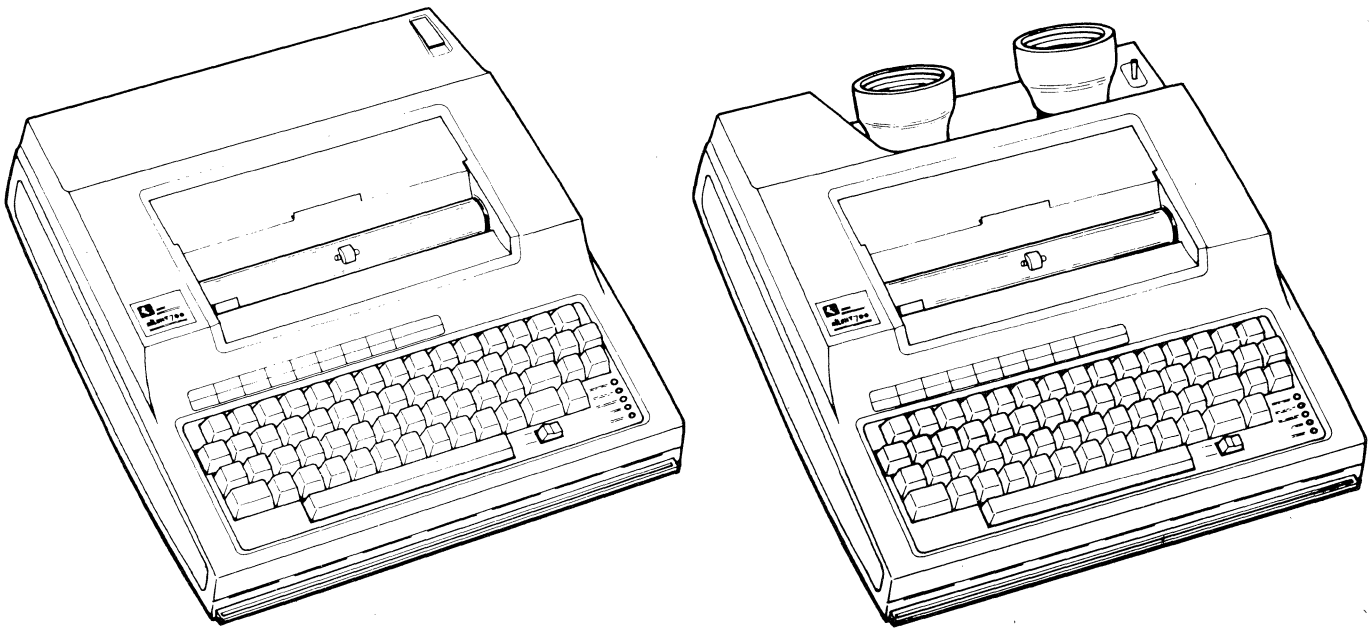
silent 700
electronic data terminals

MAINTENANCE MANUAL



for the

Model 763 ASR Data Terminal

and

Model 765 Portable Memory Terminal

MANUAL No. 2200064-9701

Issued 15 January 1978

Preliminary Issue

TEXAS INSTRUMENTS
INCORPORATED

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Figure 1-1. Memory Terminals

SECTION I

GENERAL DESCRIPTION

1.1 INTRODUCTION

The Model 763 Memory Send Receive terminal and Model 765 Portable Memory terminal represent a new generation of data terminals. The terminal has a typewriter style keyboard, a thermal printer, and a non-volatile, magnetic bubble memory system capable of storing up to a maximum of 91,206 characters. The capability to edit stored data enables the user to correct data prior to transmission to a central data processing equipment complex.

The two terminals are very similar in appearance (fig. 1-1) and operation. All references to the terminal used in this manual will apply to both models unless otherwise noted. The memory system used by the terminal is non-volatile, that is, it retains the data that is stored in it even after the power has been removed. The non-volatility of the memory is possible through the use of a magnetic bubble memory system. This memory system allows text editing and file management capabilities in addition to non-volatile data storage.

The communications system of the terminal is capable of interfacing with the majority of the commercially available modems. The Model 763 is also available with either an optional internal modem or a DC current loop interface. The Model 765 has a built-in acoustic coupler. Both terminals can communicate at standard baud rates up to and including 9600 baud.

Terminal parameters that traditionally have been controlled by switches can be altered by the use of english text commands typed in on the keyboard.

1.2 BLOCK DIAGRAM DESCRIPTION

The terminal can be functionally divided into five major subsystems as shown in figure 1-2. They are:

- Bubble Memory
- Keyboard/Printer
- Main Processor
- Communications
- Power Supply.

1.2.1 BUBBLE MEMORY. The bubble memory system provides the capability for non-volatile storage of data. The terminal has 20,000 characters of storage in the standard configuration. It is expandable, in increments of 20,000 characters, up to a maximum of 80,000 characters. The bubble memory represents a new technology in the field of solid state memories and these terminals are the first commercial application of this new memory system. The bubble memory does not have the speed that is normally associated with random-access memories and therefore is used for storage of data much as a floppy disk would be used.

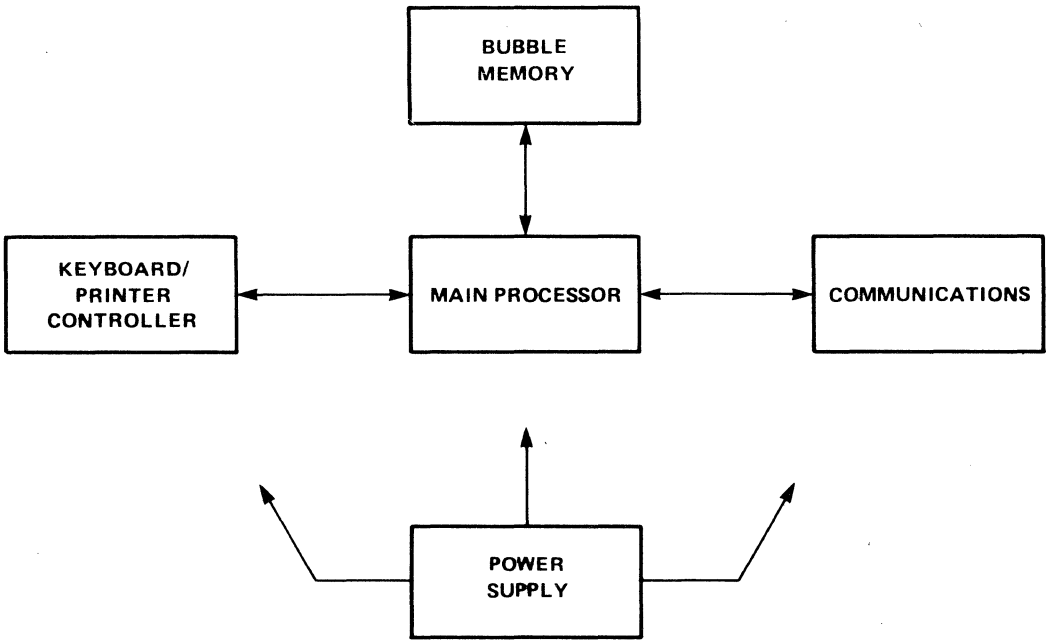


Figure 1-2. Memory Terminal Block Diagram

The bubble memory system is composed of a bubble memory controller along with function timing circuitry which controls all data exchanges between the bubble memory devices and the main processor system. The bubble memory devices and their associated drivers and sense amplifiers are located on separate printed circuit assemblies. Each memory device on an assembly can contain a maximum of 10,000 characters. The discrete memory printed circuit assembly that is installed in earlier models of the terminal contains one bubble memory device, while the newer memory printed circuit assemblies have two devices.

1.2.2 KEYBOARD/PRINTER. This system consists of a 30 character-per-second thermal printer, a full ASCII keyboard and a microprocessor (TMS 8080) with its associated read-only memories. The electronics for the keyboard/printer system is located on the upper printed circuit assembly. This is the same one that is used in the Model 743 and Model 745 terminals with a few additional connections to allow interface with the main processor located on the lower printed circuit assembly. All data entered from the keyboard is detected by the TMS 8080 and inputted to the main processor through an asynchronous, 9600 baud internal bus. The main processor checks the data from the keyboard to determine what action is required, the TMS 8080 is instructed by the main processor to execute the sequence requested. The control of the printer, keyboard scanning, and other associated functions is accomplished by the TMS 8080 which is subservient to the main processor.

1.2.3 MAIN PROCESSOR. The heart of the main processor system is the TMS 9980 microprocessor. The operating system (firmware) for the terminal is stored in the 20K of Read Only Memory (ROM). The main processor also has 12K of Random Access Memory (RAM) for terminal operations. All terminal operations are controlled either directly or indirectly by the TMS 9980. The TMS 9980 initiates data exchanges with the bubble memory system, system RAM and ROM. All communication between the terminal and a remote device is under the control of the TMS 9980 as well as the keyboard/printer system.

1.2.4 COMMUNICATIONS. The communications system is capable of data exchanges with remote devices through modems or with devices that are hardwired to the terminal. The Model 765 has a built-in acoustic coupler that can exchange data at either 110 or 300 baud. In addition both the Model 763 and Model 765 can interface with most commercially available modems through the lower port (EIA) at the rear of the terminal. The Model 763 can be ordered with either an optional internal modem or a 20 ma. DC current loop interface. The key element of the communications system is the asynchronous communication controller (TMS 9902). The TMS 9902 provides timing, data serialization and deserialization thus allowing the control of asynchronous communications by the main processor. The baud rate of the TMS 9902 is programmable allowing the baud rate to be altered by an instruction from the main processor. The other parameters of the communications system (i.e., parity, full or half duplex, ABM sequence) are controlled by the main processor and can be changed by the use of english text commands from the keyboard.

1.2.5 POWER SUPPLY. The power supply used in the terminal is split between the two major circuit boards. The two supplies provide all of the resultant DC voltage necessary to operate the terminal. In addition, it provides status signals to the bubble memory system in the event of power disruption or shutdown to prevent loss of data.

1.3 SPECIFICATIONS

The following is a list of the specifications for the terminal. These specifications apply to both the discrete and non-discrete bubble memory versions of the terminal.

PRINTER

METHOD: Non-impact, thermal printer; 5 x 7 dot matrix electrically heated on thermographic paper.

CHARACTER SET: 95 printable ASCII characters in normal mode with additional 33 control ASCII characters printed in edit mode.

CHARACTER SIZE: .26 cm x .2 cm (0.105 in. x 0.080 in.)

LINE LENGTH: 20.32 cm (8 inches); 10 characters/2.54 cm (inch); 80 characters/line.

LINE SPACING: 6 lines/2.54 cm (inch).

PRINTING RATE: up to 30 characters/second.

PAPER: TI thermographic printing paper, No. 972603, 21.6 cm (8-1/2 in.) x 30.48 m (100 ft.); last 3 m (10 ft.) color coded.

PLATEN: Friction-feed.

CARRIAGE RETURN AND LINE FEED: Automatic at column 81; no code is transmitted. The 81st character received is buffered and printed on the next line.

KEYBOARD

CODE: ASCII; 128 codes generated.

PHYSICAL

SIZE: Width: 39.1 cm (15.4 in.); Depth: 40.6 cm (16.0 in.); Height: 13.9 cm (5.5 in.); Weight: 7.7 Kg (17 pounds) including paper.

ENVIRONMENT

TEMPERATURE: operating: 10° C to 40° C (50° F to 104° F); storage: -30° C to 70° C (-22° F to 158° F) without paper; -30° C to 40° C (-22° F to 104° F) including paper.

HUMIDITY: operating: 10% to 90% (no condensation); storage: 10% to 95% (no condensation).

SHOCK: operating: 0 G.; storage: 20 g. for 11 msec.

VIBRATION: operating: 0 g., 10 to 60 Hz.; storage: 1.5 g., 5 to 500 Hz.

POWER REQUIREMENTS

VOLTAGE: 115 volts RMS, +10%-15%

FREQUENCY: 47-63 Hz.

POWER: 100 watts maximum.

DATA TRANSMISSION

METHOD: asynchronous, serial-by-bit, serial-by-character.

CODE: ASCII; 7-level, 11 bits/characters including parity, start, and two stop bits at 10 characters/second; 10 bits/character including one stop bit at speeds above 10 characters/second.

MODE: operator selectable, half or full duplex.

PARITY: operator selectable, odd, even, or mark parity; operator selectable parity checking.

RECEIVED DATA BUFFERING: character buffering on received data, permitting true 30 characters/second operation (no filler characters required after CR or LF).

TRANSMITTED DATA BUFFERING: operator selectable line buffering on data to be transmitted, permitting corrections prior to transmission.

INTERFACE: opeator selectable integral acoustic coupler/dc current loop/originate modem or EIA interface.

BAUD RATES: operator selectable 110 or 300 baud on integral interface or up to 9600 baud on EIA interface. Throughput limited to 2400 baud.

INTEGRAL ACOUSTIC COUPLER

COMPATIBILITY: Bell System 103/113 data sets.

MODE: Originate.

MODULATION: Frequency shift keying.

TRANSMIT CARRIER FREQUENCIES: Mark: 1270 Hz.; Space: 1070 Hz.

RECEIVE CARRIER FREQUENCIES: Mark: 2225 Hz.; Space 2025 Hz.

TRANSMIT LEVEL: Adjustable from -20 dBm to 0 dBm.

RECEIVER SENSITIVITY: -38 dBm with full duplex and 300 baud operation; -45 dBm with half duplex and 300 baud operation.

EIA INTERFACE

OPTIONAL AUXILIARY EIA INTERFACE KIT: used to interface the terminal to an external device such as a modem. Interface cable is a minimum of 6 feet in length and terminates with a 25-pin male connector (Cannon #DB25P or equivalent).

SIGNAL LEVELS: Serial interface signal levels are defined by EIA Standard RS-232-C as follows:

	-25 to -3 VDC	**-3 to +3 VDC**	**+3 to +25 VDC**
Data Signal	Marking	Not Defined	Space
Timing or Control Function	Off	Not Defined	On

DC CURRENT LOOP SERIAL DATA INTERFACE

MAXIMUM CURRENT: 100 milliamps (transmit or receive).

NOMINAL CURRENT: 20 milliamps.

MAXIMUM VOLTAGE DROP: 3 V (receive) and 1.5 V (transmit) while marking.

MAXIMUM TRANSMIT VOLTAGE: 50 V while spacing.

SECTION II

INSTALLATION

2.1 INTRODUCTION

This section provides general installation information. Paper loading, cable connectors and terminal testing information is also provided.

2.2 TERMINAL SETUP

This paragraph provides the steps required to set up the Model 765 terminal. The Model 763 required doing step 5 only. Proceed as follows:

1. Place the terminal with the *Silent 700* label on the case facing up on a table or stand.

2. Unlatch the suitcase cover by pushing out and down on the top part of latch until the bottom part of the latch unhooks from the groove in the suitcase bottom; then swing the bottom part of the latch away from the suitcase bottom while still pressing down on the top part of the latch.

3. Lift the suitcase cover straight up and off.

4. Remove the ac power cord from the inside of the suitcase cover.

5. Plug the three-socket female connector of the power cord into the rear of the terminal and the three-prong male connector into an ac wall outlet.

2.3 POWER APPLICATION

CAUTION

Caution should be observed when first operating the terminal after it has been stored at temperatures outside of the normal operating range. The terminal is designed to operate between 10° C and 40° C (50° F and 104° F) and should be allowed to come within the operating range before power is applied. Operation of the terminal outside of this range may result in a malfunction.

1. Check that the power cord is plugged into the terminal and the wall outlet.

2. To switch the terminal ON, flip the power switch (located on the top right rear of the terminal) toward the rear of the terminal. The terminal will respond by moving the printhead over to the left margin and typing the message "READY" followed by two characters that will indicate the revision number of the terminal internal programming.

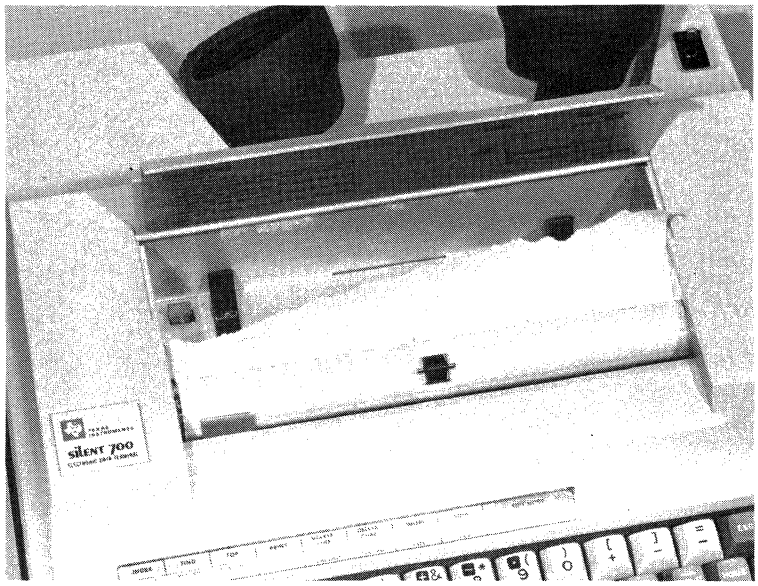
3. To switch the terminal OFF, flip the power switch toward the front of the terminal.

2.4 PAPER LOADING

Load thermal paper in the terminal as follows:

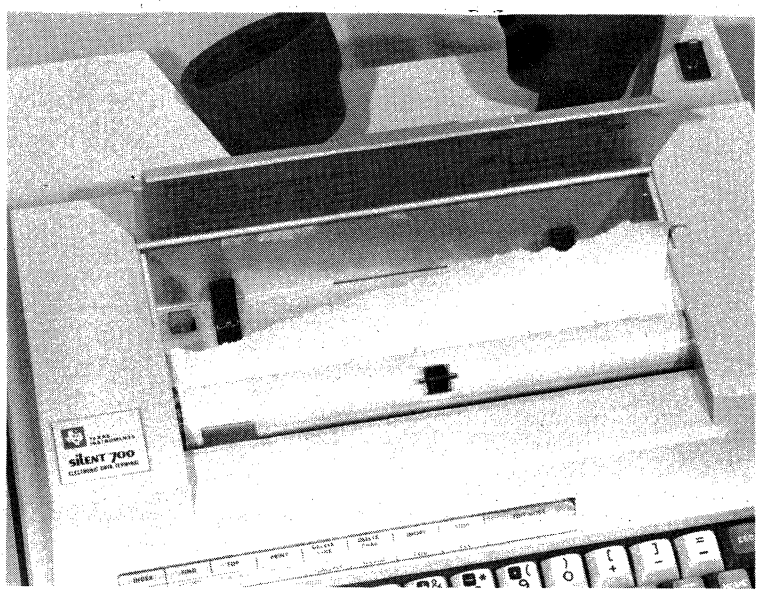
1. Switch the terminal power ON.

2. Lift the paper door.



3. If a usable amount of paper remains on the paper supply roll, grasp the unused roll and lift it from the paper compartment. Tear the paper halfway between the paper roll and the platen, then remove the roll. If no paper remains on the paper supply core, simply lift out the paper core.

4. Press and hold the PAPER ADV key until any remaining paper is ejected from the paper chute.

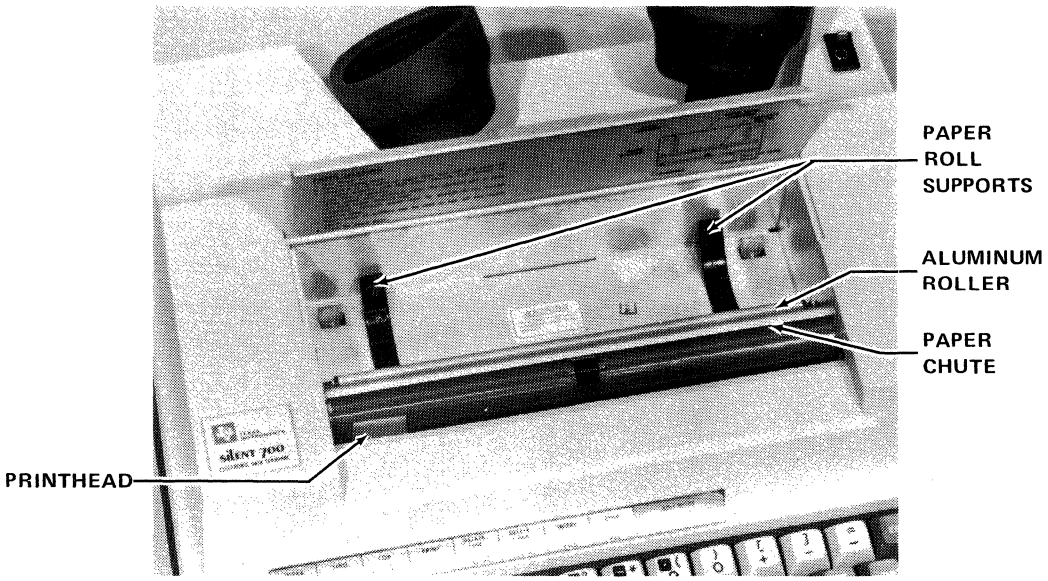


5. Grasp the new paper roll so that the loose end of the paper is toward you with the end pointed up.

CAUTION

The warranty and/or service contract on the thermal printhead is subject to nullification if the thermal printing paper used in the terminal does not meet TI specification 972603-0001.

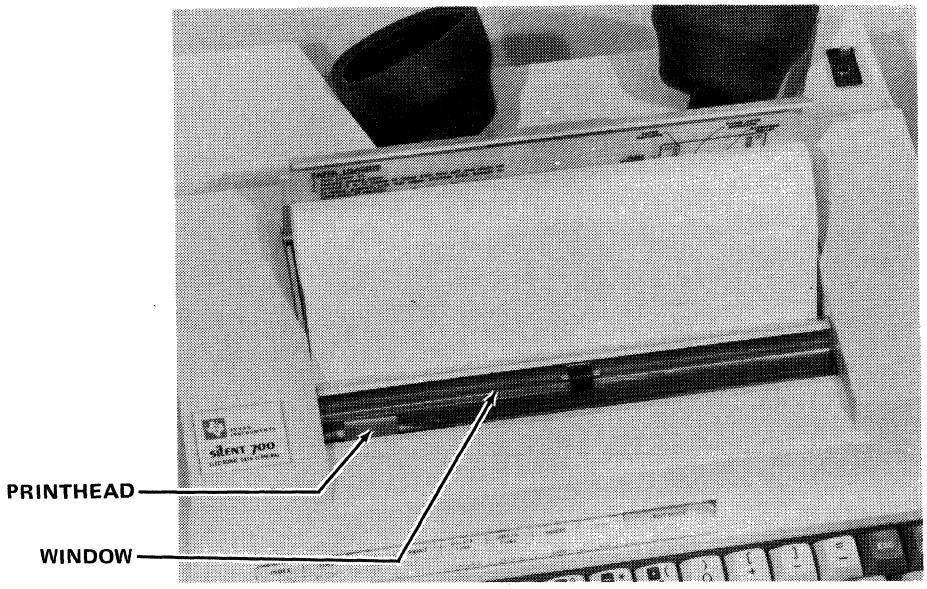
6. Place the paper roll on the paper roll supports, checking that the roll can rotate freely.



7. Grasp both corners of the loose end of the paper and gently pull up about 15 cm (6 inches).

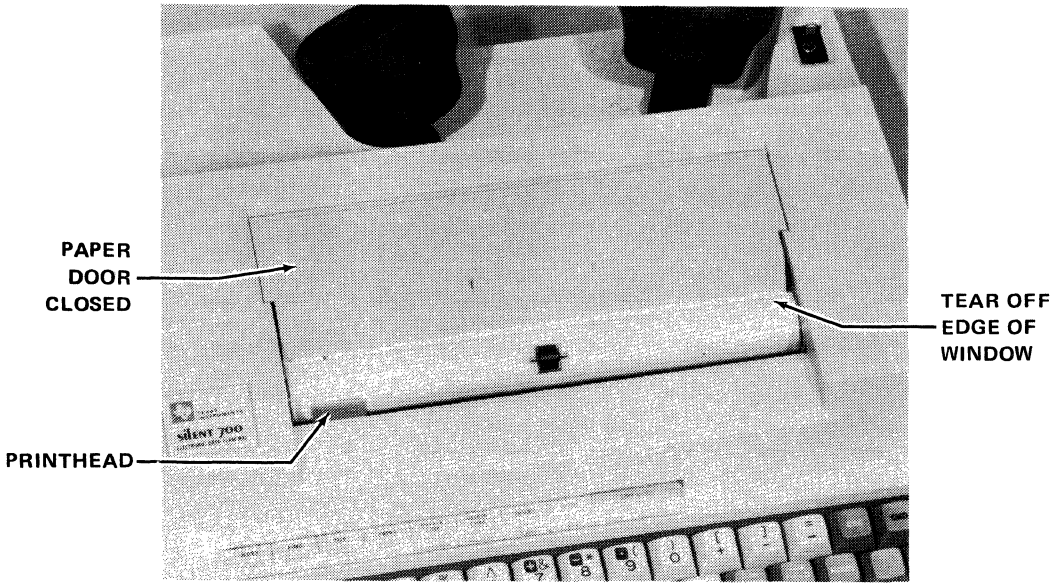
8. Feed the paper over the aluminum roller and down through the paper chute until it appears behind the window. The paper will not slide behind the printhead because the printhead is pressed against the platen.

9. Press and hold the PAPER ADV key until the paper feeds behind the printhead, then under the window. Note: If paper does not feed freely, gently push the paper down the chute and simultaneously press and hold the PAPER ADV key.



10. Tear off the excess paper by pulling it forward and down over the tear off edge of the window.

11. After the paper loading is complete, cycle the power off and on to return the printhead to the left margin.



2.5 MODEL 765 CABLE CONNECTIONS

When the Model 765 terminal is ordered in its standard configuration, it is provided with its built-in acoustic coupler. To interface with data sets, the following optional EIA cables are available:

INTERFACE — OPTION 113 cable assembly (TI Part No. 2200055)

INTERFACE — OPTION 103/202/212 cable assembly (TI Part No. 2200051)

The pin assignments are shown in tables 2-1 and 2-2 respectively.

Table 2-1. INTF-OPTN 113 Cable Pin Assignments (TI Part No. 2200055)

Terminal Connector (P1)	Cable Termination (113)	Function
P1-1	P2-1	AA
P1-2	P2-5	CB
P1-3	P2-3	BB
P1-4	P1-13	ON LEVEL
P1-8	P2-20	CD
P1-9	P2-6	CC
P1-11	P2-4	CA
P1-14	P2-2	BA
P1-15	P2-7	AB

Table 2-2. INTF-OPTN 103/202/212 Cable Pin Assignments (TI Part No. 2200051)

Terminal Connector (P1)	Cable Termination (202/212)	Function
P1-1	P2-1	AA
P1-2	P2-5	CB
P1-3	P2-3	BB
P1-4	P2-8	CF
P1-5	P2-12	SCF
P1-7	P2-11	SCA
P1-8	P2-20	CD
P1-9	P2-6	CC
P1-10	P2-22	CE
P1-11	P2-4	CA
P1-14	P2-2	BA
P1-15	P2-7	AB

2.6 MODEL 763 CABLE CONNECTIONS

When the Model 763 terminal is ordered in its standard configuration, it is provided with one of three EIA cables. To interface with data sets it is necessary to use either:

INTERFACE — OPTION 113 cable assembly (TI Part No. 2200055)

INTERFACE — OPTION 103/202/212 cable assembly (TI Part No. 2200051)

The pin assignments are shown in tables 2-1 and 2-2 respectively.

To interface the Model 763 terminal to a dc current loop use:

CURRENT LOOP cable assembly (TI Part No. 2200053)

The pin assignments are shown in table 2-3.

Table 2-3. CURRENT LOOP CABLE Pin Assignments (TI Part No. 2200053)

Terminal Connector (P1)	Cable Termination	Function
P1-6	E1	RL-1
P1-7	E2	RL-2
P1-5	E3	X-1
P1-4	E4	X-2

The 20 Ma. dc current loop (TTY) interface is passive, that is current for operation of this interface must be provided by an external source.

Full and half duplex interconnections are shown in figure 2-1.

When the Model 763 is equipped with the optional internal modem, then a Y-cable that will allow EIA interface with a CBS 1001F data coupler is required. The following cable assembly is available for this requirement.

CBS 1001F COUPLER cable assembly (TI Part No. 2200052)

The pin assignments are shown in table 2-4.

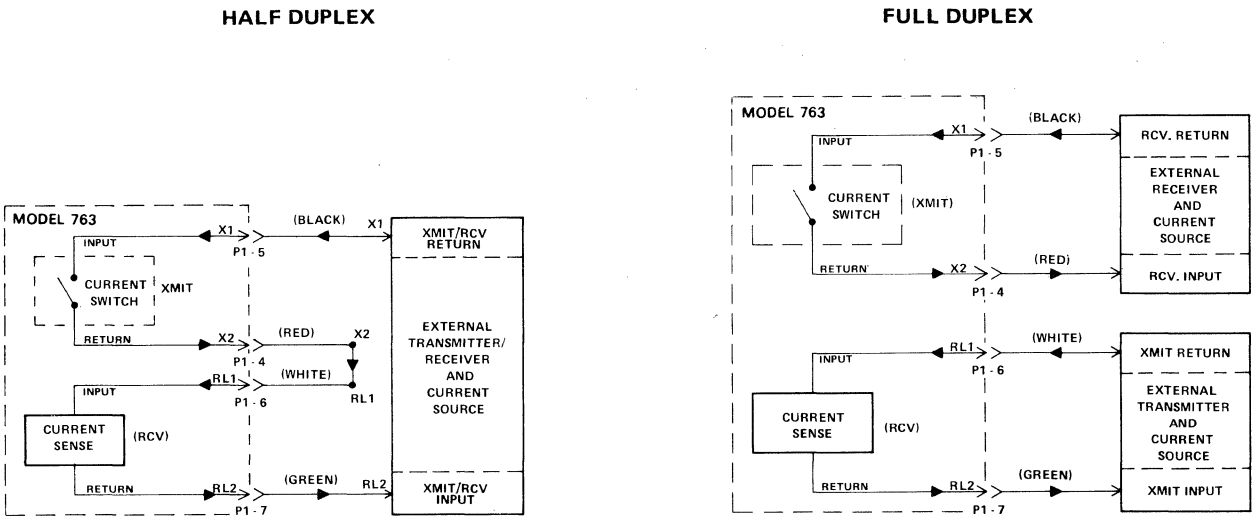
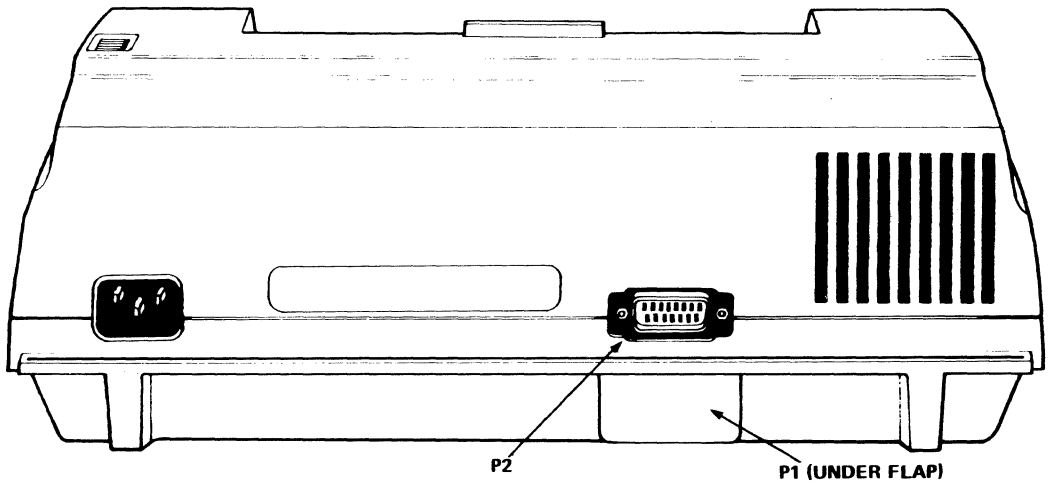


Figure 2-1. Model 763 Current Loop Connections

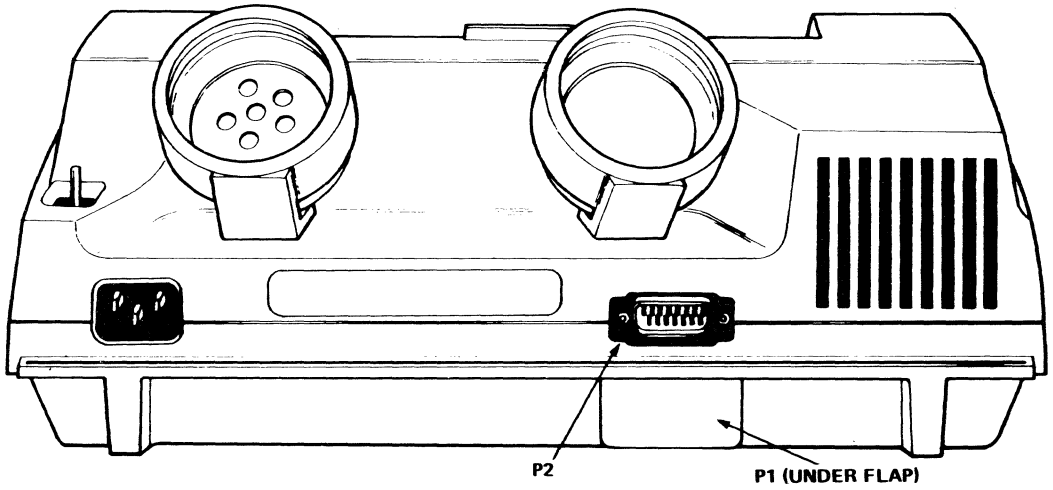
Table 2-4. CBS1001F COUPLER Cable Pin Assignments (TI Part No. 2200052)

Terminal Connector (P1 and P2 [P403])	Cable Termination (P3)	Function
P1-5	P3-SH	SH
P2-1	P3-SG	SG
P1-6	P3-DA	DA
P1-9	P3-CCT	CCT
P1-7	P3-OH	OH
P1-10	P3-RI	RI
P2-5	P3-DT	DT
P2-4	P3-DR	DR

Figure 2-2 shows the location of the cable connectors of the terminal. Table 2-5 is a cross-reference chart of the cable assemblies available and the connectors that they connect to.



MODEL 763



MODEL 765

Figure 2-2. Terminal Cable Connector Locations

Table 2-5. Interface Cables

Terminal Pin Number and Signal		INTF-OPTN 103/202/212 Cable		CBS 1001F Coupler Cable (Lugs)	INTF-OPTN 113 Cable		CURRENT LOOP (Lugs)
		EIA Ckt	Pin		EIA Ckt	Pin	
P1	**[Lower]**						
1	PG	AA	1		AA	1	
2	CTS	CB	5		CB	5	
3	RCV	BB	3		BB	3	
4	DCD	CF	8		*		
5	SH	SCF	12	SH			
6	DA			DA			
7	OH	SCA	11	OH			
8	DTR	CD	20		CD	20	
9	DSR/CCT	CC	6	CCT	CC	6	
10	RI	CE	22	RI			
11	RTS	CA	4		CA	4	
12	LOLVL						
13	HILVL						
14	XMT	BA	2		BA	2	
15	SG	AB	7		AB	7	
P2	**[Upper]**						
1	SG			SG			
2	—						
3	—						
4	DR/X2			DR			E4
5	DT/X1			DT			E3
6	RL1						E1
7	RL2						E2
8	—						
9	—						
10	—						
11	—						
12	—						
13	—						
14	—						
15	—						

2.7 EIA INTERFACE DEFINITIONS

Table 2-6 provides additional information about the interface connections used by the terminal.

2.8 TERMINAL TESTING

Once installation is complete or anytime you wish to test the terminal, refer to Section V.

Table 2-6. EIA Interface Definitions

Plug	Pin	Source	EIA Ckt.	Definition
P1	1	Common	AA	PROTECTIVE GROUND — Connected to the terminal chassis and power cord ground.
P1	2	External	CB	CTS — Clear to Send. Held to ON condition by an external device to indicate that transmission is permitted. Bell System 103 data set constantly holds this signal ON once the communications channel has been established.
P1	3	External	BB	RCV — Received data. Held to a ON state by an external device when there is no incoming data.
P1	4	External	CF	DCD — Data Carrier Detect. Held to an ON condition by an external device to indicate that received data is valid.
P1	5	External	SH	SH — Switch Hook. EIA level that is held to an ON condition by an external device to indicate a lifted handset when using an telephone set with DAA.
*P1	5	External	SCF	SCF — Reverse Channel Receive Carrier. EIA level that when ON in reverse channel mode indicated ready for terminal to transmit.
P1	6	Internal	DA	DA — Data Transmission. EIA level that is held to an ON condition to request connection to the local telephone line.
P1	7	Internal	OH	OH — Off Hook. EIA level that is held to an ON condition to cause a hook pickup signal to an associated DAA.
*P1	7	Internal	SCA	SCA — Reverse Channel Transmit. EIA level held to an ON condition when in reverse channel mode and the terminal is ready to receive.
P1	8	Internal	CD	DTR — Data Terminal Ready. Switched to the ON position to prepare an associated data set for connection to a communications channel in addition to maintaining the connection once it has been established. This signal is switched OFF to terminate a call.*
P1	9	External	CC	DSR/CCT — Data Set Ready/Coupler Cut Through. This is held to an ON condition by an external device when connection has been made to the communication channel.
P1	10	External	CE	RI — Ring Indicator. Switched to an ON condition by an external device on the receipt of each ring pulse from the line.
P1	11	Internal	CA	RTS — Request to Send. Switched to an ON condition when data is ready for transmission. In half duplex operation this signal is also used by the associated data set to control the direction of transmission and to aid in performance of the call turnaround. The Bell system 103 data sets do not require this signal to operate but it will continue to function as though it were required.
P1	12	External	DD	SCR — Synchronous Receive clock. For future use.
P1	13	External	DA	SCT — Synchronous Transmit clock. For future use.
P1	14	Internal	BA	XMT — Transmit data. Holds to a mark state when no data is being transmitted.
P1	15	Common	AB	Signal Ground — Common return for all data and control lines*.
P2 (403)	1	Common	AB	Signal Ground — Common return for all data and control lines*. pled to terminal

Table 2-6. EIA Interface Definitions (Continued)

Plug	Pin	Source	EIA Ckt.	Definition
P2	4	Common	DR	DR – Data Ring. Analog data signal of internal modem. (complement of Data Tip)
*P2	4	Internal		X2 – TTY Transmit Current Loop gated by the internal TTY switch.
P2	5	Common	DT	DT – Data Tip. Analog data signal of internal modem (complement of Data Ring)
*P	5	Internal		X1 – TTY Transmit Current Loop sourcing the internal TTY switch.
P2	6	External		RL1 – TTY Receive Current Loop sourcing the internal TTY detector.
P2	7	Internal		RL2 – TTY Receive Current Loop sinking the internal TTY detector.
P2	9	Internal	AA	Protective Ground — Connected to terminal and power cord ground*.
P2	2,3,8, 10–15			Not used.

*The 763/765 Terminal is shipped from the factory with signal ground connected to protective ground on the top PWB assembly (near PIN 1 of J403) through connector plug P330. If the user wishes to disconnect signal ground from protective ground for system interconnection reasons, he may do so by removing the inside cover and moving plug P330 one stake pin to the right of it's origional position as viewed from the keyboard. Signal ground is AC coupled to safety ground when the plug P330 is connected between the two stake pins to the right. Signal ground is directly connected to safety ground when the plug P330 is connected between the two stake pins to the left.

SECTION III

OPERATION

3.1 INTRODUCTION

This section will help you become acquainted with the Model 763 Memory Send Receive (MSR) and the Model 765 Portable Memory Terminal (PMT). Because the operation of both the Model 763 and the Model 765 is identical all references in this manual to a terminal will apply to both terminals unless it is stated otherwise. The terminal keyboard is shown in figure 3-1 and should be referred to during the following paragraphs.

3.2 KEYBOARD CONTROLS AND INDICATORS

The keyboard of the terminal is very similar in function and appearance to that of a standard electric typewriter. There are some keys that are unique to the terminal and so may be new to you. This discussion on the various controls and indicators of the terminal will help you understand what the special keys on the keyboard do and how their special functions can make using the terminal faster and easier.

3.2.1 COMMAND KEY. (CMD) Depressing the orange CMD key in the upper right side of the keyboard puts the terminal into the command mode of operation.

The terminal has two system modes of operation, the COMMAND mode and the INTERACTIVE mode.

The terminal is placed into the COMMAND mode when new commands are to be entered into the terminal. There are thirteen basic commands that are used with the *A terminal. They are:

CATALOG	EDIT	OFFLINE
CHANGE	ERASE	ONLINE
COPY	FREE	STATUS
CREATE	LOCK	RUN (See Note)
DELETE		TEST

NOTE: *B Terminals Only

Each of these commands will be discussed in detail when the particular function they are used for is presented. When the CMD key is depressed the terminal will immediately stop what it is doing, even if it is in the middle of another operation, and go into the COMMAND mode and await a command.

The INTERACTIVE mode can be viewed as the working mode. When the terminal is in the INTERACTIVE mode it can transmit and receive data and record and playback files from memory. When the terminal is switched on, it is in the INTERACTIVE mode of operation. You will notice that there is no key for this mode. This is because whenever the terminal is not in the COMMAND mode it is in the INTERACTIVE mode. Once the terminal is in the COMMAND mode it will remain in that mode until the SKIP key is depressed and the command requested has been accomplished.

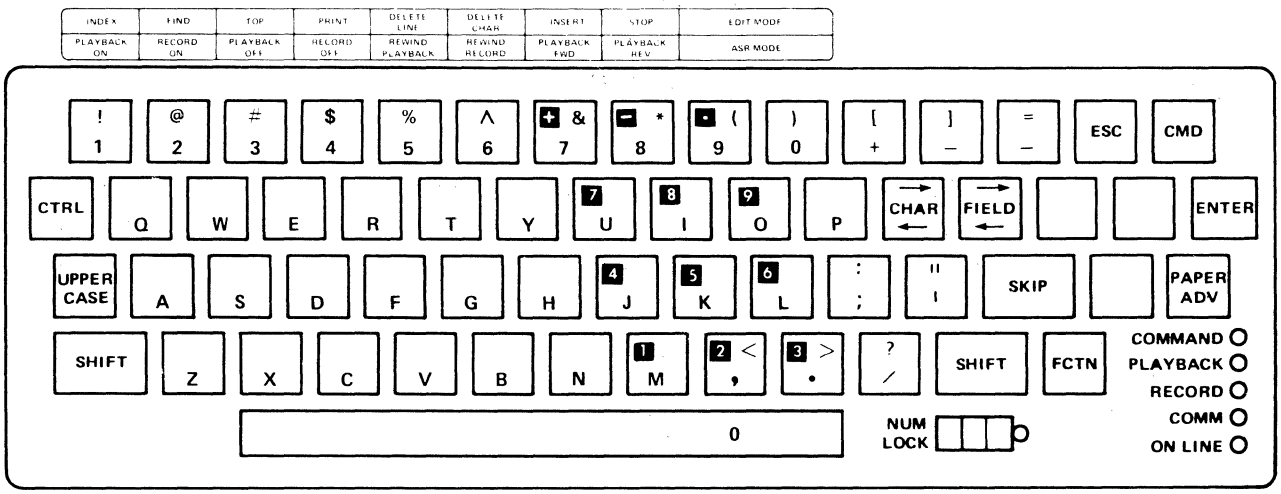


Figure 3-1. Terminal Keyboard

3.2.2 MEMORY SYSTEM. Before any of the other functions are presented, a brief discussion about the memory system used by the terminal will help you understand the function of the other keys and indicators. Both the Model 763 and the Model 765 use a revolutionary new memory system called a magnetic bubble memory. It is this memory system that lets you store information (data) for playback at a later time. When this bubble memory is combined with the powerful editing functions of the terminal, you have the ability to record, playback and edit the information before transmitting it to a local or remote device.

3.2.2.1 Memory System Information Storage. In many ways the memory system of the terminal works like files in an office file cabinet. If you wished to store some information in a file cabinet you would first place the information in a file folder. Next, you would write a name on the file so you would be able to tell it apart from other files in the file cabinet. Before information can be stored in the terminal memory, there must be a file to keep it in. Instead of a file folder, the terminal memory system reserves a space for the information to be stored in. This reserved area of memory is called a file. The terminal uses the file names to locate the information stored in the memory system.

The size of the files used in the memory system are adjustable. This means that you can make the file larger or smaller depending on the amount of information that is to be stored in the file. Just as the memory system is composed of files, the file itself is composed of records. A record is the term used to describe the length of each line in the file. The records of a file are also adjustable and can be from 1 to 80 characters long. The records in separate files may be of different lengths but all the records in one specific file must be the same length.

3.2.2.2 File Formats. Another feature unique to the terminal is that data can be recorded in the terminal memory in two different formats, LINE or CONTINUOUS.

In the LINE format, each record in memory will contain only one line of data. For lines shorter than the designated record length, memory is reserved between the end of the line of data and the end of the

record. For example, if the record of a file is 72 characters long (80 is the maximum) and the number of characters entered is only 62, then the ten characters of memory space between the end of the line of data and the end of the record would be reserved. Since the editing function is record oriented, this format is particularly helpful in preparing and/or editing a data file. It does not allow efficient use of memory, as you can see from our example there were ten characters worth of memory not used on the single line.

CONTINUOUS format fills each designated record before beginning another record. Therefore, each record may contain one or more lines of data. If the line from our previous example was rcorded in a CONTINUOUS formatted file, then after the 62 characters were entered the terminal would use the first ten characters of the next line to fill up the remaining space in the record. Although this format is more difficult to edit than the LINE format, it allows for efficient use of memory. When the data stored in memory is transmitted to a remote device through the communications channel or printed by the terminal printer it will be identical, whether it was recorded in LINE or CONTINUOUS format.

The memory and the files that are used in it have some general limitations. They are:

- The name of a file cannot exceed six characters.
- The name of a file cannot start with a number; though it may contain numbers but no spaces between characters or numbers.
- The maximum length of a record is 80 characters.
- The maximum number of records that a file can contain is determined by the amount of memory that has not been used. The CATALOG command will tell how many records are available for use.
- The maximum number of files a terminal can contain is 16.

Once the file has been created, data can be stored in it by use of the ASR FUNCTIONS which, along with the EDIT FUNCTIONS, are described in the following paragraphs.

3.2.3 FUNCTION KEYS. There are 18 special functions available that allow you to store, edit and playback data that is in the bubble memory. The FCTN key is used with the number keys located at the top of the keyboard to produce these functions. The procedure to use a function key is simple. If an F2 function is required, simply hold down the FCTN key and at the same time press the number 2 key. The definition of the F2 function is listed on the decal that is directly above the number keys. This decal lists all but two of the functions available, PRINTER ON and PRINTER OFF. You will also notice that there are two listings for each key. For example, the Function 2 (F2) means RECORD ON in the ASR mode and FIND in the EDIT mode. These two modes, ASR and EDIT should not be confused with the system modes of COMMAND and INTERACTIVE. The ASR operations are accomplished in the INTERACTIVE mode and the EDIT operations are accomplished in the COMMAND mode.

3.2.3.1 ASR and Edit Modes. The ASR is the normal operating mode of the terminal. When the unit is switched on, it is in the INTERACTIVE-ASR mode. It will remain in this mode until it is put into the EDIT mode by a command. When in the ASR mode, data can be typed, recorded in a file, played back from a file as well as many other keyboard and communications operations. The EDIT mode allows the correction of data that has been stored in the terminal memory. When in the EDIT mode, characters or lines of text can be either inserted or deleted. A function called FIND allows you to define a word or a set of words and the terminal will locate the line that the requested text is in.

3.2.3.2 ASR Function Keys. When the terminal is in the ASR mode, function keys F1 through F0 control files in memory that have been designated as the RECORD file and the PLAYBACK file. The RECORD file is simply a file in memory that is controlled by the ASR function keys. Any file in memory can be designated as the RECORD file. Only one file at a time can be the RECORD file. The same considerations apply to the PLAYBACK file. A file can be designated as both the PLAYBACK and RECORD file at the same time.

The following SR functions control the PLAYBACK and RECORD files:

F1 — PLAYBACK ON
The contents of the PLAYBACK file will be printed by the terminal printer.

F2 — RECORD ON
The terminal will begin storing information that is entered from the keyboard or the communications channel into the RECORD file.

F3 — PLAYBACK OFF
The PLAYBACK file will stop printing.

F4 — RECORD OFF
The RECORD file will stop storing information it receives from the keyboard or the communications channel.

F5 — REWIND PLAYBACK
The PLAYBACK file will return to the first record in the file.

F6 — REWIND RECORD
The designated RECORD file will return to the first record of the file.

F7 — PLAYBACK FWD
The last current PLAYBACK file record will be printed. The last current PLAYBACK file record is defined as the record that was last referenced by the terminal. If the current record has already been printed, the next record will be printed.

F8 — PLAYBACK REV
The PLAYBACK file will return to the beginning of the current record. If it is already at the beginning, it will return to the beginning of the previous record.

F9 — PRINTER ON
The terminal printer will be turned ON. This function is automatically active when either the COMMAND mode is entered or when the terminal is switched ON.

F0 — PRINTER OFF
The terminal printer will be turned OFF. This is very useful when using the communication channel and you do not wish to have the terminal print a copy of the information being transmitted.

3.2.3.3 Edit Function Keys. The EDIT mode allows you to modify the contents of an existing file in the memory. The EDIT mode is a very powerful tool that will allow you to delete a character or a large string of characters, a line of text or several lines. When characters or lines are deleted, the EDIT mode will move up the remaining text to fill the space created by the deleted text. If material must be inserted, there is an INSERT function that allows text to be inserted. The INDEX function of the EDIT mode allows you to move through a file in either direction. The EDIT mode can search a file for a word or group of words that you request. In addition there is a TOP function that allows the access of the first line of a file. The PRINT function prints a file that you are editing. As you can see, the EDIT mode has many functions that allow you to easily modify the contents of a file. This modification may be in the form of updating material, correcting errors or entering new material into an existing file. The functions available in the EDIT mode are:

F1 — INDEX
The current record pointer (the record that is being looked at) is moved forward or backward relative to the current record. The INDEX function is indicated by the INDEX prompt symbol  .

F2 — FIND
The record within a file containing a word or a group of words (called a character string) up to 15 characters (30 characters in a *B terminal) that you define will be located. The FIND function is indicated by the prompt symbol  .

F3 — TOP
The current record pointer is returned to the first record of text in the file.

F4 — PRINT
The contents of the file being edited will be printed.

F5 — DELETE LINE(S)
One or more lines of text can be deleted from the file being edited. It is indicated by the DELETE LINE prompt symbol  .

F6 — DELETE CHARACTER(S)
The ability to eliminate characters from a text one at a time is provided. It uses the DELETE CHARACTER symbol .

F7 — INSERT
The ability to insert small or large quantities of text (if there is enough room) into the file being edited is provided. The INSERT function has two symbols, an OPEN INSERT symbol to indicate where the insertion will begin and a CLOSE INSERT symbol to indicate where the insertion will end.

F8 — STOP
The terminal will leave the EDIT mode and return to the INTERACTIVE-ASR mode.

3.2.4 COMMANDS. As stated previously, there are 13 different commands (14 in *B terminal) that can be used with the terminal. To use these commands the terminal must be in the COMMAND mode. When the command and its parameters have been typed in, the SKIP key will cause the terminal to execute the command. The parameters are simply the information required by the terminal to execute the command. A description of each command follows:

CATALOG — To list all files that currently exist in memory and all of the pertinent information associated with each file. The amount of file space available for use and the record and playback file are also listed.

CHANGE — To change a terminal configuration parameter.

COPY — To copy data from one file to another file, to the printer, or to copy data from the keyboard to a file.

CREATE — To allocate memory for a data file. To assign a file name. To specify a format (LINE or CONTINUOUS), record length and the maximum number of record that a file is to contain.

DELETE — To eliminate a file from the file catalog. The memory allotted for that file becomes available for future use.

EDIT — To modify the contents of an existing file.

ERASE — To erase the contents of an existing file. The memory allocated for that file and the file name remain unchanged.

FREE — To release the file protection provided by the LOCK command.

LOCK — To prevent a file from being erased, deleted or written into.

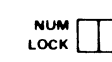
OFFLINE — To place the terminal OFF LINE for local operator use.

ONLINE — To place the terminal ON LINE for data transmission and reception through communications channel.

RUN — (*B Only) To execute commands from a file.

STATUS — To list the current status of all terminal configuration parameters.

TEST — To activate a resident test program under which the terminal will perform various self-test tasks including a ROM check and a write/read test of memory.

3.2.5 UPPER CASE LOCK KEY AND NUMERIC LOCK SWITCH.   The UPPER CASE lock key is very similar to the shift lock on a standard typewriter with one exception. When the terminal is in upper case lock, it still requires the use of the shift key to print shifted, non-alphabetic characters. For example, even with upper case lock on, the shift key is still required to print the percent, % symbol. The UPPER CASE lock key will remain on until it is depressed again.

The NUM LOCK switch located to the right of the space bar, activates the numeric pad (indicated by the small white numbers against the dark background). When the NUM LOCK switch is on (indicated by the red indicator next to it) the rest of the keyboard is inoperative with the exception of those functions shown in Appendix A. Notice that the number zero for the pad is the space bar.

3.2.6 CHARACTER AND FIELD KEYS.   Both the character and field keys are active when in either EDIT mode, COMMAND mode or when ASR RECORD ON (OFF LINE) is active.

The character key will cause the printhead to move either backward or forward one character space at a time. If the key is held down longer than one-half second, repeated operation will occur. To make the printhead backspace, simply depress the CHAR key. To make it go forward depress the SHIFT key and the CHAR key. The first time the CHAR is used, the printer will do a linefeed and one backspace each subsequent depression will cause a backspace until another key is depressed. If in the COMMAND mode or recording into a file, the CHAR key allows use of the character overstrike, that is, when the printhead is located under a character in a record depressing any character key will cause that character to replace the original character in that location. Using the CHAR forward function will cause the current record in the RECORD file to be printed one character at a time. The same is true if it is in the EDIT mode.

Depressing the field key will cause a line feed and the printhead to move to the beginning of the record. Depressing the SHIFT and FIELD keys will cause characters at the right of the printhead to be printed, stopping the printhead to the right of the last character in the record.

3.2.7 SKIP AND ENTER KEYS.   The SKIP key acts as the CARRIAGE RETURN does on a standard typewriter. When storing data in memory, the SKIP key creates an End-Of-Line (EOL) symbol when it is depressed.

The ENTER key acts as a PLAYBACK ON function in ASR mode. When editing a file, the ENTER key will cause editing to terminate on the current record.

3.2.8 PAPER ADVANCE, LINE FEED AND CARRIAGE RETURN KEYS.   

The PAPER ADV key will advance the paper one line each time it is depressed. If it is depressed and held it will cause the paper to advance continuously until it is released. This key does not generate a code that can be stored in memory.

The Line Feed (LF) key will cause the paper to advance one line. This key generates a code that can be stored in memory. The Carriage Return (CR) key will cause the terminal to perform a carriage return. This key generates a code that can be stored in memory.

3.2.9 CONTROL AND ESCAPE KEYS. CTRL ESC The CTRL key is used in conjunction with other certain keys to generate control functions used during communications.

The ESC key is used to generate the ESC code also used during communications.

3.2.10 PROGRAMMABLE KEY. KEY This key is labeled KEY and it will print the character that the operator has programmed it to print. The character definition for the KEY is changed by a simple command entered through the keyboard.

3.2.11 INDICATORS. COMMAND PLAYBACK RECORD COMM ON LINE There are six indicators located on the lower right side of the keyboard. They indicate the following, when lit:

COMMAND — The terminal is in the COMMAND mode of operation.

PLAYBACK — The PLAYBACK file is on and outputting its contents.

RECORD — The RECORD file is in the record mode and accepting data.

COMM — If the acoustic coupler (Model 765) is selected as the communications channel, this indicates that the coupler detects a carrier signal. With the EIA channel selected, this indicates a Data Set Ready condition.

ON LINE — The terminal is on line.

NUM LOCK — Located next to the rocker switch NUM LOCK; indicates that the numeric keypad is active.

3.3 TERMINAL OPERATION.

The following paragraphs contain a number of exercises that will allow you to exercise the capabilities of the terminal. Prior to the exercises, a brief description of off line operation, the terminal memory system and error codes is given.

The exercises are structured in the following format:

A brief explanation of the exercise to be performed.

The steps to be performed. These will be in upper case letters. When something is to be typed into the terminal it will be shown in bold letters.

A discussion of what response that can be expected from the terminal as well as explanation of the responses. These will be set in normal case text following most exercise steps.

General rules. These will be set apart from the exercise and give general guidelines for operation of a particular mode or function.

NOTE

These are examples of exercise formats and are not complete exercises and therefore should not be attempted.

Example 1:

TYPE IN THE WORD **STATUS** AND DEPRESS THE SKIP KEY. The terminal will print out the current terminal parameters.

In this example you are asked to type a word indicated by the bold face type which is STATUS.

Example 2:

TYPE IN **CREATE MYFILE L 4 80** AND DEPRESS THE SKIP KEY. The terminal will respond by printing a DONE message.

In this example a group of words is requested. Unless otherwise noted it makes no difference if it is upper or lower case. The spaces between the words must be included or the terminal will respond with an error code.

3.3.1 SWITCHING THE TERMINAL TO OFF LINE. When the terminal is in the off line mode of operation, it cannot communicate with any external equipment that may be connected to it. In addition, the terminal cannot accept any communications from external equipment when in the off line mode.

In the following exercises in this section the off line mode is used to prevent accidental transmission of data in case the terminal you are working with is connected to an existing data communications network. Perform the following steps to ensure that the terminal is ready to perform the exercises.

1. Check to see if the terminal is on line or off line. To do this, look at the indicator marked on line in the lower right side of the keyboard. If the indicator is lit, the terminal is ON LINE. If the indicator is not lit, then the terminal is already in an off line mode and you may proceed on to the next topic.

2. Depress the orange CMD (command) key in the upper right side of the keyboard. The terminal will respond by performing a line feed and a carriage return, that is, the paper will advance one line (line feed) and the printhead will slew over to the left margin (carriage return). The printhead will print a command symbol ▶ , the COMMAND indicator in the lower right side of the keyboard will be lit and an audible beep will be heard. You are now in the COMMAND mode and can switch the terminal off line.

3. Type in the word off line and then depress the orange SKIP near the middle right side of the keyboard. The terminal will respond by doing a carriage return and a line feed. The message DONE will be printed. Notice that the ON LINE indicator is now extinguished.

4. To switch the terminal back to the on line mode, simply repeat steps 1 through 3 and substitute the word on line in place of off line in step 3.

NOTE

With the terminal off line it is now possible to operate the terminal without any chance of accidentally transmitting data over a data communications network.

3.3.2 USING THE TERMINAL MEMORY SYSTEM. One of the features of the terminal is the ability to record and playback information in the terminal memory. This feature that allows you to type in all of your information and review as well as correct it before it is transmitted to data processing equipment.

To store information (data) in memory, it is first necessary to establish an area in memory where the data can be stored. The memory uses a system of files to organize the storage of information. The files that are used in memory are created by the operator. Each file has four factors that must be specified by the operator when the file is created. They are FILE NAME, FILE FORMAT, FILE SIZE, and RECORD SIZE. The following describes each area:

- FILE NAME. — Each file in memory has its own name. This name is used to make all future references to the file. The name of a file in memory must contain at least one letter and no more than six letters or numbers and the file name must begin with a letter.

- FILE FORMAT. — The format of the file determines how the terminal will fill up the file with the information that is entered. The two formats are: LINE and CONTINUOUS. Each has its own advantages and disadvantages. Briefly, the LINE format tells the terminal to fill up the file exactly as you type in the information. This is very direct and easy to edit later on, but is an inefficient use of memory. The CONTINUOUS format completely fills up each line (record) in a file, but is more difficult to edit. The format of the file is designated by the use of the letter C or L when the file is created.

- FILE SIZE. — This, simply is how big the file will be. The size of the file is measured in lines (records) of text.

- RECORD SIZE. — This term is a measure of how many characters will be contained in each record or line of text. The maximum record size is 80 characters.

3.3.3 ERROR CODES. Sometimes while doing these exercises mistakes are made, the terminal will inform you of these errors by printing out an error code. An error code is a two digit number that is preceded and followed by three asterisks ***??*** . When the terminal prints out an error code, you recheck your work to see if any obvious errors have been made. If you cannot determine where the error lies, look in Appendix E at the list of error codes and see what error has been detected by the terminal. For some errors, the terminal will type out a message stating the problem.

3.3.4 EXERCISE 1. USING THE MEMORY CATALOG. The first exercise will involve the use of the memory catalog. The catalog gives you a listing of all of the current files in memory as well as characteristics of the files and how much of the file has been used. In addition the catalog also lists which files have been designated as the record and playback files and also how much of memory is available for use in creating files.

1. PLACE THE TERMINAL IN THE COMMAND MODE BY DEPRESSING THE ORANGE CMD KEY IN THE UPPER RIGHT SIDE OF THE KEYBOARD. The terminal will respond by printing the command prompt symbol, ▶ , performing a linefeed (the paper will advance one line), a carriage return (the printhead will return to the left margin), producing an audible beep, and lighting the COMMAND indicator in the lower right side of the keyboard.

2. TYPE IN THE COMMAND **CATALOG** AND DEPRESS THE SKIP KEY. The word catalog is a command for the terminal to print out the memory catalog. The SKIP key is used to instruct the terminal to execute the command that has been typed in. If you make a mistake in the typing of the command message, depress the SKIP key anyway, the terminal will print out an error code and then you can start again with step 1.

```
▶ CATALOG                    MEMORY CATALOG

 NAME     TYPE     MAXIMUM   CHARS/   COMPLETE
                   RECORDS   RECORD   RECORDS
TI765     LINE.L     50        80        45
CENSUS    CONT.L      4        80         4
ORDERS    CONT.L     10        80         7
PROMPT    CONT.L     15        80        12
DATA      LINE.L     20        80         5
MYFILE    LINE        4        80         3
CARS      CONT.L      5        80         4
CREDIT    CONT.L      8        80         8

MEMORY AVAIL =  134  80-CHAR LINES
RECORD FILE:    DATA
PLAYBACK FILE:  DATA

DONE
```

Examine the catalog that has been printed. The example shown may not be representative of the catalog in your terminal. If a CATALOG EMPTY message is printed than proceed to the next exercise. The catalog is divided into eight areas. There is a listing of file names under the NAME column. The format of the file is listed to the right under the TYPE column. The letter L after the format indicates that the file is locked. Locked files will be discussed in exercise 2.

The maximum number of records that the file can contain is listed under the MAXIMUM RECORDS column. The maximum number of characters that each record can contain is in the CHARS/RECORD column. The number of records in a file that have already been filled is listed under the COMPLETE RECORDS column. Another value is the amunt of memory that is available for use in the creation of files. This figure represents the number of 80 character records that have not been committed to files. It does not include the number of file records that have not been filled. The record file and playback file listing tells which file has been designated as the record and playback files.

In the next exercise you will be shown a way to correct keyboard errors. Before proceeding with the next exercise check your catalog listing and see if there is a file in memory with a name of MYFILE or COPY2. Both of these files are going to be used with the exercises in this section. If either or both of these files exist, it will be necessary to delete them before the next exercise can be accomplished. This is because there cannot be two files with the same name. If you do not wish to delete the existing files, it is possible to do the following exercise by using the same file name but in a different case. For example, MYFILE, Myfile, and myfile are three different file names.

3.3.5 EXERCISE 2. CREATING A FILE. Before information (data) can be stored in memory there must be a file to store it in. This exercise will show you how to create a file and at the same time, demonstrate some error correcting techniques.

1. ENTER THE COMMAND MODE BY DEPRESSING THE CMD KEY.

2. TYPE IN THE WORD **CREATES** AND STRIKE THE SPACE BAR. If an error is made in the command word format, there is a way to correct the error before the SKIP key is depressed. To demonstrate this feature, the command word CREATES is incorrect, the correct command is CREATE. To correct this command with the CHAR key, proceed with step 3.

CORRECTING AN ERROR

3. DEPRESS THE CHAR KEY ONE TIME. The terminal will respond by backspacing the printhead one space.

4. DEPRESS THE CHAR KEY AGAIN. This time the terminal will respond by performing a linefeed and a backspace. The reason the terminal did not do a linefeed the first time the key was depressed is because the CHAR function detected the last character was a space (a non-printable character). The CHAR will not linefeed until it reaches a printable character. The printhead should now have its printing element (located in the extreme upper left corner of the printhead) under the letter S of the word CREATES. To delete the S, simply strike the space bar one time. This will replace the letter S with a space. Even though the letter S is still visible on the paper, it has been eliminated in the record. If an error had been made earlier in the text, you would have moved the printhead back to the point where the error was made and correct the mistake before using character overstrike (typing in the new character). It is a good point to remember that the remainder of the record (line) to the right of the printhead must now be retyped.

5. TYPE IN THE WORD **MYFILE** AND STRIKE THE SPACE BAR. This is to be the name of the file that is being created. The word MYFILE is not on the same line as CREATES. This is because of the previous correction and it has no effect on the file creation message.

6. TYPE IN THE LETTER **L** AND STRIKE THE SPACE BAR. The letter L instructs the terminal that the file will be in the LINE format. If the file was to be in the CONTINUOUS format, a C would have been entered in place of the L.

7. TYPE IN THE NUMBER **4** AND STRIKE THE SPACE BAR. This number means that the file will be limited to four records (lines) of data.

8. TYPE IN THE NUMBER **80**. This last figure instructs the terminal that each record will be able to contain a maximum of 80 characters.

9. DEPRESS THE SKIP KEY. This instructs the terminal to execute the command that has been typed in. When the terminal has completed the creation of the file, it will type out the message DONE.

You have now created a LINE formatted file by the name of MYFILE. The file can contain a maximum of four records of 80 characters each. Next, you will change the record file to MYFILE so that data can be recorded into it.

3.3.6 EXERCISE 3. CHANGE THE RECORD FILE. Proceed as follows:

1. ENTER THE COMMAND MODE.

2. TYPE IN THE WORD **CHANGE** AND STRIKE THE SPACE BAR. The command word CHANGE instructs the terminal that the function described in the next word is to be changed.

3. TYPE IN THE WORD **RECORD** AND STRIKE THE SPACE BAR. This specifies that the RECORD file is to be changed.

4. TYPE IN THE WORD **TO** AND STRIKE THE SPACE BAR.

5. TYPE IN THE WORD **MYFILE**. The last word specifies that the RECORD file is to be changed to MYFILE. This completes the CHANGE format required which is: CHANGE RECORD TO (FILE NAME).

6. DEPRESS THE SKIP KEY.

3.3.7 EXERCISE 4. CHANGE THE PLAYBACK FILE. Proceed as follows:

1. ENTER THE COMMAND MODE.

2. TYPE IN **CHANGE PLAYBACK TO MYFILE**. This is the same as the previous exercise.

3. DEPRESS THE SKIP KEY. This will cause the terminal to execute the command.

Now you have created a file, and changed the record and playback files to the newly created file. To verify that the files have been changed, use the CATALOG command and check the catalog listing. You will be using both the record and playback files in the following exercises.

3.3.8 EXERCISE 5. STORING DATA IN A FILE. Data can be stored in a file that has been designated as a record file by using the ASR function keys. The terminal functions are listed by their number, that is a function produced by depressing the FCTN key and the number key at the same time. F2 (RECORD ON) is produced by depressing the FCTN key at the same time you depress the number 2 key.

1. DEPRESS F6 (REWIND RECORD). This function ensures that the record file is at the beginning record.

2. DEPRESS F2 (RECORD ON). The terminal will respond by lighting the RECORD indicator in the lower right side of the keyboard. The terminal will now store into MYFILE whatever is typed on the keyboard. The data will be entered one record at a time until the SKIP key is depressed to indicate the end of a line. Then the text can be corrected using the CHAR and FIELD keys.

3. TYPE IN THE FOLLOWING TEXT USING THE SKIP KEY FOR A LINEFEED AND CARRIAGE RETURN:

```
THIS IS A VERY SHORT STORY.
IT ONLY CONSISTS OF FOUR LINES.
THIS LINE IS TO BE DELETED.
THIS IS THE VERY LAST LINE.
```

NOTE

When the SKIP key is depressed after the last record is typed, the terminal will respond by printing an error code.

```
♦♦♦ 73 ♦♦♦ (*A)
77 ♦♦ 77 ♦♦♦ (*B)
```

Observe that the RECORD indicator is extinguished. The error code tells you that there is no more room in the file. When the SKIP key was depressed the terminal tried to go to the next line of the file, however

there was none, so the error code was printed and the RECORD function was terminated. The normal method of terminating a RECORD ON function is to use the F4 (RECORD OFF) function which would have switched off the record indicator without printing out the error code.

The four lines of text that were typed in the previous exercise are now stored in memory. They will remain in memory until you remove or alter them. Even if the terminal is switched off, the data will remain.

3.3.9 EXERCISE 6. PLAYBACK OF A FILE. Now you will use the designated playback file to verify that the text you typed is stored in MYFILE.

1. SWITCH THE TERMINAL OFF. WAIT ONE SECOND THEN SWITCH IT BACK ON AGAIN. As you proceed through the remainder of this exercise you will be able to verify that removing the power did not affect any of the files and settings (parameters) of the terminal.

2. DEPRESS F5 (REWIND PLAYBACK). This function will return the playback file pointer to the beginning of the file.

3. DEPRESS F1 (PLAYBACK ON). This function will cause the contents of the playback file, which in the case of this exercise is MYFILE, to be printed on the terminal printer.

4. DEPRESS F1 (PLAYBACK ON) AGAIN. This time the contents will not be printed. This is because the file pointer is at the end of the file. To be able to print the contents again the file woud have to be rewound with the F5 function (REWIND PLAYBACK).

5. DEPRESS F8 (PLAYBACK REV) THREE TIMES. This will cause the playback file to go back three records (lines).

6. DEPRESS F1 (PLAYBACK ON). The printer will now print the contents of MYFILE starting with the second line of the text.

Now that you have created a file and recorded data in it, the next step will be to edit the data that is in the file. The following exercise will use all of the editing commands to change the data that has been stored in the file.

3.3.10 EXERCISE 7. EDITING A FILE. Proceed as follows:

1. PUT THE TERMINAL IN THE COMMAND MODE BY DEPRESSING THE CMD KEY.

2. TYPE IN **EDIT MYFILE** AND DEPRESS THE SKIP KEY. The terminal will respond by typing the index symbol ➧ below the command. The terminal is now in the edit mode and the function keys are now defined by the upper level of the decal.

3. DEPRESS F4 (PRINT). The contents of the file being edited will be printed. There will be an ETX printed at the end of the text to indicate that the end of the text has been reached.

4. DEPRESS F3 (TOP). This function is similar to the rewind playback function in the ASR mode. It will cause the record pointer to return to the starting record.

5. DEPRESS F2 (FIND). The terminal will respond by printing the FIND prompt symbol ⁘ . The FIND function allows you to define a string (group) of characters (up to a maximum of 15 for *A and 30 for *B) for the terminal to locate.

NOTE

Remember that the FIND function searches from the current record +1 to the end of the file. It will not search from the starting record to the current record so it is a good practice to return the file to the starting record before using the FIND function.

6. TYPE IN **FOUR** AND DEPRESS THE SKIP KEY. The terminal will indicate that it is searching for the defined word (FOUR) by printing the FIND prompt symbol after the defined character string. The second line of the text was printed because the word FOUR was found in it.

```
➧ EDIT MYFILE
➧
THIS IS A VERY SHORT STORY.
IT ONLY CONSISTS OF FOUR LINES.
THIS LINE IS TO BE DELETED.
THIS IS THE VERY LAST LINE.
ETX
➧
THIS IS A VERY SHORT STORY.
⁘ FOUR ⁘
IT ONLY CONSISTS OF FOUR LINES.
```

NOTE

If you make an error while entering your character string, you can make corrections by using the CHAR or FIELD key before the SKIP key is depressed.

7. DEPRESS AND HOLD THE CHAR KEY UNTIL THE PRINTING ELEMENT (upper left corner of the printhead) IS UNDER THE "F" OF THE WORD "FOUR".

NOTE

If the CHAR key is depressed for longer than 1/2 second, it automatically repeats until released. The other keys that operate in the same manner are: Space, Underscore, Minus, Period, and Asterisk.

8. TYPE THE WORDS **THREE LINES** AND DEPRESS THE SKIP KEY. You are using the character overstrike feature to change the word "FOUR LINES." to "THREE LINES." Depressing the SKIP key instructs the terminal to enter the line as corrected into memory and to print the next line (record).

9. DEPRESS F5 (DELETE LINE). The terminal will respond by printing a DELETE LINE prompt symbol . By using this function you are requesting that the current record be deleted from the file.

10. TYPE IN THE NUMBER **1** AND DEPRESS THE SKIP KEY. The number indicates how many lines are to be deleted, beginning with the current record. Since the number entered was a 1, only the current record will be deleted. After the specified number of lines have been deleted, all the records after the last deleted record are then moved to fill up the space. After the deletion has been completed, the terminal will print the new current record.

NOTE

The number of lines to be deleted can be corrected using the CHAR key before the SKIP key is depressed.

Entering a zero or no number at all will terminate the function and the current record will be printed and be available for editing.

```
IT ONLY CONSISTS OF FOUR LINES.
                    THREE LINES.
THIS LINE IS TO BE DELETED.
= 1
THIS IS THE VERY LAST LINE.
```

11. USE THE CHAR KEY TO POSITION THE PRINTING ELEMENT UNDER THE LETTER "V" OF THE WORD "VERY".

12. DEPRESS F6 (DELETE CHARACTER) 5 TIMES. You can simply hold the FCTN key depressed and a delete character symbol ▒ is printed each time the number 6 key is depressed. This symbol indicates that the character above it has been deleted. There are five deletions required for the four letters of the word "VERY" and the space following it.

A few points about the CHAR and FIELD keys are worth considering at this point.

- The CHAR and FIELD keys are active when the terminal is in EDIT mode, the COMMAND mode, or when the RECORD ON function is active and the terminal is off line.

- The CHAR key will cause a backspace to the last printed character the first time it is depressed. Additional depressions or holding the key down will result in a line feed and continuing backspacing.

- The FIELD key will cause a linefeed and the printhead will return to the beginning of the record.

- The CHAR key (CHAR and SHIFT key) will cause the printhead to print the contents of the current record one character at a time. When the printhead has reached the end of the data in a record it will stop and depressing the CHAR key will cause an audible beep with no action taken.

- The FIELD key (FIELD and SHIFT key), will cause the printhead to print the remainder of the contents of the current record.

13. DEPRESS THE FIELD KEY. The terminal will linefeed, printout the corrected record and the printhead will remain at the end of the text.

14. DEPRESS THE CHAR KEY ONCE. This will place the printing element under the period of the text.

15. STRIKE THE SPACE BAR (to strikeover the period) AND TYPE IN **OF THE STORY.** The record will now contain the phrase that you have just entered.

16. DEPRESS THE SKIP KEY. This will instruct the terminal that you have completed your editing of the record. The terminal will print ETX to indicate that the next record is the end of the text. The INDEX prompt symbol will be printed below the ETX message.

```
THIS IS THE VERY LAST LINE.
          ▒▒▒▒▒
THIS IS THE LAST LINE.
                        OF THE STORY.
ETX
```

17. TYPE IN A **-1** AND DEPRESS THE SKIP KEY. The -1 instructs the terminal that you require the record before the current record.

18. DEPRESS THE FIELD KEY. This will cause the printer to linefeed and move the printhead under the first character in the record.

19. DEPRESS THE CHAR (CHAR AND SHIFT) KEY THREE TIMES. This will move the printhead forward. Notice that as the printhead moves forward it prints the contents of the record one character at a time, each time the CHAR key is depressed.

20. DEPRESS F6 (DELETE CHARACTER) FIVE TIMES. This will delete the word "ONLY" and space following.

21. DEPRESS THE CHAR KEY. The terminal will print the corrected record and position the printing element under the first letter of the word CONSISTS.

NOTE

When using the DELETE character function followed by the CHAR or FIELD keys it should be understood that the following rules apply:

If the CHAR key is used, the printhead will return to the first character after the deletion.

If the CHAR key is used, the printhead will return to the last character before the deletion.

If the FIELD key is used, the printhead will return to the end of the text.

If the FIELD key is used, the printhead will return to the beginning of the record.

In all cases the record will be reprinted.

22. USING THE CHAR KEY MOVE THE PRINTHEAD UNDER THE SPACE BEFORE THE FIRST LETTER OF THE WORD "THREE".

23. DEPRESS F7 (INSERT). The terminal will print the open insert prompt symbol .

24. STRIKE THE SPACE BAR AND THEN TYPE IN THE WORD **ONLY**.

```
ETX
→ -1
IT ONLY CONSISTS OF THREE LINES.
IT ▒▒▒▒▒
IT CONSISTS OF THREE LINES.
   CONSISTS OF
              ONLY
```

25. DEPRESS F3 (TOP). This will terminate the insertion and cause the close insert smbol to be printed indicating the location where the insertion ended.

NOTE

Using any function except F6 or F7 will terminate the insert function.

26. DEPRESS F4 (PRINT). The edited text will now be printed.

27. DEPRESS F8 (STOP). The terminal will terminate the EDIT mode and enter the ASR mode.

```
                    ONLY
                        ⍙ THREE LINES.
THIS IS A VERY SHORT STORY.
IT CONSISTS OF ONLY THREE LINES.
THIS IS THE LAST LINE OF THE STORY.
ETX
→
DONE
```

Many times it is necessary to copy data from a file to the printer, to copy data from a file to another file, or to store data into a file directly from the keyboard. The COPY command will let you copy data from the keyboard into a file, even if that file is not the record file. The contents of a file can be printed out on the terminal printer using the COPY command. The contents of a file can be copied into another file by use of the COPY command. This is an advantage because the files do not have to be in the same format. This allows you to create and edit a file in the LINE format and copy it into another file in the CONTINUOUS format. The following exercise will help you to become familiar with the many uses of this command.

3.3.11 EXERCISE 8. COPY FROM FILE TO FILE. To copy data into another file, it is necessary to first create another file that the data can be copied into.

1. ENTER THE COMMAND MODE.

2. TYPE IN **CREATE COPY2 C 4 80** AND DEPRESS THE SKIP KEY. This command will produce a file in the continuous format that has the capacity of four records with each record being 80 characters in length.

3. ENTER THE COMMAND MODE.

4. TYPE IN **COPY MYFILE TO COPY2** AND DEPRESS THE SKIP KEY. This will cause the terminal to take the contents of MYFILE and copy it into the file labeled COPY2. The data stored in MYFILE remains unchanged.

5. ENTER THE COMMAND MODE.

6. TYPE IN **CATALOG**. The catalog will show that the COPY2 file has had data copied into it. Because of the difference in formats there will be one less complete record in the COPY2 file that is used in MYFILE. This is because the continuous format of the COPY2 file makes more efficient use of memory.

7. ENTER THE COMMAND MODE.

8. TYPE IN **COPY COPY2 TO PRINTER** AND DEPRESS THE SKIP KEY. This will verify that the contents of MYFILE were copied into the COPY2 file. Notice that the contents were printed even though the COPY2 is not the playback file. This is because the copy command will print the contents of any file in memory.

9. ENTER THE COMMAND MODE.

10. TYPE IN **COPY MYFILE TO PRINTER** AND DEPRESS THE SKIP KEY. The contents of MYFILE will be printed showing the copy command does not alter the contents of files that are copied.

3.3.12 EXERCISE 9. COMPARING CONTINUOUS FILES AND LINE FILES. This brief exercise will show the major differences between data stored in the continuous and line formats when printed in the edit mode of operation.

1. ENTER THE COMMAND MODE.

2. TYPE IN **EDIT COPY2** AND DEPRESS THE SKIP KEY.

3. DEPRESS F4 (PRINT). Notice that most of the text fits on one line and part of another line, instead of three separate lines. To assist you in editing continuous formatted files the end of each line of text is indicated by the End-Of-Line symbol  . This EOL symbol is generated each time the SKIP key is depressed. This character is only printed as an aid while the terminal is in the edit mode. In exercise 8 you observed that when the continuous file is printed that it looks identical to the original line formatted MYFILE. A good reminder is that both types of file formats appear identical when they are printed in the ASR mode or transmitted over the communications channel. The only time that the format shown in this exercise is seen is when the file is being edited.

3.3.13 EXERCISE 10. AN ALTERNATE METHOD OF STORING DATA IN A FILE. Up to this point, when data was to be stored in a file it was necessary to use the record file and the ASR RECORD ON function. The copy command will allow you to store data directly from the keyboard into a file without a record file. The following exercise will show you the way to store and playback data from MYFILE using the COPY command.

1. ENTER THE COMMAND MODE.

2. TYPE IN **COPY KEY TO MYFILE** AND DEPRESS THE SKIP KEY. This command instructs the terminal to store data that is entered from the keyboard into the file labeled MYFILE. The terminal will respond by leaving the COMMAND indicator lit, performing a linefeed and carriage return. The file will be erased and anything that is now typed on the keybord will be entered into MYFILE.

3. TYPE IN YOUR NAME AND ADDRESS, USE THE SKIP KEY AS A CARRIAGE RETURN AND TYPE IN YOUR COMPANY NAME AND ADDRESS ON THE SECOND LINE.

4. DEPRESS THE SKIP KEY (to return to the beginning of the next line) AND DEPRESS THE ENTER KEY.

5. TYPE IN **COPY MYFILE TO PRINTER.** The text that you entered in step 3 is now being printed. You will notice that with the COPY command it is not necessary to rewind the file before record or playback because the COPY command does it automatically. It should also be understood that the use of the COPY command does not allow you to start recording data in a file at any other record other than the first record of the file unless an END parameter is used with the command. The parameter will be discussed in a following paragraph.

3.3.14 EXERCISE 11. LOCKING, FREEING, ERASING AND DELETING FILES. After a file has been used to store data, it may become necessary to remove the data from the file so that more data can be stored in it. The terminal can remove the contents of a file without altering the file itself by using an ERASE command. The file can be eliminated by the use of a DELETE command which will remove the file and any data that is stored in it. To prevent the accidental erasure or deletion of a file there is a LOCK command that will prevent a designated file from being erased, edited, or deleted. The command that releases a file from being locked is the FREE command. This exercise will help you to become better acquainted with these functions.

1. ENTER THE COMMAND MODE.

2. TYPE **ERASE MYFILE** AND DEPRESS THE SKIP KEY. This will instruct the terminal to erase the data stored in MYFILE. You can use the CATALOG command to verify that MYFILE no longer contains any complete records.

3. ENTER THE COMMAND MODE.

4. TYPE IN **DELETE MYFILE** AND DEPRESS THE SKIP KEY. The terminal will delete MYFILE from the memory catalog.

5. ENTER THE COMMAND MODE.

6. TYPE IN **LOCK COPY2** AND DEPRESS THE SKIP KEY. The terminal will lock the file labeled COPY2. To verify this, use the CATALOG command, and the COPY2 file will have the letter L printed after its format. Also notice that the previously deleted MYFILE no longer exists.

7. TYPE THE COMMAND MODE.

8. TYPE IN **DELETE COPY2** AND DEPRESS THE SKIP KEY. The terminal will respond by printing error code ♦♦♦ 84 ♦♦♦ (attempting to write in a locked file) and no action will be taken.

   An attempt to EDIT or ERASE the locked file will produce the same error response from the terminal.

9. ENTER THE COMMAND MODE.

10. TYPE IN **FREE COPY2** AND DEPRESS THE SKIP KEY. The COPY2 file is now unlocked and can be edited, erased or edited.

You have now performed the basic off line operations of the terminal.

3.4 TERMINAL COMMUNICATIONS.

The communications system of the terminal allows exchange of data with a large variety of data communications equipment. The following paragraphs provide information needed by the operator to use the terminal with other communication equipment. Technical information and specifications necessary to interface the terminal with remote equipment are also given.

In its broadest sense, a memory data terminal is any device, connected to a communications network, which can store, transmit, receive and playback data. The Model 763 and 765 terminals are typewriters, further defined as Automatic Send-Receive (ASR) data terminals that have the ability to store the data that is typed in them and to transmit the data over a communications network. They can also receive and store information that is received from a communications network.

The difference between an ASR memory data terminal and a standard typewriter is the ability of the memory data terminal to generate codes from the keyboard. These codes can be stored, played back or printed by the terminal printer and/or transmitted to another device (data terminal, computer, etc.). The ASR also receives, stores, and/or prints the codes received from a device connected to it. The code system used by both Model 763 and 765 is the ASCII code system.

How are these digital signals passed from one device to another? If the distance between the two units is not too great (50 feet is usually the limit), the units can be hooked directly to each other by cables. When they are hooked up in this fashion the unit is said to be hardwired to the other unit.

For longer distances the use of cables becomes impractical and a method of using telephone lines becomes necessary. A device that converts the digital output of the terminal so that it is compatible with the phone lines is called a modem. The modem can be external to the terminal or built into the terminal. The Model 763 has an optional built-in modem available. When a modem is used, it is necessary to use a modem on both ends of the telephone lines. There are several types of modems available on the commercial market and it is very important that the same types of modems are used. If the modem is external to the terminal, then the modem is hardwired to the terminal and the modem is also hardwired to the telephones lines but, the terminal or modem is not considered as being hardwired to the remote device since a telephone line separates them.

The use of a modem still requires special phone devices that work with the modem. These devices would be impractical if you wished to travel with the terminal so there is a third way to communicate with a remote device. The Model 765 has a built-in acoustic coupler that uses the handset of an ordinary telephone. The terminal converts the digital signals into tones. These tones travel over the telephone lines to a device that converts the tones back into digital signals that can be used by a remote device. The acoustic coupler contains a modem and is built into the rear deck of the Model 765.

The Model 763 is capable of operating in several communications configurations, each of which is described in this manual. The primary use of the 763 is in hardwired and external modem configurations. The Model 765 is also capable of several communication configurations but the primary use is as a portable memory terminal using its built-in acoustic coupler as the means of communications.

Both Model 763 and 765 terminals have a revolutionary memory system. The memory in the terminal can store up to 20,000 characters in the standard configuration and can be expanded to 80,000 characters. This means that it is possible to type, correct and store all of the information before you transmit it to a remote device instead of transmitting data at the speed that you type, errors and all. It can also store data received from a remote device.

Communication procedures will differ from one installation to the next, the following topic is limited to the location nd operation of the different communications functions. It will not show a specific sequence of operation to make the terminal exchange data with a remote device. This is because the procedures are determined by the type of equipment the terminal is connected to as well as the remote device it is communicating with.

The terminal parameters (constants or values) of the terminal can be easily and quickly changed to meet a variety of communication requirements. Parameter selection is made by the use of the STATUS and CHANGE commands. The STATUS command will cause the terminal to print a listing of the current parameters of the terminal. The CHANGE command allows you to change any of these parameters.

