**

Syntax: `LPH`

Related Commands: CH1-CH4

Front Panel Key: Display **\ GRAPH TYPE \ MORE \ LINEAR MAGNITUDE AND PHASE**

LPI Select lowpass impulse response for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `LPI`

Remarks: Requires a calibration that used a harmonically related set of data points - time domain calibration.

Related Commands: TDC, CH1-CH4

Front Panel Key: Appl **\ DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ RESPONSE IMPULSE**

LPS Select lowpass step response for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `LPS`

Remarks: Requires a calibration that used a harmonically related set of data points - time domain calibration.

Related Commands: TDC, CH1-CH4

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ RESPONSE STEP**

LPSX? Output lowpass response for active channel impulse or step **APPL - TIME DOMAIN (Ch 10)**

Syntax: `LPSX?`

Data I/O: Outputs its number using ASCII <NR1> format as follows:
0 for IMPULSE
1 for STEP

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ RESPONSE**

LR2 Specify 2 line LRL calibration **CAL (Ch 6)**

Syntax: `LR2`

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND**

LR3 Specify 3 line LRL calibration **CAL (Ch 6)**

Syntax: `LR3`

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ TWO BANDS**

LRX? Output line selection for LRL calibration 2 line/3 line

CAL (Ch 6)

Syntax: `LRX?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ NUMBER OF BANDS USED**

LS1 Set lower segmented limit 1 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS1`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US1-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 1 ACTIVE**

LS10 Select lower segmented limit 10 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS10`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 10 ACTIVE**

LS2 Select lower segmented limit 2 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS2`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 2 ACTIVE**

LS3 Select lower segmented limit 3 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS3`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 3 ACTIVE**

LS4 Select lower segmented limit 4 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS4`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 4 ACTIVE**

LS5 Select lower segmented limit 5 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS5`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 5 ACTIVE**

LS6 Select lower segmented limit 6 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS6`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 6 ACTIVE**

LS7 Select lower segmented limit 7 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `LS7`

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 7 ACTIVE**

LS8 Select lower segmented limit 8 as the active segment **DISPLAY - LIMITS (Ch 7)**

Syntax: LS8

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 8 ACTIVE**

LS9 Select lower segmented limit 9 as the active segment **DISPLAY - LIMITS (Ch 7)**

Syntax: LS9

Remarks: All succeeding limit segment commands will apply to LSx.

Related Commands: US-US10, CH1-CH4, LSX?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 9 ACTIVE**

LSB Select least significant byte first binary transfer **REMOTE - FORMATTING (Ch 8)**

Syntax: LSB

Remarks: This is convenient for transferring data into or out of IBM/Intel based computers.

Related Commands: MSB, FMB, FMC

LSEG Select segmented limit line display mode **DISPLAY - LIMITS (Ch 7)**

Syntax: LSEG

Remarks: Any segmented limit line command selects this mode automatically.

Related Commands: LSNG

LSNG Select single limit line display mode **DISPLAY - LIMITS (Ch 7)**

Syntax: `LSNG`

Remarks: Any single limit line command selects this mode automatically.

Related Commands: LSEG

LSX? Output active segmented limit **DISPLAY - LIMITS (Ch 7)**

Syntax: `LSX?`

Data I/O: Outputs its value in ASCII <NR1> format. 1-10 for lower limit 1-10
100010 for upper limit 1-10

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT x ACTIVE**

LT0 Turn limits testing off **DISPLAY - LIMITS (Ch 7)**

Syntax: `LT0`

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE)TEST LIMITS \ LIMIT TESTING OFF**

LT1 Turn limits testing on **DISPLAY - LIMITS (Ch 7)**

Syntax: `LT1`

Status Reporting: A limit test failure will set bits (0A3 for Channels 1-4, respectively) in the Limits Event Status Register.

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE)TEST LIMITS \ LIMIT TESTING On**

LT1? Output limits testing enable status **DISPLAY - LIMITS (Ch 7)**

Syntax: `LT1?`

Data I/O: Outputs its value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE)TEST LIMITS \ LIMIT TESTING**

LTC Select coaxial transmission line for calibration **CAL (Ch 6)**

Syntax: `LTC`

Remarks: Selects a coaxial transmission line for the calibration.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CHANGE CAL METHOD AND LINE TYPE \ COAXIAL**

LTRD Output response data from the dedicated GPIB bu **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `LTRD Value1 Value2`
Value: *Value1* is the GPIB address of the device to read from. *Value2* is the number of bytes to read in ASCII <NRf> format.

Data I/O: *Value1* and *value2* are in ASCII <NRf> format and the output is in <Arbitrary Block> format.

Related Commands: LTWRT

LTST Display the limits testing menu **DISPLAY - LIMITS (Ch 7)**

Syntax: `LTST`

Related Commands: LT0, LT1

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ (MORE) TEST LIMITS**

LTU Select microstrip transmission line for calibration **CAL (Ch 6)**

Syntax: `LTU`

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CHANGE CAL METHOD AND LINE TYPE \ MICROSTRIP**

LTW Select waveguide transmission line for calibration **CAL (Ch 6)**

Syntax: `LTW`

Remarks: Can only use an offset short or CRL/LRM calibration method with waveguide calibration.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CHANGE CAL METHOD AND LINE TYPE \ WAVEGUIDE**

LTWRT Send program data to the dedicated GPIB bus **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `LTWRT Value1 Value2`
Value: *Value1* is the GPIB address of the device to write data to. *Value2* is the data to write.

Data I/O: *Value1* is in ASCII <NRf> format and *value2* is in <Arbitrary Block> format.

Related Commands: LTRD

LTX? Output line type **CAL (Ch 6)**

Syntax: `LTX?`

Data I/O: Outputs its value in ASCII <NR1> format as follows:
1 for COAX
2 for WAVEGUIDE
3 for MICROSTRIP

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ LINE TYPE**

LUP Enter upper limit value for top graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LUP Value Units`
Value: Depends on graph type; see Table 11-2 at the end of this chapter.
Units: Depends on graph type; see Table 11-2 at the end of this chapter.

Remarks: The values and suffixes are as appropriate for the graph type displayed. That is, DEG, dB, REU, etc.

Related Commands: LON, LOF, UPL0, UPL1

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ UPPER LIMIT (REF)**

LUP2 Enter upper limit value for bottom graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LUP2 Value Units`
Value: Depends on graph type; see Table 11-2 at the end of this chapter.
Units: Depends on graph type; see Table 11-2 at the end of this chapter.

Remarks: The values and suffixes are as appropriate for the graph type displayed. That is, DEG, dB, REU, etc.

Related Commands: LON, LOF, UPL20, UPL21

LUP2? Output upper limit value for bottom graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LUP2?`

Data I/O: Outputs its value in ASCII <NR3 > format.

Related Commands: LUP2

LUP? Output upper limit value for top graph on active channel **DISPLAY - LIMITS (Ch 7)**

Syntax: `LUP?`

Data I/O: Outputs its value using ASCII <NR3 > format.

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ READOUT LIMIT \ UPPER LIMIT (REF)**

LVH Select high as limits testing TTL level **DISPLAY - LIMITS (Ch 7)**

Syntax: `LVH`

Related Commands: LVL, LVX?

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ TEST LIMITS \ LIMIT TEST TTL FAIL CONDITION : TTL HIGH**

LVL Select low as limits testing TTL level **DISPLAY - LIMITS (Ch 7)**

Syntax: `LVL`

Related Commands: LVH, LVX?

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ TEST LIMITS \ LIMIT TEST TTL FAIL CONDITION : TTL LOW**

LVX? Output limits testing TTL level status **DISPLAY - LIMITS (Ch 7)**

Syntax: `LVX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for LOW
1 for HIGH

Front Panel Key: Display **\ GRAPH TYPE \ Any** then **\ LIMITS \ TEST LIMITS \ LIMIT TEST TTL FAIL CONDITION :**

LX2? Output device for line 2 of LRL calibration line/match **CAL (Ch 6)**

Syntax: `LX2?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ DEVICE 2**

LX3? Output device for line 3 of LRL calibration line/match **CAL (Ch 6)**

Syntax: `LX3?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ TWO BANDS \ NEXT CAL STEP \ DEVICE 3**

M Suffix sets distance data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `M`

Related Commands: MTR

M10C Set CW mode at marker 10 frequency **MARKER (Ch 7)**

Syntax: `M10C`

Remarks: Marker 10 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 10**

M10E Set sweep/zoom end to marker 10 frequency distance or time **MARKER (Ch 7)**

Syntax: `M10E`

Remarks: Marker 10 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (10)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (10)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 10**

M10S Set sweep/zoom start to marker 10 frequency distance or time **MARKER (Ch 7)**

Syntax: `M10S`

Remarks: Marker 10 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (10)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (10)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 10**

M11C Set CW mode at marker 11 frequency **MARKER (Ch 7)**

Syntax: `M11C`

Remarks: Marker 11 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 11**

M11E Set sweep/zoom end to marker 11 frequency distance or time **MARKER (Ch 7)**

Syntax: `M11E`

Remarks: Marker 11 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (11)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (11)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 11**

M11S Set sweep/zoom start to marker 11 frequency distance or time **MARKER (Ch 7)**

Syntax: `M11S`

Remarks: Marker 11 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (11)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (11)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 11**

M12C Set CW mode at marker 12 frequency **MARKER (Ch 7)**

Syntax: `M12C`

Remarks: Marker 12 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 12**

M12E Set sweep/zoom end to marker 12 frequency distance or time **MARKER (Ch 7)**

Syntax: `M12E`

Remarks: Marker 12 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (12)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (12)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 12**

M12S Set sweep/zoom start to marker 12 frequency distance or time **MARKER (Ch 7)**

Syntax: `M12S`

Remarks: Marker 12 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (12)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (12)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 12**

M1C Set CW mode at marker 1 frequency **MARKER (Ch 7)**

Syntax: `M1C`

Remarks: Marker 1 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 1**

M1E Set sweep/zoom end to marker 1 frequency distance or time **MARKER (Ch 7)**

Syntax: `M1E`

Remarks: Marker 1 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (1)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (1)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 1**

M1S Set sweep/zoom start to marker 1 frequency distance or time **MARKER (Ch 7)**

Syntax: `M1S`

Remarks: Marker 1 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (1)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (1)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 1**

M2C Set CW mode at marker 2 frequency **MARKER (Ch 7)**

Syntax: M2C

Remarks: Marker 2 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 2**

M2E Set sweep/zoom end to marker 2 frequency distance or time **MARKER (Ch 7)**

Syntax: M2E

Remarks: Marker 2 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (2)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (2)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 2**

M2S Set sweep/zoom start to marker 2 frequency distance or time **MARKER (Ch 7)**

Syntax: M2S

Remarks: Marker 2 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (2)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (2)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 2**

M3C Set CW mode at marker 3 frequency **MARKER (Ch 7)**

Syntax: M3C

Remarks: Marker 3 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 3**

M3E Set sweep/zoom end to marker 3 frequency distance or time **MARKER (Ch 7)**

Syntax: M3E

Remarks: Marker 3 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (3)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (3)** or
Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 3**

M3P1?

Query the mixed mode 1st balanced port pair for the M3P setup

HARD COPY (Ch 9)

Syntax: `M3P1?`

Data I/O: Outputs data in <NR1> format as follows:
0 for Mixed Mode Pair 1 and 2
1 for Mixed Mode Pair 2 and 1
2 for Mixed Mode Pair 1 and 3
3 for Mixed Mode Pair 3 and 1
4 for Mixed Mode Pair 2 and 3
5 for Mixed Mode Pair 3 and 2
6 for Mixed Mode Pair 1 and 4
7 for Mixed Mode Pair 4 and 1
8 for Mixed Mode Pair 2 and 4
9 for Mixed Mode Pair 4 and 2
10 for Mixed Mode Pair 3 and 4
11 for Mixed Mode Pair 4 and 3
Default is Mixed Mode Pair 2 and 3

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43

Front Panel Key: Hard Copy \ **OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP**

M3P1P12

Set the mixed mode 1st balanced port pair to 1:2 for the M3P setup

HARD COPY (Ch 9)

Syntax: `M3P1P12`

Related Commands: M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy \ **OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (1:2)/(2:1)**

M3P1P13

Set the mixed mode 1st balanced port pair to 1:3 for the M3P setup

HARD COPY (Ch 9)

Syntax: `M3P1P13`

Related Commands: M3P1P12, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy \ **OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (1:3)/(3:1)**

M3P1P14 Set the mixed mode 1st balanced port pair to 1:4 for the M3P setup **HARD COPY (Ch 9)**

Syntax: M3P1P14

Related Commands: M3P1P12, M3P1P13, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (1:4)/(4:1)**

M3P1P21 Set the mixed mode 1st balanced port pair to 2:1 for the M3P setup **HARD COPY (Ch 9)**

Syntax: M3P1P21

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (1:2)/(2:1)**

M3P1P23 Set the mixed mode 1st balanced port pair to 2:3 for the M3P setup **HARD COPY (Ch 9)**

Syntax: M3P1P23

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (2:3)/(3:2)**

M3P1P24 Set the mixed mode 1st balanced port pair to 2:4 for the M3P setup **HARD COPY (Ch 9)**

Syntax: M3P1P24

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (2:4)/(4:2)**

M3P1P31 Set the mixed mode 1st balanced port pair to 3:1 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3P1P31`

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (1:3)/(3:1)**

M3P1P32 Set the mixed mode 1st balanced port pair to 3:2 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3P1P32`

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P34, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (2:3)/(3:2)**

M3P1P34 Set the mixed mode 1st balanced port pair to 3:4 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3P1P34`

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P41, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (3:4)/(4:3)**

M3P1P41 Set the mixed mode 1st balanced port pair to 4:1 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3P1P41`

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P42, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (1:4)/(4:1)**

M3P1P42 Set the mixed mode 1st balanced port pair to 4:2 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3P1P42`

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P43, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (2:4)/(4:2)**

M3P1P43 Set the mixed mode 1st balanced port pair to 4:3 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3P1P43`

Related Commands: M3P1P12, M3P1P13, M3P1P14, M3P1P21, M3P1P23, M3P1P24, M3P1P31, M3P1P32, M3P1P34, M3P1P41, M3P1P42, M3P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (3:4)/(4:3)**

M3PS1 Set the mixed mode single ended port to port 1 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3PS1`

Related Commands: M3PS2, M3PS3, M3PS4, M3PS?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ SELECT SINGLE ENDED PORT \ PORT 1**

M3PS2 Set the mixed mode single ended port to port 2 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3PS2`

Related Commands: M3PS1, M3PS3, M3PS4, M3PS?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ SELECT SINGLE ENDED PORT \ PORT 2**

M3PS3 Set the mixed mode single ended port to port 3 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3PS3`

Related Commands: M3PS1, M3PS2, M3PS4, M3PS?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ SELECT SINGLE ENDED PORT \ PORT 3**

M3PS4 Set the mixed mode single ended port to port 4 for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3PS4`

Related Commands: M3PS1, M3PS2, M3PS3, M3PS?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ SELECT SINGLE ENDED PORT \ PORT 4**

M3PS? Query the mixed mode singled ended port for the M3P setup **HARD COPY (Ch 9)**

Syntax: `M3PS?`

Data I/O: Outputs data in <NR1> format as follows:
12 for Mixed Mode Singleton 1
13 for Mixed Mode Singleton 2
14 for Mixed Mode Singleton 3
15 for Mixed Mode Singleton 4
Default is Mixed Mode Singleton 1

Related Commands: M3PS1, M3PS2, M3PS3, M3PS4

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ SELECT SINGLE ENDED PORT**

M3S Set sweep/zoom start to marker 3 frequency distance or time

MARKER (Ch 7)

Syntax: `M3S`

Remarks: Marker 3 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (3)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (3)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 3**

M4C Set CW mode at marker 4 frequency

MARKER (Ch 7)

Syntax: `M4C`

Remarks: Marker 4 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 4**

M4E Set sweep/zoom end to marker 4 frequency distance or time

MARKER (Ch 7)

Syntax: `M4E`

Remarks: Marker 4 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (4)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (4)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 4**

M4P1?

Query the mixed mode 1st balanced port pair for the M4P setup

HARD COPY (Ch 9)

Syntax: `M4P1?`

Data I/O: Outputs data in <NR1> format as follows:
0 for Mixed Mode Pair 1 and 2
1 for Mixed Mode Pair 2 and 1
2 for Mixed Mode Pair 1 and 3
3 for Mixed Mode Pair 3 and 1
4 for Mixed Mode Pair 2 and 3
5 for Mixed Mode Pair 3 and 2
6 for Mixed Mode Pair 1 and 4
7 for Mixed Mode Pair 4 and 1
8 for Mixed Mode Pair 2 and 4
9 for Mixed Mode Pair 4 and 2
10 for Mixed Mode Pair 3 and 4
11 for Mixed Mode Pair 4 and 3
Default is Mixed Mode Pair 1 and 2

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43

Front Panel Key: Hard Copy \ **OUTPUT SETUP** \ **SNP OPTIONS** \ **SETUP** \ **M4P SETUP**

M4P1P12

Set the mixed mode 1st balanced port pair to 1:2 for the M4P setup

HARD COPY (Ch 9)

Syntax: `M4P1P12`

Related Commands: M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy \ **OUTPUT SETUP** \ **SNP OPTIONS** \ **SETUP** \ **M4P SETUP** \ **(1:2)/(2:1)**

M4P1P13

Set the mixed mode 1st balanced port pair to 1:3 for the M4P setup

HARD COPY (Ch 9)

Syntax: `M4P1P13`

Related Commands: M4P1P12, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy \ **OUTPUT SETUP** \ **SNP OPTIONS** \ **SETUP** \ **M4P SETUP** \ **(1:3)/(3:1)**

M4P1P14 Set the mixed mode 1st balanced port pair to 1:4 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P14`

Related Commands: M4P1P12, M4P1P13, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (1:4)/(4:1)**

M4P1P21 Set the mixed mode 1st balanced port pair to 2:1 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P21`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (1:2)/(2:1)**

M4P1P23 Set the mixed mode 1st balanced port pair to 2:3 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P23`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (2:3)/(3:2)**

M4P1P24 Set the mixed mode 1st balanced port pair to 2:4 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P24`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (2:4)/(4:2)**

M4P1P31 Set the mixed mode 1st balanced port pair to 3:1 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P31`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (1:3)/(3:1)**

M4P1P32 Set the mixed mode 1st balanced port pair to 3:2 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P32`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P34, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (2:3)/(3:2)**

M4P1P34 Set the mixed mode 1st balanced port pair to 3:4 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P34`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P41, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (3:4)/(4:3)**

M4P1P41 Set the mixed mode 1st balanced port pair to 4:1 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P41`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P42, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (1:4)/(4:1)**

M4P1P42 Set the mixed mode 1st balanced port pair to 4:2 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P42`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P43, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (2:4)/(4:2)**

M4P1P43 Set the mixed mode 1st balanced port pair to 4:3 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P1P43`

Related Commands: M4P1P12, M4P1P13, M4P1P14, M4P1P21, M4P1P23, M4P1P24, M4P1P31, M4P1P32, M4P1P34, M4P1P41, M4P1P42, M4P1?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (3:4)/(4:3)**

M4P2? Query the mixed mode 2nd balanced port pair for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P2?`

Data I/O: Outputs data in <NR1> format as follows:
0 for Mixed Mode Pair 1 and 2
1 for Mixed Mode Pair 2 and 1
2 for Mixed Mode Pair 1 and 3
3 for Mixed Mode Pair 3 and 1
4 for Mixed Mode Pair 2 and 3
5 for Mixed Mode Pair 3 and 2
6 for Mixed Mode Pair 1 and 4
7 for Mixed Mode Pair 4 and 1
8 for Mixed Mode Pair 2 and 4
9 for Mixed Mode Pair 4 and 2
10 for Mixed Mode Pair 3 and 4
11 for Mixed Mode Pair 4 and 3
Default is Mixed Mode Pair 3 and 4

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT 2ND PAIR**

M4P2P12 Set the mixed mode 2nd balanced port pair to 1:2 for the M4P setup **HARD COPY (Ch 9)**

Syntax: M4P2P12

Related Commands: 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (1:2)/(2:1)**

M4P2P13 Set the mixed mode 2nd balanced port pair to 1:3 for the M4P setup **HARD COPY (Ch 9)**

Syntax: M4P2P13

Related Commands: M4P2P12, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (1:3)/(3:1)**

M4P2P14 Set the mixed mode 2nd balanced port pair to 1:4 for the M4P setup **HARD COPY (Ch 9)**

Syntax: M4P2P14

Related Commands: M4P2P12, 4P2P13, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (1:4)/(4:1)**

M4P2P21 Set the mixed mode 2nd balanced port pair to 2:1 for the M4P setup **HARD COPY (Ch 9)**

Syntax: M4P2P21

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (1:2)/(2:1)**

M4P2P23 Set the mixed mode 2nd balanced port pair to 2:3 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P2P23`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (2:3)/(3:2)**

M4P2P24 Set the mixed mode 2nd balanced port pair to 2:4 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P2P24`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (2:4)/(4:2)**

M4P2P31 Set the mixed mode 2nd balanced port pair to 3:1 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P2P31`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (1:3)/(3:1)**

M4P2P32 Set the mixed mode 2nd balanced port pair to 3:2 for the M4P setup **HARD COPY (Ch 9)**

Syntax: `M4P2P32`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P34, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (2:3)/(3:2)**

M4P2P34 Set the mixed mode 2nd balanced port pair to 3:4 for the M4P setup

HARD COPY (Ch 9)

Syntax: `M4P2P34`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P41, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (3:4)/(4:3)**

M4P2P41 Set the mixed mode 2nd balanced port pair to 4:1 for the M4P setup

HARD COPY (Ch 9)

Syntax: `M4P2P41`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P42, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (1:4)/(4:1)**

M4P2P42 Set the mixed mode 2nd balanced port pair to 4:2 for the M4P setup

HARD COPY (Ch 9)

Syntax: `M4P2P42`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P43, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (2:4)/(4:2)**

M4P2P43 Set the mixed mode 2nd balanced port pair to 4:3 for the M4P setup

HARD COPY (Ch 9)

Syntax: `M4P2P43`

Related Commands: M4P2P12, 4P2P13, M4P2P14, M4P2P21, M4P2P23, M4P2P24, M4P2P31, M4P2P32, M4P2P34, M4P2P41, M4P2P42, M4P2?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ SELECT SECOND PAIR \ (3:4)/(4:3)**

M4S Set sweep/zoom start to marker 4 frequency distance or time

MARKER (Ch 7)

Syntax: `M4S`

Remarks: Marker 4 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (4)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (4)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 4**

M5C Set CW mode at marker 5 frequency

MARKER (Ch 7)

Syntax: `M5C`

Remarks: Marker 5 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 5**

M5E Set sweep/zoom end to marker 5 frequency distance or time

MARKER (Ch 7)

Syntax: `M5E`

Remarks: Marker 5 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (5)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (5)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 5**

M5S Set sweep/zoom start to marker 5 frequency distance or time **MARKER (Ch 7)**

Syntax: `M5S`

Remarks: Marker 5 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (5)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (5)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 5**

M6C Set CW mode at marker 6 frequency **MARKER (Ch 7)**

Syntax: `M6C`

Remarks: Marker 6 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 6**

M6E Set sweep/zoom end to marker 6 frequency distance or time **MARKER (Ch 7)**

Syntax: `M6E`

Remarks: Marker 6 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (6)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (6)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 6**

M6S Set sweep/zoom start to marker 6 frequency distance or time

MARKER (Ch 7)

Syntax: `M6S`

Remarks: Marker 6 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (6)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (6)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 6**

M7C Set CW mode at marker 7 frequency

MARKER (Ch 7)

Syntax: `M7C`

Remarks: Marker 7 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 7**

M7E Set sweep/zoom end to marker 7 frequency distance or time

MARKER (Ch 7)

Syntax: `M7E`

Remarks: Marker 7 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (7)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (7)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 7**

M7S Set sweep/zoom start to marker 7 frequency distance or time **MARKER (Ch 7)**

Syntax: `M7S`

Remarks: Marker 7 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (7)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (7)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 7**

M8C Set CW mode at marker 8 frequency **MARKER (Ch 7)**

Syntax: `M8C`

Remarks: Marker 8 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 8**

M8E Set sweep/zoom end to marker 8 frequency distance or time **MARKER (Ch 7)**

Syntax: `M8E`

Remarks: Marker 8 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (8)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (8)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 8**

M8S Set sweep/zoom start to marker 8 frequency distance or time **MARKER (Ch 7)**

Syntax: `M8S`

Remarks: Marker 8 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (8)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (8)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 8**

M9C Set CW mode at marker 9 frequency **MARKER (Ch 7)**

Syntax: `M9C`

Remarks: Marker 9 must be set.

Related Commands: MK1-MK12

Front Panel Key: Freq **\ CW MODE ON \ MARKER SWEEP \ CW FREQ MARKER 9**

M9E Set sweep/zoom end to marker 9 frequency distance or time **MARKER (Ch 7)**

Syntax: `M9E`

Remarks: Marker 9 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl **\ DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (9)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ STOP MARKER (9)** or Freq **\ CW MODE OFF \ MARKER SWEEP \ STOP SWEEP MARKER 9**

M9S Set sweep/zoom start to marker 9 frequency distance or time — **MARKER (Ch 7)**

Syntax: `M9S`

Remarks: Marker 9 must be set.

Related Commands: MK1-MK12

Front Panel Key: Appl \ **DOMAIN \ TIME LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (9)** or **DOMAIN \ DISTANCE LOWPASS \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ START MARKER (9)** or
Freq \ **CW MODE OFF \ MARKER SWEEP \ START SWEEP MARKER 9**

MAG Select log magnitude display for active channel — **DISPLAY (Ch 5)**

Syntax: `MAG`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE \ LOG MAGNITUDE**

MAT Select matched reflective devices during calibration — **CAL (Ch 6)**

Syntax: `MAT`

Related Commands: MIX

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ REFLECTION PAIRING \ MATCHED (OPEN-OPEN, SHORT-SHORT)**

MD Create a new disk directory — **UTILITY - DISK (Ch 9)**

Syntax: `MD Pathespec`
Value: See “Remarks”

Remarks: “Pathspec” is a combination of letters, numbers, \ characters and underscores that spell out the path and name of the new directory, “Pathspec” may include a drive letter of the form A: for the floppy disk or C: for the hard drive. Directory names follow the same rules as file names.

Related Commands: ADRIVE, CDRIVE, CD, MD

MD0 Turn mean display off **DISPLAY (Ch 5)**

Syntax: MD0

Related Commands: MD1, MDX?

MD1 Turn mean display on **DISPLAY (Ch 5)**

Syntax: MD1

Related Commands: MD0, MDX?

MDX? Output mean display status **DISPLAY (Ch 5)**

Syntax: MDX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: MD0, MD1

MEM Display trace memory on active channel **DISPLAY (Ch 5)**

Syntax: MEM

Remarks: Store data from selected channel to memory (STD command), before using this command to view a trace with trace memory active.

Related Commands: STD, CH1-CH4

Front Panel Key: Display **\ TRACE MEMORY \ VIEW: MEMORY**

MF Suffix sets farad data type and scales by 1E-3 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: MF

MFGCT Start multiple frequency swept power gain compression test — **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `MFGCT`

Remarks: Begins the automated sequence which collects and displays the multiple frequency swept power gain compression data.

Related Commands: SPGCA, SPGCT

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** \ **MULTIPLE FREQ GAIN COMPRESSION**

MH Suffix sets farad data type and scales by 1E-3 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `MH`

MHZ Suffix sets frequency data type and scales by 1E6 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `MHZ`

MIN Select subtraction as trace math for active channel — **DISPLAY (Ch 5)**

Syntax: `MIN`

Related Commands: MUL, ADD, DIV, CH1-CH4, MTH?

Front Panel Key: Display \ **TRACE MEMORY** \ **SELECT TRACE MATH** \ **SUBTRACT (-)**

MIX Select mixed reflective devices during calibration — **CAL (Ch 6)**

Syntax: `MIX`

Related Commands: MAT

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **LINE TYPE: MICROSTRIP** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **REFLECTION PAIRING** \ **MIXED (OPEN-SHORT, SHORT-OPEN)**

MIX? Output reflective devices selection during calibration **CAL (Ch 6)**

Syntax: MIX?

Data I/O: Output data using ASCII <NR1> integer values as follows:
0 for MATCHED PAIR
1 for MIXED PAIR

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ REFLECTION PAIRING \ MIXED (OPEN-SHORT, SHORT-OPEN)**

MIXP3 Set port 3 to be mixer port when source 2 using **CAL (Ch 6)**

Syntax: MIXP3

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE STANDARD \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ SOURCE 2 USING PORT 3 or TRANSMISSION AND REFLECTION \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT 3 or NOISE FIGURE \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT 3 or FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT 3**

MIXP4 Set port 4 to be mixer port when source 2 using **CAL (Ch 6)**

Syntax: MIXP4

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE STANDARD \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ SOURCE 2 USING PORT 4 or TRANSMISSION AND REFLECTION \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT 4 or NOISE FIGURE \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT 4 or FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT 4**

MIXPORT? Output mixer port when source 2 using **CAL (Ch 6)**

Syntax: MIXPORT?

Data I/O: Outputs value in ASCII <NR3> format as follows:
3 for PORT 3
4 for PORT 4

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ DEVICE TYPE STANDARD \ MEASUREMENT TYPE \ IMD \ SOURCE SELECTION \ SOURCE 2 USING PORT ? or TRANSMISSION AND REFLECTION \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT ? or NOISE FIGURE \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT ? or FREQUENCY TRANSLATION GROUP DELAY \ LO/RECEIVER SETUP \ SOURCE 2 USING PORT ?.**

MK1 Enter marker 1 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: MK1 Value Units
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 1**

MK10 Enter marker 10 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: MK10 Value Units
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 10**

MK10? Output marker 10 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK10?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-10 ON (10: ON)**

MK11 Enter marker 11 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK11 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 11**

MK11? Output marker 11 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK11?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-11 ON (11: ON)**

MK12 Enter marker 12 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK12 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 12**

MK12? Output marker 12 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK12?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-12 ON (12: ON)**

MK1? Output marker 1 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK1?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-1 ON (1: ON)**

MK2 Enter marker 2 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK2 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 2**

MK2? Output marker 2 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK2?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-2 ON (2: ON)**

MK3 Enter marker 3 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK3 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 3**

MK3? Output marker 3 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK3?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-3 ON (3: ON)**

MK4 Enter marker 4 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK4 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 4**

MK4? Output marker 4 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK4?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-4 ON (4: ON)**

MK5 Enter marker 5 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK5 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 5**

MK5? Output marker 5 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK5?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-5 ON (5: ON)**

MK6 Enter marker 6 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK6 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 6**

MK6? Output marker 6 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK6?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-6 ON (6: ON)**

MK7 Enter marker 7 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK7 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 7**

MK7? Output marker 7 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK7?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-7 ON (7: ON)**

MK8 Enter marker 8 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK8 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 8**

MK8? Output marker 8 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK8?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-8 ON (8: ON)**

MK9 Enter marker 9 frequency distance or time and turn on **MARKER (Ch 7)**

Syntax: `MK9 Value Units`
Value: Limited to current frequency, time, or distance sweep/zoom range
Units: time = S, MS, USC, PS, PSC, NS, NSC
distance = M, MTR, MM, MMT, CM, CMT
frequency = HZ, KHZ, MHZ, GHZ

Related Commands: MR1-MR12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ SELECT 9**

MK9? Output marker 9 frequency distance or time **MARKER (Ch 7)**

Syntax: `MK9?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in time, distance, or frequency units depending on current sweep domain.

Related Commands: OM1-OM12

Front Panel Key: Marker \ **REF MODE ON \ READOUT MARKERS \ X-9 ON (9: ON)**

MKRC Select interpolated marker functionality **MARKER (Ch 7)**

Syntax: `MKRC`

Related Commands: MKRD, MKRX?

Front Panel Key: Marker \ **MARKER MODE CONTINUOUS**

MKRCOL Enter the color number for the markers **UTILITY (Ch 9)**

Syntax: `MKRCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 at the end of this chapter.

Related Commands: ANNCOL, DATCOL, GRTCOL, LAYCOL, MNUCOL, TRCCOL, MKRCOL?

Front Panel Key: Utility \ **COLOR SETUP** \ **MARKERS & LIMITS XX COLOR NAME**

MKRCOL? Output the color number for the markers **UTILITY (Ch 9)**

Syntax: `MKRCOL?`

Data I/O: Outputs the color palette number in ASCII <NR1> format.

Related Commands: ANNCOL?, DATCOL?, GRTCOL?, LAYCOL?, MNUCOL?, TRCCOL?, MKRCOL

Front Panel Key: Utility \ **COLOR SETUP** \ **MARKERS & LIMITS XX COLOR NAME**

MKRD Select discrete marker functionality **MARKER (Ch 7)**

Syntax: `MKRD`

Related Commands: MKRC, MKRX?

Front Panel Key: Marker \ **MARKER MODE DISCRETE**

MKRX? Output interpolated/discrete marker functionality **MARKER (Ch 7)**

Syntax: `MKRX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for DISCRETE
1 for INTERPOLATED

Related Commands: MKRC, MKRD

Front Panel Key: Marker \ **MARKER MODE**

MKSL Marker search left **MARKER (Ch 7)**

Syntax: `MKSL Value Units`
Value: Depends on graph type
Units: Depends on graph type

Remarks: If the optional *value* unit(s) argument is not supplied, the search marker (marker 2) is moved from its current position to the next most previous occurrence of the search value (see mnemonic SRCH). If the *value* unit(s) argument is supplied, the search value is updated to the argument value prior to moving the search marker.

Status Reporting: If the search fails to find the search value, the search failure bit (bit 4) in the Limits Event Status Register will be set. An Execution Error will also be reported.

Related Commands: MKSR, SMKR, SRCH, SRCH?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ SEARCH \ SEARCH LEFT**

MKSR Marker search right **MARKER (Ch 7)**

Syntax: `MKSR Value Units`
Value: Depends on graph type
Units: Depend on graph type

Remarks: If the optional *value* unit(s) argument is not supplied, the search marker (marker 2) is moved from its current position to the next occurance of the search value (see mnemonic SRCH). If the *value* unit(s) argument is supplied, the search value is updated to the argument value prior to moving the search marker.

Status Reporting: If the search fails to find the search value, the search failure bit (bit 4) in the Limits Event Status Register will be set. An Execution Error will also be reported.

Related Commands: MKSL, SMKR, SRCH, SRCH?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ SEARCH \ SEARCH RIGHT**

MKT0 Turn marker tracking off **MARKER (Ch 7)**

Syntax: MKT0

Related Commands: MKT1, MKTX?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH** \ **SETUP SEARCH** \ **TRACKING OFF**

MKT1 Turn marker tracking on **MARKER (Ch 7)**

Syntax: MKT1

Related Commands: MKT0, MKTX?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH** \ **SETUP SEARCH** \ **TRACKING ON**

MKTX? Output marker tracking on/off status **MARKER (Ch 7)**

Syntax: MKTX?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MKT0, MKT1

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH** \ **SETUP SEARCH** \ **TRACKING**

MM Suffix sets distance data type and scales by 1E-3 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: MM

MM1P12 Set the mixed mode 1st balanced port pair to 1:2 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM1P12

Related Commands: MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas \ **MORE** \ **MORE** \ **SELECT BALANCED PORT PAIR** \ **(1:2)/(2:1)**

MM1P13 Set the mixed mode 1st balanced port pair to 1:3 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM1P13`

Related Commands: MM1P12, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (1:3)/(3:1)**

MM1P14 Set the mixed mode 1st balanced port pair to 1:4 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM1P14`

Related Commands: MM1P12, MM1P13, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (1:4)/(4:1)**

MM1P21 Set the mixed mode 1st balanced port pair to 2:1 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM1P21`

Related Commands: MM1P12, MM1P13, MM1P14, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (1:2)/(2:1)**

MM1P23 Set the mixed mode 1st balanced port pair to 2:3 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM1P23`

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (2:3)/(3:2)**

MM1P24 Set the mixed mode 1st balanced port pair to 2:4 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM1P24

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (2:4)/(4:2)**

MM1P31 Set the mixed mode 1st balanced port pair to 3:1 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM1P31

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (1:3)/(3:1)**

MM1P32 Set the mixed mode 1st balanced port pair to 3:2 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM1P32

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P34, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (2:3)/(3:2)**

MM1P34 Set the mixed mode 1st balanced port pair to 3:4 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM1P34

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P41, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (3:4)/(4:3)**

MM1P41 Set the mixed mode 1st balanced port pair to 4:1 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM1P41`

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P42, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (1:4)/(4:1)**

MM1P42 Set the mixed mode 1st balanced port pair to 4:2 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM1P42`

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P43, MM1P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ (2:4)/(4:2)**

MM1P43 Set the mixed mode 1st balanced port pair to 4:3 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM1P43`

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P?

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M3P SETUP \ (3:4)/(4:3)** or
Hard Copy **\ OUTPUT SETUP \ SNP OPTIONS \ SETUP \ M4P SETUP \ (3:4)/(4:3)**

MM1P?

Query the mixed mode 1st balanced port pair for the active channel S-parameter

MEAS (Ch 5)

Syntax: `MM1P?`

Data I/O: Outputs data in <NR1> format as follows:
0 for Mixed Mode Pair 1 and 2
1 for Mixed Mode Pair 2 and 1
2 for Mixed Mode Pair 1 and 3
3 for Mixed Mode Pair 3 and 1
4 for Mixed Mode Pair 2 and 3
5 for Mixed Mode Pair 3 and 2
6 for Mixed Mode Pair 1 and 4
7 for Mixed Mode Pair 4 and 1
8 for Mixed Mode Pair 2 and 4
9 for Mixed Mode Pair 4 and 2
10 for Mixed Mode Pair 3 and 4
11 for Mixed Mode Pair 4 and 3
Default is Mixed Mode Pair 1 and 2

Related Commands: MM1P12, MM1P13, MM1P14, MM1P21, MM1P23, MM1P24, MM1P31, MM1P32, MM1P34, MM1P41, MM1P42, MM1P43

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR**

MM2P12

Set the mixed mode 2nd balanced port pair to 1:2 for the active channel S-parameter

MEAS (Ch 5)

Syntax: `MM2P12`

Related Commands: MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (1:2)/(2:1)**

MM2P13

Set the mixed mode 2nd balanced port pair to 1:3 for the active channel S-parameter

MEAS (Ch 5)

Syntax: `MM2P13`

Related Commands: MM2P12, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (1:3)/(3:1)**

MM2P14 Set the mixed mode 2nd balanced port pair to 1:4 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM2P14`

Related Commands: MM2P12, MM2P13, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (1:4)/(4:1)**

MM2P21 Set the mixed mode 2nd balanced port pair to 2:1 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM2P21`

Related Commands: MM2P12, MM2P13, MM2P14, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (1:2)/(2:1)**

MM2P23 Set the mixed mode 2nd balanced port pair to 2:3 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM2P23`

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (2:3)/(3:2)**

MM2P24 Set the mixed mode 2nd balanced port pair to 2:4 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: `MM2P24`

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (2:4)/(4:2)**

MM2P31

Set the mixed mode 2nd balanced port pair to 3:1 for the active channel S-parameter

MEAS (Ch 5)

Syntax: MM2P31

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (1:3)/(3:1)**

MM2P32

Set the mixed mode 2nd balanced port pair to 3:2 for the active channel S-parameter

MEAS (Ch 5)

Syntax: MM2P32

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P34, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (2:3)/(3:2)**

MM2P34

Set the mixed mode 2nd balanced port pair to 3:4 for the active channel S-parameter

MEAS (Ch 5)

Syntax: MM2P34

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P41, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (3:4)/(4:3)**

MM2P41

Set the mixed mode 2nd balanced port pair to 4:1 for the active channel S-parameter

MEAS (Ch 5)

Syntax: MM2P41

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P42, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (1:4)/(4:1)**

MM2P42 Set the mixed mode 2nd balanced port pair to 4:2 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM2P42

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P43, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (2:4)/(4:2)**

MM2P43 Set the mixed mode 2nd balanced port pair to 4:3 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM2P43

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P?

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR \ (3:4)/(4:3)**

MM2P? Query the mixed mode 2nd balanced port pair for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MM2P?

Data I/O: Outputs data in <NR1> format as follows:
0 for Mixed Mode Pair 1 and 2
1 for Mixed Mode Pair 2 and 1
2 for Mixed Mode Pair 1 and 3
3 for Mixed Mode Pair 3 and 1
4 for Mixed Mode Pair 2 and 3
5 for Mixed Mode Pair 3 and 2
6 for Mixed Mode Pair 1 and 4
7 for Mixed Mode Pair 4 and 1
8 for Mixed Mode Pair 2 and 4
9 for Mixed Mode Pair 4 and 2
10 for Mixed Mode Pair 3 and 4
11 for Mixed Mode Pair 4 and 3
Default is Mixed Mode Pair 3 and 4

Related Commands: MM2P12, MM2P13, MM2P14, MM2P21, MM2P23, MM2P24, MM2P31, MM2P32, MM2P34, MM2P41, MM2P42, MM2P43

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT 2ND PAIR**

MMN Move active marker to minimum trace value **MARKER (Ch 7)**

Syntax: MMN

Related Commands: MMX, CH1-CH4

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ ACTIVE MARKER ON ALL CHANNELS \ MARKER TO PEAK \ MARKER TO MIN**

MMS1 Set the mixed mode single ended port to Port 1 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MMS1

Related Commands: MMS2, MMS3, MMS4, MMS?

Front Panel Key: Meas \ **MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT SINGLE ENDED PORT \ PORT 1**

MMS2 Set the mixed mode single ended port to Port 2 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MMS2

Related Commands: MMS1, MMS3, MMS4, MMS?

Front Panel Key: Meas \ **MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT SINGLE ENDED PORT \ PORT 2**

MMS3 Set the mixed mode single ended port to Port 3 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MMS3

Related Commands: MMS1, MMS2, MMS4, MMS?

Front Panel Key: Meas \ **MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT SINGLE ENDED PORT \ PORT 3**

MMS4 Set the mixed mode single ended port to Port 4 for the active channel S-parameter **MEAS (Ch 5)**

Syntax: MMS4

Related Commands: MMS1, MMS2, MMS3, MMS?

Front Panel Key: Meas \ **MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT SINGLE ENDED PORT \ PORT 4**

MMS? Query the mixed mode single ended port for the active channel S-parameter

MEAS (Ch 5)

Syntax: MMS?

Data I/O: Outputs data in <NR1> format as follows:
12 for Mixed Mode Singleton 1
13 for Mixed Mode Singleton 2
14 for Mixed Mode Singleton 3
15 for Mixed Mode Singleton 4
Default is Mixed Mode Singleton 1

Related Commands: MMS1, MMS2, MMS3, MMS4

Front Panel Key: Meas **\ MORE \ MORE \ SELECT BALANCED PORT PAIR \ SELECT SINGLE ENDED PORT**

MMSC1C1 Set the S-parameter to mixed mode SC1C1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: MMSC1C1

Related Commands: MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ SC1C1**

MMSC1C2 Set the S-parameter to mixed mode SC1C2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: MMSC1C2

Related Commands: MMSC1C1, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ SC1C2**

MMSC1D1

Set the S-parameter to mixed mode SC1D1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSC1D1`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ MORE \ SC1D1**

MMSC1D2

Set the S-parameter to mixed mode SC1D2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSC1D2`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ MORE \ SC1D2**

MMSC2C1

Set the S-parameter to mixed mode SC2C1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSC2C1`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ SC2C1**

MMSC2C2

Set the S-parameter to mixed mode SC2C2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSC2C2`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ SC2C2**

MMSC2D1

Set the S-parameter to mixed mode SC2D1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSC2D1`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ MORE \ SC2D1**

MMSC2D2

Set the S-parameter to mixed mode SC2D2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSC2D2`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ MORE \ SC2D2**

MMSCC

Set the S-parameter to mixed mode SCC with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: `MMSCC`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ SCC**

MMSCD

Set the S-parameter to mixed mode SCD with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: `MMSCD`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ SCD**

MMSCS

Set the S-parameter to mixed mode SCS with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: `MMSCS`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ SCS**

MMSD1C1 Set the S-parameter to mixed mode SD1C1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD1C1`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ SD1C1**

MMSD1C2 Set the S-parameter to mixed mode SD1C2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD1C2`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ SD1C2**

MMSD1D1 Set the S-parameter to mixed mode SD1D1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD1D1`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ SD1D1**

MMSD1D2

Set the S-parameter to mixed mode SD1D2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD1D2`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ SD1D2**

MMSD2C1

Set the S-parameter to mixed mode SD2C1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD2C1`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ MORE \ SD2C1**

MMSD2C2

Set the S-parameter to mixed mode SD2C2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD2C2`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ MORE \ MORE \ SD2C2**

MMSD2D1 Set the S-parameter to mixed mode SD2D1 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD2D1`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ SD2D1**

MMSD2D2 Set the S-parameter to mixed mode SD2D2 with the current port pair selections for the active channel

MEAS (Ch 5)

Syntax: `MMSD2D2`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSDC, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ MORE \ MORE \ SD2D2**

MMSDC Set the S-parameter to mixed mode SDC with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: `MMSDC`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDD, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ SDC**

MMSDD

Set the S-parameter to mixed mode SDD with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: MMSDD

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDS, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ SDD**

MMSDS

Set the S-parameter to mixed mode SDS with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: MMSDS

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSSC, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ SDS**

MMSSC

Set the S-parameter to mixed mode SSC with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: MMSSC

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSD

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ SSC**

MMSSD Set the S-parameter to mixed mode SSD with the current port pair/singleton selection for the active channel

MEAS (Ch 5)

Syntax: `MMSSD`

Related Commands: MMSC1C1, MMSC1C2, MMSC1D1, MMSC1D2, MMSC2C1, MMSC2C2, MMSC2D1, MMSC2D2, MMSCC, MMSCD, MMSCS, MMSD1C1, MMSD1C2, MMSD1D1, MMSD1D2, MMSD2C1, MMSD2C2, MMSD2D1, MMSD2D2, MMSDC, MMSDD, MMSDS, MMSSC

Front Panel Key: Meas **\ MIXED MODE S-PARAMETER \ SSD**

MMT Suffix sets distance data type and scales by 1E-3

DATA ENTRY SUFFIXES (Ch 5)

Syntax: `MMT`

Related Commands: MM

MMX Move active marker to maximum trace value

MARKER (Ch 7)

Syntax: `MMX`

Related Commands: MMN, CH1-CH4

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ ACTIVE MARKER ON ALL CHANNELS \ MARKER TO PEAK \ MARKER TO MAX**

MNUCOL Enter the color number for the menu headers

UTILITY (Ch 9)

Syntax: `MNUCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 (end of chapter).

Related Commands: ANNCOL, DATCOL, GRTCOL, LAYCOL, MKRCOL, TRCCOL, MNUCOL?

Front Panel Key: Utility **\ COLOR SETUP \ MENU TITLE & INFO XX COLOR NAME**

MNUCOL? Output the color number for the menu headers **UTILITY (Ch 9)**

Syntax: MNUCOL?

Data I/O: Outputs the color palette number in ASCII <NR1> format.

Related Commands: ANNCOL?, DATCOL?, GRTCOL?, LAYCOL?, MKRCOL?, TRCCOL?, MNUCOL?

Front Panel Key: Utility \ **COLOR SETUP** \ **MENU TITLE & INFO XX COLOR NAME**

MO1 Turn off marker 1 **MARKER (Ch 7)**

Syntax: MO1

MO10 Turn off marker 10 **MARKER (Ch 7)**

Syntax: MO10

MO11 Turn off marker 11 **MARKER (Ch 7)**

Syntax: MO11

MO12 Turn off marker 12 **MARKER (Ch 7)**

Syntax: MO12

MO2 Turn off marker 2 **MARKER (Ch 7)**

Syntax: MO2

MO3 Turn off marker 3 **MARKER (Ch 7)**

Syntax: MO3

MO4 Turn off marker 4 **MARKER (Ch 7)**

Syntax: MO4

MO5 Turn off marker 5 **MARKER (Ch 7)**

Syntax: MO5

MO6 Turn off marker 6 **MARKER (Ch 7)**

Syntax: MO6

MO7 Turn off marker 7 **MARKER (Ch 7)**

Syntax: MO7

MO8 Turn off marker 8 **MARKER (Ch 7)**

Syntax: MO8

MO9 Turn off marker 9 **MARKER (Ch 7)**

Syntax: MO9

MOF Turn marker display off **MARKER (Ch 7)**

Syntax: MOF

Front Panel Key: Marker \ **DISPLAY MARKER OFF**

MON Turn marker display on **MARKER (Ch 7)**

Syntax: MON

Front Panel Key: Marker \ **DISPLAY MARKER ON**

MON? Output marker display on/off status **MARKER (Ch 7)**

Syntax: MON?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Marker \ **DISPLAY MARKER**

MPH Select log magnitude and phase display for active channel **DISPLAY (Ch 5)**

Syntax: `MPH`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, PCP, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **LOG MAGNITUDE AND PHASE**

MPN Enter pen number for markers and limits **HARD COPY (Ch 9)**

Syntax: `MPN Value Units`
Value: 1 to 8
Units: XX1

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **PLOT FORMAT** \ **PEN COLORS** \ **MARKERS AND LIMITS**

MPN? Output pen number for markers and limits **HARD COPY (Ch 9)**

Syntax: `MPN?`

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: MPN

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **PLOT FORMAT** \ **PEN COLORS** \ **MARKERS AND LIMITS**

MR1 Turn marker 1 on and make it the active marker **MARKER (Ch 7)**

Syntax: `MR1`

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **MARKERS ON ACTIVE CHANNEL** \ **1: (ON)**

MR10 Turn marker 10 on and make it the active marker **MARKER (Ch 7)**

Syntax: `MR10`

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **MARKERS ON ACTIVE CHANNEL** \ **10: (ON)**

MR10? Output marker 10 on/off status **MARKER (Ch 7)**

Syntax: `MR10?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR10, MO10

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 10:**

MR11 Turn marker 11 on and make it the active marker **MARKER (Ch 7)**

Syntax: `MR11`

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 11: (ON)**

MR11? Output marker 11 on/off status **MARKER (Ch 7)**

Syntax: `MR11?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR11, MO11

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 11:**

MR12 Turn marker 12 on and make it the active marker **MARKER (Ch 7)**

Syntax: `MR12`

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 12: (ON)**

MR12? Output marker 12 on/off status **MARKER (Ch 7)**

Syntax: `MR12?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR12, MO12

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 12:**

MR1? Output marker 1 on/off status **MARKER (Ch 7)**

Syntax: `MR1?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR102, MO102

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 1:**

MR2 Turn marker 2 on and make it the active marker **MARKER (Ch 7)**

Syntax: `MR2`

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 2: (ON)**

MR2? Output marker 2 on/off status **MARKER (Ch 7)**

Syntax: `MR2?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR2, MO2

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 2:**

MR3 Turn marker 3 on and make it the active marker **MARKER (Ch 7)**

Syntax: MR3

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 3: (ON)**

MR3? Output marker 3 on/off status **MARKER (Ch 7)**

Syntax: MR3?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR3, MO3

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 3:**

MR4 Turn marker 4 on and make it the active marker **MARKER (Ch 7)**

Syntax: MR4

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 4: (ON)**

MR4? Output marker 4 on/off status **MARKER (Ch 7)**

Syntax: MR4?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR4, MO4

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 4:**

MR5 Turn marker 5 on and make it the active marker **MARKER (Ch 7)**

Syntax: MR5

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 5: (ON)**

MR5? Output marker 5 on/off status **MARKER (Ch 7)**

Syntax: MR5?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR5, MO5

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 5:**

MR6 Turn marker 6 on and make it the active marker **MARKER (Ch 7)**

Syntax: MR6

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 6: (ON)**

MR6? Output marker 6 on/off status **MARKER (Ch 7)**

Syntax: MR6?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR6, MO6

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 6:**

MR7 Turn marker 7 on and make it the active marker **MARKER (Ch 7)**

Syntax: MR7

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 7: (ON)**

MR7? Output marker 7 on/off status **MARKER (Ch 7)**

Syntax: MR7?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR7, MO7

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 7:**

MR8 Turn marker 8 on and make it the active marker **MARKER (Ch 7)**

Syntax: MR8

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 8: (ON)**

MR8? Output marker 8 on/off status **MARKER (Ch 7)**

Syntax: MR8?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR8, MO8

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 8:**

MR9 Turn marker 9 on and make it the active marker **MARKER (Ch 7)**

Syntax: MR9

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 9: (ON)**

MR9? Output marker 9 on/off status **MARKER (Ch 7)**

Syntax: MR9?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: MR9, MO9

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ 9:**

MRM Display the Marker Readout menu **MARKER (Ch 7)**

Syntax: MRM

Related Commands: LFP, LFR, LTST

MRR Restore original marker range **APPL - TIME DOMAIN (Ch 10)**

Syntax: MRR

Remarks: Valid only in the Time Domain mode.

Front Panel Key: Appl **\ DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ MARKER RANGE \ RESTORE ORIGINAL RANGE**

MRX? Output active marker number **MARKER (Ch 7)**

Syntax: MRX?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for NO MARKER
1 THRU 6 for THE MARKER NUMBER

Related Commands: MR102

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ MARKERS ON ACTIVE CHANNEL \ (1-12): (ON)**

MS Suffix sets time data type and scales by 1E-3 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: MS

MS0 Turn multiple source mode off **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `MS0`

Related Commands: MS1, MSD

Front Panel Key: Config \ **MULTIPLE SOURCE** \ **MULTIPLE SOURCE MODE OFF**

MS1 Turn multiple source mode on **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `MS1`

Related Commands: MS0, MSD

Front Panel Key: Config \ **MULTIPLE SOURCE** \ **MULTIPLE SOURCE MODE ON**

MS1C Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1C/SSC for the active channel **MEAS (Ch 5)**

Syntax: `MS1C`

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **S1C COMMON MODE**

MS1D Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1D/SSD for the active channel **MEAS (Ch 5)**

Syntax: `MS1D`

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **S1D DIFF. MODE**

MSB Select most significant byte first binary transfer **REMOTE - FORMATTING (Ch 8)**

Syntax: `MSB`

Remarks: Default format for byte ordering — not suitable for IBM/Intel based computers.

Related Commands: LSB

MSC1

Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SC1/SCS for the active channel

MEAS (Ch 5)

Syntax: `MSC1`

Related Commands: MSC1C1, MSC1C2, MSC1D1, MSC1D2, MSCC, MSCD

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SC1 COMMON MODE**

MSC1C1

Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C1 for the active channel

MEAS (Ch 5)

Syntax: `MSC1C1`

Related Commands: MSC1, MSC1C2, MSC1D1, MSC1D2, MSCC, MSCD

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SC1C1 COMMON MODE**

MSC1C2

Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C2 for the active channel

MEAS (Ch 5)

Syntax: `MSC1C2`

Related Commands: MSC1, MSC1C1, MSC1D1, MSC1D2, MSCC, MSCD

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SC1C2 COMMON MODE**

MSC1D1

Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D1 for the active channel

MEAS (Ch 5)

Syntax: `MSC1D1`

Related Commands: MSC1, MSC1C1, MSC1C2, MSC1D2, MSCC, MSCD

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SC1D1 MODE CONVERSION**

MSC1D2

Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D2 for the active channel

MEAS (Ch 5)

Syntax: `MSC1D2`

Related Commands: MSC1, MSC1C1, MSC1C2, MSC1D1, MSCC, MSCD

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SC1D2 MODE CONVERSION**

MSC2C1 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C1 for the active channel **MEAS (Ch 5)**

Syntax: `MSC2C1`

Related Commands: MSC2C2, MSC2D1, MSC2D2, MSCC, MSCD

Front Panel Key: Meas **\ MIXED MODE S- PARAMETER \ SC2C1 MODE CONVERSION**

MSC2C2 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C2 for the active channel **MEAS (Ch 5)**

Syntax: `MSC2C2`

Related Commands: MSC2C1, MSC2D1, MSC2D2, MSCC, MSCD

Front Panel Key: Meas **\ MIXED MODE S- PARAMETER \ SC2C2 MODE CONVERSION**

MSC2D1 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D1 for the active channel **MEAS (Ch 5)**

Syntax: `MSC2D1`

Related Commands: MSC2C1, MSC2C2, MSC2D2, MSCC, MSCD

Front Panel Key: Meas **\ MIXED MODE S- PARAMETER \ SC2D1 MODE CONVERSION**

MSC2D2 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D2 for the active channel **MEAS (Ch 5)**

Syntax: `MSC2D2`

Related Commands: MSC2C1, MSC2C2, MSC2D1, MSCC, MSCD

Front Panel Key: Meas **\ MIXED MODE S- PARAMETER \ SC2D2 MODE CONVERSION**

MSCC Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCC for the active channel

MEAS (Ch 5)

Syntax: `MSCC`

Related Commands: MSCD, MSC1xx, MSC2xx

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SCC COMMON MODE**

MSCD Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCD for the active channel

MEAS (Ch 5)

Syntax: `MSCD`

Related Commands: MSCC, MSC1xx, MSC2xx

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SDC MODE CONVERSION**

MSD Select multiple source define mode

CONFIG - MULTIPLE SOURCE (Ch 5)

Syntax: `MSD`

Related Commands: MS0, MS1

Front Panel Key: Config \ **MULTIPLE SOURCE** \ **MULTIPLE SOURCE MODE DEFINE**

MSD1 Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SD1/SDS for the active channel

MEAS (Ch 5)

Syntax: `MSD1`

Related Commands: MSD1C1, MSD1C2, MSD1D1, MSD1D2

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SD1 DIFF. MODE**

MSD1C1 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C1 for the active channel

MEAS (Ch 5)

Syntax: `MSD1C1`

Related Commands: MSD1, MSD1C2, MSD1D1, MSD1D2

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SD1C1 MODE CONVERSION**

MSD1C2 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C2 for the active channel **MEAS (Ch 5)**

Syntax: `MSD1C2`

Related Commands: MSD1, MSD1C1, MSD1D1, MSD1D2

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER \ SD1C2 MODE CONVERSION**

MSD1D1 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D1 for the active channel **MEAS (Ch 5)**

Syntax: `MSD1D1`

Related Commands: MSD1, MSD1C1, MSD1C2, MSD1D2

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER \ SD1D1 MODE CONVERSION**

MSD1D2 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D2 for the active channel **MEAS (Ch 5)**

Syntax: `MSD1D2`

Related Commands: MSD1, MSD1C1, MSD1C2, MSD1D1

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER \ SD1D2 MODE CONVERSION**

MSD2C1 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C1 for the active channel **MEAS (Ch 5)**

Syntax: `MSD2C1`

Related Commands: MSD2C2, MSD2D1, MSD2D2

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER \ SD1D2 MODE CONVERSION**

MSD2C2 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C2 for the active channel **MEAS (Ch 5)**

Syntax: `MSD2C2`

Related Commands: MSD2C1, MSD2D1, MSD2D2

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SD2C2 MODE CONVERSION**

MSD2D1 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D1 for the active channel **MEAS (Ch 5)**

Syntax: `MSD2D1`

Related Commands: MSD2C1, MSD2C2, MSD2D2

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SD2D1 MODE CONVERSION**

MSD2D2 Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D2 for the active channel **MEAS (Ch 5)**

Syntax: `MSD2D2`

Related Commands: MSD2C1, MSD2C2, MSD2D

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SD2D2 MODE CONVERSION**

MSDC Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDC for the active channel **MEAS (Ch 5)**

Syntax: `MSDC`

Related Commands: MSDD, MSD1xx, MSD2xx

Front Panel Key: Meas \ **MIXED MODE S- PARAMETER** \ **SDC MODE CONVERSION**

MSDD Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDD for the active channel **MEAS (Ch 5)**

Syntax: `MSDD`

Related Commands: MSDC, MSD1xx, MSD2xx

Front Panel Key: Meas **\ MIXED MODE S- PARAMETER \ SDD MODE CONVERSION**

MSFH Enter high loss value for shape factor calculation **MARKER (Ch 7)**

Syntax: `MSFH Value Units`
Value: Depends on graph type; refer to Table 11-2 at the end of this chapter.
Units: Depends on graph type; refer to Table 11-2 at the end of this chapter.

Related Commands: MSFL, MSFH?, FLTS?, DSF0, DSF1

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SHAPE FACTOR HIGH**

MSFH? Output high loss value for shape factor calculation **MARKER (Ch 7)**

Syntax: `MSFH?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: MSFH

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SHAPE FACTOR HIGH**

MSFL Enter low loss value for shape factor calculation **MARKER (Ch 7)**

Syntax: `MSFL Value Units`
Value: Depends on graph type; refer to Table 11-2 at the end of this chapter.
Units: Depends on graph type; refer to Table 11-2 at the end of this chapter.

Related Commands: MSFH, MSFL?, FLTS?, DSF0, DSF1

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SHAPE FACTOR LOW**

MSFL? Output low loss value for shape factor calculation **MARKER (Ch 7)**

Syntax: MSFL?

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: MSFL

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SHAPE FACTOR LOW**

MSR0 Select 0 as reference for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: MSR0

Related Commands: MSRD, MSRM, MSRX?, MSRMIN

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SETUP SEARCH \ 0 dB**

MSRD Select delta reference marker as reference for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: MSRD

Related Commands: MSR0, MSRM, MSRX?, MSRMIN

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SETUP SEARCH \ REF MARKER**

MSRM Select maximum as reference for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: MSRM

Related Commands: MSR0, MSRD, MSRX?, MSRMIN

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ FILTER SETUP \ SETUP SEARCH \ MAXIMUM VALUE**

MSRMIN Select min as ref for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: MSRMIN

Related Commands: MSRM, MSRD, MSR0, MSRX?

MSRMR Select maximum return as ref for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: `MSRMR`

MSRMRA Select auto mode of maximum return as ref for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: `MSRMRA`

MSRMRM Select manual mode of maximum return as ref for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: `MSRMRM`

MSRMRV Enter maximum return value for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: `MSRMRV`

MSRMRV? Output maximum return value for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: `MSRMRV?`

Data I/O: Outputs a value in ASCII <NR3 > format. The value is in frequency units.

MSRMRX? Output maximum return mode for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: `MSRMRX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for AUTO MODE and 1 for MANUAL MODE.

MSRX? Output reference selection for marker search and bandwidth calculation **MARKER (Ch 7)**

Syntax: `MSRX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for ZERO dB
1 for DELTA REF MRKR
2 for MAXIMUM VALUE
3 for MINIMUM VALUE

Related Commands: MSR0, MSRD, MSRM, MSRMIN

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ FILTER PARAMETERS \ SEARCH REFERENCE**

MSX? Output multiple source mode on/off/define **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `MSX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON
2 for DEFINE.

Front Panel Key: Config **\ MULTIPLE SOURCE \ MULTIPLE SOURCE MODE**

MTH? Output trace math math type **DISPLAY (Ch 5)**

Syntax: `MTH?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for ADD
2 for SUBSTRACT
3 for MULTIPLY
4 for DIVIDE

Related Commands: ADD, DIV, MUL, MIN, DAT?

MTR Suffix sets distance data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `MTR`

MUL — Select multiplication as trace math for active channel — **DISPLAY (Ch 5)**

Syntax: MUL

Related Commands: DIV, ADD, MIN, MTH?, CH1-CH4

Front Panel Key: Display \ **TRACE MEMORY** \ **SELECT TRACE MATH** \ **MULTIPLY (*)**

MV — Suffix sets voltage data type and scales by 1E-3 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: MV

NA1 — Select a1 as numerator for parameter being defined — **MEAS (Ch 5)**

Syntax: NA1

Related Commands: NA2, NA3, NA4, NB1, NB2, NB3, NB4, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a1 (Ra)**

NA2 — Select a2 as numerator for parameter being defined — **MEAS (Ch 5)**

Syntax: NA2

Related Commands: NA1, NA3, NA4, NB1, NB2, NB3, NB4, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a2 (Rb)**

NA3 — Select a3 = Rc as numerator for parameter being defined — **MEAS (Ch 5)**

Syntax: NA3

Related Commands: NA1, NA2, NA4, NB1, NB2, NB3, NB4, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a3 (Rc)**

NA4 Select a4 = Rd as numerator for parameter being define **MEAS (Ch 5)**

Syntax: NA4

Related Commands: NA1, NA2, NA3, NB1, NB2, NB3, NB4, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **a4 (Rd)**

NB1 Select b1 as numerator for parameter being defined **MEAS (Ch 5)**

Syntax: NB1

Related Commands: NA1, NA2, NA3, NA4, NB2, NB3, NB4, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **b1 (Ta)**

NB2 Select b2 as numerator for parameter being defined **MEAS (Ch 5)**

Syntax: NB2

Related Commands: NA1, NA2, NA3, NA4, NB1, NB3, NB4, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **b2 (Tb)**

NB3 Select b3 = Tc as numerator for parameter being defined **MEAS (Ch 5)**

Syntax: NB3

Related Commands: NA1, NA2, NA3, NA4, NB1, NB2, NB4, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **b3 (Tc)**

NB4 Select b4 = Td as numerator for parameter being define **MEAS (Ch 5)**

Syntax: NB4

Related Commands: NA1, NA2, NA3, NA4, NB1, NB2, NB3, NU1, NUM?

Front Panel Key: Meas \ **USER DEFINED** \ **CHANGE RATIO** \ **b4 (Td)**

NCS Go to next calibration step — **CAL (Ch 6)**

Syntax: NCS

Related Commands: OPC, TCD, TC1, TC2

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL** \ **NEXT CAL STEP** \ **START CAL** \ **NEXT CAL STEP**

NF Suffix sets farad data type and scales by 1E-9 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: NF

NFALCK0 Turn off the lock down — **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFALCK0

Remarks: Use only for wideband

Related Commands: NFALCK1, NFALCK?

NFALCK1 Lock down the front end attenuator — **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFALCK1

Remarks: Use only for wideband

Related Commands: NFALCK0, NFALCK?

NFALCK? Output lock or unlock down status for the front end attenuator setting — **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFALCK?

Remarks: Use only for wideband

Related Commands: NFALCK0, NFALCK1

NFAOF Turn noise figure measurement averaging off — **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFAOF

Related Commands: NFAON, NFAON?

Front Panel Key: Avg \ **NOISE FIGURE AVERAGE OFF**

NFAON Turn noise figure measurement averaging on **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFAON

Related Commands: NFAOF, NFAON?

Front Panel Key: Avg \ **NOISE FIGURE AVERAGE ON**

NFAON? Noise figure averaging on/off query **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFAON?

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: NFAON, NFAOF

Front Panel Key: Avg \ **NOISE FIGURE AVERAGE**

NFASET Lock down the front end attenuator and set it to 0, 1, 2, 3, or 4 **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFASET

Remarks: Use only for wideband

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: NFALCK0, NFALCK1, NFALCK?

NFAVEC Enter noise figure averaging count **AVG (Ch 5)**

Syntax: NFAVEC Value Units
Value: Number
Units: XX1, XX3, XM3

Data I/O: The value is input in ASCII <NR1> format.

Front Panel Key: Avg \ **NOISE FIGURE AVERAGE**

NFAVEC? Output noise figure averaging count **AVG (Ch 5)**

Syntax: NFAVEC?

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Avg \ **NOISE FIGURE AVERAGE**

NFBATTN Output the backend attenuator setting **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFBATTN

Remarks: Use only for wideband

NFBCAL Output NF backend calibration table **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFBCAL

Remarks: Use only for wideband

NFBW Enter noise figure bandwidth correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFBW Value Units
Value: ASCII <NRf> number
Units: XX1, XX3, X3M

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ DUT BANDWIDTH: WIDE \ NOISE FIGURE SETUP \ WIDEBAND BW CORR MODE ON**

NFBW? Output noise figure bandwidth correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFBW?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ DUT BANDWIDTH: WIDE \ NOISE FIGURE SETUP \ WIDEBAND BW CORR MODE**

NFBWC0 Turn off noise figure bandwidth correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFBWC0`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ DUT BANDWIDTH: WIDE \ NOISE FIGURE SETUP \ WIDEBAND BW CORR MODE OFF**

NFBWC1 Turn on noise figure bandwidth correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFBWC1`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ DUT BANDWIDTH: WIDE \ NOISE FIGURE SETUP \ WIDEBAND BW CORR MODE ON**

NFBWCX? Output noise figure bandwidth correction on/off status **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFBWCX?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ DUT BANDWIDTH: WIDE \ NOISE FIGURE SETUP \ WIDEBAND BW CORR MODE**

NFC0 Turn off noise figure correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFC0`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Cal \ **NONE**

NFC1 Turn on noise figure correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFC1`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Cal \ **APPLY CAL NOISE FIGURE ONLY**

NFC12TDONE? Output noise figure with 12 term cal done status **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFC12TDONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Cal \ **APPLY CAL NOISE FIGURE WITH 12 TERM**

NFC2 Turn on noise figure with 12-term correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFC2

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Cal \ **APPLY CAL NOISE FIGURE WITH 12 TERM**

NFCDONE? Output noise figure cal done status **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFCDONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Cal \ **APPLY CAL NOISE FIGURE ONLY**

NFCOLD Output corrected data for cold noise power **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFCOLD

Remarks: Use for wideband and narrowband

Data I/O: Outputs data in an <Arbitrary Block> format.

Related Commands: NFHOT

NFCT Enter noise figure cold temperature **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFCT Value Units`
Value: ASCII <NRf> number
Units: K, KS

Data I/O: Input using an ASCII <NRf> number

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ COLD TEMPERATURE**

NFCT? Output noise figure cold temperature **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFCT?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ COLD TEMPERATURE**

NFCX? Output noise figure correction on/off status **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFCX?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Cal \ **APPLY CAL NOISE FIGURE ONLY**

NFDAG Display available gain **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFDAG`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ DISPLAY SELECTION \ AVAILABLE GAIN**

NFDATA Output the cold data, the hot data, the front end attenuator **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFDATA`

Remarks: Use for wideband and narrowband

NFDBWN Select narrow DUT BW **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFDBWN`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DUT BANDWIDTH: NARROW**

NFDBWW Select wide DUT BW **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFDBWW`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DUT BANDWIDTH: WIDE**

NFDBWX? Output DUT BW setting **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFDBWX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DUT BANDWIDTH**

NFDENT Display equivalent noise temperature **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFDENT`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DISPLAY SELECTION** \ **EQUIVALENT NOISE TEMPERATURE**

NFDIG Display insertion gain **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFDIG`

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DISPLAY SELECTION** \ **INSERTION GAIN**

NFDNF Display noise figure **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFDNF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DISPLAY SELECTION** \ **NOISE FIGURE**

NFDX? Output noise figure display selection **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFDX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for NOISE FIGURE
2 for INSERTION GAIN
3 for AVAILABLE GAIN
4 for Y-FACTOR
5 for EQUIVALENT NOISE TEMPERATURE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DISPLAY SELECTION**

NFDYF Display Y-factor **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFDYF

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **NOISE FIGURE** \ **DISPLAY SELECTION** \ **Y FACTOR**

NFFATTN Output the front end attenuator setting **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFFATTN

Remarks: Use only for wideband

Related Commands: NFALCK0, NFALCK1, NFALCK?

NFHOT Output corrected data for hot noise power **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFHOT

Remarks: Use for wideband and narrowband

Data I/O: Outputs data in an <Arbitrary Block> format.

Related Commands: NFCOLD

NFLA Enter noise figure loss after DUT **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFLA

Data I/O: Input data using ASCII <NRf> format.

Related Commands: NFLA?

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ INSERT LOSS AFTER DUT**

NFLA? Output noise figure loss after DUT **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFLA?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: NFLA

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ INSERT LOSS AFTER DUT**

NFLB Enter noise figure loss before DUT **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFLB

Data I/O: Input data using ASCII <NRf> format.

Related Commands: NFLB?

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ INSERT LOSS BEFORE DUT**

NFLB? Output noise figure loss before DUT **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFLB?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: NFLB

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ INSERT LOSS BEFORE DUT**

NFLENR Load ENR file from floppy disk **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFLENR Value`
Value: "String" 1 to 8 characters

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ ENR TABLE OPERATION \ LOAD ENR TABLE \ FROM FLOPPY DISK: VENDOR ENR TABLE**

NFLENRH Load ENR file from hard disk **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFLENRH Value`
Value: "String" 1 to 8 characters

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ ENR TABLE OPERATION \ LOAD ENR TABLE \ FROM HARD DISK: VENDOR ENR TABLE**

NFLENRX Load ENR extension correction file from floppy disk **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFLENRX Value`
Value: "String" 1 to 8 characters

NFLENRXH Load ENR extension correction file from hard disk **APPL - NOISE FIGURE (Ch 10)**

Syntax: `NFLENRXH Value`
Value: "String" 1 to 8 characters

NFLNFX Load ENR external extension correction file from floppy disk

APPL - NOISE FIGURE (Ch 10)

Syntax: `NFLNFX Filename`
Value: Filename

Remarks: If you have an ENR external extension correction file name “enr.nfx” on floppy disk, place “enr” after NFLNFX.

Data I/O: Input string in <Arbitrary ASCII> format.

Related Commands: NFLNFXH

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ ENR TABLE OPERATION \ LOAD ENR TABLE \ FROM FLOPPY DISK: EXTERNAL ENR EXTENSION TABLE**

NFLNFXH Load ENR external extension correction file from hard disk

APPL - NOISE FIGURE (Ch 10)

Syntax: `NFLNFXH Filename`
Value: Filename

Remarks: If you have an ENR external extension correction file name “enr.nfx” on hard disk, place “enr” after NFLNFXH.

Data I/O: Input string in <Arbitrary ASCII> format.

Related Commands: NFLNFX

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ ENR TABLE OPERATION \ LOAD ENR TABLE \ FROM HARD DISK: EXTERNAL ENR EXTENSION TABLE**

NFOL Output noise figure overload status

APPL - NOISE FIGURE (Ch 10)

Syntax: `NFOL`

Remarks: Use for wideband and narrowband

NFSRCE Select external noise source **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFSRCE

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ NOISE SOURCE EXTERNAL**

NFSRCI Select internal noise source **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFSRCI

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ NOISE SOURCE INTERNAL**

NFSRCX? Output noise source selection **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFSRCX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for OFF
2 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ NOISE SOURCE**

NFSSBC0 Turn off noise figure single sideband correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFSSBC0

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ SSB CORRECTION OFF**

NFSSBC1 Turn on noise figure single sideband correction **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFSSBC1

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ SSB CORRECTION ON**

NFSSBCX? Output noise figure single sideband correction on/off **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFSSBCX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ SSB CORRECTION**

NFV Start noise figure verification **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: NFV

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Utility \ **DIAGNOSTICS \ NOISE FIGURE ASSURANCE \ VERIFY**

NFVNB? Output noise figure verification NB data **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: NFVNB?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Utility \ **DIAGNOSTICS \ NOISE FIGURE ASSURANCE \ VERIFY \ NB=**

NFVNC? Output noise figure verification NC data **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: NFVNC?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl \ **CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Utility \ **DIAGNOSTICS \ NOISE FIGURE ASSURANCE \ VERIFY \ NC=**

NFVND? Output noise figure verification ND data **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: NFVND?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Utility **\ DIAGNOSTICS \ NOISE FIGURE ASSURANCE \ VERIFY \ ND=**

NFVSB? Output noise figure verification SB data **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: NFVSB?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Utility **\ NOISE FIGURE ASSURANCE \ VERIFY \ SB=**

NFVSC? Output noise figure verification SC data **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: NFVSC?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Utility **\ NOISE FIGURE ASSURANCE \ VERIFY \ SC=**

NFVSD? Output noise figure verification SD data **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: NFVSD?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE** then Utility **\ NOISE FIGURE ASSURANCE \ VERIFY \ SD=**

NFXENR0 Turn off ENR extension table **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFXENR0

Related Commands: NFXENR1, NFXENRX?

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ ENR TABLE OPERATION \ EXTERNAL ENR EXTENSION TABLE OFF**

NFXENR1 Turn on ENR extension table **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFXENR1

Related Commands: NFXENR0, NFXENRX?

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ ENR TABLE OPERATION \ EXTERNAL ENR EXTENSION TABLE ON**

NFXENRX? Query on/off status of ENR extension table **APPL - NOISE FIGURE (Ch 10)**

Syntax: NFXENRX?

Data I/O: Outputs value on/off status using ASCII <NR1> format as follows:
0 is OFF
1 is ON

Related Commands: NFXENR0, NFXENR1

Front Panel Key: Appl **\ CHANGE APPLICATION SETUP \ MEASUREMENT TYPE \ NOISE FIGURE \ NOISE FIGURE SETUP \ ENR TABLE OPERATION \ EXTERNAL ENR EXTENSION TABLE**

NH Suffix sets farad data type and scales by 1E-9 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: NH

NMKR Select normal markers on active channel marker mode **MARKER (Ch 7)**

Syntax: NMKR

Related Commands: AMKR, FMKR, SMKR, XMKR?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ ACTIVE MARKERS ON ACTIVE CHANNELS**

NOC Select normal calibration data points **CAL (Ch 6)**

Syntax: NOC

Related Commands: SRT, STP, TOC, DFC, CWC

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM)** or **\ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM)**

NOFST Enter nominal offset value for external gain **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: NOFST Value Units
Value: The nominal offset value in ASCII <NRF> format
Units: DB

Remarks: This is the gain in the external path between Port 1 and the AUT.

Related Commands: SFGCA, SPGCA, NOFST?

Front Panel Key: Appl **\ SWEPT FREQUENCY GAIN COMPRESSION \ NOMINAL OFFSET**

NOFST? Output nominal offset value for external gain **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: NOFST?

Data I/O: Outputs its value in ASCII <NR3> format.

Related Commands: SFGCA, SPGCA, NOFST

Front Panel Key: Appl **\ SWEPT FREQUENCY GAIN COMPRESSION \ NOMINAL OFFSET**

NOP No operation **REMOTE - MISC (Ch 8)**

Syntax: NOP

NP101 Set data points to 101 **CONFIG (Ch 5)**

Syntax: NP101

Remarks: Restarts the sweep.

Related Commands: NPx series, WFS, *OPC, *OPC?, FLO

Front Panel Key: Config **\ DATA POINTS \ 101 MAX POINTS** or
Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ DATA POINT \ 101 MAX POINTS**

NP15 Set data points to 15 **CONFIG (Ch 5)**

Syntax: NP15

Front Panel Key: Config **\ DATA POINTS \ 15 MAX POINTS** or
Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ DATA POINT \ 15 MAX POINTS**

NP1601 Set data points to 1601 **CONFIG (Ch 5)**

Syntax: NP1601

Remarks: Restarts the sweep.

Related Commands: NPx series, WFS, *OPC, *OPC?, FHI, ONP

Front Panel Key: Config **\ DATA POINTS \ 1601 MAX POINTS** or
Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ DATA POINT \ 1601 MAX POINTS**

NP201 Set data points to 201 **CONFIG (Ch 5)**

Syntax: NP201

Remarks: Restarts the sweep.

Related Commands: NPx series, WFS, *OPC, *OPC?, ONP

Front Panel Key: Config \ **DATA POINTS** \ **201 MAX POINTS** or
Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINT** \ **201 MAX POINTS**

NP3 Set data points to 3 **CONFIG (Ch 5)**

Syntax: NP3

Front Panel Key: Config \ **DATA POINTS** \ **3 MAX POINTS** or
Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINT** \ **3 MAX POINTS**

NP401 Set data points to 401 **CONFIG (Ch 5)**

Syntax: NP401

Remarks: Restarts the sweep.

Related Commands: NPx series, WFS, *OPC, *OPC?, FME, ONP

Front Panel Key: Config \ **DATA POINTS** \ **401 MAX POINTS** or
Cal \ **PERFORM CAL 2 PORT CAL** **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINT** \ **401 MAX POINTS**

NP51 Set data points to 51 **CONFIG (Ch 5)**

Syntax: NP51

Remarks: Restarts the sweep.

Related Commands: NPx series, WFS, *OPC, *OPC?, ONP

Front Panel Key: Config \ **DATA POINTS** \ **51 MAX POINTS** or
Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINT** \ **51 MAX POINTS**

NP801 Set data points to 801 **CONFIG (Ch 5)**

Syntax: NP801

Remarks: Restarts the sweep.

Related Commands: NPx series, WFS, *OPC, *OPC?, ONP

Front Panel Key: Config \ **DATA POINTS** \ **801 MAX POINTS** or
Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINT** \ **801 MAX POINTS**

NPX? Output number of points currently being measured **CAL (Ch 6)**

Syntax: NPX?

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **DATA POINTS** \ **1601 MAX POINTS** \ **DATA POINTS**

NRMS Normalize S21 for gain compression testing **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: NRMS

Remarks: An S21 normalization is one of the required steps in both swept frequency and swept power gain compression testing.

Related Commands: SFGCA, SPGCA, CALR, UNDOGC

Front Panel Key: Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **NORMALIZE S21**

NS Suffix sets time data type and scales by 1E-9 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: NS

Related Commands: NSC

NS0 Turn noise source off **APPL - NOISE FIGURE (Ch 10)**

Syntax: NS0

Related Commands: NS1

NS1 Turn noise source on **APPL - NOISE FIGURE (Ch 10)**

Syntax: NS1

Related Commands: NS0

NSC Suffix sets time data type and scales by 1E-9 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: NSC

Related Commands: NS

NU1 Select unity as numerator for parameter being defined **MEAS (Ch 5)**

Syntax: NU1

Related Commands: NA1, NA2, NA3, NA4, NB1, NB2, NB3, NB4, NUM?

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ 1 (UNITY)**

NUM? Output numerator selection for parameter being defined **MEAS (Ch 5)**

Syntax: NUM?

Data I/O: Outputs its value using ASCII <NR1> format as follows:
1 for Unity
2 for a1
3 for a2
4 for b1
5 for b2
6 for a3
7 for b3
8 for a4
9 for b4

Related Commands: NA1, NA2, NA3, NA4, NB1, NB2, NB3, NB4, NU1

NUS3P Select Don't Use existing 3-port calibration **CAL (Ch 6)**

Syntax: NUS3P

OACCHAR Output AutoCal characterization data to the GPIB **CAL - AUTOCAL (Ch 6)**

Syntax: OACCHAR

Data I/O: Outputs data in an <Arbitrary Block> format.

Related Commands: IACCHAR, OACSER, OACTYPE

OACCSER2P Output the AutoCal characterization serial number for 2-port AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: OACCSER2P

Data I/O: Outputs data in ASCII <Arbitrary Block> format.

Related Commands: OACCSER4P, OACSER

OACCSER4P Output the AutoCal characterization serial number for 4-port AutoCal **CAL - AUTOCAL (Ch 6)**

Syntax: OACCSER4P

Data I/O: Outputs data in ASCII <Arbitrary Block> format.

Related Commands: OACCSER2P, OACSER

OACSER Output AutoCal box serial number **CAL - AUTOCAL (Ch 6)**

Syntax: OACSER

Data I/O: Outputs an <Arbitrary ASCII> format

Related Commands: IACCHAR, OACCHAR, OACTYPE

OACTYPE Output AutoCal box type **CAL - AUTOCAL (Ch 6)**

Syntax: OACTYPE

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: IACCHAR, OACCHAR, OACSER

OAM1 Output channel 1 active marker value **MARKER (Ch 7)**

Syntax: OAM1

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3> formatted data (see paragraph 11-3). The data output consists of one or two elements; value is determined by the graph display type selected.

Related Commands: OM1 thru OM6, OAM2, OAM3, OAM4

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ ACTIVE MARKER ON ALL CHANNELS \ CH1 -Sxx**

OAM2 Output channel 2 active marker value **MARKER (Ch 7)**

Syntax: OAM2

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3> formatted data (see paragraph 11-3). The data output consists of one or two elements; value is determined by the graph display type selected.

Related Commands: OM1 thru OM6, OAM1, OAM3, OAM4

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ ACTIVE MARKER ON ALL CHANNELS \ CH2 -Sxx**

OAM3 Output channel 3 active marker value **MARKER (Ch 7)**

Syntax: OAM3

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3> formatted data (see paragraph 11-3). The data output consists of one or two elements; value is determined by the graph display type selected.

Related Commands: OM1 thru OM6, OAM1, OAM2, OAM4

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS \ ACTIVE MARKER ON ALL CHANNELS \ CH3 -Sxx**

OAM4 Output channel 4 active marker value **MARKER (Ch 7)**

Syntax: `OAM4`

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3> formatted data (see paragraph 11-3). The data output consists of one or two elements; value is determined by the graph display type selected.

Related Commands: OM1 thru OM6, OAM1, OAM2, OAM3

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ ACTIVE MARKER ON ALL CHANNELS \ CH4 -Sxx**

OBMP Output the display as a bitmap **REMOTE - MISC (Ch 8)**

Syntax: `OBMP`

Data I/O: Outputs data using <Arbitrary Block>.

OC1 Output calibration coefficients 1 **REMOTE - CAL (Ch 8)**

Syntax: `OC1`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC10 Output calibration coefficients 10 **REMOTE - CAL (Ch 8)**

Syntax: `OC10`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC11 Output calibration coefficients 11 **REMOTE - CAL (Ch 8)**

Syntax: `OC11`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC12 Output calibration coefficients 12 **REMOTE - CAL (Ch 8)**

Syntax: `OC12`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC13 Output calibration coefficients 13 **REMOTE - CAL (Ch 8)**

Syntax: `OC13`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC14 Output calibration coefficients 14 **REMOTE - CAL (Ch 8)**

Syntax: `OC14`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC15 Output calibration coefficients 15 **REMOTE - CAL (Ch 8)**

Syntax: `OC15`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC16 Output calibration coefficients 16 **REMOTE - CAL (Ch 8)**

Syntax: OC16

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC17 Output calibration coefficients 17 **REMOTE - CAL (Ch 8)**

Syntax: OC17

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC18 Output calibration coefficients 18 **REMOTE - CAL (Ch 8)**

Syntax: OC18

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC19 Output calibration coefficients 19 **REMOTE - CAL (Ch 8)**

Syntax: `OC19`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC2 Output calibration coefficients 2 **REMOTE - CAL (Ch 8)**

Syntax: `OC2`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC20 Output calibration coefficients 20 **REMOTE - CAL (Ch 8)**

Syntax: `OC20`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC21 Output calibration coefficients 21 **REMOTE - CAL (Ch 8)**

Syntax: `OC21`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC22 Output calibration coefficients 22 **REMOTE - CAL (Ch 8)**

Syntax: `OC22`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC23 Output calibration coefficients 23 **REMOTE - CAL (Ch 8)**

Syntax: `OC23`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC24 Output calibration coefficients 24 **REMOTE - CAL (Ch 8)**

Syntax: OC24

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC25 Output calibration coefficient 25 **REMOTE - CAL (Ch 8)**

Syntax: OC25

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC26 Output calibration coefficient 26 **REMOTE - CAL (Ch 8)**

Syntax: OC26

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC27 Output calibration coefficient 27 **REMOTE - CAL (Ch 8)**

Syntax: OC27

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC28 Output calibration coefficient 28 **REMOTE - CAL (Ch 8)**

Syntax: OC28

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC29 Output calibration coefficient 29 **REMOTE - CAL (Ch 8)**

Syntax: OC29

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC3 Output calibration coefficients 3 **REMOTE - CAL (Ch 8)**

Syntax: OC3

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.ed).

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC30 Output calibration coefficient 30 **REMOTE - CAL (Ch 8)**

Syntax: OC30

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC31 Output calibration coefficient 31 **REMOTE - CAL (Ch 8)**

Syntax: `OC31`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC32 Output calibration coefficient 32 **REMOTE - CAL (Ch 8)**

Syntax: `OC32`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC33 Output calibration coefficient 33 **REMOTE - CAL (Ch 8)**

Syntax: `OC33`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC34 Output calibration coefficient 34 **REMOTE - CAL (Ch 8)**

Syntax: `OC34`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC35 Output calibration coefficient 35 **REMOTE - CAL (Ch 8)**

Syntax: `OC35`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC36 Output calibration coefficient 36 **REMOTE - CAL (Ch 8)**

Syntax: `OC36`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC37 Output calibration coefficient 37 **REMOTE - CAL (Ch 8)**

Syntax: `OC37`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC38 Output calibration coefficient 38 **REMOTE - CAL (Ch 8)**

Syntax: `OC38`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC39 Output calibration coefficient 39 **REMOTE - CAL (Ch 8)**

Syntax: `OC39`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC4 Output calibration coefficients 4 **REMOTE - CAL (Ch 8)**

Syntax: OC4

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC40 Output calibration coefficient 40 **REMOTE - CAL (Ch 8)**

Syntax: OC40

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC5 Output calibration coefficients 5 **REMOTE - CAL (Ch 8)**

Syntax: OC5

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC6 Output calibration coefficients 6 **REMOTE - CAL (Ch 8)**

Syntax: OC6

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC7 Output calibration coefficients 7 **REMOTE - CAL (Ch 8)**

Syntax: OC7

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC8 Output calibration coefficients 8 **REMOTE - CAL (Ch 8)**

Syntax: OC8

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OC9 Output calibration coefficients 9 **REMOTE - CAL (Ch 8)**

Syntax: `OC9`

Remarks: Outputs error correction coefficient selected (1 - 24), see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OCA-OCC, OCL, FMA, FMB, FMC, LSB, MSB, ONP

OCA Output calibration coefficient 10 **REMOTE - CAL (Ch 8)**

Syntax: `OCA`

Remarks: The OCA, OCB, and OCC are equivalents of OC10, OC11, and OC12 respectively.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE 4 FMC MODE

OCB Output calibration coefficient 11 **REMOTE - CAL (Ch 8)**

Syntax: `OCB`

Remarks: The OCA, OCB, and OCC are equivalents of OC10, OC11, and OC12 respectively.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE 4 FMC MODE

OCC Output calibration coefficient 12 **REMOTE - CAL (Ch 8)**

Syntax: OCC

Remarks: The OCA, OCB, and OCC are equivalents of OC10, OC11, and OC12 respectively.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE 4 FMC MODE

OCD Output corrected data for active channel parameter **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OCD

Remarks: Data correction is valid for normalization and electrical length and, if applicable, time domain. Wait for full sweep to be updated (WFS) prior to outputting data.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: FMA, FMB, FMC, LSB, MSB, ORD, OFD, ONP, WFS, CH1-CH4

OCF Output front panel setup and calibration data **REMOTE - SETUP (Ch 8)**

Syntax: OCF

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 21690 bytes (NO CALIBRATION) 188371 bytes (CALIBRATION APPLIED)

Related Commands: OFP, ICF

OCFEDE Output the front panel setup, calibration, and EDE data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OCFEDE`

Data I/O: Outputs data as an <Arbitrary Block>.

Related Commands: ICFEDE, OCS

OCFSG Output the segmented sweep data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OCFSG`

Data I/O: Outputs data as an <Arbitrary Block>.

Related Commands: ICFGS, OCS

OCL Output all applicable calibration coefficients for calibration type **REMOTE - CAL (Ch 8)**

Syntax: `OCL`

Remarks: Outputs all error correction coefficients applicable to the current calibration type; see Table 11-1 at the end of this chapter.

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The OCx output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (2 * NUMBER OF POINTS) * (NUMBER OF CAL TERMS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: OC1-OC12, OCA, OCB, OCC, ICL, ONCP, ONP

OCL3P Output additional 12 calibration coefficients for 3-port **REMOTE - CAL (Ch 8)**

Syntax: `OCL3P`

Data I/O: Outputs data using <Arbitrary Block>.

OCM Select offset short calibration method **CAL (Ch 6)**

Syntax: OCM

Related Commands: LCM, SCM

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CHANGE CAL METHOD AND LINE TYPE \ OFFSET SHORT**

OCS Output the internal buffer collected data **REMOTE - INTERNAL BUFFER (Ch 8)**

Syntax: OCS

Data I/O: Outputs data as an <Arbitrary Block>.

Related Commands: OCFEDE, OCFSG

ODAT Output hard copy tabular data to GPIB **REMOTE - MEASURED DATA (Ch 8)**

Syntax: ODAT

Remarks: Tabular data is the same as the data saved in a tabular data file (*.DAT).

Data I/O: The data is encapsulated in an <Arbitrary Block> format.

Block Size: Size varies depending on the display type and number of data points. A four-channel display at 401 data points produces 62,479 bytes; four channel 1601 points produces 239,780 bytes; one channel 401 points produces 22,530 bytes.

Related Commands: SAVE, DISKRD, OHGL, OS2P, OTXT

ODR Output directory listing of the floppy drive **REMOTE - MISC (Ch 8)**

Syntax: ODR

Data I/O: Outputs <Arbitrary Block> formatted list of comma separated file names and sizes.

Block Size: 50 + 80 * (NUMBER OF FILES)

ODRH Output directory listing of the hard drive **REMOTE - MISC (Ch 8)**

Syntax: ODRH

Data I/O: Outputs <Arbitrary Block> formatted list of comma separated file names and sizes.

Block Size: 50 + 80 * (NUMBER OF FILES)

ODV Output distance values for time domain **REMOTE - MEASURED POINTS (Ch 8)**

Syntax: ODV

Remarks: The converted distance values depend on the dielectric type set (see DISPLAY group, Dielectric commands).

Data I/O: Outputs an array of floating point values; size is equal to twice the currently set number of data points. The ODV command output contains either ASCII or binary formatted data depending on currently selected format.

Block Size: 12 + (NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: FMA, FMB, FMC, LSB, MSB, ONP, OTV, OFV

OEB Output extended status byte **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: OEB

Remarks: Returns the decimal value of the binary bit pattern of the Extended Event Status Register. The value will be from 0 to 32767.

Data I/O: Outputs value in ASCII <NR1> format (paragraph 11-3.)

Related Commands: IEM, OEM

OEDELOG Output current EDE log **CONFIG (Ch 5)**

Syntax: OEDELOG

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE (2) (3) PORT \ CONTINUE EMBEDDING/DE-EMBEDDING LOG \ PRINT LOG**

OEL Output error list **REMOTE - ERROR REPORTING (Ch 8)**

Syntax: OEL

Data I/O: Outputs formatted list of error messages separated with commas.

Block Size: 50 + 50 * (NUMBER OF ERRORS)

Related Commands: ONE, OGE, OGL

OEM Output extended status byte mask **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: OEM

Remarks: Returns the decimal value of the bit pattern of the Extended Event Status Enable Register. The value will be from 0 to 32767.

Data I/O: Outputs value in ASCII <NR1> format paragraph 11-3).

Related Commands: IEM

OFD Output final data for active channel parameter **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OFD

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter).

Data I/O: Outputs a floating point array whose size is equal to the number of points in the current sweep (the array is doubled for dual graph displays, that is, log mag/phase).

The OFD command outputs an <Arbitrary Block> containing either ASCII or binary formatted data depending on currently selected format (see format selector commands FMA, FMB, FMC).

Block Size: SINGLE GRAPH DPR0 MODE 12 + (NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE DUAL GRAPH OR SINGLE GRAPH DPR1 MODE 12 + (2 * NUMBER, OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: FMA, FMB, FMC, LSB, MSB, DPR0, DPR1, ONP, OCD, ORD, CH1-CH4, WFS

OFF Enter offset value for top graph of active channel **DISPLAY (Ch 5)**

Syntax: `OFF Value Units`
Value: Depends on graph type (see DISPLAY group).
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Related Commands: SCL, ASC, CH1-CH4

Front Panel Key: Display \ **GRAPH TYPE \ Any, except SMITH CHART** then \ **SCALE \ REFERENCE VALUE**

OFF2 Enter offset value for bottom graph of active channel **DISPLAY (Ch 5)**

Syntax: `OFF2 Value Units`
Value: Depends on graph type (see DISPLAY group).
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Related Commands: SCL2, REF2

Front Panel Key: Display \ **GRAPH TYPE \ Any, except SMITH CHART** then \ **SCALE \ REFERENCE VALUE**

OFF2? Output offset value for bottom graph of active channel **DISPLAY (Ch 5)**

Syntax: `OFF2?`

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: OFF2

Front Panel Key: Display \ **GRAPH TYPE \ Any, except SMITH CHART** then \ **SCALE \ REFERENCE VALUE** or
Utility \ **REAR PANEL \ SELECT OURPUT MODE (HORIZONTAL) (VERTICAL) \ REFERENCE VALUE**

OFF? Output offset value for top graph of active channel **DISPLAY (Ch 5)**

Syntax: `OFF?`

Data I/O: Outputs a value in ASCII <NR3> format.

Front Panel Key: Display \ **GRAPH TYPE \ Any, except SMITH CHART** then \ **SCALE \ REFERENCE VALUE** or
Utility \ **REAR PANEL \ SELECT OURPUT MODE (HORIZONTAL) (VERTICAL) \ REFERENCE VALUE**

OFP Output current front panel setup **REMOTE - SETUP (Ch 8)**

Syntax: OFP

Data I/O: Outputs <Arbitrary Block> formatted data for input later using the IFP command. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: OCF, IFP

OFV Output frequency values **REMOTE - MEASURED POINTS (Ch 8)**

Syntax: OFV

Remarks: An array of floating point values whose size is the currently set number of data points. The OFV command outputs an <Arbitrary Block> containing either ASCII or binary formatted data depending on currently selected format (see format selector commands FMA, FMB, FMC).

Block Size: 12 + (NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: ONP, FMA, FMB, FMC, LSB, MSB

OGCFD Output gain compression final data to GPIB **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OGCFD

Remarks: Consists of two data elements per swept power gain compression frequency point. The first element is the input power that produces the target gain compression value, and the second element is the output power corresponding to that input power. The format of the output data depends on the FMA, FMB or FMC mode programmed.

Data I/O: The data is encapsulated in an <Arbitrary Block> format.

Block Size: The block size depends on the number of frequency points and the FMA, FMB or FMC mode. For 10 frequency points, FMA produced 386 bytes, FMB produces 167 bytes and FMC produces 86 bytes. For 5 frequency points, FMA produces 196 bytes, FMB produces 86 bytes and FMC produces 46 bytes.

Related Commands: SPGCA, MFGCT

OGCFV Output gain compression frequency values to GPIB **REMOTE - MEASURED POINTS (Ch 8)**

Syntax: OGCFV

Remarks: This mnemonic outputs the frequency values for the swept power gain compression application.

Data I/O: The data is formatted depending on the FMA, FMB, FMC, LSB, MSB formats and encapsulated in an <Arbitrary Block> format.

Block Size: The block size depends on the number of data points and the FMA, FMB, FMC format. For ten frequency points, FMA produces 195 bytes, FMB produces 85 bytes, FMC produces 45 bytes. For five frequency points, FMA produces 99 bytes, FMB produces 45 bytes and FMC produces 25 bytes.

Related Commands: SPGCA, IFV, ONDF

OGCTXT Output text format gain compression data to GPIB **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OGCTXT

Data I/O: The data is encapsulated in an <Arbitrary Block> format.

Block Size: The block size depends on the number of frequency points. Ten frequency points produces 711 bytes. Five frequency points produces 430 bytes.

Related Commands: SPGCA, MFGCT, SAVEGC

OGE Output extended description of current GPIB error **REMOTE - ERROR REPORTING (Ch 8)**

Syntax: OGE

Remarks: See error handling information in Chapter 7 for interpretation of the output string.

Data I/O: Outputs string in <Arbitrary ASCII> format.

Block Size: 210 bytes, maximum

Related Commands: ONE, OEL

OGL Output extended description of previous GPIB error **REMOTE - ERROR REPORTING (Ch 8)**

Syntax: `OGL`

Remarks: See error handling information in Chapter 7 for interpretation of the output string.

Data I/O: Outputs string in <Arbitrary ASCII> format.

Block Size: 210 bytes, maximum

Related Commands: ONE, OEL.

OHDR Output hard copy header information to GPIB **REMOTE - MISC (Ch 8)**

Syntax: `OHDR`

Data I/O: Outputs data using <Arbitrary Block>.

OHDW Output hardware cal data to GPIB **REMOTE - MISC (Ch 8)**

Syntax: `OHDW Value`
Value: A three character string that indicates the type of hardware calibration data to output.

Remarks: The three character strings to indicate the currently defined hardware calibration types are: “ALL” for the combined hardware calibration data, “ALC” for the ALC calibration data, “FRE” for the frequency calibration data, “LO1" for the First LO calibration data, ”LO2" for the Second LO calibration data and “SLT” for the source lock threshold calibration data.

Data I/O: The data is output in <Arbitrary Block> format.

Block Size: The “ALL” data is 1191 bytes, the “ALC” data is 297 bytes, the “FRE” data is 436 bytes, the “LO1" data is 351 bytes, the ”LO2" data is 351 bytes and the “SLT” data is 293 bytes.

Related Commands: IHDW, SAVE, DISKRD

OHGL Output HPGL format data to GPIB **REMOTE - MISC (Ch 8)**

Syntax: OHGL

Remarks: This is the same data which gets written to the plotter on a plot.

Data I/O: The data is encapsulated in an <Arbitrary Block> format.

Block Size: The block size varies depending on the display and number of data points. A four-channel display with 401 points produces 40,314 bytes. A four-channel 1601 point display produces 110,314 bytes. A single channel 401 point display produces 12,659 bytes.

Related Commands: SAVE, DISKRD, ODAT, OS2P, OTXT

OHM Suffix sets impedance data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: OHM

OI Output instrument identification string with serial number **REMOTE - MISC (Ch 8)**

Syntax: OI

Data I/O: Outputs the instrument identification string using an <Arbitrary ASCII> format.

OID Output instrument identification string **REMOTE - MISC (Ch 8)**

Syntax: OID

Remarks: Outputs the VNMS operation string containing the following fields separated by commas: Model, Low Frequency in GHz, High Frequency in GHz, Low Power in dB, Reset Power in dB, Software Revision. The actual information for the MS462XX queried will be returned in each field. The power values indicate the ALC range. Use the PIP? query to output absolute power setting at Port 1.

NOTE: System power in excess of reset level is available, but not guaranteed to remain level. Excessive system power setting will cause error 5110: RF PWR UNLEVELED and/or error 52XX: RF OVERLOAD to be reported. To determine maximum available power, consult Source Control Specifications in Operation Manual.

Data I/O: Outputs an <Arbitrary ASCII > format.

Block Size: 50 bytes, maximum

Related Commands: *IDN?, *OPT?, PIP?

OLB Output limits status byte **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: OLB

Remarks: Returns the decimal value of the bit pattern of the Limits Status Register. The value will be 0 - 255.

Data I/O: Outputs value in ASCII <NR1> format.

Related Commands: ILB

OLM Output limits status byte mask **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: OLM

Data I/O: Outputs a value in ASCII <NR1> format.

Related Commands: ILM

OM1 Output marker 1 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OM1`

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-1 ON (1: ON)**

OM10 Output marker 10 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OM10`

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-10 ON (10: ON)**

OM11 Output marker 11 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OM11`

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-11 ON (11: ON)**

OM12 Output marker 12 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM12

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-12 ON (12: ON)**

OM2 Output marker 2 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM2

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-2 ON (2: ON)**

OM3 Output marker 3 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM3

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-3 ON (3: ON)**

OM3P Output M3P format data to GPIB with M3P setup set to (2:3)1 **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM3P

Data I/O: The query response is sent using the <Arbitrary Block> format.

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ M3P**

OM4 Output marker 4 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM4

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-4 ON (4: ON)**

OM4P Output M4P format data to GPIB with M4P setup set to (1:2)(3:4) **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM4P

Data I/O: The query response is sent using the <Arbitrary Block> format.

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ M4P**

OM5 Output marker 5 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM5

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-5 ON (5: ON)**

OM6 Output marker 6 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM6

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-6 ON (6: ON)**

OM7 Output marker 7 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM7

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-7 ON (7: ON)**

OM8 Output marker 8 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM8

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-8 ON (8: ON)**

OM9 Output marker 9 value **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OM9

Remarks: Data units depend on the graph type currently set. (See Table 11-2 at the end of this chapter.)

Data I/O: Outputs ASCII <NR3 > formatted data (see paragraph 11-3). The data output consists of one or two elements, whose values will be determined by the graph display type selected.