3.4.1 TERMINAL STATUS. When the terminal is in the COMMAND mode and the word STATUS is typed in and the SKIP key is depressed, the terminal will print out a status listing. This listing, as shown below, will provide you with the current status of the terminal parameters.

```
▶ STATUS
LINE MODE:      INTERNAL/ 300 BAUD/ EVEN PARITY/ HALF DUPLEX/
OPTIONS ON:     EDC/
OPTIONS OFF:    PCHECK/ ABMPRT/ AUTOABM/ EOTDIS/ BUFFER/ DC3/ DC1.3/ DC2.4/
ABM:
RECORD FILE:
PLAYBACK FILE:
TRANSMIT EOL:   CRLF
RECEIVE EOL:    CRLF
KEY:
DONE
```

3.4.1.1 Line Mode. The LINE MODE listing contains four parameters. They are:

Interface — This is the selection of the communication option. The choices are INTERNAL (acoustic coupler, originate modem or 20 ma. dc current loop) or EIA (external) interface.

Speed — This parameter determines the speed the terminal will use to communicate with another device. The speed is listed in baud rates. The selections are: 110, 200, 300, 600, 1200, 2400, 4800, 9600. Throughput is limited to 2400 baud.

NOTE

The speed that the terminal is set to must be the same as the device it is to communicate with.

Parity — This determines what type of error checking scheme will be used (if it is enabled, see PCHECK). The selections are EVEN, ODD and MARK.

Duplex — This determines the communication mode. The selections are: FULL (full duplex), HALF (half duplex), and HALFRC (half duplex with reverse channel). The HALFRC can only be used with a device connected to the EIA communication port.

3.4.1.2 Options. The STATUS printout shows two OPTION listings, OPTIONS ON and OPTIONS OFF. The options that are listed can be switched either ON or OFF. The options are:

EDC — This sets the interactive extended line control (DC1-DC4 and Extended Line Control) ON or OFF.

DC3 — Determines if a DC3 from the playback file will stop playback or not.

DC1.3 — Activates or de-activates DC1 and DC3 control of the PLAYBACK file from the receiver in the interactive mode.

DC2.4 — Activates or de-activates DC2 and DC4 control of the RECORD file from the receiver in the INTERACTIVE mode.

PCHECK — The terminal will check for parity (error detection) on received data if PCHECK function is ON. If it is ON and a parity error occurs, a question mark will be generated in place of the character in error. Parity checking only occurs in EVEN or ODD but not MARK parity.

ABMPRT — This enables or disables the printing of the ABM (Answer Back Memory) sequence when in half duplex. If ABM is secure, it will not be printed, regardless of this option.

AUTOABM — ABM auto-trigger enable. If this enable is set to ON, the terminal will automatically transmit the ABM sequence three seconds after a call is automatically answered by the terminal (EIA only).

EOTDIS — End of transmission disconnect enable. If this enable is ON, the terminal will monitor received data for an End-Of-Transmission character. If one is found the terminal will disconnect the line (EIA only).

BUFFER — If this enable is ON, the transmitter, in addition to the receiver is buffered when the terminal is in the interactive mode, i.e., data is not transmitted until the **SKIP** key is depressed or the 80 (82 with *B) character has been entered.

ABM — The Answer Back Memory (ABM) can use up to 34 ASCII characters to form the ABM sequence. If the sequence is secure, it is not printed.

RECORD FILE — This defines which file will be used in the INTERACTIVE mode as the record file.

PLAYBACK FILE — This defines which file will be used in the INTERACTIVE mode as the playback file.

XMTEOL (Transmit EOL) and RCVEOL (Receive EOL) — Defines the system transmit and receive sequences to be used when the terminal is transmitting or receive data in the INTERACTIVE ON LINE mode.

The SKIP key acts as TRANSMIT EOL in the INTERACTIVE mode when ON LINE. The parameters that can be used as TRANSMIT EOL are NL (New Line), CRLF (Carriage Return-Line Feed), DC3, or a Single Character enclosed in double quotes. NL, CRLF, or a Single Character enclosed in double quotes can be used for RECEIVE EOL. The parameters are defined as:

NL — When transmitting, a LF (Line Feed) character is sent and the printhead is placed at the beginning of the next line. When a LF character is received, the printhead is placed at the beginning of the next line.

CRLF — A Carriage Return-Line Feed sequence will be sent.

DC3 — PLAYBACK file will be turned off (if on) and a DC3-nul will be sent.

Single Character — The specified character will be sent when EOL is reached. If no character has been specified, no action will be taken.

NOTE

The end-of-file (EOL) sequence is the character set to be transmitted or received in lieu of the end-of-line symbol used internally by the terminal. For example: if the CRLF is selected as the end-of-line sequence, whenever the end-of-line symbol is read from the playback file for transmission, the symbol will be replaced with CRLF. On the other hand, whenever a CRLF sequence is received from the communication channel for recording, the end-of-line symbol will be recorded instead of the CRLF.

3.4.2 TERMINAL PARAMETER MODIFICATION. An example of how to change terminal parameters with the CHANGE command is provided in the following situation:

You have received a Model 765 terminal for use in the field. Before using the built-in acoustic coupler you check the terminal configuration with the STATUS command. The following listing is printed.

```
▶ STATUS
LINE MODE:       EIA/ 1200 BAUD/ EVEN PARITY/ HALF DUPLEX/
OPTIONS ON:      EDC/ DC3/ DC1.3/ DC2.4/
OPTIONS OFF:     PCHECK/ ABMPRT/ AUTOABM/ EOTDIS/ BUFFER/
ABM:
RECORD FILE:
PLAYBACK FILE:
TRANSMIT EOL:    CRLF
RECEIVE EOL:     CRLF
KEY:
DONE
```

You now notice that two of the parameters need to be changed so that the acoustic coupler can be used for data transmission. The baud rate (speed) is set for 1200 and the maximum that can be used with an acoustic coupler is 300. The other parameter that must be changed is INTERFACE. It must be changed from EIA (EXTERNAL) to INTERNAL. (Refer to table 3-1, the change command entry table).

To change the speed from 1200 baud to 300 baud you must use the CHANGE command. Place the terminal in the COMMAND mode and type in the CHANGE format:

CHANGE [(Parameter Name)] TO [(Entry)]

To change the baud rate using this format you would refer to the change command entry table and find the Parameter Name which, in this case, is SPEED. Since the desired rate of 300 baud is one of the acceptable entries, the number 300 would be typed in the area reserved for parameter entry. The result would be:

```
▶ CHANGE SPEED TO 300
```

When the SKIP key is depressed, the terminal acknowledges that the parameter change is complete by printing the word DONE.

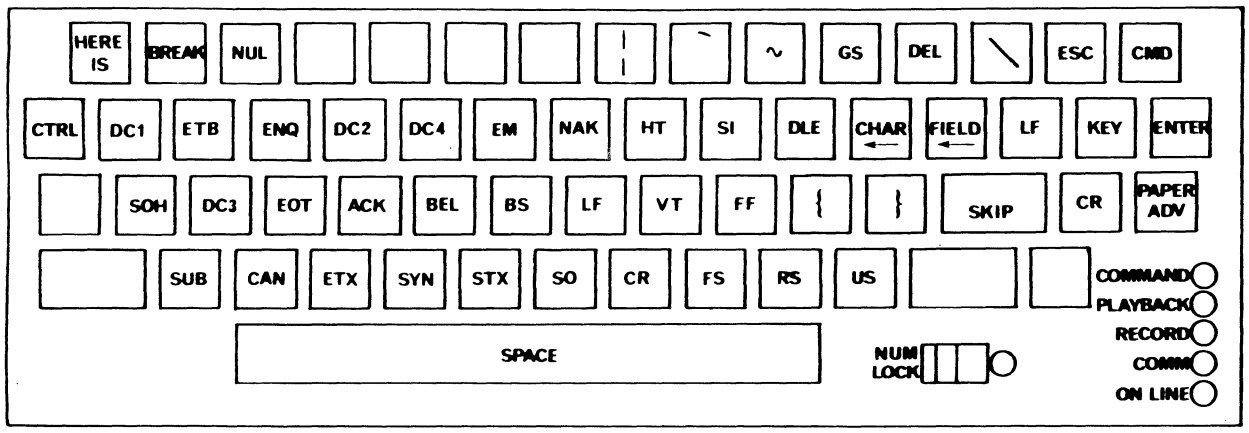
To change the INTERFACE from EIA to INTERNAL the same format is used. Referring to table 3-1, you would find that the parameter name is INTERFACE and the parameter entry is INTERNAL. After entering the COMMAND mode you would type in:

```
▶ CHANGE INTERFACE TO INTERNAL
```

After the SKIP key is depressed the terminal responds by printing the word DONE.

The STATUS command can be used to verify that the terminal parameters have been changed. Once the terminal parameters have been changed they will remain in that state even if the power is removed.

Many of the communication procedures used with data terminal require the control characters. The terminal has the capability to generate all of the standard ASCII control characters. The control characters are made by using the CTRL (control) key in conjunction with the key that corresponds with the desired function. A layout showing the control key assignments of the keyboard is shown below.



Change Command Entry Table

Parameter Name	Entry
ABMPRT	ON, OFF
AUTOABM	ON, OFF
EOTDIS	ON, OFF
RECORD*	FILENAME
PLAYBACK*	FILENAME
EDC	ON, OFF
KEY*	A SINGLE CHARACTER ENCLOSED IN DOUBLE QUOTATION MARKS
DC3	ON, OFF
DC1.3	ON, OFF
DC2.4	ON, OFF
BUFFER	ON, OFF
XMTEOL*	NL, CRLF, DC3 OR SINGLE CHARACTER ENCLOSED IN DOUBLE QUOTATION MARKS.
RCVEOL*	NL, CRLF OR SINGLE CHARACTER ENCLOSED IN DOUBLE QUOTATION MARKS.
SPEED	110, 200, 300, 600, 1200, 2400, 4800**, 9600**.
PARITY	EVEN, ODD, MARK
PCHECK	ON, OFF
DUPLEX	FULL, HALF, HALFRC
INTERFACE	INTERNAL, EIA
ABM*	UP TO 34 ASCII CHARACTERS ENCLOSED IN DOUBLE QUOTES. A SINGLE IMBEDDED DOUBLE QUOTE IS REPRESENTED BY 2 CONSECUTIVE DOUBLE QUOTES. IF AN S FOLLOWS THE CLOSING QUOTE, SEPARATED BY A SPACE, THE ABM WILL BE CONSIDERED SECURE AND WILL NOT BE PRINTED.

* No entry will yield no definition.
** The terminal can communicate with devices at these baud rates but actual throughput is limited to 2400 baud.

3.4.3 MODEL 765 OPERTION WITH AN ACOUSTIC COUPLER. This paragraph describes the operation of the Model 765 terminal with its built-in acoustic coupler. All that is required for this operation is a standard telephone set and an electrical outlet to provide power to the terminal. Setup the terminal as follows:

1. Set the terminal on a table close to a standard telephone and a commercial ac power outlet.

2. Remove the outer cover as described in Section II.

3. Remove the power cord from the inside of the cover and plug the female connector into the rear of the terminal and the male connector into an electrical outlet.

4. Switch the terminal power ON.

5. Check the ON LINE indicator in the lower right corner of the keyboard to see if it is lit. If it is lit skip to step number 8.

6. If the ON LINE indicator is not lit, place the terminal in the COMMAND mode by depressing the CMD key.

7. Type in the command ON LINE and depress the SKIP key. The ON LINE indicator should now be lit.

8. Check the terminal parameters to ensure that they meet your system requirements. The parameters can be checked by using the STATUS command described earlier in this section. STATUS, CATALOG and other commands will not be transmitted even if the terminal is ON LINE.

NOTE

When using the built-in acoustic coupler the terminal must be in INTERNAL configuration and SPEED must be 300 baud or less.

9. If any of the parameters are incorrect, they should be changed with the CHANGE command as described earlier in this section.

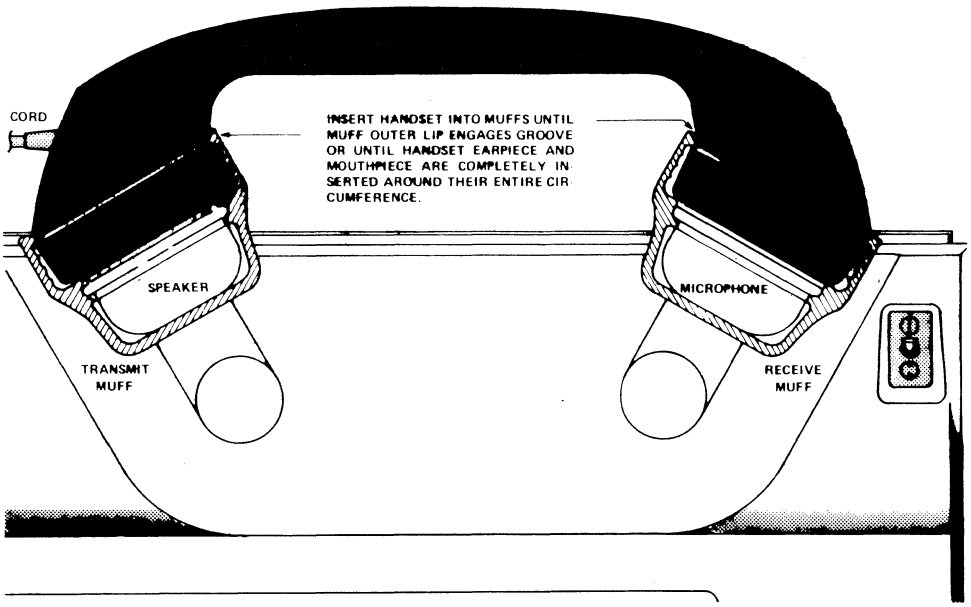
10. Open the paper door and check that the terminal is properly loaded with a sufficient supply of thermal printing paper.

11. Pick up the telephone handset and dial the appropriate number; an audible high frequency signal (data tone) can be heard after the call is answered.

12. As soon as you hear the data tone, firmly insert the telephone handset into the acoustic coupler muff so that the cord is to the left of the terminal as shown below. The Model 765 will in turn transmit a data tone to the remote equipment.

NOTE

It is very important to insert the handset into the muffs so that the outer lip of each muff mates with the grooves of the handset; or until the removable caps on the handset are completely surrounded by the inside circumference of the muffs.



13. Check that communication between your terminal and the remote equipment is in progress by observing that the COMM indicator in the lower right corner of the keyboard remains lit.

    If the COMM indicator goes out, communication has been lost and you must return to step 11.

14. Begin communication according to your system procedures.

15. When you have finished, switch the terminal OFF LINE and terminate communications according to your system procedure; remove the telephone handset from the acoustic coupler and replace the handset in its cradle.

3.4.4 MODEL 763 OR 765 OPERATION WITH A DATA SET. This paragraph describes how to use either the Model 763 or 765 terminal with an external data set. There are two different EIA data set cable assemblies that can be used with the terminal that allow the terminal to be connected to several types of data sets. The option 103/202/212 Cable Assembly (TI Part No. 2200051) allows the terminal to be connected with the following types of Bell System data sets: 103A, 103J, 202C, 202S, and 212A.

The 113 data set cable assembly is used to connect the terminal to a Bell System type 113A data set.

The type of data set to be used with the terminal will determine which cable assembly to use. Both of the cables connect to the terminal at P1 which is the bottom connector at the rear of the terminal. Setup the terminal as follows:

1. If the terminal is not already connected to the data set, ensure that it is connectd with the correct cable for the data set being used.

2. Switch ON the terminal.

3. After the terminal prints out a READY message, enter the COMMAND mode by using the CMD key.

4. Use the STATUS command followed by the SKIP key to check the current terminal parameters.

5. Ensure that the INTERFACE is EIA (external) and that the baud rate is correct for your system application. If any of the parameters are incorrect, insert the correct parameters with the CHANGE command.

6. Set the terminal to on line (if it is off line) with a CHANGE command. The COMM indicator should be lit.

7. Set all the controls on the external data set according to your system requirements.

   For instructions on operation of the data set refer to the directions provided with the data set being used.

8. When the connection is complete (the COMM indicator will be lit) you may begin communications according to your system procedure.

NOTE

If the COMM indicator goes out, communication has been lost and you must set up the data set again.

9. If your system requires, depress the keyboard HERE IS (this is produced by depressing the CTRL and number 1 keys) to transmit the contents of the Answer Back Memory (ABM).

10. When you are finished, terminate communications according to your system procedures.

3.4.5 MODEL 763 OPERATION WITH AN INTERNAL MODEM. This paragraph describes the operation of the Model 763 terminal with the optional internal modem. The CBS 1001F Coupler cable assembly (TI Part No. 2200052) must be used with the optional internal modem. This cable assembly is

a Y-cable assembly with a male and female connector. This cable allows connection of the Model 763 to a CBS 1001F type data coupler. Setup the terminal as follows:

1. If the terminal is not already connected to the data coupler, ensure that it is connected with the CBS1001F Coupler cable assembly.

2. Switch ON the terminal.

3. After the terminal prints out the READY message, enter the COMMAND mode by using the CMD key.

4. Use the STATUS command followed by the SKIP key to have the terminal print out its current parameters.

5. Check the parameters and ensure that the INTERFACE is INTERNAL and the SPEED does not exceed 300 baud. If any of these parameters do not meet your system requirements; use the CHANGE command to reconfigure them.

6. Open the paper door and check that the terminal is properly loaded with a sufficient supply of thermal printing paper.

7. If the terminal is OFF LINE, switch it to ON LINE.

8. Begin operation according to your system procedures. When the connection is complete the COMM indicator will be lit.

NOTE

If the COMM indicator goes out, communications have been lost, repeat step 8 to restore communications.

9. When you are finished, terminate communications according to your system procedures.

3.4.6 MODEL 763 OPERATION IN A DC CURRENT LOOP. To operate the Model 763 in a dc current loop (20 ma.) interface, the current loop cable assembly (TI Part No. 2200053) must be used. The terminal setup for dc current loop operation is the same for the internal modem. The operation is determined by your system procedures.

3.4.7 INTERACTIVE ON LINE FULL DUPLEX MODE. In the full duplex, on line mode, the terminal will process all ASCII characters received from the active communication channel.

Likewise, valid ASCII characters entered from the keyboard will be transmitted over the active communication channel with the selected parity. The record and playback files, if defined, can be controlled with the F1-F6 function/keys at the keyboard and the control characters (DC1-DC4) if

Extended Device Control (EDC) is on. The following is a description of the Automatic Device Control (ADC) functions:

DC2, F1 PLAYBACK ON — The playback file is transmitted.

EOL indicators are replaced with the system defined transmit EOL sequence (CRLF, NL, etc.)

DC2, F2 RECORD ON — Data from the communication channel is recorded. Data is scanned for the receive EOL sequence. If found, the sequence is replaced by the EOL indicator. The record is written to memory when an EOL is found if the file is a line formatted file. If not, the record is written when filled or a record off function occurs.

DC3, F3 PLAYBACK OFF — The playback file is turned off.

DC4, F4 RECORD OFF — The record file is turned off.

F5 REWIND PLAYBACK — The playback file will return to the first record of the file.

F6 REWIND RECORD — The record file will return to the first record of the file.

F7 — Forward One Record — The last current playback record will be transmitted.

F8 Reverse One Record — The playback file will return to the beginning of the current record.

F9 Printer On — The terminal printer is turned on.

F0 Printer Off — The terminal printer is turned off.

During a record operation at speeds above 300 baud the printer is disabled. At speeds of 300 baud and slower, data which is recorded will also be printed if the printer is enabled.

3.4.7.1 Parity. Parity is generated for each character transmitted based on the setting of the PARITY value in the terminal parameters. The parity is generated even if the PARITY CHECK option is OFF. Parity on received data is checked only if the PARITY CHECK option is ON and the PARITY value is ODD or EVEN. A general rule for parity operations using phone lines is that synchronous communications are ODD parity and asynchronous communications are EVEN parity. If the PARITY value is set to MARK, the parity bit is always set. MARK parity is almost never used.

If the parity of a received character indicates an error and the PARITY option is ON, a question mark will be stored in the bubble memory in place of the character in error. If the PARITY option is not ON then all of the characters will be stored in the bubble memory without any indication of errors that may exist.

Parity is also used to check for errors of data stored in the bubble memory system. If the data being played back out of the bubble memory system has question marks in it then it could be either indicating parity errors in the data received or the data stored. A quick check of the bubble device will indicate where the problem lies.

3.4.7.2 Answer Back Memory. An ABM sequence of up to 34 characters may be defined by use of the CHANGE command. The ABM sequence is transmitted only if the terminal is ON LINE. It is transmitted after the ENQ control character is received or when the HERE IS key is depressed. If the terminal is in the ON LINE half duplex, the ABM sequence is also printed unless the parameter ABMPRT has been set to OFF or the ABM message is "secured". If the AUTOABM parameter is enabled, the ABM sequence will be sent three seconds after a call has been auto-answered on the EIA interface. If the secure option is selected during ABM definition, the ABM will never be printed.

3.4.7.3 Interactive Buffered Operation. If the BUFFER option is on, the transmit buffer holds data coming from the keyboard for up to 80 characters in length. This data is printed as it is put into the buffer regardless of duplex selection. To initiate burst-mode transmission, the end-of-line sequence assigned to the SKIP key on the keyboard must be entered. Prior to transmission the contents of the transmit buffer may be edited from the keyboard with the CHAR or FIELD keys.

3.4.8 INTERNAL INTERFACE COMMUNICATIONS

3.4.8.1 Acoustic Coupler Interface Port Operation (765 Only). If the terminal is configured to be on line, then the ON LINE indicator on the keyboard will be lit. When the acoustic coupler detects a valid carrier on the communication line, the COMM indicator on the keyboard will be lit. The terminal must be on line and a valid carrier must be present before communications should be attempted. The absence of a valid carrier will result in an error code on attempted transmission. Half or full duplex up to 300 baud is applicable.

3.4.8.2 20 ma., DC Current Loop Interface Port Operation (763 Only). If the terminal is on line, the ON LINE and COMM indicators on the keyboard will be lit. The interface is a 4-wire system which may be connected externally for 2-wire half-duplex operation.

3.4.8.3 Internal Originate Only, 300-Baud Modem Interface Operation (763 Only). If the terminal is on line, the ON LINE indicator will be lit. When the modem detects a valid carrier on the communication line, the COMM indicator will be lit. The terminal should be on line and a valid carrier must be present before communications are attempted. The absence of a valid carrier will automatically stop reception and will result in an error code on attempted transmission. Half or full duplex up to 300 baud is applicable.

The terminal has a sufficient set of signals to interface to a CBS-type Data Access Arrangement (DAA) for full or half duplex operation and may answer with originate modem frequencies. This interface when connected nullifies the use of the EIA port since some of the signals are shared in the connector (OH/SCA, SH/SCH, CCT/DSR).

3.4.9 EIA INTERFACE OPERATION. If the terminal is configured to be on line, then the ON LINE indicator on the keyboard will be lit. If the DSR signal is true, the COMM indicator on the keyboard will be lit. The EIA port has a sufficient set of the standard RS-232-C signals to permit operation with external data sets for half, full, or half duplex with reverse channel interrupt modes of communication.

3.4.10 EXTENDED DEVICE CONTROL. Extended control of the terminal is provided to the communication channel through a two-character control sequence. The EDC must be on to use these sequences. The first character of the two-character sequence is always the control character ESC. The following is a list of the extended commands.

ESC 0 — Enter COMMAND mode and process the command which follows the 0. This is terminated by the receive EOL sequence.

ESC 1 — Transmit Status. Six hexadecimal ASCII numbers are transmitted which represent the status of the terminal. This is followed by the transmit EOL sequence.

The first two numbers represent the status of the last executed command, whether the command came from the keyboard or from the line. These two numbers can be:

00 — Command successfully executed.

XX — Two hexadecimal numbers representing the error code, if an error has occurred.

FF — An error has occurred which does not have an error code.

The next four hexadecimal numbers represent one 16-bit binary word. The meaning of a logic one in each position is as follows:

Bit 0 — Playback is assigned to an existing file.
Bit 1 — Record is assigned to an existing file.
Bit 2 — The playback and record files are the same file.
Bit 3 — The playback file is a line file (a 0 indicates a continuous file).
Bit 4 — The record file is a line file (a 0 indicates a continuous file).
Bit 5 — The record file is locked.
Bit 6 — The printer has been turned off by a printer off command.
Bit 7 — DC2.4 is on.
Bit 8 — DC1.3 is on.
Bit 9 — DC3 is on.
Bit 10 — EDC is on.
Bit 11 — Buffer is on.
Bit 12 — EOTDIS is on.
Bit 13 — AUTOABM is on.
Bit 14 — ABMPRT is on.
Bit 15 — PCHECK is on.

ESC 2 — Playback file record forward.

ESC 3 — Playback file record reverse.

ESC 4 — Rewind playback file.

ESC 5 — Rewind record file.

ESC 6 — ADC ON — turns DC1.3, DC2.4 and DC3 ON.

ESC 7 — ADC OFF — turns DC1.3, DC2.4 and DC3 OFF.

ESC 8 — Printer on.

ESC 9 — Printer off — the printer will remain off until:

1) A PRINTER ON command is encountered.

2) The COMMAND mode is entered.

3) Power is cycled.

ESC : — Lockout keyboard (*B only)

ESC ; — Free keyboard (*B only)

ESC < — Return to RUN command file (*B only)

3.5 SHORTHAND FORM OF COMMANDS AND PARAMETERS. Up until now, anytime a command has been entered into the terminal you have used the entire name of the command. To save time and effort there is an alternate way to enter the commands to the terminal. Table 3-2 provides a listing of the commands and the shorthand or abbreviated form (if there is one).

Short Form for Commands and Parameters

Command Parameter	Alternate	Description
CATALOG	CL	Print the memory file catalog
CHANGE	CG	Change a terminal configuration parameter
COPY	CP	Copy data.
CREATE	CF	Create and define a memory file.
DELETE	none	Delete a memory file.
EDIT	ED	Edit a memory file.
ERASE	none	Erase a memory file.
FREE	none	Release file protection.
INTERFACE	PORT	Used with the CHANGE command.
INTERNAL	INT *	Used with the CHANGE command.
LOCK	none	Protect a file against being erased, delete or written into.
OFF LINE	OF or OFF*	Place the terminal off line.
ON LINE	ON	Place the terminal on line.
PLAYBACK	PLAY*	Used with the Change Command.
RECORD	REC *	Used with the CHANGE command.
RUN*	none	Executes commands from a file.
STATUS	ST	Print all current terminal configuration parameters.
TEST	TS	Execute a ROM resident terminal test.

*B only

3.6 ASR FUNCTION KEYS

When the terminal is in the ASR mode, the function keys F1 through F0 control the designated playback and record files. Only one file can be made the playback file at a time. A CHANGE command is used to designate one of the files in memory to be the playback file. An example would be to make a file by the name of DATA-1 the playback file. The procedure would be:

1. Put the terminal in the COMMAND mode by depressing the CMD key.

2. Type in **CHANGE PLAYBACK TO DATA-1**.

3. Depress the SKIP key.

Once this is completed, all of the functions that are labeled PLAYBACK would take action on the DATA-1 file. The same holds true with the file designated as the RECORD file.

The files that are designated as playback and record can be the same files or different files.

The following ASR functions control the playback and record files.

3.6.1 F1 — PLAYBACK ON. The playback file will output its contents to the terminal printer and/or the communications channel depending on terminal parameters (see STATUS command in Section III). The playback file will continue to output whatever is stored in it until it reaches either an End-of-Text (ETX) or the PLAYBACK OFF (F3) function is activated. Just as a tape recorder will begin to playback at the point where the tape was last stopped, the PLAYBACK ON function begins outputting the contents of the file at the last record that was addressed.

3.6.2 F2 — RECORD ON. The designated record file will accept data from the keyboard and/or communications channel. If the file has been formatted in LINE format, the terminal will store a line of data in a memory record each time the SKIP key is depressed. If the record file is in CONTINUOUS format, then the data will be stored in the memory record everytime that the designated record length has been filled. The RECORD ON function will remain on until either the file is filled or the RECORD OFF function (see F4) is detected.

3.6.3 F3 — PLAYBACK OFF. The playback file will stop after one more character is processed.

3.6.4 F4 — RECORD OFF. The record file will stop.

3.6.5 F5 — REWIND PLAYBACK. The playback file will return to the beginning of the file. If the playback and record files have the same file name, anytime the designated playback file current record is moved forward or backward the record file is also affected. For example, if DATA-1 is both the PLAYBACK and record file and the REWIND PLAYBACK function is used, the record as well as the playback file will be rewound. If the files had different file names then the REWIND PLAYBACK would not have any effect on the record file.

3.6.6 F6 — REWIND RECORD. The record file will return to the first record of the file.

3.6.7 F7 — PLAYBACK FWD. The remainder of the current memory record will be printed. If the playback file was already at the end of a record, then the next record will be printed. If the next record is the End-of-Text (ETX), nothing will be printed.

3.6.8 F8 — PLAYBACK REV. The playback file will return to the beginning of the current record. If it was already at the beginning of a record, it will go to the beginning of the previous record.

3.6.9 F9 — PRINTER ON. The terminal printer is turned on. This function is automatically active when either the COMMAND mode is entered or when power is turned on.

3.6.10 F0 — PRINTER OFF. The terminal printer is turned off. The primary use of this feature is during communications and you do not wish to have a copy of the data being transmitted.

3.7 EDIT FUNCTION KEYS

The EDIT functions are used to modify the contents of an existing file. Memory files that have been designated as LOCKED files cannot be edited. The editor is record oriented, that is the contents of a file can be edited one record at a time. Remember that the length of a record is determined at the time that the file is created. The editing functions are controlled by the CHAR, FIELD, ENTER, and SKIP keys. Before the editing functions can be used, the terminal must be placed in the EDIT mode. The EDIT mode of the terminal is file oriented, that is, the terminal is instructed to edit files by name and the file that is to be edited need not be the playback or record file. The edit function keys will operate on the file that was requested when the terminal entered the edit mode.

The editor is entered by putting the terminal in the COMMAND mode and typing in the word **EDIT** followed by the name of the file that you wish to edit. Some general guidelines that apply to the use of the editor are:

- When you type in the name of the file to be edited, ensure that it is in the correct character case. For example, MYFILE, Myfile, and myfile are three different file names.

- If the file requested is not empty or locked, then the editor will enter the INDEX function and print the INDEX prompt symbol .

3.7.1 F1 — INDEX. When the INDEX function is selected, the terminal will print an INDEX prompt symbol ➔ . You may now enter a signed (+ or -) number 0 and 999. If no sign is specified, a + sign is assumed. When the SKIP key is depressed, the terminal will add (subtract if a - sign was entered) the number to the present (current) record location and go to the new record location. When the requested location is reached the record is printed and available for editing.

If you depress the SKIP key without entering a number, the next record is assumed. Entering a zero will keep you at the current record location. Entering any of the other function keys instead of a number will terminate the index mode and initiate the new function. In summary:

- A signed number and the SKIP key will move the editing pointer the number of records and direction (+ or -) requested. For example, if you wanted to review the text that is six records back in the file, you would enter a -6.

- The file cannot go to a negative record location. If, in our previous example, you were at line 5 and typed in a -6 the file would go to the line 0 not -1.

- All files start at line 0 and the data at line 1. This means that line 0 is above the data at line 1. This is useful when inserting lines at the beginning of a file.

3.7.2 F2 — FIND. The FIND function is used to locate a memory record which contains a defined character string (a group of characters). Upon initialization of the FIND (F2) function, the terminal printer will print the prompt symbol  . You may then enter the word or character string (up to a maximum of 15 characters) (30 characters with *B) and depress the SKIP key. The editor will begin searching for it at the current record +1. When the record is located, it is printed and the index pointer will point to this record. The printhead will stop at the end of this record. If the string is not found before the end of the file is reached, an ETX message will be printed and the pointer will be at the last record in the file. Multiple find searches can be done by depressing F2 and then the FIELD key. The last defined character string will be reprinted. Depressing the SKIP key will begin the search. General rules for the FIND function are:

- Unless you are sure the character string you need is located between the current record +1 and the end of the file you should return the pointer to the beginning of the file with a TOP (F3) function.

- The FIND function cannot be used on an empty file.

3.7.3 F3 — TOP. The TOP function will cause the file to return to the first record location (line 1) and print the contents which are then available for editing.

3.7.4 F4 — PRINT. The PRINT function will cause the terminal to begin printing each record starting with the current record +1. The terminal will continue to print the contents of the file until the end of the file is reached or until F4 or one of the other function keys is depressed at which time the current record will be printed and the function requested will be initiated. If the print function was used to stop the printing, the printhead will remain at the end of the record being printed. The record is then available for editing.

3.7.5 F5 — DELETE LINE(S). The DELETE LINE(S) function will cause the printhead to do a line feed and a carriage return and will print a delete line prompt symbol  . At this point you must enter the number of lines to be deleted starting with the current record. A number from 1 to 999 can be entered. If the wrong number is entered, it can be corrected with the CHAR ← key until the SKIP key is depressed. After the specified number of records have been deleted, all the records after the last deleted record are then moved up to fill the space. The index pointer will be placed at the first record following the deleted set of records. This is now the current record and it will be printed and is available for editing. Some rules to note:

set of records. This is now the current record and it will be printed and is available for editing. Some rules to note:

- Entering a zero or no number will terminate the function and the current record will be printed with the printhead left at the end of the record.

- If the deleted records are at the end of the file, then a ETX will be printed.

NOTE

Large deletions will tke a few seconds for the terminal to close up the records at a rate of approximately 510 characters per second. The keyboard will not respond (except CMD key) while this operation is in progress.

3.7.6 F6 — DELETE CHARACTER(S). After a record has been located and is available for editing, the DELETE CHARACTER function (F6) can be used. The character which the printhead is positioned underneath will be deleted. This deletion is indicated by printing the following symbol underneath the character deleted  . Both the CHAR and FIELD keys are used to position the printhead under the character to be deleted. The first time either of these keys is depressed after the function is used will cause the corrected record to be reprinted.

3.7.7 F7 — INSERT. After the INSERT function is initiated, the open insert symbol  is printed indicating entry into the INSERT function. When using the INSERT function to insert data into a continuous formatted file, the printhead should be moved to the location in the text where the insertion is to be made. Depress the F7 (INSERT) key and the open insert symbol will be printed followed by a line feed. When entering data in the INSERT mode keep in mind that use of the ENTER key will cause the current record to be closed and the data to the right of the open insert symbol will be temporarily saved and appended to the last record of the insertion. An example should help to show how this works. If the original text is:

```
This is the end of the text.
```

By moving the printhead under letter "o" of the word "of" and depressing the F7 key, an open insert symbol will be printed below the "o", indicating that the insertion will begin at that point. If you would depress the ENTER key at this point, the terminal will close the current record at the point indicated by the open insert symbol. The printer will line feed and carriage return to indicate that a new record had been opened. If the text **This is not the end** is typed in and the INSERT mode terminated, the terminal will append the rest of the record from the first line (that was temporarily saved) to the new record. The result would be:

```
This is not the end of the text.
```

The space from the end of the word "end" in the first line as well as the text, "This is not the end" have been inserted. Using the SKIP key when making an insertion in a CONTINUOUS formatted file will result in an End-Of-Line (EOL) symbol  being inserted at that point.

In a LINE formatted file the SKIP or ENTER key will cause the current record to be closed and a new record to be opened for insertion. A few guidelines for using the INSERT function are:

- After the text has been inserted any function except INSERT or F6 (DELETE CHARACTER) will terminate the INSERT function.

- When the printhead is positioned 10 characters prior to the end of the defined record length, an audible beep will be sounded to notify you that the maximum record length is approaching.

- If an insertion would cause the record to exceed its defined length, then an additional record will automatically be inserted to accommodate the additional characters.

- If there is no additional record space available in the file, then the characters that were temporarily saved for appending to the last record inserted will be lost.

- When there are less than ten available records remaining in a file, an audible beep will be heard each time a new record is opened.

- INSERT functions are not allowed if the terminal is already in the INSERT mode. In other words you cannot make an insertion within an insertion.

- The DELETE character function cannot be used during an insertion.

- The CHAR and FIELD keys can be used to correct insertions before the currently inserted record is closed.

3.7.8 F8 — STOP. This function terminates the edit mode and returns the terminal to the ASR mode. Note that depressing the CMD key anytime while in the edit mode will cause the terminal to abnormally terminate the edit mode, and is not recommended.

3.8 EDITING A RECORD

Once a record has been printed as a result of an EDIT function operation (i.e., FIND, INDEX, PRINT) it can be EDITED in the following way:

- The CHAR and FIELD keys may be used to position the printhead below the characters to be edited.

- The ENTER key may be used to truncate characters to the right of the printhead, close the current record and access the next record in the file. The SKIP key will also perform this operation when editing LINE formatted FILES.

- The character deletion function may be used to delete characters within the record boundaries.

- The INSERT function may be used to insert characters in the record.

- Characters may overstrike existing characters in a record or they may be appended to the contents of the record as long as the record length is not exceeded.

3.9 TEST COMMAND

The TEST command allows you to test some of the terminal without any external test equipment. A test of the terminal memory is accomplished automatically everytime the terminal is turned on. The terminal prints READY when this test has been passed successfully.

There are two forms of the TEST command that can be used with the terminal.

TEST — Activated by entering the word TEST and depressing the SKIP key. The terminal will appear to stop until the test is complete. If no errors occur, the terminal will print the message DONE. If an error occurs, a FAIL message is printed followed by one or more error codes which are defined in Section 5.2.

TEST INIT — This command will initiate a terminal initialization routine. When this command is entered the terminal will respond by printing an OK ? (Y / N) message to which you must respond with a Y or N. A N (No) will terminate the initialization with no action taken. A Y (Yes) will cause the initialization to occur. The memory catalog will be set up with no files created, even if some of the files in the catalog were locked. System parameters will be set as follows:

Speed — 300 baud
Parity — Even
Parity Checking — Off
Full Duplex Mode
Communication to Internal (A/C coupler)
No ABM
Transmit End-of-Line to CRLF
Receive End-of-Line to CRLF
No Record or Playback Files
EDC — On
No Key Definition
DC3, DC1.3 and DC2.4 — On
Buffer — Inactive
OFF LINE
ABM Auto Trigger — Off
EOT Disconnect — Off

CAUTION

Use of this function will remove ALL files from memory, even if they are locked files.

3.10 COPY COMMAND

There are two additional entries that can be used with the existing COPY command format. They are CTRL and END. By typing CTRL (*B only) after the word PRINTER the terminal will print the control characters that were recorded in the file in addition to the file contents. An example of this command would be as follows:

```
COPY MYFILE TO PRINTER CTRL
```

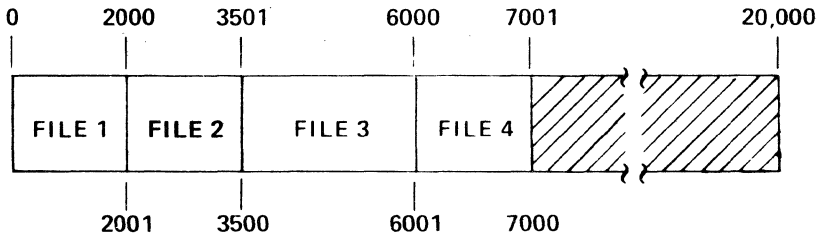
The other entry END, can be used for copying from file to file. The word END after the destination file will cause the contents of one file to be added to the end of the destination file. For example, to store the contents of MYFILE and the contents of COPY2 in the file COPY2 the following command would be used:

```
COPY MYFILE TO COPY2 END
```

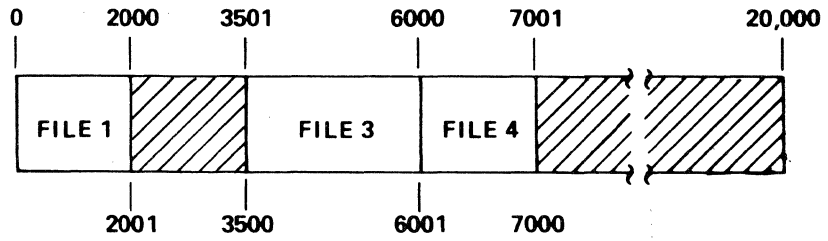
The terminal will take the contents of MYFILE and store it in COPY2 starting at the first available record following the contents of COPY2.

3.11 MEMORY COMPRESSION OPERATIONS

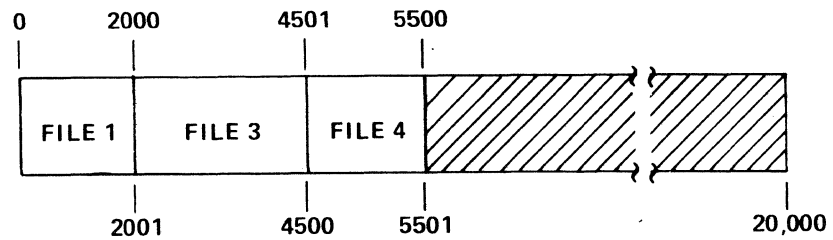
The terminal memory and its file management system form the central part of the terminal. The following discussion will help you become more familiar with this system. When a file is created using the CREATE command, the record length and the maximum number of records are specified so that the maximum required memory can be allocated for that file. For example, in the figure below, 2,000 bytes (a byte is the amount of memory needed to store one character) of memory are allocated for FILE 1, 1,500 bytes for FILE 2, 2,500 bytes for FILE 3, and 1,000 bytes for FILE 4.



If FILE 2 is deleted by the use of the DELETE command, the 1,500 bytes of memory allocated for FILE 2 is non-available for use. The file management system will not move the other files to fill up the newly released space at this time and the file will appear as shown.



If a FILE 5 is created, and its required memory is less than 13,000 bytes (the remaining space in memory), memory will be allocated for FILE 5 starting at location 7001. If the memory space required for FILE 5 is greater than 14,500 bytes, the terminal will print the message NO MORE ROOM and no action will be taken. If the memory space required for FILE 5 is greater than 13,000 bytes but less than 14,500 bytes, an automatic memory compression will take place. The terminal will print the message ONE MOMENT PLEASE to inform you that memory compression is in progress. After the memory is compressed the memory will appear as shown.



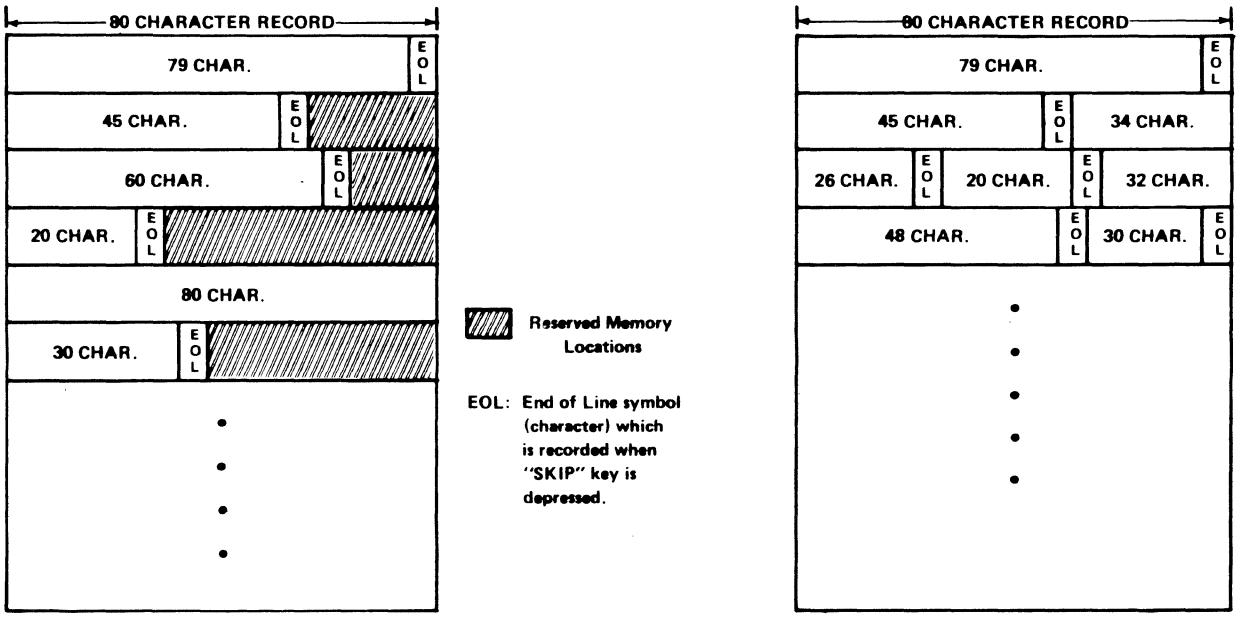
After the memory has been compressed the terminal will create FILE 5 starting a location 5501. When FILE 5 has been created the terminal will print a DONE message.

NOTE

Because of the internal structure of the bubble memory system, it is possible to store more than 20,000 characters in memory. By using record lengths that are multiples of 18 (18, 36 & 72), it is possible to store up to 22,860 characters in memory.

3.12 LINE AND CONTINUOUS FORMATS

The data recorded in each file can be in either CONTINUOUS or LINE formats. The following figures show the difference in memory use between a LINE formatted file and a CONTINUOUS formatted file.



LINE FORMAT

CONTINUOUS FORMAT

The record length of both formats is 80 characters. The data recorded consists of six printed lines totaling 314 characters. In LINE format, 480 memory locations (six records) are used while in CONTINUOUS format, 320 memory locations (four records) are used. Note that in LINE format the memory locations between the EOL character and the end of the record are available for insertions during editing but unless they are filled with text they represent wasted memory space.

When recording data in a CONTINUOUS file the last record may not be completely filled with data. In these cases the terminal will fill the remainder of the record with NUL ASCII characters (Rev. A) or non-ASCII characters called "fuzzy holes" (*B). The only time that either the NULs or the Fuzzy Holes are printed is in the EDIT mode.

3.13 PROMPTING OPERATIONS

With the flexibility of the memory system and Automatic Device Control (ADC) functions, the terminal can be used to provide prompting to guide an operator through a data collection procedure. The prompting information can be stored in the PLAYBACK file and the information requested stored in the RECORD file. The following example shows a prompting operation as it might be used for taking a census:

When you start the PLAYBACK file, the terminal prints:

```
HEAD OF HOUSEHOLD  :
```

You then type in the name of the head of the household and depress the ENTER key. The terminal responds by printing:

```
NAME OF SPOUSE  :
```

This process continues until the information required has been recorded. The entire prompted form might look like the following example.

```
▶ COPY CENSUS TO PRINTER
CENSUS FORM

HEAD OF HOUSEHOLD:
NAME OF SPOUSE:
NUMBER OF CHILDREN:
THEIR NAMES:
OCCUPATION OF HEAD OF HOUSEHOLD:
NAME OF OTHER DEPENDENTS:
THANK YOU.   PLEASE REWIND PLAYBACK
```

To illustrate how the terminal was made to give prompted instructions for the example, the contents of the PLAYBACK file have been printed with the control characters shown.

```
DONE

▶ COPY CENSUS TO PRINTER CTRL
CENSUS FORM

HEAD OF HOUSEHOLD␒:␄   ␒␒␄
NAME OF SPOUSE␒:␄   ␒␒␄
NUMBER OF CHILDREN␒:␄  ␒␒␄
THEIR NAMES␒:␄   ␒␒␄
OCCUPATION OF HEAD OF HOUSEHOLD␒:␄   ␒␒␄
NAME OF OTHER DEPENDENTS␒:␄   ␒␒␄
THANK YOU.   PLEASE REWIND PLAYBACK



DONE
```

The first line prints CENSUS FORM followed by two EOL's (not shown). The first EOL returns the printhead to the beginning of the next line, the second EOL acts like a line feed.

The third line contains the prompt statment HEAD OF HOUSEHOLD. This prompt is followed by a DC2 (RECORD ON) function that turns the RECORD file on. The next character in the PLAYBACK file, a colon, is printed and stored in the RECORD file. The colon in the PLAYBACK file is followed by a DC4 (RECORD OFF) and the RECORD file is turned off at this point.

The next character in the PLAYBACK file is a DC3 (PLAYBACK OFF) and the PLAYBACK file will be turned off *AFTER* the next character or function is processed. The next function, DC2 (RECORD ON) will turn on the RECORD file to allow recording the name of the head of the household and the PLAYBACK file will turn off. When you have completed typing in the name, you depress the ENTER key which turns on the PLAYBACK file. The terminal will detect the DC4 (RECORD OFF) and turn off the RECORD file, detect the EOL and return to the beginning of the next record in the PLAYBACK file.

This configuration of control characters (DC2.:, DC4, DC3, DC2, DC4) is repeated after every prompt.

3.14 USING ADC FUNCTIONS IN COMBINATION

There are two combinations of ADC functions that can make prompting operations even easier. The first combination, (DC3 DC3) is used at the end of the Census Form example. The terminal will interpret this as REWIND PLAYBACK and PLAYBACK OFF. Used at the end of a form, it will rewind the prompting PLAYBACK file and turn it off. This allows the prompting file to automatically reset itself after each form is complete.

The second combination (DC3 DC1) allows you to continuously repeat a prompting file. The terminal will interpret this as REWIND PLAYBACK and PLAYBACK ON. The form will continue to repeat until F3 (PLAYBACK OFF) is depressed.

The third combination (*B only) is DC3 ESC. It will cause the terminal to exit the ASR mode and return to the RUN command.

The last combination (*B only) is DC3 DLE and will cause the PLAYBACK to stop without printing an additional character.

3.15 HORIZONTAL TAB

Another function that can be used with prompting operations is the Horizontal Tab (HT). This function will cause the terminal to tab over to a specified column number. To use this function you must depress the CTRL and letter I key, which produce the HT control function. After the HT function is depressed (no character will be generated) type in the column number (1—80) you want the printhead to tab to. The column numbers need not be in sequential order, that is you can have HT69, HT27, HT80, HT01. This is useful when a PLAYBACK file has several columns in it, because the printhead moves to the tab position rapidly.

3.16 RUN COMMAND (*B ONLY)

As you have seen it is possible to get the terminal to meet the needs of numerous applications by the use of prompting. The RUN command adds even more versatility by allowing you to specify a set sequences of commands for the terminal to execute and store them in a line formatted file. When the RUN command is used the terminal will execute the commands in the specified file.

The format for the RUN command is as follows:

RUN filename

The filename specified in the command must not be a CONTINUOUS formatted file. Attempting to use a CONTINUOUS file results in an *** 99 *** error code.

The line file that contains the commands that are to be executed is referred to as a command file. The commands in a command file are called executable statements. There can be only one executable statement per record in a command file. There are three types of executable statements.

- Valid commands
- ASR functions
- Comments

3.16.1 VALID COMMANDS. Any valid command recognized by the terminal can be executed. The command is entered into the file exactly as it would be typed into the keyboard with the exception that the command key is not used. For example, if the contents of a file needed to be printed with the control characters, you would enter COPY MYFILE TO PRINTER CTRL in one record of the command file. The first character of the record must be the first character of the command.

3.16.2 ASR FUNCTIONS. This statement will cause a number of ASR functions to be executed or for ASCII characters to be printed. The format for the ASR functions are:

#n
where n is a valid function key number (0 through 9)

Any number of function keys can be put in one executable statement, as long as it fits in one record. The first character in the record must be a #. When a function key is encountered (#n) that function is executed. If there are a string of functions in one statement, the functions are executed one after the other. Care must be taken to ensure that conflicting functions do not occur in the same executable statement. For example, the ASR statement #1#5 would turn ON the PLAYBACK file but it would not rewind it because a file cannot be rewound while it is ON. If a non-function key ASCII character is encountered, the character will be printed.

When an ASR function statement is encountered the terminal enters the ASR-INTERACTIVE mode. The next record of the command file will be processed when the INTERACTIVE mode terminates. Even though the terminal is in the INTERACTIVE mode of operation the command indicator will remain lit to indicate the RUN command control.

There are three ways to terminate the ASR-INTERACTIVE mode and return it to execution of the command file.

- Encountering a D3 ESC combination from the PLAYBACK file (EDC and DC3 must be ON)
- Depressing the FUNCTION (FCTN) and ESCAPE (ESC) keys simultaneously.
- Receiving an ESC< from the communication channel. (EDC must be ON.)

3.16.3 COMMENTS. Any record in the command file that is not a valid command or an ASR function command will be printed on the printer. No carriage returns or line feeds will be added before or after the contents of the record; they must be put in the record.

The RUN command can be aborted at any time by depressing the CMD key. If any errors are encountered during a RUN sequence the respective errors will be printed in the standard error format. After the last record in the command file has been processed, the message DONE is printed and the command indicator will be extinguished.

An example of the RUN command can be used as follows:

```
OFFLINE
CHANGE PLAYBACK TO PROMPT
CHANGE RECORD TO TEMP
CHANGE EDC TO ON
CHANGE DC3 TO ON
ERASE TEMP
*30 PROMPT NUMBER ONE &4
PLEASE DEPRESS THE FCTN AND ESC KEY AFTER LAST ORDER &4
#5#6#1
COPY TEMP TO ORDERS END
&4 THANK YOU

DONE
```

This command file will set up the following files:

PLAYBACK FILE is PROMPT which has automatic rewind.
RECORD file is TEMP which provides temporary storage for orders.
ORDERS is the file where the orders are actually stored.

When the RUN command is entered the terminal parameters will be modified by the first six records of the command file. Next, the heading will be printed as follows:

```
                    PROMPT NUMBER ONE

PLEASE DEPRESS THE FCTN AND ESC KEY AFTER LAST ORDER
```

As shown in the previous example a prompted file can control the PLAYBACK and RECORD files through the use of the ADC functions. The file labeled PROMPT would playback the prompt required, turn off PLAYBACK and turn on the RECORD file which is TEMP. The TEMP file would record the response to the PROMPT file questions. The PROMPT file would continue until the last order was taken at which time the operator would depress the FCTN and ESC keys which would cause the terminal to exit the ASR mode and return to the command file. The command file will cause the contents of the TEMP file to be appended to the ORDERS file and the terminal to print a THANK YOU message.

This represents only one application of the RUN command. The RUN command can be used to meet almost any repetitive data collection procedure.

SECTION IV

THEORY OF OPERATION

4.1 INTRODUCTION

This section provides a detailed theory of operation description of the terminal. As explained in Section I, the terminal consists of five major systems which are: bubble memory, keyboard/printer, main processor, communications, and power supply. Figure 4-1 is a detailed block diagram of the terminal.

4.2 THEORY OF OPERATION

The bubble memory system is based upon the TIB 0100 series bubble memory device. The bubble memory controller (TMS 5502) works under direction of the main processor to exchange data with the memory device. The memory devices and their associated drivers and sense amplifiers allow non-volatile storage and retrieval of data entered through the keyboard or the communications system.

The keyboard/printer control system uses a TMS 8080A microprocessor to control the printer mechanism, the printhead electronics, and the scanning and encoding of the keyboard input.

The main processor (TMS 9980) controls most terminal functions, including access to the bubble memory system, control of the keyboard/printer control system, and the communications system. The main processor is connected to the keyboard/printer control system through a 9600 baud asynchronous internal communications bus.

The communications system in the Model 765 terminal includes a standard EIA port and a 300 baud, originate-only, acoustic coupler. The Model 763 terminal has an internal, originate-only modem or an optional current loop interface in addition to the standard EIA port. The communications system uses a Universal Asynchronous Receive Transmit (UART, TMS 9902) device to process data for communications. The parameters of the communications system are established by keyboard entry. Control of the communications operation is handled by the main processor.

The regulated power supply provides regulated dc to all of the major systems in the terminal. There are two versions of the power supply. One is the 115 volt domestic version and the other is the 230 volt international version.

The terminal electronics is housed in a high-impact case on three or more printed-wiring boards (PWB). Of the two large PWBs, the upper board contains the printer/keyboard controller subsystem, TTY interface, internal modem, or acoustic coupler. The lower board contains the main processor system and the bubble memory control system. Two TIB 100 series magnetic bubble memory devices and their associated drive and sense circuits reside on a smaller PWB mounted on top of the lower board. The actual number of bubble memory boards installed will vary with the memory capacity of the terminal.

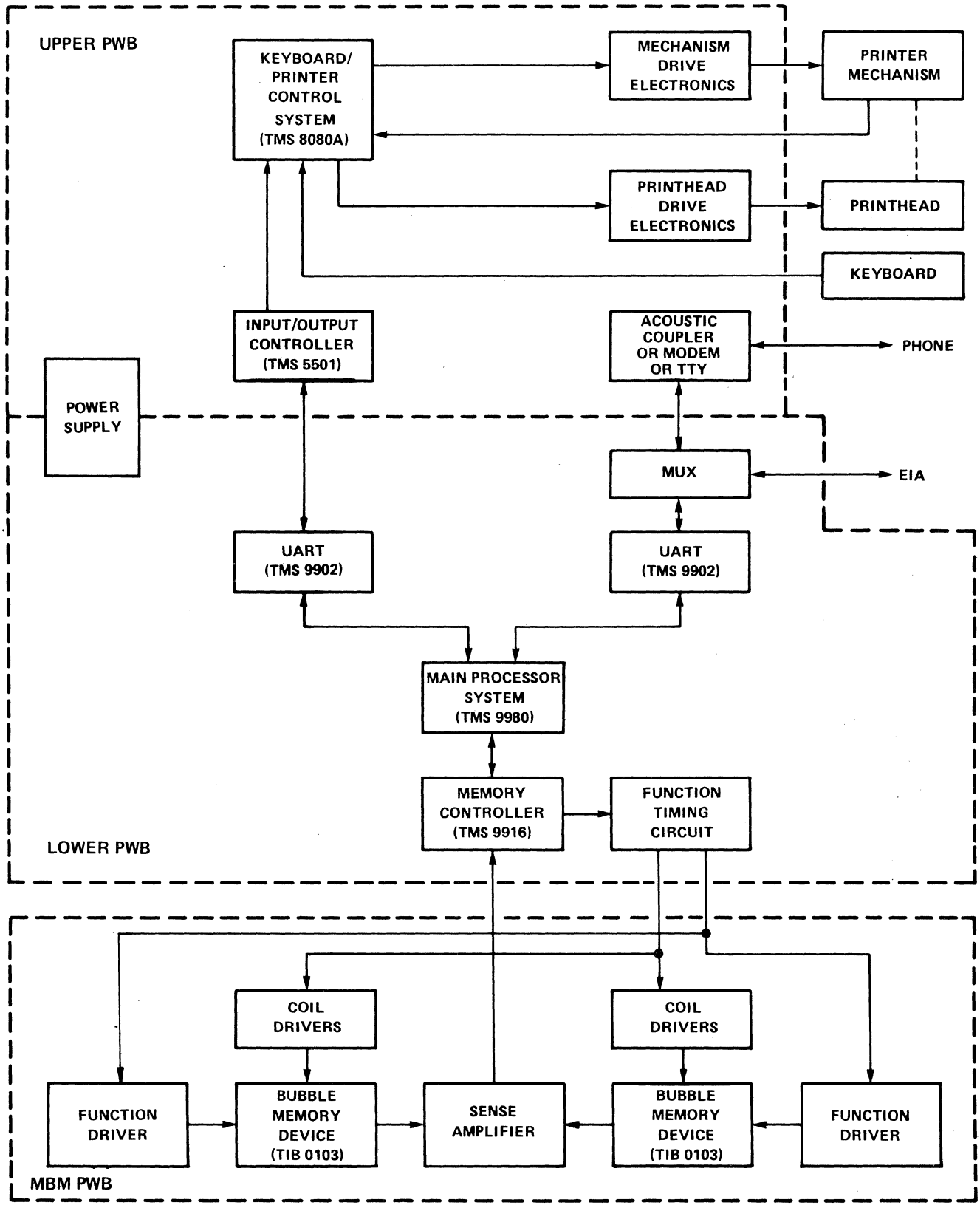


Figure 4-1. Memory Terminal Block Diagram

4.3 BUBBLE MEMORY SYSTEM

The bubble memory module is mounted on the main processor. Each memory module contains two TIB 100 series bubble memory devices. Each bubble memory device has the capacity to store up to 11K characters which gives the module a capacity of storing up to 22.5K characters (bytes). The terminal can accept a maximum of four memory modules allowing storage of 91K characters.

The bubble memory system operates under control of the main processor. Data is supplied to the memory controller (TMS 5502) from the main processor through the DATA bus. A memory controller and timing generator develop the necessary signals to perform data exchanges with the memory devices that are requested by the main processor. Upon completion of the memory opertion the memory controller sends an interrupt to the main processor to acknowledge an operation completion.

4.3.1 ORGANIZATION. Each bubble memory device is organized in a system of pages as shown in figure 4-2. Each page contains 18 characters (bytes) and each device physically contains 641 pages. The first four pages and the last page of each memory device are not available to the user. The first three pages contain the mask for redundancy correction by system firmware. The next page contains test data and the last page is not used. The memory module installed in the lowest numbered position on the main processor board is referred to as the system bubble. Pages 0 through 20 are reserved for system

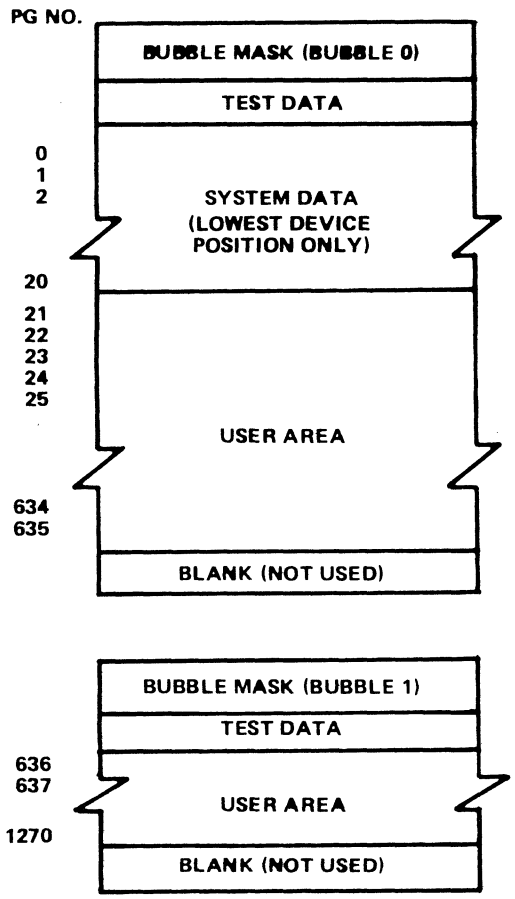


Figure 4-2. Bubble Memory Organization

use and therefore not available to the user. It is well to remember that the first four pages and last page are not numbered by the system firmware. The first user-available address is page 21 on the system bubble. The system firmware also views all of the memory devices as one large memory so that the address 635 (last available page on the system bubble) is followed by 636 which is the first available page on the next memory device.

4.3.2 ADDRESSING. Refer to figure 4-3. When access to a memory is required, the main processor inputs the page number required to the memory controller. The system firmware decvodes the page number and addresses a latch through the CRU bus that develops the bubble enable and module select signals. The bubble enable signals enable the two coil drivers and the function driver of the selected memory device. The bubble enable lines are labeled BBL0EN through BBL7EN. The module select signal enables the sense amplifier of the memory module selected. These enable signals are labeled MOD1SEL through MOD4SEL. Once the drivers have been enabled the memory controller sends the necessary control signals to cycle the memory device to the page number requested by the main processor. When the requested data is at the sense element the function timing enables the sense amplifiers to read the data.

4.3.3 DATA TRANSFERS. The memory controller in conjunction with the timing generator produces all of the control signals necessary for data transfers in and out of the memory device.

Write operations are accomplished by a memory controller by: 1) gating the write data serially to the function driver and 2) applying control signals to the timing generator which, at the exact time, inputs them to the function driver. Refer to figure 4-4. The timing chart begins at the point when the page number requested is at the transfer gate and the controller sends a transfer-out pulse to transfer the data out of the minor loops into the major loop. The function timing continues to send control signals to the coil drivers to move the data in the major loop to the replicate/annihilate element. When the first bit position reaches the replicate/annihilate element, the memory controller begins sending annihilate pulses to the element until all of the data that was transferred from the requested page (even if there was no data at this location) has been eliminated. The controller next determines when to input data, one bit at a time, to the function driver and creates a generate current pulse to write it in. This continues until all of the data to be written on that page is complete. Then the data is shifted back around to the transfer gate and a transfer-in pulse moves the data into the minor loops back in the original page location. A read operation is similar with two exceptions. The data bubbles are transferred into the major loop where they are divided by a replicator allowing a copy of the data for sensing and one for replacement in the memory. Second, instead of a generate pulse, a detect strobe is applied to the latch of the sense amplifier, so that the data can be read by the memory controller.

4.3.4 READ SEQUENCE. The reading of data stored in memory is controlled by the memory controller.

The read sequence is started by the main processor accessing and loading two of the internal registers of the memory controller with a ten bit memory address (page number). The memory controller internal registers can be accessed by using a four bit address on the controller address lines. Since the page

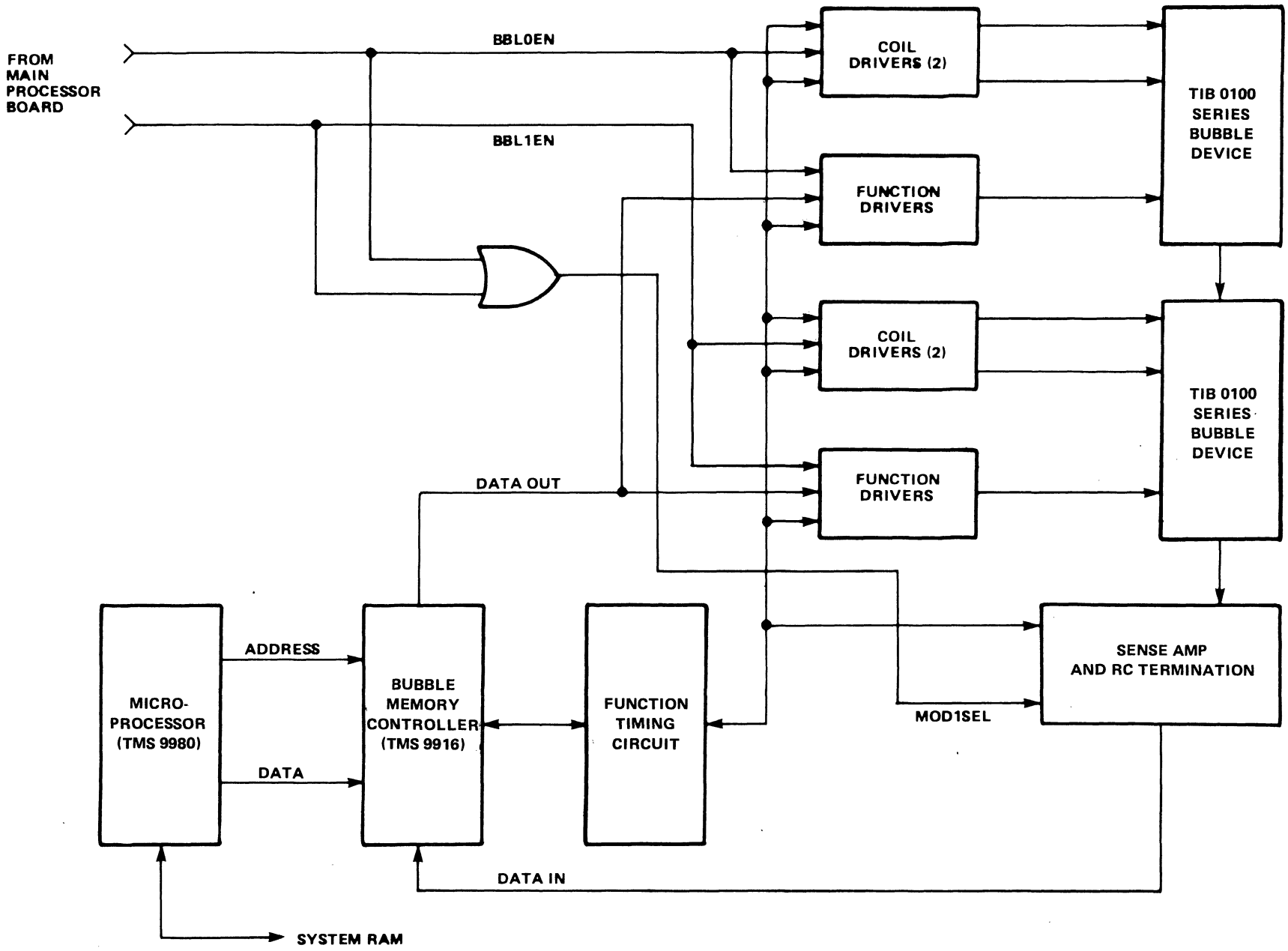
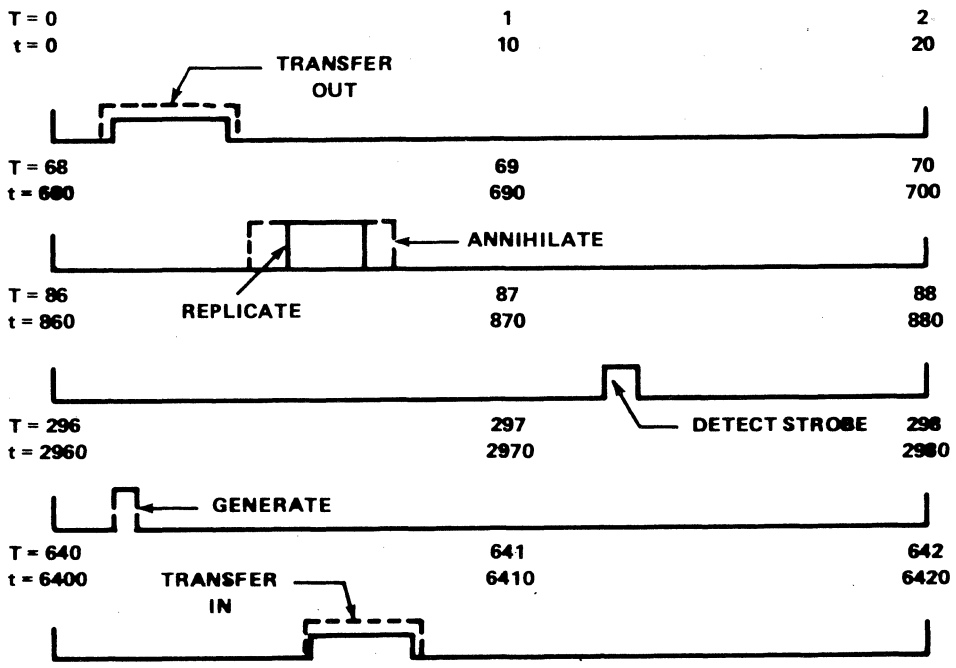


Figure 4-3. Memory System Block Diagram



Note: t in μs, T in field cycles.
Each field cycle begins at 0° field orientation.
Operations necessary to read (solid line)
Operations necessary to write (dashed line)

Figure 4-4. Memory Data Transfer Timing

number is a ten bit address, it requires two of the memory controller registers. Next, the processor sends a code of the four address lines to the memory controller which in this case will be a read command. It is worth noting that the main processor is a sixteen-bit device while the memory controller is an eight-bit device. To compensate for this difference, the memory controller only uses the odd bytes from the main processor. The even bytes do not contain any useable information and are prevented from being sampled by the memory controller select logic. Once the controller has been loaded with the data it will set the Bubble Shift Start (BSS) line active. This will cause the coil drivers to begin rotation of the data loops in the selected memory device (selection is by the main processor through the CRU bus). Only the memory device that has been selected by the main processor will be rotated. The memory controller maintains a count as the data is rotated in the device. The controller uses clock counts to compute what page number should be at the transfer element of the device at any given time during the read sequence. When the requested page number is at the transfer gate, the controller sends a transfer out enable (BXOUT) signal to the function timing circuit. The function timing circuit will perform a transfer out cycle during the next bubble shift. At the proper time, a transfer out (XOUT) signal is applied to the selected memory device through the function driver that will cause the data at the transfer gate to be transferred into the major loop of the device. The BSS signal remains active and the data in both the minor and major loops continues to move in shift register

fashion. When the memory controller internal count indicates that the first data bit in the major loop is at the annihilator/replicator element it will send a replicate enable (REP) signal through the function timing circuit that will cause each bit in the major loop to be duplicated as it passes the replicate elements. The original data will move in shift register fashion back to the transfer element of the major loop and the newly created data will move to the detector element. When the memory controller has determined that the first data bit has reached the detector element, it will cause the data bit to be strobed into the internal register of the memory controller. This continues until all data in the page has been read. When the original data in the major loop has reached the transfer gate it will send a transfer in enable (BXIN) signal to the function timing circuit that will cause the data in the major loop to be returned to its original page location in the minor loops. The memory controller continues to move the data until the original starting address is reached and then it goes through a stop cycle to orient the bubbles safely to the rest position.

When the memory controller has the entire data page in its internal register, it sends an interrupt to the main processor. On a priority basis, the main processor will honor the interrupt and read in one byte of data at a time until all 20 bytes of the page that was stored in the memory controller have been read.

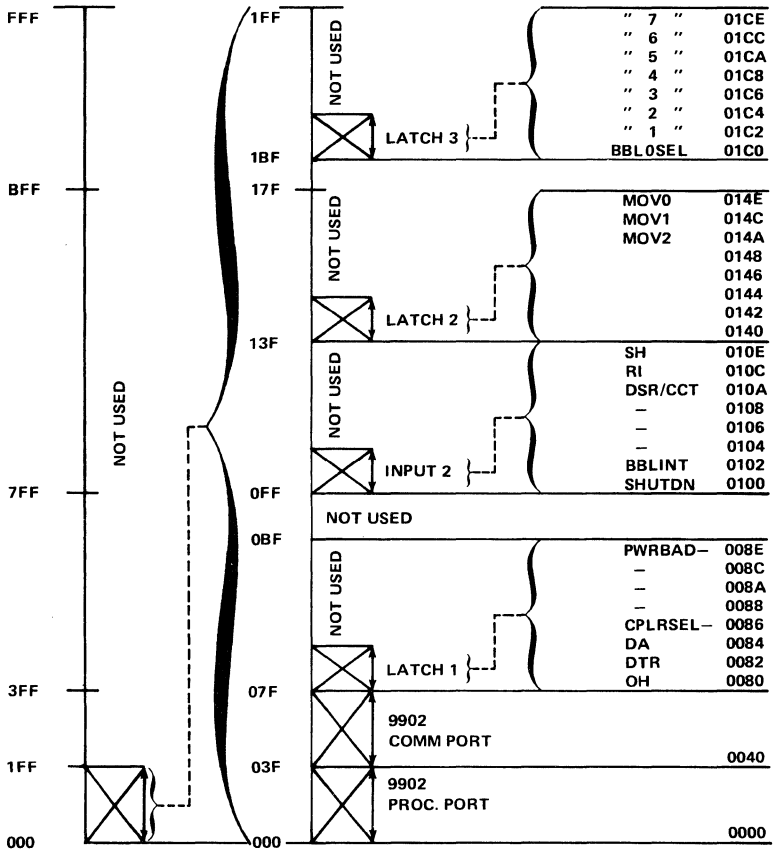
4.3.5 WRITE SEQUENCE. When the main processor stores a data word in memory, it loads the page location register and all 20 bytes of the data to be stored. As with the read cycle, the main processor addresses the internal registers of the memory controller using the four address lines. The major difference between the read and write sequence is that for the write sequence the data to be stored must also be loaded into the memory controller and the command word that follows is a write command. The memory controller will again be shifting the data in the loops until the correct page is at the transfer gate. The memory controller will then send a transfer out pulse to transfer the data into the major loop. The data will continue to move around in the major loop until the memor controller has determined that the first bit is at the annihilator/replicator element. At this time the memory controller sends an annihilate enable (BANNIH) to the function timing circuit that will cause each data bit to be diverted, without duplication, out of the major loop as it comes to the element. It is necessary to perform this annihilation cycle regardless of previous data existing in the page. At the time that the memory controller determines that the first bit has reached the generate element, it will send a data out (DO) to the function timing circuit. The data out signal will cause a generate pulse to input the first data bit of the word to be stored in memory to the function driver of the selected memory device. After all of the data to be stored in a page is loaded into the major loop, the operation proceeds to return the page to rest as discussed in the read sequence.

4.3.6 POWER UP SEQUENCE. When power is applied to the main processor, it initializes the bubble memory system. Two major tasks are performed by the main processor as part of initialization. First, a determination is made of what memory modules are installed in the terminal. Second, it reads and verifies the masks located in the first three pages of the memory devices and stores them in RAM. To check for the presence of a memory device, the main processor reads the last page of the device (which is not user available). It will continue to check until all eight memory device positions have been read. The memory controller reads the mask out of the first three pages, verifies the data and transfers it into a designated area of the system RAM. The system firmware uses this mask in conditioning data transfers with the memory devices to compensate for defective minor loops that occur during manufacturing. If this mask data should be lost from the memory device, refer to the Section V Maintenance for procedures to re-establish the mask.

4.4 MAIN PROCESSOR

The key element of the terminal is the main processor system. The TMS 9980 microprocessor is used as the main processor. The TMS 9980 and its associated memory and interface circuits constitute the main processor system.

4.4.1 TMS 9980 MICROPROCESSOR. The TMS 9980 is a single-chip 16-bit microprocessor with an 8-bit data bus. It is packaged in a 40-pin dual-in-line package. The microprocessor can address up to 16,384 bytes of memory and has four prioritized interrupts. The TMS 9980 uses a direct command-driven I/O interface designated as the communications-register unit (CRU). The CRU provides up to 2,048 directly addressable bit locations, 000 through FFF. The CRUCLK signal is used to switch from the input to the output mode. Figure 4-5 shows the CRU address assignments.



NOTE: On PWR up all outputs of latches 1 thru 3 will be inactive except DA, DTR, and OH.

Figure 4-5. CRU Address Assignments

Address bits 000 through 03F control the operation of the 9600 baud asynchronous data bus connected between the TMS 9980 and the TMS 8080 in the keyboard printer control system as shown in figure 4-6. The address bits 03F through 07F are the control signals between the TMS 9980 and the communications port as shown in figure 4-7. The remainder of the chart (fig. 4-5) shows other functions that the CRU bus can address. For example, if the main processor needed to write data into memory device 0, the CRU bus would need to output the code 01C0 (BBLOSEL). This code would cause memory device 0 to be enabled while the remainder of the memory devices would be disabled.

4.4.2 MEMORY ORGANIZATION. The terminal has 20K bytes of read only memory, 3K bytes of random access memory and from 22K to 91K bytes of bubble memory. The main processor can only address a maximum of 16K bytes of memory so a memory mapping scheme is required. Quite simply, it is the responsibility of the main processor to rearrange the existing memory through CRU addressing before accessing a memory location. The 4K ROM that is always in the system is designated as ROM 0. There are two additional 8K ROM sections designated ROM BANK0 and ROM BANK1. Figure 4-8 shows memory organization. It is possible to bring ROM BANK0 or BANK1 into the system through use of CRU signals. These same CRU address bits also control selection of the memory modules. Figure 4-9 shows the memory structure of the terminal.

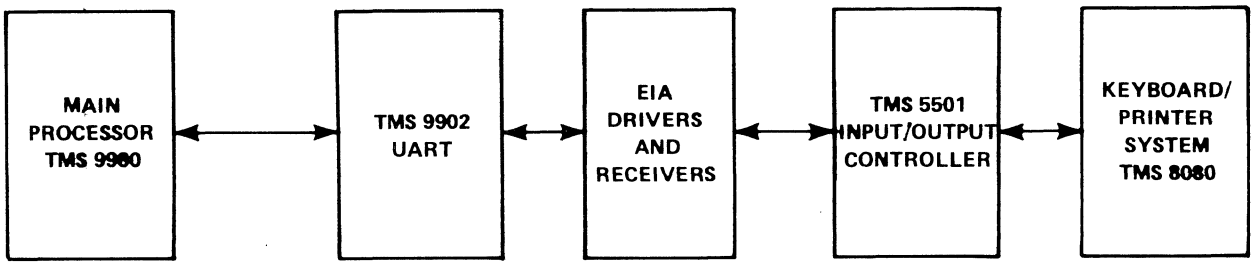


Figure 4-6. Internal 9600 Baud Asynchronous Bus Block Diagram

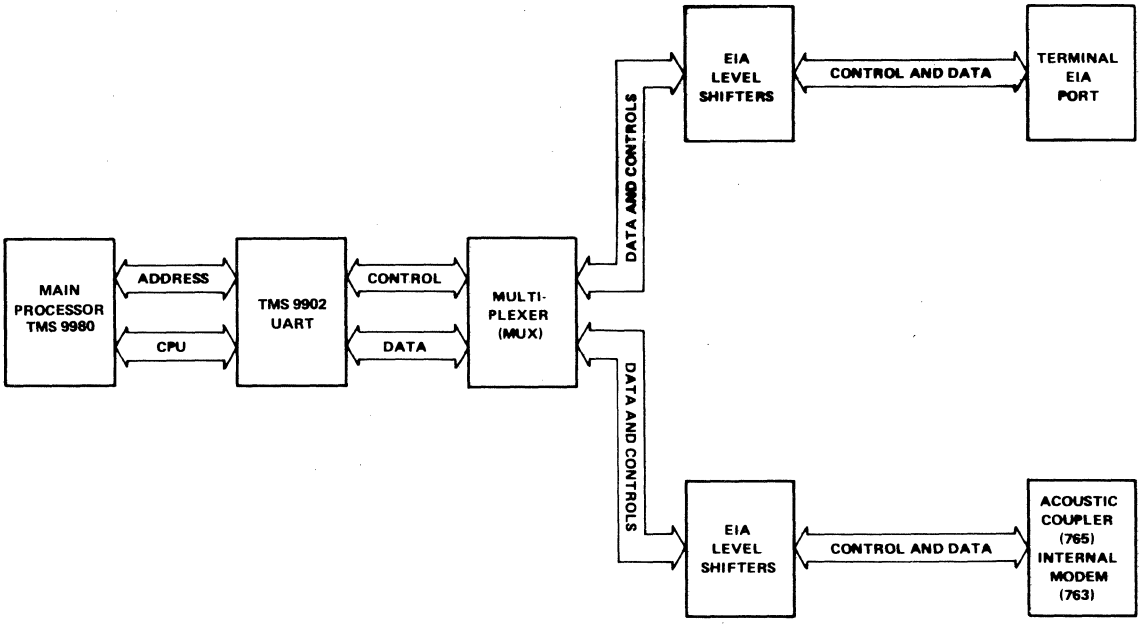


Figure 4-7. Main Processor to Communications System Interface

4.4.3 INTERRUPTS. The main processor uses a system of prioritized interrupts to determine which device requires servicing. All of the interrupts used by the terminal go to the main processor through a prioritized decoder. The output of this decoder is applied to the main processor. The decoder itself does not use latching because the interrupts will remain on until they are honored. If two interrupts arrive at the decoder simultaneously, the one with the highest priority will be serviced first. When the main processor resets the highest priority interrupt the next highest interrupt can be requested.

4.5 KEYBOARD/PRINTER CONTROL SYSTEM

Keyboard encoding and printer control is performed by an interrupt-driven, stored program, microprocessor system. This system consists of a TMS 8080 microprocessor, one 4K x 8 ROM (TMS 4732), one 64 x 8 RAM (TMS 4036), and an input/output controller (TMS 5501).

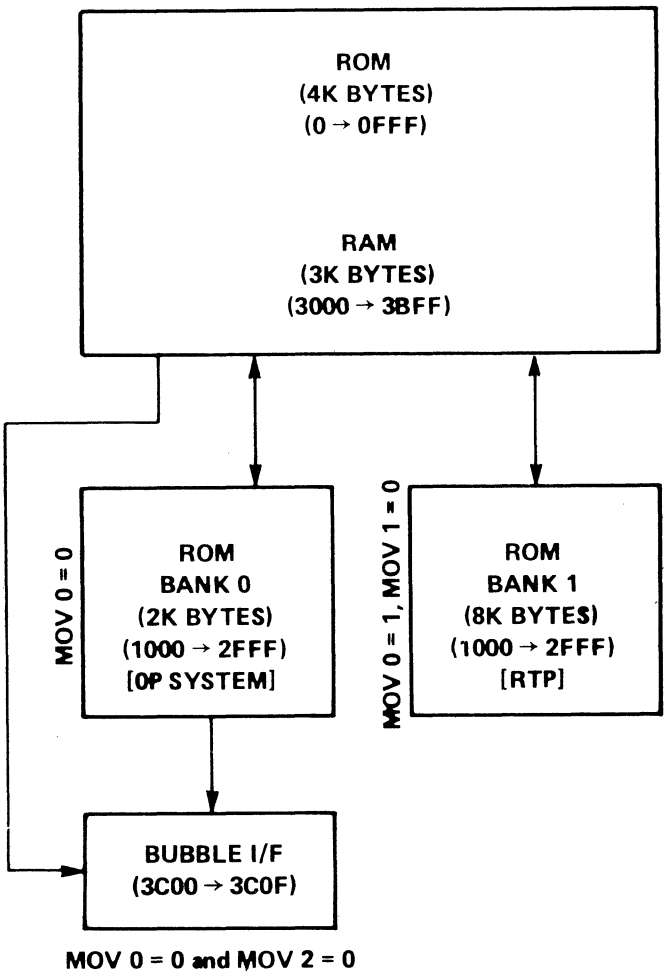


Figure 4-8. Memory Organization

The TMS 8080 system on the upper board is connected to the main processor on the lower board through a 9600 baud asynchronous internal communication bus. The TMS 9980 sends command characters directing printhead position, LED status indications and printable characters. The TMS 8080 will send encoded data from the keyboard to the main processor and will also acknowledge receipt of characters and commands. Table 4-1 describes the command and characters sent to the TMS 8080 from the main processor.

4.5.1 KEYBOARD SCAN. The TMS 8080 generates control signals to scan the keyboard once each 4.3 milliseconds. When a key depression is detected during a scan, the character is encoded and proper action is taken by the terminal. After a depression is detected, a 12 milliseconds delay is allowed for contact bounce and then scanning resumes at 4.3 millisecond intervals. No other key depressions are processed by the terminal until the first depression is released. When this occurs, a 12 millisecond delay is allowed for contact bounce, then the keyboard scan resumes at 4.3 millisecond intervals. Each scan is a complete scan so that multiple key depressions may be detected. When simultaneous depressions are detected during a scan, neither key is acted upon. This scanning/debounce technique effects a two-key rollover with lockout operation.