Related Commands: CH1-CH4, DPR0, DPR1

Front Panel Key: Marker **\ READOUT MARKERS \ X-9 ON (9: ON)**

OMM3P Output the M3P format data to the GPIB with the current M3P setup **HARD COPY (Ch 9)**

Syntax: OMM3P

Data I/O: Outputs data as an <Arbitrary Block>.

Related Commands: OMM4P

OMM4P Output the M4P format data to the GPIB with the current M4P setup **HARD COPY (Ch 9)**

Syntax: OMM4P

Data I/O: Outputs data as an <Arbitrary Block>.

Related Commands: OMM3P

OMOD Output instrument model number **REMOTE - MISC (Ch 8)**

Syntax: OMOD

Data I/O: Outputs the model number using an <Arbitrary ASCII> format.

ONCP Output number of points for current calibration **REMOTE - CAL (Ch 8)**

Syntax: ONCP

Data I/O: Outputs the number of points in ASCII <NR1> format.

Related Commands: ONP

ONCT Output number of calibration terms for current calibration **REMOTE - CAL (Ch 8)**

Syntax: ONCT

Data I/O: Outputs the value in ASCII <NR1> format. See Table 11-1 at the end of this chapter.

ONDF Output number of discrete frequencies **REMOTE - MEASURED POINTS (Ch 8)**

Syntax: ONDF

Data I/O: Outputs number in ASCII <NR1> format.

Related Commands: IFV, DFC

ONE Output number of lines in the error list **REMOTE - ERROR REPORTING (Ch 8)**

Syntax: ONE

Data I/O: Outputs a value in ASCII <NR1> format.

Related Commands: OEL, OGE, OGL

ONP Output number of points currently being measured **CONFIG (Ch 5)**

Syntax: ONP

Data I/O: Outputs a value in ASCII <NR1> format.

Front Panel Key: Config \ **DATA POINTS** \ **xxxx MAX POINTS**

ONPV Output the number of power sweep power values **REMOTE - MEASURED POINTS (Ch 8)**

Syntax: ONPV

Data I/O: Outputs number in ASCII <NR1> format.

Related Commands: PSTRT, PSTOP, PSTEP, OPSV

ONRM Output stored normalization data to GPIB **REMOTE - MEASURED DATA (Ch 8)**

Syntax: ONRM

Remarks: If normalization data has been stored, it will be output.

Data I/O: The data will be encapsulated in an <Arbitrary Block> format.

Block Size: 12832 bytes

Related Commands: INRM, SAVE, DISKRD

OPB Output the 488.2 status byte value (same as *STB?) **REMOTE - STATUS REPORTING (Ch 8)**

Syntax: OPB

Remarks: This is the equivalent command to *STB?, 488.2 Status Byte query. Returns the decimal value of the bit pattern of the Status Byte and the Master Summary Status bit 6. The value will be 0 to 255.

Data I/O: Outputs value in ASCII <NR1> format

Related Commands: *STB?

OPSV Output power sweep power values **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OPSV`

Remarks: This mnemonic outputs the power values for power sweep.

Data I/O: The data is formatted depending on the FMA, FMB, FMC, LSB, MSB formats and encapsulated in an <Arbitrary Block> format.

Block Size: The block size depends on the number of data points and the FMA, FMB, FMC format. For 21 power points, FMA produces 404 bytes, FMB produces 174 bytes, FMC produces 89 bytes. For 11 power points, FMA produces 214 bytes, FMB produces 93 bytes and FMC produces 49 bytes.

Related Commands: PSTRT, PSTOP, PSTEP, ONPV

ORD Output raw data for active channel parameter **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `ORD`

Remarks: Outputs the raw data (real and imaginary) pairs before any correction is applied. Wait for full sweep to be updated (WFS) prior to outputting data.

Data I/O: Outputs a floating point array whose size is equal to twice the number of points in the current sweep (contains real and imaginary data pairs for each point). The ORD command outputs an <Arbitrary Block> containing either ASCII or binary formatted data depending on currently selected format (see format selector commands FMA, FMB, FMC).

Block Size: 12 + (2 * NUMBER OF POINTS)
*18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: CH1-CH4, OFD, OCD, ONP, FMA, FMB, FMC, LSB, MSB

OS1 Output front panel setup number 1 **REMOTE - SETUP (Ch 8)**

Syntax: `OS1`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS10 Output front panel setup number 10 **REMOTE - SETUP (Ch 8)**

Syntax: `OS10`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS11C Output corrected S11 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS11C`

Remarks: If S11 data is being taken with the current channel selection and display type, then the data will be output. If correction is turned on then the data will be corrected data otherwise it will be the raw data. This is identical to OCD when S11 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, OCD, OS11R, FMA, FMB, FMC

OS11R Output raw S11 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS11R`

Remarks: If S11 data is being taken with the current channel selection and display type, then the raw data will be output. This is identical to ORD when S11 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, ORD, OS11C, FMA, FMB, FMC

OS12C Output corrected S12 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS12C`

Remarks: If S12 data is being taken with the current channel selection and display type, then the data will be output. If correction is turned on then the data will be corrected data otherwise it will be the raw data. This is identical to OCD when S12 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, OCD, OS12R, FMA, FMB, FMC

OS12R Output raw S12 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS12R`

Remarks: If S12 data is being taken with the current channel selection and display type, then the raw data will be output. This is identical to ORD when S12 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS13C Output corrected S13 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS13C`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS13R Output raw S13 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS13R`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS14C Output corrected S14 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS14C`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS14R Output raw S14 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS14R`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS1P1 Output S1P1 format data to gpib **HARD COPY (Ch 9)**

Syntax: `OS1P1`

Data I/O: Outputs data in an <Arbitrary Block> format.

Related Commands: OS1P2, OS1P3, OS2P, OS3P

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ S1P PORT 1**

OS1P2 Output S1P2 format data to gpib **HARD COPY (Ch 9)**

Syntax: `OS1P2`

Data I/O: Outputs data in an <Arbitrary Block> format.

Related Commands: OS1P1, OS1P3, OS2P, OS3P

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ S1P PORT 2**

OS1P3 Output S1P3 format data to gpib **HARD COPY (Ch 9)**

Syntax: `OS1P3`

Data I/O: Outputs data in an <Arbitrary Block> format.

Related Commands: OS1P1, OS1P2, OS2P, OS3P

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ S1P PORT 3**

OS1P4 Output S1P4 format data to GPIB **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS1P4`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ S1P PORT 4**

OS2 Output front panel setup number 2 **REMOTE - SETUP (Ch 8)**

Syntax: `OS2`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS21C Output corrected S21 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS21C`

Remarks: If S21 data is being taken with the current channel selection and display type, then the data will be output. If correction is turned on then the data will be corrected data otherwise it will be the raw data. This is identical to OCD when S21 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, OCD, OS21R, FMA, FMB, FMC

OS21R Output raw S21 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS21R`

Remarks: If S21 data is being taken with the current channel selection and display type, then the raw data will be output. This is identical to ORD when S21 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, ORD, OS21C, FMA, FMB, FMC

OS22C Output corrected S22 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS22C`

Remarks: If S22 data is being taken with the current channel selection and display type, then the data will be output. If correction is turned on then the data will be corrected data otherwise it will be the raw data. This is identical to OCD when S22 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, OCD, OS22R, FMA, FMB, FMC

OS22R Output raw S22 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OS22R

Remarks: If S22 data is being taken with the current channel selection and display type, then the raw data will be output. This is identical to ORD when S22 is displayed on the active channel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format. The data itself is a complex pair for each data point which is additionally formatted by the FMA, FMB and FMC modes.

Block Size: The size depends on the number of data points and the format mode. For FMA output mode, 51 points produces 1,944 bytes, 401 produces 15,237 bytes and 1601 produces 60,845 bytes. For the FMB mode, 51 points produces 822 bytes, 401 points produces 6,423 bytes and 1601 points produces 25,624 bytes. For the FMC mode, 51 points produces 414 bytes, 401 points produces 3,215 bytes and 1601 points produces 12,816 bytes.

Related Commands: CHx, ORD, OS22C, FMA, FMB, FMC

OS23C Output corrected S23 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OS23C

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS23R Output raw S23 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OS23R

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS24C Output corrected S24 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: OS24C

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS24R Output raw S24 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS24R`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS2P Output S2P format data to GPIB **HARD COPY (Ch 9)**

Syntax: `OS2P`

Remarks: The S2P output format is provided to interface with application programs requiring that kind of data.

Data I/O: The data is encapsulated in an <Arbitrary Block> format.

Block Size: The block size varies depending on the number of data points. 51 points produces 5,406 bytes, 401 points produces 41,107 bytes, 1601 points produces 163,508 bytes.

Related Commands: SAVE, DISKRD, ODAT, OHGL, OTXT

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ S2P**

OS3 Output front panel setup number 3 **REMOTE - SETUP (Ch 8)**

Syntax: `OS3`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS31C Output corrected S31 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS31C`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS31R Output raw S31 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS31R`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS32C Output corrected S32 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS32C`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS32R Output raw S32 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS32R`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS33C Output corrected S33 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS33C`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS33R Output raw S33 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS33R`

Data I/O: Outputs data using <Arbitrary Block>.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS34C Output corrected S34 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS34C`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS34R Output raw S34 data **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OS34R`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS3P Output S3P format data to gpib **HARD COPY (Ch 9)**

Syntax: `OS3P`

Data I/O: Outputs data in an <Arbitrary Block> format.

Related Commands: OS1P1, OS1P2, OS1P3, OS2P

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ DEVICE DISK FILE \ SnP OPTIONS \ S3P**

OS4 Output front panel setup number 4 **REMOTE - SETUP (Ch 8)**

Syntax: `OS4`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS41C Output corrected S41 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS41C`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS41R Output raw S41 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS41R`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS42C Output corrected S42 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS42C`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS42R Output raw S42 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS42R`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS43C Output corrected S43 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS43C`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS43R Output raw S43 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS43R`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS44C Output corrected S44 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS44C`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS44R Output raw S44 data **REMOTE - SETUP (Ch 8)**

Syntax: `OS44R`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS4P Output S3P format data to GPIB **REMOTE - SETUP (Ch 8)**

Syntax: `OS4P`

Data I/O: The query response is sent using the <Arbitrary Block> format.

Related Commands: CHx, ORD, OS12C, FMA, FMB, FMC

OS5 Output front panel setup number 5 **REMOTE - SETUP (Ch 8)**

Syntax: `OS5`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS6 Output front panel setup number 6 **REMOTE - SETUP (Ch 8)**

Syntax: `OS6`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS7 Output front panel setup number 7 **REMOTE - SETUP (Ch 8)**

Syntax: `OS7`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS8 Output front panel setup number 8 **REMOTE - SETUP (Ch 8)**

Syntax: `OS8`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OS9 Output front panel setup number 9 **REMOTE - SETUP (Ch 8)**

Syntax: `OS9`

Data I/O: Outputs <Arbitrary Block> formatted data for later input using the IS1-IS10 commands. The data is in internal system binary format and must not be edited or altered in any way.

Block Size: 8711 bytes

Related Commands: ISxx, OFP, OCF

OSER Output instrument serial number **REMOTE - MISC (Ch 8)**

Syntax: `OSER`

Data I/O: Outputs the serial number using an <Arbitrary ASCII> format.

OSGLOG Output the current segmented sweep log **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `OSGLOG Filename`
Value: "Filename" is the name of the file to be saved, complete with the extension. It may include a drive letter, path and wildcards. See Remarks below.

Remarks: Use SAVE "c:filename.sgl" to save the segmented sweep log to the hard disk.
Use SAVE "a:filename.sgl" to save the segmented sweep log to a floppy disk.
Use SAVE "c:filename.sg" to save the segmented sweep setup to the hard disk.
Use SAVE "a:filename.sg" to save the segmented sweep setup to a floppy disk.

Related Commands: PSGLOG

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ SEGMENTED SWEEP LOG**

OSL Output service log **UTILITY - SERVICE LOG (Ch 9)**

Syntax: `OSL`

Remarks: This command is useful when troubleshooting system failure or GPIB programming type problems. It is also useful for capturing and archiving error information for errors that occur during Remote Only operation.

Data I/O: Outputs formatted data that consists of service data and all error messages, with details about each error.

Block Size: 450 + 100 * (NUMBER OF ERRORS)

Related Commands: OEL, PSL, SAVLOG, SAVLOGH, CSL, ONE, OGE, OGL

Front Panel Key: Utility **\ DIAGNOSTICS \ SERVICE LOG \ DISPLAY LOG**

OTV Output time values for time domain **REMOTE - MEASURED POINTS (Ch 8)**

Syntax: `OTV`

Data I/O: An array of floating point values whose size is the currently set number of data points. The OTV command outputs an <Arbitrary Block> containing either ASCII or binary formatted data depending on currently selected format (see format selector commands FMA, FMB, FMC).

Block Size: 12 + (NUMBER OF POINTS) *18 FMA MODE *8 FMB MODE *4 FMC MODE

Related Commands: FMA, FMB, FMC, LSB, MSB, ODV, OFV, ONP

OTXT Output text format data to GPIB **REMOTE - MEASURED DATA (Ch 8)**

Syntax: `OTXT`

Remarks: Outputs data similar to tabular except data fields are separated with a tab character (ASCII value of 9) for easier loading and display in Microsoft Excel.

Data I/O: The data is encapsulated in an <Arbitrary Block> format.

Block Size: The block size varies depending on the display and number of data points. A four-channel display with 401 points produces 39,465 bytes. A four-channel 1601 point display produces 154,905bytes. A single channel 401 point display produces 13,625 bytes.

Related Commands: SAVE, DISKRD, ODAT, OHGL, OS2P

P1C Select port 1 for connector specification **CAL (Ch 6)**

Syntax: `P1C`

Remarks: Specifies Port 1 as the port to which subsequent connector related commands will apply.

Related Commands: P2C, P3C, P4C

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 CONN**

P1C? Output port 1 connector type **CAL (Ch 6)**

Syntax: `P1C?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for SMA male; 2 for SMA female
3 for K male; 4 for K female
5 for Type N male; 6 for Type N female
7 for GPC 3.5 male; 8 for GPC 3.5 female
9 for GPC 7; 10 for other & user specified
11 for V male; 12 for V female
13 for TNC male; 14 for TNC female
15 for 2.4 mm male; 16 for 2.4 mm female
17 for Type N 75 male; 18 for Type N 75 female
19 for Type 7/16 male; 20 for Type 7/16 female
21 for Special male; 22 for Special female

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ PORT 1 CONN**

P1CW0 Turn off port 1 CW mode in linear cal **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P1CW0`

Related Commands: P1CW1, P1CW?

P1CW1 Turn on port 1 CW mode in linear cal **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P1CW1`

Related Commands: P1CW0, P1CW?

P1CW? Output port 1 CW mode in linear cal on/off status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P1CW?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: P1CW0, P1CW1

P1LCOR0 Turn off port 1 linear cal correction **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P1LCOR0`

Related Commands: P1LCOR1, P1LCOR?, P1LDONE?

P1LCOR1 Turn on port 1 linear cal correction **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P1LCOR1`

Related Commands: P1LCOR0, P1LCOR?, P1LDONE?

P1LCOR? Output port 1 linear cal correction on/off status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P1LCOR?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: P1LCOR0, P1LCOR1, P1LDONE?

P1LDONE? Output port 1 linear power correction Done status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P1LDONE?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: P1LCOR0, P1LCOR1, P1LCOR?

P1P? Output approximate power level at port 1 **POWER (Ch 5)**

Syntax: P1P?

Remarks: Absolute power setting in dB. Includes flat test port power correction, when applied.

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: PWR?, SA1?, FP0, FP1

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **PORT 1 POWER** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** \ **TEST AUT** \ **PORT 1 POWER** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **PORT 1 POWER**

P2C Select port 2 for connector specification **CAL (Ch 6)**

Syntax: P2C

Related Commands: P1C, P3C, P4C

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **PORT 2 CONN**

P2C? Output port 2 connector type **CAL (Ch 6)**

Syntax: P2C?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for SMA male; 2 for SMA female
3 for K male; 4 for K female
5 for Type N male; 6 for Type N female
7 for GPC 3.5 male; 8 for GPC 3.5 female
9 for GPC 7; 10 for other & user specified
11 for V male; 12 for V female
13 for TNC male; 14 for TNC female
15 for 2.4 mm male; 16 for 2.4 mm female
17 for Type N 75 male; 18 for Type N 75 female
19 for Type 7/16 male; 20 for Type 7/16 female
21 for Special male; 22 for Special female

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **PORT 2 CONN**

P3C Select port 3 for connector specification **CAL (Ch 6)**

Syntax: `P3C`

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN**

P3C? Output port 3 connector type **CAL (Ch 6)**

Syntax: `P3C?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for SMA male; 2 for SMA female
3 for K male; 4 for K female
5 for Type N male; 6 for Type N female
7 for GPC 3.5 male; 8 for GPC 3.5 female
9 for GPC 7; 10 for other & user specified
11 for V male; 12 for V female
13 for TNC male; 14 for TNC female
15 for 2.4 mm male; 16 for 2.4 mm female
17 for Type N 75 male; 18 for Type N 75 female
19 for Type 7/16 male; 20 for Type 7/16 female
21 for Special male; 22 for Special female

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 3 CONN**

P3CW0 Turn off port 3 CW mode in linear cal **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P3CW0`

Related Commands: P3CW1, P3CW?

P3CW1 Turn on port 3 CW mode in linear cal **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P3CW1`

Related Commands: P3CW0, P3CW?

P3CW? Output port 3 CW mode in linear cal on/off status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P3CW?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: P3CW0, P3CW1

P3LCOR0 Turn off port 3 linear cal correction **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P3LCOR0`

Related Commands: P3LCOR1, P3LCOR?, P3LDONE?

P3LCOR1 Turn on port 3 linear cal correction **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P3LCOR1`

Related Commands: P3LCOR0, P3LCOR?, P3LDONE?

P3LCOR? Output port 3 linear cal correction on/off status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P3LCOR?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: P3LCOR0, P3LCOR1, P3LDONE?

P3LDONE? Output port 1 linear power correction done status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `P3LDONE?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: P3LCOR0, P3LCOR1, P3LCOR?

P3P? Output approximate power level at port 3 **POWER (Ch 5)**

Syntax: `P3P?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Power \ **SOURCE 2 SETUP** \ **PORT 3 POWER** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** \ **TEST AUT** \ **PORT 3 POWER**

P4C Select port 4 for connector specification **CAL (Ch 6)**

Syntax: `P4C`

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL** \ **NEXT CAL STEP** \ **PORT 4 CONN**

P4C? Output port 4 connector type **CAL (Ch 6)**

Syntax: `P4C?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for SMA male; 2 for SMA female
3 for K male; 4 for K female
5 for Type N male; 6 for Type N female
7 for GPC 3.5 male; 8 for GPC 3.5 female
9 for GPC 7; 10 for other & user specified
11 for V male; 12 for V female
13 for TNC male; 14 for TNC female
15 for 2.4 mm male; 16 for 2.4 mm female
17 for Type N 75 male; 18 for Type N 75 female
19 for Type 7/16 male; 20 for Type 7/16 female
21 for Special male; 22 for Special female

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL** \ **NEXT CAL STEP** \ **PORT 4 CONN**

PBL Select 1/4 size plot bottom left corner **HARD COPY (Ch 9)**

Syntax: `PBL`

Remarks: Selects a quarter-size plot, which appears in the bottom left corner of the screen.

Related Commands: PBR, PFL

Front Panel Key: Hard Copy **\ OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ LOWER LEFT**

PBR Select 1/4 size plot bottom right corner **HARD COPY (Ch 9)**

Syntax: `PBR`

Remarks: Selects a quarter-size plot, which appears in the bottom right corner of the screen.

Related Commands: PBL, PFL

Front Panel Key: Hard Copy **\ OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ LOWER RIGHT**

PCP Select measurement phase polar chart mode **DISPLAY (Ch 5)**

Syntax: `PCP`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCS, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display **\GRAPH TYPE \ (LINEAR POLAR) (LOG POLAR)** then **\ SCALE \ SELECT POLAR CHART MODE**

PCS Select sweep position polar chart mode **DISPLAY (Ch 5)**

Syntax: `PCS`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCX?, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display **\GRAPH TYPE \ (LINEAR POLAR) (LOG POLAR)** then **\ SCALE \ SELECT POLAR CHART MODE \ MAGNITUDE, SWEEP POSITION**

PCX? Output polar chart mode **DISPLAY (Ch 5)**

Syntax: `PCX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for PHASE
2 for POSITION

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHA, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

PDR Print directory listing of the floppy drive **UTILITY - DISK (Ch 9)**

Syntax: `PDR`

Remarks: A copy of the directory listing of the floppy drive is sent to the printer.

Related Commands: ODR, ODRH, PDRH

PDRH Print directory listing of the hard drive **UTILITY - DISK (Ch 9)**

Syntax: `PDRH`

Remarks: A copy of the directory listing of the hard drive is sent to the printer.

Related Commands: ODR, ODRH, PDR

PEDELOG Print current EDE log **CONFIG (Ch 5)**

Syntax: `PEDELOG`

Front Panel Key: Config **\ NTWK EMBEDDING/DE-EMBEDDING \ SELECT DEVICE TYPE (2) (3) PORT \ CONTINUE EMBEDDING/DE-EMBEDDING LOG \ SAVE LOG TO FLOPPY DISK**

PEL Print the error list **UTILITY - SERVICE LOG (Ch 9)**

Syntax: `PEL`

Remarks: A formatted list of the error messages in the service log is sent to the printer.

Related Commands: OFL, OSL, PSL

Front Panel Key: Utility **\ DIAGNOSTICS \ SERVICE LOG \ PRINT LOG**

PERPORT Select per port as chop mode type **SWEEP (Ch 5)**

Syntax: PERPORT

Front Panel Key: Sweep \ **MORE \ MEASUREMENT ENHANCEMENT \ PER PORT**

PF Suffix sets farad data type and scales by 1E-12 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: PF

PFL Select full-size plot **HARD COPY (Ch 9)**

Syntax: PFL

Related Commands: PBL, PFR

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ FULL SIZE**

PFS Print full screen image **HARD COPY (Ch 9)**

Syntax: PFS

Related Commands: PGR

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT GRAPHICAL DATA \ SCREEN AREA TO OUTPUT FULL SCREEN**

PGR Print graph area screen image **HARD COPY (Ch 9)**

Syntax: PGR

Related Commands: PFS

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT GRAPHICAL DATA \ SCREEN AREA TO OUTPUT GRAPH ONLY**

PGT Plot graticule **HARD COPY (Ch 9)**

Syntax: PGT

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ OBJECTS TO PLOT GRATICULE ON**

PH Suffix sets farad data type and scales by 1E-12 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `PH`

PHA Select phase display for active channel **DISPLAY (Ch 5)**

Syntax: `PHA`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PLG, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display **\ GRAPH TYPE \ PHASE**

PHO Enter phase offset for display channel **DISPLAY (Ch 5)**

Syntax: `PHO Value Units`
Value: -180 to +180
Units: DEG

Front Panel Key: Display **\ GRAPH TYPE \ (PHASE) (LOG MAGNITUDE & PHASE) (LINEAR MAGNITUDE & PHASE)** then **\SCALE \ PHASE SHIFT**

PHO? Output phase offset for display channel **DISPLAY (Ch 5)**

Syntax: `PHO?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display **\ GRAPH TYPE \ (PHASE) (LOG MAGNITUDE & PHASE) (LINEAR MAGNITUDE & PHASE)** then **\SCALE \ PHASE SHIFT**

PLD Plot data area only **HARD COPY (Ch 9)**

Syntax: `PLD`

Front Panel Key: Hard Copy **\ OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ OBJECTS TO PLOT HEADER (Area)**

PLG Select log polar display for active channel **DISPLAY (Ch 5)**

Syntax: `PLG`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLR, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **MORE** \ **LOG POLAR**

PLH Plot header **HARD COPY (Ch 9)**

Syntax: `PLH`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **OBJECTS TO PLOT HEADER ON**

PLM Plot markers and limits **HARD COPY (Ch 9)**

Syntax: `PLM`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **OBJECTS TO PLOT** \ **LIMITS ON**

PLO? Output plot mode portrait or landscape **HARD COPY (Ch 9)**

Syntax: `PLO?`

Data I/O: Outputs value in ASCII <NR1> format as follows:
0 for PORTRAIT
1 for LANDSCAPE

Related Commands: PORT, LAND

Front Panel Key: Hard Copy \ **PAGE ORIENTATION**

PLR Select linear polar display for active channel **DISPLAY (Ch 5)**

Syntax: `PLR`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLG, POW, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **MORE** \ **LINEAR POLAR**

PLS Plot entire screen **HARD COPY (Ch 9)**

Syntax: `PLS`

Related Commands: CH1-CH4

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ FULL PLOT**

PLT Plot data traces only **HARD COPY (Ch 9)**

Syntax: `PLT`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ OBJECTS TO PLOT DATA TRACES AND MARKER ON**

PMK Print tabular data for Markers **HARD COPY (Ch 9)**

Syntax: `PMK`

Related Commands: CH1-CH4

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ MARKER DATA ON**

PMN Plot menu **HARD COPY (Ch 9)**

Syntax: `PMN`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ OBJECTS TO PLOT MENU ON**

PMT Print tabular data for traces and markers **HARD COPY (Ch 9)**

Syntax: `PMT`

Related Commands: CH1-CH4

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ MARKER DATA OFF**

POP Enter parallel output port 8-bit decimal word (0-255) **SEQ (Ch 10)**

Syntax: `POP Value Units`
Value: Integer
Units: XX1

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT PORT (0-255)**

POP? Output parallel output port 8-bit decimal word (0-255) **SEQ (Ch 10)**

Syntax: `POP?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT PORT (0-255)**

POPBC0 Clear parallel output port bit 0 **SEQ (Ch 10)**

Syntax: `POPBC0`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 0**

POPBC1 Clear parallel output port bit 1 **SEQ (Ch 10)**

Syntax: `POPBC1`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 1**

POPBC2 Clear parallel output port bit 2 **SEQ (Ch 10)**

Syntax: `POPBC2`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 2**

POPBC3 Clear parallel output port bit 3 **SEQ (Ch 10)**

Syntax: `POPBC3`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 3**

POPBC4 Clear parallel output port bit 4 **SEQ (Ch 10)**

Syntax: `POPBC4`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 4**

POPBC5 Clear parallel output port bit 5 **SEQ (Ch 10)**

Syntax: `POPBC5`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 5**

POPBC6 Clear parallel output port bit 6 **SEQ (Ch 10)**

Syntax: `POPBC6`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 6**

POPBC7 Clear parallel output port bit 7 **SEQ (Ch 10)**

Syntax: `POPBC7`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ CLEAR PARALLEL OUT BIT 7**

POPBS0 Set parallel output port bit 0 **SEQ (Ch 10)**

Syntax: `POPBS0`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 0**

POPBS1 Set parallel output port bit 1 **SEQ (Ch 10)**

Syntax: `POPBS1`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 1**

POPBS2 Set parallel output port bit 2 **SEQ (Ch 10)**

Syntax: `POPBS2`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 2**

POPBS3 Set parallel output port bit 3 **SEQ (Ch 10)**

Syntax: `POPBS3`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 3**

POPBS4 Set parallel output port bit 4 **SEQ (Ch 10)**

Syntax: `POPBS4`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 4**

POPBS5 Set parallel output port bit 5 **SEQ (Ch 10)**

Syntax: `POPBS5`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 5**

POPBS6 Set parallel output port bit 6 **SEQ (Ch 10)**

Syntax: `POPBS6`

Front Panel Key: Seq **\ TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 6**

POPBS7 Set parallel output port bit 7 **SEQ (Ch 10)**

Syntax: `POPBS7`

Front Panel Key: Seq \ **TTL I/0 \ PARALLEL OUT SETUP \ SET PARALLEL OUT BIT 7**

PORT Select portrait mode for output plot **HARD COPY (Ch 9)**

Syntax: `PORT`

Related Commands: LAND, PLO?

Front Panel Key: Hard Copy \ **PAGE ORIENTATION PORTRAIT**

POSET Enter phase offset for active channel **DISPLAY (Ch 5)**

Syntax: `POSET`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Display \ **REFERENCE PLANE \ PHASE OFFSET**

POSET? Output phase offset for active channel **DISPLAY (Ch 5)**

Syntax: `POSET?`

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Display \ **REFERENCE PLANE \ PHASE OFFSET**

POW Select power out display for active channel **DISPLAY (Ch 5)**

Syntax: `POW`

Related Commands: DLA, IMG, ISC, ISE, ISM, IMG, LIN, MAG, MPH, PCP, PCS, PCX?, PHA, PLG, PLR, REL, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE \ MORE \ POWER OUT**

PRNTYPDJ Select HP Deskjet printer **HARD COPY (Ch 9)**

Syntax: PRNTYPDJ

Related Commands: PRNTYPEP, PRNTYPLJ, PRNTYPTJ, PRNTYPX?

Front Panel Key: Hard Copy \ **OUTPUT DEVICE \ PRINTER \ OUTPUT SETUP \ PRINTER TYPE DESKJET**

PRNTYPEP Select Epson FX printer **HARD COPY (Ch 9)**

Syntax: PRNTYPEP

Related Commands: PRNTYPDJ, PRNTYPLJ, PRNTYPTJ, PRNTYPX?

Front Panel Key: Hard Copy \ **OUTPUT DEVICE \ PRINTER \ OUTPUT SETUP \ PRINTER TYPE EPSON**

PRNTYPLJ Select HP Laserjet printer **HARD COPY (Ch 9)**

Syntax: PRNTYPLJ

Related Commands: PRNTYPDJ, PRNTYPEP, PRNTYPTJ, PRNTYPX?

Front Panel Key: Hard Copy \ **OUTPUT DEVICE \ PRINTER \ OUTPUT SETUP \ PRINTER TYPE DESKJET**

PRNTYPTJ Select HP Thinkjet printer **HARD COPY (Ch 9)**

Syntax: PRNTYPTJ

Related Commands: PRNTYPDJ, PRNTYPEP, PRNTYPLJ, PRNTYPX?

Front Panel Key: Hard Copy \ **OUTPUT DEVICE \ PRINTER \ OUTPUT SETUP \ PRINTER TYPE THINKJET**

PRNTYPX? Output printer type **HARD COPY (Ch 9)**

Syntax: PRNTYPX?

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: PRNTYPDJ, PRNTYPEP, PRNTYPLJ, PRNTYPTJ

Front Panel Key: Hard Copy \ **OUTPUT DEVICE \ PRINTER \ OUTPUT SETUP \ PRINTER TYPE**

PRT? Perform printer test and output status **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `PRT?`

Remarks: For service use only. Requires a special test fixture.

Data I/O: Returns a value in ASCII <NR1> format as follows:
0 for NO FAILURE
1 for FAILED

Front Panel Key: Utility **\ DIAGNOSTICS \ PERIPHERAL TESTS \ PRINTER INTERFACE**

PS Suffix sets time data type and scales by 1E02 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `PS`

PSC Suffix sets time data type and scales by 1E02 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `PSC`

PSDP Enter number of points drawn in power sweep mode **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSDP`

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: PSDP?

PSDP? Output number of points drawn in power sweep **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSDP?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: PSDP

PSET Enter target power for gain compression receiver calibration **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSET Value Units`
Value: The value in ASCII <NRf> format
Units: DB

Related Commands: SPGCA, PSET?, CALR

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ P SET**

PSET? Output target power for gain compression receiver calibration **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSET?`

Data I/O: The value is output in ASCII <NR3> format

Related Commands: SPGCA, PSET, CALR

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ P SET**

PSF Enter swept power frequency **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSF Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Freq \ **SWEPT POWER FREQUENCY**

PSF? Output swept power frequency **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSF?`

Data I/O: The target value will be output in ASCII <NR3> format.

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Freq \ **SWEPT POWER FREQUENCY**

PSFP1 Enter number of frequency points to be skipped during linear power correction for source 1 **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSFP1`

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: PSFP1?, PSFP3, PSFP3?

PSFP1? Output number of frequency points to be skipped during linear power correction for source 1 **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSFP1?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: PSFP1, PSFP3, PSFP3?

PSFP3 Enter number of frequency points to be skipped during linear power correction for source 2 **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSFP3`

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: PSFP1, PSFP1?, PSFP3?

PSFP3? Output number of frequency points to be skipped during linear power correction for source 2 **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSFP3?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: PSFP1, PSFP1?, PSFP3

PSGLOG Print the current segmented sweep log **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: `PSGLOG`

Related Commands: OSGLOG

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ SEGMENTED SWEEP LOG \ PRINT LOG**

PSL Print the service log — **UTILITY - SERVICE LOG (Ch 9)**

Syntax: `PSL`

Front Panel Key: Utility \ **DIAGNOSTICS \ SERVICE LOG \ PRINT LOG**

PSLC Perform power sweep linearity calibration — **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSLC`

Related Commands: PSLCP10, PSLCP11, PSLCP1X?, PSLCP1DONE?

PSLCP10 Turn power sweep linearity calibration off — **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSLCP10`

Related Commands: PSLCP11, PSLCP1DONE?, PSLCP1X?

PSLCP11 Turn power sweep linearity calibration on — **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSLCP11`

Related Commands: PSLCP10, PSLCP1DONE?, PSLCP1X?

PSLCP1DONE? Output power sweep linearity calibration done status — **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSLCP1DONE?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for power sweep OFF
1 for power sweep ON

Related Commands: PSLCP10, PSLCP11, PSLCP1X?

PSLCP1X? Output power sweep linearity calibration on/off status — **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSLCP1X?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for power sweep OFF
1 for power sweep ON

Related Commands: PSLCP10, PSLCP11, PSLCP1DONE?

PSLCP30 Turn power sweep linearity calibration off **SWEEP - POWER SWEEP (Ch 5)**

Syntax: PSLCP30

Related Commands: PSLCP31, PSLCP3DONE?, PSLCP3X?

PSLCP31 Turn power sweep linearity calibration on **SWEEP - POWER SWEEP (Ch 5)**

Syntax: PSLCP31

Related Commands: PSLCP30, PSLCP3DONE?, PSLCP3X?

PSLCP3DONE? Output power sweep linearity calibration done status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: PSLCP3DONE?

Related Commands: PSLCP30, PSLCP31, PSLCP3X?

PSLCP3X? Output power sweep linearity calibration on/off status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: PSLCP3X?

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for power sweep OFF
1 for power sweep ON

Related Commands: PSLCP30, PSLCP31, PSLCP3DONE?

PSNOP1 Enter port 1 nominal offset in power sweep mode **SWEEP - POWER SWEEP (Ch 5)**

Syntax: PSNOP1

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: PSNOP1?

PSNOP1? Output port 1 nominal offset in power sweep mode **SWEEP - POWER SWEEP (Ch 5)**

Syntax: PSNOP1?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: PSNOP1

PSNOP3 Enter port 3 nominal offset in power sweep mode **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSNOP3`

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: PSNOP3?

PSNOP3? Output port 3 nominal offset in power sweep mode **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `PSNOP3?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: PSNOP3

PSRC Enter power source as active **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `PSRC`

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: PSRC?

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **SELECT SOURCE X**

PSRC? Output active power source **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: `PSRC?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: PSRC

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **SELECT SOURCE X**

PST Stop print/plot **HARD COPY (Ch 9)**

Syntax: `PST`

PSTEP Enter power sweep step size **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSTEP Value Units`
Value: See "Remarks"
Units: DB

Remarks: The power step value in ASCII <NRF> format.

Related Commands: PSTRT, PSTOP

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ STEPSIZE** or
Freq \ **STEPSIZE**

PSTEP? Output power sweep step size **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSTEP?`

Data I/O: The value is output in ASCII <NR3> format.

Related Commands: PSTRT, PSTOP, PSTEP

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ STEPSIZE** or
Freq \ **STEPSIZE**

PSTOP Enter power sweep stop power **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSTOP Value Units`
Value: See "Remarks"
Units: DB

Remarks: The power stop value in ASCII <NRF> format.

Related Commands: PSTRT, PSTEP

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ P STOP** or
Freq \ **PSTOP**

PSTOP? Output power sweep stop power **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSTOP?`

Data I/O: The value is output in ASCII <NR3> format.

Related Commands: PSTRT, PSTOP, PSTEP

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ P STOP** or
Freq \ **PSTOP**

PSTRT Enter power sweep start power **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSTRT Value Units`
Value: See “Remarks”
Units: DB

Remarks: The start power in ASCII <NRF> format.

Related Commands: PSTOP, PSTEP

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ P START** or
Freq \ **PSTART**

PSTRT? Output power sweep start power **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSTRT?`

Data I/O: The value is output in ASCII <NR3> format.

Related Commands: PSTRT, PSTOP, PSTEP

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ SET POWER \ P START** or
Freq \ **PSTART**

PSWC Perform power sweep linearity calibration **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSWC`

Remarks: Command will start the calibration. The frequency list and power sweep power values must have already been entered.

Related Commands: SPGCA, PSTRT, PSTOP, PSTEP, IFV

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Cal \ **LINEAR POWER**

PSWC0 Turn power sweep linearity calibration off **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSWC0`

Remarks: The power sweep linearity calibration coefficients will not be applied to the power.

Related Commands: PSWC1, PSWCX?

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Cal \ **LINEAR POWER CORRECTION OFF**

PSWC1 Turn power sweep linearity calibration on **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSWC1`

Remarks: The power sweep linearity calibration coefficients will be applied to the power output.

Related Commands: PSWC0, PSWCX?

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Cal \ **LINEAR POWER CORRECTION ON**

PSWCDONE? Output power sweep linearity cal done status **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSWCDONE?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

PSWCX? Output power sweep linearity calibration on/off status — **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: PSWCX?

Data I/O: Outputs data in ASCII <NR1> format as follows. 0 for calibration OFF 1 for calibration ON

Related Commands: PSWC0, PSWC1

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Cal \ **LINEAR POWER CORRECTION**

PSWP Select power sweep — **SWEEP - POWER SWEEP (Ch 5)**

Syntax: PSWP

Related Commands: FSWP, SWPX?

Front Panel Key: Sweep \ **SWEEP TYPE FREQUENCY**

PSWP0 Turn power sweep off — **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: PSWP0

Remarks: Turns power sweep off at the current CWF frequency.

Related Commands: CWF, PSWP1, PSWPX?

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Freq \ **POWER SWEEP OFF**

PSWP1 Turn power sweep on — **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: PSWP1

Remarks: Turns power sweep on at the current CW frequency.

Related Commands: CWF, PSWP0, PSWPX?

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Freq \ **POWER SWEEP ON**

PSWPX? Output power sweep on/off status **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `PSWPX?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for power sweep OFF
1 for power sweep ON

Related Commands: PSWP0, PSWP1

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION** then Freq \ **POWER SWEEP**

PT0 Set tabular printout points skipped to 0 **HARD COPY (Ch 9)**

Syntax: `PT0`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT TABULAR DATA** \ **PRINT DENSITY**

PT1 Set tabular printout points skipped to 1 **HARD COPY (Ch 9)**

Syntax: `PT1`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT TABULAR DATA** \ **PRINT DENSITY 1**

PT2 Set tabular printout points skipped to 2 **HARD COPY (Ch 9)**

Syntax: `PT2`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT TABULAR DATA** \ **PRINT DENSITY 2**

PT3 Set tabular printout points skipped to 3 **HARD COPY (Ch 9)**

Syntax: `PT3`

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT TABULAR DATA** \ **PRINT DENSITY 3**

PT4 Set tabular printout points skipped to 4 **HARD COPY (Ch 9)**

Syntax: PT4

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ PRINT DENSITY 4**

PT5 Set tabular printout points skipped to 5 **HARD COPY (Ch 9)**

Syntax: PT5

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ PRINT DENSITY 5**

PT6 Set tabular printout points skipped to 6 **HARD COPY (Ch 9)**

Syntax: PT6

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ PRINT DENSITY 6**

PT7 Set tabular printout points skipped to 7 **HARD COPY (Ch 9)**

Syntax: PT7

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ PRINT DENSITY 7**

PT8 Set tabular printout points skipped to 8 **HARD COPY (Ch 9)**

Syntax: PT8

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ PRINT DENSITY 8**

PT9 Set tabular printout points skipped to 9 **HARD COPY (Ch 9)**

Syntax: PT9

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER \ OUTPUT SETUP \ OUTPUT FORMAT TABULAR DATA \ PRINT DENSITY 9**

PTAVG Set the averaging type to Point-by-Point averaging **AVG (Ch 5)**

Syntax: PTAVG

Related Commands: SWAVG, SWAVG?

Front Panel Key: Avg \ **AVERAGING TYPE**

PTB Print tabular data for traces **HARD COPY (Ch 9)**

Syntax: PTB

Related Commands: PT0-PT9

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PRINTER** \ **OUTPUT SETUP** \ **OUTPUT FORMAT TABULAR DATA** \ **SWEEP DATA ON**

PTL Select 1/4 size plot top left corner **HARD COPY (Ch 9)**

Syntax: PTL

Related Commands: PTR, PBR, PBL, PFL

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **PLOT FORMAT** \ **UPPER LEFT**

PTP Enter the target power for flat power correction **POWER - FLAT POWER (Ch 5)**

Syntax: PTP Value Units
Value: See "Remarks"
Units: DBM

Remarks: The power level in ASCII <NRF> format. The calibration will be performed using this as the power level to be achieved.

Related Commands: PTP?, SFC, FP0, FP1

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **FLAT TEST PORT POWER CAL** \ **POWER TARGET** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **CALIBRATE FOR FLATNESS** \ **POWER TARGET**

PTP3

Enter the target power for flat power correction for source 2

POWER - FLAT POWER (Ch 5)

Syntax: `PTP3 Value Units`
Value: See “Remarks”
Units: DBM

Remarks: The power level in ASCII <NRF> format. The calibration will be performed using this as the power level to be achieved.

Related Commands: PTP3?, SFC, FP0, FP1

Front Panel Key: Power **\ SOURCE 2 SETUP \ FLAT TEST PORT POWER CAL \ POWER TARGET**

PTP3?

Output the target power for flat power correction for

POWER - FLAT POWER (Ch 5)

Syntax: `PTP3?`

Data I/O: Outputs data in ASCII <NR3> format.

Related Commands: PTP3, SFC, FP0, FP1

Front Panel Key: Power **\ SOURCE 2 SETUP \ FLAT TEST PORT POWER CAL \POWER TARGET**

PTP?

Output the target power for flat power correction

POWER - FLAT POWER (Ch 5)

Syntax: `PTP?`

Data I/O: Outputs data in ASCII <NR3> format.

Related Commands: PTP, SFC, FP0, FP1

Front Panel Key: Power **\ SOURCE 1 SETUP \ FLAT TEST PORT POWER CAL \ POWER TARGET** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ TEST SIGNALS \ CALIBRATE FOR FLATNESS \ POWER TARGET**

PTR Select 1/4 size plot top right corner — **HARD COPY (Ch 9)**

Syntax: `PTR`

Related Commands: PTL, PBR, PBL, PFL

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ UPPER RIGHT**

PTS Enter number of points to be skipped during flat power correction — **POWER - FLAT POWER (Ch 5)**

Syntax: `PTS Value Units`
Value: 1 to 65
Units: XX1

Front Panel Key: Power \ **SOURCE 1 SETUP \ FLAT TEST PORT POWER CAL \ xxx POINTS MEASURE 1 PWR POINT EVERY xx POINTS**

PTS3 Enter number of points to be skipped during flat power correction for source 2 — **POWER - FLAT POWER (Ch 5)**

Syntax: `PTS3 Value Units`
Value: 1 to 65
Units: XX1

Front Panel Key: Power \ **SOURCE 2 FLAT TEST PORT POWER CALIBRATION \ xxx POINTS MEASURE 1 PWR POINT EVERY xx POINT(S)**

PTS3? Output number of points to be skipped during flat power correction for source 2 — **POWER - FLAT POWER (Ch 5)**

Syntax: `PTS3?`

Data I/O: Outputs a value in ASCII <NR1> format.

Front Panel Key: Power \ **SOURCE 1 SETUP \ FLAT TEST PORT POWER CAL \ xxx POINTS MEASURE 1 PWR POINT EVERY xx POINTS**

PTX? Output tabular printout points skipped **HARD COPY (Ch 9)**

Syntax: PTX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for SKIP 0 POINTS
1 for SKIP 1 POINT
2 for SKIP 2 POINTS
3 for SKIP 3 POINTS
4 for SKIP 4 POINTS
5 for SKIP 5 POINTS
6 for SKIP 6 POINTS
7 for SKIP 7 POINTS
8 for SKIP 8 POINTS
9 for for SKIP 9 POINTS

Related Commands: PT0, PT1, PT2, PT3, PT4, PT5, PT6, PT7, PT8, PT9

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ UPPER X**

PW2 Enter source 2 power level **POWER (Ch 5)**

Syntax: PW2 Value Units
Value: Depends on the power range of the source
Units: DBM, XX1, XX3, XM3

Front Panel Key: Power \ **SOURCE 2 SETUP \ SOURCE 2 POWER** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION \ TEST AUT \ SOURCE 2 POWER** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ TEST SIGNALS \ SOURCE 2 POWER**

PW2? Output source 2 power level **POWER (Ch 5)**

Syntax: PW2?

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Power \ **SOURCE 2 SETUP \ SOURCE 2 POWER** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION \ TEST AUT \ SOURCE 2 POWER** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ TEST SIGNALS \ SOURCE 2 POWER**

PW3 Enter external source 3 power level **POWER (Ch 5)**

Syntax: `PW3 Value Units`
Value: ASCII <NRf> number
Units: DB, DBL, DBM

Data I/O: Input value using ASCII <NRf> number.

Front Panel Key: Power \ **SOURCE 3 SETUP** \ **SOURCE 3 POWER**

PW3? Output external source 3 power level **POWER (Ch 5)**

Syntax: `PW3?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Power \ **SOURCE 3 SETUP** \ **SOURCE 3 POWER**

PW4 Enter external source 4 power level **POWER (Ch 5)**

Syntax: `PW4 Value Units`
Value: ASCII <NRf> number
Units: DB, DBL, DBM

Data I/O: Input value using ASCII <NRf> number.

Front Panel Key: Power \ **SOURCE 4 SETUP** \ **SOURCE 4 POWER**

PW4? Output external source 4 power level **POWER (Ch 5)**

Syntax: `PW4?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Power \ **SOURCE 4 SETUP** \ **SOURCE 4 POWER**

PWR Enter internal source power level **POWER (Ch 5)**

Syntax: PWR Value Units
Value: Depends on the MS462XX power range
Units: DB, XX1, XX3, XM3

Related Commands: OID, P1P?, PWR?

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **SOURCE 1 POWER** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** \ **TEST AUT** \ **SOURCE 1 POWER** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **SOURCE 1 POWER**

PWR? Output internal source power level **POWER (Ch 5)**

Syntax: PWR?

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: OID, PIP?

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **SOURCE 1 POWER** or
SWEPT FREQUENCY GAIN COMPRESSION \ **TEST AUT** \ **SOURCE 1 POWER** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **SOURCE 1 POWER**

PXX? Output plot location **HARD COPY (Ch 9)**

Syntax: PXX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for UPPER LEFT
2 for UPPER RIGHT
3 for LOWER LEFT
4 for LOWER RIGHT
5 for FULL SIZE

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER** \ **OUTPUT SETUP** \ **PLOT FORMAT**

RAD Suffix sets phase data type and scales by 180/pi **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: RAD

RC1 Recall front panel setup number 1 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC1`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 1**

RC10 Recall front panel setup number 10 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC10`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 10**

RC2 Recall front panel setup number 2 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC2`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 2**

RC3 Recall front panel setup number 3 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC3`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 3**

RC4 Recall front panel setup number 4 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC4`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 4**

RC5 Recall front panel setup number 5 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC5`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 5**

RC6 Recall front panel setup number 6 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC6`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 6**

RC7 Recall front panel setup number 7 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC7`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 7**

RC8 Recall front panel setup number 8 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC8`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 8**

RC9 Recall front panel setup number 9 from memory **SAVE/RECALL (Ch 9)**

Syntax: `RC9`

Front Panel Key: Save/Recall \ **RECALL** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 9**

RCALLOG Output the receiver calibration log **POWER - RECEIVER CAL (Ch 5)**

Syntax: `RCALLOG`

Related Commands: RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

Front Panel Key: Power \ **RECEIVER CAL** \ **DISPLAY RECEIVER CAL TABLE**

RCALP10 Turn off port 1 receiver calibration for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP10

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 1 OFF** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP11 Turn on port 1 receiver calibration for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP11

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 1 ON** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP1DONE? Output port 1 receiver calibration done status for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP1DONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NOT DONE
1 for DONE

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 1 DONE** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP1X? Output port 1 receiver calibration on/off status for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP1X?

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for OFF and 1 for ON.

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 1** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP20 Turn off port 2 receiver calibration for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP20

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 2 OFF** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP21 Turn on port 2 receiver calibration for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: `RCALP21`

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 2 ON** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP2DONE? Output port 2 receiver calibration done status for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: `RCALP2DONE?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 2 DONE** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP2X? Output port 2 receiver calibration on/off status for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: `RCALP2X?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 2** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP30 Turn off port 3 receiver calibration for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: `RCALP30`

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 3 OFF** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP31 Turn on port 3 receiver calibration for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP31

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 3 ON** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP3DONE? Output port 3 receiver calibration done status for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP3DONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 3 DONE** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALP3X? Output port 3 receiver calibration on/off status for receiver type TEST

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALP3X?

Data I/O: Outputs ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL FOR PORT 3** or Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** then Cal \ **CALIBRATE RECEIVER**

RCALRP1 Set receiver calibration receive to port 1

POWER - RECEIVER CAL (Ch 5)

Syntax: RCALRP1

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **RECEIVER PORT 1** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **RECEIVER PORT 1**

RCALRP2 Set receiver calibration receive to port 2 **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALRP2

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **RECEIVER PORT 2** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **RECEIVER PORT 2**

RCALRP3 Set receiver calibration receive to port 3 **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALRP3

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **RECEIVER PORT 3** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **RECEIVER PORT 3**

RCALRPX? Output receiver calibration receive port **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALRPX?

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for PORT 1
2 for PORT 2
3 for PORT 3
4 for PORT 4

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **RECEIVER PORT X** or

Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **RECEIVER PORT X**

RCALSP1 Set receiver calibration source to port 1 **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALSP1

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **SOURCE PORT 1** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **SOURCE PORT 1**

RCALSP2 Set receiver calibration source to port 2 **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALSP2

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **SOURCE PORT 2** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **SOURCE PORT 2**

RCALSP3 Set receiver calibration source to port 3 **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALSP3

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **SOURCE PORT 3** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **SOURCE PORT 3**

RCALSPX? Output receiver calibration source port **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALSPX?

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for PORT 1
2 for PORT 2
3 for PORT 3
4 for PORT 4

Front Panel Key: Power \ **RECEIVER CAL** \ **RECEIVER CAL** \ **SOURCE PORT X** or Appl \ **CHANGE APPLICATION SETUP** \ **MEASUREMENT TYPE** \ **HARMONIC** then Cal \ **RECEIVER SETUP** \ **RECEIVER CAL** \ **SOURCE PORT X**

RCALTYPE? Output the receiver type **POWER - RECEIVER CAL (Ch 5)**

Syntax: RCALTYPE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for TEST PORT
1 for REFERENCE PORT
Default is TEST PORT

Related Commands: RCALLOG, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

Front Panel Key: Power \ **RECEIVER CAL** \ **DISPLAY RECEIVER CAL TABLE**

RCCM1 Fast recall cal data from memory 1 **SAVE/RECALL (Ch 9)**

Syntax: RCCM1

Front Panel Key: Save/Recall **\ RECALL \ CAL DATA IN INTERNAL MEMORY \ CAL 1**

RCCM2 Fast recall cal data from memory 2 **SAVE/RECALL (Ch 9)**

Syntax: RCCM2

Front Panel Key: Save/Recall **\ RECALL \ CAL DATA IN INTERNAL MEMORY \ CAL 2**

RCCM3 Fast recall cal data from memory 3 **SAVE/RECALL (Ch 9)**

Syntax: RCCM3

Front Panel Key: Save/Recall **\ RECALL \ CAL DATA IN INTERNAL MEMORY \ CAL 3**

RCCM4 Fast recall cal data from memory 4 **SAVE/RECALL (Ch 9)**

Syntax: RCCM4

Front Panel Key: Save/Recall **\ RECALL \ CAL DATA IN INTERNAL MEMORY \ CAL 4**

RCCM5 Fast recall cal data from memory 5 **SAVE/RECALL (Ch 9)**

Syntax: RCCM5

Front Panel Key: Save/Recall **\ RECALL \ CAL DATA IN INTERNAL MEMORY \ CAL 5**

RCCM6 Fast recall cal data from memory 6 **SAVE/RECALL (Ch 9)**

Syntax: RCCM6

Front Panel Key: Save/Recall **\ RECALL \ CAL DATA IN INTERNAL MEMORY \ CAL 6**

RCCM7 Fast recall cal data from memory 7 **SAVE/RECALL (Ch 9)**

Syntax: RCCM7

Front Panel Key: Save/Recall **\ RECALL \ CAL DATA IN INTERNAL MEMORY \ CAL 7**

RCCM8 Fast recall cal data from memory 8 **SAVE/RECALL (Ch 9)**

Syntax: RCCM8

Front Panel Key: Save/Recall \ **RECALL** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 8**

RCLALL Recall combined hardware calibration file from floppy disk **UTILITY - DISK (Ch 9)**

Syntax: RCLALL

Remarks: The Combined Hardware Calibration file has the fixed name 'HW_CAL.ALL'.

Related Commands: RCLALLH

RCLALLH Recall combined hardware calibration file from hard disk **UTILITY - DISK (Ch 9)**

Syntax: RCLALLH

Remarks: The Combined Hardware Calibration file has the fixed name 'HW_CAL.ALL'.

Related Commands: RCLALL

RD Remove a disk directory **UTILITY - DISK (Ch 9)**

Syntax: RD Value
Value: See "Remarks"

Remarks: "pathspec" is a combination of letters, numbers, \ characters and underscores which spell out the path and directory name. "pathspec" may include a drive letter of the form A: for the floppy disk and C: for the hard drive. Directory names follow the same rules as filenames.

Related Commands: MD

RDA Select automatic reference delay calculation **DISPLAY (Ch 5)**

Syntax: RDA

Remarks: Calculation impacted by dielectric setting.

Related Commands: CH1-CH4, RDD, RDT, DIx commands in DISPLAY Group.

Front Panel Key: Display \ **REFERENCE PLANE** \ **AUTO**

RDD Enter reference delay in distance for active channel — **DISPLAY (Ch 5)**

Syntax: `RDD Value Units`
Value: -999.999 to +999.999
Units: M, MTR, MM, MMT, CM, CMT

Remarks: Calculation impacted by dielectric setting.

Related Commands: CH1-CH4, RDA, RDT, DIx commands in DISPLAY Group.

Front Panel Key: Display \ **REFERENCE PLANE** \ **DISTANCE**

RDD? Output reference delay in distance for active channel — **DISPLAY (Ch 5)**

Syntax: `RDD?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display \ **REFERENCE PLANE** \ **DISTANCE** or
Marker \ **READOUT MARKERS** \ **CH x - Sxx REFERENCE PLANE** \

RDDS Enter reference delay in distance for S-parameters in active channel — **DISPLAY (Ch 5)**

Syntax: `RDDS`

Data I/O: The value is input in ASCII <NRf> format.

RDDS? Output reference delay in distance for S-parameters in active channel — **DISPLAY (Ch 5)**

Syntax: `RDDS?`

Data I/O: Outputs data using ASCII <NR3> format.

RDT Enter reference delay in time for active channel — **DISPLAY (Ch 5)**

Syntax: `RDT Value Units`
Value: -999.999 to +999.999
Units: SEC, MS, US, NS, PS

Status Reporting: CH1-CH4, RDD, RDA

Front Panel Key: Display \ **REFERENCE PLANE** \ **TIME**

RDT? Output reference delay in time for active channel **DISPLAY (Ch 5)**

Syntax: RDT?

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display \ **REFERENCE PLANE** \ **TIME**

RDTS Enter reference delay in time for S-parameters in active channel **DISPLAY (Ch 5)**

Syntax: RDTS

Data I/O: The value is input in ASCII <NRf> format.

RDTS? Output reference delay in time for S-parameters in active channel **DISPLAY (Ch 5)**

Syntax: RDTS?

Data I/O: Outputs data using ASCII <NR3> format.

REBOOT Reboots the instrument **REMOTE - SYNC (Ch 8)**

Syntax: REBOOT

RECALL Recall a data file from disk to a task **DISPLAY (Ch 5)**

Syntax: RECALL
Value: See “Remarks”

Remarks: “filename” is the name of the file to be recalled. It may include a drive letter and path. Not all files are recallable. You can recall files with the following name/extensions: (front panel and calibration data files) *.CAL, (normalization data files) *.NRM, (tabular data files) *.DAT, (service log files) *.LOG, (error list files) *.ELG, (hardware calibration files) HW_CAL.*, (calibration kit data files) KIT_INFO.*. Recalled tabular data, service log and error list files go to the printer for printing. The others are stored internally.

Related Commands: SAVE

Front Panel Key: Display \ **TRACE MEMORY** \ **DISK OPERATIONS** \ **RECALL MEMORY FROM HARD (FLOPPY) DISK** or
Utility \ **DIAGNOSTICS** \ **HARDWARE CAL** \ **DISK OPERATIONS** \ **RECALL FROM HARD (FLOPPY) DISK** or
Hard Copy \ **OUTPUT OPTIONS** or
Save/Recall \ **RECALL**

REF Enter reference line for top graph of active channel **DISPLAY (Ch 5)**

Syntax: `REF Value Units`
Value: 0 to 8
Units: Depends on graph type; see Table 11-2 at the end of this chapter.

Status Reporting: CH1-CH4, OFF, SCL

Front Panel Key: Display **\ GRAPH TYPE \ Any, except SMITH CHART** then **\ SCALE \ REFERENCE LINE**

REF2 Enter reference line for bottom graph of active channel **DISPLAY (Ch 5)**

Syntax: `REF2 Value Units`
Value: 0 to 8
Units: Depends on graph type; see Table 11-2 at the end of this chapter.

Related Commands: CH1-CH4, OFF2, SCL2

Front Panel Key: Display **\ GRAPH TYPE \ Any, except SMITH CHART** then **\ SCALE \ REFERENCE LINE**

REF2? Output reference line for bottom graph of active channel **DISPLAY (Ch 5)**

Syntax: `REF2?`

Data I/O: Outputs a value in ASCII <NR1> format.

Related Commands: REF2

Front Panel Key: Display **\ GRAPH TYPE \ Any, except SMITH CHART** then **\ SCALE \ REFERENCE LINE**

REF? Output reference line for top graph of active channel **DISPLAY (Ch 5)**

Syntax: `REF?`

Data I/O: Outputs a value in ASCII <NR1> format.

Front Panel Key: Display **\ GRAPH TYPE \ Any, except SMITH CHART** then **\ SCALE \ REFERENCE LINE**

REL Select real display for active channel **DISPLAY (Ch 5)**

Syntax: REL

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLG, POW, PLR, RIM, SMC, SME, SMI, SWR

Front Panel Key: Display **\ GRAPH TYPE \ MORE \ MORE \ REAL**

RESTARTCAL Restart application calibration measurement **CAL (Ch 6)**

Syntax: RESTARTCAL

REU Suffix sets real data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: REU

RGZ Select reflective device greater than Z0 **CAL (Ch 6)**

Syntax: RGZ

Related Commands: RLZ

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ NEXT CAL STEP \ OPEN (GREATER THAN Z0)**

RH0 Select RF off in hold mode **CONFIG (Ch 5)**

Syntax: RH0

Related Commands: HLD, RHI, BH0

Front Panel Key: Config **\ HOLD \ HOLD CONDITIONS RF OFF**

RH1 Select RF on in hold **CONFIG (Ch 5)**

Syntax: RH1

Related Commands: HLD, RH0, BH0

Front Panel Key: Config **\ HOLD \ HOLD CONDITIONS RF ON**

RHX? Output RF on/off during hold status **CONFIG (Ch 5)**

Syntax: `RHX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Config \ **HOLD** \ **HOLD CONDITIONS RF**

RIM Select real and imaginary display for active channel **DISPLAY (Ch 5)**

Syntax: `RIM`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLG, POW, PLR, REL, SMC, SME, SMI, SWR

Front Panel Key: Display \ **GRAPH TYPE** \ **MORE** \ **MORE** \ **REAL AND IMAGINARY**

RK? Output RK mode on/off status **REMOTE - MISC (Ch 8)**

Syntax: `RK?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: RKOFF, RKON

RKOFF Turn off RK mode **REMOTE - MISC (Ch 8)**

Syntax: `RKOFF`

Related Commands: RKON, RK?

RKON Turn on RK mode **REMOTE - MISC (Ch 8)**

Syntax: `RKON`

Related Commands: RKOFF, RK?

RLZ Select reflective device less than Z0 **CAL (Ch 6)**

Syntax: RLZ

Related Commands: RGZ

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ NEXT CAL STEP \ SHORT (LESS THAN Z0)**

RM1 Select reference plane at line 1 midpoint **CAL (Ch 6)**

Syntax: RM1

Related Commands: RRP

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ MIDDLE OF LINE 1 (REF)**

RMX? Output reference plane location for LRL calibration **CAL (Ch 6)**

Syntax: RMX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for LINE 1 MIDPOINT
1 for the REFERENCE PLANE AT THE REFERENCE PLANE

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ LOCATION OF REFERENCE PLANES**

ROL Enter reflective device offset length **CAL (Ch 6)**

Syntax: ROL Value Units
Value: 00.000 to +10.000
Units: MMT, CMT, MTR, MM, CM, M

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ NEXT CAL STEP \ NEXT CAL STEP \ OFFSET LENGTH**

ROL? Output reflective device offset length **CAL (Ch 6)**

Syntax: `ROL?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ NEXT CAL STEP \ NEXT CAL STEP \ NEXT CAL STEP \ OFFSET LENGTH OF REFLECTIVE DEVICE**

ROLP3 Enter reflective device offset length for 3-port TRX calibration **CAL (Ch 6)**

Syntax: `ROLP3 Value Units`
Value: 00.000 to +10.000
Units: MMT, CMT, MTR, MM, CM, M

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ CAL METHOD: TRX \ NEXT CAL STEP \ CHANGE PARAMETERS \ NEXT CAL STEP \ OFFSET LENGTH**

ROLP3? Output reflective device offset length for 3-port TRX **CAL (Ch 6)**

Syntax: `ROLP3?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ CAL METHOD: TRX \ NEXT CAL STEP \ CHANGE PARAMETERS \ NEXT CAL STEP \ OFFSET LENGTH OF REFLECTIVE DEVICE**

ROLP4 Enter reflective device offset length for 4-port TRX calibration **CAL (Ch 6)**

Syntax: `ROLP4`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ CAL METHOD: TRX \ NEXT CAL STEP \ CHANGE PARAMETERS \ NEXT CAL STEP \ PORT 4 SHORT OFFSET LENGTH**

ROLP4? Output reflective device offset length for 4-port TRX calibration **CAL (Ch 6)**

Syntax: ROLP4?

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ CAL METHOD: TRX \ NEXT CAL STEP \ CHANGE PARAMETERS \ NEXT CAL STEP \ PORT 4 SHORT OFFSET LENGTH**

RPC Repeat previous calibration **CAL (Ch 6)**

Syntax: RPC

Remarks: Performs exactly the same as the BEG command, except that it uses existing calibration setup. This command is useful after recalling a saved calibration.

Related Commands: BEG, KEC, TC1, TC2, NCS

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ REPEAT PREVIOUS CAL**

RPCHAN Select Per Channel for reference plane **CAL (Ch 6)**

Syntax: RPCHAN

RPCPX? Output reference plane Per Channel/Port status **CAL (Ch 6)**

Syntax: RPCPX?

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for PER PORT
1 for PER CHANNEL

RPO Enter rear panel DC voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: RPO Value Units
Value: 00.000 to +10.000
Units: VLT

Front Panel Key: Utility \ **REAR PANEL \ SELECT OUTPUT MODE**

RPO? Output rear panel DC voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RPO?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Utility **\ REAR PANEL \ SELECT OUTPUT MODE**

RPPORT Select Per Port for reference plane **CAL (Ch 6)**

Syntax: `RPPORT`

RPPORTNUM Enter reference plane port number **DISPLAY (Ch 5)**

Syntax: `RPPORTNUM`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Display **\ REFERENCE PLANE \ PORT X**

RPPORTNUM? Output active reference plane port number **DISPLAY (Ch 5)**

Syntax: `RPPORTNUM?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for PORT 1
2 for PORT 2
3 for PORT 3
4 for PORT 4

Front Panel Key: Display **\ REFERENCE PLANE \ PORT X**

RRCALP10 Turn Off the Port 1 receiver calibration for the receiver type REFERENCE **POWER - RECEIVER CAL (Ch 5)**

Syntax: `RRCALP10`

Related Commands: RCALLOG, RCALTYPE?, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP11 Turn On the Port 1 receiver calibration for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: RRCALP11

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP1DONE? Output the Port 1 receiver calibration Done status for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: RRCALP1DONE?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NOT DONE
1 for DONE
Default is NOT DONE

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP1X? Output the Port 1 receiver calibration On/Off status for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: RRCALP1X?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON
Default is OFF

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP20 Turn Off the Port 2 receiver calibration for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: RRCALP20

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP21 Turn On the Port 2 receiver calibration for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALP21`

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP2DONE? Output the Port 2 receiver calibration Done status for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALP2DONE?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NOT DONE
1 for DONE
Default is NOT DONE

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP2X? Output the Port 2 receiver calibration On/Off status for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALP2X?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON
Default is OFF

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP30 Turn Off the Port 3 receiver calibration for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALP30`

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP31 Turn On the Port 3 receiver calibration for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALP31`

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP3DONE?, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP3DONE? Output the Port 3 receiver calibration Done status for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALP3DONE?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for NOT DONE
1 for DONE
Default is NOT DONE

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3X?, RRCALTYPE, TRCALTYPE

RRCALP3X? Output the Port 3 receiver calibration On/Off status for the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALP3X?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON
Default is OFF

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALTYPE, TRCALTYPE

RRCALTYPE Select the receiver type REFERENCE

POWER - RECEIVER CAL (Ch 5)

Syntax: `RRCALTYPE`

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, TRCALTYPE

Front Panel Key: Power **\ RECEIVER CAL \ RECEIVER CAL \ RECEIVER TYPE**

RRP Select reference plane at reflection plane **CAL (Ch 6)**

Syntax: `RRP`

Remarks: Selects reference plane to be at the reflection plane for the LRL calibration.

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ENDS OF LINE 1 (REF)**

RST Instrument reset (same as *RST) **DEFAULT (Ch 5)**

Syntax: `RST`

Remarks: Resets the MS462XX to default state with all user programmable parameters set to their default values. Default state settings are listed in Chapter 12. This command does not affect the Output Queue, Status or Parallel Poll Registers, or the VNMS GPIB address setting.

Related Commands: *RST, RST0, RST1

Front Panel Key: Default \ **CONTINUE**

RST0 Reset instrument front panel memories and reserved parameters **DEFAULT (Ch 5)**

Syntax: `RST0`

Remarks: Resets the VNMS set to their default values. Default state settings are listed in Chapter 12. Additionally, front panel stored setups are cleared, the reserved parameters are set to their default values, and the GPIB address is changed to its default value (6). This command does not affect the Output Queue, Status, or Parallel Poll Registers. Reserved parameters are those parameters which are initialized at factory turn-on. They are also initialized after a battery-backed RAM failure occurs.

Related Commands: *RST, RST, RST1

Front Panel Key: Default \ **CONTINUE**

RST1 Reset instrument and front panel memories **DEFAULT (Ch 5)**

Syntax: `RST1`

Remarks: Resets the VNMS to the default state with all user programmable parameters set to their default values. Default state settings are listed in Chapter 12. Additionally, front panel stored setups are cleared. This command does not affect the Output Queue, Status, Parallel Poll Registers, or the GPIB address.

Related Commands: *RST, RST, RST0

Front Panel Key: Default \ **CONTINUE**

RSTAVG Reset the Sweep-by-Sweep averaging sweep count **AVG (Ch 5)**

Syntax: `RSTAVG`

Related Commands: AVGCNT?

Front Panel Key: Avg \ **RESET AVG. COUNT**

RSTCOL Reset color configuration to default **UTILITY (Ch 9)**

Syntax: `RSTCOL`

Front Panel Key: Utility \ **COLOR SETUP** \ **RESET COLORS**

RSTDAC Restore frequency from 10 MHz calibration and not save DAC number into BBRAM **UTILITY (Ch 9)**

Syntax: `RSTDAC`

RSTFSWP Restore full sweep **SWEEP (Ch 5)**

Syntax: `RSTFSWP`

RSTGC Reset gain compression parameters to default **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `RSTGC`

Remarks: This is not an instrument reset

RT0 Turn ripples testing off **CONFIG (Ch 5)**

Syntax: `RT0`

Front Panel Key: Config \ **RIPPLE TEST** \ **RIPPLE TEST OFF**

RT1 Turn ripples testing on **CONFIG (Ch 5)**

Syntax: `RT1`

Front Panel Key: Config \ **RIPPLE TEST** \ **RIPPLE TEST ON**

RT? Output ripples testing enable status **CONFIG (Ch 5)**

Syntax: `RT?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Config \ **RIPPLE TEST** \ **RIPPLE TEST**

RTL Return to local **CLR/LOCAL (Ch 9)**

Syntax: `RTL`

Remarks: Performs the same function as the RETURN TO LOCAL key. It has no effect if the VNMS is in the local lockout mode.

RTVAL Enter ripples testing value **CONFIG (Ch 5)**

Syntax: `RTVAL`

RTVAL? Output ripples testing value **CONFIG (Ch 5)**

Syntax: `RTVAL?`

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Config \ **RIPPLE TEST** \ **RIPPLE TEST**

RV0 Turn rear panel output voltage off **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RV0`

Front Panel Key: Utility \ **REAR PANEL** \ **OUTPUT VOLTAGE OFF**

RV1 Turn rear panel output voltage on **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RV1`

Front Panel Key: Utility \ **REAR PANEL** \ **OUTPUT VOLTAGE ON**

RV1? Output rear panel output voltage on/off status **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RV1?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Utility \ **REAR PANEL** \ **OUTPUT VOLTAGE**

RVA1 Enter rear panel output voltage value when port 1 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA1 Value Units`
Value: Voltage
Units: V, VLT, MV

Front Panel Key: Utility \ **REAR PANE** \ **DRIVEN PORT** \ **SET OUTPUT VOLTAGES: PORT 1**

RVA1? Output rear panel output voltage value when port 1 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA1?`

Data I/O: Outputs voltage using ASCII <NR3> integer values.

Front Panel Key: Utility \ **REAR PANE** \ **DRIVEN PORT** \ **SET OUTPUT VOLTAGES: PORT 1**

RVA2 Enter rear panel output voltage value when port 2 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA2 Value Units`
Value: Voltage
Units: V, VLT, MV

Front Panel Key: Utility **\ REAR PANE \ DRIVEN PORT \ SET OUTPUT VOLTAGES: PORT 2**

RVA2? Output rear panel output voltage value when port 2 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA2?`

Data I/O: Outputs voltage using ASCII <NR3> integer values.

Front Panel Key: Utility **\ REAR PANE \ DRIVEN PORT \ SET OUTPUT VOLTAGES: PORT 2**

RVA3 Enter rear panel output voltage value when port 3 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA3 Value Units`
Value: Voltage
Units: V, VLT, MV

Front Panel Key: Utility **\ REAR PANE \ DRIVEN PORT \ SET OUTPUT VOLTAGES: PORT 3**

RVA3? Output rear panel output voltage value when port 3 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA3?`

Data I/O: Outputs voltage using ASCII <NR3> integer values.

Front Panel Key: Utility **\ REAR PANE \ DRIVEN PORT \ SET OUTPUT VOLTAGES: PORT 3**

RVA4 Enter rear panel output voltage value when Port 4 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA4`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Utility **\ REAR PANE \ DRIVEN PORT \ SET OUTPUT VOLTAGES: PORT 4**

RVA4? Output rear panel output voltage value when Port 4 is driving **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVA4?`

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Utility **\ REAR PANE \ DRIVEN PORT \ SET OUTPUT VOLTAGES: PORT 4**

RVD Set rear panel output mode to dc value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVD`

Related Commands: RVH, RVV, RVL, RVX?

Front Panel Key: Utility **\ REAR PANEL \ SELECT OUTPUT MODE**

RVH Set rear panel output mode to horizontal **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVH`

Related Commands: RVD, RVV, RVL, RVX?

Front Panel Key: Utility **\ REAR PANEL \ SELECT OUTPUT MODE HORIZONTAL**

RVL Set rear panel output mode to lock direction **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVL`

Related Commands: RVH, RVV, RVD, RVX?

Front Panel Key: Utility **\ REAR PANEL \ SELECT OUTPUT MODE DRIVEN PORT**

RVP Set rear panel output mode to driven port **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVP`

Front Panel Key: Utility \ **REAR PANEL** \ **SELECT OUTPUT MODE DRIVEN PORT**

RVSP Enter rear panel stop voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVSP Value Units`
Value: Voltage
Units: V, VLT, MV

Front Panel Key: Utility \ **REAR PANEL** \ **HORIZONTAL** \ **STOP**

RVSP? Output rear panel stop voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVSP?`

Data I/O: Outputs voltage using ASCII <NR3> integer values.

Front Panel Key: Utility \ **REAR PANEL** \ **HORIZONTAL** \ **STOP**

RVST Enter rear panel start voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVST Value Units`
Value: Voltage
Units: V, VLT, MV

Front Panel Key: Utility \ **REAR PANEL** \ **HORIZONTAL** \ **START**

RVST? Output rear panel start voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVST?`

Data I/O: Outputs voltage using ASCII <NR3> integer values.

Front Panel Key: Utility \ **REAR PANEL** \ **HORIZONTAL** \ **START**

RVT Set rear panel output mode to TTL **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVT`

Front Panel Key: Utility \ **REAR PANEL** \ **SELECT OUTPUT MODE TTL OUTPUT**

RVTP1 Select port 1 for TTL rear panel output voltage **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP1`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 1**

RVTP1HL Set TTL rear panel output voltage type to TTL active high level **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP1HL`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 1 LEVEL HIGH**

RVTP1HP Set TTL rear panel output voltage type to TTL active high pulse **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP1HP`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 1 LEVEL HIGH PULSE**

RVTP1LL Set TTL rear panel output voltage type to TTL active low level **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP1LL`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 1 LEVEL LOW**

RVTP1LP Set TTL rear panel output voltage type to TTL active low pulse **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP1LP`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 1 LEVEL LOW PULSE**

RVTP1X? Output TTL rear panel output voltage type **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP1X?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for TTL HIGH
2 for TTL LOW
3 for TTL HIGH PULSE
4 for TTL LOW PULSES

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 1 LEVEL**

RVTP2 Select port 2 for TTL rear panel output voltage **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP2`

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 2**

RVTP2HL Set TTL rear panel output voltage type on port 2 to TTL active high level. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP2HL`

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 2 LEVEL HIGH**

RVTP2HP Set TTL rear panel output voltage type on port 2 to TTL active high pulse. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP2HP`

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 2 LEVEL HIGH PULSE**

RVTP2LL Set TTL rear panel output voltage type on port 2 to TTL active low level. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP2LL`

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 2 LEVEL LOW**

RVTP2LP Set TTL rear panel output voltage type on port 2 to TTL active low pulse. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP2LP`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 2 LEVEL LOW PULSE**

RVTP2X? Output TTL rear panel output voltage type on port 2. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP2X?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for TTL HIGH
2 for TTL LOW
3 for TTL HIGH PULSE
4 for TTL LOW PULSES

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 2 LEVEL**

RVTP3 Select port 3 for TTL rear panel output voltage **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP3`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 3**

RVTP3HL Set TTL rear panel output voltage type on port 3 to TTL active high level. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP3HL`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 3 LEVEL HIGH**

RVTP3HP Set TTL rear panel output voltage type on port 3 to TTL active high pulse. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP3HP`

Front Panel Key: Utility \ **REAR PANEL** \ **TTL OUTPUT** \ **SELECT PORT 3 LEVEL HIGH PULSE**

RVTP3LL Set TTL rear panel output voltage type on port 3 to TTL active low level. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP3LL`

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 3 LEVEL LOW**

RVTP3LP Set TTL rear panel output voltage type on port 3 to TTL active low pulse. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP3LP`

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 3 LEVEL LOW PULSE**

RVTP3X? Output TTL rear panel output voltage type on port 3. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP3X?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for TTL HIGH
2 for TTL LOW
3 for TTL HIGH PULSE
4 for TTL LOW PULSES

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT 3 LEVEL**

RVTP4 Select Port 4 for TTL rear panel output voltage. **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP4`

RVTP4HL Set TTL rear panel output voltage type on port 4 to TTL active high level **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP4HL`

RVTP4HP Set TTL rear panel output voltage type on port 4 to TTL active high pulse **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP4HP`

RVTP4LL Set TTL rear panel output voltage type on port 4 to TTL active low level **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP4LL`

RVTP4LP Set TTL rear panel output voltage type on port 4 to TTL active low pulse **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP4LP`

RVTP4X? Output TTL rear panel output voltage type on port 4 **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTP4X?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for TTL HIGH
2 for TTL LOW
3 for TTL HIGH PULSE
4 for TTL LOW PULSES

RVTPX? Output TTL rear panel output voltage type **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVTPX?`

Data I/O: Outputs ASCII <NR1> integer values as follows:
1 for PORT 1
2 for PORT 2
3 for PORT 3
4 for PORT 4

Front Panel Key: Utility **\ REAR PANEL \ TTL OUTPUT \ SELECT PORT X LEVEL**

RVV Set rear panel output mode to vertical **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVV`

Related Commands: RVH, RVD, RVL, RVX?

Front Panel Key: Utility **\ REAR PANEL \ SELECT OUTPUT MODE VERTICAL**

RVX? Output rear panel output mode **UTILITY - REAR PANEL (Ch 10)**

Syntax: `RVX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for HORIZONTAL
2 for VERTICAL
3 for DRIVEN PORT
4 for DC OUTPUT
5 for TTL output

Front Panel Key: Utility **\ REAR PANEL \ SELECT OUTPUT MODE VERTICAL**

RXZ? Output reflective device type in LRL calibration greater/less than Z0 **CAL (Ch 6)**

Syntax: `RXZ?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LRL/LRM PARAMETERS \ ONE BAND \ NEXT CAL STEP \ NEXT CAL STEP \ OPEN-SHORT**

S Suffix sets time data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `S`

S11 Measure S11 on active channel **MEAS (Ch 5)**

Syntax: `S11`

Remarks: S11 is the value of the signal leaving Port 1 vs the value of the signal being reflected back into Port 1. Any channel that is displaying the user parameter USR2 will now display S11.

Related Commands: S12, S13, S14, S21, S22, S23, S24, CH1-CH4

Front Panel Key: Meas **\ S11, REFL/USER 2**

S12 Measure S12 on active channel **MEAS (Ch 5)**

Syntax: `S12`

Remarks: S12 is the value of the signal leaving Port 2 vs the value of the signal being received at Port 1. Any channel that is displaying the user parameter USR3 will now display S12.

Related Commands: S11, S13, S14, S21, S22, S23, S24, CH1-CH4

Front Panel Key: Meas \ **S12, TRANS/USER 3**

S13 Measure S13 on active channel **MEAS (Ch 5)**

Syntax: `S13`

Remarks: S13 is the value of the signal leaving Port 3 vs the value of the signal being received at Port 1. Any channel that is displaying the user parameter USR5 will now display S13.

Related Commands: S11, S12, S14, S21, S22, S23, S24, CH1-CH4

Front Panel Key: Meas \ **S13,TRANS/USER 5**

S14 Measure S14 on active channel **MEAS (Ch 5)**

Syntax: `S14`

Related Commands: S11, S12, S13, S21, S22, S23, S24, CH1-CH4

Front Panel Key: Meas \ **S14,TRANS/USER 10**

S21 Measure S21 on active channel **MEAS (Ch 5)**

Syntax: `S21`

Remarks: S21 is the value of the signal leaving Port 1 vs the value of the signal being received at port 2. Any channel that is displaying the user parameter USR1 will now display S21.

Related Commands: S11, S12, S13, S14, S22, S23, S24, CH1-CH4

Front Panel Key: Meas \ **S21,TRANS/USER 1**

S22 Measure S22 on active channel **MEAS (Ch 5)**

Syntax: `S22`

Remarks: S22 is the value of the signal leaving port 2 vs the value of the signal being reflected back into port 2. Any channel that is displaying the user parameter USR4 will now display S22.

Related Commands: S11, S12, S13, S14, S21, S23, S24, CH1-CH4

Front Panel Key: Meas \ **S22, REFL/USER 4**

S23 Measure S23 on active channel **MEAS (Ch 5)**

Syntax: `S23`

Remarks: S23 is the value of the signal leaving Port 1 vs the value of the signal being received at port 3. Any channel that is displaying the user parameter USR6 will now display S23.

Related Commands: S11, S12, S13, S14, S21, S22, S24, CH1-CH4

Front Panel Key: Meas \ **S23, TRANS/USER 6**

S24 Measure S24 on active channel **MEAS (Ch 5)**

Syntax: `S24`

Related Commands: S11, S12, S13, S14, S21, S22, S23, CH1-CH4

Front Panel Key: Meas \ **S24, TRANS/USER 11**

S31 Measure S31 on active channel **MEAS (Ch 5)**

Syntax: `S31`

Remarks: S31 is the value of the signal leaving Port 1 vs the value of the signal being received at port 3. Any channel that is displaying the user parameter USR7 will now display S31.

Related Commands: S32, S33, S34, CH1-CH4

Front Panel Key: Meas \ **S31, TRANS/USER 7**

S32 Measure S32 on active channel **MEAS (Ch 5)**

Syntax: `S32`

Remarks: S32 is the value of the signal leaving port 2 vs the value of the signal being reflected back into port 3. Any channel that is displaying the user parameter USR8 will now display S32.

Related Commands: S31, S33, S34, CH1-CH4

Front Panel Key: Meas \ **S32, TRANS/USER 8**

S33 Measure S33 on active channel **MEAS (Ch 5)**

Syntax: `S33`

Remarks: S33 is the value of the signal leaving Port 3 vs the value of the signal being reflected back into Port 3. Any channel that is displaying the user parameter USR9 will now display S33.

Related Commands: S31, S32, S34, CH1-CH4

Front Panel Key: Meas \ **S33, REFL/USER 9**

S34 Measure S34 on active channel **MEAS (Ch 5)**

Syntax: `S34`

Related Commands: S31, S32, S33, CH1-CH4

Front Panel Key: Meas \ **S33, TRANS/USER 7**

S41 Measure S41 on active channel **MEAS (Ch 5)**

Syntax: `S41`

Related Commands: S41, S42, S43, S44, CH1-CH4

Front Panel Key: Meas \ **S33, TRANS/USER 12**

S42 Measure S42 on active channel **MEAS (Ch 5)**

Syntax: S42

Related Commands: S41, S43, S44, CH1-CH4

Front Panel Key: Meas \ **S33, TRANS/USER 13**

S43 Measure S43 on active channel **MEAS (Ch 5)**

Syntax: S43

Related Commands: S41, S42, S44, CH1-CH4

Front Panel Key: Meas \ **S33, REFL/USER 15**

S44 Measure S44 on active channel **MEAS (Ch 5)**

Syntax: S44

Related Commands: S41, S42, S43, CH1-CH4

Front Panel Key: Meas \ **S33, REFL/USER 16**

SA1 Enter port 1 source attenuator value **POWER (Ch 5)**

Syntax: SA1 Value Units
Value: 0 to 70 dB, in 10 dB steps
Units: DB, DBL, DBM, XX1, XX3, XM3

Remarks: Attenuates the signal output from Port 1.

Related Commands: PWR, P1P?, TA2

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **PORT 1 ATTN** or
Appl \ **SWEPT POWER GAIN COMPRESSION** \ **SET ATTENUATION** \ **PORT 1 ATTN** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** \ **TEST AUT** \ **PORT 1 ATTN** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **PORT 1 ATTN**

SA1? Output port 1 source attenuator value **POWER (Ch 5)**

Syntax: `SA1?`

Data I/O: Outputs a value in ASCII <NR1> format.

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **PORT 1 ATTN** or
Appl \ **SWEPT POWER GAIN COMPRESSION** \ **SET ATTENUATION** \ **PORT 1 ATTN** or
Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** \ **TEST AUT** \ **PORT 1 ATTN** or
Cal \ **PERFORM CAL 2-PORT CAL** \ **NEXT CAL STEP** \ **FULL 12-TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **TEST SIGNALS** \ **PORT 1 ATTN**

SA3 Enter port 3 source attenuator value **POWER (Ch 5)**

Syntax: `SA3 Value Units`
Value: ASCII <NRf> number
Units: XX1, XX3, XM3

Data I/O: The value is input using an ASCII <NRf> number.

Front Panel Key: Power \ **SOURCE 2 SETUP** \ **PORT 3 ATTN** or
Appl \ **SWEPT POWER GAIN COMPRESSION** \ **SET ATTENUATION** \ **PORT 3 ATTN**

SA3? Output port 3 source attenuator value **POWER (Ch 5)**

Syntax: `SA3?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for 0 dB
10 for 10 dB
20 for 20 dB
30 for 30 dB
40 for 40 dB
50 for 50 dB
60 for 60 dB
70 for 70 dB
80 for 80 dB
90 for 90 dB
100 for 100 dB
110 for 110 dB

Front Panel Key: Power \ **SOURCE 1 SETUP** \ **PORT 3 ATTN** or
Appl \ **SWEPT POWER GAIN COMPRESSION** \ **SET ATTENUATION** \ **PORT 3 ATTN**

SAVALL Save combined hardware cal to floppy disk **UTILITY - DISK (Ch 9)**

Syntax: SAVALL

Remarks: For service use only.

Related Commands: SAVALLH

SAVALLH Save combined hardware cal to hard disk **UTILITY - DISK (Ch 9)**

Syntax: SAVALLH

Remarks: For service use only.

Related Commands: SAVALL

SAVDAC Save 10 MHz DAC number into BBRAM **SAVE/RECALL (Ch 9)**

Syntax: SAVDAC

SAVE Save a data file to disk **SAVE/RECALL (Ch 9)**

Syntax: SAVE Value
Value: See "Remarks"

Remarks: "filename" is the name of the file to which the data is stored. May include a drive letter, and path. The file name defines the type of data which is to be saved. The types of data and associated file names that can be saved are shown in Chapter 9, Table 9-9.

Related Commands: RECALL

Front Panel Key: Display \ **TRACE MEMORY** \ **DISK OPERATIONS** \ **SAVE MEMORY TO HARD (FLOPPY) DISK** or
Utility \ **DIAGNOSTICS** \ **HARDWARE CAL** \ **DISK OPERATIONS** \ **SAVE DATA** \ **SAVE TO HARD (FLOPPY) DISK** or
Hard Copy \ **OUTPUT OPTIONS** or
Save/Recall \ **SAVE**

SAVEGC Save text format gain compression data to disk **UTILITY - DISK (Ch 9)**

Syntax: `SAVEGC Value`
Value: See "Remarks"

Remarks: "filename" is the name of the file to which the data is stored. May include a drive letter, and path. The extension must be TXT. The data items are separated with tabs (ASCII value 9) in order to be compatible with Microsoft Excel.

Related Commands: SAVE, SPGCA, MFGCT, OGCTXT

SBD Enter substrate dielectric for microstrip calibration **CAL (Ch 6)**

Syntax: `SBD Value Units`
Value: 1.0 to 9999.99
Units: XX1, XX3, XM3

Status Reporting: SBT

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ SUBSTRATE DIELECTRIC**

SBD? Output substrate dielectric for microstrip calibration **CAL (Ch 6)**

Syntax: `SBD?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ SUBSTRATE DIELECTRIC**

SBT Enter substrate thickness for microstrip calibration **CAL (Ch 6)**

Syntax: SBT Value Units
Value: 0.001 mm to 1000 mm
Units: M, MTR, MM, MMT, CM, CMT

Status Reporting: SBD

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ THICKNESS OF SUBSTRATE**

SBT? Output substrate thickness for microstrip calibration **CAL (Ch 6)**

Syntax: SBT?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ THICKNESS OF SUBSTRATE**

SCL Enter scale resolution for top graph of active channel **DISPLAY (Ch 5)**

Syntax: SCL Value Units
Value: Depends on graph type: Mag Resolution: 0.001-50, Phase Resolution: 0.01-90, Polar Resolution: E-9-999.99, Mag Resolution: 200 max, Smith/Inverted Smith: -30, 10, 20, 30
Units: Depends on graph type; refer to Table 11-2 at the end of this chapter.

Remarks: Depends on graph type: Mag Resolution: 0.001-50, Phase Resolution: 0.01-90, Polar Resolution: E-9-999.99, Mag Resolution: 200 max, Smith/Inverted Smith: -3, 0, 10, 20, 30.

Related Commands: OFF, REF, ISE, ISC, SME, SMC

Front Panel Key: Display **\ GRAPH TYPE \ Any, except SMITH CHART** then **\ SCALE \ RESOLUTION**

SCL2 Enter scale resolution for bottom graph of active channel **DISPLAY (Ch 5)**

Syntax: `SCL2 Value Units`

Value: Depends on graph type: Mag Resolution: 0.001-50, Phase Resolution: 0.01-90, Polar Resolution: E-9-999.99, Mag Resolution: 200 max, Smith/Inverted Smith: -30, 10, 20, 30

Units: Depends on graph type; refer to Table 11-2 at the end of this chapter.

Remarks: Depends on graph type: Mag Resolution: 0.001-50, Phase Resolution: 0.01-90, Polar Resolution: E-9-999.99, Mag Resolution: 200 max, Smith/Inverted Smith: -30, 10, 20, 30.

Related Commands: OFF2, REF2

Front Panel Key: Display \ **GRAPH TYPE \ Any, except SMITH CHART** then \ **SCALE \ RESOLUTION**

SCL2? Output scale resolution for bottom graph of active channel **DISPLAY (Ch 5)**

Syntax: `SCL2?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: SCL2

Front Panel Key: Display \ **GRAPH TYPE \ Any, except SMITH CHART** then \ **SCALE \ RESOLUTION** or
Utility \ **REAR PANEL \ SELECT OURPUT MODE (HORIZONTAL) (VERTICAL) \ VERTICAL RESOLUTION**

SCL? Output scale resolution for top graph of active channel **DISPLAY (Ch 5)**

Syntax: `SCL?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display \ **GRAPH TYPE \ Any, except SMITH CHART** then \ **SCALE \ RESOLUTION** or
Utility \ **REAR PANEL \ SELECT OURPUT MODE (HORIZONTAL) (VERTICAL) \ VERTICAL RESOLUTION**

SCM Select standard calibration method **CAL (Ch 6)**

Syntax: SCM

Related Commands: LCM, OCM

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CHANGE CAL METHOD \ STANDARD**

SD0 Turn marker screen display off **MARKER (Ch 7)**

Syntax: SD0

Related Commands: SD1, SDX?

SD1 Turn marker screen display on **MARKER (Ch 7)**

Syntax: SD1

Related Commands: SD0, SDX?

SDG Start diagnostics mode **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: SDG

Remarks: For service use only.

Front Panel Key: Utility \ **DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY)**

SDP0 Turn the power sweep marker screen display OFF **MARKER (Ch 7)**

Syntax: SDP0

Related Commands: SDP1, SDPX?

SDP1 Turn the power sweep marker screen display ON **MARKER (Ch 7)**

Syntax: SDP1

Related Commands: SDP0, SDPX?

SDPX? Output the power sweep marker screen display status **MARKER (Ch 7)**

Syntax: SDPX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for FALSE
1 for TRUE

Related Commands: SDP0, SDP1

SDX? Output marker screen display status **MARKER (Ch 7)**

Syntax: SDX?

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for screen display OFF
1 for screen display ON

Related Commands: SD0, SD1

SEQDEL1 Delete sequence 1 **SEQ (Ch 10)**

Syntax: SEQDEL1

Front Panel Key: Seq \ **UTILITY** \ **DELETE SEQUENCE** \ **SEQUENCE 1**

SEQDEL2 Delete sequence 2 **SEQ (Ch 10)**

Syntax: SEQDEL2

Front Panel Key: Seq \ **UTILITY** \ **DELETE SEQUENCE** \ **SEQUENCE 2**

SEQDEL3 Delete sequence 3 **SEQ (Ch 10)**

Syntax: SEQDEL3

Front Panel Key: Seq \ **UTILITY** \ **DELETE SEQUENCE** \ **SEQUENCE 3**

SEQDEL4 Delete sequence 4 **SEQ (Ch 10)**

Syntax: SEQDEL4

Front Panel Key: Seq \ **UTILITY** \ **DELETE SEQUENCE** \ **SEQUENCE 4**

SEQDEL5 Delete sequence 5 **SEQ (Ch 10)**

Syntax: SEQDEL5

Front Panel Key: Seq \ **UTILITY** \ **DELETE SEQUENCE** \ **SEQUENCE 5**

SEQDEL6 Delete sequence 6 **SEQ (Ch 10)**

Syntax: SEQDEL6

Front Panel Key: Seq \ **UTILITY** \ **DELETE SEQUENCE** \ **SEQUENCE 6**

SEQDEL7 Delete sequence 7 **SEQ (Ch 10)**

Syntax: SEQDEL7

Front Panel Key: Seq \ **UTILITY** \ **DELETE SEQUENCE** \ **SEQUENCE 7**

SEQDGMSG0 Turn saving sequence display message to service log off **SEQ (Ch 10)**

Syntax: SEQDGMSG0

Front Panel Key: Seq \ **UTILITY** \ **SAVE MESSAGE TO SERVER LOG OFF**

SEQDGMSG1 Turn saving sequence display message to service log on **SEQ (Ch 10)**

Syntax: SEQDGMSG1

Front Panel Key: Seq \ **UTILITY** \ **SAVE MESSAGE TO SERVER LOG ON**

SEQDGMSG? Output saving sequence display message to service log status **SEQ (Ch 10)**

Syntax: SEQDGMSG?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Seq \ **UTILITY** \ **SAVE MESSAGE TO SERVER LOG**

SEQEXE1 Execute sequence 1 **SEQ (Ch 10)**

Syntax: `SEQEXE1`

Front Panel Key: Seq \ **EXECUTE SEQUENCE** \ **SEQUENCE 1**

SEQEXE2 Execute sequence 2 **SEQ (Ch 10)**

Syntax: `SEQEXE2`

Front Panel Key: Seq \ **EXECUTE SEQUENCE** \ **SEQUENCE 2**

SEQEXE3 Execute sequence 3 **SEQ (Ch 10)**

Syntax: `SEQEXE3`

Front Panel Key: Seq \ **EXECUTE SEQUENCE** \ **SEQUENCE 3**

SEQEXE4 Execute sequence 4 **SEQ (Ch 10)**

Syntax: `SEQEXE4`

Front Panel Key: Seq \ **EXECUTE SEQUENCE** \ **SEQUENCE 4**

SEQEXE5 Execute sequence 5 **SEQ (Ch 10)**

Syntax: `SEQEXE5`

Front Panel Key: Seq \ **EXECUTE SEQUENCE** \ **SEQUENCE 5**

SEQEXE6 Execute sequence 6 **SEQ (Ch 10)**

Syntax: `SEQEXE6`

Front Panel Key: Seq \ **EXECUTE SEQUENCE** \ **SEQUENCE 6**

SEQEXE7 Execute sequence 7 **SEQ (Ch 10)**

Syntax: `SEQEXE7`

Front Panel Key: Seq \ **EXECUTE SEQUENCE** \ **SEQUENCE 7**

SEQHELP0 Turn off sequence help message **SEQ (Ch 10)**

Syntax: SEQHELP0

Related Commands: SEQHELP1, SEQHELP?

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ MORE \ SEQUENCE HELP MESSAGE OFF**

SEQHELP1 Turn on sequence help message **SEQ (Ch 10)**

Syntax: SEQHELP1

Related Commands: SEQHELP0, SEQHELP?

Front Panel Key: Hard Copy **\ OUTPUT HEADERS SETUP \ MORE \ SEQUENCE HELP MESSAGE ON**

SEQHELP? Output sequence help message mode on/off **SEQ (Ch 10)**

Syntax: SEQHELP?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: SEQHELP0, SEQHELP1

SEQLOA1 Recall sequence 1 from floppy disk **SEQ (Ch 10)**

Syntax: SEQLOA1 Value
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 1 \ FROM FLOPPY DISK**

SEQLOA2 Recall sequence 2 from floppy disk **SEQ (Ch 10)**

Syntax: SEQLOA2 Value
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 2 \ FROM FLOPPY DISK**

SEQLOA3 Recall sequence 3 from floppy disk **SEQ (Ch 10)**

Syntax: `SEQLOA3 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 3 \ FROM FLOPPY DISK**

SEQLOA4 Recall sequence 4 from floppy disk **SEQ (Ch 10)**

Syntax: `SEQLOA4 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 4 \ FROM FLOPPY DISK**

SEQLOA5 Recall sequence 5 from floppy disk **SEQ (Ch 10)**

Syntax: `SEQLOA5 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 5 \ FROM FLOPPY DISK**

SEQLOA6 Recall sequence 6 from floppy disk **SEQ (Ch 10)**

Syntax: `SEQLOA6 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 6 \ FROM FLOPPY DISK**

SEQLOA7 Recall sequence 7 from floppy disk **SEQ (Ch 10)**

Syntax: `SEQLOA7 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 7 \ FROM FLOPPY DISK**

SEQLOAH1 Recall sequence 1 from hard disk **SEQ (Ch 10)**

Syntax: `SEQLOAH1 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 1 \ FROM HARD DISK**

SEQLOAH2 Recall sequence 2 from hard disk **SEQ (Ch 10)**

Syntax: `SEQLOAH2 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 2 \ FROM HARD DISK**

SEQLOAH3 Recall sequence 3 from hard disk **SEQ (Ch 10)**

Syntax: `SEQLOAH3 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 3 \ FROM HARD DISK**

SEQLOAH4 Recall sequence 4 from hard disk **SEQ (Ch 10)**

Syntax: `SEQLOAH4 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 4 \ FROM HARD DISK**

SEQLOAH5 Recall sequence 5 from hard disk **SEQ (Ch 10)**

Syntax: `SEQLOAH5 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 5 \ FROM HARD DISK**

SEQLOAH6 Recall sequence 6 from hard disk **SEQ (Ch 10)**

Syntax: `SEQLOAH6 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 6 \ FROM HARD DISK**

SEQLOAH7 Recall sequence 7 from hard disk **SEQ (Ch 10)**

Syntax: `SEQLOAH7 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ LOAD SEQUENCE 7 \ FROM HARD DISK**

SEQNAM1 Enter sequence 1 name **SEQ (Ch 10)**

Syntax: `SEQNAM1 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 1**

SEQNAM1? Output sequence 1 name **SEQ (Ch 10)**

Syntax: `SEQNAM1?`

Data I/O: Outputs name using <Arbitrary ASCII> format.

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 1**

SEQNAM2 Enter sequence 2 name **SEQ (Ch 10)**

Syntax: `SEQNAM2 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 2**

SEQNAM2? Output sequence 2 name **SEQ (Ch 10)**

Syntax: `SEQNAM2?`

Data I/O: Outputs name using <Arbitrary ASCII> format.

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 2**

SEQNAM3 Enter sequence 3 name **SEQ (Ch 10)**

Syntax: `SEQNAM3 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 3**

SEQNAM3? Output sequence 3 name **SEQ (Ch 10)**

Syntax: `SEQNAM3?`

Data I/O: Outputs name using <Arbitrary ASCII> format.

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 3**

SEQNAM4 Enter sequence 4 name **SEQ (Ch 10)**

Syntax: `SEQNAM4 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 4**

SEQNAM4? Output sequence 4 name **SEQ (Ch 10)**

Syntax: `SEQNAM4?`

Data I/O: Outputs name using <Arbitrary ASCII> format.

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 4**

SEQNAM5 Enter sequence 5 name **SEQ (Ch 10)**

Syntax: `SEQNAM5 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 5**

SEQNAM5? Output sequence 5 name **SEQ (Ch 10)**

Syntax: `SEQNAM5?`

Data I/O: Outputs name using <Arbitrary ASCII> format.

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 5**

SEQNAM6 Enter sequence 6 name **SEQ (Ch 10)**

Syntax: `SEQNAM6 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 6**

SEQNAM6? Output sequence 6 name **SEQ (Ch 10)**

Syntax: `SEQNAM6?`

Data I/O: Outputs name using <Arbitrary ASCII> format.

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 6**

SEQNAM7 Enter sequence 7 name **SEQ (Ch 10)**

Syntax: `SEQNAM7 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 7**

SEQNAM7? Output sequence 7 name **SEQ (Ch 10)**

Syntax: `SEQNAM7?`

Data I/O: Outputs name using <Arbitrary ASCII> format.

Front Panel Key: Seq \ **UTILITY** \ **RENAME SEQUENCE** \ **SEQUENCE 7**

SEQOP0 Turn off sequence operator message **HARD COPY (Ch 9)**

Syntax: `SEQOP0`

Related Commands: SEQOP1, SEQOP?

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **MORE** \ **SEQ OPERATOR MESSAGE OFF**

SEQOP1 Turn on sequence operator message **HARD COPY (Ch 9)**

Syntax: `SEQOP1`

Related Commands: SEQOP0, SEQOP?

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **MORE** \ **SEQ OPERATOR MESSAGE ON**

SEQOP? Output sequence operator message mode on/off **HARD COPY (Ch 9)**

Syntax: `SEQOP?`

Data I/O: Outputs value on/off status using ASCII <NR1> format as follows:
0 is OFF
1 is ON

Related Commands: SEQOP0, SEQOP1

Front Panel Key: Hard Copy \ **OUTPUT HEADERS SETUP** \ **MORE** \ **SEQ OPERATOR MESSAGE**

SEQSAV1 Save sequence 1 to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAV1 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 1 (FDD)**

SEQSAV2 Save sequence 2 to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAV2 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 2 (FDD)**

SEQSAV3 Save sequence 3 to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAV3 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 3 (FDD)**

SEQSAV4 Save sequence 4 to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAV4 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 4 (FDD)**

SEQSAV5 Save sequence 5 to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAV5 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 5 (FDD)**

SEQSAV6 Save sequence 6 to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAV6 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 6 (FDD)**

SEQSAV7 Save sequence 7 to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAV7 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 7 (FDD)**

SEQSAVH1 Save sequence 1 to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVH1 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 1 (HDD)**

SEQSAVH2 Save sequence 2 to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVH2 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 2 (HDD)**

SEQSAVH3 Save sequence 3 to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVH3 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 3 (HDD)**

SEQSAVH4 Save sequence 4 to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVH4 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 4 (HDD)**

SEQSAVH5 Save sequence 5 to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVH5 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq \ **UTILITY** \ **SAVE SEQUENCE** \ **SEQUENCE 5 (HDD)**

SEQSAVH6 Save sequence 6 to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVH6 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE \ SEQUENCE 6 (HDD)**

SEQSAVH7 Save sequence 7 to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVH7 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE \ SEQUENCE 7 (HDD)**

SEQSAVT1 Save sequence 1 text to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAVT1 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 1 (FDD)**

SEQSAVT2 Save sequence 2 text to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAVT2 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 2 (FDD)**

SEQSAVT3 Save sequence 3 text to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAVT3 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 3 (FDD)**

SEQSAVT4 Save sequence 4 text to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAVT4 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 4 (FDD)**

SEQSAVT5 Save sequence 5 text to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAVT5 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 5 (FDD)**

SEQSAVT6 Save sequence 6 text to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAVT6 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 6 (FDD)**

SEQSAVT7 Save sequence 7 text to floppy disk **SEQ (Ch 10)**

Syntax: `SEQSAVT7 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 7 (FDD)**

SEQSAVTH1 Save sequence 1 text to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVTH1 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 1 (HDD)**

SEQSAVTH2 Save sequence 2 text to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVTH2 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 2 (HDD)**

SEQSAVTH3 Save sequence 3 text to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVTH3 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 3 (HDD)**

SEQSAVTH4 Save sequence 4 text to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVTH4 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 4 (HDD)**

SEQSAVTH5 Save sequence 5 text to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVTH5 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 5 (HDD)**

SEQSAVTH6 Save sequence 6 text to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVTH6 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 6 (HDD)**

SEQSAVTH7 Save sequence 7 text to hard disk **SEQ (Ch 10)**

Syntax: `SEQSAVTH7 Value`
Value: "String" 1 to 8 characters

Front Panel Key: Seq **\ UTILITY \ SAVE SEQUENCE IN ASCII FORMAT \ SEQUENCE 7 (HDD)**

SETBD Set balanced differential S-parameters setup to be default setup for all channels **DISPLAY (Ch 5)**

Syntax: `SETBD`

Front Panel Key: Display \ **DISPLAY MODE \ SETUP DISPLAY GROUP \ SETUP S-PARAMS IN ALL CHANNELS \ BALANCED DIFFERENTIAL**

SETCHANKEY Setup channel keys on front panel to channel keys **DISPLAY (Ch 5)**

Syntax: `SETCHANKEY`

Front Panel Key: Display \ **DISPLAY MODE\ SETUP DISPLAY GROUP\ REDEFINE CHANNEL KEYS \ CHANNEL KEY/GROUP**

SETCHANKEY? Output channel key setup **DISPLAY (Ch 5)**

Syntax: `SETCHANKEY?`

Data I/O: Outputs data using ASCII <NR3> format as follows:
0 to set Channel keys to CHANNEL
1 to set Channel keys to GROUP

Front Panel Key: Display \ **DISPLAY MODE\ SETUP DISPLAY GROU \ REDEFINE CHANNEL KEYS \ CHANNEL KEY/GROUP**

SETGRPKEY Setup channel keys on front panel to group keys **DISPLAY (Ch 5)**

Syntax: `SETGRPKEY`

Front Panel Key: Display \ **DISPLAY MODE \ SETUP DISPLAY GROUP \ REDEFINE CHANNEL KEYS \ CHANNEL KEY/GROUP**

SETSB Set single ended/balanced differential S-parameters setup to be default setup for all channels **DISPLAY (Ch 5)**

Syntax: `SETSB`

Front Panel Key: Display \ **DISPLAY MODE \ SETUP DISPLAY GROUP \ SETUP S-PARAMS IN ALL CHANNELS \ SINGLE ENDED/BALANCED DIFFERENTIAL**

SETSE Set single ended S-parameters setup to be default setup for all channels — **DISPLAY (Ch 5)**

Syntax: SETSE

Front Panel Key: Display \ **DISPLAY MODE \ SETUP DISPLAY GROUP \ SETUP S-PARAMS IN ALL CHANNELS \ SINGLE ENDED S-PARAMS**

SETSPARAM? Output default S-parameter setup for all channels — **DISPLAY (Ch 5)**

Syntax: SETSPARAM?

Data I/O: Outputs data using ASCII <NR3> format as follows:
0 for SINGLE END S-PARAMS
1 for BALANCED DIFFERENTIAL
2 for SINGLE END/BALANCED DIFFERENTIAL

SETUP Display frequency menu — **FREQ (Ch 5)**

Syntax: SETUP

SFC Perform flat test port calibration — **POWER - FLAT POWER (Ch 5)**

Syntax: SFC

Front Panel Key: Power \ **SOURCE 1 SETUP \ FLAT TEST PORT POWER CAL \ BEGIN CAL** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ TEST SIGNALS \ CALIBRATE FOR FLATNESS \ BEGIN CAL**

SFGCA Select swept frequency gain compression application — **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: SFGCA

Remarks: Alias APPGCF

Related Commands: SPGCA, UNDOGC

SFGCT Start swept frequency gain compression test **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: SFGCT

Remarks: Begin testing gain compression over the current frequency range and at the current power level setting.

Related Commands: SFGCA

Front Panel Key: Appl \ **SWEPT FREQUENCY GAIN COMPRESSION** \ **TEST AUT**

SG? Output the segmented sweep flag on/off status **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SG?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Related Commands: SGON, SGOFF

SGAPL Apply the current define definition of the segmented sweep **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SGAPL

Front Panel Key: Sweep \ **MORE** \ **SEGMENTED SWEEP** \ **SEGMENTED SWEEP MODE APPLY** \ **CONTINUE**

SGMODE? Query the segmented sweep define mode **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SGMODE?

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: SGSTP?, SGPTS?, SGPTS?

SGOFF Turn the segmented sweep flag OFF **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SGOFF

Related Commands: SGON, SG?

SGON Turn the segmented sweep flag ON **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SGON

Related Commands: SGOFF, SG?

SGPTS? Output the total number of points of all of the applied segments **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SGPTS?

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: SGSTP?, SGSTRT?, SPTS?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ DATA POINTS** or Appl **\ TRANSMISSION AND REFLECTION \ Cal \ PERFORM CAL (or MANUAL CAL) \ 2-PORT \ NEXT CAL STEP \ EXCLUDE ISOLATION \ SEGMENTED SWEEP \ DATA POINTS**

SGSTP? Output the stop frequency of the last applied segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SGSTP?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: SGPTS?, SGSTRT?, SPTS?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ STOP** or Appl **\ TRANSMISSION AND REFLECTION \ Cal \ PERFORM CAL (or MANUAL CAL) \ 2-PORT \ NEXT CAL STEP \ EXCLUDE ISOLATION \ SEGMENTED SWEEP \ STOP**

SGSTRT? Output the start frequency of the first applied segment **SWEEP - SEGMENTED SWEEP (Ch 5)**

Syntax: SGSTRT?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: SGPTS?, SGSTP?, SPTS?

Front Panel Key: Sweep **\ MORE \ SEGMENTED SWEEP \ SEGMENTED SWEEP MODE DEFINE \ START** or Appl **\ TRANSMISSION AND REFLECTION \ Cal \ PERFORM CAL (or MANUAL CAL) \ 2-PORT \ NEXT CAL STEP \ EXCLUDE ISOLATION \ SEGMENTED SWEEP \ START**

SH1 Set offset short 1 or 2 offset length for offset short calibration **CAL (Ch 6)**

Syntax: SH1 Value Units
Value: -999.999 to +999.999
Units: M, MTR, MM, MMT, CM, CMT

Status Reporting: OCM, WSH1, WSH2

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ OFFSET LENGTHS OF SHORTS \ SHORT 1**

SH1? Output offset short 1 offset length **CAL (Ch 6)**

Syntax: SH1?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ OFFSET LENGTHS OF SHORTS \ PORT 1 SHORTS**

SH2 Set offset short 1 or 2 offset length for offset short calibration **CAL (Ch 6)**

Syntax: `SH2 Value Units`
Value: -999.999 to +999.999
Units: M, MTR, MM, MMT, CM, CMT

Status Reporting: OCM, WSH1, WSH2

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ OFFSET LENGTHS OF SHORTS \ SHORT 2**

SH2? Output offset short 2 offset length **CAL (Ch 6)**

Syntax: `SH2?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ OFFSET LENGTHS OF SHORTS \ PORT 1 SHORTS**

SINP Enter single power **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `SINP`

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: SINP?, SINP0, SINP1, SINPX?

Front Panel Key: Sweep **\ SWEPT TYPE POWER SWEEP** then Power **\ SINGLE POWER**

SINP0 Turn off single power mode **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `SINP0`

Related Commands: SINP, SINP?, SINP1, SINPX?

Front Panel Key: Sweep **\ SWEEP TYPE POWER SWEEP** then Power **\ SINGLE POWER OFF**

SINP1 Turn on single power mode **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `SINP1`

Related Commands: SINP, SINP?, SINP0, SINPX?

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **SINGLE POWER ON**

SINP? Output single power **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `SINP?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: SINP, SINP0, SINP1, SINPX?

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **SINGLE POWER**

SINPX? Output single power mode on/off status **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `SINPX?`

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: SINP, SINP?, SINP0, SINP1

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **SINGLE POWER**

SIS0 Turn off simultaneous internal sources mode **CONFIG (Ch 5)**

Syntax: `SIS0`

Front Panel Key: Config \ **INTERNAL SOURCES BOTH ENABLED OFF**

SIS1 Turn on simultaneous internal sources mode **CONFIG (Ch 5)**

Syntax: `SIS1`

Front Panel Key: Config \ **INTERNAL SOURCES BOTH ENABLED ON**

SIS2CWF Enter internal source 2 CW frequency and turn CW on **CONFIG (Ch 5)**

Syntax: `SIS2CWF Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

SIS2CWF? Output internal source 2 CW frequency **CONFIG (Ch 5)**

Syntax: `SIS2CWF?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

SIS2CWOFF Turn internal source 2 CW off **CONFIG (Ch 5)**

Syntax: `SIS2CWOFF`

SIS2CWON Turn internal source 2 CW on at current CW frequency **CONFIG (Ch 5)**

Syntax: `SIS2CWON`

SIS2CWON? Output internal source 2 CW on/off status **CONFIG (Ch 5)**

Syntax: `SIS2CWON?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

SIS2OFF Enter internal source 2 offset from source 1 frequency **CONFIG (Ch 5)**

Syntax: `SIS2OFF Value Units`
Value: Frequency
Units: HZ, KHZ, MHZ, GHZ

SIS2OFF? Output internal source 2 offset from source 1 frequency **CONFIG (Ch 5)**

Syntax: `SIS2OFF?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

SISX? Output simultaneous internal sources mode on/off **CONFIG (Ch 5)**

Syntax: SISX?

Data I/O: Outputs automatic DUT protection on/off status using ASCII <NR1> format as follows:
0 for Automatic DUT Protection is OFF

Front Panel Key: Config \ **INTERNAL SOURCES BOTH ENABLED**

SLC Clear all segmented limits definitions **DISPLAY - LIMITS (Ch 7)**

Syntax: SLC

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ CLEAR ALL SEGMENTS**

SLD Select sliding load for calibration **CAL (Ch 6)**

Syntax: SLD

Remarks: During calibration the data-taking process for the load includes six slide positions. If any calibration frequencies are below 2 GHz, a broadband load must be used.

Related Commands: BBL

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ LOAD TYPE \ SLIDING LOAD**

SLDP3 Select sliding load for 3-port calibration **CAL (Ch 6)**

Syntax: SLDP3

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ LOAD TYPE**

SLDP4 Select sliding load for 4-port calibration **CAL (Ch 6)**

Syntax: SLDP4

SLH Enter segmented limits horizontal offset **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLH Value Units`
Value: Frequency, time, or distance in current sweep range
Units: XM3, XX1, XX3

Related Commands: SLV

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ SET SEGMENT OFFSETS \ HORIZONTAL**

SLH? Output segmented limits horizontal offset **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLH?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ SET SEGMENT OFFSETS \ HORIZONTAL**

SLL0 Turn lower segmented limits display off **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLL0`

Related Commands: LON, LOF, SLL1

SLL1 Turn lower segmented limits display on **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLL1`

Related Commands: LON, LOF, SLL0

SLLX? Output lower segmented limits display on/off status **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLLX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

SLU0 Turn upper segmented limits display off **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLU0`

Related Commands: LON, LOF, SLU1

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ UPPER (LOWER) LIMIT OFF**

SLU1 Turn upper segmented limits display on **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLU1`

Related Commands: LON, LOF, SLL, SLU0

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ UPPER (LOWER) LIMIT ON**

SLUX? Output upper segmented limits display on/off status **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLUX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ UPPER (LOWER) LIMIT**

SLV Enter segmented limits vertical offset **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLV Value Units`
Value: Depends on graph type (see DISPLAY group)
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Related Commands: SLH

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ SET SEGMENT OFFSETS \ VERTICAL**

SLV? Output segmented limits vertical offset **DISPLAY - LIMITS (Ch 7)**

Syntax: `SLV?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ SET SEGMENT OFFSETS \ VERTICAL**

SMC Enter scale and select compressed Smith chart display **DISPLAY (Ch 5)**

Syntax: `SMC Value Units`
Value: 10, 20, 30
Units: DBL, XX1

Remarks: Selects the compressed Smith Chart for display on the active channel.

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLG, POW, PLR, REL, SMI, SME, SMI, SWR

Front Panel Key: Display **\ GRAPH TYPE \ SMITH CHART (IMPEDANCE)** then **\ SCALE \ COMPRESS 3dB**

SME Enter scale and select expanded Smith chart display **DISPLAY (Ch 5)**

Syntax: `SME Value Units`
Value: -3, 0, 10, 20, 30
Units: DBL, XX1

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLG, POW, PLR, REL, SMC, SME, SMI, SWR

Front Panel Key: Display **\ GRAPH TYPE \ SMITH CHART (IMPEDANCE)** then **\ SCALE \ EXPAND**

SMI Select normal Smith chart for active channel **DISPLAY (Ch 5)**

Syntax: `SMI`

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLG, POW, PLR, REL, RIM, SMC, SME, SWR

Front Panel Key: Display **\ GRAPH TYPE \ SMITH CHART (IMPEDANCE)** then **\ SCALE \ NORMAL SMITH**

SMKR Select marker search marker mode **MARKER (Ch 7)**

Syntax: `SMKR`

Related Commands: AMKR, FMKR, NMKR, SMKRMAX, SMKRMIN, XMKR?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ SEARCH**

SMKRMAX Select marker search maximum **MARKER (Ch 7)**

Syntax: `SMKRMAX`

Related Commands: SMKRMIN, XMKR?, XMKRP?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ SEARCH (MAXIMUM)**

SMKRMIN Select marker search minimum **MARKER (Ch 7)**

Syntax: `SMKRMIN`

Related Commands: SMKRMAX, XMKR?, XMKRP?

Front Panel Key: Marker **\ MARKER READOUT FUNCTIONS \ SEARCH (MINIMUM)**

SMKRX Select the marker search x-axis marker mode **MARKER (Ch 7)**

Syntax: `SMKRX`

Related Commands: XMKRP?

Front Panel Key: Markers **\ MARKER READOUT FUNCTIONS \ SEARCH (X-AXIS)**

SNPDB Select log magnitude and phase as SnP output format **HARD COPY (Ch 9)**

Syntax: `SNPDB`

Front Panel Key: Hard Copy **\ OUTPUT SETUP \ SnP OPTIONS \ SETUP \ LOG MAG**

SNPFMTX? Output SnP output format selection **HARD COPY (Ch 9)**

Syntax: SNPFMTX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for LINEAR MAGNITUDE AND PHASE
2 for LOG MAGNITUDE AND PHASE
3 for REAL AND IMAGINARY

Front Panel Key: Hard Copy \ **OUTPUT SETUP** \ **SnP OPTIONS** \ **SETUP** \ **LIN MAG**

SNPGHZ Select GHz as SnP frequency units **HARD COPY (Ch 9)**

Syntax: SNPGHZ

SNPHZ Select Hz as SnP frequency units **HARD COPY (Ch 9)**

Syntax: SNPHZ

SNPKHZ Select KHz as SnP frequency units **HARD COPY (Ch 9)**

Syntax: SNPKHZ

SNPMA Select linear magnitude and phase as SnP output format **HARD COPY (Ch 9)**

Syntax: SNPMA

Front Panel Key: Hard Copy \ **OUTPUT SETUP** \ **SnP OPTIONS** \ **SETUP** \ **LIN MAG**

SNPMHZ Select MHz as SnP frequency units **HARD COPY (Ch 9)**

Syntax: SNPMHZ

SNPRI Select real and imaginary as SnP output format **HARD COPY (Ch 9)**

Syntax: SNPRI

Front Panel Key: Hard Copy \ **OUTPUT SETUP** \ **SnP OPTIONS** \ **SETUP** \ **REAL-IMAG**

SNPUNITX? Output SnP frequency units selection **HARD COPY (Ch 9)**

Syntax: SNPUNITX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for GHz
2 for MHz
3 for KHz
4 for Hz

SOF Turn off smoothing **AVG (Ch 5)**

Syntax: SOF

Related Commands: SON

Front Panel Key: Avg \ **TRACE SMOOTHING OFF**

SOF? Output smoothing on/off status **AVG (Ch 5)**

Syntax: SOF?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Avg \ **TRACE SMOOTHING**

SOLT Select SOLT calibration method **CAL (Ch 6)**

Syntax: SOLT

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ CHANGE CAL METHOD \ SOLT**

SOLT4P Select SOLT calibration method for 4-port calibration **CAL (Ch 6)**

Syntax: SOLT4P

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL \ CHANGE CAL METHOD \ SOLT (NOT FOR WAVEGUIDE)**

SON Enter smoothing value and turn on **AVG (Ch 5)**

Syntax: SON Value Units
Value: 0 to 20
Units: XX1, XX3, XM3

Related Commands: SOF

Front Panel Key: Avg \ **TRACE SMOOTHING ON AND SMOOTHING X% OF SWEEP**

SON? Output smoothing value **AVG (Ch 5)**

Syntax: SON?

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Avg \ **TRACE SMOOTHING ON AND SMOOTHING X% OF SWEEP**

SPA0 Spur avoidance mode off **SWEEP (Ch 5)**

Syntax: SPA0

Front Panel Key: Sweep \ **MORE \ MEASUREMENT ENHANCEMENT \ SPUR AVOIDANCE OFF**

SPA1 Spur avoidance mode on **SWEEP (Ch 5)**

Syntax: SPA1

Front Panel Key: Sweep \ **MORE \ MEASUREMENT ENHANCEMENT \ SPUR AVOIDANCE ON**

SPAN Enter frequency span **FREQ (Ch 5)**

Syntax: SPAN Value Units
Value: Can be any frequency span up to the high frequency limit minus the low frequency limit of the MS462XX
Units: HZ, KHZ, MHZ, GHZ

Related Commands: CNTR, CNTR?, SPAN?, SRT, SRT?, STP, STP?

Front Panel Key: Freq \ **SET CENTER/SPAN \ SPAN** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ SET CENTER SPAN \ SPAN**

SPAN? Output frequency span **FREQ (Ch 5)**

Syntax: SPAN?

Data I/O: Outputs a value in ASCII <NR3> format.

Related Commands: CNTR, CNTR?, SPAN, SRT, SRT?, STP, STP?

Front Panel Key: Freq **\ SET CENTER/SPAN \ SPAN** or
Cal **\ PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ SET CENTER SPAN \ SPAN**

SPARAM Select All S-parameters as chop mode type **SWEEP (Ch 5)**

Syntax: SPARAM

Front Panel Key: Sweep **\ MORE \ MEASUREMENT ENHANCEMENT \ ALL PARAMS**

SPAX? Output spur avoidance mode on/off status **SWEEP (Ch 5)**

Syntax: SPAX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Sweep **\ MORE \ MEASUREMENT ENHANCEMENT \ SPUR AVOIDANCE**

SPD Enter pen speed percentage **HARD COPY (Ch 9)**

Syntax: SPD Value Units
Value: 10 to 100
Units: XX1, XX3, XM3

Front Panel Key: Hard Copy **\ OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ PEN COLORS \ PEN SPEED**

SPD? Output pen speed percentage **HARD COPY (Ch 9)**

Syntax: `SPD?`

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: SPD

Front Panel Key: Hard Copy \ **OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ PEN COLORS \ PEN SPEED**

SPGCA Select swept power gain compression application **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `SPGCA`

Related Commands: SFGCA, UNDOGC

SPGCT Start swept power gain compression test **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `SPGCT`

Remarks: Begins the automated sequence which finds the gain compression target at one of the specified frequency points.

Related Commands: SPGCA, MFGCT

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ MULTIPLE FREQUENCY GAIN COMPRESSION \ TEST AUT**

SPH Enter active segmented limit horizontal stop position **DISPLAY - LIMITS (Ch 7)**

Syntax: `SPH Value Units`
Value: Frequency, time, or distance in current sweep range
Units: XX1, XX3, XM3

Related Commands: LS01-LS010, US01-US10

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) EDIT SEGMENTS \ EDIT UPPER LIMITS \ STOP POSITION HORIZONTAL**

SPH? Output active segmented limit horizontal stop position — **DISPLAY - LIMITS (Ch 7)**

Syntax: SPH?

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then \ **LIMITS \ (MORE) EDIT SEGMENTS \ EDIT UPPER LIMITS \ STOP POSITION HORIZONTAL**

SPTS? Output the number of smoothing points — **AVG (Ch 5)**

Syntax: SPTS?

Data I/O: Outputs data using ASCII <NR1> integer values.

Related Commands: SGPTS?, SGSTP?, SGSTRT?

Front Panel Key: Avg \ **SMOOTHING**

SPV Enter active segmented limit vertical stop position — **DISPLAY - LIMITS (Ch 7)**

Syntax: SPV Value Units
Value: Depends on graph type (see DISPLAY group)
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Related Commands: LS01-LS010, US01-US10

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then \ **LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT UPPER LIMITS \ STOP POSITION VERTICAL**

SPV? Output active segmented limit vertical stop position — **DISPLAY - LIMITS (Ch 7)**

Syntax: SPV?

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then \ **LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT UPPER LIMITS \ STOP POSITION VERTICAL**

SRC1AC? Output source 1 active/inactive status **CONFIG (Ch 5)**

Syntax: `SRC1AC?`

Data I/O: Outputs the status in ASCII <NR1> format as follows:
0 for INACTIVE
1 for ACTIVE

SRC2? Output external source 2 existence information **CONFIG (Ch 5)**

Syntax: `SRC2?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

SRC2AC Select source 2 as active **CONFIG (Ch 5)**

Syntax: `SRC2AC`

Related Commands: SRC2NA, SRC2AC?

Front Panel Key: Config **\ SOURCE \ SOURCE 2 \ ACTIVE**

SRC2AC? Output source 2 active/inactive status **CONFIG (Ch 5)**

Syntax: `SRC2AC?`

Data I/O: Outputs the status in ASCII <NR1> format as follows:
0 for INACTIVE
1 for ACTIVE

Related Commands: SRC2AC, SRC2NA

Front Panel Key: Config **\ SOURCE \ SOURCE 2 \ ACTIVE**

SRC2MOD? Output external source 2 model/version string **CONFIG (Ch 5)**

Syntax: `SRC2MOD?`

Data I/O: Outputs data using undelimited 7-bit ASCII text.

SRC2NA Select source 2 as not active **CONFIG (Ch 5)**

Syntax: `SRC2NA`

Related Commands: SRC2AC, SRC2AC?

Front Panel Key: Config \ **SOURCE** \ **SOURCE 2** \ **INACTIVE**

SRC3? Output external source 3 existence information **CONFIG (Ch 5)**

Syntax: `SRC3?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

SRC3AC Select source 3 as active **CONFIG (Ch 5)**

Syntax: `SRC3AC`

Front Panel Key: Config \ **SOURCE** \ **SOURCE 3** \ **ACTIVE**

SRC3AC? Output source 3 active/inactive status **CONFIG (Ch 5)**

Syntax: `SRC3AC?`

Data I/O: Output data using ASCII <NR1> integer values as follows:
0 for INACTIVE and 1 for ACTIVE

Front Panel Key: Config \ **SOURCE** \ **SOURCE 3** \ **ACTIVE**

SRC3MOD? Output external source 3 model/version string **CONFIG (Ch 5)**

Syntax: `SRC3MOD?`

Data I/O: Outputs data using undelimited 7-bit ASCII text.

SRC3NA Select source 3 as not active **CONFIG (Ch 5)**

Syntax: `SRC3NA`

Front Panel Key: Config \ **SOURCE** \ **SOURCE 3** \ **INACTIVE**

SRC4? Output external source 4 existence information **CONFIG (Ch 5)**

Syntax: `SRC4?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

SRC4AC Select source 4 as active **CONFIG (Ch 5)**

Syntax: `SRC4AC`

Front Panel Key: Config **\ SOURCE \ SOURCE 4 \ ACTIVE**

SRC4AC? Output source 4 active/inactive status **CONFIG (Ch 5)**

Syntax: `SRC4AC?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for INACTIVE and 1 for ACTIVE

Front Panel Key: Config **\ SOURCE \ SOURCE 4 \ ACTIVE**

SRC4MOD? Output external source 4 model/version string **CONFIG (Ch 5)**

Syntax: `SRC4MOD?`

Data I/O: Outputs data using undelimited 7-bit ASCII text.

SRC4NA Select source 4 as not active **CONFIG (Ch 5)**

Syntax: `SRC4NA`

Front Panel Key: Config **\ SOURCE \ SOURCE 4 \ INACTIVE**

SRCH Enter marker search value **MARKER (Ch 7)**

Syntax: `SRCH Value Units`
Value: Depends on graph type
Units: Depend on graph type

Related Commands: MKSL, MKSR, SMKR, SRCH?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH** \ **VALUE or Marker** \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)** \ **Y VALUE**

SRCH? Output marker search value **MARKER (Ch 7)**

Syntax: `SRCH?`

Data I/O: Outputs the search value in ASCII <NR3> format.

Related Commands: MKSL, MKSR, SMKR, SRCH

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH or Marker** \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)**

SRCHFX? Output the marker search x-value in GHz and the marker failure status **MARKER (Ch 7)**

Syntax: `SRCHFX?`

Data I/O: Outputs the marker search data using ASCII <NR2> floating point values in decimal point format and outputs the marker failure data using ASCII <NR1> integer values.

Related Commands: SRCHFXP?, SRCHX?, SRCHXP?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)**

SRCHFXP? Output the marker search x-value in dBm and the marker failure status in the power sweep mode **MARKER (Ch 7)**

Syntax: `SRCHFXP?`

Data I/O: Outputs the marker search data using ASCII <NR2> floating point values in decimal point format and outputs the marker failure data using ASCII <NR1> integer values.

Related Commands: SRCHFX?, SRCHX?, SRCHXP?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)**

SRCHP Enter marker search value in power sweep mode **MARKER (Ch 7)**

Syntax: SRCHP

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)** \ **Y VALUE**

SRCHP? Output marker search value in power sweep mode **MARKER (Ch 7)**

Syntax: SRCHP?

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)**

SRCHX? Output the marker search x-value **MARKER (Ch 7)**

Syntax: SRCHX?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: SRCHFX?, SRCHFXP?, SRCHXP?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)**

SRCHXP? Output the marker search x-value in the power sweep mode **MARKER (Ch 7)**

Syntax: SRCHXP?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: SRCHFX?, SRCHFXP?, SRCHX?

Front Panel Key: Marker \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)**

SRT Enter start frequency **FREQ (Ch 5)**

Syntax: SRT Value Units
Value: Can be any frequency from low frequency limit of MS462XX to current sweep stop frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: If a calibration is in place, the lower limit is the calibration start frequency.

Related Commands: STP, CWF

Front Panel Key: Freq \ **START** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ START**

SRT? Output start frequency **FREQ (Ch 5)**

Syntax: SRT?

Data I/O: Outputs a value in ASCII <NR3 > format.

Related Commands: STP, CWF

Front Panel Key: Freq \ **START** or
Sweepl \ **SWEEP TYPE POWER SWEEP** then Freq \ **START** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ START**

SSC Select the segmented sweep calibration data points **CAL (Ch 6)**

Syntax: SSC

Front Panel Key: Appl \ **TRANSMISSION AND REFLECTION \ Cal \ PERFORM CAL (or MANUAL CAL) \ 2-PORT \ NEXT CAL STEP \ EXCLUDE ISOLATION \ SEGMENTED SWEEP**

STD Store trace to memory on active channel **DISPLAY (Ch 5)**

Syntax: STD

Remarks: Stores the active channel's trace data in memory.

Related Commands: MEM, DNM, DTM, CH1-CH4

Front Panel Key: Display \ **TRACE MEMORY \ STORE DATA TO MEMORY**

STEPP Enter power step **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `STEPP`

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: STEPP?, STOPP, STOPP?, STRTP, STRTP?

Front Panel Key: Sweep **\ SWEEP TYPE POWER SWEEP** then Power **\ STEP SIZE**

STEPP? Output power step **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `STEPP?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: STEPP, STOPP, STOPP?, STRTP, STRTP?

Front Panel Key: Sweep **\ SWEEP TYPE POWER SWEEP** then Power **\ STEP SIZE**

STH Enter active segmented limit horizontal start position **DISPLAY - LIMITS (Ch 7)**

Syntax: `STH Value Units`
Value: Frequency, time, or distance
Units: XX1, XX3, XM3

Related Commands: STV, LS01-LS010, US01-US10

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT UPPER LIMITS \ START POSITION HORIZONTAL**

STH? Output active segmented limit horizontal start position **DISPLAY - LIMITS (Ch 7)**

Syntax: `STH?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT UPPER LIMITS \ START POSITION HORIZONTAL**

STOPP Enter stop power **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `STOPP`

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: STEPP, STEPP? STOPP?, STRTP, STRTP?

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **STOP**

STOPP? Output stop power **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `STOPP?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: STEPP, STEPP?, STOPP, STRTP, STRTP?

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **STOP**

STP Enter stop frequency **FREQ (Ch 5)**

Syntax: `STP Value Units`
Value: Can be any frequency from current start-sweep frequency to maximum MS462XX frequency
Units: HZ, KHZ, MHZ, GHZ

Remarks: Upper frequency limit is reduced to the maximum calibrated frequency, if a calibration is in place.

Related Commands: SRT, CWF

Front Panel Key: Freq \ **STOP** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ STOP**

STP? Output stop frequency **FREQ (Ch 5)**

Syntax: `STP?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Freq \ **STOP** or
Sweepl \ **SWEEP TYPE POWER SWEEP** then Freq \ **STOP** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ STOP**

STRTP Enter start power **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `STRTP`

Data I/O: Input data using an ASCII <NRf> number.

Related Commands: STEPP, STEPP?, STOPP, STOPP?, STRTP?

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **START**

STRTP? Output start power **SWEEP - POWER SWEEP (Ch 5)**

Syntax: `STRTP?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: STEPP, STEPP?, STOPP, STOPP?, STRTP

Front Panel Key: Sweep \ **SWEEP TYPE POWER SWEEP** then Power \ **START**

STV Enter active segmented limit vertical start position **DISPLAY - LIMITS (Ch 7)**

Syntax: `STV Value Units`
Value: Depends on graph type (see DISPLAY group)
Units: Depends on graph type (see Table 11-2 at the end of this chapter).

Related Commands: STH, LS01-LS010, US01-US10

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT UPPER LIMITS \ START POSITION VERTICAL**

STV? Output active segmented limit vertical start position — **DISPLAY - LIMITS (Ch 7)**

Syntax: `STV?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT UPPER LIMITS \ START POSITION VERTICAL**

SV1 Save front panel setup number 1 to memory — **SAVE/RECALL (Ch 9)**

Syntax: `SV1`

Related Commands: RC1-RC10

Front Panel Key: Save/Recall **\ SAVE \ FRONT PANEL SETUP IN INTERNAL MEMORY 1**

SV10 Save front panel setup number 10 to memory — **SAVE/RECALL (Ch 9)**

Syntax: `SV10`

Related Commands: RC1-RC10

Front Panel Key: Save/Recall **\ SAVE \ FRONT PANEL SETUP IN INTERNAL MEMORY 10**

SV2 Save front panel setup number 2 to memory — **SAVE/RECALL (Ch 9)**

Syntax: `SV2`

Related Commands: RC1-RC10

Front Panel Key: Save/Recall **\ SAVE \ FRONT PANEL SETUP IN INTERNAL MEMORY 2**

SV3 Save front panel setup number 3 to memory **SAVE/RECALL (Ch 9)**

Syntax: SV3

Related Commands: RC1-RC10

Front Panel Key: Save/Recall \ **SAVE** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 3**

SV4 Save front panel setup number 4 to memory **SAVE/RECALL (Ch 9)**

Syntax: SV4

Related Commands: RC1-RC10

Front Panel Key: Save/Recall \ **SAVE** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 4**

SV5 Save front panel setup number 5 to memory **SAVE/RECALL (Ch 9)**

Syntax: SV5

Related Commands: RC1-RC10

Front Panel Key: Save/Recall \ **SAVE** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 5**

SV6 Save front panel setup number 6 to memory **SAVE/RECALL (Ch 9)**

Syntax: SV6

Related Commands: RC1-RC10

Front Panel Key: Save/Recall \ **SAVE** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 6**

SV7 Save front panel setup number 7 to memory **SAVE/RECALL (Ch 9)**

Syntax: SV7

Related Commands: RC1-RC10

Front Panel Key: Save/Recall \ **SAVE** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 7**

SV8 Save front panel setup number 8 to memory **SAVE/RECALL (Ch 9)**

Syntax: SV8

Related Commands: RC1-RC10

Front Panel Key: Save/Recall \ **SAVE** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 8**

SV9 Save front panel setup number 9 to memory **SAVE/RECALL (Ch 9)**

Syntax: SV9

Related Commands: RC1-RC10

Front Panel Key: Save/Recall \ **SAVE** \ **FRONT PANEL SETUP IN INTERNAL MEMORY 9**

SVB Save current band definitions **CONFIG - MULTIPLE SOURCE (Ch 5)**

Syntax: SVB

Remarks: See command's functional group

Related Commands: BD-BD5, CLB

Front Panel Key: Config \ **MULTIPLE SOURCE** \ **DEFINE BANDS** \ **STORE BAND X BANDS STORED:**

SVCM1 Save cal data in internal memory 1 **SAVE/RECALL (Ch 9)**

Syntax: SVCM1

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 1**

SVCM2 Save cal data in internal memory 2 **SAVE/RECALL (Ch 9)**

Syntax: SVCM2

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 2**

SVCM3 Save cal data in internal memory 3 **SAVE/RECALL (Ch 9)**

Syntax: SVCM3

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 3**

SVCM4 Save cal data in internal memory 4 **SAVE/RECALL (Ch 9)**

Syntax: SVCM4

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 4**

SVCM5 Save cal data in internal memory 5 **SAVE/RECALL (Ch 9)**

Syntax: SVCM5

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 5**

SVCM6 Save cal data in internal memory 6 **SAVE/RECALL (Ch 9)**

Syntax: SVCM6

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 6**

SVCM7 Save cal data in internal memory 7 **SAVE/RECALL (Ch 9)**

Syntax: SVCM7

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 7**

SVCM8 Save cal data in internal memory 8 **SAVE/RECALL (Ch 9)**

Syntax: SVCM8

Front Panel Key: Save/Recall \ **SAVE** \ **CAL DATA IN INTERNAL MEMORY** \ **CAL 8**

SWAVG Set the averaging type to Sweep-by-Sweep averaging **AVG (Ch 5)**

Syntax: SWAVG

Related Commands: PTAVG, SWAVG?

Front Panel Key: Avg \ **AVERAGING TYPE**

SWAVG? Output the averaging type of Point-by-Point or Sweep-by-Sweep **AVG (Ch 5)**

Syntax: SWAVG?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for Per Point Averaging and 1 for Per Sweep Averaging.

Related Commands: PTAVG, SWAVG

Front Panel Key: Avg \ **AVERAGING TYPE**

SWP Return to normal sweep mode **FREQ (Ch 5)**

Syntax: SWP

Remarks: Use this command to return to sweep mode from CW.

Related Commands: CWF

Front Panel Key: Freq \ **C.W. MODE OFF** or
Sweep \ **SWEEP TYPE POWER SWEEP** then Freq \ **C.W. MODE OFF**
or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ C.W. (1 POINT) \ C.W. FREQ OFF**

SWP? Output sweep mode **FREQ (Ch 5)**

Syntax: SWP?

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for CW
2 for DISCRETE FILL
3 for NORMAL SWEEP
4 for HARMONIC TIME DOMAIN

Front Panel Key: Freq \ **C.W. MODE OFF** or
Sweep \ **SWEEP TYPE POWER SWEEP** then Freq \ **C.W. MODE OFF**
or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ C.W. (1 POINT) \ C.W. FREQ OFF**

SWPC0 Turn off chop sweep mode **SWEEP (Ch 5)**

Syntax: `SWPC0`

Front Panel Key: Sweep \ **MORE \ MEASUREMENT ENHANCEMENT \ CHOP SWEEP OFF**

SWPC1 Turn on chop sweep mode **SWEEP (Ch 5)**

Syntax: `SWPC1`

Front Panel Key: Sweep \ **MORE \ MEASUREMENT ENHANCEMENT \ CHOP SWEEP ON**

SWPCX? Output chop sweep mode on/off **SWEEP (Ch 5)**

Syntax: `SWPCX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for PRIORITY SPEED
2 for PRIORITY ACCURACY

Front Panel Key: Sweep \ **MORE \ MEASUREMENT ENHANCEMENT \ CHOP SWEEP**

SWPDIR? Output instantaneous sweep direction forward/reverse **REMOTE - SYNC (Ch 8)**

Syntax: `SWPDIR?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for FORWARD
2 for REVERSE

Related Commands: HLD, CTN

SWPT Enter sweep time **SWEEP (Ch 5)**

Syntax: `SWPT Value Units`
Value: Time
Units: S, MS, US, PS

Front Panel Key: Sweep \ **SWEEP TIME**

SWPT0 Turn off sweep time measurement **SWEEP (Ch 5)**

Syntax: `SWPT0`

Related Commands: SWPT1, SWPTX?

Front Panel Key: Sweep \ **SWEEP TIME OFF**

SWPT1 Turn on sweep time measurement **SWEEP (Ch 5)**

Syntax: `SWPT1`

Related Commands: SWPT0, SWPTX?

Front Panel Key: Sweep \ **SWEEP TIME ON**

SWPT? Output sweep time **SWEEP (Ch 5)**

Syntax: `SWPT?`

Data I/O: Outputs sweep time using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Sweep \ **SWEEP TIME**

SWPTMA Set auto sweep time mode **SWEEP (Ch 5)**

Syntax: `SWPTMA`

Front Panel Key: Sweep \ **SWEEP TIME MODE AUTO**

SWPTMM Set manual sweep time mode **SWEEP (Ch 5)**

Syntax: `SWPTMM`

Front Panel Key: Sweep \ **SWEEP TIME MODE MANUAL**

SWPTMX? Output sweep time mode **SWEEP (Ch 5)**

Syntax: SWPTMX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for AUTO
2 for MANUAL sweep mode

Front Panel Key: Sweep \ **SWEEP TIME MODE**

SWPTX? Output sweep time measurement on/off status **SWEEP (Ch 5)**

Syntax: SWPTX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: SWPT0, SWPT1

Front Panel Key: Sweep \ **SWEEP TIME ON/OFF**

SWPX? Output sweep type selection **SWEEP (Ch 5)**

Syntax: SWPX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for FREQUENCY SWEEP
0 for POWER SWEEP

Related Commands: FSWP, PSWP

Front Panel Key: Sweep \ **SWEEP TYPE**

SWR Select SWR display for active channel **DISPLAY (Ch 5)**

Syntax: SWR

Related Commands: DLA, CH1-CH4, IMG, ISC, ISE, ISM, LIN, MAG, MPH, PCP, PCS, PHX?, PHA, PLG, POW, PLR, REL, SMC, SME, SMI

Front Panel Key: Display \ **GRAPH TYPE** \ **SWR**

SXX? Output S-parameter or user defined parameter of active channel **MEAS (Ch 5)**

Syntax: SXX?

Data I/O: Outputs data using <NR1> integer values as follows:
(in S-parameter mode)
13 for S13; 23 for S23; 31 for S31; 32 for S32; 33 for S33; 14 for S14; 24 for S24; 41 for S41; 42 for S42; 34 for S34; 43 for S43; 44 for S44;101 for S1d; 102 for Sd1; 103 for Sdd; 104 for S1c; 105 for Sc1; 106 for Scc; 107 for Sdc; 108 for Scd; 109 for Sd1d1; 110 for Sd1d2; 111 for Sd2d1; 112 for Sd2d2; 113 for Sc1c1; 114 for Sc1c2; 115 for Sc2c1; 116 for Sc2c2; 117 for Sd1c1; 118 for Sd1c2; 119 for Sd2c1; 120 for Sd2c2; 121 for Sc1d1; 122 for Sc1d2; 123 for Sc2d1; 124 for Sc2d2

(in user defined S-parameter mode)
1 for USER 1; 2 for USER 2; 3 for USER 3; 4 for USER 4; 5 for USER 5; 6 for USER 6; 7 for USER 7; 8 for USER 8; 9 for USER 9; 10 for USER 10; 11 for USER 11; 12 for USER 12; 13 for USER 13; 14 for USER 14; 15 for USER 15; 16 for USER 16

SYSZ0? Output system impedance **CAL (Ch 6)**

Syntax: SYSZ0?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

T13 Select overlaid channel 1 and 3 display **DISPLAY (Ch 5)**

Syntax: T13

Remarks: Restarts the sweep.

Related Commands: WFS, D13

Front Panel Key: Display \ **DISPLAY MODE** \ **OVERLAY DUAL CHANNELS 1&3**

T14 Overlay all four channels (Limited to selected Graph types) **DISPLAY (Ch 5)**

Syntax: T14

Related Commands: T13, T24, D13, D14, D24, DSP, DSP?

Front Panel Key: Display \ **DISPLAY MODE** \ **OVERLAY ALL FOUR CHANNELS**

T24 Select overlaid channel 2 and 4 display **DISPLAY (Ch 5)**

Syntax: `T24`

Remarks: Restarts the sweep.

Related Commands: WFS, D24

Front Panel Key: Display \ **DISPLAY MODE** \ **OVERLAY DUAL CHANNELS 2&4**

TBP Select time bandpass mode for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `TBP`

Remarks: Selects time bandpass mode for the active channel.

Related Commands: CH1-CH4

Front Panel Key: Appl \ **DOMAIN** \ **TIME, BANDPASS**

TC1 Take calibration data for port 1 **CAL (Ch 6)**

Syntax: `TC1`

Related Commands: TC2, NCS, TCD

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **CAL METHOD: LRL/LRM** \ **NEXT CAL STEP** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **START CAL** \ **MEASURE PORT 1 DEVICE**

TC2 Take calibration data for port 2 **CAL (Ch 6)**

Syntax: `TC2`

Related Commands: TC1, NCS, TCD

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **CAL METHOD: LRL/LRM** \ **NEXT CAL STEP** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **START CAL** \ **MEASURE PORT 2 DEVICE**

TCD Take calibration data on one or both ports as necessary — **CAL (Ch 6)**

Syntax: TCD

Related Commands: NC1, NC2, NCS

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ START CAL \ MEASURE BOTH PORTS**

TCM Select TRM calibration method — **CAL (Ch 6)**

Syntax: TCM

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ CHANGE CAL METHOD \ TRM**

TDC Select time domain harmonic frequency calibration data points — **CAL (Ch 6)**

Syntax: TDC

Remarks: Required for low pass time/distance domain measurements. The resulting frequency sweep will consist of harmonic multiples of the start frequency. The Stop frequency is the start frequency times the number of data points selected up to the maximum instrument frequency.

Related Commands: NOC, DFC

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ TIME DOMAIN (HARMONIC)**

TDDIST Set time domain parameter to distance for active channel — **APPL - TIME DOMAIN (Ch 10)**

Syntax: TDDIST

Related Commands: TDDIST?

Front Panel Key: Appl \ **DOMAIN \ DISPLAY DISTANCE**

TDDIST? Output active channel time domain parameter distance or time

APPL - TIME DOMAIN (Ch 10)

Syntax: TDDIST?

Data I/O: Outputs value in ASCII <NR1> format as follows:
1 for TIME
2 for DISTANCE

Related Commands: TDDIST, TDTIME

Front Panel Key: Appl \ **DOMAIN** \ **DISPLAY DISTANCE**

TDPI0 Turn phasor impulse response off for active channel

APPL - TIME DOMAIN (Ch 10)

Syntax: TDPI0

Related Commands: TDPI1

Front Panel Key: Appl \ **DOMAIN** \ **TIME, LOWPASS** \ **DISPLAY, DISTANCE (TIME)** \ **SETUP** \ **RANGE SETUP** \ **RESPONSE IMPULSE OFF**

TDPI1 Turn phasor impulse response on for active channel

APPL - TIME DOMAIN (Ch 10)

Syntax: TDPI1

Related Commands: TDPI0

Front Panel Key: Appl \ **DOMAIN** \ **TIME, LOWPASS** \ **DISPLAY, DISTANCE (TIME)** \ **SETUP** \ **RANGE SETUP** \ **RESPONSE IMPULSE ON**

TDPIX? Output phasor impulse on/off status for active channel

APPL - TIME DOMAIN (Ch 10)

Syntax: TDPIX?

Data I/O: Outputs value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: TDPI0, TDPI1

Front Panel Key: Appl \ **DOMAIN** \ **TIME, LOWPASS** \ **DISPLAY, DISTANCE (TIME)** \ **SETUP** \ **RANGE SETUP** \ **RESPONSE IMPULSE**

TDTIME Set time domain parameter to time for active channel — **APPL - TIME DOMAIN (Ch 10)**

Syntax: `TDTIME`

Related Commands: TDDIST, TDDIST?

Front Panel Key: Appl \ **DOMAIN** \ **DISPLAY TIME**

TDX? Output domain mode for active channel — **APPL - TIME DOMAIN (Ch 10)**

Syntax: `TDX?`

Data I/O: Ouputs a value in ASCII <NR1> format as follows:
0 for FREQUENCY
1 for FREQUENCY W/GATE
2 for LP IMPULSE
3 for LP STEP
4 for BP
5 for BP PHASOR IMPULSE

Front Panel Key: Appl \ **DOMAIN** \ **FREQUENCY, NO TIME GATE**

TEB Select external trigger executes *DDT definition — **SWEEP (Ch 5)**

Syntax: `TEB`

TENMHZERR? Output 10 MHz calibration max error — **CAL (Ch 6)**

Syntax: `TENMHZERR?`

Data I/O: Outputs data using ASCII <NR3> format.

TEX Select external measurement triggering — **SWEEP (Ch 5)**

Syntax: `TEX`

Related Commands: TIN

Front Panel Key: Sweep \ **MORE** \ **TRIGGERS** \ **MEASUREMENT EXTERNAL**

TEXS Select external measurement sweep triggering **SWEEP (Ch 5)**

Syntax: `TEXS`

Related Commands: TEX, TEXSB

TEXSB Select external measurement sweep triggering and execute trigger buffer **SWEEP (Ch 5)**

Syntax: `TEXSB`

Related Commands: TEX, TEXS

THRU23 Include port 2, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `THRU23`

Related Commands: THRU23N, THRU23?

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 2, 3 THROUGH?**

THRU23? Output selection of include or omit port 2, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `THRU23?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT

Related Commands: THRU23N, THRU23

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 2, 3 THROUGH?**

THRU23N Omit port 2, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `THRU23N`

Related Commands: THRU23, THRU23?

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 2, 4 THROUGH?**

THRU24 Include port 2, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `THRU24`

Related Commands: THRU24?, THRU24N

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 2, 4 THROUGH?**

THRU24? Output selection of include or omit port 2, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `THRU24?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT

Related Commands: THRU24, THRU24N

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 2, 4 THROUGH?**

THRU24N Omit port 2, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `THRU24N`

Related Commands: THRU24, THRU24?

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 2, 4 THROUGH?**

THRU34 Include port 3, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `THRU34`

Related Commands: THRU34?, THRU34N

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 3, 4 THROUGH?**

THRU34? Output selection of include or omit port 3, 4 thru/reciprocal measurement — **CAL (Ch 6)**

Syntax: `THRU34?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT

Related Commands: THRU34, THRU34N

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 3, 4 THROUGH?**

THRU34N Omit port 3, 4 thru/reciprocal measurement — **CAL (Ch 6)**

Syntax: `THRU34N`

Related Commands: THRU34, THRU34?

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ DO PORT 3, 4 THROUGH?**

TIB Select GPIB measurement triggering — **SWEEP (Ch 5)**

Syntax: `TIB`

Related Commands: TIBSB

TIBS Select GPIB measurement sweep triggering — **SWEEP (Ch 5)**

Syntax: `TIBS`

TIBSB Select GPIB measurement sweep triggering and execute trigger buffer — **SWEEP (Ch 5)**

Syntax: `TIBSB`

Related Commands: TIB

TIME Enter the system time **UTILITY (Ch 9)**

Syntax: `TIME Value1 Value2`
Value: *Value1* and *Value2* are in ASCII <NRF> format

Remarks: *Value1* is the hour (1 - 24) and *value2* is the minute (0 - 59). Notice the comma separator. This modifies the system time stored on the processor board.

Related Commands: DATE, DATE?, TIME?

Front Panel Key: Utility \ **CLOCK SETUP** \ **HOUR (MINUTE)**

TIME? Output the system time **UTILITY (Ch 9)**

Syntax: `TIME?`

Data I/O: The date is output as two ASCII <NR1> format numbers separated by a comma. The first is the hour (1 - 24) and the second is the minute (0 - 59).

Related Commands: DATE, DATE?, TIME

Front Panel Key: Utility \ **CLOCK SETUP** \ **HOUR (MINUTE)**

TIN Select internal measurement triggering **SWEEP (Ch 5)**

Syntax: `TIN`

Related Commands: TEX

Front Panel Key: Sweep \ **MORE** \ **TRIGGERS** \ **MEASUREMENT INTERNAL**

TLP Select time lowpass mode for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `TLP`

Related Commands: TDC, CH1-CH4

Front Panel Key: Appl \ **DOMAIN** \ **TIME, LOWPASS**

TLZ Enter thru line impedance for calibration **CAL (Ch 6)**

Syntax: `TLZ Value Units`
Value: 1.0 to 9999.99
Units: XX1, XX3, XM3, OHM

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ THROUGHLINE PARAMETERS \ THROUGHLINE IMPEDANCE**

TLZ? Output thru line impedance for calibration **CAL (Ch 6)**

Syntax: `TLZ?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ THROUGHLINE PARAMETERS \ THROUGHLINE IMPEDANCE**

TOL Enter thru offset/reciprocal length for calibration **CAL (Ch 6)**

Syntax: `TOL Value Units`
Value: -999.9999 to +999.9999
Units: M, MTR, MM, MMT, CM, CMT

Related Commands: TDL, TFE, TFL

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ THROUGHLINE PARAMETERS \ OFFSET LENGTH**

TOL? Output thru offset/reciprocal length for calibration **CAL (Ch 6)**

Syntax: `TOL?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ THROUGHLINE PARAMETERS \ OFFSET LENGTH**

TOLP14 Enter port 1, 4 thru offset/reciprocal length for 4-port calibration **CAL (Ch 6)**

Syntax: `TOLP14`

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: TOLP14?, TOLP24, TOLP24?, TOLP3, TOLP3?, TOLP34, TOLP34?

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 1, 4**

TOLP14? Output port 1, 4 thru offset/reciprocal length for 4-port calibration **CAL (Ch 6)**

Syntax: `TOLP14?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TOLP14, TOLP24, TOLP24?, TOLP3, TOLP3?, TOLP34, TOLP34?

Front Panel Key: Cal **\ PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 1, 4**

TOLP23 Enter port 2, 3 thru offset/reciprocal length for 3-port calibration **CAL (Ch 6)**

Syntax: `TOLP23`

Data I/O: The value is input in ASCII <NRf> format.

Front Panel Key: Cal **\ PERFORM CAL \ 4 PORT \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 2, 3**

TOLP23? Output port 2, 3 thru offset/reciprocal length for 3-port calibration **CAL (Ch 6)**

Syntax: `TOLP23?`

Data I/O: Outputs data using ASCII <NR3> format.

Front Panel Key: Cal **\ PERFORM CAL \ 4 PORT \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 2, 3**

TOLP24 Enter port 2, 4 thru offset/reciprocal length for 4-port calibration **CAL (Ch 6)**

Syntax: `TOLP24`

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: TOLP14, TOLP14?, TOLP24?, TOLP3, TOLP3?, TOLP34, TOLP34?

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 2, 4**

TOLP24? Output port 2, 4 thru offset/reciprocal length for 4-port calibration **CAL (Ch 6)**

Syntax: `TOLP24?`

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TOLP14, TOLP14?, TOLP24, TOLP3, TOLP3?, TOLP34, TOLP34?

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 2, 4**

TOLP3 Enter thru offset/reciprocal length for 3-port calibration **CAL (Ch 6)**

Syntax: `TOLP3 Value Units`
Value: -999.9999 to +999.9999
Units: M, MTR, MM, MMT, CM, CMT

Related Commands: TOLP14, TOLP14?, TOLP24, TOLP24?, TOLP3?, TOLP34, TOLP34?

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 1, 3 THROUGHLINE OFFSET LENGTH**

TOLP34 Enter port 3, 4 thru offset/reciprocal length for 4-port calibration **CAL (Ch 6)**

Syntax: `TOLP34`

Data I/O: The value is input in ASCII <NRf> format.

Related Commands: TOLP14, TOLP14?, TOLP24, TOLP24?, TOLP3, TOLP3?, TOLP34?

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 3, 4**

TOLP34? Output port 3, 4 thru offset/reciprocal length for 4-port calibration — **CAL (Ch 6)**

Syntax: TOLP34?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TOLP14, TOLP14?, TOLP24, TOLP24?, TOLP3, TOLP3?, TOLP34

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ THROUGHLINE OFFSET \ PORT 3, 4**

TOLP3? Output thru offsett/reciprocal length for 3-port calibration — **CAL (Ch 6)**

Syntax: TOLP3?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Related Commands: TOLP14, TOLP14?, TOLP24, TOLP24?, TOLP3, TOLP34, TOLP34?

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL \ NEXT CAL STEP \ PORT 1, 3 THROUGHLINE OFFSET LENGTH**

TP1 Select port 1 for flat power correction — **POWER - FLAT POWER (Ch 5)**

Syntax: TP1

Front Panel Key: Power \ **SOURCE 1 SETUP \ FLAT TEST PORT POWER CAL \ BEGIN CAL** or
Cal \ **PERFORM CAL 2-PORT CAL \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ TEST SIGNALS \ CALIBRATE FOR FLATNESS \ BEGIN CAL**

TP3 Select port 3 for flat power correction — **POWER - FLAT POWER (Ch 5)**

Syntax: TP3

Front Panel Key: Power \ **SOURCE 2 SETUP \ FLAT TEST PORT POWER CAL \ BEGIN CAL**

TPI Select time phasor impulse mode for active channel **APPL - TIME DOMAIN (Ch 10)**

Syntax: `TPI`

Related Commands: CH1-CH4

TPN Enter pen number for trace overlay data **HARD COPY (Ch 9)**

Syntax: `TPN  Value Units`
Value: 1 to 8
Units: XX1

Front Panel Key: Hard Copy **\ OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ PEN COLORS \ DATA TRACE OVERLAY**

TPN? Output pen number for trace overlay data **HARD COPY (Ch 9)**

Syntax: `TPN?`

Data I/O: Outputs data using ASCII <NR1> format.

Related Commands: TPN, DPN, DPN?

Front Panel Key: Hard Copy **\ OUTPUT DEVICE PLOTTER \ OUTPUT SETUP \ PLOT FORMAT \ PEN COLORS \ DATA TRACE OVERLAY**

TPX? Output selected port for flat power correction **POWER - FLAT POWER (Ch 5)**

Syntax: `TPX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for PORT 1
3 for PORT 3

Front Panel Key: Power **\ SOURCE 1 (SOURCE 2) SETUP \ FLAT TEST PORT POWER CAL \ BEGIN CAL**

TRCALTYPE Select the receiver type TEST **POWER - RECEIVER CAL (Ch 5)**

Syntax: `TRCALTYPE`

Related Commands: RCALLOG, RCALTYPE?, RRCALP10, RRCALP11, RRCALP1DONE?, RRCALP1X?, RRCALP20, RRCALP21, RRCALP2DONE?, RRCALP2X?, RRCALP30, RRCALP31, RRCALP3DONE?, RRCALP3X?, RRCALTYPE

Front Panel Key: Power **\ RECEIVER CAL \ RECEIVER CAL \ RECEIVER TYPE**

TRCCOL Enter the color number for memory data **UTILITY (Ch 9)**

Syntax: `TRCCOL Value`
Value: 0 to 47

Remarks: Color palette numbers are listed in Table 11-3 at the end of this chapter.

Related Commands: ANNCOL, DATCOL, GRTCOL, LAYCOL, MKRCOL, MNUCOL, TRCCOL?

Front Panel Key: Utility **\ COLOR SETUP \ MEMORY DATA XX COLOR NAME**

TRCCOL? Output the color number for memory data **UTILITY (Ch 9)**

Syntax: `TRCCOL?`

Data I/O: Outputs the color palette number in ASCII <NR1> format.

Related Commands: ANNCOL?, DATCOL?, GRTCOL?, LAYCOL?, MKRCOL?, MNUCOL?, TRCCOL

Front Panel Key: Utility **\ COLOR SETUP \ MEMORY DATA XX COLOR NAME**

TRP12D? Query the port 1, 2 device type **CAL (Ch 6)**

Syntax: `TRP12D?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for THRU
1 for RECIPROCAL
Default value is THRU

Related Commands: TRP12DR, TRP12DT, TRP12OL, TRP12OL?

Front Panel Key: Cal **\ PERFORM CAL \ 2-PORT CAL ** select calibration type, isolation, and data points \ **\ NEXT CAL STEP \ THROUGHLINE\ RECIPROCAL \ 1,2 DEVICE TYPE**

TRP12DR Set the port 1, 2 device type to RECIPROCAL **CAL (Ch 6)**

Syntax: `TRP12DR`

Related Commands: TRP12D?, TRP12DT, TRP12OL, TRP12OL?

Front Panel Key: Cal **\ PERFORM CAL \ 2-PORT CAL ** select calibration type, isolation, and data points \ **\ NEXT CAL STEP \ THROUGHLINE\ RECIPROCAL \ 1,2 DEVICE TYPE**

TRP12DT Set the port 1, 2 device type to THRU **CAL (Ch 6)**

Syntax: `TRP12DT`

Related Commands: TRP12D?, TRP12DR, TRP12OL, TRP12OL?

Front Panel Key: Cal **\ PERFORM CAL \ 2-PORT CAL ** select calibration type, isolation, and data points \ **\ NEXT CAL STEP \ THROUGHLINE\ RECIPRO-CAL \ 1,2 DEVICE TYPE**

TRP12OL Enter the thru/reciprocal offset length for port 1, 2 **CAL (Ch 6)**

Syntax: `TRP12OL Value Units`
Value: 0.0 - 999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Remarks: Same as TOL

Data I/O: Enter the offset length in ASCII <NRF> format.

Related Commands: TRP12D?, TRP12DR, TRP12DT, TRP12OL?

Front Panel Key: Cal **\ PERFORM CAL \ 2-PORT CAL ** select calibration type, isolation, and data points \ **\ NEXT CAL STEP \ THROUGHLINE\ RECIPRO-CAL \ 1,2 DEVICE TYPE LENGTH**

TRP12OL? Output the thru/reciprocal offset length for port 1, 2 **CAL (Ch 6)**

Syntax: `TRP12OL?`

Remarks: Same as TOL?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TRP12D?, TRP12DR, TRP12DT, TRP12OL

Front Panel Key: Cal **\ PERFORM CAL \ 2-PORT CAL ** select calibration type, isolation, and data points \ **\ NEXT CAL STEP \ THROUGHLINE\ RECIPRO-CAL \ 1,2 DEVICE TYPE LENGTH**

TRP13D? Query the port 1, 3 device type **CAL (Ch 6)**

Syntax: `TRP13D?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for THRU
1 for RECIPROCA
Default value is THRU

Related Commands: TRP13DR, TRP13DT, TRP13I, TRP13I?, TRP13O, TRP13OL, TRP13OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 1,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,3 DEVICE TYPE**

TRP13DR Set the port 1, 3 device type to RECIPROCAL **CAL (Ch 6)**

Syntax: `TRP13DR`

Related Commands: TRP13D?, TRP13DT, TRP13I, TRP13I?, TRP13O, TRP13OL, TRP13OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 1,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,3 DEVICE TYPE**

TRP13DT Set the port 1, 3 device type to THRU **CAL (Ch 6)**

Syntax: `TRP13DT`

Related Commands: TRP13D?, TRP13DR, TRP13I, TRP13I?, TRP13O, TRP13OL, TRP13OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 1,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,3 DEVICE TYPE**

TRP13I Include the port 1, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP13I`

Related Commands: TRP13D?, TRP13DR, TRP13DT, TRP13I?, TRP13O, TRP13OL, TRP13OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,3?** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,3?**

TRP13I? Output the selection of omit or include for the port 1, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP13I?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT
Default setting is INCLUDE

Related Commands: TRP13D?, TRP13DR, TRP13DT, TRP13I, TRP13O, TRP13OL, TRP13OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,3?** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,3?**

TRP13O Omit the port 1, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP13O`

Related Commands: TRP13D?, TRP13DR, TRP13DT, TRP13I, TRP13I?, TRP13OL, TRP13OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,3?** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,3?**

TRP13OL Enter the thru/reciprocal offset length for port 1, 3 **CAL (Ch 6)**

Syntax: `TRP13OL Value Units`
Value: 0.0 - 999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Remarks: Same as TOLP3

Data I/O: Enter the offset length in ASCII <NRF> format.

Related Commands: TRP13D?, TRP13DR, TRP13DT, TRP13I, TRP13I?, TRP13O, TRP13OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 1,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,3 DEVICE TYPE**

TRP13OL? Output the thru/reciprocal offset length for port 1, 3 **CAL (Ch 6)**

Syntax: `TRP13OL?`

Remarks: Same as TOLP3?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TRP13D?, TRP13DR, TRP13DT, TRP13I, TRP13I?, TRP13O, TRP13OL

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 1,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,3 DEVICE TYPE**

TRP14D? Query the port 1, 4 device type **CAL (Ch 6)**

Syntax: `TRP14D?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for THRU
1 for RECIPROCA
Default value is THRU

Related Commands: TRP14DR, TRP14DT, TRP14I, TRP14I?, TRP14O, TRP14OL, TRP14OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,4 DEVICE TYPE**

TRP14DR Set the port 1, 4 device type to RECIPROCAL **CAL (Ch 6)**

Syntax: `TRP14DR`

Related Commands: TRP14D?, TRP14DT, TRP14I, TRP14I?, TRP14O, TRP14OL, TRP14OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,4 DEVICE TYPE**

TRP14DT Set the port 1, 4 device type to THRU **CAL (Ch 6)**

Syntax: `TRP14DT`

Related Commands: TRP14D?, TRP14DR, TRP14I, TRP14I?, TRP14O, TRP14OL, TRP14OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,4 DEVICE TYPE**

TRP14I Include the port 1, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP14I`

Related Commands: TRP14D?, TRP14DR, TRP14DT, TRP14I?, TRP14O, TRP14OL, TRP14OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,4?**

TRP14I? Output the selection of omit or include for the port 1, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: TRP14I?

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT
Default setting is INCLUDE

Related Commands: TRP14D?, TRP14DR, TRP14DT, TRP14I, TRP14O, TRP14OL, TRP14OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,4?**

TRP14O Omit the port 1, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: TRP14O

Related Commands: TRP14D?, TRP14DR, TRP14DT, TRP14I, TRP14I?, TRP14OL, TRP14OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 1,4?**

TRP14OL Enter the thru/reciprocal offset length for port 1, 4 **CAL (Ch 6)**

Syntax: TRP14OL Value Units
Value: 0.0 - 9999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Remarks: Same as TOLP14

Data I/O: Enter the offset length in ASCII <NRF> format.

Related Commands: TRP14D?, TRP14DR, TRP14DT, TRP14I, TRP14I?, TRP14O, TRP14OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,4 DEVICE TYPE**

TRP14OL? Output the thru/reciprocal offset length for port 1, 4 **CAL (Ch 6)**

Syntax: TRP14OL?

Remarks: Same as TOLP14?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TRP14D?, TRP14DR, TRP14DT, TRP14I, TRP14I?, TRP14O, TRP14OL

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 1,4 DEVICE TYPE**

TRP23D? Query the port 2, 3 device type **CAL (Ch 6)**

Syntax: TRP23D?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for THRU
1 for RECIPROCA
Default value is THRU

Related Commands: TRP23DR, TRP23DT, TRP23I, TRP23I?, TRP23O, TRP23OL, TRP23OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 2,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 2,3 DEVICE TYPE**

TRP23DR Set the port 2, 3 device type to RECIPROCAL **CAL (Ch 6)**

Syntax: TRP23DR

Related Commands: TRP23D?, TRP23DT, TRP23I, TRP23I?, TRP23O, TRP23OL, TRP23OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 2,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 2,3 DEVICE TYPE**

TRP23DT Set the port 2, 3 device type to THRU **CAL (Ch 6)**

Syntax: `TRP23DT`

Related Commands: TRP23D?, TRP23DR, TRP23I, TRP23I?, TRP23O, TRP23OL, TRP23OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 2,3 DEVICE TYPE** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 2,3 DEVICE TYPE**

TRP23I Include the port 2, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP23I`

Remarks: Same as THRU23

Related Commands: TRP23D?, TRP23DR, TRP23DT, TRP23I?, TRP23O, TRP23OL, TRP23OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 2,3** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MEASURE PORT 2,3?**

TRP23I? Output the selection of omit or include for the port 2, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP23I?`

Remarks: Same as THRU23?

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT
Default setting is OMIT

Related Commands: TRP23D?, TRP23DR, TRP23DT, TRP23I, TRP23O, TRP23OL, TRP23OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 2,3?** or Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MEASURE PORT 2,3?**

TRP23O Omit the port 2, 3 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: TRP23O

Remarks: Same as THRU23N

Related Commands: TRP23D?, TRP23DR, TRP23DT, TRP23I, TRP23I?, TRP23OL, TRP23OL?

Front Panel Key: Cal \ **PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 2,3?** or Cal \ **PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MEASURE PORT 2,3?**

TRP23OL Enter the thru/reciprocal offset length for port 2, 3 **CAL (Ch 6)**

Syntax: TRP23OL Value Units
Value: 0.0 - 999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Remarks: Same as TOLP23

Data I/O: Enter the offset length in ASCII <NRF> format.

Related Commands: TRP23D?, TRP23DR, TRP23DT, TRP23I, TRP23I?, TRP23O, TRP23OL?

Front Panel Key: Cal \ **PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 2,3 DEVICE TYPE** or Cal \ **PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 2,3 DEVICE TYPE**

TRP23OL? Output the thru/reciprocal offset length for port 2, 3 **CAL (Ch 6)**

Syntax: TRP23OL?

Remarks: Same as TOLP23?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TRP23D?, TRP23DR, TRP23DT, TRP23I, TRP23I?, TRP23O, TRP23OL

Front Panel Key: Cal \ **PERFORM CAL \ MANUAL CAL \ 3-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ 2,3 DEVICE TYPE** or Cal \ **PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ 2,3 DEVICE TYPE**

TRP24D? Query the port 2, 4 device type **CAL (Ch 6)**

Syntax: TRP24D?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for THRU
1 for RECIPROCAL
Default value is THRU

Related Commands: TRP24DR, TRP24DT, TRP24I, TRP24I?, TRP24O, TRP24OL, TRP24OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 2,4 DEVICE TYPE**

TRP24DR Set the port 2, 4 device type to RECIPROCAL **CAL (Ch 6)**

Syntax: TRP24DR

Related Commands: TRP24D?, TRP24DT, TRP24I, TRP24I?, TRP24O, TRP24OL, TRP24OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 2,4 DEVICE TYPE**

TRP24DT Set the port 2, 4 device type to THRU **CAL (Ch 6)**

Syntax: TRP24DT

Related Commands: TRP24D?, TRP24DR, TRP24I, TRP24I?, TRP24O, TRP24OL, TRP24OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 2,4 DEVICE TYPE**

TRP24I Include the port 2, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: TRP24I

Remarks: Same as THRU24

Related Commands: TRP24D?, TRP24DR, TRP24DT, TRP24I?, TRP24O, TRP24OL, TRP24OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 2,4?**

TRP24I? Output the selection of omit or include for the port 2, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: TRP24I?

Remarks: Same as THRU24?

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT
Default setting is OMIT

Related Commands: TRP24D?, TRP24DR, TRP24DT, TRP24I, TRP24O, TRP24OL, TRP24OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 2,4?**

TRP24O Omit the port 2, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: TRP24O

Remarks: Same as THRU24N

Related Commands: TRP24D?, TRP24DR, TRP24DT, TRP24I, TRP24I?, TRP24OL, TRP24OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 2,4?**

TRP24OL Enter the thru/reciprocal offset length for port 2, 4 **CAL (Ch 6)**

Syntax: TRP24OL Value Units
Value: 0.0 - 999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Remarks: Same as TOLP24

Data I/O: Enter the offset length in ASCII <NRF> format.

Related Commands: TRP24D?, TRP24DR, TRP24DT, TRP24I, TRP24I?, TRP24O, TRP24OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 2,4 DEVICE TYPE**

TRP24OL? Output the thru/reciprocal offset length for port 2, 4 **CAL (Ch 6)**

Syntax: TRP24OL?

Remarks: Same as TOLP24?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TRP24D?, TRP24DR, TRP24DT, TRP24I, TRP24I?, TRP24O, TRP24OL

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 2,4 DEVICE TYPE**

TRP34D? Query the port 3, 4 device type **CAL (Ch 6)**

Syntax: TRP34D?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for THRU
1 for RECIPROCAL
Default value is THRU

Related Commands: TRP34DR, TRP34DT, TRP34I, TRP34I?, TRP34O, TRP34OL, TRP34OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 3,4 DEVICE TYPE**

TRP34DR Set the port 3, 4 device type to RECIPROCAL **CAL (Ch 6)**

Syntax: TRP34DR

Related Commands: TRP34D?, TRP34DT, TRP34I, TRP34I?, TRP34O, TRP34OL, TRP34OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 3,4 DEVICE TYPE**

TRP34DT Set the port 3, 4 device type to THRU **CAL (Ch 6)**

Syntax: `TRP34DT`

Related Commands: TRP34D?, TRP34DR, TRP34I, TRP34I?, TRP34O, TRP34OL, TRP34OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 3,4 DEVICE TYPE**

TRP34I Include the port 3, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP34I`

Remarks: Same as THRU34

Related Commands: TRP34D?, TRP34DR, TRP34DT, TRP34I?, TRP34O, TRP34OL, TRP34OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 3,4?**

TRP34I? Output the selection of omit or include for the port 3, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP34I?`

Remarks: Same as THRU34?

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for OMIT MEASUREMENT
1 for INCLUDE MEASUREMENT
Default setting is OMIT

Related Commands: TRP34D?, TRP34DR, TRP34DT, TRP34I, TRP34O, TRP34OL, TRP34OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 3,4?**

TRP34O Omit the port 3, 4 thru/reciprocal measurement **CAL (Ch 6)**

Syntax: `TRP34O`

Remarks: Same as THRU34N

Related Commands: TRP34D?, TRP34DR, TRP34DT, TRP34I, TRP34I?, TRP34OL, TRP34OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ MEASURE PORT 3,4?**

TRP34OL Enter the thru/reciprocal offset length for port 3, 4 **CAL (Ch 6)**

Syntax: `TRP34OL Value Units`
Value: 0.0 - 999.999 (meters)
Units: M, MTR, MM, MMT, CM, CMT

Remarks: Same as TOLP34

Data I/O: Enter the offset length in ASCII <NRF> format.

Related Commands: TRP34D?, TRP34DR, TRP34DT, TRP34I, TRP34I?, TRP34O, TRP34OL?

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 3,4 DEVICE TYPE**

TRP34OL? Output the thru/reciprocal offset length for port 3, 4 **CAL (Ch 6)**

Syntax: `TRP34OL?`

Remarks: Same as TOLP34?

Data I/O: Outputs data using ASCII <NR3> format.

Related Commands: TRP34D?, TRP34DR, TRP34DT, TRP34I, TRP34I?, TRP34O, TRP34OL

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4-PORT \ NEXT CAL STEP \ THRU/RECIPROCAL PARAMETERS \ SELECT DEVICE TYPE \ MORE \ 3,4 DEVICE TYPE**

TRS Trigger/restart sweep **CONFIG (Ch 5)**

Syntax: `TRS`

Remarks: Restarts the sweep (continuous sweep mode) or triggers a single sweep (in hold mode).

Related Commands: WFS, HLD, CTN

Front Panel Key: Config \ **HOLD** \ **SINGLE SWEEP AND HOLD**

TRX Select TRX calibration method **CAL (Ch 6)**

Syntax: `TRX`

Related Commands: TRX4P

Front Panel Key: Cal \ **PERFORM CAL 3 PORT CAL** \ **CHANGE CAL METHOD** \ **TRX**

TRX4P Select TRX calibration method for 4-port calibration **CAL (Ch 6)**

Syntax: `TRX4P`

Related Commands: TRX

Front Panel Key: Cal \ **PERFORM CAL 4 PORT CAL** \ **CHANGE CAL METHOD** \ **TRX**

TSALCMS1 Source 1 ALC modulator drive voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSALCMS1`

Front Panel Key: Utility \ **DIAGNOSTICS** \ **TROUBLESHOOTING** \ **MORE** \ **SOURCE 1** \ **ALC MODULATOR DRIVE VOLTAGE**

TSALCMS2 Source 2 ALC modulator drive voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSALCMS2`

Front Panel Key: Utility \ **DIAGNOSTICS** \ **TROUBLESHOOTING** \ **MORE** \ **SOURCE 2** \ **ALC MODULATOR DRIVE VOLTAGE**

TSALCS1 Select source 1 for ALC verification **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSALCS1

Front Panel Key: Utility **\ DIAGNOSTICS \ HARDWARE CAL \ SOURCE ALC CAL \ SELECT SOURCE 1**

TSALCS2 Select source 2 for ALC verification **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSALCS2

Front Panel Key: Utility **\ DIAGNOSTICS \ HARDWARE CAL \ SOURCE ALC CAL \ SELECT SOURCE 2**

TSALCV Start source ALC verification **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSALCV

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ VERIFY ALC CALIBRATION**

TSBEG Start diagnostics mode - same as SDG **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSBEG

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY)**

TSDDSS1 Source 1 reference DDS voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSDDSS1

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 1 \ DDS REFERENCE CLOCK VOLTAGE**

TSDDSS2 Source 2 reference DDS voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSDDSS2

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 2 \ DDS REFERENCE CLOCK VOLTAGE**

TSDRAM Start DRAM test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSDRAM`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ MORE \ DRAM \ START TEST**

TSDSPSRAM Start DSP SRAM test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSDSPSRAM`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ MORE \ DRAM \ START TEST**

TSDVMC Enter DVM channel number - same as DVM **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSDVMC Value`
Value: 0 to 128

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ DVM CHANNEL**

TSEFMEM Start extended FLASH memory test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSEFMEM`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ EXTENDED FLASH MEMORY**

TSEND End diagnostics mode - same as EDG **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSEND`

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ FINISHED, RECOVER FROM TROUBLESHOOTING**

TSEXTI Display external A/D input - same as EXD **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSEXTI`

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ EXTERNAL A/D INPUT**

TSFMEM Start FLASH memory test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSFMEM`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ FLASH MEMORY**

TSGDRAM Start graphic DRAM test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSGDRAM`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ MORE \ DRAM \ START TEST**

TSGVRAM Start graphic VRAM test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSGVRAM`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ MORE \ DRAM \ START TEST**

TSHETO Het oscillator voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSHETO`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ HET OSCILLATOR VOLTAGE**

TSLATR? Diagnostic read latch - same as DRL **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSLATR?`

Remarks: For service use only.

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ TRIGGER READ \ READ DATA**

TSLATW Diagnostic write latch - same as DWL **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSLATW

Remarks: For service use only.

Front Panel Key: Utility \ **DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ LATCH ADDRESS** or **WRITE DATA** or **TRIGGER WRITE**

TSLEVAS1 Source 1 level amplifier voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSLEVAS1

Front Panel Key: Utility \ **DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 1 \ LEVEL AMPLIFIER VOLTAGE**

TSLEVAS2 Source 2 level amplifier voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSLEVAS2

Front Panel Key: Utility \ **DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 2 \ LEVEL AMPLIFIER VOLTAGE**

TSLOGAS1 Source 1 logarithmic amplifier voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSLOGAS1

Front Panel Key: Utility \ **DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 1 \ LOG AMPLIFIER VOLTAGE**

TSLOGAS2 Source 2 logarithmic amplifier voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSLOGAS2

Front Panel Key: Utility \ **DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 2 \ LOG AMPLIFIER VOLTAGE**

TSMAIVLO1 LO1 main VCO voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: TSMAIVLO1

Front Panel Key: Utility \ **DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ LO1 \ MAIN VCO VOLTAGE**

TSMAIVS1 Source 1 main VCO voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMAIVS1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 1 \ MAIN VCO VOLTAGE**

TSMAIVS2 Source 2 main VCO voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMAIVS2`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 2 \ MAIN VCO VOLTAGE**

TSMCOO0 Common offset mode off **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMCOO0`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ COMMON OFFSET MODE OFF**

TSMCOO1 Common offset mode on **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMCOO1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ COMMON OFFSET MODE ON**

TSMHAR0 Harmonic mode off **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMHAR0`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ HARMONIC MODE OFF**

TSMHAR1 Harmonic mode on **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMHAR1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ HARMONIC MODE ON**

TSMSPA0 Spur avoidance mode off **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMSPA0`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ SPUR AVOIDANCE MODE OFF**

TSMSPA1 Spur avoidance mode on **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMSPA1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ SPUR AVOIDANCE MODE ON**

TSMSPU0 Speed up circuit mode off **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMSPU0`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ SPEED UP CIRCUIT OFF**

TSMSPU1 Speed up circuit mode on **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSMSPU1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ SELECT MODES \ SPEED UP CIRCUIT ON**

TSOFFVLO1 LO1 offset VCO voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSOFFVLO1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ LO1 \ OFFSET VCO VOLTAGE**

TSOFFVS1 Source 1 offset VCO voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSOFFVS1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 1 \ OFFSET VCO VOLTAGE**

TSOFFVS2 Source 2 offset VCO voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSOFFVS2`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 2 \ OFFSET VCO VOLTAGE**

TSPWRLS1 Source 1 power level DAC voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSPWRLS1`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 1 \ POWER LEVEL DAC VOLTAGE**

TSPWRLS2 Source 2 power level DAC voltage **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSPWRLS2`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING \ MORE \ SOURCE 2 \ POWER LEVEL DAC VOLTAGE**

TSSRAM Start SRAM test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSSRAM`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ SRAM**

TSSRAMD Start SRAM disk test **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSSRAMD`

Front Panel Key: Utility **\ DIAGNOSTICS \ TROUBLESHOOTING (SERVICE USE ONLY) \ MORE \ MORE \ SRAM DISK**

TST Perform self test and output status (same as *TST?) **REMOTE - IEEE 488.2 (Ch 8)**

Syntax: `TST`

Remarks: Causes the VNMS to perform an extensive, fully automated internal circuits self test. Detailed error messages indicating self test failures, if any, are placed in the service log in the order they occur. The query returns a “1" if any part of the self test failed, or a ”0" when passed.

NOTE: When commands TST or *TST? are sent to the MS462XX, the VNMS output power is momentarily set to the model-dependent Rated Power level during the self test. Ensure that any equipment connected to Port 1 or Port 2 will not be damaged by this power level.

Data I/O: Returns a value in ASCII format.

Related Commands: ONE, OEL, OSL, PSL, *TST?

Front Panel Key: Utility \ **DIAGNOSTICS** \ **START SELF TEST**

TSTRENF Noise figure measurement **UTILITY - DIAGNOSTICS (Ch 9)**

Syntax: `TSTRENF`

TUNE0 Turn tune mode off **SWEEP (Ch 5)**

Syntax: `TUNE0`

Front Panel Key: Sweep \ **TUNE MODE OFF**

TUNE1 Turn tune mode on **SWEEP (Ch 5)**

Syntax: `TUNE1`

Front Panel Key: Sweep \ **TUNE MODE ON**

TUNESWP Enter number of sweeps in tune mode **SWEEP (Ch 5)**

Syntax: `TUNESWP`

Front Panel Key: Sweep \ **TUNE MODE COUNT**

TUNESWP? Output number of sweeps in tune mode **SWEEP (Ch 5)**

Syntax: TUNESWP?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Sweep \ **TUNE MODE COUNT**

TUNEX? Output tune mode on/off status **SWEEP (Ch 5)**

Syntax: TUNEX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for OFF
1 for ON

Front Panel Key: Sweep \ **TUNE MODE**

TXX? Output trigger source **SWEEP (Ch 5)**

Syntax: TXX?

Data I/O: Outputs data using ASCII <NR1> format as follows:
1 for TIN
2 for TEX
3 for TIB
4 for TEB
5 for TIBSB
6 for TIBS
7 for TEXAS
8 for TEXSB

Related Commands: TIN, TEX

Front Panel Key: Sweep \ **MORE** \ **TRIGGERS** \ **MEASUREMENT**

U10 Select 10 mil UTF calibration kit **CAL (Ch 6)**

Syntax: U10

Related Commands: U15, U25

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL** \ **LINE TYPE: MICROSTRIP** \ **NEXT CAL STEP** \ **FULL 12 TERM** \ **INCLUDE ISOLATION** \ **NORMAL (1601 POINTS MAXIMUM)** \ **NEXT CAL STEP** \ **MICROSTRIP PARAMETERS** \ **10 MIL KIT**

U15 Select 15 mil UTF calibration kit **CAL (Ch 6)**

Syntax: `U15`

Related Commands: U10, U25

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ 15 MIL KIT**

U25 Select 25 mil UTF calibration kit **CAL (Ch 6)**

Syntax: `U25`

Related Commands: U10, U15

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ 25 MIL KIT**

UDP11 Select the S11 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP11`

Front Panel Key: Meas \ **USER DEFINED \ CHANGE RATIO \ S11/USER2**

UDP12 Select the S12 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP12`

Front Panel Key: Meas \ **USER DEFINED \ CHANGE RATIO \ S12/USER3**

UDP13 Select the S13 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP13`

Front Panel Key: Meas \ **USER DEFINED \ CHANGE RATIO \ S13/USER5**

UDP14 Select the S14 User Defined parameter **MEAS (Ch 5)**

Syntax: `UDP14`

UDP21 Select the S21 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP21`

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ S21/USER1**

UDP22 Select the S22 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP22`

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ S22/USER4**

UDP23 Select the S23 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP23`

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ S23/USER6**

UDP24 Select the S24 User Defined parameter **MEAS (Ch 5)**

Syntax: `UDP24`

UDP31 Select the S31 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP31`

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ S31/USER7**

UDP32 Select the S32 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP32`

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ S32/USER8**

UDP33 Select the S33 user defined parameter **MEAS (Ch 5)**

Syntax: `UDP33`

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ S33/USER9**

UDP34 Select the S34 User Defined parameter **MEAS (Ch 5)**

Syntax: `UDP34`

UDP41 Select the S41 User Defined parameter **MEAS (Ch 5)**

Syntax: `UDP41`

UDP42 Select the S42 User Defined parameter **MEAS (Ch 5)**

Syntax: `UDP42`

UDP43 Select the S43 User Defined parameter **MEAS (Ch 5)**

Syntax: `UDP43`

UDP44 Select the S44 User Defined parameter **MEAS (Ch 5)**

Syntax: `UDP44`

UDPX? Output User Defined parameter for active channel **MEAS (Ch 5)**

Syntax: `UDPX?`

Data I/O: Outputs data using ASCII <NR1> integer values.

Front Panel Key: Meas **\ USER DEFINED \ CHANGE RATIO \ Sxx/USERx**

UF Suffix sets farad data type and scales by 1E-6 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `UF`

UH Suffix sets farad data type and scales by 1E-6 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `UH`

UMDIS0 Turn off user message display **REMOTE - USER MESSAGE (Ch 8)**

Syntax: `UMDIS0`

UMDIS1 Turn on user message display **REMOTE - USER MESSAGE (Ch 8)**

Syntax: `UMDIS1`

UMDISX? Output user message display on/off status **REMOTE - USER MESSAGE (Ch 8)**

Syntax: UMDISX?

Data I/O: Outputs data using ASCII <NR1> integer values.

UMRST Reset all user message display parameters **REMOTE - USER MESSAGE (Ch 8)**

Syntax: UMRST

UMSTR Enter the user message display string **REMOTE - USER MESSAGE (Ch 8)**

Syntax: UMSTR Value
Value: "String" 1 to 8 characters

UMSTR? Output the user message display string **REMOTE - USER MESSAGE (Ch 8)**

Syntax: UMSTR?

Data I/O: Outputs data using undelimited 7-bit ASCII text.

UMXLOC Enter the user message display starting X location **REMOTE - USER MESSAGE (Ch 8)**

Syntax: UMXLOC Value Units
Value: ASCII <NRf> number
Units: XX1, XX3, XM3

UMXLOC? Output the user message display starting X location **REMOTE - USER MESSAGE (Ch 8)**

Syntax: UMXLOC?

Data I/O: Outputs data using ASCII <NR1> integer values.

UMYLOC Enter the user message display starting Y location **REMOTE - USER MESSAGE (Ch 8)**

Syntax: UMYLOC Value Units
Value: ASCII <NRf> number
Units: ASCII <NRf> number

Data I/O: Input an ASCII <NRf> number

UMYLOC? Output the user message display starting Y location — **REMOTE - USER MESSAGE (Ch 8)**

Syntax: `UMYLOC?`

Data I/O: Outputs data using ASCII <NR1> integer values.

UNDOGC Exit gain compression and undo changes — **APPL - GAIN COMPRESSION (Ch 10)**

Syntax: `UNDOGC`

Remarks: Returns to the normal S parameter measurement state.

Related Commands: SFGCA, SPGCA

Front Panel Key: Appl \ **SWEPT POWER GAIN COMPRESSION \ MULTIPLE FREQUENCY GAIN COMPRESSION \ RETURN TO T/R MODE**

UPL0 Turn upper limit off — **DISPLAY - LIMITS (Ch 7)**

Syntax: `UPL0`

Related Commands: UPL1, LUP, LON, LOF

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ UPPER LIMIT OFF**

UPL1 Turn upper limit on at current value — **DISPLAY - LIMITS (Ch 7)**

Syntax: `UPL1`

Related Commands: UPL0, LUP, LON, LOF

Front Panel Key: Display \ **GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ UPPER LIMIT ON**

UPL20 Turn upper limit off for bottom graph — **DISPLAY - LIMITS (Ch 7)**

Syntax: `UPL20`

Related Commands: UPL21, LUP2, LON, LOF

UPL21 Turn upper limit on at current value for bottom graph — **DISPLAY - LIMITS (Ch 7)**

Syntax: `UPL21`

Related Commands: UPL20, LUP2, LON, LOF

UPL2X? Output upper limit on/off status for bottom graph — **DISPLAY - LIMITS (Ch 7)**

Syntax: `UPL2X?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Related Commands: UPL20, UPL21

UPLX? Output upper limit on/off status — **DISPLAY - LIMITS (Ch 7)**

Syntax: `UPLX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for OFF
1 for ON

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ UPPER LIMIT**

US Suffix sets time data type and scales by 1E-6 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `US`

US1 Select upper segmented limit 1 as the active segment — **DISPLAY - LIMITS (Ch 7)**

Syntax: `US1`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 1 ACTIVE**

US10 Select upper segmented limit 10 as the active segment — **DISPLAY - LIMITS (Ch 7)**

Syntax: `US10`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 10 ACTIVE**

US2 Select upper segmented limit 2 as the active segment — **DISPLAY - LIMITS (Ch 7)**

Syntax: `US2`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 2 ACTIVE**

US3 Select upper segmented limit 3 as the active segment — **DISPLAY - LIMITS (Ch 7)**

Syntax: `US3`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 3 ACTIVE**

US3P Select use existing 3-port calibration — **CAL (Ch 6)**

Syntax: `US3P`

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4 PORT CAL \ USE EXISTING 3 PORT CAL?**

US3P? Output selection of use existing 3-port calibration or not **CAL (Ch 6)**

Syntax: `US3P?`

Data I/O: Outputs data in ASCII <NR1> format as follows:
0 for DO NOT USE EXISTING 3 PORT CAL
1 for USE EXISTING 3 PORT CAL

Front Panel Key: Cal **\ PERFORM CAL \ MANUAL CAL \ 4 PORT CAL \ USE EXISTING 3 PORT CAL?**

US4 Select upper segmented limit 4 as the active segment **DISPLAY - LIMITS (Ch 7)**

Syntax: `US4`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 4 ACTIVE**

US5 Select upper segmented limit 5 as the active segment **DISPLAY - LIMITS (Ch 7)**

Syntax: `US5`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 5 ACTIVE**

US6 Select upper segmented limit 6 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `US6`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 6 ACTIVE**

US7 Select upper segmented limit 7 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `US7`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) EDIT SEGMENTS \ EDIT UPPER LIMITS \ SEGMENT 7 ACTIVE**

US8 Select upper segmented limit 8 as the active segment

DISPLAY - LIMITS (Ch 7)

Syntax: `US8`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 8 ACTIVE**

US9 Select upper segmented limit 9 as the active segment — **DISPLAY - LIMITS (Ch 7)**

Syntax: `US9`

Remarks: Makes USx the active segmented upper limit.

Related Commands: CH1-CH4, LS1-LS10, LSx?

Front Panel Key: Display **\ GRAPH TYPE \ Any; except LINEAR POLAR, LOG POLAR, SMITH CHART, or POWER** then **\ LIMITS \ (MORE) SEGMENTED LIMITS \ EDIT SEGMENTS \ EDIT LOWER (UPPER) LIMITS \ SEGMENT 9 ACTIVE**

USC Suffix sets time data type and scales by 1E-6 — **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `USC`

USE Enter effective dielectric for microstrip calibration — **CAL (Ch 6)**

Syntax: `USE Value Units`
Value: 1.0 to 9999.99
Units: XX1, XX3, XM3

Related Commands: USW, USZ

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ EFFECTIVE DIELECTRIC**

USE? Output effective dielectric for microstrip calibration — **CAL (Ch 6)**

Syntax: `USE?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ EFFECTIVE DIELECTRIC**

USL Enter label string for user parameter being defined **MEAS (Ch 5)**

Syntax: `USL String`
Value: "String" with a maximum of five characters. Displays on the screen.

Related Commands: USL?

Front Panel Key: Meas \ **USER DEFINED** \ **USER LABEL**

USL? Output label string for the user parameter being defined **MEAS (Ch 5)**

Syntax: `USL?`

Data I/O: The string is output in <Arbitrary ASCII> format.

Block Size: Five bytes maximum.

Related Commands: USL

Front Panel Key: Meas \ **USER DEFINED** \ **USER LABEL**

USR1 Measure the user parameter 1 on active channel **MEAS (Ch 5)**

Syntax: `USR1`

Remarks: USR1 takes the place of S21. Any channel displaying S21 will now display USR1.

Related Commands: USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas \ **USER DEFINED** \ **S21/USER1**

USR10 Measure user parameter 10 on active channel **MEAS (Ch 5)**

Syntax: `USR10`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

USR11 Measure user parameter 11 on active channel **MEAS (Ch 5)**

Syntax: `USR11`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

USR12 Measure user parameter 12 on active channel **MEAS (Ch 5)**

Syntax: `USR12`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

USR13 Measure user parameter 13 on active channel **MEAS (Ch 5)**

Syntax: `USR13`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

USR14 Measure user parameter 14 on active channel **MEAS (Ch 5)**

Syntax: `USR14`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

USR15 Measure user parameter 15 on active channel **MEAS (Ch 5)**

Syntax: `USR15`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

USR16 Measure user parameter 16 on active channel **MEAS (Ch 5)**

Syntax: `USR16`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

USR2 Measure user parameter 2 on active channel **MEAS (Ch 5)**

Syntax: `USR2`

Remarks: USR2 takes the place of S11. Any channel displaying S11 will now display USR2.

Related Commands: USR1, USR3, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S11/USER2**

USR3 Measure user parameter 3 on active channel **MEAS (Ch 5)**

Syntax: `USR3`

Remarks: USR3 takes the place of S12. Any channel displaying S12 will now display USR3.

Related Commands: USR1, USR2, USR4, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S12/USER3**

USR4 Measure user parameter 4 on active channel **MEAS (Ch 5)**

Syntax: `USR4`

Remarks: USR4 takes the place of S22. Any channel displaying S22 will now display USR4.

Related Commands: USR1, USR2, USR3, USR5, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S22/USER4**

USR5 Measure user parameter 5 on active channel **MEAS (Ch 5)**

Syntax: `USR5`

Related Commands: USR1, USR2, USR3, USR4, USR6, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S13/USER5**

USR6 Measure user parameter 6 on active channel **MEAS (Ch 5)**

Syntax: `USR6`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR7, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S23/USER6**

USR7 Measure user parameter 7 on active channel **MEAS (Ch 5)**

Syntax: `USR7`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR8, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S31/USER7**

USR8 Measure user parameter 8 on active channel **MEAS (Ch 5)**

Syntax: `USR8`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR9, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S32/USER8**

USR9 Measure user parameter 9 on active channel **MEAS (Ch 5)**

Syntax: `USR9`

Related Commands: USR1, USR2, USR3, USR4, USR5, USR6, USR7, USR8, USR10, USR11, USR12, USR13, USR14, USR15, USR16, S11, S21, S12, S22, S31, S32, S33, S41, S42, S43, S44

Front Panel Key: Meas **\ USER DEFINED \ S33/USER9**

USW Enter microstrip width for microstrip calibration **CAL (Ch 6)**

Syntax: `USW Value Units`
Value: 0.001 mm to 1000 mm
Units: M, MTR, MM, MMT, CM, CMT

Related Commands: USE, USZ

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ WIDTH OF STRIP**

USW? Output microstrip width for microstrip calibration **CAL (Ch 6)**

Syntax: `USW?`

Data I/O: Outputs data usiing ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ WIDTH OF STRIP**

USZ Enter microstrip impedance for microstrip calibration **CAL (Ch 6)**

Syntax: `USZ Value Units`
Value: 1.0 to 9999.99
Units: XX1, XX3, XM3, OHM

Related Commands: USE, USW

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ Zc**

USZ? Output microstrip impedance for microstrip calibration **CAL (Ch 6)**

Syntax: `USZ?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS \ USER DEFINED \ Zc**

UTFD Select user defined microstrip calibration kit **CAL (Ch 6)**

Syntax: `UTFD`

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS**

UTFX? Output microstrip cal kit selection USER/U10/U15/U25 **CAL (Ch 6)**

Syntax: UTFX?

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for USER DEFINED
1 for 10 MIL UTF
2 for 15MIL UTF
3 for 25MIL UTF kit

Front Panel Key: Cal \ **PERFORM CAL 2 PORT CAL \ LINE TYPE: MICROSTRIP \ NEXT CAL STEP \ FULL 12 TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ MICROSTRIP PARAMETERS**

V Suffix sets voltage data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: V

VELO? Output relative velocity for lowpass distance **APPL - TIME DOMAIN (Ch 10)**

Syntax: VELO?

Data I/O: Outputs relative velocity value using ASCII <NR3> format.

Front Panel Key: Appl \ **DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ RELATIVE VELOCITY**

VLT Suffix sets voltage data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: VLT

VSP Enter rear panel stop voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: VSP Value Units
Value: 00.000 to +10.000 volts
Units: V, VLT

Related Commands: VST

Front Panel Key: Utility \ **REAR PANEL \ HORIZONTAL \ STOP**

VSP? Output rear panel stop voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `VSP?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Utility **\ REAR PANEL \ HORIZONTAL \ STOP**

VST Enter rear panel start voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `VST Value Units`
Value: 00.000 to +10.000 volts
Units: V, VLT

Related Commands: VSP

Front Panel Key: Utility **\ REAR PANEL \ HORIZONTAL \ START**

VST? Output rear panel start voltage value **UTILITY - REAR PANEL (Ch 10)**

Syntax: `VST?`

Data I/O: Outputs a value in ASCII <NR3 > format.

Front Panel Key: Utility **\ REAR PANEL \ HORIZONTAL \ START**

WCO Enter waveguide cutoff frequency for user defined kit **CAL (Ch 6)**

Syntax: `WCO Value Units`
Value: 0 to current start frequency
Units: HZ, KHZ, MHZ, GHZ

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ WAVEGUIDE CUTOFF FREQ** or **PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USER DEFINED \ WAVEGUIDE CUTOFF FREQUENCY**

WCO? Output waveguide cutoff frequency for user defined kit **CAL (Ch 6)**

Syntax: `WCO?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: LRL/LRM \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ WAVEGUIDE CUTOFF FREQ** or **PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USER DEFINED \ WAVEGUIDE CUTOFF FREQUENCY**

WFS Wait full sweep until all display data is valid **REMOTE - SYNC (Ch 8)**

Syntax: `WFS`

Remarks: This command is useful before autoscaling, normalizing, or finding the minimum/maximum values (with markers). It is required when outputting data from the MS462XX to ensure that all data points in the sweep are valid. WFS is effective for dual sweeps containing forward and reverse parameters and also for insuring time domain processing is complete.

Status Reporting: Sets bit 4 in the Extended Event Status Register when complete.

Related Commands: TRS, HLD

WGCUTOFF? Output the waveguide cal kit cutoff frequency **CAL (Ch 6)**

Syntax: `WGCUTOFF?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ CUTOFF FREQ**

WGSER? Output waveguide cal kit serial number **CAL (Ch 6)**

Syntax: WGSER?

Data I/O: Outputs data using undelimited 7-bit ASCII text.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ IDENTIFIER**

WGSHOFF1? Output the waveguide cal kit short 1 offset **CAL (Ch 6)**

Syntax: WGSHOFF1?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ SHORT 1**

WGSHOFF2? Output the waveguide cal kit short 2 offset **CAL (Ch 6)**

Syntax: WGSHOFF2?

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ SHORT 2**

WIDE Use entire display width for graphs **UTILITY (Ch 9)**

Syntax: WIDE

WKD Select user defined waveguide calibration kit **CAL (Ch 6)**

Syntax: `WKD`

Related Commands: WKI

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USER DEFINED**

WKI Select installed waveguide calibration kit **CAL (Ch 6)**

Syntax: `WKI`

Related Commands: WKD

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USE INSTALLED WAVEGUIDE KIT**

WKX? Output waveguide calibration kit selection user/install **CAL (Ch 6)**

Syntax: `WKX?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
0 for USER DEFINED
1 for INSTALLED kit

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USE INSTALLED WAVEGUIDE KIT**

WLS Select low sidelobe window shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: `WLS`

Related Commands: WMS, WNM, WRT, CH1-CH4

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ WINDOW SHAPE \ LOW SIDELOBE**

WMS Select minimum sidelobe window shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: `WMS`

Related Commands: WLS, WMS, WRT, CH1-CH4

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ WINDOW SHAPE \ MIN SIDELOBE**

WNM Select nominal window shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: `WNM`

Related Commands: WLS, WMS, WRT, CH1-CH4

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ WINDOW SHAPE \ NOMINAL**

WRT Select rectangular window shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: `WRT`

Related Commands: WLS, WMS, WRT, CH1-CH4

Front Panel Key: Appl \ **DOMAIN \ TIME, LOWPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ MORE \ WINDOW SHAPE \ RECTANGULAR**

WSH1 Enter waveguide short offset 1 for user defined kit **CAL (Ch 6)**

Syntax: `WSH1 Value Units`
Value: -999.999 to +999.999
Units: M, CM, MM

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USER DEFINED \ OFFSET LENGTH OF SHORT 1**

WSH1? Output waveguide short 1 offset for user defined kit **CAL (Ch 6)**

Syntax: `WSH1?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USER DEFINED \ OFFSET LENGTH OF SHORT 1**

WSH2 Enter waveguide short offset 2 for user defined kit **CAL (Ch 6)**

Syntax: `WSH2 Value Units`
Value: -999.999 to +999.999
Units: M, CM, MM

Related Commands: WSH1

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USER DEFINED \ OFFSET LENGTH OF SHORT 2**

WSH2? Output waveguide short 2 offset for user defined kit **CAL (Ch 6)**

Syntax: `WSH2?`

Data I/O: Outputs data using ASCII <NR3> floating point values in exponential format.

Front Panel Key: Cal **\ PERFORM CAL 2 PORT CAL \ CAL METHOD: OFFSET SHORT \ LINE TYPE: WAVEGUIDE \ NEXT CAL STEP \ FULL 12-TERM \ INCLUDE ISOLATION \ NORMAL (1601 POINTS MAXIMUM) \ NEXT CAL STEP \ WAVEGUIDE PARAMETERS \ USER DEFINED \ OFFSET LENGTH OF SHORT 2**

WSX? Output window shape **APPL - TIME DOMAIN (Ch 10)**

Syntax: `WSX?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
1 for RECTANGULAR
2 for NOMINAL
3 for LOW SIDELOBE
4 for MINIMUM SIDELOBE

XM3 Suffix sets unitless data type and scales by 1E-3 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `XM3`

XMKR? Output marker mode **MARKER (Ch 7)**

Syntax: `XMKR?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for MARKERS ON ACTIVE CHANNEL MODE
1 for ACTIVE MARKER ALL CHANNELS MODE
2 for FILTER PARAMETER MEASUREMENT MODE
3 for MARKER SEARCH MARKER MODE

Related Commands: AMKR, FMKR, NMKR, SMKR, SMKRMAX, SMKRMIN

XMKRP? Output the power sweep marker mode **MARKER (Ch 7)**

Syntax: `XMKRP?`

Data I/O: Outputs data using ASCII <NR1> integer values as follows:
1 for READOUT_MRKRS_ACTIVE_CHANNEL
2 for READOUT_ACTIVE_MRKR_ALL_CHANNELS=1, READOUT_FILTER_PARAMS
3 for READOUT_SEARCH
4 for READOUT_SEARCH_X_AXIS

Related Commands: SMKRX, SMKRMAX, SMKRMIN

Front Panel Key: Markers \ **MARKER READOUT FUNCTIONS** \ **SEARCH (X-AXIS)**

XSB? Output byte order for output data LSB or MSB **REMOTE - FORMATTING (Ch 8)**

Syntax: `XSB?`

Data I/O: Outputs a value in ASCII <NR1> format as follows:
0 for LSB
1 for MSB

Related Commands: LSB, MSB

XX1 Suffix sets unitless data type **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `XX1`

XX3 Suffix sets unitless data type and scales by 1E3 **DATA ENTRY SUFFIXES (Ch 5)**

Syntax: `XX3`

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?, ZSN, ZSP, ZCT, MRR

ZCT Enter zoom range center value time or distance **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZCT Value Units`
Value: -999.999 to +999.999
Units: PSC, NSC, USC, PS, NS, MS, S, MMT, CMT, MTR, MM, CM, M

Remarks: The *value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x 10 / SQROOT of dielectric constant

Use the query command DIX? to output the value for dielectric constant. If the time domain parameter is time, *val* is assumed to be a time value. If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?, ZSN, ZSP, ZST, MRR, ZCT?

Front Panel Key: Appl **\ DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ CENTER**

ZCT? Output zoom range center value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZCT?`

Data I/O: Outputs value in ASCII <NR3> format.

Related Commands: ZCT

Front Panel Key: Appl **\ DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ CENTER**

ZSN Enter zoom range span value time or distance **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZSN Value Units`
Value: 0 to 999.999
Units: PSC, NSC, S, US, USC, PS, NS, MS, MMT, CMT, MTR, MM, CM, M

Remarks: The *value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x 10 / SQROOT of dielectric constant

Use the query command DIX? to output the value for dielectric constant. If the time domain parameter is time, *value* is assumed to be a time value. If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?, ZCT, ZSP, ZST, ZSN?

Front Panel Key: Appl \ **DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ SPAN**

ZSN? Output zoom range span value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZSN?`

Data I/O: Outputs value in ASCII <NR3> format.

Related Commands: ZSN

Front Panel Key: Appl \ **DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ SPAN**

ZSP Enter zoom range stop value time or distance **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZSP Value Units`
Value: -999.999 to +999.999
Units: PSC, NSC, S, US, USC, PS, NS, MS, MMT, CMT, MTR, MM, CM, M

Remarks: The *value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x 10 / SQROOT of dielectric constant

Use the query command DIX? to output the value for dielectric constant. If the time domain parameter is time, *value* is assumed to be a time value. If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Related Commands: DIA, DIT, DIM, DIP, DIE, DIX?, TDDIST?, ZSN, ZCT, ZST, MRR, ZSP?