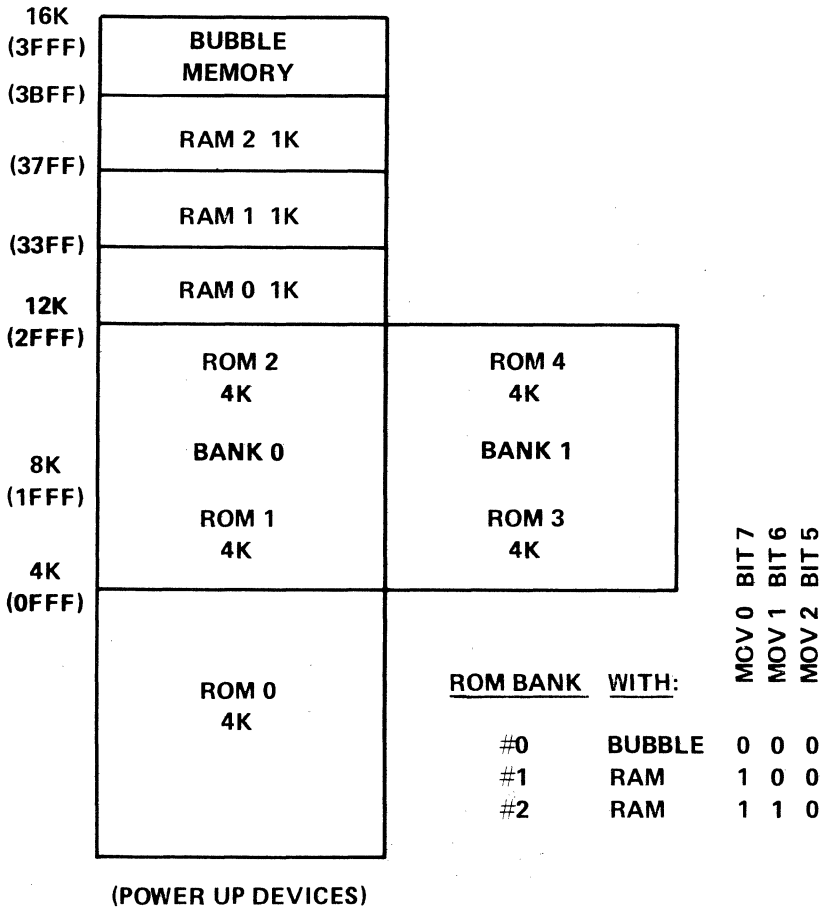


Figure 4-9. Memory Structure

Table 4-1. Main Processor to TMS 8080 Commands

Character (Hex)	Functions
00-1F	Control character. Only BS, BELL, LF, and CR will be processed. All others are ignored.
20-7F	Full ASCII character set. The appropriate dot pattern is generated and printed. Auto CR occurs with reception of 81st character.
80	Forces a system restart. Causes the head to seek the left. Same as a power up sequence.
81-D0	Causes the head to slew to the indicated column. 81 for Column 1 D0 for Column 80 Note the head will slew left or right, to reach the column.
D1	Short BELL (50 msec)
D2-DD	LED Control ON/OFF
DE-DF	Undefined – Will be ignored
E0	Prints COMMAND Prompt Symbol

Table 4-1. Main Processor to TMS 8080 Commands (Concluded)

Character (Hex)	Functions
E1	Prints Edit Record Index Symbol
E2	Prints End-of-Line (EOL) Symbol
E3	Prints Edit Record Delete Symbol
E4	Prints Start of Insert Mode Character
E5	Prints End of Insert Mode Character
E6	Prints Delete Character Symbol
E7	Prints Find Character String Prompt
E8-EF	Ignored
F0	Resets the TMS 8080 Control Character Print Feature
F1	Enables the TMS 8080 Control Character Print Feature
F2	Performs a CR-LF operation
F3	Sets Half Duplex Lockout
F4	Resets Half Duplex Lockout

4.5.2 PRINTHEAD POSITIONING. The TMS 8080 generates control signals for horizontal positioning of the printhead as well as vertical positioning with respect to the paper.

The control electronics positions the printhead horizontally by properly timing different levels of current through the windings of the 3-phase, 15-degree stepping motor. The motor is mechanically coupled to the printhead. The control electronics monitors an optical sensor mounted on the motor for the feedback to control stepping motion during printing and slew motion. The print/step cycle operates asynchronously up to 35 characters per second. The cycle time is divided into three basic segments: settle - 11.3 ms, print - 10 ms, and step -7.2 ms. Slew time for carriage return for a full 80 columns is a maximum of 195 ms. Backspace operations are performed in one character time. Printhead positioning is done in 0.100 inch increments. An automatic carriage return-line feed is executed upon receipt of the 81st character in a line. Upon power turn on, the printhead is backspaced to the left margin. Fault detection methods are used by the TMS 8080 to prevent damage during power cycling conditions, obstruction of printhead motion, or loss of optical sensor signal.

The TMS 8080 positions the printhead vertically by properly timing current levels through the 4-phase, line feed stepping motor. The stepping motor is mechanically coupled to the paper drive roller advancing paper underneath the printhead. A line feed operation is performed in one character time. The paper advance key on the keyboard allows the operator to direct the TMS 8080 to perform the repeated line feeds until released.

The control electronics generates timed current levels through the head lift solenoid which is mechanically coupled to the head pressure bar, to relieve printhead pressure during line feed and head slew operations.

4.5.3 CHARACTER PRINTING. The TMS 8080 generates the proper control signals to form the appropriate character using the 5 x 7 dot matrix of the thermal printhead. The print voltage is enabled and then the matrix data is transferred to the printhead one column at a time. After 10 ms have elapsed, print voltage is removed. The printhead is then ready for the next character.

The domestic/international character set is shown in Appendix C. Dot patterns for control characters are shown in Appendix D. Note that these are only printed if the control character print mode has been set up by the TMS 9980 system.

4.5.4 PRINTER MECHANISM. The mechanism positions the printhead horizontally as each character is printed, slews the printhead to a desired position and advances the paper to position the printhead vertically for the next line of print under control of the TMS 8080. The last character printed as well as the previous line are visible by the operator under normal lighting conditions. A line is composed of 80 character positions.

4.5.5 PRINTHEAD SYSTEM. The printhead consists of a five by seven matrix of 35 heating elements and a transistor mounted on a monolithic chip. Mounted on a heatsink, the chip is connected to the printhead interface printed circuit card with a flexible cable. Mounted on the printhead interface printed circuit card are two selected resistors (RTRIM and R3) which control the characteristics of the temperature compensation circuit so that its operation is optimum for each individual printhead. A block diagram of the printhead system is shown in figure 4-10.

Each of the 35 heating elements on the printhead consists of an SCR and a heating element. The 35 elements are controlled by the printhead driver address lines diagrammed in figure 4-11. When both X and Y inputs to a given element are positive, the SCR energizes and remains on (approximately 10 msec).

4.5.6 PRINTHEAD DRIVERS. The printhead drivers are implemented on two SN98614 linear integrated circuits, each of which consists of six driver circuits. Each driver circuit has a low power, TTL, AND-input stage and a totem pole, power transistor output stage. All drivers are enabled by a signal called PHDSTRBE, and each is controlled by address lines from the processor. Each driver translates TTL data into the levels necessary to control the printhead heating elements. The nominal output levels of the drivers are -4.7 volts low and +3.5 volts high.

4.5.7 TEMPERATURE COMPENSATION CIRCUIT. The printhead compensation circuit provides a regulated, temperature compensated voltage to the printhead. The voltage is programmed by the selected resistors on the printhead interface printed circuit card and the voltage drop across the base-emitter and base-collector junctions of the temperature compensation transistor on the monolithic printhead chip.

4.5.8 PRINT VOLTAGE CIRCUIT. Refer to the schematic in Section VII, R112 meters current to RTRIM and DT (temperature-compensating transistor). RTRIM and DT are connected in series with R110 to ground on the printhead assembly. RTRIM is selected during manufacture so that its resistance compensates for variations in the voltage/current characteristics of DT. Thus, the resulting PVOLTS is correct for particular printhead.

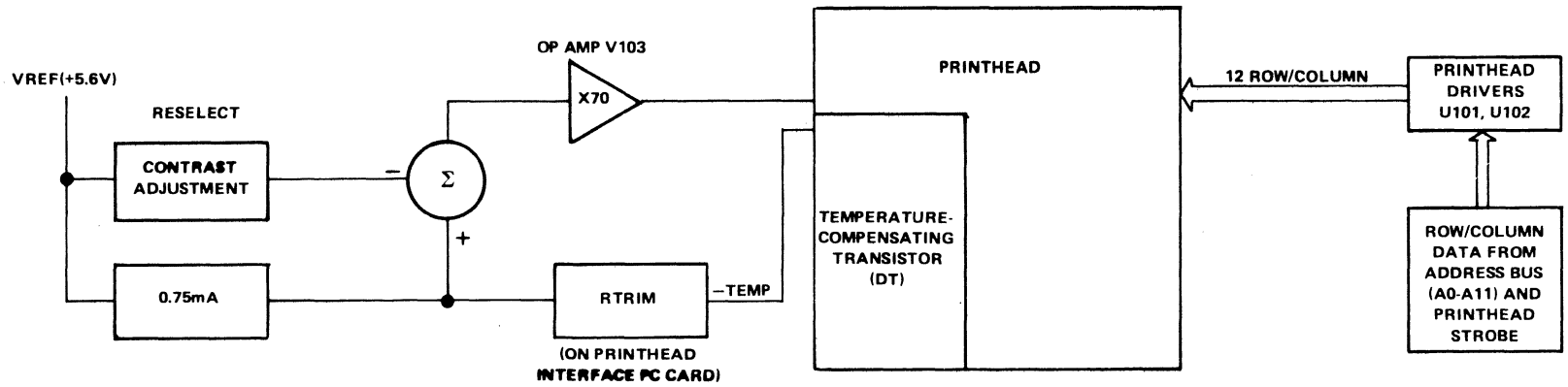


Figure 4-10. Printhead System Block Diagram

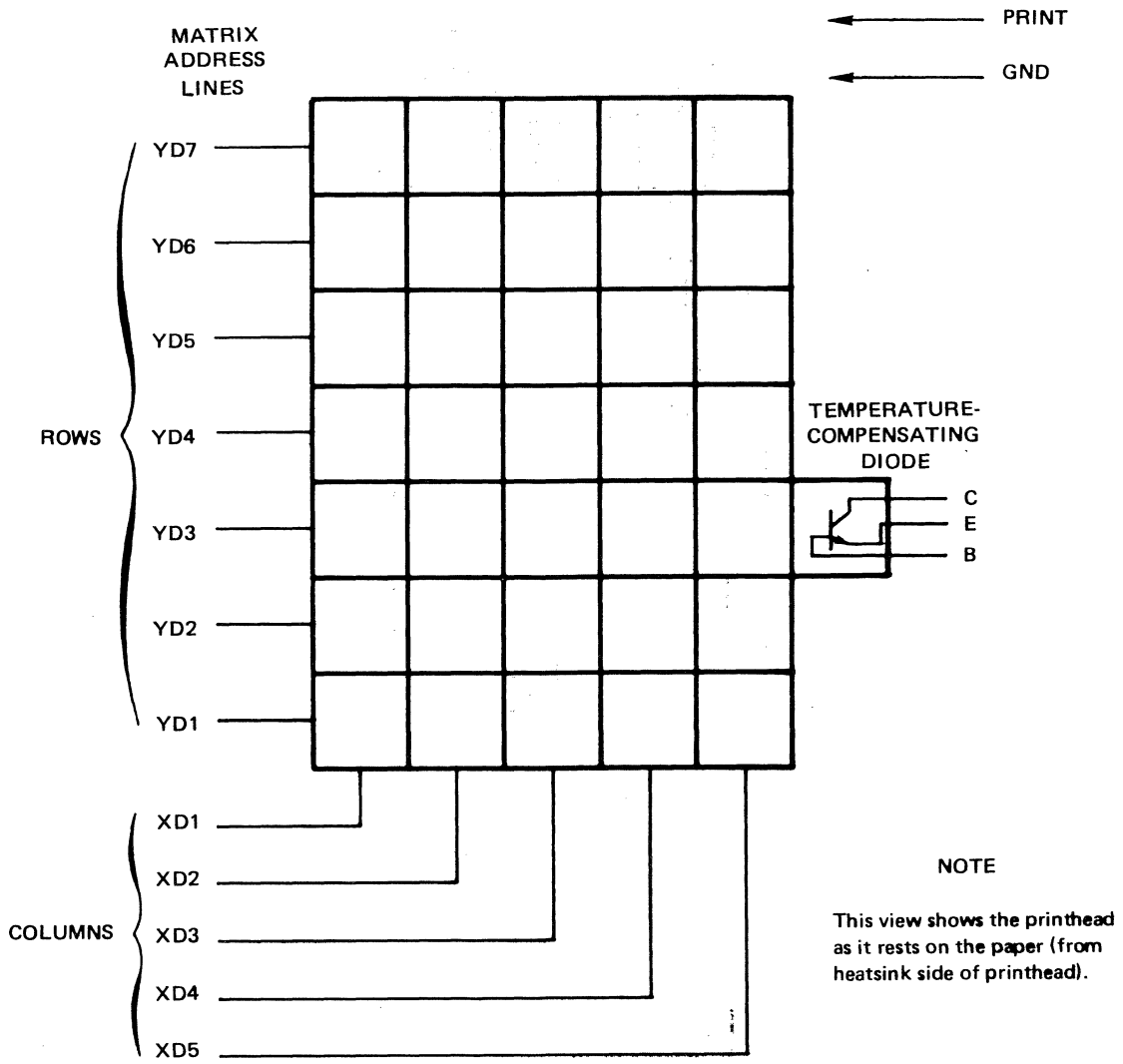


Figure 4-11. Printhead Driver Address Lines

When the PRINT signal is at logical ZERO from the processor, Q103 is energized, applying +5 volts to the cathode of CR106 which holds it off and holds Q102 on. Capacitor C114 charges which results in impedance changes, in RTRIM and DT.

When PRINT switches high and Q103 is off, the Q103 collector and CR106 cathode are at -12 volts. This switches Q102 off and prevents the voltage on C114 from changing during a PRINT period.

Circuit gain is not changed when the CONTRAST potentiometer R123 is adjusted. Gain is fixed at 70. R122 is selected during manufacturing unit test of the printhead interface printed circuit card in order to calibrate the function of the temperature compensation circuit. This calibration enables use of any printhead with any printhead interface printed circuit card without any adjustment or circuit change.

Transistor Q101 switches the base of Q104 to ground and holds it there except when PVOLTS is to be turned on. Diodes CR101 and CR102 provide base current to Q101 to keep it at ground whenever a break occurs in the DT/TRIM circuit which would cause excessive PVOLTS.

As diagrammed in figure 4-12, C113 and R108 control the initial step of PVOLTS and the rate of change of PVOLTS when Q104 is switched on by Q101 being turned off. Transistor Q103 and C109 form a timing circuit whose natural period is 10.5 to 15 msec. Normally, this circuit is switched on at the leading edge and off at the trailing edge of the 10-millisecond PRINT control signal from the TMS 8080A. But only in case of a TMS 8080A failure which allows PRINT to stay at a logic ONE level would the PRINT time be controlled by this circuit.

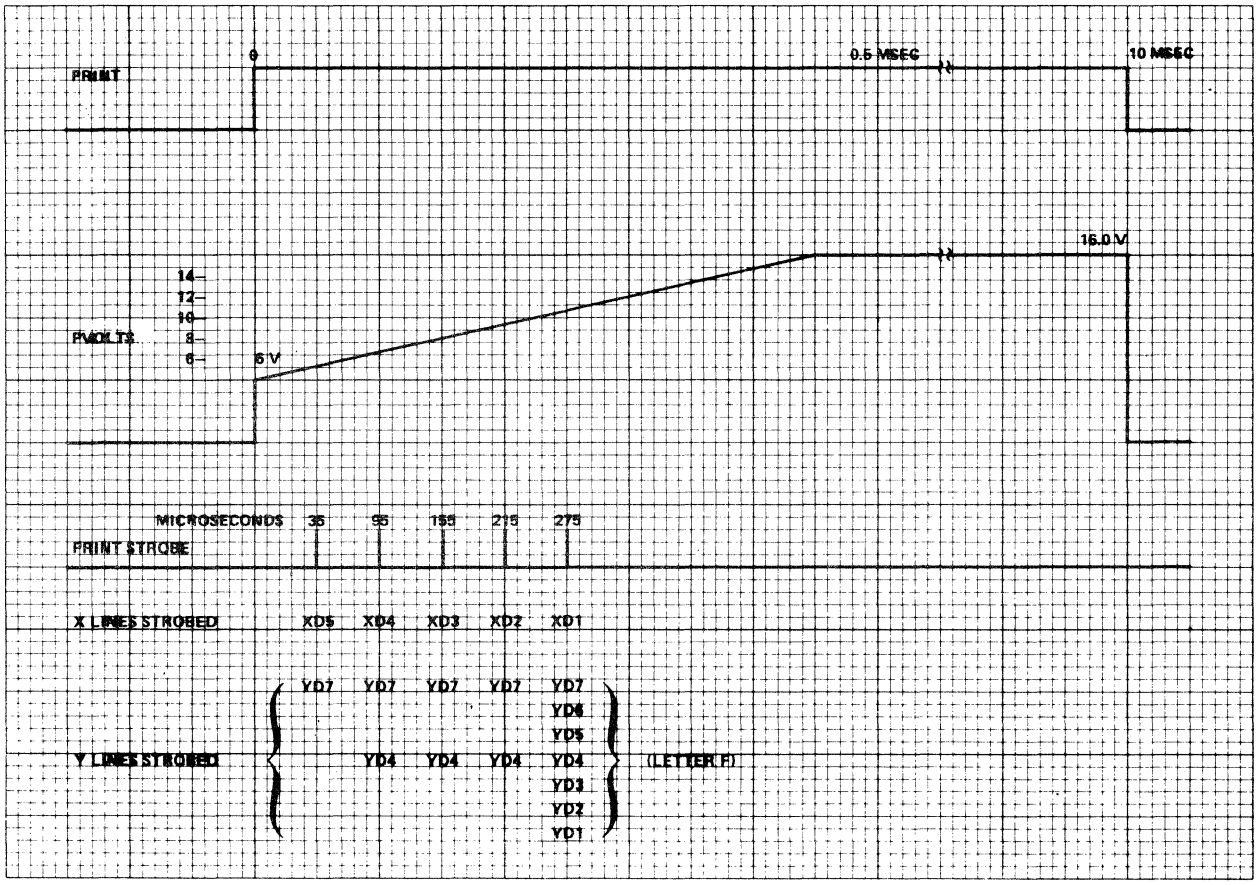


Figure 4-12. PVOLTS Control

4.5.9 MECHANISM DRIVE ELECTRONICS. The mechanism drive electronics converts the TTL level signals of the control electronics into closed-loop, controlled, dc current for application to a three-phase, 15-degree stepping motor, a printhead pressure solenoid, and a paper advance permanent magnet stepper motor located on the printer mechanism. The selection and control of these currents are programmed by the TMS 8080A and its associated firmware algorithms.

The motor drive electronics is comprised of four circuits: phase selecting circuits, a current regulator circuit, a current decay circuit, and a feedback sensor circuit. A block diagram of the motor drive electronics is shown in figure 4-13.

4.5.9.1 Phase Selecting Circuits. Current in each of the three motor phases is selected and controlled by three identical transistor networks:

Phase A — Q207, Q208, Q215
Phase B — Q206, Q204, Q202
Phase C — Q205, Q201, Q203

The operation of the circuits is discussed using only one network, phase A, as an example. The TTL logic level from U26-10 (PHA) selects current flowing in phase A. When this signal is a logic ONE, base current is supplied to Q207. Emitter current in Q207 energizes Q208, supplying sufficient base drive to saturate Q215. Emitter current of Q215 is applied to the phase A winding.

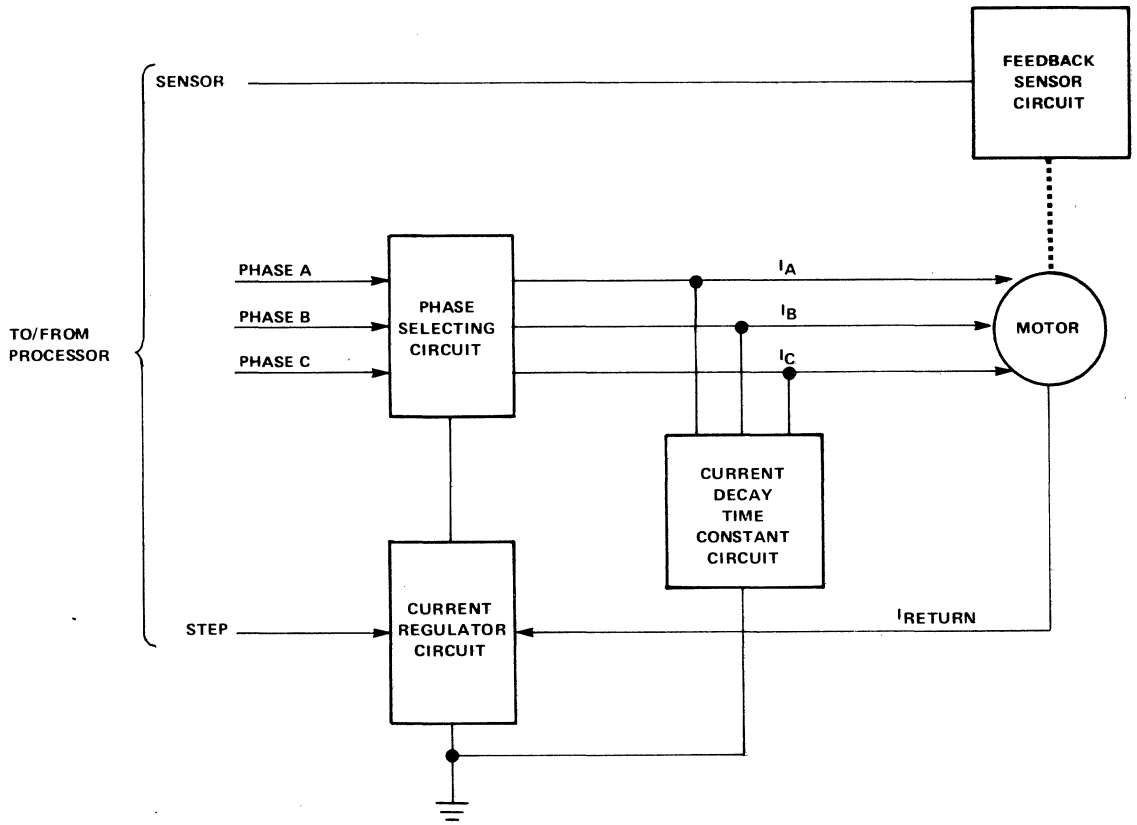


Figure 4-13. Motor Drive Circuit Block Diagram

4.5.9.2 Current Regulator Circuit. Emitter current for Q205, Q206, and Q207 is controlled by the current regulator circuit (schematic 983842, sheet 6). This circuit is a switching regulator type, synchronized to a 20-kHz square wave signal (PWRCLK) from U28-8. This signal is integrated by C203, R223, and C209. The resulting triangular signal is summed with the motor phase current sample voltage from R233 and is applied to pin 2 of U201. When the voltage at pin 3 of U201 is more positive than at pin 2, emitter current for the phase select circuits is switched on by U201 thrugh R212. When the voltage at pin 2 is more positive, the emitter current is switched off.

The reference voltage at pin 3 of U201 is set by the TMS 8080A to one of two levels, which consequently regulates the motor phase current to one of two levels. Hold current is regulated at 0.65 amps and step current is regulated at 1.4 amps. When the STEP signal from U26-5 is at a logic ZERO, the current regulator circuit applies hold current to the motor phase winding. When the STEP signal goes from a logic ZERO to ONE, the current regulator circuit ramps the motor current up to 1.4 amps by charging C204 through R222, and R234 to prevent sudden changes in motor torque and to reduce audible noise in printhead movement.

4.5.9.3 Current Decay Circuit. When the current regulator senses sufficient current in the motor and switches off the current through Q215, the emitter of Q215 is suddenly switched from +30 volts to negative voltage by the inductive flyback of the motor winding. The value of this negative voltage determines the time necessary to discharge the current in that winding.

During periods when motor current needs to remain constant, transistors Q214 and Q209 are energized with base current through CR202 and R229. The flyback voltage during these periods is limited to approximately -2 volts. This provides a very long discharge time and enhances regulator efficiency.

When the processor requires quick discharge of the phase current, it sets a ONE at U26 pin 2, FAST signal. This energizes Q212 and Q213 which removes base current from Q214 and Q209. This enables VCE Q209 to go to -22 volts, providing a 0.75 amps per msec discharge rate for the motor winding feedback sensor circuit. The TMS 8080A requires data on position of the motor in order to "know" when to apply braking, to change phases, or to make other decisions concerning motion of the printhead carriage. This data is provided by the feedback sensor. Figure 4-14 diagrams the output characteristics of the feedback sensor circuit.

4.5.9.4 Feedback Sensor Circuit. Primary operation of the feedback sensor is accomplished by a 24-position slotted wheel which interrupts a light path between an IR emitting diode and a photosensitive transistor as shown in figure 4-15. This assembly is mounted on the stepping motor which drives the printhead carriage. The current from the phototransistor is translated into a TTL logic level signal by the Q2 and Q3 circuit.

As the slotted wheel opens the light path, current flows through the phototransistor, energizing Q2 which deenergizes Q3. Resistor R15 adds hysteresis to the circuit to provide regenerative feedback during transitions; this eliminates false triggering of the sensor.

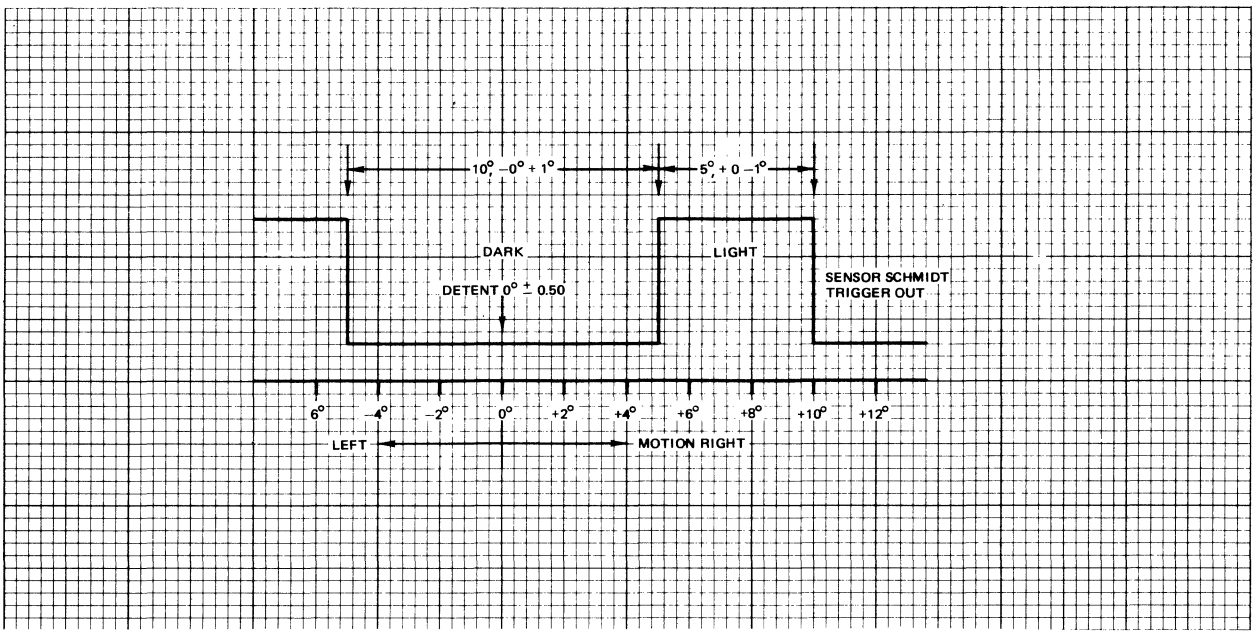


Figure 4-14. Motor Drive Feedback Sensor Output Characteristics

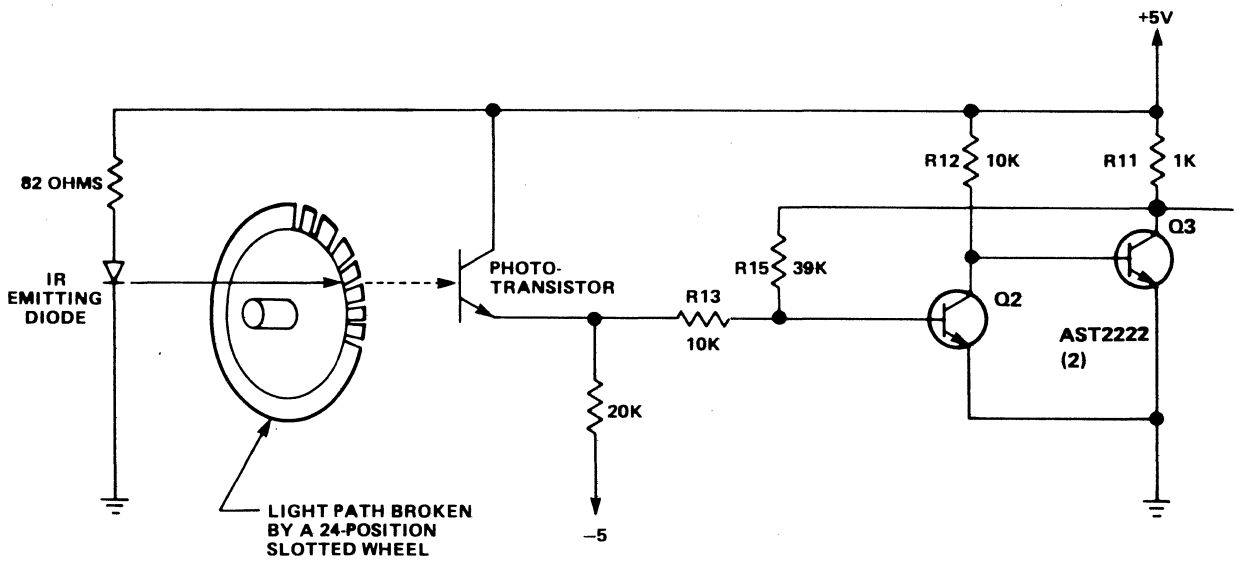


Figure 4-15. Feedback Sensor Circuitry

4.5.10 SOLENOID AND STEPPER MOTOR DRIVERS. The drivers are saturated transistor voltage switches controlled from the TMS 8080 buffer for energizing the LF-Step B-headlift solenoid and/or the LF-Step A-line feed stepper motor. The transistors are NP darlington devices with a minimum current gain of 1000 specified for inductive switching applications.

4.5.10.1 Headlift Without Line Feed. The headlift function is performed when the base drive resistors R253 and R255 for transistors Q251 and Q252 respectively are switched to a logic one level. This causes Q251 and Q252 to go into conduction permitting current to flow from the +30 volt supply to the headlift solenoid through fuse F252. Current also flows through parallel resistor R258, through both sets of motor windings, through Q251 and Q252 to the +30 volt supply return. The transistor clamps the stored inductive energy at solenoid turnoff. The headlift without line feed function is subject to a maximum 20 percent duty cycle based on a maximum "on" time of 45 seconds.

4.5.10.2 Headlift With Line Feed. The TMS 8080A performs a headlift with line feed by switching transistors Q251 and Q252 into conduction in the following sequence:

Step No.	Conducting Transistor	ϕ	Motor Phase Conductor	Time In Milliseconds
1A	Q251	7.5°	1	0-3
1B	Q251	15.0°	2	3-6
2A	Q252	22.5°	3	6-9
2B	Q252	30.0°	4	9-12
3A	Q251	37.5°	1	12-15
3A	Q251	45.0°	2	15-18
4A	Q252	52.5°	3	18-21
4B	Q252	60.0°	4	21-24

Motor phase 1 is energized by the charging of capacitor C213 from the +30 volt supply through the motor winding and Q251. Motor phase 2 is dc coupled and energized when Q251 is switched on. Motor phase 3 is energized by charging capacitor C212 from +30 volt supply through the motor winding and conducting transistor Q252. Motor phase 4 is dc coupled and energized when Q252 is switched on. Diodes CR251 and CR252 provide reverse voltage protection for capacitors C213 and C212.

Headlift with line feed is subject to a maximum duty cycle of 40 percent based on a maximum "on" time of 30 seconds.

4.5.11 KEYBOARD. The keyboard is the primary data input device of the terminal. The keyboard contains 59 single-action keys, one rocker-action key (NUM LOCK), one alternate-action key (UPPER CASE), and six indicators.

The keyboard layout and symbolization is shown in Appendix A. This appendix also shows the keyboard with various mode key combinations.

As part of the keyboard/printer control system, a two-key rollover feature is included to allow for the possibility of operation of a second key before the first key is released. Keyboard encoding is shown in Appendix B. Note that the MSB is used to indicate non-ASCII functions.

4.5.11.1 Keyboard Indicators. There are six (6) LED indicators:

COMMAND Indicates the terminal is in the COMMAND mode and not the interactive mode.

PLAYBACK Indicates the ASR Playback Function is active in the Interactive Mode.

RECORD Indicates the ASR Record function is active in the Interactive Mode.

COMM If the acoustic coupler is selected as the communication channel, then this LED lights when the coupler detects a carrier signal. With the EIA channel selected as the communication channel, this LED reflects the state of the "Data Set Ready" signal.

ON LINE Indicates a "Data Terminal Ready" condition.

NUM LOCK Indicates the numeric pad of the keyboard is active.

4.5.11.2 Mode Key Priority. The following priority is used when encoding characters entered on the keyboard.

Function Key Depressed
Control Key Depressed
Shift Key Depressed
NUM Mode

This allows entering shifted, control, and function key codes while in the numeric mode.

4.5.11.3 Automatic Repeat of a Key. Several selected keys will automatically begin repeating at a 15 character per second rate when the key is held down for longer than one half second. The following keys have automatic repeat:

Space	Underscore
Minus	Period
Period	CHAR
	Asterisk

4.5.11.4 High Speed Repeat for Test Purposes. By depressing both the CTRL and SHIFT key while the UPPER CASE key is selected, any shifted key can be repeated once every 17 milliseconds. Once initiated, this repeat operation will continue (even with no keys depressed) until a key is entered which does not have the CTRL and SHIFT depressed and the UPPER CASE selected. This repeat operation is intended for test purposes only. The terminal must not be in the record mode.

4.6 COMMUNICATIONS SYSTEM. The acoustic coupler/modem circuitry in the terminal provides the interface between the terminal and a standard commercial telephone line. Since the bandwidth of telephone lines is limited, digital information cannot feasibly be transmitted over very long distances. However, digital information can be converted into analog form which can be transmitted over telephone company voice-grade telephone lines of the direct distance dialing (DDD) network. The acoustic coupler is standard on the Model 765; the modem is an option avilable on the Model 763.

For 300-baud operation an analog technique called frequency shift keying (FSK) is used to transmit data. Frequency shift keying simply is the shifting of a signal between two frequencies. One frequency represents a logic ONE; the other represents a logic ZERO.

Figure 4-16 shows an alternating digital data pattern and its FSK equivalent. The acoustic coupler/modem circuitry in the terminal converts the digital data to be transmitted into an FSK signal and also converts a received FSK signal into digital data. The bandwidths of the FSK signals are chosen to provide simultaneous transmission and reception of data (full duplex) over a single voice-grade line. The frequencies assigned to the acoustic coupler/modem are listed in table 4-2. The Bell System frequencies are used primarily in the United States, Canada, and Mexico. The CCITT frequencies are used throughout Europe, Japan, and Australia. The acoustic coupler interfaces with the telephone line through a standard telephone handset which fits into two rubber muffs on the rear of the terminal. One muff contains a microphone; the other, a speaker. The interface is entirely acoustic.

The modem (available as an option only on the Model 763) interfaces directly with the telephone line through a transformer contained within the data coupler required to connect the modem to the telephone line. A block diagram of the acoustic coupler/modem is shown in figure 4-17. Note that the modem and acoustic coupler share most of the same circuitry; for this reason the operation of the acoustic coupler is described first and the differences between the acoustic coupler and modem are discerned where appropriate in the text.

4.6.1 RECEIVER SECTION. The receiver section of the acoustic coupler/modem consists of a buffer, bandpass filter, limiter, mark and space filters, difference integrator, data filter, carrier detect, and carrier detect delay circuits. The microphone is connected through the buffer (simply a high gain amplifier) to a bandpass filter which passes in-band signals and attenuates out-of-band signals and noise, thus providing selectivity. The output of the bandpass filter is applied to the limiter which provides a constant amplitude signal to the mark and space filters. The mark filter's greatest output occurs when the mark frequency is received, and the space filter's greatest output occurs when the space frequency is received.

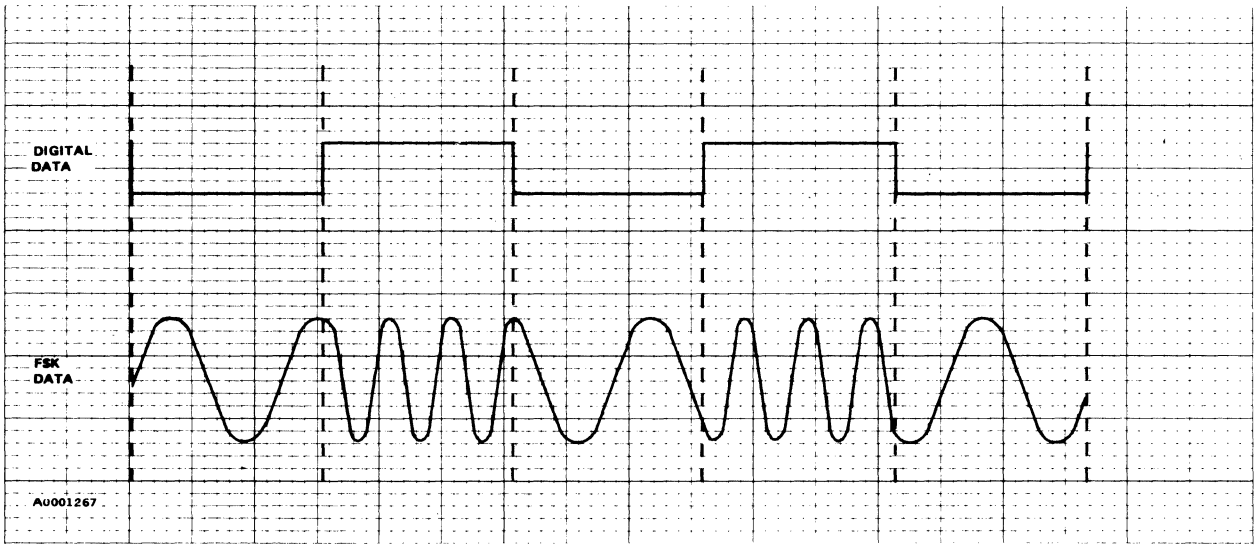


Figure 4-16. Frequency Shift Keying (FSK) Modulation

Table 4-2. Acoustic Coupler/Modem FSK Transmission Frequency

Signal	Bell System		CCITT	
	Xmit	Rcv.	Xmit	Rcv.
Logic One (Mark)	1270	2225	980	1650
Logic Zero (Space)	1070	2025	1180	1850

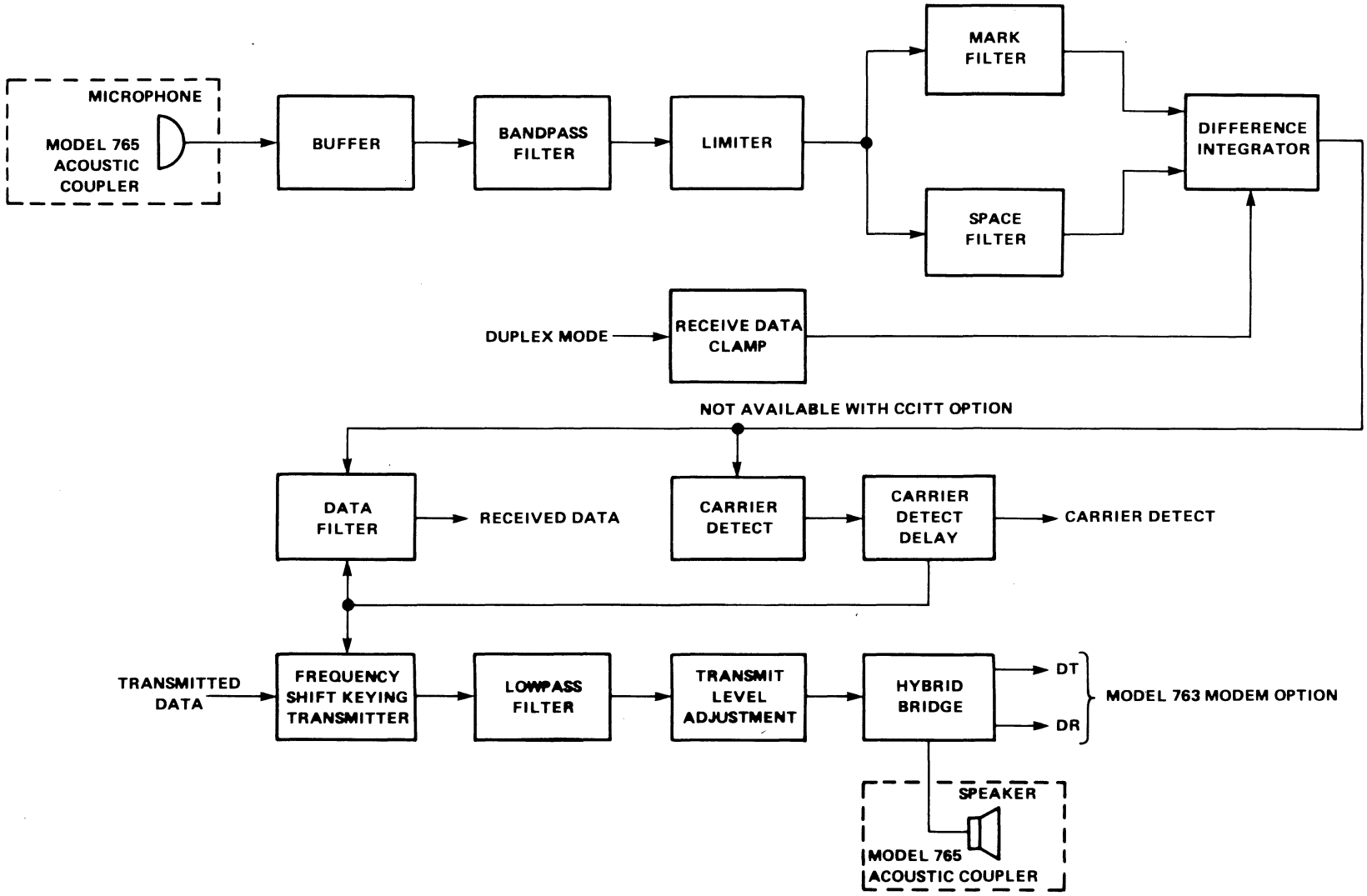


Figure 4-17. Acoustic Coupler/Modem Block Diagram

The output of the mark and space filters is applied to a difference integrator which determines which filter has the most output over a bit time. The difference integrator's output is applied to the data filter and carrier detect circuit. The data filter smoothes the difference integrator output and converts the signal to ±10 volt levels. The carrier detector circuit determines whether an in-band or out-of-band signal is present at the input of the receiver.

An in-band signal starts a 3 to 7 second delay, provided a jumper is installed at E425-E426, in the carrier detect delay circuit before it provides a valid carrier indication to the terminal and transmitter circuit. An out-of-band signal starts a 100 to 300 millisecond delay before a no-carrier indication is provided to the terminal and transmitter.

Referring to the schematic in Section VII, the signal input to the acoustic coupler is an audible tone emitted by the telephone handset. This FSK signal is converted to an electrical signal by the microphone. The incoming signal then is amplified by the buffer amplifier (U413, R501, R500, and R495), the gain of which is determined by R501 and R495.

The signal then goes to a three-stage, stagger-tuned bandpass filter which amplifiers in-band signals and attenuates out-of-band signals and noise. The first stage of the filter (U413, R491, R494, R502, C428, and C427) has a nominal center frequency of 2345 Hz, a gain of 14 dB and a Q of 5. The second stage of the bandpass filter (U407, R489, R490, R450, C418, and C417) has a nominal center frequency of 1915 Hz, a gain of 14 dB, and a Q of 5. The last stage of the filter (U406, R446, R429, R445, C412, and C411) has a nominal center frequency of 2125 Hz, a gain of 3 dB and a Q of 5.

The composite filter response yields an overall gain of 25 dB with relatively linear phase characteristics and a 300-Hz bandwidth. The linear phase characteristics contribute to equal mark and space frequency delays.

The limiter (U406, R442, R444, CR408, CR409) produces a constant amplitude (±0.7 volts, peak-to-peak) input signal for the mark and space filters by limiting the positive and negative excursions of the output with CR408 and CR409.

The bandwidth of the incoming signal at 300 baud is 300 hertz, centered about the carrier frequency of 2125 Hz (1750 Hz for CCITT). To receive signals of this bandwidth, the mark filter is nominally tuned to 2275 Hz, and the space filter is tuned to 1975 Hz. Both filters have equal gains, and the envelope delay at the center frequency of each filter is equal.

The difference integrator circuitry determines which filter has the most output over a bit time. The outputs of the mark and space filters are subtracted by CR413, R476, CR416, and R479 and by CR415, R481, CR414, and R474. When a mark is received, the output of U410 (pin 1) is in positive saturation; similarly, when a space is received U410 (pin 1) is in negative saturation. Under no-signal conditions, the output of U410 is nominally zero volts.

The data filter stage, R455, R554, and C413, form a low-pass filter which removes any carrier frequency signals still present on the output of the difference integrator. The remaining components of the data filter (U410, R454, and R453) consitute a comparator with hystersis. The output of U410 (pin 7) is in negative saturation for a mark and in positive saturation for a space. In addition, the receive-data signal is held in the mark condition whenever the carrier detect delay output signal is off (-12 volts), indicating no valid carrier is present.

4.6.2 CARRIER DETECT. The carrier detect circuit determines if a valid FSK signal is being received. The carrier detect circuit receives its input signal from the output of the difference integrator (U410, pin 1) which is +10 volts or -10 volts when a signal is received or zero volts when no signal is received.

Under a no-signal condition U404 (pin 1) is +10 volts since U404 (pin 2) is pulled to -12 volts through R423, and U404 (pin 3) is at zero volts. When the output of the difference integrator exceeds +2 volts, the input (U404, pin 2) becomes more positive than pin 3 (U404), and the output (U404, pin 1) switches to -10 volts.

Similarly, when the output of the difference integrator ranges between the negative saturation voltage of U410 (pin 1) and -5 volts, the noninverting input of the carrier detect op-amp (U404, pin 3) is more negative than the inverting input (U404, pin 2), so the output switches to -10 volts. To prevent a loss of carrier indication while receiving data during which the output of the difference integrator is switching between +10 volts and -10 volts, the voltage stored on C409 and C404 (in conjunction with the RC time constants of C409, R422, and R424 or C404, R402, and R403) are sufficient to prevent the output of U404 (pin 1) from switching to a no-carrier condition (+10 volts).

4.6.3 CARRIER DETECT DELAY. The carrier detect delay circuit generates the appropriate energizing and deenergizing delays required by the terminal. A -10 volt signal from U404 (pin 1) indicates that a valid carrier is present. Since CR405 is reverse biased, capacitors C410 and C432 are charged to -10 volts through R426. The jumper installed at E425-E426 provides for the normal turn-on and turn-off delays. With this jumper removed, shorter delays are provided. R426 along with C410 and C432 determine the turn-on time of 3 to 7 seconds. With the short delay option, the turn-on time is 1 to 2 seconds. When the voltage across C410 is less than the -7.5 volt threshold of the comparator formed by U404, R404, R405, R406, its output switches to +10 volts, indicating the presence of a valid carrier. When the output of the carrier detect circuit (U404, pin 1) is +10 volts, C410 and C432 discharge through R425 and CR405. R425 along with C410 and C432 determine the turn-off time of 100-300 milliseconds (50-100 milliseconds with the short delay option). When the voltage across C410 is more positive than -4 volts, the comparator output switches to -10 volts, indicating no valid carrier.

4.6.4 RECEIVE DATA CLAMP (Not Available With CCITT Option). The purpose of the receive data clamp circuit is to eliminate the effects of erroneous receive data caused by the second harmonic frequencies of the transmitter being within the bandwidth of the receiver. The function of this circuit is to force, or clamp, the receive-data signal to a mark condition whenever the transmit data signal is in a space condition. The circuit is enabled only when the terminal is in the half-duplex mode.

With a -10 volt level at U405 (pin 1), the transmitter is in the space condition. Thus CR428 is forward biased, and C431 charges toward -10 volts through R473. Buffer amplifier U415 (pin 1) tracks the capacitor voltage towards -10 volts which causes the output of U1 (pin 8) to switch to +5 volts. This turns on Q551 which causes CR426 and CR427 to turn on, bringing U415 (pin 5) to approximately +1.5 volts. If the terminal is in the half-duplex mode, the output latch U25 (pin 7) is turned on and pulled to +5 volts through R22. Thus U415 (pin 7) is in negative saturation (-10 volts), causing CR425 to be forward biased. This then forces, or clamps, the output of the difference integrator U410 (pin 1) to +10 volts, regardless of the receiver input signal. This causes the receive data signal to be held in the

mark condition, along with holding the carrier detect signal on. When the transmit data signal returns to the mark condition, U405 (pin 1) switches to +10 volts. This turns off CR428 and now C431 discharges toward +10 volts through R473 and R488. The output of U1 (pin 8) switches to ground, causing Q551 to turn off. This pulls U415 (pin 5) to +12 volts through R499 since CR426 and CR427 turn off. This causes U415 (pin 7) to switch to +10 volts, which turns off CR425. This then frees the difference integrator and allows it to switch with the incoming signal. When the terminal is in the full-duplex mode, the output latch U25 (pin 7) is off and held near ground. Thus since the non-inverting input of U415 (pin 5) never goes below ground, the output of U415 (pin 7) always is +10 volts, which turns off CR425, effectively disabling the circuit during full-duplex.

4.6.5 TRANSMITTER SECTION. The transmitter section consists of an FSK transmitter including transmit inhibit circuitry, a low-pass filter, a transmit level adjustment, and hybrid bridge circuits. The FSK transmitter is a triangular-wave oscillator which oscillates at one of the two FSK frequencies selected by the digital transmit data signal. The transmitter is enabled to oscillate only after a valid carrier is present and the carrier detect signal is on. The low-pass filter removes the higher order harmonics present in the triangular wave. The low-pass filter output is connected through the output level adjustment to the hybrid bridge.

When the board is configured as an acoustic coupler (Model 765), the hybrid bridge is used as a buffer amplifier to drive the speaker. When the board is configured as a modem (Model 763 option), the hybrid bridge permits the FSK transmit data to be applied to the telephone line through the DT and DR leads. In the modem configuration the received FSK data also is present on the DT and DR leads since it is a two-wire full-duplex system. The hybrid bridge not only applies the received FSK signal to the receiver input, but it also isolates the transmitter section from the receiver section.

For purposes of discussion, refer to schematic 937298, sheet 8 in Section VII and assume that the output of U412 (pin 7) of the FSK transmitter is at -12 volts. CR412 is reverse biased, and CR411 is forward biased. A -4.3 volt reference is established by CR420, CR417, and CR419. The constant negative voltage at the input of integrator (U407, C416, and the series combination of R472 and R448) causes the output (U407, pin 7) to ramp linearly positive with time.

When the output passes +4.3 volts, the noninverting input of U412 is slightly positive because of the voltage divider formed by R487 and R485 between the negative reference and U407 (pin 7). The positive voltage at U412 (pin 2) causes the output to switch to +12 volts, and a +4.3 volt reference is established by CR421, CR417, and CR418 at the input to the integrator. The integrator now ramps linearly negative until the output is slightly less than -4.3 volts. The noninverting input of U412 is now slightly negative, so the output switches to -12 volts, and the cycle starts again.

In order to change the frequency of the oscillator, a shunt resistor (R447) is switched across the series combination of R472 and R448 by Q405. Transistor Q405 is switched on and off by the output level present at U405; on during the mark frequency, off during the space frequency. The transmitter is enabled and disabled using the carrier detect signal present at U404 (pin 7). When a valid carrier is present, U404 (pin 7) is +10 volts which turns on Q406 which turns off U407. This enables the comparator U412, thus enabling the transmitter. While carrier detect is off, U404 (pin 7) is -10 volts, forcing Q406 off and Q407 on, which disables U412 and the transmitter.

4.6.6 TRANSMIT LOW-PASS FILTER. The triangular wave output of the transmitter section is altered using a low-pass filter to lower the distortion by attenuating all harmonics of the fundamental frequency. The resultant output is a sine wave of approximately ±9 volts peak-to-peak.

4.6.7 TRANSMIT LEVEL. The output of the low-pass filter is applied through a 10K ohm potentiometer which determines the output transmit level. Integrated circuit U414 (pins 1, 2, and 3) form a buffer to drive either the speaker (acoustic coupler) or the duplexer (modem).

The duplexer (U414, pins 5, 6, and 7; R496, R498, and R499) provides the appropriate driving and terminating impedances to match the modem to the data access arrangement. The duplexer also provides isolation between the transmitter and receiver of the modem to prevent a strong transmitted signal from swamping a small received signal. Zener diodes, CR422 and CR423 protect the DT and DR leads from high voltage spikes.

4.7 POWER SUPPLY

The terminal power supply converts ac input power to the regulated dc levels required to drive all of the systems within the terminal. The power supply has been designated to operate over a wide range of steady-state and transient cdonditions. The terminal consumes a maximum of 150 watts.

4.7.1 FUNCTIONAL ELEMENTS. Refer to figure 4-18. The terminal power supply is located on both the upper and lower boards. Functionally, the power supply can be divided into six major groups. 1) unregulated supply, 2) soft start circuit, 3) the dc-to-dc converters, 4) voltage regulator circuits, 5) failure protect circuits, 6) output rectifier and filter circuits. Of the six major groups only the first two listed, the unregulated supply and the soft start circuit, are not duplicated. The remaining four groups are duplicated on the upper and lower boards and are identical with each other except that the upper board (PWB-1) has a +30 volt output that does not exist on the lower board (PWB-2) circuits. The 1N4007 diode (CR334) in the positive leg of the unregulated dc input located on the bottom board keeps the top board from stealing the stored energy from the bottom board reservoir capacitors (needed to preserve power to the bubble memory system) during ac power down or ac power loss >2.5 cycles. This component is unique to the bottom board power supply. Because the operation of the redundant areas of the power supply is identical, only the upper board circuitry will be examined. The ac input is rectified and filtered in the unregulated (PWB-1) area of the supply. The unregulated dc is applied to both converters. The regulator circuits control their respective converters by altering their frequency and duty cycle to meet input and load variations. The converters use the flyback principle to couple energy in the transformer primary winding to the secondary winding and to the output rectifiers, filters, and load. The output is a stable, well-regulated dc that is used to drive the subsystems within the terminal.

4.7.2 UNREGULATED SUPPLY. The unregulated section of the power supply is located on the upper board and provides unregulated dc to both boards. In operation, the ac input power is applied through an electromagnetic interference (EMI) filter through the power switch located on the upper board. When the switch is closed, ac power is applied to a full-wave bridge rectifier. The pulsating dc output of the bridge circuit is applied across filter capacitors to produce smoothed, unregulated 160 volt dc that is applied to both upper and lower converters. The output of the bridge circuit is also applied to the soft start circuit.

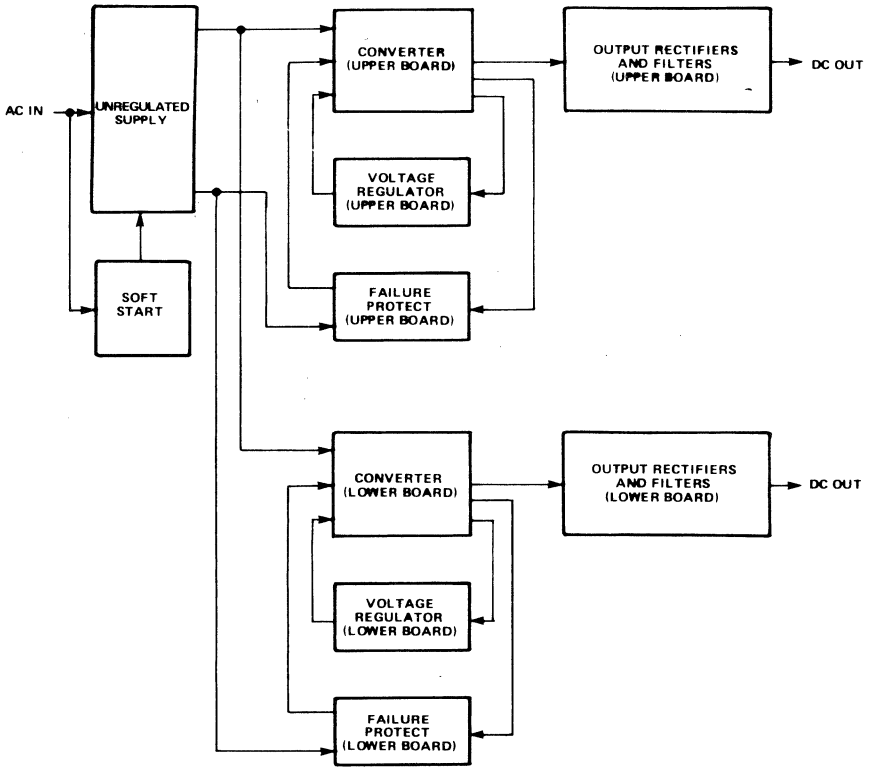


Figure 4-18. Power Supply Block Diagram

4.7.3 SOFT START CIRCUIT. The soft start circuit is located in the area of the unregulated supply on the upper board. The soft start circuit provides a starting current limiter for the unregulated supply. When the terminal is initially switched on the charging current for the filter capacitors is limited by passing it through a low value (18 ohm) resistor. At the same time, the output of the full-wave rectifier circuit is applied to a RC network. After about 50 milliseconds the voltage across the RC network has reached a level sufficient to trigger the SCR into conduction that bypasses the current limiting resistor. Once the SCR goes into conduction it remains on until the ac power is removed.

4.7.4 DC TO DC CONVERTER CIRCUIT. The principle of operation used by the dc-to-dc converter is that of a blocking oscillator. See figure 4-19. The converter is self starting so that when power is applied, power switching transistor Q311 goes into saturation allowing current to pass through the primary winding. The output of the tertiary winding drives the Q311 base circuit. The current continues to increase with time. The actual amount of time it takes the current to ramp up is a function of the applied unregulated dc voltage and the primary inductance of the transformer. Before the transistor reaches its maximum current handling capacity or saturation current of the transformer primary winding, the emitter resistor R338 will have a sufficient voltage drop across it to switch on transistor Q309 of the instantaneous over current protection circuit. This will drop the base potential on Q311 and switch it off. When Q311 switches off the primary winding polarity reverses and it ceases to act ass a load and begins to act a a source when its induced field collapses. The polarity on all other winding also reverses. This change begins the flyback that produces the transformer action necessary to couple the energy in the primary to the secondary windings. The snubber circuit on the primary winding is to slow down the polarity reversal to prevent damage to Q311 during turn off.

In operation the converter will be delivering maximum safe amount of power to charge the output filter capacitors during initial turn on. During this period, the charge time of the transformer is terminated by Q309. After the output filter capacitors have charged to the correct level, the charge time of the transformer is terminated by the regulator.

Another circuit on the transformer primary is the flyback limiter. This circuit absorbs a set amount of energy on the leading edge of the flyback voltage to prevent overshoot. If this overshoot is not absorbed, the regulator will sense the overshoot and use its value for regulation. This would cause the output voltage to vary with line and load variations and thus reduce regulation.

4.7.5 VOLTAGE REGULATOR. The regulator circuit controls the output voltages of the power supply by sensing the flyback voltages and varying the frequency and duty cycle of the converter to compensate for line and load variations. When power is initially applied, maximum power is required to charge the output filter capacitors. Because of this, the converter must deliver maximum current to the output and the regulator has no effect on the converter. During this period the power transistor is turned off by the instantaneous over current protection circuit as it approaches maximum current on each cycle.

As the load requirements diminish to their steady state values the power output of the converter must be reduced. The regulator begins to switch off the converter power transistor before it reaches the maximum safe current level. Refer to figure 4-20. During flyback, capacitor C313 charges to the average flyback voltage. This voltage signal is input through the inverting side of U302 to establish a current level of Q305. Transistor Q305 acts as an adjustable constant current source to timing capacitor C317. The amount of current through Q305 is a function of the level of flyback voltage stored on C313. During flyback the output of the tertiary winding has kept C317 discharged. When Q311 begins to conduct again, C317 is allowed to charge at a rate determined by the amount of current being passed by Q305. When the voltage across C317 reaches the correct level, Q307 and Q308 will switch on. Transistor Q308 sinks Q311's base current and switches Q311 off. In summary, when the load increases, greater current is required of the supply. The converter must remain on for longer periods of time. To accomplish this, U302 senses a lower flyback voltage (because of the increased load) and lower the output current of Q305 which causes C317 to take longer to charge. The longer it takes C317 to charge the longer that Q311 is on per cycle.

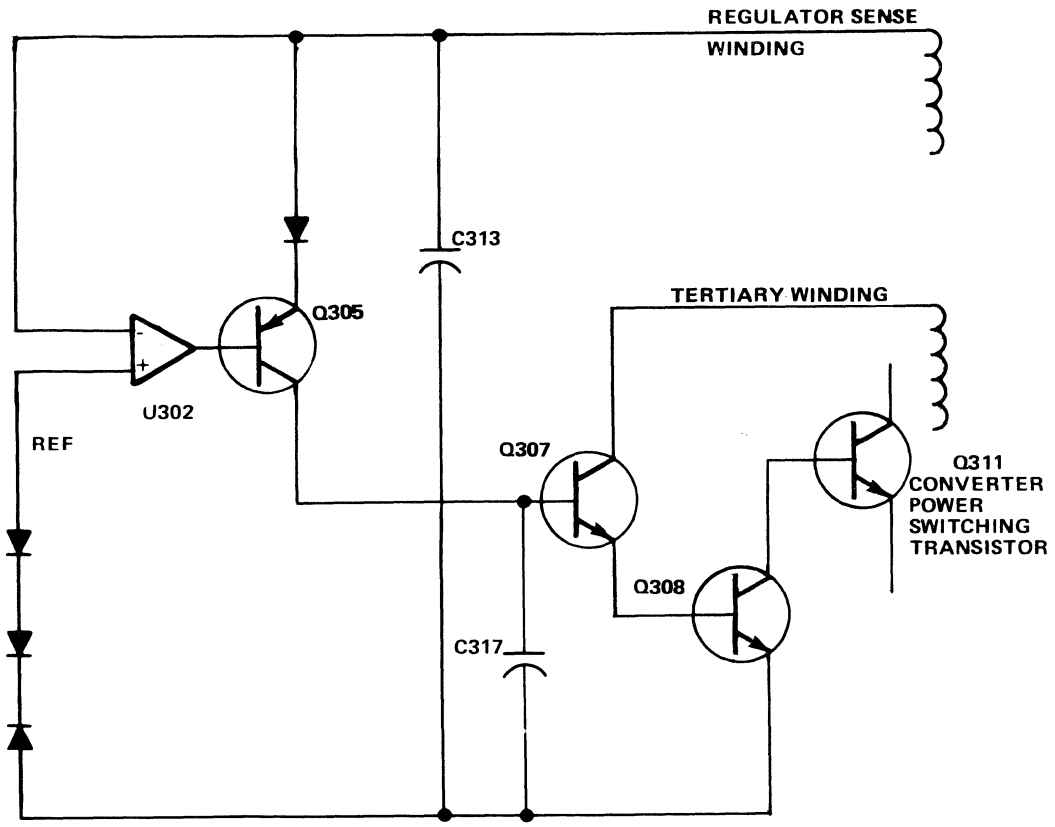


Figure 4-20. Regulator Circuit, Simplified Diagram

Conversely, when the load decreases, less current is required of the supply. The converter must remain on for shorter periods of time. To accomplish this, U302 senses a higher flyback voltage (because of the decreased load) and increases the output current of Q305 which causes C317 to charge faster. The faster C317 charges the shorter time Q311 is on per cycle.

4.7.6 FAILURE PROTECT CIRCUIT. This circuit provides protection to the power supply and its load against output overvoltage or sustained overcurrent. The failure protection circuit consists of four transistors and their associated components. It forms an over voltage sense, sustained over-current sense, latch, and driver which switches off the power switching transistor of the converter. When the circuit latches it holds the power switching transistor off as long as the primary side dc is present. The circuit is disabled during initial power up until the soft start SCR is triggered into conduction. When the SCR goes into conduction the failure protect circuit is enabled.

SECTION V

MAINTENANCE

5.1 INTRODUCTION

The terminal has been designed with several built-in test features that will aid in the quick isolation of failures. In addition, this section provides a series of comprehensive troubleshooting charts that will serve as a guide to the use of the built-in tests to quickly isolate a defective assembly. Paragraph 5.4 provides the correct procedure for cleaning the terminal printhead. Paragraph 5.5 contains information concerning the location of and the correct procedure for removal and replacement of a defective component. The adjustment of the printer system is discussed in Paragraph 5.6. Testing of the communication system is presented in Paragraph 5.7.

5.2 SELF TEST. The terminal contains several built-in tests. The random access memory is checked automatically each time the terminal is turned on. The system read only memory and bubble memory system is tested by calling up a test that is resident in ROM. In addition there is a test initialization sequence, a built-in test for bubble memory masks, and a high-speed character repeat function that can be used to isolate terminal failures.

5.2.1 RAM TEST. Each time the terminal is turned on, a test of the terminal RAM is initiated and circuitry on the upper board will cause the printer to perform a linefeed, make the printhead slew to the left margin, and light the COMMAND indicator. At the same time, the main processor, located on the lower board, will conduct a RAM test. If the RAM successfully passes the test, the main processor sends a READY message to be printed.

If the RAM fails, or the main processor is malfunctioning then the terminal will still perform as previously described with the exception that the message READY will not be printed.

If the printer/keyboard control system located on the upper board is malfunctioning, the printer will not linefeed, slew to the left margin or print a READY message.

5.2.2 TEST INITIALIZATION. The TEST INIT command will initiate the system initialization routine. This routine is NOT necessary to run any of the terminal built-in tests. It provides a simple and quick method to set up the terminal with an empty catalog and a predetermined set of terminal parameters.

When the TEST INIT command is entered, the terminal will respond with the prompt message OK? (Y/N) to which a Y or N must be entered. An N will terminate the initialization with no action taken. A Y will cause the initialization to occur. The catalog will be set up with no files created, even if some of the files are locked. The terminal parameters will be set as follows:

Speed — 300 baud
Parity — Even
Parity Checking — Off
Full Duplex Mode
Communication to Internal (A/C coupler)
No ABM
Transmit End-of-Line to CRLF
Receive End-of-Line to CRLF
No Record or Playback Files
EDC — On
No Key Definition
DC3, DC1.3 and DC2.4 — On
Buffer — Inactive
OFF LINE
ABM Auto Trigger — Off
EOT Disconnect — Off

CAUTION

Use of this function will remove ALL files from memory, even if they are locked files.

5.2.3 ROM AND BUBBLE MEMORY TEST. The TEST command will activate a test routine, resident in ROM, that will perform the following tests:

- CRC ROM check on the main processor ROMs.
- Read and write a single page of data from each bubble device in the memory system.

If an error occurs as a result of the test, a FAIL message is printed followed by an error code. If no errors occur, then a DONE message is printed when the test terminates. It should be noted that after the TEST command has been entered the terminal will appear to go inactive while the test is in progress. The following is a list of errors for the test:

FAIL — 1	ROM1 CRC FAIL (U58)
FAIL — 2	ROM2 CRC FAIL (U59)
FAIL — 3	ROM3 CRC FAIL (U60)
FAIL — 4	ROM4 CRC FAIL (U61)
FAIL — 5	ROM5 CRC FAIL (U62)
FAIL — 6	BUBBLE 0 FAIL
FAIL — 7	BUBBLE 1 FAIL
FAIL — 8	BUBBLE 2 FAIL
FAIL — 9	BUBBLE 3 FAIL
FAIL — A	BUBBLE 4 FAIL
FAIL — B	BUBBLE 5 FAIL
FAIL — C	BUBBLE 6 FAIL
FAIL — D	BUBBLE 7 FAIL

5.2.4 DISCRETE AND DUAL MEMORY BOARDS. There are two different types of memory boards used in the terminal, discrete memory boards and dual memory boards. The discrete memory boards contain one bubble memory device per board. Because of their size, only two discrete memory boards can be installed in a terminal. Each discrete memory board can store 10K characters. The location of the bubble devices on the discrete memory board is shown in figure 5-1.

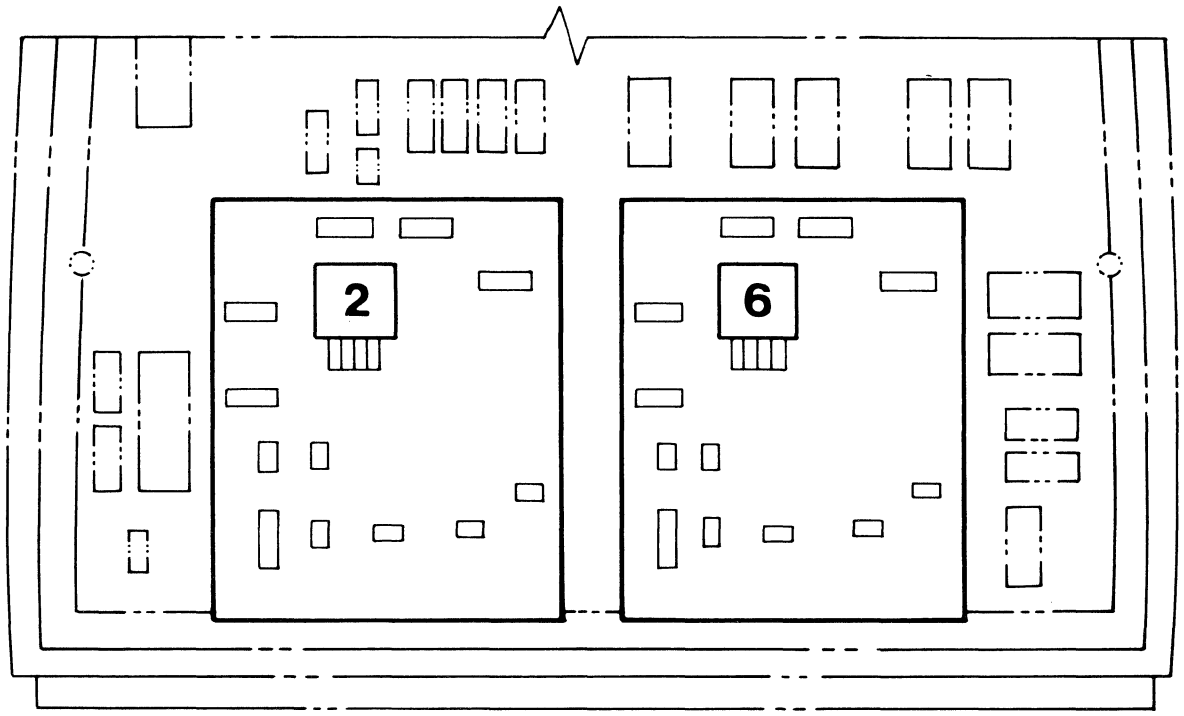


Figure 5-1. Discrete Memory Board

The dual memory board contains two bubble devices per board and is one half the size of the discrete board. Each dual memory board can store 20K characters. A maximum of four dual memory boards can be installed in a terminal. Memory boards can not be mixed, that is, a discrete board and a dual memory board cannot be installed together in the same terminal. The location of the bubble devices on the dual memory board is shown in figure 5-2.

5.2.4.1 Bubble Mask Tests. Each bubble memory device in the terminal requires a mask for read write operations. The bubble mask is simply a string of characters that define which of the minor loops in the bubble device are defective. The memory system uses the mask information to condition the data transfers with the bubble device to correct for the defective loops. Each bubble device has a mask defined by the manufacturer that is unique to the bubble device. These bubble mask tests allow the checking of the mask that is already installed in the bubble device. If the mask is lost, it also allows the mask to be reinserted into the bubble device. The TEST MASK command will cause the terminal to print the mask for each bubble device in the system. The format of the mask is as follows:

MBM n AABBCCDDEEFFGGHHIIJJKKLLMMXXXX

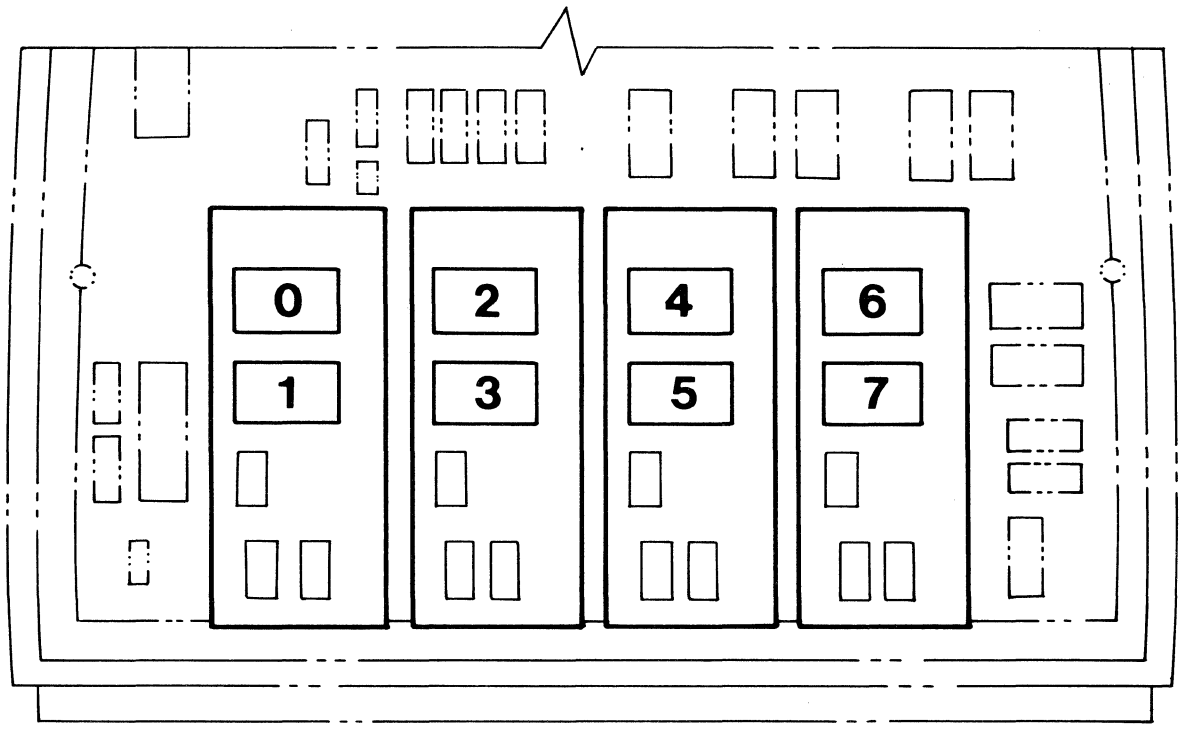


Figure 5-2. Dual Memory Board

The MBM (Magnetic Bubble Memory) device number (0-7) is followd by a character string. Each double letter represents a two digit hexadecimal number which indicates a defective minor loop. The 13 defective loops are represented. The XXXX is a four digit CRC check character which is used to validate the mask during input to protect against input errors. If there is no bubble device installed in a memory location or the mask of the bubble device in that location has been lost, the terminal will print out the following message:

MBM n OUT

Where n represents the location number where there is no bubble device installed, or the mask has been lost.

If a bubble mask has been lost and the mask information for that device is not available, the mask data is also printed on the bubble device. To read the data, it is necessary to open the terminal; remove the upper board and examine the bubble device in question. An example of the mask data for a bubble device is shown in figure 5-3. The mask number is read from left to right and top to bottom. The mask number illustrated is 1832495D92939798999A9B9C9D9CF5. The mask number printed on the bubble device is listed in groups of five characters for ease of reading. When the number is entered using the TEST MASK instruction, there are no spaces in between. The last line of the bubble device is the part number of a bubble device with a mask label on it and has nothing to do with the bubble mask data.

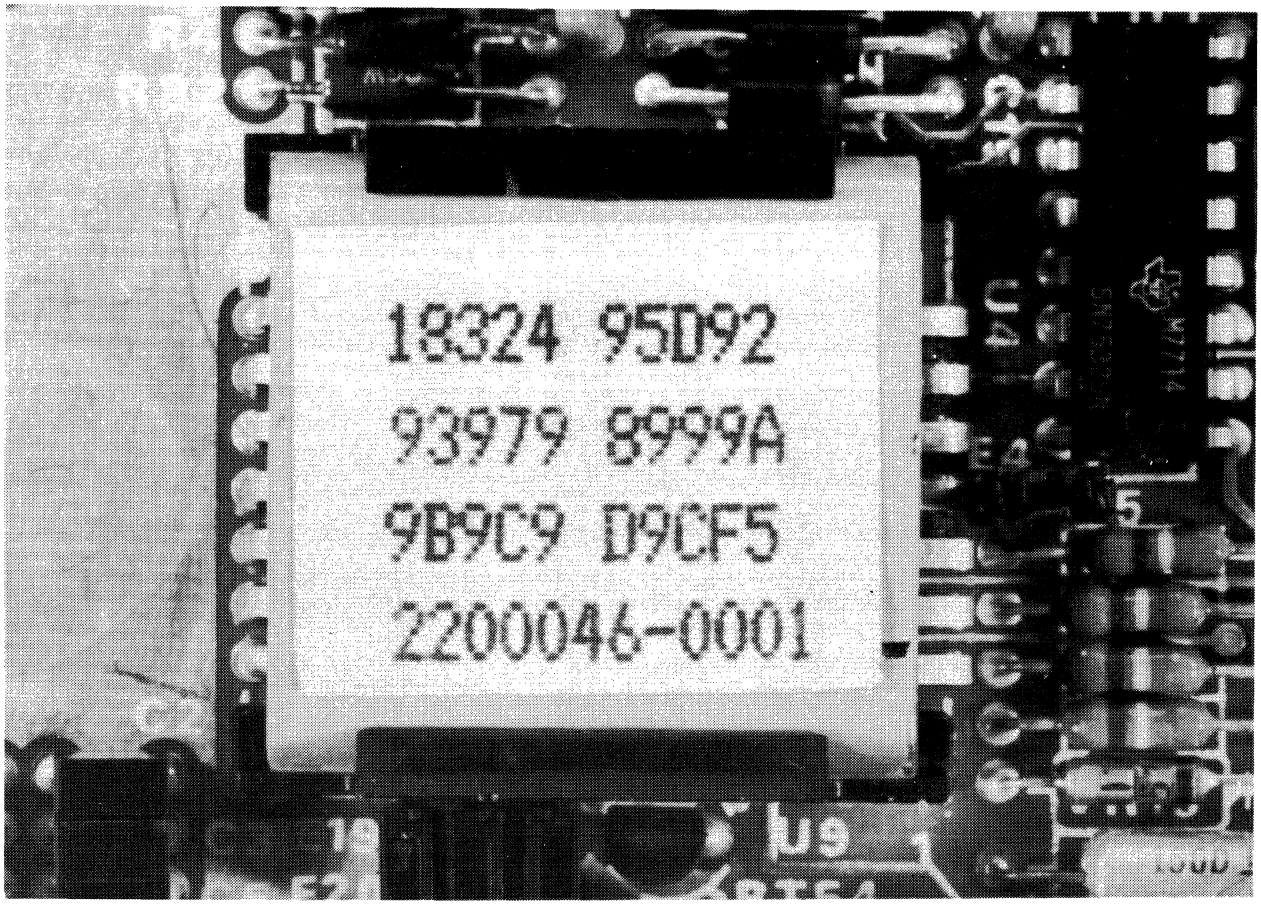


Figure 5-3. Bubble Mask Data Label

5.2.4.2 Entering Bubble Masks. If a bubble mask is lost, it can be rewritten into the bubble device by the use of the TEST MASK n command, where n represents the bubble device number. The mask associated with bubble memory device n (0-7) will be set to the value of the character string that is entered after the TEST MASK command. If the masks of both bubble devices are lost in a discrete bubble memory terminal, then the TEST MASK command cannot be used to reload the masks into the bubble devices. In this case, either both memory modules can be replaced or a one module can be installed and a TEST MASK n command can be used to re-enter the remaining bubble memory mask.

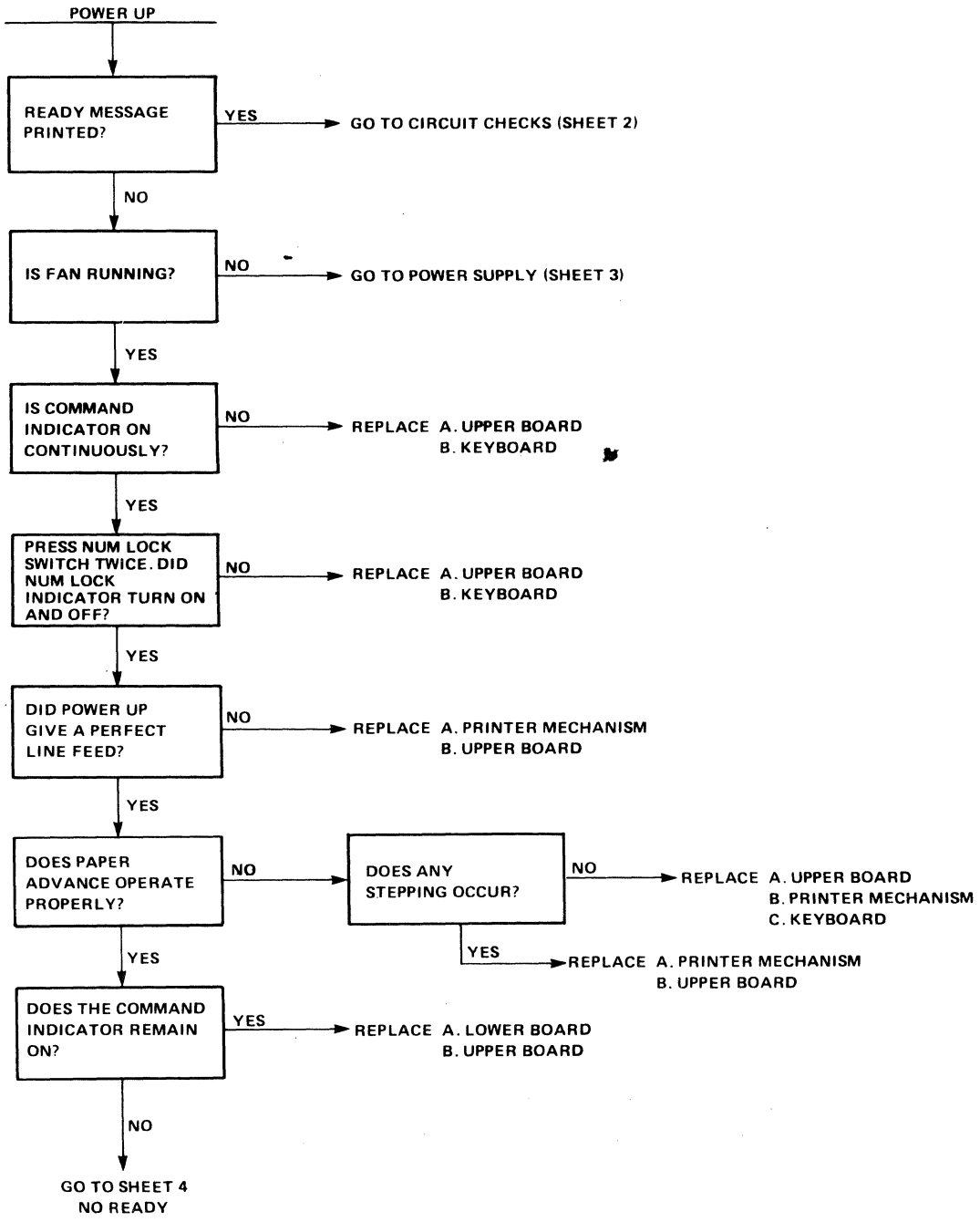
CAUTION

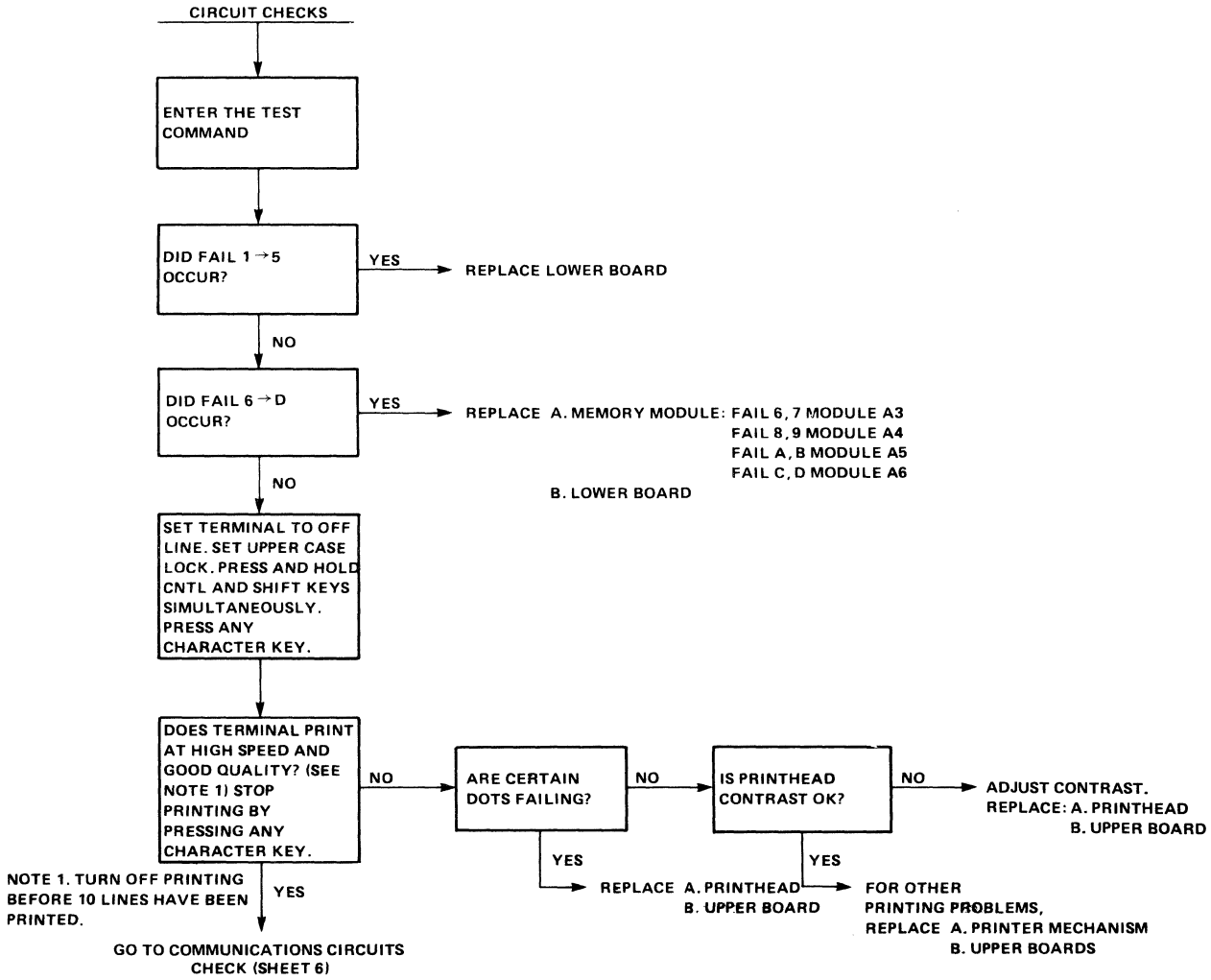
Care should be exercised in the installation of the bubble memory mask. If an incorrect mask is entered, the bubble device will not work correctly even if the correct mask is entered at a later time. If an incorrect mask is entered, replacement memory board must be installed because the bubble device is no longer reliable.