Front Panel Key: Appl **\ DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ STOP**

ZSP? Output zoom range stop value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZSP?`

Data I/O: Outputs value in ASCII <NR3> format.

Related Commands: ZSP

Front Panel Key: Appl **\ DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ STOP**

ZST Enter zoom range start value time or distance **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZST Value Units`
Value: -999.999 to +999.999
Units: PSC, NSC, S, US, USC, PS, NS, MS, MMT, CMT, MTR, MM, CM, M

Remarks: The *value* limits listed above are for time only. To derive distance limits, use the equation:

distance=time limit x 299792458 x 10 / SQROOT of dielectric constant

Use the query command DIX? to output the value for dielectric constant. If the time domain parameter is time, *value* is assumed to be a time value. If the time domain parameter is distance, *value* is assumed to be a distance value.

Use the query command TDDIST? to get the time domain parameter.

Front Panel Key: Appl **\ DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ START**

ZST? Output zoom range start value **APPL - TIME DOMAIN (Ch 10)**

Syntax: `ZST?`

Data I/O: Outputs value in ASCII <NR3> format.

Related Commands: ZST

Front Panel Key: Appl **\ DOMAIN \ TIME, BANDPASS \ DISPLAY, DISTANCE (TIME) \ SETUP \ RANGE SETUP \ START**

Table 11-1. *Calibration Coefficient (Error Term) Input/Output Ordering by Calibration Type (1 of 2)*

Calibration (Related Commands)**	Calibration Coefficient (Error Term)*											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
3-Port	See Sheet 2											
12-Term (C12, A12)	EDF	ESF	ERF	ETF	ELF	EXF	EDR	ESR	ERR	ETR	ELR	EXR
1 Path 2 Port FWD (C8T, A8T)	EDF	ESF	ERF	ETF	EXF							
1 Path 2 Port REV (C8R, A8R)	EDR	ESR	ERR	ETR	EXR							
2 Path 3 Port	EF_{21}	EX_{21}	ED_1	EP_{1S}	ET_{11}	ET_{31}	EX_{31}					
Reflection Only Port 1 (CRF, ARF)	EDF	ESF	ERF									
Reflection Only Port 2 (CRR, ARR)	EDR	ESR	ERR									
Reflection Only Both Ports (CRB, ARB)	EDF	ESF	ERF	EDR	ESR	ERR						
Transmission Frequency Response FWD (CFT, AFT)	ETF	EXF										
Transmission Frequency Response REV (CRT, ART)	ETR	EXR										
Transmission Frequency Response FWD&REV (CBT, ABT)	ETF	EXF	ETR	EXR								

* See OCx and ICx Series commands.

** The commands listed in parenthesis are used to set and/or simulate calibration process (refer to Chapter 5, Calibration).

Table 11-1. *Calibration Coefficient (Error Term) Input/Output Ordering by Calibration Type (2 of 2)*

Calibration (Related Commands)**	Calibration Coefficient (Error Term)*											
	13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
3-Port	ED_{33}	ET_{31}	ET_{32}	ET_{13}	ET_{23}	ER_{33}	EL_{33}	ES_{33}	EX_{31}	EX_{32}	EX_{13}	EX_{21}
2-Path 3-Port	ET_{21}	EX_{21}	ED_{1}	EP_{1S}	ET_{11}	ET_{31}	EX_{31}					
Calibration (Related Commands)**	**Calibration Coefficient (Error Term)***											
	25	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
4-Port	ED_{4}	ET_{14}	ET_{41}	ET_{24}	ET_{42}	ET_{34}	ET_{43}	ET_{44}	EP_{4L}	EP_{4S}	EX_{14}	EX_{24}
Error Term (Cont)	**37**	**38**	**39**	**40**								
4-Port (Cont)	EX_{34}	EX_{41}	EX_{42}	EX_{43}								

Table Legend

3-Port Error Term = Eanm

2-Port Error Term = Eaw

a = Error Class

D = Directivity

T = Transmission Tracking

R = Reflection Tracking

S = Source Match

L = Load Match

X = Crosstalk and Isolation

n = Test Channel (Measurement Port)

m= Reference Channel (that is, Driving Port)

w= Forward (F), Reverse (R)

Table 11-2. *Output Values and Graph Display Types*

Graph Display Type (OFF Command)	Units per Division	Reference Value	Related Suffix Units*
Log magnitude	0.001–50	–999.999 to +999.999	DB
Phase	0.01–45	–999.999 to +999.999	
–360 to +360	DEG, RAD		
Log mag & phase	0.001–50,		
0.01–45	–999.999 to +999.999		
–360 to +360	DB,		
DEG, RAD			
Linear magnitude	1E12 to –999.999	–999.999 to +999.999	V, XX1, XX3, XM3
Linear mag & phase	1E12 to –999.999		
0.01–454	–999.999 to +999.999		
–360 to +360	V, XX1, XX3, XM3		
DEG, RAD			
Smith chart	–3, 0, 10, 20, 30	N/A	DB
Inverted Smith	–3, 0, 10, 20, 30	N/A	DB
Group delay	1E15 to 999.999 sec	999.999 sec	SEC, MS, US, NS, PS
Log polar	0.001–50,		
–360 to +360	0.001–50,		
–999.999 to –999.99	DB		
DEG, RAD			

Table 11-3. *Color Palette Numbers to be used with Model MS462X*

Palette No.	Color	Palette No.	Color	Palette No.	Color
0	Black	16	Goldenrod	32	Cyan
1	Dim Grey	17	Med. Goldenrod	33	Cadet Blue
2	Light Grey	18	Wheat	34	Sky Blue
3	Grey	19	Khaki	35	Steel Blue
4	Salmon	20	Yellow Green	36	Slate Blue
5	Firebrick	21	Green Yellow	37	Blue
6	Brown	22	Pale Green	38	Medium Blue
7	Pink	23	Lime Green	39	Blue Violet
8	Orange red	24	Green	40	Medium Orchid
9	Orange	25	Spring Green	41	Thistle
10	Red	26	Forest Green	42	Plum
11	Coral	27	Sea Green	43	Magenta
12	Gold	28	Aquamarine	44	Purple
13	Sienna	29	Med. Aquamarine	45	Maroon
14	Tan	30	Turquoise	46	Violet red
15	Yellow	31	Dark Turquoise	47	White

Table 11-4. *MS462X Options*

Models & Frequency Ranges

MS4622A: 10 MHz to 3 GHz, T/R

MS4622B: 10 MHz to 6 GHz, T/R

MS4623A: 10 MHz to 3 GHz, Full Reversing

MS4623B: 10 MHz to 6 GHz, Full Reversing

Option Number	Description	Availability
2	Time Domain	All Models
3A	2nd Internal Source	3 GHz Source – B Models
3B	2nd Internal Source	6 GHz Source – B Models
4	Noise Figure[1]	B Models Only
6	3rd Test Port	B Models Only
7	T/R Step Attenuator	A Models Only
8	Harmonic Measurement	All Models
9	External SCSI Interface	All Models
10	AutoCal Control	All Models
11	Test Port Connector	All Models[2]
12	Color LCD	A Models Only
13	Intermodulation Distortion	All Models

Footnotes:

1 – Only 50 MHz to 3 GHz

2 – Standard Connector is N-female, No cost option for 3.5 mm (male), 3.5 mm (female), N-Male, or GPC-7.

Table 11-5. *Connector Codes*

Connector codes for commands requiring a “specified connector” input, such as CONCC0?, CONCC1?, CONCC2? etc.

Code	Connector
1	SMA male
2	SMA female
3	K male
4	K female
5	N male
6	N female
7	GPC 3.5 male
8	GPC 3.5 female
9	GPC 7
11	V male
12	V female
13	TNC male
14	TNC female
15	MM 2.4 male
16	MM 2.4 female
17	N, 75 Ohm, male
18	N, 75 Ohm, female
19	Special, male
20	Special, female

Chapter 12
Instrument Data

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Chapter 12
Instrument Data

12-1 INTRODUCTION

This chapter provides general tabular information for the Model MS462XX. Much of this information is presented in previous chapters, but is repeated here for easy access. The subject of each table in this chapter is listed on the chapter Contents page

12-2 GPIB RESET CONFIGURATION

The MS462XX will be set to the default front panel setup conditions listed in Table 12-1 upon receipt of the ∗RST common command. Additionally, GPIB Remote-Only functions are set or cleared as listed in Table 12-2.

Table 12-1. *Default Front Panel Settings (1 of 2)*

Function	Default Setting
Active Menu	FREQ (Can be restored with the SETUP command)
Measurement	*Maximum Sweep Range:* Model Dependent *Source Power:* Model Dependent *Data Points:* Normal (401 points) *Measurement:* Sweep Mode, restarted *Hold:* Hold/Continue, RF and bias off in hold mode
Channel	Quad (four-channel) display Channel 1 active
Display	*Channel 1:* S11, 1:1 Smith Chart *Channel 2:* S12, Log Magnitude and Phase *Channel 3:* S21, Log Magnitude and Phase *Channel 4:* S22, 1:1 Smith Chart *Scale:* 10 dB/Division or 90°/Division *Offset:* 0.000dB or 0.00 degree *Reference Position:* Midscale *Electrical Delay:* 0.00 seconds *Dielectric:* Air (1.000649) *Normalization:* Off *Normalized Trace Data:* Erased
Enhancement	*Video IF Bandwidth:* Normal *Averaging:* Off, 1 average *Smoothing:* Off, 0%
Calibration	*Correction:* Off and Calibration erased *Trace Mode:* Off *Connector:* Model dependent *Load:* Broadband

Table 12-1. *Default Front Panel Settings (2 of 2)*

Function	Default Setting
Markers/Limits	*Markers On/Off:* All off *Markers Enabled/Disabled:* All enabled Marker Frequency: All set to the start-sweep frequency (or start -time distance Δ *Reference:* Off *Limits:* All set to reference position value
System State and Save/Recall	*Identification and Options Data:* Unchanged *GPIB Addresses:* Unchanged *Frequency Blanking :* Disengaged, *Internal Memory Saved:* Unchanged *Installed Cal Coefficients:* Unchanged
Output	*Output Type:* Printer (full screen, clear headers) *Marker and Sweep Data:* Enabled *Printout:* Every point *Headers:* Cleared and disabled
Diagnostics	*Service Log/Error Messages:* Unchanged *Internal Hardware Calibrations Data:* Unchanged *Troubleshooting:* Recovered from (that is, turned off)
Triggering	*Mode:* Internal *Automatic I.F. Cal:* On

Table 12-2. *GPIB Remote-Only Functions Status*

Memories Saved:	Memories Cleared/Changed:
Information reported via the *IDN? and *OPT? query commands. SRQ Standard Event Status Extended Event Status Limits Pass/Fail Status Enable Registers Standard, Extended, and Limits GPIB Input and Output Buffers	Trigger action for *TRG and Group Execute Trigger is set to null. Operation Complete State: Idle Data Transfer Format Defaults: FMA, MSB, DPR0

12-3 CALIBRATION COEFFICIENTS

Table 12-3 lists the calibration coefficients that are generated during the MS462XX calibration process using the Calibration Coefficients Commands (OCx - 1Cx). Refer to Chapter 8, Calibration Coefficients Data Transfer.

Table 12-3. *Calibration Coefficient (Error Term) Input/Output Ordering by Calibration Type (1 of 3)*

Calibration (Related Commands)**	Calibration Coefficient (Error Term)*											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
3-Port	See Sheet 2											
12-Term (C12, A12)	EDF	ESF	ERF	ETF	ELF	EXF	EDR	ESR	ERR	ETR	ELR	EXR
1 Path 2 Port FWD (C8T, A8T)	EDF	ESF	ERF	ETF	EXF							
1 Path 2 Port REV (C8R, A8R)	EDR	ESR	ERR	ETR	EXR							
2 Path 3 Port	EF_{21}	EX_{21}	ED_1	EP_{1S}	ET_{11}	ET_{31}	EX_{31}					
Reflection Only Port 1 (CRF, ARF)	EDF	ESF	ERF									
Reflection Only Port 2 (CRR, ARR)	EDR	ESR	ERR									
Reflection Only Both Ports (CRB, ARB)	EDF	ESF	ERF	EDR	ESR	ERR						
Transmission Frequency Response FWD (CFT, AFT)	ETF	EXF										
Transmission Frequency Response REV (CRT, ART)	ETR	EXR										

Table 12-3. *Calibration Coefficient (Error Term) Input/Output Ordering by Calibration Type (2 of 3)*

Calibration (Related Commands)**	Calibration Coefficient (Error Term)*											
	1	2	3	4	5	6	7	8	9	10	11	12
Transmission Frequency Response FWD&REV (CBT, ABT)	ETF	EXF	ETR	EXR								

* See OCx and ICx Series commands.

** The commands listed in parenthesis are used to set and/or simulate calibration process (refer to Chapter 5, Calibration).

Table 12-3. *Calibration Coefficient (Error Term) Input/Output Ordering by Calibration Type (3 of 3)*

Calibration (Related Commands)**	Calibration Coefficient (Error Term)*											
	13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
3-Port	ED_{33}	ET_{31}	ET_{32}	ET_{13}	ET_{23}	ER_{33}	EL_{33}	ES_{33}	EX_{31}	EX_{32}	EX_{13}	EX_{21}
2-Path 3-Port	ET_{21}	EX_{21}	ED_{1}	EP_{1S}	ET_{11}	TE_{31}	EX_{31}					
Calibration (Related Commands)**	**Calibration Coefficient (Error Term)***											
	25	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
4-Port	ED_{4}	ET_{14}	ET_{41}	ET_{24}	ET_{42}	ET_{34}	ET_{43}	ET_{44}	EP_{4L}	EP_{4S}	EX_{14}	EX_{24}
Error Term (Cont)	**37**	**38**	**39**	**40**								
4-Port (Cont)	EX_{34}	EX_{41}	EX_{42}	X_{43}								

Table Legend

3-Port Error Term = Eanm

2-Port Error Term = Eaw

a = Error Class

D = Directivity

T = Transmission Tracking

R = Reflection Tracking

S = Source Match

L = Load Match

X = Crosstalk and Isolation

n = Test Channel (Measurement Port)

m= Reference Channel (that is, Driving Port)

w= Forward (F), Reverse (R)

12-4 NUMERIC DATA SUFFIX MNEMONICS

Table 12-4 lists the numeric data suffix mnemonics for the Model MS462XX VNA. These mnemonics are used when entering numeric data with GPIB commands (usage of these codes is optional). Refer to Chapter 5, Data Entry Suffix Codes.

Table 12-4. *Numeric Data Suffix Mnemonics*

Code	Parameter Type	Weighting Factor
DB, DBL, DBM	Power	1.0
DEG	Phase	1.0
RAD	Phase	$180^{\circ}/\pi$
HZ	Frequency	1.0
KHZ	Frequency	10E+3
MHZ	Frequency	10E+6
GHZ	Frequency	10E+9
REU	Real	1.0
IMU	Imaginary	1.0
S	Time	1.0
MS	Time	10E-3
US, USC	Time	10E-6
NS, NSC	Time	10E-9
PS, PSC	Time	10E-12
FS	Time	10E-15
M, MTR	Distance	1.0
CM, CMT	Distance	10E-2
MM, MMT	Distance	10E-3
OHM	Impedance	1.0
V, VLT	Voltage	1.0
MV	Voltage	10E-3
K, KS	Temperature	Degrees Kelvin
XM3	Unitless	10E-3
XX1	Unitless	1.0
XX3	Unitless	10E+3

12-5 OUTPUT VALUES AND GRAPH DISPLAY TYPES

Table 12-5 lists the various characteristics that are related to the different graph types used by the MS462XX screen displays. This information relates to various input commands described throughout Chapters 5 through 10.

Table 12-5. *Graph Display Type Related Data*

Graph Display Type	Units per Division	Reference Value (OFF Command)	Related Suffix Units*
Log magnitude	0.001–50	–999.999 to +999.999	DB
Phase	0.01–45	–999.999 to +999.999 –360 to +360	DEG, RAD
Log mag & phase	0.001–50, 0.01–45	–999.999 to +999.999 –360 to +360	DB, DEG, RAD
Linear magnitude	$1E^{12}$ to –999.999	–999.999 to +999.999	V, XX1, XX3, XM3
Linear mag & phase	$1E^{12}$ to –999.999 0.01–454	–999.999 to +999.999 –360 to +360	V, XX1, XX3, XM3 DEG, RAD
Smith chart	–3, 0, 10, 20, 30	N/A	DB
Inverted Smith	–3, 0, 10, 20, 30	N/A	DB
Group delay	$1E^{15}$ to 999.999 sec	999.999 sec	SEC, MS, US, NS, PS
Log polar	0.001–50, –360 to +360	0.001–50, –999.999 to –999.99	DB DEG, RAD
Linear polar	$1E^{-12}$ to 200, –360 to +360	$5E^{-12}$ to 200, –360 to +360	V, XX1, XX3, XM3 DEG, RAD
Real	$1E^{-12}$ to +999.999	–999.999 to +999.999	REU
Imaginary	$1E^{-12}$ to +999.999	–999.999 to +999.999	IMU
Real & Imaginary	$1E^{-12}$ to +999.999	–999.999 to +999.999	REU IMU
SWR	$1E^{-12}$ to +999.999	0 to $1E^{6}$	XX1, XX3, XM3

12-6 COLOR PALETTE NUMBERS

Table 12-6 lists the Color Palette numbers (codes) that are used with the GPIB commands that control data graph and menu colors for MS462XX screen displays. Refer to Chapter 9, System State, Colorization.

Table 12-6 *Color Palette Numbers to be used with Model MS462XX*

Palette No.	Color	Palette Number	Color	Palette No.	Color
0	Black	16	Goldenrod	32	Cyan
1	Dim Grey	17	Med. Goldenrod	33	Cadet Blue
2	Light Grey	18	Wheat	34	Sky Blue
3	Grey	19	Khaki	35	Steel Blue
4	Salmon	20	Yellow Green	36	Slate Blue
5	Firebrick	21	Green Yellow	37	Blue
6	Brown	22	Pale Green	38	Medium Blue
7	Pink	23	Lime Green	39	Blue Violet
8	Orange red	24	Green	40	Medium Orchid
9	Orange	25	Spring Green	41	Thistle
10	Red	26	Forest Green	42	Plum
11	Coral	27	Sea Green	43	Magenta
12	Gold	28	Aquamarine	44	Purple
13	Sienna	29	Med. Aquamarine	45	Maroon
14	Tan	30	Turquoise	46	Violet red
15	Yellow	31	Dark Turquoise	47	White

Chapter 13
Error Messages

Table of Contents

Chapter 13
Error Messages

13-1 INTRODUCTION

This chapter provides a listing of error messages that appear on the MS462XX display or that are written to the internal software Service Log.

13-2 OPERATIONAL ERROR MESSAGES

Table 13-1 provides a listing and description of the operational error messages.

13-3 PERIPHERAL ERROR MESSAGES

Table 13-2 provides a listing and description of the peripheral-related-error messages (hard and floppy disk and GPIB). The numbered errors in this group are also written to the Service Log, since they may indicate system problems.

13-4 SELF TEST ERROR MESSAGES

Table 13-3 provides a listing and description of Self Test-related error messages. These errors are entered in the Service Log and output as part of the response of OGE/OGL commands.

13-5 TROUBLESHOOING ERROR MESSAGES

Table 13-4 provides a listing and description of troubleshooting error messages. These errors are entered in the Service Log and output as part of the response of OGE/OGL commands.

Table 13-1. *Operational Error Messages (1 of 6)*

Message	Description	Corrective Action
ALC SHAPER DAC CAL FAIL	ALC CAL fail.	Contact Anritsu.
ADSP NMI ERROR		Contact Anritsu.
DSP ST ERROR	DSP self-test fail.	Contact Anritsu.
FLASH WRITE ERROR	FLASH memory write fail.	Contact Anritsu.
FLASH ERASE ERROR	FLASH memory erase fail.	Contact Anritsu.
MEMORY TEST ERROR		
NCR ACC1 ERROR	Hard drive controller test fail.	Contact Anritsu.
NCR ACC2 ERROR	Hard drive controller test fail.	Contact Anritsu.
NCR SFIFO ERROR	Hard drive controller test fail.	Contact Anritsu.
NCR DFIFO ERROR	Hard drive controller test fail.	Contact Anritsu.
NCR LPBK ERROR	Hard drive controller test fail.	Contact Anritsu.
NCR SCRIPT ERROR	Hard drive controller test fail.	Contact Anritsu.
NCR IRQ ERROR	Hard drive controller test fail.	Contact Anritsu.
LANC SELF TEST_ERROR	LANC controller test fail.	Contact Anritsu.
LANC IRQ ERROR	LANC controller test fail.	Contact Anritsu.
LANC REG STATE ERROR	LANC controller test fail.	Contact Anritsu.
LANC DUMP TEST ERROR	LANC controller test fail.	Contact Anritsu.
LANC DIAG ERROR	LANC controller test fail.	Contact Anritsu.
LANC SCB ERROR	LANC controller test fail.	Contact Anritsu.
LANC CANT IDLE ERROR	LANC controller test fail.	Contact Anritsu.
LANC IRQ PENDING ERROR	LANC controller test fail.	Contact Anritsu.
LANC IDLE ERROR	LANC controller test fail.	Contact Anritsu.
LANC TIMEOUT ERROR	LANC controller test fail.	Contact Anritsu.
LANC CONFIGURE ERROR	LANC controller test fail.	Contact Anritsu.
LANC SETUP ERROR	LANC controller test fail.	Contact Anritsu.
LANC BCMP ERROR	LANC controller test fail.	Contact Anritsu.
LANC TRANSMIT ERROR	LANC controller test fail.	Contact Anritsu.
LANC DATA ERROR	LANC controller test fail.	Contact Anritsu.
RTC BATT LOW ERROR	Timerkeeper RAM test fail.	Contact Anritsu.
RTC NOT RUN ERROR	Timerkeeper RAM test fail.	Contact Anritsu.
RTC NOT FREEZE ERROR	Timerkeeper RAM test fail.	Contact Anritsu.
RTC CLK ERROR	Timerkeeper RAM test fail.	Contact Anritsu.

Table 13-1. *Operational Error Messages (2 of 6)*

Message	Description	Corrective Action
RTC DATA MISCOMPARE	Timerkeeper RAM test fail.	Contact Anritsu.
RTC RAM ERROR	Timerkeeper RAM test fail.	Contact Anritsu.
RTC ADDR ERROR	Timerkeeper RAM test fail.	Contact Anritsu.
RTC DATA VERIFY ERROR	Timerkeeper RAM test fail.	Contact Anritsu.
SCC RW ERROR	Serial port self-test fail.	Contact Anritsu.
SCC INTERRUPT ERROR	Serial port self-test fail.	Contact Anritsu.
SCSI INIT ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI ISTAT ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI SSTAT0 ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI SSTAT1 ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI SSTAT2 ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO NOT EMPTY ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI NCR LOOPBACK ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO BIT SET ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI SHIFT ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI INTERRUPT ENABLE ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI DEST ID ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI OUTPUT DATA LTCH REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI TRANSFER REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI CHIP ID REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI DATA STRUCT REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI TEMP STACK REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI DMA BYTE COUNTER REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI DMA NEXT DATA REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO WALK THRU ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO READ ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO READ WRITE ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO READ EMPTY ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO EMPTY ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO SET DMA ENABLE ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO CLR BITS ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO CLR PARITY BIT ERROR	Hard drive controller test fail.	Contact Anritsu.

Table 13-1. *Operational Error Messages (3 of 6)*

Message	Description	Corrective Action
SCSI FIFO LANE FULL ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO DMA PARITY BIT ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO DMA READ WRITE ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO DMA LANE FULL ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI FIFO DMA LANE EMPTY ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI BUS DATA LINES SETUP ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI DMA NEXT DATA INIT ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI DMA LOOPPBACK RW ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI DMA BYTE COUNT REG ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI GEN SGE SSTAT0 ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI GEN SGE ISTAT ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI CLR SGE SSTA0 ERROR	Hard drive controller test fail.	Contact Anritsu.
SCSI CLR SGE ISTAT ERROR	Hard drive controller test fail.	Contact Anritsu.
SEQ FILE NOT FOUND	Sequence file is not on disk.	Correct file name.
SEQ ERROR ON STATEMENT	A statement can't be used.	Recreate the statement.
SEQ EDIT BUSY	Sequence is busy in editing.	Terminate sequence edit.
SEQ EXECUTE BUSY	Sequence is in execution mode.	Terminate sequence execute.
SEQ UNKNOWN ERROR	An unknown error occurs.	Contact Anritsu.
SKT BUFF OVERWITTEN ERROR	Network buffer error.	Contact Anritsu.
SKT REGION DLTD ERROR	Network buffer error.	Contact Anritsu.
SKT REGION ID INCORRECT	Network buffer error.	Contact Anritsu.
SKT SEG NOT BELONG TO REGION	Network buffer error.	Contact Anritsu.
SKT WRONG REGION BEGIN ADDR	Network buffer error.	Contact Anritsu.
SKT SEQ DISALLOCATED ALREADY	Network buffer error.	Contact Anritsu.
SKT WRONG BUFF BEGIN ADDR	Network buffer error.	Contact Anritsu.
SKT BUFFER FREED ALREADY	Network buffer error.	Contact Anritsu.
SKT NODE SPECIFIER OUT OF RANGE	Network addressing error.	Contact Anritsu.
SKT INIT NOT COMPLETED	Network start up error.	Contact Anritsu.
SKT NO SUCH ADDRESS	Network addressing error.	Contact Anritsu.
SKT INVALID DESCRIPTOR	Network socket description error.	Contact Anritsu.
SKT NO BROADCAST ON SOCKET	Network socket error.	Contact Anritsu.
SKT ENTRY DUPLIATED	Network table error.	Contact Anritsu.
SKT INVALID ARGUMENT	Network table error.	Contact Anritsu.

Table 13-1. *Operational Error Messages (4 of 6)*

Message	Description	Corrective Action
SKT OUT OF INTERNAL TABLE SPACE	Network table error.	Contact Anritsu.
SKT SOCKET DISCONNECTED	Socket has been removed from table.	
SKT BLOCK ON NON-BLOCK SOCKET	Network trasmission is blocked.	Receive all output.
SKT INVALID DESCRIPTOR	Socket has been removed.	
SKT INCOMPLETED CONN ON NON-SKT	Network connection error.	
SKT INVALID DESTINATION ADDR	Unreachable destination.	Clear table.
SKT DATA TRANSMITTED NOT IN UNIT	Fragmental transmission.	
SKT INVALID OPTNAME/LEVEL		
SKT INVALID OPERATION ON SOCKET		
SKT MEMBER NOT IN AF_INET	Invalid protocol.	
SKT SPECIFIED ADDR IN USE	Invalid network addressing.	
SKT ADDRESS NOT AVAILABLE	Invalid network addressing.	
SKT NOT REACHABLE DESTINATION	Unreachable destination.	
SKT PEER ABORTED CONNECTION	Peer networked unit may be power down.	
SKT PEER RESET CONNECTION	Peer networked unit resets connection.	
SKT ALLOCATION ON INTERNAL BUFF		
SKT SOCKET ALREADY CONNECTED	Duplicate in connection.	
SKT SOCKET NOT CONNECTED	Connection is brokent.	
SKT CONNECTION REQUEST REFUSED	A connection request is rejected.	
SKT ROUTE NOT FOUND	A routing address is not found.	
SKT COLLISION IN SELECT	An error on select a socket.	
SKT INVALID TASK ID	An invalid task ID.	
SKT INQUE NULL ERROR	Buffering error	Contact Anritsu.
SKT INQUE ERROR	Buffering error	Contact Anritsu.
SKT INQUE NO MEMORY ERROR	Buffering errror	Contact Anritsu.
SKT SOCKET NOT FOUND ERROR	Socket doesn't exist.	Contact Anritsu.
SKT UNKNOWN ERROR		Contact Anritsu.
AUTOCAL ASSURANCE FAIL SUMMARY		None
LC VERIFY FAIL		
SRC PWR CHANGED AFTER CAL		
ATTEN CHANGED AFTER CAL		

Table 13-1. *Operational Error Messages (5 of 6)*

Message	Description	Corrective Action
CAL DATE TOO OLD	Calibration data is too old to use.	Redo a calibration.
CAL COEFF NOT INSTALLED	Calibration coefficietn data is not install.	Install the data.
TEMP TOO HIGH	Temperature is too high to accept.	Decrease temperature.
TOO HIGH TEMP CHANGE	Temperature is too high to change to.	Decrease the need temperature.
H/W RETUNED SINCE CAL		
BAD FILENAME	File name is not acceptable.	Re-enter the file name according to the rule.
CAL MAY BE INVALID	Calibration data may not be applicable for the current application.	Check the calibration.
FLAT CAL MAY BE INVALID	Flat calibration data invalid.	Redo a flat calibration.
FLAT PWR TURNED OFF	Flat power is off.	
HARD COPY OUTPUT ABORTED	An abort of hardcopy out is performed.	
CORRECTION UNAVAILABLE	No correction is done for the channel's parameter.	
TIME DOMAIN INVALID	Time domain value is not valid.	
GATE MUST BE ON		
SMOOTHING INVALID		
MEMORY DATA INVALID	Memory may be corrupted.	Contact Anritsu.
NEED HARMONIC SWEEP		
NON-LOCKED REF N/A		
PARAMETER INVALID		
CORRUPT OR INCOMPATIBLE FILE		
NOT ALLOWED AT THIS TIME		
STORED SWP FREQS CLEARED		
HARD COPY DATA CAPTURE FAILED	A hardcopy of data can't be made.	
PRINTER BUSY	Printer is busy in performing other task.	Check connection or wait.
VALUE NOT FOUND	The need value is not found in the system.	
OUT OF SOURCE CONTROL RANGE	The value is not in the control range.	Correct the value.
ABORTED: INCOMPATIBLE FILES	Not an acceptable file type.	
POWER OUT OF CALIBRATED RANGE	Power is not in the range of CAL.	

Table 13-1. *Operational Error Messages (6 of 6)*

Message	Description	Corrective Action
LOGO FILE NOT FOUND	LOGO file is not on the disk.	Create a LOGO file and re-load.
POWER RESTORED TO CAL RANGE		
FREQUENCIES NOT SET		
MULTIPLE SOURCE MODE ACTIVE		
SYSTEM IMPEDANCES CHANGED		
NON-STD CONNECTOR IMPEDANCE		
NON-STD BAND DEFINITION		
NOT ALLOWED DURING IF CAL		
TRACE MATH APPLIED		
THREE PORT CORRECTION		

Table 13-2. *Peripherals (Hard and Floppy Disks and GPIB) Error Messages (1 of 2)*

Code	Message	Description	Corrective Action
7100	FILE MARKED READ ONLY	Can't perform a write.	Mark the file to write accessable if needed.
7140	GENERAL FLOPPY DRIVE FAIL	Invalid disk media or format.	Reformat disk in the MS462XX.
7142	FLOPPY DISK READ ERROR	Can't perform a read.	Reformat disk in the MS462XX.
7143	FLOPPY DISK WRITE ERROR	Can't performa a write.	Reformat disk in the MS462XX.
7146	FLOPPY DISK CHANGED	Not the same disk.	Insert the same disk.
7147	FLOPPY DISK UNAVAILABLE	Can't access floppy disk.	Check the MX462X supports floopy disk.
7169	FLOPPY INIT FAIL	Can't initial floppy disk.	Check if it is a bad disk.
7170	GENERAL HARD DISK FAIL	Can't access hard disk.	Check if there is a hard disk or bad connection.
7172	HARD DISK READ ERROR	Can't perform a read.	Check if the disk is compatible.
7173	HARD DISK WRITE ERROR	Can't perform a write.	Check if the disk is compatible.
7177	HARD DISK UNAVAILABLE	Can't access hard disk.	Check if there is a hard disk or bad connection.
7199	HARD DISK INIT FAIL	Can't initialize hard disk.	Check if the disk is compatible or bad connection.
7200	IEEE 488.2 GPIB BUS ERROR	See Chapter 8.	
7203	NO LISTENER ON BUS	See Chapter 8.	
7204	GPIB COMMAND ERROR	See Chapter 8.	
7205	GPIB EXECUTION ERROR	See Chapter 8.	
7206	GPIB DEVICE SPECIFIC ERROR	See Chapter 8.	
7207	GPIB QUERY ERROR	See Chapter 8.	
7210	DEDICATED GPIB BUS ERROR	See Chapter 8.	
7220	PLOTTER NOT RESPONDING	Plotter doesn't respond to the operation	Check if bad connection occurred or power off.
7221	PLOTTER NOT READY	Plotter is not ready.	Wait until it is not busy or check if bad connection occurred.
7222	PLOTTER OUT OF PAPER	There is no paper.	Place paper.
7223	PLOTTER PEN UP	Pen is not ready.	Place pen in right position.
7230	POWER METER NOT RESPONDING	Power meter is not ready.	Check if bad connection occurred.

Table 13-2. *Peripherals (Hard and Floppy Disks and GPIB) Error Messages (2 of 2)*

Code	Message	Description	Corrective Action
7250	EXT SOURCE NOT RESPONDING	External source is not ready.	Check if bad connection occurred.
7310	PRINTER NOT RESPONDING	Printer is not ready.	Check if bad connection or power off.
7311	PRINTER NOT READY	Printer is not ready.	Check if bad connection.
7312	PRINTER OUT OF PAPER	Printer is out of paper.	Place paper.
7330	SERIAL PORT ERROR		
7340	ETHERNET PORT ERROR		
7350	EXT TRIG RATE TOO FAST		
7410	EXT KYBD ERROR	External keyboard error.	Check connection.
8100	PWR FAIL		
8120	GENERAL MEMORY FAIL		
8121	NON-VOLATILE MEMORY FAIL		
8130	PROCESSING FAIL		
8140	GENERAL DISK BUFFER ERROR		

Table 13-3. *Self Test Error Messages (1 of 3)*

Code	Message	Code	Message
0002	SRC1 COMM FAIL	0114-1	A TO D EXT ANA OUTP FAIL -10V
0003	SRC2 COMM FAIL	0114-2	A TO D EXT ANA OUTP FAIL 0V
0005	PWR SUPPLY UP +5V	0114-3	A TO D EXT ANA OUTP FAIL +10V
0006	PWR SUPPLY UP +15V	0116	BATTERY TEST FAIL
0007	PWR SUPPLY UP -15V	0117	SRAM DISK CHECK FAIL
0008	PWR SUPPLY UP +12V	0119	SCSI CHECK FAIL
0009	PWR SUPPLY UP -125V	0120	ETHERNET CHECK FAIL
0010	PWR SUPPLY UP +10V	0121	SERIAL PORT FAIL
0011	PWR SUPPLY BB +28V	0125	DSP SRAM FAIL
0012	PWR SUPPLY BB +5V	0126	DSP FAIL
0013	PWR SUPPLY BB +6.5V	0127	REAL TIME CLOCK TEST FAIL
0014	PWR SUPPLY BB -13.4V	0128	ST RTC FAIL
0015	PWR SUPPLY BB -10V	0201	FTGD REFERENCE FAIL
0016	PWR SUPPLY BB +28VN	0300	SRC2 COMM FAIL
0017	OPTIONS BOARD PWR SUPPLY +12V	0302	SRC2 OFST LCK IND FAIL
0018	OPTIONS BOARD PWR SUPPLY -12V	0303-1	SRC2 OFST TUNE VOL FAIL 850MHZ
0019	OPTIONS BOARD PWR SUPPLY -5V	0303-2	SRC2 OFST TUNE VOL FAIL 120MHZ
0020	OPTIONS BOARD PWR SUPPLY +5V	0303-3	SRC2 OFST TUNE VOL FAIL 1550MHZ
0021	FTGD SYNTH LOCK DET PWR SUPPLY	0304	SRC2 MCOM LCK IND FAIL
0022	PWR SUPPLY UP -5V	0305-1	SRC2 MCOM TUNE VOL FAIL 850MHZ
0092	ETHERNET TEST FAILED	0305-2	SRC2 MCOM TUNE VOL FAIL 1200MHZ
0095	PRNT INTERFACE TEST FAILED	0305-3	SRC2 MCOM TUNE VOL FAIL 1550MHZ
0097	GPIB INTERFACE TEST FAILED	0306	SRC2 M NOCOM LCK IND FAIL
0099	SELF TEST FAILED	0307-1	SRC2 M NOCOM TUNE VOL FAIL 850MHZ
0101	BBRAM CHECK FAIL	0307-2	SRC2 M NOCOM TUNE VOL FAIL 1200MHZ
0102	SRAM CHECK FAIL	0307-3	SRC2 M NOCOM TUNE VOL FAIL 1550MHZ
0106	CLOCK NOT RUNNING	0308	SRC2 FREQ PATH BAND1 FAIL
0107	EXT KEYB CNTRL FAIL	0309	SRC2 FREQ PATH BAND2 FAIL
0108	FLOPPY DISK CNTRL FAIL	0310	SRC2 FREQ PATH BAND3 FAIL
0109	VRAM CHECK FAIL	0311	SRC2 FREQ PATH BAND4 FAIL
0110	FRONT PANEL CNTRL FAIL	0312	SRC2 FREQ PATH BAND5 FAIL
0111	ROTARY KNOB FAIL	0313	SRC2 FREQ PATH BAND6 FAIL

Table 13-3. *Self Test Error Messages (2 of 3)*

Code	Message	Code	Message
0314	SRC2 FREQ PATH BAND7 FAIL	0409-2	SRC1 M NOCOM TUNE VOL FAIL 1200MHZ
0315	SRC2 FREQ PATH BAND8 FAIL	0409-3	SRC1 M NOCOM TUNE VOL FAIL 1550MHZ
0316	SRC2 FREQ PATH BAND9 FAIL	0410	LO1 OFST LCK IND FAIL
0317	SRC2 FREQ PATH BAND10 FAIL	0411-1	LO1 OFST TUNE VOL FAIL 850MHZ
0318-1	SRC2 PWR LEVEL DAC FAIL -10V	0411-2	LO1 OFST TUNE VOL FAIL 1200MHZ
0318-2	SRC2 PWR LEVEL DAC FAIL -5V	0411-3	LO1 OFST TUNE VOL FAIL 1550MHZ
0318-3	SRC2 PWR LEVEL DAC FAIL 0V	0412	LO1 MAIN LCK IND FAIL
0320	SRC2 FREQ PATH BAND1 FAIL	0413-1	LO1 MAIN TUNE VOL FAIL 850MHZ
0321	SRC2 FREQ PATH BAND2 FAIL	0413-2	LO1 MAIN TUNE VOL FAIL 1200MHZ
0322	SRC2 FREQ PATH BAND3 FAIL	0413-3	LO1 MAIN TUNE VOL FAIL 1550MHZ
0323	SRC2 FREQ PATH BAND4 FAIL	0414	SRC1 FREQ PATH BAND1 FAIL
0324	SRC2 FREQ PATH BAND5 FAIL	0415	SRC1 FREQ PATH BAND2 FAIL
0325	SRC2 FREQ PATH BAND6 FAIL	0416	SRC1 FREQ PATH BAND3 FAIL
0326	SRC2 FREQ PATH BAND7 FAIL	0417	SRC1 FREQ PATH BAND4 FAIL
0327	SRC2 FREQ PATH BAND8 FAIL	0418	SRC1 FREQ PATH BAND5 FAIL
0328	SRC2 FREQ PATH BAND9 FAIL	0419	SRC1 FREQ PATH BAND6 FAIL
0329	SRC2 FREQ PATH BAND10 FAIL	0420	SRC1 FREQ PATH BAND7 FAIL
0400	SRC1 COMM FAIL	0421	SRC1 FREQ PATH BAND8 FAIL
0401	HET PHS LCK IND FAIL	0422	SRC1 FREQ PATH BAND9 FAIL
0402-1	HET TUNE VOL FAIL 850MHZ	0423	SRC1 FREQ PATH BAND10 FAIL
0402-2	HET TUNE VOL FAIL 1200MHZ	0424-1	SRC1 PWR LEVEL DAC FAIL -10V
0402-3	HET TUNE VOL FAIL 1550MHZ	0424-2	SRC1 PWR LEVEL DAC FAIL -5V
0404	SRC1 OFST LCK IND FAIL	0424-3	SRC1 PWR LEVEL DAC FAIL 0V
0405-1	SRC1 OFST TUNE VOL FAIL 850MHZ	0426	SRC1 ALC CAL BAND1 FAIL
0405-2	SRC1 OFST TUNE VOL FAIL 120MHZ	0427	SRC1 ALC CAL BAND2 FAIL
0405-3	SRC1 OFST TUNE VOL FAIL 1550MHZ	0428	SRC1 ALC CAL BAND3 FAIL
0406	SRC1 MCOM LCK IND FAIL	0429	SRC1 ALC CAL BAND4 FAIL
0407-1	SRC1 MCOM TUNE VOL FAIL 850MHZ	0430	SRC1 ALC CAL BAND5 FAIL
0407-2	SRC1 MCOM TUNE VOL FAIL 1200MHZ	0431	SRC1 ALC CAL BAND6 FAIL
0407-3	SRC1 MCOM TUNE VOL FAIL 1550MHZ	0432	SRC1 ALC CAL BAND7 FAIL
0408	SRC1 M NOCOM LCK IND FAIL	0433	SRC1 ALC CAL BAND8 FAIL
0409-1	SRC1 M NOCOM TUNE VOL FAIL 850MHZ	0434	SRC1 ALC CAL BAND9 FAIL

Table 13-3. *Self Test Error Messages (3 of 3)*

Code	Message	Code	Message
0435	SRC1 ALC CAL BAND10 FAIL	0505	REFERENCE GAIN RANGING FAIL
0501	INTERNAL 10MHZ FAIL		
0502	REFERENCE CHANNEL FAIL		
0503	TEST CHANNEL FAIL		
0504	TEST GAIN RANGING FAIL		

Table 13-4. *Troubleshooting Error Codes (1 of 2)*

Code	Message
0912	BBRAM CHECK FAIL
0913	SRAM CHECK FAIL
0914	SCSI DEVICE FAIL
0915	MCCHIP FAIL
0915	MCCHIP TIMER 1 FAIL
0916	MCCHIP TIMER 2 FAIL
0919	CLOCK NOT RUNNING
1312	EXT KEYBD CNTRL FAIL
1313	FLOPPY DISK CNTRL FAIL
1411	A14 VME BUS INTERFACE FAIL
1512	VRAM CHECK FAIL
1611	HARD DISK CONTROL FAIL
1811	AUXILLARY IO FAIL
1912	FRONT PANEL CNTRL FAIL
1913	ROTARY KNOB FAIL
2115	SRC F TUNE PATH BND1 FAIL
2116	SRC F TUNE PATH BND2 FAIL
2117	SRC F TUNE PATH BND3 FAIL
2118	SRC F TUNE PATH BND4 FAIL
2119	SRC F TUNE PATH BND5 FAIL
2120	SRC F TUNE PATH BND6 FAIL
2121	SRC F TUNE PATH BND7 FAIL
2122	SRC F TUNE PATH BND8 FAIL
2123	SRC F TUNE PATH BND9 FAIL
2124	SRC F TUNE PATH BND10 FAIL
2125	SRC PWR LEVEL DAC FAIL
2126	SRC DETECTOR ZERO CAL FAIL
2127	SRC ALC CAL BND1 FAIL
2128	SRC ALC CAL BND2 FAIL
2129	SRC ALC CAL BND3 FAIL
2130	SRC ALC CAL BND4 FAIL

Code	Message
0912	BBRAM CHECK FAIL
2131	SRC ALC CAL BND5 FAIL
2132	SRC ALC CAL BND6 FAIL
2133	SRC ALC CAL BND7 FAIL
2134	SRC ALC CAL BND8 FAIL
2135	SRC ALC CAL BND9 FAIL
2136	SRC ALC CAL BND10 FAIL
4101	LO1 CAL FAIL
4102	LO1 CAL LOCK FAIL
4103	LO1 CAL VERIFY VOLT FAIL
4104	LO1 CAL VERIFY DAC FAIL
4105	LO1 CAL VERIFY LOCK FAIL
4201	LO2 MAIN CAL FAIL
4202	LO2 MAIN CAL LOCK FAIL
4203	LO2 MAIN VERIFY VOLT FAIL
4204	LO2 MAIN VERIFY DAC FAIL
4205	LO2 OFFSET CAL FAIL
4206	LO2 OFFSET CAL LOCK FAIL
4207	LO2 OFFST VERIFY VOLT FAIL
4208	LO2 OFFST VERIFY DAC FAIL
4209	LO2 CAL VERIFY LOCK FAIL
4401	SRC ALC LOG AMP CAL FAIL
4402	SRC ALC CAL VERIFY FAIL
4451	SLT CAL FAIL
4452	SLT CAL LOCK FAIL
4453	SLT CAL OUT OF RANGE FAIL
4454	SLT CAL VERIFY FAIL
4500	IF CAL FAIL
5110	RF PWR UNLEVELED
5210	REF A CHAN RF OVERLOAD
5220	REF B CHAN RF OVERLOAD

Table 13-4. *Troubleshooting Error Codes (2 of 2)*

Code	Message
0912	BBRAM CHECK FAIL
5230	TA CHAN RF OVERLOAD
5240	TB CHAN RF OVERLOAD

Part 4 Supplemental Data

This part consists of four appendices that provide supplemental data that will aid in understanding the MS462XX programming material.

Appendix A – *contains a primer for the IEEE 488 GPIB. This primer is intended to assist new users in understanding GPIB basics.*

Appendix B – *provides a quick reference to all MS462XX GPIB commands. Each reference lists the command name, a brief description of the command function, and a reference to the pertinent chapter in this manual.*

Appendix C – *provides description and codes for the HP8753D Language Support.*

Appendix A
Introduction to the IEEE 488 Bus

Table of Contents

Appendix A Introduction to the IEEE 488 Bus

A-1 INTRODUCTION

This appendix contains general descriptions of the IEEE 488 Bus, generally known as the General Purpose Interface Bus (GPIB).

A-2 IEEE 488.2 STANDARD

The IEEE 488.2 Standard specifies the use of protocols, formats, and certain common commands for use with the GPIB. The applicable information regarding IEEE 488.2 usage for the MS462XX is documented throughout the MS462XX Programming Manual where used.

A-3 IEEE 488.1 BUS OVERVIEW

The IEEE-488 General Purpose Interface Bus (GPIB) is an instrumentation interface for integrating instruments, computers, printers, plotters, and other measurement devices into systems. The GPIB uses 16 signal lines to effect transfer of information between all devices connected on the bus.

The following requirements and restrictions apply to the GPIB.

- No more than 15 devices can be interconnected by one contiguous bus; however, an instrumentation system may contain more than one interface bus.
- The maximum total cumulative cable length for one interface bus may not exceed twice the number of devices connected (in meters), or 20 meters whichever is less.
- A maximum data rate of 1 Mb/s across the interface on any signal line.
- Each device on the interface bus must have a unique address, ranging from 00 to 30.

The devices on the GPIB are connected in parallel, as shown in Figure A-1. The interface consists of 16 signal lines and 8 ground lines in a shielded cable. Eight of the signal lines are the data lines, DIO 1 thru DIO 8. These data lines carry messages (data and commands), one byte at a time, among the GPIB devices. Three of the remaining lines are the handshake lines that control the transfer of message bytes between devices. The five remaining signal lines are referred to as interface management lines.

The following paragraphs provide an overview of the GPIB including a description of the functional elements, bus structure, bus data transfer

process, interface management bus, device interface function requirements, and message types.

A-4 IEEE 488 BUS FUNCTIONAL ELEMENTS

Effective communications between devices on the GPIB requires three functional elements; a talker, a listener, and a controller. Each device on the GPIB is categorized as one of these elements depending on its current interface function and capabilities.

Talker A talker is a device capable of sending device-dependent data to another device on the bus when addressed to talk. Only one GPIB device at a time can be an active talker.

Listener A listener is a device capable of receiving device-dependent data from another device on the bus when addressed to listen. Any number of GPIB devices can be listeners simultaneously.

Controller A controller is a device, usually a computer, capable of managing the operation of the GPIB. Only one GPIB device at a time can be an active controller. The active controller manages the transfer of device-dependent data between GPIB devices by designating who will talk and who will listen.

System Controller The system controller is the device that always retains ultimate control of the GPIB. When the system is first powered-up, the system controller is the active controller and manages the GPIB. The system controller can pass control to a device, making it the new active controller. The new active controller, in turn, may pass control on to yet another device. Even if it is not the active controller, the system controller maintains control of the Interface Clear (IFC) and Remote Enable (REN) interface management lines and can thus take control of the GPIB at anytime.

A-5 IEEE 488 BUS STRUCTURE

The GPIB uses 16 signal lines to carry data and commands between the devices connected to the bus. The interface signal lines are organized into three functional groups.

- Data Bus (8 lines)
- Data Byte Transfer Control Bus (3 lines)
- General Interface Management Bus (5 lines)

The signal lines in each of the three groups are designated according to function. Table A-1 lists these designations.

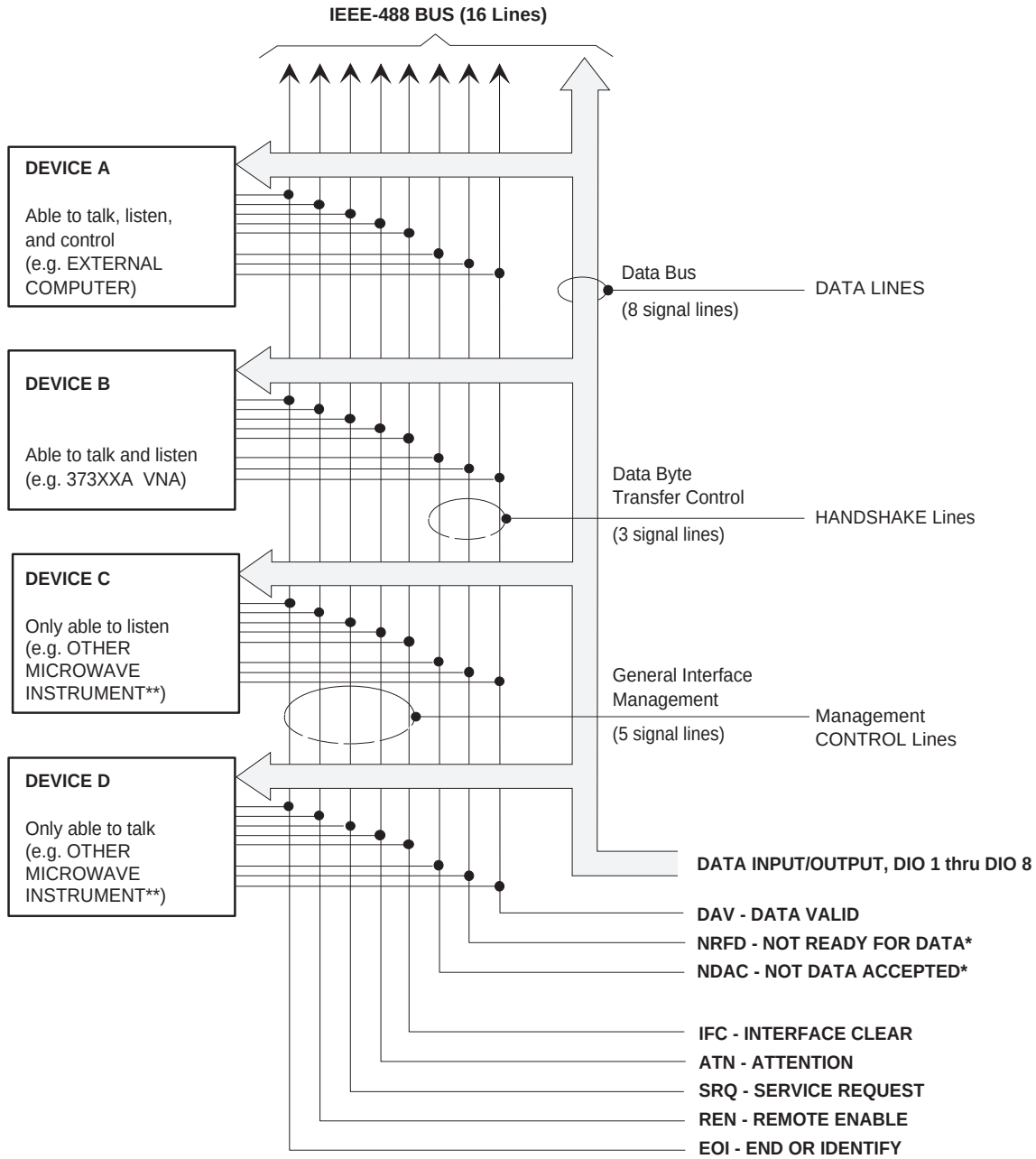
Table A-1. *Interface Bus Signal Line Designations*

Bus Type	Signal Line Name	Function
Data Bus	DIO1–DIO8	Data Input/Output, 1 thru 8
Data Byte Transfer and Control	DAV	Data Available
	NRFD	Not Ready For Data
	NDAC	Not Data Accepted
General Interface Control	ATN	Attention
	IFC	Interface Clear
	SRQ	Service Request
	REN	Remote Enable
	EOI	End Or Identify

A-6 IEEE 488 DATA BUS DESCRIPTION

The data bus is the conduit for the transfer of data and commands between the devices on the GPIB. It contains eight bi-directional, active-low signal lines—DIO 1 thru DIO 8. Data and commands are transferred over the data bus in byte-serial, bit-parallel form. This means that one byte of data (eight bits) is transferred over the bus at a time. DIO 1 represents the least-significant bit (LSB) in this byte and DIO 8 represents the most-significant bit (MSB). Bytes of data are normally formatted in seven-bit ASCII (American Standard Code for Information Interchange) code. The eighth (parity) bit is not used.

Each byte placed on the data bus represents either a command or a data byte. If the Attention (ATN) interface management line is TRUE while the data is transferred, then the data bus is carrying a bus command which is to be received by every GPIB device. If ATN is FALSE, then a data byte is being transferred and only the active listeners will receive that byte.



* Negation is represented by low state on these two lines

** The configuration shown in this diagram depicts an external computer connected via GPIB to a 373XXA Vector Network Analyzer and other microwave instruments (if used).

Figure A-1. *Interface Connections and Bus Structure*

A-7 DATA BYTE TRANSFER CONTROL BUS DESCRIPTION

Control of the transfer of each byte of data on the data bus is accomplished by a technique called the three-wire handshake, which involves the three signal lines of the Data Byte Transfer Control Bus. This technique forces data transfers at the speed of the slowest listener, which ensures data integrity in multiple listener transfers. One line (DAV) is controlled by the talker, while the other two (NRFD and NDAC) are wired-OR lines shared by all active listeners. The handshake lines, like the other GPIB lines, are active low. The technique is described briefly in the following paragraphs and is depicted in Figure A-2. For further information, refer to ANSI/IEEE Std 488.1.

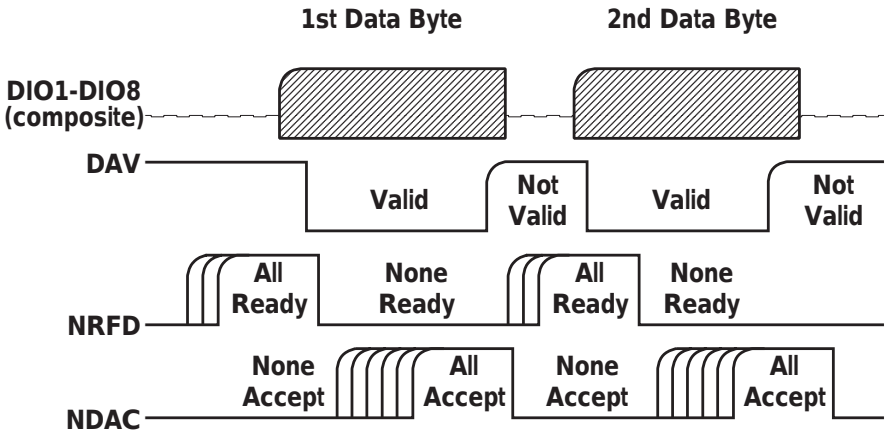


Figure A-2. *Typical GPIB Handshake Operation*

DAV *Data Valid*
This line is controlled by the active talker. Before sending any data, the talker verifies that NDAC is TRUE (active low) which indicates that all listeners have accepted the previous data byte. The talker then places a byte on the data lines and waits until NRFD is FALSE (high), which indicates that all addressed listeners are ready to accept the information. When both NRFD and NDAC are in the proper state, the talker sets the DAV line TRUE (active low) to indicate that the data on the bus is valid (stable).

NRFD *Not Ready For Data*
This line is used by the listeners to inform the talker when they are ready to accept new data. The talker must wait for each listener to set

the NRFD line FALSE (high), which they will do at their own rate. This assures that all devices that are to accept the data are ready to receive it.

NDAC *Not Data Accepted*

This line is also controlled by the listeners and is used to inform the talker that each device addressed to listen has accepted the data. Each device releases NDAC at its own rate, but NDAC will not go FALSE (high) until the slowest listener has accepted the data byte.

A-8 GENERAL INTERFACE MANAGEMENT BUS DESCRIPTION

The general interface management bus is a group of five signal lines used to manage the flow of information across the GPIB. A description of the function of each of the individual control lines is provided below.

ATN *Attention*
The active controller uses the ATN line to define whether the information on the data bus is a command or is data. When ATN is TRUE (low), the bus is in the command mode and the data lines carry bus commands. When ATN is FALSE (high), the bus is in the data mode and the data lines carry device-dependent instructions or data.

EOI *End or Identify*
The EOI line is used to indicate the last byte of a multibyte data transfer. The talker sets the EOI line TRUE during the last data byte.

The active controller also uses the EOI line in conjunction with the ATN line to initiate a parallel poll sequence.

IFC *Interface Clear*
Only the system controller uses this line. When IFC is TRUE (low), all devices on the bus are placed in a known, quiescent state (unaddressed to talk, unaddressed to listen, and service request idle).

REN *Remote Enable*
Only the system controller uses this line. When REN is set TRUE (low), the bus is in the remote mode and devices are addressed either to listen or to talk. When the bus is in remote and a device is addressed, it receives instructions from the GPIB rather than from its front panel. When REN is set FALSE (high), the bus and all devices return to local operation.

SRQ *Service Request*
The SRQ line is set TRUE (low) by any device requesting service by the active controller.

MS462XX Vector Network Measurement System

GPIB QUICK REFERENCE GUIDE

This manual supplements the MS462XX Programming Manual. Insert it behind the tab marked Appendix B, GPIB Quick Reference Guide in that manual.

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MS462X VNMS GPIB Quick Reference Guide

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MS462X VNMS
GPIB Quick Reference Guide

1. *INTRODUCTION*

This appendix provides a quick reference to the MS462X GPIB Programming commands.

2. *GENERAL*

This guide is divided into two listings. Table 1, beginning on page 4, provides an alphabetical listing of all MS462X commands. These commands are also listed alphabetically and fully described in the MS462X Programming Manual, Chapter 11.

Table 2, beginning on page 88, provides a command listing that is functionally grouped. These function groups are described in Chapters 5 thru 10 of the MS462X Programming Manual.

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
*CLS	Clear status bytes and structures	REMOTE - IEEE 488.2 (Ch 8)
*DDT	Enter the 488.2 define device trigger command string	REMOTE - IEEE 488.2 (Ch 8)
*ESE	Enter the 488.2 standard event status enable mask	REMOTE - IEEE 488.2 (Ch 8)
*ESE?	Output the 488.2 standard event status enable mask	REMOTE - IEEE 488.2 (Ch 8)
*ESR?	Output the 488.2 standard event status register value	REMOTE - IEEE 488.2 (Ch 8)
*IDN?	Output the 488.2 instrument identification string	REMOTE - IEEE 488.2 (Ch 8)
*IST?	Output the value of the *ist* message	REMOTE - IEEE 488.2 (Ch 8)
*OPC	Initiate the 488.2 operation complete sequence	REMOTE - IEEE 488.2 (Ch 8)
*OPC?	Initiate the 488.2 operation complete query sequence	REMOTE - IEEE 488.2 (Ch 8)
*OPT?	Output the 488.2 options installed string	REMOTE - IEEE 488.2 (Ch 8)
*PRE	Enter the 488.2 parallel poll register enable mask	REMOTE - IEEE 488.2 (Ch 8)
*PRE?	Output the 488.2 parallel poll register enable mask	REMOTE - IEEE 488.2 (Ch 8)
*RST	Resets the instrument	REMOTE - IEEE 488.2 (Ch 8)
*SRE	Enter the 488.2 service request enable mask	REMOTE - IEEE 488.2 (Ch 8)
*SRE?	Output the 488.2 service request enable mask	REMOTE - IEEE 488.2 (Ch 8)
*STB?	Output the 488.2 status byte value	REMOTE - IEEE 488.2 (Ch 8)
*TRG	Initiate a group execute trigger sequence	REMOTE - IEEE 488.2 (Ch 8)
*TST?	Perform self test and output status	REMOTE - IEEE 488.2 (Ch 8)
*WAI	Wait to continue	REMOTE - IEEE 488.2 (Ch 8)
2PATH3PORT	Select 2-path 3-port calibration method	CAL (Ch 6)
A12	Simulate 12-term calibration	CAL (Ch 6)
A120	Simulate 12-term calibration and initialize all 2-port correction coefficients	CAL (Ch 6)
A24	Simulate 3-port calibration	CAL (Ch 6)
A3P	Simulate 3-port calibration	CAL (Ch 6)
A3P0	Simulate 3-port calibration and initialize all 3-port correction coefficients	CAL (Ch 6)
A40	Simulate 4-port calibration	CAL (Ch 6)
A4P	Simulate 4-port calibration	CAL (Ch 6)
A4P0	Simulate 4-port calibration and initialize all 4-port correction coefficients	CAL (Ch 6)
A8R	Simulate 1-path 2-port calibration reverse path	CAL (Ch 6)
A8T	Simulate 1-path 2-port calibration forward path	CAL (Ch 6)
ABORTCAL	Abort calibration and keep existing calibration data	CAL (Ch 6)
ABSPHASE0	Turn absolute phase OFF	APPL (Ch 10)
ABSPHASE1	Turn absolute phase ON	APPL (Ch 10)
ABSPHASE?	Output the absolute phase ON/OFF status	APPL (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ABT	Simulate translation frequency response calibration forward and reverse	CAL (Ch 6)
AC2PBTYPE	Set AutoCal to 2-port box type	CAL - AUTOCAL (Ch 6)
AC4PBTYPE	Set AutoCal to 4-port box type	CAL - AUTOCAL (Ch 6)
ACAA	Set AutoCal standard to assurance	CAL - AUTOCAL (Ch 6)
ACADIR1	Enter directivity 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR1?	Output directivity 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR2	Enter directivity 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR2?	Output directivity 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR3	Enter directivity 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR3?	Output directivity 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADPL	Enter adapter length for AutoCal	CAL - AUTOCAL (Ch 6)
ACADPL?	Output adapter length for AutoCal	CAL - AUTOCAL (Ch 6)
ACADR	Set AutoCal type to adapter removal	CAL - AUTOCAL (Ch 6)
ACADTL	Adapter connected to “LEFT” port of the 2-port AutoCal box	CAL - AUTOCAL (Ch 6)
ACADTR	Adapter connected to “RIGHT” port of the 2-port AutoCal box	CAL - AUTOCAL (Ch 6)
ACADTX?	Output adapter removal port “LEFT” or “RIGHT” in the 2-port AutoCal box that the adapter is connected to	CAL - AUTOCAL (Ch 6)
ACAL1R2	Set adapter removal port to ADAPT & L=1 and R=2	CAL - AUTOCAL (Ch 6)
ACALM1	Enter load match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM1?	Output load match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM2	Enter load match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM2?	Output load match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM3	Enter load match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM3?	Output load match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACAP?	Output ports configuration for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACAR1L2	Set adapter removal port to ADAPT & R=1 and L=2	CAL - AUTOCAL (Ch 6)
ACARET1	Enter reflection tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARET1?	Output reflection tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARET2	Enter reflection tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARET2?	Output reflection tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARP?	Output adapter removal port configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACAS?	Output AutoCal assurance status	CAL - AUTOCAL (Ch 6)
ACASRC1	Enter source match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC1?	Output source match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC2	Enter source match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC2?	Output source match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC3	Enter source match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ACASRC3?	Output source match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT1	Enter transmission tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT1?	Output transmission tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT2	Enter transmission tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT2?	Output transmission tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACAVNA1	Set adapter connected to port 1	CAL - AUTOCAL (Ch 6)
ACAVNA2	Set adapter connected to port 2	CAL - AUTOCAL (Ch 6)
ACAVNAPX?	Output adapter removal port configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACBTYPE?	Output AutoCal 2-port or 4-port box type	CAL - AUTOCAL (Ch 6)
ACDEF	Include isolation	CAL - AUTOCAL (Ch 6)
ACF2P?	Output port selection for full 2-port AutoCal	CAL - AUTOCAL (Ch 6)
ACF2TC	Set the AutoCal full 2-port Thru type to calibrator	CAL - AUTOCAL (Ch 6)
ACF2TT	Set the AutoCal full 2-port Thru type to True Thru	CAL - AUTOCAL (Ch 6)
ACF2TX?	Output full 2-port Thru type for AutoCal	CAL - AUTOCAL (Ch 6)
ACHFD	Save AutoCal characterization to floppy disk	CAL - AUTOCAL (Ch 6)
ACHHD	Save AutoCal characterization to hard disk	CAL - AUTOCAL (Ch 6)
ACIAX?	Output AutoCal isolation yes/no setting	CAL - AUTOCAL (Ch 6)
ACISO	Enter number of averaging for isolation	CAL - AUTOCAL (Ch 6)
ACISO?	Output number of averaging for isolation	CAL - AUTOCAL (Ch 6)
ACL1AR2	Set adapter removal port to L=1 and ADAPT & R=2	CAL - AUTOCAL (Ch 6)
ACL1R2	Set the AutoCal ports to L=1 and R=2	CAL - AUTOCAL (Ch 6)
ACLO	Enter number of averaging for load	CAL - AUTOCAL (Ch 6)
ACLO?	Output number of averaging for load	CAL - AUTOCAL (Ch 6)
ACLOAD	Set AutoCal standard to load	CAL - AUTOCAL (Ch 6)
ACOMIT	Omit isolation	CAL - AUTOCAL (Ch 6)
ACOPEN	Set AutoCal standard to open	CAL - AUTOCAL (Ch 6)
ACP1?	Output port 1 configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACP2?	Output port 2 configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACP2L	Set the AutoCal port to LEFT for reflection only cal, port 2	CAL - AUTOCAL (Ch 6)
ACP2R	Set the AutoCal port 2 to RIGHT for reflection only cal, port 2	CAL - AUTOCAL (Ch 6)
ACPA	Select AutoCal port A for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPATH?	Output AutoCal connected path	CAL - AUTOCAL (Ch 6)
ACPB	Select AutoCal port B for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPC	Select AutoCal port C for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPCFG	Enter string to setup port configuration for 4 Port AutoCal Box	CAL - AUTOCAL (Ch 6)
ACPCFG?	Output port configuration for 4 Port AutoCal Box	CAL - AUTOCAL (Ch 6)
ACPL	Set the AutoCal port to LEFT	CAL - AUTOCAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ACPR	Set the AutoCal port to RIGHT	CAL - AUTOCAL (Ch 6)
ACPX	Select AutoCal port X for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPX?	Output AutoCal port selected for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPXA	Set AutoCal connected path to port X-A	CAL - AUTOCAL (Ch 6)
ACPXB	Set AutoCal connected path to port X-B	CAL - AUTOCAL (Ch 6)
ACPXC	Set AutoCal connected path to port X-C	CAL - AUTOCAL (Ch 6)
ACR1AL2	Set adapter removal port to R=1 and ADAPT & L=2	CAL - AUTOCAL (Ch 6)
ACR1L2	Set the AutoCal ports to R=1 and L=2	CAL - AUTOCAL (Ch 6)
ACRFL	Enter number of averaging for reflection	CAL - AUTOCAL (Ch 6)
ACRFL?	Output number of averaging for reflection	CAL - AUTOCAL (Ch 6)
ACS11	Set AutoCal type to S11	CAL - AUTOCAL (Ch 6)
ACS11S22	Set AutoCal type to both S11 and S22	CAL - AUTOCAL (Ch 6)
ACS22	Set AutoCal type to S22	CAL - AUTOCAL (Ch 6)
ACSF2P	Set AutoCal type to full 2-port	CAL - AUTOCAL (Ch 6)
ACSF3P	Set AutoCal type to full 3-port	CAL - AUTOCAL (Ch 6)
ACSF4P	Set AutoCal type to full 4-port	CAL - AUTOCAL (Ch 6)
ACSHORT	Set AutoCal standard to short	CAL - AUTOCAL (Ch 6)
ACSTD?	Output AutoCal standard	CAL - AUTOCAL (Ch 6)
ACSTMEA	Continue AutoCal Thru update	CAL - AUTOCAL (Ch 6)
ACTHRU	Set AutoCal standard to Thru	CAL - AUTOCAL (Ch 6)
ACTHRU12T0	Do port 1, 2 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU12T1	Do port 1, 2 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU12X?	Output selection of port 1, 2 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU13T0	Do port 1, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU13T1	Do port 1, 3 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU13X?	Output selection of port 1, 3 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU14T0	Do port 1, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU14T1	Do port 1, 4 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU14X?	Output selection of port 1, 4 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU23T0	Do port 2, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU23T1	Do port 2, 3 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU23X?	Output selection of port 2, 3 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU24T0	Do port 2, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU24T1	Do port 2, 4 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ACTHRU24X?	Output selection of port 2, 4 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU34T0	Do port 3, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU34T1	Do port 3, 4 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU34X?	Output selection of port 3, 4 thru measurement	CAL - AUTOCAL (Ch 6)
ACTOLP12	Enter port 1, 2 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP12?	Output port 1, 2 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP13	Enter port 1, 3 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP13?	Output port 1, 3 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP14	Enter port 1, 4 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP14?	Output port 1, 4 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP23	Enter port 2, 3 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP23?	Output port 2, 3 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP24	Enter port 2, 4 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP24?	Output port 2, 4 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP34	Enter port 3, 4 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP34?	Output port 3, 4 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTUAVG	Enter number of averaging for AutoCal Thru update	CAL - AUTOCAL (Ch 6)
ACTUAVG?	Output number of averaging for AutoCal Thru update	CAL - AUTOCAL (Ch 6)
ACTULS	Apply last Thru update calibration setup	CAL - AUTOCAL (Ch 6)
ACX?	Output AutoCal type	CAL - AUTOCAL (Ch 6)
ADD	Select addition as trace math for active channel	DISPLAY (Ch 5)
ADDGP?	Output instrument GPIB address	UTILITY (Ch 5)
ADDIP?	Output instrument network IP address	UTILITY (Ch 5)
ADDNDSG	Add the next defined segment or go to the next segment	SWEEP - SEGMENTED SWEEP (Ch 5)
ADDPLT	Enter plotter GPIB address	UTILITY (Ch 5)
ADDPLT?	Output plotter GPIB address	UTILITY (Ch 5)
ADDPM	Enter power meter GPIB address	UTILITY (Ch 5)
ADDPM?	Output power meter GPIB address	UTILITY (Ch 5)
ADDSRC2	Enter external source 2 GPIB address	CONFIG (Ch 5)
ADDSRC2?	Output external source 2 GPIB address	CONFIG (Ch 5)
ADDSRC3	Enter external source 3 GPIB address	CONFIG (Ch 5)
ADDSRC3?	Output external source 3 GPIB address	CONFIG (Ch 5)
ADDSRC4	Enter external source 4 GPIB address	CONFIG (Ch 5)
ADDSRC4?	Output external source 4 GPIB address	CONFIG (Ch 5)
ADPL	Enter electrical length for adapter removal	CAL (Ch 6)
ADPL?	Output electrical length for adapter removal	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ADRIVE	Select the floppy drive as the default drive	UTILITY - DISK (Ch 9)
AFT	Simulate transmission frequency response calibration forward path	CAL (Ch 6)
AH0	Turn automatic DUT protection off	CONFIG (Ch 5)
AH1	Turn automatic DUT protection on	CONFIG (Ch 5)
AHX?	Output automatic DUT protection on/off status	CONFIG (Ch 5)
ALC	Perform ALC loop internal calibration	UTILITY - DIAGNOSTICS (Ch 9)
ALCERRS1?	Output source 1 ALC calibration error	CAL (Ch 6)
ALCERRS2?	Output source 2 ALC calibration error	CAL (Ch 6)
ALTS0	Turn alternate sweep mode off	SWEEP (Ch 5)
ALTS1	Turn alternate sweep mode on	SWEEP (Ch 5)
ALTSX?	Output alternate sweep mode on/off status	SWEEP (Ch 5)
AMKR	Select active marker on all channels marker mode	MARKER (Ch 7)
ANNCOL	Enter the color number for annotation and menu text	UTILITY (Ch 9)
ANNCOL?	Output the color number for annotation and menu text	UTILITY (Ch 9)
AOF	Turn averaging off	AVG (Ch 5)
AOF?	Output averaging on/off status	AVG (Ch 5)
AON	Turn averaging on	AVG (Ch 5)
APPC12T?	Output 12 Term calibration done status	CAL (Ch 6)
APPC3P?	Output 3-port calibration done status	CAL (Ch 6)
APPC4P?	Output 4-port calibration done status	CAL (Ch 6)
APPDEVM	Select mixer device type for application	APPL (Ch 10)
APPDEVS	Select standard device type for application	APPL (Ch 10)
APPDEVX?	Output device type for application	APPL (Ch 10)
APPENTC	Set application entry state to current state	APPL (Ch 10)
APPENTP	Set application entry state to previous state	APPL (Ch 10)
APPENTX?	Output application entry state	APPL (Ch 10)
APPFTGD	Select frequency translation group delay application type	APPL - FTGD (Ch 10)
APPGCF	Select swept frequency gain compression application type	APPL (Ch 10)
APPGCP	Select swept power gain compression application type	APPL (Ch 10)
APPHAR	Select harmonic application type	APPL (Ch 10)
APPIMD	Select IMD application type	APPL (Ch 10)
APPLORCW0	Turn off LO CW mode	APPL (Ch 10)
APPLORCW1	Turn on LO CW mode	APPL (Ch 10)
APPLORCWF	Enter LO CW frequency	APPL (Ch 10)
APPLORCWF?	Output LO CW frequency	APPL (Ch 10)
APPLORCWX?	Output LO CW on/off status	APPL (Ch 10)
APPLOROFF	Enter LO offset frequency	APPL (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
APPLOROFF?	Output LO offset frequency	APPL (Ch 10)
APPLORRCD	Select receiver down conversion	APPL (Ch 10)
APPLORRCN	Select receiver no conversion	APPL (Ch 10)
APPLORRCU	Select receiver up conversion	APPL (Ch 10)
APPLORRCX?	Output receiver conversion type	APPL (Ch 10)
APPLORS2	Select source 2 for LO	APPL (Ch 10)
APPLORS3	Select source 3 for LO	APPL (Ch 10)
APPLORS4	Select source 4 for LO	APPL (Ch 10)
APPLORSX?	Output LO source number	APPL (Ch 10)
APPNF	Select noise figure application type	APPL (Ch 10)
APPSWPC	Set application sweep mode to CW receiver	APPL (Ch 10)
APPSWPS	Set application sweep mode to source sweep	APPL (Ch 10)
APPSWPX?	Output application sweep mode	APPL (Ch 10)
APPTR	Select transmission and reflection application type	APPL (Ch 10)
APPX?	Output application type	APPL (Ch 10)
APR	Enter group delay aperture setting on active channel	DISPLAY (Ch 5)
APR?	Output group delay aperture setting on active channel	DISPLAY (Ch 5)
APRXSTP	Enter approximate stop frequency	CAL (Ch 6)
APRXSTP?	Output approximate stop frequency	CAL (Ch 6)
ARB	Simulate reflection only calibration both ports	CAL (Ch 6)
ARF	Simulate reflection only calibration port 1	CAL (Ch 6)
ARR	Simulate reflection only calibration port 2	CAL (Ch 6)
ART	Simulate translation frequency response calibration reverse path	CAL (Ch 6)
ASC	Autoscale the active channel display	DISPLAY (Ch 5)
ASP	Enter polar stop sweep position angle	DISPLAY (Ch 5)
ASP?	Output polar stop sweep position angle	DISPLAY (Ch 5)
AST	Enter polar start sweep position angle	DISPLAY (Ch 5)
AST?	Output polar start sweep position angle	DISPLAY (Ch 5)
ATTN	Attach next segment and make it the active segment	DISPLAY - LIMITS (Ch 7)
AVG	Enter averaging count and turn it on	AVG (Ch 5)
AVG?	Output averaging count	AVG (Ch 5)
AVGCNT?	Output the current Sweep-by-Sweep average sweep count	AVG (Ch 5)
BAC	Perform backend attenuator calibration	UTILITY - DIAGNOSTICS (Ch 9)
BBL	Select broadband load for calibration	CAL (Ch 6)
BBLP3	Select broadband load for 3-port calibration	CAL (Ch 6)
BBLP4	Select broadband load for 4-port calibration	CAL (Ch 6)
BBX?	Output load type for calibration broadband/sliding load	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
BBXP3?	Output load type for 3-port calibration broadband/sliding load	CAL (Ch 6)
BBXP4?	Output load type for 4-port calibration broadband/sliding load	CAL (Ch 6)
BBZ	Enter broadband load impedance for calibration	CAL (Ch 6)
BBZ?	Output broadband load impedance for calibration	CAL (Ch 6)
BBZL	Enter broadband load inductance for calibration	CAL (Ch 6)
BBZL?	Output broadband load inductance for calibration	CAL (Ch 6)
BC0	Turn LCD display off (disabled)	UTILITY (Ch 9)
BC1	Turn LCD display on (enabled)	UTILITY (Ch 9)
BCKCOL	Enter the color number for background	UTILITY (Ch 9)
BCKCOL?	Output the color number for background	UTILITY (Ch 9)
BCX?	Output LCD display on/off status	UTILITY (Ch 9)
BD1	Select band 1 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD2	Select band 2 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD3	Select band 3 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD4	Select band 4 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD5	Select band 5 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BEEP0	Disable the instrument beeper on GPIB errors	UTILITY (Ch 9)
BEEP1	Enable the instrument beeper on GPIB errors	UTILITY (Ch 9)
BEEPX?	Output GPIB beep on error enable/disable status	UTILITY (Ch 9)
BEG	Begin taking calibration data	CAL (Ch 6)
BEG3P	Begin taking 3-port calibration data	CAL (Ch 6)
BEG4P	Begin taking 4-port calibration data	CAL (Ch 6)
BEGAC	Initialize an AutoCal measurement	CAL - AUTOCAL (Ch 6)
BEGACA	Start AutoCal assurance	CAL - AUTOCAL (Ch 6)
BEGCH	Start AutoCal characterization	CAL - AUTOCAL (Ch 6)
BEGEN	Begin taking harmonic enhancement calibration data	APPL - HARMONIC (Ch 10)
BEGFTGD	Start frequency translation group delay calibration	APPL - FTGD (Ch 10)
BEGHAR	Begin taking both harmonic enhancement and phase calibration	APPL - HARMONIC (Ch 10)
BEGIMD	Begin taking IMD calibration data	APPL - IMD (Ch 10)
BEGN	Begin next segment and make it the active segment	DISPLAY - LIMITS (Ch 7)
BEGNF	Begin taking noise figure calibration data	APPL - NOISE FIGURE (Ch 10)
BEGNFRF	Begin taking noise figure with RF calibration data	APPL - NOISE FIGURE (Ch 10)
BEGPH	Begin taking harmonic phase calibration data	APPL - HARMONIC (Ch 10)
BEGR	Begin receiver calibration	POWER - RECEIVER CAL (Ch 5)
BEGTU	Start AutoCal Thru update	CAL - AUTOCAL (Ch 6)
BH0	Turn bias off while in hold	CONFIG (Ch 5)
BH1	Turn bias on while in hold	CONFIG (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
BHX?	Output bias on/off during hold status	CONFIG (Ch 5)
BMPB	Select black on white as bitmap type	HARD COPY (Ch 9)
BMPC	Select color on white as bitmap type	HARD COPY (Ch 9)
BMPT	Select true color as bitmap type	HARD COPY (Ch 9)
BMPX?	Output bitmap type	HARD COPY (Ch 9)
BNDNFCW?	Output multiple source band Noise Figure ENR source CW flag	APPL - NOISE FIGURE (Ch 10)
BNDNFDIV?	Output multiple source band Noise Figure ENR source divisor	APPL - NOISE FIGURE (Ch 10)
BNDNFMUL?	Output multiple source band Noise Figure ENR source multiplier	APPL - NOISE FIGURE (Ch 10)
BNDNFOFF?	Output multiple source band Noise Figure ENR source offset	APPL - NOISE FIGURE (Ch 10)
BNDRCW?	Output multiple source band receiver CW flag for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRDIV?	Output multiple source band receiver divisor for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRMUL?	Output multiple source band receiver multiplier for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDROFF?	Output multiple source band receiver offset for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSCW?	Output multiple source band receiver source CW flag	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSDIV?	Output multiple source band receiver source divisor	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSMUL?	Output multiple source band receiver source multiplier	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSOFF?	Output multiple source band receiver source offset	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1CW?	Output multiple source band source 1 CW flag for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1DIV?	Output multiple source band source 1 divisor for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1MUL?	Output multiple source band source 1 multiplier for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1OFF?	Output multiple source band source 1 offset for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2CW?	Output multiple source band source 2 CW flag for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2DIV?	Output multiple source band source 2 divisor for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2MUL?	Output multiple source band source 2 multiplier for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2OFF?	Output multiple source band source 2 offset for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3CW?	Output multiple source band source 3 CW flag	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3DIV?	Output multiple source band source 3 divisor	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3MUL?	Output multiple source band source 3 multiplier	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3OFF?	Output multiple source band source 3 offset	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4CW?	Output multiple source band source 4 CW flag	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4DIV?	Output multiple source band source 4 divisor	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4MUL?	Output multiple source band source 4 multiplier	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4OFF?	Output multiple source band source 4 offset	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDSRT?	Output multiple source band start frequency for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
BNDSTP?	Output multiple source band stop frequency for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BPF	Enter break point frequency for 3 line LRL calibration	CAL (Ch 6)
BPF?	Output break point frequency for 3 line LRL calibration	CAL (Ch 6)
BSP	Enter band stop frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
BSP?	Output band stop frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
BST	Enter band start frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
BST?	Output band start frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
BWL3	Set bandwidth loss value to 3 dB	MARKER (Ch 7)
BWLS	Enter bandwidth loss value	MARKER (Ch 7)
BWLS?	Output bandwidth loss value	MARKER (Ch 7)
C12	Select 12 term calibration	CAL (Ch 6)
C8R	Select 1-path 2-port calibration reverse path	CAL (Ch 6)
C8T	Select 1-path 2-port calibration forward path	CAL (Ch 6)
CALR	Perform receiver calibration for gain compression testing	APPL - GAIN COMPRESSION (Ch 10)
CAS	Clear active segmented limit vertical/horizontal definitions	DISPLAY - LIMITS (Ch 7)
CBT	Select translation frequency response calibration forward and reverse	CAL (Ch 6)
CC0	Enter capacitance coefficient 0 for open	CAL (Ch 6)
CC0?	Output capacitance coefficient 0 for open	CAL (Ch 6)
CC1	Enter capacitance coefficient 1 for open	CAL (Ch 6)
CC1?	Output capacitance coefficient 1 for open	CAL (Ch 6)
CC2	Enter capacitance coefficient 2 for open	CAL (Ch 6)
CC2?	Output capacitance coefficient 2 for open	CAL (Ch 6)
CC3	Enter capacitance coefficient 3 for open	CAL (Ch 6)
CC3?	Output capacitance coefficient 3 for open	CAL (Ch 6)
CD	Change default directory	UTILITY - DISK (Ch 9)
CDATTN0?	Output port 1 attenuation of power sweep mode from selected cal memory	CAL (Ch 6)
CDATTN2?	Output port 3 attenuation of power sweep mode from selected cal memory	CAL (Ch 6)
CDCALTP?	Output 2-port cal type from selected cal memory	CAL (Ch 6)
CDCON?	Output port 1 connector from selected cal memory	CAL (Ch 6)
CDCWF?	Output cw mode frequency from selected cal memory	CAL (Ch 6)
CDEND1?	Output end power for power source 1 or end frequency from selected cal memory	CAL (Ch 6)
CDEND2?	Output end power for power source 2 from selected cal memory	CAL (Ch 6)
CDEND3?	Output end power for power source 3 from selected cal memory	CAL (Ch 6)
CDEND4?	Output end power for power source 4 from selected cal memory	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CDFREQ?	Output cal data freq list from selected cal memory	CAL (Ch 6)
CDFSW?	Output sweep type from selected cal memory	CAL (Ch 6)
CDFXCALTP?	Output Flexible Cal calibration type	CAL - FLEXIBLE CAL (Ch 6)
CDLNTP?	Output line type from selected cal memory	CAL (Ch 6)
CDNOP1?	Output port 1 nominal offset of power sweep mode from selected cal memory	CAL (Ch 6)
CDNOP3?	Output port 3 nominal offset of power sweep mode from selected cal memory	CAL (Ch 6)
CDNUM?	Output data number of power/frequency from selected cal memory	CAL (Ch 6)
CDP2CON?	Output port 2 connector from selected cal memory	CAL (Ch 6)
CDP3CALTP?	Output 3-port cal type from selected cal memory	CAL (Ch 6)
CDP3CON?	Output port 3 connector from selected cal memory	CAL (Ch 6)
CDP4CALTP?	Output 4-port cal type from selected cal memory	CAL (Ch 6)
CDP4CON?	Output port 4 connector from selected cal memory	CAL (Ch 6)
CDPTS?	Output cal data points from selected cal memory	CAL (Ch 6)
CDPTSPWR?	Output cal data point of power sweep mode from selected cal memory	CAL (Ch 6)
CDRIVE	Select the hard disk as the default drive	UTILITY - DISK (Ch 9)
CDSRC2PWR?	Output power in power source 2 from selected cal memory	CAL (Ch 6)
CDSRCPWR?	Output power in power source 1 from selected cal memory	CAL (Ch 6)
CDSTEP?	Output min power/frequency step from selected cal memory	CAL (Ch 6)
CDSTRT1?	Output start power for power source 1 or start frequency from selected cal memory	CAL (Ch 6)
CDSTRT2?	Output start power for power source 2 from selected cal memory	CAL (Ch 6)
CDSTRT3?	Output start power for power source 3 from selected cal memory	CAL (Ch 6)
CDSTRT4?	Output start power for power source 4 from selected cal memory	CAL (Ch 6)
CF2	Select female 2.4mm connector for current port	CAL (Ch 6)
CF3	Select female GPC-3.5 connector for current port	CAL (Ch 6)
CF716	Select female Type 7/16 connector for current port	CAL (Ch 6)
CFC	Select female TNC connector for current port	CAL (Ch 6)
CFD	Collect final data in an internal buffer	REMOTE - MEASURED DATA (Ch 8)
CFFX?	Query Flexible Cal define mode	CAL - FLEXIBLE CAL (Ch 6)
CFK	Select female K Connector for current port	CAL (Ch 6)
CFN	Select female Type N connector for current port	CAL (Ch 6)
CFN75	Select female Type N 75-ohm connector for current port	CAL (Ch 6)
CFS	Select female SMA connector for current port	CAL (Ch 6)
CFSP	Select special female connector for current port	CAL (Ch 6)
CFT	Select transmission frequency response calibration forward path	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CFV	Select female V Connector for current port	CAL (Ch 6)
CFXI?	Output Flexible Cal input method	CAL - FLEXIBLE CAL (Ch 6)
CFXICU	Select Flexible Customize Cal	CAL - FLEXIBLE CAL (Ch 6)
CFXIFU	Select Flexible Full Term Cal	CAL - FLEXIBLE CAL (Ch 6)
CFXIRF	Select Flexible Reflection Cal	CAL - FLEXIBLE CAL (Ch 6)
CH1	Make channel 1 the active channel	CH (Ch 5)
CH2	Make channel 2 the active channel	CH (Ch 5)
CH3	Make channel 3 the active channel	CH (Ch 5)
CH4	Make channel 4 the active channel	CH (Ch 5)
CHAPR?	Output group delay aperture setting for specified channel	DISPLAY (Ch 5)
CHDAT?	Output trace memory display mode for specified channel	DISPLAY (Ch 5)
CHDDX?	Output domain parameter frequency/distance/time for specified channel	APPL - TIME DOMAIN (Ch 10)
CHGOF?	Output the time domain gating mode on/off/display for specified channel	APPL - TIME DOMAIN (Ch 10)
CHGRF?	Output graph type for specified channel	DISPLAY (Ch 5)
CHLFD2?	Output limit frequency readout delta value for bottom graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLFD?	Output limit frequency readout delta value for top graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLLO2?	Output lower limit value for bottom graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLLO?	Output lower limit value for top graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLON?	Output limits display on/off status for specified channel	DISPLAY - LIMITS (Ch 7)
CHLPSX?	Output the time domain impulse/step response for specified channel	APPL - TIME DOMAIN (Ch 10)
CHLUP2?	Output upper limit value for bottom graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLUP?	Output upper limit value for top graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHMTH?	Output trace math math type for specified channel	DISPLAY (Ch 5)
CHOFF2?	Output offset value for the bottom graph for specified channel	DISPLAY (Ch 5)
CHOFF?	Output offset value for the top graph for specified channel	DISPLAY (Ch 5)
CHOPMODE?	Output chop mode type status	SWEEP (Ch 5)
CHPHO?	Output phase offset for specified channel	DISPLAY (Ch 5)
CHRDD?	Output reference delay in distance for specified channel	DISPLAY (Ch 5)
CHRDT?	Output reference delay in time for specified channel	DISPLAY (Ch 5)
CHREF2?	Output reference line for the bottom graph for specified channel	DISPLAY (Ch 5)
CHREF?	Output reference line for the top graph for specified channel	DISPLAY (Ch 5)
CHSCL2?	Output scale resolution for the bottom graph for specified channel	DISPLAY (Ch 5)
CHSCL?	Output scale resolution for the top graph for specified channel	DISPLAY (Ch 5)
CHSLH?	Output segmented limits horizontal offset for specified channel	DISPLAY - LIMITS (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CHSLLX?	Output lower segmented limits display on/off status for specified channel	DISPLAY - LIMITS (Ch 7)
CHSLUX?	Output upper segmented limits display on/off status for specified channel	DISPLAY - LIMITS (Ch 7)
CHSLV?	Output segmented limits vertical offset for specified channel	DISPLAY - LIMITS (Ch 7)
CHSXX?	Output parameter or user defined parameter for specified channel	MEAS (Ch 5)
CHTDDIST?	Output the time domain parameter distance/time for specified channel	APPL - TIME DOMAIN (Ch 10)
CHTDPIX?	Output the time domain phasor impulse on/off status for specified channel	APPL - TIME DOMAIN (Ch 10)
CHTDX?	Output domain mode for specified channel	APPL - TIME DOMAIN (Ch 10)
CHX?	Output active channel number	CH (Ch 5)
CL0	Enter inductive coefficient 0 for short	CAL (Ch 6)
CL0?	Output inductive coefficient 0 for short	CAL (Ch 6)
CL1	Enter inductive coefficient 1 for short	CAL (Ch 6)
CL1?	Output inductive coefficient 1 for short	CAL (Ch 6)
CL2	Enter inductive coefficient 2 for short	CAL (Ch 6)
CL2?	Output inductive coefficient 2 for short	CAL (Ch 6)
CL3	Enter inductive coefficient 3 for short	CAL (Ch 6)
CL3?	Output inductive coefficient 3 for short	CAL (Ch 6)
CLB	Clear all multiple source band definitions	CONFIG - MULTIPLE SOURCE (Ch 5)
CLRDSG	Clear all the defined segments of the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
CM	Suffix sets distance data type and scales by 1E-2	DATA ENTRY SUFFIXES (Ch 5)
CM2	Select male 2.4mm connector for current port	CAL (Ch 6)
CM3	Select male GPC-3.5 connector for current port	CAL (Ch 6)
CM3PX?	Output calibration method for 3-port cal	CAL (Ch 6)
CM4PX?	Output calibration method for 4-port calibration	CAL (Ch 6)
CM716	Select male Type 7/16 connector for current port	CAL (Ch 6)
CMC	Select male TNC connector for current port	CAL (Ch 6)
CMK	Select male K Connector for current port	CAL (Ch 6)
CMN	Select male N connector for current port	CAL (Ch 6)
CMN75	Select male Type N 75-Ohm connector for current port	CAL (Ch 6)
CMS	Select male SMA connector for current port	CAL (Ch 6)
CMSP	Select special male connector for current port	CAL (Ch 6)
CMT	Suffix sets distance data type and scales by 1E-2	DATA ENTRY SUFFIXES (Ch 5)
CMV	Select male V Connector for current port	CAL (Ch 6)
CMX?	Output calibration method	CAL (Ch 6)
CND	Select user specified connector for current port	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CNG	Select GPC-7 connector for current port	CAL (Ch 6)
CNTR	Enter center frequency	FREQ (Ch 5)
CNTR?	Output center frequency	FREQ (Ch 5)
COF	Turn 2 and 3-port error correction and Flexible Cal off	CAL (Ch 6)
CON	Turn 2-port error correction on	CAL (Ch 6)
CON3P	Turn 3-port error correction on	CAL (Ch 6)
CON3P?	Output 3-port error correction on/off status	CAL (Ch 6)
CON4P	Turn 4-port error correction on	CAL (Ch 6)
CON4P?	Output 4-Port error correction on/off status	CAL (Ch 6)
CON?	Output 2-port error correction on/off status	CAL (Ch 6)
CONCC0?	Output capacitance coefficient 0 of open device for specified connector	CAL (Ch 6)
CONCC1?	Output capacitance coefficient 1 of open device for specified connector	CAL (Ch 6)
CONCC2?	Output capacitance coefficient 2 of open device for specified connector	CAL (Ch 6)
CONCC3?	Output capacitance coefficient 3 of open device for specified connector	CAL (Ch 6)
CONFX	Turn flexible error correction on	CAL - FLEXIBLE CAL (Ch 6)
CONFX?	Output flexible error correction on/off status	CAL - FLEXIBLE CAL (Ch 6)
CONOPOFF?	Output offset of open device for specified connector	CAL (Ch 6)
CONOPSER?	Output serial number of open device for specified connector	CAL (Ch 6)
CONSHANG?	Output angle of short device for specified connector	CAL (Ch 6)
CONSHOFF?	Output offset of short device for specified connector	CAL (Ch 6)
CONSHSER?	Output serial number of short device for specified connector	CAL (Ch 6)
COO	Enter offset for open for user specified connector	CAL (Ch 6)
COO?	Output offset for open for user specified connector	CAL (Ch 6)
COPY	Copy a files contents to another file	UTILITY - DISK (Ch 9)
COS	Enter offset for short for user specified connector	CAL (Ch 6)
COS?	Output offset for short for user specified connector	CAL (Ch 6)
CPYALLFH	Copy combined hardware cal file from floppy to hard disk	UTILITY - DISK (Ch 9)
CPYALLHF	Copy combined hardware cal file from hard to floppy disk	UTILITY - DISK (Ch 9)
CRB	Select reflection only calibration both ports	CAL (Ch 6)
CRF	Select reflection only calibration port 1	CAL (Ch 6)
CRR	Select reflection only calibration port 2	CAL (Ch 6)
CRT	Select transmission frequency response calibration reverse path	CAL (Ch 6)
CSB	Clear status bytes and structures (same as *CLS)	REMOTE - STATUS REPORTING (Ch 8)
CSF?	Output calibration start frequency	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CSL	Clear service log	UTILITY - SERVICE LOG (Ch 9)
CSWP?	Output sweep mode for calibration	CAL (Ch 6)
CTF?	Output calibration stop frequency	CAL (Ch 6)
CTN	Continue sweeping from current point	HOLD (Ch 5)
CWC	Select CW frequency calibration data points	CAL (Ch 6)
CWD?	Output current working directory string	UTILITY - DISK (Ch 9)
CWF	Enter CW frequency and turn CW on	FREQ (Ch 5)
CWF?	Output CW frequency	FREQ (Ch 5)
CWON	Turn CW on at current CW frequency	FREQ (Ch 5)
CWON?	Output CW on/off status	FREQ (Ch 5)
CWP	Enter number of points drawn in CW	CONFIG (Ch 5)
CWP?	Output number of points drawn in CW	CONFIG (Ch 5)
CXD?	Output internal buffer data collection mode	REMOTE - MEASURED DATA (Ch 8)
CXX?	Output calibration type	CAL (Ch 6)
D13	Display channels 1 & 3	DISPLAY (Ch 5)
D14	Display all four channels	DISPLAY (Ch 5)
D24	Select dual channel display with channels 2 & 4	DISPLAY (Ch 5)
DA1	Select a1 = Ra as denominator for parameter being defined	MEAS (Ch 5)
DA2	Select a2 = Rb as denominator for parameter being defined	MEAS (Ch 5)
DA3	Select a3 = Rc as denominator for parameter being defined	MEAS (Ch 5)
DA4	Select a4 = Rd as denominator for parameter being defined	MEAS (Ch 5)
DAC	Enter DAC number of 10 MHz calibration	UTILITY (Ch 9)
DAC?	Output DAC number of 10 MHz calibration	UTILITY (Ch 9)
DAT	Display data only on active channel	DISPLAY (Ch 5)
DAT?	Output trace memory display mode	DISPLAY (Ch 5)
DATCOL	Enter the color number for data	UTILITY (Ch 9)
DATCOL?	Output the color number for data	UTILITY (Ch 9)
DATE	Enter the system date	UTILITY (Ch 9)
DATE?	Output the system date	UTILITY (Ch 9)
DB	Suffix sets power data type	DATA ENTRY SUFFIXES (Ch 5)
DB1	Select b1 = Ta as denominator for parameter being defined	MEAS (Ch 5)
DB2	Select b2 = Tb as denominator for parameter being defined	MEAS (Ch 5)
DB3	Select b3 = Tc as denominator for parameter being defined	MEAS (Ch 5)
DB4	Select b4 = Td as denominator for parameter being defined	MEAS (Ch 5)
DBL	Suffix sets power data type	DATA ENTRY SUFFIXES (Ch 5)
DBM	Suffix sets power data type	DATA ENTRY SUFFIXES (Ch 5)
DBP	Select distance bandpass mode for active channel	APPL - TIME DOMAIN (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DC1	Display channel 1 and 2 operating parameters	UTILITY (Ch 9)
DC3	Display channel 3 and 4 operating parameters	UTILITY (Ch 9)
DCA	Select automatic DC term calculation for lowpass	APPL - TIME DOMAIN (Ch 10)
DCCTN	Resume internal buffer data collection	REMOTE - MEASURED DATA (Ch 8)
DCCTN?	Output internal buffer data collection resume/suspend status	REMOTE - MEASURED DATA (Ch 8)
DCHLD	Suspend internal buffer data collection	REMOTE - MEASURED DATA (Ch 8)
DCMRK	Insert the mark value into the internal buffer	REMOTE - MEASURED DATA (Ch 8)
DCO	Select open for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DCOFF	Turn internal buffer data collection mode off	REMOTE - MEASURED DATA (Ch 8)
DCP	Display calibration parameters 1st page	UTILITY (Ch 9)
DCP1	Display calibration parameters 1st page	UTILITY (Ch 9)
DCPCUR?	Output data collection buffer current point count	REMOTE - MEASURED DATA (Ch 8)
DCPMAX?	Output data collection buffer maximum number of points	REMOTE - MEASURED DATA (Ch 8)
DCREFC?	Output reflection coefficient for lowpass	APPL - TIME DOMAIN (Ch 10)
DCS	Select short for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DCV	Enter value for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DCV?	Output lowpass DC term value	APPL - TIME DOMAIN (Ch 10)
DCX?	Output lowpass DC term selection	APPL - TIME DOMAIN (Ch 10)
DCZ	Select line impedance for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DD0	Turn data drawing off	DISPLAY (Ch 5)
DD1	Turn data drawing on	DISPLAY (Ch 5)
DD1?	Output data drawing on/off status	DISPLAY (Ch 5)
DDX?	Output active channel domain parameter frequency distance or time	APPL - TIME DOMAIN (Ch 10)
DE1	Select unity as denominator for parameter being defined	MEAS (Ch 5)
DEG	Suffix sets phase data type	DATA ENTRY SUFFIXES (Ch 5)
DEL	Delete a file from disk	UTILITY - DISK (Ch 9)
DELALL	Delete combined hardware cal file from floppy disk	UTILITY - DISK (Ch 9)
DELALLH	Delete combined hardware cal file from hard disk	UTILITY - DISK (Ch 9)
DELLDSG	Delete the last defined segment of the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DEN?	Output denominator selection for parameter being defined	MEAS (Ch 5)
DF2	Display 2.4mm female connector information	UTILITY (Ch 9)
DF3	Display GPC-3.5 female connector information	UTILITY (Ch 9)
DF716	Display 7/16 female connector information	UTILITY (Ch 9)
DFC	Select discrete frequency calibration data points	CAL (Ch 6)
DFD	Done specifying discrete frequency ranges	FREQ - DISCRETE FILL (Ch 5)
DFK	Display K female connector information	UTILITY (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DFN	Display N female connector information	UTILITY (Ch 9)
DFN75	Display N Female 75-Ohm connector information	UTILITY (Ch 9)
DFP	Display front panel instrument state	UTILITY (Ch 9)
DFQ	Enter single discrete frequency	FREQ - DISCRETE FILL (Ch 5)
DFQ?	Output discrete fill single discrete frequency	FREQ - DISCRETE FILL (Ch 5)
DFS	Display SMA female connector information	UTILITY (Ch 9)
DFSP	Display special female connector information	UTILITY (Ch 9)
DFT	Display TNC female connector information	UTILITY (Ch 9)
DFV	Display female V Connector information	UTILITY (Ch 9)
DG7	Display GPC-7 male connector information	UTILITY (Ch 9)
DGS	Display GPIB status information	UTILITY (Ch 9)
DGT	Display first LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DGT1	Display first LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DGT2	Display second LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DGT3	Display third LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DIA	Select air as active dielectric	DISPLAY (Ch 5)
DIE	Enter a dielectric value	DISPLAY (Ch 5)
DIM	Select microporous teflon as active dielectric	DISPLAY (Ch 5)
DIP	Select polyethylene as active dielectric	DISPLAY (Ch 5)
DIR	Output a directory listing to the GPIB	UTILITY - DISK (Ch 9)
DIS	Display active segmented limit	DISPLAY - LIMITS (Ch 7)
DIS?	Output active segmented limit on/off status	DISPLAY - LIMITS (Ch 7)
DISKRD	Output disk file data to the GPIB	UTILITY - DISK (Ch 9)
DISKWR	Write GPIB data to a disk file	UTILITY - DISK (Ch 9)
DIT	Select teflon as active dielectric	DISPLAY (Ch 5)
DIV	Select division as trace math for active channel	DISPLAY (Ch 5)
DIX?	Output dielectric constant	DISPLAY (Ch 5)
DLA	Select group delay display for active channel	DISPLAY (Ch 5)
DLP	Select distance lowpass mode for active channel	APPL - TIME DOMAIN (Ch 10)
DM2	Display 2.4mm male connector information	UTILITY (Ch 9)
DM3	Display GPC-3.5 male connector information	UTILITY (Ch 9)
DM716	Display 7/16 male connector information	UTILITY (Ch 9)
DMK	Display K male connector information	UTILITY (Ch 9)
DMN	Display N male connector information	UTILITY (Ch 9)
DMN75	Display N Male 75-Ohm connector information	UTILITY (Ch 9)
DMS	Display SMA male connector information	UTILITY (Ch 9)
DMSP	Display Special Male connector information	UTILITY (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DMT	Display TNC male connector information	UTILITY (Ch 9)
DMV	Display V male connector information	UTILITY (Ch 9)
DNM	Display data normalized to trace memory on active channel	DISPLAY (Ch 5)
DPI	Select distance phasor impulse mode for active channel	APPL - TIME DOMAIN (Ch 10)
DPN	Enter pen number for data	HARD COPY (Ch 9)
DPN?	Output pen number for data	HARD COPY (Ch 9)
DPR0	Visible data only OFD format	REMOTE - MEASURED DATA (Ch 8)
DPR1	Data pair always OFD format	REMOTE - MEASURED DATA (Ch 8)
DPRX?	Output data pair mode visible only or pair always	REMOTE - MEASURED DATA (Ch 8)
DR1	Select Marker 1 as delta reference marker	MARKER (Ch 7)
DR10	Select Marker 10 as delta reference marker	MARKER (Ch 7)
DR11	Select Marker 11 as delta reference marker	MARKER (Ch 7)
DR12	Select Marker 12 as delta reference marker	MARKER (Ch 7)
DR2	Select Marker 2 as delta reference marker	MARKER (Ch 7)
DR3	Select Marker 3 as delta reference marker	MARKER (Ch 7)
DR4	Select Marker 4 as delta reference marker	MARKER (Ch 7)
DR5	Select Marker 5 as delta reference marker	MARKER (Ch 7)
DR6	Select Marker 6 as delta reference marker	MARKER (Ch 7)
DR7	Select Marker 7 as delta reference marker	MARKER (Ch 7)
DR8	Select Marker 8 as delta reference marker	MARKER (Ch 7)
DR9	Select Marker 9 as delta reference marker	MARKER (Ch 7)
DRF	Turn delta reference mode on	MARKER (Ch 7)
DRL	Diagnostic read latch	UTILITY - DIAGNOSTICS (Ch 9)
DRO	Turn delta reference mode off	MARKER (Ch 7)
DRO?	Output delta reference mode on/off status	MARKER (Ch 7)
DRX?	Output delta reference marker number	MARKER (Ch 7)
DSF0	Disable filter shape factor calculation	MARKER (Ch 7)
DSF1	Enable filter shape factor calculation	MARKER (Ch 7)
DSFX?	Output filter shape factor calculation enable/disable status	MARKER (Ch 7)
DSG?	Output the active defined segment flag ON/OFF status	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGAVG	Enter the averaging count for the active defined segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGAVG?	Output the averaging count of the active defined segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGDFD	Done specifying discrete frequency ranges for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGDFQ	Enter a single discrete frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGDFQ?	Output the discrete fill single discrete frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DSGFIL	Fill the defined discrete frequency range for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRC	Clear all of the defined discrete frequency ranges for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRI	Enter the segmented sweep discrete fill increment frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRI?	Output the segmented sweep discrete fill increment frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRP	Enter the segmented sweep discrete fill number of points for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRP?	Output the discrete fill number of points for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRS	Enter the discrete fill start frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRS?	Output the discrete fill start frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW10	Set the IFBW to 10 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW100	Set the IFBW to 100 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW10K	Set the IFBW to 10 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW1K	Set the IFBW to 1 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW30	Set the IFBW to 30 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW300	Set the IFBW to 300 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW30K	Set the IFBW to 30 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW3K	Set the IFBW to 3 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBWX?	Output the active defined segment IF bandwidth in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGNO	Set the active defined segment number for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGNO?	Output the active defined segment number for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGOFF	Turn the active defined segment flag OFF	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGON	Turn the active define segment flag ON	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGONDF	Output the number of discrete frequencies	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPTS	Enter the number of points for the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPTS?	Output the number of points of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPWR1	Enter the Source 1 power level for the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DSGPWR1?	Output the Source 1 power level of the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPWR2	Enter the Source 2 power level for the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPWR2?	Output the Source 2 power level of the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTP	Enter the stop frequency of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTP?	Output the start frequency of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTRT	Enter the start frequency of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTRT?	Output the start frequency of the active define segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSP	Select single channel display	DISPLAY (Ch 5)
DSP?	Output channel display mode	DISPLAY (Ch 5)
DSQ0	Disable filter Q calculation	MARKER (Ch 7)
DSQ1	Enable filter Q calculation	MARKER (Ch 7)
DSQX?	Output filter Q calculation enable/disable status	MARKER (Ch 7)
DTM	Display measurement data and trace memory on active channel	DISPLAY (Ch 5)
DVM	Enter DVM channel number	UTILITY - DIAGNOSTICS (Ch 9)
DWG	Display waveguide parameters	UTILITY (Ch 9)
DWL	Diagnostic write latch	UTILITY - DIAGNOSTICS (Ch 9)
EANAIN	Measure EXT. ANALOG IN on active channel	MEAS (Ch 5)
ECW	Select CW operation for component being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
ED1	Edit source 1 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
ED2	Edit source 2 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
ED3	Edit source 3 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
ED4	Edit source 4 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
EDADD	Select add on to network for embedding/de-embedding	CONFIG (Ch 5)
EDADD?	Output Add on to Network or Modify Last Network for embedding/de-embedding	CONFIG (Ch 5)
EDE	Edit ENR source equation	APPL (Ch 10)
EDE0	Turn Embedding/De-embedding Mode off	CONFIG (Ch 5)
EDE1	Turn Embedding/De-embedding Mode on	CONFIG (Ch 5)
EDE?	Output Embedding/De-embedding Mode status	CONFIG (Ch 5)
EDEAIR	Select air as dielectric type for T-line section	CONFIG (Ch 5)
EDEAPP	Apply Embedding/De-embedding Network	CONFIG (Ch 5)
EDECAP	Enter capacitance for LC circuit	CONFIG (Ch 5)
EDECAP4P1	Enter capacitance 1 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
EDECAP4P1?	Output capacitance 1 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDECAP4P2	Enter capacitance 2 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDECAP4P2?	Output capacitance 2 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDECAP?	Output capacitance for LC circuit	CONFIG (Ch 5)
EDECKT?	Output embedding/de-embedding network generation method selection	CONFIG (Ch 5)
EDECPLS	Select C(P)-L(S) as LC circuit type	CONFIG (Ch 5)
EDECSCP	Select C(S)-L(P) as LC circuit type	CONFIG (Ch 5)
EDECSLP	Select C(S)-L(P) as LC circuit type	CONFIG (Ch 5)
EDECSLP4P	Select C(S)-L(P) as the LC circuit type for the 4-port circuit	CONFIG (Ch 5)
EDED	Select de-embedding as embedding/de-embedding method	CONFIG (Ch 5)
EDEDEF	Define embedding/de-embedding network	CONFIG (Ch 5)
EDEDEF?	Output apply or define embedding/de-embedding network	CONFIG (Ch 5)
EDEDIEL	Enter relative dielectric for T-line section	CONFIG (Ch 5)
EDEDIEL?	Output relative dielectric for T-line section	CONFIG (Ch 5)
EDEDT?	Output dielectric type for T-line section	CONFIG (Ch 5)
EDEDUT2	Select 2-port test device for embedding/de-embedding	CONFIG (Ch 5)
EDEDUT3	Select 3-port test device for embedding/de-embedding	CONFIG (Ch 5)
EDEDUT4	Select 4-port test device for embedding/de-embedding	CONFIG (Ch 5)
EDEDUT?	Output device type selection for embedding/de-embeddin	CONFIG (Ch 5)
EDEE	Select embedding as embedding/de-embedding method	CONFIG (Ch 5)
EDEED?	Output embedding/de-embedding method selection	CONFIG (Ch 5)
EDEIMP	Enter impedance for T-line section	CONFIG (Ch 5)
EDEIMP?	Output impedance for T-line section	CONFIG (Ch 5)
EDEIND	Enter inductance for LC circuit	CONFIG (Ch 5)
EDEIND4P	Enter inductance for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDEIND4P2	Enter Inductance 2 for the circuit topology in four-port embedding/de-embedding	CONFIG (Ch 5)
EDEIND4P2?	Output Inductance 2 for the circuit topology in four-port embedding/de-embedding	CONFIG (Ch 5)
EDEIND4P?	Output inductance for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDEIND?	Output inductance for LC circuit	CONFIG (Ch 5)
EDELC	Select LC circuit as embedding/de-embedding network generation method	CONFIG (Ch 5)
EDELC4P?	Outputs the four-port LC circuit type selection	CONFIG (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
EDELC?	Output LC circuit type selection	CONFIG (Ch 5)
EDELEN	Enter length for T-line section	CONFIG (Ch 5)
EDELEN?	Output length for T-line section	CONFIG (Ch 5)
EDELOS	Enter loss for T-line section	CONFIG (Ch 5)
EDELOS?	Output loss for T-line section	CONFIG (Ch 5)
EDELPCS	Select L(P)-C(S) as LC circuit type	CONFIG (Ch 5)
EDELSCP	Select L(S)-C(P) as LC circuit type	CONFIG (Ch 5)
EDELSCP4P	Select L(S)-C(P) as the LC circuit type for the four-port circuit	CONFIG (Ch 5)
EDEMIC	Select microporous teflon as dielectric type for T-line	CONFIG (Ch 5)
EDEMODIFY	Select Modify Last Network for embedding/de-embedding	CONFIG (Ch 5)
EDEOTH	Select Other as dielectric type for T-line section	CONFIG (Ch 5)
EDEPOLY	Select Polyethylene as dielectric type for T-line section	CONFIG (Ch 5)
EDEPORT1	Select port 1 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT12	Select port 1 and port 2 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT2	Select port 2 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT23	Select port 2 and port 3 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT3	Select port 3 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT34	Select port 3 and port 4 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT4	Select port 4 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT?	Output active port number for embedding/de-embedding	CONFIG (Ch 5)
EDERST	Reset all ports reference plane for embedding/de-embedding	CONFIG (Ch 5)
EDETEF	Select teflon as dielectric type for T-line section	CONFIG (Ch 5)
EDETIME	Enter time for T-line section	CONFIG (Ch 5)
EDETIME?	Output time for T-line section	CONFIG (Ch 5)
EDETLINE	Select T-line section as embedding/de-embedding network	CONFIG (Ch 5)
EDG	End diagnostics mode	UTILITY - DIAGNOSTICS (Ch 9)
EDR	Edit receiver equation	CONFIG - MULTIPLE SOURCE (Ch 5)
EDRS	Edit receiver source equation	CONFIG - MULTIPLE SOURCE (Ch 5)
EDV	Enter divisor value for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EDV?	Output the divisor value for the equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EDX?	Output equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EKT	Select external keyboard testing	UTILITY - DIAGNOSTICS (Ch 9)
EML	Enter multiplier value for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EML?	Output multiplier value for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EOS	Enter offset frequency for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EOS?	Output offset frequency for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
ESW	Select sweep operation for component being edited	CONFIG - MULTIPLE SOURCE (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
EX2RF0	Turn external source 2 rf off	CAL - FLEXIBLE CAL (Ch 6)
EX2RF1	Turn external source 2 rf on	CAL - FLEXIBLE CAL (Ch 6)
EX3RF0	Turn external source 3 rf off	CAL - FLEXIBLE CAL (Ch 6)
EX3RF1	Turn external source 3 rf on	CAL - FLEXIBLE CAL (Ch 6)
EX4RF0	Turn external source 4 rf off	CAL - FLEXIBLE CAL (Ch 6)
EX4RF1	Turn external source 4 rf on	CAL - FLEXIBLE CAL (Ch 6)
EXD	Display external A/D input	UTILITY - DIAGNOSTICS (Ch 9)
EXISTD?	Output directory existence information	UTILITY - DISK (Ch 9)
EXISTF?	Output file existence information	UTILITY - DISK (Ch 9)
EXRCALP1	Select Port 1 as the extended receiver port	POWER - RECEIVER CAL (Ch 5)
EXRCALP2	Select Port 2 as the extended receiver port	POWER - RECEIVER CAL (Ch 5)
EXRCALP3	Select Port 3 as the extended receiver port	POWER - RECEIVER CAL (Ch 5)
EXRCALPX?	Output the extended receiver port selection	POWER - RECEIVER CAL (Ch 5)
EXRCALTYPE?	Output the receiver type for extended receiver operation	POWER - RECEIVER CAL (Ch 5)
EXRRCALTYPE	Select the receiver type REFERENCE for the extended receiver operation	POWER - RECEIVER CAL (Ch 5)
EXTIO0	Disable external output I/O	DISPLAY (Ch 5)
EXTIO1	Enable external output I/O	DISPLAY (Ch 5)
EXTIOX?	Output external output I/O enable/disable status	DISPLAY (Ch 5)
EXTRCALTYPE	Select the receiver type TEST for extended receiver operation	POWER - RECEIVER CAL (Ch 5)
EXTRCLR	Clear all of the extended receiver calibrations	POWER - RECEIVER CAL (Ch 5)
EXW?	Output multiple source sweep flag for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
F	Suffix sets farad data type and scales by 1E0	DATA ENTRY SUFFIXES (Ch 5)
FCW0	Turn fast CW measurement mode off	SWEEP (Ch 5)
FCW1	Turn fast CW measurement mode 1 on	SWEEP (Ch 5)
FCWX?	Output fast CW measurement mode	SWEEP (Ch 5)
FDH0	Select variable length arbitrary block headers	REMOTE - FORMATTING (Ch 8)
FDH1	Select fixed length arbitrary block headers	REMOTE - FORMATTING (Ch 8)
FDH2	Select zero length arbitrary block headers	REMOTE - FORMATTING (Ch 8)
FDHX?	Output arbitrary block header length selection	REMOTE - FORMATTING (Ch 8)
FFD	Send form feed to printer and stop print/plot	HARD COPY (Ch 9)
FGT	Select frequency with time gate for active channel	APPL - TIME DOMAIN (Ch 10)
FHI	Set data points to 1601	CONFIG (Ch 5)
FIL	Fill defined discrete frequency range	FREQ - DISCRETE FILL (Ch 5)
FLICK0	Turn flickering off	SWEEP (Ch 5)
FLICK1	Turn flickering on	SWEEP (Ch 5)
FLICKX?	Output flickering on/off status	SWEEP (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FLO	Set data points to 101	CONFIG (Ch 5)
FLTBW?	Output filter bandwidth	MARKER (Ch 7)
FLTC?	Output filter center frequency	MARKER (Ch 7)
FLTL?	Output filter loss at reference value	MARKER (Ch 7)
FLTQ?	Output filter Q	MARKER (Ch 7)
FLTS?	Output filter shape factor	MARKER (Ch 7)
FMA	Select ASCII data transfer format	REMOTE - FORMATTING (Ch 8)
FMB	Select IEEE754 64 bit data transfer format	REMOTE - FORMATTING (Ch 8)
FMC	Select IEEE754 32 bit data transfer format	REMOTE - FORMATTING (Ch 8)
FME	Set data points to 401	CONFIG (Ch 5)
FMKR	Select filter parameters marker mode	MARKER (Ch 7)
FMT0	Select normal ASCII data element delimiting	REMOTE - FORMATTING (Ch 8)
FMT1	Select enhanced ASCII data element delimiting	REMOTE - FORMATTING (Ch 8)
FMTX?	Output ASCII data element delimiting mode	REMOTE - FORMATTING (Ch 8)
FMX?	Output data output mode FMA FMB or FMC	REMOTE - FORMATTING (Ch 8)
FOF	Blank frequency information	CONFIG (Ch 5)
FON	Display frequency information	CONFIG (Ch 5)
FOX?	Output frequency information on/off status	CONFIG (Ch 5)
FP0	Turn flat power correction off	POWER - FLAT POWER (Ch 5)
FP1	Turn flat power correction on	POWER - FLAT POWER (Ch 5)
FP1DONE?	Output port 1 flat power correction done status	POWER - FLAT POWER (Ch 5)
FP30	Turn port 3 flat power correction off	POWER - FLAT POWER (Ch 5)
FP31	Turn port 3 flat power correction on	POWER - FLAT POWER (Ch 5)
FP3DONE?	Output port 3 flat power correction done status	POWER - FLAT POWER (Ch 5)
FP3X?	Output port 3 flat power correction on/off status	POWER - FLAT POWER (Ch 5)
FPT	Select front panel keypad testing	UTILITY - DIAGNOSTICS (Ch 9)
FPX?	Output flat power correction on/off status	POWER - FLAT POWER (Ch 5)
FQD	Select frequency domain for active channel	APPL - TIME DOMAIN (Ch 10)
FRC	Clear all defined discrete frequency ranges	FREQ - DISCRETE FILL (Ch 5)
FREFE	Select external frequency reference	UTILITY - REAR PANEL (Ch 10)
FREFI	Select internal frequency reference	UTILITY - REAR PANEL (Ch 10)
FREFX?	Output frequency reference internal/external setting	UTILITY - REAR PANEL (Ch 10)
FRI	Enter discrete fill increment frequency	FREQ - DISCRETE FILL (Ch 5)
FRI?	Output discrete fill increment frequency	FREQ - DISCRETE FILL (Ch 5)
FRP	Enter discrete fill number of points	FREQ - DISCRETE FILL (Ch 5)
FRP?	Output discrete fill number of points	FREQ - DISCRETE FILL (Ch 5)
FRS	Enter discrete fill start frequency	FREQ - DISCRETE FILL (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FRS?	Output discrete fill start frequency	FREQ - DISCRETE FILL (Ch 5)
FS	Suffix sets time data type and scales by 1E-15	DATA ENTRY SUFFIXES (Ch 5)
FSWP	Select frequency sweep	SWEEP (Ch 5)
FTGDC0	Turn off frequency translation group delay correction	APPL - FTGD (Ch 10)
FTGDC1	Turn on frequency translation group delay correction	APPL - FTGD (Ch 10)
FTGDCDONE?	Output frequency translation group delay cal done status	APPL - FTGD (Ch 10)
FTGDCX?	Output frequency translation group delay correction on/off status	APPL - FTGD (Ch 10)
FTP1	Enter the target frequency for linear power correction	POWER (Ch 5)
FTP1?	Output the target frequency for linear power correction	POWER (Ch 5)
FTP3	Enter the target frequency for linear power correction	POWER (Ch 5)
FTP3?	Output the target frequency for linear power correction	POWER (Ch 5)
FXAPL	Apply Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXP1T0	Turns off Port 1 selection. Do not apply correction to any S-parameter involving port 1	CAL - FLEXIBLE CAL (Ch 6)
FXP1T1	Turns on Port 1 selection. Correct S11. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
FXP1T?	Query Port 1 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXP2T0	Turns off Port 2 selection. Do not apply correction to any S-parameter involving port 2	CAL - FLEXIBLE CAL (Ch 6)
FXP2T1	Turns on Port 2 selection. Correct S22. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
FXP2T?	Query Port 2 selection for Flexible Cal.	CAL - FLEXIBLE CAL (Ch 6)
FXP3T0	Turns off Port 3 selection. Do not apply correction to any S-parameter involving port 3	CAL - FLEXIBLE CAL (Ch 6)
FXP3T1	Turns on Port 3 selection. Correct S33. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
FXP3T?	Query Port 3 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXP4T0	Turns off Port 4 selection. Do not apply correction to any S-parameter involving port 4	CAL - FLEXIBLE CAL (Ch 6)
FXP4T1	Turns on Port 4 selection. Correct S44. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
FXP4T?	Query Port 4 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS11T0	Turn off S11 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS11T1	Turn on S11 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS11T?	Output S11 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS12T0	Turn off S12 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS12T1	Turn on S12 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS12T?	Output S12 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS13T0	Turn off S13 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS13T1	Turn on S13 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FXS13T?	Output S13 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS14T0	Turn off S14 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS14T1	Turn on S14 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS14T?	Output S14 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS21T0	Turn off S21 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS21T1	Turn on S21 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS21T?	Output S21 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS22T0	Turn off S22 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS22T1	Turn on S22 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS22T?	Output S22 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS23T0	Turn off S23 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS23T1	Turn on S23 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS23T?	Output S23 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS24T0	Turn off S24 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS24T1	Turn on S24 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS24T?	Output S24 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS31T0	Turn off S31 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS31T1	Turn on S31 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS31T?	Output S31 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS32T0	Turn off S32 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS32T1	Turn on S32 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS32T?	Output S32 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS33T0	Turn off S33 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS33T1	Turn on S33 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS33T?	Output S33 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS34T0	Turn off S34 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS34T1	Turn on S34 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS34T?	Output S34 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS41T0	Turn off S41 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS41T1	Turn on S41 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS41T?	Output S41 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS42T0	Turn off S42 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS42T1	Turn on S42 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS42T?	Output S42 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS43T0	Turn off S43 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS43T1	Turn on S43 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS43T?	Output S43 selection on/off	CAL - FLEXIBLE CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FXS44T0	Turn off S44 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS44T1	Turn on S44 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS44T?	Output S44 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXSOFF	Turn off all the S-parameters when Flexible Cal is being applied	CAL - FLEXIBLE CAL (Ch 6)
FXSON	Turn on all the S-parameters when Flexible Cal is being applied	CAL - FLEXIBLE CAL (Ch 6)
GCFS?	Output the multiple gain compression fixed scale flag ON/OFF status	APPL - GAIN COMPRESSION (Ch 10)
GCFSOFF	Turn the multiple gain compression fixed scale flag OFF	APPL - GAIN COMPRESSION (Ch 10)
GCFSON	Turn the multiple gain compression fixed scale flag ON	APPL - GAIN COMPRESSION (Ch 10)
GCMP	Enter gain compression point search value	APPL - GAIN COMPRESSION (Ch 10)
GCMP?	Output gain compression point search value	APPL - GAIN COMPRESSION (Ch 10)
GCSNS210	Turn self normalization of S21 off	APPL - GAIN COMPRESSION (Ch 10)
GCSNS211	Turn self normalization of S21 on	APPL - GAIN COMPRESSION (Ch 10)
GCSNS21?	Output self normalization of S21 status	APPL - GAIN COMPRESSION (Ch 10)
GCT	Enter gate center value distance or time	APPL - TIME DOMAIN (Ch 10)
GCT?	Output gate center value	APPL - TIME DOMAIN (Ch 10)
GCYSP	Enter the Y-stop power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
GCYSP?	Output the Y-stop power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
GCYST	Enter the Y-start power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
GCYST?	Output the Y-start power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
GDS	Gate symbols displayed on active channel	APPL - TIME DOMAIN (Ch 10)
GENS2P	Generate S2P files in hard disk with default name (ntwk_p1.s2p, ..., ntwk_p4.s2p) from disk and calibrate	HARD COPY (Ch 9)
GHZ	Suffix sets frequency data type and scales by 1E9	DATA ENTRY SUFFIXES (Ch 5)
GLS	Select low sidelobe gate shape	APPL - TIME DOMAIN (Ch 10)
GMS	Select minimum sidelobe gate shape	APPL - TIME DOMAIN (Ch 10)
GNM	Select nominal gate shape	APPL - TIME DOMAIN (Ch 10)
GOF	Turn off gating on active channel	APPL - TIME DOMAIN (Ch 10)
GOF?	Output gating mode on active channel	APPL - TIME DOMAIN (Ch 10)
GON	Turn on gating on active channel	APPL - TIME DOMAIN (Ch 10)
GPN	Enter pen number for graticule	HARD COPY (Ch 9)
GPN?	Output pen number for graticule	HARD COPY (Ch 9)
GRF?	Output graph type for active channel	DISPLAY (Ch 5)
GROUP1	Select Group 1 to be active group	DISPLAY (Ch 5)
GROUP2	Select Group 2 to be active group	DISPLAY (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
GROUP3	Select Group 3 to be active group	DISPLAY (Ch 5)
GROUP4	Select Group 4 to be active group	DISPLAY (Ch 5)
GROUP?	Output active group number	DISPLAY (Ch 5)
GRT	Select Rectangular gate shape	APPL - TIME DOMAIN (Ch 10)
GRTCOL	Enter the color number for the graticule	UTILITY (Ch 9)
GRTCOL?	Output the color number for the graticule	UTILITY (Ch 9)
GSN	Enter gate span value distance or time	APPL - TIME DOMAIN (Ch 10)
GSN?	Output gate span value	APPL - TIME DOMAIN (Ch 10)
GSP	Enter gate stop value distance or time	APPL - TIME DOMAIN (Ch 10)
GSP?	Output gate stop value	APPL - TIME DOMAIN (Ch 10)
GST	Enter gate start value distance or time	APPL - TIME DOMAIN (Ch 10)
GST?	Output gate start value	APPL - TIME DOMAIN (Ch 10)
GSX?	Output Gate Shape setting	APPL - TIME DOMAIN (Ch 10)
H	Suffix sets farad data type and scales by 1E0	DATA ENTRY SUFFIXES (Ch 5)
HAR1	Select 1st harmonic (fundamental) frequency	APPL - HARMONIC (Ch 10)
HAR2	Select 2nd harmonic frequency	APPL - HARMONIC (Ch 10)
HAR3	Select 3rd harmonic frequency	APPL - HARMONIC (Ch 10)
HAR4	Select 4th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR5	Select 5th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR6	Select 6th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR7	Select 7th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR8	Select 8th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR9	Select 9th harmonic frequency	APPL - HARMONIC (Ch 10)
HARCE	Select harmonic enhancement correction	APPL - HARMONIC (Ch 10)
HARCEDONE?	Output harmonic enhancement cal done status	APPL - HARMONIC (Ch 10)
HARCEP	Select harmonic enhancement and Phase correction	APPL - HARMONIC (Ch 10)
HARCEPDONE?	Output harmonic enhancement and Phase cal done status	APPL - HARMONIC (Ch 10)
HARCN	Select No harmonic correction	APPL - HARMONIC (Ch 10)
HARCPDONE?	Output harmonic phase cal done status	APPL - HARMONIC (Ch 10)
HARCX?	Output harmonic correction setting	APPL - HARMONIC (Ch 10)
HARDOF	Select harmonic display relative to output fundamental frequency	APPL - HARMONIC (Ch 10)
HARDSF	Select harmonic display relative to source fundamental frequency	APPL - HARMONIC (Ch 10)
HARDSH	Select harmonic display relative to source harmonic frequency	APPL - HARMONIC (Ch 10)
HARDX?	Output harmonic display setting	APPL - HARMONIC (Ch 10)
HARP12	Select ports 1 and 2	APPL - HARMONIC (Ch 10)
HARP13	Select ports 1 and 3	APPL - HARMONIC (Ch 10)
HARPX?	Output ports 1 and 2 or 1 and 3 setting	APPL - HARMONIC (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
HARX?	Output harmonic frequency number	APPL - HARMONIC (Ch 10)
HC0	Disable internal IF calibration	SWEEP (Ch 5)
HC1	Enable internal IF calibration and trigger an IF calibration	SWEEP (Ch 5)
HCT	Trigger an IF calibration	SWEEP (Ch 5)
HCX?	Output internal IF calibration enable/disable status	SWEEP (Ch 5)
HD0	Turn off tabular data headers and page formatting	HARD COPY (Ch 9)
HD1	Turn on tabular data headers and page formatting	HARD COPY (Ch 9)
HDX?	Output tabular data headers and page formatting on/off status	HARD COPY (Ch 9)
HELP0	Turn off help display	APPL (Ch 10)
HELP1	Turn on help display	APPL (Ch 10)
HELPX?	Output help display on/off status	APPL (Ch 10)
HID	Hide active segmented limit	DISPLAY - LIMITS (Ch 7)
HIGHF?	Output the highest frequency	REMOTE - MISC (Ch 8)
HLD	Put sweep into hold mode	HOLD (Ch 5)
HLD?	Output the sweep hold status	HOLD (Ch 5)
HPN	Enter pen number for header	HARD COPY (Ch 9)
HPN?	Output pen number for header	HARD COPY (Ch 9)
HZ	Suffix sets frequency data type	DATA ENTRY SUFFIXES (Ch 5)
IACCHAR	Input AutoCal characterization data from the GPIB	CAL - AUTOCAL (Ch 6)
IARF	Enter adapter removal files from GPIB and calibrate	CAL (Ch 6)
IC1	Enter calibration coefficient 1	REMOTE - CAL (Ch 8)
IC10	Enter calibration coefficient 10	REMOTE - CAL (Ch 8)
IC11	Enter calibration coefficient 11	REMOTE - CAL (Ch 8)
IC12	Enter calibration coefficient 12	REMOTE - CAL (Ch 8)
IC13	Enter calibration coefficient 13	REMOTE - CAL (Ch 8)
IC14	Enter calibration coefficient 14	REMOTE - CAL (Ch 8)
IC15	Enter calibration coefficient 15	REMOTE - CAL (Ch 8)
IC16	Enter calibration coefficient 16	REMOTE - CAL (Ch 8)
IC17	Enter calibration coefficient 17	REMOTE - CAL (Ch 8)
IC18	Enter calibration coefficient 18	REMOTE - CAL (Ch 8)
IC19	Enter calibration coefficient 19	REMOTE - CAL (Ch 8)
IC2	Enter calibration coefficient 2	REMOTE - CAL (Ch 8)
IC20	Enter calibration coefficient 20	REMOTE - CAL (Ch 8)
IC21	Enter calibration coefficient 21	REMOTE - CAL (Ch 8)
IC22	Enter calibration coefficient 22	REMOTE - CAL (Ch 8)
IC23	Enter calibration coefficient 23	REMOTE - CAL (Ch 8)
IC24	Enter calibration coefficient 24	REMOTE - CAL (Ch 8)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
IC25	Enter calibration coefficient 25	REMOTE - CAL (Ch 8)
IC26	Enter calibration coefficient 26	REMOTE - CAL (Ch 8)
IC27	Enter calibration coefficient 27	REMOTE - CAL (Ch 8)
IC28	Enter calibration coefficient 28	REMOTE - CAL (Ch 8)
IC29	Enter calibration coefficient 29	REMOTE - CAL (Ch 8)
IC3	Enter calibration coefficient 3	REMOTE - CAL (Ch 8)
IC30	Enter calibration coefficient 30	REMOTE - CAL (Ch 8)
IC31	Enter calibration coefficient 31	REMOTE - CAL (Ch 8)
IC32	Enter calibration coefficient 32	REMOTE - CAL (Ch 8)
IC33	Enter calibration coefficient 33	REMOTE - CAL (Ch 8)
IC34	Enter calibration coefficient 34	REMOTE - CAL (Ch 8)
IC35	Enter calibration coefficient 35	REMOTE - CAL (Ch 8)
IC36	Enter calibration coefficient 36	REMOTE - CAL (Ch 8)
IC37	Enter calibration coefficient 37	REMOTE - CAL (Ch 8)
IC38	Enter calibration coefficient 38	REMOTE - CAL (Ch 8)
IC39	Enter calibration coefficient 39	REMOTE - CAL (Ch 8)
IC4	Enter calibration coefficient 4	REMOTE - CAL (Ch 8)
IC40	Enter calibration coefficient 40	REMOTE - CAL (Ch 8)
IC5	Enter calibration coefficient 5	REMOTE - CAL (Ch 8)
IC6	Enter calibration coefficient 6	REMOTE - CAL (Ch 8)
IC7	Enter calibration coefficient 7	REMOTE - CAL (Ch 8)
IC8	Enter calibration coefficient 8	REMOTE - CAL (Ch 8)
IC9	Enter calibration coefficient 9	REMOTE - CAL (Ch 8)
ICA	Enter calibration coefficient 10	REMOTE - CAL (Ch 8)
ICB	Enter calibration coefficient 11	REMOTE - CAL (Ch 8)
ICC	Enter calibration coefficient 12	REMOTE - CAL (Ch 8)
ICD	Enter corrected data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
ICF	Enter front panel setup and calibration data	REMOTE - SETUP (Ch 8)
ICFEDE	Enter the front panel setup, calibration, and EDE data	REMOTE - SETUP (Ch 8)
ICFSG	Enter the segmented sweep data	REMOTE - SETUP (Ch 8)
ICL	Enter all applicable calibration coefficients for cal type	REMOTE - CAL (Ch 8)
ICL3P	Enter additional 12 calibration coefficients for 3-port	REMOTE - CAL (Ch 8)
ICM0	Turn interchannel math off	DISPLAY (Ch 5)
ICM1	Turn interchannel math on	DISPLAY (Ch 5)
ICMX?	Output interchannel math on/off status	DISPLAY (Ch 5)
ICOP1	Enter interchannel num for operand 1	DISPLAY (Ch 5)
ICOP1?	Output interchannel num for operand 1	DISPLAY (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ICOP2	Enter interchannel num for operand 2	DISPLAY (Ch 5)
ICOP2?	Output interchannel num for operand 2	DISPLAY (Ch 5)
IEM	Enter extended status byte mask	REMOTE - STATUS REPORTING (Ch 8)
IF1	Select 10 Hz IF bandwidth	AVG (Ch 5)
IF2	Select 100 Hz IF bandwidth	AVG (Ch 5)
IF3	Select 1 kHz IF bandwidth	AVG (Ch 5)
IF4	Select 10 kHz IF bandwidth	AVG (Ch 5)
IFA	Select 30 kHz IF bandwidth	AVG (Ch 5)
IFBW10	Select 10 Hz IF bandwidth	AVG (Ch 5)
IFBW100	Select 100 Hz IF bandwidth	AVG (Ch 5)
IFBW10K	Select 10 kHz IF bandwidth	AVG (Ch 5)
IFBW1K	Select 1 kHz IF bandwidth	AVG (Ch 5)
IFBW30	Select 30 Hz IF bandwidth	AVG (Ch 5)
IFBW300	Select 300 Hz IF bandwidth	AVG (Ch 5)
IFBW30K	Select 30 kHz IF bandwidth	AVG (Ch 5)
IFBW3K	Select 3 kHz IF bandwidth	AVG (Ch 5)
IFBWX?	Output IF bandwidth (10-30000)	AVG (Ch 5)
IFD	Enter final data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
IFM	Select 10 Hz IF bandwidth	AVG (Ch 5)
IFN	Select 1 kHz IF bandwidth	AVG (Ch 5)
IFP	Enter current front panel setup	REMOTE - SETUP (Ch 8)
IFR	Select 100 Hz IF bandwidth	AVG (Ch 5)
IFV	Enter frequency values	APPL (Ch 10)
IFX?	Output IF bandwidth (1-4)	AVG (Ch 5)
IHDW	Enter hardware cal data from GPIB	REMOTE - MISC (Ch 8)
IKIT	Enter calkit data from GPIB	REMOTE - MISC (Ch 8)
ILM	Enter limits status byte mask	REMOTE - STATUS REPORTING (Ch 8)
IMD3	Select 3rd order intermodulation products	APPL - IMD (Ch 10)
IMD5	Select 5th order intermodulation products	APPL - IMD (Ch 10)
IMD7	Select 7th order intermodulation products	APPL - IMD (Ch 10)
IMD9	Select 9th order intermodulation products	APPL - IMD (Ch 10)
IMDC0	Turn off IMD correction	APPL - IMD (Ch 10)
IMDC1	Turn on IMD correction	APPL - IMD (Ch 10)
IMDCDONE?	Output IMD cal done status	APPL - IMD (Ch 10)
IMDCX?	Output IMD correction on/off status	APPL - IMD (Ch 10)
IMDDI	Display IMD intercept	APPL - IMD (Ch 10)
IMDDP	Display IMD product	APPL - IMD (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
IMDDX?	Output IMD display selection	APPL - IMD (Ch 10)
IMDLOS2	Select source 2 for IMD LO	APPL - IMD (Ch 10)
IMDLOS3	Select source 3 for IMD LO	APPL - IMD (Ch 10)
IMDLOS4	Select source 4 for IMD LO	APPL - IMD (Ch 10)
IMDLOSX?	Output IMD tone 1 source number	APPL - IMD (Ch 10)
IMDMRI	Select Input as measurement reference for IMD	APPL - IMD (Ch 10)
IMDMRO	Select Output as measurement reference for IMD	APPL - IMD (Ch 10)
IMDMRX?	Output measurement reference for IMD	APPL - IMD (Ch 10)
IMDOX?	Output IMD ORDER selection	APPL - IMD (Ch 10)
IMDRT1	Select IMD relative to tone 1	APPL - IMD (Ch 10)
IMDRT2	Select IMD relative to tone 2	APPL - IMD (Ch 10)
IMDRTX?	Output IMD display relative to tone number selection	APPL - IMD (Ch 10)
IMDSSMA	Select source selection apply mode	APPL - IMD (Ch 10)
IMDSSMD	Select source selection define mode	APPL - IMD (Ch 10)
IMDSSMX?	Output source selection mode	APPL - IMD (Ch 10)
IMDT1S1	Select source 1 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1S2	Select source 2 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1S3	Select source 3 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1S4	Select source 4 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1SX?	Output IMD tone 1 source number	APPL - IMD (Ch 10)
IMDT2OFF	Enter IMD tone 2 offset	APPL - IMD (Ch 10)
IMDT2OFF?	Output IMD tone 2 offset	APPL - IMD (Ch 10)
IMDT2S1	Select source 1 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2S2	Select source 2 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2S3	Select source 3 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2S4	Select source 4 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2SX?	Output IMD tone 2 source number	APPL - IMD (Ch 10)
IMG	Select imaginary display for active channel	DISPLAY (Ch 5)
IMPCOMPU?	Output computation method selection for impedance transformation	CONFIG (Ch 5)
IMPPORT	Enter port number as active for impedance transformation	CONFIG (Ch 5)
IMPPORT?	Output active port number for impedance transformation	CONFIG (Ch 5)
IMPPOWER	Select power-wave as computation method for impedance transformation	CONFIG (Ch 5)
IMPPSEUDO	Select pseudo-wave as computation method for impedance transformation	CONFIG (Ch 5)
IMPREACT	Enter reactive term for impedance transformation	CONFIG (Ch 5)
IMPREACT?	Output reactiv term for impedance transformation	CONFIG (Ch 5)
IMPRESIST	Enter resistive term for impedance transformation	CONFIG (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
IMPRESIST?	Output resistive term for impedance transformation	CONFIG (Ch 5)
IMPTS0	Turn impedance transformation mode off	CONFIG (Ch 5)
IMPTS1	Turn impedance transformation mode on	CONFIG (Ch 5)
IMPTS?	Output impedance transformation mode status	CONFIG (Ch 5)
IMU	Suffix sets imaginary data type	DATA ENTRY SUFFIXES (Ch 5)
INRM	Enter normalization data from GPIB	REMOTE - MEASURED DATA (Ch 8)
INT	Initialize (format) floppy disk	UTILITY - DISK (Ch 9)
IPM	Enter the 488.2 service request enable mask	REMOTE - STATUS REPORTING (Ch 8)
IS1	Enter front panel setup 1	REMOTE - SETUP (Ch 8)
IS10	Enter front panel setup 10	REMOTE - SETUP (Ch 8)
IS2	Enter front panel setup 2	REMOTE - SETUP (Ch 8)
IS3	Enter front panel setup 3	REMOTE - SETUP (Ch 8)
IS4	Enter front panel setup 4	REMOTE - SETUP (Ch 8)
IS5	Enter front panel setup 5	REMOTE - SETUP (Ch 8)
IS6	Enter front panel setup 6	REMOTE - SETUP (Ch 8)
IS7	Enter front panel setup 7	REMOTE - SETUP (Ch 8)
IS8	Enter front panel setup 8	REMOTE - SETUP (Ch 8)
IS9	Enter front panel setup 9	REMOTE - SETUP (Ch 8)
ISC	Enter scale and select inverted compressed Smith chart display	DISPLAY (Ch 5)
ISE	Enter scale and select inverted expanded Smith chart display	DISPLAY (Ch 5)
ISF	Exclude isolation	CAL (Ch 6)
ISM	Select normal inverted Smith chart for active channel	DISPLAY (Ch 5)
ISN	Include isolation	CAL (Ch 6)
ISX?	Output isolation calibration selected true/false	CAL (Ch 6)
K	Suffix sets degrees Kelvin data type	DATA ENTRY SUFFIXES (Ch 5)
KEC	Keep existing calibration data	CAL (Ch 6)
KEL	Suffix sets degrees Kelvin data type	DATA ENTRY SUFFIXES (Ch 5)
KHZ	Suffix sets frequency data type and scales by 1E3	DATA ENTRY SUFFIXES (Ch 5)
LAND	Select landscape mode for output plot	HARD COPY (Ch 9)
LANG	Enable the specified language support	UTILITY (Ch 9)
LANG?	Query the current language support	UTILITY (Ch 9)
LAYCOL	Enter the color number for overlay data	UTILITY (Ch 9)
LAYCOL?	Output the color number for overlay data	UTILITY (Ch 9)
LB0	Turn limits testing beep on failure off	DISPLAY - LIMITS (Ch 7)
LB1	Turn limits testing beep on failure on	DISPLAY - LIMITS (Ch 7)
LBX?	Output limits testing beeper enable status	DISPLAY - LIMITS (Ch 7)
LCM	Select LRL calibration method	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
LCM0	Disable printing comment information	HARD COPY (Ch 9)
LCM1	Enable printing comment information	HARD COPY (Ch 9)
LDARF	Load adapter removal files from disk and calibrate	CAL (Ch 6)
LDT0	Disable printing date/time	HARD COPY (Ch 9)
LDT1	Enable printing date/time	HARD COPY (Ch 9)
LDV0	Disable printing device ID	HARD COPY (Ch 9)
LDV1	Enable printing device ID	HARD COPY (Ch 9)
LFD	Enter limit frequency readout delta value	DISPLAY - LIMITS (Ch 7)
LFD2	Enter limit frequency readout delta value for bottom graph	DISPLAY - LIMITS (Ch 7)
LFD2?	Output limit frequency readout delta value for bottom graph	DISPLAY - LIMITS (Ch 7)
LFD?	Output limit frequency readout delta value	DISPLAY - LIMITS (Ch 7)
LFP	Select limit frequency readout for phase displays	DISPLAY - LIMITS (Ch 7)
LFR	Select limit frequency readout for active channel	DISPLAY - LIMITS (Ch 7)
LID	Enter string for DUT identity	HARD COPY (Ch 9)
LID?	Output string for DUT identity	HARD COPY (Ch 9)
LIN	Select linear magnitude display for active channel	DISPLAY (Ch 5)
LKT	Load calibration kit information from floppy disk	UTILITY - DISK (Ch 9)
LL1	Enter length of line 1 for LRL calibration	CAL (Ch 6)
LL1?	Output length of line 1 for LRL calibration	CAL (Ch 6)
LL1P3	Enter length of line 1 for 3-port TRX calibration	CAL (Ch 6)
LL1P3?	Output length of line 1 for 3-port TRX calibration	CAL (Ch 6)
LL2	Enter length of line 2 for LRL calibration	CAL (Ch 6)
LL2?	Output length of line 2 for LRL calibration	CAL (Ch 6)
LL2P3	Enter length of line 2 for 3-port TRX calibration	CAL (Ch 6)
LL2P3?	Output length of line 2 for 3-port TRX calibration	CAL (Ch 6)
LL3	Enter length of line 3 for LRL calibration	CAL (Ch 6)
LL3?	Output length of line 3 for LRL calibration	CAL (Ch 6)
LLM?	Output limit line display mode single or segmented	DISPLAY - LIMITS (Ch 7)
LLO	Enter lower limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LLO2	Enter lower limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LLO2?	Output lower limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LLO?	Output lower limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LLZ	Enter line impedance for LRL calibration	CAL (Ch 6)
LLZ?	Output line impedance for LRL calibration	CAL (Ch 6)
LM2	Select a match for the second device during a LRM type calibration	CAL (Ch 6)
LM3	Select a match for the third device during a LRM type calibration	CAL (Ch 6)
LMD0	Disable printing model information	HARD COPY (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
LMD1	Enable printing model information	HARD COPY (Ch 9)
LMS	Enter string for DUT model/serial number	HARD COPY (Ch 9)
LMS?	Output string for DUT model/serial number	HARD COPY (Ch 9)
LNM	Enter string for operator name	HARD COPY (Ch 9)
LNM?	Output string for operator name	HARD COPY (Ch 9)
LOC	Enter string for operator comment	HARD COPY (Ch 9)
LOC?	Output string for operator comment	HARD COPY (Ch 9)
LOF	Limits display off	DISPLAY - LIMITS (Ch 7)
LOGO0	Turn hard copy logo off	HARD COPY (Ch 9)
LOGO1	Turn hard copy logo on	HARD COPY (Ch 9)
LOGO?	Output hard copy logo selection standard/user defined	HARD COPY (Ch 9)
LOGOS	Select standard hard copy logo	HARD COPY (Ch 9)
LOGOU	Select user defined hard copy logo	HARD COPY (Ch 9)
LOGOX?	Output hard copy logo on/off status	HARD COPY (Ch 9)
LOL0	Turn lower limit off	DISPLAY - LIMITS (Ch 7)
LOL1	Turn lower limit on at current value	DISPLAY - LIMITS (Ch 7)
LOL20	Turn lower limit off for bottom graph	DISPLAY - LIMITS (Ch 7)
LOL21	Turn lower limit on at current value for bottom graph	DISPLAY - LIMITS (Ch 7)
LOL2X?	Output lower limit on/off status for bottom graph	DISPLAY - LIMITS (Ch 7)
LOLX?	Output lower limit on/off status	DISPLAY - LIMITS (Ch 7)
LON	Limits display on	DISPLAY - LIMITS (Ch 7)
LON?	Output limits display on/off status	DISPLAY - LIMITS (Ch 7)
LOP0	Disable printing operator information	HARD COPY (Ch 9)
LOP1	Enable printing operator information	HARD COPY (Ch 9)
LPF1?	Output limit test failure status on channel 1	DISPLAY - LIMITS (Ch 7)
LPF2?	Output limit test failure status on channel 2	DISPLAY - LIMITS (Ch 7)
LPF3?	Output limit test failure status on channel 3	DISPLAY - LIMITS (Ch 7)
LPF4?	Output limit test failure status on channel 4	DISPLAY - LIMITS (Ch 7)
LPF?	Output limit test failure status all channels	DISPLAY - LIMITS (Ch 7)
LPH	Select linear magnitude and phase display for active channel	DISPLAY (Ch 5)
LPI	Select lowpass impulse response for active channel	APPL - TIME DOMAIN (Ch 10)
LPS	Select lowpass step response for active channel	APPL - TIME DOMAIN (Ch 10)
LPSX?	Output lowpass response for active channel impulse or step	APPL - TIME DOMAIN (Ch 10)
LR2	Specify 2 line LRL calibration	CAL (Ch 6)
LR3	Specify 3 line LRL calibration	CAL (Ch 6)
LRX?	Output line selection for LRL calibration 2 line/3 line	CAL (Ch 6)
LS1	Set lower segmented limit 1 as the active segment	DISPLAY - LIMITS (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
LS10	Select lower segmented limit 10 as the active segment	DISPLAY - LIMITS (Ch 7)
LS2	Select lower segmented limit 2 as the active segment	DISPLAY - LIMITS (Ch 7)
LS3	Select lower segmented limit 3 as the active segment	DISPLAY - LIMITS (Ch 7)
LS4	Select lower segmented limit 4 as the active segment	DISPLAY - LIMITS (Ch 7)
LS5	Select lower segmented limit 5 as the active segment	DISPLAY - LIMITS (Ch 7)
LS6	Select lower segmented limit 6 as the active segment	DISPLAY - LIMITS (Ch 7)
LS7	Select lower segmented limit 7 as the active segment	DISPLAY - LIMITS (Ch 7)
LS8	Select lower segmented limit 8 as the active segment	DISPLAY - LIMITS (Ch 7)
LS9	Select lower segmented limit 9 as the active segment	DISPLAY - LIMITS (Ch 7)
LSB	Select least significant byte first binary transfer	REMOTE - FORMATTING (Ch 8)
LSEG	Select segmented limit line display mode	DISPLAY - LIMITS (Ch 7)
LSNG	Select single limit line display mode	DISPLAY - LIMITS (Ch 7)
LSX?	Output active segmented limit	DISPLAY - LIMITS (Ch 7)
LT0	Turn limits testing off	DISPLAY - LIMITS (Ch 7)
LT1	Turn limits testing on	DISPLAY - LIMITS (Ch 7)
LT1?	Output limits testing enable status	DISPLAY - LIMITS (Ch 7)
LTC	Select coaxial transmission line for calibration	CAL (Ch 6)
LTRD	Output response data from the dedicated GPIB bus	CONFIG - MULTIPLE SOURCE (Ch 5)
LTST	Display the limits testing menu	DISPLAY - LIMITS (Ch 7)
LTU	Select microstrip transmission line for calibration	CAL (Ch 6)
LTW	Select waveguide transmission line for calibration	CAL (Ch 6)
LTWRT	Send program data to the dedicated GPIB bus	CONFIG - MULTIPLE SOURCE (Ch 5)
LTX?	Output line type	CAL (Ch 6)
LUP	Enter upper limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LUP2	Enter upper limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LUP2?	Output upper limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LUP?	Output upper limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LVH	Select high as limits testing TTL level	DISPLAY - LIMITS (Ch 7)
LVL	Select low as limits testing TTL level	DISPLAY - LIMITS (Ch 7)
LVX?	Output limits testing TTL level status	DISPLAY - LIMITS (Ch 7)
LX2?	Output device for line 2 of LRL calibration line/match	CAL (Ch 6)
LX3?	Output device for line 3 of LRL calibration line/match	CAL (Ch 6)
M	Suffix sets distance data type	DATA ENTRY SUFFIXES (Ch 5)
M10C	Set CW mode at marker 10 frequency	MARKER (Ch 7)
M10E	Set sweep/zoom end to marker 10 frequency distance or time	MARKER (Ch 7)
M10S	Set sweep/zoom start to marker 10 frequency distance or time	MARKER (Ch 7)
M11C	Set CW mode at marker 11 frequency	MARKER (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
M11E	Set sweep/zoom end to marker 11 frequency distance or time	MARKER (Ch 7)
M11S	Set sweep/zoom start to marker 11 frequency distance or time	MARKER (Ch 7)
M12C	Set CW mode at marker 12 frequency	MARKER (Ch 7)
M12E	Set sweep/zoom end to marker 12 frequency distance or time	MARKER (Ch 7)
M12S	Set sweep/zoom start to marker 12 frequency distance or time	MARKER (Ch 7)
M1C	Set CW mode at marker 1 frequency	MARKER (Ch 7)
M1E	Set sweep/zoom end to marker 1 frequency distance or time	MARKER (Ch 7)
M1S	Set sweep/zoom start to marker 1 frequency distance or time	MARKER (Ch 7)
M2C	Set CW mode at marker 2 frequency	MARKER (Ch 7)
M2E	Set sweep/zoom end to marker 2 frequency distance or time	MARKER (Ch 7)
M2S	Set sweep/zoom start to marker 2 frequency distance or time	MARKER (Ch 7)
M3C	Set CW mode at marker 3 frequency	MARKER (Ch 7)
M3E	Set sweep/zoom end to marker 3 frequency distance or time	MARKER (Ch 7)
M3P1?	Query the mixed mode 1st balanced port pair for the M3P setup	HARD COPY (Ch 9)
M3P1P12	Set the mixed mode 1st balanced port pair to 1:2 for the M3P setup	HARD COPY (Ch 9)
M3P1P13	Set the mixed mode 1st balanced port pair to 1:3 for the M3P setup	HARD COPY (Ch 9)
M3P1P14	Set the mixed mode 1st balanced port pair to 1:4 for the M3P setup	HARD COPY (Ch 9)
M3P1P21	Set the mixed mode 1st balanced port pair to 2:1 for the M3P setup	HARD COPY (Ch 9)
M3P1P23	Set the mixed mode 1st balanced port pair to 2:3 for the M3P setup	HARD COPY (Ch 9)
M3P1P24	Set the mixed mode 1st balanced port pair to 2:4 for the M3P setup	HARD COPY (Ch 9)
M3P1P31	Set the mixed mode 1st balanced port pair to 3:1 for the M3P setup	HARD COPY (Ch 9)
M3P1P32	Set the mixed mode 1st balanced port pair to 3:2 for the M3P setup	HARD COPY (Ch 9)
M3P1P34	Set the mixed mode 1st balanced port pair to 3:4 for the M3P setup	HARD COPY (Ch 9)
M3P1P41	Set the mixed mode 1st balanced port pair to 4:1 for the M3P setup	HARD COPY (Ch 9)
M3P1P42	Set the mixed mode 1st balanced port pair to 4:2 for the M3P setup	HARD COPY (Ch 9)
M3P1P43	Set the mixed mode 1st balanced port pair to 4:3 for the M3P setup	HARD COPY (Ch 9)
M3PS1	Set the mixed mode single ended port to port 1 for the M3P setup	HARD COPY (Ch 9)
M3PS2	Set the mixed mode single ended port to port 2 for the M3P setup	HARD COPY (Ch 9)
M3PS3	Set the mixed mode single ended port to port 3 for the M3P setup	HARD COPY (Ch 9)
M3PS4	Set the mixed mode single ended port to port 4 for the M3P setup	HARD COPY (Ch 9)
M3PS?	Query the mixed mode singled ended port for the M3P setup	HARD COPY (Ch 9)
M3S	Set sweep/zoom start to marker 3 frequency distance or time	MARKER (Ch 7)
M4C	Set CW mode at marker 4 frequency	MARKER (Ch 7)
M4E	Set sweep/zoom end to marker 4 frequency distance or time	MARKER (Ch 7)
M4P1?	Query the mixed mode 1st balanced port pair for the M4P setup	HARD COPY (Ch 9)
M4P1P12	Set the mixed mode 1st balanced port pair to 1:2 for the M4P setup	HARD COPY (Ch 9)
M4P1P13	Set the mixed mode 1st balanced port pair to 1:3 for the M4P setup	HARD COPY (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
M4P1P14	Set the mixed mode 1st balanced port pair to 1:4 for the M4P setup	HARD COPY (Ch 9)
M4P1P21	Set the mixed mode 1st balanced port pair to 2:1 for the M4P setup	HARD COPY (Ch 9)
M4P1P23	Set the mixed mode 1st balanced port pair to 2:3 for the M4P setup	HARD COPY (Ch 9)
M4P1P24	Set the mixed mode 1st balanced port pair to 2:4 for the M4P setup	HARD COPY (Ch 9)
M4P1P31	Set the mixed mode 1st balanced port pair to 3:1 for the M4P setup	HARD COPY (Ch 9)
M4P1P32	Set the mixed mode 1st balanced port pair to 3:2 for the M4P setup	HARD COPY (Ch 9)
M4P1P34	Set the mixed mode 1st balanced port pair to 3:4 for the M4P setup	HARD COPY (Ch 9)
M4P1P41	Set the mixed mode 1st balanced port pair to 4:1 for the M4P setup	HARD COPY (Ch 9)
M4P1P42	Set the mixed mode 1st balanced port pair to 4:2 for the M4P setup	HARD COPY (Ch 9)
M4P1P43	Set the mixed mode 1st balanced port pair to 4:3 for the M4P setup	HARD COPY (Ch 9)
M4P2?	Query the mixed mode 2nd balanced port pair for the M4P setup	HARD COPY (Ch 9)
M4P2P12	Set the mixed mode 2nd balanced port pair to 1:2 for the M4P setup	HARD COPY (Ch 9)
M4P2P13	Set the mixed mode 2nd balanced port pair to 1:3 for the M4P setup	HARD COPY (Ch 9)
M4P2P14	Set the mixed mode 2nd balanced port pair to 1:4 for the M4P setup	HARD COPY (Ch 9)
M4P2P21	Set the mixed mode 2nd balanced port pair to 2:1 for the M4P setup	HARD COPY (Ch 9)
M4P2P23	Set the mixed mode 2nd balanced port pair to 2:3 for the M4P setup	HARD COPY (Ch 9)
M4P2P24	Set the mixed mode 2nd balanced port pair to 2:4 for the M4P setup	HARD COPY (Ch 9)
M4P2P31	Set the mixed mode 2nd balanced port pair to 3:1 for the M4P setup	HARD COPY (Ch 9)
M4P2P32	Set the mixed mode 2nd balanced port pair to 3:2 for the M4P setup	HARD COPY (Ch 9)
M4P2P34	Set the mixed mode 2nd balanced port pair to 3:4 for the M4P setup	HARD COPY (Ch 9)
M4P2P41	Set the mixed mode 2nd balanced port pair to 4:1 for the M4P setup	HARD COPY (Ch 9)
M4P2P42	Set the mixed mode 2nd balanced port pair to 4:2 for the M4P setup	HARD COPY (Ch 9)
M4P2P43	Set the mixed mode 2nd balanced port pair to 4:3 for the M4P setup	HARD COPY (Ch 9)
M4S	Set sweep/zoom start to marker 4 frequency distance or time	MARKER (Ch 7)
M5C	Set CW mode at marker 5 frequency	MARKER (Ch 7)
M5E	Set sweep/zoom end to marker 5 frequency distance or time	MARKER (Ch 7)
M5S	Set sweep/zoom start to marker 5 frequency distance or time	MARKER (Ch 7)
M6C	Set CW mode at marker 6 frequency	MARKER (Ch 7)
M6E	Set sweep/zoom end to marker 6 frequency distance or time	MARKER (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
M6S	Set sweep/zoom start to marker 6 frequency distance or time	MARKER (Ch 7)
M7C	Set CW mode at marker 7 frequency	MARKER (Ch 7)
M7E	Set sweep/zoom end to marker 7 frequency distance or time	MARKER (Ch 7)
M7S	Set sweep/zoom start to marker 7 frequency distance or time	MARKER (Ch 7)
M8C	Set CW mode at marker 8 frequency	MARKER (Ch 7)
M8E	Set sweep/zoom end to marker 8 frequency distance or time	MARKER (Ch 7)
M8S	Set sweep/zoom start to marker 8 frequency distance or time	MARKER (Ch 7)
M9C	Set CW mode at marker 9 frequency	MARKER (Ch 7)
M9E	Set sweep/zoom end to marker 9 frequency distance or time	MARKER (Ch 7)
M9S	Set sweep/zoom start to marker 9 frequency distance or time	MARKER (Ch 7)
MAG	Select log magnitude display for active channel	DISPLAY (Ch 5)
MAT	Select matched reflective devices during calibration	CAL (Ch 6)
MD	Create a new disk directory	UTILITY - DISK (Ch 9)
MD0	Turn mean display off	DISPLAY (Ch 5)
MD1	Turn mean display on	DISPLAY (Ch 5)
MDX?	Output mean display status	DISPLAY (Ch 5)
MEM	Display trace memory on active channel	DISPLAY (Ch 5)
MF	Suffix sets farad data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MFGCT	Start multiple frequency swept power gain compression test	APPL - GAIN COMPRESSION (Ch 10)
MH	Suffix sets farad data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MHZ	Suffix sets frequency data type and scales by 1E6	DATA ENTRY SUFFIXES (Ch 5)
MIN	Select subtraction as trace math for active channel	DISPLAY (Ch 5)
MIX	Select mixed reflective devices during calibration	CAL (Ch 6)
MIX?	Output reflective devices selection during calibration	CAL (Ch 6)
MIXP3	Set port 3 to be mixer port when source 2 using	CAL (Ch 6)
MIXP4	Set port 4 to be mixer port when source 2 using	CAL (Ch 6)
MIXPORT?	Output mixer port when source 2 using	CAL (Ch 6)
MK1	Enter marker 1 frequency distance or time and turn on	MARKER (Ch 7)
MK10	Enter marker 10 frequency distance or time and turn on	MARKER (Ch 7)
MK10?	Output marker 10 frequency distance or time	MARKER (Ch 7)
MK11	Enter marker 11 frequency distance or time and turn on	MARKER (Ch 7)
MK11?	Output marker 11 frequency distance or time	MARKER (Ch 7)
MK12	Enter marker 12 frequency distance or time and turn on	MARKER (Ch 7)
MK12?	Output marker 12 frequency distance or time	MARKER (Ch 7)
MK1?	Output marker 1 frequency distance or time	MARKER (Ch 7)
MK2	Enter marker 2 frequency distance or time and turn on	MARKER (Ch 7)
MK2?	Output marker 2 frequency distance or time	MARKER (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MK3	Enter marker 3 frequency distance or time and turn on	MARKER (Ch 7)
MK3?	Output marker 3 frequency distance or time	MARKER (Ch 7)
MK4	Enter marker 4 frequency distance or time and turn on	MARKER (Ch 7)
MK4?	Output marker 4 frequency distance or time	MARKER (Ch 7)
MK5	Enter marker 5 frequency distance or time and turn on	MARKER (Ch 7)
MK5?	Output marker 5 frequency distance or time	MARKER (Ch 7)
MK6	Enter marker 6 frequency distance or time and turn on	MARKER (Ch 7)
MK6?	Output marker 6 frequency distance or time	MARKER (Ch 7)
MK7	Enter marker 7 frequency distance or time and turn on	MARKER (Ch 7)
MK7?	Output marker 7 frequency distance or time	MARKER (Ch 7)
MK8	Enter marker 8 frequency distance or time and turn on	MARKER (Ch 7)
MK8?	Output marker 8 frequency distance or time	MARKER (Ch 7)
MK9	Enter marker 9 frequency distance or time and turn on	MARKER (Ch 7)
MK9?	Output marker 9 frequency distance or time	MARKER (Ch 7)
MKRC	Select interpolated marker functionality	MARKER (Ch 7)
MKRCOL	Enter the color number for the markers	UTILITY (Ch 9)
MKRCOL?	Output the color number for the markers	UTILITY (Ch 9)
MKRD	Select discrete marker functionality	MARKER (Ch 7)
MKRX?	Output interpolated/discrete marker functionality	MARKER (Ch 7)
MKSL	Marker search left	MARKER (Ch 7)
MKSR	Marker search right	MARKER (Ch 7)
MKT0	Turn marker tracking off	MARKER (Ch 7)
MKT1	Turn marker tracking on	MARKER (Ch 7)
MKTX?	Output marker tracking on/off status	MARKER (Ch 7)
MM	Suffix sets distance data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MM1P12	Set the mixed mode 1st balanced port pair to 1:2 for the active channel S-parameter	MEAS (Ch 5)
MM1P13	Set the mixed mode 1st balanced port pair to 1:3 for the active channel S-parameter	MEAS (Ch 5)
MM1P14	Set the mixed mode 1st balanced port pair to 1:4 for the active channel S-parameter	MEAS (Ch 5)
MM1P21	Set the mixed mode 1st balanced port pair to 2:1 for the active channel S-parameter	MEAS (Ch 5)
MM1P23	Set the mixed mode 1st balanced port pair to 2:3 for the active channel S-parameter	MEAS (Ch 5)
MM1P24	Set the mixed mode 1st balanced port pair to 2:4 for the active channel S-parameter	MEAS (Ch 5)
MM1P31	Set the mixed mode 1st balanced port pair to 3:1 for the active channel S-parameter	MEAS (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MM1P32	Set the mixed mode 1st balanced port pair to 3:2 for the active channel S-parameter	MEAS (Ch 5)
MM1P34	Set the mixed mode 1st balanced port pair to 3:4 for the active channel S-parameter	MEAS (Ch 5)
MM1P41	Set the mixed mode 1st balanced port pair to 4:1 for the active channel S-parameter	MEAS (Ch 5)
MM1P42	Set the mixed mode 1st balanced port pair to 4:2 for the active channel S-parameter	MEAS (Ch 5)
MM1P43	Set the mixed mode 1st balanced port pair to 4:3 for the active channel S-parameter	MEAS (Ch 5)
MM1P?	Query the mixed mode 1st balanced port pair for the active channel S-parameter	MEAS (Ch 5)
MM2P12	Set the mixed mode 2nd balanced port pair to 1:2 for the active channel S-parameter	MEAS (Ch 5)
MM2P13	Set the mixed mode 2nd balanced port pair to 1:3 for the active channel S-parameter	MEAS (Ch 5)
MM2P14	Set the mixed mode 2nd balanced port pair to 1:4 for the active channel S-parameter	MEAS (Ch 5)
MM2P21	Set the mixed mode 2nd balanced port pair to 2:1 for the active channel S-parameter	MEAS (Ch 5)
MM2P23	Set the mixed mode 2nd balanced port pair to 2:3 for the active channel S-parameter	MEAS (Ch 5)
MM2P24	Set the mixed mode 2nd balanced port pair to 2:4 for the active channel S-parameter	MEAS (Ch 5)
MM2P31	Set the mixed mode 2nd balanced port pair to 3:1 for the active channel S-parameter	MEAS (Ch 5)
MM2P32	Set the mixed mode 2nd balanced port pair to 3:2 for the active channel S-parameter	MEAS (Ch 5)
MM2P34	Set the mixed mode 2nd balanced port pair to 3:4 for the active channel S-parameter	MEAS (Ch 5)
MM2P41	Set the mixed mode 2nd balanced port pair to 4:1 for the active channel S-parameter	MEAS (Ch 5)
MM2P42	Set the mixed mode 2nd balanced port pair to 4:2 for the active channel S-parameter	MEAS (Ch 5)
MM2P43	Set the mixed mode 2nd balanced port pair to 4:3 for the active channel S-parameter	MEAS (Ch 5)
MM2P?	Query the mixed mode 2nd balanced port pair for the active channel S-parameter	MEAS (Ch 5)
MMN	Move active marker to minimum trace value	MARKER (Ch 7)
MMS1	Set the mixed mode single ended port to Port 1 for the active channel S-parameter	MEAS (Ch 5)
MMS2	Set the mixed mode single ended port to Port 2 for the active channel S-parameter	MEAS (Ch 5)
MMS3	Set the mixed mode single ended port to Port 3 for the active channel S-parameter	MEAS (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MMS4	Set the mixed mode single ended port to Port 4 for the active channel S-parameter	MEAS (Ch 5)
MMS?	Query the mixed mode single ended port for the active channel S-parameter	MEAS (Ch 5)
MMSC1C1	Set the S-parameter to mixed mode SC1C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC1C2	Set the S-parameter to mixed mode SC1C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC1D1	Set the S-parameter to mixed mode SC1D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC1D2	Set the S-parameter to mixed mode SC1D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2C1	Set the S-parameter to mixed mode SC2C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2C2	Set the S-parameter to mixed mode SC2C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2D1	Set the S-parameter to mixed mode SC2D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2D2	Set the S-parameter to mixed mode SC2D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSCC	Set the S-parameter to mixed mode SCC with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSCD	Set the S-parameter to mixed mode SCD with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSCS	Set the S-parameter to mixed mode SCS with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSD1C1	Set the S-parameter to mixed mode SD1C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD1C2	Set the S-parameter to mixed mode SD1C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD1D1	Set the S-parameter to mixed mode SD1D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD1D2	Set the S-parameter to mixed mode SD1D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2C1	Set the S-parameter to mixed mode SD2C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2C2	Set the S-parameter to mixed mode SD2C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2D1	Set the S-parameter to mixed mode SD2D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2D2	Set the S-parameter to mixed mode SD2D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSDC	Set the S-parameter to mixed mode SDC with the current port pair/singleton selection for the active channel	MEAS (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MMSDD	Set the S-parameter to mixed mode SDD with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSDS	Set the S-parameter to mixed mode SDS with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSSC	Set the S-parameter to mixed mode SSC with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSSD	Set the S-parameter to mixed mode SSD with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMT	Suffix sets distance data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MMX	Move active marker to maximum trace value	MARKER (Ch 7)
MNUCOL	Enter the color number for the menu headers	UTILITY (Ch 9)
MNUCOL?	Output the color number for the menu headers	UTILITY (Ch 9)
MO1	Turn off marker 1	MARKER (Ch 7)
MO10	Turn off marker 10	MARKER (Ch 7)
MO11	Turn off marker 11	MARKER (Ch 7)
MO12	Turn off marker 12	MARKER (Ch 7)
MO2	Turn off marker 2	MARKER (Ch 7)
MO3	Turn off marker 3	MARKER (Ch 7)
MO4	Turn off marker 4	MARKER (Ch 7)
MO5	Turn off marker 5	MARKER (Ch 7)
MO6	Turn off marker 6	MARKER (Ch 7)
MO7	Turn off marker 7	MARKER (Ch 7)
MO8	Turn off marker 8	MARKER (Ch 7)
MO9	Turn off marker 9	MARKER (Ch 7)
MOF	Turn marker display off	MARKER (Ch 7)
MON	Turn marker display on	MARKER (Ch 7)
MON?	Output marker display on/off status	MARKER (Ch 7)
MPH	Select log magnitude and phase display for active channel	DISPLAY (Ch 5)
MPN	Enter pen number for markers and limits	HARD COPY (Ch 9)
MPN?	Output pen number for markers and limits	HARD COPY (Ch 9)
MR1	Turn marker 1 on and make it the active marker	MARKER (Ch 7)
MR10	Turn marker 10 on and make it the active marker	MARKER (Ch 7)
MR10?	Output marker 10 on/off status	MARKER (Ch 7)
MR11	Turn marker 11 on and make it the active marker	MARKER (Ch 7)
MR11?	Output marker 11 on/off status	MARKER (Ch 7)
MR12	Turn marker 12 on and make it the active marker	MARKER (Ch 7)
MR12?	Output marker 12 on/off status	MARKER (Ch 7)
MR1?	Output marker 1 on/off status	MARKER (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MR2	Turn marker 2 on and make it the active marker	MARKER (Ch 7)
MR2?	Output marker 2 on/off status	MARKER (Ch 7)
MR3	Turn marker 3 on and make it the active marker	MARKER (Ch 7)
MR3?	Output marker 3 on/off status	MARKER (Ch 7)
MR4	Turn marker 4 on and make it the active marker	MARKER (Ch 7)
MR4?	Output marker 4 on/off status	MARKER (Ch 7)
MR5	Turn marker 5 on and make it the active marker	MARKER (Ch 7)
MR5?	Output marker 5 on/off status	MARKER (Ch 7)
MR6	Turn marker 6 on and make it the active marker	MARKER (Ch 7)
MR6?	Output marker 6 on/off status	MARKER (Ch 7)
MR7	Turn marker 7 on and make it the active marker	MARKER (Ch 7)
MR7?	Output marker 7 on/off status	MARKER (Ch 7)
MR8	Turn marker 8 on and make it the active marker	MARKER (Ch 7)
MR8?	Output marker 8 on/off status	MARKER (Ch 7)
MR9	Turn marker 9 on and make it the active marker	MARKER (Ch 7)
MR9?	Output marker 9 on/off status	MARKER (Ch 7)
MRM	Display the Marker Readout menu	MARKER (Ch 7)
MRR	Restore original marker range	APPL - TIME DOMAIN (Ch 10)
MRX?	Output active marker number	MARKER (Ch 7)
MS	Suffix sets time data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MS0	Turn multiple source mode off	CONFIG - MULTIPLE SOURCE (Ch 5)
MS1	Turn multiple source mode on	CONFIG - MULTIPLE SOURCE (Ch 5)
MS1C	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1C/SSC for the active channel	MEAS (Ch 5)
MS1D	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1D/SSD for the active channel	MEAS (Ch 5)
MSB	Select most significant byte first binary transfer	REMOTE - FORMATTING (Ch 8)
MSC1	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SC1/SCS for the active channel	MEAS (Ch 5)
MSC1C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C1 for the active channel	MEAS (Ch 5)
MSC1C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C2 for the active channel	MEAS (Ch 5)
MSC1D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D1 for the active channel	MEAS (Ch 5)
MSC1D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D2 for the active channel	MEAS (Ch 5)
MSC2C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C1 for the active channel	MEAS (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MSC2C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C2 for the active channel	MEAS (Ch 5)
MSC2D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D1 for the active channel	MEAS (Ch 5)
MSC2D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D2 for the active channel	MEAS (Ch 5)
MSCC	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCC for the active channel	MEAS (Ch 5)
MSCD	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCD for the active channel	MEAS (Ch 5)
MSD	Select multiple source define mode	CONFIG - MULTIPLE SOURCE (Ch 5)
MSD1	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SD1/SDS for the active channel	MEAS (Ch 5)
MSD1C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C1 for the active channel	MEAS (Ch 5)
MSD1C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C2 for the active channel	MEAS (Ch 5)
MSD1D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D1 for the active channel	MEAS (Ch 5)
MSD1D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D2 for the active channel	MEAS (Ch 5)
MSD2C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C1 for the active channel	MEAS (Ch 5)
MSD2C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C2 for the active channel	MEAS (Ch 5)
MSD2D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D1 for the active channel	MEAS (Ch 5)
MSD2D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D2 for the active channel	MEAS (Ch 5)
MSDC	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDC for the active channel	MEAS (Ch 5)
MSDD	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDD for the active channel	MEAS (Ch 5)
MSFH	Enter high loss value for shape factor calculation	MARKER (Ch 7)
MSFH?	Output high loss value for shape factor calculation	MARKER (Ch 7)
MSFL	Enter low loss value for shape factor calculation	MARKER (Ch 7)
MSFL?	Output low loss value for shape factor calculation	MARKER (Ch 7)
MSR0	Select 0 as reference for marker search and bandwidth calculation	MARKER (Ch 7)
MSRD	Select delta reference marker as reference for marker search and bandwidth calculation	MARKER (Ch 7)
MSRM	Select maximum as reference for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMIN	Select min as ref for marker search and bandwidth calculation	MARKER (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MSRMR	Select maximum return as ref for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRA	Select auto mode of maximum return as ref for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRM	Select manual mode of maximum return as ref for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRV	Enter maximum return value for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRV?	Output maximum return value for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRX?	Output maximum return mode for marker search and bandwidth calculation	MARKER (Ch 7)
MSRX?	Output reference selection for marker search and bandwidth calculation	MARKER (Ch 7)
MSX?	Output multiple source mode on/off/define	CONFIG - MULTIPLE SOURCE (Ch 5)
MTH?	Output trace math math type	DISPLAY (Ch 5)
MTR	Suffix sets distance data type	DATA ENTRY SUFFIXES (Ch 5)
MUL	Select multiplication as trace math for active channel	DISPLAY (Ch 5)
MV	Suffix sets voltage data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
NA1	Select a1 as numerator for parameter being defined	MEAS (Ch 5)
NA2	Select a2 as numerator for parameter being defined	MEAS (Ch 5)
NA3	Select a3 = Rc as numerator for parameter being defined	MEAS (Ch 5)
NA4	Select a4 = Rd as numerator for parameter being define	MEAS (Ch 5)
NB1	Select b1 as numerator for parameter being defined	MEAS (Ch 5)
NB2	Select b2 as numerator for parameter being defined	MEAS (Ch 5)
NB3	Select b3 = Tc as numerator for parameter being defined	MEAS (Ch 5)
NB4	Select b4 = Td as numerator for parameter being define	MEAS (Ch 5)
NCS	Go to next calibration step	CAL (Ch 6)
NF	Suffix sets farad data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)
NFALCK0	Turn off the lock down	APPL - NOISE FIGURE (Ch 10)
NFALCK1	Lock down the front end attenuator	APPL - NOISE FIGURE (Ch 10)
NFALCK?	Output lock or unlock down status for the front end attenuator setting	APPL - NOISE FIGURE (Ch 10)
NFAOF	Turn noise figure measurement averaging off	APPL - NOISE FIGURE (Ch 10)
NFAON	Turn noise figure measurement averaging on	APPL - NOISE FIGURE (Ch 10)
NFAON?	Noise figure averaging on/off query	APPL - NOISE FIGURE (Ch 10)
NFASET	Lock down the front end attenuator and set it to 0, 1, 2, 3, or 4	APPL - NOISE FIGURE (Ch 10)
NFAVEC	Enter noise figure averaging count	AVG (Ch 5)
NFAVEC?	Output noise figure averaging count	AVG (Ch 5)
NFBATTN	Output the backend attenuator setting	APPL - NOISE FIGURE (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
NFBCAL	Output NF backend calibration table	APPL - NOISE FIGURE (Ch 10)
NFBW	Enter noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBW?	Output noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBWC0	Turn off noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBWC1	Turn on noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBWCX?	Output noise figure bandwidth correction on/off status	APPL - NOISE FIGURE (Ch 10)
NFC0	Turn off noise figure correction	APPL - NOISE FIGURE (Ch 10)
NFC1	Turn on noise figure correction	APPL - NOISE FIGURE (Ch 10)
NFC12TDONE?	Output noise figure with 12 term cal done status	APPL - NOISE FIGURE (Ch 10)
NFC2	Turn on noise figure with 12-term correction	APPL - NOISE FIGURE (Ch 10)
NFCDONE?	Output noise figure cal done status	APPL - NOISE FIGURE (Ch 10)
NFCOLD	Output corrected data for cold noise power	APPL - NOISE FIGURE (Ch 10)
NFCT	Enter noise figure cold temperature	APPL - NOISE FIGURE (Ch 10)
NFCT?	Output noise figure cold temperature	APPL - NOISE FIGURE (Ch 10)
NFCX?	Output noise figure correction on/off status	APPL - NOISE FIGURE (Ch 10)
NFDAG	Display available gain	APPL - NOISE FIGURE (Ch 10)
NFDATA	Output the cold data, the hot data, the front end attenuator	APPL - NOISE FIGURE (Ch 10)
NFDBWN	Select narrow DUT BW	APPL - NOISE FIGURE (Ch 10)
NFDBWW	Select wide DUT BW	APPL - NOISE FIGURE (Ch 10)
NFDBWX?	Output DUT BW setting	APPL - NOISE FIGURE (Ch 10)
NFDENT	Display equivalent noise temperature	APPL - NOISE FIGURE (Ch 10)
NFDIG	Display insertion gain	APPL - NOISE FIGURE (Ch 10)
NFDNF	Display noise figure	APPL - NOISE FIGURE (Ch 10)
NFDX?	Output noise figure display selection	APPL - NOISE FIGURE (Ch 10)
NFDYF	Display Y-factor	APPL - NOISE FIGURE (Ch 10)
NFFATTN	Output the front end attenuator setting	APPL - NOISE FIGURE (Ch 10)
NFHOT	Output corrected data for hot noise power	APPL - NOISE FIGURE (Ch 10)
NFLA	Enter noise figure loss after DUT	APPL - NOISE FIGURE (Ch 10)
NFLA?	Output noise figure loss after DUT	APPL - NOISE FIGURE (Ch 10)
NFLB	Enter noise figure loss before DUT	APPL - NOISE FIGURE (Ch 10)
NFLB?	Output noise figure loss before DUT	APPL - NOISE FIGURE (Ch 10)
NFLENR	Load ENR file from floppy disk	APPL - NOISE FIGURE (Ch 10)
NFLENRH	Load ENR file from hard disk	APPL - NOISE FIGURE (Ch 10)
NFLENRX	Load ENR extension correction file from floppy disk	APPL - NOISE FIGURE (Ch 10)
NFLENRXH	Load ENR extension correction file from hard disk	APPL - NOISE FIGURE (Ch 10)
NFLNFX	Load ENR external extension correction file from floppy disk	APPL - NOISE FIGURE (Ch 10)
NFLNFXH	Load ENR external extension correction file from hard disk	APPL - NOISE FIGURE (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
NFOL	Output noise figure overload status	APPL - NOISE FIGURE (Ch 10)
NFSRCE	Select external noise source	APPL - NOISE FIGURE (Ch 10)
NFSRCI	Select internal noise source	APPL - NOISE FIGURE (Ch 10)
NFSRCX?	Output noise source selection	APPL - NOISE FIGURE (Ch 10)
NFSSBC0	Turn off noise figure single sideband correction	APPL - NOISE FIGURE (Ch 10)
NFSSBC1	Turn on noise figure single sideband correction	APPL - NOISE FIGURE (Ch 10)
NFSSBCX?	Output noise figure single sideband correction on/off	APPL - NOISE FIGURE (Ch 10)
NFV	Start noise figure verification	UTILITY - DIAGNOSTICS (Ch 9)
NFVNB?	Output noise figure verification NB data	UTILITY - DIAGNOSTICS (Ch 9)
NFVNC?	Output noise figure verification NC data	UTILITY - DIAGNOSTICS (Ch 9)
NFVND?	Output noise figure verification ND data	UTILITY - DIAGNOSTICS (Ch 9)
NFVSB?	Output noise figure verification SB data	UTILITY - DIAGNOSTICS (Ch 9)
NFVSC?	Output noise figure verification SC data	UTILITY - DIAGNOSTICS (Ch 9)
NFVSD?	Output noise figure verification SD data	UTILITY - DIAGNOSTICS (Ch 9)
NFXENR0	Turn off ENR extension table	APPL - NOISE FIGURE (Ch 10)
NFXENR1	Turn on ENR extension table	APPL - NOISE FIGURE (Ch 10)
NFXENRX?	Query on/off status of ENR extension table	APPL - NOISE FIGURE (Ch 10)
NH	Suffix sets farad data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)
NMKR	Select normal markers on active channel marker mode	MARKER (Ch 7)
NOC	Select normal calibration data points	CAL (Ch 6)
NOFST	Enter nominal offset value for external gain	APPL - GAIN COMPRESSION (Ch 10)
NOFST?	Output nominal offset value for external gain	APPL - GAIN COMPRESSION (Ch 10)
NOP	No operation	REMOTE - MISC (Ch 8)
NP101	Set data points to 101	CONFIG (Ch 5)
NP15	Set data points to 15	CONFIG (Ch 5)
NP1601	Set data points to 1601	CONFIG (Ch 5)
NP201	Set data points to 201	CONFIG (Ch 5)
NP3	Set data points to 3	CONFIG (Ch 5)
NP401	Set data points to 401	CONFIG (Ch 5)
NP51	Set data points to 51	CONFIG (Ch 5)
NP801	Set data points to 801	CONFIG (Ch 5)
NPX?	Output number of points currently being measured	CAL (Ch 6)
NRMS	Normalize S21 for gain compression testing	APPL - GAIN COMPRESSION (Ch 10)
NS	Suffix sets time data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)
NS0	Turn noise source off	APPL - NOISE FIGURE (Ch 10)
NS1	Turn noise source on	APPL - NOISE FIGURE (Ch 10)
NSC	Suffix sets time data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
NU1	Select unity as numerator for parameter being defined	MEAS (Ch 5)
NUM?	Output numerator selection for parameter being defined	MEAS (Ch 5)
NUS3P	Select Don't Use existing 3-port calibration	CAL (Ch 6)
OACCHAR	Output AutoCal characterization data to the GPIB	CAL - AUTOCAL (Ch 6)
OACCSER2P	Output the AutoCal characterization serial number for 2-port AutoCal	CAL - AUTOCAL (Ch 6)
OACCSER4P	Output the AutoCal characterization serial number for 4-port AutoCal	CAL - AUTOCAL (Ch 6)
OACSER	Output AutoCal box serial number	CAL - AUTOCAL (Ch 6)
OACTYPE	Output AutoCal box type	CAL - AUTOCAL (Ch 6)
OAM1	Output channel 1 active marker value	MARKER (Ch 7)
OAM2	Output channel 2 active marker value	MARKER (Ch 7)
OAM3	Output channel 3 active marker value	MARKER (Ch 7)
OAM4	Output channel 4 active marker value	MARKER (Ch 7)
OBMP	Output the display as a bitmap	REMOTE - MISC (Ch 8)
OC1	Output calibration coefficients 1	REMOTE - CAL (Ch 8)
OC10	Output calibration coefficients 10	REMOTE - CAL (Ch 8)
OC11	Output calibration coefficients 11	REMOTE - CAL (Ch 8)
OC12	Output calibration coefficients 12	REMOTE - CAL (Ch 8)
OC13	Output calibration coefficients 13	REMOTE - CAL (Ch 8)
OC14	Output calibration coefficients 14	REMOTE - CAL (Ch 8)
OC15	Output calibration coefficients 15	REMOTE - CAL (Ch 8)
OC16	Output calibration coefficients 16	REMOTE - CAL (Ch 8)
OC17	Output calibration coefficients 17	REMOTE - CAL (Ch 8)
OC18	Output calibration coefficients 18	REMOTE - CAL (Ch 8)
OC19	Output calibration coefficients 19	REMOTE - CAL (Ch 8)
OC2	Output calibration coefficients 2	REMOTE - CAL (Ch 8)
OC20	Output calibration coefficients 20	REMOTE - CAL (Ch 8)
OC21	Output calibration coefficients 21	REMOTE - CAL (Ch 8)
OC22	Output calibration coefficients 22	REMOTE - CAL (Ch 8)
OC23	Output calibration coefficients 23	REMOTE - CAL (Ch 8)
OC24	Output calibration coefficients 24	REMOTE - CAL (Ch 8)
OC25	Output calibration coefficient 25	REMOTE - CAL (Ch 8)
OC26	Output calibration coefficient 26	REMOTE - CAL (Ch 8)
OC27	Output calibration coefficient 27	REMOTE - CAL (Ch 8)
OC28	Output calibration coefficient 28	REMOTE - CAL (Ch 8)
OC29	Output calibration coefficient 29	REMOTE - CAL (Ch 8)
OC3	Output calibration coefficients 3	REMOTE - CAL (Ch 8)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
OC30	Output calibration coefficient 30	REMOTE - CAL (Ch 8)
OC31	Output calibration coefficient 31	REMOTE - CAL (Ch 8)
OC32	Output calibration coefficient 32	REMOTE - CAL (Ch 8)
OC33	Output calibration coefficient 33	REMOTE - CAL (Ch 8)
OC34	Output calibration coefficient 34	REMOTE - CAL (Ch 8)
OC35	Output calibration coefficient 35	REMOTE - CAL (Ch 8)
OC36	Output calibration coefficient 36	REMOTE - CAL (Ch 8)
OC37	Output calibration coefficient 37	REMOTE - CAL (Ch 8)
OC38	Output calibration coefficient 38	REMOTE - CAL (Ch 8)
OC39	Output calibration coefficient 39	REMOTE - CAL (Ch 8)
OC4	Output calibration coefficients 4	REMOTE - CAL (Ch 8)
OC40	Output calibration coefficient 40	REMOTE - CAL (Ch 8)
OC5	Output calibration coefficients 5	REMOTE - CAL (Ch 8)
OC6	Output calibration coefficients 6	REMOTE - CAL (Ch 8)
OC7	Output calibration coefficients 7	REMOTE - CAL (Ch 8)
OC8	Output calibration coefficients 8	REMOTE - CAL (Ch 8)
OC9	Output calibration coefficients 9	REMOTE - CAL (Ch 8)
OCA	Output calibration coefficient 10	REMOTE - CAL (Ch 8)
OCB	Output calibration coefficient 11	REMOTE - CAL (Ch 8)
OCC	Output calibration coefficient 12	REMOTE - CAL (Ch 8)
OCD	Output corrected data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
OCF	Output front panel setup and calibration data	REMOTE - SETUP (Ch 8)
OCFEDE	Output the front panel setup, calibration, and EDE data	REMOTE - MEASURED DATA (Ch 8)
OCFSG	Output the segmented sweep data	REMOTE - MEASURED DATA (Ch 8)
OCL	Output all applicable calibration coefficients for calibration type	REMOTE - CAL (Ch 8)
OCL3P	Output additional 12 calibration coefficients for 3-port	REMOTE - CAL (Ch 8)
OCM	Select offset short calibration method	CAL (Ch 6)
OCS	Output the internal buffer collected data	REMOTE - MEASURED DATA (Ch 8)
ODAT	Output hard copy tabular data to GPIB	REMOTE - MEASURED DATA (Ch 8)
ODR	Output directory listing of the floppy drive	REMOTE - MISC (Ch 8)
ODRH	Output directory listing of the hard drive	REMOTE - MISC (Ch 8)
ODV	Output distance values for time domain	REMOTE - MEASURED POINTS (Ch 8)
OEB	Output extended status byte	REMOTE - STATUS REPORTING (Ch 8)
OEDELOG	Output current EDE log	CONFIG (Ch 5)
OEL	Output error list	REMOTE - ERROR REPORTING (Ch 8)
OEM	Output extended status byte mask	REMOTE - STATUS REPORTING (Ch 8)
OFD	Output final data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
OFF	Enter offset value for top graph of active channel	DISPLAY (Ch 5)
OFF2	Enter offset value for bottom graph of active channel	DISPLAY (Ch 5)
OFF2?	Output offset value for bottom graph of active channel	DISPLAY (Ch 5)
OFF?	Output offset value for top graph of active channel	DISPLAY (Ch 5)
OFP	Output current front panel setup	REMOTE - SETUP (Ch 8)
OFV	Output frequency values	REMOTE - MEASURED POINTS (Ch 8)
OGCFD	Output gain compression final data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OGCFV	Output gain compression frequency values to GPIB	REMOTE - MEASURED POINTS (Ch 8)
OGCTXT	Output text format gain compression data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OGE	Output extended description of current GPIB error	REMOTE - ERROR REPORTING (Ch 8)
OGL	Output extended description of previous GPIB error	REMOTE - ERROR REPORTING (Ch 8)
OHDR	Output hard copy header information to GPIB	REMOTE - MISC (Ch 8)
OHDW	Output hardware cal data to GPIB	REMOTE - MISC (Ch 8)
OHGL	Output HPGL format data to GPIB	REMOTE - MISC (Ch 8)
OHM	Suffix sets impedance data type	DATA ENTRY SUFFIXES (Ch 5)
OI	Output instrument identification string with serial number	REMOTE - MISC (Ch 8)
OID	Output instrument identification string	REMOTE - MISC (Ch 8)
OLB	Output limits status byte	REMOTE - STATUS REPORTING (Ch 8)
OLM	Output limits status byte mask	REMOTE - STATUS REPORTING (Ch 8)
OM1	Output marker 1 value	REMOTE - MEASURED DATA (Ch 8)
OM10	Output marker 10 value	REMOTE - MEASURED DATA (Ch 8)
OM11	Output marker 11 value	REMOTE - MEASURED DATA (Ch 8)
OM12	Output marker 12 value	REMOTE - MEASURED DATA (Ch 8)
OM2	Output marker 2 value	REMOTE - MEASURED DATA (Ch 8)
OM3	Output marker 3 value	REMOTE - MEASURED DATA (Ch 8)
OM3P	Output M3P format data to GPIB with M3P setup set to (2:3)1	REMOTE - MEASURED DATA (Ch 8)
OM4	Output marker 4 value	REMOTE - MEASURED DATA (Ch 8)
OM4P	Output M4P format data to GPIB with M4P setup set to (1:2)(3:4)	REMOTE - MEASURED DATA (Ch 8)
OM5	Output marker 5 value	REMOTE - MEASURED DATA (Ch 8)
OM6	Output marker 6 value	REMOTE - MEASURED DATA (Ch 8)
OM7	Output marker 7 value	REMOTE - MEASURED DATA (Ch 8)
OM8	Output marker 8 value	REMOTE - MEASURED DATA (Ch 8)
OM9	Output marker 9 value	REMOTE - MEASURED DATA (Ch 8)
OMM3P	Output the M3P format data to the GPIB with the current M3P setup	HARD COPY (Ch 9)
OMM4P	Output the M4P format data to the GPIB with the current M4P setup	HARD COPY (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
OMOD	Output instrument model number	REMOTE - MISC (Ch 8)
ONCP	Output number of points for current calibration	REMOTE - CAL (Ch 8)
ONCT	Output number of calibration terms for current calibration	REMOTE - CAL (Ch 8)
ONDF	Output number of discrete frequencies	REMOTE - MEASURED POINTS (Ch 8)
ONE	Output number of lines in the error list	REMOTE - ERROR REPORTING (Ch 8)
ONP	Output number of points currently being measured	CONFIG (Ch 5)
ONPV	Output the number of power sweep power values	REMOTE - MEASURED POINTS (Ch 8)
ONRM	Output stored normalization data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OPB	Output the 488.2 status byte value (same as *STB?)	REMOTE - STATUS REPORTING (Ch 8)
OPSV	Output power sweep power values	REMOTE - MEASURED DATA (Ch 8)
ORD	Output raw data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
OS1	Output front panel setup number 1	REMOTE - SETUP (Ch 8)
OS10	Output front panel setup number 10	REMOTE - SETUP (Ch 8)
OS11C	Output corrected S11 data	REMOTE - MEASURED DATA (Ch 8)
OS11R	Output raw S11 data	REMOTE - MEASURED DATA (Ch 8)
OS12C	Output corrected S12 data	REMOTE - MEASURED DATA (Ch 8)
OS12R	Output raw S12 data	REMOTE - MEASURED DATA (Ch 8)
OS13C	Output corrected S13 data	REMOTE - MEASURED DATA (Ch 8)
OS13R	Output raw S13 data	REMOTE - MEASURED DATA (Ch 8)
OS14C	Output corrected S14 data	REMOTE - MEASURED DATA (Ch 8)
OS14R	Output raw S14 data	REMOTE - MEASURED DATA (Ch 8)
OS1P1	Output S1P1 format data to gpib	HARD COPY (Ch 9)
OS1P2	Output S1P2 format data to gpib	HARD COPY (Ch 9)
OS1P3	Output S1P3 format data to gpib	HARD COPY (Ch 9)
OS1P4	Output S1P4 format data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OS2	Output front panel setup number 2	REMOTE - SETUP (Ch 8)
OS21C	Output corrected S21 data	REMOTE - MEASURED DATA (Ch 8)
OS21R	Output raw S21 data	REMOTE - MEASURED DATA (Ch 8)
OS22C	Output corrected S22 data	REMOTE - MEASURED DATA (Ch 8)
OS22R	Output raw S22 data	REMOTE - MEASURED DATA (Ch 8)
OS23C	Output corrected S23 data	REMOTE - MEASURED DATA (Ch 8)
OS23R	Output raw S23 data	REMOTE - MEASURED DATA (Ch 8)
OS24C	Output corrected S24 data	REMOTE - MEASURED DATA (Ch 8)
OS24R	Output raw S24 data	REMOTE - MEASURED DATA (Ch 8)
OS2P	Output S2P format data to GPIB	HARD COPY (Ch 9)
OS3	Output front panel setup number 3	REMOTE - SETUP (Ch 8)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
OS31C	Output corrected S31 data	REMOTE - MEASURED DATA (Ch 8)
OS31R	Output raw S31 data	REMOTE - MEASURED DATA (Ch 8)
OS32C	Output corrected S32 data	REMOTE - MEASURED DATA (Ch 8)
OS32R	Output raw S32 data	REMOTE - MEASURED DATA (Ch 8)
OS33C	Output corrected S33 data	REMOTE - MEASURED DATA (Ch 8)
OS33R	Output raw S33 data	REMOTE - MEASURED DATA (Ch 8)
OS34C	Output corrected S34 data	REMOTE - MEASURED DATA (Ch 8)
OS34R	Output raw S34 data	REMOTE - MEASURED DATA (Ch 8)
OS3P	Output S3P format data to gpib	HARD COPY (Ch 9)
OS4	Output front panel setup number 4	REMOTE - SETUP (Ch 8)
OS41C	Output corrected S41 data	REMOTE - SETUP (Ch 8)
OS41R	Output raw S41 data	REMOTE - SETUP (Ch 8)
OS42C	Output corrected S42 data	REMOTE - SETUP (Ch 8)
OS42R	Output raw S42 data	REMOTE - SETUP (Ch 8)
OS43C	Output corrected S43 data	REMOTE - SETUP (Ch 8)
OS43R	Output raw S43 data	REMOTE - SETUP (Ch 8)
OS44C	Output corrected S44 data	REMOTE - SETUP (Ch 8)
OS44R	Output raw S44 data	REMOTE - SETUP (Ch 8)
OS4P	Output S3P format data to GPIB	REMOTE - SETUP (Ch 8)
OS5	Output front panel setup number 5	REMOTE - SETUP (Ch 8)
OS6	Output front panel setup number 6	REMOTE - SETUP (Ch 8)
OS7	Output front panel setup number 7	REMOTE - SETUP (Ch 8)
OS8	Output front panel setup number 8	REMOTE - SETUP (Ch 8)
OS9	Output front panel setup number 9	REMOTE - SETUP (Ch 8)
OSER	Output instrument serial number	REMOTE - MISC (Ch 8)
OSGLOG	Output the current segmented sweep log	SWEEP - SEGMENTED SWEEP (Ch 5)
OSL	Output service log	UTILITY - SERVICE LOG (Ch 9)
OTV	Output time values for time domain	REMOTE - MEASURED POINTS (Ch 8)
OTXT	Output text format data to GPIB	REMOTE - MEASURED DATA (Ch 8)
P1C	Select port 1 for connector specification	CAL (Ch 6)
P1C?	Output port 1 connector type	CAL (Ch 6)
P1CW0	Turn off port 1 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P1CW1	Turn on port 1 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P1CW?	Output port 1 CW mode in linear cal on/off status	SWEEP - POWER SWEEP (Ch 5)
P1LCOR0	Turn off port 1 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P1LCOR1	Turn on port 1 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P1LCOR?	Output port 1 linear cal correction on/off status	SWEEP - POWER SWEEP (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
P1LDONE?	Output port 1 linear power correction Done status	SWEEP - POWER SWEEP (Ch 5)
P1P?	Output approximate power level at port 1	POWER (Ch 5)
P2C	Select port 2 for connector specification	CAL (Ch 6)
P2C?	Output port 2 connector type	CAL (Ch 6)
P3C	Select port 3 for connector specification	CAL (Ch 6)
P3C?	Output port 3 connector type	CAL (Ch 6)
P3CW0	Turn off port 3 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P3CW1	Turn on port 3 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P3CW?	Output port 3 CW mode in linear cal on/off status	SWEEP - POWER SWEEP (Ch 5)
P3LCOR0	Turn off port 3 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P3LCOR1	Turn on port 3 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P3LCOR?	Output port 3 linear cal correction on/off status	SWEEP - POWER SWEEP (Ch 5)
P3LDONE?	Output port 1 linear power correction done status	SWEEP - POWER SWEEP (Ch 5)
P3P?	Output approximate power level at port 3	POWER (Ch 5)
P4C	Select port 4 for connector specification	CAL (Ch 6)
P4C?	Output port 4 connector type	CAL (Ch 6)
PBL	Select 1/4 size plot bottom left corner	HARD COPY (Ch 9)
PBR	Select 1/4 size plot bottom right corner	HARD COPY (Ch 9)
PCP	Select measurement phase polar chart mode	DISPLAY (Ch 5)
PCS	Select sweep position polar chart mode	DISPLAY (Ch 5)
PCX?	Output polar chart mode	DISPLAY (Ch 5)
PDR	Print directory listing of the floppy drive	UTILITY - DISK (Ch 9)
PDRH	Print directory listing of the hard drive	UTILITY - DISK (Ch 9)
PEDELOG	Print current EDE log	CONFIG (Ch 5)
PEL	Print the error list	UTILITY - SERVICE LOG (Ch 9)
PERPORT	Select per port as chop mode type	SWEEP (Ch 5)
PF	Suffix sets farad data type and scales by 1E-12	DATA ENTRY SUFFIXES (Ch 5)
PFL	Select full-size plot	HARD COPY (Ch 9)
PFS	Print full screen image	HARD COPY (Ch 9)
PGR	Print graph area screen image	HARD COPY (Ch 9)
PGT	Plot graticule	HARD COPY (Ch 9)
PH	Suffix sets farad data type and scales by 1E-12	DATA ENTRY SUFFIXES (Ch 5)
PHA	Select phase display for active channel	DISPLAY (Ch 5)
PHO	Enter phase offset for display channel	DISPLAY (Ch 5)
PHO?	Output phase offset for display channel	DISPLAY (Ch 5)
PLD	Plot data area only	HARD COPY (Ch 9)
PLG	Select log polar display for active channel	DISPLAY (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PLH	Plot header	HARD COPY (Ch 9)
PLM	Plot markers and limits	HARD COPY (Ch 9)
PLO?	Output plot mode portrait or landscape	HARD COPY (Ch 9)
PLR	Select linear polar display for active channel	DISPLAY (Ch 5)
PLS	Plot entire screen	HARD COPY (Ch 9)
PLT	Plot data traces only	HARD COPY (Ch 9)
PMK	Print tabular data for Markers	HARD COPY (Ch 9)
PMN	Plot menu	HARD COPY (Ch 9)
PMT	Print tabular data for traces and markers	HARD COPY (Ch 9)
POP	Enter parallel output port 8-bit decimal word (0-255)	SEQ (Ch 10)
POP?	Output parallel output port 8-bit decimal word (0-255)	SEQ (Ch 10)
POPBC0	Clear parallel output port bit 0	SEQ (Ch 10)
POPBC1	Clear parallel output port bit 1	SEQ (Ch 10)
POPBC2	Clear parallel output port bit 2	SEQ (Ch 10)
POPBC3	Clear parallel output port bit 3	SEQ (Ch 10)
POPBC4	Clear parallel output port bit 4	SEQ (Ch 10)
POPBC5	Clear parallel output port bit 5	SEQ (Ch 10)
POPBC6	Clear parallel output port bit 6	SEQ (Ch 10)
POPBC7	Clear parallel output port bit 7	SEQ (Ch 10)
POPBS0	Set parallel output port bit 0	SEQ (Ch 10)
POPBS1	Set parallel output port bit 1	SEQ (Ch 10)
POPBS2	Set parallel output port bit 2	SEQ (Ch 10)
POPBS3	Set parallel output port bit 3	SEQ (Ch 10)
POPBS4	Set parallel output port bit 4	SEQ (Ch 10)
POPBS5	Set parallel output port bit 5	SEQ (Ch 10)
POPBS6	Set parallel output port bit 6	SEQ (Ch 10)
POPBS7	Set parallel output port bit 7	SEQ (Ch 10)
PORT	Select portrait mode for output plot	HARD COPY (Ch 9)
POSET	Enter phase offset for active channel	DISPLAY (Ch 5)
POSET?	Output phase offset for active channel	DISPLAY (Ch 5)
POW	Select power out display for active channel	DISPLAY (Ch 5)
PRNTYPDJ	Select HP Deskjet printer	HARD COPY (Ch 9)
PRNTYPEP	Select Epson FX printer	HARD COPY (Ch 9)
PRNTYPLJ	Select HP Laserjet printer	HARD COPY (Ch 9)
PRNTYPTJ	Select HP Thinkjet printer	HARD COPY (Ch 9)
PRNTYPX?	Output printer type	HARD COPY (Ch 9)
PRT?	Perform printer test and output status	UTILITY - DIAGNOSTICS (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PS	Suffix sets time data type and scales by 1E02	DATA ENTRY SUFFIXES (Ch 5)
PSC	Suffix sets time data type and scales by 1E02	DATA ENTRY SUFFIXES (Ch 5)
PSDP	Enter number of points drawn in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSDP?	Output number of points drawn in power sweep	SWEEP - POWER SWEEP (Ch 5)
PSET	Enter target power for gain compression receiver calibration	APPL - GAIN COMPRESSION (Ch 10)
PSET?	Output target power for gain compression receiver calibration	APPL - GAIN COMPRESSION (Ch 10)
PSF	Enter swept power frequency	APPL - GAIN COMPRESSION (Ch 10)
PSF?	Output swept power frequency	APPL - GAIN COMPRESSION (Ch 10)
PSFP1	Enter number of frequency points to be skipped during linear power correction for source 1	SWEEP - POWER SWEEP (Ch 5)
PSFP1?	Output number of frequency points to be skipped during linear power correction for source 1	SWEEP - POWER SWEEP (Ch 5)
PSFP3	Enter number of frequency points to be skipped during linear power correction for source 2	SWEEP - POWER SWEEP (Ch 5)
PSFP3?	Output number of frequency points to be skipped during linear power correction for source 2	SWEEP - POWER SWEEP (Ch 5)
PSGLOG	Print the current segmented sweep log	SWEEP - SEGMENTED SWEEP (Ch 5)
PSL	Print the service log	UTILITY - SERVICE LOG (Ch 9)
PSLC	Perform power sweep linearity calibration	SWEEP - POWER SWEEP (Ch 5)
PSLCP10	Turn power sweep linearity calibration off	SWEEP - POWER SWEEP (Ch 5)
PSLCP11	Turn power sweep linearity calibration on	SWEEP - POWER SWEEP (Ch 5)
PSLCP1DONE?	Output power sweep linearity calibration done status	SWEEP - POWER SWEEP (Ch 5)
PSLCP1X?	Output power sweep linearity calibration on/off status	SWEEP - POWER SWEEP (Ch 5)
PSLCP30	Turn power sweep linearity calibration off	SWEEP - POWER SWEEP (Ch 5)
PSLCP31	Turn power sweep linearity calibration on	SWEEP - POWER SWEEP (Ch 5)
PSLCP3DONE?	Output power sweep linearity calibration done status	SWEEP - POWER SWEEP (Ch 5)
PSLCP3X?	Output power sweep linearity calibration on/off status	SWEEP - POWER SWEEP (Ch 5)
PSNOP1	Enter port 1 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSNOP1?	Output port 1 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSNOP3	Enter port 3 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSNOP3?	Output port 3 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSRC	Enter power source as active	CONFIG - MULTIPLE SOURCE (Ch 5)
PSRC?	Output active power source	CONFIG - MULTIPLE SOURCE (Ch 5)
PST	Stop print/plot	HARD COPY (Ch 9)
PSTEP	Enter power sweep step size	APPL - GAIN COMPRESSION (Ch 10)
PSTEP?	Output power sweep step size	APPL - GAIN COMPRESSION (Ch 10)
PSTOP	Enter power sweep stop power	APPL - GAIN COMPRESSION (Ch 10)
PSTOP?	Output power sweep stop power	APPL - GAIN COMPRESSION (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PSTRT	Enter power sweep start power	APPL - GAIN COMPRESSION (Ch 10)
PSTRT?	Output power sweep start power	APPL - GAIN COMPRESSION (Ch 10)
PSWC	Perform power sweep linearity calibration	APPL - GAIN COMPRESSION (Ch 10)
PSWC0	Turn power sweep linearity calibration off	APPL - GAIN COMPRESSION (Ch 10)
PSWC1	Turn power sweep linearity calibration on	APPL - GAIN COMPRESSION (Ch 10)
PSWCDONE?	Output power sweep linearity cal done status	APPL - GAIN COMPRESSION (Ch 10)
PSWCX?	Output power sweep linearity calibration on/off status	APPL - GAIN COMPRESSION (Ch 10)
PSWP	Select power sweep	SWEEP - POWER SWEEP (Ch 5)
PSWP0	Turn power sweep off	APPL - GAIN COMPRESSION (Ch 10)
PSWP1	Turn power sweep on	APPL - GAIN COMPRESSION (Ch 10)
PSWPX?	Output power sweep on/off status	APPL - GAIN COMPRESSION (Ch 10)
PT0	Set tabular printout points skipped to 0	HARD COPY (Ch 9)
PT1	Set tabular printout points skipped to 1	HARD COPY (Ch 9)
PT2	Set tabular printout points skipped to 2	HARD COPY (Ch 9)
PT3	Set tabular printout points skipped to 3	HARD COPY (Ch 9)
PT4	Set tabular printout points skipped to 4	HARD COPY (Ch 9)
PT5	Set tabular printout points skipped to 5	HARD COPY (Ch 9)
PT6	Set tabular printout points skipped to 6	HARD COPY (Ch 9)
PT7	Set tabular printout points skipped to 7	HARD COPY (Ch 9)
PT8	Set tabular printout points skipped to 8	HARD COPY (Ch 9)
PT9	Set tabular printout points skipped to 9	HARD COPY (Ch 9)
PTAVG	Set the averaging type to Point-by-Point averaging	AVG (Ch 5)
PTB	Print tabular data for traces	HARD COPY (Ch 9)
PTL	Select 1/4 size plot top left corner	HARD COPY (Ch 9)
PTP	Enter the target power for flat power correction	POWER - FLAT POWER (Ch 5)
PTP3	Enter the target power for flat power correction for source 2	POWER - FLAT POWER (Ch 5)
PTP3?	Output the target power for flat power correction for	POWER - FLAT POWER (Ch 5)
PTP?	Output the target power for flat power correction	POWER - FLAT POWER (Ch 5)
PTR	Select 1/4 size plot top right corner	HARD COPY (Ch 9)
PTS	Enter number of points to be skipped during flat power correction	POWER - FLAT POWER (Ch 5)
PTS3	Enter number of points to be skipped during flat power correction for source 2	POWER - FLAT POWER (Ch 5)
PTS3?	Output number of points to be skipped during flat power correction for source 2	POWER - FLAT POWER (Ch 5)
PTX?	Output tabular printout points skipped	HARD COPY (Ch 9)
PW2	Enter source 2 power level	POWER (Ch 5)
PW2?	Output source 2 power level	POWER (Ch 5)
PW3	Enter external source 3 power level	POWER (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PW3?	Output external source 3 power level	POWER (Ch 5)
PW4	Enter external source 4 power level	POWER (Ch 5)
PW4?	Output external source 4 power level	POWER (Ch 5)
PWR	Enter internal source power level	POWER (Ch 5)
PWR?	Output internal source power level	POWER (Ch 5)
PXX?	Output plot location	HARD COPY (Ch 9)
RAD	Suffix sets phase data type and scales by 180/pi	DATA ENTRY SUFFIXES (Ch 5)
RC1	Recall front panel setup number 1 from memory	SAVE/RECALL (Ch 9)
RC10	Recall front panel setup number 10 from memory	SAVE/RECALL (Ch 9)
RC2	Recall front panel setup number 2 from memory	SAVE/RECALL (Ch 9)
RC3	Recall front panel setup number 3 from memory	SAVE/RECALL (Ch 9)
RC4	Recall front panel setup number 4 from memory	SAVE/RECALL (Ch 9)
RC5	Recall front panel setup number 5 from memory	SAVE/RECALL (Ch 9)
RC6	Recall front panel setup number 6 from memory	SAVE/RECALL (Ch 9)
RC7	Recall front panel setup number 7 from memory	SAVE/RECALL (Ch 9)
RC8	Recall front panel setup number 8 from memory	SAVE/RECALL (Ch 9)
RC9	Recall front panel setup number 9 from memory	SAVE/RECALL (Ch 9)
RCALLOG	Output the receiver calibration log	POWER - RECEIVER CAL (Ch 5)
RCALP10	Turn off port 1 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP11	Turn on port 1 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP1DONE?	Output port 1 receiver calibration done status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP1X?	Output port 1 receiver calibration on/off status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP20	Turn off port 2 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP21	Turn on port 2 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP2DONE?	Output port 2 receiver calibration done status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP2X?	Output port 2 receiver calibration on/off status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP30	Turn off port 3 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP31	Turn on port 3 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP3DONE?	Output port 3 receiver calibration done status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP3X?	Output port 3 receiver calibration on/off status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALRP1	Set receiver calibration receive to port 1	POWER - RECEIVER CAL (Ch 5)
RCALRP2	Set receiver calibration receive to port 2	POWER - RECEIVER CAL (Ch 5)
RCALRP3	Set receiver calibration receive to port 3	POWER - RECEIVER CAL (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RCALRPX?	Output receiver calibration receive port	POWER - RECEIVER CAL (Ch 5)
RCALSP1	Set receiver calibration source to port 1	POWER - RECEIVER CAL (Ch 5)
RCALSP2	Set receiver calibration source to port 2	POWER - RECEIVER CAL (Ch 5)
RCALSP3	Set receiver calibration source to port 3	POWER - RECEIVER CAL (Ch 5)
RCALSPX?	Output receiver calibration source port	POWER - RECEIVER CAL (Ch 5)
RCALTYPE?	Output the receiver type	POWER - RECEIVER CAL (Ch 5)
RCCM1	Fast recall cal data from memory 1	SAVE/RECALL (Ch 9)
RCCM2	Fast recall cal data from memory 2	SAVE/RECALL (Ch 9)
RCCM3	Fast recall cal data from memory 3	SAVE/RECALL (Ch 9)
RCCM4	Fast recall cal data from memory 4	SAVE/RECALL (Ch 9)
RCCM5	Fast recall cal data from memory 5	SAVE/RECALL (Ch 9)
RCCM6	Fast recall cal data from memory 6	SAVE/RECALL (Ch 9)
RCCM7	Fast recall cal data from memory 7	SAVE/RECALL (Ch 9)
RCCM8	Fast recall cal data from memory 8	SAVE/RECALL (Ch 9)
RCLALL	Recall combined hardware calibration file from floppy disk	UTILITY - DISK (Ch 9)
RCLALLH	Recall combined hardware calibration file from hard disk	UTILITY - DISK (Ch 9)
RD	Remove a disk directory	UTILITY - DISK (Ch 9)
RDA	Select automatic reference delay calculation	DISPLAY (Ch 5)
RDD	Enter reference delay in distance for active channel	DISPLAY (Ch 5)
RDD?	Output reference delay in distance for active channel	DISPLAY (Ch 5)
RDDS	Enter reference delay in distance for S-parameters in active channel	DISPLAY (Ch 5)
RDDS?	Output reference delay in distance for S-parameters in active channel	DISPLAY (Ch 5)
RDT	Enter reference delay in time for active channel	DISPLAY (Ch 5)
RDT?	Output reference delay in time for active channel	DISPLAY (Ch 5)
RDTS	Enter reference delay in time for S-parameters in active channel	DISPLAY (Ch 5)
RDTS?	Output reference delay in time for S-parameters in active channel	DISPLAY (Ch 5)
REBOOT	Reboots the instrument	REMOTE - SYNC (Ch 8)
RECALL	Recall a data file from disk to a task	DISPLAY (Ch 5)
REF	Enter reference line for top graph of active channel	DISPLAY (Ch 5)
REF2	Enter reference line for bottom graph of active channel	DISPLAY (Ch 5)
REF2?	Output reference line for bottom graph of active channel	DISPLAY (Ch 5)
REF?	Output reference line for top graph of active channel	DISPLAY (Ch 5)
REL	Select real display for active channel	DISPLAY (Ch 5)
RESTARTCAL	Restart application calibration measurement	CAL (Ch 6)
REU	Suffix sets real data type	DATA ENTRY SUFFIXES (Ch 5)
RGZ	Select reflective device greater than Z0	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RH0	Select RF off in hold mode	CONFIG (Ch 5)
RH1	Select RF on in hold	CONFIG (Ch 5)
RHX?	Output RF on/off during hold status	CONFIG (Ch 5)
RIM	Select real and imaginary display for active channel	DISPLAY (Ch 5)
RK?	Output RK mode on/off status	REMOTE - MISC (Ch 8)
RKOFF	Turn off RK mode	REMOTE - MISC (Ch 8)
RKON	Turn on RK mode	REMOTE - MISC (Ch 8)
RLZ	Select reflective device less than Z0	CAL (Ch 6)
RM1	Select reference plane at line 1 midpoint	CAL (Ch 6)
RMX?	Output reference plane location for LRL calibration	CAL (Ch 6)
ROL	Enter reflective device offset length	CAL (Ch 6)
ROL?	Output reflective device offset length	CAL (Ch 6)
ROLP3	Enter reflective device offset length for 3-port TRX calibration	CAL (Ch 6)
ROLP3?	Output reflective device offset length for 3-port TRX	CAL (Ch 6)
ROLP4	Enter reflective device offset length for 4-port TRX calibration	CAL (Ch 6)
ROLP4?	Output reflective device offset length for 4-port TRX calibration	CAL (Ch 6)
RPC	Repeat previous calibration	CAL (Ch 6)
RPCHAN	Select Per Channel for reference plane	CAL (Ch 6)
RPCPX?	Output reference plane Per Channel/Port status	CAL (Ch 6)
RPO	Enter rear panel DC voltage value	UTILITY - REAR PANEL (Ch 10)
RPO?	Output rear panel DC voltage value	UTILITY - REAR PANEL (Ch 10)
RPPORT	Select Per Port for reference plane	CAL (Ch 6)
RPPORTNUM	Enter reference plane port number	DISPLAY (Ch 5)
RPPORTNUM?	Output active reference plane port number	DISPLAY (Ch 5)
RRCALP10	Turn Off the Port 1 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP11	Turn On the Port 1 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP1DONE?	Output the Port 1 receiver calibration Done status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP1X?	Output the Port 1 receiver calibration On/Off status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP20	Turn Off the Port 2 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP21	Turn On the Port 2 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP2DONE?	Output the Port 2 receiver calibration Done status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP2X?	Output the Port 2 receiver calibration On/Off status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RRCALP30	Turn Off the Port 3 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP31	Turn On the Port 3 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP3DONE?	Output the Port 3 receiver calibration Done status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP3X?	Output the Port 3 receiver calibration On/Off status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALTYPE	Select the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRP	Select reference plane at reflection plane	CAL (Ch 6)
RST	Instrument reset (same as *RST)	DEFAULT (Ch 5)
RST0	Reset instrument front panel memories and reserved parameters	DEFAULT (Ch 5)
RST1	Reset instrument and front panel memories	DEFAULT (Ch 5)
RSTAVG	Reset the Sweep-by-Sweep averaging sweep count	AVG (Ch 5)
RSTCOL	Reset color configuration to default	UTILITY (Ch 9)
RSTDAC	Restore frequency from 10 MHz calibration and not save DAC number into BBRAM	UTILITY (Ch 9)
RSTFSWP	Restore full sweep	SWEEP (Ch 5)
RSTGC	Reset gain compression parameters to default	APPL - GAIN COMPRESSION (Ch 10)
RT0	Turn ripples testing off	CONFIG (Ch 5)
RT1	Turn ripples testing on	CONFIG (Ch 5)
RT?	Output ripples testing enable status	CONFIG (Ch 5)
RTL	Return to local	CLR/LOCAL (Ch 9)
RTVAL	Enter ripples testing value	CONFIG (Ch 5)
RTVAL?	Output ripples testing value	CONFIG (Ch 5)
RV0	Turn rear panel output voltage off	UTILITY - REAR PANEL (Ch 10)
RV1	Turn rear panel output voltage on	UTILITY - REAR PANEL (Ch 10)
RV1?	Output rear panel output voltage on/off status	UTILITY - REAR PANEL (Ch 10)
RVA1	Enter rear panel output voltage value when port 1 is driving	UTILITY - REAR PANEL (Ch 10)
RVA1?	Output rear panel output voltage value when port 1 is driving	UTILITY - REAR PANEL (Ch 10)
RVA2	Enter rear panel output voltage value when port 2 is driving	UTILITY - REAR PANEL (Ch 10)
RVA2?	Output rear panel output voltage value when port 2 is driving	UTILITY - REAR PANEL (Ch 10)
RVA3	Enter rear panel output voltage value when port 3 is driving	UTILITY - REAR PANEL (Ch 10)
RVA3?	Output rear panel output voltage value when port 3 is driving	UTILITY - REAR PANEL (Ch 10)
RVA4	Enter rear panel output voltage value when Port 4 is driving	UTILITY - REAR PANEL (Ch 10)
RVA4?	Output rear panel output voltage value when Port 4 is driving	UTILITY - REAR PANEL (Ch 10)
RVD	Set rear panel output mode to dc value	UTILITY - REAR PANEL (Ch 10)
RVH	Set rear panel output mode to horizontal	UTILITY - REAR PANEL (Ch 10)
RVL	Set rear panel output mode to lock direction	UTILITY - REAR PANEL (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RVP	Set rear panel output mode to driven port	UTILITY - REAR PANEL (Ch 10)
RVSP	Enter rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
RVSP?	Output rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
RVST	Enter rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
RVST?	Output rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
RVT	Set rear panel output mode to TTL	UTILITY - REAR PANEL (Ch 10)
RVTP1	Select port 1 for TTL rear panel output voltage	UTILITY - REAR PANEL (Ch 10)
RVTP1HL	Set TTL rear panel output voltage type to TTL active high level	UTILITY - REAR PANEL (Ch 10)
RVTP1HP	Set TTL rear panel output voltage type to TTL active high pulse	UTILITY - REAR PANEL (Ch 10)
RVTP1LL	Set TTL rear panel output voltage type to TTL active low level	UTILITY - REAR PANEL (Ch 10)
RVTP1LP	Set TTL rear panel output voltage type to TTL active low pulse	UTILITY - REAR PANEL (Ch 10)
RVTP1X?	Output TTL rear panel output voltage type	UTILITY - REAR PANEL (Ch 10)
RVTP2	Select port 2 for TTL rear panel output voltage	UTILITY - REAR PANEL (Ch 10)
RVTP2HL	Set TTL rear panel output voltage type on port 2 to TTL active high level.	UTILITY - REAR PANEL (Ch 10)
RVTP2HP	Set TTL rear panel output voltage type on port 2 to TTL active high pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP2LL	Set TTL rear panel output voltage type on port 2 to TTL active low level.	UTILITY - REAR PANEL (Ch 10)
RVTP2LP	Set TTL rear panel output voltage type on port 2 to TTL active low pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP2X?	Output TTL rear panel output voltage type on port 2.	UTILITY - REAR PANEL (Ch 10)
RVTP3	Select port 3 for TTL rear panel output voltage	UTILITY - REAR PANEL (Ch 10)
RVTP3HL	Set TTL rear panel output voltage type on port 3 to TTL active high level.	UTILITY - REAR PANEL (Ch 10)
RVTP3HP	Set TTL rear panel output voltage type on port 3 to TTL active high pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP3LL	Set TTL rear panel output voltage type on port 3 to TTL active low level.	UTILITY - REAR PANEL (Ch 10)
RVTP3LP	Set TTL rear panel output voltage type on port 3 to TTL active low pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP3X?	Output TTL rear panel output voltage type on port 3.	UTILITY - REAR PANEL (Ch 10)
RVTP4	Select Port 4 for TTL rear panel output voltage.	UTILITY - REAR PANEL (Ch 10)
RVTP4HL	Set TTL rear panel output voltage type on port 4 to TTL active high level	UTILITY - REAR PANEL (Ch 10)
RVTP4HP	Set TTL rear panel output voltage type on port 4 to TTL active high pulse	UTILITY - REAR PANEL (Ch 10)
RVTP4LL	Set TTL rear panel output voltage type on port 4 to TTL active low level	UTILITY - REAR PANEL (Ch 10)
RVTP4LP	Set TTL rear panel output voltage type on port 4 to TTL active low pulse	UTILITY - REAR PANEL (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RVTP4X?	Output TTL rear panel output voltage type on port 4	UTILITY - REAR PANEL (Ch 10)
RVTPX?	Output TTL rear panel output voltage type	UTILITY - REAR PANEL (Ch 10)
RVV	Set rear panel output mode to vertical	UTILITY - REAR PANEL (Ch 10)
RVX?	Output rear panel output mode	UTILITY - REAR PANEL (Ch 10)
RXZ?	Output reflective device type in LRL calibration greater/less than Z0	CAL (Ch 6)
S	Suffix sets time data type	DATA ENTRY SUFFIXES (Ch 5)
S11	Measure S11 on active channel	MEAS (Ch 5)
S12	Measure S12 on active channel	MEAS (Ch 5)
S13	Measure S13 on active channel	MEAS (Ch 5)
S14	Measure S14 on active channel	MEAS (Ch 5)
S21	Measure S21 on active channel	MEAS (Ch 5)
S22	Measure S22 on active channel	MEAS (Ch 5)
S23	Measure S23 on active channel	MEAS (Ch 5)
S24	Measure S24 on active channel	MEAS (Ch 5)
S31	Measure S31 on active channel	MEAS (Ch 5)
S32	Measure S32 on active channel	MEAS (Ch 5)
S33	Measure S33 on active channel	MEAS (Ch 5)
S34	Measure S34 on active channel	MEAS (Ch 5)
S41	Measure S41 on active channel	MEAS (Ch 5)
S42	Measure S42 on active channel	MEAS (Ch 5)
S43	Measure S43 on active channel	MEAS (Ch 5)
S44	Measure S44 on active channel	MEAS (Ch 5)
SA1	Enter port 1 source attenuator value	POWER (Ch 5)
SA1?	Output port 1 source attenuator value	POWER (Ch 5)
SA3	Enter port 3 source attenuator value	POWER (Ch 5)
SA3?	Output port 3 source attenuator value	POWER (Ch 5)
SAVALL	Save combined hardware cal to floppy disk	UTILITY - DISK (Ch 9)
SAVALLH	Save combined hardware cal to hard disk	UTILITY - DISK (Ch 9)
SAVDAC	Save 10 MHz DAC number into BBRAM	SAVE/RECALL (Ch 9)
SAVE	Save a data file to disk	SAVE/RECALL (Ch 9)
SAVEGC	Save text format gain compression data to disk	UTILITY - DISK (Ch 9)
SBD	Enter substrate dielectric for microstrip calibration	CAL (Ch 6)
SBD?	Output substrate dielectric for microstrip calibration	CAL (Ch 6)
SBT	Enter substrate thickness for microstrip calibration	CAL (Ch 6)
SBT?	Output substrate thickness for microstrip calibration	CAL (Ch 6)
SCL	Enter scale resolution for top graph of active channel	DISPLAY (Ch 5)
SCL2	Enter scale resolution for bottom graph of active channel	DISPLAY (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SCL2?	Output scale resolution for bottom graph of active channel	DISPLAY (Ch 5)
SCL?	Output scale resolution for top graph of active channel	DISPLAY (Ch 5)
SCM	Select standard calibration method	CAL (Ch 6)
SD0	Turn marker screen display off	MARKER (Ch 7)
SD1	Turn marker screen display on	MARKER (Ch 7)
SDG	Start diagnostics mode	UTILITY - DIAGNOSTICS (Ch 9)
SDP0	Turn the power sweep marker screen display OFF	MARKER (Ch 7)
SDP1	Turn the power sweep marker screen display ON	MARKER (Ch 7)
SDPX?	Output the power sweep marker screen display status	MARKER (Ch 7)
SDX?	Output marker screen display status	MARKER (Ch 7)
SEQDEL1	Delete sequence 1	SEQ (Ch 10)
SEQDEL2	Delete sequence 2	SEQ (Ch 10)
SEQDEL3	Delete sequence 3	SEQ (Ch 10)
SEQDEL4	Delete sequence 4	SEQ (Ch 10)
SEQDEL5	Delete sequence 5	SEQ (Ch 10)
SEQDEL6	Delete sequence 6	SEQ (Ch 10)
SEQDEL7	Delete sequence 7	SEQ (Ch 10)
SEQDGMSG0	Turn saving sequence display message to service log off	SEQ (Ch 10)
SEQDGMSG1	Turn saving sequence display message to service log on	SEQ (Ch 10)
SEQDGMSG?	Output saving sequence display message to service log status	SEQ (Ch 10)
SEQEXE1	Execute sequence 1	SEQ (Ch 10)
SEQEXE2	Execute sequence 2	SEQ (Ch 10)
SEQEXE3	Execute sequence 3	SEQ (Ch 10)
SEQEXE4	Execute sequence 4	SEQ (Ch 10)
SEQEXE5	Execute sequence 5	SEQ (Ch 10)
SEQEXE6	Execute sequence 6	SEQ (Ch 10)
SEQEXE7	Execute sequence 7	SEQ (Ch 10)
SEQHELP0	Turn off sequence help message	SEQ (Ch 10)
SEQHELP1	Turn on sequence help message	SEQ (Ch 10)
SEQHELP?	Output sequence help message mode on/off	SEQ (Ch 10)
SEQLOA1	Recall sequence 1 from floppy disk	SEQ (Ch 10)
SEQLOA2	Recall sequence 2 from floppy disk	SEQ (Ch 10)
SEQLOA3	Recall sequence 3 from floppy disk	SEQ (Ch 10)
SEQLOA4	Recall sequence 4 from floppy disk	SEQ (Ch 10)
SEQLOA5	Recall sequence 5 from floppy disk	SEQ (Ch 10)
SEQLOA6	Recall sequence 6 from floppy disk	SEQ (Ch 10)
SEQLOA7	Recall sequence 7 from floppy disk	SEQ (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SEQLOAH1	Recall sequence 1 from hard disk	SEQ (Ch 10)
SEQLOAH2	Recall sequence 2 from hard disk	SEQ (Ch 10)
SEQLOAH3	Recall sequence 3 from hard disk	SEQ (Ch 10)
SEQLOAH4	Recall sequence 4 from hard disk	SEQ (Ch 10)
SEQLOAH5	Recall sequence 5 from hard disk	SEQ (Ch 10)
SEQLOAH6	Recall sequence 6 from hard disk	SEQ (Ch 10)
SEQLOAH7	Recall sequence 7 from hard disk	SEQ (Ch 10)
SEQNAM1	Enter sequence 1 name	SEQ (Ch 10)
SEQNAM1?	Output sequence 1 name	SEQ (Ch 10)
SEQNAM2	Enter sequence 2 name	SEQ (Ch 10)
SEQNAM2?	Output sequence 2 name	SEQ (Ch 10)
SEQNAM3	Enter sequence 3 name	SEQ (Ch 10)
SEQNAM3?	Output sequence 3 name	SEQ (Ch 10)
SEQNAM4	Enter sequence 4 name	SEQ (Ch 10)
SEQNAM4?	Output sequence 4 name	SEQ (Ch 10)
SEQNAM5	Enter sequence 5 name	SEQ (Ch 10)
SEQNAM5?	Output sequence 5 name	SEQ (Ch 10)
SEQNAM6	Enter sequence 6 name	SEQ (Ch 10)
SEQNAM6?	Output sequence 6 name	SEQ (Ch 10)
SEQNAM7	Enter sequence 7 name	SEQ (Ch 10)
SEQNAM7?	Output sequence 7 name	SEQ (Ch 10)
SEQOP0	Turn off sequence operator message	HARD COPY (Ch 9)
SEQOP1	Turn on sequence operator message	HARD COPY (Ch 9)
SEQOP?	Output sequence operator message mode on/off	HARD COPY (Ch 9)
SEQSAV1	Save sequence 1 to floppy disk	SEQ (Ch 10)
SEQSAV2	Save sequence 2 to floppy disk	SEQ (Ch 10)
SEQSAV3	Save sequence 3 to floppy disk	SEQ (Ch 10)
SEQSAV4	Save sequence 4 to floppy disk	SEQ (Ch 10)
SEQSAV5	Save sequence 5 to floppy disk	SEQ (Ch 10)
SEQSAV6	Save sequence 6 to floppy disk	SEQ (Ch 10)
SEQSAV7	Save sequence 7 to floppy disk	SEQ (Ch 10)
SEQSAVH1	Save sequence 1 to hard disk	SEQ (Ch 10)
SEQSAVH2	Save sequence 2 to hard disk	SEQ (Ch 10)
SEQSAVH3	Save sequence 3 to hard disk	SEQ (Ch 10)
SEQSAVH4	Save sequence 4 to hard disk	SEQ (Ch 10)
SEQSAVH5	Save sequence 5 to hard disk	SEQ (Ch 10)
SEQSAVH6	Save sequence 6 to hard disk	SEQ (Ch 10)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SEQSAVH7	Save sequence 7 to hard disk	SEQ (Ch 10)
SEQSAVT1	Save sequence 1 text to floppy disk	SEQ (Ch 10)
SEQSAVT2	Save sequence 2 text to floppy disk	SEQ (Ch 10)
SEQSAVT3	Save sequence 3 text to floppy disk	SEQ (Ch 10)
SEQSAVT4	Save sequence 4 text to floppy disk	SEQ (Ch 10)
SEQSAVT5	Save sequence 5 text to floppy disk	SEQ (Ch 10)
SEQSAVT6	Save sequence 6 text to floppy disk	SEQ (Ch 10)
SEQSAVT7	Save sequence 7 text to floppy disk	SEQ (Ch 10)
SEQSAVTH1	Save sequence 1 text to hard disk	SEQ (Ch 10)
SEQSAVTH2	Save sequence 2 text to hard disk	SEQ (Ch 10)
SEQSAVTH3	Save sequence 3 text to hard disk	SEQ (Ch 10)
SEQSAVTH4	Save sequence 4 text to hard disk	SEQ (Ch 10)
SEQSAVTH5	Save sequence 5 text to hard disk	SEQ (Ch 10)
SEQSAVTH6	Save sequence 6 text to hard disk	SEQ (Ch 10)
SEQSAVTH7	Save sequence 7 text to hard disk	SEQ (Ch 10)
SETBD	Set balanced differential S-parameters setup to be default setup for all channels	DISPLAY (Ch 5)
SETCHANKEY	Setup channel keys on front panel to channel keys	DISPLAY (Ch 5)
SETCHANKEY?	Output channel key setup	DISPLAY (Ch 5)
SETGRPKEY	Setup channel keys on front panel to group keys	DISPLAY (Ch 5)
SETSB	Set single ended/balanced differential S-parameters setup to be default setup for all channels	DISPLAY (Ch 5)
SETSE	Set single ended S-parameters setup to be default setup for all channels	DISPLAY (Ch 5)
SETSPARAM?	Output default S-parameter setup for all channels	DISPLAY (Ch 5)
SETUP	Display frequency menu	FREQ (Ch 5)
SFC	Perform flat test port calibration	POWER - FLAT POWER (Ch 5)
SFGCA	Select swept frequency gain compression application	APPL - GAIN COMPRESSION (Ch 10)
SFGCT	Start swept frequency gain compression test	APPL - GAIN COMPRESSION (Ch 10)
SG?	Output the segmented sweep flag on/off status	SWEEP - SEGMENTED SWEEP (Ch 5)
SGAPL	Apply the current define definition of the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
SGMODE?	Query the segmented sweep define mode	SWEEP - SEGMENTED SWEEP (Ch 5)
SGOFF	Turn the segmented sweep flag OFF	SWEEP - SEGMENTED SWEEP (Ch 5)
SGON	Turn the segmented sweep flag ON	SWEEP - SEGMENTED SWEEP (Ch 5)
SGPTS?	Output the total number of points of all of the applied segments	SWEEP - SEGMENTED SWEEP (Ch 5)
SGSTP?	Output the stop frequency of the last applied segment	SWEEP - SEGMENTED SWEEP (Ch 5)
SGSTRT?	Output the start frequency of the first applied segment	SWEEP - SEGMENTED SWEEP (Ch 5)
SH1	Set offset short 1 or 2 offset length for offset short calibration	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SH1?	Output offset short 1 offset length	CAL (Ch 6)
SH2	Set offset short 1 or 2 offset length for offset short calibration	CAL (Ch 6)
SH2?	Output offset short 2 offset length	CAL (Ch 6)
SINP	Enter single power	SWEEP - POWER SWEEP (Ch 5)
SINP0	Turn off single power mode	SWEEP - POWER SWEEP (Ch 5)
SINP1	Turn on single power mode	SWEEP - POWER SWEEP (Ch 5)
SINP?	Output single power	SWEEP - POWER SWEEP (Ch 5)
SINPX?	Output single power mode on/off status	SWEEP - POWER SWEEP (Ch 5)
SIS0	Turn off simultaneous internal sources mode	CONFIG (Ch 5)
SIS1	Turn on simultaneous internal sources mode	CONFIG (Ch 5)
SIS2CWF	Enter internal source 2 CW frequency and turn CW on	CONFIG (Ch 5)
SIS2CWF?	Output internal source 2 CW frequency	CONFIG (Ch 5)
SIS2CWOFF	Turn internal source 2 CW off	CONFIG (Ch 5)
SIS2CWON	Turn internal source 2 CW on at current CW frequency	CONFIG (Ch 5)
SIS2CWON?	Output internal source 2 CW on/off status	CONFIG (Ch 5)
SIS2OFF	Enter internal source 2 offset from source 1 frequency	CONFIG (Ch 5)
SIS2OFF?	Output internal source 2 offset from source 1 frequency	CONFIG (Ch 5)
SISX?	Output simultaneous internal sources mode on/off	CONFIG (Ch 5)
SLC	Clear all segmented limits definitions	DISPLAY - LIMITS (Ch 7)
SLD	Select sliding load for calibration	CAL (Ch 6)
SLDP3	Select sliding load for 3-port calibration	CAL (Ch 6)
SLDP4	Select sliding load for 4-port calibration	CAL (Ch 6)
SLH	Enter segmented limits horizontal offset	DISPLAY - LIMITS (Ch 7)
SLH?	Output segmented limits horizontal offset	DISPLAY - LIMITS (Ch 7)
SLL0	Turn lower segmented limits display off	DISPLAY - LIMITS (Ch 7)
SLL1	Turn lower segmented limits display on	DISPLAY - LIMITS (Ch 7)
SLLX?	Output lower segmented limits display on/off status	DISPLAY - LIMITS (Ch 7)
SLU0	Turn upper segmented limits display off	DISPLAY - LIMITS (Ch 7)
SLU1	Turn upper segmented limits display on	DISPLAY - LIMITS (Ch 7)
SLUX?	Output upper segmented limits display on/off status	DISPLAY - LIMITS (Ch 7)
SLV	Enter segmented limits vertical offset	DISPLAY - LIMITS (Ch 7)
SLV?	Output segmented limits vertical offset	DISPLAY - LIMITS (Ch 7)
SMC	Enter scale and select compressed Smith chart display	DISPLAY (Ch 5)
SME	Enter scale and select expanded Smith chart display	DISPLAY (Ch 5)
SMI	Select normal Smith chart for active channel	DISPLAY (Ch 5)
SMKR	Select marker search marker mode	MARKER (Ch 7)
SMKRMAX	Select marker search maximum	MARKER (Ch 7)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SMKRMIN	Select marker search minimum	MARKER (Ch 7)
SMKRX	Select the marker search x-axis marker mode	MARKER (Ch 7)
SNPDB	Select log magnitude and phase as SnP output format	HARD COPY (Ch 9)
SNPFMTX?	Output SnP output format selection	HARD COPY (Ch 9)
SNPGHZ	Select GHz as SnP frequency units	HARD COPY (Ch 9)
SNPHZ	Select Hz as SnP frequency units	HARD COPY (Ch 9)
SNPKHZ	Select KHz as SnP frequency units	HARD COPY (Ch 9)
SNPMA	Select linear magnitude and phase as SnP output format	HARD COPY (Ch 9)
SNPMHZ	Select MHz as SnP frequency units	HARD COPY (Ch 9)
SNPRI	Select real and imaginary as SnP output format	HARD COPY (Ch 9)
SNPUNITX?	Output SnP frequency units selection	HARD COPY (Ch 9)
SOF	Turn off smoothing	AVG (Ch 5)
SOF?	Output smoothing on/off status	AVG (Ch 5)
SOLT	Select SOLT calibration method	CAL (Ch 6)
SOLT4P	Select SOLT calibration method for 4-port calibration	CAL (Ch 6)
SON	Enter smoothing value and turn on	AVG (Ch 5)
SON?	Output smoothing value	AVG (Ch 5)
SPA0	Spur avoidance mode off	SWEEP (Ch 5)
SPA1	Spur avoidance mode on	SWEEP (Ch 5)
SPAN	Enter frequency span	FREQ (Ch 5)
SPAN?	Output frequency span	FREQ (Ch 5)
SPARAM	Select All S-parameters as chop mode type	SWEEP (Ch 5)
SPAX?	Output spur avoidance mode on/off status	SWEEP (Ch 5)
SPD	Enter pen speed percentage	HARD COPY (Ch 9)
SPD?	Output pen speed percentage	HARD COPY (Ch 9)
SPGCA	Select swept power gain compression application	APPL - GAIN COMPRESSION (Ch 10)
SPGCT	Start swept power gain compression test	APPL - GAIN COMPRESSION (Ch 10)
SPH	Enter active segmented limit horizontal stop position	DISPLAY - LIMITS (Ch 7)
SPH?	Output active segmented limit horizontal stop position	DISPLAY - LIMITS (Ch 7)
SPTS?	Output the number of smoothing points	AVG (Ch 5)
SPV	Enter active segmented limit vertical stop position	DISPLAY - LIMITS (Ch 7)
SPV?	Output active segmented limit vertical stop position	DISPLAY - LIMITS (Ch 7)
SRC1AC?	Output source 1 active/inactive status	CONFIG (Ch 5)
SRC2?	Output external source 2 existence information	CONFIG (Ch 5)
SRC2AC	Select source 2 as active	CONFIG (Ch 5)
SRC2AC?	Output source 2 active/inactive status	CONFIG (Ch 5)
SRC2MOD?	Output external source 2 model/version string	CONFIG (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SRC2NA	Select source 2 as not active	CONFIG (Ch 5)
SRC3?	Output external source 3 existence information	CONFIG (Ch 5)
SRC3AC	Select source 3 as active	CONFIG (Ch 5)
SRC3AC?	Output source 3 active/inactive status	CONFIG (Ch 5)
SRC3MOD?	Output external source 3 model/version string	CONFIG (Ch 5)
SRC3NA	Select source 3 as not active	CONFIG (Ch 5)
SRC4?	Output external source 4 existence information	CONFIG (Ch 5)
SRC4AC	Select source 4 as active	CONFIG (Ch 5)
SRC4AC?	Output source 4 active/inactive status	CONFIG (Ch 5)
SRC4MOD?	Output external source 4 model/version string	CONFIG (Ch 5)
SRC4NA	Select source 4 as not active	CONFIG (Ch 5)
SRCH	Enter marker search value	MARKER (Ch 7)
SRCH?	Output marker search value	MARKER (Ch 7)
SRCHFX?	Output the marker search x-value in GHz and the marker failure status	MARKER (Ch 7)
SRCHFXP?	Output the marker search x-value in dBm and the marker failure status in the power sweep mode	MARKER (Ch 7)
SRCHP	Enter marker search value in power sweep mode	MARKER (Ch 7)
SRCHP?	Output marker search value in power sweep mode	MARKER (Ch 7)
SRCHX?	Output the marker search x-value	MARKER (Ch 7)
SRCHXP?	Output the marker search x-value in the power sweep mode	MARKER (Ch 7)
SRT	Enter start frequency	FREQ (Ch 5)
SRT?	Output start frequency	FREQ (Ch 5)
SSC	Select the segmented sweep calibration data points	CAL (Ch 6)
STD	Store trace to memory on active channel	DISPLAY (Ch 5)
STEPP	Enter power step	SWEEP - POWER SWEEP (Ch 5)
STEPP?	Output power step	SWEEP - POWER SWEEP (Ch 5)
STH	Enter active segmented limit horizontal start position	DISPLAY - LIMITS (Ch 7)
STH?	Output active segmented limit horizontal start position	DISPLAY - LIMITS (Ch 7)
STOPP	Enter stop power	SWEEP - POWER SWEEP (Ch 5)
STOPP?	Output stop power	SWEEP - POWER SWEEP (Ch 5)
STP	Enter stop frequency	FREQ (Ch 5)
STP?	Output stop frequency	FREQ (Ch 5)
STRTP	Enter start power	SWEEP - POWER SWEEP (Ch 5)
STRTP?	Output start power	SWEEP - POWER SWEEP (Ch 5)
STV	Enter active segmented limit vertical start position	DISPLAY - LIMITS (Ch 7)
STV?	Output active segmented limit vertical start position	DISPLAY - LIMITS (Ch 7)
SV1	Save front panel setup number 1 to memory	SAVE/RECALL (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SV10	Save front panel setup number 10 to memory	SAVE/RECALL (Ch 9)
SV2	Save front panel setup number 2 to memory	SAVE/RECALL (Ch 9)
SV3	Save front panel setup number 3 to memory	SAVE/RECALL (Ch 9)
SV4	Save front panel setup number 4 to memory	SAVE/RECALL (Ch 9)
SV5	Save front panel setup number 5 to memory	SAVE/RECALL (Ch 9)
SV6	Save front panel setup number 6 to memory	SAVE/RECALL (Ch 9)
SV7	Save front panel setup number 7 to memory	SAVE/RECALL (Ch 9)
SV8	Save front panel setup number 8 to memory	SAVE/RECALL (Ch 9)
SV9	Save front panel setup number 9 to memory	SAVE/RECALL (Ch 9)
SVB	Save current band definitions	CONFIG - MULTIPLE SOURCE (Ch 5)
SVCM1	Save cal data in internal memory 1	SAVE/RECALL (Ch 9)
SVCM2	Save cal data in internal memory 2	SAVE/RECALL (Ch 9)
SVCM3	Save cal data in internal memory 3	SAVE/RECALL (Ch 9)
SVCM4	Save cal data in internal memory 4	SAVE/RECALL (Ch 9)
SVCM5	Save cal data in internal memory 5	SAVE/RECALL (Ch 9)
SVCM6	Save cal data in internal memory 6	SAVE/RECALL (Ch 9)
SVCM7	Save cal data in internal memory 7	SAVE/RECALL (Ch 9)
SVCM8	Save cal data in internal memory 8	SAVE/RECALL (Ch 9)
SWAVG	Set the averaging type to Sweep-by-Sweep averaging	AVG (Ch 5)
SWAVG?	Output the averaging type of Point-by-Point or Sweep-by-Sweep	AVG (Ch 5)
SWP	Return to normal sweep mode	FREQ (Ch 5)
SWP?	Output sweep mode	FREQ (Ch 5)
SWPC0	Turn off chop sweep mode	SWEEP (Ch 5)
SWPC1	Turn on chop sweep mode	SWEEP (Ch 5)
SWPCX?	Output chop sweep mode on/off	SWEEP (Ch 5)
SWPDIR?	Output instantaneous sweep direction forward/reverse	REMOTE - SYNC (Ch 8)
SWPT	Enter sweep time	SWEEP (Ch 5)
SWPT0	Turn off sweep time measurement	SWEEP (Ch 5)
SWPT1	Turn on sweep time measurement	SWEEP (Ch 5)
SWPT?	Output sweep time	SWEEP (Ch 5)
SWPTMA	Set auto sweep time mode	SWEEP (Ch 5)
SWPTMM	Set manual sweep time mode	SWEEP (Ch 5)
SWPTMX?	Output sweep time mode	SWEEP (Ch 5)
SWPTX?	Output sweep time measurement on/off status	SWEEP (Ch 5)
SWPX?	Output sweep type selection	SWEEP (Ch 5)
SWR	Select SWR display for active channel	DISPLAY (Ch 5)
SXX?	Output S-parameter or user defined parameter of active channel	MEAS (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SYSZ0?	Output system impedance	CAL (Ch 6)
T13	Select overlaid channel 1 and 3 display	DISPLAY (Ch 5)
T14	Overlay all four channels (Limited to selected Graph types)	DISPLAY (Ch 5)
T24	Select overlaid channel 2 and 4 display	DISPLAY (Ch 5)
TBP	Select time bandpass mode for active channel	APPL - TIME DOMAIN (Ch 10)
TC1	Take calibration data for port 1	CAL (Ch 6)
TC2	Take calibration data for port 2	CAL (Ch 6)
TCD	Take calibration data on one or both ports as necessary	CAL (Ch 6)
TCM	Select TRM calibration method	CAL (Ch 6)
TDC	Select time domain harmonic frequency calibration data points	CAL (Ch 6)
TDDIST	Set time domain parameter to distance for active channel	APPL - TIME DOMAIN (Ch 10)
TDDIST?	Output active channel time domain parameter distance or time	APPL - TIME DOMAIN (Ch 10)
TDPI0	Turn phasor impulse response off for active channel	APPL - TIME DOMAIN (Ch 10)
TDPI1	Turn phasor impulse response on for active channel	APPL - TIME DOMAIN (Ch 10)
TDPIX?	Output phasor impulse on/off status for active channel	APPL - TIME DOMAIN (Ch 10)
TDTIME	Set time domain parameter to time for active channel	APPL - TIME DOMAIN (Ch 10)
TDX?	Output domain mode for active channel	APPL - TIME DOMAIN (Ch 10)
TEB	Select external trigger executes *DDT definition	SWEEP (Ch 5)
TENMHZERR?	Output 10 MHz calibration max error	CAL (Ch 6)
TEX	Select external measurement triggering	SWEEP (Ch 5)
TEXS	Select external measurement sweep triggering	SWEEP (Ch 5)
TEXSB	Select external measurement sweep triggering and execute trigger buffer	SWEEP (Ch 5)
THRU23	Include port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
THRU23?	Output selection of include or omit port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
THRU23N	Omit port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
THRU24	Include port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU24?	Output selection of include or omit port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU24N	Omit port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU34	Include port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU34?	Output selection of include or omit port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU34N	Omit port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
TIB	Select GPIB measurement triggering	SWEEP (Ch 5)
TIBS	Select GPIB measurement sweep triggering	SWEEP (Ch 5)
TIBSB	Select GPIB measurement sweep triggering and execute trigger buffer	SWEEP (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TIME	Enter the system time	UTILITY (Ch 9)
TIME?	Output the system time	UTILITY (Ch 9)
TIN	Select internal measurement triggering	SWEEP (Ch 5)
TLP	Select time lowpass mode for active channel	APPL - TIME DOMAIN (Ch 10)
TLZ	Enter thru line impedance for calibration	CAL (Ch 6)
TLZ?	Output thru line impedance for calibration	CAL (Ch 6)
TOL	Enter thru offset/reciprocal length for calibration	CAL (Ch 6)
TOL?	Output thru offset/reciprocal length for calibration	CAL (Ch 6)
TOLP14	Enter port 1, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP14?	Output port 1, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP23	Enter port 2, 3 thru offset/reciprocal length for 3-port calibration	CAL (Ch 6)
TOLP23?	Output port 2, 3 thru offset/reciprocal length for 3-port calibration	CAL (Ch 6)
TOLP24	Enter port 2, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP24?	Output port 2, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP3	Enter thru offset/reciprocal length for 3-port calibration	CAL (Ch 6)
TOLP34	Enter port 3, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP34?	Output port 3, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP3?	Output thru offsett/reciprocal length for 3-port calibration	CAL (Ch 6)
TP1	Select port 1 for flat power correction	POWER - FLAT POWER (Ch 5)
TP3	Select port 3 for flat power correction	POWER - FLAT POWER (Ch 5)
TPI	Select time phasor impulse mode for active channel	APPL - TIME DOMAIN (Ch 10)
TPN	Enter pen number for trace overlay data	HARD COPY (Ch 9)
TPN?	Output pen number for trace overlay data	HARD COPY (Ch 9)
TPX?	Output selected port for flat power correction	POWER - FLAT POWER (Ch 5)
TRCALTYPE	Select the receiver type TEST	POWER - RECEIVER CAL (Ch 5)
TRCCOL	Enter the color number for memory data	UTILITY (Ch 9)
TRCCOL?	Output the color number for memory data	UTILITY (Ch 9)
TRP12D?	Query the port 1, 2 device type	CAL (Ch 6)
TRP12DR	Set the port 1, 2 device type to RECIPROCAL	CAL (Ch 6)
TRP12DT	Set the port 1, 2 device type to THRU	CAL (Ch 6)
TRP12OL	Enter the thru/reciprocal offset length for port 1, 2	CAL (Ch 6)
TRP12OL?	Output the thru/reciprocal offset length for port 1, 2	CAL (Ch 6)
TRP13D?	Query the port 1, 3 device type	CAL (Ch 6)
TRP13DR	Set the port 1, 3 device type to RECIPROCAL	CAL (Ch 6)
TRP13DT	Set the port 1, 3 device type to THRU	CAL (Ch 6)
TRP13I	Include the port 1, 3 thru/reciprocal measurement	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TRP13I?	Output the selection of omit or include for the port 1, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP13O	Omit the port 1, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP13OL	Enter the thru/reciprocal offset length for port 1, 3	CAL (Ch 6)
TRP13OL?	Output the thru/reciprocal offset length for port 1, 3	CAL (Ch 6)
TRP14D?	Query the port 1, 4 device type	CAL (Ch 6)
TRP14DR	Set the port 1, 4 device type to RECIPROCAL	CAL (Ch 6)
TRP14DT	Set the port 1, 4 device type to THRU	CAL (Ch 6)
TRP14I	Include the port 1, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP14I?	Output the selection of omit or include for the port 1, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP14O	Omit the port 1, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP14OL	Enter the thru/reciprocal offset length for port 1, 4	CAL (Ch 6)
TRP14OL?	Output the thru/reciprocal offset length for port 1, 4	CAL (Ch 6)
TRP23D?	Query the port 2, 3 device type	CAL (Ch 6)
TRP23DR	Set the port 2, 3 device type to RECIPROCAL	CAL (Ch 6)
TRP23DT	Set the port 2, 3 device type to THRU	CAL (Ch 6)
TRP23I	Include the port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP23I?	Output the selection of omit or include for the port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP23O	Omit the port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP23OL	Enter the thru/reciprocal offset length for port 2, 3	CAL (Ch 6)
TRP23OL?	Output the thru/reciprocal offset length for port 2, 3	CAL (Ch 6)
TRP24D?	Query the port 2, 4 device type	CAL (Ch 6)
TRP24DR	Set the port 2, 4 device type to RECIPROCAL	CAL (Ch 6)
TRP24DT	Set the port 2, 4 device type to THRU	CAL (Ch 6)
TRP24I	Include the port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP24I?	Output the selection of omit or include for the port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP24O	Omit the port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP24OL	Enter the thru/reciprocal offset length for port 2, 4	CAL (Ch 6)
TRP24OL?	Output the thru/reciprocal offset length for port 2, 4	CAL (Ch 6)
TRP34D?	Query the port 3, 4 device type	CAL (Ch 6)
TRP34DR	Set the port 3, 4 device type to RECIPROCAL	CAL (Ch 6)
TRP34DT	Set the port 3, 4 device type to THRU	CAL (Ch 6)
TRP34I	Include the port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP34I?	Output the selection of omit or include for the port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP34O	Omit the port 3, 4 thru/reciprocal measurement	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TRP34OL	Enter the thru/reciprocal offset length for port 3, 4	CAL (Ch 6)
TRP34OL?	Output the thru/reciprocal offset length for port 3, 4	CAL (Ch 6)
TRS	Trigger/restart sweep	CONFIG (Ch 5)
TRX	Select TRX calibration method	CAL (Ch 6)
TRX4P	Select TRX calibration method for 4-port calibration	CAL (Ch 6)
TSALCMS1	Source 1 ALC modulator drive voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSALCMS2	Source 2 ALC modulator drive voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSALCS1	Select source 1 for ALC verification	UTILITY - DIAGNOSTICS (Ch 9)
TSALCS2	Select source 2 for ALC verification	UTILITY - DIAGNOSTICS (Ch 9)
TSALCV	Start source ALC verification	UTILITY - DIAGNOSTICS (Ch 9)
TSBEG	Start diagnostics mode - same as SDG	UTILITY - DIAGNOSTICS (Ch 9)
TSDDSS1	Source 1 reference DDS voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSDDSS2	Source 2 reference DDS voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSDRAM	Start DRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSDSPSRAM	Start DSP SRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSDVMC	Enter DVM channel number - same as DVM	UTILITY - DIAGNOSTICS (Ch 9)
TSEFMEM	Start extended FLASH memory test	UTILITY - DIAGNOSTICS (Ch 9)
TSEND	End diagnostics mode - same as EDG	UTILITY - DIAGNOSTICS (Ch 9)
TSEXTI	Display external A/D input - same as EXD	UTILITY - DIAGNOSTICS (Ch 9)
TSFMEM	Start FLASH memory test	UTILITY - DIAGNOSTICS (Ch 9)
TSGDRAM	Start graphic DRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSGVRAM	Start graphic VRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSHETO	Het oscillator voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLATR?	Diagnostic read latch - same as DRL	UTILITY - DIAGNOSTICS (Ch 9)
TSLATW	Diagnostic write latch - same as DWL	UTILITY - DIAGNOSTICS (Ch 9)
TSLEVAS1	Source 1 level amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLEVAS2	Source 2 level amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLOGAS1	Source 1 logarithmic amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLOGAS2	Source 2 logarithmic amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSMAIVLO1	LO1 main VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSMAIVS1	Source 1 main VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSMAIVS2	Source 2 main VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSMCOO0	Common offset mode off	UTILITY - DIAGNOSTICS (Ch 9)
TSMCOO1	Common offset mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSMHAR0	Harmonic mode off	UTILITY - DIAGNOSTICS (Ch 9)
TSMHAR1	Harmonic mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSMSPA0	Spur avoidance mode off	UTILITY - DIAGNOSTICS (Ch 9)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TSMSPA1	Spur avoidance mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSMSPU0	Speed up circuit mode off	UTILITY - DIAGNOSTICS (Ch 9)
TSMSPU1	Speed up circuit mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSOFFVLO1	LO1 offset VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSOFFVS1	Source 1 offset VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSOFFVS2	Source 2 offset VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSPWRLS1	Source 1 power level DAC voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSPWRLS2	Source 2 power level DAC voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSSRAM	Start SRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSSRAMD	Start SRAM disk test	UTILITY - DIAGNOSTICS (Ch 9)
TST	Perform self test and output status (same as *TST?)	REMOTE - IEEE 488.2 (Ch 8)
TSTRENF	Noise figure measurement	UTILITY - DIAGNOSTICS (Ch 9)
TUNE0	Turn tune mode off	SWEEP (Ch 5)
TUNE1	Turn tune mode on	SWEEP (Ch 5)
TUNESWP	Enter number of sweeps in tune mode	SWEEP (Ch 5)
TUNESWP?	Output number of sweeps in tune mode	SWEEP (Ch 5)
TUNEX?	Output tune mode on/off status	SWEEP (Ch 5)
TXX?	Output trigger source	SWEEP (Ch 5)
U10	Select 10 mil UTF calibration kit	CAL (Ch 6)
U15	Select 15 mil UTF calibration kit	CAL (Ch 6)
U25	Select 25 mil UTF calibration kit	CAL (Ch 6)
UDP11	Select the S11 user defined parameter	MEAS (Ch 5)
UDP12	Select the S12 user defined parameter	MEAS (Ch 5)
UDP13	Select the S13 user defined parameter	MEAS (Ch 5)
UDP14	Select the S14 User Defined parameter	MEAS (Ch 5)
UDP21	Select the S21 user defined parameter	MEAS (Ch 5)
UDP22	Select the S22 user defined parameter	MEAS (Ch 5)
UDP23	Select the S23 user defined parameter	MEAS (Ch 5)
UDP24	Select the S24 User Defined parameter	MEAS (Ch 5)
UDP31	Select the S31 user defined parameter	MEAS (Ch 5)
UDP32	Select the S32 user defined parameter	MEAS (Ch 5)
UDP33	Select the S33 user defined parameter	MEAS (Ch 5)
UDP34	Select the S34 User Defined parameter	MEAS (Ch 5)
UDP41	Select the S41 User Defined parameter	MEAS (Ch 5)
UDP42	Select the S42 User Defined parameter	MEAS (Ch 5)
UDP43	Select the S43 User Defined parameter	MEAS (Ch 5)
UDP44	Select the S44 User Defined parameter	MEAS (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
UDPX?	Output User Defined parameter for active channel	MEAS (Ch 5)
UF	Suffix sets farad data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
UH	Suffix sets farad data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
UMDIS0	Turn off user message display	REMOTE - USER MESSAGE (Ch 8)
UMDIS1	Turn on user message display	REMOTE - USER MESSAGE (Ch 8)
UMDISX?	Output user message display on/off status	REMOTE - USER MESSAGE (Ch 8)
UMRST	Reset all user message display parameters	REMOTE - USER MESSAGE (Ch 8)
UMSTR	Enter the user message display string	REMOTE - USER MESSAGE (Ch 8)
UMSTR?	Output the user message display string	REMOTE - USER MESSAGE (Ch 8)
UMXLOC	Enter the user message display starting X location	REMOTE - USER MESSAGE (Ch 8)
UMXLOC?	Output the user message display starting X location	REMOTE - USER MESSAGE (Ch 8)
UMYLOC	Enter the user message display starting Y location	REMOTE - USER MESSAGE (Ch 8)
UMYLOC?	Output the user message display starting Y location	REMOTE - USER MESSAGE (Ch 8)
UNDOGC	Exit gain compression and undo changes	APPL - GAIN COMPRESSION (Ch 10)
UPL0	Turn upper limit off	DISPLAY - LIMITS (Ch 7)
UPL1	Turn upper limit on at current value	DISPLAY - LIMITS (Ch 7)
UPL20	Turn upper limit off for bottom graph	DISPLAY - LIMITS (Ch 7)
UPL21	Turn upper limit on at current value for bottom graph	DISPLAY - LIMITS (Ch 7)
UPL2X?	Output upper limit on/off status for bottom graph	DISPLAY - LIMITS (Ch 7)
UPLX?	Output upper limit on/off status	DISPLAY - LIMITS (Ch 7)
US	Suffix sets time data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
US1	Select upper segmented limit 1 as the active segment	DISPLAY - LIMITS (Ch 7)
US10	Select upper segmented limit 10 as the active segment	DISPLAY - LIMITS (Ch 7)
US2	Select upper segmented limit 2 as the active segment	DISPLAY - LIMITS (Ch 7)
US3	Select upper segmented limit 3 as the active segment	DISPLAY - LIMITS (Ch 7)
US3P	Select use existing 3-port calibration	CAL (Ch 6)
US3P?	Output selection of use existing 3-port calibration or not	CAL (Ch 6)
US4	Select upper segmented limit 4 as the active segment	DISPLAY - LIMITS (Ch 7)
US5	Select upper segmented limit 5 as the active segment	DISPLAY - LIMITS (Ch 7)
US6	Select upper segmented limit 6 as the active segment	DISPLAY - LIMITS (Ch 7)
US7	Select upper segmented limit 7 as the active segment	DISPLAY - LIMITS (Ch 7)
US8	Select upper segmented limit 8 as the active segment	DISPLAY - LIMITS (Ch 7)
US9	Select upper segmented limit 9 as the active segment	DISPLAY - LIMITS (Ch 7)
USC	Suffix sets time data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
USE	Enter effective dielectric for microstrip calibration	CAL (Ch 6)
USE?	Output effective dielectric for microstrip calibration	CAL (Ch 6)
USL	Enter label string for user parameter being defined	MEAS (Ch 5)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
USL?	Output label string for the user parameter being defined	MEAS (Ch 5)
USR1	Measure the user parameter 1 on active channel	MEAS (Ch 5)
USR10	Measure user parameter 10 on active channel	MEAS (Ch 5)
USR11	Measure user parameter 11 on active channel	MEAS (Ch 5)
USR12	Measure user parameter 12 on active channel	MEAS (Ch 5)
USR13	Measure user parameter 13 on active channel	MEAS (Ch 5)
USR14	Measure user parameter 14 on active channel	MEAS (Ch 5)
USR15	Measure user parameter 15 on active channel	MEAS (Ch 5)
USR16	Measure user parameter 16 on active channel	MEAS (Ch 5)
USR2	Measure user parameter 2 on active channel	MEAS (Ch 5)
USR3	Measure user parameter 3 on active channel	MEAS (Ch 5)
USR4	Measure user parameter 4 on active channel	MEAS (Ch 5)
USR5	Measure user parameter 5 on active channel	MEAS (Ch 5)
USR6	Measure user parameter 6 on active channel	MEAS (Ch 5)
USR7	Measure user parameter 7 on active channel	MEAS (Ch 5)
USR8	Measure user parameter 8 on active channel	MEAS (Ch 5)
USR9	Measure user parameter 9 on active channel	MEAS (Ch 5)
USW	Enter microstrip width for microstrip calibration	CAL (Ch 6)
USW?	Output microstrip width for microstrip calibration	CAL (Ch 6)
USZ	Enter microstrip impedance for microstrip calibration	CAL (Ch 6)
USZ?	Output microstrip impedance for microstrip calibration	CAL (Ch 6)
UTFD	Select user defined microstrip calibration kit	CAL (Ch 6)
UTFX?	Output microstrip cal kit selection USER/U10/U15/U25	CAL (Ch 6)
V	Suffix sets voltage data type	DATA ENTRY SUFFIXES (Ch 5)
VELO?	Output relative velocity for lowpass distance	APPL - TIME DOMAIN (Ch 10)
VLT	Suffix sets voltage data type	DATA ENTRY SUFFIXES (Ch 5)
VSP	Enter rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
VSP?	Output rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
VST	Enter rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
VST?	Output rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
WCO	Enter waveguide cutoff frequency for user defined kit	CAL (Ch 6)
WCO?	Output waveguide cutoff frequency for user defined kit	CAL (Ch 6)
WFS	Wait full sweep until all display data is valid	REMOTE - SYNC (Ch 8)
WGCUTOFF?	Output the waveguide cal kit cutoff frequency	CAL (Ch 6)
WGSER?	Output waveguide cal kit serial number	CAL (Ch 6)
WGSHOFF1?	Output the waveguide cal kit short 1 offset	CAL (Ch 6)
WGSHOFF2?	Output the waveguide cal kit short 2 offset	CAL (Ch 6)