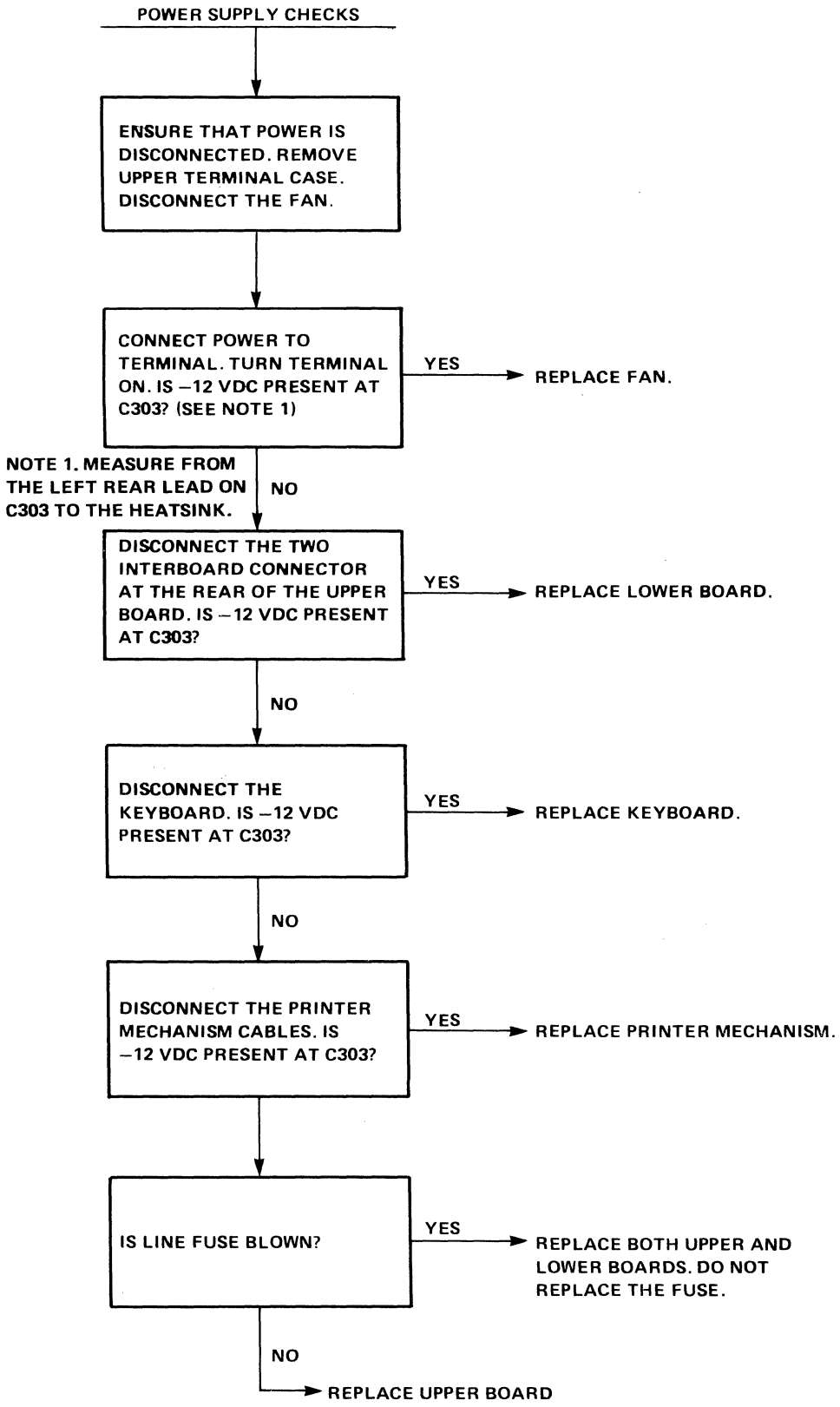
5.2.5 HIGH SPEED CHARACTER REPEAT. By depressing both the control and shift keys while the keyboard is in the upper case mode, any shifted key can be repeated once every 17 milliseconds. Once initiated, this repeat operation will continue (even with no keys depressed) until a key is entered which does not have the control, shift, and upper case function also depressed. The terminal must not be in the record mode.

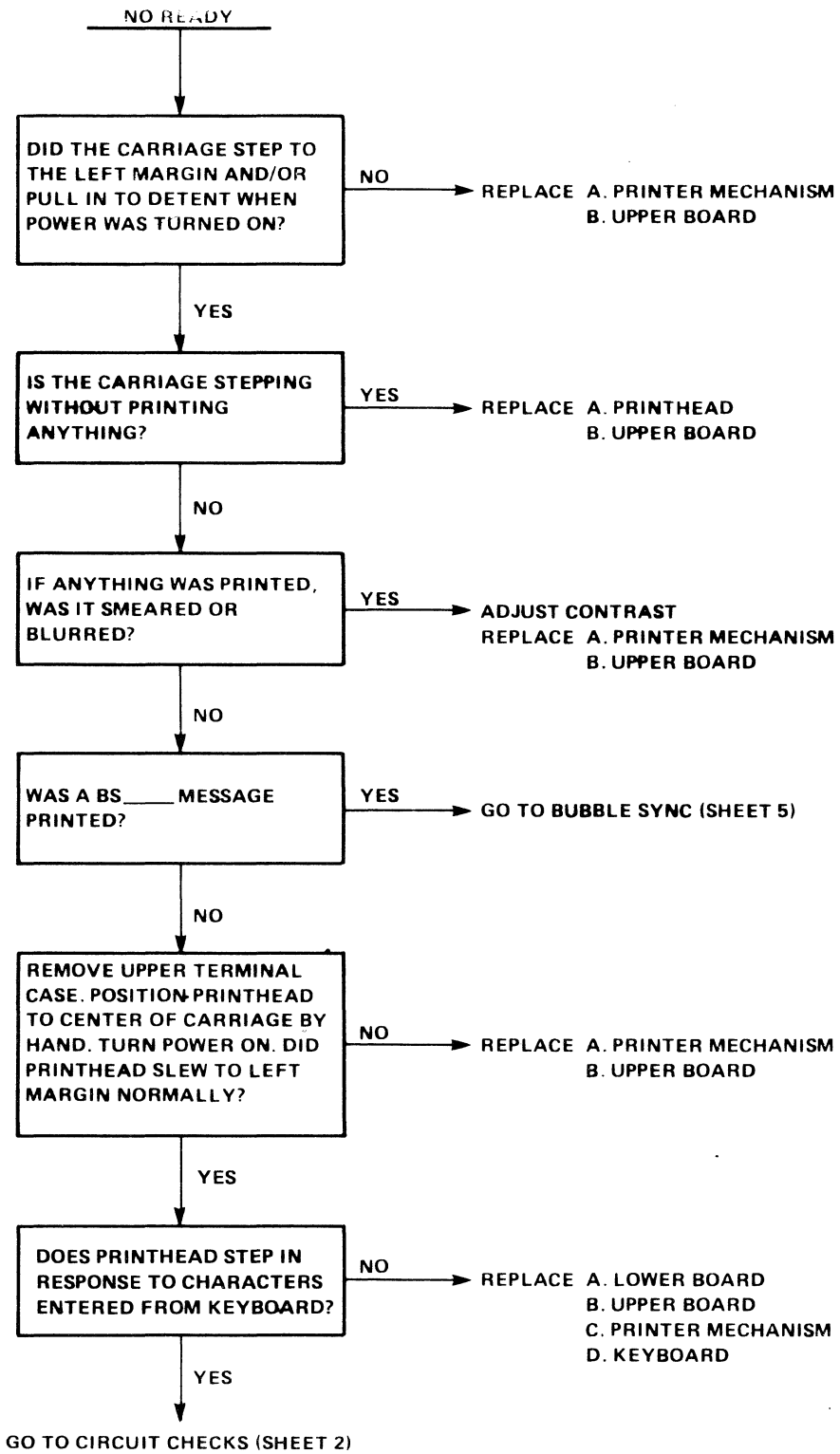
5.3 TROUBLESHOOTING CHART.

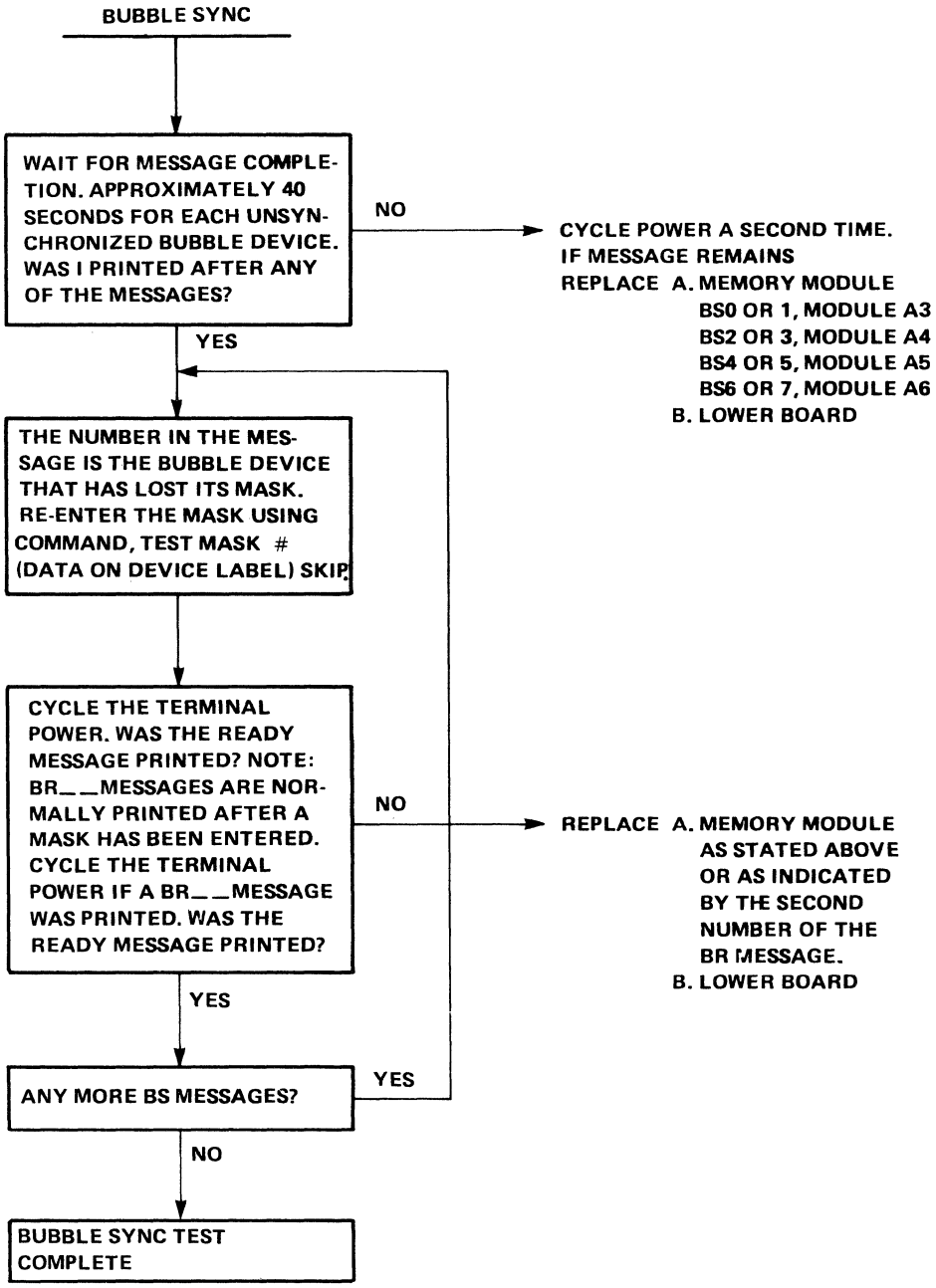
This troubleshooting chart is designed to assist you in quickly determining the faulty assembly in a terminal. Start with the chart on sheet one and proceed as directed.

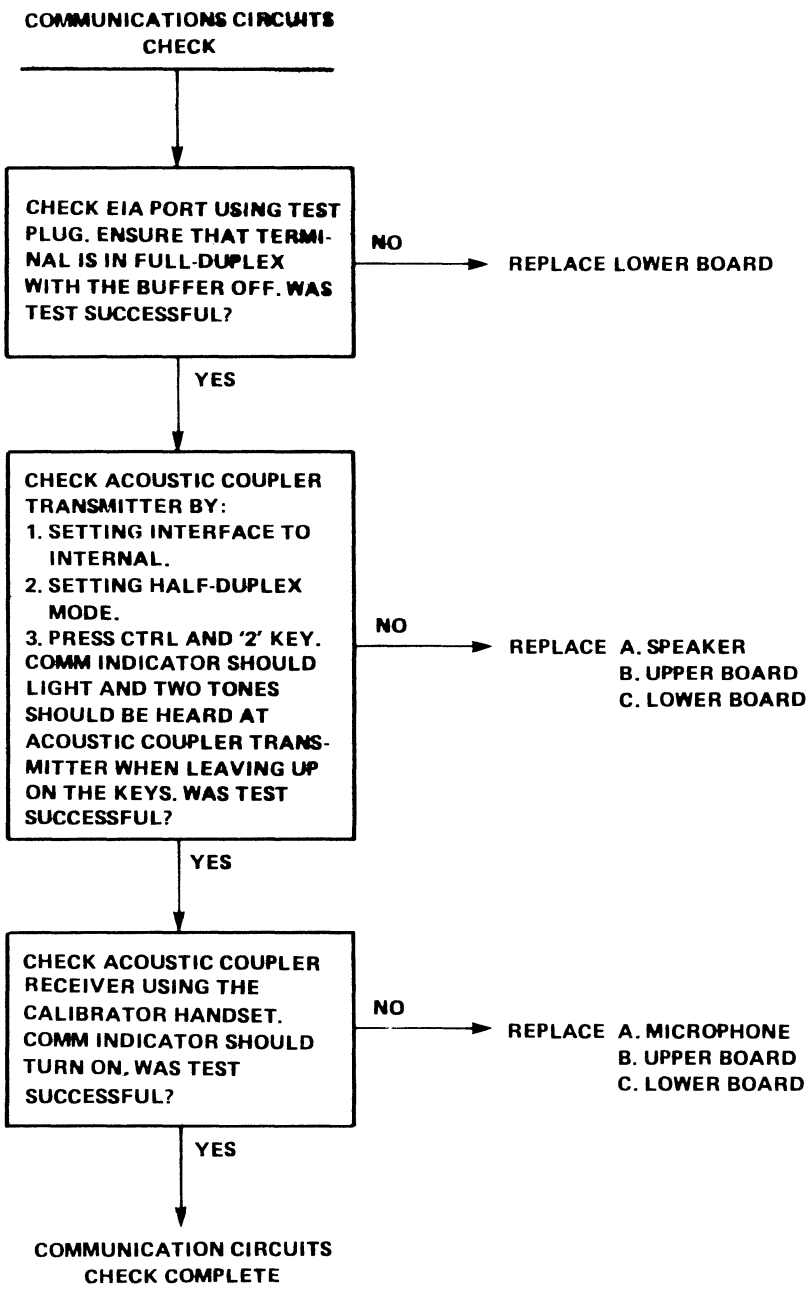



CIRCUIT CHECKS
ENTER THE TEST COMMAND
DID FAIL 1→5 OCCUR?
YES
REPLACE LOWER BOARD
NO
DID FAIL 6→D OCCUR?
YES
REPLACE A. MEMORY MODULE: FAIL 6, 7 MODULE A3
FAIL 8, 9 MODULE A4
FAIL A, B MODULE A5
FAIL C, D MODULE A6
B. LOWER BOARD
NO
SET TERMINAL TO OFF LINE. SET UPPER CASE LOCK. PRESS AND HOLD CNTL AND SHIFT KEYS SIMULTANEOUSLY. PRESS ANY CHARACTER KEY.
DOES TERMINAL PRINT AT HIGH SPEED AND GOOD QUALITY? (SEE NOTE 1) STOP PRINTING BY PRESSING ANY CHARACTER KEY.
NO
ARE CERTAIN DOTS FAILING?
NO
IS PRINTHEAD CONTRAST OK?
NO
ADJUST CONTRAST.
REPLACE: A. PRINTHEAD
B. UPPER BOARD
YES
REPLACE A. PRINTHEAD
B. UPPER BOARD
YES
FOR OTHER PRINTING PROBLEMS,
REPLACE A. PRINTER MECHANISM
B. UPPER BOARDS
NOTE 1. TURN OFF PRINTING BEFORE 10 LINES HAVE BEEN PRINTED.
YES
GO TO COMMUNICATIONS CIRCUITS CHECK (SHEET 6)


POWER SUPPLY CHECKS
ENSURE THAT POWER IS DISCONNECTED. REMOVE UPPER TERMINAL CASE. DISCONNECT THE FAN.
CONNECT POWER TO TERMINAL. TURN TERMINAL ON. IS −12 VDC PRESENT AT C303? (SEE NOTE 1)
YES
REPLACE FAN.
NOTE 1. MEASURE FROM THE LEFT REAR LEAD ON C303 TO THE HEATSINK.
NO
DISCONNECT THE TWO INTERBOARD CONNECTOR AT THE REAR OF THE UPPER BOARD. IS −12 VDC PRESENT AT C303?
YES
REPLACE LOWER BOARD.
NO
DISCONNECT THE KEYBOARD. IS −12 VDC PRESENT AT C303?
YES
REPLACE KEYBOARD.
NO
DISCONNECT THE PRINTER MECHANISM CABLES. IS −12 VDC PRESENT AT C303?
YES
REPLACE PRINTER MECHANISM.
IS LINE FUSE BLOWN?
YES
REPLACE BOTH UPPER AND LOWER BOARDS. DO NOT REPLACE THE FUSE.
NO
REPLACE UPPER BOARD


NO READY
DID THE CARRIAGE STEP TO THE LEFT MARGIN AND/OR PULL IN TO DETENT WHEN POWER WAS TURNED ON?
NO
REPLACE A. PRINTER MECHANISM
B. UPPER BOARD
YES
IS THE CARRIAGE STEPPING WITHOUT PRINTING ANYTHING?
YES
REPLACE A. PRINTHEAD
B. UPPER BOARD
NO
IF ANYTHING WAS PRINTED, WAS IT SMEARED OR BLURRED?
YES
ADJUST CONTRAST
REPLACE A. PRINTER MECHANISM
B. UPPER BOARD
NO
WAS A BS____ MESSAGE PRINTED?
YES
GO TO BUBBLE SYNC (SHEET 5)
NO
REMOVE UPPER TERMINAL CASE. POSITION PRINTHEAD TO CENTER OF CARRIAGE BY HAND. TURN POWER ON. DID PRINTHEAD SLEW TO LEFT MARGIN NORMALLY?
NO
REPLACE A. PRINTER MECHANISM
B. UPPER BOARD
YES
DOES PRINTHEAD STEP IN RESPONSE TO CHARACTERS ENTERED FROM KEYBOARD?
NO
REPLACE A. LOWER BOARD
B. UPPER BOARD
C. PRINTER MECHANISM
D. KEYBOARD
YES
GO TO CIRCUIT CHECKS (SHEET 2)


BUBBLE SYNC
WAIT FOR MESSAGE COMPLETION. APPROXIMATELY 40 SECONDS FOR EACH UNSYNCHRONIZED BUBBLE DEVICE. WAS I PRINTED AFTER ANY OF THE MESSAGES?
NO
CYCLE POWER A SECOND TIME. IF MESSAGE REMAINS
REPLACE A. MEMORY MODULE
BS0 OR 1, MODULE A3
BS2 OR 3, MODULE A4
BS4 OR 5, MODULE A5
BS6 OR 7, MODULE A6
B. LOWER BOARD
YES
THE NUMBER IN THE MESSAGE IS THE BUBBLE DEVICE THAT HAS LOST ITS MASK. RE-ENTER THE MASK USING COMMAND, TEST MASK # (DATA ON DEVICE LABEL) SKIP.
CYCLE THE TERMINAL POWER. WAS THE READY MESSAGE PRINTED? NOTE: BR__MESSAGES ARE NORMALLY PRINTED AFTER A MASK HAS BEEN ENTERED. CYCLE THE TERMINAL POWER IF A BR__MESSAGE WAS PRINTED. WAS THE READY MESSAGE PRINTED?
NO
REPLACE A. MEMORY MODULE AS STATED ABOVE OR AS INDICATED BY THE SECOND NUMBER OF THE BR MESSAGE.
B. LOWER BOARD
YES
ANY MORE BS MESSAGES?
YES
NO
BUBBLE SYNC TEST COMPLETE


COMMUNICATIONS CIRCUITS CHECK
CHECK EIA PORT USING TEST PLUG. ENSURE THAT TERMINAL IS IN FULL-DUPLEX WITH THE BUFFER OFF. WAS TEST SUCCESSFUL?
NO
REPLACE LOWER BOARD
YES
CHECK ACOUSTIC COUPLER TRANSMITTER BY:
1. SETTING INTERFACE TO INTERNAL.
2. SETTING HALF-DUPLEX MODE.
3. PRESS CTRL AND '2' KEY. COMM INDICATOR SHOULD LIGHT AND TWO TONES SHOULD BE HEARD AT ACOUSTIC COUPLER TRANSMITTER WHEN LEAVING UP ON THE KEYS. WAS TEST SUCCESSFUL?
NO
REPLACE A. SPEAKER
B. UPPER BOARD
C. LOWER BOARD
YES
CHECK ACOUSTIC COUPLER RECEIVER USING THE CALIBRATOR HANDSET. COMM INDICATOR SHOULD TURN ON. WAS TEST SUCCESSFUL?
NO
REPLACE A. MICROPHONE
B. UPPER BOARD
C. LOWER BOARD
YES
COMMUNICATION CIRCUITS CHECK COMPLETE

5.4 REMOVAL AND REPLACEMENT.

The following paragraphs explain how to remove and replace the components of the terminal. Figure 5-4 shows the location of terminal components.

CAUTION

Disconnect the memory terminal ac power cord from the wall receptable before attempting any internal disassembly procedures.

5.4.1 UPPER TERMINAL CASE. Remove the upper terminal case as follows:

1. Disconnect the power cord and communications cable (if present) from the rear of the terminal.

2. Open the paper supply door and remove the paper from the terminal. This will prevent the paper from falling out during case removal.

3. Place the terminal upside down on a padded working surface.

4. Remove the four recessed screws which secure the base to the upper cover.

5. Grasp the upper cover and base together and turn the terminal right side up.

6. Remove the upper case cover.

NOTE

The Model 765 has two wire assemblies located inside of the case at the rear of the terminal. These connections are for the acoustic coupler and must be disconnected. To disconnect, simply remove the two connecting plugs at the point where they attach to the upper board.

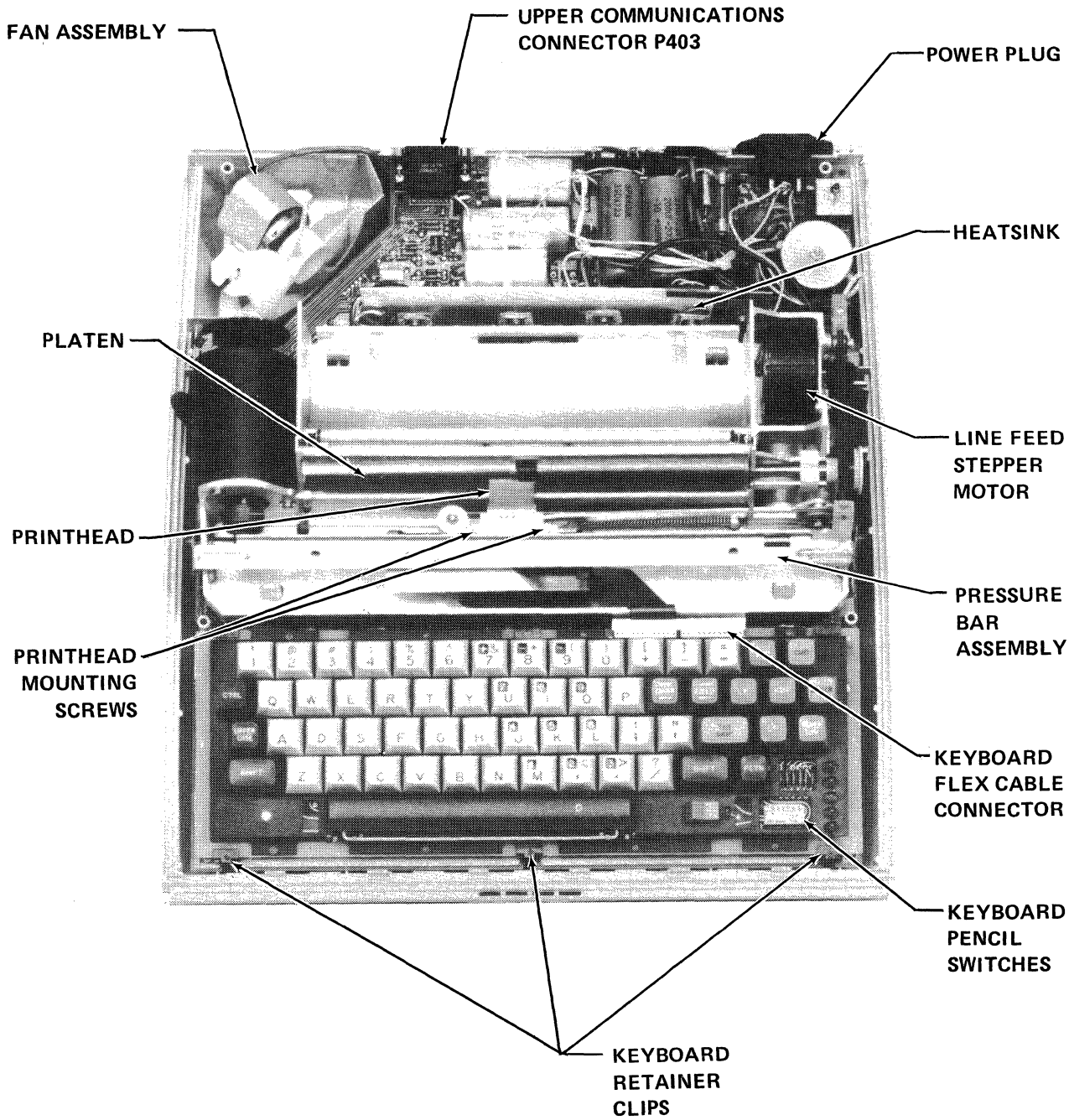


Figure 5-4. Terminal Component Locations

Replace the upper terminal case as follows:

1. Set the upper case on its back at the rear of the memory terminal.

2. Connect the two acoustic coupler assembly cables (Model 765 only) to the upper board.

3. Verify that the fan, printer mechanism, printhead, keyboard, and lower board cables are connected to their upper board connector pins.

4. Verify that the power cord receptacle is inserted in its groove in the base of the terminal case.

5. Lower the front of the upper case, keeping cables and wires off of the heatsink and away from the fan blade.

6. Guide the paper compartment rear wall (on the upper case) into the slot at the bottom rear of the mechanism paper supply compartment.

7. Verify that the sides, front, and rear of the case are engaged in their respective grooves in the base.

8. Grasp the upper case and base together and turn the unit upside down.

9. Install the four screws through the base and tighten.

5.4.2 PRINTER MECHANISM. Remove the printer mechanism as follows:

1. Remove the top of the terminal case as described in paragraph 5.4.1.

2. Refer to figure 5-5 and disconnect the sensor and motor connectors, and the mechanism ground connector.

CAUTION

Grasp the connectors only by their plastic bodies when disconnecting. Do not pull on the wires. Needle-nose pliers may be used if more convenient.

3. Release the front of the mechanism by pressing the two front support posts toward the rear of the terminal.

4. Lift the front of the terminal sufficiently to clear the two front posts and slide the mechanism backward to center the rear posts in the mechanism slots.

5. Lift the entire mechanism approximately four inches (10 cm) and unplug the printhead connector (J101) from the upper PWB. The connector is located below the mechanism.

6. Lift the mechanism from the terminal.

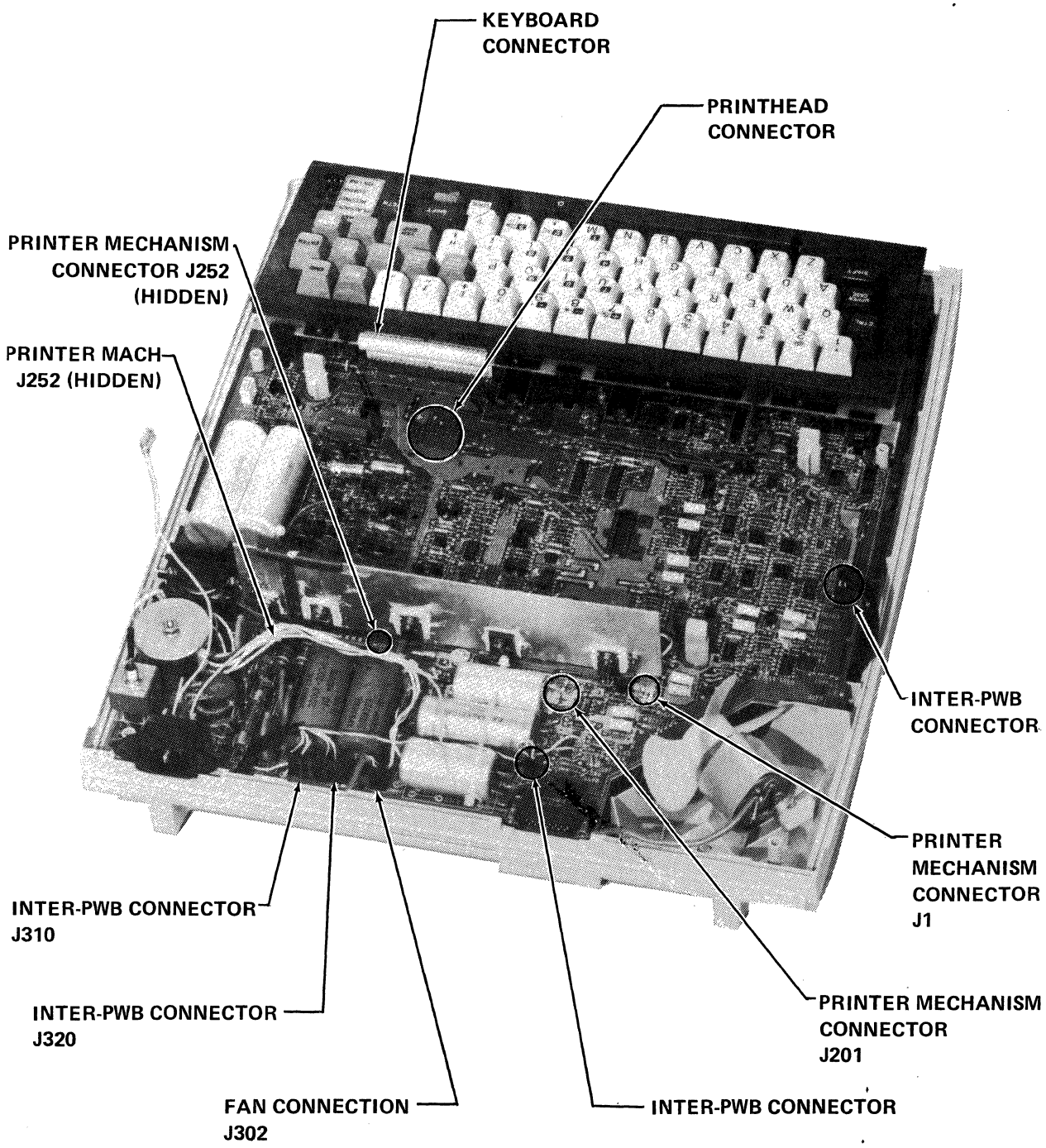


Figure 5-5. Terminal Connector Locations

Replace the printer mechanism as follows:

1. Verify that the four spring spacers are seated atop each of the four mechanism mounting posts.

2. Hold the mechanism above the upper board and connect the printhead connector to J101 on the board.

3. Route the motor and sensor cables under the mechanism and behind the left rear mounting post.

4. Connect the sensor cable to J1 and the motor cable to J201. Refer to figure 5-5 and connect the printhead solenoid connector to J251 and the line feed stepper motor connector to J252. Connect the mechanism around cable to the tab located beneath the line feed stepper motor.

5. Lower the rear mechanism slots over the rear mounting posts and press down the mechanism to engage posts. Pull the mechanism forward to engage the front slots and mounting posts and press down to engage the front posts.

5.4.3 PRINTHEAD. Remove the printhead as follows:

1. Remove the top of the terminal case as described in paragraph 5.4.1.

2. Remove the printer mechanism as described in paragraph 5.4.2.

3. Remove the plastic clip that holds the flat flexible ribbon cable to the printer mechanism.

4. Release the pressure bar assembly (fig. 5-6) by disconnecting the plastic solenoid linkage at the point where it attaches to the pressure bar assembly.

5. Loosen both the 3/16th inch head screws that secure the printhead to the printhead carriage assembly.

6. Lift the clear plastic window (fig. 5-7), grasp the printhead assembly pulling up and back until it is clear of the two plastic aligning tabs.

7. Gently remove the printhead assembly (if the printhead does not come off, repeat steps 5 and 6) and let the clear plastic window return to its resting position.

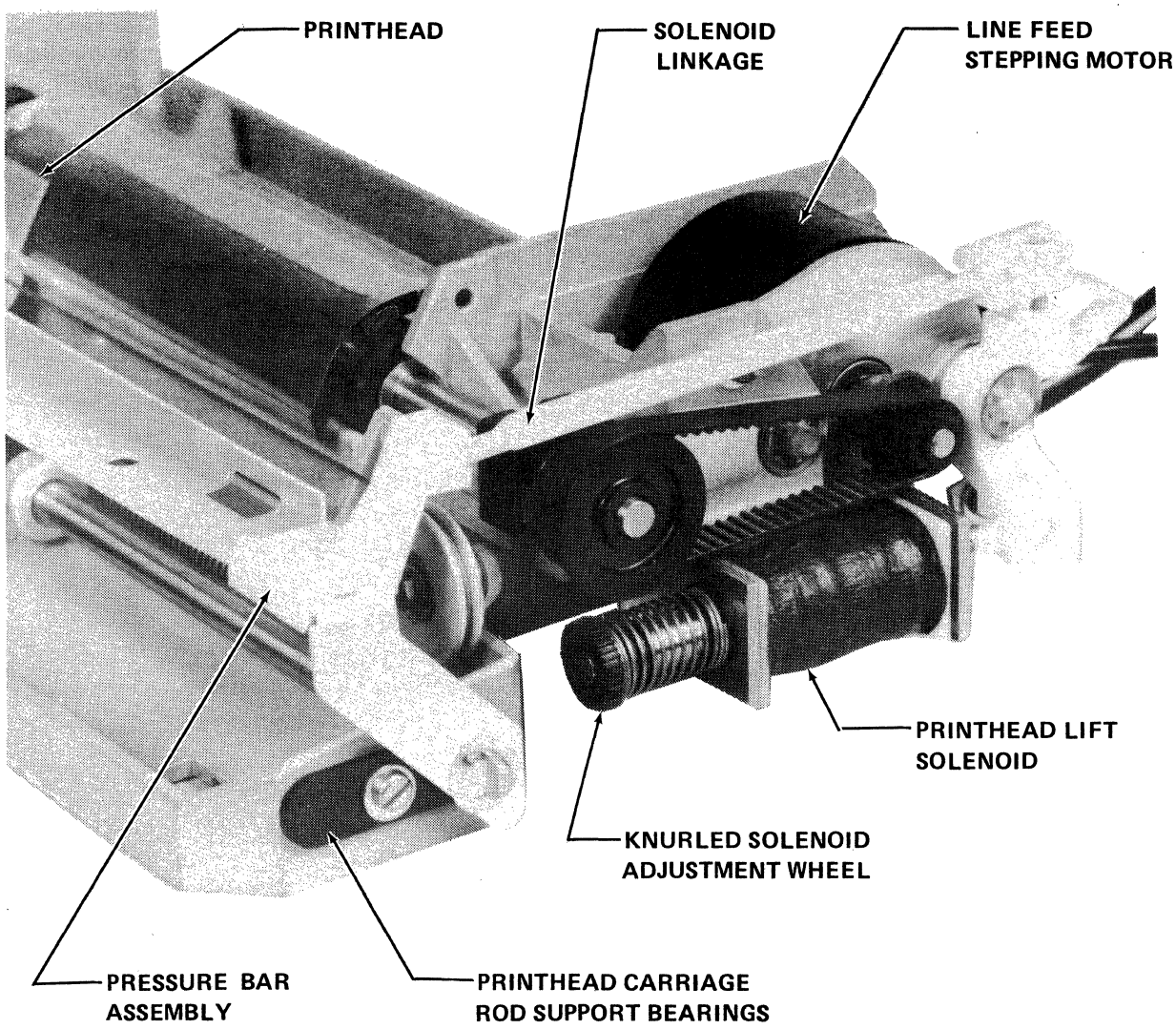


Figure 5-6. Printer Mechanism Component Locations

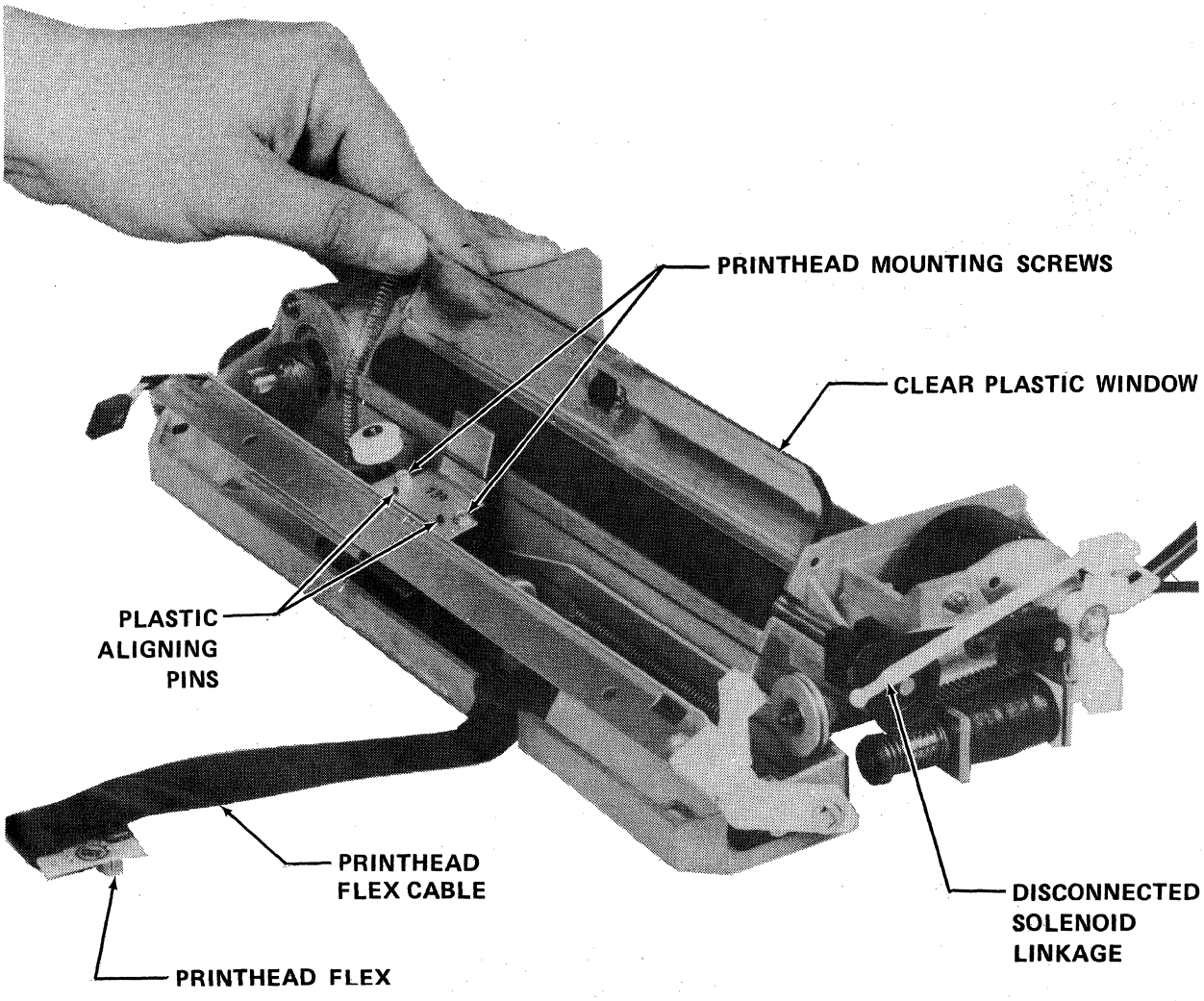


Figure 5-7. Printhead Removal

Replace the printhead as follows:

1. Lift the clear plastic window (fig. 5-7).

2. Slide the printhead into position onto the printhead carriage. Ensure that the two plastic pins fit into the holes on the printhead assembly.

3. Tighten the two screws that retain the printhead assembly.

4. Adjust the printhead pressure as instructed in paragraph 5.5.1.

5. Lay the flexible cable under the printhead with a rolling loop to the left.

6. Secure the flexible cable to the mechanism with the plastic clip.

7. Install the mechanism in the terminal as instructed in paragraph 5.4.2.

8. Adjust printhead position alignment as instructed in paragraph 5.5.2.

5.4.4 KEYBOARD. Remove the keyboard as follows:

1. Remove the top of the terminal case as described in section 5.4.1.

2. Remove the keyboard bezel by relieving the snap-on posts on the left and right ends of the keyboard and the bezel.

3. Press the keyboard assembly toward the rear of the terminal until the three front retainer clips are free of the keyboard.

4. Lift the front of the keyboard assembly up and slide the keyboard forward off of the terminal.

5. Holding the keyboard in one hand, place the index finger of the other hand under the flat ribbon connector as shown. Gently pull up on the cable keyboard connection until it is free of the keyboard.

Replace the keyboard as follows:

1. Lay the keyboard in front of the terminal and connect the keyboard flex cable connector to the keyboard.

CAUTION

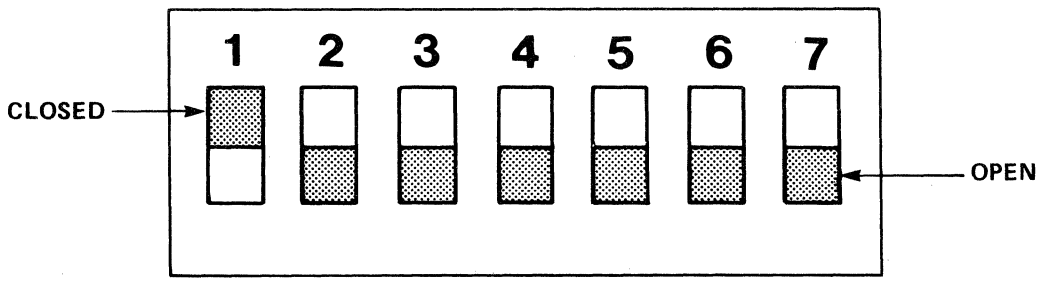
Extreme care should be exercised when installing the keyboard flex cable connector. The connector pins are made of a thin metal and are easily bent or broken. Verify that all of the pins are in the respect-sockets of the connector before applying insertion force.

2. Lift the keyboard and insert the rear edge into the three rear keyboard clips of the base while gently folding the cable beneath the keyboard.

3. Push the keyboard toward the rear of the terminal until the front clips of the base are clear. Lower the front edge of the keyboard and release, inserting the front edge into the three front clips.

4. Verify that the pencil switches located in the lower right corner of the keyboard are set the same as the keyboard being replaced. A listing of the keyboard pencil switch setting is provided in figure 5-8.

5. Install the keyboard bezel by pushing down on the bezel until the two end posts snap into place.



KEYBOARD	CLOSE SWITCH NUMBER
USA	NONE
UNITED KINGDOM	1 ONLY
FRENCH	2 ONLY
DENMARK/NORWAY	3 ONLY
SWEDEN/FINLAND	4 ONLY
GERMAN	5 ONLY

Figure 5-8. Keyboard Pencil Switch Settings

5.4.5. FAN ASSEMBLY

1. Remove the upper terminal case as described in paragraph 5.4.1.
2. Unplug the fan connector from the upper PWB at J302 (fig. 5-5).
3. Loosen both fan bracket screws.
4. Slide the fan motor and blades forward and out of the bracket.

Replace the fan by completing the above steps in the reverse order. Rotate the fan blades manually to ascertain freedom of movement. If the movement of the fan blades is restricted, position the fan in the bracket as needed.

5.4.6 UPPER BOARD. Remove the upper board as follows:

1. Remove the upper terminal case as described in paragraph 5.4.1.
2. Remove the printer mechanism as described in paragraph 5.4.2.
3. Remove the mounting post springs and spacers.
4. Disconnect the four inter-board connectors (fig. 5-5).
5. Slide the ac power receptable out of its mounting slots.
6. Remove the upper board by lifting it straight up.

Replace the upper board by reversing the order of removal.

CAUTION

When replacing the upper board verify that the black conductive foam has been removed from the underside of the board. Damage to the terminal could result if it is not removed.

NOTE

Spare upper boards do not include the ROM kit. Transfer the ROM from socket XU10 of the defective board to the new board.

Verify that the jumpers on the replacement board are identical with the jumpers of the defective board. Option jumper location information is shown in Table G-1 in Appendix G.

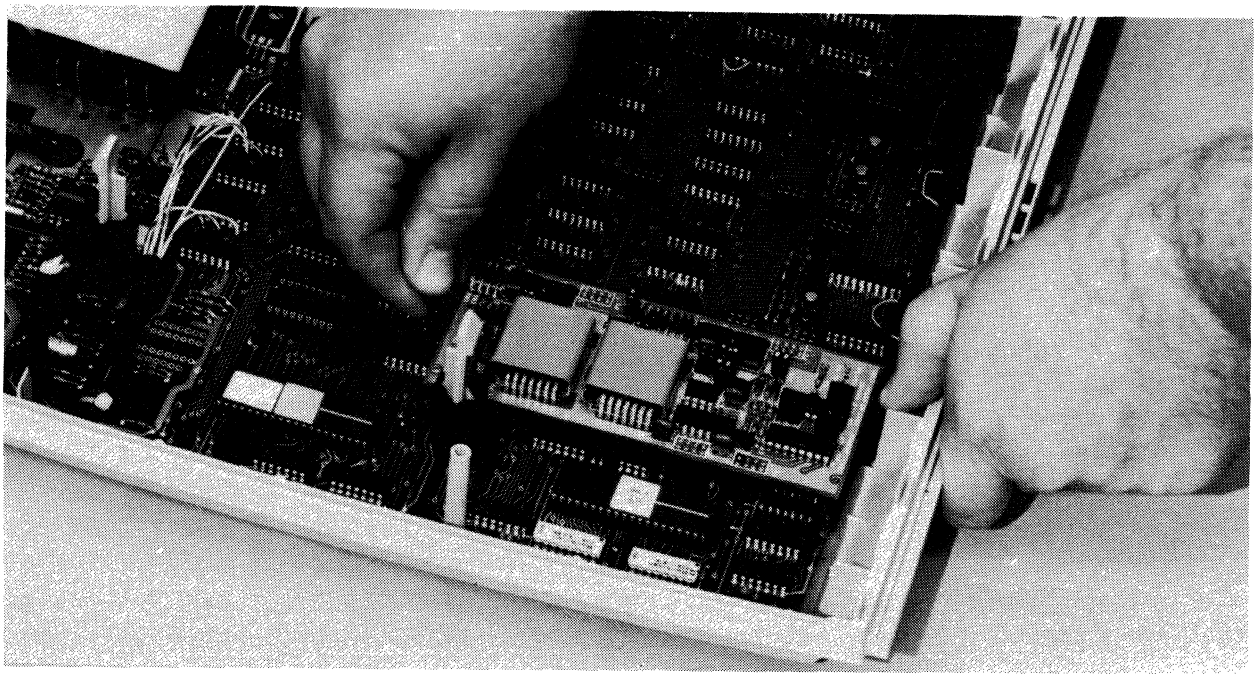


Figure 5-9. Discrete Memory Module Removal

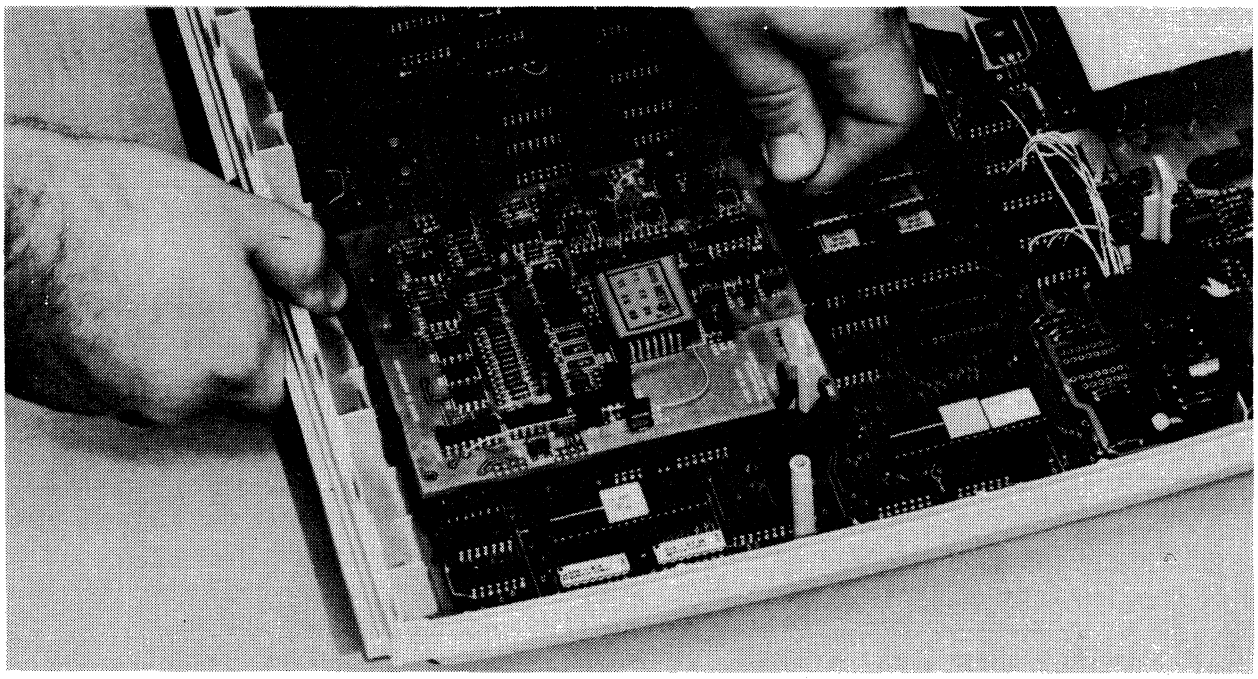


Figure 5-10. Dual Memory Module Removal

5.4.7 MEMORY BOARDS. Remove memory boards as follows:

1. Remove the upper board as described in paragraph 5.4.6.

2. Refer to figure 5-2 for location numbers of discrete memory boards and figure 5-3 for location numbers of dual memory boards.

3. Bend back the memory board retaining clips with your thumbs and lift the memory board out of its sockets with your index and middle finger as shown in figure 5-9 and 5-10. New board connectors are stiff and may require extra effort to remove them.

4. Remove the memory board by lifting it straight up.

Replace the memory board by performing the following steps:

1. Rest the memory board on the retainer clips above the sockets.

2. Verify that the pins on the memory board are aligned with the sockets on the lower board.

3. Apply pressure on both sides of the memory board until the retaining clips snap into place.

4. Replace the upper board (para. 5.4.6).

5.4.8 LOWER BOARD

1. Remove the upper board as described in paragraph 5.4.6.

2. Remove mounting post spacers.

3. Remove the lower board by lifting it straight out.

Replacement of the lower PWB is accomplished by reversing the order of removal.

CAUTION

When replacing the lower board verify that the black conductive foam (if present) has been removed from the underside of the board. Damage to the terminal could result if it is not removed.

NOTE

Spare lower boards do not include the ROM kit. Transfer the five ROM's from sockets U58 through U62 of the defective board to the new board. If the terminal is a *B, then the PROM at socket U65 must also be transferred.

5.5 TERMINAL ADJUSTMENTS

Under normal operating conditions, the closed-loop control circuitry of the printer systems will compensate for friction changes caused by wear, temperature variations, and component aging. No field adjustments are required except alignment of the thermal printhead after replacement of the mechanism or printhead assembly. If print quality deteriorates, do not attempt adjustments until the cause is fully understood.

5.5.1. PRINTHEAD PRESSURE ADJUSTMENT. Adjust printhead pressure as follows:

1. Remove the upper terminal case as described in paragraph 5.4.1.

2. Manually position the printhead approximately four inches from the left margin.

3. Press the printhead lift solenoid (fig. 5-6) so that the solenoid is in the fully energized position.

4. Place a measuring device along the solenoid linkage and measure the travel distance.

5. Adjust the solenoid travel to at least 0.05 cm (0.02 inches) but no greater than 0.11 cm (0.045 inches) by rotating the knurled solenoid adjustment wheel (fig. 5-6). Rotate the wheel clockwise to increase the travel, counterclockwise to decrease the travel.

6. Repeat steps 3 through 5 several times to ascertain that the adjustment is correct.

5.5.2 PRINTHEAD POSITION ALIGNMENT. After installing a new printhead, check a printed line of zeros. If the tops or the bottom of the zeroes are missing anywhere along the printed line, correct by repositioning the printhead carriage rod support bearings (fig. 5-6) as follows:

1. Loosen the screw that clamps the bearing to the frame. Move the bearing up if the bottom of the characters are missing; move down if the top of the characters are missing. Independently adjust each end of the carriage rod support bearings for the condition observed.

2. After adjusting, verify that the printhead carriage does not rub against the frame and that the top of the printhead does not interfere with the clear plastic window and its associated roller.

3. Retighten the clamping screws and type several more lines of zeros to recheck printing quality. Readjust as necessary.

5.5.3 ADJUSTMENT. You will probably never have to adjust the printing contrast since it is preset at the factory for optimum clarity. But if the contrast has been changed and you want a darker or lighter image, here's how to adjust it.

1. For *darker* print insert a small standard screwdriver into the hole marked CONTRAST located on the right side of the terminal; then rotate the screwdriver clockwise (toward *D*), while printing characters from the keyboard, until the printed image is dark enough.

NOTE

If the print blurs, you've rotated the screwdriver too far. If so, adjust it to a lighter print.

2. For *lighter* print rotate the screwdriver counterclockwise (toward *L*), while printing characters from the keyboard, until the printed image is light enough.

5.5.4 TRANSMIT LEVEL ADJUSTMENT. The transmit level is factory-calibrated for optimum performance with most U.S. telephone systems. However, because of the conditions of some handsets and since line losses occur in some areas, it may be necessary to increase or decrease the transmit level to compensate for unusual conditions. Adjust the transmit level for optimum performance by inserting a small screwdriver into the hole marked TRANSMIT LEVEL; rotate clockwise to improve log-on or counterclockwise to reduce data errors.

5.6 COMMUNICATIONS SYSTEM TESTING

The communications system of the terminal can be tested by using a test plug that connects to the EIA port in the rear of the terminal. The plug takes the signals from the transmit side of the terminal and returns the same signals to the terminal receiver. The procedure for using the test plug is as follows:

1. Using the STATUS command verify that the following terminal parameters are set:

Interface —EIA	Baud — Any baud rate
Duplex — Full	Buffer — ON

If any of the parameters are incorrect, use the CHANGE command to correct them.

2. Insert the test plug, TI part number 2200076-0001, into the lower interface connection, P1.

3. Switch the terminal to ON LINE.

4. Type in up to 80 characters.

5. Depress the SKIP key or if 80 characters have been typed in type in one more character. With *B terminals it will transmit on the 82 character.

6. The terminal should print the text that was typed in. If it does, then the communications system is functioning normally.

5.7 PRINTHEAD CLEANING

The printhead should be cleaned each time a new roll of thermal paper is loaded into the terminal. Clean more often if the printed image begins to fade because of residue accumulating on the printhead. Proceed as follows:

1. Remove all thermal paper from the paper chute (refer to Loading Paper in Section II).

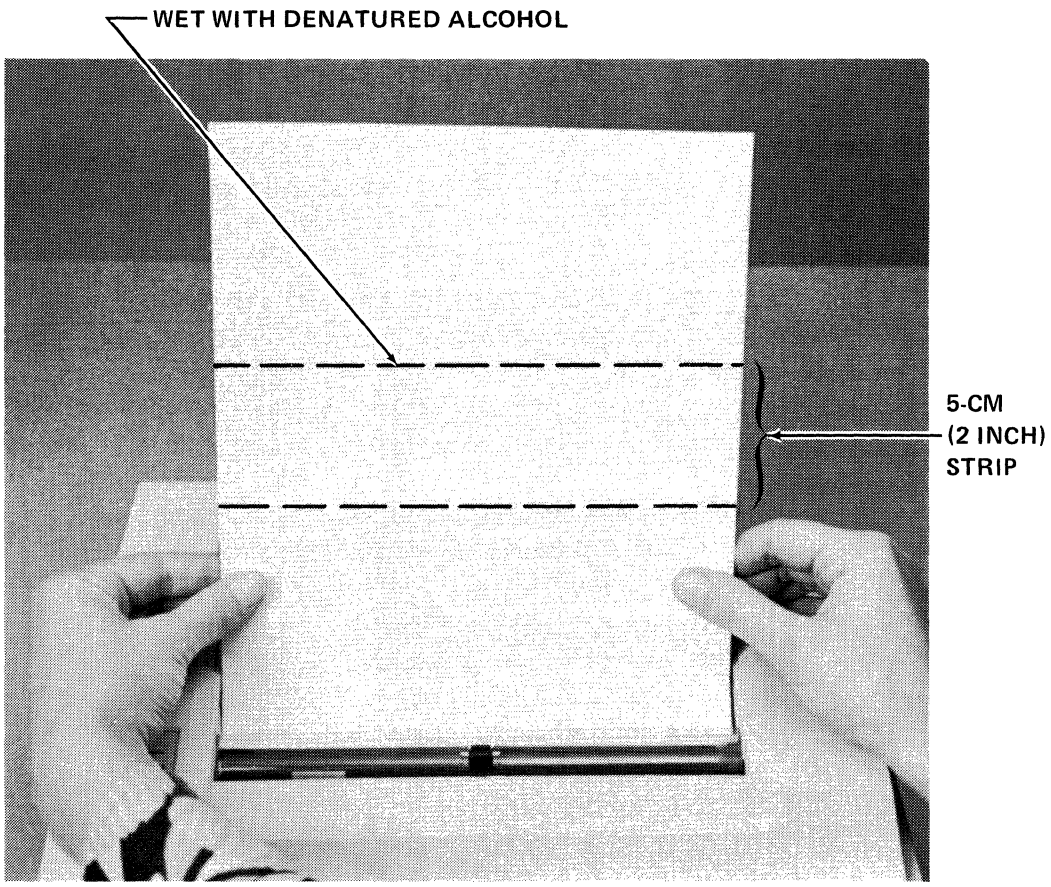


Figure 5-11. Printhead Cleaning

2. Using denatured alcohol, wet a 5 cm (2 inch) wide strip across a sheet of good quality bond paper. Insert the sheet down the paper chute as shown in figure 5-11.

NOTE

Denatured alcohol is available from Texas Instruments in pint containers (TI Part No. 230007-0000).

3. Print five lines on the bond paper across the 5 cm (2 inch) strip wetted with alcohol. Then advance the paper to a dry area and print two more lines.

NOTE

The printhead will not print a visible image on the bond paper.

SECTION VI

PARTS LIST

6.1 INTRODUCTION

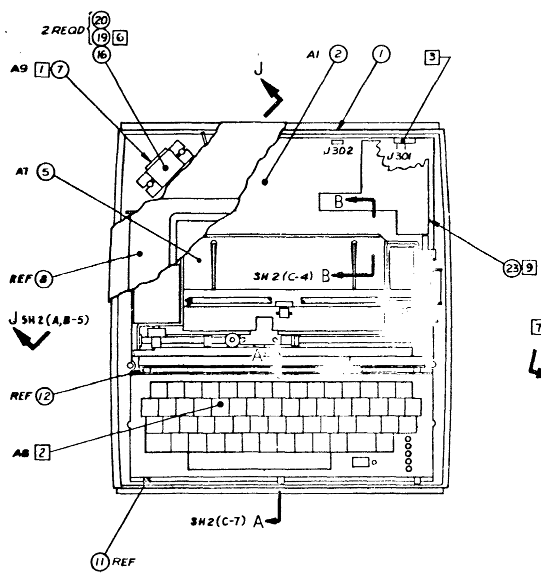
This section contains the assembly drawings and their associated parts list for the terminal.

NOTES: UNLESS OTHERWISE SPECIFIED

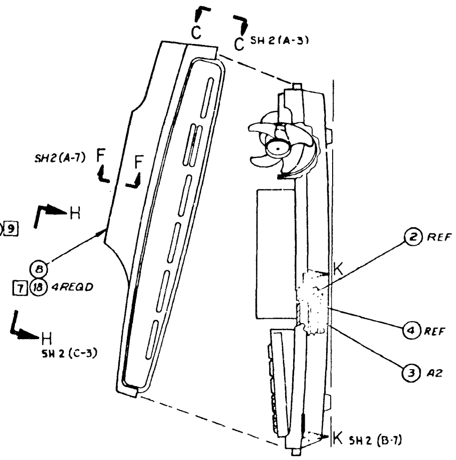
1. INSTALL FAN (ITEM 7) AND POSITION SO THAT THE BLADES ARE CENTERED BETWEEN THE MOUNTING BRACKET (ITEM 16) AND PWB (ITEM 2)
2. KEYBOARD IS A SALES ORDER ITEM AND IS SHOWN FOR REFERENCE ONLY
3. INSURE A1 J301 (POWER CONNECTOR ON PWB ASSY, ITEM 2) IS INSTALLED IN RETAINING SLOTS OF THE BASE (ITEM 1) AND COVER ASSY (ITEM 8) BEFORE INSTALLING HARDWARE (ITEM 18)
4. TRIM FAN CUTOUT ON COVER (ITEM 8) TO DIMENSIONS SHOWN PRIOR TO INSTALLING FAN BAFFLE (ITEM 31)
5. APPLY ITEM 17 TO NON-TEXTURED AREA
6. TIGHTEN TO 8 ±.5 INCH-POUNDS
7. TIGHTEN TO 3.5 ±.5 INCH-POUNDS
8. POWER CORD (ITEM 10) SHIPPED WITH -0001, -0002 & -0005 ASSYS, IS A SALES ORDER ITEM ON -0003 & -0004 ASSYS
9. SAFETY COVER (ITEM 23) INSTALLED ON PWB ASSY (ITEM 2) OVER POWER SUPPLY HIGH VOLTAGE AREA
10. ~~MEMORY MODULES A4, A5, AND A6, ARE SALES ORDER ITEMS AND ARE TO BE INSTALLED IN RESPECTIVE LOCATIONS AS REQUIRED~~
11. ORDER ENTRY CONFIGURATION OPTION. IF UNSPECIFIED SHORT SIGNAL GROUND TO CHASSIS GROUND BY CONNECTING P330 TO E366 & E367. IF REQUIRED TO ISOLATE SIGNAL GROUND FROM CHASSIS GROUND, CONNECT P330 TO E367 & E368.
12. INSTALL ITEM 4 ACROSS MEMORY LOCATIONS A3-A4 & A5-A6 AS SHOWN

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	418830 MRW [illegible] LM CHANGES	[illegible]	[illegible]
	B	CN425697 [illegible] 1) ITEM 4 WAS QTY 1 PN [illegible] 2) DELE NOTE 10 [illegible] ADDED NOTE 12	[illegible]	[illegible]



INNER COVER (ITEM 8) REMOVED FOR CLARITY



PART NO.	DESCRIPTION
2200049-0005	DATA TERMINAL, 763-EIA/TTY, KATA KANA
2200049-0004	-2301 EIA/TTY, W/BARR.
2200049-0003	-2301 EIA/TTY
2200049-0002	-[illegible] W/MODEM
2200049-0001	DATA TERMINAL, 763-[illegible] EIA/TTY

REV STATUS OF SHEETS	REV	B	B
	SH	1	2

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TEXAS INSTRUMENTS

DATA TERMINAL, 763

D 2200049

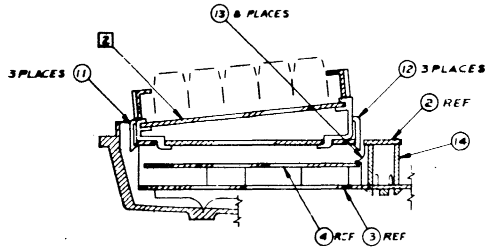
SCALE 1/2

APPLICATION

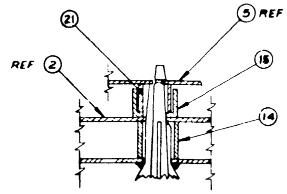
30

LM

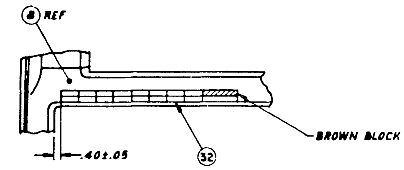
6-1



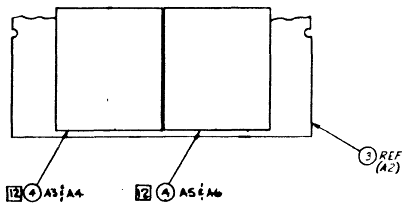
SECTION A-A
SH I (B-6)



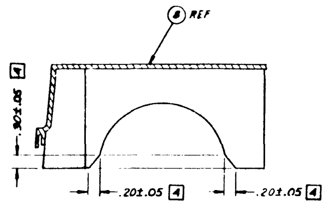
SECTION B-B
SH I (B-6)
SCALE: NONE
4 PLACES
(2 ROTATED 180°)



VIEW H-H
SH I (B-5)
SCALE: 1/2
ROTATED 12° CCW

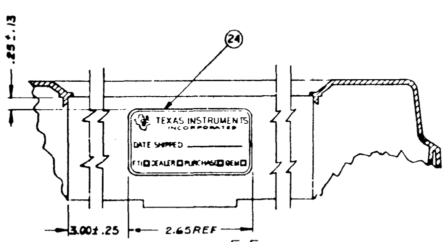


SECTION K-K
SH I (B-3)
SCALE: 1/2

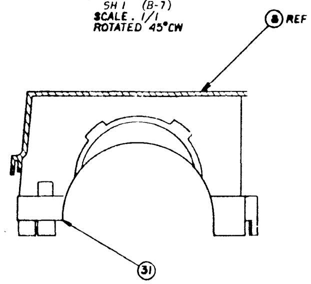


SECTION J-J
(MODIFICATION)
SH I (B-7)
SCALE: 1/1
ROTATED 45° CW

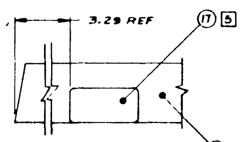
	CABLE HOOK-UP SCHEDULE			REMARKS
	DESCRIPTION	START	FINISH	
1	(ITEM 7) FAN ASSY	A5 W1 P302	A1 - J302	
2	5 PRINTHEAD	A7A1 W1 P101	A1 - J101	PRINTHEAD INCLUDED WITH ITEM 5
3	KEYBOARD ASSY	A1 W1 P1	A8 - J1	2
.				
7	5 MOTOR DRIVE	A7A1 W1 P201	A1 - J201	INCLUDED WITH ITEM 5
8	5 HEAD LIFT SOL	A7A2 W1 P251	- J251	
9	5 LINE FEED MOTOR	A7A3 W1 P252	- J252	
10	5 SENSOR	A7A1A2 W1 P1	- J1	
11	3 COMM CABLE	A2 W1 P404	A1 - E401 THRU E405, E424	CABLES INCLUDED ON ITEM 3
12	(ITEM 3) POWER CABLE	A2 W2 P310	A1 - J310	
		A2 W2 P320	A1 - J320	
		A2 W2 P330	A1 - E366 & E367 11 OR A1 - E367 & E368 11	



SECTION F-F
SH I (C-5)
ROTATED 90° CW



SECTION J-J
(INSTALLATION)
SH I (B-7)
SCALE: 1/1
ROTATED 45° CW



VIEW C-C
SH I (C-4)
SCALE: NONE
ROTATED 90° CW

D 96214 2200049 B

D 2200049

SHEET 2

LIST OF MATERIALS

Assembly	Part No.	Rev.
DATA TERMINAL, 115V EIA/TTY	2200049-0001	D
DATA TERMINAL, 115V W/MODEM	2200049-0002	D
DATA TERMINAL, 230V E/A/TTY	2200049-0003	D
DATA TERMINAL, 230V EIA/TTY, W/BARRIER	2200049-0004	D
DATA TERMINAL, 763 EIA/TTY, KATAKANA	2200049-0005	D

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999227-0002	BASE,PORTABLE MEMORY TERMINAL (PMT)	
0002	00001.000	EA	0937300-0002	TERMINAL ELECTRONICS,743-EIA/TTY	for –0001 & –0005
–0002	00001.000	EA	0937300-0001	TERMINAL ELECTRONICS,743/745 W/MODEM	for –0002 only
0002	00001.000	EA	0937310-0002	TERMINAL ELEC,743-EIA/TTY-WE	for –0003 only
0002	00001.000	EA	0937310-0004	TERMINAL ELECTRONICS 743 EIA/TTY (U.K.)	for –0004 only
0003	00001.000	EA	0999222-0001	BUBBLE MEMORY CONTROLLER-PMT,115V	for –0001, –0002, & –0005
0003	00001.000	EA	0999222-0002	BUBBLE MEMORY CONTROLLER-PMT,230V	for –0003 only
0003	00001.000	EA	0999222-0003	BUBBLE MEMORY CONTROLLER-PMT,230V UK	for –0003 only
0004	00002.000	EA	0999236-0001	DISCRETE MEMORY ASSY	
0005	00001.000	EA	0999264-0001	MECHANISM ASSY,STEPPER MOTOR, W/PRINTHD	
0007	00001.000	EA	0999232-0001	FAN ASSEMBLY PORTABLE MEMORY TERM (PMT)	
0008	00001.000	EA	2200044-0001	COVER ASSY,INNER-763 PTR W/O XMIT ADJUST	for all except –0002
0008	00001.000	EA	2200044-0002	COVER ASSY,INNER 763,PTR WITH XMIT ADJ	for –0002 only
0010	00001.000	EA	0996289-0002	CORD SET,3-PIN PWR-DOMESTIC GRAY W/CLIP	for –0001, –0002, & –0005 only
0011	00003.000	EA	0983905-0001	CLIP,KEYBOARD,FRONT	
0012	00003.000	EA	0983904-0001	CLIP,KEYBOARD,REAR	
0013	00008.000	EA	0999225-0001	CLIP,RETAINER,MEMORY BOARD	
0014	00005.000	EA	0999228-0001	SPACER,BOARD	
0015	00004.000	EA	0983907-0001	SPACER,SPRING	
0016	00001.000	EA	0983863-0001	BRACKET,FAN MOTOR	
0017	00001.000	EA	0999231-0009	PLATE,ID,FOR TERMINAL P/N 2200049-0001	
0017	00001.000	EA	0999231-0010	PLATE,ID,FOR TERMINAL P/N 2200049-0002	
0017	00001.000	EA	0999231-0011	PLATE,ID,FOR TERMINAL P/N 2200049-0003	
0017	00001.000	EA	0999231-0012	PLATE,ID,FOR TERMINAL P/N 2200049-0004	
–0017	00001.000	EA	0999231-0038	PLATE,ID,FOR TERMINAL P/N 2200049-0005	
0018	00004.000	EA	0972988-0073	SCREW,4-40 X 2.000 PAN HEAD CRES	
0019	00002.000	EA	0972679-0009	SCREW #4-20 X 3/8"LG THD FORM,HEX	
0020	00002.000	EA	0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	
0021	00004.000	EA	0419346-0342	HELICAL COMPRESS SPRING	
0023	00001.000	EA	0937304-0001	COVER, SAFETY	
0024	00001.000	EA	0960141-0001	LABEL,SERVICE	
0025	00001.000	EA	0999250-9701	MANUAL,OPERATOR,MODEL 763/765 PRINTER	
0026	00001.000	RL	0972603-0001	PAPER,THERMAL PRINTING,WHITE	
0027	REF	EA	0999251-9901	TEST PROCEDURE,SIL	
0028	REF	EA	0999252-9901	TEST PROCEDURE,RUN-IN,PMT	
0029	REF	EA	0999253-9901	TEST PROCEDURE,MANUAL,PMT	
0030	00001.000	EA	0999242-0001	KIT,INSTALLATION, ROM	
0031	00001.000	EA	0999240-0001	BAFFLE ADAPTOR,FAN	
0032	00001.000	EA	2200039-0001	LABEL,FUNCTION	
0033	REF	EA	2200064-9701	MAINTENANCE MANUAL 763/765	

NOTES: UNLESS OTHERWISE SPECIFIED

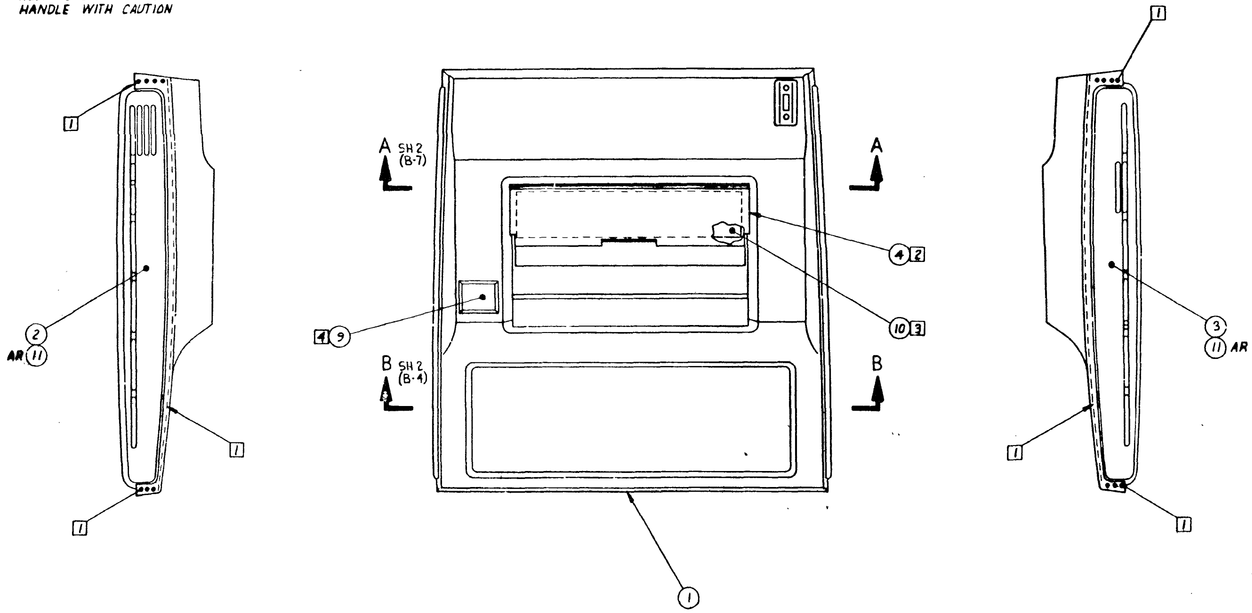
[1] ASSEMBLE OUTER COVER (ITEM 1), LEFT SIDE INSERT (ITEM 2), AND RIGHT SIDE INSERT (ITEM 3) BY APPLYING ONE SOLID BEAD OF ADHESIVE (ITEM 11) CLOSE TO EDGE OF PARTS IN AREAS INDICATED:
•••• INDICATES APPLY TO FARSIDE OF INNER COVER
---- INDICATES APPLY TO FARSIDE OF INSERTS (WITHOUT RIBS)
SLIDE INSERTS INTO SLOTS OF INNER COVER. RIDGES ON SIDE INSERTS MUST TOUCH INNER COVER EDGE. CLAMP INNER COVER AND SIDE INSERTS TOGETHER AT UNIT PARTING LINE FOR APPROXIMATELY 4 MINUTES TO REACH HANDLING STRENGTH. CURE 1 HR MIN BEFORE INSTALLATION.
WARNING: ADHESIVE ITEM 11 BONDS SKIN TO ANY SURFACE IN SECONDS. KEEP ADHESIVE OFF OF SKIN AND HANDLE WITH CAUTION

[2] INSTALL PAPER DOOR (ITEM 4) BY BOWING OR BENDING AND INSERTING STUDS INTO HOLES ON COVER (ITEM 1)

[3] CENTER PAPER LOADING LABEL (ITEM 10) ON UNDERSIDE OF PAPER DOOR (ITEM 4) WITHIN ±.10 OF CENTERLINE OF DOOR

[4] IF THE SALES ORDER CONFIGURATION SHEET SPECIFIES A SPECIAL CUSTOMER NAMEPLATE, INSTALL IT IN PLACE OF THE STANDARD NAMEPLATE (ITEM 7)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ECN 323837 LM CHANGES	7/18/77	
	B	ECN 415822 LM CHANGES	7/18/77	
	C	ECN 429343 (E) CLANCLIMAIS (1) TITLE WAS COVER ASSEMBLY 763 (2) DASH NO BLOCK -1 & -2 DESC WAS COVER ASSY, INNER, 763 PRINTER ... ADJUST	1-13-78	



PART NUMBER	DESCRIPTION
2200044-0002	COVER ASSEMBLY, 743/763, WITH XMIT ADJUST
2200044-0001	COVER ASSEMBLY, 743/763 WITHOUT XMIT ADJUST

D 2200044

REV STATUS OF SHEETS	REV	C	B		
	SH	1	2		

-2	-1	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION
QTY REQD						

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

HOLE TOLERANCE

.013 THRU .125 +.004 −.001	.126 THRU .250 +.005 −.001	.251 THRU .500 +.006 −.001
.501 THRU .750 +.008 −.001	.751 THRU 1.000 +.010 −.001	1.001 THRU 2.000 +.012 −.001

NEXT ASSY	USED ON
2200049	8738

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES
  ANGLES ±1°
  3 PLACE DECIMALS ±.010
  2 PLACE DECIMALS ±.02

DWN Rod Conti DATE 4-26-77
CHK 7/8/77
ENGR 7-21-77
QA 7-22-77
APVD 7-21-77 7/21/77
CNTR NO 7/26/77
DESIGN ACTIVITY RELEASE 7/26/77

TEXAS INSTRUMENTS INCORPORATED
Equipment Group Dallas Texas

COVER ASSEMBLY,
743/763

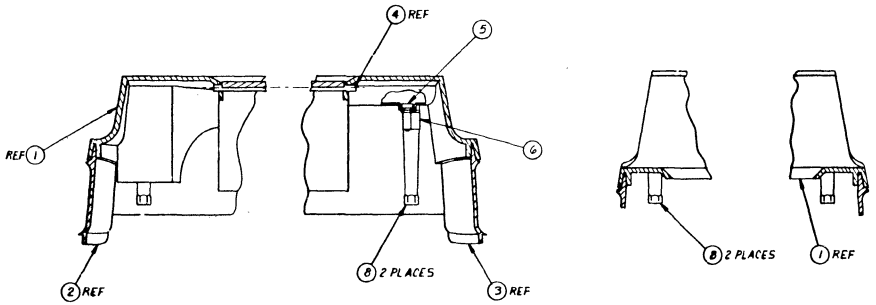
SIZE D | CODE IDENT NO 96214 | DRAWING NO 2200044

SCALE 1/2 | SHEET 1 OF 2

TI 79141

LM

6-4



SECTION A-A
SH 1 (C-6)

SECTION B-B
SH 1 (B-6)

D 2200044

SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	2200044	B
SCALE 1//		SHEET 2	

LIST OF MATERIALS

Assembly	Part No.	Rev.
COVER ASSY, INNER –763 PTR W/O XMIT ADJUST	2200044-0001	B
COVER ASSY, INNER–763 PTR W/O XMIT ADJUST	2200044-0002	B

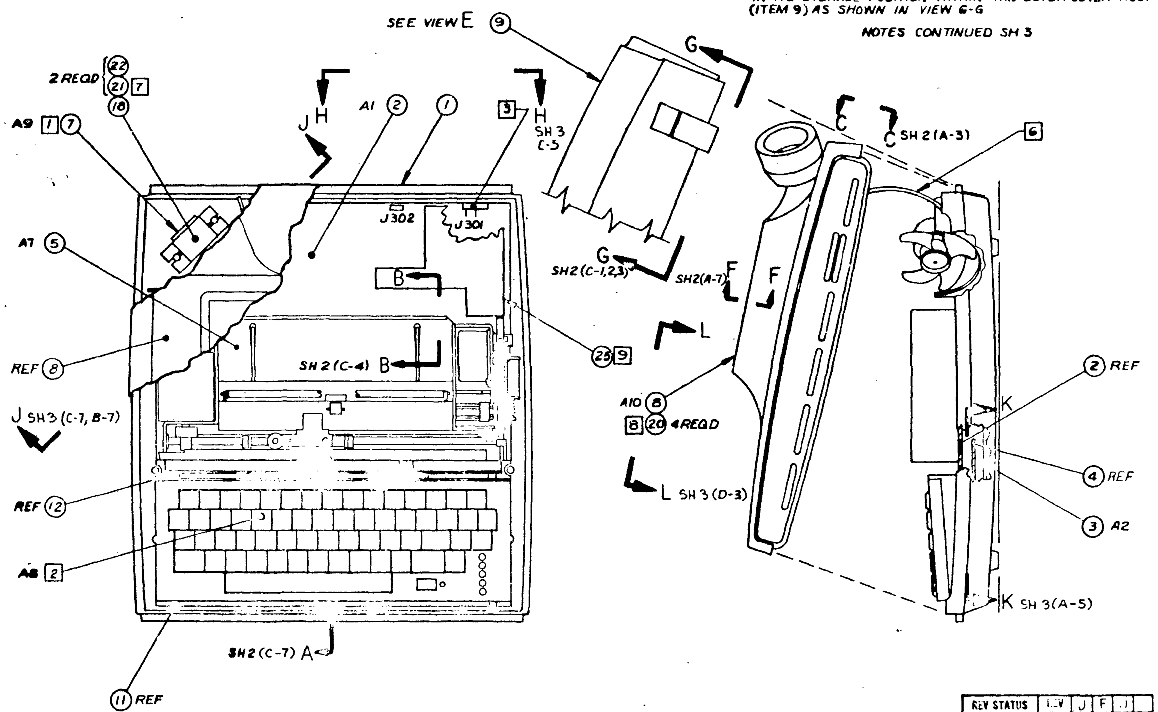
Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0983991-0002	COVER 743	
0002	00001.000	EA	0999248-0003	INSERT,LEFT SIDE W/O XMT LEV ADJ,VENTED	for –0001 only
0002	00001.000	EA	0999248-0001	INSERT,LEFT SIDE W/XMT LEV ADJ,VENTED	for –0002 only
0003	00001.000	EA	0999249-0001	INSERT,RIGHT SIDE,VENTED	
0004	00001.000	EA	0983865-0001	DOOR,PAPER	
0005	00001.000	EA	0983931-0001	ADAPTER SWITCH	
0006	00001.000	EA	2200040-0001	COLLAR, SWITCH	
0008	00004.000	EA	0772334-0001	FASTNER 4-40 ON-SERT	
0009	00001.000	EA	0983913-0001	NAMEPLATE,INNER COVER	
0010	00001.000	EA	0983912-0001	LABEL,PAPER LOADING	
0011	AR	EA	0972799-0001	ADHESIVE SOLVENTLESS RAPID CURING	

NOTES: UNLESS OTHERWISE SPECIFIED

1. INSTALL FAN (ITEM 7) AND POSITION SO THAT THE BLADES ARE CENTERED BETWEEN THE MOUNTING BRACKET (ITEM 18) AND THE PWB (ITEM 2)
2. KEYBOARD IS A SALES ORDER ITEM AND IS SHOWN FOR REFERENCE ONLY
3. INSURE A1 J301 (POWER CONNECTOR ON PWB ASSY ITEM 2) IS INSTALLED IN RETAINING SLOTS OF ITEMS 1 & 8 BEFORE INSTALLING ITEM 20
4. INSTALL NAMEPLATE (ITEM 24) ON OUTER COVER AS SHOW IN VIEW "E"
5. APPLY ITEM 19 TO NON-TEXTURED AREA
6. KEEP WIRES OUT OF FAN AND OFF HEATSINK WHEN INSTALLING COVER ASSY (ITEM 8)
7. TIGHTEN TO 8 ±.5 INCH-POUNDS
8. TIGHTEN TO 3.5 ±.5 INCH-POUNDS
9. SAFETY COVER (ITEM 25) INSTALLED ON PWB ASSY (ITEM 2) OVER POWER SUPPLY HIGH VOLTAGE AREA
10. ~~MEMORY MODULES A4, A5 AND A6 ARE SALES ORDER ITEMS AND ARE TO BE INSTALLED IN RESPECTIVE LOCATIONS AS REQUIRED~~
11. TRIM FAN CUTOUT ON COVER (ITEM 8) TO DIMENSIONS SHOWN PRIOR TO INSTALLING FAN BAFFLE (ITEM 34)
12. INSTALL POWER CORD (ITEM 10 ON -0001, -0003 & -0007, SALES ORDER ITEM ON -0002, -0004, -0005 & -0006) IN ITS STORAGE POSITION WITHIN THE OUTER COVER ASSY (ITEM 9) AS SHOWN IN VIEW G-G

NOTES CONTINUED SH 3

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	424683 MIKE WOLF 4-5-77 ENGR LM CHANGES	7/12/77	[signature]
	B	423837 R Cook 6-28-77 ENGR LM & PICTORIAL CHANGES	7/14/77	[signature]
	C	418829 Mike Wolf 6-30-77 ENGR LM & PICTORIAL CHANGES	7/12/77	[signature]
	D	CN425635 J Pearcey (1) ALL LM'S, ITEM 8 DESCR, "-765" WAS "-765/775" (2) ON -3, ITEM 32 WAS PN 999242-2 (3) ON -4, ITEM 29 QTY WAS 1 (4) ON -5, ITEM 8 WAS PN 999239-6 (5) ON -6, ITEM 8 WAS PN 999239-5	7-20-77	[signature]
	E	CN425697 D. Smith (1) DELE NOTE 10 (2) ADD NOTE 14 (3) ITEM 4 WAS PN 999261-1, QTY 1 ON ALL DASH NUMBERS	9/15/77	[signature]
	F	CN 429251 (D) R Lemons (1) IN CABLE HOOK-UP SCHEDULE WIRE NO 12 FINISH STATION WAS A1-366 & E 367 OR A1-E 367 & E368 (2) 13 WAS E 366 E 367, E367 & E 368 (3) ON -0002 THRU -0007 LMS ITEM 27 WAS 999250-9701 (4) ON -0002 THRU -0007 LMS ITEM 2 WAS 937310-0003 (5) ON -0002 THUR -0007 LMS ADDED ITEM 38 (6) ON -0001 THUR -0007 LMS ADDED ITEM 39 (7) ADDED NOTE 15 (8) REVISED VIEW H-H TO SHOW ITEM 38	11-1-77	[signature]
	G	CN 429249 (C) C. [signature] (1) ADDED NOTES 16, 17, 18, AND 19 SH 3.	12-16-77	[signature]
	H	CN429310 (C) R. [signature] (1) ON -0001 THRU -0006 LMS ITEM 32 WAS 999242-0001	2-8-78	[signature]
	J	CN432493 (D) R. [signature] (1) REVISED LM PER EXTENSIVE ENGR CHANGES (2) ADDED NOTES 20 & 21 (SH 3)	4-7-78	[signature]



INNER COVER (ITEM 8) & OUTER COVER (ITEM 9) REMOVED FOR CLARITY

PART NUMBER	DESCRIPTION
999230-0007	DATA TERMINAL, PMT - KATA KANA
999230-0006	- 230V GERMANY
999230-0005	- 230V AUSTRALIA
999230-0004	- 230V W/ BARRIER
999230-0003	- 115V JAPAN
999230-0002	- 230V CCITT
999230-0001	DATA TERMINAL, PMT - 115V DOMESTIC

REV STATUS OF SHEETS	REV	J	F	J
	SH	1	2	3

PARTS LIST — QTY REQD | ITEM NO | CODE IDENT | PART OR IDENTIFYING NUMBER | NOMENCLATURE OR DESCRIPTION | PROCUREMENT SPECIFICATION

UNLESS OTHERWISE SPECIFIED: REMOVE ALL BURRS AND SHARP EDGES; CONCENTRICITY MACHINED DIAMETERS .010 FIM; DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING; IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY; INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES; TOLERANCES: 3 PLACE DECIMALS ±.010; 2 PLACE DECIMALS ±.02

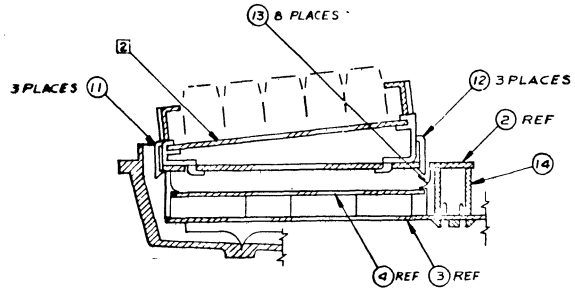
APPLICATION

TEXAS INSTRUMENTS

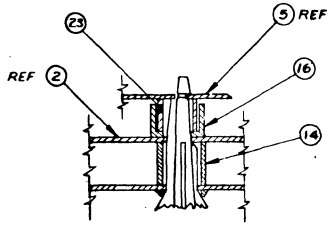
DATA TERMINAL, PORTABLE MEMORY TERMINAL

D 96214 999230

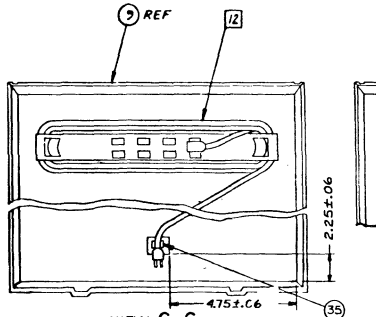
LM



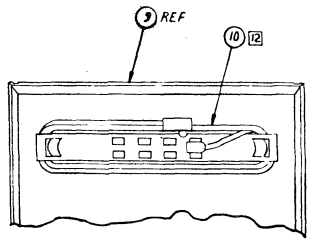
SECTION A-A
SH 1 (B-6)



SECTION B-B
SH 1 (C-6)
SCALE: NONE
4 PLACES
(2 ROTATED 180°)

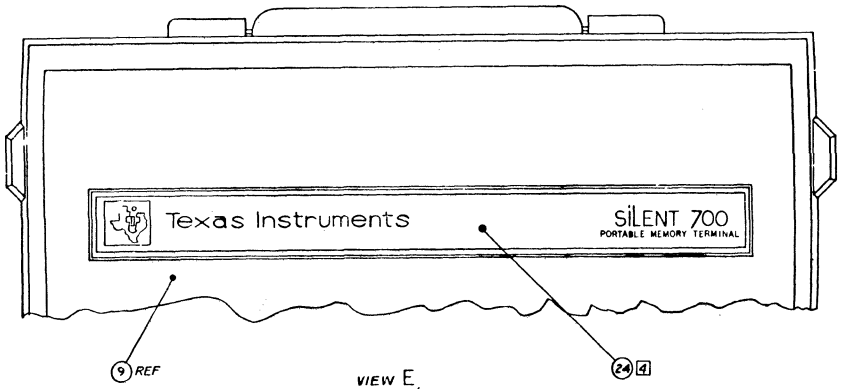


VIEW G-G
SH 1 (C-5)
SCALE: 1/4
(-0002, -0004, -0005, & -0006)

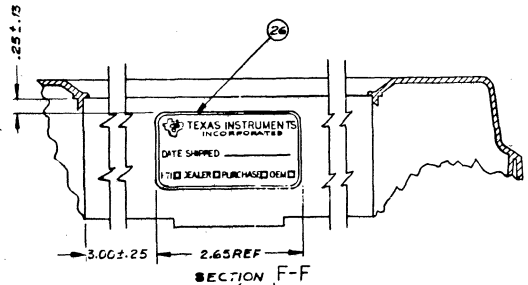


VIEW G-G
SH 1 (C-5)
SCALE: 1/4
(-0001, -0003, & -0007)

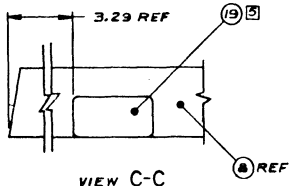
CABLE HOOK-UP SCHEDULE				REMARKS
	DESCRIPTION	START	FINISH	
1	(ITEM 7) FAN ASSY	A9 W1 P302	A1 - J302	
2	5 PRINTHEAD	A7A1 W1 P101	A1 - J101	PRINTHEAD INCLUDED WITH ITEM 5
3	KEYBOARD ASSY	A1 W1 P1	A8 - J1	2
5	8 SPEAKER	A10 W1 P401	A1 - J401	SPEAKER INCLUDED WITH ITEM 8
6	8 MICROPHONE	A10 W2 P402	- J402	MICROPHONE INCLUDED WITH ITEM 8
7	5 MOTOR DRIVE	A7 A1 W1 P201	- J201	
8	5 HEAD LIFT SOL	A7 A2 W1 P251	- J251	INCLUDED WITH ITEM 5
9	5 LINE FEED MOTOR	A7 A3 W1 P252	- J252	
10	5 SENSOR	A7 A1 A2 W1 P1	- J1	
11	3 COMM CABLE	A2 W1 P404	A1 - E401 THRU E406, E424	CABLES INCLUDED ON ITEM 3
12	(ITEM 3) POWER CABLE	A2 W2 P310	A1 - J310	
		A2 W2 P320	A1 - J320	
		A2 W2 P330	A1 - E365 & E366 13 OR A1 - E366 & E367 13	



VIEW E
SCALE: 2/1
ROTATED 180°



SECTION F-F
SH 1 (C-4)
ROTATED 90° CW



VIEW C-C
SH 1 (C-4)
SCALE: NONE
ROTATED 90° CW

SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	999230	F
SCALE 1/1		SHEET 2	

8-9

D 999230

TI 21879

[13] ORDER ENTRY CONFIGURATION OPTION. IF UNSPECIFIED, SHORT SIGNAL GROUND TO CHASSIS GROUND BY CONNECTING P330 TO E365 & E366 IF REQUIRED TO ISOLATE SIGNAL GROUND FROM CHASSIS GROUND, CONNECT P330 TO E366 & E367

[14] INSTALL ITEM 4 ACROSS MEMORY LOCATIONS A3-A4 & A5-A6 AS SHOWN

[15] INSTALL ITEM 38, COVER, I/O CONNECTOR ON -0002 THRU -0007 ONLY

16. MAX GAP BETWEEN OUTER RIB ON SIDE INSERT AND INNER COVER SHALL BE .060 IN.

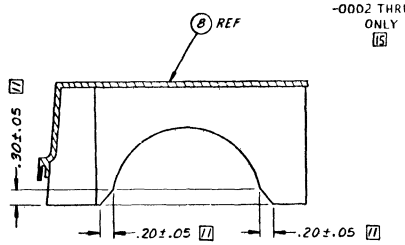
17. MAX GAP BETWEEN OUTER RIB ON SIDE INSERT AND BASE SHALL BE .060 IN.