Table 1. *Alphabetical Listing of Programming Codes (Mnemonics)*

Command	Description	Function
WIDE	Use entire display width for graphs	UTILITY (Ch 9)
WKD	Select user defined waveguide calibration kit	CAL (Ch 6)
WKI	Select installed waveguide calibration kit	CAL (Ch 6)
WKX?	Output waveguide calibration kit selection user/install	CAL (Ch 6)
WLS	Select low sidelobe window shape	APPL - TIME DOMAIN (Ch 10)
WMS	Select minimum sidelobe window shape	APPL - TIME DOMAIN (Ch 10)
WNM	Select nominal window shape	APPL - TIME DOMAIN (Ch 10)
WRT	Select rectangular window shape	APPL - TIME DOMAIN (Ch 10)
WSH1	Enter waveguide short offset 1 for user defined kit	CAL (Ch 6)
WSH1?	Output waveguide short 1 offset for user defined kit	CAL (Ch 6)
WSH2	Enter waveguide short offset 2 for user defined kit	CAL (Ch 6)
WSH2?	Output waveguide short 2 offset for user defined kit	CAL (Ch 6)
WSX?	Output window shape	APPL - TIME DOMAIN (Ch 10)
XM3	Suffix sets unitless data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
XMKR?	Output marker mode	MARKER (Ch 7)
XMKRP?	Output the power sweep marker mode	MARKER (Ch 7)
XSB?	Output byte order for output data LSB or MSB	REMOTE - FORMATTING (Ch 8)
XX1	Suffix sets unitless data type	DATA ENTRY SUFFIXES (Ch 5)
XX3	Suffix sets unitless data type and scales by 1E3	DATA ENTRY SUFFIXES (Ch 5)
ZCT	Enter zoom range center value time or distance	APPL - TIME DOMAIN (Ch 10)
ZCT?	Output zoom range center value	APPL - TIME DOMAIN (Ch 10)
ZSN	Enter zoom range span value time or distance	APPL - TIME DOMAIN (Ch 10)
ZSN?	Output zoom range span value	APPL - TIME DOMAIN (Ch 10)
ZSP	Enter zoom range stop value time or distance	APPL - TIME DOMAIN (Ch 10)
ZSP?	Output zoom range stop value	APPL - TIME DOMAIN (Ch 10)
ZST	Enter zoom range start value time or distance	APPL - TIME DOMAIN (Ch 10)
ZST?	Output zoom range start value	APPL - TIME DOMAIN (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ABSPHASE?	Output the absolute phase ON/OFF status	APPL (Ch 10)
ABSPHASE0	Turn absolute phase OFF	APPL (Ch 10)
ABSPHASE1	Turn absolute phase ON	APPL (Ch 10)
APPDEVM	Select mixer device type for application	APPL (Ch 10)
APPDEVS	Select standard device type for application	APPL (Ch 10)
APPDEVX?	Output device type for application	APPL (Ch 10)
APPENTC	Set application entry state to current state	APPL (Ch 10)
APPENTP	Set application entry state to previous state	APPL (Ch 10)
APPENTX?	Output application entry state	APPL (Ch 10)
APPGCF	Select swept frequency gain compression application type	APPL (Ch 10)
APPGCP	Select swept power gain compression application type	APPL (Ch 10)
APPHAR	Select harmonic application type	APPL (Ch 10)
APPIMD	Select IMD application type	APPL (Ch 10)
APPLORCW0	Turn off LO CW mode	APPL (Ch 10)
APPLORCW1	Turn on LO CW mode	APPL (Ch 10)
APPLORCWF	Enter LO CW frequency	APPL (Ch 10)
APPLORCWF?	Output LO CW frequency	APPL (Ch 10)
APPLORCWX?	Output LO CW on/off status	APPL (Ch 10)
APPLOROFF	Enter LO offset frequency	APPL (Ch 10)
APPLOROFF?	Output LO offset frequency	APPL (Ch 10)
APPLORRCD	Select receiver down conversion	APPL (Ch 10)
APPLORRCN	Select receiver no conversion	APPL (Ch 10)
APPLORRCU	Select receiver up conversion	APPL (Ch 10)
APPLORRCX?	Output receiver conversion type	APPL (Ch 10)
APPLORS2	Select source 2 for LO	APPL (Ch 10)
APPLORS3	Select source 3 for LO	APPL (Ch 10)
APPLORS4	Select source 4 for LO	APPL (Ch 10)
APPLORSX?	Output LO source number	APPL (Ch 10)
APPNF	Select noise figure application type	APPL (Ch 10)
APPSWPC	Set application sweep mode to CW receiver	APPL (Ch 10)
APPSWPS	Set application sweep mode to source sweep	APPL (Ch 10)
APPSWPX?	Output application sweep mode	APPL (Ch 10)
APPTR	Select transmission and reflection application type	APPL (Ch 10)
APPX?	Output application type	APPL (Ch 10)
EDE	Edit ENR source equation	APPL (Ch 10)
HELP0	Turn off help display	APPL (Ch 10)
HELP1	Turn on help display	APPL (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
HELPX?	Output help display on/off status	APPL (Ch 10)
IFV	Enter frequency values	APPL (Ch 10)
APPFTGD	Select frequency translation group delay application type	APPL - FTGD (Ch 10)
BEGFTGD	Start frequency translation group delay calibration	APPL - FTGD (Ch 10)
FTGDC0	Turn off frequency translation group delay correction	APPL - FTGD (Ch 10)
FTGDC1	Turn on frequency translation group delay correction	APPL - FTGD (Ch 10)
FTGDCDONE?	Output frequency translation group delay cal done status	APPL - FTGD (Ch 10)
FTGDCX?	Output frequency translation group delay correction on/off status	APPL - FTGD (Ch 10)
CALR	Perform receiver calibration for gain compression testing	APPL - GAIN COMPRESSION (Ch 10)
GCFS?	Output the multiple gain compression fixed scale flag ON/OFF status	APPL - GAIN COMPRESSION (Ch 10)
GCFSOFF	Turn the multiple gain compression fixed scale flag OFF	APPL - GAIN COMPRESSION (Ch 10)
GCFSON	Turn the multiple gain compression fixed scale flag ON	APPL - GAIN COMPRESSION (Ch 10)
GCMP	Enter gain compression point search value	APPL - GAIN COMPRESSION (Ch 10)
GCMP?	Output gain compression point search value	APPL - GAIN COMPRESSION (Ch 10)
GCSNS21?	Output self normalization of S21 status	APPL - GAIN COMPRESSION (Ch 10)
GCSNS210	Turn self normalization of S21 off	APPL - GAIN COMPRESSION (Ch 10)
GCSNS211	Turn self normalization of S21 on	APPL - GAIN COMPRESSION (Ch 10)
GCYSP	Enter the Y-stop power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
GCYSP?	Output the Y-stop power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
GCYST	Enter the Y-start power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
GCYST?	Output the Y-start power level for multiple frequency gain compression	APPL - GAIN COMPRESSION (Ch 10)
MFGCT	Start multiple frequency swept power gain compression test	APPL - GAIN COMPRESSION (Ch 10)
NOFST	Enter nominal offset value for external gain	APPL - GAIN COMPRESSION (Ch 10)
NOFST?	Output nominal offset value for external gain	APPL - GAIN COMPRESSION (Ch 10)
NRMS	Normalize S21 for gain compression testing	APPL - GAIN COMPRESSION (Ch 10)
PSET	Enter target power for gain compression receiver calibration	APPL - GAIN COMPRESSION (Ch 10)
PSET?	Output target power for gain compression receiver calibration	APPL - GAIN COMPRESSION (Ch 10)
PSF	Enter swept power frequency	APPL - GAIN COMPRESSION (Ch 10)
PSF?	Output swept power frequency	APPL - GAIN COMPRESSION (Ch 10)
PSTEP	Enter power sweep step size	APPL - GAIN COMPRESSION (Ch 10)
PSTEP?	Output power sweep step size	APPL - GAIN COMPRESSION (Ch 10)
PSTOP	Enter power sweep stop power	APPL - GAIN COMPRESSION (Ch 10)
PSTOP?	Output power sweep stop power	APPL - GAIN COMPRESSION (Ch 10)
PSTRT	Enter power sweep start power	APPL - GAIN COMPRESSION (Ch 10)
PSTRT?	Output power sweep start power	APPL - GAIN COMPRESSION (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PSWC	Perform power sweep linearity calibration	APPL - GAIN COMPRESSION (Ch 10)
PSWC0	Turn power sweep linearity calibration off	APPL - GAIN COMPRESSION (Ch 10)
PSWC1	Turn power sweep linearity calibration on	APPL - GAIN COMPRESSION (Ch 10)
PSWCDONE?	Output power sweep linearity cal done status	APPL - GAIN COMPRESSION (Ch 10)
PSWCX?	Output power sweep linearity calibration on/off status	APPL - GAIN COMPRESSION (Ch 10)
PSWP0	Turn power sweep off	APPL - GAIN COMPRESSION (Ch 10)
PSWP1	Turn power sweep on	APPL - GAIN COMPRESSION (Ch 10)
PSWPX?	Output power sweep on/off status	APPL - GAIN COMPRESSION (Ch 10)
RSTGC	Reset gain compression parameters to default	APPL - GAIN COMPRESSION (Ch 10)
SFGCA	Select swept frequency gain compression application	APPL - GAIN COMPRESSION (Ch 10)
SFGCT	Start swept frequency gain compression test	APPL - GAIN COMPRESSION (Ch 10)
SPGCA	Select swept power gain compression application	APPL - GAIN COMPRESSION (Ch 10)
SPGCT	Start swept power gain compression test	APPL - GAIN COMPRESSION (Ch 10)
UNDOGC	Exit gain compression and undo changes	APPL - GAIN COMPRESSION (Ch 10)
BEGEN	Begin taking harmonic enhancement calibration data	APPL - HARMONIC (Ch 10)
BEGHAR	Begin taking both harmonic enhancement and phase calibration	APPL - HARMONIC (Ch 10)
BEGPH	Begin taking harmonic phase calibration data	APPL - HARMONIC (Ch 10)
HAR1	Select 1st harmonic (fundamental) frequency	APPL - HARMONIC (Ch 10)
HAR2	Select 2nd harmonic frequency	APPL - HARMONIC (Ch 10)
HAR3	Select 3rd harmonic frequency	APPL - HARMONIC (Ch 10)
HAR4	Select 4th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR5	Select 5th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR6	Select 6th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR7	Select 7th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR8	Select 8th harmonic frequency	APPL - HARMONIC (Ch 10)
HAR9	Select 9th harmonic frequency	APPL - HARMONIC (Ch 10)
HARCE	Select harmonic enhancement correction	APPL - HARMONIC (Ch 10)
HARCEDONE?	Output harmonic enhancement cal done status	APPL - HARMONIC (Ch 10)
HARCEP	Select harmonic enhancement and Phase correction	APPL - HARMONIC (Ch 10)
HARCEPDONE?	Output harmonic enhancement and Phase cal done status	APPL - HARMONIC (Ch 10)
HARCN	Select No harmonic correction	APPL - HARMONIC (Ch 10)
HARCPDONE?	Output harmonic phase cal done status	APPL - HARMONIC (Ch 10)
HARCX?	Output harmonic correction setting	APPL - HARMONIC (Ch 10)
HARDOF	Select harmonic display relative to output fundamental frequency	APPL - HARMONIC (Ch 10)
HARDSF	Select harmonic display relative to source fundamental frequency	APPL - HARMONIC (Ch 10)
HARDSH	Select harmonic display relative to source harmonic frequency	APPL - HARMONIC (Ch 10)
HARDX?	Output harmonic display setting	APPL - HARMONIC (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
HARP12	Select ports 1 and 2	APPL - HARMONIC (Ch 10)
HARP13	Select ports 1 and 3	APPL - HARMONIC (Ch 10)
HARPX?	Output ports 1 and 2 or 1 and 3 setting	APPL - HARMONIC (Ch 10)
HARX?	Output harmonic frequency number	APPL - HARMONIC (Ch 10)
BEGIMD	Begin taking IMD calibration data	APPL - IMD (Ch 10)
IMD3	Select 3rd order intermodulation products	APPL - IMD (Ch 10)
IMD5	Select 5th order intermodulation products	APPL - IMD (Ch 10)
IMD7	Select 7th order intermodulation products	APPL - IMD (Ch 10)
IMD9	Select 9th order intermodulation products	APPL - IMD (Ch 10)
IMDC0	Turn off IMD correction	APPL - IMD (Ch 10)
IMDC1	Turn on IMD correction	APPL - IMD (Ch 10)
IMDCDONE?	Output IMD cal done status	APPL - IMD (Ch 10)
IMDCX?	Output IMD correction on/off status	APPL - IMD (Ch 10)
IMDDI	Display IMD intercept	APPL - IMD (Ch 10)
IMDDP	Display IMD product	APPL - IMD (Ch 10)
IMDDX?	Output IMD display selection	APPL - IMD (Ch 10)
IMDLOS2	Select source 2 for IMD LO	APPL - IMD (Ch 10)
IMDLOS3	Select source 3 for IMD LO	APPL - IMD (Ch 10)
IMDLOS4	Select source 4 for IMD LO	APPL - IMD (Ch 10)
IMDLOSX?	Output IMD tone 1 source number	APPL - IMD (Ch 10)
IMDMRI	Select Input as measurement reference for IMD	APPL - IMD (Ch 10)
IMDMRO	Select Output as measurement reference for IMD	APPL - IMD (Ch 10)
IMDMRX?	Output measurement reference for IMD	APPL - IMD (Ch 10)
IMDOX?	Output IMD ORDER selection	APPL - IMD (Ch 10)
IMDRT1	Select IMD relative to tone 1	APPL - IMD (Ch 10)
IMDRT2	Select IMD relative to tone 2	APPL - IMD (Ch 10)
IMDRTX?	Output IMD display relative to tone number selection	APPL - IMD (Ch 10)
IMDSSMA	Select source selection apply mode	APPL - IMD (Ch 10)
IMDSSMD	Select source selection define mode	APPL - IMD (Ch 10)
IMDSSMX?	Output source selection mode	APPL - IMD (Ch 10)
IMDT1S1	Select source 1 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1S2	Select source 2 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1S3	Select source 3 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1S4	Select source 4 for IMD tone 1	APPL - IMD (Ch 10)
IMDT1SX?	Output IMD tone 1 source number	APPL - IMD (Ch 10)
IMDT2OFF	Enter IMD tone 2 offset	APPL - IMD (Ch 10)
IMDT2OFF?	Output IMD tone 2 offset	APPL - IMD (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
IMDT2S1	Select source 1 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2S2	Select source 2 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2S3	Select source 3 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2S4	Select source 4 for IMD tone 2	APPL - IMD (Ch 10)
IMDT2SX?	Output IMD tone 2 source number	APPL - IMD (Ch 10)
BEGNF	Begin taking noise figure calibration data	APPL - NOISE FIGURE (Ch 10)
BEGNFRF	Begin taking noise figure with RF calibration data	APPL - NOISE FIGURE (Ch 10)
BNDNFCW?	Output multiple source band Noise Figure ENR source CW flag	APPL - NOISE FIGURE (Ch 10)
BNDNFDIV?	Output multiple source band Noise Figure ENR source divisor	APPL - NOISE FIGURE (Ch 10)
BNDNFMUL?	Output multiple source band Noise Figure ENR source multiplier	APPL - NOISE FIGURE (Ch 10)
BNDNFOFF?	Output multiple source band Noise Figure ENR source offset	APPL - NOISE FIGURE (Ch 10)
NFALCK?	Output lock or unlock down status for the front end attenuator setting	APPL - NOISE FIGURE (Ch 10)
NFALCK0	Turn off the lock down	APPL - NOISE FIGURE (Ch 10)
NFALCK1	Lock down the front end attenuator	APPL - NOISE FIGURE (Ch 10)
NFAOF	Turn noise figure measurement averaging off	APPL - NOISE FIGURE (Ch 10)
NFAON	Turn noise figure measurement averaging on	APPL - NOISE FIGURE (Ch 10)
NFAON?	Noise figure averaging on/off query	APPL - NOISE FIGURE (Ch 10)
NFASET	Lock down the front end attenuator and set it to 0, 1, 2, 3, or 4	APPL - NOISE FIGURE (Ch 10)
NFBATTN	Output the backend attenuator setting	APPL - NOISE FIGURE (Ch 10)
NFBCAL	Output NF backend calibration table	APPL - NOISE FIGURE (Ch 10)
NFBW	Enter noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBW?	Output noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBWC0	Turn off noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBWC1	Turn on noise figure bandwidth correction	APPL - NOISE FIGURE (Ch 10)
NFBWCX?	Output noise figure bandwidth correction on/off status	APPL - NOISE FIGURE (Ch 10)
NFC0	Turn off noise figure correction	APPL - NOISE FIGURE (Ch 10)
NFC1	Turn on noise figure correction	APPL - NOISE FIGURE (Ch 10)
NFC12TDONE?	Output noise figure with 12 term cal done status	APPL - NOISE FIGURE (Ch 10)
NFC2	Turn on noise figure with 12-term correction	APPL - NOISE FIGURE (Ch 10)
NFCDONE?	Output noise figure cal done status	APPL - NOISE FIGURE (Ch 10)
NFCOLD	Output corrected data for cold noise power	APPL - NOISE FIGURE (Ch 10)
NFCT	Enter noise figure cold temperature	APPL - NOISE FIGURE (Ch 10)
NFCT?	Output noise figure cold temperature	APPL - NOISE FIGURE (Ch 10)
NFCX?	Output noise figure correction on/off status	APPL - NOISE FIGURE (Ch 10)
NFDAG	Display available gain	APPL - NOISE FIGURE (Ch 10)
NFDATA	Output the cold data, the hot data, the front end attenuator	APPL - NOISE FIGURE (Ch 10)
NFDBWN	Select narrow DUT BW	APPL - NOISE FIGURE (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
NFDBWW	Select wide DUT BW	APPL - NOISE FIGURE (Ch 10)
NFDBWX?	Output DUT BW setting	APPL - NOISE FIGURE (Ch 10)
NFDENT	Display equivalent noise temperature	APPL - NOISE FIGURE (Ch 10)
NFDIG	Display insertion gain	APPL - NOISE FIGURE (Ch 10)
NFDNF	Display noise figure	APPL - NOISE FIGURE (Ch 10)
NFDX?	Output noise figure display selection	APPL - NOISE FIGURE (Ch 10)
NFDYF	Display Y-factor	APPL - NOISE FIGURE (Ch 10)
NFFATTN	Output the front end attenuator setting	APPL - NOISE FIGURE (Ch 10)
NFHOT	Output corrected data for hot noise power	APPL - NOISE FIGURE (Ch 10)
NFLA	Enter noise figure loss after DUT	APPL - NOISE FIGURE (Ch 10)
NFLA?	Output noise figure loss after DUT	APPL - NOISE FIGURE (Ch 10)
NFLB	Enter noise figure loss before DUT	APPL - NOISE FIGURE (Ch 10)
NFLB?	Output noise figure loss before DUT	APPL - NOISE FIGURE (Ch 10)
NFLENR	Load ENR file from floppy disk	APPL - NOISE FIGURE (Ch 10)
NFLENRH	Load ENR file from hard disk	APPL - NOISE FIGURE (Ch 10)
NFLENRX	Load ENR extension correction file from floppy disk	APPL - NOISE FIGURE (Ch 10)
NFLENRXH	Load ENR extension correction file from hard disk	APPL - NOISE FIGURE (Ch 10)
NFLNFX	Load ENR external extension correction file from floppy disk	APPL - NOISE FIGURE (Ch 10)
NFLNFXH	Load ENR external extension correction file from hard disk	APPL - NOISE FIGURE (Ch 10)
NFOL	Output noise figure overload status	APPL - NOISE FIGURE (Ch 10)
NFSRCE	Select external noise source	APPL - NOISE FIGURE (Ch 10)
NFSRCI	Select internal noise source	APPL - NOISE FIGURE (Ch 10)
NFSRCX?	Output noise source selection	APPL - NOISE FIGURE (Ch 10)
NFSSBC0	Turn off noise figure single sideband correction	APPL - NOISE FIGURE (Ch 10)
NFSSBC1	Turn on noise figure single sideband correction	APPL - NOISE FIGURE (Ch 10)
NFSSBCX?	Output noise figure single sideband correction on/off	APPL - NOISE FIGURE (Ch 10)
NFXENR0	Turn off ENR extension table	APPL - NOISE FIGURE (Ch 10)
NFXENR1	Turn on ENR extension table	APPL - NOISE FIGURE (Ch 10)
NFXENRX?	Query on/off status of ENR extension table	APPL - NOISE FIGURE (Ch 10)
NS0	Turn noise source off	APPL - NOISE FIGURE (Ch 10)
NS1	Turn noise source on	APPL - NOISE FIGURE (Ch 10)
CHDDX?	Output domain parameter frequency/distance/time for specified channel	APPL - TIME DOMAIN (Ch 10)
CHGOF?	Output the time domain gating mode on/off/display for specified channel	APPL - TIME DOMAIN (Ch 10)
CHLPSX?	Output the time domain impulse/step response for specified channel	APPL - TIME DOMAIN (Ch 10)
CHTDDIST?	Output the time domain parameter distance/time for specified channel	APPL - TIME DOMAIN (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CHTDPIX?	Output the time domain phasor impulse on/off status for specified channel	APPL - TIME DOMAIN (Ch 10)
CHTDX?	Output domain mode for specified channel	APPL - TIME DOMAIN (Ch 10)
DBP	Select distance bandpass mode for active channel	APPL - TIME DOMAIN (Ch 10)
DCA	Select automatic DC term calculation for lowpass	APPL - TIME DOMAIN (Ch 10)
DCO	Select open for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DCREFC?	Output reflection coefficient for lowpass	APPL - TIME DOMAIN (Ch 10)
DCS	Select short for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DCV	Enter value for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DCV?	Output lowpass DC term value	APPL - TIME DOMAIN (Ch 10)
DCX?	Output lowpass DC term selection	APPL - TIME DOMAIN (Ch 10)
DCZ	Select line impedance for DC term for lowpass	APPL - TIME DOMAIN (Ch 10)
DDX?	Output active channel domain parameter frequency distance or time	APPL - TIME DOMAIN (Ch 10)
DLP	Select distance lowpass mode for active channel	APPL - TIME DOMAIN (Ch 10)
DPI	Select distance phasor impulse mode for active channel	APPL - TIME DOMAIN (Ch 10)
FGT	Select frequency with time gate for active channel	APPL - TIME DOMAIN (Ch 10)
FQD	Select frequency domain for active channel	APPL - TIME DOMAIN (Ch 10)
GCT	Enter gate center value distance or time	APPL - TIME DOMAIN (Ch 10)
GCT?	Output gate center value	APPL - TIME DOMAIN (Ch 10)
GDS	Gate symbols displayed on active channel	APPL - TIME DOMAIN (Ch 10)
GLS	Select low sidelobe gate shape	APPL - TIME DOMAIN (Ch 10)
GMS	Select minimum sidelobe gate shape	APPL - TIME DOMAIN (Ch 10)
GNM	Select nominal gate shape	APPL - TIME DOMAIN (Ch 10)
GOF	Turn off gating on active channel	APPL - TIME DOMAIN (Ch 10)
GOF?	Output gating mode on active channel	APPL - TIME DOMAIN (Ch 10)
GON	Turn on gating on active channel	APPL - TIME DOMAIN (Ch 10)
GRT	Select Rectangular gate shape	APPL - TIME DOMAIN (Ch 10)
GSN	Enter gate span value distance or time	APPL - TIME DOMAIN (Ch 10)
GSN?	Output gate span value	APPL - TIME DOMAIN (Ch 10)
GSP	Enter gate stop value distance or time	APPL - TIME DOMAIN (Ch 10)
GSP?	Output gate stop value	APPL - TIME DOMAIN (Ch 10)
GST	Enter gate start value distance or time	APPL - TIME DOMAIN (Ch 10)
GST?	Output gate start value	APPL - TIME DOMAIN (Ch 10)
GSX?	Output Gate Shape setting	APPL - TIME DOMAIN (Ch 10)
LPI	Select lowpass impulse response for active channel	APPL - TIME DOMAIN (Ch 10)
LPS	Select lowpass step response for active channel	APPL - TIME DOMAIN (Ch 10)
LPSX?	Output lowpass response for active channel impulse or step	APPL - TIME DOMAIN (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MRR	Restore original marker range	APPL - TIME DOMAIN (Ch 10)
TBP	Select time bandpass mode for active channel	APPL - TIME DOMAIN (Ch 10)
TDDIST	Set time domain parameter to distance for active channel	APPL - TIME DOMAIN (Ch 10)
TDDIST?	Output active channel time domain parameter distance or time	APPL - TIME DOMAIN (Ch 10)
TDPI0	Turn phasor impulse response off for active channel	APPL - TIME DOMAIN (Ch 10)
TDPI1	Turn phasor impulse response on for active channel	APPL - TIME DOMAIN (Ch 10)
TDPIX?	Output phasor impulse on/off status for active channel	APPL - TIME DOMAIN (Ch 10)
TDTIME	Set time domain parameter to time for active channel	APPL - TIME DOMAIN (Ch 10)
TDX?	Output domain mode for active channel	APPL - TIME DOMAIN (Ch 10)
TLP	Select time lowpass mode for active channel	APPL - TIME DOMAIN (Ch 10)
TPI	Select time phasor impulse mode for active channel	APPL - TIME DOMAIN (Ch 10)
VELO?	Output relative velocity for lowpass distance	APPL - TIME DOMAIN (Ch 10)
WLS	Select low sidelobe window shape	APPL - TIME DOMAIN (Ch 10)
WMS	Select minimum sidelobe window shape	APPL - TIME DOMAIN (Ch 10)
WNM	Select nominal window shape	APPL - TIME DOMAIN (Ch 10)
WRT	Select rectangular window shape	APPL - TIME DOMAIN (Ch 10)
WSX?	Output window shape	APPL - TIME DOMAIN (Ch 10)
ZCT	Enter zoom range center value time or distance	APPL - TIME DOMAIN (Ch 10)
ZCT?	Output zoom range center value	APPL - TIME DOMAIN (Ch 10)
ZSN	Enter zoom range span value time or distance	APPL - TIME DOMAIN (Ch 10)
ZSN?	Output zoom range span value	APPL - TIME DOMAIN (Ch 10)
ZSP	Enter zoom range stop value time or distance	APPL - TIME DOMAIN (Ch 10)
ZSP?	Output zoom range stop value	APPL - TIME DOMAIN (Ch 10)
ZST	Enter zoom range start value time or distance	APPL - TIME DOMAIN (Ch 10)
ZST?	Output zoom range start value	APPL - TIME DOMAIN (Ch 10)
AOF	Turn averaging off	AVG (Ch 5)
AOF?	Output averaging on/off status	AVG (Ch 5)
AON	Turn averaging on	AVG (Ch 5)
AVG	Enter averaging count and turn it on	AVG (Ch 5)
AVG?	Output averaging count	AVG (Ch 5)
AVGCNT?	Output the current Sweep-by-Sweep average sweep count	AVG (Ch 5)
IF1	Select 10 Hz IF bandwidth	AVG (Ch 5)
IF2	Select 100 Hz IF bandwidth	AVG (Ch 5)
IF3	Select 1 kHz IF bandwidth	AVG (Ch 5)
IF4	Select 10 kHz IF bandwidth	AVG (Ch 5)
IFA	Select 30 kHz IF bandwidth	AVG (Ch 5)
IFBW10	Select 10 Hz IF bandwidth	AVG (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
IFBW100	Select 100 Hz IF bandwidth	AVG (Ch 5)
IFBW10K	Select 10 kHz IF bandwidth	AVG (Ch 5)
IFBW1K	Select 1 kHz IF bandwidth	AVG (Ch 5)
IFBW30	Select 30 Hz IF bandwidth	AVG (Ch 5)
IFBW300	Select 300 Hz IF bandwidth	AVG (Ch 5)
IFBW30K	Select 30 kHz IF bandwidth	AVG (Ch 5)
IFBW3K	Select 3 kHz IF bandwidth	AVG (Ch 5)
IFBWX?	Output IF bandwidth (10-30000)	AVG (Ch 5)
IFM	Select 10 Hz IF bandwidth	AVG (Ch 5)
IFN	Select 1 kHz IF bandwidth	AVG (Ch 5)
IFR	Select 100 Hz IF bandwidth	AVG (Ch 5)
IFX?	Output IF bandwidth (1-4)	AVG (Ch 5)
NFAVEC	Enter noise figure averaging count	AVG (Ch 5)
NFAVEC?	Output noise figure averaging count	AVG (Ch 5)
PTAVG	Set the averaging type to Point-by-Point averaging	AVG (Ch 5)
RSTAVG	Reset the Sweep-by-Sweep averaging sweep count	AVG (Ch 5)
SOF	Turn off smoothing	AVG (Ch 5)
SOF?	Output smoothing on/off status	AVG (Ch 5)
SON	Enter smoothing value and turn on	AVG (Ch 5)
SON?	Output smoothing value	AVG (Ch 5)
SPTS?	Output the number of smoothing points	AVG (Ch 5)
SWAVG	Set the averaging type to Sweep-by-Sweep averaging	AVG (Ch 5)
SWAVG?	Output the averaging type of Point-by-Point or Sweep-by-Sweep	AVG (Ch 5)
2PATH3PORT	Select 2-path 3-port calibration method	CAL (Ch 6)
A12	Simulate 12-term calibration	CAL (Ch 6)
A24	Simulate 3-port calibration	CAL (Ch 6)
A3P	Simulate 3-port calibration	CAL (Ch 6)
A40	Simulate 4-port calibration	CAL (Ch 6)
A4P	Simulate 4-port calibration	CAL (Ch 6)
A4P0	Simulate 4-port calibration and initialize all 4-port correction coefficients	CAL (Ch 6)
A8R	Simulate 1-path 2-port calibration reverse path	CAL (Ch 6)
A8T	Simulate 1-path 2-port calibration forward path	CAL (Ch 6)
ABORTCAL	Abort calibration and keep existing calibration data	CAL (Ch 6)
ABT	Simulate translation frequency response calibration forward and reverse	CAL (Ch 6)
ADPL	Enter electrical length for adapter removal	CAL (Ch 6)
ADPL?	Output electrical length for adapter removal	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
AFT	Simulate transmission frequency response calibration forward path	CAL (Ch 6)
ALCERRS1?	Output source 1 ALC calibration error	CAL (Ch 6)
ALCERRS2?	Output source 2 ALC calibration error	CAL (Ch 6)
APPC12T?	Output 12 Term calibration done status	CAL (Ch 6)
APPC3P?	Output 3-port calibration done status	CAL (Ch 6)
APPC4P?	Output 4-port calibration done status	CAL (Ch 6)
APRXSTP	Enter approximate stop frequency	CAL (Ch 6)
APRXSTP?	Output approximate stop frequency	CAL (Ch 6)
ARB	Simulate reflection only calibration both ports	CAL (Ch 6)
ARF	Simulate reflection only calibration port 1	CAL (Ch 6)
ARR	Simulate reflection only calibration port 2	CAL (Ch 6)
ART	Simulate translation frequency response calibration reverse path	CAL (Ch 6)
BBL	Select broadband load for calibration	CAL (Ch 6)
BBLP3	Select broadband load for 3-port calibration	CAL (Ch 6)
BBLP4	Select broadband load for 4-port calibration	CAL (Ch 6)
BBX?	Output load type for calibration broadband/sliding load	CAL (Ch 6)
BBXP3?	Output load type for 3-port calibration broadband/sliding load	CAL (Ch 6)
BBXP4?	Output load type for 4-port calibration broadband/sliding load	CAL (Ch 6)
BBZ	Enter broadband load impedance for calibration	CAL (Ch 6)
BBZ?	Output broadband load impedance for calibration	CAL (Ch 6)
BBZL	Enter broadband load inductance for calibration	CAL (Ch 6)
BBZL?	Output broadband load inductance for calibration	CAL (Ch 6)
BEG	Begin taking calibration data	CAL (Ch 6)
BEG3P	Begin taking 3-port calibration data	CAL (Ch 6)
BEG4P	Begin taking 4-port calibration data	CAL (Ch 6)
BPF	Enter break point frequency for 3 line LRL calibration	CAL (Ch 6)
BPF?	Output break point frequency for 3 line LRL calibration	CAL (Ch 6)
C12	Select 12 term calibration	CAL (Ch 6)
C8R	Select 1-path 2-port calibration reverse path	CAL (Ch 6)
C8T	Select 1-path 2-port calibration forward path	CAL (Ch 6)
CBT	Select translation frequency response calibration forward and reverse	CAL (Ch 6)
CC0	Enter capacitance coefficient 0 for open	CAL (Ch 6)
CC0?	Output capacitance coefficient 0 for open	CAL (Ch 6)
CC1	Enter capacitance coefficient 1 for open	CAL (Ch 6)
CC1?	Output capacitance coefficient 1 for open	CAL (Ch 6)
CC2	Enter capacitance coefficient 2 for open	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CC2?	Output capacitance coefficient 2 for open	CAL (Ch 6)
CC3	Enter capacitance coefficient 3 for open	CAL (Ch 6)
CC3?	Output capacitance coefficient 3 for open	CAL (Ch 6)
CDATTN0?	Output port 1 attenuation of power sweep mode from selected cal memory	CAL (Ch 6)
CDATTN2?	Output port 3 attenuation of power sweep mode from selected cal memory	CAL (Ch 6)
CDCALTP?	Output 2-port cal type from selected cal memory	CAL (Ch 6)
CDCON?	Output port 1 connector from selected cal memory	CAL (Ch 6)
CDCWF?	Output cw mode frequency from selected cal memory	CAL (Ch 6)
CDEND1?	Output end power for power source 1 or end frequency from selected cal memory	CAL (Ch 6)
CDEND2?	Output end power for power source 2 from selected cal memory	CAL (Ch 6)
CDEND3?	Output end power for power source 3 from selected cal memory	CAL (Ch 6)
CDEND4?	Output end power for power source 4 from selected cal memory	CAL (Ch 6)
CDFREQ?	Output cal data freq list from selected cal memory	CAL (Ch 6)
CDFSW?	Output sweep type from selected cal memory	CAL (Ch 6)
CDLNTP?	Output line type from selected cal memory	CAL (Ch 6)
CDNOP1?	Output port 1 nominal offset of power sweep mode from selected cal memory	CAL (Ch 6)
CDNOP3?	Output port 3 nominal offset of power sweep mode from selected cal memory	CAL (Ch 6)
CDNUM?	Output data number of power/frequency from selected cal memory	CAL (Ch 6)
CDP2CON?	Output port 2 connector from selected cal memory	CAL (Ch 6)
CDP3CALTP?	Output 3-port cal type from selected cal memory	CAL (Ch 6)
CDP3CON?	Output port 3 connector from selected cal memory	CAL (Ch 6)
CDP4CALTP?	Output 4-port cal type from selected cal memory	CAL (Ch 6)
CDP4CON?	Output port 4 connector from selected cal memory	CAL (Ch 6)
CDPTS?	Output cal data points from selected cal memory	CAL (Ch 6)
CDPTSPWR?	Output cal data point of power sweep mode from selected cal memory	CAL (Ch 6)
CDSRC2PWR?	Output power in power source 2 from selected cal memory	CAL (Ch 6)
CDSRCPWR?	Output power in power source 1 from selected cal memory	CAL (Ch 6)
CDSTEP?	Output min power/frequency step from selected cal memory	CAL (Ch 6)
CDSTRT1?	Output start power for power source 1 or start frequency from selected cal memory	CAL (Ch 6)
CDSTRT2?	Output start power for power source 2 from selected cal memory	CAL (Ch 6)
CDSTRT3?	Output start power for power source 3 from selected cal memory	CAL (Ch 6)
CDSTRT4?	Output start power for power source 4 from selected cal memory	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CF2	Select female 2.4mm connector for current port	CAL (Ch 6)
CF3	Select female GPC-3.5 connector for current port	CAL (Ch 6)
CF716	Select female Type 7/16 connector for current port	CAL (Ch 6)
CFC	Select female TNC connector for current port	CAL (Ch 6)
CFK	Select female K Connector for current port	CAL (Ch 6)
CFN	Select female Type N connector for current port	CAL (Ch 6)
CFN75	Select female Type N 75-ohm connector for current port	CAL (Ch 6)
CFS	Select female SMA connector for current port	CAL (Ch 6)
CFSP	Select special female connector for current port	CAL (Ch 6)
CFT	Select transmission frequency response calibration forward path	CAL (Ch 6)
CFV	Select female V Connector for current port	CAL (Ch 6)
CL0	Enter inductive coefficient 0 for short	CAL (Ch 6)
CL0?	Output inductive coefficient 0 for short	CAL (Ch 6)
CL1	Enter inductive coefficient 1 for short	CAL (Ch 6)
CL1?	Output inductive coefficient 1 for short	CAL (Ch 6)
CL2	Enter inductive coefficient 2 for short	CAL (Ch 6)
CL2?	Output inductive coefficient 2 for short	CAL (Ch 6)
CL3	Enter inductive coefficient 3 for short	CAL (Ch 6)
CL3?	Output inductive coefficient 3 for short	CAL (Ch 6)
CM2	Select male 2.4mm connector for current port	CAL (Ch 6)
CM3	Select male GPC-3.5 connector for current port	CAL (Ch 6)
CM3PX?	Output calibration method for 3-port cal	CAL (Ch 6)
CM4PX?	Output calibration method for 4-port calibration	CAL (Ch 6)
CM716	Select male Type 7/16 connector for current port	CAL (Ch 6)
CMC	Select male TNC connector for current port	CAL (Ch 6)
CMK	Select male K Connector for current port	CAL (Ch 6)
CMN	Select male N connector for current port	CAL (Ch 6)
CMN75	Select male Type N 75-Ohm connector for current port	CAL (Ch 6)
CMS	Select male SMA connector for current port	CAL (Ch 6)
CMSP	Select special male connector for current port	CAL (Ch 6)
CMV	Select male V Connector for current port	CAL (Ch 6)
CMX?	Output calibration method	CAL (Ch 6)
CND	Select user specified connector for current port	CAL (Ch 6)
CNG	Select GPC-7 connector for current port	CAL (Ch 6)
COF	Turn 2 and 3-port error correction and Flexible Cal off	CAL (Ch 6)
CON	Turn 2-port error correction on	CAL (Ch 6)
CON?	Output 2-port error correction on/off status	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CON3P	Turn 3-port error correction on	CAL (Ch 6)
CON3P?	Output 3-port error correction on/off status	CAL (Ch 6)
CON4P	Turn 4-port error correction on	CAL (Ch 6)
CON4P?	Output 4-Port error correction on/off status	CAL (Ch 6)
CONCC0?	Output capacitance coefficient 0 of open device for specified connector	CAL (Ch 6)
CONCC1?	Output capacitance coefficient 1 of open device for specified connector	CAL (Ch 6)
CONCC2?	Output capacitance coefficient 2 of open device for specified connector	CAL (Ch 6)
CONCC3?	Output capacitance coefficient 3 of open device for specified connector	CAL (Ch 6)
CONOPOFF?	Output offset of open device for specified connector	CAL (Ch 6)
CONOPSER?	Output serial number of open device for specified connector	CAL (Ch 6)
CONSHANG?	Output angle of short device for specified connector	CAL (Ch 6)
CONSHOFF?	Output offset of short device for specified connector	CAL (Ch 6)
CONSHSER?	Output serial number of short device for specified connector	CAL (Ch 6)
COO	Enter offset for open for user specified connector	CAL (Ch 6)
COO?	Output offset for open for user specified connector	CAL (Ch 6)
COS	Enter offset for short for user specified connector	CAL (Ch 6)
COS?	Output offset for short for user specified connector	CAL (Ch 6)
CRB	Select reflection only calibration both ports	CAL (Ch 6)
CRF	Select reflection only calibration port 1	CAL (Ch 6)
CRR	Select reflection only calibration port 2	CAL (Ch 6)
CRT	Select transmission frequency response calibration reverse path	CAL (Ch 6)
CSF?	Output calibration start frequency	CAL (Ch 6)
CSWP?	Output sweep mode for calibration	CAL (Ch 6)
CTF?	Output calibration stop frequency	CAL (Ch 6)
CWC	Select CW frequency calibration data points	CAL (Ch 6)
CXX?	Output calibration type	CAL (Ch 6)
DFC	Select discrete frequency calibration data points	CAL (Ch 6)
IARF	Enter adapter removal files from GPIB and calibrate	CAL (Ch 6)
ISF	Exclude isolation	CAL (Ch 6)
ISN	Include isolation	CAL (Ch 6)
ISX?	Output isolation calibration selected true/false	CAL (Ch 6)
KEC	Keep existing calibration data	CAL (Ch 6)
LCM	Select LRL calibration method	CAL (Ch 6)
LDARF	Load adapter removal files from disk and calibrate	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
LL1	Enter length of line 1 for LRL calibration	CAL (Ch 6)
LL1?	Output length of line 1 for LRL calibration	CAL (Ch 6)
LL1P3	Enter length of line 1 for 3-port TRX calibration	CAL (Ch 6)
LL1P3?	Output length of line 1 for 3-port TRX calibration	CAL (Ch 6)
LL2	Enter length of line 2 for LRL calibration	CAL (Ch 6)
LL2?	Output length of line 2 for LRL calibration	CAL (Ch 6)
LL2P3	Enter length of line 2 for 3-port TRX calibration	CAL (Ch 6)
LL2P3?	Output length of line 2 for 3-port TRX calibration	CAL (Ch 6)
LL3	Enter length of line 3 for LRL calibration	CAL (Ch 6)
LL3?	Output length of line 3 for LRL calibration	CAL (Ch 6)
LLZ	Enter line impedance for LRL calibration	CAL (Ch 6)
LLZ?	Output line impedance for LRL calibration	CAL (Ch 6)
LM2	Select a match for the second device during a LRM type calibration	CAL (Ch 6)
LM3	Select a match for the third device during a LRM type calibration	CAL (Ch 6)
LR2	Specify 2 line LRL calibration	CAL (Ch 6)
LR3	Specify 3 line LRL calibration	CAL (Ch 6)
LRX?	Output line selection for LRL calibration 2 line/3 line	CAL (Ch 6)
LTC	Select coaxial transmission line for calibration	CAL (Ch 6)
LTU	Select microstrip transmission line for calibration	CAL (Ch 6)
LTW	Select waveguide transmission line for calibration	CAL (Ch 6)
LTX?	Output line type	CAL (Ch 6)
LX2?	Output device for line 2 of LRL calibration line/match	CAL (Ch 6)
LX3?	Output device for line 3 of LRL calibration line/match	CAL (Ch 6)
MAT	Select matched reflective devices during calibration	CAL (Ch 6)
MIX	Select mixed reflective devices during calibration	CAL (Ch 6)
MIX?	Output reflective devices selection during calibration	CAL (Ch 6)
MIXP3	Set port 3 to be mixer port when source 2 using	CAL (Ch 6)
MIXP4	Set port 4 to be mixer port when source 2 using	CAL (Ch 6)
MIXPORT?	Output mixer port when source 2 using	CAL (Ch 6)
NCS	Go to next calibration step	CAL (Ch 6)
NOC	Select normal calibration data points	CAL (Ch 6)
NPX?	Output number of points currently being measured	CAL (Ch 6)
NUS3P	Select Don’t Use existing 3-port calibration	CAL (Ch 6)
OCM	Select offset short calibration method	CAL (Ch 6)
P1C	Select port 1 for connector specification	CAL (Ch 6)
P1C?	Output port 1 connector type	CAL (Ch 6)
P2C	Select port 2 for connector specification	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
P2C?	Output port 2 connector type	CAL (Ch 6)
P3C	Select port 3 for connector specification	CAL (Ch 6)
P3C?	Output port 3 connector type	CAL (Ch 6)
P4C	Select port 4 for connector specification	CAL (Ch 6)
P4C?	Output port 4 connector type	CAL (Ch 6)
RESTARTCAL	Restart application calibration measurement	CAL (Ch 6)
RGZ	Select reflective device greater than Z0	CAL (Ch 6)
RLZ	Select reflective device less than Z0	CAL (Ch 6)
RM1	Select reference plane at line 1 midpoint	CAL (Ch 6)
RMX?	Output reference plane location for LRL calibration	CAL (Ch 6)
ROL	Enter reflective device offset length	CAL (Ch 6)
ROL?	Output reflective device offset length	CAL (Ch 6)
ROLP3	Enter reflective device offset length for 3-port TRX calibration	CAL (Ch 6)
ROLP3?	Output reflective device offset length for 3-port TRX	CAL (Ch 6)
ROLP4	Enter reflective device offset length for 4-port TRX calibration	CAL (Ch 6)
ROLP4?	Output reflective device offset length for 4-port TRX calibration	CAL (Ch 6)
RPC	Repeat previous calibration	CAL (Ch 6)
RPCHAN	Select Per Channel for reference plane	CAL (Ch 6)
RPCPX?	Output reference plane Per Channel/Port status	CAL (Ch 6)
RPPORT	Select Per Port for reference plane	CAL (Ch 6)
RRP	Select reference plane at reflection plane	CAL (Ch 6)
RXZ?	Output reflective device type in LRL calibration greater/less than Z0	CAL (Ch 6)
SBD	Enter substrate dielectric for microstrip calibration	CAL (Ch 6)
SBD?	Output substrate dielectric for microstrip calibration	CAL (Ch 6)
SBT	Enter substrate thickness for microstrip calibration	CAL (Ch 6)
SBT?	Output substrate thickness for microstrip calibration	CAL (Ch 6)
SCM	Select standard calibration method	CAL (Ch 6)
SH1	Set offset short 1 or 2 offset length for offset short calibration	CAL (Ch 6)
SH1?	Output offset short 1 offset length	CAL (Ch 6)
SH2	Set offset short 1 or 2 offset length for offset short calibration	CAL (Ch 6)
SH2?	Output offset short 2 offset length	CAL (Ch 6)
SLD	Select sliding load for calibration	CAL (Ch 6)
SLDP3	Select sliding load for 3-port calibration	CAL (Ch 6)
SLDP4	Select sliding load for 4-port calibration	CAL (Ch 6)
TRP14I	Include the port 1, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP14I?	Output the selection of omit or include for the port 1, 4 thru/reciprocal measurement	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TRP14O	Omit the port 1, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP14OL	Enter the thru/reciprocal offset length for port 1, 4	CAL (Ch 6)
TRP14OL?	Output the thru/reciprocal offset length for port 1, 4	CAL (Ch 6)
TRP23D?	Query the port 2, 3 device type	CAL (Ch 6)
TRP23DR	Set the port 2, 3 device type to RECIPROCAL	CAL (Ch 6)
TRP23DT	Set the port 2, 3 device type to THRU	CAL (Ch 6)
TRP23I	Include the port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
SOLT	Select SOLT calibration method	CAL (Ch 6)
SOLT4P	Select SOLT calibration method for 4-port calibration	CAL (Ch 6)
SSC	Select the segmented sweep calibration data points	CAL (Ch 6)
SYSZ0?	Output system impedance	CAL (Ch 6)
TC1	Take calibration data for port 1	CAL (Ch 6)
TC2	Take calibration data for port 2	CAL (Ch 6)
TCD	Take calibration data on one or both ports as necessary	CAL (Ch 6)
TCM	Select TRM calibration method	CAL (Ch 6)
TDC	Select time domain harmonic frequency calibration data points	CAL (Ch 6)
TENMHZERR?	Output 10 MHz calibration max error	CAL (Ch 6)
THRU23	Include port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
THRU23?	Output selection of include or omit port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
THRU23N	Omit port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
THRU24	Include port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU24?	Output selection of include or omit port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU24N	Omit port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU34	Include port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU34?	Output selection of include or omit port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
THRU34N	Omit port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
TLZ	Enter thru line impedance for calibration	CAL (Ch 6)
TLZ?	Output thru line impedance for calibration	CAL (Ch 6)
TOL	Enter thru offset/reciprocal length for calibration	CAL (Ch 6)
TOL?	Output thru offset/reciprocal length for calibration	CAL (Ch 6)
TOLP14	Enter port 1, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP14?	Output port 1, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP23	Enter port 2, 3 thru offset/reciprocal length for 3-port calibration	CAL (Ch 6)
TOLP23?	Output port 2, 3 thru offset/reciprocal length for 3-port calibration	CAL (Ch 6)
TOLP24	Enter port 2, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TOLP24?	Output port 2, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP3	Enter thru offset/reciprocal length for 3-port calibration	CAL (Ch 6)
TOLP3?	Output thru offsett/reciprocal length for 3-port calibration	CAL (Ch 6)
TOLP34	Enter port 3, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TOLP34?	Output port 3, 4 thru offset/reciprocal length for 4-port calibration	CAL (Ch 6)
TRP12D?	Query the port 1, 2 device type	CAL (Ch 6)
TRP12DR	Set the port 1, 2 device type to RECIPROCAL	CAL (Ch 6)
TRP12DT	Set the port 1, 2 device type to THRU	CAL (Ch 6)
TRP12OL	Enter the thru/reciprocal offset length for port 1, 2	CAL (Ch 6)
TRP12OL?	Output the thru/reciprocal offset length for port 1, 2	CAL (Ch 6)
TRP13D?	Query the port 1, 3 device type	CAL (Ch 6)
TRP13DR	Set the port 1, 3 device type to RECIPROCAL	CAL (Ch 6)
TRP13DT	Set the port 1, 3 device type to THRU	CAL (Ch 6)
TRP13I	Include the port 1, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP13I?	Output the selection of omit or include for the port 1, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP13O	Omit the port 1, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP13OL	Enter the thru/reciprocal offset length for port 1, 3	CAL (Ch 6)
TRP13OL?	Output the thru/reciprocal offset length for port 1, 3	CAL (Ch 6)
TRP14D?	Query the port 1, 4 device type	CAL (Ch 6)
TRP14DR	Set the port 1, 4 device type to RECIPROCAL	CAL (Ch 6)
TRP14DT	Set the port 1, 4 device type to THRU	CAL (Ch 6)
TRP23I?	Output the selection of omit or include for the port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP23O	Omit the port 2, 3 thru/reciprocal measurement	CAL (Ch 6)
TRP23OL	Enter the thru/reciprocal offset length for port 2, 3	CAL (Ch 6)
TRP23OL?	Output the thru/reciprocal offset length for port 2, 3	CAL (Ch 6)
TRP24D?	Query the port 2, 4 device type	CAL (Ch 6)
TRP24DR	Set the port 2, 4 device type to RECIPROCAL	CAL (Ch 6)
TRP24DT	Set the port 2, 4 device type to THRU	CAL (Ch 6)
TRP24I	Include the port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP24I?	Output the selection of omit or include for the port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP24O	Omit the port 2, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP24OL	Enter the thru/reciprocal offset length for port 2, 4	CAL (Ch 6)
TRP24OL?	Output the thru/reciprocal offset length for port 2, 4	CAL (Ch 6)
TRP34D?	Query the port 3, 4 device type	CAL (Ch 6)
TRP34DR	Set the port 3, 4 device type to RECIPROCAL	CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TRP34DT	Set the port 3, 4 device type to THRU	CAL (Ch 6)
TRP34I	Include the port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP34I?	Output the selection of omit or include for the port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP34O	Omit the port 3, 4 thru/reciprocal measurement	CAL (Ch 6)
TRP34OL	Enter the thru/reciprocal offset length for port 3, 4	CAL (Ch 6)
TRP34OL?	Output the thru/reciprocal offset length for port 3, 4	CAL (Ch 6)
TRX	Select TRX calibration method	CAL (Ch 6)
TRX4P	Select TRX calibration method for 4-port calibration	CAL (Ch 6)
U10	Select 10 mil UTF calibration kit	CAL (Ch 6)
U15	Select 15 mil UTF calibration kit	CAL (Ch 6)
U25	Select 25 mil UTF calibration kit	CAL (Ch 6)
US3P	Select use existing 3-port calibration	CAL (Ch 6)
US3P?	Output selection of use existing 3-port calibration or not	CAL (Ch 6)
USE	Enter effective dielectric for microstrip calibration	CAL (Ch 6)
USE?	Output effective dielectric for microstrip calibration	CAL (Ch 6)
USW	Enter microstrip width for microstrip calibration	CAL (Ch 6)
USW?	Output microstrip width for microstrip calibration	CAL (Ch 6)
USZ	Enter microstrip impedance for microstrip calibration	CAL (Ch 6)
USZ?	Output microstrip impedance for microstrip calibration	CAL (Ch 6)
UTFD	Select user defined microstrip calibration kit	CAL (Ch 6)
UTFX?	Output microstrip cal kit selection USER/U10/U15/U25	CAL (Ch 6)
WCO	Enter waveguide cutoff frequency for user defined kit	CAL (Ch 6)
WCO?	Output waveguide cutoff frequency for user defined kit	CAL (Ch 6)
WGCUTOFF?	Output the waveguide cal kit cutoff frequency	CAL (Ch 6)
WGSER?	Output waveguide cal kit serial number	CAL (Ch 6)
WGSHOFF1?	Output the waveguide cal kit short 1 offset	CAL (Ch 6)
WGSHOFF2?	Output the waveguide cal kit short 2 offset	CAL (Ch 6)
WKD	Select user defined waveguide calibration kit	CAL (Ch 6)
WKI	Select installed waveguide calibration kit	CAL (Ch 6)
WKX?	Output waveguide calibration kit selection user/install	CAL (Ch 6)
WSH1	Enter waveguide short offset 1 for user defined kit	CAL (Ch 6)
WSH1?	Output waveguide short 1 offset for user defined kit	CAL (Ch 6)
WSH2	Enter waveguide short offset 2 for user defined kit	CAL (Ch 6)
WSH2?	Output waveguide short 2 offset for user defined kit	CAL (Ch 6)
ACF2TT	Set the AutoCal full 2-port Thru type to True Thru	CAL - AUTOCAL (Ch 6)
ACF2TX?	Output full 2-port Thru type for AutoCal	CAL - AUTOCAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ACHFD	Save AutoCal characterization to floppy disk	CAL - AUTOCAL (Ch 6)
ACHHD	Save AutoCal characterization to hard disk	CAL - AUTOCAL (Ch 6)
ACIAX?	Output AutoCal isolation yes/no setting	CAL - AUTOCAL (Ch 6)
ACISO	Enter number of averaging for isolation	CAL - AUTOCAL (Ch 6)
ACISO?	Output number of averaging for isolation	CAL - AUTOCAL (Ch 6)
ACL1AR2	Set adapter removal port to L=1 and ADAPT & R=2	CAL - AUTOCAL (Ch 6)
ACL1R2	Set the AutoCal ports to L=1 and R=2	CAL - AUTOCAL (Ch 6)
ACLO	Enter number of averaging for load	CAL - AUTOCAL (Ch 6)
ACLO?	Output number of averaging for load	CAL - AUTOCAL (Ch 6)
ACLOAD	Set AutoCal standard to load	CAL - AUTOCAL (Ch 6)
ACOMIT	Omit isolation	CAL - AUTOCAL (Ch 6)
ACOPEN	Set AutoCal standard to open	CAL - AUTOCAL (Ch 6)
ACP1?	Output port 1 configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACP2?	Output port 2 configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACP2L	Set the AutoCal port to LEFT for reflection only cal, port 2	CAL - AUTOCAL (Ch 6)
ACP2R	Set the AutoCal port 2 to RIGHT for reflection only cal, port 2	CAL - AUTOCAL (Ch 6)
ACPA	Select AutoCal port A for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPATH?	Output AutoCal connected path	CAL - AUTOCAL (Ch 6)
ACPB	Select AutoCal port B for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPC	Select AutoCal port C for reflection only cal	CAL - AUTOCAL (Ch 6)
AC2PBTYPE	Set AutoCal to 2-port box type	CAL - AUTOCAL (Ch 6)
AC4PBTYPE	Set AutoCal to 4-port box type	CAL - AUTOCAL (Ch 6)
ACAA	Set AutoCal standard to assurance	CAL - AUTOCAL (Ch 6)
ACADIR1	Enter directivity 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR1?	Output directivity 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR2	Enter directivity 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR2?	Output directivity 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR3	Enter directivity 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADIR3?	Output directivity 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACADPL	Enter adapter length for AutoCal	CAL - AUTOCAL (Ch 6)
ACADPL?	Output adapter length for AutoCal	CAL - AUTOCAL (Ch 6)
ACADR	Set AutoCal type to adapter removal	CAL - AUTOCAL (Ch 6)
ACADTL	Adapter connected to “LEFT” port of the 2-port AutoCal box	CAL - AUTOCAL (Ch 6)
ACADTR	Adapter connected to “RIGHT” port of the 2-port AutoCal box	CAL - AUTOCAL (Ch 6)
ACADTX?	Output adapter removal port “LEFT” or “RIGHT” in the 2-port AutoCal box that the adapter is connected to	CAL - AUTOCAL (Ch 6)
ACAL1R2	Set adapter removal port to ADAPT & L=1 and R=2	CAL - AUTOCAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ACALM1	Enter load match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM1?	Output load match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM2	Enter load match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM2?	Output load match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM3	Enter load match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACALM3?	Output load match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACAP?	Output ports configuration for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACAR1L2	Set adapter removal port to ADAPT & R=1 and L=2	CAL - AUTOCAL (Ch 6)
ACARET1	Enter reflection tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARET1?	Output reflection tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARET2	Enter reflection tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARET2?	Output reflection tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACARP?	Output adapter removal port configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACAS?	Output AutoCal assurance status	CAL - AUTOCAL (Ch 6)
ACASRC1	Enter source match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC1?	Output source match 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC2	Enter source match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC2?	Output source match 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC3	Enter source match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACASRC3?	Output source match 3 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT1	Enter transmission tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT1?	Output transmission tracking 1 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT2	Enter transmission tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACATRT2?	Output transmission tracking 2 for AutoCal assurance limits	CAL - AUTOCAL (Ch 6)
ACAVNA1	Set adapter connected to port 1	CAL - AUTOCAL (Ch 6)
ACAVNA2	Set adapter connected to port 2	CAL - AUTOCAL (Ch 6)
ACAVNAPX?	Output adapter removal port configuration for AutoCal	CAL - AUTOCAL (Ch 6)
ACBTYPE?	Output AutoCal 2-port or 4-port box type	CAL - AUTOCAL (Ch 6)
ACDEF	Include isolation	CAL - AUTOCAL (Ch 6)
ACF2P?	Output port selection for full 2-port AutoCal	CAL - AUTOCAL (Ch 6)
ACF2TC	Set the AutoCal full 2-port Thru type to calibrator	CAL - AUTOCAL (Ch 6)
ACPCFG	Enter string to setup port configuration for 4 Port AutoCal Box	CAL - AUTOCAL (Ch 6)
ACPCFG?	Output port configuration for 4 Port AutoCal Box	CAL - AUTOCAL (Ch 6)
ACPL	Set the AutoCal port to LEFT	CAL - AUTOCAL (Ch 6)
ACPR	Set the AutoCal port to RIGHT	CAL - AUTOCAL (Ch 6)
ACPX	Select AutoCal port X for reflection only cal	CAL - AUTOCAL (Ch 6)
ACPX?	Output AutoCal port selected for reflection only cal	CAL - AUTOCAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ACPXA	Set AutoCal connected path to port X-A	CAL - AUTOCAL (Ch 6)
ACPXB	Set AutoCal connected path to port X-B	CAL - AUTOCAL (Ch 6)
ACPXC	Set AutoCal connected path to port X-C	CAL - AUTOCAL (Ch 6)
ACR1AL2	Set adapter removal port to R=1 and ADAPT & L=2	CAL - AUTOCAL (Ch 6)
ACR1L2	Set the AutoCal ports to R=1 and L=2	CAL - AUTOCAL (Ch 6)
ACRFL	Enter number of averaging for reflection	CAL - AUTOCAL (Ch 6)
ACRFL?	Output number of averaging for reflection	CAL - AUTOCAL (Ch 6)
ACS11	Set AutoCal type to S11	CAL - AUTOCAL (Ch 6)
ACS11S22	Set AutoCal type to both S11 and S22	CAL - AUTOCAL (Ch 6)
ACS22	Set AutoCal type to S22	CAL - AUTOCAL (Ch 6)
ACSF2P	Set AutoCal type to full 2-port	CAL - AUTOCAL (Ch 6)
ACSF3P	Set AutoCal type to full 3-port	CAL - AUTOCAL (Ch 6)
ACSF4P	Set AutoCal type to full 4-port	CAL - AUTOCAL (Ch 6)
ACSHORT	Set AutoCal standard to short	CAL - AUTOCAL (Ch 6)
ACSTD?	Output AutoCal standard	CAL - AUTOCAL (Ch 6)
ACSTMEA	Continue AutoCal Thru update	CAL - AUTOCAL (Ch 6)
ACTHRU	Set AutoCal standard to Thru	CAL - AUTOCAL (Ch 6)
ACTHRU12T0	Do port 1, 2 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU12T1	Do port 1, 2 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU12X?	Output selection of port 1, 2 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU13T0	Do port 1, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU13T1	Do port 1, 3 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU13X?	Output selection of port 1, 3 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU14T0	Do port 1, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU14T1	Do port 1, 4 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU14X?	Output selection of port 1, 4 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU23T0	Do port 2, 3 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU23T1	Do port 2, 3 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU23X?	Output selection of port 2, 3 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU24T0	Do port 2, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)
ACTHRU24T1	Do port 2, 4 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU24X?	Output selection of port 2, 4 thru measurement	CAL - AUTOCAL (Ch 6)
ACTHRU34T0	Do port 3, 4 thru measurement using AutoCal THRU or omit THRU depending on the port configuration	CAL - AUTOCAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ACTHRU34T1	Do port 3, 4 thru measurement using TRUE THRU	CAL - AUTOCAL (Ch 6)
ACTHRU34X?	Output selection of port 3, 4 thru measurement	CAL - AUTOCAL (Ch 6)
ACTOLP12	Enter port 1, 2 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP12?	Output port 1, 2 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP13	Enter port 1, 3 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP13?	Output port 1, 3 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP14	Enter port 1, 4 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP14?	Output port 1, 4 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP23	Enter port 2, 3 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP23?	Output port 2, 3 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP24	Enter port 2, 4 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP24?	Output port 2, 4 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP34	Enter port 3, 4 thru line length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTOLP34?	Output port 3, 4 thru offset length for AutoCal	CAL - AUTOCAL (Ch 6)
ACTUAVG	Enter number of averaging for AutoCal Thru update	CAL - AUTOCAL (Ch 6)
ACTUAVG?	Output number of averaging for AutoCal Thru update	CAL - AUTOCAL (Ch 6)
ACTULS	Apply last Thru update calibration setup	CAL - AUTOCAL (Ch 6)
ACX?	Output AutoCal type	CAL - AUTOCAL (Ch 6)
BEGAC	Initialize an AutoCal measurement	CAL - AUTOCAL (Ch 6)
BEGACA	Start AutoCal assurance	CAL - AUTOCAL (Ch 6)
BEGCH	Start AutoCal characterization	CAL - AUTOCAL (Ch 6)
BEGTU	Start AutoCal Thru update	CAL - AUTOCAL (Ch 6)
IACCHAR	Input AutoCal characterization data from the GPIB	CAL - AUTOCAL (Ch 6)
OACCHAR	Output AutoCal characterization data to the GPIB	CAL - AUTOCAL (Ch 6)
OACCSER2P	Output the AutoCal characterization serial number for 2-port AutoCal	CAL - AUTOCAL (Ch 6)
OACCSER4P	Output the AutoCal characterization serial number for 4-port AutoCal	CAL - AUTOCAL (Ch 6)
OACSER	Output AutoCal box serial number	CAL - AUTOCAL (Ch 6)
OACTYPE	Output AutoCal box type	CAL - AUTOCAL (Ch 6)
FXAPL	Apply Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXP1T?	Query Port 1 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXP1T0	Turns off Port 1 selection. Do not apply correction to any S-parameter involving port 1	CAL - FLEXIBLE CAL (Ch 6)
FXP1T1	Turns on Port 1 selection. Correct S11. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
FXP2T?	Query Port 2 selection for Flexible Cal.	CAL - FLEXIBLE CAL (Ch 6)
FXP2T0	Turns off Port 2 selection. Do not apply correction to any S-parameter involving port 2	CAL - FLEXIBLE CAL (Ch 6)
FXP2T1	Turns on Port 2 selection. Correct S22. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
FXP3T?	Query Port 3 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FXP3T0	Turns off Port 3 selection. Do not apply correction to any S-parameter involving port 3	CAL - FLEXIBLE CAL (Ch 6)
FXP3T1	Turns on Port 3 selection. Correct S33. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
CDFXCALTP?	Output Flexible Cal calibration type	CAL - FLEXIBLE CAL (Ch 6)
CFFX?	Query Flexible Cal define mode	CAL - FLEXIBLE CAL (Ch 6)
CFXI?	Output Flexible Cal input method	CAL - FLEXIBLE CAL (Ch 6)
CFXICU	Select Flexible Customize Cal	CAL - FLEXIBLE CAL (Ch 6)
CFXIFU	Select Flexible Full Term Cal	CAL - FLEXIBLE CAL (Ch 6)
CFXIRF	Select Flexible Reflection Cal	CAL - FLEXIBLE CAL (Ch 6)
CONFX	Turn flexible error correction on	CAL - FLEXIBLE CAL (Ch 6)
CONFX?	Output flexible error correction on/off status	CAL - FLEXIBLE CAL (Ch 6)
EX2RF0	Turn external source 2 rf off	CAL - FLEXIBLE CAL (Ch 6)
EX2RF1	Turn external source 2 rf on	CAL - FLEXIBLE CAL (Ch 6)
EX3RF0	Turn external source 3 rf off	CAL - FLEXIBLE CAL (Ch 6)
EX3RF1	Turn external source 3 rf on	CAL - FLEXIBLE CAL (Ch 6)
EX4RF0	Turn external source 4 rf off	CAL - FLEXIBLE CAL (Ch 6)
EX4RF1	Turn external source 4 rf on	CAL - FLEXIBLE CAL (Ch 6)
FXP4T?	Query Port 4 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXP4T0	Turns off Port 4 selection. Do not apply correction to any S-parameter involving port 4	CAL - FLEXIBLE CAL (Ch 6)
FXP4T1	Turns on Port 4 selection. Correct S44. If in full term cal input method	CAL - FLEXIBLE CAL (Ch 6)
FXS11T?	Output S11 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS11T0	Turn off S11 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS11T1	Turn on S11 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS12T?	Output S12 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS12T0	Turn off S12 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS12T1	Turn on S12 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS13T?	Output S13 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS13T0	Turn off S13 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS13T1	Turn on S13 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS14T?	Output S14 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS14T0	Turn off S14 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS14T1	Turn on S14 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS21T?	Output S21 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS21T0	Turn off S21 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS21T1	Turn on S21 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS22T?	Output S22 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS22T0	Turn off S22 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FXS22T1	Turn on S22 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS23T?	Output S23 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS23T0	Turn off S23 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS23T1	Turn on S23 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS24T?	Output S24 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS24T0	Turn off S24 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS24T1	Turn on S24 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS31T?	Output S31 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS31T0	Turn off S31 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS31T1	Turn on S31 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS32T?	Output S32 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS32T0	Turn off S32 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS32T1	Turn on S32 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS33T?	Output S33 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS33T0	Turn off S33 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS33T1	Turn on S33 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS34T?	Output S34 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS34T0	Turn off S34 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS34T1	Turn on S34 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS41T?	Output S41 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS41T0	Turn off S41 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS41T1	Turn on S41 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS42T?	Output S42 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS42T0	Turn off S42 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS42T1	Turn on S42 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS43T?	Output S43 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS43T0	Turn off S43 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS43T1	Turn on S43 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS44T?	Output S44 selection on/off	CAL - FLEXIBLE CAL (Ch 6)
FXS44T0	Turn off S44 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXS44T1	Turn on S44 selection for Flexible Cal	CAL - FLEXIBLE CAL (Ch 6)
FXSOFF	Turn off all the S-parameters when Flexible Cal is being applied	CAL - FLEXIBLE CAL (Ch 6)
FXSON	Turn on all the S-parameters when Flexible Cal is being applied	CAL - FLEXIBLE CAL (Ch 6)
CH1	Make channel 1 the active channel	CH (Ch 5)
CH2	Make channel 2 the active channel	CH (Ch 5)
CH3	Make channel 3 the active channel	CH (Ch 5)
CH4	Make channel 4 the active channel	CH (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CHX?	Output active channel number	CH (Ch 5)
RTL	Return to local	CLR/LOCAL (Ch 9)
ADDSRC2	Enter external source 2 GPIB address	CONFIG (Ch 5)
ADDSRC2?	Output external source 2 GPIB address	CONFIG (Ch 5)
ADDSRC3	Enter external source 3 GPIB address	CONFIG (Ch 5)
ADDSRC3?	Output external source 3 GPIB address	CONFIG (Ch 5)
ADDSRC4	Enter external source 4 GPIB address	CONFIG (Ch 5)
ADDSRC4?	Output external source 4 GPIB address	CONFIG (Ch 5)
AH0	Turn automatic DUT protection off	CONFIG (Ch 5)
AH1	Turn automatic DUT protection on	CONFIG (Ch 5)
AHX?	Output automatic DUT protection on/off status	CONFIG (Ch 5)
BH0	Turn bias off while in hold	CONFIG (Ch 5)
BH1	Turn bias on while in hold	CONFIG (Ch 5)
BHX?	Output bias on/off during hold status	CONFIG (Ch 5)
CWP	Enter number of points drawn in CW	CONFIG (Ch 5)
CWP?	Output number of points drawn in CW	CONFIG (Ch 5)
EDADD	Select add on to network for embedding/de-embedding	CONFIG (Ch 5)
EDADD?	Output Add on to Network or Modify Last Network for embedding/de-embedding	CONFIG (Ch 5)
EDE?	Output Embedding/De-embedding Mode status	CONFIG (Ch 5)
EDE0	Turn Embedding/De-embedding Mode off	CONFIG (Ch 5)
EDE1	Turn Embedding/De-embedding Mode on	CONFIG (Ch 5)
EDEAIR	Select air as dielectric type for T-line section	CONFIG (Ch 5)
EDEAPP	Apply Embedding/De-embedding Network	CONFIG (Ch 5)
EDECAP	Enter capacitance for LC circuit	CONFIG (Ch 5)
EDECAP?	Output capacitance for LC circuit	CONFIG (Ch 5)
EDECAP4P1	Enter capacitance 1 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDECAP4P1?	Output capacitance 1 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDECAP4P2	Enter capacitance 2 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDECAP4P2?	Output capacitance 2 for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDECKT?	Output embedding/de-embedding network generation method selection	CONFIG (Ch 5)
EDECPLS	Select C(P)-L(S) as LC circuit type	CONFIG (Ch 5)
EDECSCP	Select C(S)-L(P) as LC circuit type	CONFIG (Ch 5)
EDECSLP	Select C(S)-L(P) as LC circuit type	CONFIG (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
EDECSLP4P	Select C(S)-L(P) as the LC circuit type for the 4-port circuit	CONFIG (Ch 5)
EDED	Select de-embedding as embedding/de-embedding method	CONFIG (Ch 5)
EDEDEF	Define embedding/de-embedding network	CONFIG (Ch 5)
EDEDEF?	Output apply or define embedding/de-embedding network	CONFIG (Ch 5)
EDEDIEL	Enter relative dielectric for T-line section	CONFIG (Ch 5)
EDEDIEL?	Output relative dielectric for T-line section	CONFIG (Ch 5)
EDEDT?	Output dielectric type for T-line section	CONFIG (Ch 5)
EDEDUT?	Output device type selection for embedding/de-embeddin	CONFIG (Ch 5)
EDEDUT2	Select 2-port test device for embedding/de-embedding	CONFIG (Ch 5)
EDEDUT3	Select 3-port test device for embedding/de-embedding	CONFIG (Ch 5)
EDEDUT4	Select 4-port test device for embedding/de-embedding	CONFIG (Ch 5)
EDEE	Select embedding as embedding/de-embedding method	CONFIG (Ch 5)
EDEED?	Output embedding/de-embedding method selection	CONFIG (Ch 5)
EDEIMP	Enter impedance for T-line section	CONFIG (Ch 5)
EDEIMP?	Output impedance for T-line section	CONFIG (Ch 5)
EDEIND	Enter inductance for LC circuit	CONFIG (Ch 5)
EDEIND?	Output inductance for LC circuit	CONFIG (Ch 5)
EDEIND4P	Enter inductance for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDEIND4P?	Output inductance for circuit topology in four port embedding/de-embedding	CONFIG (Ch 5)
EDEIND4P2	Enter Inductance 2 for the circuit topology in four-port embedding/de-embedding	CONFIG (Ch 5)
EDEIND4P2?	Output Inductance 2 for the circuit topology in four-port embedding/de-embedding	CONFIG (Ch 5)
EDELC	Select LC circuit as embedding/de-embedding network generation method	CONFIG (Ch 5)
EDELC?	Output LC circuit type selection	CONFIG (Ch 5)
EDELC4P?	Outputs the four-port LC circuit type selection	CONFIG (Ch 5)
EDELEN	Enter length for T-line section	CONFIG (Ch 5)
EDELEN?	Output length for T-line section	CONFIG (Ch 5)
EDELOS	Enter loss for T-line section	CONFIG (Ch 5)
EDELOS?	Output loss for T-line section	CONFIG (Ch 5)
EDELPCS	Select L(P)-C(S) as LC circuit type	CONFIG (Ch 5)
EDELSCP	Select L(S)-C(P) as LC circuit type	CONFIG (Ch 5)
EDELSCP4P	Select L(S)-C(P) as the LC circuit type for the four-port circuit	CONFIG (Ch 5)
EDEMIC	Select microporous teflon as dielectric type for T-line	CONFIG (Ch 5)
EDEMODIFY	Select Modify Last Network for embedding/de-embedding	CONFIG (Ch 5)
EDEOTH	Select Other as dielectric type for T-line section	CONFIG (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
EDEPOLY	Select Polyethylene as dielectric type for T-line section	CONFIG (Ch 5)
EDEPORT?	Output active port number for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT1	Select port 1 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT12	Select port 1 and port 2 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT2	Select port 2 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT23	Select port 2 and port 3 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT3	Select port 3 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT34	Select port 3 and port 4 for embedding/de-embedding	CONFIG (Ch 5)
EDEPORT4	Select port 4 for embedding/de-embedding	CONFIG (Ch 5)
EDERST	Reset all ports reference plane for embedding/de-embedding	CONFIG (Ch 5)
EDETEF	Select teflon as dielectric type for T-line section	CONFIG (Ch 5)
EDETIME	Enter time for T-line section	CONFIG (Ch 5)
EDETIME?	Output time for T-line section	CONFIG (Ch 5)
EDETLINE	Select T-line section as embedding/de-embedding network	CONFIG (Ch 5)
FHI	Set data points to 1601	CONFIG (Ch 5)
FLO	Set data points to 101	CONFIG (Ch 5)
FME	Set data points to 401	CONFIG (Ch 5)
FOF	Blank frequency information	CONFIG (Ch 5)
FON	Display frequency information	CONFIG (Ch 5)
FOX?	Output frequency information on/off status	CONFIG (Ch 5)
IMPCOMPU?	Output computation method selection for impedance transformation	CONFIG (Ch 5)
IMPPORT	Enter port number as active for impedance transformation	CONFIG (Ch 5)
IMPPORT?	Output active port number for impedance transformation	CONFIG (Ch 5)
IMPPOWER	Select power-wave as computation method for impedance transformation	CONFIG (Ch 5)
IMPPSEUDO	Select pseudo-wave as computation method for impedance transformation	CONFIG (Ch 5)
IMPREACT	Enter reactive term for impedance transformation	CONFIG (Ch 5)
IMPREACT?	Output reactiv term for impedance transformation	CONFIG (Ch 5)
IMPRESIST	Enter resistive term for impedance transformation	CONFIG (Ch 5)
IMPRESIST?	Output resistive term for impedance transformation	CONFIG (Ch 5)
IMPTS?	Output impedance transformation mode status	CONFIG (Ch 5)
IMPTS0	Turn impedance transformation mode off	CONFIG (Ch 5)
IMPTS1	Turn impedance transformation mode on	CONFIG (Ch 5)
NP101	Set data points to 101	CONFIG (Ch 5)
NP15	Set data points to 15	CONFIG (Ch 5)
NP1601	Set data points to 1601	CONFIG (Ch 5)
NP201	Set data points to 201	CONFIG (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
NP3	Set data points to 3	CONFIG (Ch 5)
NP401	Set data points to 401	CONFIG (Ch 5)
NP51	Set data points to 51	CONFIG (Ch 5)
NP801	Set data points to 801	CONFIG (Ch 5)
OEDELOG	Output current EDE log	CONFIG (Ch 5)
ONP	Output number of points currently being measured	CONFIG (Ch 5)
PEDELOG	Print current EDE log	CONFIG (Ch 5)
RH0	Select RF off in hold mode	CONFIG (Ch 5)
RH1	Select RF on in hold	CONFIG (Ch 5)
RHX?	Output RF on/off during hold status	CONFIG (Ch 5)
RT?	Output ripples testing enable status	CONFIG (Ch 5)
RT0	Turn ripples testing off	CONFIG (Ch 5)
RT1	Turn ripples testing on	CONFIG (Ch 5)
RTVAL	Enter ripples testing value	CONFIG (Ch 5)
RTVAL?	Output ripples testing value	CONFIG (Ch 5)
SIS0	Turn off simultaneous internal sources mode	CONFIG (Ch 5)
SIS1	Turn on simultaneous internal sources mode	CONFIG (Ch 5)
SIS2CWF	Enter internal source 2 CW frequency and turn CW on	CONFIG (Ch 5)
SIS2CWF?	Output internal source 2 CW frequency	CONFIG (Ch 5)
SIS2CWOFF	Turn internal source 2 CW off	CONFIG (Ch 5)
SIS2CWON	Turn internal source 2 CW on at current CW frequency	CONFIG (Ch 5)
SIS2CWON?	Output internal source 2 CW on/off status	CONFIG (Ch 5)
SIS2OFF	Enter internal source 2 offset from source 1 frequency	CONFIG (Ch 5)
SIS2OFF?	Output internal source 2 offset from source 1 frequency	CONFIG (Ch 5)
SISX?	Output simultaneous internal sources mode on/off	CONFIG (Ch 5)
SRC1AC?	Output source 1 active/inactive status	CONFIG (Ch 5)
SRC2?	Output external source 2 existence information	CONFIG (Ch 5)
SRC2AC	Select source 2 as active	CONFIG (Ch 5)
SRC2AC?	Output source 2 active/inactive status	CONFIG (Ch 5)
SRC2MOD?	Output external source 2 model/version string	CONFIG (Ch 5)
SRC2NA	Select source 2 as not active	CONFIG (Ch 5)
SRC3?	Output external source 3 existence information	CONFIG (Ch 5)
SRC3AC	Select source 3 as active	CONFIG (Ch 5)
SRC3AC?	Output source 3 active/inactive status	CONFIG (Ch 5)
SRC3MOD?	Output external source 3 model/version string	CONFIG (Ch 5)
SRC3NA	Select source 3 as not active	CONFIG (Ch 5)
SRC4?	Output external source 4 existence information	CONFIG (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SRC4AC	Select source 4 as active	CONFIG (Ch 5)
SRC4AC?	Output source 4 active/inactive status	CONFIG (Ch 5)
SRC4MOD?	Output external source 4 model/version string	CONFIG (Ch 5)
SRC4NA	Select source 4 as not active	CONFIG (Ch 5)
TRS	Trigger/restart sweep	CONFIG (Ch 5)
BD1	Select band 1 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD2	Select band 2 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD3	Select band 3 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD4	Select band 4 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BD5	Select band 5 for definition	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRCW?	Output multiple source band receiver CW flag for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRDIV?	Output multiple source band receiver divisor for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRMUL?	Output multiple source band receiver multiplier for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDROFF?	Output multiple source band receiver offset for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSCW?	Output multiple source band receiver source CW flag	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSDIV?	Output multiple source band receiver source divisor	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSMUL?	Output multiple source band receiver source multiplier	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDRSOFF?	Output multiple source band receiver source offset	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1CW?	Output multiple source band source 1 CW flag for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1DIV?	Output multiple source band source 1 divisor for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1MUL?	Output multiple source band source 1 multiplier for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS1OFF?	Output multiple source band source 1 offset for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2CW?	Output multiple source band source 2 CW flag for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2DIV?	Output multiple source band source 2 divisor for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2MUL?	Output multiple source band source 2 multiplier for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS2OFF?	Output multiple source band source 2 offset for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3CW?	Output multiple source band source 3 CW flag	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3DIV?	Output multiple source band source 3 divisor	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3MUL?	Output multiple source band source 3 multiplier	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS3OFF?	Output multiple source band source 3 offset	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4CW?	Output multiple source band source 4 CW flag	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4DIV?	Output multiple source band source 4 divisor	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4MUL?	Output multiple source band source 4 multiplier	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDS4OFF?	Output multiple source band source 4 offset	CONFIG - MULTIPLE SOURCE (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
BNDSRT?	Output multiple source band start frequency for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BNDSTP?	Output multiple source band stop frequency for specified band	CONFIG - MULTIPLE SOURCE (Ch 5)
BSP	Enter band stop frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
BSP?	Output band stop frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
BST	Enter band start frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
BST?	Output band start frequency	CONFIG - MULTIPLE SOURCE (Ch 5)
CLB	Clear all multiple source band definitions	CONFIG - MULTIPLE SOURCE (Ch 5)
ECW	Select CW operation for component being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
ED1	Edit source 1 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
ED2	Edit source 2 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
ED3	Edit source 3 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
ED4	Edit source 4 equation	CONFIG - MULTIPLE SOURCE (Ch 5)
EDR	Edit receiver equation	CONFIG - MULTIPLE SOURCE (Ch 5)
EDRS	Edit receiver source equation	CONFIG - MULTIPLE SOURCE (Ch 5)
EDV	Enter divisor value for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EDV?	Output the divisor value for the equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EDX?	Output equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EML	Enter multiplier value for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EML?	Output multiplier value for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EOS	Enter offset frequency for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EOS?	Output offset frequency for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
ESW	Select sweep operation for component being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
EXW?	Output multiple source sweep flag for equation being edited	CONFIG - MULTIPLE SOURCE (Ch 5)
LTRD	Output response data from the dedicated GPIB bus	CONFIG - MULTIPLE SOURCE (Ch 5)
LTWRT	Send program data to the dedicated GPIB bus	CONFIG - MULTIPLE SOURCE (Ch 5)
MS0	Turn multiple source mode off	CONFIG - MULTIPLE SOURCE (Ch 5)
MS1	Turn multiple source mode on	CONFIG - MULTIPLE SOURCE (Ch 5)
MSD	Select multiple source define mode	CONFIG - MULTIPLE SOURCE (Ch 5)
MSX?	Output multiple source mode on/off/define	CONFIG - MULTIPLE SOURCE (Ch 5)
PSRC	Enter power source as active	CONFIG - MULTIPLE SOURCE (Ch 5)
PSRC?	Output active power source	CONFIG - MULTIPLE SOURCE (Ch 5)
SVB	Save current band definitions	CONFIG - MULTIPLE SOURCE (Ch 5)
CM	Suffix sets distance data type and scales by 1E-2	DATA ENTRY SUFFIXES (Ch 5)
CMT	Suffix sets distance data type and scales by 1E-2	DATA ENTRY SUFFIXES (Ch 5)
DB	Suffix sets power data type	DATA ENTRY SUFFIXES (Ch 5)
DBL	Suffix sets power data type	DATA ENTRY SUFFIXES (Ch 5)
DBM	Suffix sets power data type	DATA ENTRY SUFFIXES (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DEG	Suffix sets phase data type	DATA ENTRY SUFFIXES (Ch 5)
F	Suffix sets farad data type and scales by 1E0	DATA ENTRY SUFFIXES (Ch 5)
FS	Suffix sets time data type and scales by 1E-15	DATA ENTRY SUFFIXES (Ch 5)
GHZ	Suffix sets frequency data type and scales by 1E9	DATA ENTRY SUFFIXES (Ch 5)
H	Suffix sets farad data type and scales by 1E0	DATA ENTRY SUFFIXES (Ch 5)
HZ	Suffix sets frequency data type	DATA ENTRY SUFFIXES (Ch 5)
IMU	Suffix sets imaginary data type	DATA ENTRY SUFFIXES (Ch 5)
K	Suffix sets degrees Kelvin data type	DATA ENTRY SUFFIXES (Ch 5)
KEL	Suffix sets degrees Kelvin data type	DATA ENTRY SUFFIXES (Ch 5)
KHZ	Suffix sets frequency data type and scales by 1E3	DATA ENTRY SUFFIXES (Ch 5)
M	Suffix sets distance data type	DATA ENTRY SUFFIXES (Ch 5)
MF	Suffix sets farad data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MH	Suffix sets farad data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MHZ	Suffix sets frequency data type and scales by 1E6	DATA ENTRY SUFFIXES (Ch 5)
MM	Suffix sets distance data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MMT	Suffix sets distance data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MS	Suffix sets time data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
MTR	Suffix sets distance data type	DATA ENTRY SUFFIXES (Ch 5)
MV	Suffix sets voltage data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
NF	Suffix sets farad data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)
NH	Suffix sets farad data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)
NS	Suffix sets time data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)
NSC	Suffix sets time data type and scales by 1E-9	DATA ENTRY SUFFIXES (Ch 5)
OHM	Suffix sets impedance data type	DATA ENTRY SUFFIXES (Ch 5)
PF	Suffix sets farad data type and scales by 1E-12	DATA ENTRY SUFFIXES (Ch 5)
PH	Suffix sets farad data type and scales by 1E-12	DATA ENTRY SUFFIXES (Ch 5)
PS	Suffix sets time data type and scales by 1E02	DATA ENTRY SUFFIXES (Ch 5)
PSC	Suffix sets time data type and scales by 1E02	DATA ENTRY SUFFIXES (Ch 5)
RAD	Suffix sets phase data type and scales by 180/pi	DATA ENTRY SUFFIXES (Ch 5)
REU	Suffix sets real data type	DATA ENTRY SUFFIXES (Ch 5)
S	Suffix sets time data type	DATA ENTRY SUFFIXES (Ch 5)
UF	Suffix sets farad data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
UH	Suffix sets farad data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
US	Suffix sets time data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
USC	Suffix sets time data type and scales by 1E-6	DATA ENTRY SUFFIXES (Ch 5)
V	Suffix sets voltage data type	DATA ENTRY SUFFIXES (Ch 5)
VLT	Suffix sets voltage data type	DATA ENTRY SUFFIXES (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
XM3	Suffix sets unitless data type and scales by 1E-3	DATA ENTRY SUFFIXES (Ch 5)
XX1	Suffix sets unitless data type	DATA ENTRY SUFFIXES (Ch 5)
XX3	Suffix sets unitless data type and scales by 1E3	DATA ENTRY SUFFIXES (Ch 5)
RST	Instrument reset (same as *RST)	DEFAULT (Ch 5)
RST0	Reset instrument front panel memories and reserved parameters	DEFAULT (Ch 5)
RST1	Reset instrument and front panel memories	DEFAULT (Ch 5)
ADD	Select addition as trace math for active channel	DISPLAY (Ch 5)
APR	Enter group delay aperture setting on active channel	DISPLAY (Ch 5)
APR?	Output group delay aperture setting on active channel	DISPLAY (Ch 5)
ASC	Autoscale the active channel display	DISPLAY (Ch 5)
ASP	Enter polar stop sweep position angle	DISPLAY (Ch 5)
ASP?	Output polar stop sweep position angle	DISPLAY (Ch 5)
AST	Enter polar start sweep position angle	DISPLAY (Ch 5)
AST?	Output polar start sweep position angle	DISPLAY (Ch 5)
CHAPR?	Output group delay aperture setting for specified channel	DISPLAY (Ch 5)
CHDAT?	Output trace memory display mode for specified channel	DISPLAY (Ch 5)
CHGRF?	Output graph type for specified channel	DISPLAY (Ch 5)
CHMTH?	Output trace math math type for specified channel	DISPLAY (Ch 5)
CHOFF?	Output offset value for the top graph for specified channel	DISPLAY (Ch 5)
CHOFF2?	Output offset value for the bottom graph for specified channel	DISPLAY (Ch 5)
CHPHO?	Output phase offset for specified channel	DISPLAY (Ch 5)
CHRDD?	Output reference delay in distance for specified channel	DISPLAY (Ch 5)
CHRDT?	Output reference delay in time for specified channel	DISPLAY (Ch 5)
CHREF?	Output reference line for the top graph for specified channel	DISPLAY (Ch 5)
CHREF2?	Output reference line for the bottom graph for specified channel	DISPLAY (Ch 5)
CHSCL?	Output scale resolution for the top graph for specified channel	DISPLAY (Ch 5)
CHSCL2?	Output scale resolution for the bottom graph for specified channel	DISPLAY (Ch 5)
D13	Display channels 1 & 3	DISPLAY (Ch 5)
D14	Display all four channels	DISPLAY (Ch 5)
D24	Select dual channel display with channels 2 & 4	DISPLAY (Ch 5)
DAT	Display data only on active channel	DISPLAY (Ch 5)
DAT?	Output trace memory display mode	DISPLAY (Ch 5)
DD0	Turn data drawing off	DISPLAY (Ch 5)
DD1	Turn data drawing on	DISPLAY (Ch 5)
DD1?	Output data drawing on/off status	DISPLAY (Ch 5)
DIA	Select air as active dielectric	DISPLAY (Ch 5)
DIE	Enter a dielectric value	DISPLAY (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DIM	Select microporous teflon as active dielectric	DISPLAY (Ch 5)
DIP	Select polyethylene as active dielectric	DISPLAY (Ch 5)
DIT	Select teflon as active dielectric	DISPLAY (Ch 5)
DIV	Select division as trace math for active channel	DISPLAY (Ch 5)
DIX?	Output dielectric constant	DISPLAY (Ch 5)
DLA	Select group delay display for active channel	DISPLAY (Ch 5)
DNM	Display data normalized to trace memory on active channel	DISPLAY (Ch 5)
DSP	Select single channel display	DISPLAY (Ch 5)
DSP?	Output channel display mode	DISPLAY (Ch 5)
DTM	Display measurement data and trace memory on active channel	DISPLAY (Ch 5)
EXTIO0	Disable external output I/O	DISPLAY (Ch 5)
EXTIO1	Enable external output I/O	DISPLAY (Ch 5)
EXTIOX?	Output external output I/O enable/disable status	DISPLAY (Ch 5)
GRF?	Output graph type for active channel	DISPLAY (Ch 5)
GROUP?	Output active group number	DISPLAY (Ch 5)
GROUP1	Select Group 1 to be active group	DISPLAY (Ch 5)
GROUP2	Select Group 2 to be active group	DISPLAY (Ch 5)
GROUP3	Select Group 3 to be active group	DISPLAY (Ch 5)
GROUP4	Select Group 4 to be active group	DISPLAY (Ch 5)
ICM0	Turn interchannel math off	DISPLAY (Ch 5)
ICM1	Turn interchannel math on	DISPLAY (Ch 5)
ICMX?	Output interchannel math on/off status	DISPLAY (Ch 5)
ICOP1	Enter interchannel num for operand 1	DISPLAY (Ch 5)
ICOP1?	Output interchannel num for operand 1	DISPLAY (Ch 5)
ICOP2	Enter interchannel num for operand 2	DISPLAY (Ch 5)
ICOP2?	Output interchannel num for operand 2	DISPLAY (Ch 5)
IMG	Select imaginary display for active channel	DISPLAY (Ch 5)
ISC	Enter scale and select inverted compressed Smith chart display	DISPLAY (Ch 5)
ISE	Enter scale and select inverted expanded Smith chart display	DISPLAY (Ch 5)
ISM	Select normal inverted Smith chart for active channel	DISPLAY (Ch 5)
LIN	Select linear magnitude display for active channel	DISPLAY (Ch 5)
LPH	Select linear magnitude and phase display for active channel	DISPLAY (Ch 5)
MAG	Select log magnitude display for active channel	DISPLAY (Ch 5)
MD0	Turn mean display off	DISPLAY (Ch 5)
MD1	Turn mean display on	DISPLAY (Ch 5)
MDX?	Output mean display status	DISPLAY (Ch 5)
MEM	Display trace memory on active channel	DISPLAY (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MIN	Select subtraction as trace math for active channel	DISPLAY (Ch 5)
MPH	Select log magnitude and phase display for active channel	DISPLAY (Ch 5)
MTH?	Output trace math math type	DISPLAY (Ch 5)
MUL	Select multiplication as trace math for active channel	DISPLAY (Ch 5)
OFF	Enter offset value for top graph of active channel	DISPLAY (Ch 5)
OFF?	Output offset value for top graph of active channel	DISPLAY (Ch 5)
OFF2	Enter offset value for bottom graph of active channel	DISPLAY (Ch 5)
OFF2?	Output offset value for bottom graph of active channel	DISPLAY (Ch 5)
PCP	Select measurement phase polar chart mode	DISPLAY (Ch 5)
PCS	Select sweep position polar chart mode	DISPLAY (Ch 5)
PCX?	Output polar chart mode	DISPLAY (Ch 5)
PHA	Select phase display for active channel	DISPLAY (Ch 5)
PHO	Enter phase offset for display channel	DISPLAY (Ch 5)
PHO?	Output phase offset for display channel	DISPLAY (Ch 5)
PLG	Select log polar display for active channel	DISPLAY (Ch 5)
PLR	Select linear polar display for active channel	DISPLAY (Ch 5)
POSET	Enter phase offset for active channel	DISPLAY (Ch 5)
POSET?	Output phase offset for active channel	DISPLAY (Ch 5)
POW	Select power out display for active channel	DISPLAY (Ch 5)
RDA	Select automatic reference delay calculation	DISPLAY (Ch 5)
RDD	Enter reference delay in distance for active channel	DISPLAY (Ch 5)
RDD?	Output reference delay in distance for active channel	DISPLAY (Ch 5)
RDDS	Enter reference delay in distance for S-parameters in active channel	DISPLAY (Ch 5)
RDDS?	Output reference delay in distance for S-parameters in active channel	DISPLAY (Ch 5)
RDT	Enter reference delay in time for active channel	DISPLAY (Ch 5)
RDT?	Output reference delay in time for active channel	DISPLAY (Ch 5)
RDTS	Enter reference delay in time for S-parameters in active channel	DISPLAY (Ch 5)
RDTS?	Output reference delay in time for S-parameters in active channel	DISPLAY (Ch 5)
RECALL	Recall a data file from disk to a task	DISPLAY (Ch 5)
REF	Enter reference line for top graph of active channel	DISPLAY (Ch 5)
REF?	Output reference line for top graph of active channel	DISPLAY (Ch 5)
REF2	Enter reference line for bottom graph of active channel	DISPLAY (Ch 5)
REF2?	Output reference line for bottom graph of active channel	DISPLAY (Ch 5)
REL	Select real display for active channel	DISPLAY (Ch 5)
RIM	Select real and imaginary display for active channel	DISPLAY (Ch 5)
RPPORTNUM	Enter reference plane port number	DISPLAY (Ch 5)
RPPORTNUM?	Output active reference plane port number	DISPLAY (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SCL	Enter scale resolution for top graph of active channel	DISPLAY (Ch 5)
SCL?	Output scale resolution for top graph of active channel	DISPLAY (Ch 5)
SCL2	Enter scale resolution for bottom graph of active channel	DISPLAY (Ch 5)
SCL2?	Output scale resolution for bottom graph of active channel	DISPLAY (Ch 5)
SETBD	Set balanced differential S-parameters setup to be default setup for all channels	DISPLAY (Ch 5)
SETCHANKEY	Setup channel keys on front panel to channel keys	DISPLAY (Ch 5)
SETCHANKEY?	Output channel key setup	DISPLAY (Ch 5)
SETGRPKEY	Setup channel keys on front panel to group keys	DISPLAY (Ch 5)
SETSB	Set single ended/balanced differential S-parameters setup to be default setup for all channels	DISPLAY (Ch 5)
SETSE	Set single ended S-parameters setup to be default setup for all channels	DISPLAY (Ch 5)
SETSPARAM?	Output default S-parameter setup for all channels	DISPLAY (Ch 5)
SMC	Enter scale and select compressed Smith chart display	DISPLAY (Ch 5)
SME	Enter scale and select expanded Smith chart display	DISPLAY (Ch 5)
SMI	Select normal Smith chart for active channel	DISPLAY (Ch 5)
STD	Store trace to memory on active channel	DISPLAY (Ch 5)
SWR	Select SWR display for active channel	DISPLAY (Ch 5)
T13	Select overlaid channel 1 and 3 display	DISPLAY (Ch 5)
T14	Overlay all four channels (Limited to selected Graph types)	DISPLAY (Ch 5)
T24	Select overlaid channel 2 and 4 display	DISPLAY (Ch 5)
ATTN	Attach next segment and make it the active segment	DISPLAY - LIMITS (Ch 7)
BEGN	Begin next segment and make it the active segment	DISPLAY - LIMITS (Ch 7)
CAS	Clear active segmented limit vertical/horizontal definitions	DISPLAY - LIMITS (Ch 7)
CHLFD?	Output limit frequency readout delta value for top graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLFD2?	Output limit frequency readout delta value for bottom graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLLO?	Output lower limit value for top graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLLO2?	Output lower limit value for bottom graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLON?	Output limits display on/off status for specified channel	DISPLAY - LIMITS (Ch 7)
CHLUP?	Output upper limit value for top graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHLUP2?	Output upper limit value for bottom graph for specified channel	DISPLAY - LIMITS (Ch 7)
CHSLH?	Output segmented limits horizontal offset for specified channel	DISPLAY - LIMITS (Ch 7)
CHSLLX?	Output lower segmented limits display on/off status for specified channel	DISPLAY - LIMITS (Ch 7)
CHSLUX?	Output upper segmented limits display on/off status for specified channel	DISPLAY - LIMITS (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
CHSLV?	Output segmented limits vertical offset for specified channel	DISPLAY - LIMITS (Ch 7)
DIS	Display active segmented limit	DISPLAY - LIMITS (Ch 7)
DIS?	Output active segmented limit on/off status	DISPLAY - LIMITS (Ch 7)
HID	Hide active segmented limit	DISPLAY - LIMITS (Ch 7)
LB0	Turn limits testing beep on failure off	DISPLAY - LIMITS (Ch 7)
LB1	Turn limits testing beep on failure on	DISPLAY - LIMITS (Ch 7)
LBX?	Output limits testing beeper enable status	DISPLAY - LIMITS (Ch 7)
LFD	Enter limit frequency readout delta value	DISPLAY - LIMITS (Ch 7)
LFD?	Output limit frequency readout delta value	DISPLAY - LIMITS (Ch 7)
LFD2	Enter limit frequency readout delta value for bottom graph	DISPLAY - LIMITS (Ch 7)
LFD2?	Output limit frequency readout delta value for bottom graph	DISPLAY - LIMITS (Ch 7)
LFP	Select limit frequency readout for phase displays	DISPLAY - LIMITS (Ch 7)
LFR	Select limit frequency readout for active channel	DISPLAY - LIMITS (Ch 7)
LLM?	Output limit line display mode single or segmented	DISPLAY - LIMITS (Ch 7)
LLO	Enter lower limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LLO?	Output lower limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LLO2	Enter lower limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LLO2?	Output lower limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LOF	Limits display off	DISPLAY - LIMITS (Ch 7)
LOL0	Turn lower limit off	DISPLAY - LIMITS (Ch 7)
LOL1	Turn lower limit on at current value	DISPLAY - LIMITS (Ch 7)
LOL20	Turn lower limit off for bottom graph	DISPLAY - LIMITS (Ch 7)
LOL21	Turn lower limit on at current value for bottom graph	DISPLAY - LIMITS (Ch 7)
LOL2X?	Output lower limit on/off status for bottom graph	DISPLAY - LIMITS (Ch 7)
LOLX?	Output lower limit on/off status	DISPLAY - LIMITS (Ch 7)
LON	Limits display on	DISPLAY - LIMITS (Ch 7)
LON?	Output limits display on/off status	DISPLAY - LIMITS (Ch 7)
LPF?	Output limit test failure status all channels	DISPLAY - LIMITS (Ch 7)
LPF1?	Output limit test failure status on channel 1	DISPLAY - LIMITS (Ch 7)
LPF2?	Output limit test failure status on channel 2	DISPLAY - LIMITS (Ch 7)
LPF3?	Output limit test failure status on channel 3	DISPLAY - LIMITS (Ch 7)
LPF4?	Output limit test failure status on channel 4	DISPLAY - LIMITS (Ch 7)
LS1	Set lower segmented limit 1 as the active segment	DISPLAY - LIMITS (Ch 7)
LS10	Select lower segmented limit 10 as the active segment	DISPLAY - LIMITS (Ch 7)
LS2	Select lower segmented limit 2 as the active segment	DISPLAY - LIMITS (Ch 7)
LS3	Select lower segmented limit 3 as the active segment	DISPLAY - LIMITS (Ch 7)
LS4	Select lower segmented limit 4 as the active segment	DISPLAY - LIMITS (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
LS5	Select lower segmented limit 5 as the active segment	DISPLAY - LIMITS (Ch 7)
LS6	Select lower segmented limit 6 as the active segment	DISPLAY - LIMITS (Ch 7)
LS7	Select lower segmented limit 7 as the active segment	DISPLAY - LIMITS (Ch 7)
LS8	Select lower segmented limit 8 as the active segment	DISPLAY - LIMITS (Ch 7)
LS9	Select lower segmented limit 9 as the active segment	DISPLAY - LIMITS (Ch 7)
LSEG	Select segmented limit line display mode	DISPLAY - LIMITS (Ch 7)
LSNG	Select single limit line display mode	DISPLAY - LIMITS (Ch 7)
LSX?	Output active segmented limit	DISPLAY - LIMITS (Ch 7)
LT0	Turn limits testing off	DISPLAY - LIMITS (Ch 7)
LT1	Turn limits testing on	DISPLAY - LIMITS (Ch 7)
LT1?	Output limits testing enable status	DISPLAY - LIMITS (Ch 7)
LTST	Display the limits testing menu	DISPLAY - LIMITS (Ch 7)
LUP	Enter upper limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LUP?	Output upper limit value for top graph on active channel	DISPLAY - LIMITS (Ch 7)
LUP2	Enter upper limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LUP2?	Output upper limit value for bottom graph on active channel	DISPLAY - LIMITS (Ch 7)
LVH	Select high as limits testing TTL level	DISPLAY - LIMITS (Ch 7)
LVL	Select low as limits testing TTL level	DISPLAY - LIMITS (Ch 7)
LVX?	Output limits testing TTL level status	DISPLAY - LIMITS (Ch 7)
SLC	Clear all segmented limits definitions	DISPLAY - LIMITS (Ch 7)
SLH	Enter segmented limits horizontal offset	DISPLAY - LIMITS (Ch 7)
SLH?	Output segmented limits horizontal offset	DISPLAY - LIMITS (Ch 7)
SLL0	Turn lower segmented limits display off	DISPLAY - LIMITS (Ch 7)
SLL1	Turn lower segmented limits display on	DISPLAY - LIMITS (Ch 7)
SLLX?	Output lower segmented limits display on/off status	DISPLAY - LIMITS (Ch 7)
SLU0	Turn upper segmented limits display off	DISPLAY - LIMITS (Ch 7)
SLU1	Turn upper segmented limits display on	DISPLAY - LIMITS (Ch 7)
SLUX?	Output upper segmented limits display on/off status	DISPLAY - LIMITS (Ch 7)
SLV	Enter segmented limits vertical offset	DISPLAY - LIMITS (Ch 7)
SLV?	Output segmented limits vertical offset	DISPLAY - LIMITS (Ch 7)
SPH	Enter active segmented limit horizontal stop position	DISPLAY - LIMITS (Ch 7)
SPH?	Output active segmented limit horizontal stop position	DISPLAY - LIMITS (Ch 7)
SPV	Enter active segmented limit vertical stop position	DISPLAY - LIMITS (Ch 7)
SPV?	Output active segmented limit vertical stop position	DISPLAY - LIMITS (Ch 7)
STH	Enter active segmented limit horizontal start position	DISPLAY - LIMITS (Ch 7)
STH?	Output active segmented limit horizontal start position	DISPLAY - LIMITS (Ch 7)
STV	Enter active segmented limit vertical start position	DISPLAY - LIMITS (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
STV?	Output active segmented limit vertical start position	DISPLAY - LIMITS (Ch 7)
UPL0	Turn upper limit off	DISPLAY - LIMITS (Ch 7)
UPL1	Turn upper limit on at current value	DISPLAY - LIMITS (Ch 7)
UPL20	Turn upper limit off for bottom graph	DISPLAY - LIMITS (Ch 7)
UPL21	Turn upper limit on at current value for bottom graph	DISPLAY - LIMITS (Ch 7)
UPL2X?	Output upper limit on/off status for bottom graph	DISPLAY - LIMITS (Ch 7)
UPLX?	Output upper limit on/off status	DISPLAY - LIMITS (Ch 7)