18. THERE SHALL BE .090 IN. LIMIT TO LATERAL GAP BETWEEN THE SIDE INSERT AND BASE OR INNER COVER.

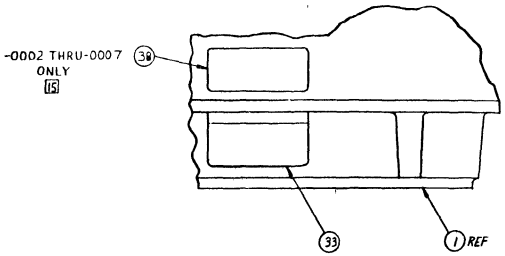
19. THERE SHALL BE .090 IN LIMIT TO THE RADIAL GAP BETWEEN THE SIDE INSERT AND BASE OR INNER COVER

20. SYSTEMS CONFIGURED WITH 999236-0101 (CHEVRON BUBBLE ASSY) ARE ONLY COMPATIBLE WITH 999222-0101, -0102 & -0103 CONTROLLER PCA'S

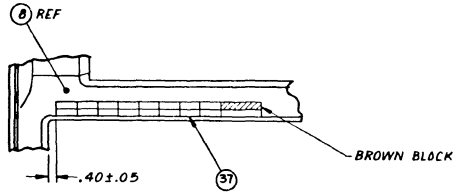
21. SYSTEMS CONFIGURED WITH 999236-0001 (T-BAR BUBBLE ASSY) ARE ONLY COMPATIBLE WITH 999222-0001, -0002 & -0003 CONTROLLER PCA'S. THESE ASSEMBLIES ARE ALTERNATES TO THOSE DESCRIBED IN NOTE 20.



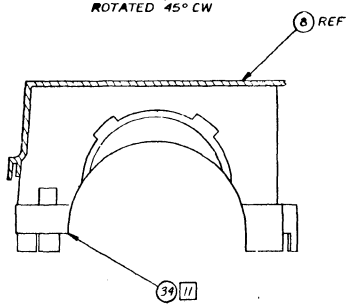
SECTION J-J
(MODIFICATION)
SH 1 (B-7)
SCALE: 1/1
ROTATED 45° CW



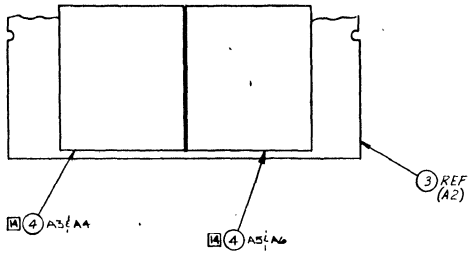
VIEW H-H
SH 1 (C-5)
SCALE: NONE
ROTATED 180°



VIEW L-L
SH 1 (B-3)
SCALE: 1/2
ROTATED 12° CCW



SECTION J-J
(INSTALLATION)
SH 1 (B-7)
SCALE: 1/1
ROTATED 45° CW



SECTION K-K
SH 1 (B-3)
SCALE: 1/2

SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	999230	J
SCALE		SHEET 3	

999230 D

6-9

T1 2/16/78

LIST OF MATERIALS

Assembly	Part No.	Rev.
DATA TERMINAL, PMT-115V DOMESTIC	0999230-0001	F
DATA TERMINAL, PMT-230V CCITT	0999230-0002	F
DATA TERMINAL, PMT-115V JAPAN	0999230-0003	F
DATA TERMINAL, PMT-230V W/BARRIER	0999230-0004	F
DATA TERMINAL, PMT-230V AUST.	0999230-0005	F
DATA TERMINAL, PMT-230V GERMANY	0999230-0006	F
DATA TERMINAL, PMT-KATAKANA	0999230-0007	F

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999227-0002	BASE,PORTABLE MEMORY TERMINAL (PMT)	
0002	00001.000	EA	0937300-0001	TERMINAL ELECTRONICS,743/745 W/MODEM	for -0001
0002	00001.000	EA	0937310-0001	TERM ELEC,743/745 W/COUPLER,WE/UK	for -0002, -0004, -0005, & -0006
0002	00001.000	EA	0937300-0003	TERMINAL ELECTRONICS,743/745 CC ITT MODM	for -0003 & -0007
0002	00001.000	EA	0937300-0003	TERMINAL ELECTRONICS,743/745 CC ITT MODM	
0003	00001.000	EA	0999222-0001	BUBBLE MEMORY CONTROLLER-PMT,115V	for -0001, -0003, & -0007
0003	00001.000	EA	0999222-0002	BUBBLE MEMORY CONTROLLER-PMT,230V	for -0002, -0005, & -0006
0003	00001.000	EA	0999222-0003	BUBBLE MEMORY CONTROLLER-PMT,230V UK	for -0004
0003	00001.000	EA	0999222-0002	BUBBLE MEMORY CONTROLLER-PMT,230V	
0004	00002.000	EA	0999236-0001	DISCRETE MEMORY ASSY	
0005	00001.000	EA	0999264-0001	MECHANISM ASSY,STEPPER MOTOR, W/PRINTHD	
0007	00001.000	EA	0999232-0001	FAN ASSEMBLY PORTABLE MEMORY TERM (PMT)	
0008	00001.000	EA	0999239-0001	COVER ASSY, INNER- 765, W/XMT ADJ	
0008	00001.000	EA	0999239-0003	COVER ASSY, INNER- 765, W/O XMT ADJ	for -0002 & -0004
0008	00001.000	EA	0999239-0004	COVER ASSY, INNER- 765, JAPANESE	for -0003 & -0007
0008	00001.000	EA	0999239-0005	COVER ASSY, INNER 765,OVS MUFF W/STRP	
0008	00001.000	EA	0999239-0006	COVER ASSY,INNER 765,STD MUFF W/STRP	
0009	00001.000	EA	0983809-0001	OUTER COVER ASSY	
0010	00001.000	EA	0996289-0002	CORD SET,3-PIN PWR-DOMESTIC GRAY W/CLIP	for -0001, -0003, & -0007 only
0011	00003.000	EA	0983905-0001	CLIP,KEYBOARD,FRONT	
0012	00003.000	EA	0983904-0001	CLIP,KEYBOARD,REAR	
0013	00008.000	EA	0999225-0001	CLIP,RETAINER,MEMORY BOARD	
0014	00005.000	EA	0999228-0001	SPACER,BOARD	
0016	00004.000	EA	0983907-0001	SPACER,SPRING	
0018	00001.000	EA	0983863-0001	BRACKET,FAN MOTOR	
0019	00001.000	EA	0999231-0002	PLATE,ID,FOR TERMINAL P/N 999230-0001	
0019	00001.000	EA	0999231-0003	PLATE,ID,FOR TERMINAL P/N 999230-0002	
0019	00001.000	EA	0999231-0004	PLATE,ID,FOR TERMINAL P/N 999230-0003	
0019	00001.000	EA	0999231-0005	PLATE,ID,FOR TERMINAL P/N 999230-0004	
0019	00001.000	EA	0999231-0006	PLATE,ID,FOR TERMINAL P/N 999230-0005	
0019	00001.000	EA	0999231-0007	PLATE,ID,FOR TERMINAL P/N 999230-0006	
0019	00001.000	EA	0999231-0008	PLATE,ID,FOR TERMINAL P/N 999230-0007	
0020	00004.000	EA	0972988-0073	SCREW,4-40 X 2.000 PAN HEAD CRES	
0021	00002.000	EA	0972679-0009	SCREW #4-20 X 3/8"LG THD FORM,HEX	
0022	00002.000	EA	0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	
0023	00004.000	EA	0419346-0342	HELICAL COMPRESS SPRING	
0024	00001.000	EA	0983914-0002	NAMEPLATE,OUTER COVER	

LIST OF MATERIALS

Assembly	Part No.	Rev.
DATA TERMINAL, PMT-115V DOMESTIC	0999230-0001	F
DATA TERMINAL, PMT-230V CCITT	0999230-0002	F
DATA TERMINAL, PMT-115V JAPAN	0999230-0003	F
DATA TERMINAL, PMT-230V W/BARRIER	0999230-0004	F
DATA TERMINAL, PMT-230V AUST.	0999230-0005	F
DATA TERMINAL, PMT-230V GERMANY	0999230-0006	F
DATA TERMINAL, PMT-KATAKANA	0999230-0007	F

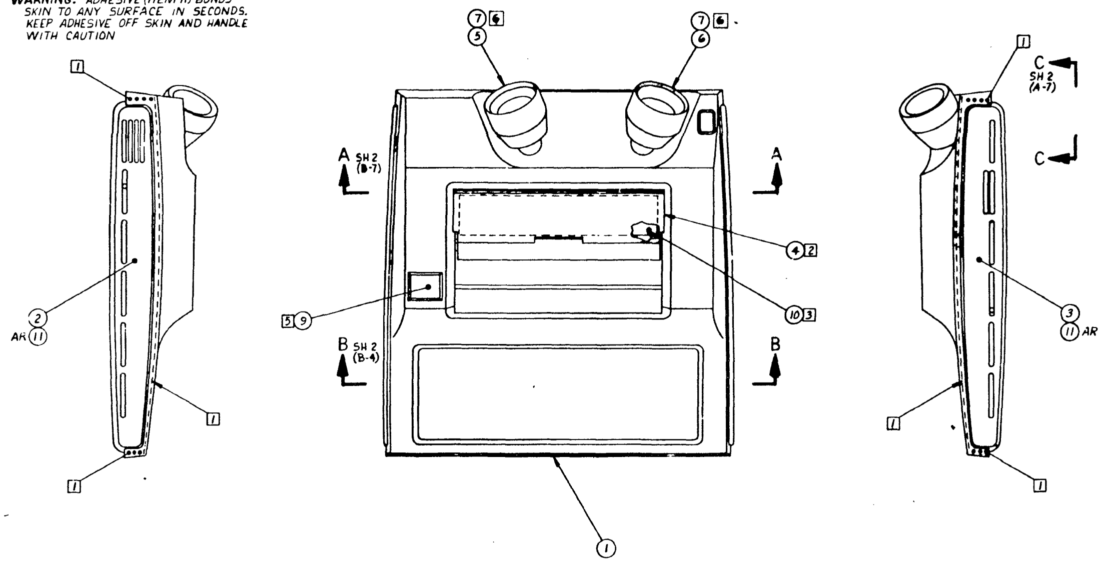
Item No.	Quantity		TI Part No.	Description	Remarks
0025	00001.000	EA	0937304-0001	COVER, SAFETY	
0026	00001.000	EA	0960141-0001	LABEL,SERVICE	
0027	00001.000	EA	0999250-9701	MANUAL,OPERATOR,MODEL 763/765 PRINTER	
0028	00001.000	RL	0972603-0001	PAPER,THERMAL PRINTING,WHITE	
0029	REF	EA	0999251-9901	TEST PROCEDURE,SIL	
0030	REF	EA	0999252-9901	TEST PROCEDURE,RUN-IN,PMT	
0031	REF	EA	0999253-9901	TEST PROCEDURE,MANUAL,PMT	
0032	00001.000	EA	0999242-0001	KIT,INSTALLATION, ROM	for all except -0007
0032	00001.000	EA	0999242-0002	ROM KIT	for -0007 only
0033	00001.000	EA	0999233-0001	DOOR,CONNECTOR	
0034	00001.000	EA	0999240-0001	BAFFLE ADAPTOR,FAN	
0037	00001.000	EA	2200039-0001	LABEL,FUNCTION	
0038	00001.000	EA	0995639-0001	COVER,I/O CONNECTOR	
0039	REF	EA	2200064-9701	MAINTENANCE MANUAL 763/765	
0033	00001.000	EA	0999233-0001	DOOR,CONNECTOR	
0034	00001.000	EA	0999240-0001	BAFFLE ADAPTOR,FAN	
0035	00001.000	EA	0996098-0003	CLIP,CABLE MOUNTING	for -0002, -0004, -0005, & -0006 only
0036	AR	EA	0972799-0001	ADHESIVE SOLVENTLESS RAPID CURING	
0037	00001.000	EA	2200039-0001	LABEL,FUNCTION	
0038	00001.000	EA	0995639-0001	COVER,I/O CONNECTOR	for all except -0001
0039	REF	EA	2200064-9701	MAINTENANCE MANUAL 763/765	

999239 | 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	ECN424683 R. Conti LM CHANGES	1/13/77	
B	ECN 423837 LM CHANGES	1/18/77	
C	ECN 415821 LM CHANGES	1/ 8/77	

NOTES UNLESS OTHERWISE SPECIFIED

1. ASSEMBLE OUTER COVER (ITEM 1), LEFT SIDE INSERT (ITEM 2), AND RIGHT SIDE INSERT (ITEM 3) BY APPLYING ONE SOLID BEAD OF ADHESIVE (ITEM 11) CLOSE TO EDGE OF PARTS IN AREAS INDICATED:
   •••• INDICATES APPLY TO FARSIDE OF INNER COVER
   ---- INDICATES APPLY TO FARSIDE OF INSERTS (WITHOUT RIBS)
   SLIDE INSERTS INTO SLOTS OF INNER COVER. RIDGES ON SIDE INSERTS MUST TOUCH INNER COVER EDGE. CLAMP INNER COVER AND SIDE INSERTS TOGETHER AT UNIT PARTING LINE FOR APPROXIMATELY 4 MINUTES TO REACH HANDLING STRENGTH. CURE 1 HR MIN BEFORE INSTALLATION.
   WARNING: ADHESIVE (ITEM 11) BONDS SKIN TO ANY SURFACE IN SECONDS. KEEP ADHESIVE OFF SKIN AND HANDLE WITH CAUTION
2. INSTALL PAPER DOOR (ITEM 4) BY BOWING OR BENDING AND INSERTING STUDS INTO HOLES ON COVER (ITEM 1)
3. CENTER PAPER LOADING LABEL (ITEM 10) ON UNDERSIDE OF PAPER DOOR (ITEM 4) WITHIN ±.10 OF CENTERLINE OF DOOR
4. PULL LEADS OF MUFF ASSYS (ITEMS 5 AND 6) TOGETHER AND SECURE TO EACH OTHER USING STRAP (ITEM 12)
5. IF THE SALES ORDER CONFIGURATION SHEET SPECIFIES A SPECIAL CUSTOMER NAMEPLATE, INSTALL IT IN PLACE OF THE STANDARD NAMEPLATE (ITEM 7)
6. USE SILICONE RUBBER (ITEM 14) TO STRAIN RELIEVE CABLE BY APPLYING TO CAVITY OF MUFF RETAINER (ITEM 7) AFTER INSTALLATION. SEE VIEW C-C



PART NUMBER	DESCRIPTION
999239-0006	COVER ASSY, INNER-765, STANDARD MUFF W/STRAP
999239-0005	COVER ASSY, INNER-765, OVERSIZE MUFF W/STRAP
999239-0004	COVER ASSY, INNER-765, JAPANESE
999239-0003	COVER ASSY, INNER-765, W/O XMT ADJ
999239-0001	COVER ASSY, INNER-765, W/XMT ADJ

REV STATUS OF SHEETS	REV	C	C
	SH	1	2

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999230	8738

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ±.010 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.251 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.751 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

DWN Roel Conti 4-5-77
CHK 7/18/77
ENG 7-19-77
7-19-77
7-22-77
CONTR 7/26/77
7/26/77

TEXAS INSTRUMENTS INCORPORATED Dallas Texas

COVER ASSEMBLY, INNER-765

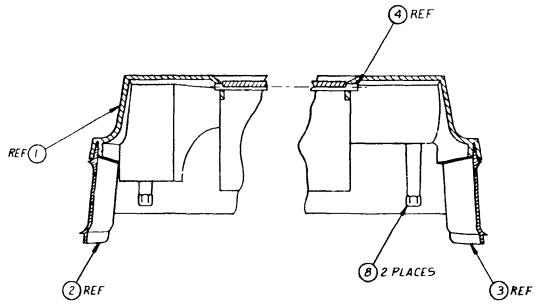
D 96214 999239

1/2 C 1 OF 2

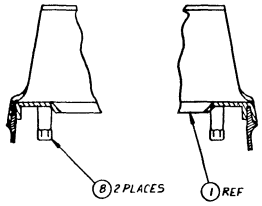
SEQ NO	IDENT	F SPEC	NO	ADDITIONAL	NOTES
	PROCESS		CLASSIFICATION		

PROCESSES FOR CORRELATION TO CUTTING SPECIFICATIONS SEE TI DRAWING 219467

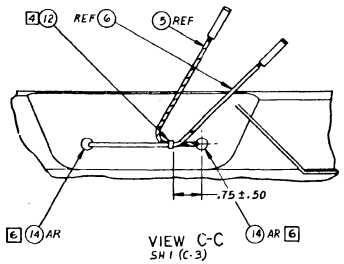
30 LM



SECTION A-A
SH 1 (C-6)



SECTION B-B
SH 1 (B-6)



VIEW C-C
SH 1 (C-3)

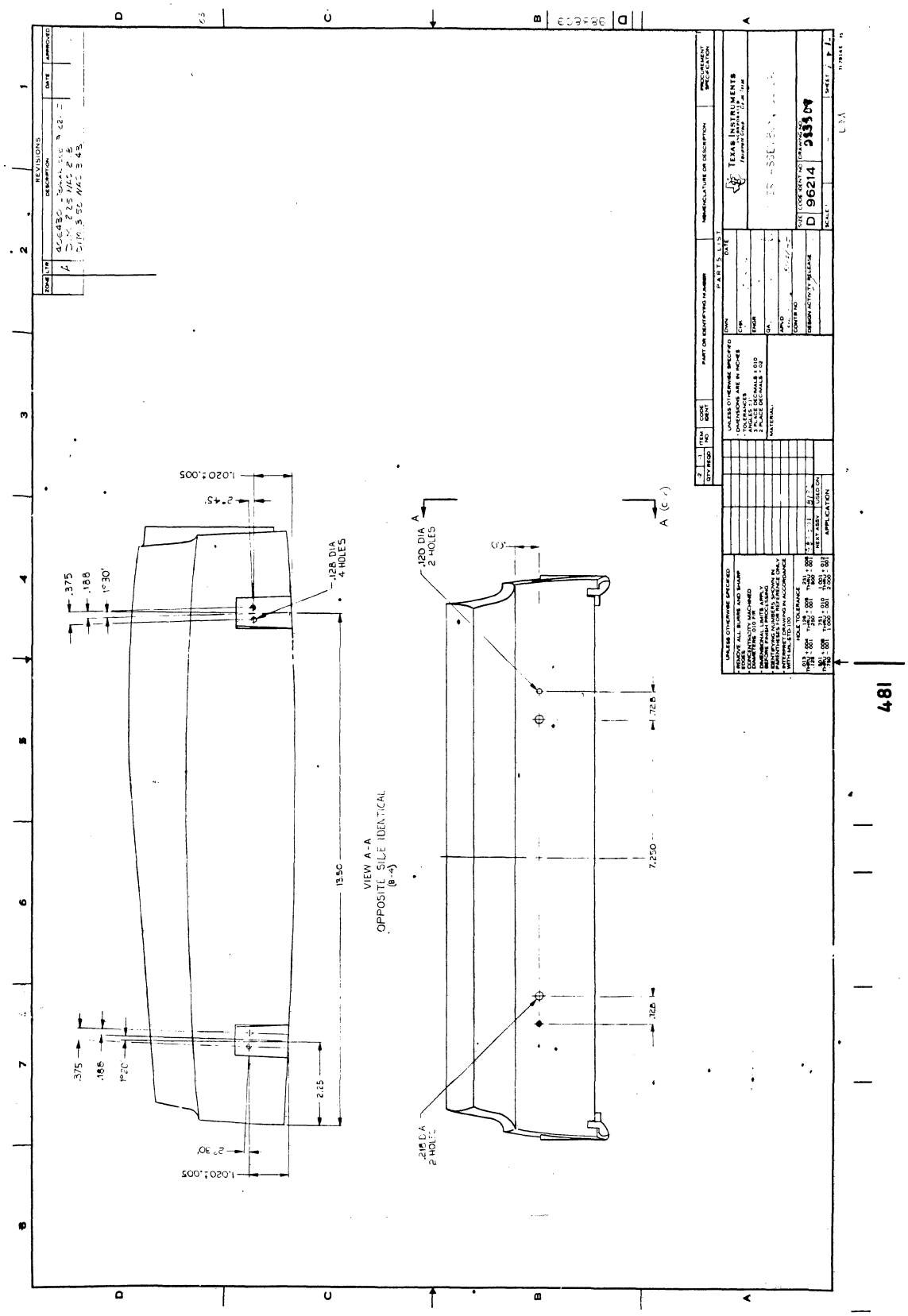
SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	999239	C
SCALE 1/1		SHEET 2	

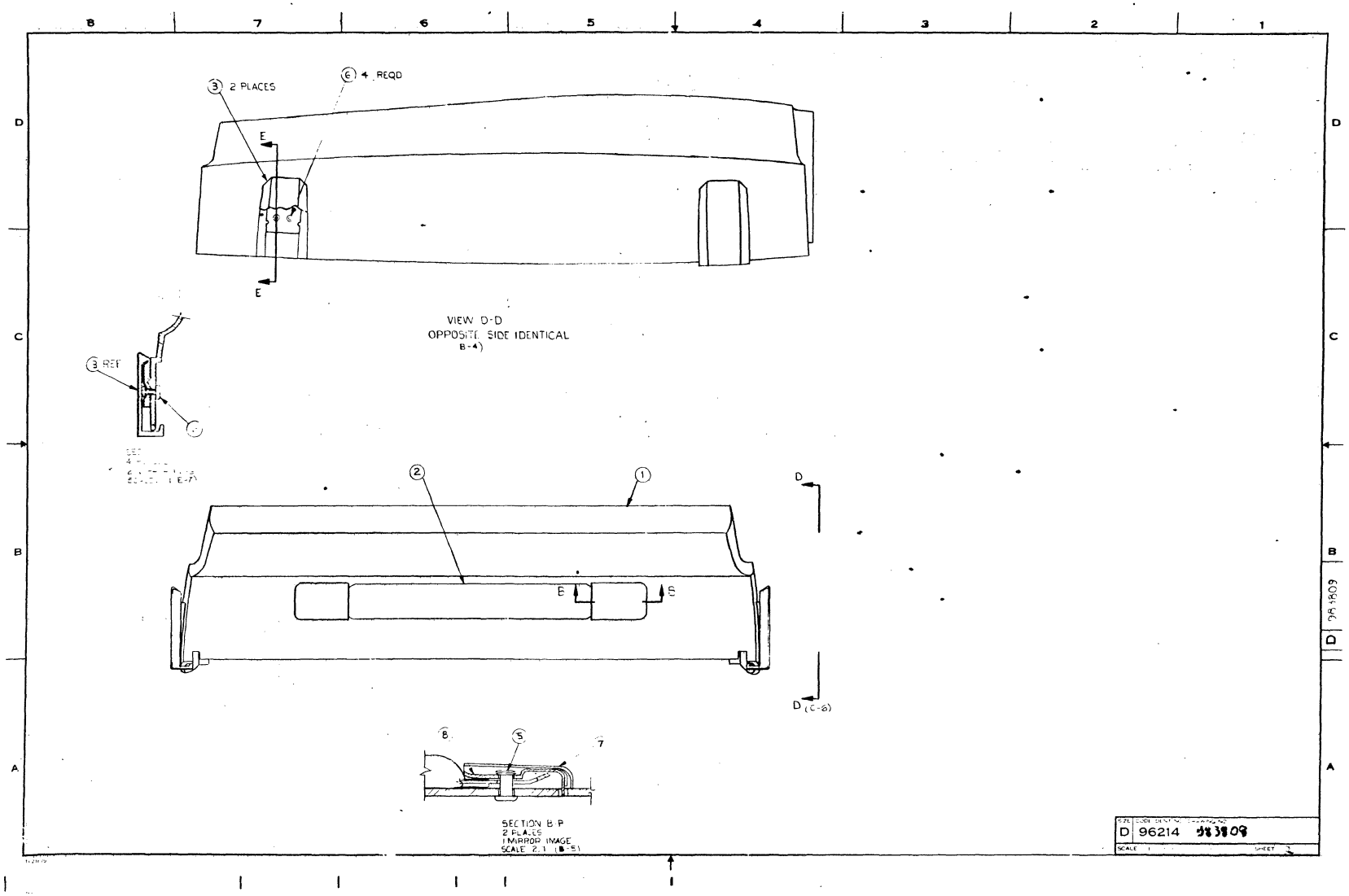
D 999239

LIST OF MATERIALS

Assembly	Part No.	Rev.
COVER ASSY, INNER–745, W/XMT ADJ	0999239-0001	C
COVER ASSY, INNER–745, W/O XMT ADJ	0999239-0003	C
COVER ASSY, INNER–745, JAPANESE	0999239-0004	C
COVER ASSY, INNER–745, OVS MUFF W/STRAP	0999239-0005	C
COVER ASSY, INNER–745, STD MUFF W/STRAP	0999239-0006	C

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0983981-0002	COVER,INNER-PRINTER CASE	
0002	00001.000	EA	0999248-0001	INSERT,LEFT SIDE W/XMT LEV ADJ,VENTED	
0003	00001.000	EA	0999249-0001	INSERT,RIGHT SIDE,VENTED	
0004	00001.000	EA	0983865-0001	DOOR,PAPER	
0005	00001.000	EA	0983826-0001	MUFF ASSY,TRANSMIT,ACOUSTIC COUPLER	for -0001, -0003, & -0006
0005	00001.000	EA	0995670-0002	MUFF ASSY, XMIT,OVERSIZE, W/STRAP	for -0004 & -0005
0006	00001.000	EA	0983827-0001	MUFF ASSY,RECEIVE ACOUSTIC COUPLER	for -0001 & -0003
0006	00001.000	EA	0995671-0001	MUFF ASSY,/RETAINER-REC-ACOUSTIC COUPLER	for -0004 & -0006
0006	00001.000	EA	0995671-0002	MUFF ASSY,RCV,OVERSIZE,W/STRAP	for -0005
0007	00002.000	EA	0983875-0001	RETAINER,MUFF	
0008	00004.000	EA	0772334-0001	FASTNER 4-40 ON-SERT	
0009	00001.000	EA	0983913-0001	NAMEPLATE,INNER COVER	
0010	00001.000	EA	0983912-0001	LABEL,PAPER LOADING	
0011	AR	EA	0972799-0001	ADHESIVE SOLVENTLESS RAPID CURING	
0012	00001.000	EA	0418212-0040	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	
0014	AR	TU	0417559-0001	SILICONE RUBBER (RTV) DOW 3140	


TEXAS INSTRUMENTS
D 96214
3133C9
481
.128 DIA
4 HOLES
.120 DIA
2 HOLES
.218 DIA
2 HOLES
VIEW A-A
OPPOSITE SIDE IDENTICAL
(B-4)
1.020 ± .005
2.45°
.375
.188
1°30'
13.50
2.25
2°30'
1°20'
7.250
.726
.726


8
7
6
5
4
3
2
1
D
C
B
A
3 2 PLACES
6 4 REQD
E
E
VIEW D-D
OPPOSITE SIDE IDENTICAL
B-4)
3 REF
2
1
D
D
(C-8)
E
E
8
5
7
SECTION B-B
2 PLACES
1 MIRROR IMAGE
SCALE 2:1 (B-5)
D 96214
SCALE
SHEET

LIST OF MATERIALS

Assembly
OUTER COVER ASSY

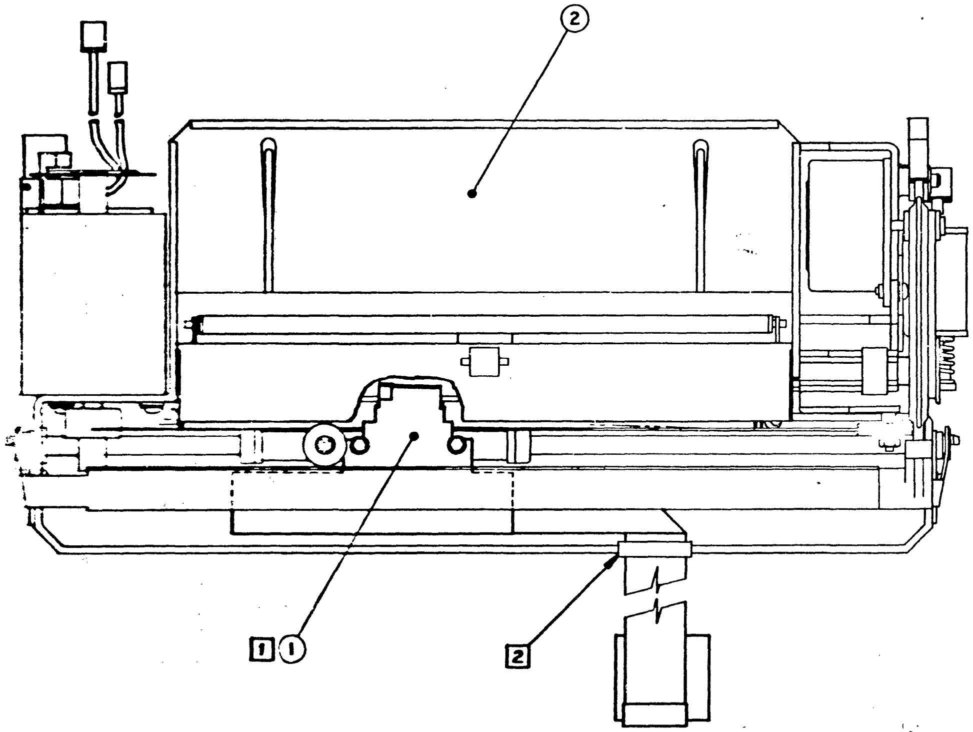
Part No. 0983809-0001 Rev. A

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0983982-0001	COVER,OUTER-PRINTER CASE	
0002	00001.000	EA	0972449-0001	HANDLE,CASE-CARRYING,SOFT TOUCH	
0003	00004.000	EA	0983901-0001	LATCH CASE	
0005	00002.000	EA	0418606-0190	RIVET .188 X.407 TUBULAR,C'SINK HEAD	
0006	00008.000	EA	0418606-0035	RIVET .123 X.375 TUBULAR,C'SINK HEAD	
0007	00002.000	EA	0972447-0001	CAP,PUSH-ON-HANDLE	
0008	00002.000	EA	0972448-0001	RETAINER,CASE HANDLE	

NOTES: UNLESS OTHERWISE SPECIFIED

1. INSTALL ITEM 1 TO ITEM 2 BEING CAREFUL TO ALIGN PROPERLY WITH MOLDED-IN ALIGNMENT PINS USING EXISTING HARDWARE
2. DRESS CABLE AND CLIP IN POSITION WITH EXISTING CLIP

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	CN429254 (C) R. Clemens (1) ITEM 3 P/N WAS 2200043-9901	10-27-77	J. R.



QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
2200049	8738
999270	8738

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°; 3 PLACE DECIMALS ±.010; 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

MECHANISM ASSY, STEPPER MOTOR W/PRINTHEAD

SIZE C | FSCM NO 96214 | DRAWING NO 999264

SCALE 1/1 | SHEET

999264

02

30

LM

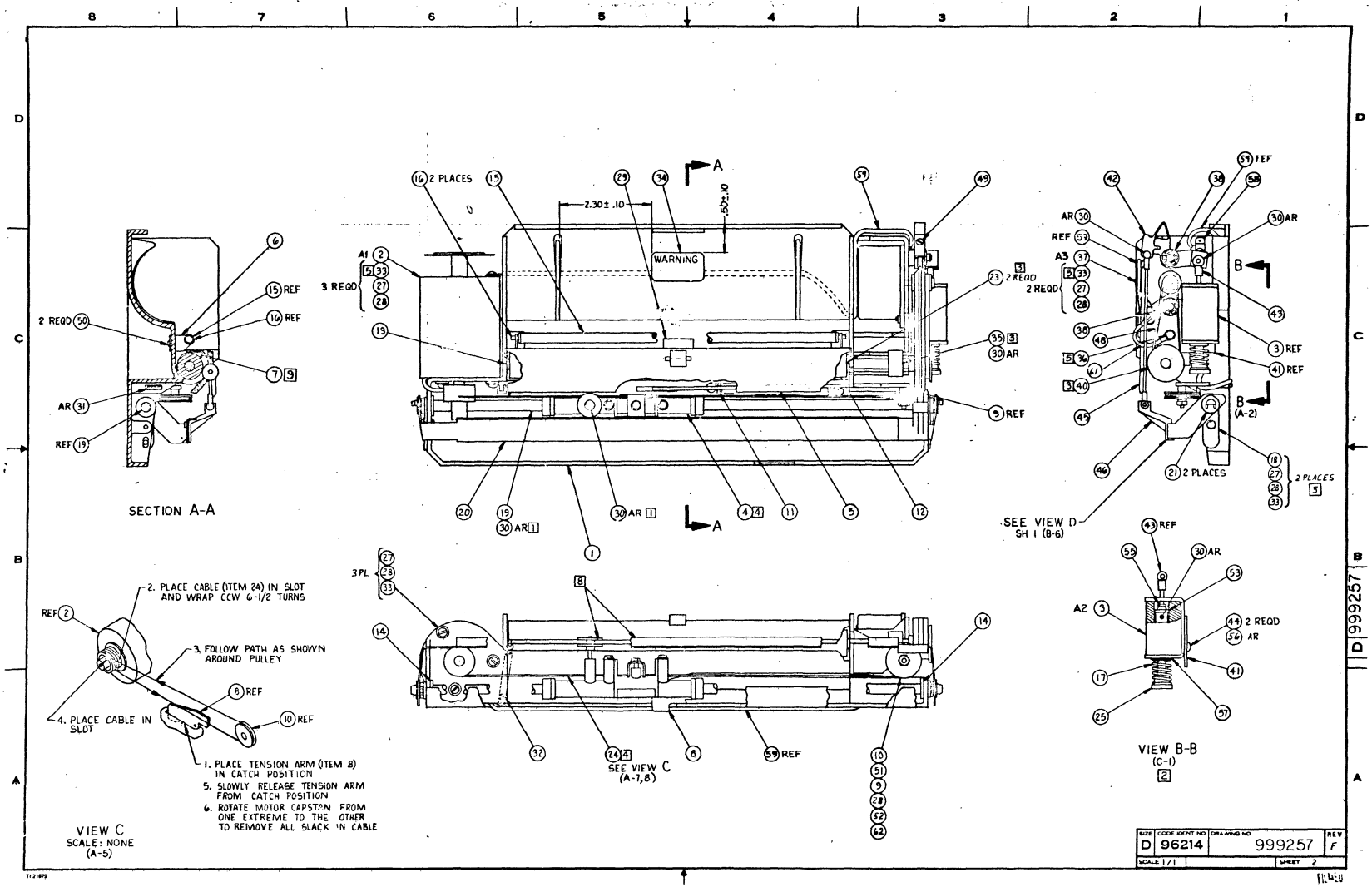
FILMED

LIST OF MATERIALS

Assembly
MECHANISM ASSY, STEPPER MOTOR, W/PRINTHD

Part No. 0999264-0001 Rev. *

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0983829-0001	PRINTHEAD ASSY	
0002	00001.000	EA	0999257-0001	MECHANISM ASSY-BMC FRAME	
0003	REF	EA	2200043-9501	FUNCTIONAL TEST PROCEDURE	


SECTION A-A
VIEW C
SCALE: NONE
(A-5)
1. PLACE TENSION ARM (ITEM 8) IN CATCH POSITION
2. PLACE CABLE (ITEM 24) IN SLOT AND WRAP CCW 6-1/2 TURNS
3. FOLLOW PATH AS SHOWN AROUND PULLEY
4. PLACE CABLE IN SLOT
5. SLOWLY RELEASE TENSION ARM FROM CATCH POSITION
6. ROTATE MOTOR CAPSTAN FROM ONE EXTREME TO THE OTHER TO REMOVE ALL SLACK IN CABLE
WARNING
2.30±.10
.50±.10
SEE VIEW C (A-7,8)
SEE VIEW D SH 1 (B-6)
VIEW B-B
(C-1)
2
SIZE D
CODE IDENT NO 96214
DRAWING NO 999257
REV F
SCALE 1/1
SHEET 2

LIST OF MATERIALS

Assembly	Part No.	Rev.
MECHANISM ASSY–BMC FRAME	0999257-0001	D

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999247-0001	FRAME, MECHINISM PMT	
0002	00001.000	EA	0983812-0002	MOTOR,DRIVE-PRINTER	
0003	00001.000	EA	0983816-0001	SOLENOID,PRINTHEAD	
0004	00001.000	EA	0983817-0001	CARRIAGE ASSY,PRINTHEAD	
0005	00001.000	EA	0983818-0001	WINDOW ASSY	
0006	00001.000	EA	0983873-0001	SPRING,DANCER	
0007	00001.000	EA	2200030-0001	DEFLECTOR,PAPER	
0008	00001.000	EA	0983880-0001	ARM,PULLEY-TENSION	
0009	00001.000	EA	0983883-0002	SPACER, PULLEY- PMT	
0010	00001.000	EA	0959402-0001	PULLEY,CABLE	
0011	00001.000	EA	0999258-0001	SPRING,CABLE TENSION	
0012	00001.000	EA	0999263-0001	ROLLER,PAPER DRIVE	
0013	00001.000	EA	0772684-0005	BEARINGS,SLEEVE-FLANGED NYLON .2510 ID	
0014	00002.000	EA	0244440-0003	BUMPER,.500 O.D.	
0015	00001.000	EA	0983872-0001	ROLLER,DANCER	
0016	00002.000	EA	0983874-0001	PIVOT	
0017	00001.000	EA	2200031-0001	SPRING,HEAD LIFT (STEPPER)	
0018	00002.000	EA	0983889-0001	BEARING,ROD SUPPORT	
0019	00001.000	EA	0983884-0001	ROD,CARRIAGE	
0020	00001.000	EA	0983886-0001	BRACKET,BAIL	
0021	00002.000	EA	0983938-0001	BAIL RETAINER	
0023	00001.000	EA	0972485-0001	WASHER,STEEL-THRUST	
0024	00001.000	EA	0959297-0002	CABLE,DRIVE- PMT	
0025	00001.000	EA	0983900-0001	KNOB,PLUNGER	
0027	00006.000	EA	0411027-0803	WASHER .125 X .250 X .022 FLAT CRES	
0028	00006.000	EA	0411104-0135	WASHER #4 LOCKSPLIT	
0029	00001.000	EA	0999246-0001	PAD,FRICTION	
0030	AR	EA	0232573-0001	OIL #43 TERRESTIC	
0031	AR	TU	0232334-6050	LUBRICANT SILICONE GRS LT GR 2 OZ TUBE	
0032	00001.000	EA	0983916-0001	SPRING,EXTENSION	
0033	00005.000	EA	0972988-0015	SCREW 4-40 X .375 PAN HEAD CRES	
0034	00001.000	EA	0989712-0002	LABEL,WARNING,743/745	
0035	00001.000	EA	2200032-0001	BEARING,RETAINER	
0036	00003.000	EA	0972969-0003	SCREW 4-24 X 1/2 HEX WASHER HEAD	
0037	00001.000	EA	2200045-0001	MOTOR ASSEMBLY, 4 PH. STEPPER	
0038	00002.000	EA	0972491-0023	RING,RETAINING	
0040	00001.000	EA	2200033-0001	PULLEY,30T TIMING BELT	
0041	00001.000	EA	2200041-0001	BRACKET,SOLENOID ADJUST	
0042	00001.000	EA	2200034-0001	PIVOT ARM,SOLENOID	
0043	00001.000	EA	2200035-0001	BALL,SOLENOID DRIVE	

LIST OF MATERIALS

Assembly
MECHANISM ASSY–BMC FRAME

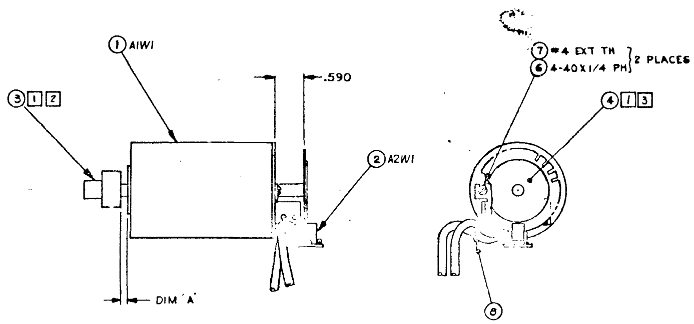
Part No. 0999257-0001 Rev. D

Item No.	Quantity		TI Part No.	Description	Remarks
0044	00002.000	EA	0972988-0012	SCREW 4-40 X .188 PAN HEAD CRES	
0045	00001.000	EA	2200037-0001	DRIVE LINK,BALL	
0046	00001.000	EA	2200038-0001	BAIL LINK,BALL DRIVE	
0048	00001.000	EA	0537711-0005	DRIVE BELT	
0049	00001.000	EA	0996624-0001	SCREW,PLASTITE	
0050	00002.000	EA	0972831-0002	RIVET,1/8X.195,TUBULAR,STEEL,BLIND	
0051	00001.000	EA	0972990-0017	SCREW 4-40 X .625 FLT HEAD CRES	
0052	00001.000	EA	0416453-0021	NUT,PLAIN,4-40 UNC-28 HEX,CRES,SMALL	
0053	00001.000	EA	0983969-0001	O-RING	
0055	00001.000	EA	0983968-0001	WASHER RUBBER 1/32 THK GRAY	
0056	AR	EA	0802749-0222	ADHESIVE,THREAD SEALING AND LOCKING	
0057	00001.000	EA	0983915-0001	WASHER,SHOULDER SPRING	
0058	00001.000	EA	0972172-0003	TERMINAL .187"WD QDISC TAB STYLE	
0059	00001.000	EA	2200061-0001	CABLE, MOTOR GROUND	
0060	REF	EA	0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	

NOTES:
1. SUPPORT MOTOR SHAFT WHILE PRESSING ON WHEEL (IT. 4) AND CAPSTAN (IT. 3)
2. ALIGN CAPSTAN (IT. 3) BORE FLAT WITH MOTOR SHAFT FLAT
3. ALIGN WHEEL (IT. 4) BORE FLAT WITH MOTOR SHAFT FLAT

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	7-29-75 REDRAWN PER ENG. REDESIGN		
	B	415516 (C) 7-8-76 1. ADDED ITEMS 9 & 10 AND ADDED NOTE 4.		
	C	CN424621 (C) (1) DELETED ITEMS 9 & 10 FROM LM (2) DELETED NOTE 4	7-28-77	
	D	CN424259 (C) (1) ADDED DIM A TO F/D (2) ADDED DASH NO BLOCK (3) CREATED -2 LM.	8-11-77	
	E	CN423832 (D) C. LANGLINAIS (1) ZN C-6 ADDED REF DESIG A1W1 TO CALLOUT 1 (2) ZN C-5 ADDED REF DESIG A2W1 TO CALLOUT 2.	10-18-77	



DASH NO	DIM 'A'
-0001	.130
-0002	.200

PART NO	DESCRIPTION
983812-0002	MOTOR DRIVE-PRINTER
983812-0001	MOTOR DRIVE-PRINTER

QTY REQD	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES
  ANGLES ±1°
  3 PLACE DECIMALS ± .010
  2 PLACE DECIMALS ± .02

MATERIAL

5-20-75 · 6-10-75 · 8-1-75 · 7-75 · 8-6-75

TEXAS INSTRUMENTS INCORPORATED
Equipment Group Dallas, Texas

MOTOR, DRIVE - PRINTER

SIZE D | CODE IDENT NO 96214 | DRAWING NO 983812

SCALE 1/1

D 983812

LIST OF MATERIALS

Assembly: MOTOR, DRIVE–PRINTER

Part No. 0983812-0001 Rev. D

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0983813-0001	MOTOR,WIRED	
0002	00001.000	EA	0983814-0001	SENSOR,FEEDBACK WHEEL–MOTOR	
0003	00001.000	EA	0983870-0001	CAPSTAN,MOTOR	
0004	00001.000	EA	0215505-0001	WHEEL,FEEDBACK SENSOR	
0006	00002.000	EA	0972988-0013	SCREW 4–40 X .250 PAN HEAD CRES	
0007	00002.000	EA	0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	
0009	00001.000	EA	0418212-0040	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	

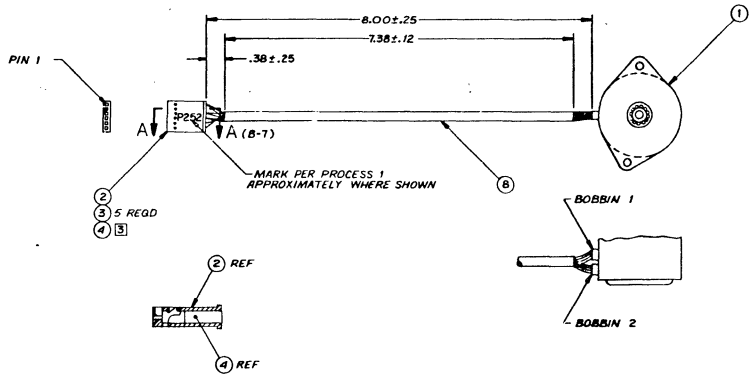
NOTES: UNLESS OTHERWISE SPECIFIED

1. COLOR (BLACK, TYPE 6 OR WHITE, TYPE 9) SHALL CONTRAST WITH COLOR OF ITEM 2 OR ALTERNATE ITEM 5
2. WIRES SHALL BE CRIMPED IN COMMON RECEPTACLE PER WIRE LIST REQUIREMENTS
3. KEYING PLUG SHOULD BE INSTALLED SUCH THAT KEEPER PROJECTS THRU THE APPROPRIATE SLOT IN THE HOUSING AS SHOWN IN SECTION A-A

WIRE NO.	DESCRIPTION	START STATION	FINISH STATION	ITEM NO.	
1	MOTOR	BOBBIN 1 - BLK	P252-1	1	2
2	MOTOR	RED	P252-3	1	2
3	MOTOR	YEL	P252-6	1	
4	MOTOR	BOBBIN 1 - WHT	P252-5	1	
5	MOTOR	BOBBIN 2 - BLK	P252-3	1	2
6	MOTOR	RED	P252-1	1	
7	MOTOR	YEL	P252-4	1	
8	MOTOR	BOBBIN 2 - WHT	P252-4	1	
—	PLUG	—	P252-2	4	

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED



SECTION A-A
(C-7)
SCALE: NONE
(ITEMS 2, 3, & 4 ONLY)

PARTS LIST

-2 QTY REQD	-1 QTY REQD	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY, MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

HOLE TOLERANCE

.513 ± .002 / THRU .127 ± .001	.126 ± .005 / THRU .250 ± .001	.251 ± .006 / THRU .500 ± .001
.501 ± .002 / THRU .750 ± .001	.751 ± .010 / THRU 1.000 ± .001	1.001 ± .015 / THRU 2.000 ± .001

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
  3 PLACE DECIMALS ±.010
  2 PLACE DECIMALS ±.02

DSN	DATE
DW	6/14/77
ENGR	6/15/77
QA	7/7/77
APPD	7/19/77
CONTR NO	
ORIGIN ACTIVITY RELEASE	9/28/77

TEXAS INSTRUMENTS INCORPORATED, Equipment Group, Dallas, Texas

MOTOR ASSEMBLY, 4 PH STEPPER

SIZE	CODE IDENT NO	DRAWING NO
D	96214	2200045

SCALE 1/1 SHEET

SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL
1	MARK	100-07	00	[1]
PROCESS			CLASSIFICATION	

FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

999257	8738
NEXT ASSY	USED ON
APPLICATION	

T-1914F

2200045

6-25

30

LM

LIST OF MATERIALS

Assembly
MOTOR ASSEMBLY, 4 PH. STEPPER

Part No. 2200045-0001 Rev. *

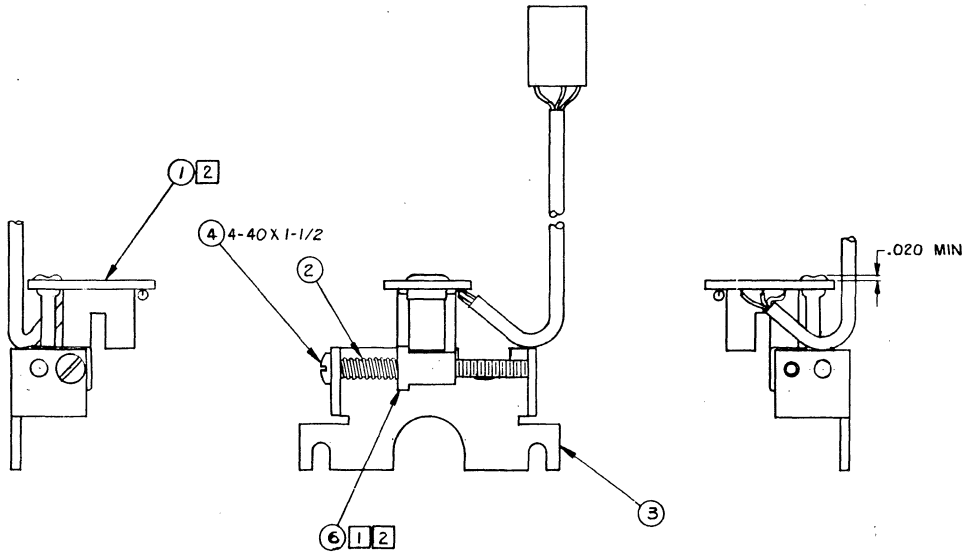
Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999256-0001	MOTOR,STEPPING PAPER DRIVE	
0002	00001.000	EA	0972484-0006	CONNECTOR HOUSING 6 CONTACT	
0003	00005.000	EA	0972104-0001	CONTACT ELEC-LOCKING,WIRE-TO.025 SQ POST	
0004	00001.000	EA	0972599-0001	KEY,POLARIZATION,CONNECTOR	
0004A				ITEMS 2,3,AND 4 CAN ONLY	
0004B				BE USED TOGETHER	
0005	00000.000	EA	0772707-0031	RECEPTACLE,TERMINAL- 6 CAVITIES	
0006	00000.000	EA	0972482-0006	CONTACT,ELECTRICAL,CRIMP	
0007	00000.000	EA	0800335-0001	KEY,POLARIZATION,CONNECTOR	
0007A				ITEMS 5,6,AND 7 MAYBE	
0007B				USED AS ALTERNATE ITEMS	
0007C				FOR ITEMS 2,3,AND 4.	
0007D				ITEMS 5,6,AND 7 CAN ONLY	
0007E				BE USED TOGETHER	
0008	00000.708	FT	0411634-2100	SLEEVE,PVC .208 DIA .020 WALL	

NOTES: UNLESS OTHERWISE SPECIFIED

[1] CHECK THAT NO BINDING OF THE SCREW (IT. 4) IN THE BRACKET (IT. 3) OCCURS THAT WOULD ALLOW THE SCREW TO BACK OUT BEFORE THE CARRIER (IT. 6) TONGUE BOTTOMS OUT AGAINST THE SLOT END.

[2] ASSEMBLE SENSOR (ITEM 1) TO CARRIER (ITEM 6) PER PROCESS 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	R.S. Wilson 7-29-75 REDRAWN PER ENG DESIGN CHANGE	7/30/75	



SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL CLASSIFICATION
1	ASSEM	540-01	00	2
PROCESS				

INTERPRET PROCESSES PER TI DRAWING 2214457

QTY REQD .2	QTY REQD .1	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL STD 100

HOLE TOLERANCE

.013 THRU .125 + .004 - .001	.251 THRU .500 + .005 - .001	.501 THRU .750 + .008 - .001
.751 THRU 1.000 + .010 - .001	1.001 THRU 3.000 + .012 - .001	

NEXT ASSY	USED ON
983812	8732
APPLICATION	

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ± 1° 3 PLACE DECIMALS ± .010 2 PLACE DECIMALS ± .02

		DATE
DWN	R. Wilson	7-29-75
CHK		7-30-75
ENGR		8-6-75
QA	N.C. Schultz	8-7-75
APVD		8/6/75
COMPT NO		8/11/75
DESIGN ACTIVITY RELEASE		8/19/75

TEXAS INSTRUMENTS INCORPORATED
Equipment Group Dallas Texas

SENSOR, FEEDBACK WHEEL - MOTOR

SIZE	CODE IDENT NO	DRAWING NO
C	96214	983814

SCALE 2/1 REV A SHEET

LM

983814 C

6-27

LIST OF MATERIALS

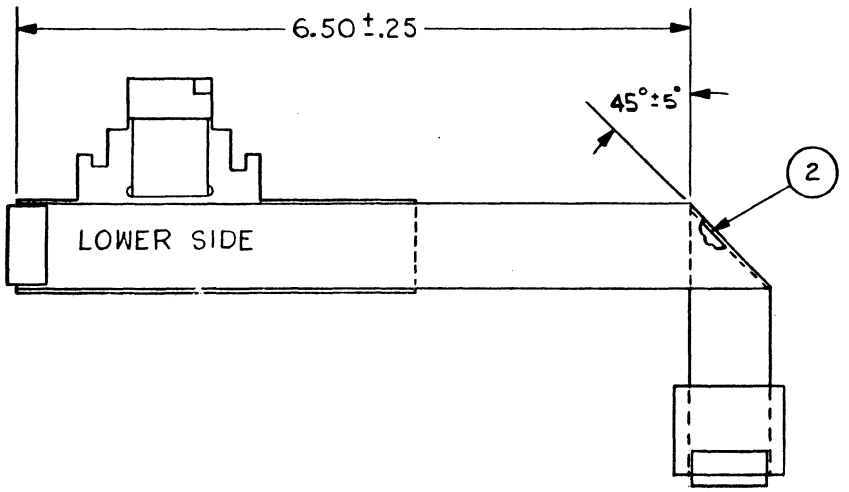
Assembly
SENSOR, FEEDBACK WHEEL–MOTOR

Part No. 0983814-0001 Rev. A

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0983820-0001	SENSOR	
0002	00001.000	EA	0960177-0001	SPRING,FEEDBACK SENSOR	
0003	00001.000	EA	0983920-0001	BRACKET,MTG-FEEDBACK SENSOR	
0004	00001.000	EA	0972988-0023	SCREW 4-40 X 1.50 PAN HEAD CRES	
0006	00001.000	EA	0983919-0001	CARRIER	

983829

REVISIONS			
LTR	DESCRIPTION	DATE	APPD



-0002	-0001	ITEM NO.	UNIT OF ISSUE	DWG SIZE	PART NUMBER	DESCRIPTION	VENDOR PART NUMBER
QTY REQD							

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED	PROCESSES
DECIMAL .XX ± .02 .XXX ± .010 FRACTIONAL ± 1/64 ANGULAR ± 1° CONCENTRICITY MACHINED DIAMETERS .004 TIR ALL DIMENSIONS TO BE MET BEFORE PLATING REMOVE ALL BURRS AND SHARP EDGES DO NOT SCALE THIS DRAWING ALL DIMENSIONS IN INCHES SURFACES MARKED ✓ TO HAVE ✓	
DRILLED HOLE TOLERANCES .013 TO .136 +.003 −.002 .136 TO .250 +.005 −.003 .250 AND ABOVE ± .005	

PROJ NO.	SIZE	NEXT ASSY DWG NO.
8732		983833
8101		983833

DRAFTSMAN 3/12/75
CKD—DRAFTSMAN 8-15-75
DESIGN ENGINEER 8/25
APPD—ENGINEER 9/25
APPD LPO 9/27/75
RELEASE 9/27/75

TEXAS INSTRUMENTS
INCORPORATED
DIGITAL SYSTEMS DIVISION
HOUSTON, TEXAS

TITLE PRINTHEAD, ASSY

UNIT

SYSTEM

SCALE FULL | B | 983829 | REV.

YI-9641-C P

LM

LIST OF MATERIALS

Assembly
PRINTHEAD ASSY ____

Part No. 0983829-0001 Rev. *_

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0983830-0001	PRINTHEAD ASSY RESISTOR SELECT EPN 2-1	
0002	00001.000	EA	0983922-0001	TAPE, DOUBLE SIDED PRINTHEAD CABLE	

NOTES: UNLESS OTHERWISE SPECIFIED

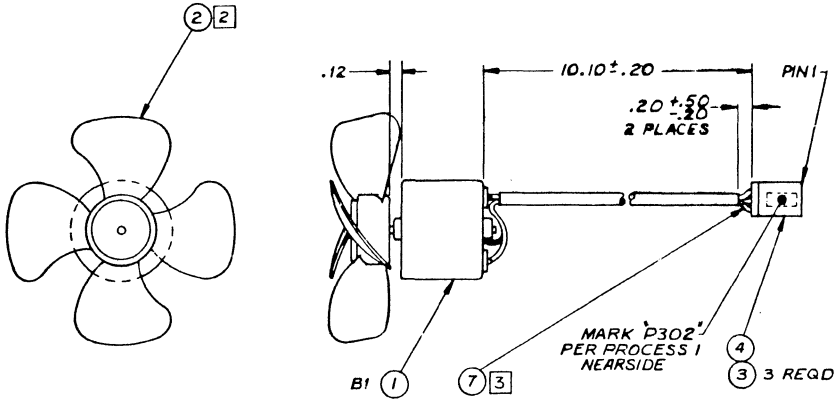
1. COLOR (BLACK, TYPE 6 OR WHITE, TYPE 9) SHALL CONTRAST COLOR OF ITEM 4
2. SUPPORT SHAFT OF ITEM 1 AXIALLY WHILE INSTALLING ITEM 2
3. ADD TUBING (ITEM 7) TO SHIELD CABLE TO BE FLUSH TO CONNECTOR AND ALLOW ONE-TENTH INCH MAX GAP BETWEEN MOTOR SLEEVING

WIRING LIST

WIRE NO	DESCRIPTION	START STATION	FINISH STATION	REMARKS	ITEM NO
1	FAN MOTOR	B1 - RED	P302 - 1	PINS 1 & 3 ARE INTER CHANGABLE	1
2	FAN MOTOR	B1 - BLACK	P302-2		1
3	FAN MOTOR	B1 - SHIELD	P302-3 [3]		1

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	CN 424683 Mat-Way 4-5-77 LM REVISED PER D ENGR CHNGS	4/6/77	
B	CN 424686 Mat-Way 4-13-77 LM REVISED PER D ENGR CHNGS	4/15/77	
C	CN 415820 Mat-Way 5-11-77 QTY ITEM 7 WAS AR	5/16/77	



SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL
1	MARK	100-07	710	1
	PROCESS		CLASSIFICATION	

FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

QTY REQD 2	QTY REQD 1	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION
				PARTS LIST		

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 TIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD 100

HOLE TOLERANCE

.013 THRU .125	+ .004 - .001	.126 THRU .250	+ .005 - .001	.251 THRU .500	+ .006 - .001
.501 THRU .750	+ .008 - .001	.751 THRU 1.000	+ .010 - .001	1.001 THRU 2.000	+ .012 - .001

999230 B7723

TEXT APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES
  - ANGLES ± 1°
  - 3 PLACE DECIMALS ± .010
  - 2 PLACE DECIMALS ± .04

		DATE
DWN	Thomas Formby	3-4-77
CHK	Gary Simms (B)	4/15/77
ITEM		5-11-77
QA		5/19/77
APVD		
OTHER		
OTHER		9/1/77

TEXAS INSTRUMENTS INCORPORATED
Equipment Group Dallas, Texas

FAN ASSEMBLY, PDET

SIZE	CODE IDENT NO	DRAWING NO
C	96214	999232

SCALE 1/1

999232 C

30

LM

LIST OF MATERIALS

Assembly

FAN ASSEMBLY PORTABLE MEMORY TERM (PMT)

Part No. 0999232-0001 Rev. C

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0972486-0003	MOTOR,FAN 12V DC	
0001A				B1	
0002	00001.000	EA	0996515-0001	FAN BLADE,3-IN X.078 DIA HUB BORE	
0003	00003.000	EA	0972104-0001	CONTACT ELEC-LOCKING,WIRE-TO.025 SQ POST	
0004	00001.000	EA	0972484-0003	CONNECTOR HOUSING 3 CONTACT	
0004A				P302	
0004B				ITEMS 3 AND 4 CAN ONLY BE	
0004C				USED TOGETHER	
0005	00000.000	EA	0972482-0006	CONTACT,ELECTRICAL,CRIMP	
0006	00000.000	EA	0772707-0034	RECEPTACLE,TERMINAL- 3 CAVITIES	
0006A				ITEMS 5 AND 6 MAY BE USED	
0006B				AS ALTERNATES TO ITEMS 3	
0006C				AND 4 ITEMS 5 AND 6 MAY	
0006D				ONLY BE USED TOGETHER	
0007	00000.030	FT	0417177-0004	INSUL SLVG,.125 ID ELEC-HT SHRINKABLE	

A 999241

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
2200060	8738	A	CN423840 J. Piercey (1) ADDED -2 THRU -7 PARTS	7/8/77	[signature]
		B	CN424085 L. Piercey (1) REDRAWN WITH CHANGES -- WAS "KEYBOARD ASSEMBLY, FULL ASCII PDET"	8-1-77	[signature]

PART NUMBER	DESCRIPTION
0999241-0007	KEYBOARD ASSY, PMT - KATA KANA
0999241-0006	PMT, GERMAN
0999241-0005	PMT, SWEDEN/FINLAND
0999241-0004	PMT, DENMARK/NORWAY
0999241-0003	PMT, FRANCE/BELGIUM
0999241-0002	PMT, UNITED KINGDOM
0999241-0001	KEYBOARD ASSY, PMT

REV STATUS OF SHEETS	
REV	B B
SHEET	1 2

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ANGLES ±1° 3 PLACE DECIMAL ± .010 2 PLACE DECIMAL ± .02

IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY

INTERPRET DWG IN ACCORDANCE WITH MIL STD 100

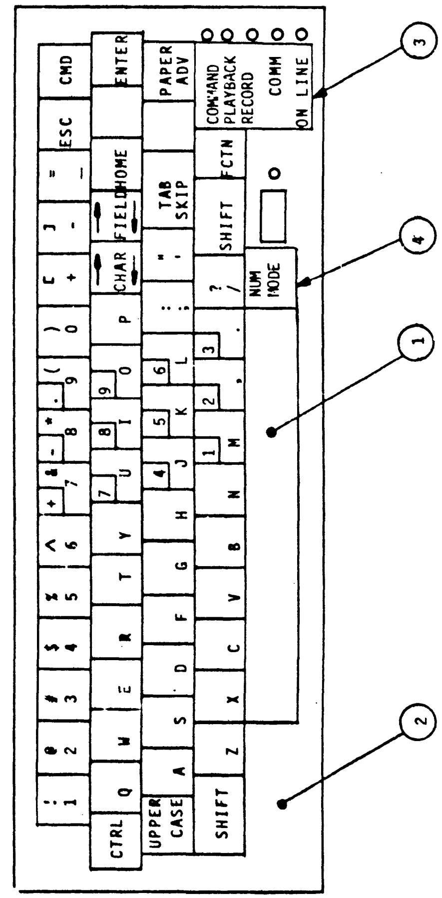
DWN MR WOLF 3/7/77
CHK [signature] 3-9-77
ENG [signature] 3-8-77
QA [signature] 3-10-77
[signature] 3-8-77
[signature] 3/9/77
RELEASE [signature] 3/10/77

TEXAS INSTRUMENTS INCORPORATED
Equipment Group Dallas, Texas

KEYBOARD ASSEMBLY, PORTABLE MEMORY TERMINAL

SIZE	CODE IDENT NO	DRAWING NO
A	96214	999241
SCALE NONE		SHEET 1 of 2

TI 0923-C   30   FILMED LM



NOTES:
1 INSTALL KEYBOARD KITS (ITEM 6 OR 7) PER DRAWING NO. 2200047 WHERE REQUIRED.

TEXAS INSTRUMENTS INCORPORATED DIGITAL SYSTEMS DIVISION HOUSTON TEXAS

SIZE	DRAWING NO	REV
A	999241	B
	SHEET 2	

FILMED

LIST OF MATERIALS

Assembly					Part No.	Rev.
KEYBOARD ASSY, PMT					0999241-0001	B
Item No.	Quantity		TI Part No.	Description		Remarks
0001	00001.000	EA	0999224-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT		for all except –0007
0002	00001.000	EA	0999226-0003	BEZEL,KEYBOARD,PMT		
0003	00001.000	EA	2200050-0001	LABEL,TERMINAL STATUS		
0004	00001.000	EA	2200057-0001	LABEL,NUMERIC MODE		
0005	00000.000	EA	2200048-0001	KEYBOARD,UNENCODED W/KEYTOPS,PMT		
0005A				ITEM 5 MAY BE USED AS AN		
0005B				ALTERNATE FOR ITEM 1		
KEYBOARD ASSY, PMT, UNITED KINGDOM					0999241-0002	B
0001	00001.000	EA	0999224-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT		
0001A				ITEMS 1 AND 6 SHALL ONLY		
0001B				BE USED TOGETHER		
0002	00001.000	EA	0999226-0003	BEZEL,KEYBOARD,PMT		
0003	00001.000	EA	2200050-0001	LABEL,TERMINAL STATUS		
0004	00001.000	EA	2200057-0001	LABEL,NUMERIC MODE		
0005	00000.000	EA	2200048-0001	KEYBOARD,UNENCODED W/KEYTOPS,PMT		
0005A				ITEMS 5 AND 7 SHALL ONLY		
0005B				BE USED TOGETHER		
0006	00001.000	EA	2200047-0001	KEY MOD KIT,INTL-PMT KEYBD-U.K.		
0007	00000.000	EA	2200047-0011	KEY MOD KIT,INTL-PMT KEYBD-U.K.		
0007A				ITEMS 5 AND 7 MAY BE USED		
0007B				AS ALTERNATES TO ITEMS 1		
0007C				AND 6		
KEYBOARD ASSY, PMT, FRANCE/BELGIUM					0999241-0003	B
0001	00001.000	EA	0999224-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT		
0001A				ITEMS 1 AND 6 SHALL ONLY		
0001B				BE USED TOGETHER		
0002	00001.000	EA	0999226-0003	BEZEL,KEYBOARD,PMT		
0003	00001.000	EA	2200050-0001	LABEL,TERMINAL STATUS		
0004	00001.000	EA	2200057-0001	LABEL,NUMERIC MODE		
0005	00000.000	EA	2200048-0001	KEYBOARD,UNENCODED W/KEYTOPS,PMT		
0005A				ITEMS 5 AND 7 SHALL ONLY		
0005B				BE USED TOGETHER		
0006	00001.000	EA	2200047-0002	KEY MOD KIT,INTL-PMT KYBD-FRANCE/BELGIUM		
0007	00000.000	EA	2200047-0012	KEY MOD KIT,INTL-PMT KYBD-FRANCE/BELGIUM		
0007A				ITEMS 5 AND 7 MAY BE USED		
0007B				AS ALTERNATES TO ITEMS 1		
0007C				AND 6		

LIST OF MATERIALS

Assembly	Part No.	Rev.
KEYBOARD ASSY, PMT, DENMARK/NORWAY	0999241-0004	B

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999224-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT	
0001A				ITEMS 1 AND 6 SHALL ONLY	
0001B				BE USED TOGETHER	
0002	00001.000	EA	0999226-0003	BEZEL,KEYBOARD,PMT	
0003	00001.000	EA	2200050-0001	LABEL,TERMINAL STATUS	
0004	00001.000	EA	2200057-0001	LABEL,NUMERIC MODE	
0005	00000.000	EA	2200048-0001	KEYBOARD,UNENCODED W/KEYTOPS,PMT	
0005A				ITEMS 5 AND 7 SHALL ONLY	
0005B				BE USED TOGETHER	
0006	00001.000	EA	2200047-0003	KEY MOD KIT,INTL-PMT KEYBD-DEN/NOR	
0007	00000.000	EA	2200047-0013	KEY MOD KIT,INTL-PMT KEYBD-DEN/NOR	
0007A				ITEMS 5 AND 7 MAY BE USED	
0007B				AS ALTERNATES TO ITEMS 1	
0007C				AND 6	

KEYBOARD ASSY, PMT, SWEDEN/FINLAND					0999241-0005 B
0001	00001.000	EA	0999224-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT	
0001A				ITEMS 1 AND 6 SHALL ONLY	
0001B				BE USED TOGETHER	
0002	00001.000	EA	0999226-0003	BEZEL,KEYBOARD,PMT	
0003	00001.000	EA	2200050-0001	LABEL,TERMINAL STATUS	
0004	00001.000	EA	2200057-0001	LABEL,NUMERIC MODE	
0005	00000.000	EA	2200048-0001	KEYBOARD,UNENCODED W/KEYTOPS,PMT	
0005A				ITEMS 5 AND 7 SHALL ONLY	
0005B				BE USED TOGETHER	
0006	00001.000	EA	2200047-0004	KEY MOD KIT,INTL-PMT KEYBD-SWED/FIN	
0007	00000.000	EA	2200047-0014	KEY MOD KIT,INTL-PMT KEYBD-SWED/FIN	
0007A				ITEMS 5 AND 7 MAY BE USED	
0007B				AS ALTERNATES TO ITEMS 1	
0007C				AND 6	

KEYBOARD ASSY, PMT, GERMANY					0999241-0006 B
0001	00001.000	EA	0999224-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT	
0001A				ITEMS 1 AND 6 SHALL ONLY	
0001B				BE USED TOGETHER	
0002	00001.000	EA	0999226-0003	BEZEL,KEYBOARD,PMT	
0003	00001.000	EA	2200050-0001	LABEL,TERMINAL STATUS	
0004	00001.000	EA	2200057-0001	LABEL,NUMERIC MODE	
0005	00000.000	EA	2200048-0001	KEYBOARD,UNENCODED W/KEYTOPS,PMT	
0005A				ITEMS 5 AND 7 SHALL ONLY	
0005B				BE USED TOGETHER	
0006	00001.000	EA	2200047-0005	KEY MOD KIT,INTL-PMT KEYBD-GERMANY	
0007	00000.000	EA	2200047-0015	KEY MOD KIT,INTL-PMT KEYBD-GERMANY	
0007A				ITEMS 5 AND 7 MAY BE USED	
0007B				AS ALTERNATES TO ITEMS 1	
0007C				AND 6	

LIST OF MATERIALS

Assembly	Part No.	Rev.
KEYBOARD ASSY, PMT, KATAKANA	0999241-0007	B

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	2200058-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT,KATAKAN	
0002	00001.000	EA	0999243-0001	BEZEL,KEYBOARD,PMT,KATA KANA	
0003	00001.000	EA	2200050-0001	LABEL,TERMINAL STATUS	
0004	00001.000	EA	2200057-0001	LABEL,NUMERIC MODE	
0005	00000.000	EA	2200059-0001	KEYBOARD,UNENCODED,W/KEYTOPS,PMT,KATAKAN	
0005A				ITEM 5 MAY BE USED AS AN	
0005B				ALTERNATE TO ITEM 1	

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN 421782 (D) (1)REVISED PER EXTENSIVE ENGINEERING CHANGE (2) UPDATED REVISION LEVEL BLOCK	9-12-77	
B	CN 421786 (C) (1) REVISED PER EXTENSIVE ENGINEERING CHANGE (2) UPDATED REVISION LEVEL BLOCK	12-1-77	
C	CN 429244 (C) (1) ON-1, 2, 3, CHG ITEM 172, R10 WAS R11, ITEM 182 R11 WAS R10 (2) UPDATED REVISION LEVEL BLOCK	12-1-77	

NOTES: UNLESS OTHERWISE SPECIFIED:

1. CLINCHING COMPONENT LEADS OPTIONAL.
2. DONOT SOLDER ON COMPONENT SIDE.
3. MASK TOOLING HOLES ON BOTH SIDES OF BOARD TO PREVENT SOLDER FROM ENTERING HOLES.
4. MOUNTING HOLES FOR SNAP-IN SAFETY COVER (PN 937304); INSTALL AFTER TEST.
5. ZZZ INDICATES COMPONENTS NOT USED.
6. MAX LEAD LEGNTH FROM CONDUCTOR SIDE OF BOARD IS .075.
7. J301 (ITEM 22) MOUNTED FLUSH ON PWB (ITEM 1); SECURE TO PWB USING ITEM 274, OR ALT ITEM 284
8. INSTALL WITH TIN PLATED CONTACT END OF CABLE IN BOARD.
9. ~~SOLDER CABLE SHIELD TO J301 CENTER PIN~~ ~~CHASSIS GROUND~~
10. R122 ITEM 106 SELECTED AT UNIT TEST; (261, 316, 365, 432, 511, 619, 732, 887, 1100 OR 1400 OHMS.)
11. U10, U12, U14 & U30 USED FOR OPTIONS, INSTALLED AT UNIT CONFIGURATION; IF USED SECURE AS PER NOTE 31.
12. MOUNT DISC (ITEM 239) TO SUPPORT ITEM 259 USING SILICONE (RTV) (ITEM 280) 3 POSTS ON SUPPORT USED TO CENTER DISC. DISC SHOULD NOT TOUCH POSTS ON SUPPORT.
13. INSTALL JUMPER PLUG (ITEM 257) ON PINS (ITEM 229) AT (E311 & E314), (E312 & E315), (E317 & E318), (E320 & E321), (E325 & E326), (E329 & E330), (E382 & E383) AFTER TEST
14. IF THE WRAPS (ITEM 274) ARE USED, TIE KNOT SHOULD BE POSITIONED ON THE COMPONENT SIDE OF THE PWB (ITEM 1) (SEE VIEW H-H ALTERNATE)
15. SOLDER WIRE TO HOLE IN GROUND PLANE ON PWB (E381).
16. INSTALL JUMPERS (ITEM 258) BETWEEN (E360 & E361) AND (E363 & E364). 115V POWER SUPPLY.
17. INSTALL FUSE CLIP WITH END TANGS TO OUTSIDE OF FUSE POSITION.
18. T301 LEADS SHALL BE RESTRAINED AS NECESSARY USING EXISTING TIE-WRAPS.
19. POT ADJUSTMENT SHOULD FACE EDGE OF PC BOARD. SECURE TO PWB WITH ITEM 284 ALONGSIDE OF FACING EDGE OF BOARD AND ACCESSIBLE END.
20. TIGHTEN SCREWS ON Q311 HEATSINK TO 6 IN-LBS, TIGHTEN ALL OTHER SCREWS TO 3 IN-LBS.
21. CRYSTAL Y1 (ITEM 231) IS TO BE INSTALLED SUCH THAT THE CRYSTAL CASE IS .030 (MIN) FROM THE NEAREST ETCH RUN.
22. JUMPERS INSTALLED AT UNIT CONFIGURATION IF REQUIRED.
23. ITEMS 102, 103, 104, 105, 152, 153 & 154 TO BE INSTALLED WITH THE CLEARENCE OF .020 (MIN) & .120 (MAX) BETWEEN COMPONENT BODY AND PWB.
24. MAXIMUM INSTALLED HEIGHT ON C323, C324, C328, C329 (ITEM 67) IS 0.87.
25. SEAL THREADS ON ITEM 269 PER PROCESS 4
26. STAMP OR MARK SITE CODE IN APPROXIMATE LOCATION INDICATED. THE CODE WILL INDICATE MONTH YEAR AND SITE OF MANUFACTURER AS FOLLOWS:

    SITE: 1- HOUSTON, 2- AUSTIN
    YEAR: LAST DIGIT
    MONTH: 01-09, A-C

    EXAMPLE: MAY, 1976 HOUSTON - CODE# 056A
27. INSTALL SAFETY GROUND WIRE (ITEM 277) AS FOLLOWS:
    BETWEEN J301 CENTER PIN AND E355,
    BETWEEN J301 CENTER PIN AND E349,
    ADD RTV AS NEEDED.
28. STACK C325 AND C326 HORIZONTALLY ON TOP OF T302. SLEEVE ALL FOUR LEADS WITH ITEM 283. INSTALL ONE LEAD OF C326 IN HOLE NEAREST SILK SCREEN "C325". INSTALL SECOND LEAD OF C325 IN HOLE JUST BELOW E355. INSTALL ONE LEAD OF C326 IN HOLE JUST ABOVE E355 AND SECOND IN HOLE JUST ABOVE AND TO THE RIGHT OF R334. USE .1V (ITEM 280) AS NEEDED TO SECURE COMPONENTS.
29. INSTALL JUMPER (WHITE TEFLON WIRE ITEM 278) BETWEEN E388 & E389 AND E390 & E391.
30. SECURE WITH ITEM 280 AT END OPPISITE LEADS OR ALTERNATE (ITEM 274).
31. SECURE DEVICES TO SOCKETS WITH ITEM 280 AT BOTH ENDS OR WITH ALTERNATE ITEM 274. (SEE VIEW P-P, SH 6).
32. SECURE TO PWB WITH 1 INCH MIN BEAD OF ITEM 280 ALONG EACH ACCESSABLE SIDE AND BETWEEN ADJACENT CAPACITORS (SEE VIEW H-H, SH 5) OR USE ALTERNATE (ITEM 274).
33. IF ITEM 274 (TIE WRAPS) IS USED FOR NOTES 7, 30, 31 AND/OR 32, DO NOT INSTALL UNTIL AFTER TEST. ALSO, IF ITEM 280 (RTV) IS USED FOR NOTES 7, 28, 30, 31, & 32, DO NOT INSTALL UNTIL AFTER TEST
34. C 356, CR354 AND CR355 ARE NOT INSTALLED ON DOMESTIC BOARD. INSTALL JUMPER WIRES (ITEM 278) IN PLACE OF THESE COMPONENTS APPLY SILICON GREASE (ITEM 306) TO BACK SIDE OF TRANSISTOR BEFORE INSTALLATION

(NOTES CONT SHT 6)

4	SEAL	650-01	15	USE ITEM 282	
3	SLDR	127-01	00		
2	SLDR	126-02	00		
1	MARK	100-02	21	HEIGHT .09, COLOR BLK	
MFG NO	IDENT	TYPE	NO	ADDITIONAL	NOTES
	PROCESS			CLASSIFICATION	

TEST PROC (937301)	*	*	*	*
ASSEMBLY (937300)	*	A	B	C
SCHEMATIC (937298)	*	*	A	A
PWB (937299)	*	*	C	C

REVISION LEVEL

937300-B003	TERMINAL ELECTRONICS, 743/745 W/CCITT MODEM
937300-B002	TERMINAL ELECTRONICS, 743-EIA/TTY
937300-B001	TERMINAL ELECTRONICS, 743/745 W/MODEM
937300-D003	TERMINAL ELECTRONICS, 743/745 W/CCITT MODEM
937300-C002	TERMINAL ELECTRONICS, 743-EIA/TTY
937300-C001	TERMINAL ELECTRONICS, 743/745 W/MODEM
PART NUMBER	DESCRIPTION

REV STATUS: REV C B B B B B
OF SHEETS: SHEET 1 2 3 4 5 6

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°; 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-STD-100
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIA/CLMPS .010 TIM
- DIMENSIONAL LIMITS APPLY AFTER PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 / .129	+.004 −.001	.251 / .500	+.006 −.001
.501 / .750	+.008 −.001	.751 / 1.000	+.010 −.001
1.001 / 1.500	+.012 −.001	1.501 / 2.000	+.014 −.001

8732

NEXT ASSY USED ON
APPLICATION

DRN C Clapp 6-12-77
CHK [illegible] 7-13-77
ENGR [illegible]
PM [illegible]
QA [illegible] 6-23-77
MFG [illegible] 7-19-77

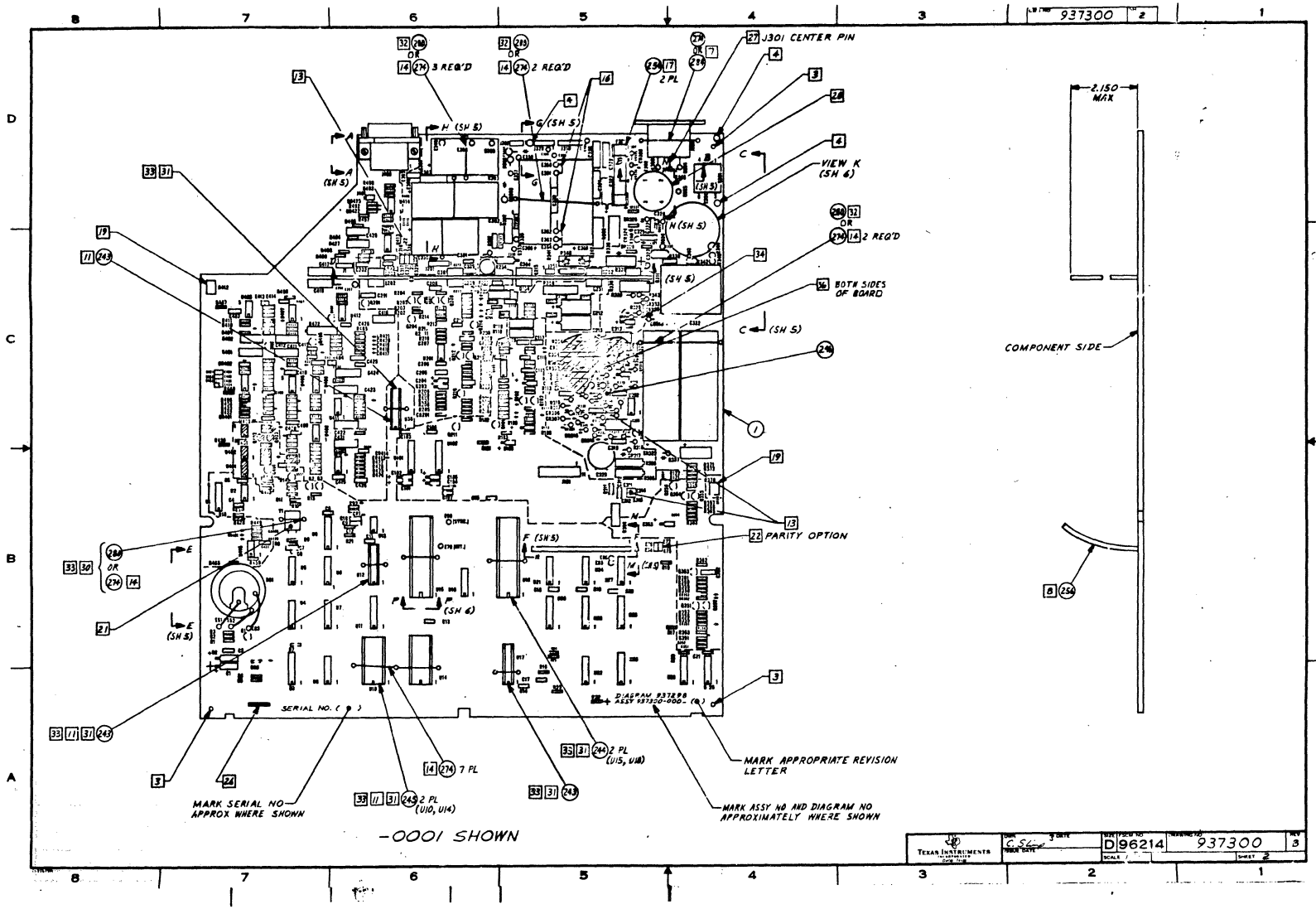
TEXAS INSTRUMENTS INCORPORATED, DALLAS, TEXAS

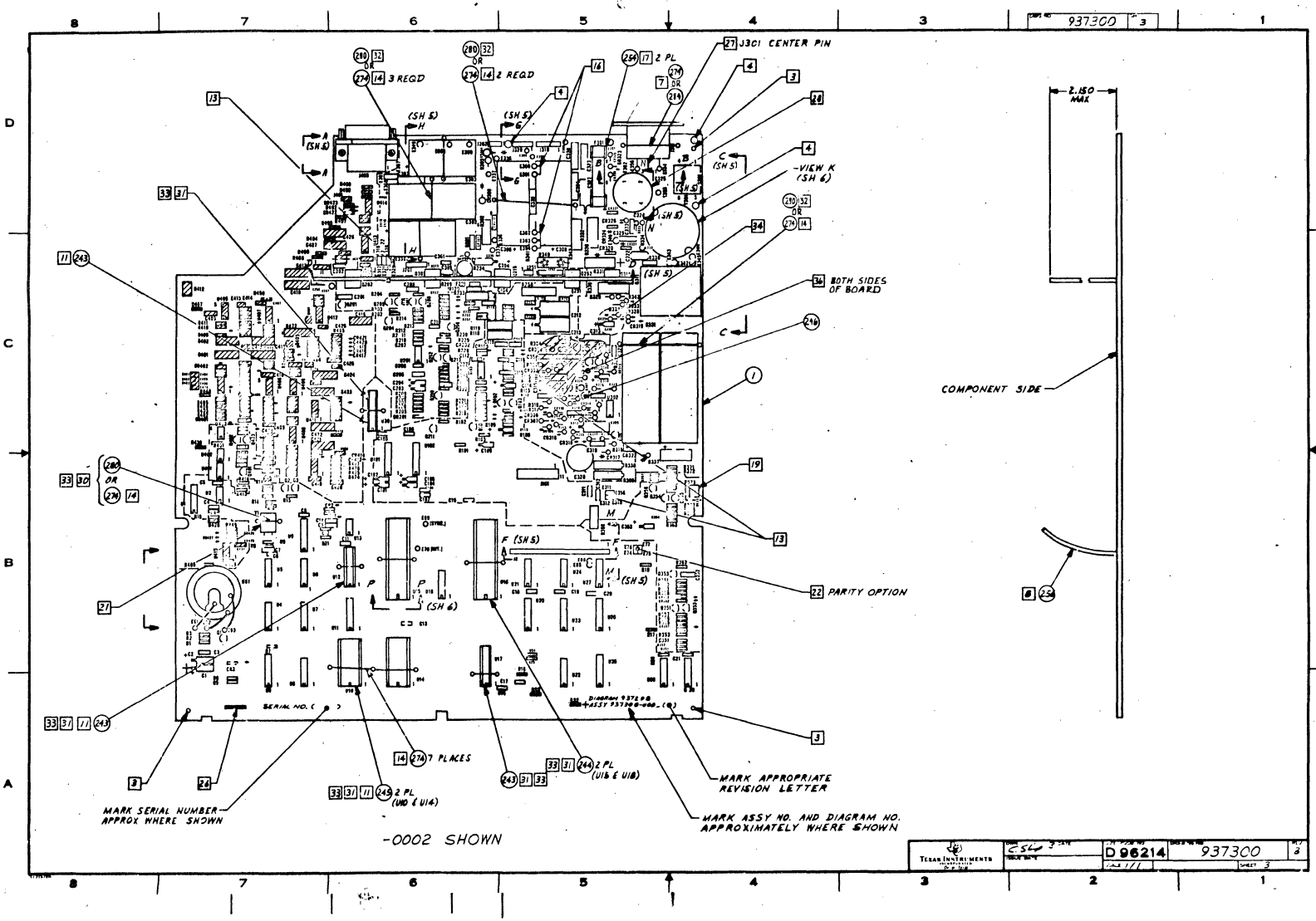
TERMINAL ELECTRONICS

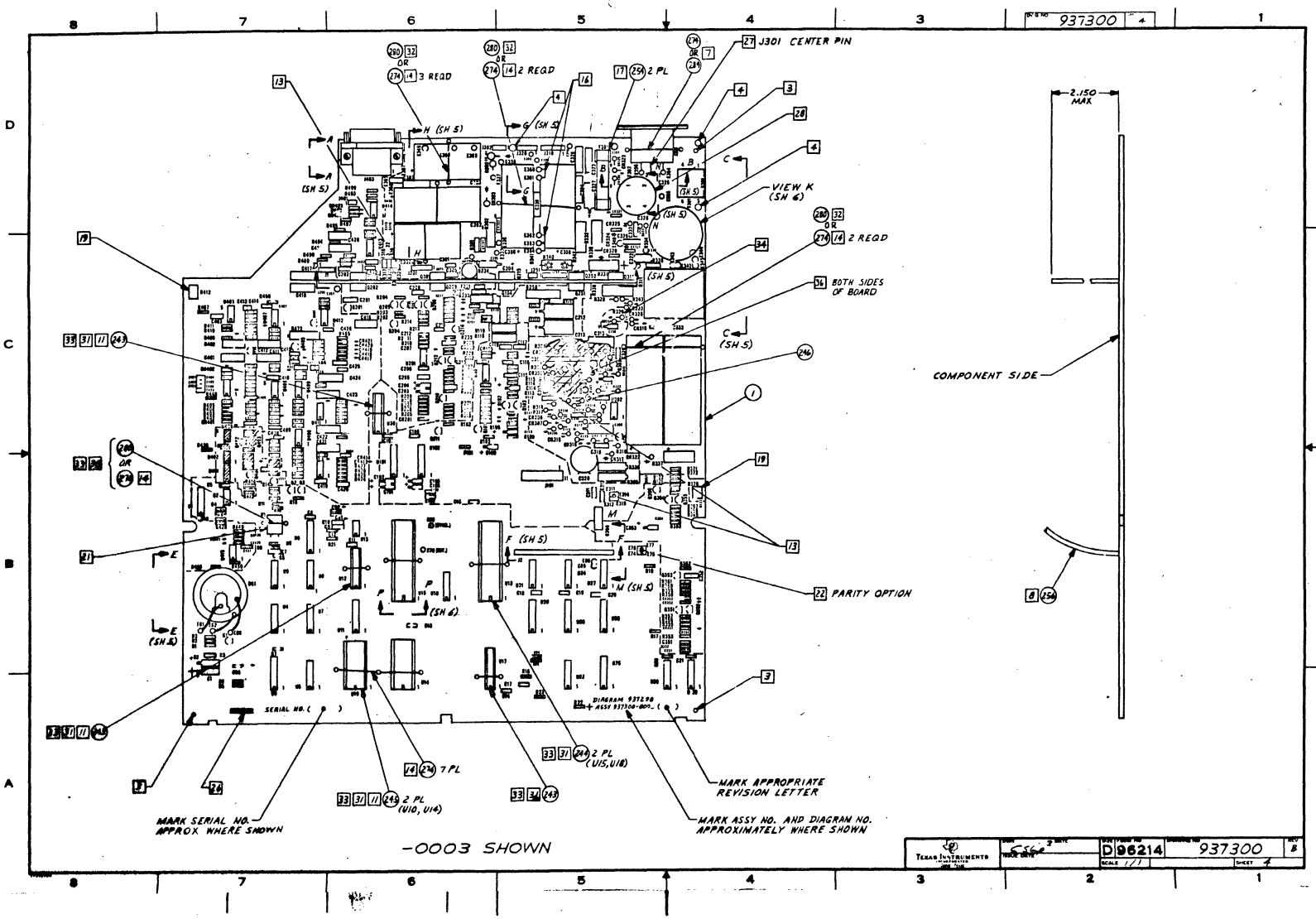
SIZE D | FSCM NO 96214 | DRAWING NO 937300

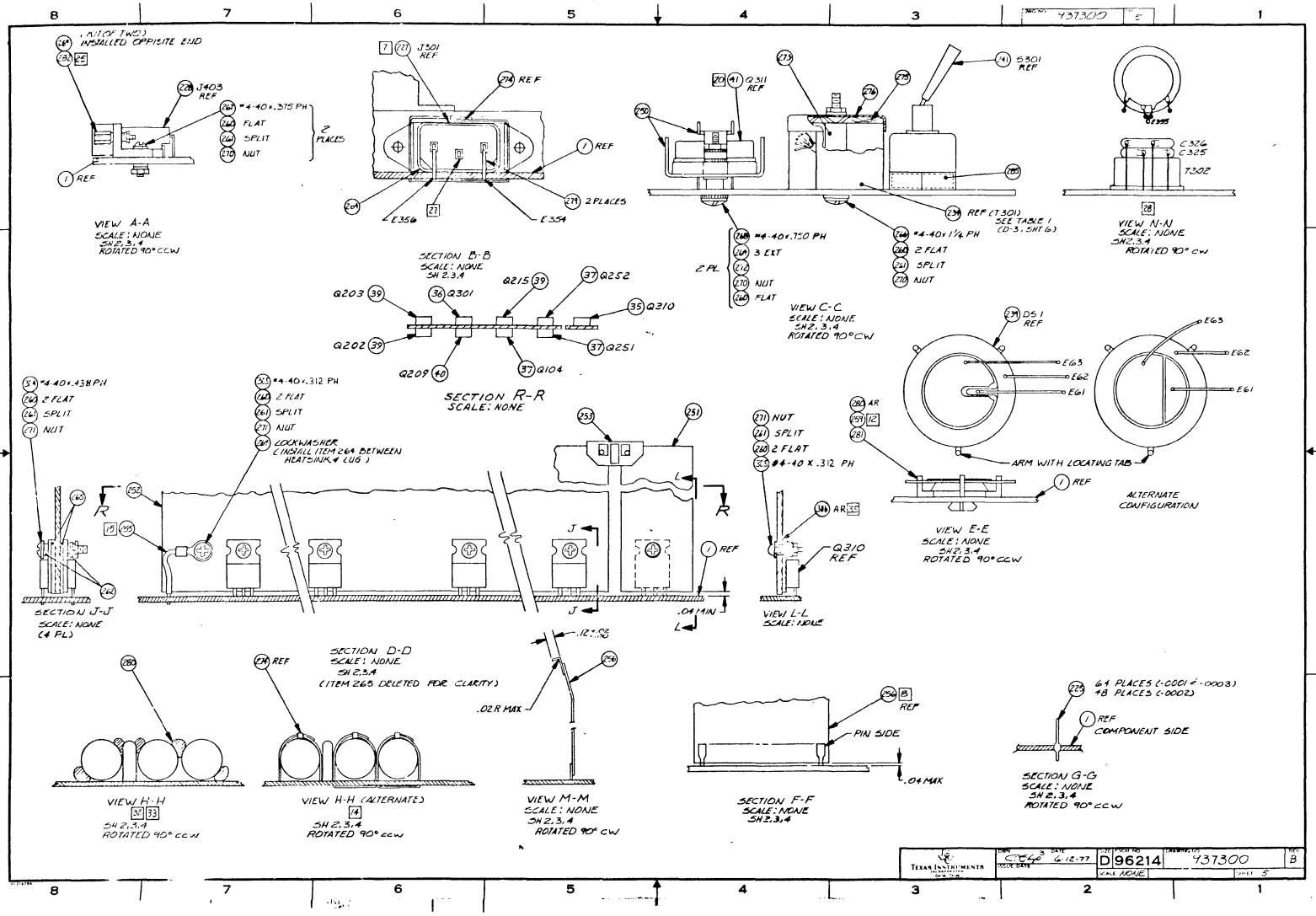
SCALE 1/1 | SHEET 1 OF 6

8 7 6 5 4 32 3 2 LM * 1


937300
J301 CENTER PIN
3 REQ'D
2 REQ'D
2 PL
VIEW K (SH 6)
2 REQ'D
BOTH SIDES OF BOARD
PARITY OPTION
7 PL
2 PL (U15, U18)
2 PL (U10, U14)
MARK SERIAL NO APPROX WHERE SHOWN
MARK APPROPRIATE REVISION LETTER
MARK ASSY NO AND DIAGRAM NO APPROXIMATELY WHERE SHOWN
SERIAL NO. ( )
-0001 SHOWN
2.150 MAX
COMPONENT SIDE
D96214
937300


937300 A 3
27 J3C1 CENTER PIN
2 PL
3 REQD
2 REQD
(SH 5)
-VIEW K (SH 6)
BOTH SIDES OF BOARD
2.150 MAX
COMPONENT SIDE
PARITY OPTION
7 PLACES
2 PL (U16 & U14)
2 PL (U18 & U18)
MARK APPROPRIATE REVISION LETTER
MARK SERIAL NUMBER APPROX WHERE SHOWN
MARK ASSY NO. AND DIAGRAM NO. APPROXIMATELY WHERE SHOWN
-0002 SHOWN
TEXAS INSTRUMENTS
D 96214
937300
SHEET 3


937300
27 J301 CENTER PIN
280 32 OR 274 14 3 REQD
280 32 OR 274 14 2 REQD
77 254 2 PL
VIEW K (SH 6)
280 32 OR 274 14 2 REQD
56 BOTH SIDES OF BOARD
22 PARITY OPTION
14 24 7 PL
33 37 11 249 2 PL (U10, U14)
33 37 244 2 PL (U15, U18)
53 54 243
MARK SERIAL NO. APPROX WHERE SHOWN
MARK APPROPRIATE REVISION LETTER
MARK ASSY NO. AND DIAGRAM NO. APPROXIMATELY WHERE SHOWN
2.150 MAX
COMPONENT SIDE
-0003 SHOWN
TEXAS INSTRUMENTS
D96214
937300
B


VIEW A-A
SCALE: NONE
SH 2,3,4
ROTATED 90° CCW
SECTION B-B
SCALE: NONE
SH 2,3,4
SECTION R-R
SCALE: NONE
VIEW C-C
SCALE: NONE
SH 2,3,4
ROTATED 90° CW
VIEW N-N
SCALE: NONE
SH 2,3,4
ROTATED 90° CW
VIEW E-E
SCALE: NONE
SH 2,3,4
ROTATED 90° CCW
ALTERNATE CONFIGURATION
SECTION J-J
SCALE: NONE
(4 PL)
VIEW L-L
SCALE: NONE
SECTION D-D
SCALE: NONE
SH 2,3,4
(ITEM 265 DELETED FOR CLARITY)
VIEW H-H
SH 2,3,4
ROTATED 90° CCW
VIEW H-H (ALTERNATE)
SH 2,3,4
ROTATED 90° CCW
VIEW M-M
SCALE: NONE
SH 2,3,4
ROTATED 90° CW
SECTION F-F
SCALE: NONE
SH 2,3,4
SECTION G-G
SCALE: NONE
SH 2,3,4
ROTATED 90° CCW
COMPONENT SIDE
PIN SIDE
ARM WITH LOCATING TAB
737300
D96214
SCALE NONE

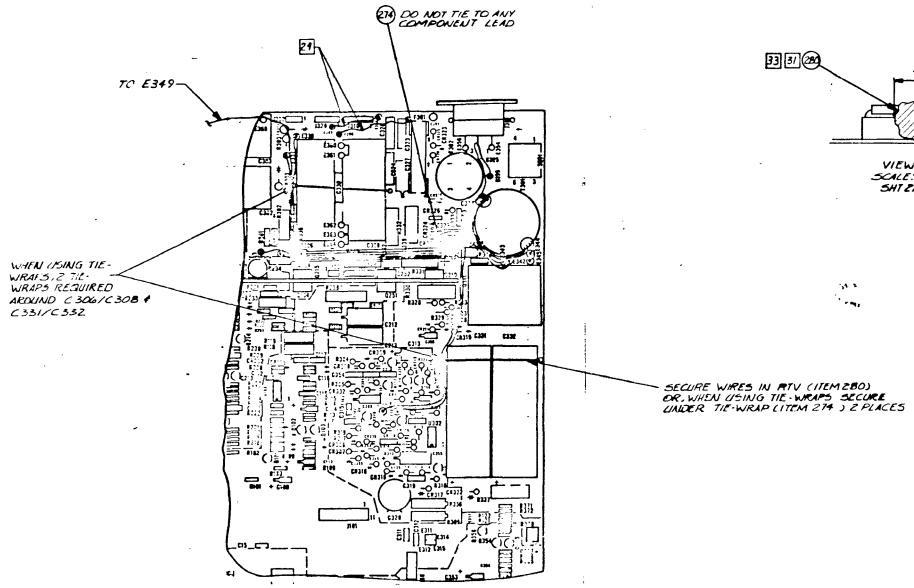
DWG NO 937300 REV G

NOTES CONT:

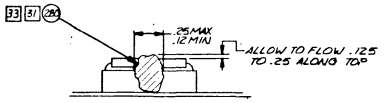
35 APPLY SILICON GREASE (ITEM 306) TO BACK SIDE OF TRANSISTOR BEFORE INSTALLATION.

36 CLEAN DESIGNATED AREAS WITH ALCOHOL, DRY WITH HOT AIR, AND CONFORMAL COAT WITH RTV 3140 (ITEM 280). THIS OPERATION TO BE PERFORMED AFTER TEST.

37 WHEN USING A REV 'A' PCB (1337299) THE FOLLOWING DIFFERENCES SHOULD BE NOTED:
(1) R373 IS LABLED R 273 ON THE SILKSCREEN
(2) R409 IS LABLED R 323 ON THE SILKSCREEN
(3) ON THE SILKSCREEN FOR J301, PINS 4 & 6 SHOULD BE REVERSED
(4) THE FOLLOWING CAPS SHOULD BE INSTALLED WITH LEADS FACING THE J-03 SIDE OF PCB: C301, C302, C303. POLARITY SHOULD BE PER SHT 2 OF THIS DRAWING
(5) E 257, E 258, C356, CR359, AND CR355 ARE NOT ON THE REV 'A' PCB AND ALL INSTRUCTIONS CONCERNING THESE PARTS SHOULD BE IGNORED



VIEW K
SCALE: NONE
SHT 2, 3, 4
WIRE ROUTING VIEW (T301)
FOR ALL ORDER NO (SEE TABLE I, BELOW)



VIEW P-P
SCALE: NONE
SHT 2, 3, 4

TABLE I

NO	WIRE COLOR	FROM	TO
1	BROWN	T301-1	E340
2	RED	-2	E339
3	ORANGE	-3	E344
4	YELLOW	-4	E345
5	GREEN	-5	E302
6	BLUE	-6	E301
7	VIOLET	-7	E336
8	GRAY	-8	E333
9	WHITE	-9	E335
10	BLACK	-10	E332
11	WHT/BRN	-11	E337
12	WHT/RED	-12	E338
13	WHT/GRN	-13	E342
14	WHT/YEL	T301-14	E343
15		J301-2	E349

TEXAS INSTRUMENTS | DRWN C. Schamp DATE 6-12-77 | CHK DATE | DWG NO D96214 | SIZE | REVISION 937300 | REV 3 | SHEET 1/1 | SHEET NO

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0937299-0001	PWB, TERMINAL ELECTRONICS, 743/745	
0002	00001.000	EA	0222222-7109	NETWORK SN74109N	
0002A				U003	
0003	00002.000	EA	0222222-7157	NETWORK SN74157N	
0003A				UQ20 U23	
0004	00001.000	EA	0222222-7174	NETWORK SN74174N	
0004A				U026	
0005	00002.000	EA	0222222-7175	NETWORK SN74175N	
0005A				U009 U025	
0006	00002.000	EA	0222222-7404	NETWORK SN7404N	
0006A				U005 U021	
0007	00002.000	EA	0222222-7406	NETWORK SN7406N	
0007A				U024 U027	
0008	00001.000	EA	0222222-7492	NETWORK-SN7492N	
0008A				U028	
0009	00001.000	EA	0222222-7493	NETWORK-SN7493N	
0009A				U029	
0010	00002.000	EA	0222224-2741	NETWORK SN72741P OPERATIONAL AMP	
0010A				U103 U302	
0011	00002.000	EA	0222225-2311	NETWORK LM311N,SN72311P	for-0001 & -0003
0011	00001.000	EA	0222225-2311	NETWORK LM311N,SN72311P	for -0002
0011A				U201	
0012	00001.000	EA	0972788-0001	NETWORK,SN74LS11,POSITIVE AND GATE	
0012A				U008	
0013	00001.000	EA	0244715-7404	NETWORK,SN74L04N	
0013A				U004	
0014	00001.000	EA	0537948-0001	NETWORK SN75150P	
0014A				U002	
0015	00001.000	EA	0944472-0001	NETWORK,TMS-8080 MICRO PROCESSOR	
0015A				U015	
0016	00001.000	EA	0972450-0002	NETWORK,SN75189AN/MC1489AL QUAD LINE RCR	
0016A				U001	
0017	00001.000	EA	0972452-0001	NETWORK,TMS4036NL 64WORD X 8BIT ST RAM	
0017A				U017	
0018	00011.000	EA	0996034-0002	IC,RC4558P OPERATIONAL AMPLIFIER	for-0001 & -0003
0018A				U404 THRU U411 U413 U414	
0018B				U415	for -0001 only
0019	00001.000	EA	0972469-0002	NETWORK TMS5504,I/O AND TIMER	
0019A				U018	
0020	00001.000	EA	0996093-0001	NETWORK,SN75350P,DUAL NAND DRIVER	
0020A				U013	

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0021	00002.000	EA	0972900-7432	NETWORK SN74LS32N	
0021A				U006 U007	
0022A				U101 U102	
0023	00001.000	EA	0972141-0062	NETWORK,RESISTOR 6.8K OHMS 2% 14 PIN	
0023A				U016	
0024	00001.000	EA	0972141-0057	NETWORK,RES. 4.7 K OHM 2 % 14 PIN DIP	
0024A				U022	
0025	00001.000	EA	0972900-7138	NETWORK SN74LS138N	
0025A				U011	
0028	00001.000	EA	0971000-0001	IC,OPTICALLY COUPLED ISOLATOR	for -0002 only
0028A				U402	
0029	00001.000	EA	0972625-0001	NETWORK OCI449 OPTICALLY COUPLED	
0029A				U403	
0030	00001.000	EA	0972018-0004	TRANSISTOR,E176-FET P CHAN SILICON JCT	for -0003 only
0030A				Q405	
0031	00001.000	EA	0772116-0001	TRANSISTOR TIS75	
0031A				Q102	
0032	00005.000	EA	0800523-0001	TRANSISTOR A5T2907 PNP SILICON	
0032A				Q103 Q213 Q214 Q303 Q305	
0033	00024.000	EA	0972057-0001	TRANSISTOR-A5T2222 NPN SILICON	for -0001
0033A				Q001 Q002 Q003 Q101 Q205	
0033B				Q206 Q207 Q210 Q211 Q212	
0033C				Q302 Q304 Q306 Q308 Q309	
0033D				Q351 THRU Q356 Q406 Q407	
0033E				Q551	
0033	00023.000	EA	0972057-0001	TRANSISTOR-A5T2222 NPN SILICON	for -0002
0033A				Q001 Q002 Q003 Q101 Q205	
0033B				Q206 Q207 Q210 Q211 Q212	
0033C				Q302 Q304 Q306 Q308 Q309	
0033D				Q351 THRU Q356 Q401 Q403	
0033	00023.000	EA	0972057-0001	TRANSISTOR-A5T2222 NPN SILICON	for -0003
0033A				Q001 Q002 Q003 Q101 Q205	
0033B				Q206 Q207 Q210 Q211 Q212	
0033C				Q302 Q304 Q306 Q308 Q309	
0033D				Q351 THRU Q356 Q406	
0034	00003.000	EA	0972455-0004	TRANSISTOR,SILICON-P-N-P,A5T4029	
0034A				Q201 Q204 Q208	
0035	00001.000	EA	0972465-0002	THYRISTORS,TRIODE P-N-P-N SILICON TIC106	
0035A				Q310	
0036	00001.000	EA	0972499-0001	NETWORK,LM320T-5.0/MC7905CP,-5 VOLT	
0036A				Q301	
0037	00003.000	EA	0972572-0002	TRANSISTOR,TIP121 SILICON N-P-N DARLNGTN	
0037A				Q104 Q251 Q252	

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0038	00001.000	EA	0972957-0001	TRANSISTOR,2N930A NPN LOW CUR AMP,TO-18	
0038A				Q307	
0039	00003.000	EA	0972962-0001	TRANSISTOR,TIP41B NPN,PLASTIC	
0039A				Q202 Q203 Q215	
0040	00001.000	EA	0972963-0001	TRANSISTOR,TIP42B PNP,PLASTIC	
0040A				Q209	
0041	00001.000	EA	0974759-0001	TRANSISTOR,FP1580,N-P-N SILICON	
0041A				Q311	
0042	00001.000	EA	0772637-0006	TRANSISTOR,TIS99	for -0002 only
0042A				Q402	
0046	00008.000	EA	0539468-0007	DIODE,1N4007 1AMP 1000PIV RECTIFIER	
0046A				CR315 CR320 CR323 CR324	
0046B				CR325 CR326 CR330 CR331	
0047	00003.000	EA	0996281-0001	DIODE UES 1101	
0047A				CR301 CR302 CR304	
0048	00005.000	EA	0972268-0002	DIODE 1N4934-1 AMP	
0048A				CR205 CR206 CR207 CR251	
0048B				CR252	
0049	00001.000	EA	0972268-0006	DIODE 1N4937 1 AMP	
0049A				CR321	
0050	00001.000	EA	0972454-0017	DIODE 1N714A 10V 5% SIL VOLT REG	
0050A				CR107	
0051	00001.000	EA	0972454-0005	DIODE,1N721A 20V 5% SIL VOLT REG	
0051A				CR203	
0052	00002.000	EA	0972460-0007	DIODE,SILICON,ZENER 1%	
0052A				CR104 CR351	
0053	00001.000	EA	0972608-0001	DIODE,1N5820 3AMP SCHOTTKY RECTIFIER	
0053A				CR303	
0054	00050.000	EA	0972932-0001	DIODE,1N914B SWITCHING 75V P1V 75MA 4NS	
0054A				CR001 CR002 CR003 CR103	
0054B				CR105 CR106 CR108 CR202	
0054C				CR204 CR306 THRU CR311	
0054D				CR313 CR314 CR316 CR318	for -0001
0054E				CR319 CR328 CR332 CR334	
0054F				CR335 CR336 CR352 CR353	
0054G				CR401 CR402 CR404 CR405	
0054H				CR406 CR408 THRU CR416	
0054J				CR418 CR419 CR420 CR421	
0054K				CR425 THRU CR429	

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0054	00027.000	EA	0972932-0001	DIODE,1N914B SWITCHING 75V PIV 75MA 4NS	
0054A				CR001 CR002 CR003 CR103	
0054B				CR105 CR106 CR108 CR202	
0054C				CR204 CR206 THRU CR311	for -0002
0054D				CR313 CR314 CR316 CR318	
0054E				CR319 CR328 CR332 CR334	
0054F				CR335 CR336 CR352 CR353	
0054	00046.000	EA	0972932-0001	DIODE,1N914B SWITCHING 75V PIV 75MA 4NS	
0054A				CR001 CR002 CR003 CR103	
0054B				CR105 CR106 CR108 CR202	
0054C				CR204 CR206 THRU CR311	
0054D				CR313 CR314 CR316 CR318	
0054E				CR319 CR328 CR332 CR334	for -0003
0054F				CR335 CR336 CR352 CR353	
0054G				CR401 CR402 CR404 CR405	
0054H				CR408 THRU CR416	
0054J				CR418 CR419 CR420 CR421	
0054K				CR424 CR429	
0055	00001.000	EA	0972934-0006	DIODE,1N751A 5.1 V 5% SIL VOLT REG	for-0001 & -0003
0055A				CR201	
0055	00002.000	EA	0972934-0006	DIODE,1N751A 5.1 V 5% SIL VOLT REG	for -0002
0055A				CR201 CR407	
0056	00001.000	EA	0972934-0008	DIODE,1N753A 6.2 V 5% SIL VOLT REG	for-0001 & -0003
0056A				CR317	
0057	00004.000	EA	0972934-0014	DIODE,IN759A 12.0 V 5% SIL VOLT REG	for-0001 & -0003
0057A				CR305 CR333 CR422 CR423	
0057	00002.000	EA	0972934-0014	DIODE,IN759A 12.0 V 5% SIL VOLT REG	for -0002
0057A				CR305 CR333	
0058	00002.000	EA	0972967-0001	DIODE 1N4152 SILICON SWITCHING	
0058A				CR101 CR102	
0059	00001.000	EA	0996281-0006	RECTIFIER,SS3892/UES1302,V(R)100V I(O)6A	
0059A				CR322	
0060	00001.000	EA	0972934-0001	DIODE,1N746A 3.3 V 5% SIL VOLT REG	for-0001 & -0003
0060A				CR417	
0060	00001.000	EA	0539468-0003	DIODE,1N4003 1AMP 200PIV RECTIFIER	for -0002
0060A				CR403	
0065	00001.000	EA	0419051-0102	CAP FIX FILM FOIL .001 UF 5% 200VDC	
0065A				C402	
0066	00005.000	EA	0410529-0103	CAP FIX CERAMIC .010 MF GMV 1 KV	
0066A				C307 C320 C325 C326 C330	

LIST OF MATERIALS

Assembly Part No. Rev.

Item No.	Quantity		TI Part No.	Description	Remarks
0067	00004.000	EA	0412645-0015	CAPACITOR,.1 UF +80,-20% 500VDC CER DIEL	
0067A				C323 C324 C328 C329	
0068	00001.000	EA	0418356-2344	CAP FIX 0.22 MF 50V 10% TANTALUM SOLID	
0068A				C204	
0069	00003.000	EA	0418356-2350	CAP FIX 0.47 MF 50V 10% TANTALUM SOLID	
0069A				C113 C203 C318	
0070	00037.000	EA	0972759-0021	CAP.. .047MFD,+80%-20%, 25VDC	for-0001 & -0003
0070A				C004 C005 C006 C008	
0070B				C011 THRU C015	
0070C				C017 THRU C021	
0070D				C103 C106 C107 C108 C110	
0070E				C111 C112 C116 C206 C207	
0070F				C210 C211 C351 C406 C407	
0070G				C408 C413 C414 C415 C425	
0070H				C426 C429 C430	
0070	00027.000	EA	0972759-0021	CAP.. .047MFD,+80%-20%, 25VDC	for -0002
0070A				C004 C005 C006 C008 C103	
0070B				C011 THRU C015 C106 C107	
0070C				C017 THRU C021 C108 C110	
0070D				C111 C112 C116 C206 C207	
0070E				C210 C211 C351	
0071	00002.000	EA	0972225-0510	CAPACITOR,1.0 UF 50V 20% CERAMIC	for-0001 & -0003
0071A				C305 C410	
0071	00001.000	EA	0972225-0510	CAPACITOR,1.0 UF 50V 20% CERAMIC	for -0002
0071A				C305	
0072	00012.000	EA	0972476-0001	CAP,.01UF,1% 50WVDC MINIMUM	for-0001 & -0003
0072A				C401 C411 C412 C416 C417	
0072B				C418 C421 C422 C423 C424	
0072C				C427 C428	
0073	00002.000	EA	0972601-0001	CAPACITOR 200UF 200WVDC 10%	
0073A				C306 C308	
0074	00001.000	EA	0972924-0002	CAP FIX TANT SOLID 56 MFD 10 % 6 VOLT	
0074A				C309	
0075	00001.000	EA	0972924-0006	CAP FIX TANT SOLID 39 MFD 10 % 10 VOLT	
0075A				C001	
0076	00001.000	EA	0972924-0010	CAP FIX TANT SOLID 22 MFD 10 % 15 VOLT	
0076A				C304	
0077	00001.000	EA	0972924-0011	CAP FIX TANT SOLID 68 MFD 10 % 15 VOLT	
0077A				C327	
0078	00001.000	EA	0972924-0014	CAP FIX TANT SOLID 15 MFD 10 % 20 VOLT	
0078A				C002	

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0079	00002.000	EA	0972924-0015	CAP FIX TANT SOLID 47 MFD 10 % 20 VOLT	
00794				C313 C355	
0080	00002.000	EA	0972924-0017	CAP FIX TANT SOLID 1.0 MFD 10 % 35 VOLT	
00804				C109 C114	
0081	00001.000	EA	0972928-0005	CAP FIX MICA 500V 1500 PF 5 %	
0081A				C322	
0082	00001.000	EA	0972929-0379	CAP FIX CERAMIC 100 PF 10 % 200 V	
0082A				C007	
0083	00002.000	EA	0972929-0376	CAP FIX CERAMIC 68.0 PF 10 % 200 V	
0083A				C009 C010	
0084	00003.000	EA	0972929-0385	CAP FIX CERAMIC 220 PF 10% 200V	
0084A				C119 C205 C352	
0085	00002.000	EA	0972929-0397	CAP FIX CERAMIC .001 UF 10% 200V	
0085A				C115 C117	
0086	00002.000	EA	0972929-0411	CAP FIX CERAMIC .0056 UF 10% 100V	
0086A				C419 C420	
0087	00001.000	EA	0996615-0002	CAPACITOR,4400UF 7.5V ELECTROLYTIC	
0087A				C302	
0088	00002.000	EA	0996615-0001	CAPACITOR 2200 UF 16VDC 10% ELECTROLY	
0088A				C301 C303	
0088	00001.000	EA	0996615-0001	CAPACITOR 2200 UF 16VDC 10% ELECTROLY	
0088A				C301 C303	
0089	00002.000	EA	0996615-0003	CAPACITOR,1500 UF 40VDC 10% ELECTROLYTIC	
0089A				C331 C332	
0089	00001.000	EA	0996615-0003	CAPACITOR,1500 UF 40VDC 10% ELECTROLYTIC	
0089A				C331 C332	
0090	00003.000	EA	0972965-0004	CAP FIX CERAMIC 2200 PF 10% 200V	
0090A				C003 C404 C409	
0090	00001.000	EA	0972965-0004	CAP FIX CERAMIC 2200 PF 10% 200V	
0090A				C003	
0091	00002.000	EA	0972965-0008	CAP FIX CERAMIC .0047 MF 10% 200 V	
0091A				C317 C354	
0092	00005.000	EA	0972965-0012	CAP FIX CERAMIC .010 MF 10% 200V	
0092A				C118 C201 C202 C208 C209	
0093	00002.000	EA	0972965-0016	CAP FIX CERAMIC .022 MF 10% 100V	
0093A				C315 C321	
0094	00010.000	EA	0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	
0094A				C310 C311 C312 C314 C316	
0094B				C319 C333 C403 C405 C431	
0094	00007.000	EA	0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	
0094A				C310 C311 C312 C314	
0094B				C316 C319 C333	

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Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0094	00009.000	EA	0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	for -0003
0094A				C310 C311 C312 C314 C316	
0094B				C319 C333 C403 C405	
0095	00001.000	EA	0972225-0522	CAPACITOR,2.2 UF 50V 20% CERAMIC	for-0001 & -0003 only
0095A				C432	
0096	00005.000	EA	0972924-0013	CAP FIX TANT SOLID 2.2 MFD 10 % 20 VOLT	
0096A				C101 C102 C104 C105 C353	
0097	00002.000	EA	0996597-0001	CAPACITOR,25 UF 40V 10% ALUM ELECTROLYTI	
0097A				C212 C213	
0100	00001.000	EA	0983937-0003	RESISTOR,SELECTED,743/745 PWR,MODEM CKT	for-0001 & -0003 only
0100A				R468 OR R469	
0101	00001.000	EA	0972630-0018	RES FIX .150 OHM 1W 1% WIREWOUND POWER	
0101A				R338	
0102	00001.000	EA	0972942-0079	RESISTOR,9.0 OHMS 5% FX,WW 5W	
0102A				R330	
0103	00001.000	EA	0972942-0020	RES FIX 600. OHMS 5% 5 WATT WIREWOUND	
0103A				R337	
0104	00002.000	EA	0538425-0115	RES 15000. OHM 5% 2WATT FIX COMP	
0104A				R332 R339	
0105	00001.000	EA	0538425-0123	RES 33000. OHM 5% 2WATT FIX COMP	
0105A				R340	
0106	00001.000	EA	0983937-0001	RESISTOR,SELECTED,743/745 PWR,PVOLTS	
0106A				R122	
0107	00001.000	EA	0539370-0289	RES FIX FILM 100 OHM 1% .25 WATT	
0107A				R110	
0108	00001.000	EA	0539370-0345	RES FIX FILM 383 OHM 1% .25 WATT	
0108A				R121	
0109	00001.000	EA	0539370-0347	RES FIX FILM 402 OHM 1% .25 WATT	
0109A				R222	
0110	00001.000	EA	0539370-0373	RES FIX FILM 750 OHM 1% .25 WATT	
0110A				R494	
0111	00001.000	EA	0539370-0374	RES,FIXED FILM 768 OHMS 1% .25WATT	for-0001 & -0003 only
0111A				R429	
0112	00001.000	EA	0539370-0382	RES FIX FILM 931 OHM 1% .25 WATT	for-0001 & -0003 only
0112A				R490	
0113	00001.000	EA	0539370-0383	RES FIX FILM 953 OHM 1% .25 WATT	for-0001 & -0002
— 0113	00002.000	EA	0539370-0383	RES FIX FILM 953 OHM 1% .25 WATT	for -0003
— 0113A				R207 R429	

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Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0113A				R207	
0114	00001.000	EA	0539370-0385	RES FIX FILM 1.00K OHM 1% .25 WATT	
0114A				R355	
0115	00001.000	EA	0539370-0399	RES FIX FILM 1.40K OHM 1% .25 WATT	
0115A				R444	
0116	00001.000	EA	0539370-0427	RES FIX FILM 2.74K OHM 1% .25 WATT	
0116A				R114	
0117	00001.000	EA	0539370-0441	RES FIX FILM 3.83K OHM 1% .25 WATT	
0117A				R208	
0118	00001.000	EA	0539370-0530	RES FIX FILM 32.4K OHM 1% .25 WATT	
0118A				R430	
0119	00002.000	EA	0539370-0465	RES FIX FILM 6.81K OHM 1% .25 WATT	
0119A				R411 R502	
0118A				R430	
0119	00001.000	EA	0539370-0465	RES FIX FILM 6.81K OHM 1% .25 WATT	
0119A				R411	
0120	00001.000	EA	0539370-0473	RES FIX FILM 8.25K OHM 1% .25 WATT	
0120A				R354	
0121	00001.000	EA	0539370-0477	RES FIX FILM 9.09K OHM 1% .25 WATT	
0121A				R325	
0122	00001.000	EA	0539370-0489	RES FIX FILM 12.1K OHM 1% .25 WATT	
0122A				R206	
0123	00001.000	EA	0539370-0497	RES FIX FILM 14.7K OHM 1% .25 WATT	
0123A				R335	
0124	00001.000	EA	0539370-0499	RES FIX FILM 15.4K OHM 1% .25 WATT	
0124A				R101	
0125	00001.000	EA	0539370-0574	RES FIX FILM 93.1K OHM 1% .25 WATT	
0125A				R410	
0126	00001.000	EA	0539370-0522	RES FIX FILM 26.7K OHM 1% .25 WATT	
0126A				R446	
0127	00001.000	EA	0539370-0561	RES FIX FILM 68.1K OHM 1% .25 WATT	
0127A				R491	
0128	00002.000	EA	0539370-0565	RES FIX FILM 75.0K OHM 1% .25 WATT	
0128A				R442 R445	
0129	00001.000	EA	0539370-0569	RES FIX FILM 82.5K OHM 1% .25 WATT	
0129A				R450	
0126	00001.000	EA	0539370-0505	RES FIX FILM 17.8K OHM 1% .25 WATT	
0126A				R446	
0127	00001.000	EA	0539370-0568	RES FIX FILM 80.6K OHM 1% .25 WATT	
0127A				R491	
0128	00001.000	EA	0539370-0565	RES FIX FILM 75.0K OHM 1% .25 WATT	
0128A				R442	

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Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0129	00001.000	EA	0539370-0578	RES FIX FILM 102 K OHM 1% .25 WATT	
0129A				R450	for -0003 only
0130	00001.000	EA	0539370-0606	RES FIX FILM 200 K OHM 1% .25 WATT	
0130A				R500	for-0001 & -0003 only
0131	00002.000	EA	0539370-0620	RES FIXED FILM 280 K OHMS 1% .25WATT	
0131A				R457 R461	for-0001 & -0003 only
0132	00003.000	EA	0539812-0005	RES FIX FILM 1.00K OHM .1% .125 WATT	
0132A				R351 R356 R357	
0133	00001.000	EA	0539812-0048	RES,FIXED 3.09K OHMS 1/8 WATT .1%	
0133A				R353	
0134	00001.000	EA	0539812-0024	RES FIX FILM 215 OHM .1% .125 WATT	
0134A				R113	
0135	00001.000	EA	0539812-0025	RES FIX FILM 383 OHM .1% .125 WATT	
0135A				R115	
0136	00001.000	EA	0539812-0027	RES FIX FILM 1.15K OHM .1% .125 WATT	
0136A				R352	
0137	00001.000	EA	0539812-0028	RES FIX FILM 6.19K OHM .1% .125 WATT	
0137A				R112	
0138	00004.000	EA	0539812-0058	RESISTOR,FIXED,FILM 6.99K .1% .125 WATT	
0138A				R463 R464 R466 R483	
0139	00004.000	EA	0539812-0059	RESISTOR,FIXED,FILM 8.05K .1% .125 WATT	
0139A				R438 R456 R460 R478	for -0001 only
0140	00001.000	EA	0539812-0031	RES FIX FILM 9.24K OHM .1% .125 WATT	
0140A				R462	
0141	00001.000	EA	0539812-0032	RES FIX FILM 10.5K OHM .1% .125 WATT	
0141A				R458	
0142	00002.000	EA	0539812-0033	RES FIX FILM 23.2K OHM .1% .125 WATT	
0142A				R485 R487	
0143	00002.000	EA	0539812-0034	RES FIX FILM 31.6K OHM .1% .125 WATT	
0138	00004.000	EA	0539812-0060	RESISTOR,FIXED,FILM 9.94K .1% .125 WATT	
0138A				R463 R464 R466 R483	
0139	00004.000	EA	0539812-0061	RESISTOR,FIXED,FILM 8.37K .1% .125 WATT	
0139A				R438 R456 R460 R478	
0140	00001.000	EA	0539812-0041	RES FIX FILM 14.0K .1% .125 WATT	for -0003 only
0140A				R462	
0141	00001.000	EA	0539812-0040	RES FIX FILM 11.4K .1% .125 WATT	
0141A				R458	
0142	00003.000	EA	0539812-0044	RES FIX FILM 24.3K .1% .125 WATT	
0142A				R448 R485 R487	
0143	00002.000	EA	0539812-0034	RES FIX FILM 31.6K OHM .1% .125 WATT	
0143A				R441 R443	

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	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0143A				R441 R443	
0144	00001.000	EA	0539812-0035	RES FIX FILM 33.2K OHM .1% .125 WATT	
0144A				R117	
0145	00001.000	EA	0539812-0039	RES FIX FILM 124K OHM .1% .125 WATT	for-0001 & -0003 only
0145A				R447	
0146	00001.000	EA	0972228-0008	RES,VAR 2 K-OHM CERMET ELEMENT	
0146A				R472	for-0001 & -0003 only
0147	00001.000	EA	0972228-0010	RESISTOR,VARIABLE 10K OHM CERMET FILM	
0147A				R336	
0148	00001.000	EA	0972228-0013	X RES.VAR 100K OHM CERMET FILM	
0148A				R309	
0149	00001.000	EA	0972466-0001	RES,VAR,CERMET-20K,5%	
0149A				R234	
0150	00001.000	EA	0972619-0004	RESISTOR VAR 500 OHM 5% .5W	
0150A				R123	
0151	00001.000	EA	0996295-0010	RES VAR. 10,000 OHMS 5W 10%	
0151A				R412	for-0001 & -0003 only
0152	00001.000	EA	0972554-0006	RESISTOR,FIXED,WIREWOUND .5 OHM 3W 1%	
0152A				R233	
0153	00001.000	EA	0972942-0013	RES FIX 20.0 OHMS 5% 5 WATT WIREWOUND	
0153A				R258	
0154	00001.000	EA	0972942-0039	RES FIX 400 OHM 5% 5 WATT WIREWOUND	
0154A				R331	
0155	00001.000	EA	0972946-0009	RES FIX 4.7 OHM 5 % .25 W.CARBON FILM	
0155A				R311	
0156	00001.000	EA	0972946-0013	RES FIX 6.8 OHM 5%.25W CARBON FILM	
0156A				R312	
0157	00003.000	EA	0972946-0017	RES FIX 10.0 OHM 5 % .25 W.CARBON FILM	
0157A				R201 R204 R217	
0158	00002.000	EA	0972946-0021	RES FIX 15.0 OHM 5 % .25 W.CARBON FILM	
0158A				R231 R344	
0159	00001.000	EA	0972946-0025	RES FIX 22.0 OHM 5 % .25 W.CARBON FILM	
0159A				R327	
0160	00001.000	EA	0972946-0039	RES FIX 82.0 OHMS 5 % .25 W CARBON FILM	
0160A				R313	
0161	00003.000	EA	0972946-0003	RES FIX 2.7 OHM 5 % .25 W.CARBON FILM	for -0001
0161A				R314 R459 R467	
0162	00007.000	EA	0972946-0045	RES FIX 150 OHM 5 % .25 W CARBON FILM	for -0001
0162A				R202 R203 R216 R227 R315	
0162B				R334 R449	

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Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0162	00009.000	EA	0972946-0045	RES FIX 150 OHM 5 % .25 W CARBON FILM	
0162A				R202 R203 R216 R227 R315	for -0002
0162B				R334 R401 R417 R434	
0162	00006.000	EA	0972946-0045	RES FIX 150 OHM 5 % .25 W CARBON FILM	
0162A				R202 R203 R216 R227 R315	for -0003
0162B				R334	
0163	00002.000	EA	0972946-0048	RES FIX 200 OHM 5 % .25 W CARBON FILM	
0163A				R253 R255	
0164	00002.000	EA	0972946-0049	RES FIX 220 OHM 5 % .25 W CARBON FILM	
0164A				R018 R212	
0165	00001.000	EA	0972946-0052	RES FIX 300 OHM 5 % .25 W CARBON FILM	
0165A				R106	
0166	00005.000	EA	0972946-0053	RES FIX 330 OHM 5 % .25 W CARBON FILM	for-0001 & -0003
0166A				R205 R230 R251 R252 R409	
0166	00004.000	EA	0972946-0053	RES FIX 330 OHM 5 % .25 W CARBON FILM	for -0002
0166A				R205 R230 R251 R252	
0167	00003.000	EA	0972946-0055	RES FIX 390 OHM 5 % .25 W CARBON FILM	
0167A				R316 R318 R320	
0168	00006.000	EA	0972946-0057	RES FIX 470 OHM 5 % .25 W CARBON FILM	
0168A				R008 R009 R102 R211 R228	
0168B				R343	
0169	00006.000	EA	0972946-0058	RES FIX 510 OHM 5 % .25 W CARBON FILM	
0169A				R003 R007 R016 R017 R019	
0169B				R020	
0170	00001.000	EA	0972946-0059	RES FIX 560 OHM 5 % .25 W CARBON FILM	
0170A				R333	
0171	00001.000	EA	0972946-0060	RES FIX 620 OHM 5 % .25 W CARBON FILM	
0171A				R358	
0172	00015.000	EA	0972946-0065	RES FIX 1.0K OHM 5% .25 W CARBON FILM	
0172A				R004 R005 R006 R010 R021	for -0001
0172B				R103 R213 R214 R215 R218	
0172C				R226 R323 R470 R551 R553	
0172	00016.000	EA	0972946-0065	RES FIX 1.0K OHM 5% .25 W CARBON FILM	
0172A				R004 R005 R006 R010 R021	
0172B				R103 R213 R214 R215 R218	for -0002
0172C				R226 R323 R413 R416 R419	
0172D				R440	
0172	00014.000	EA	0972946-0065	RES FIX 1.0K OHM 5% .25 W CARBON FILM	

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Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0172A				R004 R005 R006 R010 R021	for -0003 only
0172B				R103 R213 R214 R215 R218	for -0003 only
0172C				R226 R323 R470 R553	for -0003 only
0173	00003.000	EA	0972946-0069	RES FIX 1.5K OHM 5 % .25 W CARBON FILM	
0173A				R304 R407 R452	
0173	00002.000	EA	0972946-0069	RES FIX 1.5K OHM 5 % .25 W CARBON FILM	for -0002
0173A				R304 R420	for -0002
0174	00001.000	EA	0972946-0071	RES FIX 1.8K OHM 5 % .25 W CARBON FILM	
0174A				R107	
0175B				R361 R366 R367 R370 R371	
0175C				R414	
0174	00001.000	EA	0972946-0071	RES FIX 1.8K OHM 5 % .25 W CARBON FILM	
0174A				R107	
0175	00012.000	EA	0972946-0072	RES FIX 2.0K OHM 5 % .25 W CARBON FILM	
0175A				R105 R209 R254 R256 R360	for -0001
0175B				R361 R366 R367 R370 R371	for -0001
0175C				R022 R414	for -0001
0175	00011.000	EA	0972946-0072	RES FIX 2.0K OHM 5 % .25 W CARBON FILM	
0175A				R105 R209 R254 R256 R360	for-0002 & -0003
0175B				R361 R366 R367 R370 R371	for-0002 & -0003
0175C				R414	for-0002 & -0003
0176	00001.000	EA	0972946-0075	RES FIX 2.7K OHM 5 % .25 W CARBON FILM	
0176A				R225	
0177	00006.000	EA	0972946-0076	RES FIX 3.0K OHM 5 % .25 W CARBON FILM	
0177A				R421 R473 R475 R477 R480	for -0001 only
0177B				R482	for -0001 only
0177	00005.000	EA	0972946-0076	RES FIX 3.0K OHM 5 % .25 W CARBON FILM	
0177A				R421 R475 R477 R480	for -0003 only
0177B				R482	for -0003 only
0178	00005.000	EA	0972946-0077	RES FIX 3.3K OHM 5 % .25 W CARBON FILM	
0178A				R326 R359 R435 R437 R497	for-0001 & -0003
0178	00003.000	EA	0972946-0077	RES FIX 3.3K OHM 5 % .25 W CARBON FILM	
0178A				R326 R359 R497	for -0002
0179	00003.000	EA	0972946-0079	RES FIX 3.9K OHM 5 % .25 W CARBON FILM	
0179A				R219 R220 R221	
0180	00005.000	EA	0972946-0081	RES FIX 4.7K OHM 5 % .25 W CARBON FILM	
0180A				R104 R109 R116 R432 R433	for-0001 & -0003
0180	00003.000	EA	0972946-0081	RES FIX 4.7K OHM 5 % .25 W CARBON FILM	
0180A				R104 R109 R116	for -0002

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Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, 763/765, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0181	00004.000	EA	0972946-0082	RES FIX 5.1K OHM 5 % .25 W CARBON FILM	
0181A				R362 THRU R365	
0182	00006.000	EA	0972946-0085	RES FIX 6.8K OHM 5 % .25 W CARBON FILM	
0182A				R011 R023 R024 R025 R307	
0182B				R372	
0183	00001.000	EA	0972946-0087	RES FIX 8.2K OHM 5 % .25 W CARBON FILM	
0183A				R454	for-0001 & -0003 only
0184	00013.000	EA	0972946-0089	RES FIX 10K OHM 5% .25 W CARBON FILM	
0184A				R012 R013 R223 R306 R321	
0184B				R455 R474 R476 R479 R481	for-0001 & -0003
0184C				R492 R552 R554	
0184	00006.000	EA	0972946-0089	RES FIX 10K OHM 5% .25 W CARBON FILM	
0184A				R012 R013 R223 R306 R321	for -0002
0184B				R436	
0185	00001.000	EA	0972946-0091	RES FIX 12 K OHM 5% .25 W CARBON FILM	
0185A				R486	for-0001 & -0003 only
0186	00001.000	EA	0972946-0092	RES FIX 13 K OHM 5 % .25 W CARBON FILM	
0186A				R431	for-0001 & -0003 only
0187	00003.000	EA	0972946-0095	RES FIX 18K OHM 5% .25 W CARBON FILM	
0187A				R232 R324 R345	
0188	00002.000	EA	0972946-0096	RES FIX 20 K OHM 5 % .25 W CARBON FILM	for-0001 & -0003
0188A				R014 R427	
0188	00001.000	EA	0972946-0096	RES FIX 20 K OHM 5 % .25 W CARBON FILM	for -0002
0188A				R014	
0190	00001.000	EA	0972946-0099	RES FIX 27 K OHM 5 % .25 W CARBON FILM	
0190A				R405	
0191	00001.000	EA	0972946-0103	RES FIX 39 K OHM 5 % .25 W CARBON FILM	
0191A				R015	
0192	00002.000	EA	0972946-0105	RES FIX 47 K OHM 5 % .25 W CARBON FILM	
0192A				R395 R408	
0193	00004.000	EA	0972946-0110	RES FIX 75 K OHM 5 % .25 W CARBON FILM	
0193A				R402 R422 R495 R369	
0194	00003.000	EA	0972946-0113	RES FIX 100K OHM 5 % .25 W CARBON FILM	
0194A				R404 R453 R471	
0195	00001.000	EA	0972946-0031	RES FIX 39.0 OHM 5 % .25 W.CARBON FILM	
0195A				R002	
0196	00001.000	EA	0972946-0116	RES FIX 130K OHM 5 % .25 W CARBON FILM	
0196A				R406	for-0001 & -0003 only
0197	00002.000	EA	0972946-0117	RES FIX 150K OHM 5 % .25 W CARBON FILM	
0197A				R001 R425	for-0001 & -0003

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0197	00001.000	EA	0972946-0117	RES FIX 150K OHM 5 % .25 W CARBON FILM	
0197A				R001	
0198	00002.000	EA	0972946-0127	RES FIX 390K OHM 5 % .25 W CARBON FILM	
0198A				R403 R424	
0199	00001.000	EA	0972946-0129	RES FIX 470K OHM 5 % .25 W CARBON FILM	
0199A				R328	
0200	00001.000	EA	0972946-0131	RES FIX 560K OHM 5 % .25 W CARBON FILM	
0200A				R210	
0201	00001.000	EA	0972946-0134	RES FIX 750K OHM 5 % .25 W CARBON FILM	
0201A				R111	
0202	00002.000	EA	0972946-0135	RES FIX 820K OHM 5 % .25 W CARBON FILM	
0202A				R423 R501	
0203	00001.000	EA	0972946-0137	RES FIX 1.0M OHM 5 % .25 W CARBON FILM	
0203A				R451	
0204	00002.000	EA	0972946-0037	RES FIX 6R.0 OHM 5 % .25 W.CARBON FILM	
0204A				R317 R346	
0205	00001.000	EA	0972946-0139	RES FIX 1.2M OHM 5 % .25 W CARBON FILM	
0205A				R426	
0206	00001.000	EA	0972946-0093	RES FIX 15K OHM 5% .25 W CARBON FILM	
0206A				R224	
0207	00001.000	EA	0972947-0029	RES FIX 33 OHM 5 % .5 W CARBON FILM	
0207A				R322	
0208	00003.000	EA	0972947-0057	RES FIX 470 OHM 5% .5 W CARBON FILM	
0208A				R229 R301 R303	
0209	00002.000	EA	0972946-0060	RES FIX 620 OHM 5 % .25 W CARBON FILM	
0209A				R493 R499	
0210	00001.000	EA	0972947-0065	RES FIX 1.0K OHM 5% .5 W CARBON FILM	
0210A				R484	
0211	00001.000	EA	0972947-0117	RES FIX 150K OHM 5%.5W CARBON FILM	
0211A				R329	
0212	00001.000	EA	0972978-0069	RES FIX COMP 47 OHMS 1.0W 5%	
0212A				R302	
0213	00001.000	EA	0972978-0093	RES FIX COMP 470 OHMS 1.0W 5%	
0213A				R119	
0214	00001.000	EA	0972978-0100	RES FIX COMP 910 OHMS 1.0W 5%	
0214A				R368	
0215	00001.000	EA	0972978-0113	RES FIXED 3.3K OHMS 1.0 WATT 5%	
0215A				R118	
0216	00001.000	EA	0539370-0556	RES FIX FILM 60.4K OHM 1% .25 WATT	
0216A				R488	
0217	00001.000	EA	0972947-0072	RES FIX 2.0K OHM 5% .5 W CARBON FILM	
0217A				R120	
0218	00001.000	EA	0972946-0063	RES FIX 820 OHM 5% .25 W CARBON FILM	
0218A				R108	

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0219	00001.000	EA	0972946-0010	RESISTOR,5.1 OHMS .25W 5% EX INSULATED	
0219A				R373	
0220	00003.000	EA	0539370-0515	RES FIX FILM 22.6K OHM 1% .25 WATT	
0220A				R448 R496 R498	for -0001 only
0220	00002.000	EA	0539370-0515	RES FIX FILM 22.6K OHM 1% .25 WATT	for -0003 only
0220A				R496 R498	
0221	00003.000	EA	0972946-0037	RES FIX 68.0 OHM 5 % .25 W.CARBON FILM	
0221A				R317 R346 R418	for -0002 only
0222	00001.000	EA	0972946-0050	RES FIX 240 OHM 5 % .25 W CARBON FILM	
0222A				R415	
0223	00001.000	EA	0539370-0472	RES FIX FILM 8.06K OHM 1% .25 WATT	
0223A				R502	for -0003 only
0224	00001.000	EA	0539370-0482	RES FIX FILM 10.2K OHM 1% .25 WATT	
0224A				R489	
0225	00064.000	EA	0972456-0002	PIN,.025 SQUARE	
0226	00001.000	EA	0972498-0001	CONN,DBL ROW,EDGE MTG-20 POSITIONS	
0226A				J101	
0227	00001.000	EA	0996260-0001	RECEPTACLE,3-PIN AC PWR	
0227A				J301	
0228	00001.000	EA	0972620-0001	CONN,PLUG,PC BD-15 POSITION	
0228A				J403	
0229	00001.000	EA	0539370-0572	RES FIX FILM 88.7K OHM 1% .25 WATT	
0229A				R445	
0230	00001.000	EA	0416434-0203	FUSE 2.0 A 250V 3AG	
0230A				F301	
0231	00003.000	EA	0530588-0008	FUSE,CARTRIDGE 2 AMP	
0231A				F201 F251 F252	
0234	00001.000	EA	0972602-0001	XFORMER,SW RGLTR,PWR SPLY 596UH+/-60UH	
0234A				T301	
0235	00001.000	EA	0972614-0001	TRANSFORMER,TOROID	
0235A				T302	
0237	00001.000	EA	0972445-0001	CRYSTAL,12 MHZ,QUARTZ	
0237A				Y001	
0239	00001.000	EA	0972461-0001	DISC,SOUND-PIEZO-ELECT 3200 + 600HZ	
0239A				DS001	
0241	00001.000	EA	0996592-0001	SWITCH,TOGGLE,DPDT 3A/250 VAC 6A/120 VAC	
0241A				S301	

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0937300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0937300-0002	D
TERMINAL ELECTRONICS, CCITT MODEM	0937300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0243	00003.000	EA	0539544-0010	SOCKET,20PIN IC LOW PROFILE SOLDER TAIL	
0243A				XU012 XU017 XU030	
0244	00002.000	EA	0539544-0009	SOCKET,40PIN IC LOW PROFILE SOLDER TAIL	
0244A				XU015 XU018	
0245	00002.000	EA	0539544-0007	SOCKET,24PIN IC LOW PROFILE SOLDER TAIL	
0245A				XU010 XU014	
0246	00001.000	EA	0185113-0001	X SPACER XST TO-18 CASE	
0246A				XQ307	
0250	00001.000	EA	0533517-0001	HEATSINK,ELECT-ELEC TOP AND BASE,TO-3	
0251	00001.000	EA	0999429-0001	HEATSINK,TIP-POWER SUPPLY,SOFT START	
0252	00001.000	EA	0999428-0001	HEATSINK,DRIVER	
0253	00001.000	EA	0999254-0001	CLIP,HEATSINK RETAINER	
0254	00002.000	EA	0772635-0001	CLIP,FUSE	
0255	00001.000	EA	0983836-0001	CABLE,HEATSINK GROUND	
0256	00001.000	EA	0972493-0001	CABLE ASSEMBLY,FLAT-FLEXIBLE	
0257	00009.000	EA	0972487-0001	JUMPER PLUG,CONNECTOR BLACK	
0258	00000.100	FT	0411400-0022	WIRE 22AWG ELETRO-TIN-PLATED,COPPER	
0259	00001.000	EA	0983910-0001	SUPPORT,TONE GENERATOR	
0260	00018.000	EA	0411027-0803	WASHER .125 X .250 X .022 FLAT CRES	
0261	00009.000	EA	0411104-0135	WASHER #4 LOCKSPLIT	
0262	00009.000	EA	0972628-0001	WASHER,#4 .115ID .200OD-SHLDR NON-MET	
0264	00007.000	EA	0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	
0265	00008.000	EA	0972779-0001	INSULATOR,MICA COATED,TO-220 CASE	
0266	00001.000	EA	0972988-0022	SCREW 4-40 X 1.25 PAN HEAD CRES	
0267	00002.000	EA	0972988-0015	SCREW 4-40 X .375 PAN HEAD CRES	
0268	00002.000	EA	0972988-0019	SCREW 4-40 X .750 PAN HEAD CRES	
0269	00002.000	EA	0406769-0001	SCREW,SPECIAL,CONNECTOR LOCKING	
0270	00005.000	EA	0411115-0044	NUT,4-40 HEXAGON CRES STEEL	
0271	00006.000	EA	0416453-0021	NUT,PLAIN,4-40 UNC-2B HEX,CRES,SMALL	
0272	00002.000	EA	0416925-0400	SPACER,#4 1/8"LG ALUM ANODIZED	
0273	00001.000	EA	0416925-0412	SPACER,#4 7/8"LG ALUM ANODIZED	
0274	00016.000	EA	0972632-0001	STRAP,TIE DOWN,CABLE-NON-STD,0-1-1/4 D.	
0275	00001.000	EA	0972621-0001	SPRING,RING	
0276	00001.000	EA	0972306-0001	COVER,ROUND-ALUMINUM SEAMLESS	
0277	00001.000	FT	0996286-4455	WIRE #20 AWG GRN/YEL	
0278	00001.000	FT	0236528-0000	WIRE 22 AWG 1 COND WHITE TEFLON SOLID	
0279	00000.500	FT	0411400-0018	WIRE,BARE TINNED,18AWG, COPPER BUS	
0280	AR	TU	0417559-0001	SILICONE RUBBER (RTV) DOW 3140	
0281	AR	PT	0417200-0004	PRIMER,SILICONE RUBBER-RED	
0282	AR	QT	0415804-0005	SEALING COMPOUND,ANAEROBIC-BLUE GRADE C	

LIST OF MATERIALS

Assembly	Part No.	Rev.
TERMINAL ELECTRONICS, 763/765 W/MODEM	0837300-0001	D
TERMINAL ELECTRONICS, 763, EIA/TTY	0837300-0002	D
TERMINAL ELECTRONICS, CCITT MODEM	0837300-0003	D

Item No.	Quantity		TI Part No.	Description	Remarks
0283	00000.200	FT	0410499-0008	INSULATION SLEEVING,TEFLON #18 NATURAL	
0284	AR	EA	0996527-0001	ADHESIVE,LOCTITE 416	
0285	00001.000	EA	0999430-0001	SPACER, SWITCH	
0300	REF	EA	0937298-9901	DIAGRAM,LOGIC,DETAILED, TERMINAL ELECT.	
0301	REF	EA	0937301-9901	TEST PROCEDURE, TERMINAL ELECTRONICS	
0302	REF	EA	0937302-9901	SPECIFICATION, TERMINAL ELECTRONICS	
0303	REF	EA	0984023-9901	LISTING,PWR INTERFACE SIGNALS,743/745	
0304	00004.000	EA	0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0305	00002.000	EA	0972988-0014	SCREW 4-40 X .312 PAN HEAD CRES	
0306	AR	EA	0415886-0001	GREASE,SILICONE,HEAT COND. (8 OZ TUBE)	
0307	00001.000	EA	0983837-0001	WIRING HARNESS MECHANISM GROUND	
0308	00002.000	EA	0230029-0001	BEAD SHIELDING	

999222 | 1

NOTES UNLESS OTHERWISE SPECIFIED
1. CLINCHING COMPONENT LEADS OPTIONAL
2. DO NOT SOLDER ON COMPONENT SIDE
3. MASK TOOLING HOLES ON BOTH SIDES OF BOARD TO PREVENT SOLDER FROM ENTERING HOLES
4. MAXIMUM LEAD LENGTH FROM CONDUCTOR SIDE OF BOARD IS .075
[5] MAXIMUM INSTALLED HEIGHT OF C320 (ITEM 87) AND C323, C324, C328 AND C329 (ITEM 91) IS 0.87
[6] POWER RESISTORS ITEMS 133 THRU 136 ARE TO BE INSTALLED WITH A CLEARANCE OF .020MIN AND .120 MAX BETWEEN COMPONENT BODY AND PWB (ITEM 1)
[7] SLEEVE CRYSTAL Y1 (ITEM 146) WITH HEATSHRINKABLE TUBING (ITEM 159) TO INSULATE CAN FROM CONDUCTOR RUNS. SECURE WITH RTV (ITEM 28) AT END OPPOSITE LEADS
[8] SECURE DEVICES TO SOCKETS WITH RTV (ITEM 28) AT BOTH ENDS
[9] SECURE CAPACITORS TO PWB WITH A 1 INCH MIN BEAD OF RTV (ITEM 28) ALONG EACH ACCESSABLE SIDE AND BETWEEN ADJACENT CAPACITORS
[10] CONFORMAL COAT DESIGNATED AREAS WITH RTV (ITEM 28). DO NOT USE PRIMER. DO NOT COAT TEST PADS ON CONDUCTOR SIDE OF PWB
[11] INSTALL INSULATOR (ITEM 31) UNDER Q3, Q6, Q9, Q12, AND Q307
[12] TIGHTEN SCREWS ON CONNECTOR J1 (ITEM 4) TO 3 IN-LBS. TIGHTEN ALL OTHER SCREWS TO 6 IN-LBS
[13] SEAL THREADS ON ITEM 30 PER F-6.6 USING ITEM 32
[14] INSTALL JUMPER PLUG (ITEM 16) ON PINS (ITEM 7) AT:
E313-E314, E319-E320, E321-E322, E323-E324, E325-E326, E327-E328, E329-E330, E331-E332, E333-E334, E346-E347
[15] INSTALL JUMPERS USING WIRE (ITEM 29) BETWEEN:
E337-E338, E340-E341 (-0001 AND -8001 115 POWER SUPPLY)
E317-E318, E338-E339 (-0002 -0003 -8002 & -8003 230V POWER SUPPLY)
[16] STAMP OR MARK SITE DATE CODE IN APPROXIMATE LOCATION SHOWN. THE CODE WILL INDICATE MONTH, YEAR, & SITE OF MANUFACTURER AS FOLLOWS:
MMYS
S: SITE: 1 - HOUSTON, 2 - AUSTIN
Y: YEAR: LAST DIGIT
MM: MONTH: 01-09, 10-12
EXAMPLE: SEPTEMBER 1977 HOUSTON CODE NO IS: 0971
[17] INSTALL INSULATOR (ITEM 156) OVER CAPACITORS USING 1 INCH MIN LONG BEADS OF RTV (ITEM 28)
[18] CONNECTOR (ITEM 5) GROUPS ON FINISHED ASSEMBLY MUST BE ALIGNED PER DIMENSIONS INDICATED

NOTES CONTINUED IN ZONE B-8

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
H	418682 A. Conti GENERATED DRAWING & REVISED LM	7/2/77	
J	CR 42553-A 10-11-2 ITEM 35 PN WAS 972931-42	7/24/77	

TABLE I

TRANFORMER LEAD	TERMINATION	REMARKS
SHORT BROWN	E301	[21]
SHORT RED	E302	
ORANGE	E303	[21]
YELLOW	E304	
LONG BROWN	E312	[21]
LONG RED	E311	
VIOLET	E308	[21]
GREY	E307	
BLACK	E309	[21]
WHITE	E310	
GREEN	E306	[21]
BLUE	E305	

TABLE II

CABLE LEAD	TERMINATION	REMARKS
BLACK/WHITE	E344	[21]
BROWN/WHITE	E345	
RED/WHITE	E316	[21]
WHITE	E315	
YELLOW/GREEN	E120	

TABLE III

CABLE LEAD	TERMINATION	REMARKS
BLACK/WHITE	E53	
RED/WHITE	E52	
ORANGE/WHITE	E51	
YELLOW/WHITE	E58	
BLUE/WHITE	E54	
VIOLET/WHITE	E55	
GRAY/WHITE	E121	

NOTES CONTINUED (FROM ZONE C4):
[19] INSTALL U44 (ITEM 70) IN SOCKET WITH PIN 1 OF DEVICE INSTALLED IN POSITION 1 OF SOCKET. POSITIONS 10 & 11 WILL BE UNUSED
[20] ROUTE TRANSFORMER T301 (ITEM 77) WIRES AS SHOWN IN VIEW G. CONNECT WIRES AS INDICATED IN TABLE I
[21] ROUTE AND CONNECT THESE WIRES AS A PAIR
[22] DASH NUMBERS 8XXX DENOTE TESTED ASSEMBLIES TO BE USED AS SPARES FOR FIELD INSTALLATION
EXAMPLE: -8001 = -0001 TESTED
[23] ONLY 16 PIN SOCKETS (ITEM 10) ARE INSTALLED IN U53, U57, U65, & U66. ONLY A 20 PIN SOCKET (ITEM 11) IS INSTALLED IN U10. ONLY 24 PIN SOCKETS (ITEM 12) ARE INSTALLED IN USE THRU U69
[24] NO COMPONENT IS INSTALLED AT THIS LOCATION ON -0001 ASSY (U82, R341, R342,
[25] NO COMPONENT IS INSTALLED AT THIS LOCATION ON -0002 & -0003 ASSY (U82, R340)
[26] ROUTE POWER SUPPLY CABLE (ITEM 2) AS SHOWN AND CONNECT PER TABLE II
[27] ROUTE COMMUNICATIONS CABLE (ITEM 3) AS SHOWN AND CONNECT PER TABLE III

22 PART NUMBER	DESCRIPTION
999222-0003	BUBBLE MEMORY CONTROLLER - PMT, 230V UK
999222-0002	BUBBLE MEMORY CONTROLLER - PMT, 230V
999222-0001	BUBBLE MEMORY CONTROLLER - PMT, 115V

REVISION LEVEL STATUS

DOCUMENT	REVISION
ASSEMBLY	H J
SCHEMATIC 999221	* *
PWB 999220	

REV STATUS OF SHEETS: REV J | 11 | 11; SHEET 1 | 2 | 3

4	SEAL	650-01	5	USE ITEM 32	[13]
3	MARK	55-02	21	HEIGHT .09, COLOR BLACK	
2	SLDR	127-02	00		
1	SLDR	124-02	06		[2]

NO	ITEM NO	ADDITIONAL CLASSIFICATION	NOTES

ITEM NO	QTY	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°; 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING IN MIL-STD-100
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MAY NOT EXCEED TOLERANCE OF POSITION
- DIMENSIONAL LIMITS APPLY AFTER PLATING
- PARENTHETICAL INFORMATION FOR REFERENCE ONLY

Aprel Conti 8-9-77

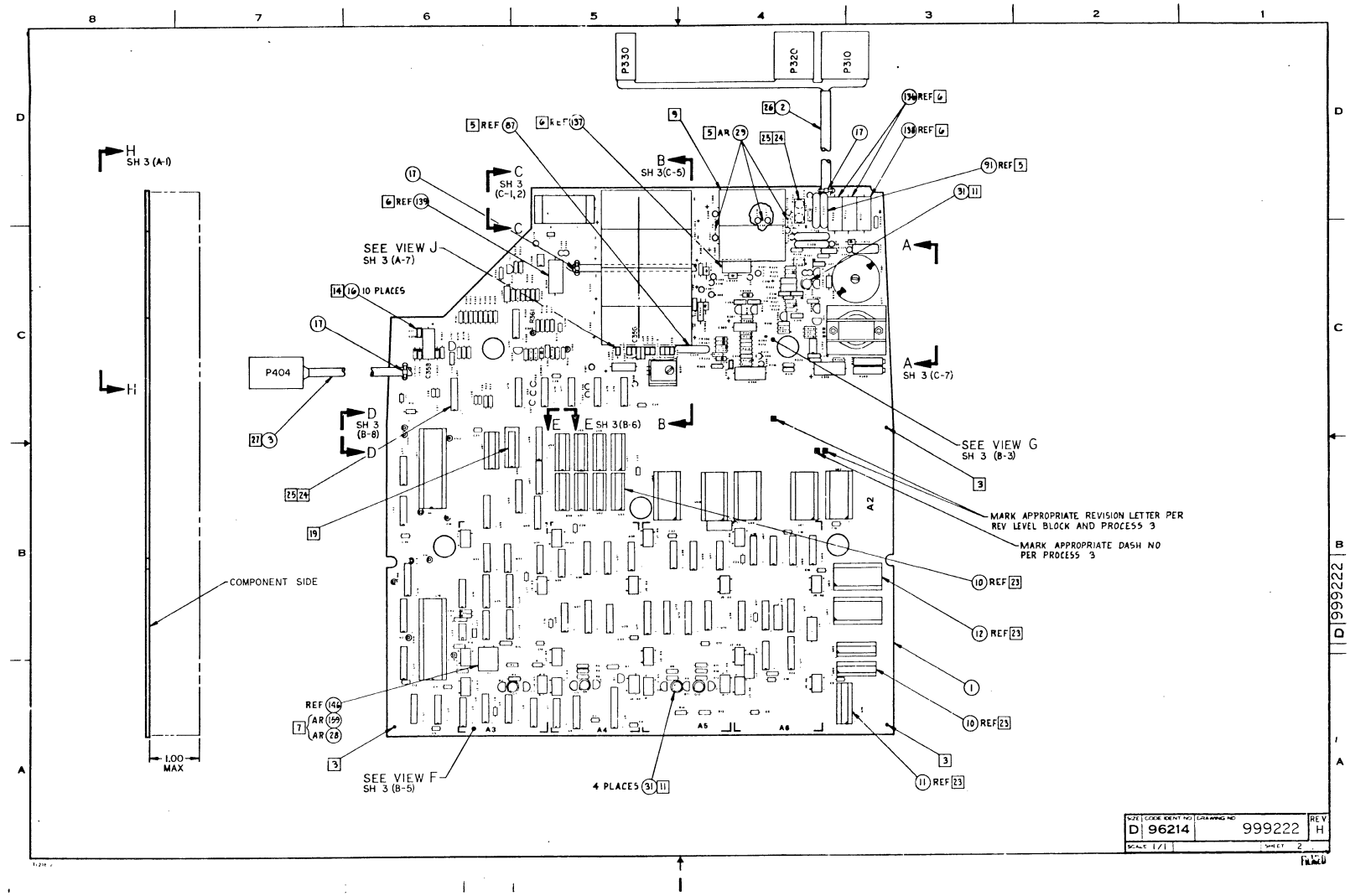
TEXAS INSTRUMENTS INCORPORATED, Data Terminal Division

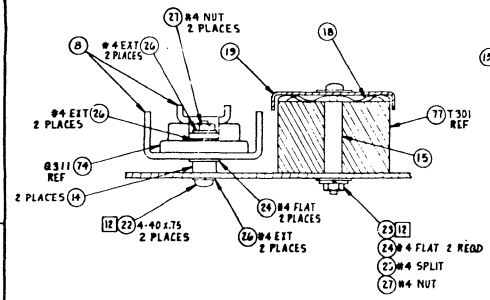
BUBBLE MEMORY CONTROLLER-PORTABLE MEMORY TERMINAL

2702049	8798
999230	8738
NEXT ASSY	USED ON
APPLICATION	

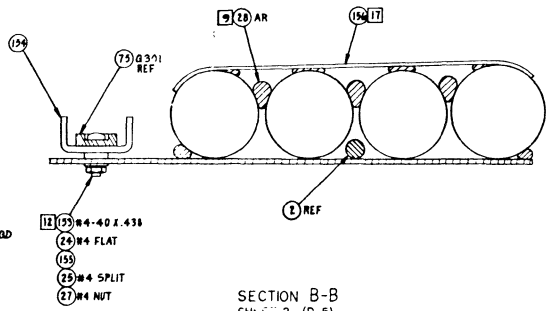
D 96214 | 999222 | 1/1 | 1 OF 3

LM 1

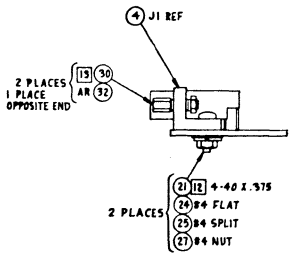

P330
P320
P310
P404
SEE VIEW J
SH 3 (A-7)
SEE VIEW G
SH 3 (B-3)
SEE VIEW F
SH 3 (B-5)
SH 3 (C-7)
SH 3 (B-8)
SH 3(B-6)
SH 3(C-5)
SH 3 (C-1, 2)
SH 3 (A-1)
14 16 10 PLACES
4 PLACES 31 11
COMPONENT SIDE
.100 MAX
MARK APPROPRIATE REVISION LETTER PER REV LEVEL BLOCK AND PROCESS 3
MARK APPROPRIATE DASH NO PER PROCESS 3
A2
A3
A4
A5
A6
SIZE D
CODE IDENT NO 96214
DRAWING NO 999222
REV H
SCALE 1/1
SHEET 2
D 999222 B



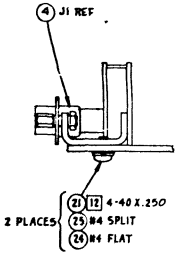
SECTION A-A
SHEET 2 (C-3)
SCALE 2/1
ROTATED 90°CW



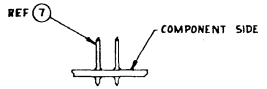
SECTION B-B
SHEET 2 (D-5)
SCALE 2/1
ROTATED 90°CW



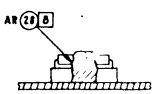
VIEW C-C
SHEET 2 (D-5)
SCALE 2/1
ROTATED 90°CCW
999222-0001 & -0002



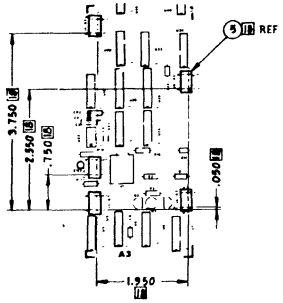
VIEW C-C
SHEET 2 (D-5)
SCALE 2/1
ROTATED 90°CCW
999222-0003



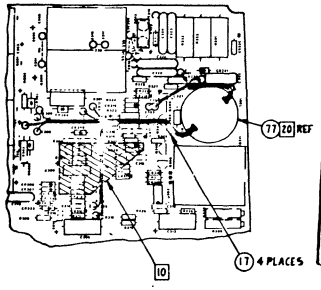
VIEW D-D
SHEET 2 (C-6)
SCALE 2/1
ROTATED 90°CCW



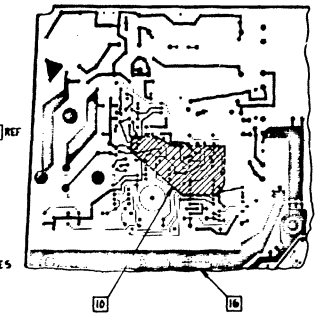
VIEW E-E
SHEET 2 (C-5)
SCALE NONE
ROTATED 180°
10 PLACES



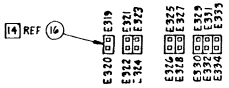
VIEW F
SHEET 2 (A-6)
SCALE 1/1
4 PLACES
(A3, A4, A5, & A6)



VIEW G
SHEET 2 (B-3)
SCALE 1/1



VIEW H-H
SHEET 2 (D-8)
SCALE 1/1



VIEW J
SHEET 2 (C-6)
SCALE NONE

SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	999222	H
SCALE		SHEET 3	

D999222

LIST OF MATERIALS

Assembly	Part No.	Rev.
BUBBLE MEMORY CONTROLLER-PMT, 115V	0999222-0001	L
BUBBLE MEMORY CONTROLLER-PMT, 230V	0999222-0002	L

Item No.	Quantity		TI Part No.	Description	Remarks
0085	00001.000	EA	0972928-0001	CAP FIX MICA 1000 PF 500V 5%	
0085A				C322	for -0002
0086	00002.000	EA	0972965-0008	CAP FIX CERAMIC .0047 MF 10% 200 V	
0086A				C317,C354	
0087	00001.000	EA	0410529-0103	CAP FIX CERAMIC .010 MF GMV 1 KV	
0087A				C320	for -0001
0087	00001.000	EA	0412735-0048	CAP .005 MF 3000V + OR- 20%	
0087A				C320	for -0002
0088	00002.000	EA	0972965-0016	CAP FIX CERAMIC .022 MF 10% 100V	
0088A				C315,C321	
0090	00010.000	EA	0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	
0090A				C314,C319,C310,C316,C305,	
0090B				C332,C356,C357,C3,C353	
0091	00004.000	EA	0412645-0015	CAPACITOR,.1 UF +80,-20% 500VDC CER DIEL	
0091A				C328,C329,C323,C324	
0092	00002.000	EA	0418356-2350	CAP FIX 0.47 MF 50V 10% TANTALUM SOLID	
0092A				C318,C350	
0093	00001.000	EA	0972924-0010	CAP FIX TANT SOLID 22 MFD 10 % 15 VOLT	
0093A				C304	
0094	00003.000	EA	0972924-0015	CAP FIX TANT SOLID 47 MFD 10 % 20 VOLT	
0094A				C355,C313,C358	
0095	00001.000	EA	0972924-0002	CAP FIX TANT SOLID 56 MFD 10 % 6 VOLT	
0095A				C309	
0096	00002.000	EA	0972601-0002	CAPACITOR 100UF 200WVDC 10%	
0096A				C306,C308	
0097	00001.000	EA	0972931-0040	CAP FIXED 2700 MFD 16V 10% ALUM	
0097A				C301	
0098	00001.000	EA	0996479-0002	CAPACITOR,4000UF 13V FX ELCTLT ALUM	
0098A				C303	
0099	00002.000	EA	0972931-0005	CAP FIXED 5000 MFD 5 VDC	
0099A				C331,C302	
0100	00004.000	EA	0538428-0001	COIL RF 5.60 UH .32 OHM 495 MA LT10K129	
0100A				L1,L2,L3,L4	
0101	00001.000	EA	0539370-0477	RES FIX FILM 9.09K OHM 1% .25 WATT	
0101A				R325	
0102	00001.000	EA	0539370-0540	RES FIX FILM 41.2K OHM 1% .25 WATT	
0102A				R363	
0103	00001.000	EA	0539370-0538	RES FIX FILM 39.2K OHM 1% .25 WATT	
0103A				R364	
0104	00001.000	EA	0972946-0003	RES FIX 2.7 OHM 5 % .25 W.CARBON FILM	
0104A				R314	
0105	00001.000	EA	0972946-0009	RES FIX 4.7 OHM 5 % .25 W.CARBON FILM	
0105A				R311	
0106	00001.000	EA	0972946-0013	RES FIX 6.8 OHM 5%.25W CARBON FILM	