US1	Select upper segmented limit 1 as the active segment	DISPLAY - LIMITS (Ch 7)
US10	Select upper segmented limit 10 as the active segment	DISPLAY - LIMITS (Ch 7)
US2	Select upper segmented limit 2 as the active segment	DISPLAY - LIMITS (Ch 7)
US3	Select upper segmented limit 3 as the active segment	DISPLAY - LIMITS (Ch 7)
US4	Select upper segmented limit 4 as the active segment	DISPLAY - LIMITS (Ch 7)
US5	Select upper segmented limit 5 as the active segment	DISPLAY - LIMITS (Ch 7)
US6	Select upper segmented limit 6 as the active segment	DISPLAY - LIMITS (Ch 7)
US7	Select upper segmented limit 7 as the active segment	DISPLAY - LIMITS (Ch 7)
US8	Select upper segmented limit 8 as the active segment	DISPLAY - LIMITS (Ch 7)
US9	Select upper segmented limit 9 as the active segment	DISPLAY - LIMITS (Ch 7)
CNTR	Enter center frequency	FREQ (Ch 5)
CNTR?	Output center frequency	FREQ (Ch 5)
CWF	Enter CW frequency and turn CW on	FREQ (Ch 5)
CWF?	Output CW frequency	FREQ (Ch 5)
CWON	Turn CW on at current CW frequency	FREQ (Ch 5)
CWON?	Output CW on/off status	FREQ (Ch 5)
SETUP	Display frequency menu	FREQ (Ch 5)
SPAN	Enter frequency span	FREQ (Ch 5)
SPAN?	Output frequency span	FREQ (Ch 5)
SRT	Enter start frequency	FREQ (Ch 5)
SRT?	Output start frequency	FREQ (Ch 5)
STP	Enter stop frequency	FREQ (Ch 5)
STP?	Output stop frequency	FREQ (Ch 5)
SWP	Return to normal sweep mode	FREQ (Ch 5)
SWP?	Output sweep mode	FREQ (Ch 5)
DFD	Done specifying discrete frequency ranges	FREQ - DISCRETE FILL (Ch 5)
DFQ	Enter single discrete frequency	FREQ - DISCRETE FILL (Ch 5)
DFQ?	Output discrete fill single discrete frequency	FREQ - DISCRETE FILL (Ch 5)
FIL	Fill defined discrete frequency range	FREQ - DISCRETE FILL (Ch 5)
FRC	Clear all defined discrete frequency ranges	FREQ - DISCRETE FILL (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FRI	Enter discrete fill increment frequency	FREQ - DISCRETE FILL (Ch 5)
FRI?	Output discrete fill increment frequency	FREQ - DISCRETE FILL (Ch 5)
FRP	Enter discrete fill number of points	FREQ - DISCRETE FILL (Ch 5)
FRP?	Output discrete fill number of points	FREQ - DISCRETE FILL (Ch 5)
FRS	Enter discrete fill start frequency	FREQ - DISCRETE FILL (Ch 5)
FRS?	Output discrete fill start frequency	FREQ - DISCRETE FILL (Ch 5)
BMPB	Select black on white as bitmap type	HARD COPY (Ch 9)
BMPC	Select color on white as bitmap type	HARD COPY (Ch 9)
BMPT	Select true color as bitmap type	HARD COPY (Ch 9)
BMPX?	Output bitmap type	HARD COPY (Ch 9)
DPN	Enter pen number for data	HARD COPY (Ch 9)
DPN?	Output pen number for data	HARD COPY (Ch 9)
FFD	Send form feed to printer and stop print/plot	HARD COPY (Ch 9)
GENS2P	Generate S2P files in hard disk with default name (ntwk_p1.s2p, ..., ntwk_p4.s2p) from disk and calibrate	HARD COPY (Ch 9)
GPN	Enter pen number for graticule	HARD COPY (Ch 9)
GPN?	Output pen number for graticule	HARD COPY (Ch 9)
HD0	Turn off tabular data headers and page formatting	HARD COPY (Ch 9)
HD1	Turn on tabular data headers and page formatting	HARD COPY (Ch 9)
HDX?	Output tabular data headers and page formatting on/off status	HARD COPY (Ch 9)
HPN	Enter pen number for header	HARD COPY (Ch 9)
HPN?	Output pen number for header	HARD COPY (Ch 9)
LAND	Select landscape mode for output plot	HARD COPY (Ch 9)
LCM0	Disable printing comment information	HARD COPY (Ch 9)
LCM1	Enable printing comment information	HARD COPY (Ch 9)
LDT0	Disable printing date/time	HARD COPY (Ch 9)
LDT1	Enable printing date/time	HARD COPY (Ch 9)
LDV0	Disable printing device ID	HARD COPY (Ch 9)
LDV1	Enable printing device ID	HARD COPY (Ch 9)
LID	Enter string for DUT identity	HARD COPY (Ch 9)
LID?	Output string for DUT identity	HARD COPY (Ch 9)
LMD0	Disable printing model information	HARD COPY (Ch 9)
LMD1	Enable printing model information	HARD COPY (Ch 9)
LMS	Enter string for DUT model/serial number	HARD COPY (Ch 9)
LMS?	Output string for DUT model/serial number	HARD COPY (Ch 9)
LNM	Enter string for operator name	HARD COPY (Ch 9)
LNM?	Output string for operator name	HARD COPY (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
LOC	Enter string for operator comment	HARD COPY (Ch 9)
LOC?	Output string for operator comment	HARD COPY (Ch 9)
LOGO?	Output hard copy logo selection standard/user defined	HARD COPY (Ch 9)
LOGO0	Turn hard copy logo off	HARD COPY (Ch 9)
LOGO1	Turn hard copy logo on	HARD COPY (Ch 9)
LOGOS	Select standard hard copy logo	HARD COPY (Ch 9)
LOGOU	Select user defined hard copy logo	HARD COPY (Ch 9)
LOGOX?	Output hard copy logo on/off status	HARD COPY (Ch 9)
LOP0	Disable printing operator information	HARD COPY (Ch 9)
LOP1	Enable printing operator information	HARD COPY (Ch 9)
M3P1?	Query the mixed mode 1st balanced port pair for the M3P setup	HARD COPY (Ch 9)
M3P1P12	Set the mixed mode 1st balanced port pair to 1:2 for the M3P setup	HARD COPY (Ch 9)
M3P1P13	Set the mixed mode 1st balanced port pair to 1:3 for the M3P setup	HARD COPY (Ch 9)
M3P1P14	Set the mixed mode 1st balanced port pair to 1:4 for the M3P setup	HARD COPY (Ch 9)
M3P1P21	Set the mixed mode 1st balanced port pair to 2:1 for the M3P setup	HARD COPY (Ch 9)
M3P1P23	Set the mixed mode 1st balanced port pair to 2:3 for the M3P setup	HARD COPY (Ch 9)
M3P1P24	Set the mixed mode 1st balanced port pair to 2:4 for the M3P setup	HARD COPY (Ch 9)
M3P1P31	Set the mixed mode 1st balanced port pair to 3:1 for the M3P setup	HARD COPY (Ch 9)
M3P1P32	Set the mixed mode 1st balanced port pair to 3:2 for the M3P setup	HARD COPY (Ch 9)
M3P1P34	Set the mixed mode 1st balanced port pair to 3:4 for the M3P setup	HARD COPY (Ch 9)
M3P1P41	Set the mixed mode 1st balanced port pair to 4:1 for the M3P setup	HARD COPY (Ch 9)
M3P1P42	Set the mixed mode 1st balanced port pair to 4:2 for the M3P setup	HARD COPY (Ch 9)
M3P1P43	Set the mixed mode 1st balanced port pair to 4:3 for the M3P setup	HARD COPY (Ch 9)
M3PS?	Query the mixed mode singled ended port for the M3P setup	HARD COPY (Ch 9)
M3PS1	Set the mixed mode single ended port to port 1 for the M3P setup	HARD COPY (Ch 9)
M3PS2	Set the mixed mode single ended port to port 2 for the M3P setup	HARD COPY (Ch 9)
M3PS3	Set the mixed mode single ended port to port 3 for the M3P setup	HARD COPY (Ch 9)
M3PS4	Set the mixed mode single ended port to port 4 for the M3P setup	HARD COPY (Ch 9)
M4P1?	Query the mixed mode 1st balanced port pair for the M4P setup	HARD COPY (Ch 9)
M4P1P12	Set the mixed mode 1st balanced port pair to 1:2 for the M4P setup	HARD COPY (Ch 9)
M4P1P13	Set the mixed mode 1st balanced port pair to 1:3 for the M4P setup	HARD COPY (Ch 9)
M4P1P14	Set the mixed mode 1st balanced port pair to 1:4 for the M4P setup	HARD COPY (Ch 9)
M4P1P21	Set the mixed mode 1st balanced port pair to 2:1 for the M4P setup	HARD COPY (Ch 9)
M4P1P23	Set the mixed mode 1st balanced port pair to 2:3 for the M4P setup	HARD COPY (Ch 9)
M4P1P24	Set the mixed mode 1st balanced port pair to 2:4 for the M4P setup	HARD COPY (Ch 9)
M4P1P31	Set the mixed mode 1st balanced port pair to 3:1 for the M4P setup	HARD COPY (Ch 9)
M4P1P32	Set the mixed mode 1st balanced port pair to 3:2 for the M4P setup	HARD COPY (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
M4P1P34	Set the mixed mode 1st balanced port pair to 3:4 for the M4P setup	HARD COPY (Ch 9)
M4P1P41	Set the mixed mode 1st balanced port pair to 4:1 for the M4P setup	HARD COPY (Ch 9)
M4P1P42	Set the mixed mode 1st balanced port pair to 4:2 for the M4P setup	HARD COPY (Ch 9)
M4P1P43	Set the mixed mode 1st balanced port pair to 4:3 for the M4P setup	HARD COPY (Ch 9)
M4P2?	Query the mixed mode 2nd balanced port pair for the M4P setup	HARD COPY (Ch 9)
M4P2P12	Set the mixed mode 2nd balanced port pair to 1:2 for the M4P setup	HARD COPY (Ch 9)
M4P2P13	Set the mixed mode 2nd balanced port pair to 1:3 for the M4P setup	HARD COPY (Ch 9)
M4P2P14	Set the mixed mode 2nd balanced port pair to 1:4 for the M4P setup	HARD COPY (Ch 9)
M4P2P21	Set the mixed mode 2nd balanced port pair to 2:1 for the M4P setup	HARD COPY (Ch 9)
M4P2P23	Set the mixed mode 2nd balanced port pair to 2:3 for the M4P setup	HARD COPY (Ch 9)
M4P2P24	Set the mixed mode 2nd balanced port pair to 2:4 for the M4P setup	HARD COPY (Ch 9)
M4P2P31	Set the mixed mode 2nd balanced port pair to 3:1 for the M4P setup	HARD COPY (Ch 9)
M4P2P32	Set the mixed mode 2nd balanced port pair to 3:2 for the M4P setup	HARD COPY (Ch 9)
M4P2P34	Set the mixed mode 2nd balanced port pair to 3:4 for the M4P setup	HARD COPY (Ch 9)
M4P2P41	Set the mixed mode 2nd balanced port pair to 4:1 for the M4P setup	HARD COPY (Ch 9)
M4P2P42	Set the mixed mode 2nd balanced port pair to 4:2 for the M4P setup	HARD COPY (Ch 9)
M4P2P43	Set the mixed mode 2nd balanced port pair to 4:3 for the M4P setup	HARD COPY (Ch 9)
MPN	Enter pen number for markers and limits	HARD COPY (Ch 9)
MPN?	Output pen number for markers and limits	HARD COPY (Ch 9)
OMM3P	Output the M3P format data to the GPIB with the current M3P setup	HARD COPY (Ch 9)
OMM4P	Output the M4P format data to the GPIB with the current M4P setup	HARD COPY (Ch 9)
OS1P1	Output S1P1 format data to gpib	HARD COPY (Ch 9)
OS1P2	Output S1P2 format data to gpib	HARD COPY (Ch 9)
OS1P3	Output S1P3 format data to gpib	HARD COPY (Ch 9)
OS2P	Output S2P format data to GPIB	HARD COPY (Ch 9)
OS3P	Output S3P format data to gpib	HARD COPY (Ch 9)
PBL	Select 1/4 size plot bottom left corner	HARD COPY (Ch 9)
PBR	Select 1/4 size plot bottom right corner	HARD COPY (Ch 9)
PFL	Select full-size plot	HARD COPY (Ch 9)
PFS	Print full screen image	HARD COPY (Ch 9)
PGR	Print graph area screen image	HARD COPY (Ch 9)
PGT	Plot graticule	HARD COPY (Ch 9)
PLD	Plot data area only	HARD COPY (Ch 9)
PLH	Plot header	HARD COPY (Ch 9)
PLM	Plot markers and limits	HARD COPY (Ch 9)
PLO?	Output plot mode portrait or landscape	HARD COPY (Ch 9)
PLS	Plot entire screen	HARD COPY (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PLT	Plot data traces only	HARD COPY (Ch 9)
PMK	Print tabular data for Markers	HARD COPY (Ch 9)
PMN	Plot menu	HARD COPY (Ch 9)
PMT	Print tabular data for traces and markers	HARD COPY (Ch 9)
PORT	Select portrait mode for output plot	HARD COPY (Ch 9)
PRNTYPDJ	Select HP Deskjet printer	HARD COPY (Ch 9)
PRNTYPEP	Select Epson FX printer	HARD COPY (Ch 9)
PRNTYPLJ	Select HP Laserjet printer	HARD COPY (Ch 9)
PRNTYPTJ	Select HP Thinkjet printer	HARD COPY (Ch 9)
PRNTYPX?	Output printer type	HARD COPY (Ch 9)
PST	Stop print/plot	HARD COPY (Ch 9)
PT0	Set tabular printout points skipped to 0	HARD COPY (Ch 9)
PT1	Set tabular printout points skipped to 1	HARD COPY (Ch 9)
PT2	Set tabular printout points skipped to 2	HARD COPY (Ch 9)
PT3	Set tabular printout points skipped to 3	HARD COPY (Ch 9)
PT4	Set tabular printout points skipped to 4	HARD COPY (Ch 9)
PT5	Set tabular printout points skipped to 5	HARD COPY (Ch 9)
PT6	Set tabular printout points skipped to 6	HARD COPY (Ch 9)
PT7	Set tabular printout points skipped to 7	HARD COPY (Ch 9)
PT8	Set tabular printout points skipped to 8	HARD COPY (Ch 9)
PT9	Set tabular printout points skipped to 9	HARD COPY (Ch 9)
PTB	Print tabular data for traces	HARD COPY (Ch 9)
PTL	Select 1/4 size plot top left corner	HARD COPY (Ch 9)
PTR	Select 1/4 size plot top right corner	HARD COPY (Ch 9)
PTX?	Output tabular printout points skipped	HARD COPY (Ch 9)
PXX?	Output plot location	HARD COPY (Ch 9)
SEQOP?	Output sequence operator message mode on/off	HARD COPY (Ch 9)
SEQOP0	Turn off sequence operator message	HARD COPY (Ch 9)
SEQOP1	Turn on sequence operator message	HARD COPY (Ch 9)
SNPDB	Select log magnitude and phase as SnP output format	HARD COPY (Ch 9)
SNPFMTX?	Output SnP output format selection	HARD COPY (Ch 9)
SNPGHZ	Select GHz as SnP frequency units	HARD COPY (Ch 9)
SNPHZ	Select Hz as SnP frequency units	HARD COPY (Ch 9)
SNPKHZ	Select KHz as SnP frequency units	HARD COPY (Ch 9)
SNPMA	Select linear magnitude and phase as SnP output format	HARD COPY (Ch 9)
SNPMHZ	Select MHz as SnP frequency units	HARD COPY (Ch 9)
SNPRI	Select real and imaginary as SnP output format	HARD COPY (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SNPUNITX?	Output SnP frequency units selection	HARD COPY (Ch 9)
SPD	Enter pen speed percentage	HARD COPY (Ch 9)
SPD?	Output pen speed percentage	HARD COPY (Ch 9)
TPN	Enter pen number for trace overlay data	HARD COPY (Ch 9)
TPN?	Output pen number for trace overlay data	HARD COPY (Ch 9)
CTN	Continue sweeping from current point	HOLD (Ch 5)
HLD	Put sweep into hold mode	HOLD (Ch 5)
HLD?	Output the sweep hold status	HOLD (Ch 5)
AMKR	Select active marker on all channels marker mode	MARKER (Ch 7)
MK3	Enter marker 3 frequency distance or time and turn on	MARKER (Ch 7)
MK3?	Output marker 3 frequency distance or time	MARKER (Ch 7)
MK4	Enter marker 4 frequency distance or time and turn on	MARKER (Ch 7)
MK4?	Output marker 4 frequency distance or time	MARKER (Ch 7)
MK5	Enter marker 5 frequency distance or time and turn on	MARKER (Ch 7)
MK5?	Output marker 5 frequency distance or time	MARKER (Ch 7)
MK6	Enter marker 6 frequency distance or time and turn on	MARKER (Ch 7)
MK6?	Output marker 6 frequency distance or time	MARKER (Ch 7)
MK7	Enter marker 7 frequency distance or time and turn on	MARKER (Ch 7)
MK7?	Output marker 7 frequency distance or time	MARKER (Ch 7)
MK8	Enter marker 8 frequency distance or time and turn on	MARKER (Ch 7)
MK8?	Output marker 8 frequency distance or time	MARKER (Ch 7)
MK9	Enter marker 9 frequency distance or time and turn on	MARKER (Ch 7)
MK9?	Output marker 9 frequency distance or time	MARKER (Ch 7)
MKRC	Select interpolated marker functionality	MARKER (Ch 7)
MKRD	Select discrete marker functionality	MARKER (Ch 7)
BWL3	Set bandwidth loss value to 3 dB	MARKER (Ch 7)
BWLS	Enter bandwidth loss value	MARKER (Ch 7)
BWLS?	Output bandwidth loss value	MARKER (Ch 7)
DR1	Select Marker 1 as delta reference marker	MARKER (Ch 7)
DR10	Select Marker 10 as delta reference marker	MARKER (Ch 7)
DR11	Select Marker 11 as delta reference marker	MARKER (Ch 7)
DR12	Select Marker 12 as delta reference marker	MARKER (Ch 7)
DR2	Select Marker 2 as delta reference marker	MARKER (Ch 7)
DR3	Select Marker 3 as delta reference marker	MARKER (Ch 7)
DR4	Select Marker 4 as delta reference marker	MARKER (Ch 7)
DR5	Select Marker 5 as delta reference marker	MARKER (Ch 7)
DR6	Select Marker 6 as delta reference marker	MARKER (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DR7	Select Marker 7 as delta reference marker	MARKER (Ch 7)
DR8	Select Marker 8 as delta reference marker	MARKER (Ch 7)
DR9	Select Marker 9 as delta reference marker	MARKER (Ch 7)
DRF	Turn delta reference mode on	MARKER (Ch 7)
DRO	Turn delta reference mode off	MARKER (Ch 7)
DRO?	Output delta reference mode on/off status	MARKER (Ch 7)
DRX?	Output delta reference marker number	MARKER (Ch 7)
DSF0	Disable filter shape factor calculation	MARKER (Ch 7)
DSF1	Enable filter shape factor calculation	MARKER (Ch 7)
DSFX?	Output filter shape factor calculation enable/disable status	MARKER (Ch 7)
DSQ0	Disable filter Q calculation	MARKER (Ch 7)
DSQ1	Enable filter Q calculation	MARKER (Ch 7)
DSQX?	Output filter Q calculation enable/disable status	MARKER (Ch 7)
FLTBW?	Output filter bandwidth	MARKER (Ch 7)
FLTC?	Output filter center frequency	MARKER (Ch 7)
FLTL?	Output filter loss at reference value	MARKER (Ch 7)
FLTQ?	Output filter Q	MARKER (Ch 7)
FLTS?	Output filter shape factor	MARKER (Ch 7)
FMKR	Select filter parameters marker mode	MARKER (Ch 7)
M10C	Set CW mode at marker 10 frequency	MARKER (Ch 7)
M10E	Set sweep/zoom end to marker 10 frequency distance or time	MARKER (Ch 7)
M10S	Set sweep/zoom start to marker 10 frequency distance or time	MARKER (Ch 7)
M11C	Set CW mode at marker 11 frequency	MARKER (Ch 7)
M11E	Set sweep/zoom end to marker 11 frequency distance or time	MARKER (Ch 7)
M11S	Set sweep/zoom start to marker 11 frequency distance or time	MARKER (Ch 7)
M12C	Set CW mode at marker 12 frequency	MARKER (Ch 7)
M12E	Set sweep/zoom end to marker 12 frequency distance or time	MARKER (Ch 7)
M12S	Set sweep/zoom start to marker 12 frequency distance or time	MARKER (Ch 7)
M1C	Set CW mode at marker 1 frequency	MARKER (Ch 7)
M1E	Set sweep/zoom end to marker 1 frequency distance or time	MARKER (Ch 7)
M1S	Set sweep/zoom start to marker 1 frequency distance or time	MARKER (Ch 7)
M2C	Set CW mode at marker 2 frequency	MARKER (Ch 7)
M2E	Set sweep/zoom end to marker 2 frequency distance or time	MARKER (Ch 7)
M2S	Set sweep/zoom start to marker 2 frequency distance or time	MARKER (Ch 7)
M3C	Set CW mode at marker 3 frequency	MARKER (Ch 7)
M3E	Set sweep/zoom end to marker 3 frequency distance or time	MARKER (Ch 7)
M3S	Set sweep/zoom start to marker 3 frequency distance or time	MARKER (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
M4C	Set CW mode at marker 4 frequency	MARKER (Ch 7)
M4E	Set sweep/zoom end to marker 4 frequency distance or time	MARKER (Ch 7)
M4S	Set sweep/zoom start to marker 4 frequency distance or time	MARKER (Ch 7)
M5C	Set CW mode at marker 5 frequency	MARKER (Ch 7)
M5E	Set sweep/zoom end to marker 5 frequency distance or time	MARKER (Ch 7)
M5S	Set sweep/zoom start to marker 5 frequency distance or time	MARKER (Ch 7)
M6C	Set CW mode at marker 6 frequency	MARKER (Ch 7)
M6E	Set sweep/zoom end to marker 6 frequency distance or time	MARKER (Ch 7)
M6S	Set sweep/zoom start to marker 6 frequency distance or time	MARKER (Ch 7)
M7C	Set CW mode at marker 7 frequency	MARKER (Ch 7)
M7E	Set sweep/zoom end to marker 7 frequency distance or time	MARKER (Ch 7)
M7S	Set sweep/zoom start to marker 7 frequency distance or time	MARKER (Ch 7)
M8C	Set CW mode at marker 8 frequency	MARKER (Ch 7)
M8E	Set sweep/zoom end to marker 8 frequency distance or time	MARKER (Ch 7)
M8S	Set sweep/zoom start to marker 8 frequency distance or time	MARKER (Ch 7)
M9C	Set CW mode at marker 9 frequency	MARKER (Ch 7)
M9E	Set sweep/zoom end to marker 9 frequency distance or time	MARKER (Ch 7)
M9S	Set sweep/zoom start to marker 9 frequency distance or time	MARKER (Ch 7)
MK1	Enter marker 1 frequency distance or time and turn on	MARKER (Ch 7)
MK1?	Output marker 1 frequency distance or time	MARKER (Ch 7)
MK10	Enter marker 10 frequency distance or time and turn on	MARKER (Ch 7)
MK10?	Output marker 10 frequency distance or time	MARKER (Ch 7)
MK11	Enter marker 11 frequency distance or time and turn on	MARKER (Ch 7)
MK11?	Output marker 11 frequency distance or time	MARKER (Ch 7)
MK12	Enter marker 12 frequency distance or time and turn on	MARKER (Ch 7)
MK12?	Output marker 12 frequency distance or time	MARKER (Ch 7)
MK2	Enter marker 2 frequency distance or time and turn on	MARKER (Ch 7)
MK2?	Output marker 2 frequency distance or time	MARKER (Ch 7)
MKRX?	Output interpolated/discrete marker functionality	MARKER (Ch 7)
MKSL	Marker search left	MARKER (Ch 7)
MKSR	Marker search right	MARKER (Ch 7)
MKT0	Turn marker tracking off	MARKER (Ch 7)
MKT1	Turn marker tracking on	MARKER (Ch 7)
MKTX?	Output marker tracking on/off status	MARKER (Ch 7)
MMN	Move active marker to minimum trace value	MARKER (Ch 7)
MMX	Move active marker to maximum trace value	MARKER (Ch 7)
MO1	Turn off marker 1	MARKER (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MO10	Turn off marker 10	MARKER (Ch 7)
MO11	Turn off marker 11	MARKER (Ch 7)
MO12	Turn off marker 12	MARKER (Ch 7)
MO2	Turn off marker 2	MARKER (Ch 7)
MO3	Turn off marker 3	MARKER (Ch 7)
MO4	Turn off marker 4	MARKER (Ch 7)
MO5	Turn off marker 5	MARKER (Ch 7)
MO6	Turn off marker 6	MARKER (Ch 7)
MO7	Turn off marker 7	MARKER (Ch 7)
MO8	Turn off marker 8	MARKER (Ch 7)
MO9	Turn off marker 9	MARKER (Ch 7)
MOF	Turn marker display off	MARKER (Ch 7)
MON	Turn marker display on	MARKER (Ch 7)
MON?	Output marker display on/off status	MARKER (Ch 7)
MR1	Turn marker 1 on and make it the active marker	MARKER (Ch 7)
MR1?	Output marker 1 on/off status	MARKER (Ch 7)
MR10	Turn marker 10 on and make it the active marker	MARKER (Ch 7)
MR10?	Output marker 10 on/off status	MARKER (Ch 7)
MR11	Turn marker 11 on and make it the active marker	MARKER (Ch 7)
MR11?	Output marker 11 on/off status	MARKER (Ch 7)
MR12	Turn marker 12 on and make it the active marker	MARKER (Ch 7)
MR12?	Output marker 12 on/off status	MARKER (Ch 7)
MR2	Turn marker 2 on and make it the active marker	MARKER (Ch 7)
MR2?	Output marker 2 on/off status	MARKER (Ch 7)
MR3	Turn marker 3 on and make it the active marker	MARKER (Ch 7)
MR3?	Output marker 3 on/off status	MARKER (Ch 7)
MR4	Turn marker 4 on and make it the active marker	MARKER (Ch 7)
MR4?	Output marker 4 on/off status	MARKER (Ch 7)
MR5	Turn marker 5 on and make it the active marker	MARKER (Ch 7)
MR5?	Output marker 5 on/off status	MARKER (Ch 7)
MR6	Turn marker 6 on and make it the active marker	MARKER (Ch 7)
MR6?	Output marker 6 on/off status	MARKER (Ch 7)
MR7	Turn marker 7 on and make it the active marker	MARKER (Ch 7)
MR7?	Output marker 7 on/off status	MARKER (Ch 7)
MR8	Turn marker 8 on and make it the active marker	MARKER (Ch 7)
MR8?	Output marker 8 on/off status	MARKER (Ch 7)
MR9	Turn marker 9 on and make it the active marker	MARKER (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MR9?	Output marker 9 on/off status	MARKER (Ch 7)
MRM	Display the Marker Readout menu	MARKER (Ch 7)
MRX?	Output active marker number	MARKER (Ch 7)
MSFH	Enter high loss value for shape factor calculation	MARKER (Ch 7)
MSFH?	Output high loss value for shape factor calculation	MARKER (Ch 7)
MSFL	Enter low loss value for shape factor calculation	MARKER (Ch 7)
MSFL?	Output low loss value for shape factor calculation	MARKER (Ch 7)
MSR0	Select 0 as reference for marker search and bandwidth calculation	MARKER (Ch 7)
MSRD	Select delta reference marker as reference for marker search and bandwidth calculation	MARKER (Ch 7)
MSRM	Select maximum as reference for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMIN	Select min as ref for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMR	Select maximum return as ref for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRA	Select auto mode of maximum return as ref for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRM	Select manual mode of maximum return as ref for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRV	Enter maximum return value for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRV?	Output maximum return value for marker search and bandwidth calculation	MARKER (Ch 7)
MSRMRX?	Output maximum return mode for marker search and bandwidth calculation	MARKER (Ch 7)
MSRX?	Output reference selection for marker search and bandwidth calculation	MARKER (Ch 7)
NMKR	Select normal markers on active channel marker mode	MARKER (Ch 7)
OAM1	Output channel 1 active marker value	MARKER (Ch 7)
OAM2	Output channel 2 active marker value	MARKER (Ch 7)
OAM3	Output channel 3 active marker value	MARKER (Ch 7)
OAM4	Output channel 4 active marker value	MARKER (Ch 7)
SD0	Turn marker screen display off	MARKER (Ch 7)
SD1	Turn marker screen display on	MARKER (Ch 7)
SDP0	Turn the power sweep marker screen display OFF	MARKER (Ch 7)
SDP1	Turn the power sweep marker screen display ON	MARKER (Ch 7)
SDPX?	Output the power sweep marker screen display status	MARKER (Ch 7)
SDX?	Output marker screen display status	MARKER (Ch 7)
SMKR	Select marker search marker mode	MARKER (Ch 7)
SMKRMAX	Select marker search maximum	MARKER (Ch 7)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SMKRMIN	Select marker search minimum	MARKER (Ch 7)
SMKRX	Select the marker search x-axis marker mode	MARKER (Ch 7)
SRCH	Enter marker search value	MARKER (Ch 7)
SRCH?	Output marker search value	MARKER (Ch 7)
SRCHFX?	Output the marker search x-value in GHz and the marker failure status	MARKER (Ch 7)
SRCHFXP?	Output the marker search x-value in dBm and the marker failure status in the power sweep mode	MARKER (Ch 7)
SRCHP	Enter marker search value in power sweep mode	MARKER (Ch 7)
SRCHP?	Output marker search value in power sweep mode	MARKER (Ch 7)
SRCHX?	Output the marker search x-value	MARKER (Ch 7)
SRCHXP?	Output the marker search x-value in the power sweep mode	MARKER (Ch 7)
XMKR?	Output marker mode	MARKER (Ch 7)
XMKRP?	Output the power sweep marker mode	MARKER (Ch 7)
CHSXX?	Output parameter or user defined parameter for specified channel	MEAS (Ch 5)
DA1	Select a1 = Ra as denominator for parameter being defined	MEAS (Ch 5)
DA2	Select a2 = Rb as denominator for parameter being defined	MEAS (Ch 5)
DA3	Select a3 = Rc as denominator for parameter being defined	MEAS (Ch 5)
DA4	Select a4 = Rd as denominator for parameter being defined	MEAS (Ch 5)
DB1	Select b1 = Ta as denominator for parameter being defined	MEAS (Ch 5)
DB2	Select b2 = Tb as denominator for parameter being defined	MEAS (Ch 5)
DB3	Select b3 = Tc as denominator for parameter being defined	MEAS (Ch 5)
DB4	Select b4 = Td as denominator for parameter being defined	MEAS (Ch 5)
DE1	Select unity as denominator for parameter being defined	MEAS (Ch 5)
DEN?	Output denominator selection for parameter being defined	MEAS (Ch 5)
EANAIN	Measure EXT. ANALOG IN on active channel	MEAS (Ch 5)
MM1P?	Query the mixed mode 1st balanced port pair for the active channel S-parameter	MEAS (Ch 5)
MM1P12	Set the mixed mode 1st balanced port pair to 1:2 for the active channel S-parameter	MEAS (Ch 5)
MM1P13	Set the mixed mode 1st balanced port pair to 1:3 for the active channel S-parameter	MEAS (Ch 5)
MM1P14	Set the mixed mode 1st balanced port pair to 1:4 for the active channel S-parameter	MEAS (Ch 5)
MM1P21	Set the mixed mode 1st balanced port pair to 2:1 for the active channel S-parameter	MEAS (Ch 5)
MM1P23	Set the mixed mode 1st balanced port pair to 2:3 for the active channel S-parameter	MEAS (Ch 5)
MM1P24	Set the mixed mode 1st balanced port pair to 2:4 for the active channel S-parameter	MEAS (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MM1P31	Set the mixed mode 1st balanced port pair to 3:1 for the active channel S-parameter	MEAS (Ch 5)
MM1P32	Set the mixed mode 1st balanced port pair to 3:2 for the active channel S-parameter	MEAS (Ch 5)
MM1P34	Set the mixed mode 1st balanced port pair to 3:4 for the active channel S-parameter	MEAS (Ch 5)
MM1P41	Set the mixed mode 1st balanced port pair to 4:1 for the active channel S-parameter	MEAS (Ch 5)
MM1P42	Set the mixed mode 1st balanced port pair to 4:2 for the active channel S-parameter	MEAS (Ch 5)
MM1P43	Set the mixed mode 1st balanced port pair to 4:3 for the active channel S-parameter	MEAS (Ch 5)
MM2P?	Query the mixed mode 2nd balanced port pair for the active channel S-parameter	MEAS (Ch 5)
MM2P12	Set the mixed mode 2nd balanced port pair to 1:2 for the active channel S-parameter	MEAS (Ch 5)
MM2P13	Set the mixed mode 2nd balanced port pair to 1:3 for the active channel S-parameter	MEAS (Ch 5)
MM2P14	Set the mixed mode 2nd balanced port pair to 1:4 for the active channel S-parameter	MEAS (Ch 5)
MM2P21	Set the mixed mode 2nd balanced port pair to 2:1 for the active channel S-parameter	MEAS (Ch 5)
MM2P23	Set the mixed mode 2nd balanced port pair to 2:3 for the active channel S-parameter	MEAS (Ch 5)
MM2P24	Set the mixed mode 2nd balanced port pair to 2:4 for the active channel S-parameter	MEAS (Ch 5)
MM2P31	Set the mixed mode 2nd balanced port pair to 3:1 for the active channel S-parameter	MEAS (Ch 5)
MM2P32	Set the mixed mode 2nd balanced port pair to 3:2 for the active channel S-parameter	MEAS (Ch 5)
MM2P34	Set the mixed mode 2nd balanced port pair to 3:4 for the active channel S-parameter	MEAS (Ch 5)
MM2P41	Set the mixed mode 2nd balanced port pair to 4:1 for the active channel S-parameter	MEAS (Ch 5)
MM2P42	Set the mixed mode 2nd balanced port pair to 4:2 for the active channel S-parameter	MEAS (Ch 5)
MM2P43	Set the mixed mode 2nd balanced port pair to 4:3 for the active channel S-parameter	MEAS (Ch 5)
MMS?	Query the mixed mode single ended port for the active channel S-parameter	MEAS (Ch 5)
MMS1	Set the mixed mode single ended port to Port 1 for the active channel S-parameter	MEAS (Ch 5)
MMS2	Set the mixed mode single ended port to Port 2 for the active channel S-parameter	MEAS (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MMS3	Set the mixed mode single ended port to Port 3 for the active channel S-parameter	MEAS (Ch 5)
MMS4	Set the mixed mode single ended port to Port 4 for the active channel S-parameter	MEAS (Ch 5)
MMSC1C1	Set the S-parameter to mixed mode SC1C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC1C2	Set the S-parameter to mixed mode SC1C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC1D1	Set the S-parameter to mixed mode SC1D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC1D2	Set the S-parameter to mixed mode SC1D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2C1	Set the S-parameter to mixed mode SC2C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2C2	Set the S-parameter to mixed mode SC2C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2D1	Set the S-parameter to mixed mode SC2D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSC2D2	Set the S-parameter to mixed mode SC2D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSCC	Set the S-parameter to mixed mode SCC with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSCD	Set the S-parameter to mixed mode SCD with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSCS	Set the S-parameter to mixed mode SCS with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSD1C1	Set the S-parameter to mixed mode SD1C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD1C2	Set the S-parameter to mixed mode SD1C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD1D1	Set the S-parameter to mixed mode SD1D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD1D2	Set the S-parameter to mixed mode SD1D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2C1	Set the S-parameter to mixed mode SD2C1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2C2	Set the S-parameter to mixed mode SD2C2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2D1	Set the S-parameter to mixed mode SD2D1 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSD2D2	Set the S-parameter to mixed mode SD2D2 with the current port pair selections for the active channel	MEAS (Ch 5)
MMSDC	Set the S-parameter to mixed mode SDC with the current port pair/singleton selection for the active channel	MEAS (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MMSDD	Set the S-parameter to mixed mode SDD with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSDS	Set the S-parameter to mixed mode SDS with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSSC	Set the S-parameter to mixed mode SSC with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MMSSD	Set the S-parameter to mixed mode SSD with the current port pair/singleton selection for the active channel	MEAS (Ch 5)
MS1C	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1C/SSC for the active channel	MEAS (Ch 5)
MS1D	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to S1D/SSD for the active channel	MEAS (Ch 5)
MSC1	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SC1/SCS for the active channel	MEAS (Ch 5)
MSC1C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C1 for the active channel	MEAS (Ch 5)
MSC1C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1C2 for the active channel	MEAS (Ch 5)
MSC1D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D1 for the active channel	MEAS (Ch 5)
MSC1D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC1D2 for the active channel	MEAS (Ch 5)
MSC2C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C1 for the active channel	MEAS (Ch 5)
MSC2C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2C2 for the active channel	MEAS (Ch 5)
MSC2D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D1 for the active channel	MEAS (Ch 5)
MSC2D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SC2D2 for the active channel	MEAS (Ch 5)
MSCC	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCC for the active channel	MEAS (Ch 5)
MSCD	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SCD for the active channel	MEAS (Ch 5)
MSD1	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SD1/SDS for the active channel	MEAS (Ch 5)
MSD1C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C1 for the active channel	MEAS (Ch 5)
MSD1C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1C2 for the active channel	MEAS (Ch 5)
MSD1D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D1 for the active channel	MEAS (Ch 5)
MSD1D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD1D2 for the active channel	MEAS (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
MSD2C1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C1 for the active channel	MEAS (Ch 5)
MSD2C2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2C2 for the active channel	MEAS (Ch 5)
MSD2D1	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D1 for the active channel	MEAS (Ch 5)
MSD2D2	Set the balanced port pair selection to (1:2)(3:4) and S-parameter to SD2D2 for the active channel	MEAS (Ch 5)
MSDC	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDC for the active channel	MEAS (Ch 5)
MSDD	Set the balanced port pair and singleton selection to (2:3)1 and S-parameter to SDD for the active channel	MEAS (Ch 5)
NA1	Select a1 as numerator for parameter being defined	MEAS (Ch 5)
NA2	Select a2 as numerator for parameter being defined	MEAS (Ch 5)
NA3	Select a3 = Rc as numerator for parameter being defined	MEAS (Ch 5)
NA4	Select a4 = Rd as numerator for parameter being define	MEAS (Ch 5)
NB1	Select b1 as numerator for parameter being defined	MEAS (Ch 5)
NB2	Select b2 as numerator for parameter being defined	MEAS (Ch 5)
NB3	Select b3 = Tc as numerator for parameter being defined	MEAS (Ch 5)
NB4	Select b4 = Td as numerator for parameter being define	MEAS (Ch 5)
NU1	Select unity as numerator for parameter being defined	MEAS (Ch 5)
NUM?	Output numerator selection for parameter being defined	MEAS (Ch 5)
S11	Measure S11 on active channel	MEAS (Ch 5)
S12	Measure S12 on active channel	MEAS (Ch 5)
S13	Measure S13 on active channel	MEAS (Ch 5)
S14	Measure S14 on active channel	MEAS (Ch 5)
S21	Measure S21 on active channel	MEAS (Ch 5)
S22	Measure S22 on active channel	MEAS (Ch 5)
S23	Measure S23 on active channel	MEAS (Ch 5)
S24	Measure S24 on active channel	MEAS (Ch 5)
S31	Measure S31 on active channel	MEAS (Ch 5)
S32	Measure S32 on active channel	MEAS (Ch 5)
S33	Measure S33 on active channel	MEAS (Ch 5)
S34	Measure S34 on active channel	MEAS (Ch 5)
S41	Measure S41 on active channel	MEAS (Ch 5)
S42	Measure S42 on active channel	MEAS (Ch 5)
S43	Measure S43 on active channel	MEAS (Ch 5)
S44	Measure S44 on active channel	MEAS (Ch 5)
SXX?	Output S-parameter or user defined parameter of active channel	MEAS (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
UDP11	Select the S11 user defined parameter	MEAS (Ch 5)
UDP12	Select the S12 user defined parameter	MEAS (Ch 5)
UDP13	Select the S13 user defined parameter	MEAS (Ch 5)
UDP14	Select the S14 User Defined parameter	MEAS (Ch 5)
UDP21	Select the S21 user defined parameter	MEAS (Ch 5)
UDP22	Select the S22 user defined parameter	MEAS (Ch 5)
UDP23	Select the S23 user defined parameter	MEAS (Ch 5)
UDP24	Select the S24 User Defined parameter	MEAS (Ch 5)
UDP31	Select the S31 user defined parameter	MEAS (Ch 5)
UDP32	Select the S32 user defined parameter	MEAS (Ch 5)
UDP33	Select the S33 user defined parameter	MEAS (Ch 5)
UDP34	Select the S34 User Defined parameter	MEAS (Ch 5)
UDP41	Select the S41 User Defined parameter	MEAS (Ch 5)
UDP42	Select the S42 User Defined parameter	MEAS (Ch 5)
UDP43	Select the S43 User Defined parameter	MEAS (Ch 5)
UDP44	Select the S44 User Defined parameter	MEAS (Ch 5)
UDPX?	Output User Defined parameter for active channel	MEAS (Ch 5)
USL	Enter label string for user parameter being defined	MEAS (Ch 5)
USL?	Output label string for the user parameter being defined	MEAS (Ch 5)
USR1	Measure the user parameter 1 on active channel	MEAS (Ch 5)
USR10	Measure user parameter 10 on active channel	MEAS (Ch 5)
USR11	Measure user parameter 11 on active channel	MEAS (Ch 5)
USR12	Measure user parameter 12 on active channel	MEAS (Ch 5)
USR13	Measure user parameter 13 on active channel	MEAS (Ch 5)
USR14	Measure user parameter 14 on active channel	MEAS (Ch 5)
USR15	Measure user parameter 15 on active channel	MEAS (Ch 5)
USR16	Measure user parameter 16 on active channel	MEAS (Ch 5)
USR2	Measure user parameter 2 on active channel	MEAS (Ch 5)
USR3	Measure user parameter 3 on active channel	MEAS (Ch 5)
USR4	Measure user parameter 4 on active channel	MEAS (Ch 5)
USR5	Measure user parameter 5 on active channel	MEAS (Ch 5)
USR6	Measure user parameter 6 on active channel	MEAS (Ch 5)
USR7	Measure user parameter 7 on active channel	MEAS (Ch 5)
USR8	Measure user parameter 8 on active channel	MEAS (Ch 5)
USR9	Measure user parameter 9 on active channel	MEAS (Ch 5)
FTP1?	Output the target frequency for linear power correction	POWER (Ch 5)
FTP3	Enter the target frequency for linear power correction	POWER (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
FTP3?	Output the target frequency for linear power correction	POWER (Ch 5)
FTP1	Enter the target frequency for linear power correction	POWER (Ch 5)
P1P?	Output approximate power level at port 1	POWER (Ch 5)
P3P?	Output approximate power level at port 3	POWER (Ch 5)
PW2	Enter source 2 power level	POWER (Ch 5)
PW2?	Output source 2 power level	POWER (Ch 5)
PW3	Enter external source 3 power level	POWER (Ch 5)
PW3?	Output external source 3 power level	POWER (Ch 5)
PW4	Enter external source 4 power level	POWER (Ch 5)
PW4?	Output external source 4 power level	POWER (Ch 5)
PWR	Enter internal source power level	POWER (Ch 5)
PWR?	Output internal source power level	POWER (Ch 5)
SA1	Enter port 1 source attenuator value	POWER (Ch 5)
SA1?	Output port 1 source attenuator value	POWER (Ch 5)
SA3	Enter port 3 source attenuator value	POWER (Ch 5)
SA3?	Output port 3 source attenuator value	POWER (Ch 5)
FP0	Turn flat power correction off	POWER - FLAT POWER (Ch 5)
FP1	Turn flat power correction on	POWER - FLAT POWER (Ch 5)
FP1DONE?	Output port 1 flat power correction done status	POWER - FLAT POWER (Ch 5)
FP30	Turn port 3 flat power correction off	POWER - FLAT POWER (Ch 5)
FP31	Turn port 3 flat power correction on	POWER - FLAT POWER (Ch 5)
FP3DONE?	Output port 3 flat power correction done status	POWER - FLAT POWER (Ch 5)
FP3X?	Output port 3 flat power correction on/off status	POWER - FLAT POWER (Ch 5)
FPX?	Output flat power correction on/off status	POWER - FLAT POWER (Ch 5)
PTP	Enter the target power for flat power correction	POWER - FLAT POWER (Ch 5)
PTP?	Output the target power for flat power correction	POWER - FLAT POWER (Ch 5)
PTP3	Enter the target power for flat power correction for source 2	POWER - FLAT POWER (Ch 5)
PTP3?	Output the target power for flat power correction for	POWER - FLAT POWER (Ch 5)
PTS	Enter number of points to be skipped during flat power correction	POWER - FLAT POWER (Ch 5)
PTS3	Enter number of points to be skipped during flat power correction for source 2	POWER - FLAT POWER (Ch 5)
PTS3?	Output number of points to be skipped during flat power correction for source 2	POWER - FLAT POWER (Ch 5)
SFC	Perform flat test port calibration	POWER - FLAT POWER (Ch 5)
TP1	Select port 1 for flat power correction	POWER - FLAT POWER (Ch 5)
TP3	Select port 3 for flat power correction	POWER - FLAT POWER (Ch 5)
TPX?	Output selected port for flat power correction	POWER - FLAT POWER (Ch 5)
BEGR	Begin receiver calibration	POWER - RECEIVER CAL (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
EXRCALP1	Select Port 1 as the extended receiver port	POWER - RECEIVER CAL (Ch 5)
EXRCALP2	Select Port 2 as the extended receiver port	POWER - RECEIVER CAL (Ch 5)
EXRCALP3	Select Port 3 as the extended receiver port	POWER - RECEIVER CAL (Ch 5)
EXRCALPX?	Output the extended receiver port selection	POWER - RECEIVER CAL (Ch 5)
EXRCALTYPE?	Output the receiver type for extended receiver operation	POWER - RECEIVER CAL (Ch 5)
EXRRCALTYPE	Select the receiver type REFERENCE for the extended receiver operation	POWER - RECEIVER CAL (Ch 5)
EXTRCALTYPE	Select the receiver type TEST for extended receiver operation	POWER - RECEIVER CAL (Ch 5)
EXTRCLR	Clear all of the extended receiver calibrations	POWER - RECEIVER CAL (Ch 5)
RCALLOG	Output the receiver calibration log	POWER - RECEIVER CAL (Ch 5)
RCALP10	Turn off port 1receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP11	Turn on port 1 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP1DONE?	Output port 1 receiver calibration done status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP1X?	Output port 1 receiver calibration on/off status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP20	Turn off port 2 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP21	Turn on port 2 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP2DONE?	Output port 2 receiver calibration done status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP2X?	Output port 2 receiver calibration on/off status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP30	Turn off port 3 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP31	Turn on port 3 receiver calibration for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP3DONE?	Output port 3 receiver calibration done status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALP3X?	Output port 3 receiver calibration on/off status for receiver type TEST	POWER - RECEIVER CAL (Ch 5)
RCALRP1	Set receiver calibration receive to port 1	POWER - RECEIVER CAL (Ch 5)
RCALRP2	Set receiver calibration receive to port 2	POWER - RECEIVER CAL (Ch 5)
RCALRP3	Set receiver calibration receive to port 3	POWER - RECEIVER CAL (Ch 5)
RCALRPX?	Output receiver calibration receive port	POWER - RECEIVER CAL (Ch 5)
RCALSP1	Set receiver calibration source to port 1	POWER - RECEIVER CAL (Ch 5)
RCALSP2	Set receiver calibration source to port 2	POWER - RECEIVER CAL (Ch 5)
RCALSP3	Set receiver calibration source to port 3	POWER - RECEIVER CAL (Ch 5)
RCALSPX?	Output receiver calibration source port	POWER - RECEIVER CAL (Ch 5)
RCALTYPE?	Output the receiver type	POWER - RECEIVER CAL (Ch 5)
RRCALP10	Turn Off the Port 1 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP11	Turn On the Port 1 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP1DONE?	Output the Port 1 receiver calibration Done status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP1X?	Output the Port 1 receiver calibration On/Off status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RRCALP20	Turn Off the Port 2 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP21	Turn On the Port 2 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP2DONE?	Output the Port 2 receiver calibration Done status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP2X?	Output the Port 2 receiver calibration On/Off status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP30	Turn Off the Port 3 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP31	Turn On the Port 3 receiver calibration for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP3DONE?	Output the Port 3 receiver calibration Done status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALP3X?	Output the Port 3 receiver calibration On/Off status for the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
RRCALTYPE	Select the receiver type REFERENCE	POWER - RECEIVER CAL (Ch 5)
TRCALTYPE	Select the receiver type TEST	POWER - RECEIVER CAL (Ch 5)
IC29	Enter calibration coefficient 29	REMOTE - CAL (Ch 8)
IC3	Enter calibration coefficient 3	REMOTE - CAL (Ch 8)
IC30	Enter calibration coefficient 30	REMOTE - CAL (Ch 8)
IC31	Enter calibration coefficient 31	REMOTE - CAL (Ch 8)
IC32	Enter calibration coefficient 32	REMOTE - CAL (Ch 8)
IC33	Enter calibration coefficient 33	REMOTE - CAL (Ch 8)
IC34	Enter calibration coefficient 34	REMOTE - CAL (Ch 8)
IC35	Enter calibration coefficient 35	REMOTE - CAL (Ch 8)
IC36	Enter calibration coefficient 36	REMOTE - CAL (Ch 8)
IC37	Enter calibration coefficient 37	REMOTE - CAL (Ch 8)
IC38	Enter calibration coefficient 38	REMOTE - CAL (Ch 8)
IC39	Enter calibration coefficient 39	REMOTE - CAL (Ch 8)
IC4	Enter calibration coefficient 4	REMOTE - CAL (Ch 8)
IC40	Enter calibration coefficient 40	REMOTE - CAL (Ch 8)
IC5	Enter calibration coefficient 5	REMOTE - CAL (Ch 8)
IC6	Enter calibration coefficient 6	REMOTE - CAL (Ch 8)
IC7	Enter calibration coefficient 7	REMOTE - CAL (Ch 8)
IC8	Enter calibration coefficient 8	REMOTE - CAL (Ch 8)
IC9	Enter calibration coefficient 9	REMOTE - CAL (Ch 8)
ICA	Enter calibration coefficient 10	REMOTE - CAL (Ch 8)
ICB	Enter calibration coefficient 11	REMOTE - CAL (Ch 8)
IC1	Enter calibration coefficient 1	REMOTE - CAL (Ch 8)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
IC10	Enter calibration coefficient 10	REMOTE - CAL (Ch 8)
IC11	Enter calibration coefficient 11	REMOTE - CAL (Ch 8)
IC12	Enter calibration coefficient 12	REMOTE - CAL (Ch 8)
IC13	Enter calibration coefficient 13	REMOTE - CAL (Ch 8)
IC14	Enter calibration coefficient 14	REMOTE - CAL (Ch 8)
IC15	Enter calibration coefficient 15	REMOTE - CAL (Ch 8)
IC16	Enter calibration coefficient 16	REMOTE - CAL (Ch 8)
IC17	Enter calibration coefficient 17	REMOTE - CAL (Ch 8)
IC18	Enter calibration coefficient 18	REMOTE - CAL (Ch 8)
IC19	Enter calibration coefficient 19	REMOTE - CAL (Ch 8)
IC2	Enter calibration coefficient 2	REMOTE - CAL (Ch 8)
IC20	Enter calibration coefficient 20	REMOTE - CAL (Ch 8)
IC21	Enter calibration coefficient 21	REMOTE - CAL (Ch 8)
IC22	Enter calibration coefficient 22	REMOTE - CAL (Ch 8)
IC23	Enter calibration coefficient 23	REMOTE - CAL (Ch 8)
IC24	Enter calibration coefficient 24	REMOTE - CAL (Ch 8)
IC25	Enter calibration coefficient 25	REMOTE - CAL (Ch 8)
IC26	Enter calibration coefficient 26	REMOTE - CAL (Ch 8)
IC27	Enter calibration coefficient 27	REMOTE - CAL (Ch 8)
IC28	Enter calibration coefficient 28	REMOTE - CAL (Ch 8)
ICC	Enter calibration coefficient 12	REMOTE - CAL (Ch 8)
ICL	Enter all applicable calibration coefficients for cal type	REMOTE - CAL (Ch 8)
ICL3P	Enter additional 12 calibration coefficients for 3-port	REMOTE - CAL (Ch 8)
OC1	Output calibration coefficients 1	REMOTE - CAL (Ch 8)
OC10	Output calibration coefficients 10	REMOTE - CAL (Ch 8)
OC11	Output calibration coefficients 11	REMOTE - CAL (Ch 8)
OC12	Output calibration coefficients 12	REMOTE - CAL (Ch 8)
OC13	Output calibration coefficients 13	REMOTE - CAL (Ch 8)
OC14	Output calibration coefficients 14	REMOTE - CAL (Ch 8)
OC15	Output calibration coefficients 15	REMOTE - CAL (Ch 8)
OC16	Output calibration coefficients 16	REMOTE - CAL (Ch 8)
OC17	Output calibration coefficients 17	REMOTE - CAL (Ch 8)
OC18	Output calibration coefficients 18	REMOTE - CAL (Ch 8)
OC19	Output calibration coefficients 19	REMOTE - CAL (Ch 8)
OC2	Output calibration coefficients 2	REMOTE - CAL (Ch 8)
OC20	Output calibration coefficients 20	REMOTE - CAL (Ch 8)
OC21	Output calibration coefficients 21	REMOTE - CAL (Ch 8)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
OC22	Output calibration coefficients 22	REMOTE - CAL (Ch 8)
OC23	Output calibration coefficients 23	REMOTE - CAL (Ch 8)
OC24	Output calibration coefficients 24	REMOTE - CAL (Ch 8)
OC25	Output calibration coefficient 25	REMOTE - CAL (Ch 8)
OC26	Output calibration coefficient 26	REMOTE - CAL (Ch 8)
OC27	Output calibration coefficient 27	REMOTE - CAL (Ch 8)
OC28	Output calibration coefficient 28	REMOTE - CAL (Ch 8)
OC29	Output calibration coefficient 29	REMOTE - CAL (Ch 8)
OC3	Output calibration coefficients 3	REMOTE - CAL (Ch 8)
OC30	Output calibration coefficient 30	REMOTE - CAL (Ch 8)
OC31	Output calibration coefficient 31	REMOTE - CAL (Ch 8)
OC32	Output calibration coefficient 32	REMOTE - CAL (Ch 8)
OC33	Output calibration coefficient 33	REMOTE - CAL (Ch 8)
OC34	Output calibration coefficient 34	REMOTE - CAL (Ch 8)
OC35	Output calibration coefficient 35	REMOTE - CAL (Ch 8)
OC36	Output calibration coefficient 36	REMOTE - CAL (Ch 8)
OC37	Output calibration coefficient 37	REMOTE - CAL (Ch 8)
OC38	Output calibration coefficient 38	REMOTE - CAL (Ch 8)
OC39	Output calibration coefficient 39	REMOTE - CAL (Ch 8)
OC4	Output calibration coefficients 4	REMOTE - CAL (Ch 8)
OC40	Output calibration coefficient 40	REMOTE - CAL (Ch 8)
OC5	Output calibration coefficients 5	REMOTE - CAL (Ch 8)
OC6	Output calibration coefficients 6	REMOTE - CAL (Ch 8)
OC7	Output calibration coefficients 7	REMOTE - CAL (Ch 8)
OC8	Output calibration coefficients 8	REMOTE - CAL (Ch 8)
OC9	Output calibration coefficients 9	REMOTE - CAL (Ch 8)
OCA	Output calibration coefficient 10	REMOTE - CAL (Ch 8)
OCB	Output calibration coefficient 11	REMOTE - CAL (Ch 8)
OCC	Output calibration coefficient 12	REMOTE - CAL (Ch 8)
OCL	Output all applicable calibration coefficients for calibration type	REMOTE - CAL (Ch 8)
OCL3P	Output additional 12 calibration coefficients for 3-port	REMOTE - CAL (Ch 8)
ONCP	Output number of points for current calibration	REMOTE - CAL (Ch 8)
ONCT	Output number of calibration terms for current calibration	REMOTE - CAL (Ch 8)
OEL	Output error list	REMOTE - ERROR REPORTING (Ch 8)
OGE	Output extended description of current GPIB error	REMOTE - ERROR REPORTING (Ch 8)
OGL	Output extended description of previous GPIB error	REMOTE - ERROR REPORTING (Ch 8)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ONE	Output number of lines in the error list	REMOTE - ERROR REPORTING (Ch 8)
FDH0	Select variable length arbitrary block headers	REMOTE - FORMATTING (Ch 8)
FDH1	Select fixed length arbitrary block headers	REMOTE - FORMATTING (Ch 8)
FDH2	Select zero length arbitrary block headers	REMOTE - FORMATTING (Ch 8)
FDHX?	Output arbitrary block header length selection	REMOTE - FORMATTING (Ch 8)
FMA	Select ASCII data transfer format	REMOTE - FORMATTING (Ch 8)
FMB	Select IEEE754 64 bit data transfer format	REMOTE - FORMATTING (Ch 8)
FMC	Select IEEE754 32 bit data transfer format	REMOTE - FORMATTING (Ch 8)
FMT0	Select normal ASCII data element delimiting	REMOTE - FORMATTING (Ch 8)
FMT1	Select enhanced ASCII data element delimiting	REMOTE - FORMATTING (Ch 8)
FMTX?	Output ASCII data element delimiting mode	REMOTE - FORMATTING (Ch 8)
FMX?	Output data output mode FMA FMB or FMC	REMOTE - FORMATTING (Ch 8)
LSB	Select least significant byte first binary transfer	REMOTE - FORMATTING (Ch 8)
MSB	Select most significant byte first binary transfer	REMOTE - FORMATTING (Ch 8)
XSB?	Output byte order for output data LSB or MSB	REMOTE - FORMATTING (Ch 8)
*CLS	Clear status bytes and structures	REMOTE - IEEE 488.2 (Ch 8)
*DDT	Enter the 488.2 define device trigger command string	REMOTE - IEEE 488.2 (Ch 8)
*ESE	Enter the 488.2 standard event status enable mask	REMOTE - IEEE 488.2 (Ch 8)
*ESE?	Output the 488.2 standard event status enable mask	REMOTE - IEEE 488.2 (Ch 8)
*ESR?	Output the 488.2 standard event status register value	REMOTE - IEEE 488.2 (Ch 8)
*IDN?	Output the 488.2 instrument identification string	REMOTE - IEEE 488.2 (Ch 8)
*IST?	Output the value of the *ist* message	REMOTE - IEEE 488.2 (Ch 8)
*OPC	Initiate the 488.2 operation complete sequence	REMOTE - IEEE 488.2 (Ch 8)
*OPC?	Initiate the 488.2 operation complete query sequence	REMOTE - IEEE 488.2 (Ch 8)
*OPT?	Output the 488.2 options installed string	REMOTE - IEEE 488.2 (Ch 8)
*PRE	Enter the 488.2 parallel poll register enable mask	REMOTE - IEEE 488.2 (Ch 8)
*PRE?	Output the 488.2 parallel poll register enable mask	REMOTE - IEEE 488.2 (Ch 8)
*RST	Resets the instrument	REMOTE - IEEE 488.2 (Ch 8)
*SRE	Enter the 488.2 service request enable mask	REMOTE - IEEE 488.2 (Ch 8)
*SRE?	Output the 488.2 service request enable mask	REMOTE - IEEE 488.2 (Ch 8)
*STB?	Output the 488.2 status byte value	REMOTE - IEEE 488.2 (Ch 8)
*TRG	Initiate a group execute trigger sequence	REMOTE - IEEE 488.2 (Ch 8)
*TST?	Perform self test and output status	REMOTE - IEEE 488.2 (Ch 8)
*WAI	Wait to continue	REMOTE - IEEE 488.2 (Ch 8)
TST	Perform self test and output status (same as *TST?)	REMOTE - IEEE 488.2 (Ch 8)
CFD	Collect final data in an internal buffer	REMOTE - MEASURED DATA (Ch 8)
CXD?	Output internal buffer data collection mode	REMOTE - MEASURED DATA (Ch 8)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DCCTN	Resume internal buffer data collection	REMOTE - MEASURED DATA (Ch 8)
DCCTN?	Output internal buffer data collection resume/suspend status	REMOTE - MEASURED DATA (Ch 8)
DCHLD	Suspend internal buffer data collection	REMOTE - MEASURED DATA (Ch 8)
DCMRK	Insert the mark value into the internal buffer	REMOTE - MEASURED DATA (Ch 8)
DCOFF	Turn internal buffer data collection mode off	REMOTE - MEASURED DATA (Ch 8)
DCPCUR?	Output data collection buffer current point count	REMOTE - MEASURED DATA (Ch 8)
DCPMAX?	Output data collection buffer maximum number of points	REMOTE - MEASURED DATA (Ch 8)
DPR0	Visible data only OFD format	REMOTE - MEASURED DATA (Ch 8)
DPR1	Data pair always OFD format	REMOTE - MEASURED DATA (Ch 8)
DPRX?	Output data pair mode visible only or pair always	REMOTE - MEASURED DATA (Ch 8)
ICD	Enter corrected data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
IFD	Enter final data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
INRM	Enter normalization data from GPIB	REMOTE - MEASURED DATA (Ch 8)
OCD	Output corrected data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
OCFEDE	Output the front panel setup, calibration, and EDE data	REMOTE - MEASURED DATA (Ch 8)
OCFSG	Output the segmented sweep data	REMOTE - MEASURED DATA (Ch 8)
OCS	Output the internal buffer collected data	REMOTE - MEASURED DATA (Ch 8)
ODAT	Output hard copy tabular data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OFD	Output final data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
OGCFD	Output gain compression final data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OGCTXT	Output text format gain compression data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OM1	Output marker 1 value	REMOTE - MEASURED DATA (Ch 8)
OM10	Output marker 10 value	REMOTE - MEASURED DATA (Ch 8)
OM11	Output marker 11 value	REMOTE - MEASURED DATA (Ch 8)
OM12	Output marker 12 value	REMOTE - MEASURED DATA (Ch 8)
OM2	Output marker 2 value	REMOTE - MEASURED DATA (Ch 8)
OM3	Output marker 3 value	REMOTE - MEASURED DATA (Ch 8)
OM3P	Output M3P format data to GPIB with M3P setup set to (2:3)1	REMOTE - MEASURED DATA (Ch 8)
OM4	Output marker 4 value	REMOTE - MEASURED DATA (Ch 8)
OM4P	Output M4P format data to GPIB with M4P setup set to (1:2)(3:4)	REMOTE - MEASURED DATA (Ch 8)
OM5	Output marker 5 value	REMOTE - MEASURED DATA (Ch 8)
OM6	Output marker 6 value	REMOTE - MEASURED DATA (Ch 8)
OM7	Output marker 7 value	REMOTE - MEASURED DATA (Ch 8)
OM8	Output marker 8 value	REMOTE - MEASURED DATA (Ch 8)
OM9	Output marker 9 value	REMOTE - MEASURED DATA (Ch 8)
ONRM	Output stored normalization data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OPSV	Output power sweep power values	REMOTE - MEASURED DATA (Ch 8)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ORD	Output raw data for active channel parameter	REMOTE - MEASURED DATA (Ch 8)
OS11C	Output corrected S11 data	REMOTE - MEASURED DATA (Ch 8)
OS11R	Output raw S11 data	REMOTE - MEASURED DATA (Ch 8)
OS12C	Output corrected S12 data	REMOTE - MEASURED DATA (Ch 8)
OS12R	Output raw S12 data	REMOTE - MEASURED DATA (Ch 8)
OS13C	Output corrected S13 data	REMOTE - MEASURED DATA (Ch 8)
OS13R	Output raw S13 data	REMOTE - MEASURED DATA (Ch 8)
OS14C	Output corrected S14 data	REMOTE - MEASURED DATA (Ch 8)
OS14R	Output raw S14 data	REMOTE - MEASURED DATA (Ch 8)
OS1P4	Output S1P4 format data to GPIB	REMOTE - MEASURED DATA (Ch 8)
OS21C	Output corrected S21 data	REMOTE - MEASURED DATA (Ch 8)
OS21R	Output raw S21 data	REMOTE - MEASURED DATA (Ch 8)
OS22C	Output corrected S22 data	REMOTE - MEASURED DATA (Ch 8)
OS22R	Output raw S22 data	REMOTE - MEASURED DATA (Ch 8)
OS23C	Output corrected S23 data	REMOTE - MEASURED DATA (Ch 8)
OS23R	Output raw S23 data	REMOTE - MEASURED DATA (Ch 8)
OS24C	Output corrected S24 data	REMOTE - MEASURED DATA (Ch 8)
OS24R	Output raw S24 data	REMOTE - MEASURED DATA (Ch 8)
OS31C	Output corrected S31 data	REMOTE - MEASURED DATA (Ch 8)
OS31R	Output raw S31 data	REMOTE - MEASURED DATA (Ch 8)
OS32C	Output corrected S32 data	REMOTE - MEASURED DATA (Ch 8)
OS32R	Output raw S32 data	REMOTE - MEASURED DATA (Ch 8)
OS33C	Output corrected S33 data	REMOTE - MEASURED DATA (Ch 8)
OS33R	Output raw S33 data	REMOTE - MEASURED DATA (Ch 8)
OS34C	Output corrected S34 data	REMOTE - MEASURED DATA (Ch 8)
OS34R	Output raw S34 data	REMOTE - MEASURED DATA (Ch 8)
OTXT	Output text format data to GPIB	REMOTE - MEASURED DATA (Ch 8)
ODV	Output distance values for time domain	REMOTE - MEASURED POINTS (Ch 8)
OFV	Output frequency values	REMOTE - MEASURED POINTS (Ch 8)
OGCFV	Output gain compression frequency values to GPIB	REMOTE - MEASURED POINTS (Ch 8)
ONDF	Output number of discrete frequencies	REMOTE - MEASURED POINTS (Ch 8)
ONPV	Output the number of power sweep power values	REMOTE - MEASURED POINTS (Ch 8)
OTV	Output time values for time domain	REMOTE - MEASURED POINTS (Ch 8)
HIGHF?	Output the highest frequency	REMOTE - MISC (Ch 8)
IHDW	Enter hardware cal data from GPIB	REMOTE - MISC (Ch 8)
IKIT	Enter calkit data from GPIB	REMOTE - MISC (Ch 8)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
NOP	No operation	REMOTE - MISC (Ch 8)
OBMP	Output the display as a bitmap	REMOTE - MISC (Ch 8)
ODR	Output directory listing of the floppy drive	REMOTE - MISC (Ch 8)
ODRH	Output directory listing of the hard drive	REMOTE - MISC (Ch 8)
OHDR	Output hard copy header information to GPIB	REMOTE - MISC (Ch 8)
OHDW	Output hardware cal data to GPIB	REMOTE - MISC (Ch 8)
OHGL	Output HPGL format data to GPIB	REMOTE - MISC (Ch 8)
OI	Output instrument identification string with serial number	REMOTE - MISC (Ch 8)
OID	Output instrument identification string	REMOTE - MISC (Ch 8)
OMOD	Output instrument model number	REMOTE - MISC (Ch 8)
OSER	Output instrument serial number	REMOTE - MISC (Ch 8)
RK?	Output RK mode on/off status	REMOTE - MISC (Ch 8)
RKOFF	Turn off RK mode	REMOTE - MISC (Ch 8)
RKON	Turn on RK mode	REMOTE - MISC (Ch 8)
ICF	Enter front panel setup and calibration data	REMOTE - SETUP (Ch 8)
ICFEDE	Enter the front panel setup, calibration, and EDE data	REMOTE - SETUP (Ch 8)
ICFSG	Enter the segmented sweep data	REMOTE - SETUP (Ch 8)
IFP	Enter current front panel setup	REMOTE - SETUP (Ch 8)
IS1	Enter front panel setup 1	REMOTE - SETUP (Ch 8)
IS10	Enter front panel setup 10	REMOTE - SETUP (Ch 8)
IS2	Enter front panel setup 2	REMOTE - SETUP (Ch 8)
IS3	Enter front panel setup 3	REMOTE - SETUP (Ch 8)
IS4	Enter front panel setup 4	REMOTE - SETUP (Ch 8)
IS5	Enter front panel setup 5	REMOTE - SETUP (Ch 8)
IS6	Enter front panel setup 6	REMOTE - SETUP (Ch 8)
IS7	Enter front panel setup 7	REMOTE - SETUP (Ch 8)
IS8	Enter front panel setup 8	REMOTE - SETUP (Ch 8)
IS9	Enter front panel setup 9	REMOTE - SETUP (Ch 8)
OCF	Output front panel setup and calibration data	REMOTE - SETUP (Ch 8)
OFP	Output current front panel setup	REMOTE - SETUP (Ch 8)
OS1	Output front panel setup number 1	REMOTE - SETUP (Ch 8)
OS10	Output front panel setup number 10	REMOTE - SETUP (Ch 8)
OS2	Output front panel setup number 2	REMOTE - SETUP (Ch 8)
OS3	Output front panel setup number 3	REMOTE - SETUP (Ch 8)
OS4	Output front panel setup number 4	REMOTE - SETUP (Ch 8)
OS41C	Output corrected S41 data	REMOTE - SETUP (Ch 8)
OS41R	Output raw S41 data	REMOTE - SETUP (Ch 8)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
OS42C	Output corrected S42 data	REMOTE - SETUP (Ch 8)
OS42R	Output raw S42 data	REMOTE - SETUP (Ch 8)
OS43C	Output corrected S43 data	REMOTE - SETUP (Ch 8)
OS43R	Output raw S43 data	REMOTE - SETUP (Ch 8)
OS44C	Output corrected S44 data	REMOTE - SETUP (Ch 8)
OS44R	Output raw S44 data	REMOTE - SETUP (Ch 8)
OS4P	Output S3P format data to GPIB	REMOTE - SETUP (Ch 8)
OS5	Output front panel setup number 5	REMOTE - SETUP (Ch 8)
OS6	Output front panel setup number 6	REMOTE - SETUP (Ch 8)
OS7	Output front panel setup number 7	REMOTE - SETUP (Ch 8)
OS8	Output front panel setup number 8	REMOTE - SETUP (Ch 8)
OS9	Output front panel setup number 9	REMOTE - SETUP (Ch 8)
CSB	Clear status bytes and structures (same as *CLS)	REMOTE - STATUS REPORTING (Ch 8)
IEM	Enter extended status byte mask	REMOTE - STATUS REPORTING (Ch 8)
ILM	Enter limits status byte mask	REMOTE - STATUS REPORTING (Ch 8)
IPM	Enter the 488.2 service request enable mask	REMOTE - STATUS REPORTING (Ch 8)
OEB	Output extended status byte	REMOTE - STATUS REPORTING (Ch 8)
OEM	Output extended status byte mask	REMOTE - STATUS REPORTING (Ch 8)
OLB	Output limits status byte	REMOTE - STATUS REPORTING (Ch 8)
OLM	Output limits status byte mask	REMOTE - STATUS REPORTING (Ch 8)
OPB	Output the 488.2 status byte value (same as *STB?)	REMOTE - STATUS REPORTING (Ch 8)
REBOOT	Reboots the instrument	REMOTE - SYNC (Ch 8)
SWPDIR?	Output instantaneous sweep direction forward/reverse	REMOTE - SYNC (Ch 8)
WFS	Wait full sweep until all display data is valid	REMOTE - SYNC (Ch 8)
UMDIS0	Turn off user message display	REMOTE - USER MESSAGE (Ch 8)
UMDIS1	Turn on user message display	REMOTE - USER MESSAGE (Ch 8)
UMDISX?	Output user message display on/off status	REMOTE - USER MESSAGE (Ch 8)
UMRST	Reset all user message display parameters	REMOTE - USER MESSAGE (Ch 8)
UMSTR	Enter the user message display string	REMOTE - USER MESSAGE (Ch 8)
UMSTR?	Output the user message display string	REMOTE - USER MESSAGE (Ch 8)
UMXLOC	Enter the user message display starting X location	REMOTE - USER MESSAGE (Ch 8)
UMXLOC?	Output the user message display starting X location	REMOTE - USER MESSAGE (Ch 8)
UMYLOC	Enter the user message display starting Y location	REMOTE - USER MESSAGE (Ch 8)
UMYLOC?	Output the user message display starting Y location	REMOTE - USER MESSAGE (Ch 8)
RC1	Recall front panel setup number 1 from memory	SAVE/RECALL (Ch 9)
RC10	Recall front panel setup number 10 from memory	SAVE/RECALL (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RC2	Recall front panel setup number 2 from memory	SAVE/RECALL (Ch 9)
RC3	Recall front panel setup number 3 from memory	SAVE/RECALL (Ch 9)
RC4	Recall front panel setup number 4 from memory	SAVE/RECALL (Ch 9)
RC5	Recall front panel setup number 5 from memory	SAVE/RECALL (Ch 9)
RC6	Recall front panel setup number 6 from memory	SAVE/RECALL (Ch 9)
RC7	Recall front panel setup number 7 from memory	SAVE/RECALL (Ch 9)
RC8	Recall front panel setup number 8 from memory	SAVE/RECALL (Ch 9)
RC9	Recall front panel setup number 9 from memory	SAVE/RECALL (Ch 9)
RCCM1	Fast recall cal data from memory 1	SAVE/RECALL (Ch 9)
RCCM2	Fast recall cal data from memory 2	SAVE/RECALL (Ch 9)
RCCM3	Fast recall cal data from memory 3	SAVE/RECALL (Ch 9)
RCCM4	Fast recall cal data from memory 4	SAVE/RECALL (Ch 9)
RCCM5	Fast recall cal data from memory 5	SAVE/RECALL (Ch 9)
RCCM6	Fast recall cal data from memory 6	SAVE/RECALL (Ch 9)
RCCM7	Fast recall cal data from memory 7	SAVE/RECALL (Ch 9)
RCCM8	Fast recall cal data from memory 8	SAVE/RECALL (Ch 9)
SAVDAC	Save 10 MHz DAC number into BBRAM	SAVE/RECALL (Ch 9)
SAVE	Save a data file to disk	SAVE/RECALL (Ch 9)
SV1	Save front panel setup number 1 to memory	SAVE/RECALL (Ch 9)
SV10	Save front panel setup number 10 to memory	SAVE/RECALL (Ch 9)
SV2	Save front panel setup number 2 to memory	SAVE/RECALL (Ch 9)
SV3	Save front panel setup number 3 to memory	SAVE/RECALL (Ch 9)
SV4	Save front panel setup number 4 to memory	SAVE/RECALL (Ch 9)
SV5	Save front panel setup number 5 to memory	SAVE/RECALL (Ch 9)
SV6	Save front panel setup number 6 to memory	SAVE/RECALL (Ch 9)
SV7	Save front panel setup number 7 to memory	SAVE/RECALL (Ch 9)
SV8	Save front panel setup number 8 to memory	SAVE/RECALL (Ch 9)
SV9	Save front panel setup number 9 to memory	SAVE/RECALL (Ch 9)
SVCM1	Save cal data in internal memory 1	SAVE/RECALL (Ch 9)
SVCM2	Save cal data in internal memory 2	SAVE/RECALL (Ch 9)
SVCM3	Save cal data in internal memory 3	SAVE/RECALL (Ch 9)
SVCM4	Save cal data in internal memory 4	SAVE/RECALL (Ch 9)
SVCM5	Save cal data in internal memory 5	SAVE/RECALL (Ch 9)
SVCM6	Save cal data in internal memory 6	SAVE/RECALL (Ch 9)
SVCM7	Save cal data in internal memory 7	SAVE/RECALL (Ch 9)
SVCM8	Save cal data in internal memory 8	SAVE/RECALL (Ch 9)
POP	Enter parallel output port 8-bit decimal word (0-255)	SEQ (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
POP?	Output parallel output port 8-bit decimal word (0-255)	SEQ (Ch 10)
POPBC0	Clear parallel output port bit 0	SEQ (Ch 10)
POPBC1	Clear parallel output port bit 1	SEQ (Ch 10)
POPBC2	Clear parallel output port bit 2	SEQ (Ch 10)
POPBC3	Clear parallel output port bit 3	SEQ (Ch 10)
POPBC4	Clear parallel output port bit 4	SEQ (Ch 10)
POPBC5	Clear parallel output port bit 5	SEQ (Ch 10)
POPBC6	Clear parallel output port bit 6	SEQ (Ch 10)
POPBC7	Clear parallel output port bit 7	SEQ (Ch 10)
POPBS0	Set parallel output port bit 0	SEQ (Ch 10)
POPBS1	Set parallel output port bit 1	SEQ (Ch 10)
POPBS2	Set parallel output port bit 2	SEQ (Ch 10)
POPBS3	Set parallel output port bit 3	SEQ (Ch 10)
POPBS4	Set parallel output port bit 4	SEQ (Ch 10)
POPBS5	Set parallel output port bit 5	SEQ (Ch 10)
POPBS6	Set parallel output port bit 6	SEQ (Ch 10)
POPBS7	Set parallel output port bit 7	SEQ (Ch 10)
SEQDEL1	Delete sequence 1	SEQ (Ch 10)
SEQDEL2	Delete sequence 2	SEQ (Ch 10)
SEQDEL3	Delete sequence 3	SEQ (Ch 10)
SEQDEL4	Delete sequence 4	SEQ (Ch 10)
SEQDEL5	Delete sequence 5	SEQ (Ch 10)
SEQDEL6	Delete sequence 6	SEQ (Ch 10)
SEQDEL7	Delete sequence 7	SEQ (Ch 10)
SEQDGMSG?	Output saving sequence display message to service log status	SEQ (Ch 10)
SEQDGMSG0	Turn saving sequence display message to service log off	SEQ (Ch 10)
SEQDGMSG1	Turn saving sequence display message to service log on	SEQ (Ch 10)
SEQEXE1	Execute sequence 1	SEQ (Ch 10)
SEQEXE2	Execute sequence 2	SEQ (Ch 10)
SEQEXE3	Execute sequence 3	SEQ (Ch 10)
SEQEXE4	Execute sequence 4	SEQ (Ch 10)
SEQEXE5	Execute sequence 5	SEQ (Ch 10)
SEQEXE6	Execute sequence 6	SEQ (Ch 10)
SEQEXE7	Execute sequence 7	SEQ (Ch 10)
SEQHELP?	Output sequence help message mode on/off	SEQ (Ch 10)
SEQHELP0	Turn off sequence help message	SEQ (Ch 10)
SEQHELP1	Turn on sequence help message	SEQ (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SEQLOA1	Recall sequence 1 from floppy disk	SEQ (Ch 10)
SEQLOA2	Recall sequence 2 from floppy disk	SEQ (Ch 10)
SEQLOA3	Recall sequence 3 from floppy disk	SEQ (Ch 10)
SEQLOA4	Recall sequence 4 from floppy disk	SEQ (Ch 10)
SEQLOA5	Recall sequence 5 from floppy disk	SEQ (Ch 10)
SEQLOA6	Recall sequence 6 from floppy disk	SEQ (Ch 10)
SEQLOA7	Recall sequence 7 from floppy disk	SEQ (Ch 10)
SEQLOAH1	Recall sequence 1 from hard disk	SEQ (Ch 10)
SEQLOAH2	Recall sequence 2 from hard disk	SEQ (Ch 10)
SEQLOAH3	Recall sequence 3 from hard disk	SEQ (Ch 10)
SEQLOAH4	Recall sequence 4 from hard disk	SEQ (Ch 10)
SEQLOAH5	Recall sequence 5 from hard disk	SEQ (Ch 10)
SEQLOAH6	Recall sequence 6 from hard disk	SEQ (Ch 10)
SEQLOAH7	Recall sequence 7 from hard disk	SEQ (Ch 10)
SEQNAM1	Enter sequence 1 name	SEQ (Ch 10)
SEQNAM1?	Output sequence 1 name	SEQ (Ch 10)
SEQNAM2	Enter sequence 2 name	SEQ (Ch 10)
SEQNAM2?	Output sequence 2 name	SEQ (Ch 10)
SEQNAM3	Enter sequence 3 name	SEQ (Ch 10)
SEQNAM3?	Output sequence 3 name	SEQ (Ch 10)
SEQNAM4	Enter sequence 4 name	SEQ (Ch 10)
SEQNAM4?	Output sequence 4 name	SEQ (Ch 10)
SEQNAM5	Enter sequence 5 name	SEQ (Ch 10)
SEQNAM5?	Output sequence 5 name	SEQ (Ch 10)
SEQNAM6	Enter sequence 6 name	SEQ (Ch 10)
SEQNAM6?	Output sequence 6 name	SEQ (Ch 10)
SEQNAM7	Enter sequence 7 name	SEQ (Ch 10)
SEQNAM7?	Output sequence 7 name	SEQ (Ch 10)
SEQSAV1	Save sequence 1 to floppy disk	SEQ (Ch 10)
SEQSAV2	Save sequence 2 to floppy disk	SEQ (Ch 10)
SEQSAV3	Save sequence 3 to floppy disk	SEQ (Ch 10)
SEQSAV4	Save sequence 4 to floppy disk	SEQ (Ch 10)
SEQSAV5	Save sequence 5 to floppy disk	SEQ (Ch 10)
SEQSAV6	Save sequence 6 to floppy disk	SEQ (Ch 10)
SEQSAV7	Save sequence 7 to floppy disk	SEQ (Ch 10)
SEQSAVH1	Save sequence 1 to hard disk	SEQ (Ch 10)
SEQSAVH2	Save sequence 2 to hard disk	SEQ (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SEQSAVH3	Save sequence 3 to hard disk	SEQ (Ch 10)
SEQSAVH4	Save sequence 4 to hard disk	SEQ (Ch 10)
SEQSAVH5	Save sequence 5 to hard disk	SEQ (Ch 10)
SEQSAVH6	Save sequence 6 to hard disk	SEQ (Ch 10)
SEQSAVH7	Save sequence 7 to hard disk	SEQ (Ch 10)
SEQSAVT1	Save sequence 1 text to floppy disk	SEQ (Ch 10)
SEQSAVT2	Save sequence 2 text to floppy disk	SEQ (Ch 10)
SEQSAVT3	Save sequence 3 text to floppy disk	SEQ (Ch 10)
SEQSAVT4	Save sequence 4 text to floppy disk	SEQ (Ch 10)
SEQSAVT5	Save sequence 5 text to floppy disk	SEQ (Ch 10)
SEQSAVT6	Save sequence 6 text to floppy disk	SEQ (Ch 10)
SEQSAVT7	Save sequence 7 text to floppy disk	SEQ (Ch 10)
SEQSAVTH1	Save sequence 1 text to hard disk	SEQ (Ch 10)
SEQSAVTH2	Save sequence 2 text to hard disk	SEQ (Ch 10)
SEQSAVTH3	Save sequence 3 text to hard disk	SEQ (Ch 10)
SEQSAVTH4	Save sequence 4 text to hard disk	SEQ (Ch 10)
SEQSAVTH5	Save sequence 5 text to hard disk	SEQ (Ch 10)
SEQSAVTH6	Save sequence 6 text to hard disk	SEQ (Ch 10)
SEQSAVTH7	Save sequence 7 text to hard disk	SEQ (Ch 10)
ALTS0	Turn alternate sweep mode off	SWEEP (Ch 5)
ALTS1	Turn alternate sweep mode on	SWEEP (Ch 5)
ALTSX?	Output alternate sweep mode on/off status	SWEEP (Ch 5)
CHOPMODE?	Output chop mode type status	SWEEP (Ch 5)
FCW0	Turn fast CW measurement mode off	SWEEP (Ch 5)
FCW1	Turn fast CW measurement mode 1 on	SWEEP (Ch 5)
FCWX?	Output fast CW measurement mode	SWEEP (Ch 5)
FLICK0	Turn flickering off	SWEEP (Ch 5)
FLICK1	Turn flickering on	SWEEP (Ch 5)
FLICKX?	Output flickering on/off status	SWEEP (Ch 5)
FSWP	Select frequency sweep	SWEEP (Ch 5)
HC0	Disable internal IF calibration	SWEEP (Ch 5)
HC1	Enable internal IF calibration and trigger an IF calibration	SWEEP (Ch 5)
HCT	Trigger an IF calibration	SWEEP (Ch 5)
HCX?	Output internal IF calibration enable/disable status	SWEEP (Ch 5)
PERPORT	Select per port as chop mode type	SWEEP (Ch 5)
RSTFSWP	Restore full sweep	SWEEP (Ch 5)
SPA0	Spur avoidance mode off	SWEEP (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
SPA1	Spur avoidance mode on	SWEEP (Ch 5)
SPARAM	Select All S-parameters as chop mode type	SWEEP (Ch 5)
SPAX?	Output spur avoidance mode on/off status	SWEEP (Ch 5)
SWPC0	Turn off chop sweep mode	SWEEP (Ch 5)
SWPC1	Turn on chop sweep mode	SWEEP (Ch 5)
SWPCX?	Output chop sweep mode on/off	SWEEP (Ch 5)
SWPT	Enter sweep time	SWEEP (Ch 5)
SWPT?	Output sweep time	SWEEP (Ch 5)
SWPT0	Turn off sweep time measurement	SWEEP (Ch 5)
SWPT1	Turn on sweep time measurement	SWEEP (Ch 5)
SWPTMA	Set auto sweep time mode	SWEEP (Ch 5)
SWPTMM	Set manual sweep time mode	SWEEP (Ch 5)
SWPTMX?	Output sweep time mode	SWEEP (Ch 5)
SWPTX?	Output sweep time measurement on/off status	SWEEP (Ch 5)
SWPX?	Output sweep type selection	SWEEP (Ch 5)
TEB	Select external trigger executes *DDT definition	SWEEP (Ch 5)
TEX	Select external measurement triggering	SWEEP (Ch 5)
TEXS	Select external measurement sweep triggering	SWEEP (Ch 5)
TEXSB	Select external measurement sweep triggering and execute trigger buffer	SWEEP (Ch 5)
TIB	Select GPIB measurement triggering	SWEEP (Ch 5)
TIBS	Select GPIB measurement sweep triggering	SWEEP (Ch 5)
TIBSB	Select GPIB measurement sweep triggering and execute trigger buffer	SWEEP (Ch 5)
TIN	Select internal measurement triggering	SWEEP (Ch 5)
TUNE0	Turn tune mode off	SWEEP (Ch 5)
TUNE1	Turn tune mode on	SWEEP (Ch 5)
TUNESWP	Enter number of sweeps in tune mode	SWEEP (Ch 5)
TUNESWP?	Output number of sweeps in tune mode	SWEEP (Ch 5)
TUNEX?	Output tune mode on/off status	SWEEP (Ch 5)
TXX?	Output trigger source	SWEEP (Ch 5)
P1CW?	Output port 1 CW mode in linear cal on/off status	SWEEP - POWER SWEEP (Ch 5)
P1CW0	Turn off port 1 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P1CW1	Turn on port 1 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P1LCOR?	Output port 1 linear cal correction on/off status	SWEEP - POWER SWEEP (Ch 5)
P1LCOR0	Turn off port 1 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P1LCOR1	Turn on port 1 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P1LDONE?	Output port 1 linear power correction Done status	SWEEP - POWER SWEEP (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
P3CW?	Output port 3 CW mode in linear cal on/off status	SWEEP - POWER SWEEP (Ch 5)
P3CW0	Turn off port 3 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P3CW1	Turn on port 3 CW mode in linear cal	SWEEP - POWER SWEEP (Ch 5)
P3LCOR?	Output port 3 linear cal correction on/off status	SWEEP - POWER SWEEP (Ch 5)
P3LCOR0	Turn off port 3 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P3LCOR1	Turn on port 3 linear cal correction	SWEEP - POWER SWEEP (Ch 5)
P3LDONE?	Output port 1 linear power correction done status	SWEEP - POWER SWEEP (Ch 5)
PSDP	Enter number of points drawn in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSDP?	Output number of points drawn in power sweep	SWEEP - POWER SWEEP (Ch 5)
PSFP1	Enter number of frequency points to be skipped during linear power correction for source 1	SWEEP - POWER SWEEP (Ch 5)
PSFP1?	Output number of frequency points to be skipped during linear power correction for source 1	SWEEP - POWER SWEEP (Ch 5)
PSFP3	Enter number of frequency points to be skipped during linear power correction for source 2	SWEEP - POWER SWEEP (Ch 5)
PSFP3?	Output number of frequency points to be skipped during linear power correction for source 2	SWEEP - POWER SWEEP (Ch 5)
PSLC	Perform power sweep linearity calibration	SWEEP - POWER SWEEP (Ch 5)
PSLCP10	Turn power sweep linearity calibration off	SWEEP - POWER SWEEP (Ch 5)
PSLCP11	Turn power sweep linearity calibration on	SWEEP - POWER SWEEP (Ch 5)
PSLCP1DONE?	Output power sweep linearity calibration done status	SWEEP - POWER SWEEP (Ch 5)
PSLCP1X?	Output power sweep linearity calibration on/off status	SWEEP - POWER SWEEP (Ch 5)
PSLCP30	Turn power sweep linearity calibration off	SWEEP - POWER SWEEP (Ch 5)
PSLCP31	Turn power sweep linearity calibration on	SWEEP - POWER SWEEP (Ch 5)
PSLCP3DONE?	Output power sweep linearity calibration done status	SWEEP - POWER SWEEP (Ch 5)
PSLCP3X?	Output power sweep linearity calibration on/off status	SWEEP - POWER SWEEP (Ch 5)
PSNOP1	Enter port 1 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSNOP1?	Output port 1 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSNOP3	Enter port 3 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSNOP3?	Output port 3 nominal offset in power sweep mode	SWEEP - POWER SWEEP (Ch 5)
PSWP	Select power sweep	SWEEP - POWER SWEEP (Ch 5)
SINP	Enter single power	SWEEP - POWER SWEEP (Ch 5)
SINP?	Output single power	SWEEP - POWER SWEEP (Ch 5)
SINP0	Turn off single power mode	SWEEP - POWER SWEEP (Ch 5)
SINP1	Turn on single power mode	SWEEP - POWER SWEEP (Ch 5)
SINPX?	Output single power mode on/off status	SWEEP - POWER SWEEP (Ch 5)
STEPP	Enter power step	SWEEP - POWER SWEEP (Ch 5)
STEPP?	Output power step	SWEEP - POWER SWEEP (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
STOPP	Enter stop power	SWEEP - POWER SWEEP (Ch 5)
STOPP?	Output stop power	SWEEP - POWER SWEEP (Ch 5)
STRTP	Enter start power	SWEEP - POWER SWEEP (Ch 5)
STRTP?	Output start power	SWEEP - POWER SWEEP (Ch 5)
ADDNDSG	Add the next defined segment or go to the next segment	SWEEP - SEGMENTED SWEEP (Ch 5)
CLRDSG	Clear all the defined segments of the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DELLDSG	Delete the last defined segment of the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSG?	Output the active defined segment flag ON/OFF status	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGAVG	Enter the averaging count for the active defined segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGAVG?	Output the averaging count of the active defined segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGDFD	Done specifying discrete frequency ranges for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGDFQ	Enter a single discrete frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGDFQ?	Output the discrete fill single discrete frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFIL	Fill the defined discrete frequency range for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRC	Clear all of the defined discrete frequency ranges for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRI	Enter the segmented sweep discrete fill increment frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRI?	Output the segmented sweep discrete fill increment frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRP	Enter the segmented sweep discrete fill number of points for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRP?	Output the discrete fill number of points for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRS	Enter the discrete fill start frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGFRS?	Output the discrete fill start frequency for the active discrete segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW10	Set the IFBW to 10 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW100	Set the IFBW to 100 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW10K	Set the IFBW to 10 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW1K	Set the IFBW to 1 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW30	Set the IFBW to 30 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW300	Set the IFBW to 300 Hz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DSGIFBW30K	Set the IFBW to 30 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBW3K	Set the IFBW to 3 kHz for the active defined segment in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGIFBWX?	Output the active defined segment IF bandwidth in the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGNO	Set the active defined segment number for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGNO?	Output the active defined segment number for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGOFF	Turn the active defined segment flag OFF	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGON	Turn the active define segment flag ON	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGONDF	Output the number of discrete frequencies	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPTS	Enter the number of points for the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPTS?	Output the number of points of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPWR1	Enter the Source 1 power level for the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPWR1?	Output the Source 1 power level of the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPWR2	Enter the Source 2 power level for the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGPWR2?	Output the Source 2 power level of the active segment	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTP	Enter the stop frequency of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTP?	Output the start frequency of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTRT	Enter the start frequency of the active defined segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
DSGSTRT?	Output the start frequency of the active define segment for the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
OSGLOG	Output the current segmented sweep log	SWEEP - SEGMENTED SWEEP (Ch 5)
PSGLOG	Print the current segmented sweep log	SWEEP - SEGMENTED SWEEP (Ch 5)
SG?	Output the segmented sweep flag on/off status	SWEEP - SEGMENTED SWEEP (Ch 5)
SGAPL	Apply the current define definition of the segmented sweep	SWEEP - SEGMENTED SWEEP (Ch 5)
SGMODE?	Query the segmented sweep define mode	SWEEP - SEGMENTED SWEEP (Ch 5)
SGOFF	Turn the segmented sweep flag OFF	SWEEP - SEGMENTED SWEEP (Ch 5)
SGON	Turn the segmented sweep flag ON	SWEEP - SEGMENTED SWEEP (Ch 5)
SGPTS?	Output the total number of points of all of the applied segments	SWEEP - SEGMENTED SWEEP (Ch 5)
SGSTP?	Output the stop frequency of the last applied segment	SWEEP - SEGMENTED SWEEP (Ch 5)
SGSTRT?	Output the start frequency of the first applied segment	SWEEP - SEGMENTED SWEEP (Ch 5)
ADDGP?	Output instrument GPIB address	UTILITY (Ch 5)
ADDIP?	Output instrument network IP address	UTILITY (Ch 5)
ADDPLT	Enter plotter GPIB address	UTILITY (Ch 5)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
ADDPLT?	Output plotter GPIB address	UTILITY (Ch 5)
ADDPM	Enter power meter GPIB address	UTILITY (Ch 5)
ADDPM?	Output power meter GPIB address	UTILITY (Ch 5)
ANNCOL	Enter the color number for annotation and menu text	UTILITY (Ch 9)
ANNCOL?	Output the color number for annotation and menu text	UTILITY (Ch 9)
BC0	Turn LCD display off (disabled)	UTILITY (Ch 9)
BC1	Turn LCD display on (enabled)	UTILITY (Ch 9)
BCKCOL	Enter the color number for background	UTILITY (Ch 9)
BCKCOL?	Output the color number for background	UTILITY (Ch 9)
BCX?	Output LCD display on/off status	UTILITY (Ch 9)
BEEP0	Disable the instrument beeper on GPIB errors	UTILITY (Ch 9)
BEEP1	Enable the instrument beeper on GPIB errors	UTILITY (Ch 9)
BEEPX?	Output GPIB beep on error enable/disable status	UTILITY (Ch 9)
MKRCOL	Enter the color number for the markers	UTILITY (Ch 9)
MKRCOL?	Output the color number for the markers	UTILITY (Ch 9)
DAC	Enter DAC number of 10 MHz calibration	UTILITY (Ch 9)
DAC?	Output DAC number of 10 MHz calibration	UTILITY (Ch 9)
DATCOL	Enter the color number for data	UTILITY (Ch 9)
DATCOL?	Output the color number for data	UTILITY (Ch 9)
DATE	Enter the system date	UTILITY (Ch 9)
DATE?	Output the system date	UTILITY (Ch 9)
DC1	Display channel 1 and 2 operating parameters	UTILITY (Ch 9)
DC3	Display channel 3 and 4 operating parameters	UTILITY (Ch 9)
DCP	Display calibration parameters 1st page	UTILITY (Ch 9)
DCP1	Display calibration parameters 1st page	UTILITY (Ch 9)
DF2	Display 2.4mm female connector information	UTILITY (Ch 9)
DF3	Display GPC-3.5 female connector information	UTILITY (Ch 9)
DF716	Display 7/16 female connector information	UTILITY (Ch 9)
DFK	Display K female connector information	UTILITY (Ch 9)
DFN	Display N female connector information	UTILITY (Ch 9)
DFN75	Display N Female 75-Ohm connector information	UTILITY (Ch 9)
DFP	Display front panel instrument state	UTILITY (Ch 9)
DFS	Display SMA female connector information	UTILITY (Ch 9)
DFSP	Display special female connector information	UTILITY (Ch 9)
DFT	Display TNC female connector information	UTILITY (Ch 9)
DFV	Display female V Connector information	UTILITY (Ch 9)
DG7	Display GPC-7 male connector information	UTILITY (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
DGS	Display GPIB status information	UTILITY (Ch 9)
DM2	Display 2.4mm male connector information	UTILITY (Ch 9)
DM3	Display GPC-3.5 male connector information	UTILITY (Ch 9)
DM716	Display 7/16 male connector information	UTILITY (Ch 9)
DMK	Display K male connector information	UTILITY (Ch 9)
DMN	Display N male connector information	UTILITY (Ch 9)
DMN75	Display N Male 75-Ohm connector information	UTILITY (Ch 9)
DMS	Display SMA male connector information	UTILITY (Ch 9)
DMSP	Display Special Male connector information	UTILITY (Ch 9)
DMT	Display TNC male connector information	UTILITY (Ch 9)
DMV	Display V male connector information	UTILITY (Ch 9)
DWG	Display waveguide parameters	UTILITY (Ch 9)
GRTCOL	Enter the color number for the graticule	UTILITY (Ch 9)
GRTCOL?	Output the color number for the graticule	UTILITY (Ch 9)
LANG	Enable the specified language support	UTILITY (Ch 9)
LANG?	Query the current language support	UTILITY (Ch 9)
LAYCOL	Enter the color number for overlay data	UTILITY (Ch 9)
LAYCOL?	Output the color number for overlay data	UTILITY (Ch 9)
MNUCOL	Enter the color number for the menu headers	UTILITY (Ch 9)
MNUCOL?	Output the color number for the menu headers	UTILITY (Ch 9)
RSTCOL	Reset color configuration to default	UTILITY (Ch 9)
RSTDAC	Restore frequency from 10 MHz calibration and not save DAC number into BBRAM	UTILITY (Ch 9)
TIME	Enter the system time	UTILITY (Ch 9)
TIME?	Output the system time	UTILITY (Ch 9)
TRCCOL	Enter the color number for memory data	UTILITY (Ch 9)
TRCCOL?	Output the color number for memory data	UTILITY (Ch 9)
WIDE	Use entire display width for graphs	UTILITY (Ch 9)
ALC	Perform ALC loop internal calibration	UTILITY - DIAGNOSTICS (Ch 9)
BAC	Perform backend attenuator calibration	UTILITY - DIAGNOSTICS (Ch 9)
DGT	Display first LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DGT1	Display first LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DGT2	Display second LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DGT3	Display third LCD test pattern	UTILITY - DIAGNOSTICS (Ch 9)
DRL	Diagnostic read latch	UTILITY - DIAGNOSTICS (Ch 9)
DVM	Enter DVM channel number	UTILITY - DIAGNOSTICS (Ch 9)
DWL	Diagnostic write latch	UTILITY - DIAGNOSTICS (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
EDG	End diagnostics mode	UTILITY - DIAGNOSTICS (Ch 9)
EKT	Select external keyboard testing	UTILITY - DIAGNOSTICS (Ch 9)
EXD	Display external A/D input	UTILITY - DIAGNOSTICS (Ch 9)
FPT	Select front panel keypad testing	UTILITY - DIAGNOSTICS (Ch 9)
NFV	Start noise figure verification	UTILITY - DIAGNOSTICS (Ch 9)
NFVNB?	Output noise figure verification NB data	UTILITY - DIAGNOSTICS (Ch 9)
NFVNC?	Output noise figure verification NC data	UTILITY - DIAGNOSTICS (Ch 9)
NFVND?	Output noise figure verification ND data	UTILITY - DIAGNOSTICS (Ch 9)
NFVSB?	Output noise figure verification SB data	UTILITY - DIAGNOSTICS (Ch 9)
NFVSC?	Output noise figure verification SC data	UTILITY - DIAGNOSTICS (Ch 9)
NFVSD?	Output noise figure verification SD data	UTILITY - DIAGNOSTICS (Ch 9)
PRT?	Perform printer test and output status	UTILITY - DIAGNOSTICS (Ch 9)
SDG	Start diagnostics mode	UTILITY - DIAGNOSTICS (Ch 9)
TSALCMS1	Source 1 ALC modulator drive voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSALCMS2	Source 2 ALC modulator drive voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSALCS1	Select source 1 for ALC verification	UTILITY - DIAGNOSTICS (Ch 9)
TSALCS2	Select source 2 for ALC verification	UTILITY - DIAGNOSTICS (Ch 9)
TSALCV	Start source ALC verification	UTILITY - DIAGNOSTICS (Ch 9)
TSBEG	Start diagnostics mode - same as SDG	UTILITY - DIAGNOSTICS (Ch 9)
TSDDSS1	Source 1 reference DDS voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSDDSS2	Source 2 reference DDS voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSDRAM	Start DRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSDSPSRAM	Start DSP SRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSDVMC	Enter DVM channel number - same as DVM	UTILITY - DIAGNOSTICS (Ch 9)
TSEFMEM	Start extended FLASH memory test	UTILITY - DIAGNOSTICS (Ch 9)
TSEND	End diagnostics mode - same as EDG	UTILITY - DIAGNOSTICS (Ch 9)
TSEXTI	Display external A/D input - same as EXD	UTILITY - DIAGNOSTICS (Ch 9)
TSFMEM	Start FLASH memory test	UTILITY - DIAGNOSTICS (Ch 9)
TSGDRAM	Start graphic DRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSGVRAM	Start graphic VRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSHETO	Het oscillator voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLATR?	Diagnostic read latch - same as DRL	UTILITY - DIAGNOSTICS (Ch 9)
TSLATW	Diagnostic write latch - same as DWL	UTILITY - DIAGNOSTICS (Ch 9)
TSLEVAS1	Source 1 level amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLEVAS2	Source 2 level amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLOGAS1	Source 1 logarithmic amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSLOGAS2	Source 2 logarithmic amplifier voltage	UTILITY - DIAGNOSTICS (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
TSMAIVLO1	LO1 main VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSMAIVS1	Source 1 main VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSMAIVS2	Source 2 main VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSMCOO0	Common offset mode off	UTILITY - DIAGNOSTICS (Ch 9)
TSMCOO1	Common offset mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSMHAR0	Harmonic mode off	UTILITY - DIAGNOSTICS (Ch 9)
TSMHAR1	Harmonic mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSMSPA0	Spur avoidance mode off	UTILITY - DIAGNOSTICS (Ch 9)
TSMSPA1	Spur avoidance mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSMSPU0	Speed up circuit mode off	UTILITY - DIAGNOSTICS (Ch 9)
TSMSPU1	Speed up circuit mode on	UTILITY - DIAGNOSTICS (Ch 9)
TSOFFVLO1	LO1 offset VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSOFFVS1	Source 1 offset VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSOFFVS2	Source 2 offset VCO voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSPWRLS1	Source 1 power level DAC voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSPWRLS2	Source 2 power level DAC voltage	UTILITY - DIAGNOSTICS (Ch 9)
TSSRAM	Start SRAM test	UTILITY - DIAGNOSTICS (Ch 9)
TSSRAMD	Start SRAM disk test	UTILITY - DIAGNOSTICS (Ch 9)
TSTRENF	Noise figure measurement	UTILITY - DIAGNOSTICS (Ch 9)
ADRIVE	Select the floppy drive as the default drive	UTILITY - DISK (Ch 9)
CD	Change default directory	UTILITY - DISK (Ch 9)
CDRIVE	Select the hard disk as the default drive	UTILITY - DISK (Ch 9)
COPY	Copy a files contents to another file	UTILITY - DISK (Ch 9)
CPYALLFH	Copy combined hardware cal file from floppy to hard disk	UTILITY - DISK (Ch 9)
CPYALLHF	Copy combined hardware cal file from hard to floppy disk	UTILITY - DISK (Ch 9)
CWD?	Output current working directory string	UTILITY - DISK (Ch 9)
DEL	Delete a file from disk	UTILITY - DISK (Ch 9)
DELALL	Delete combined hardware cal file from floppy disk	UTILITY - DISK (Ch 9)
DELALLH	Delete combined hardware cal file from hard disk	UTILITY - DISK (Ch 9)
DIR	Output a directory listing to the GPIB	UTILITY - DISK (Ch 9)
DISKRD	Output disk file data to the GPIB	UTILITY - DISK (Ch 9)
DISKWR	Write GPIB data to a disk file	UTILITY - DISK (Ch 9)
EXISTD?	Output directory existence information	UTILITY - DISK (Ch 9)
EXISTF?	Output file existence information	UTILITY - DISK (Ch 9)
INT	Initialize (format) floppy disk	UTILITY - DISK (Ch 9)
LKT	Load calibration kit information from floppy disk	UTILITY - DISK (Ch 9)
MD	Create a new disk directory	UTILITY - DISK (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PDR	Print directory listing of the floppy drive	UTILITY - DISK (Ch 9)
PDRH	Print directory listing of the hard drive	UTILITY - DISK (Ch 9)
RCLALL	Recall combined hardware calibration file from floppy disk	UTILITY - DISK (Ch 9)
RCLALLH	Recall combined hardware calibration file from hard disk	UTILITY - DISK (Ch 9)
RD	Remove a disk directory	UTILITY - DISK (Ch 9)
SAVALL	Save combined hardware cal to floppy disk	UTILITY - DISK (Ch 9)
SAVALLH	Save combined hardware cal to hard disk	UTILITY - DISK (Ch 9)
SAVEGC	Save text format gain compression data to disk	UTILITY - DISK (Ch 9)
RVA1	Enter rear panel output voltage value when port 1 is driving	UTILITY - REAR PANEL (Ch 10)
RVA1?	Output rear panel output voltage value when port 1 is driving	UTILITY - REAR PANEL (Ch 10)
RVA2	Enter rear panel output voltage value when port 2 is driving	UTILITY - REAR PANEL (Ch 10)
RVA2?	Output rear panel output voltage value when port 2 is driving	UTILITY - REAR PANEL (Ch 10)
RVA3	Enter rear panel output voltage value when port 3 is driving	UTILITY - REAR PANEL (Ch 10)
RVA3?	Output rear panel output voltage value when port 3 is driving	UTILITY - REAR PANEL (Ch 10)
RVA4	Enter rear panel output voltage value when Port 4 is driving	UTILITY - REAR PANEL (Ch 10)
RVA4?	Output rear panel output voltage value when Port 4 is driving	UTILITY - REAR PANEL (Ch 10)
RVD	Set rear panel output mode to dc value	UTILITY - REAR PANEL (Ch 10)
RVH	Set rear panel output mode to horizontal	UTILITY - REAR PANEL (Ch 10)
RVL	Set rear panel output mode to lock direction	UTILITY - REAR PANEL (Ch 10)
RVP	Set rear panel output mode to driven port	UTILITY - REAR PANEL (Ch 10)
RVSP	Enter rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
FREFE	Select external frequency reference	UTILITY - REAR PANEL (Ch 10)
FREFI	Select internal frequency reference	UTILITY - REAR PANEL (Ch 10)
FREFX?	Output frequency reference internal/external setting	UTILITY - REAR PANEL (Ch 10)
RPO	Enter rear panel DC voltage value	UTILITY - REAR PANEL (Ch 10)
RPO?	Output rear panel DC voltage value	UTILITY - REAR PANEL (Ch 10)
RV0	Turn rear panel output voltage off	UTILITY - REAR PANEL (Ch 10)
RV1	Turn rear panel output voltage on	UTILITY - REAR PANEL (Ch 10)
RV1?	Output rear panel output voltage on/off status	UTILITY - REAR PANEL (Ch 10)
RVSP?	Output rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
RVST	Enter rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
RVST?	Output rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
RVT	Set rear panel output mode to TTL	UTILITY - REAR PANEL (Ch 10)
RVTP1	Select port 1 for TTL rear panel output voltage	UTILITY - REAR PANEL (Ch 10)
RVTP1HL	Set TTL rear panel output voltage type to TTL active high level	UTILITY - REAR PANEL (Ch 10)
RVTP1HP	Set TTL rear panel output voltage type to TTL active high pulse	UTILITY - REAR PANEL (Ch 10)
RVTP1LL	Set TTL rear panel output voltage type to TTL active low level	UTILITY - REAR PANEL (Ch 10)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
RVTP1LP	Set TTL rear panel output voltage type to TTL active low pulse	UTILITY - REAR PANEL (Ch 10)
RVTP1X?	Output TTL rear panel output voltage type	UTILITY - REAR PANEL (Ch 10)
RVTP2	Select port 2 for TTL rear panel output voltage	UTILITY - REAR PANEL (Ch 10)
RVTP2HL	Set TTL rear panel output voltage type on port 2 to TTL active high level.	UTILITY - REAR PANEL (Ch 10)
RVTP2HP	Set TTL rear panel output voltage type on port 2 to TTL active high pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP2LL	Set TTL rear panel output voltage type on port 2 to TTL active low level.	UTILITY - REAR PANEL (Ch 10)
RVTP2LP	Set TTL rear panel output voltage type on port 2 to TTL active low pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP2X?	Output TTL rear panel output voltage type on port 2.	UTILITY - REAR PANEL (Ch 10)
RVTP3	Select port 3 for TTL rear panel output voltage	UTILITY - REAR PANEL (Ch 10)
RVTP3HL	Set TTL rear panel output voltage type on port 3 to TTL active high level.	UTILITY - REAR PANEL (Ch 10)
RVTP3HP	Set TTL rear panel output voltage type on port 3 to TTL active high pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP3LL	Set TTL rear panel output voltage type on port 3 to TTL active low level.	UTILITY - REAR PANEL (Ch 10)
RVTP3LP	Set TTL rear panel output voltage type on port 3 to TTL active low pulse.	UTILITY - REAR PANEL (Ch 10)
RVTP3X?	Output TTL rear panel output voltage type on port 3.	UTILITY - REAR PANEL (Ch 10)
RVTP4	Select Port 4 for TTL rear panel output voltage.	UTILITY - REAR PANEL (Ch 10)
RVTP4HL	Set TTL rear panel output voltage type on port 4 to TTL active high level	UTILITY - REAR PANEL (Ch 10)
RVTP4HP	Set TTL rear panel output voltage type on port 4 to TTL active high pulse	UTILITY - REAR PANEL (Ch 10)
RVTP4LL	Set TTL rear panel output voltage type on port 4 to TTL active low level	UTILITY - REAR PANEL (Ch 10)
RVTP4LP	Set TTL rear panel output voltage type on port 4 to TTL active low pulse	UTILITY - REAR PANEL (Ch 10)
RVTP4X?	Output TTL rear panel output voltage type on port 4	UTILITY - REAR PANEL (Ch 10)
RVTPX?	Output TTL rear panel output voltage type	UTILITY - REAR PANEL (Ch 10)
RVV	Set rear panel output mode to vertical	UTILITY - REAR PANEL (Ch 10)
RVX?	Output rear panel output mode	UTILITY - REAR PANEL (Ch 10)
VSP	Enter rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
VSP?	Output rear panel stop voltage value	UTILITY - REAR PANEL (Ch 10)
VST	Enter rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
VST?	Output rear panel start voltage value	UTILITY - REAR PANEL (Ch 10)
CSL	Clear service log	UTILITY - SERVICE LOG (Ch 9)
OSL	Output service log	UTILITY - SERVICE LOG (Ch 9)