LIST OF MATERIALS

Assembly	Part No.	Rev.
BUBBLE MEMORY CONTROLLER-PMT, 115V	0990222-0001	L
BUBBLE MEMORY CONTROLLER-PMT, 230V	0990222-0002	L

Item No.	Quantity		TI Part No.	Description	Remarks
0106A				R312	
0107	00001.000	EA	0972946-0021	RES FIX 15.0 OHM 5 % .25 W.CARBON FILM	
0107A				R343	
0108	00001.000	EA	0972946-0025	RES FIX 22.0 OHM 5 % .25 W.CARBON FILM	
0108A				R327	
0109	00002.000	EA	0972946-0037	RES FIX 68.0 OHM 5 % .25 W.CARBON FILM	
0109A				R317,R345	
0110	00001.000	EA	0972946-0039	RES FIX 82.0 OHMS 5 % .25 W CARBON FILM	
0110A				R313	
0111	00002.000	EA	0972946-0041	RES FIX 100 OHM 5 % .25 W CARBON FILM	
0111A				R355,R379	
0112	00001.000	EA	0972946-0045	RES FIX 150 OHM 5 % .25 W CARBON FILM	
0112A				R315	
0113	00001.000	EA	0972946-0047	RES FIX 180 OHM 5 % .25 W CARBON FILM	
0113A				R362	
0114	00003.000	EA	0972946-0055	RES FIX 390 OHM 5 % .25 W CARBON FILM	
0114A				R318,R316,R320	
0115	00006.000	EA	0972946-0057	RES FIX 470 OHM 5 % .25 W CARBON FILM	
0115A				R3,R6,R9,R12,R15,R17	
0116	00001.000	EA	0972946-0061	RES FIX 680 OHM 5 % .25 W CARBON FILM	
0116A				R16	
0117	00006.000	EA	0972946-0065	RES FIX 1.0K OHM 5% .25 W CARBON FILM	
0117A				R18,R22,R23,R323,R357,R24	
0118	00001.000	EA	0972946-0069	RES FIX 1.5K OHM 5 % .25 W CARBON FILM	
0118A				R304	
0119	00008.000	EA	0972946-0072	RES FIX 2.0K OHM 5 % .25 W CARBON FILM	
0119A				R1,R2,R4,R5,R7,R8,R10,R11	
0120	00004.000	EA	0972946-0073	RES FIX 2.2K OHM 5 % .25 W CARBON FILM	
0120A				R367,R377,R380,R391	
0121	00001.000	EA	0972946-0077	RES FIX 3.3K OHM 5 % .25 W CARBON FILM	
0121A				R326	
0122	00007.000	EA	0972946-0081	RES FIX 4.7K OHM 5 % .25 W CARBON FILM	
0122A				R352,R353,R366,R378,R371,	
0122B				R376,R390	
0123	00001.000	EA	0972946-0085	RES FIX 6.8K OHM 5 % .25 W CARBON FILM	
0123A				R307	
0124	00002.000	EA	0972946-0089	RES FIX 10K OHM 5% .25 W CARBON FILM	
0124A				R321,R306	
0125	00002.000	EA	0972946-0095	RES FIX 18K OHM 5% .25 W CARBON FILM	
0125A				R324,R344	
0126	00009.000	EA	0972946-0105	RES FIX 47 K OHM 5 % .25 W CARBON FILM	for -0001
0126A				R369,R368,R372,R373,R358,	for -0001
0126B				R360,R359,R356,R305	for -0001

LIST OF MATERIALS

Assembly	Part No.	Rev.
BUBBLE MEMORY CONTROLLER-PMT, 115V	0999222-0001	L
BUBBLE MEMORY CONTROLLER-PMT, 230V	0999222-0002	L

Item No.	Quantity		TI Part No.	Description	Remarks
0126	00008.000	EA	0972946-0105	RES FIX 47 K OHM 5 % .25 W CARBON FILM	for –0002
0126A				R369,R368,R372,R373,R358	
0126B				R360,R359,R356	
0127	00003.000	EA	0972946-0121	RES FIX 220K OHM 5 % .25 W CARBON FILM	
0127A				R370,R375,R361	
0128	00001.000	EA	0972946-0123	RES FIX 270K OHM 5 % .25 W CARBON FILM	
0128A				R374	
0129	00003.000	EA	0972946-0129	RES FIX 470K OHM 5 % .25 W CARBON FILM	
0129A				R365,R328,R354	
0130	00001.000	EA	0972947-0029	RES FIX 33 OHM 5 % .5 W CARBON FILM	
0130A				R322	
0131	00001.000	EA	0972947-0057	RES FIX 470 OHM 5% .5 W CARBON FILM	
0131A				R303	
0132	00001.000	EA	0972947-0117	RES FIX 150K OHM 5%.5W CARBON FILM	for –0001
0132A				R329	
0132	00001.000	EA	0972947-0123	RES FIX 270K OHM 5% .5 W CARBON FILM	for –0002
0132A				R329	
0133	00001.000	EA	0972630-0034	RES FIXED 0.221 OHMS 1WATT 1%	for –0001
0133A				R338	
0133	00001.000	EA	0972630-0077	RESISTOR,0.619 OHMS 1W,5% FX WW	for –0002
0133A				R338	
0134	00001.000	EA	0972978-0069	RES FIX COMP 47 OHMS 1.0W 5%	
0134A				R302	
0135	00001.000	EA	0972978-0024	RES,FIXED 68K 1 WATT 10%	for –0001
0135A				R340	
0135	00002.000	EA	0972947-0113	RES FIX 100K OHM 5% .5 W CARBON FILM	for –0002
0135A				R341,R342	
0136	00002.000	EA	0538425-0115	RES 15000. OHM 5% 2WATT FIX COMP	for –0001
0136A				R332,R333	
0136	00002.000	EA	0972942-0047	RES FIX 22K OHMS 5 WATT 10%	for –0002
0136A				R332,R333	
0137	00001.000	EA	0972942-0112	RES,FIXED 68 OHMS 5 WATT 5%	
0137A				R301	
0138	00001.000	EA	0972942-0039	RES FIX 400 OHM 5% 5 WATT WIREWOUND	for –0001
0138A				R331	
0138	00001.000	EA	0972942-0020	RES FIX 600. OHMS 5% 5 WATT WIREWOUND	for –0002
0138A				R331	
0139	00001.000	EA	0972942-1082	RES,FIXED 18K OHMS 5 WATT 5%	for –0001
0139A				R350	
0139	00001.000	EA	0972942-0031	RES FIX 30.0 K OHMS 5% 5 WATT WIREWOUND	for –0002
0139A				R350	
0141	00001.000	EA	0800118-0008	RESISTOR 1.0KOHMS DIL PULL UP 16 PINS	

LIST OF MATERIALS

Assembly	Part No.	Rev.
BUBBLE MEMORY CONTROLLER-PMT, 115V	0999222-0001	L
BUBBLE MEMORY CONTROLLER-PMT, 230V	0999222-0002	L

Item No.	Quantity		TI Part No.	Description	Remarks
0141	00001.000	EA	0800118-0008	RESISTOR 1.0KOHMS DIL PULL UP 16 PINS	
0141A				U17	
0142	00001.000	EA	0800118-0015	RESISTOR 6.8KOHMS DIL PULL UP 16 PINS	
0142A				U21	
0143	00001.000	EA	0972228-0010	RESISTOR,VARIABLE 10K OHM CERMET FILM	
0143A				R336	
0144	00001.000	EA	0972228-0013	X RES.VAR 100K OHM CERMET FILM	
0144A				R309	
0145	00004.000	EA	0972955-0001	XSTR 2N2369A,NPN,HIGH SPEED SW,TO-18	
0145A				Q3,Q6,Q9,Q12	
0146	00001.000	EA	0418801-0006	CRYSTAL,QUARTZ 16.000 MHZ CR-64/U	
0146A				Y1	
0147	00032.000	EA	0972763-0021	CAP.,FIXED,AXIAL LEAD,.047 UF,+80%,-20%	
0147A				C4,C5,C6,C7,C8,C9,C10,C11	
0147B				C12,C13,C14,C15,C16,C17,	
0147C				C18,C19,C20,C21,C22,C23,	
0147D				C24,C25,C26,C27,C28,C29,	
0147E				C30,C31,C32,C33,C34,C330	
0148	00001.000	EA	0539370-0497	RES FIX FILM 14.7K OHM 1% .25 WATT	
0148A				R335	
0149	00001.000	EA	0972946-0048	RES FIX 200 OHM 5 % .25 W CARBON FILM	
0149A				R13	
0150	00001.000	EA	0972946-0050	RES FIX 240 OHM 5 % .25 W CARBON FILM	
0150A				R14	
0151	00001.000	EA	0972900-7404	NETWORK SN74LS04N	
0151A				U1	
0152	REF	EA	0999221-9901	ELECTRONIC SCHEM DIAG,LOWER BD-PMT	
0153	00001.000	EA	0972988-0016	SCREW 4-40 X .438 PAN HEAD CRES	
0154	00001.000	EA	0996285-0004	HEATSINK,TRANSISTOR .750 X .750	
0155	00001.000	EA	0418730-0204	WASHER- #4 X .125 ID .312 OD PLAS & SYN	
0156	00001.000	EA	0999255-0001	INSULATOR, CAPACITOR-LOWER BD	
0157	00001.000	EA	0972946-0136	RES FIX 910K OHM 5% .25W CARBON FILM	
0157A				R328	for -0002 only
0158	00001.000	EA	0972946-0110	RES FIX 75 K OHM 5 % .25 W CARBON FILM	
0158A				R305	for -0002 only
0159	00000.700	FT	0417177-0219	INSUL SLEEVING .224IDX.015THK HT SHRNK	018632-
0160	REF	EA	0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	

LIST OF MATERIALS

Assembly	Part No.	Rev.
BUBBLE MEMORY CONTROLLER-PMT, 115V	0999222-0001	L
BUBBLE MEMORY CONTROLLER-PMT, 230V	0999222-0002	L

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999220-0001	PWB, PORTABLE KSR-PDET	
0002	00001.000	EA	0999237-0001	CABLE ASSY,POWER SUPPLY,PDET	
0003	00001.000	EA	0999238-0001	COMMUNICATIONS CABLE PMT	
0004	00001.000	EA	0972854-0003	CONNECTOR,RECP,PC 15 CONTACTS	
0004A				J1	
0005	00020.000	EA	0972498-0002	CONNECTOR,8 POS DBL ROW,EDGE MTG	
0005A				A3J1,A3J2,A3J3,A3J4,A3J5,	
0005B				A4J1,A4J2,A4J3,A4J4,A4J5,	
0005C				A5J1,A5J2,A5J3,A5J4,A5J5,	
0005D				A6J1,A6J2,A6J3,A6J4,A6J5	
0007	00032.000	EA	0972456-0002	PIN,.025 SQUARE	
0007A				E100,E101,E102,E103,E104,	
0007B				E105,E106,E107,E108,E109,	
0007C				E110,E313,E314,E319 E320	
0007D				E321,E322,E323,E324,E325,	
0007E				E326,E327,E328,E329,E330,	
0007F				E331,E332,E333,E334	
0007G				E346,E347,E348	
0008	00001.000	EA	0533517-0001	HEATSINK,ELECT-ELEC TOP AND BASE,TO-3	
0010	00009.000	EA	0539544-0005	SOCKET,18PIN IC LOW PROFILE SOLDER TAIL	
0010A				XU50 XU51 XU52 XU53 XU54	
0010B				XU55 XU56 XU57 XU81	
0011	00004.000	EA	0539544-0010	SOCKET,20PIN IC LOW PROFILE SOLDER TAIL	
0011A				XU10 XU44 XU65 XU66	
0012	00007.000	EA	0539544-0007	SOCKET,24PIN IC LOW PROFILE SOLDER TAIL	
0012A				XU58 XU59 XU60 XU61 XU62	
0012B				XU63 XU64	
0013	00002.000	EA	0539544-0009	SOCKET,40PIN IC LOW PROFILE SOLDER TAIL	
0013A				XU80 XU18	
0014	00002.000	EA	0416925-0400	SPACER,#4 1/8"LG ALUM ANODIZED	
0015	00001.000	EA	0416925-0411	SPACER #4 3/16 X .028 SCREW & BOLT	
0016	00010.000	EA	0972487-0001	JUMPER PLUG,CONNECTOR BLACK	
0017	00006.000	EA	0418212-0010	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	
0018	00001.000	EA	0972621-0002	SPRING RING	
0019	00001.000	EA	0972306-0002	COVER ROUND	
0021	00002.000	EA	0972988-0015	SCREW 4-40 X .375 PAN HEAD CRES	
0022	00002.000	EA	0972988-0019	SCREW 4-40 X .750 PAN HEAD CRES	
0023	00001.000	EA	0972988-0022	SCREW 4-40 X 1.25 PAN HEAD CRES	
0024	00008.000	EA	0411027-0803	WASHER .125 X .250 X .022 FLAT CRES	
0025	00004.000	EA	0411104-0135	WASHER #4 LOCKSPLIT	

LIST OF MATERIALS

Assembly	Part No.	Rev.
BUBBLE MEMORY CONTROLLER-PMT, 115V	0999222-0001	L
BUBBLE MEMORY CONTROLLER-PMT, 230V	0999222-0002	L

Item No.	Quantity		TI Part No.	Description	Remarks
0026	00006.000	EA	0411101-0057	LOCKWASHER # 4 EXTERNAL TOOTH CRES	
0027	00006.000	EA	0416453-0021	NUT,PLAIN,4-40 UNC-2B HEX,CRES,SMALL	
0028	AR	TU	0417559-0001	SILICONE RUBBER (RTV) DOW 3140	
0029	AR	FT	0411400-0022	WIRE 22AWG ELETRO-TIN-PLATED,COPPER	
0030	00002.000	EA	0406769-0001	SCREW,SPECIAL,CONNECTOR LOCKING	
0031	00005.000	EA	0185113-0001	X SPACER XST TO-18 CASE	
0032	AR	QT	0415804-0005	SEALING COMPOUND,ANAEROBIC-BLUE GRADE C	
0033	00001.000	EA	0972663-0001	NETWORK,LM339N	
0033A				U351	
0034	00002.000	EA	0222222-7400	NETWORK SN7400N	
0034A				U5,U7	
0035	00001.000	EA	0222222-7402	NETWORK SN7402N	
0035A				U30	
0036	00005.000	EA	0222222-7404	NETWORK SN7404N	
0036A				U28,U35,U38,U41,U74	
0037	00001.000	EA	0222222-7408	NETWORK-SN7408N	
0037A				U6	
0038	00008.000	EA	0222222-7432	NETWORK SN7432N	
0038A				U39,U16,U3,U4,U68,U70,	
0038B				U67,U69	
0039	00003.000	EA	0222222-7451	NETWORK SN7451N	
0039A				U2,U40,U31	
0040	00001.000	EA	0222222-7474	NETWORK SN7474N	
0040A				U29	
0041	00001.000	EA	0222222-7486	NETWORK-SN7486N	
0041A				U32	
0042	00002.000	EA	0222222-7109	NETWORK SN74109N	
0042A				U25,U26	
0043	00001.000	EA	0222222-7120	NETWORK-SN74120N	
0043A				U19	
0044	00001.000	EA	0222222-7148	NETWORK SN74148N	
0044A				U45	
0045	00002.000	EA	0222222-7161	NETWORK SN74161N	
0045A				U11,U12	
0046	00001.000	EA	0222222-7174	NETWORK SN74174N	
0046A				U8	
0047	00001.000	EA	0972159-7251	NETWORK SN74251N 16 PINS	
0047A				U37	
0048	00003.000	EA	0972120-0001	NETWORK TTL/MSI 9334	
0048A				U71,U72,U73	

LIST OF MATERIALS

Assembly	Part No.	Rev.
BUBBLE MEMORY CONTROLLER-PMT, 230V UK	0999222-0003	L

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999222-0002	BUBBLE MEMORY CONTROLLER-PMT,230V	
0004	00001.000	EA	2200056-0001	CONNECTOR ASSY, BARRIER CIRCUIT	
0004A				J1	
0004B				REMOVE AND DISCARD	
0004C				EXISTING CONNECTOR J1 AND	
0004D				MOUNTING HARDWARE.	
0004E				INSTALL THIS CONNECTOR	
0004F				AS SHOWN IN VIEW C-C	
0021	00002.000	EA	0972988-0013	SCREW 4-40 X .250 PAN HEAD CRES	
0024	00002.000	EA	0411027-0803	WASHER .125 X .250 X .022 FLAT CRES	
0025	00002.000	EA	0411104-0135	WASHER #4 LOCKSPLIT	

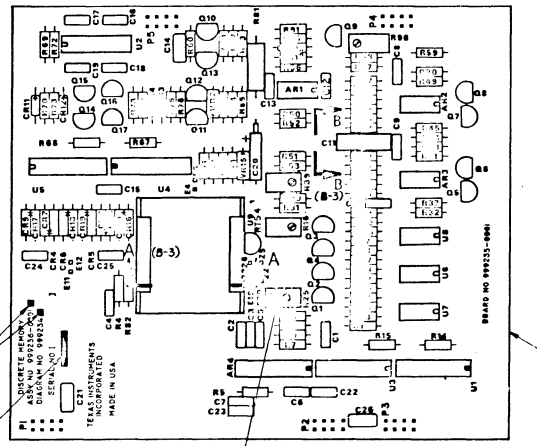
999236

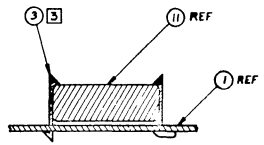
NOTES UNLESS OTHERWISE SPECIFIED
1 MAX LEAD LENGTH TO BE .062 FROM CONDUCTOR SIDE OF BOARD
2 DO NOT SOLDER ON COMPONENT SIDE
3 INSTALL BUBBLE CLIP (ITEM 3) AFTER PROCESS 2 ITEM 11 TO BE INSTALLED USING PROCESS 3
~~4 MASK ALL TOOL HOLES ON BOTH SIDES OF BOARD WITH SOLDERMASK TO PREVENT SOLDER FROM FLOWING DOWN TOOL HOLES~~
5 MARK SITE/DATE CODE ON ASSEMBLY IN LOCATION INDICATED PER 994396 (ITEM 75) PARAGRAPH 4.0 AND PROCESS 1
6 MARK APPROPRIATE REVISION LETTER PER REVISION LEVEL BLOCK AND PROCESS 1

NOTES CONTINUED:
7 PINS (ITEM 2) ARE TO BE INSTALLED ON CONDUCTOR SIDE AFTER PROCESS 2 ONLY ON THE FOLLOWING LOCATIONS: P1-1 THRU P1-8, P2-1 THRU P2-8, P3-1 THRU P3-8, P4-1 THRU P4-8, AND P5-1 THRU P5-8 (ALL OTHER LOCATIONS ARE INSTALLED ON COMPONENT SIDE)
8. JUMPER PLUGS (ITEM 96) TO BE INSTALLED BETWEEN E4 & E5, E11 & E12, E19 & E20, E22 & E23, AND E25 & E26. PLUGS TO BE INSTALLED AT TEST.
9. ADJUSTMENT SCREWS OF VARIABLE RESISTORS, (ITEMS 57 THRU 60) ARE TO BE SEALED WITH CEMENT (ITEM 90) AFTER TEST
10. INSTALL R16, R29, R89, R90 WITH ADJUSTMENT SCREWS AS SHOWN
11 ITEM 63 (C11) MAY BE INSTALLED PER SECTION B-B IF NECESSARY TO MEET .57 MAX COMPONENT HEIGHT
12 JUMPER WIRE (ITEM 76) INSTALLED IN LOCATION FOR R25

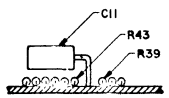
REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	424685	5/24/77	
B	424686	6/7/77	
C	427850	6/15/77	
D	423857	6/28/77	
E	424081	6/15/77	
F	425601	7/14/77	
G	425605	7/21/77	
H	CN425692	7-29-77	
I	DELE ITEM 56 PN 972215-3 QTY 1 (2) ADD ITEM 76		
J	CN425694	7-29-77	
	1) ADD ITEM 4 (2) ADD ITEM 80 (3) ITEM 49 QTY WAS 9 DELE REF DES R66 (4) ITEM 51 QTY WAS 6, DELE REF DES R71 R74 R77 R80 (5) ITEM 11 PN WAS 994396-1		

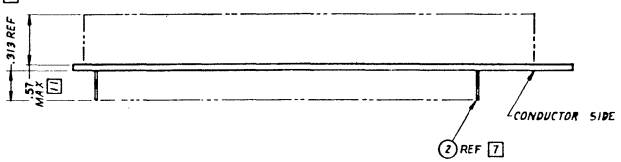




SECTION A-A
(B-7)



SECTION B-B
(C-6)
ROTATED 90° CCW
11



3	SLDR	127-01	00	
2	SLDR	124-02	00	
1	MARK	100-02	21	HEIGHT .06, COLOR BLACK

REVISION LEVEL: DIAGRAM 999234 H | ASSEMBLY D E F G H

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES
2200049	8738				
999230	8738				

PARTS LIST

Texas Instruments Incorporated
Dallas, Texas

DISCRETE MEMORY

D 96214 | 999236

LIST OF MATERIALS

Assembly	Part No.	Rev.
DISCRETE MEMORY ASSY	0999236-0001	K

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999235-0001	PWB, DISCRETE MEMORY	
0002	00050.000	EA	0972456-0002	PIN,.025 SQUARE	
0002A				P1-1 THRU P1-8	
0002B				P2-1 THRU P2-8	
0002C				P3-1 THRU P3-8	
0002D				P4-1 THRU P4-8	
0002E				P5-1 THRU P5-8	
0002F				E4,E5,E11,E12,E19,E20,F22,	
0002G				E23,E25,E26	
0002H				ITEM 97 MAY BE USED	
0002J				AS AN ALTERNATE	
0003	00001.000	EA	2200036-0001	CLIP,BUBBLE MEMORY	
0004	00003.000	EA	0972463-0001	NETWORK,SN72558P/MC1458P1 OP AMP	
0004A				AR1,AR2,AR3	
0005	00001.000	EA	0222222-7400	NETWORK SN7400N	
0005A				U1	
0006	00001.000	EA	0222222-7402	NETWORK SN7402N	
0006A				U2	
0007	00001.000	EA	0222222-7474	NETWORK SN7474N	
0007A				U3	
0008	00002.000	EA	0996436-0001	IC,MEMORY DRIVER	
0008A				U4,U5	
0009	00003.000	EA	0996437-0001	IC,SN75463BP DUAL PERIPHERAL POS & DRIVE	
0009A				U6,U7,U8	
0010	00001.000	EA	0996467-0002	IC, MC1544L, SENSE AMP, 4 CHANNEL	
0010A				AR4	
0011	00001.000	EA	2200046-0001	BUBBLE MEMORY,MASK LABELED	
0011A				U9	
0012	00011.000	EA	0972057-0001	TRANSISTOR-A5T2222 NPN SILICON	
0012A				Q5,Q6,Q7,Q8,Q10,Q11,Q12,	
0012B				Q14,Q15,Q16,Q17	
0013	00006.000	EA	0800523-0001	TRANSISTOR A5T2907 PNP SILICON	
0013A				Q1,Q2,Q3,Q4,Q9,Q13,	
0014	00001.000	EA	0972934-0005	DIODE,1N750A 4.7 V 5% SIL VOLT REG	
0014A				VR2	
0015	00001.000	EA	0972934-0006	DIODE,1N751A 5.1 V 5% SIL VOLT REG	
0015A				VR15	
0016	00001.000	EA	0972131-0001	DIODE,ZENER,6-2V 5%	
0016A-				VR1	
0017	00005.000	EA	0972932-0001	DIODE,1N914B SWITCHING 75V P1V 75MA 4NS	

LIST OF MATERIALS

Assembly	Part No.	Rev.
DISCRETE MEMORY ASSY	0999236-0001	K

Item No.	Quantity		TI Part No.	Description	Remarks
0017A				CR11,CR12,CR13,CR14,CR20	
0018	00012.000	EA	0996463-0002	DIODE VSK130 RECTIFIER	
0018A				CR3 THRU CR10	
0018B				CR16 THRU CR19	
0019	00001.000	EA	0996534-0001	THERMISTOR,POS TEMPERATURE COEFFICIENT	
0019A				RT54	
0020	00003.000	EA	0539370-0193	RES FIX FILM 10.0 OHM 1% .25 WATT	
0020A				R29,R31,R82	
0024	00002.000	EA	0539370-0272	RES FIX FILM 66.5 OHM 1% .25 WATT	
0024A				R83,R87	
0026	00002.000	EA	0539370-0289	RES FIX FILM 100 OHM 1% .25 WATT	
0026A				R1,R4	
0027	00001.000	EA	0539370-0336	RES FIX FILM 309 OHM 1% .25 WATT	
0027A				R55	
0028	00003.000	EA	0539370-0349	RES FIX FILM 422 OHM 1% .25 WATT	
0028A				R18,R19,R27	
0029	00003.000	EA	0539370-0355	RES FIX FILM 487 OHM 1% .25 WATT	
0029A				R17,R22,R28	
0030	00001.000	EA	0539370-0403	RES FIX FILM 1.54K OHM 1% .25 WATT	
0030A				R58	
0031	00001.000	EA	0539370-0409	RES FIX FILM 1.78K OHM 1% .25 WATT	
0031A				R46	
0032	00003.000	EA	0539370-0411	RES FIX FILM 1.87K OHM 1% .25 WATT	
0032A				R2,R3,R38	
0033	00001.000	EA	0539370-0416	RES FIX FILM 2.10K OHM 1% .25 WATT	
0033A				R43	
0034	00001.000	EA	0539370-0423	RES FIX FILM 2.49K OHM 1% .25 WATT	
0034A				R56	
0035	00001.000	EA	0539370-0427	RES FIX FILM 2.74K OHM 1% .25 WATT	
0035A				R47	
0036	00001.000	EA	0539370-0434	RES FIX FILM 3.24K OHM 1% .25 WATT	
0036A				R39	
0037	00001.000	EA	0539370-0398	RES FIX FILM 1.37K OHM 1% .25 WATT	
0037A				R42	
0038	00001.000	EA	0539370-0463	RES FIX FILM 6.49K OHM 1% .25 WATT	
0038A				R53	
0039	00001.000	EA	0539370-0452	RES FIX FILM 4.99K OHM 1% .25 WATT	
0039A				R35	
0040	00001.000	EA	0539370-0465	RES FIX FILM 6.81K OHM 1% .25 WATT	
0040A				R44	

LIST OF MATERIALS

Assembly	Part No.	Rev.
DISCRETE MEMORY ASSY	0999236-0001	K

Item No.	Quantity		TI Part No.	Description	Remarks
0041	00001.000	EA	0539370-0471	RES FIX FILM 7.87K OHM 1% .25 WATT	
0041A				R40	
0042	00008.000	EA	0539370-0481	RES FIX FILM 10.0K OHM 1% .25 WATT	
0042A				R6,R7,R36,R37,R41,R45,	
0042B				R49,R57	
0043	00001.000	EA	0539370-0482	RES FIX FILM 10.5K OHM 1% .25 WATT	
0043A				R48	
0044	00002.000	EA	0539370-0577	RES FIX FILM 100 K OHM 1% .25 WATT	
0044A				R51,R52	
0045	00004.000	EA	0972946-0003	RES FIX 2.7 OHM 5 % .25 W.CARBON FILM	
0045A				R30,R32,R33,R34	
0046	00001.000	EA	0972946-0053	RES FIX 330 OHM 5 % .25 W CARBON FILM	
0046A				R66	
0047	00002.000	EA	0972946-0038	RES FIX 75.0 OHM 5 % .25 W.CARBON FILM	
0047A				R67,R68	
0048	00001.000	EA	0972946-0121	RES FIX 220K OHM 5 % .25 W CARBON FILM	
0048A				R91	
0049	00008.000	EA	0972946-0065	RES FIX 1.0K OHM 5% .25 W CARBON FILM	
0049A				R5,R14,R15,R61,R69,R72,R75	
0049B				R78	
0050	00004.000	EA	0972946-0055	RES FIX 390 OHM 5 % .25 W CARBON FILM	
0050A				R71,R74,R77,R80	
0051	00002.000	EA	0972946-0073	RES FIX 2.2K OHM 5 % .25 W CARBON FILM	
0051A				R64,R65	
0052	00005.000	EA	0972946-0079	RES FIX 3.9K OHM 5 % .25 W CARBON FILM	
0052A				R63,R70,R73,R76,R79	
0053	00001.000	EA	0972946-0089	RES FIX 10K OHM 5% .25 W CARBON FILM	
0053A				R62	
0054	00001.000	EA	0972946-0097	RES FIX 22 K OHM 5 % .25 W CARBON FILM	
0054A				R60	
0055	00001.000	EA	0972946-0105	RES FIX 47 K OHM 5 % .25 W CARBON FILM	
0055A				R59	
0056	00001.000	EA	0972978-0074	RES FIX COMP 75 OHMS 1.0 WATT 5%	
0056A				R81	
0057	00001.000	EA	0972213-0001	RESISTOR VAR 10 OHMS 1.0 WATT 5%	
0057A				R16	
0059	00001.000	EA	0972227-0009	RES,VAR 5000 OHMS 2% 50 WATT	
0059A				R90	
0060	00001.000	EA	0972227-0008	X RES VAR 2K OHMS CERMET FILM	
0060A				R89	

LIST OF MATERIALS

Assembly: DISCRETE MEMORY ASSY — Part No.: 0999236-0001 — Rev.: K

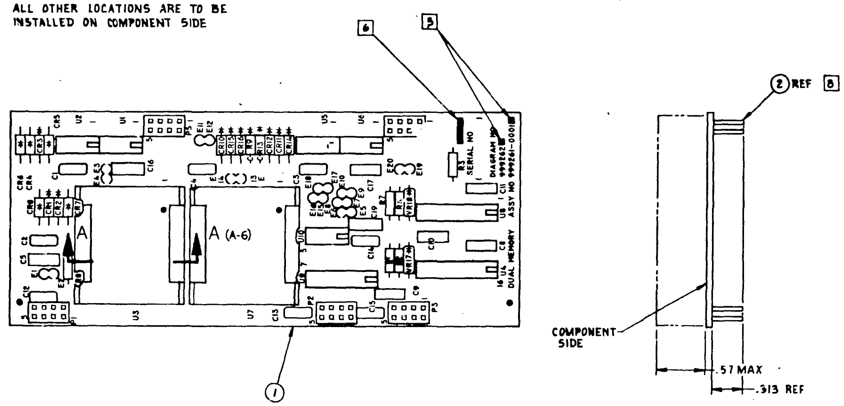
Item No.	Quantity		TI Part No.	Description	Remarks
0061	00001.000	EA	0972924-0010	CAP FIX TANT SOLID 22 MFD 10 % 15 VOLT	
0061A				C20	
0062	00011.000	EA	0972225-0510	CAPACITOR,1.0 UF 50V 20% CERAMIC	
0062A				C8,C9,C10,C14,C15,C21,C22,	
0062B				C23,C24,C25,C26	
0063	00001.000	EA	0972225-0533	CAPACITOR,3.3 UF 50V 20% CERAMIC	
0063A				C11	
0064	00006.000	EA	0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	
0064A				C1,C4,C6,C7,C12,C13	
0065	00001.000	EA	0972929-0391	CAP FIX CERAMIC 470 PF 10 % 200 V	
0065A				C5	
0066	00006.000	EA	0972929-0397	CAP FIX CERAMIC .001 UF 10% 200V	
0066A				C2,C3,C16,C17,C18,C19	
0069	00001.000	EA	0539370-0236	RESISTOR,28.0 OHMS 1% .25W FX FILM	
0069A				R85	
0070	00001.000	EA	0539370-0356	RES FIX FILM 499 OHM 1% .25 WATT	
0070A				R23	
0071	00001.000	EA	0539370-0338	RES FIX FILM 324 OHM 1% .25 WATT	
0071A				R24	
0072	00001.000	EA	0539370-0301	RESISTOR,133 OHMS 1% .25W FX FILM	
0072A				R86	
0073	00001.000	EA	0539370-0548	RES FIX FILM 49.9K OHM 1% .25 WATT	
0073A				R50	
0075	REF	EA	0994396-9901	PROCEDURE,SITE & DATE CODE SERIALIZATION	
0076	00000.042	FT	0411400-0022	WIRE 22AWG ELETRO-TIN-PLATED,COPPER	
0076A				R25 JUMPER	
0096	00005.000	EA	0972487-0001	JUMPER PLUG,CONNECTOR BLACK	
0097	00000.000	EA	0972494-0001	PIN,.025 SQUARE	
0097A				ALTERNATE FOR ITEM 2	
0099	AR	EA	0231023-0011	CEMENT GLYPTAL,GE-1201 RED ENAMEL	
0100	REF	EA	0999234-9901	DIAGRAM,LOGIC	
0101	REF	EA	2202050-9901	TST PROC, 763 BUBBLE BD TSTR & ADAPTER	

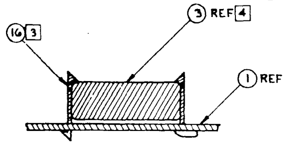
999261

REV	DESCRIPTION	DATE	APPROVED
E	CN418680 R. Conti GENERATED DRAWING & REVISED LM	12/20/77	

NOTES UNLESS OTHERWISE SPECIFIED

1. MAX LEAD LENGTH TO BE .062 FROM CONDUCTOR SIDE OF BOARD
2. DO NOT SOLDER ON COMPONENT SIDE
3. [3] INSTALL BUBBLE MEMORY CLIP (ITEM 16) AFTER PROCESS 1
4. [4] BUBBLE MEMORY (ITEM 3) TO BE INSTALLED USING PROCESS 2
5. [5] MARK APPROPRIATE REV LTR PER REV LEVEL BLOCK AND PROCESS 3
6. [6] MARK SITE/DATE CODE ON ASSEMBLY IN LOCATION INDICATED PER 994396 (ITEM 17) PARAGRAPH 4.0 AND PROCESS 3
7. JUMPER PLUGS (ITEM 15) TO BE INSTALLED BETWEEN E1 & E2, E3 & E4, E5 & E6, E7 & E8, E9 & E10, E11 & E12, E13 & E14, E15 & E16, E17 & E18, AND E19 & E20. PLUGS TO BE INSTALLED AT TEST
8. [8] PINS (ITEM 2) ARE TO BE INSTALLED ON CONDUCTOR SIDE AFTER PROCESS 1 ONLY IN THE FOLLOWING LOCATIONS:
   P1-1 THRU P1-8, P2-1 THRU P2-8,
   P3-1 THRU P3-8, P4-1 THRU P4-8,
   P5-1 THRU P5-8
   ALL OTHER LOCATIONS ARE TO BE INSTALLED ON COMPONENT SIDE





SECTION A-A
2 PLACES
(B-6)

SEQ NO	IDENT	E SPEC	NO	ADDITIONAL	NOTES
3	MARK	100-02	21	HEIGHT 06 COLOR BLACK	[5][6]
2	SLDR	127-01	00		
1	SLDR	124-02	00		

PROCESS / CLASSIFICATION

REVISION LEVEL STATUS						
DOCUMENT	REVISION					
ASSEMBLY	*	A	B	C	D	E
SCHEMATIC 999262	*	*	*	*	*	*

NEXT ASSY	USED ON
2200062	8738
2200049	8738
999230	8738

APPLICATION

QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

TEXAS INSTRUMENTS

DUAL BUBBLE MEMORY

D 96214 999261

LM

02

6-75

LIST OF MATERIALS

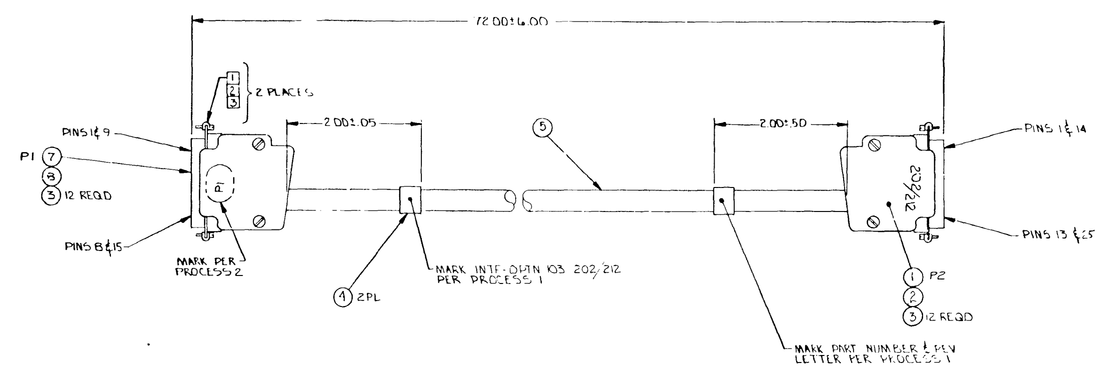
Assembly	Part No.	Rev.
DUAL BUBBLE MEMORY, PWB ASSEMBLY	0999261-0001	E

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0999260-0001	PWB, DOUBLE BUBBLE	
0002	00060.000	EA	0972456-0002	PIN,.025 SQUARE	
0002A				P1-1 THRU P1-8	
0002B				P2-1 THRU P2-8	
0002C				P3-1 THRU P3-8	
0002D				P4-1 THRU P4-8	
0002E				P5-1 THRU P5-8	
0002F				E1 THRU E20	
0003	00002.000	EA	0996589-0001	IC,MAGNETIC BUBBLE MEMORY	
0003A				U3 U7	
0004	00001.000	EA	0996536-0001	SENSE AMP 14 PIN TRISTATE	
0004A				U9	
0005	00016.000	EA	0996463-0002	DIODE VSK130 RECTIFIER	
0005A				CR1 THRU CR16	
0006	00002.000	EA	0996538-0001	IC,FUNCTION DRIVER,BUBBLE MEMORY	
0006A				U4 U8	
0007	00004.000	EA	0996535-0001	IC,COIL DRIVER, BUBBLE MEMORY	
0007A				U1 U2 U5 U6	
0008	00004.000	EA	0539370-0385	RES FIX FILM 1.00K OHM 1% .25 WATT	
0008A				R1 R2 R3 R4	
0009	00001.000	EA	0996537-0001	IC,TERMINATION NETWORK	
0009A				U10	
0010	00008.000	EA	0972225-0510	CAPACITOR,1.0 UF 50V 20% CERAMIC	
0010A				C1 C2 C3 C4 C12 C13 C14	
0010B				C15	
0011	00008.000	EA	0972965-0024	CAP FIX CERAMIC .100 MF 10% 100V	
0011A				C5 C8 C9 C10 C11 C16 C17	
0011B				C19	
0012	00002.000	EA	0972934-0008	DIODE,1N753A 6.2 V 5% SIL VOLT REG	
0012A				VR17 VR18	
0013	REF	EA	0999262-9901	SCHEMATIC, BUBBLE MEMORY	
0014	00002.000	EA	0539370-0289	RES FIX FILM 100 OHM 1% .25 WATT	
0014A				R7 R8	
0015	00010.000	EA	0972487-0001	JUMPER PLUG,CONNECTOR BLACK	
0016	00002.000	EA	2200036-0001	CLIP,BUBBLE MEMORY	

NOTES UNLESS OTHERWISE SPECIFIED

1. CABLE CLAMP SCREWS & RETAINER CLIPS & SCREWS INCLUDED WITH ITEM 2
2. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME AS SCREW HEAD
3. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIPS

WIRE NO	DESCRIPTION		FROM	TO	SIGNATURE		REMARKS
1	22 AWG	BLK	P1-1	P2-1	AA	5	
2	↑	WHT	-2	-5	CB	↑	
3		RED	-3	-3	BB		
4		GRN	-4	-8	CF		
5		BRN	-5	-12	SCF		
6		BLU	-7	-11	SCA		
7		ORN	-8	-20	CD		
8		YEL	-9	-6	CC		
9		VIO	-10	-22	CE		
10		GRY	-11	-4	CA		
11	↓	PINK	-14	-2	BA	↓	
12	22 AWG	TAN	P1-15	P2-7	AB	5	



ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSY. 757/765, LIA 103/202/212 DATA SET

D 96214

LIST OF MATERIALS

Assembly	Part No.	Rev.
CBL ASSY, 763/765/EIA 103/202/212 DATA SET	2200051-0001	*

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0539409-0005	CONNECTOR,PLUG 25 PINS	
0001A				P2	
0002	00001.000	EA	0539903-0001	HOOD,CONN 25 PIN WITH RETAINERS	
0003	00024.000	EA	0539430-0003	CONTACT,PIN 24-20AWG .068 INSUL DIA	
0004	00002.000	EA	0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	
0005	00006.500	FT	0972444-0005	CABLE,12COND 22AWG UL LISTED	
0006	REF	EA	0985903-9901	TEST PGM,103/202/212 DATA SET CABLE-OMNI	
0007	00001.000	EA	0539409-0003	CONNECTOR, RACK AND PANEL, 15POS	
0007A				P1	
0008	00001.000	EA	0539903-0005	HOOD,CONN 15 PIN WITH RETAINERS	

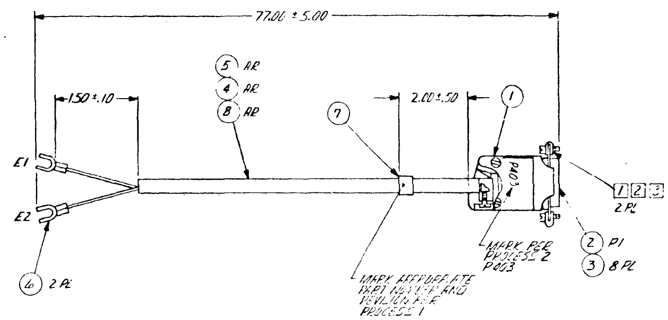
NOTES: UNLESS OTHERWISE SPECIFIED:

1. CABLE CLAMP SCREWS AND RETAINER CLIPS AND SCREWS INCLUDED WITH ITEM 1.
2. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME SIDE AS SCREW HEAD.
3. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIPS.

WIRE NO	DESCRIPTION	TOTAL LENGTH	START STATION	FINISH STATION	SIGNATURE	REMARKS	LW ITEM NO
1	22 AWG RED/WHT		P1-5	E-1	DT	RED IS DATA TIP	5
2	22 AWG BLK/WHT		P1-4	E-2	DR	BLK IS DATA RING	4

DWG NO 2200052

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
C	CN434296 (3) CBoyce (1) REPLACES REV B WITH CHANGE (2) REVISED PER EXTENSIVE ENGR CHANGES.	7-10-78	[illegible]



SEQ NO	IDENT	F SPEC	NO	ADDITIONAL	NOTES
2	MARK	100-07	712	CLR WHITE TYPE 9	
1	MARK	100-07	712	CLR BLACK TYPE 6	
	PROCESS		CLASSIFICATION		

PROCESSES — FOR CORRELATION TO CONTROLLING SPECIFICATIONS SEE DRAWING [illegible]

QTY -1	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTE

PARTS LIST

NEXT ASSY	USED ON
2200060	8738

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES: ANGLES ±1°, 3 PLACE DECIMALS ±.010, 2 PLACE DECIMALS ±.02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MA[illegible] DIAMETERS [illegible]
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125: +.004 −.001	.126 THRU .250: +.005 −.001	.251 THRU .500: +.006 −.001
.501 THRU [illegible]: +.008 −.001	.751 THRU [illegible]: +.010 −.001	1.001 THRU [illegible]: +.012 −.001

TEXAS INSTRUMENTS INCORPORATED Dallas Texas

CABLE ASSY. 733 INTERNAL MODEM TO CDT DAA

D 96214 2200052

4 34 3 2 LIM 1

6-79

LIST OF MATERIALS

Assembly	Part No.	Rev.
CBL ASSY, INTERNAL MODEM/DAA	2200052-0001	*

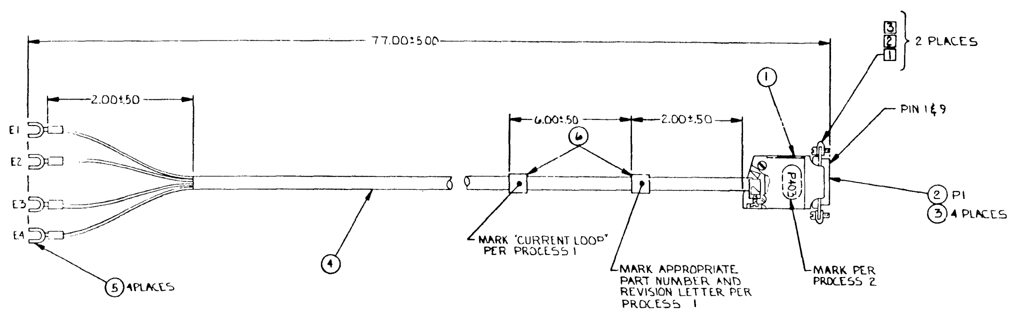
Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0539409-0003	CONNECTOR, RACK AND PANEL, 15POS	
0001A				P1	
0002	00002.000	EA	0539903-0005	HOOD,CONN 15 PIN WITH RETAINERS	
0003	00010.000	EA	0539430-0003	CONTACT,PIN 24-20AWG .068 INSUL DIA	
0004	00001.000	EA	0968999-0001	PWB,DATA COUPLER CABLE	
0004A				P3	
0005	00002.000	EA	0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	
0006	00008.000	EA	0418212-0010	STRAP,TIEDOWN,ADJUSTABLE,PLASTIC	
0007	00006.500	FT	0972444-0012	CABLE,5COND,22 AWG,300 WV,PVC INSULATED	
0008	REF	EA	0985904-9901	TEST PGM,763 INTERNAL MODEM/DAA-OMNI	
0009	00006.500	FT	0972444-0007	CABLE,1 SHLD PR W/DRAIN 22AWG UL LISTED	
0010	00001.000	EA	0539409-0004	CONNECTOR,RCPT 15 PINS	
0010A				P2	
0011	00003.000	EA	0539430-0004	CONTACT,SOCKET 24-20AWG .068 INSUL DIA	

REVISIONS (2200053)

REV	DESCRIPTION	DATE	APPROVED

NOTES UNLESS OTHERWISE SPECIFIED
1. CABLE CLAMP SCREWS AND RETAINER CLIPS AND SCREWS INCLUDED WITH ITEM 1
2. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME SIDE AS SCREW HEAD
3. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIPS

WIRE NO	DESCRIPTION	TOTAL LENGTH	START STATION	FINISH STATION	REMARKS	ITEM NO
1	22 AWG WHITE	6.5FT	P1-6	E1	RL-1	4
2	22 AWG GREEN	6.5FT	P1-7	E2	RL-2	4
3	22 AWG BLACK	6.5FT	P1-5	E3	X-1	4
4	22 AWG RED	6.5FT	P1-4	E4	X-2	4



NO	PROCESS		CLASSIFICATION	NOTES
2	MARK 100-01	712	CLF WHITE TYPE 9	
1	MARK 150-01	712	CLF BLACK TYPE 6	

QTY -1	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
2200060	873B

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1° 3 PLACE DECIMALS ± .010 2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.251 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.751 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

DATE 7-13-77 · 8-8-77 · 8/4/77

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSY, 763, TTY CURRENT LOOP INTERFACE

D 96214 · DRAWING NO 2200053

LM · FILMED

LIST OF MATERIALS

Assembly	Part No.	Rev.
CBL ASSY, 763, TTY CURRENT LOOP INTERFACE	2200053-0001	*

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0539903-0005	HOOD,CONN 15 PIN WITH RETAINERS	
0002	00001.000	EA	0539409-0004	CONNECTOR,RCPT 15 PINS	
0002A				P1	
0003	00004.000	EA	0539430-0004	CONTACT,SOCKET 24-20AWG .068 INSUL DIA	
0004	00006.500	FT	0417453-0002	CABLE,4COND,22AWG,200V,.168 OD,	
0005	00004.000	EA	0972561-0001	TERMINAL,SLOTTED TONGUE #4 STUD	
0005A				E1 THRU E4	
0006	00002.000	EA	0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	
0007	REF	EA	0985905-9901	TEST PGM,763 TTY INTERFACE-OMNI	

NOTES: UNLESS OTHERWISE SPECIFIED

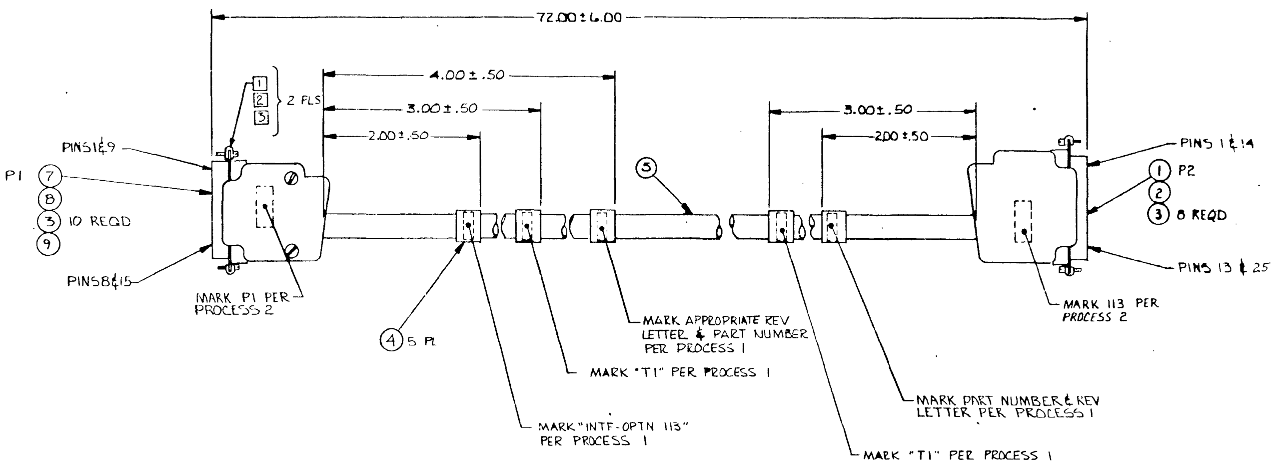
1. CABLE CLAMP SCREWS & RETAINER CLIPS & SCREWS INCLUDED WITH ITEM 2
2. RETAINER CLIP INSTALLED WITH THREADED HOLE ON SAME AS SCREW HEAD
3. SCREWS MUST BE THREADED COMPLETELY THRU RETAINER CLIPS
4. THIS CABLE IS TO BE CONSTRUCTED WITH UL LISTED MATERIALS ONLY.

WIRE NO	DESCRIPTION	START STATION	FINISH STATION	SIGNATURE	ITEM NO	REMARKS
1	22AWG CABLE-BLK	P1-1	P2-1	AA	5	
2	22AWG-CABLE-WHT	-2	P2-5	CB	5	
3	22AWG-CABLE-RED	-3	P2-3	BB	5	
4	22AWG-WIRE-WHT	-4	P1-13	ON LEVEL	5	
5	22AWG-CABLE-YEL	-8	P2-20	CD	5	
6	-VIO	-9	-6	CC	5	
7	-GRY	-11	-4	CA	5	
8	-BLU	-14	-2	BA	5	
9	-ORN	P1-15	P2-7	AB	5	
10	-GRN	—	—	—	5	NOT USED
11	22AWG-CABLE-BRN	—	—	—	5	NOT USED

DWG NO 2200055 SH

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	CN429302 (...) 1) START STATION, WIRE NO. 2 WAS P1-5	11-21-77	[illegible]
B	CN429281 (D) H. D... (1) REVISED PICTORIAL OF CONN P1 & CONN P1/P2 MARKING	1-18-78	[illegible]
C	CN418304 (C) G. Mallett (1) ADDED NOTE 4 (2) ADDED 3 CABLE MARKERS AND DIMS (3) ITEM 4 QTY WAS 2	5-9-78	[illegible]



SEQ NO	IDENT	SPEC	NO	ADDITIONAL	NOTES
2	MARK	[illegible]	712	COLOR WHITE, TYPE 9	
1	MARK	[illegible]	716	COLOR [illegible], TYPE 4	
	PROCESS		CLASSIFICATION		

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
2200060	8738

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
  3 PLACE DECIMALS ± .010
  2 PLACE DECIMALS ± .02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.251 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.751 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

CABLE ASSY, 763/765 EIA, 113 DATA SET

D 96214 2200055

LIST OF MATERIALS

Assembly	Part No.	Rev.
CBL ASSY, 763/765 EIA, 113 DATA SET	2200055-0001	*

Item No.	Quantity		TI Part No.	Description	Remarks
0001	00001.000	EA	0539409-0005	CONNECTOR,PLUG 25 PINS	
0001A				P2	
0002	00001.000	EA	0539903-0001	HOOD,CONN 25 PIN WITH RETAINERS	
0003	00018.000	EA	0539430-0003	CONTACT,PIN 24-20AWG .068 INSUL DIA	
0004	00002.000	EA	0418201-0060	STRAP,MARKER,ADJUSTABLE,PLASTIC	
0005	00006.500	FT	0972444-0001	CABLE,10COND 22AWG UL LISTED	
0006	REF	EA	0985906-9901	TEST PGM,763/765 EIA,113 DATA SET-OMNI	
0007	00001.000	EA	0539409-0003	CONNECTOR, RACK AND PANEL, 15POS	
0007A				P1	
0008	00001.000	EA	0539903-0005	HOOD,CONN 15 PIN WITH RETAINERS	
0009	00000.250	FT	0538347-3999	WIRE HOOKUP B-22 AWG 19 STR WHITE	

SECTION VII

ELECTRICAL DRAWINGS

7.1 INTRODUCTION

This section contains the logic diagrams for the terminal.

[12] THESE TRANSISTORS ARE MOUNTED ON HEATSINKS.

[13] IF NECESSARY A SELECTED RESISTOR IS INSTALLED AT UNIT TEST IN LOCATION R468 OR R469 AS REQUIRED IN ORDER TO ACHIEVE MARK/SPACE SYMMETRY.

[14] RESISTORS WITH NO VALUES SPECIFIED ARE NOT INSTALLED ON 115V PCB.

[15] U12 IS USED FOR OPTIONAL ABM AND IS INSTALLED FROM CONFIGURATION GUIDE AT UNIT ASSEMBLY.

[16] NOT INSTALLED, FOR FUTURE USE ONLY.

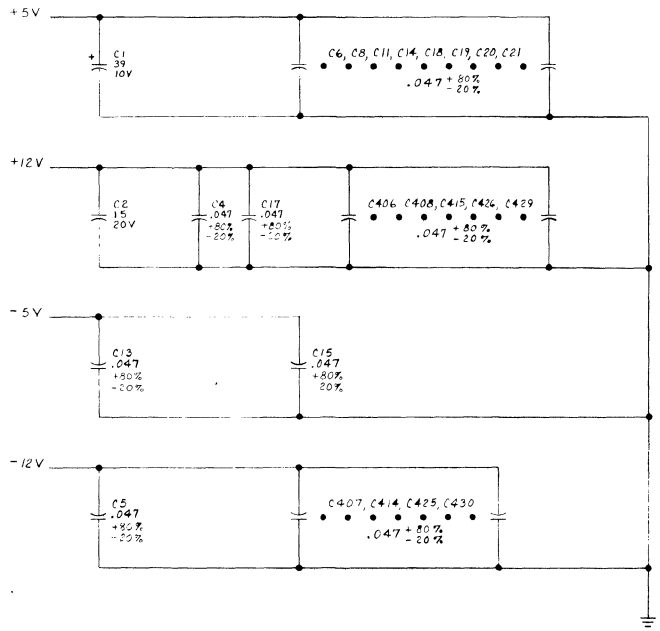
[17] REV 'A' BOARDS WILL NOT HAVE C356 OR JUMPER WIRE. THESE POINTS WILL BE CONNECTED BY ETCH RUN TO +16VR.

NOTES: UNLESS OTHERWISE SPECIFIED;

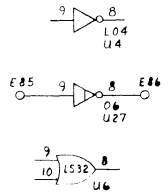
1. ALL DEVICE TYPES ARE PREFIXED WITH SN74.
2. VCC IS APPLIED TO PIN 14 OF ALL 14-PIN IC'S AND PIN 16 OF ALL 16-PIN IC'S.
3. GROUND IS APPLIED TO PIN 7 OF ALL 14-PIN IC'S AND PIN 8 OF ALL 16-PIN IC'S.
4. DEVICE TYPE, PIN NUMBERS, AND REFERENCE DESIGNATOR OF IC IS SHOWN AS FOLLOWS;

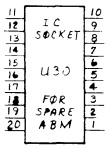
00 AND 04 = DEVICE TYPE
4, 5, AND 6 = PIN NUMBERS
U14 AND U21 = REFERENCE DESIGNATOR

5. RESISTORS ARE 1/4 WATT, 5%.
6. DIODES NOT MARKED ARE IN914B.
7. AMPLIFIERS NOT MARKED ARE RC4558P.
8. ON RC4558P AMPLIFIERS, PIN 4 IS TIED TO -12V AND PIN 8 IS TIED TO +12V.
9. □ = SYMBOL USED FOR "E" NUMBERS WHICH HAVE A SQUARE PIN.
10. SHEETS 8 AND 9 SHOW THE MODEM/ACOUSTIC COUPLER CIRCUITRY; SHEET 8 APPLIES TO 937298-0001 ASSY, AND SHEET 9 APPLIES TO 937298-0003 ASSY.
11. NO TEST POINTS MAY BE MOVED WITHOUT PRIOR APPROVAL BY TEST ENGINEERING.



SPARES





REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	CN4217B3(C) #		

PARTS LIST

QTY REQD	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

HOLE TOLERANCE

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES
  - ANGLES ± 1°
  - 3 PLACE DECIMALS ± .010
  - 2 PLACE DECIMALS ± .02

MATERIAL:

NEXT ASSY | USED ON

APPLICATION

DWN | DATE

CHK C. ALCALA 5-11-77

ENGR | DATE

MFG | DATE

QUALITY | DATE

DESIGN AUTHORITY RELEASE | DATE

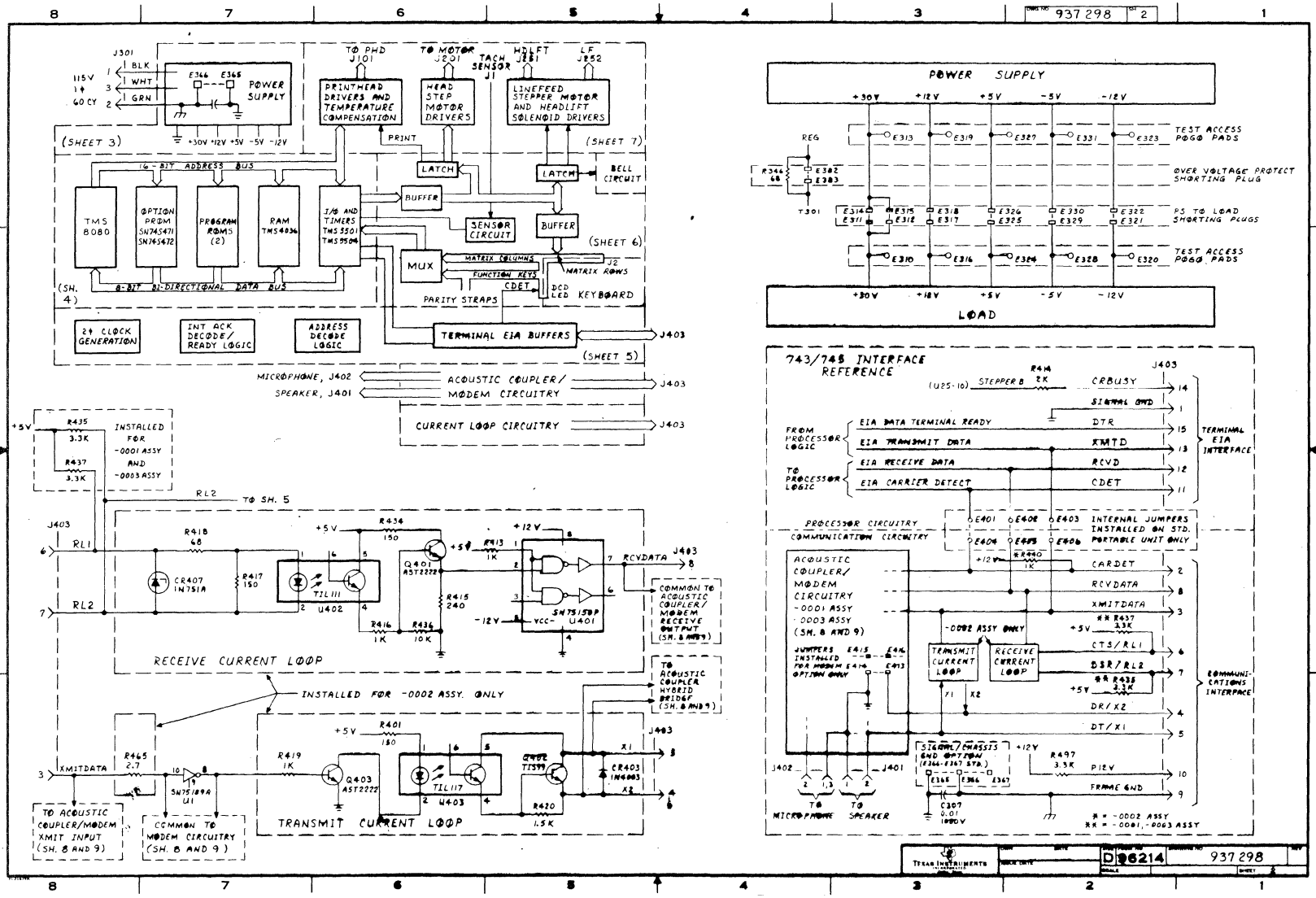
TEXAS INSTRUMENTS INCORPORATED
Equipment Group — Dallas, Texas

DIAGRAM, LOGIC-SCHEMATIC
MODEL 743/745
SATA TERMINAL

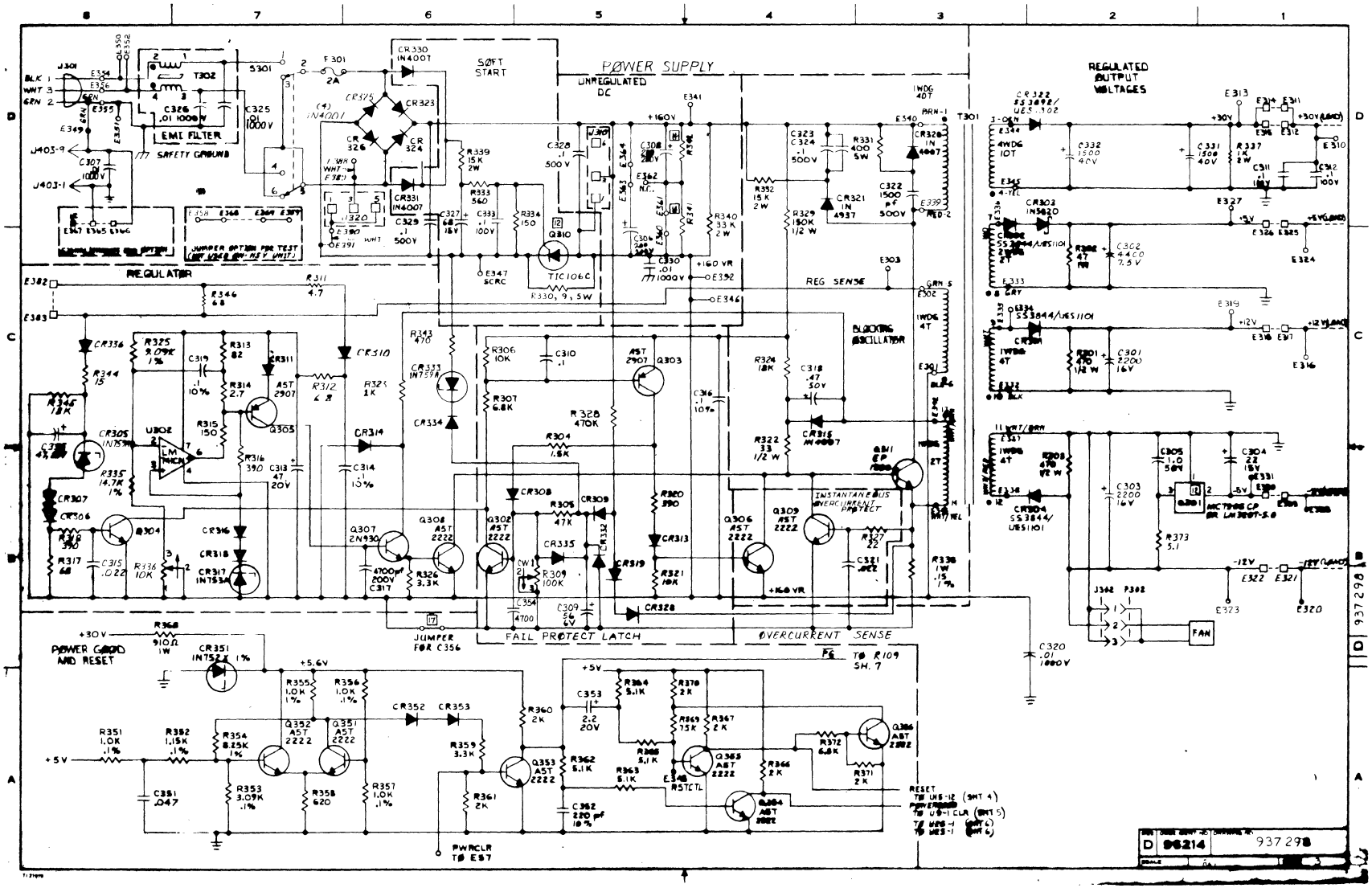
SIZE	CODE IDENT NO	DRAWING NO
D	96214	937298

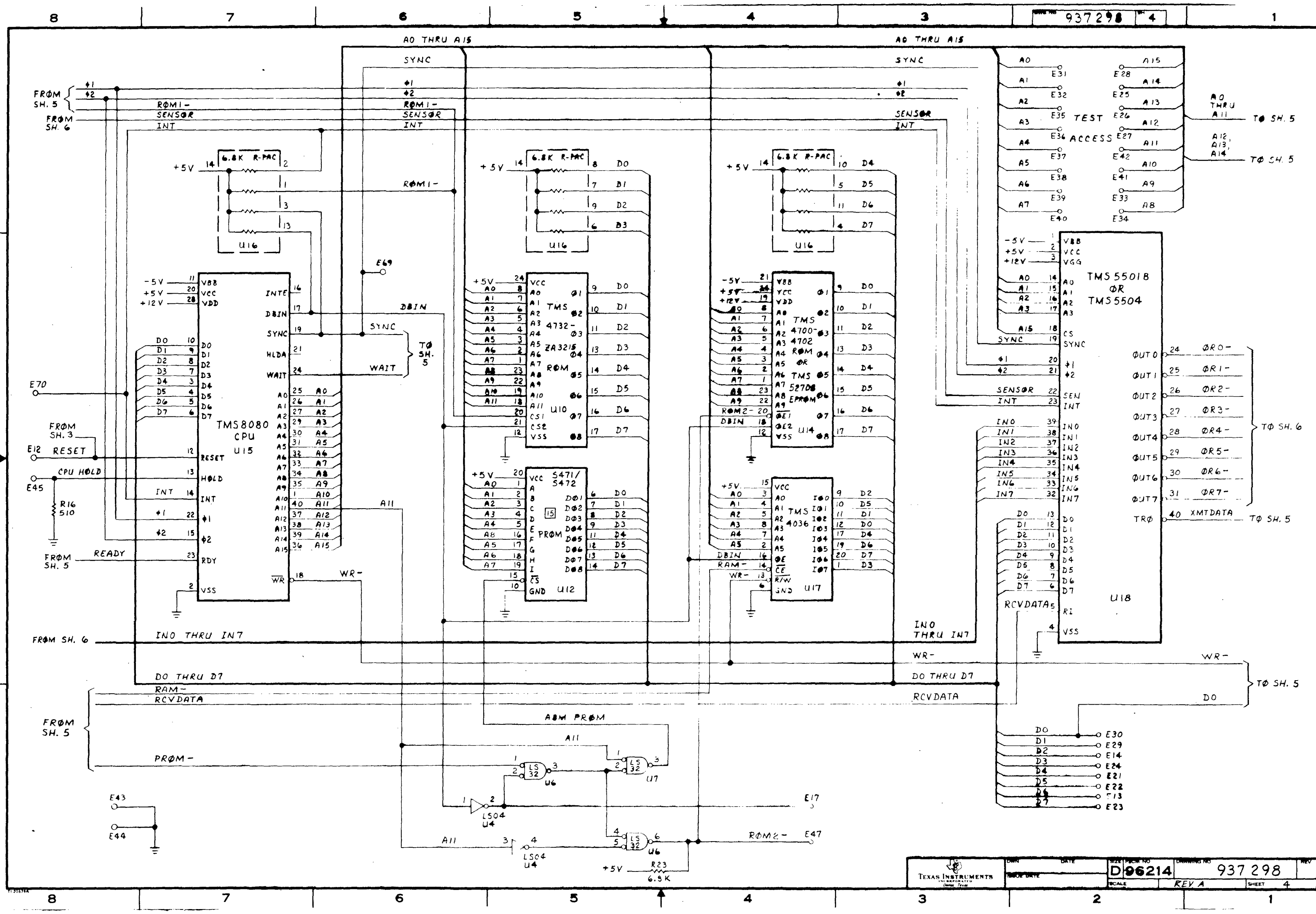
SCALE | SHEET 1 OF 9

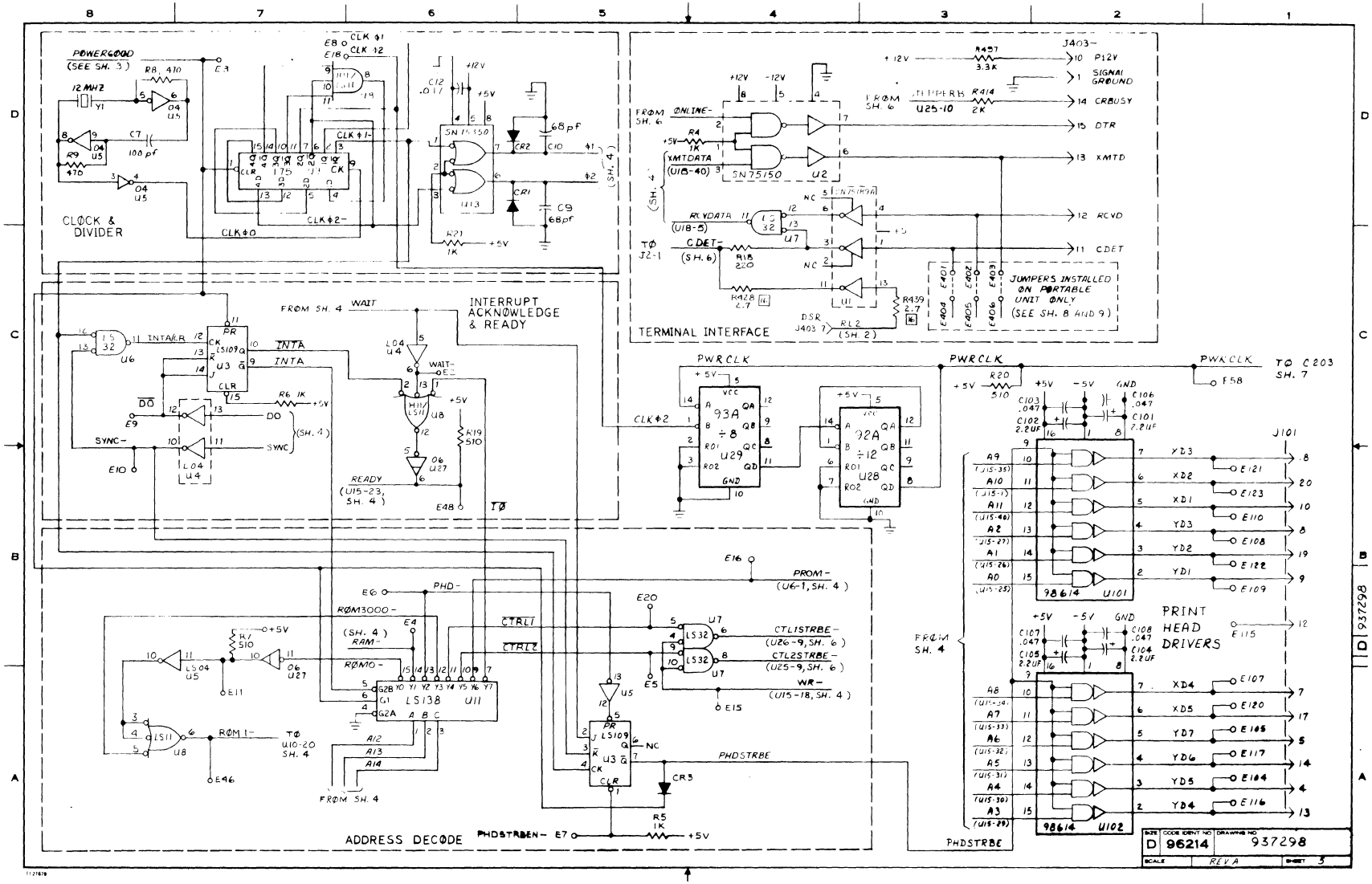
TI-78140 P1



TEXAS INSTRUMENTS
D 96214
937298

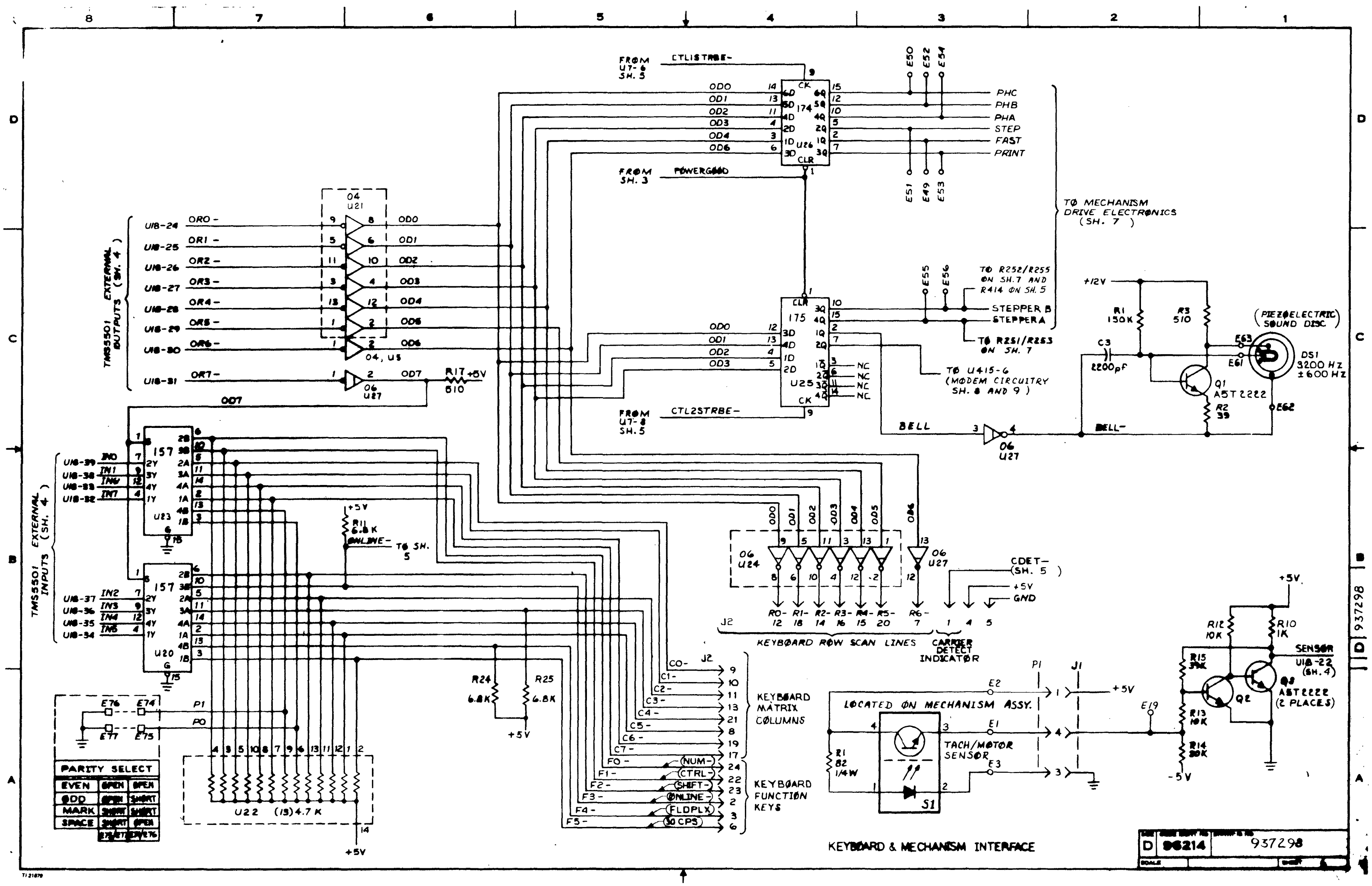

POWER SUPPLY
UNREGULATED DC
REGULATED OUTPUT VOLTAGES
REGULATOR
BLOCKING OSCILLATOR
REG SENSE
FAIL PROTECT LATCH
OVERCURRENT SENSE
POWER GOOD AND RESET
SOFT START
EMI FILTER
SAFETY GROUND
JUMPER FOR C356
PWRCLR TO E57
RESET
FAN
D 96214
937298


937298 4
A0 THRU A15
SYNC
FROM SH. 5
FROM SH. 6
ROM1-
SENSOR
INT
6.8K R-PAC
U16
TMS8080 CPU U15
TMS 4732-ZA3215 ROM U10
TMS 4700-4702 ROM OR TMS 52708 EPROM U14
5471/5472 PROM U12
TMS 4036 U17
TMS 55018 OR TMS5504
U18
TEST ACCESS
TO SH. 5
TO SH. 6
FROM SH. 3
RESET
CPU HOLD
READY
R16 510
FROM SH. 6
IN0 THRU IN7
DO THRU D7
RAM-
RCVDATA
WR-
XMTDATA
DBIN
WAIT
PROM-
ABM PROM
ROM2-
R23 6.5K
LS32 U6
LS32 U7
LS04 U4
E43
E44
E17
E47
TEXAS INSTRUMENTS
D 96214
937 298
REV. A
SHEET 4

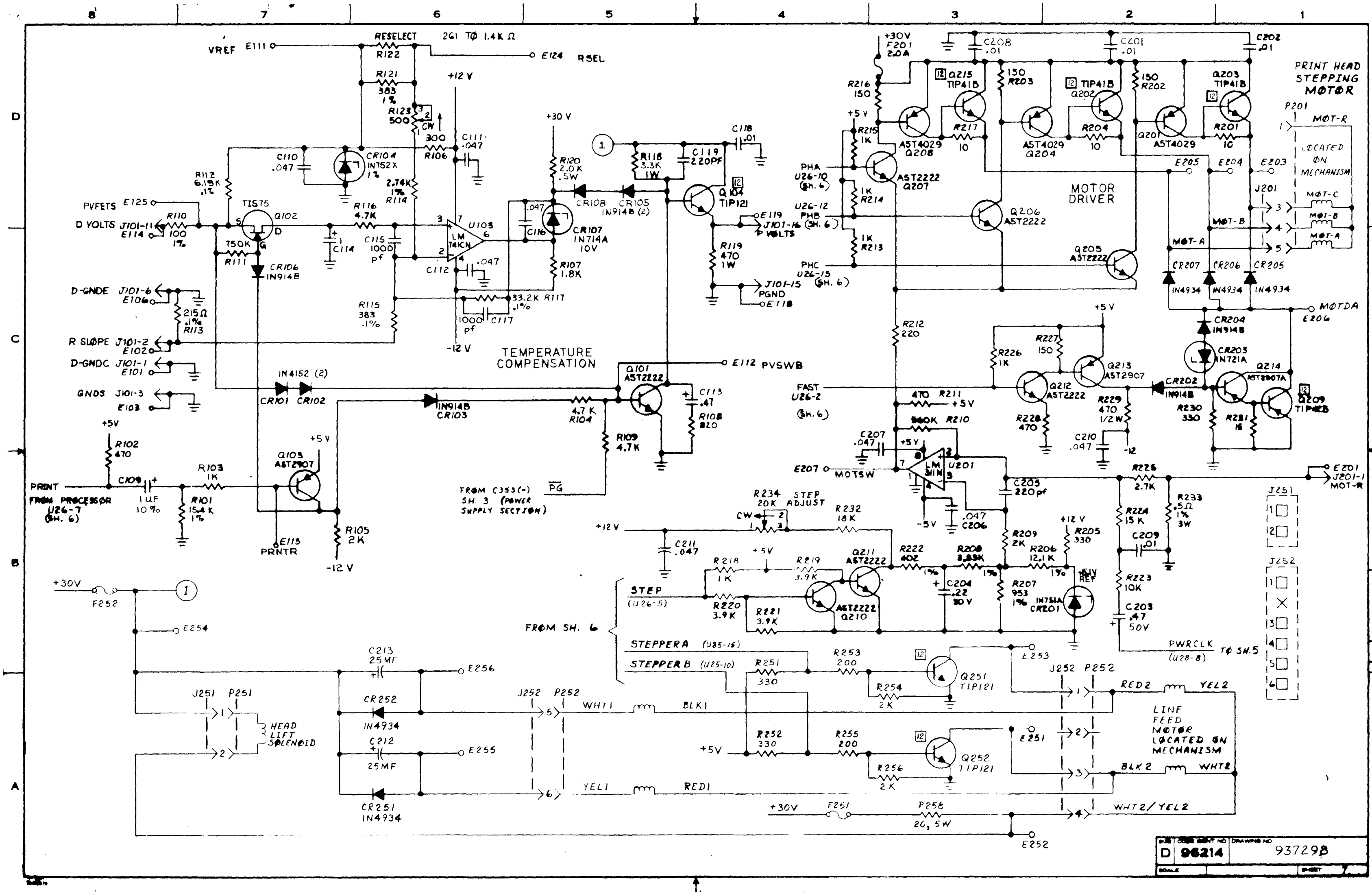


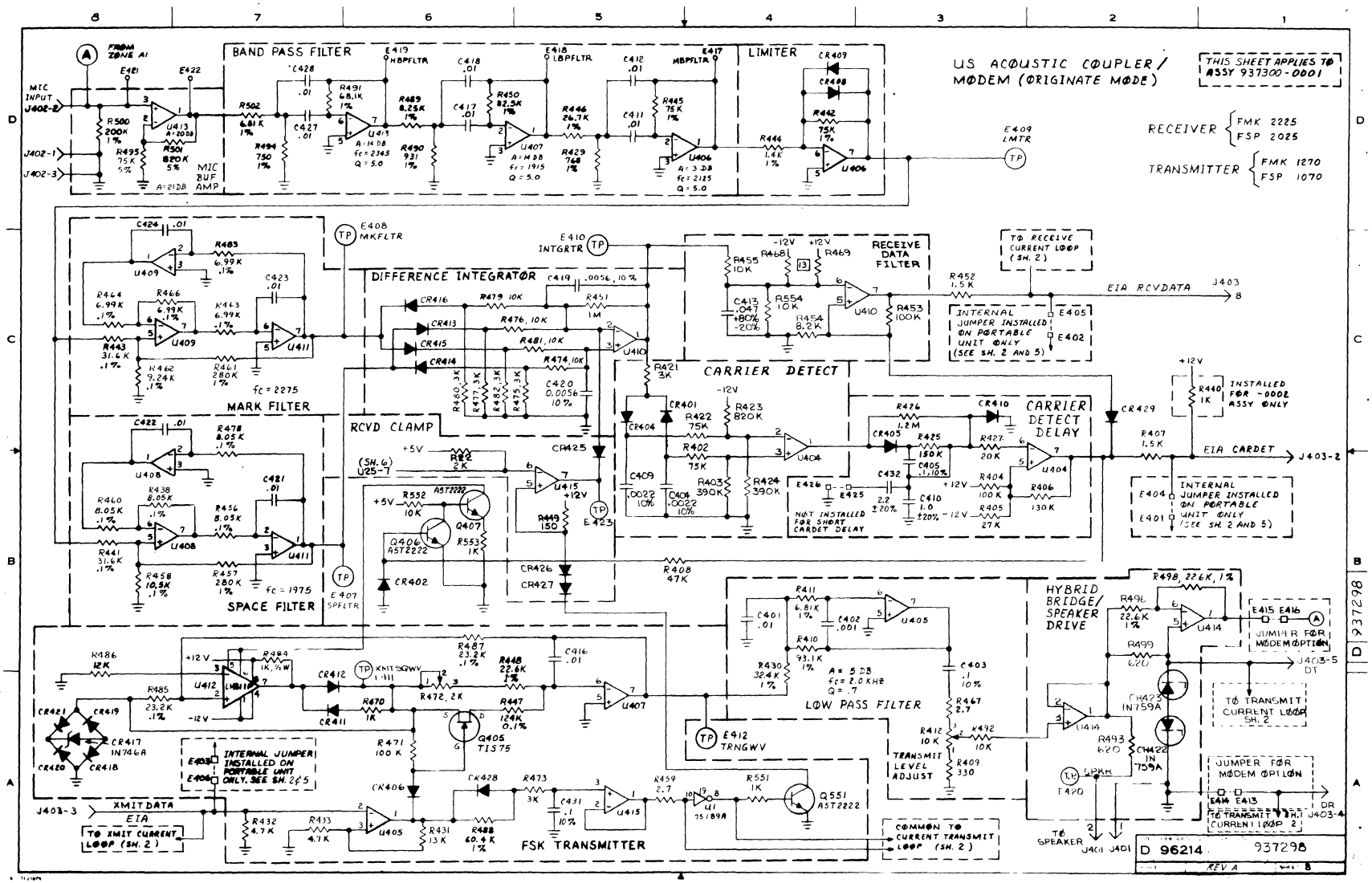
SIZE	CODE IDENT NO	DRAWING NO
D	96214	937298
SCALE	REV A	SHEET 5

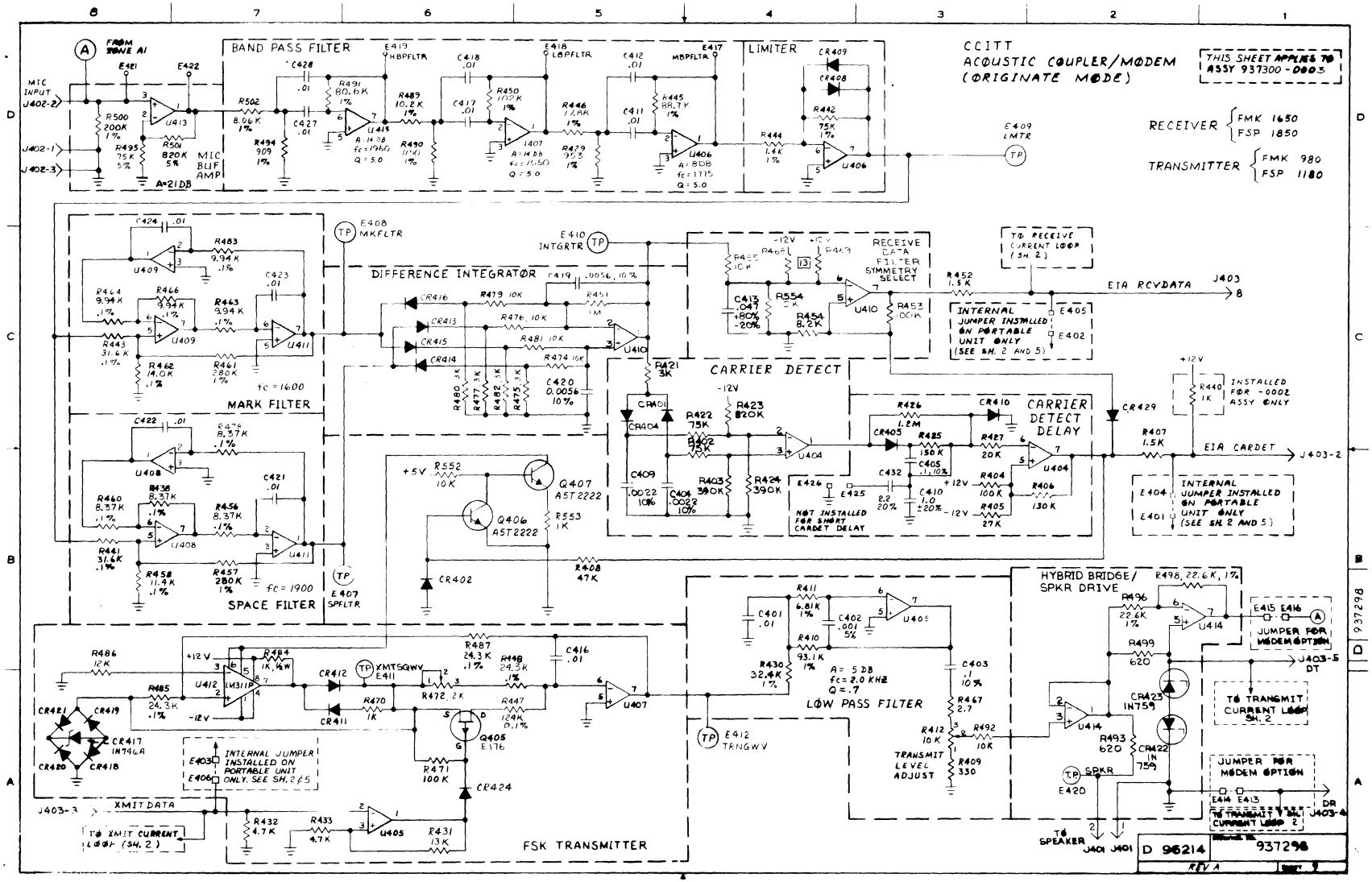
937298 D



TO MECHANISM DRIVE ELECTRONICS (SH. 7)
TMS5501 EXTERNAL OUTPUTS (SH. 4)
TMS5501 EXTERNAL INPUTS (SH. 4)
PHC
PHB
PHA
STEP
FAST
PRINT
STEPPER B
STEPPER A
TO U415-6 (MODEM CIRCUITRY SH. 8 AND 9)
BELL
(PIEZOELECTRIC SOUND DISC)
DS1 3200 HZ ±600 HZ
Q1 A5T2222
KEYBOARD ROW SCAN LINES
CARRIER DETECT INDICATOR
KEYBOARD MATRIX COLUMNS
KEYBOARD FUNCTION KEYS
NUM-
CTRL-
SHIFT-
ONLINE-
FLDPLX
30 CPS
LOCATED ON MECHANISM ASSY.
TACH/MOTOR SENSOR
PARITY SELECT
EVEN
ODD
MARK
SPACE
U22 (13) 4.7 K
KEYBOARD & MECHANISM INTERFACE
D 96214 937298


TEMPERATURE COMPENSATION
MOTOR DRIVER
PRINT HEAD STEPPING MOTOR
LOCATED ON MECHANISM
LINE FEED MOTOR LOCATED ON MECHANISM
HEAD LIFT SOLENOID
VREF E111
RESELECT R122
261 TO 1.4K Ω
E124 RSEL
PVFETS E125
D VOLTS J101-11 E114
D-GNDE J101-6 E106
R SLOPE J101-2 E102
D-GNDC J101-1 E101
GNDS J101-3 E103
PRINT FROM PROCESSOR U26-7 (SH. 6)
E113 PRNTR
FROM C353(-) SH. 3 (POWER SUPPLY SECTION)
E112 PVSWB
E119 J101-16 P VOLTS
J101-15 PGND E118
PHA U26-10 (SH. 6)
PHB U26-12 (SH. 6)
PHC U26-15 (SH. 6)
FAST U26-2 (SH. 6)
E207 MOTSW
STEP ADJUST
FROM SH. 6
STEP (U26-5)
STEPPER A (U25-16)
STEPPER B (U25-10)
PWRCLK (U28-8) TO SH. 5
E201 J201-1 MOT-R
MOTDA E206
MOT-R
MOT-C
MOT-B
MOT-A
+30V F201 2.0A
+30V F252
+30V F251
R258 20, 5W
RED2 YEL2
BLK2 WHT2
WHT2/YEL2
WHT1 BLK1
YEL1 RED1
D 96214 937298
D 937298


US ACOUSTIC COUPLER / MODEM (ORIGINATE MODE)
THIS SHEET APPLIES TO ASSY 937300-0001
RECEIVER { FMK 2225 FSP 2025
TRANSMITTER { FMK 1270 FSP 1070
BAND PASS FILTER
LIMITER
MIC BUF AMP
DIFFERENCE INTEGRATOR
MARK FILTER
SPACE FILTER
RCVD CLAMP
CARRIER DETECT
CARRIER DETECT DELAY
RECEIVE DATA FILTER
LOW PASS FILTER
HYBRID BRIDGE/ SPEAKER DRIVE
FSK TRANSMITTER
TRANSMIT LEVEL ADJUST
EIA RCVDATA
EIA CARDET
XMIT DATA EIA
TO RECEIVE CURRENT LOOP (SH. 2)
TO XMIT CURRENT LOOP (SH. 2)
TO TRANSMIT CURRENT LOOP SH. 2
COMMON TO CURRENT TRANSMIT LOOP (SH. 2)
INTERNAL JUMPER INSTALLED ON PORTABLE UNIT ONLY. SEE SH. 2&5
INTERNAL JUMPER INSTALLED ON PORTABLE UNIT ONLY (SEE SH. 2 AND 5)
INSTALLED FOR -0002 ASSY ONLY
JUMPER FOR MODEM OPTION
NOT INSTALLED FOR SHORT CARDET DELAY
D 96214 937298 REV A


CCITT
ACOUSTIC COUPLER/MODEM
(ORIGINATE MODE)
THIS SHEET APPLIES TO ASSY 937300-0003
RECEIVER { FMK 1650 FSP 1850
TRANSMITTER { FMK 980 FSP 1180
BAND PASS FILTER
LIMITER
MIC BUF AMP
A=21DB
DIFFERENCE INTEGRATOR
MARK FILTER
fc = 1600
SPACE FILTER
fc = 1900
CARRIER DETECT
CARRIER DETECT DELAY
RECEIVE DATA FILTER SYMMETRY SELECT
FSK TRANSMITTER
LOW PASS FILTER
A= 5 DB
fc = 2.0 KHZ
Q = .7
TRANSMIT LEVEL ADJUST
HYBRID BRIDGE/ SPKR DRIVE
EIA RCVDATA
EIA CARDET
XMIT DATA
INTERNAL JUMPER INSTALLED ON PORTABLE UNIT ONLY. SEE SH. 2 & 5
INTERNAL JUMPER INSTALLED ON PORTABLE UNIT ONLY (SEE SH. 2 AND 5)
NOT INSTALLED FOR SHORT CARDET DELAY
INSTALLED FOR -0002 ASSY ONLY
JUMPER FOR MODEM OPTION
TO TRANSMIT CURRENT LOOP SH. 2
TO RECEIVE CURRENT LOOP (SH. 2)
TO XMIT CURRENT LOOP (SH. 2)
TO SPEAKER J401
D 96214
937298
REV A

NOTES: UNLESS OTHERWISE SPECIFIED;

1. ALL DEVICE TYPES ARE PREFIXED WITH SN74.
2. VCC IS APPLIED TO PIN 14 OF ALL 14-PIN IC'S AND PIN 16 OF ALL 16-PIN IC'S.
3. GROUND IS APPLIED TO PIN 7 OF ALL 14-PIN IC'S AND PIN 8 OF ALL 16-PIN IC'S.
4. DEVICE TYPE, PIN NUMBERS, AND REFERENCE DESIGNATOR OF IC IS SHOWN AS FOLLOWS;

00 AND 04 = DEVICE TYPE
4, 5, AND 6 = PIN NUMBERS
U14 AND U21 = REFERENCE DESIGNATOR

5. RESISTORS ARE 1/4 WATT, 5%.
6. DIODES NOT MARKED ARE IN914B.
7. AMPLIFIERS NOT MARKED ARE RC4558P.
8. ON RC4558P AMPLIFIERS, PIN 4 IS TIED TO -12V AND PIN 8 IS TIED TO +12V.
9. □ = SYMBOL USED FOR "E" NUMBERS WHICH HAVE A SQUARE PIN.
10. SHEETS 8 AND 9 SHOW THE MODEM/ACOUSTIC COUPLER CIRCUITRY; SHEET 8 APPLIES TO 937298-0001 ASSY, AND SHEET 9 APPLIES TO 937298-0003 ASSY.
11. NO TEST POINTS MAY BE MOVED WITHOUT PRIOR APPROVAL BY TEST ENGINEERING.