Table 2. *Functional Listing of Programming Codes (Mnemonics)*

Command	Description	Function
PEL	Print the error list	UTILITY - SERVICE LOG (Ch 9)
PSL	Print the service log	UTILITY - SERVICE LOG (Ch 9)


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Appendix C
HP8753D Language Support

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Appendix C
HP8753D Language Support

C-1 INTRODUCTION

This appendix provides information and commands supporting the Hewlett-Packard 8753D language support.

C-2 GENERAL

The 8753D mode is designed for maximum flexibility in controlling both MS462X series and 8753D instruments from a single ATE program. This programming guide will prove helpful as you begin updating 8753D programs to also support your MS462X VNA. It will be helpful as you read this information to keep in mind that you are programming a MS462X VNA that also accepts a subset of the 8753D commands.

This means:

- You will need to know how the instrument operates in the 8753D support mode and how to invoke that mode.
- You will need to learn the 488.2 style programming that the MS462X follows. Fortunately, if you have programmed any other 488.2 compliant instrument, you already know how to program the MS462X.
- You will need to note the differences in supported measurement functions that you are using in your ATE application and account for them.

C-3 ATE PROGRAM STRUCTURE AND COMMAND OVERVIEW

The first thing you'll need to do is add the language mode selection command to your program. This is `LANG "8753D"`. To turn off the 8753D support mode, issue the command `LANG "NATIVE"`. Note that changing language mode does not change the instrument front panel state. If you want the default 8753D state, just issue the reset command after changing the language mode. The MS462X will automatically detect the current mode and perform the reset actions accordingly.

The MS462X will always respond to the 8753D's identification commands by issuing its MS462X identification string. It will do this regardless of the current language mode. The response is the standard IEEE 488.2 identification string format, see the *IDN? Command in Chapter 11 of this manual. The idea is you can always detect whether a MS462X is connected and dynamically switch it to the 8753D language mode from your ATE program.

All MS462X GPIB commands are supported during the 8753D mode. This will allow you to easily add a switch statement in your program so you can use MS462X features not available on the 8753D. It will also allow you to use the native MS462X command set to perform 8753D functions not supported in the 8753D mode. (The MS462X supports approximately 300 of the most commonly used 8753D commands). You can therefore make small incremental upgrades to your existing 8753D application program as you need them but at the same time begin using the MS462X immediately without having to learn most of its functions or data transfer or status reporting protocols. Note that identical commands (commands whose syntax is exactly the same in both instruments) are executed according to the currently set mode.

NOTE

- Language selection is from front panel: Utility key and REMOTE INTERFACE softkey.
- The RST0 command will reset the language to the native mode.
- Cycling power will preserve the current language mode.

There are differences in power range, frequency range, scaling, and other "ranges" between the two instruments. These differences also vary according to specific models and installed options. In general, as long as you stay within ranges of the currently connected MS462X model, it will accept the setting requested. For the most part, out of range setting requests will cause the currently connected instrument's closest settings to be used.

C-4 PROGRAMMING PROTOCOLS

The MS462X complies to the widely accepted IEEE 488.2 standard, where as the 8753D does not. This means you will likely need to make one or more of the following adjustments to your program to be able to properly communicate with the MS462X. These changes should also work with an 8753D as it has a loosely defined communication protocol. Key differences are noted below for quick reference. Refer to Chapter 1 of this manual for complete information on IEEE 488.2 programming protocols.

Ensure each program message is terminated properly; that is, use a linefeed character (NL, 0xA) at the end of each program message. You should also set EOI at the end of each transmission. Note that EOI and termination character detection are usually set up at the GPIB board driver level prior to running your application. Refer to the GPIB board manufacturer's manual for details.

Always use a single semicolon (the character ";") between consecutive commands within a program message. You should not use semicolons

at the end of a program message, although the MS462X will not complain if you do.

Be sure to send complete commands; that is, you must send a mnemonic and its data without a semicolon (";"), a linefeed (NL, 0xA), or an EOI separating them. For example:

```
STAR;1000 MHZ
```

is invalid because the 1000 MHZ is data for the STAR mnemonic so it should not be separated with a semicolon. The correct way to separate a command and its data is to use a space:

```
STAR 1000 MHZ
```

You should also have a space between the data and its units terminator code (such as MHZ or GHZ).

Timing Operation execution times will naturally vary between the two instruments (they are different platforms) so you may have to adjust fixed wait times in your program. For example, a reset operation on the MS462X takes longer to complete than on the 8753D. If your timeout setting for the GPIB driver is set too low, a function that is waiting for a reset to complete before the output from an OPC? command arrives (i.e.: OPC?;RST) will timeout prematurely and produce a timeout error. Since it will have timed out without having read the data requested (the 1 from the OPC?), it will cause the MS462X to generate a QUERY error the next time you send a new program message. This is a defined error condition in the IEEE 488.2 protocol. See Chapters 2 and 3 of this manual to get information on various ATE timeout programming techniques and other protocol error conditions you should be aware of.

C-5 DATA INPUT/OUTPUT PROTOCOLS AND EXCEPTION CONDITIONS

The MS462X performs data IO in accordance with the IEEE 488.2 at all times. In general this should not impact most programs that input commands and consume the data produced in an orderly fashion. This heading covers the essential exception conditions that may impact your program as the 8753D does not handle these types of conditions with a defined protocol.

Outputs from the MS462X will always terminate with a line feed (NL, 0xA) character and will concurrently set the EOI line true. This means normal data transfer sizes will be (as produced by the 8753D) +1. The additional character is the line feed (0xA). Although you should read the additional byte out of the MS462X, it will continue to function if you do not. More on this later.

Commands producing Arbitrary ASCII Data (headerless ASCII streams) must be the last output command in a program message. This is an IEEE 488.2 requirement that is needed because the data

contents, being ASCII data, may contain a semicolon and thus your application program would have no way of distinguishing whether this is data or a separator between two output elements. Examples of this data type include data strings produced by the IDN? and OUTPERRO commands. This should not be a problem to a program written for the 8753D as it has a single response output buffer; that is, each output will overwrite the buffer and remain there until read. Commands that produce numeric ASCII data (such as POIN?) are not impacted by this condition since their numeric output can not contain a semicolon as part of the data. Also, commands that produce block data outputs are not impacted by this condition, since the data is preceded by a header defining the length of the data block.

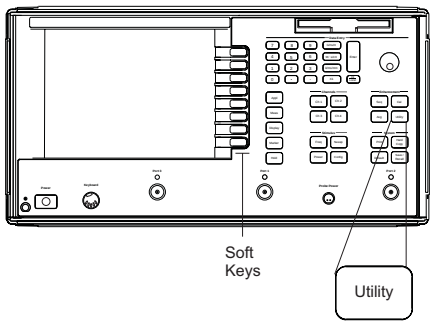
The MS462X has a dynamic output buffer that holds all the data produced from a single program message (with one exception as stated above). All data in the output buffer must be consumed prior to inputting additional program messages or a QUERY error will be produced before the newly arriving program message is processed. This is an IEEE 488.2 rule that ensures data requested by one program message is not sent to a second newly arriving program message. Although the buffer will be emptied if a new program message is received, the MS462X will not generate an error message if it is in the 8753D mode. Therefore, you should read all the data produced from a program message prior to sending another one.

C-6 HANDLING PROGRAMMING PROBLEMS

The following text describes what to do if you encounter programming problems.

Service Log

The first thing to do when you get an error (including GPIB errors) on the MS462X is to read the Service Log. It is accessible from the front panel, as follows:



Step 1. Press the Utility key (left).

Step 2. Press the **DIAGNOSTICS, SERVICE LOG,** then **DISPLAY LOG** soft keys.

The Service Log is a plain-text, circular log that maintains error message information in nonvolatile memory until you clear it or it fills up (oldest errors will be overwritten). The log can be printed or saved to floppy disk for later viewing. All log operations including front panel operations can be accessed remotely. In addition, the complete service log, an error message listing, or just the number of errors in the log can be output from the MS462X by using the mnemonics OSL, OEL, and ONE, respectively. See Chapter 8 of this manual for more information on these and other error reporting commands and the useful information they provide.

Command Errors If you get "Command Errors" you are probably trying to execute a command that was not found in the MS462X's command tables. This includes trying to send an unsupported 8753D command, forgetting to set the 8753D mode using `LANG "8753D"`, or improperly terminating or separating commands from each other or from their data elements. The service log will be extremely helpful in quickly identifying your programming errors, both during and after development of your ATE application.

Query Errors If you get "Query Errors" you are probably violating some of the data input or output rules.

Execution or Device Errors If you get "Execution Errors" you are probably attempting to do something the MS462X can not do, such as encountering a range violation or issuing a command the MS462X can not execute in its current state.

The OUTPERRO command (which outputs and deletes the most recent error message from the error queue) is also supported and for the most part, its normal format is adhered to. However, its output data contents (message number and text) follow the defined MS462X error data. Also error generation conditions are as defined for the MS462X. Refer to Chapter 13 of this manual for a listing of error messages. Note that the OUTPERRO command has a separate queue; consequently, it does not destroy the error information in the main service log.

C-7 UNSUPPORTED FEATURES

The following 8753D commands are not supported in the 8753D language mode.

- Uncoupled operation (channel, port, power, frequency, alt sweep, markers, etc.)
- Power slope and sweep
- Sequence (Macros)
- Harmonics
- Frequency offset
- Sweep time
- Calibration process sequencing
- Transform (Time Domain)

C-8 GENERAL OPERATIONAL RESTRICTIONS

Internal data formats of the 8753D are not supported in the MS462X. Supported 8753D data transfer commands that transfer internal-use-only data such as learn strings will transfer data in the MS462X internal format. This should have little impact on ATE programs since the data is not intended for parsing or decoding. However, the sizes of the data transfers are different so fixed transfer buffers in your pro-

gram will need to be adjusted accordingly. See the equivalent MS462X commands in Chapter 11 for sizes of the data transfers. Also, note that only MS462X data will be accepted by such commands.

Similarly, hardcopy output and save/recall operations to and from storage locations (i.e. printers, plotters, memory registers, and disk files) will be accomplished in the native MS462X data formats. This means prints, plots, and saved disk files from a MS462X will not resemble the 8753D prints, plots, and files.

Support is not provided for commands that alter display presentation. Examples of this include: log frequency sweep, marker zero, and display of user graphics and instructions.

C-9 SUPPORTED FEATURES AND COMMANDS

The following tables list the supported set of 8753D commands by functional area. See next heading for an alphabetical listing of supported commands.

The names and order of the groups listed below are the same as those listed in the 8753D's HP-IB Command Reference Manual (tables 1-1, 1-2, and 1-3). These names also correspond to the 8753D front panel naming convention; that is, key groups, keys, and menus.

Each group identifies operations within it that are not supported, as well as significant differences or limitations from 8753D behavior. In general, range differences (scale, power, etc.) are not identified unless operational characteristics are impacted (Example: IF Bandwidth range settings). Also all commands and features identified below are subject to the general restrictions and limitations stated earlier (heading D-8). Query versions of the commands (where defined by the 8753D) are generally supported.

Avg Averaging is accomplished on a point-by-point basis versus the 8753D sweep-by-sweep approach. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Averaging	Restart	AVERREST	
Averaging	Factor	AVERFACT	Factor is number of measurements at each point
Averaging	On/Off	AVERO	
Smoothing	Set Aperture	SMOOAPER	
Smoothing	On/Off	SMOOO	
IF Bandwidth	Set IF Bandwidth	IFBW	Rounded to 30, 300, 3000

Error Correction, Calibration

Turning calibration correction on and off and setting velocity factor are the only supported operations. Ability to sequence or perform a calibration and calibration kits are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Correction	On/Off	CORR	
Velocity Factor	Set Value	VELOFACT	

Power Meter (Test Port) Calibration

Only the following commands are supported: per sweep calibration power leveling, and power loss and calibration sensor table/segment editing. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Power Meter calibration	Off	PWMCOFF	
Power Meter calibration	One Sweep	PWMCONES	
Power Meter calibration	Take calibration Sweep	TAKCS	
Power Meter calibration	Number Of Readings	NUMR	accepted but ignored
Power Meter calibration	Set Port calibration Power	PWRMCAL	

Channel

Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Channel	CH 1 Active	CHAN1	
Channel	CH 2 Active	CHAN2	remapped to channel 3

Copy

Printer and plotter Autofeed (On/Off), color printing, line type selection (solid=>dotted), and plot scale (full/grat) are not supported. List values display not supported but will be printed in MS462X text format. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Copy Display	To Printer	PRINALL	
Copy Display	To Plotter	PLOT	
Quadrant	Left Lower	LEFL	
Quadrant	Left Upper	LEFU	

Quadrant	Right Lower	RIGL	
Quadrant	Right Upper	RIGU	
Quadrant	Full Page	FULP	

Display Beeper, CRT (to include titling), adjust display, modify colors, adjust colors, and ratioed channels display (D2/D1 => D2) are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Channel	Dual on/off	DUAC	channel 1&3 or 2&4 only
Display	Data	DISPDATA	
Display	Memory Only	DISPMEMO	
Display	Data And Mem	DISPDATM	
Display	Data/Mem	DISPDDM	
Display	Data-Mem	DISPDMM	
Display	Data to Mem	DATI	
Freq notation	Blank	FREO	

Format The graph type is tied to the S-parameter measurement selection on a per channel basis. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Format	Log mag	LOGM	
Format	Phase	PHAS	
Format	Delay	DELA	
Format	Smith chart	SMIC	
Format	Polar	POLA	
Format	Lin mag	LINM	
Format	Real	REAL	
Format	Imaginary	IMAG	
Format	SWR	SWR	

Local HP-IB modes (Talker/Listener, Controller), Debug (GPIB commands display), Disk Drive (Unit/Volume), Plotter Type, Paint Jet Printer Type, Printer/Plotter Port Selection (Serial, Parallel, HP-IB), Serial Port, and Parallel Port programming are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
HP-IB Addresses	Plotter	ADDRPLOT	
HP-IB Addresses	Power Meter	ADDRPOWM	
Printer Type	ThinkJet	PRNTYPTJ	Also drives QuietJet
Printer Type	DeskJet	PRNTYPDJ	B/W only; Same command as LaserJet
Printer Type	LaserJet	PRNTYPLJ	II and III series only; Same command as DeskJet
Printer Type	Epson-P2	PRNTYPEP	FX, MX, and compatibles

Meas (Measure) Conversion to alternate parameters and analog input are not supported. Changing a user defined parameter will change all instances of that measurement parameter on all channels currently displaying it.

Menu (Stimulus) Uncoupled power and port, power trip, sweep time, trigger on point, uncoupled channels, power slope, log sweep, CW time sweep and power sweep are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Power	Level	POWE	
Power	Ranges 0-7	PRAN	
Power	Power range auto/manual	PWRR	
Measurement	Restart	REST	
Trigger	Hold	HOLD	
Trigger	Single	SING	
Trigger	Number of groups	NUMG	Always sweeps once, query returns 1
Trigger	Continuous	CONT	
Trigger	External trigger off	EXTOFF	
Trigger	External trigger on	EXTON	
Points	Specify number of points	POIN	
Sweep type	linear	LINFREQ	

Marker Marker zero, fixed marker position, and coupled markers are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Select active	1 to 6	MARK	
Select active	All off	MARKOFF	
Delta reference	1 to 6	DELR	Displayed delta value sign is neg of MS462X
Delta reference	Mode off	DELO	
Marker placement	continuous	MARKCONT	
Marker placement	discrete	MARKDISC	Not allowed in filter and search modes
Displayed	On/Off	DISM	
Polar markers	Lin	POLMLIN	
Smith markers	Linear	SMIMLIN	
Smith markers	Log	SMIMLOG	

Marker Function

Target, search left/right, width and tracking search, and marker statistics are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Set Function To Marker Value	Start	MARKSTAR	
Set Function To Marker Value	Stop	MARKSTOP	
Search	Off	SEAOFF	Not applicable
Search	Maximum	SEAMAX	Only allowed in log mag format
Search	Minimum	SEAMIN	Only allowed in log mag format

Save/Recall, Internal Registers

Register clear and title functions are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Save	Selected reg	SAVE	
Save	Selected reg	SAVEREG	Range is 1 10 only
Recall	Selected reg	RECA	
Recall	Selected reg	RECAREG	Range is 01 10 only

Disk Files

Save format (ASCII/Citifile/binary), LIF format, raw data and user graphics storage, and external disk are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Purge	Selected file	PURG	
Store	To disk	STOR	
Title	Disk file	TITF	
Include with disk files	Formatted data	EXTMFORM ON/OFF	
Include with disk files	Data only	EXTMDATO ON/OFF	
Load	From disk	LOAD	
Initialize	Internal disk	INID	
Select storage	Internal disk	INTD	
Select storage	Internal memory	INTM	
Save format	Save as ASCII	SAVUASCI	only format supported

Scale Reference

Phase offset is not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Scale	Auto	AUTO	
Scale	Value	SCAL	
Reference	Position	REFP	Range is 0 8 only
Reference	Value	REFV	
Delay	Set Delay	ELED	

Stimulus

Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Stimulus	Center	CENT	
Stimulus	Span	SPAN	
Stimulus	Start	STAR	
Stimulus	Stop	STOP	

System

Instrument mode (receiver), and service (analog bus) operations are not supported. Harmonic mode and frequency offset (mixer mode) also not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Set Clock	Time Stamp	TIMESTAM	
Set Clock	Set Date	SETDATE	
Set Clock	Set Time	SETTIME	

System - Limit Testing

Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Limit line	on/off	LIMILINE	
Limit test	on/off	LIMITEST	
Limit test	Beeper	BEEPFAIL	
Limit offset	Stimulus	LIMISTIO	
Limit offset	Amplitude	LIMIAMPO	

HP-IB Only, Miscellaneous Group

Key and key code query, revision display, learn string revision, sampler correction, and external trigger polarity selection are not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Identity	Output ID string	IDN?	Outputs Anritsu information
No operation	No operation	NOOP	
On Completion	Report Completion of Last OPC[?]-compatible command	OPC	
Preset	Resets instrument	PRES	
Reset	Resets instrument	RST	
Wait	Delay	WAIT	

HP-IB Only, Output Group

The following outputs are not supported: active function, interpolative calibration data, calibration kit, power meter interpolative calibration data, key code, external source frequency, sequencing, memory, marker statistics, and display title. Data for saved calibrations and other internal data and setups will be in the MS462X native format.

Function	Action	Mnemonic	Differences/Limitations
Error Coefficient	Output Error Coefficient Array	OUTPCALC	
Data	Output Corrected Data	OUTPDATA	
Error	Output Error	OUTPERRO	
Formatted	utput Formatted Data	OUTPFORM	Non-displayed parameter values are zeroed out. Use dual parameter graph setting if both data values are desired.
Identity	Output Identify String	OUTPIDEN	Outputs MS462X identity string
Learn String	Output Learn String	OUTPLEAS	Use MS462X's OCF/ICF if resending setup back in.
Limit failures	Output limit failure points only	OUTPLIMF	
Limit list	Output limit results for all points	OUTPLIML	
Limit marker	Output limit results at the marker	OUTPLIMM	
Marker	Output Marker Data	OUTPMARK	Non-displayed parameter value is zeroed out. Use dual parameter graph setting if both data values are desired.
Clock	Output Date	READDATE	
Clock	Output Time	READTIME	
Plot	Output Plot String in HP-GL	OUTPPLOT	
Raw Data	Outputs Uncorrected Data Array	OUTPRAW1	
Raw Data	Outputs Uncorrected Data Array	OUTPRAW2	

Function	Action	Mnemonic	Differences/Limitations
Raw Data	Outputs Uncorrected Data Array	OUTPRAW3	
Raw Data	Outputs Uncorrected Data Array	OUTPRAW4	
Status Byte	Output Status Byte	OUTPSTAT	

HP-IB Only, Output Formats

Internal binary data array format (FORM1) not supported. Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Output Format	32 Bit Floating Point	FORM2	Default reset setting
Output Format	64 Bit Floating Point	FORM3	
Output Format	ASCII, no header	FORM4	
Output Format	32 Bit Floating Point, PC	FORM5	

HP-IB Only, Status Reporting

The following status events are not supported: Status Byte: Bits 0 and 1 (Reverse Get, Forward Get); Event Status Register B: Bits 1 and 2 (Service Routine Waiting, Data Entry Complete); Event Status Register: Bits 1, 3, and 6 (Request Control, Sequence, User Request). Supported commands are shown below.

Function	Action	Mnemonic	Differences/Limitations
Clear	Clear Status Byte	CLES	
Interrogate	Return Event Status Register B	ESB?	
Interrogate	Return Event Status Register	ESR?	
Interrogate	Return Status Byte	OUTPSTAT	
Enable	Enable Event Status Register	ESE	
Enable	Enable Event Status Register B	ESNB	
Enable	Enable SRQ	SRE	

C-10 ALPHABETICAL COMMAND LISTING

The following is an alphabetical listing of supported 8753d commands, queries, and data entry terminator codes.

Mnemonic	Description
ADDRPLOT	Select plotter address
ADDRPLOT?	Output plotter address
ADDRPOWM	Select power meter address
ADDRPOWM?	Output power meter address
AUTO	Autoscale the active channel display
AVERFACT	Enter averaging count
AVERFACT?	Output averaging count
AVERO?	Output averaging on/off
AVEROOFF	Turn averaging off
AVEROON	Turn averaging on
AVERREST	Restart sweep
BEEPFAIL?	Output limits testing beeper enable status
BEEPFAILOFF	Turn limits testing beep on failure off
BEEPFAILON	Turn limits testing beep on failure on
CENT	Enter center frequency
CENT?	Output center frequency
CHAN1	Select channel 1 as active channel
CHAN2	Select channel 3 as active channel
CLES	Clear Status Byte and Structures
CLS	Clear Status Byte and Structures
CONT	Continue sweeping from current point
CONT?	Output the sweep continue state
CORR?	Output error correction on/off status
CORROFF	Turn error correction off
CORRON	Turn error correction on
DATI	Store trace to memory on active channel
DATI?	Query if trace stored to memory on active channel
DB	Suffix sets power data type
DELA	Select group delay displayed for active channel

Mnemonic	Description
DELA?	Query if group delay displayed for active channel
DELO	Turn marker delta reference mode off
DELO?	Output marker delta reference mode on/off status
DELR1	Select marker 1 as Delta Reference marker
DELR1?	Output marker 1 delta on/off status
DELR2	Select marker 2 as Delta Reference marker
DELR2?	Output marker 2 delta on/off status
DELR3	Select marker 3 as Delta Reference marker
DELR3?	Output marker 3 delta on/off status
DELR4	Select marker 4 as Delta Reference marker
DELR4?	Output marker 4 delta on/off status
DELR5	Select marker 5 as Delta Reference marker
DELR5?	Output marker 5 delta on/off status
DELR6	Select marker 6 as Delta Reference marker
DELR6?	Output marker 6 delta on/off status
DISM?	Output marker display on/off status
DISMOFF	Turn marker display off
DISMON	Turn marker display on
DISPDATA	Display data only on active channel
DISPDATA?	Query data only displayed on active channel
DISPDATM	Display measurement data and trace memory on active channel
DISPDATM?	Query measurement data and trace memory visible on active channel
DISPDDM	Select division as trace math for active channel
DISPDDM?	Query division as trace math for active channel
DISPDMM	Select subtraction as trace math for active channel
DISPDMM?	Query subtraction as trace math for active channel
DISPMEMO	Display trace memory on active channel
DISPMEMO?	Query trace memory visible on active channel
DUAC?	Query dual channel display
DUACOFF	Select single channel display
DUACON	Select dual channel display

Mnemonic	Description
ELED	Enter reference delay in time for active channel
ELED?	Output reference delay in time for active channel
ESB?	Output the Event Status Register B value
ESE	Enter the Event Status Register Enable mask
ESE?	Output the Event Status Register Enable mask
ESNB	Enter the Event Status Register B Enable mask
ESNB?	Output the Event Status Register B Enable mask
ESR?	Output the Event Status Register value
EXTMDATO?	Output formatted data only on/off setting
EXTMDATOOFF	Exclude formatted data only with file save
EXTMDATOON	Include formatted data only with file save
EXTMFORM?	Output formatted data on/off setting
EXTMFORMOFF	Exclude formatted data with file save
EXTMFORMON	Include formatted data with file save
EXTOFF	Select internal measurement triggering
EXTOFF?	Output internal trigger state
EXTON	Select external measurement triggering
EXTON?	Output external trigger state
FORM2	Select 32 bit floating point binary transfer with most significant byte first
FORM3	Select 64 bit floating point binary transfer with most significant byte first
FORM4	Select ASCII numeric data transfer
FORM5	Select 32 bit floating point binary transfer with least significant byte first
FREQO	Blank frequency information
FS	Suffix sets time data type and scales by 1E-15
FULP	Select full page plots
FULP?	Query full page plots
GHZ	Suffix sets frequency data type and scales by 1E9
HOLD	Put sweep into hold mode
HOLD?	Output the sweep hold status
HZ	Suffix sets frequency data type

Mnemonic	Description
IDN?	Output the instrument identification string
IFBW	Set I.F. bandwidth
IFBW?	Output I.F. bandwidth setting
IMAG	Select imaginary display for active channel
IMAG?	Query if imaginary displayed for active channel
INID	Initialize (format) floppy disk
INTD	Select internal disk for storage
INTM	Select internal memory for storage
KHZ	Suffix sets frequency data type and scales by 1E3
LEFL	Select lower left quadrant for plots
LEFL?	Query lower left quadrant for plots
LEFU	Select upper left quadrant for plots
LEFU?	Query upper left quadrant for plots
LIMIAMPO	Enter segmented limits vertical offset
LIMIAMPO?	Output segmented limits vertical offset
LIMILINEOFF	Limits display off
LIMILINEON	Limits display on
LIMISTIO	Enter segmented limits horizontal offset
LIMISTIO?	Output segmented limits horizontal offset
LIMITEST?	Output limits testing enable status
LIMITESTOFF	Turn limits testing off
LIMITESTON	Turn limits testing on
LINFREQ	Select linear sweep
LINFREQ?	Output linear sweep on/off status
LINM	Select linear magnitude display for active channel
LINM?	Query if linear magnitude displayed for active channel
LOAD1	Load front panel setup and calibration from file 1
LOAD2	Load front panel setup and calibration from file 2
LOAD3	Load front panel setup and calibration from file 3
LOAD4	Load front panel setup and calibration from file 4
LOAD5	Load front panel setup and calibration from file 5
LOGM	Select log magnitude display for active channel

Mnemonic	Description
LOGM?	Query log magnitude display used for active channel
MARK1	Turn marker 1 on, make it the active marker and optionally set frequency
MARK1?	Output marker 1 stimulus value
MARK2	Turn marker 2 on, make it the active marker and optionally set frequency
MARK2?	Output marker 2 stimulus value
MARK3	Turn marker 3 on, make it the active marker and optionally set frequency
MARK3?	Output marker 3 stimulus value
MARK4	Turn marker 4 on, make it the active marker and optionally set frequency
MARK4?	Output marker 4 stimulus value
MARK5	Turn marker 5 on, make it the active marker and optionally set frequency
MARK5?	Output marker 5 stimulus value
MARK6	Turn marker 6 on, make it the active marker and optionally set frequency
MARK6?	Output marker 6 stimulus value
MARKCONT	Select interpolated marker functionality
MARKCONT?	Output marker continuous on/off status
MARKDISC	Select discrete marker functionality
MARKDISC?	Output marker discrete on/off status
MARKOFF	Turn all markers off
MARKOFF?	Query markers off
MARKSTAR	Set sweep/zoom start frequency distance or time to active marker
MARKSTOP	Set sweep/zoom stop frequency distance or time to active marker
MHZ	Suffix sets frequency data type and scales by 1E6
MS	Suffix sets time data type and scales by 1E-3
NOOP	Do nothing
NS	Suffix sets time data type and scales by 1E-9
NUMG	Execute a number of sweeps

Mnemonic	Description
NUMR	Enter number of readings per point during flat power calibration
NUMR?	Output number of readings per point during flat power correction
OPC	Initiate the operation complete sequence
OPC?	Initiate the operation complete query sequence
OUTPCALC01	Output calibration coefficient 1
OUTPCALC02	Output calibration coefficient 2
OUTPCALC03	Output calibration coefficient 3
OUTPCALC04	Output calibration coefficient 4
OUTPCALC05	Output calibration coefficient 5
OUTPCALC06	Output calibration coefficient 6
OUTPCALC07	Output calibration coefficient 7
OUTPCALC08	Output calibration coefficient 8
OUTPCALC09	Output calibration coefficient 9
OUTPCALC10	Output calibration coefficient 10
OUTPCALC11	Output calibration coefficient 11
OUTPCALC12	Output calibration coefficient 12
OUTPDATA	Output corrected data for active channel parameter
OUTPERRO	Output error message
OUTPFORM	Output final data for active channel parameter
OUTPIDEN	Output the instrument identification string
OUTPLEAS	Output current front panel setup
OUTPLIMF	Output limit test results for each failed point
OUTPLIML	Output limit test failure results for each point in the sweep
OUTPLIMM	Output limit test failure results at the marker
OUTPMARK	Output the active marker values
OUTPPLOT	Output HPGL format data to GPIB
OUTPRAW1	Output current parameter raw data (or S11 if 12T cal is on)
OUTPRAW2	Output raw S21 data if 12-term calibration is active
OUTPRAW3	Output raw S12 data if 12-term calibration is active
OUTPRAW4	Output raw S22 data if 12-term calibration is active
OUTPSTAT	Output the Status Byte value

Mnemonic	Description
PHAS	Select phase display for active channel
PHAS?	Query if phase displayed for active channel
PLOT	Plot entire screen
POIN	Set number of data points
POIN?	Output number of points setting
POLA	Select linear polar display for active channel
POLA?	Query if linear polar displayed for active channel
POLMLIN	Select linear marker readout for polar graphs
POLMLIN?	Query linear marker readout for polar graphs
POWE	Enter port 1 source power level
POWE?	Output port 1 source power level
PRAN0	Set port 1 source attenuator to 0 dB
PRAN1	Set port 1 source attenuator to 10 dB
PRAN2	Set port 1 source attenuator to 20 dB
PRAN3	Set port 1 source attenuator to 30 dB
PRAN4	Set port 1 source attenuator to 40 dB
PRAN5	Set port 1 source attenuator to 50 dB
PRAN6	Set port 1 source attenuator to 60 dB
PRAN7	Set port 1 source attenuator to 70 dB
PRES	Instrument reset
PRINALL	Copy display to printer
PRNTYPDJ	Select Hp DeskJet printer
PRNTYPEP	Select Epson FX printer
PRNTYPLJ	Select Hp LaserJet printer
PRNTYPTJ	Select Hp ThinkJet printer
PS	Suffix sets time data type and scales by 1E-12
PURG1	Delete file 1
PURG2	Delete file 2
PURG3	Delete file 3
PURG4	Delete file 4
PURG5	Delete file 5
PWMCOFF	Turn flat power calibration off

Mnemonic	Description
PWMCONES	Turn flat power calibration on
PWMCONES?	Output flat power calibration on/off status
PWRMCAL	Enter the target power for flat power calibration
PWRMCAL?	Output the target power for flat power calibration
PWRR?	Output port 1 automatic attenuator on/off status
PWRRPAUTO	Turn port 1 automatic attenuator range on
PWRRPMAN	Turn port 1 automatic attenuator range off
READDATE	Output the system date
READTIME	Output the system time
REAL	Select real display for active channel
REAL?	Query if real displayed for active channel
RECA1	Recall front panel setup number 1 from memory
RECA2	Recall front panel setup number 2 from memory
RECA3	Recall front panel setup number 3 from memory
RECA4	Recall front panel setup number 4 from memory
RECA5	Recall front panel setup number 5 from memory
RECAREG01	Recall front panel setup number 1 from memory
RECAREG10	Recall front panel setup number 10 from memory
RECAREG02	Recall front panel setup number 2 from memory
RECAREG03	Recall front panel setup number 3 from memory
RECAREG04	Recall front panel setup number 4 from memory
RECAREG05	Recall front panel setup number 5 from memory
RECAREG06	Recall front panel setup number 6 from memory
RECAREG07	Recall front panel setup number 7 from memory
RECAREG08	Recall front panel setup number 8 from memory
RECAREG09	Recall front panel setup number 9 from memory
REFP	Enter reference line for top graph of active channel
REFP?	Output reference line for top graph of active channel
REFV	Enter offset value for top graph of active channel
REFV?	Output offset value for top graph of active channel
REST	Restart averaging
RIGL	Select lower right quadrant for plots

Mnemonic	Description
RIGL?	Query lower right quadrant for plots
RIGU	Select upper right quadrant for plots
RIGU?	Query upper right quadrant for plots
S	Suffix sets time data type
S11	Select S11
S11?	Query if S11 selected on active channel
S12	Select S12
S12?	Query if S12 selected on active channel
S21	Select S21
S21?	Query if S21 selected on active channel
S22	Select S22
S22?	Query if S22 selected on active channel
SAVE1	Save front panel setup number 1 to memory
SAVE2	Save front panel setup number 2 to memory
SAVE3	Save front panel setup number 3 to memory
SAVE4	Save front panel setup number 4 to memory
SAVE5	Save front panel setup number 5 to memory
SAVEREG01	Save front panel setup number 1 to memory
SAVEREG10	Save front panel setup number 10 to memory
SAVEREG02	Save front panel setup number 2 to memory
SAVEREG03	Save front panel setup number 3 to memory
SAVEREG04	Save front panel setup number 4 to memory
SAVEREG05	Save front panel setup number 5 to memory
SAVEREG06	Save front panel setup number 6 to memory
SAVEREG07	Save front panel setup number 7 to memory
SAVEREG08	Save front panel setup number 8 to memory
SAVEREG09	Save front panel setup number 9 to memory
SAVUASCI	Save files as ASCII
SCAL	Enter Scale Resolution for top graph of active channel
SCAL?	Output Scale Resolution for top graph of active channel
SEAMAX	Move active marker to maximum trace value
SEAMAX?	Output marker search for maximum on/off status

Mnemonic	Description
SEAMIN	Move active marker to minimum trace value
SEAMIN?	Output marker search for minimum on/off status
SEAOFF	Turn marker search off
SEAOFF?	Output marker search on/off status
SETDATE	Enter the system date
SETTIME	Enter the system time
SING	Put into single sweep mode
SMIC	Select smith chart for active channel
SMIC?	Query if smith chart displayed for active channel
SMIMLIN	Select admittance marker readout for smith charts
SMIMLOG	Select impedance marker readout for smith charts
SMOOAPER	Enter smoothing aperture
SMOOAPER?	Output smoothing aperture
SMOOO?	Output smoothing on/off
SMOOOOFF	Turn smoothing off
SMOOOON	Turn smoothing on
SPAN	Enter frequency span
SPAN?	Output frequency span
SRE	Enter the Service Request Enable mask
SRE?	Output the Service Request Enable mask
STAR	Enter start frequency
STAR?	Output start frequency
STB?	Output the Status Byte value
STOP	Enter stop frequency
STOP?	Output stop frequency
STOR1	Store to file 1
STOR2	Store to file 2
STOR3	Store to file 3
STOR4	Store to file 4
STOR5	Store to file 5
SWR	Select SWR display for active channel
SWR?	Query if SWR displayed for active channel

Mnemonic	Description
TAKCS	Perform flat test port calibration
TIMESTAM?	Output printing date and time on/off setting
TIMESTAMOFF	Disable printing date/time
TIMESTAMON	Enable printing date/time
TITF1	Rename file 1
TITF2	Rename file 2
TITF3	Rename file 3
TITF4	Rename file 4
TITF5	Rename file 5
US	Suffix sets time data type and scales by 1E-6
V	Suffix sets voltage data type
VELOFACT	Enter velocity factor
VELOFACT?	Output velocity factor
WAIT	Wait to continue