[12] THESE TRANSISTORS ARE MOUNTED ON HEATSINKS.

[13] IF NECESSARY A SELECTED RESISTOR IS INSTALLED AT UNIT TEST IN LOCATION R468 OR R469 AS REQUIRED IN ORDER TO ACHIEVE MARK/SPACE SYMMETRY.

[14] RESISTORS WITH NO VALUES SPECIFIED ARE NOT INSTALLED ON 230V PCB

[15] U12 IS USED FOR OPTIONAL ABM AND IS INSTALLED FROM CONFIGURATION GUIDE AT UNIT ASSEMBLY.

[16] NOT INSTALLED. FOR FUTURE USE ONLY

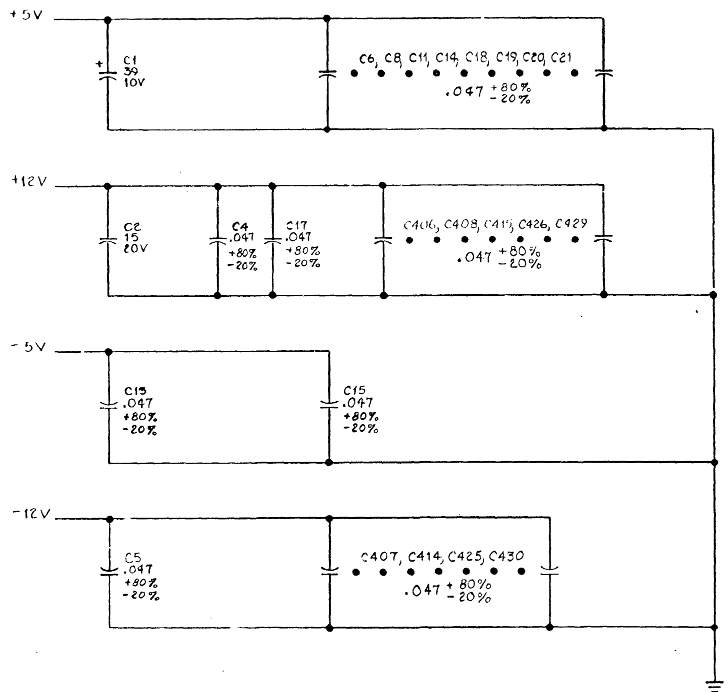
[17] REV. "A" BOARDS WILL NOT HAVE CR354, CR355, OR C356. THESE POINTS WILL BE CONNECTED BY ETCH TO +300VR.

[18] FERRITE BEAD INSTALLED ON STAKE PIN FOR REV. B & C PCB'S ONLY

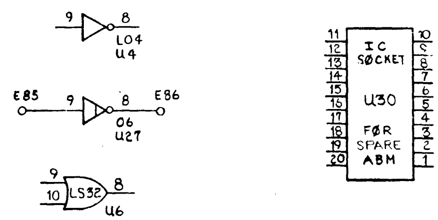
[19] ETCH REPLACED WITH COIL (.68uH) OR FERRITE BEADS (2) ON REV E

[20] ALL REV A & EARLIER PCB'S WILL HAVE R373 INSTALLED. REV B PCB'S WILL HAVE EITHER R373 OR JUMPER WIRE. REV C WILL HAVE JUMPER WIRE. REV E & LATER WILL HAVE ETCH.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	CN421785 (C)	11-22-77	
	B	CN429363	3-6-78	
	C	CN436057	3-17-78	



SPARES



REV STATUS	REV	C		B	A	A		C	A
OF SHEETS	SHEET	1	2	3	4	5	6	7	8

QTY REQD -2	QTY REQD -1	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

HOLE TOLERANCE

.013 THRU .125 +.004 -.001	.126 THRU .250 +.005 -.001	.250 THRU .500 +.006 -.001
.501 THRU .750 +.008 -.001	.750 THRU 1.000 +.010 -.001	1.001 THRU 2.000 +.012 -.001

NEXT ASSY	USED ON
937310	573X

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES
ANGLES ±1°
3 PLACE DECIMALS ±.010
2 PLACE DECIMALS ±.02

MATERIAL

DWN
CHK C. KEELER 8-11-77
ENGR 8-15-77
QA 8-1?-77
AT 8-22-77
CONTR NO
DESIGN ACTIVITY RELEASE 8-22-77

TEXAS INSTRUMENTS INCORPORATED
Equipment Group Dallas Texas

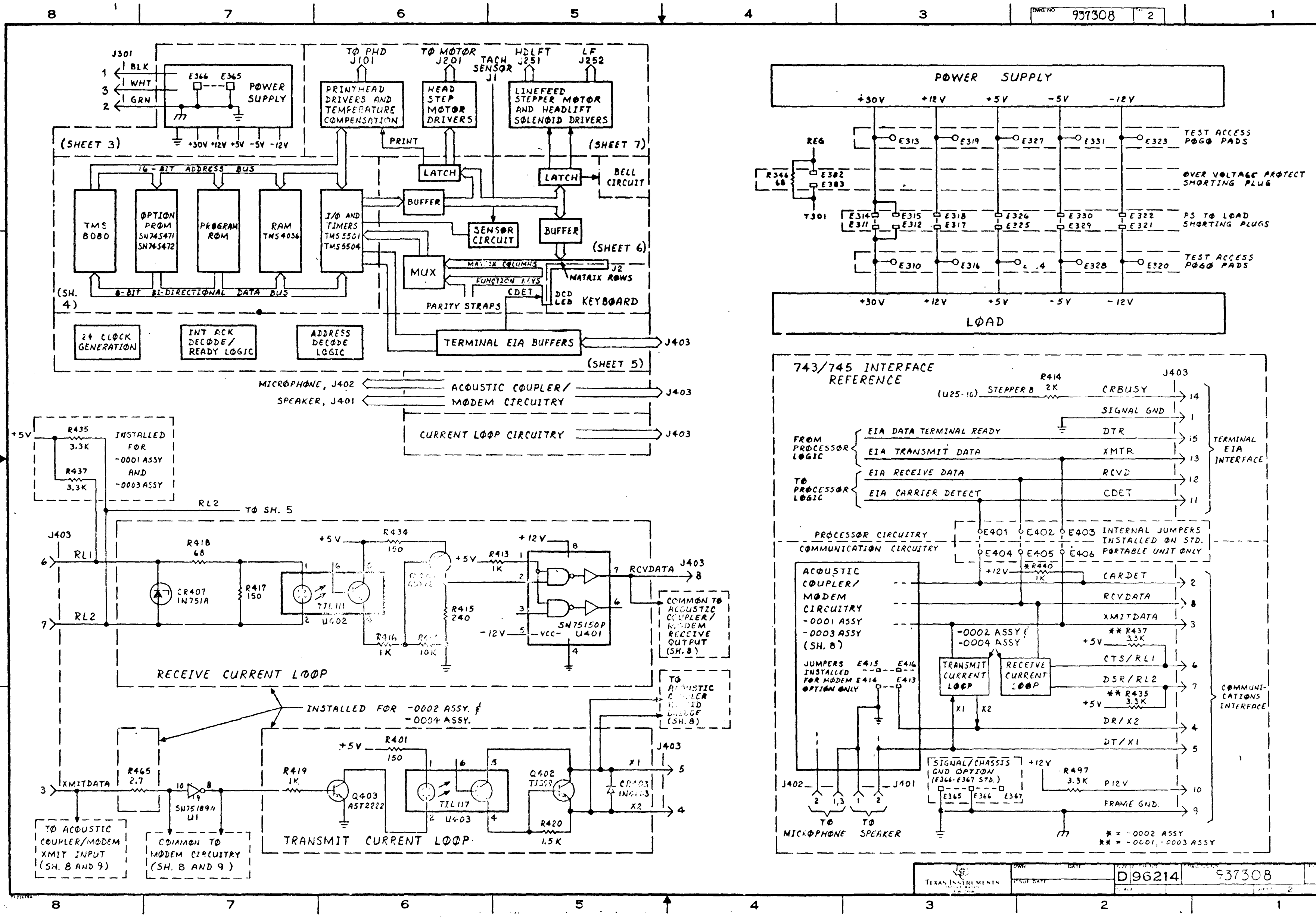
DIAGRAM, LOGIC-SCHEMATIC
MODEL 743E/745E
DATA TERMINAL

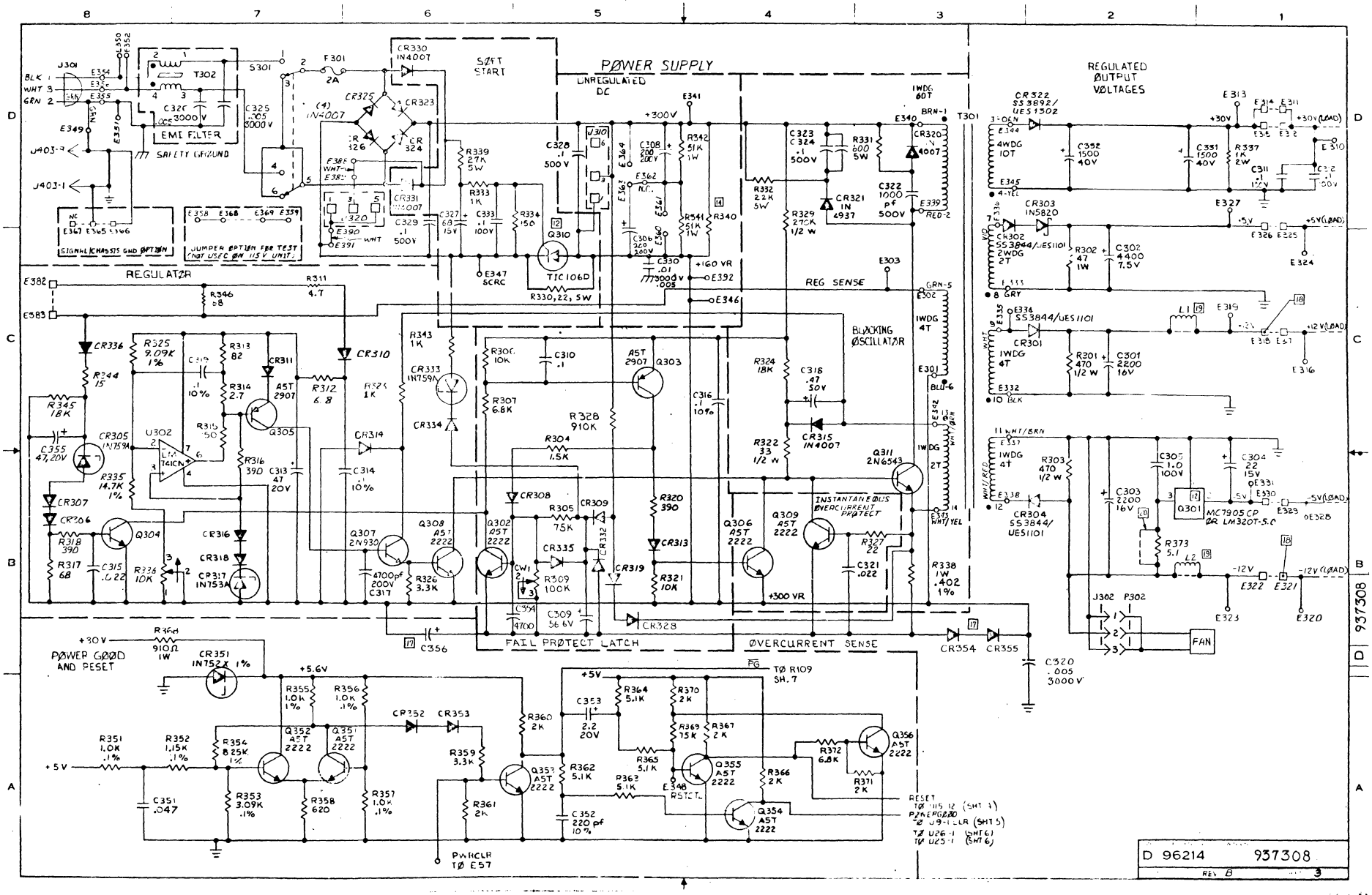
SIZE D | CODE IDENT NO 96214 | DRAWING NO 937308

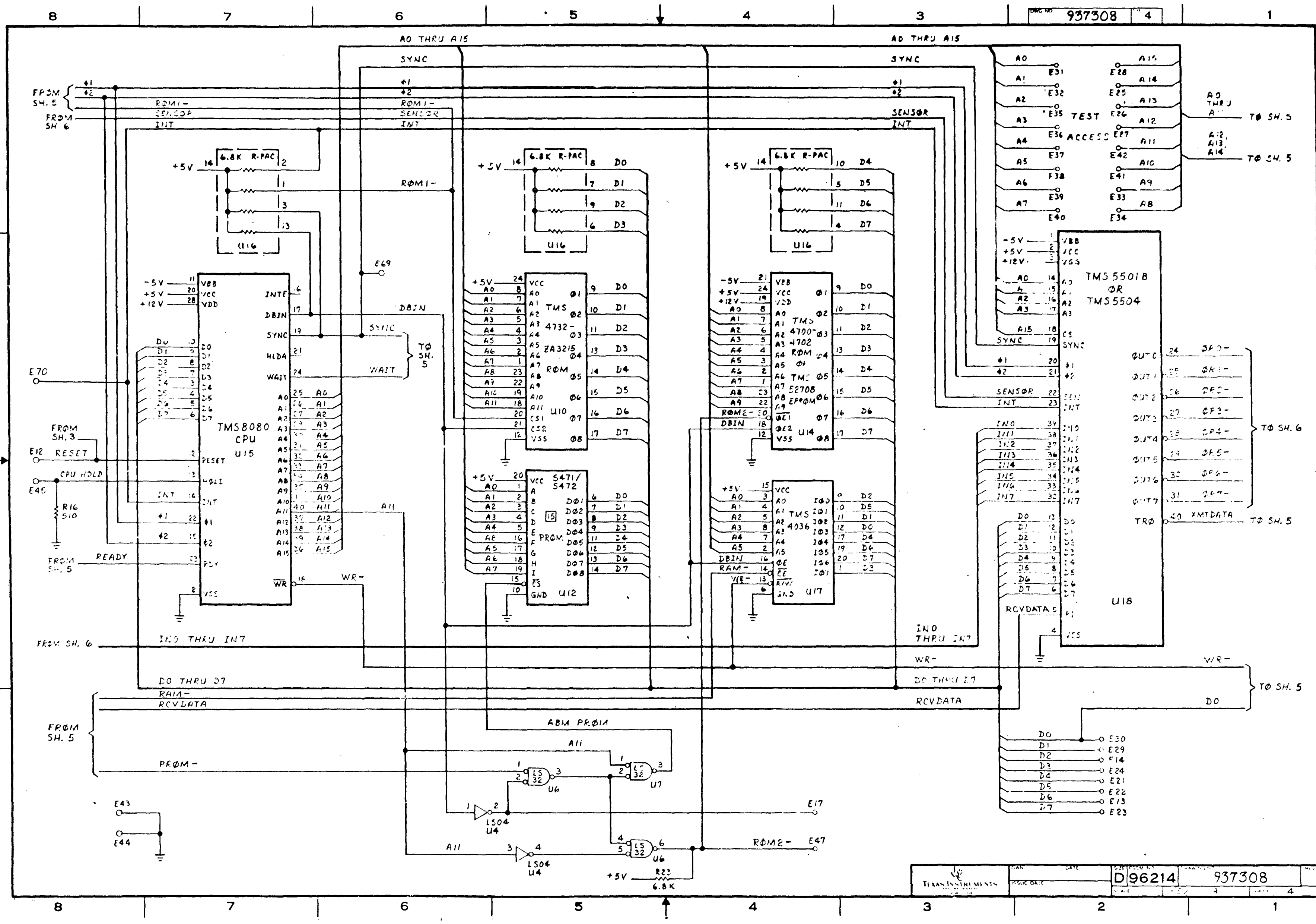
SCALE | SHEET 1 OF 8

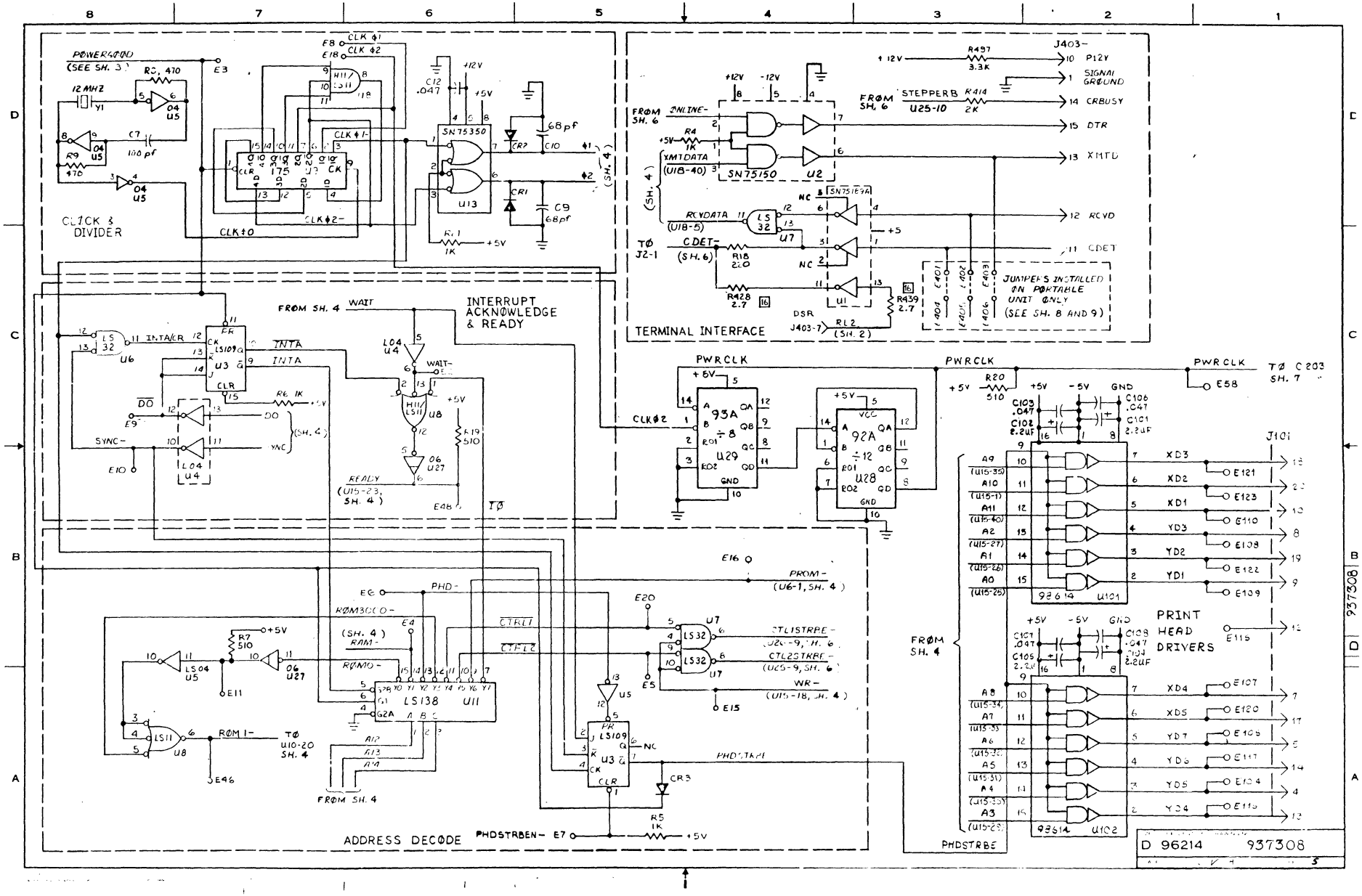
D 937308

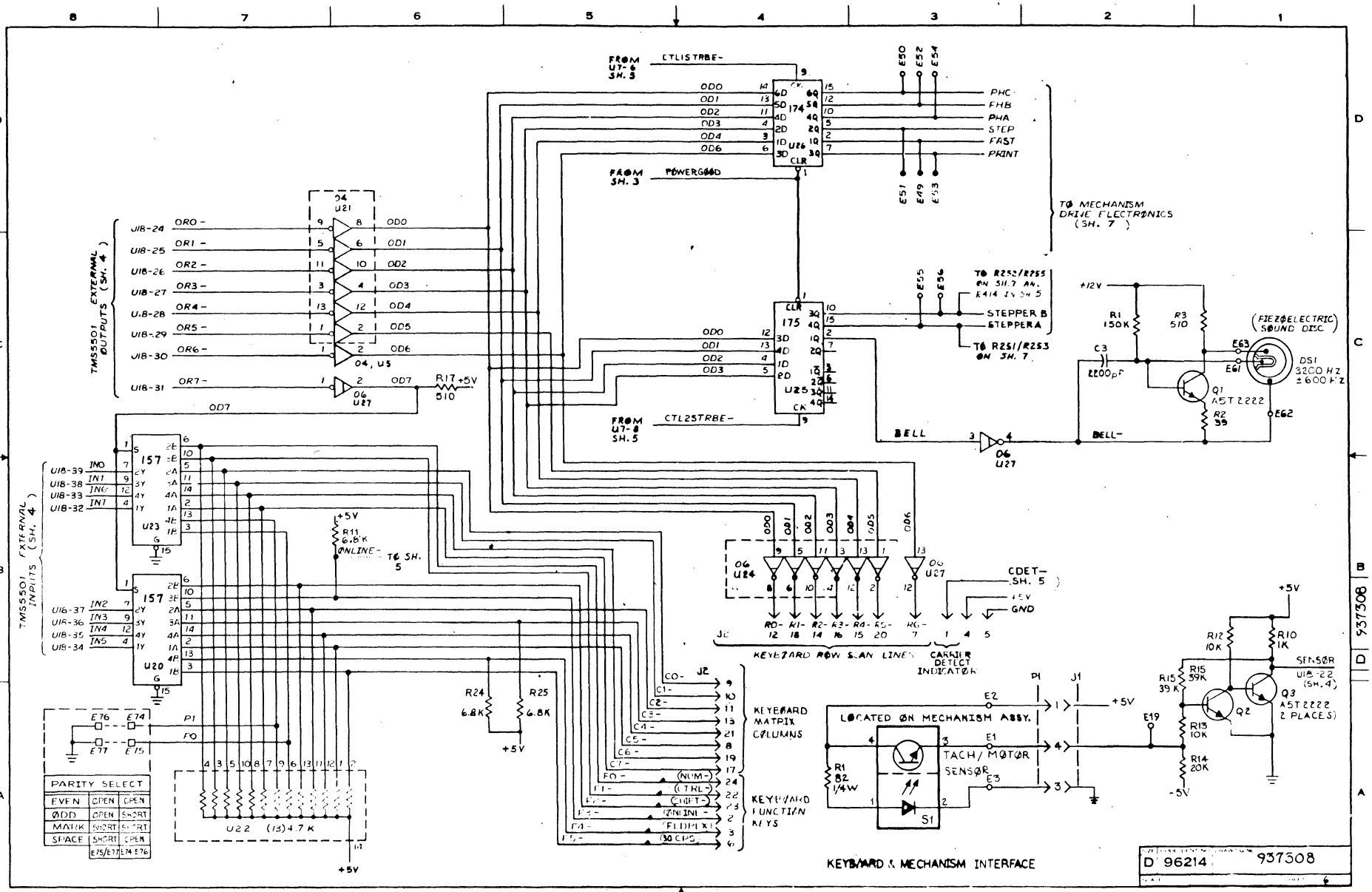
TI 7914D

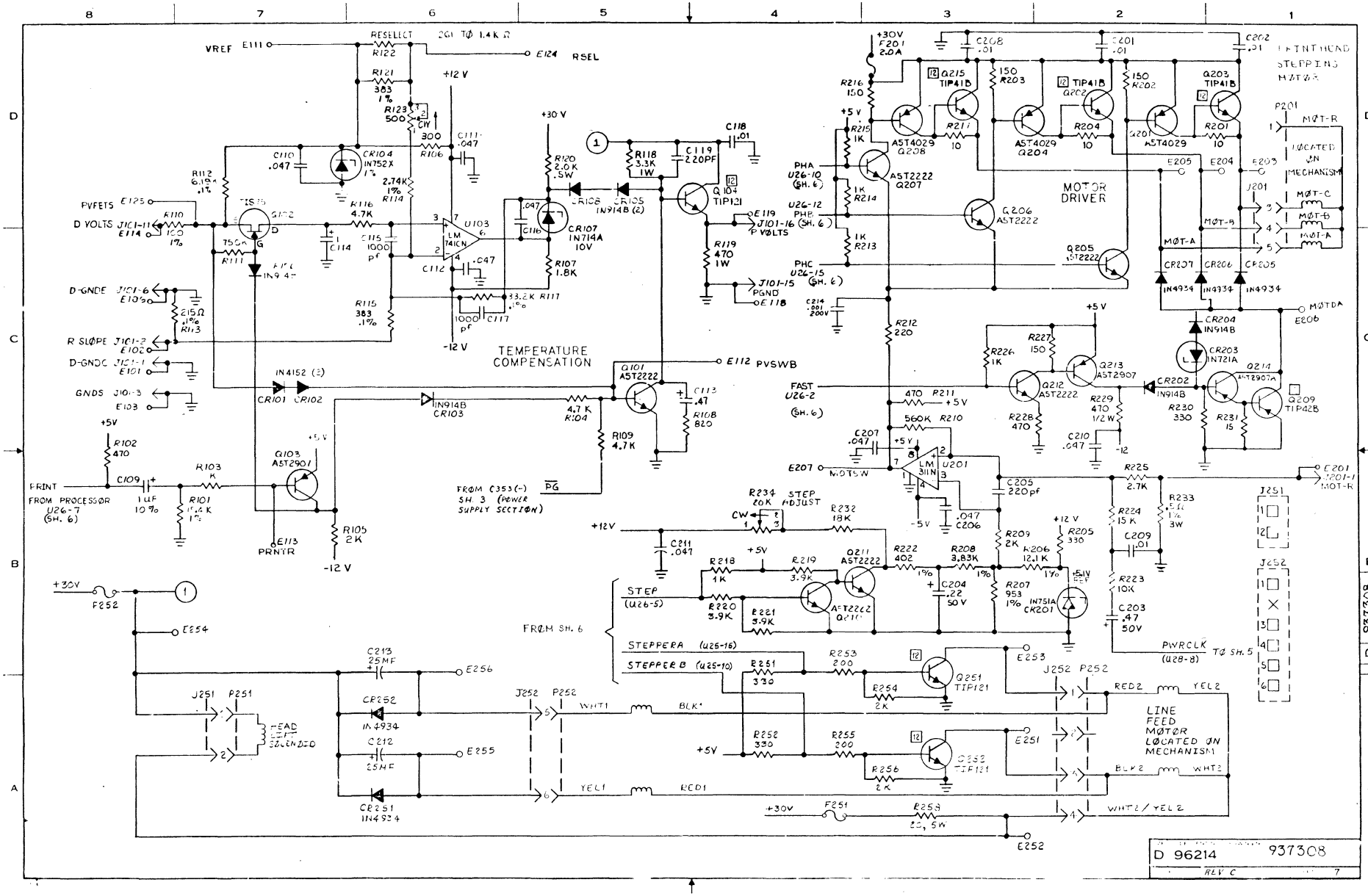

937308
J301
BLK
WHT
GRN
E366
E365
POWER SUPPLY
+30V +12V +5V -5V -12V
(SHEET 3)
TO PHD J101
TO MOTOR J201
TACH SENSOR J1
HDLFT J251
LF J252
PRINTHEAD DRIVERS AND TEMPERATURE COMPENSATION
HEAD STEP MOTOR DRIVERS
LINEFEED STEPPER MOTOR AND HEADLIFT SOLENOID DRIVERS
PRINT
LATCH
(SHEET 7)
BELL CIRCUIT
16-BIT ADDRESS BUS
TMS 8080
OPTION PROM SN74S471 SN74S472
PROGRAM ROM
RAM TMS4036
I/O AND TIMERS TMS5501 TMS5504
BUFFER
SENSOR CIRCUIT
(SHEET 6)
MUX
MATRIX COLUMNS
FUNCTION KEYS
MATRIX ROWS
J2
(SH. 4)
8-BIT BI-DIRECTIONAL DATA BUS
PARITY STRAPS
CDET
DCD LED
KEYBOARD
2Φ CLOCK GENERATION
INT ACK DECODE/ READY LOGIC
ADDRESS DECODE LOGIC
TERMINAL EIA BUFFERS
J403
(SHEET 5)
MICROPHONE, J402
SPEAKER, J401
ACOUSTIC COUPLER/ MODEM CIRCUITRY
CURRENT LOOP CIRCUITRY
POWER SUPPLY
REG
R346 68
E382
E383
T301
E313 E319 E327 E331 E323
TEST ACCESS POGO PADS
OVER VOLTAGE PROTECT SHORTING PLUG
E314 E311 E315 E312 E318 E317 E326 E325 E330 E329 E322 E321
PS TO LOAD SHORTING PLUGS
E310 E316 E328 E320
TEST ACCESS POGO PADS
LOAD
+5V
R435 3.3K
R437 3.3K
INSTALLED FOR -0001 ASSY AND -0003 ASSY
RL2 TO SH. 5
RL1
R418 68
CR407 1N751A
R417 150
TIL111 U402
R434 150
R413 1K
+12V
RCVDATA
SN75150P U401
R415 240
R416 1K
-12V
RECEIVE CURRENT LOOP
COMMON TO ACOUSTIC COUPLER/ MODEM RECEIVE OUTPUT (SH. 8)
INSTALLED FOR -0002 ASSY. & -0004 ASSY.
XMITDATA
R465 2.7
SN75189N U1
R419 1K
Q403 A5T2222
R401 150
TIL117 U403
Q402 TIS59
R420 1.5K
X1
X2
TRANSMIT CURRENT LOOP
TO ACOUSTIC COUPLER/MODEM XMIT INPUT (SH. 8 AND 9)
COMMON TO MODEM CIRCUITRY (SH. 8 AND 9)
743/745 INTERFACE REFERENCE
R414 2K
(U25-10) STEPPER B
CRBUSY
SIGNAL GND
FROM PROCESSOR LOGIC
EIA DATA TERMINAL READY
DTR
EIA TRANSMIT DATA
XMTR
TO PROCESSOR LOGIC
EIA RECEIVE DATA
RCVD
EIA CARRIER DETECT
CDET
TERMINAL EIA INTERFACE
PROCESSOR CIRCUITRY
COMMUNICATION CIRCUITRY
E401 E402 E403
E404 E405 E406
INTERNAL JUMPERS INSTALLED ON STD. PORTABLE UNIT ONLY
ACOUSTIC COUPLER/ MODEM CIRCUITRY -0001 ASSY -0003 ASSY (SH. 8)
*R440 1K
CARDET
RCVDATA
XMITDATA
-0002 ASSY & -0004 ASSY
** R437 3.3K
CTS/RL1
TRANSMIT CURRENT LOOP
RECEIVE CURRENT LOOP
DSR/RL2
** R435 3.3K
JUMPERS INSTALLED FOR MODEM OPTION ONLY
E415 E416 E414 E413
DR/X2
DT/X1
COMMUNI-CATIONS INTERFACE
SIGNAL/CHASSIS GND OPTION (E366-E367 STD.)
E365 E366 E367
R497 3.3K
P12V
FRAME GND.
J402
J401
TO MICROPHONE
TO SPEAKER
* = -0002 ASSY
** = -0001, -0003 ASSY
TEXAS INSTRUMENTS
D 96214
937308
2

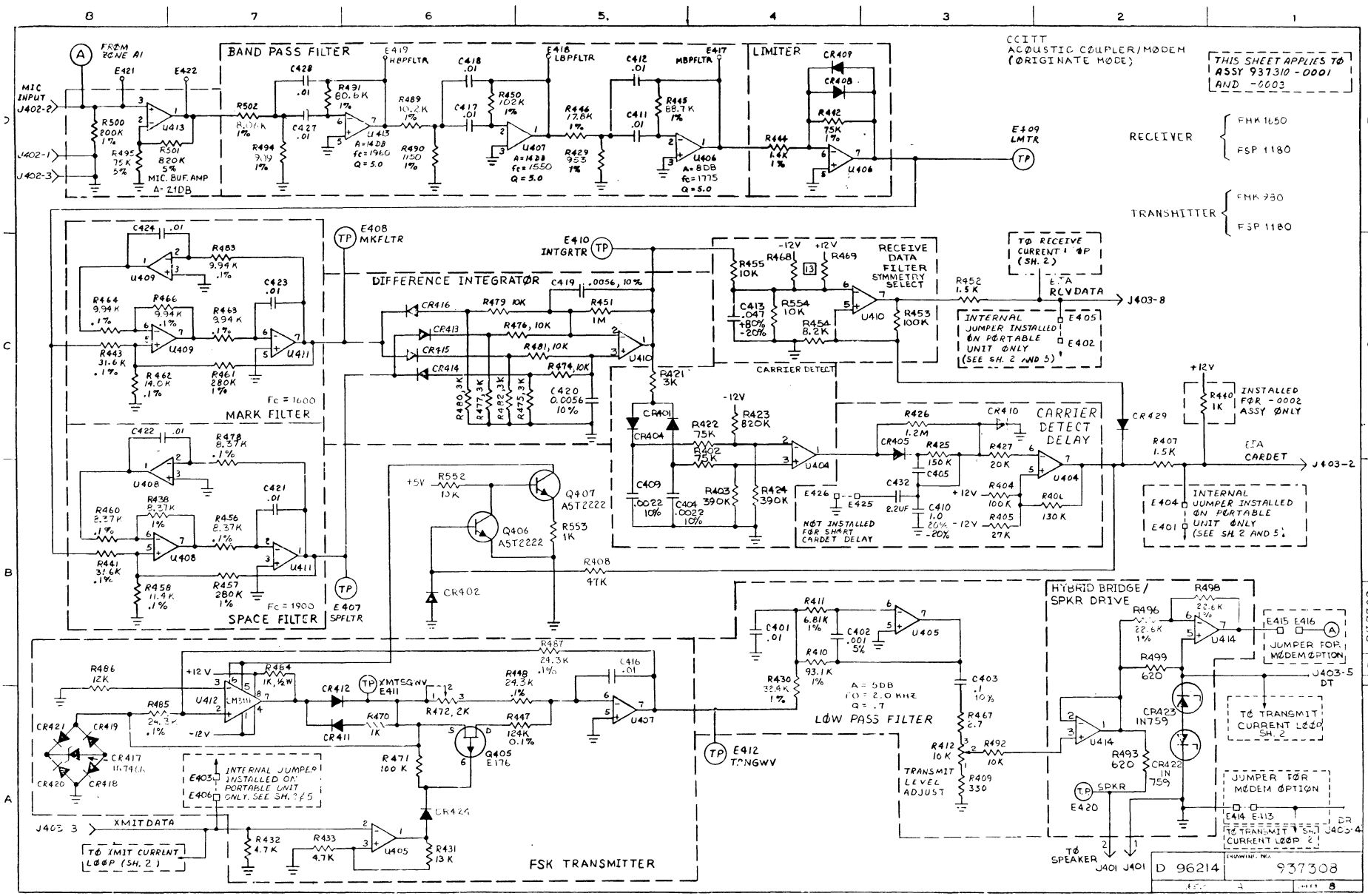

POWER SUPPLY
UNREGULATED DC
REGULATED OUTPUT VOLTAGES
SOFT START
REGULATOR
BLOCKING OSCILLATOR
REG SENSE
FAIL PROTECT LATCH
OVERCURRENT SENSE
INSTANTANEOUS OVERCURRENT PROTECT
POWER GOOD AND RESET
EMI FILTER
SAFETY GROUND
SIGNAL CHASSIS GND OPTION
JUMPER OPTION FOR TEST (NOT USED ON 115V UNIT)
FAN
D 96214 937308
REV B


937308
TMS8080 CPU U15
TMS 4732-ZA3215 ROM U10
S471/S472 PROM U12
TMS 4700-4702 ROM OR TMS 2708 EPROM U14
TMS 4036 U17
TMS 5501B OR TMS 5504
U18
6.8K R-PAC
U16
A0 THRU A15
SYNC
TEST ACCESS
TO SH. 5
TO SH. 6
FROM SH. 5
FROM SH. 6
FROM SH. 3
RESET
CPU HOLD
READY
IN0 THRU IN7
D0 THRU D7
WR-
RAM-
RCVDATA
PROM-
ROM1-
ROM2-
ABM PROM A
XMTDATA
Texas Instruments
D 96214
937308
4


CLOCK & DIVIDER
TERMINAL INTERFACE
INTERRUPT ACKNOWLEDGE & READY
ADDRESS DECODE
PRINT HEAD DRIVERS
TO J2-1
FROM SH. 4
PHDSTRBE
PWRCLK
PHDSTRBEN- E7
D 96214 937308

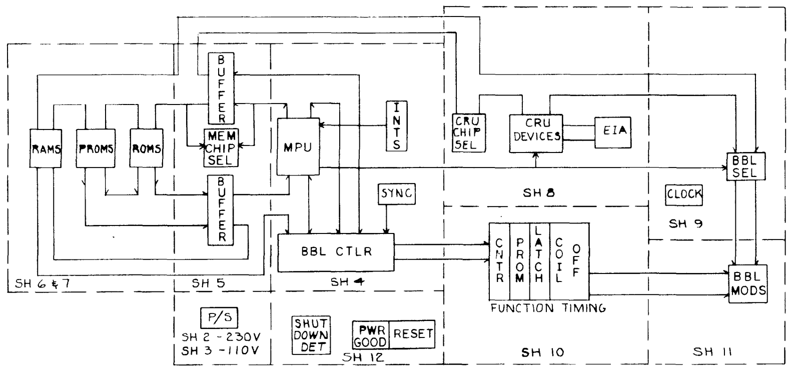

FROM U7-8 SH. 3
CTLISTRBE-
U26
74174
CLR
PHC
PHB
PHA
STEP
FAST
PRINT
FROM SH. 3
POWERGOOD
TO MECHANISM DRIVE ELECTRONICS (SH. 7)
E50
E52
E54
E51
E49
E53
TMS5501 EXTERNAL OUTPUTS (SH. 4)
U18-24 ORO-
U18-25 OR1-
U18-26 OR2-
U18-27 OR3-
U18-28 OR4-
U18-29 OR5-
U18-30 OR6-
U18-31 OR7-
U21
04, U5
06 U27
OD0
OD1
OD2
OD3
OD4
OD5
OD6
OD7
R17 +5V 510
U25
175
CLR
CK
STEPPER B
STEPPER A
TO R253/R255 ON SH.7 AND R414 IN SH.5
TO R251/R253 ON SH.7
E55
E56
FROM U7-8 SH.5
CTL2STRBE-
+12V
R1 150K
R3 510
C3 2200pF
(PIEZOELECTRIC) SOUND DISC
DS1 3200 HZ ± 600 HZ
E63
E61
E62
Q1 AST2222
R2 33
BELL
BELL-
TMS5501 EXTERNAL INPUTS (SH. 4)
U18-39 IN0
U18-38 IN1
U18-33 IN6
U18-32 IN7
U18-37 IN2
U18-36 IN3
U18-35 IN4
U18-34 IN5
157
U23
U20
+5V
R11 6.8K ONLINE-
TO SH. 5
06 U24
06 U27
CDET- SH. 5
+5V
GND
KEYBOARD ROW SCAN LINES
CARRIER DETECT INDICATOR
R0- R1- R2- R3- R4- R5- R6-
J2
KEYBOARD MATRIX COLUMNS
KEYBOARD FUNCTION KEYS
(NUM-)
(CTRL-)
(QUIET-)
(ONLINE-)
(FLIPFLX)
(30 CPS)
R24 6.8K
R25 6.8K
U22 (13) 4.7K
P1
FO
E76
E74
E77
E75
PARITY SELECT
EVEN OPEN OPEN
ODD OPEN SHORT
MARK SHORT SHORT
SPACE SHORT OPEN
E75/E77 E74 E76
LOCATED ON MECHANISM ASSY.
TACH/MOTOR SENSOR
S1
R1 82 1/4W
E1
E2
E3
E19
J1
P1
+5V
-5V
R10 1K
R12 10K
R15 39K
R13 10K
R14 20K
SENSOR
U18-22 (SH.4)
Q2
Q3 AST2222 (2 PLACES)
KEYBOARD & MECHANISM INTERFACE
D 96214
937308


TEMPERATURE COMPENSATION
MOTOR DRIVER
LINE FEED MOTOR LOCATED ON MECHANISM
PRINTHEAD STEPPING MOTOR
LOCATED ON MECHANISM
VREF
RESELECT
RSEL
PVFETS
D VOLTS
R SLOPE
D-GNDC
GNDS
PRINT
FROM PROCESSOR U26-7 (SH. 6)
PRNTR
PVSWB
FAST U26-2 (SH. 6)
MOTSW
PWRCLK (U28-8) TO SH. 5
STEP (U26-5)
STEPPERA (U26-16)
STEPPERB (U25-10)
FROM SH. 6
PHA U26-10 (SH. 6)
PHB U26-12 (SH. 6)
PHC U26-15 (SH. 6)
P VOLTS
PGND
MOTDA
MOT-R
MOT-C
MOT-B
MOT-A
HEAD LIFT SOLENOID
LINE FEED MOTOR LOCATED ON MECHANISM
D 96214
937308
REV C

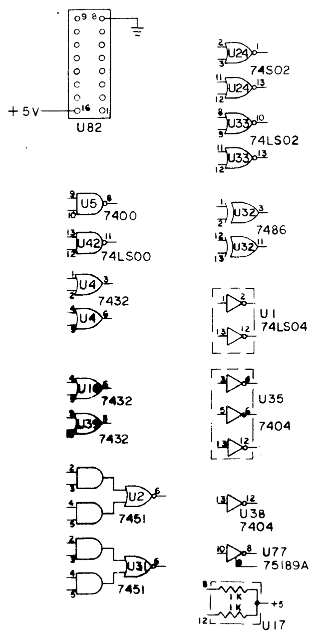

CCITT
ACOUSTIC COUPLER/MODEM
(ORIGINATE MODE)
THIS SHEET APPLIES TO
ASSY 937310-0001
AND -0003
RECEIVER
FHK 1650
FSP 1180
TRANSMITTER
FHK 930
FSP 1180
BAND PASS FILTER
LIMITER
MIC. BUF. AMP
A= 21DB
MARK FILTER
Fc = 1600
SPACE FILTER
Fc = 1900
DIFFERENCE INTEGRATOR
CARRIER DETECT
RECEIVE DATA FILTER SYMMETRY SELECT
CARRIER DETECT DELAY
HYBRID BRIDGE / SPKR DRIVE
LOW PASS FILTER
FSK TRANSMITTER
TRANSMIT LEVEL ADJUST
TO RECEIVE CURRENT LOOP (SH. 2)
TO TRANSMIT CURRENT LOOP (SH. 2)
TO SPEAKER
INTERNAL JUMPER INSTALLED ON PORTABLE UNIT ONLY (SEE SH. 2 AND 5)
NOT INSTALLED FOR SMART CARDET DELAY
JUMPER FOR MODEM OPTION
INSTALLED FOR -0002 ASSY ONLY
RCV DATA
CARDET
XMIT DATA
TO XMIT CURRENT LOOP (SH. 2)
937308
D 96214

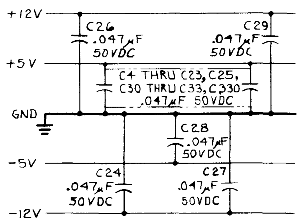
NOTES: UNLESS OTHERWISE SPECIFIED:

1. CAPACITANCE VALUES ARE IN MICROFARADS
2. RESISTANCE VALUES ARE IN OHMS
3. RESISTORS ARE .25WATT, 5%
4. AN OPTIONAL SYNCHRONOUS CHIP (TMS9903) REQUIRES EXTRA SIGNALS SCT AND SCR AND A 20 PIN SOCKET FOR U44, SH 8
5. TEST FIXTURE SPRING PIN POSITION (NAME IS THAT OF NEAREST PIN). (REF. 2202078)
6. ⊢□---□⊣ SYMBOLS REPRESENT PWB MOUNTED SQUARE PINS UTILIZED FOR JUMPERING CIRCUIT WITH JUMPER PLUG AS INDICATED.



SPARES:





REV STATUS OF SHEETS	REV												
	SH	1	2	3	4	5	6	7	8	9	10	11	12

-1 QTY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION	NOTES

PARTS LIST

NEXT ASSY	USED ON
999222	8738

APPLICATION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES. ANGLES ±1° 3 PLACE DECIMALS ± 010 2 PLACE DECIMALS ± 02
- INTERPRET DRAWING PER MIL-D-1000
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY MACHINED DIAMETERS 010 FIM
- DIMENSIONAL LIMITS APPLY BEFORE PROCESSES
- PARENTHETICAL INFO FOR REF ONLY

HOLE TOLERANCE

013 THRU 125 +004 -001	126 THRU 250 +005 -001	251 THRU 500 +006 -001
501 THRU 750 +008 -001	751 THRU 1 000 +010 -001	1 001 THRU 2 000 +012 -001

DWN 6-24-77; CHK 9/17/77; ENGR 9/19/77; QA 9/20/77; 9/20/77

TEXAS INSTRUMENTS INCORPORATED Dallas, Texas

ELECTRONIC SCHEMATIC DIAGRAM, BUBBLE MEMORY CONTROLLER - PORTABLE MEMORY TERMINAL

SIZE D | FSCM NO 96214 | DRAWING NO 999221

SCALE NONE | SHEET 1 OF 12

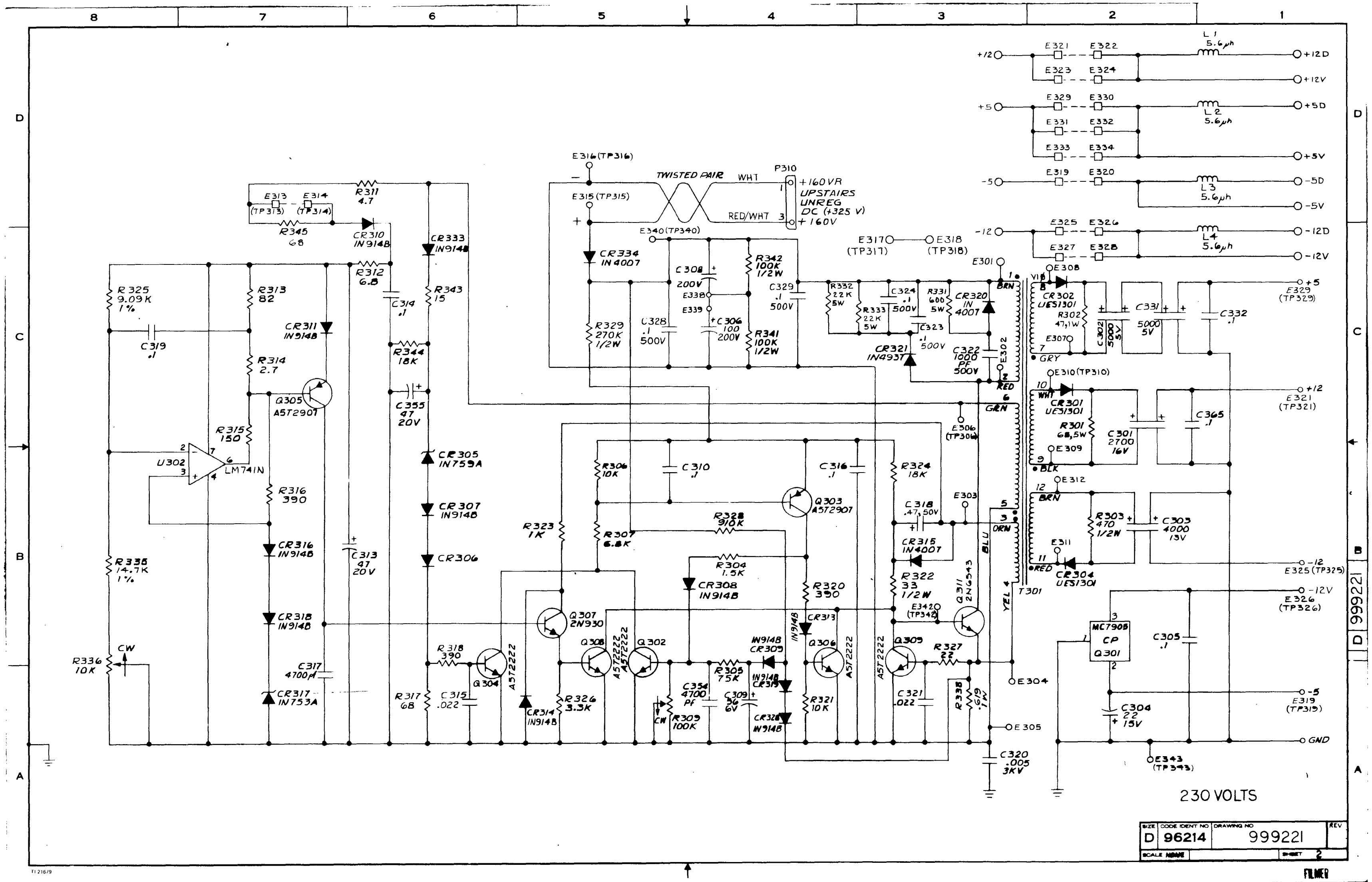
DWG NO 999221 SH 1

REVISIONS

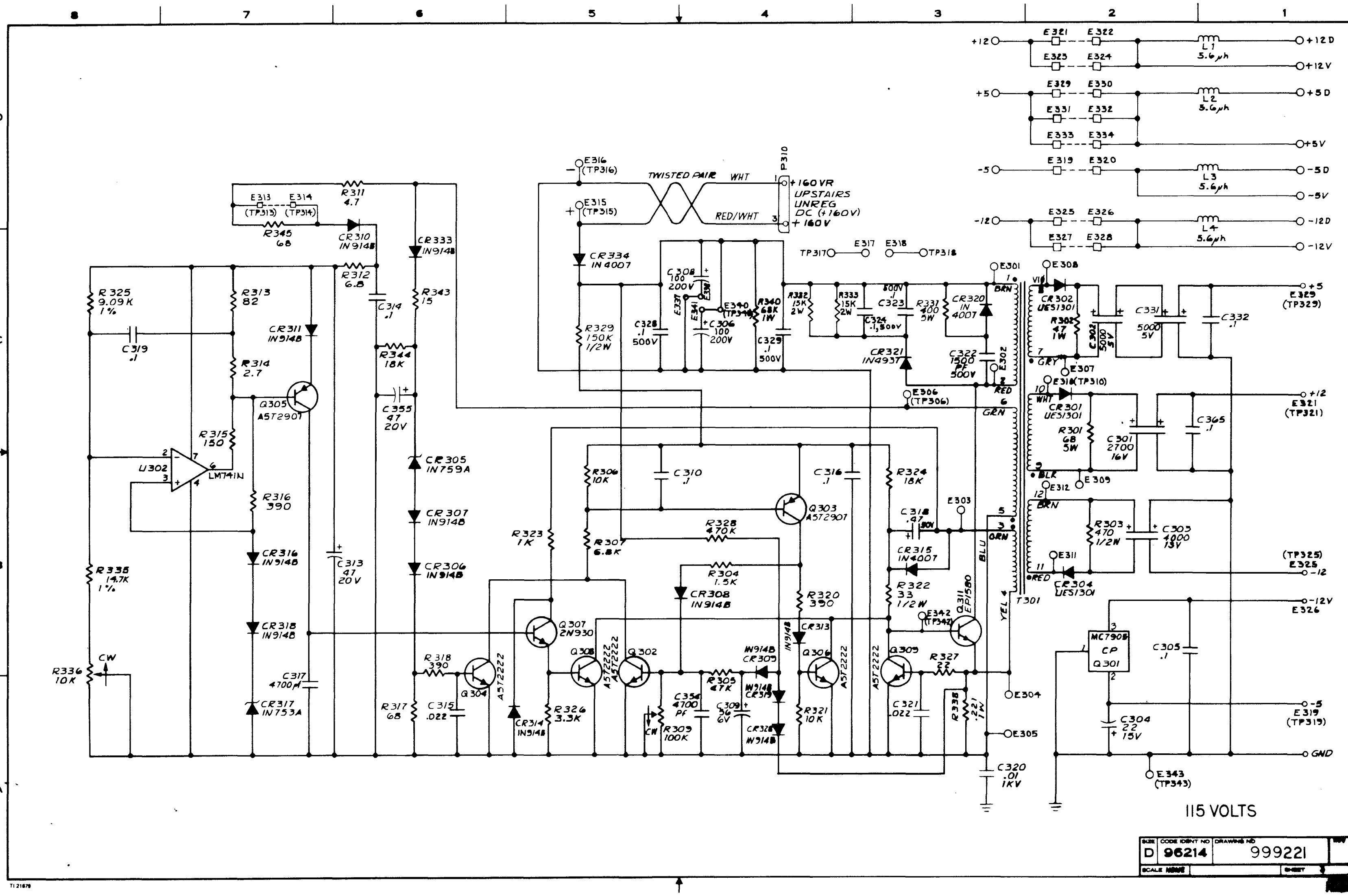
REV	DESCRIPTION	DATE	APPROVED

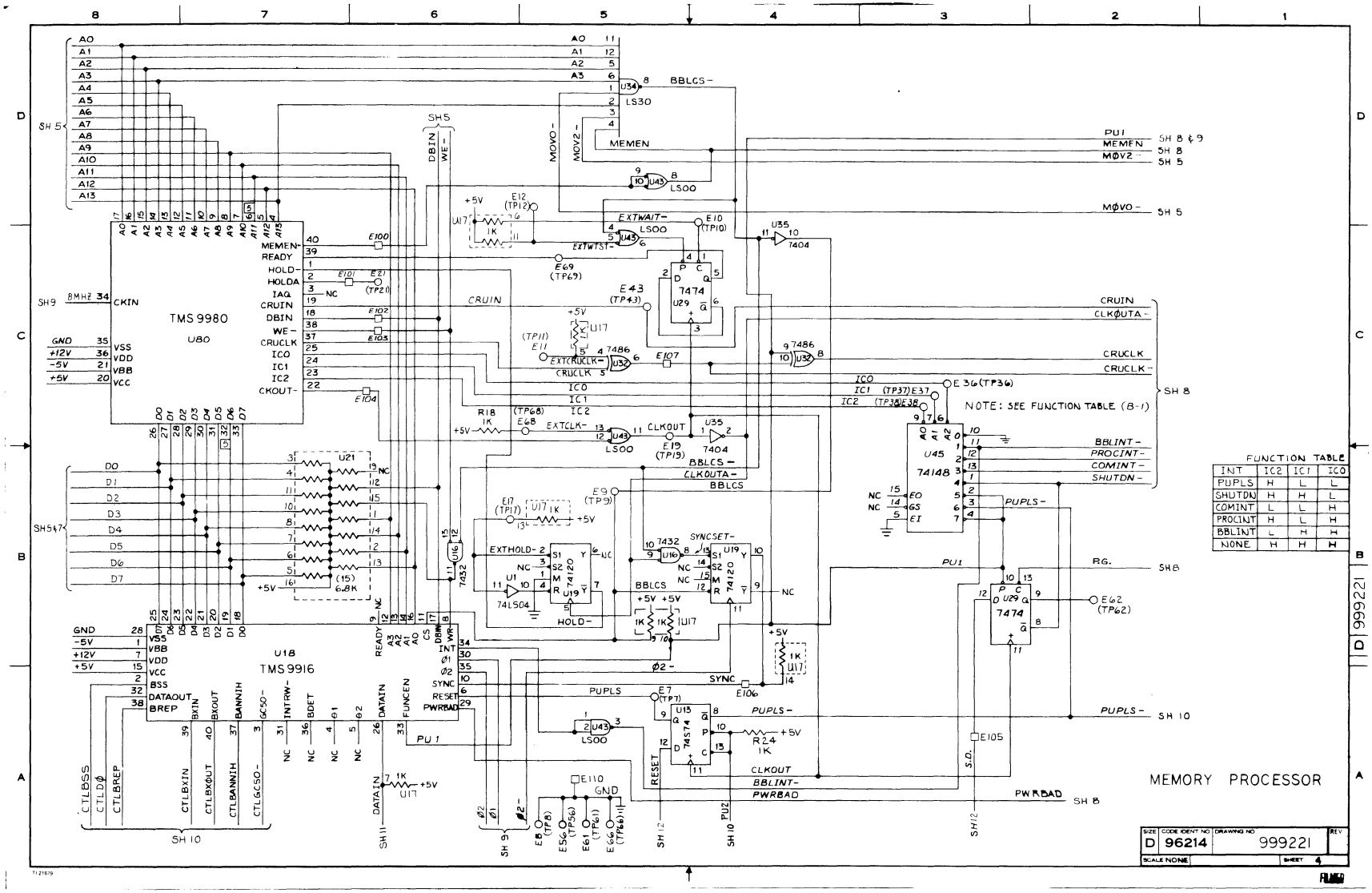
SEQ NO	IDENT	F-SPEC	NO	ADDITIONAL	NOTES
	PROCESS		CLASSIFICATION		

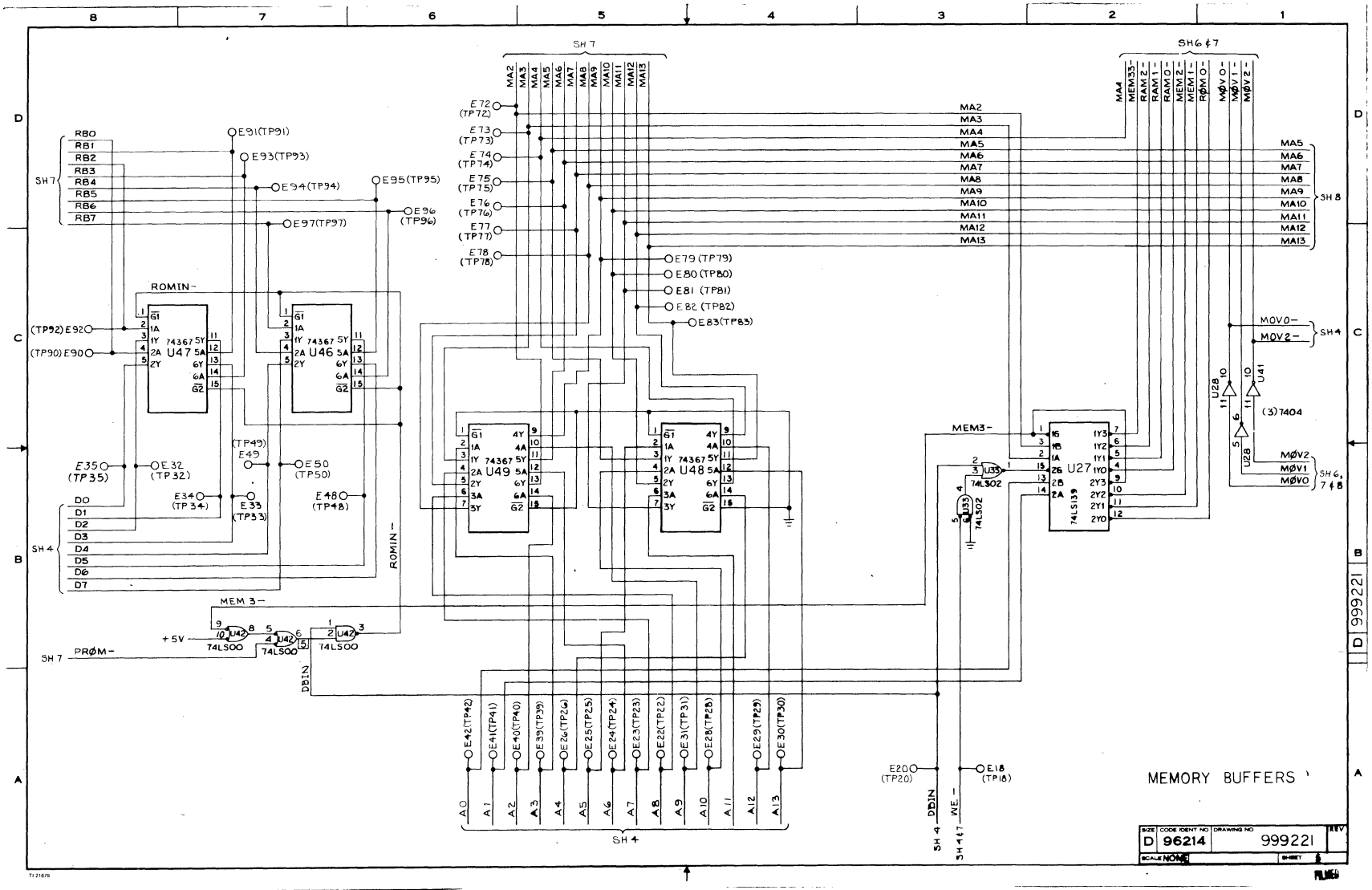
PROCESSES — FOR CORRELATION TO GOVT/IND SPECIFICATIONS, SEE TI DRAWING 729467

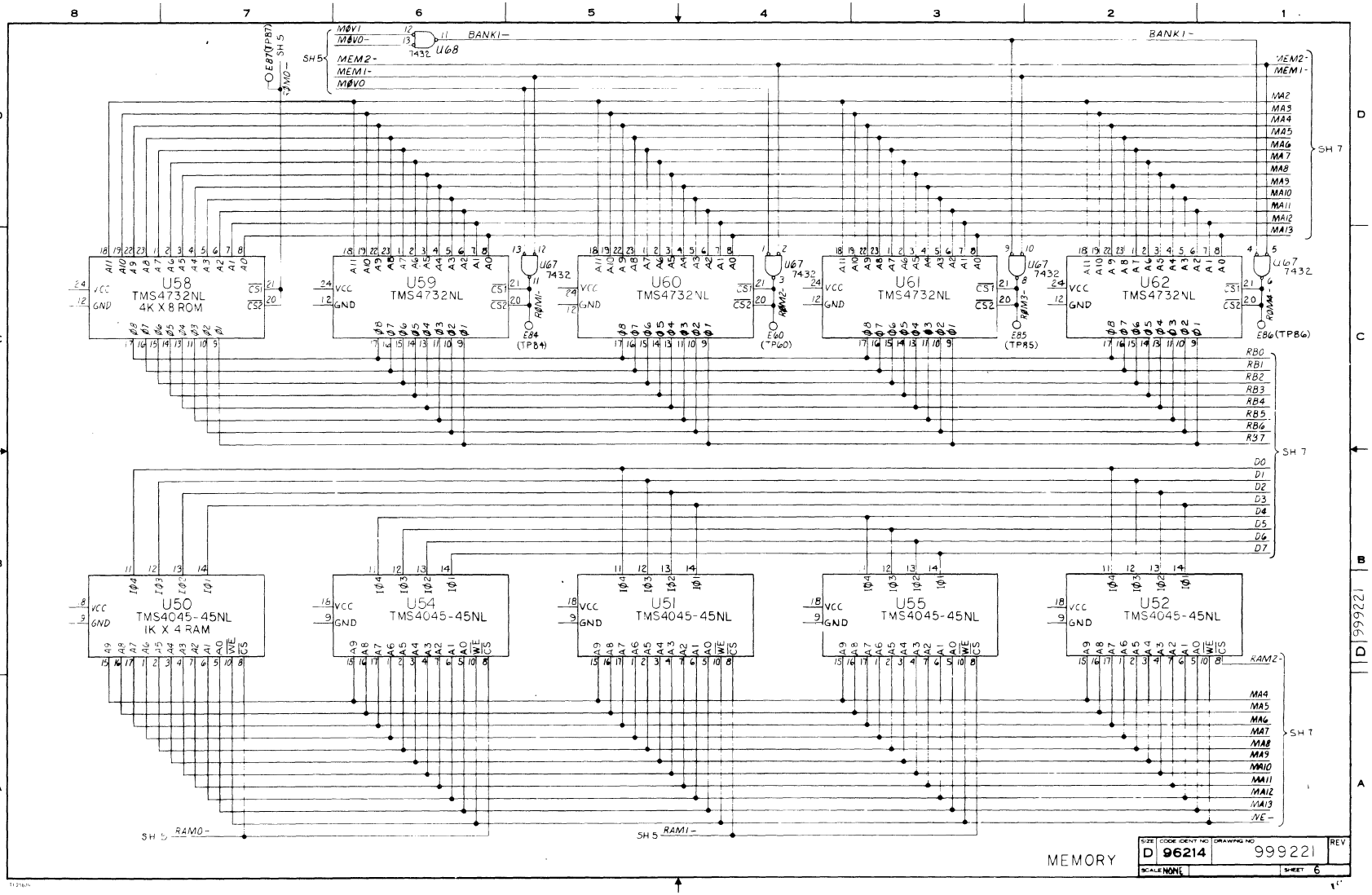


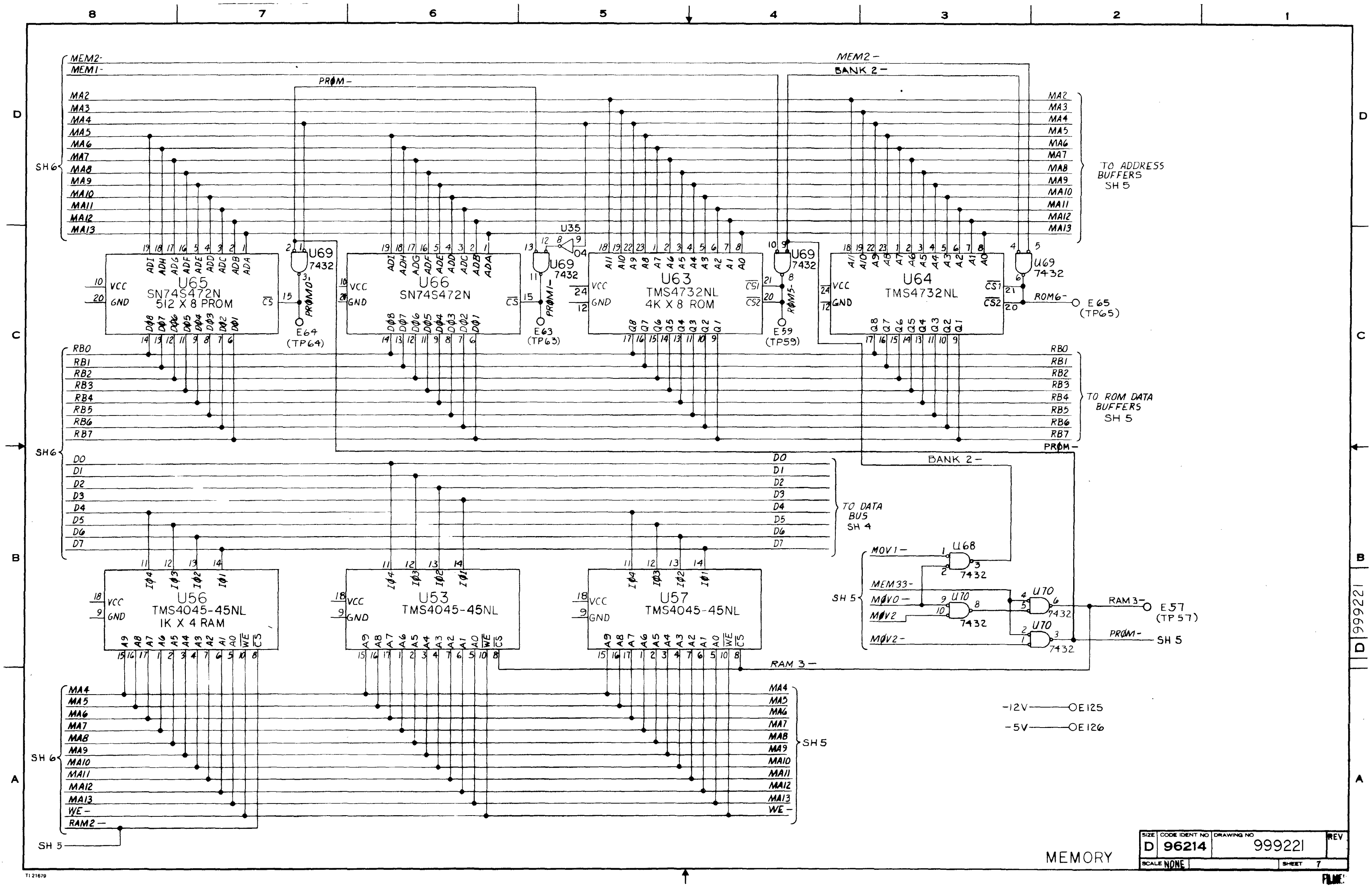
+12
E321 E322
L1 5.6μh
+12D
E323 E324
+12V
+5
E329 E330
L2 5.6μh
+5D
E331 E332
E333 E334
+5V
-5
E319 E320
L3 5.6μh
-5D
-5V
-12
E325 E326
L4 5.6μh
-12D
E327 E328
-12V
E316 (TP316)
E315 (TP315)
TWISTED PAIR
WHT
RED/WHT
P310
+160VR
UPSTAIRS
UNREG
DC (+325 V)
+160V
E340 (TP340)
E317 (TP317)
E318 (TP318)
E301
E313 (TP313)
E314 (TP314)
R311 4.7
R345 68
CR310 IN914B
CR333 IN914B
R312 6.8
R343 15
C314 .1
R344 18K
C355 47 20V
CR305 IN759A
CR307 IN914B
CR306
R325 9.09K 1%
R313 82
CR311 IN914B
C319 .1
R314 2.7
Q305 A5T2907
R315 150
U302
LM741N
R316 390
CR316 IN914B
C313 47 20V
CR318 IN914B
C317 4700pf
CR317 IN753A
R335 14.7K 1%
R336 10K
CW
R318 390
Q304
R317 68
C315 .022
A5T2222
CR314 IN914B
CR334 IN4007
R329 270K 1/2W
C328 .1 500V
C308 200V
E338
E339
C306 100 200V
R342 100K 1/2W
R341 100K 1/2W
C329 .1 500V
R332 22K 5W
R333 22K 5W
C324 .1 500V
R331 600 5W
CR320 IN4007
C323 .1 500V
CR321 IN4937
C322 1000 PF 500V
E302
BRN
RED
GRN
E306 (TP306)
R306 10K
C310 .1
C316 .1
R324 18K
Q303 A5T2907
R323 1K
R307 6.8K
R328 910K
C318 .47 50V
E303
CR315 IN4007
R304 1.5K
CR308 IN914B
R322 33 1/2W
R320 390
Q307 2N930
E342 (TP342)
Q311 2N6543
Q308
Q302
CR313
IN914B
CR309
Q306
Q309
R327 22
R326 3.3K
C354 4700 PF
R305 75K
C309 56 6V
CR319
CR328 IN914B
R309 100K
R321 10K
C321 .022
R338 .619 1W
E304
E305
C320 .005 3KV
BLU
YEL
T301
E308
CR302 UES1301
R302 47,1W
E307
GRY
C302 5000 5V
C331 5000 5V
C332 .1
E329 (TP329)
E310 (TP310)
WHT
CR301 UES1301
R301 68,5W
E309
C301 2700 16V
C365 .1
E321 (TP321)
BLK
E312
R303 470 1/2W
C303 4000 15V
E311
CR304 UES1301
E325 (TP325)
E326 (TP326)
MC7905 CP Q301
C305 .1
C304 22 15V
E319 (TP319)
GND
E343 (TP343)
230 VOLTS
D 96214 999221
SCALE NONE
SHEET 2
D 999221

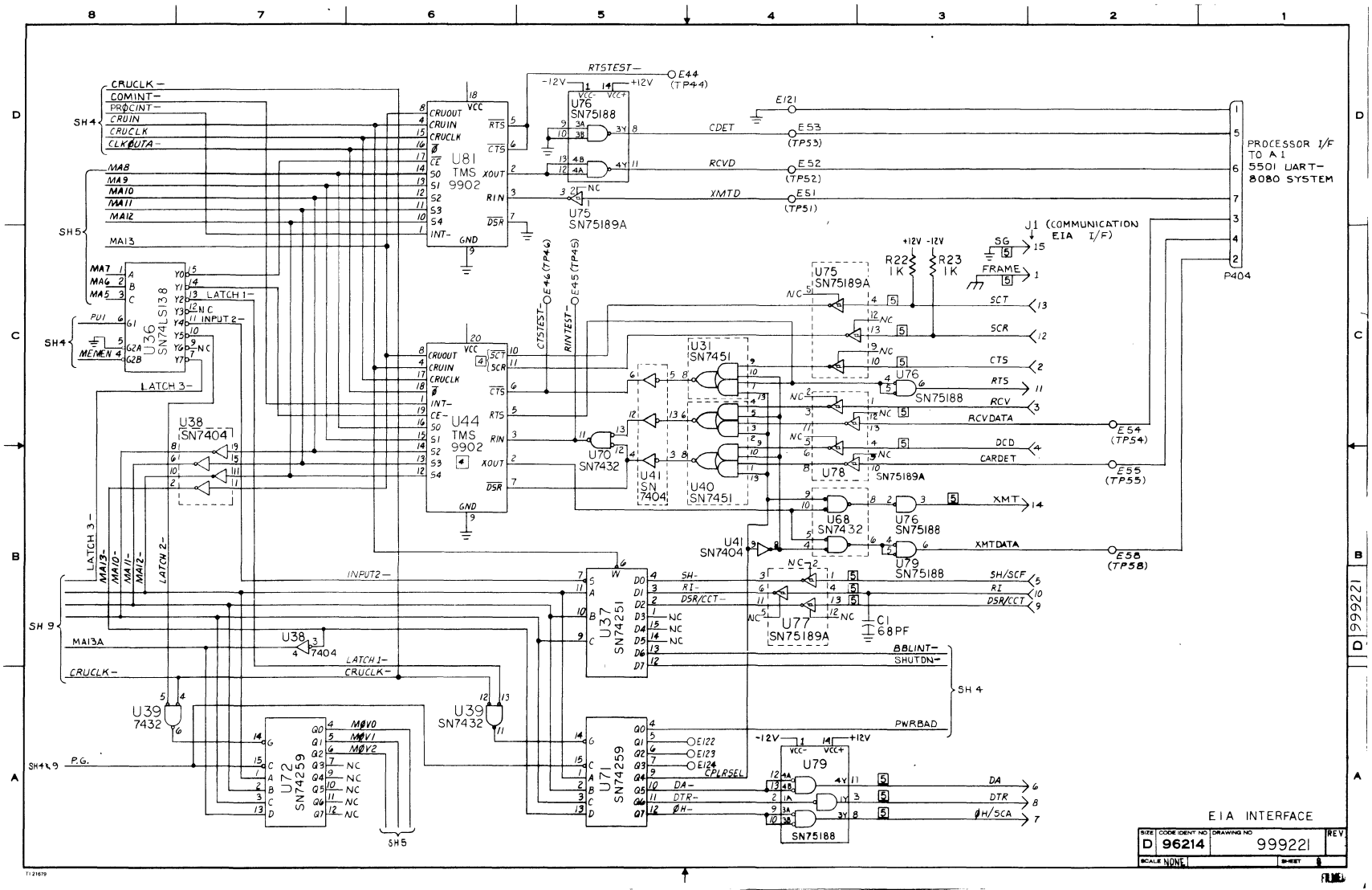

TWISTED PAIR
WHT
RED/WHT
P310
+160VR
UPSTAIRS
UNREG
DC (+160V)
+160V
E316 (TP316)
E315 (TP315)
E313 (TP313)
E314 (TP314)
R311 4.7
R345 68
CR310 IN914B
R312 6.8
R325 9.09K 1%
R313 82
CR311 IN914B
C319 .1
R314 2.7
Q305 A5T2907
R315 150
U302 LM741N
R316 390
CR316 IN914B
CR318 IN914B
CR317 IN753A
C317 4700µf
C313 47 20V
C314 .1
R344 18K
C355 47 20V
CR333 IN914B
R343 15
CR305 IN759A
CR307 IN914B
CR306 IN914B
R335 14.7K 1%
R336 10K
CW
R318 390
R317 68
C315 .022
Q304
A5T2222
CR314 IN914B
R323 1K
Q307 2N930
Q308
Q302
R326 3.3K
CR334 IN4007
R329 150K 1/2W
R306 10K
R307 6.8K
C310 .1
R328 470K
R304 1.5K
CR308 IN914B
Q303 A5T2907
C316 .1
R320 390
CR313
R305 47K
CR309
CR319
CR328
C354 4700 PF
C309 56 6V
R309 100K
Q306
R321 10K
R324 18K
C318 .47
CR315 IN4007
R322 33 1/2W
E342 (TP342)
Q311 EP1580
Q309
C321 .022
R327 22
R338 .221 1W
C320 .01 1KV
E304
E305
E303
C308 100 200V
C306 100 200V
E340 (TP340)
R340 68K 1W
C328 .1 500V
C329 .1 500V
R332 15K 2W
R333 15K 2W
C324 .1 500V
C323 .1 500V
R331 400 5W
CR320 IN4007
CR321 IN4937
C322 1500 PF 500V
E306 (TP306)
TP317
E317
E318
TP318
E301
E308
T301
BRN
GRY
RED
GRN
WHT
BLK
ORN
BLU
YEL
CR302 UES1301
R302 47 1W
C302 5000 5V
C331 5000 5V
C332 .1
E329 (TP329)
+5
E307
E310 (TP310)
CR301 UES1301
R301 68 5W
C301 2700 16V
C365 .1
E321 (TP321)
+12
E312
E309
R303 470 1/2W
C303 4000 15V
E311
CR304 UES1301
(TP325) E325 -12
-12V E326
MC7905 CP Q301
C305 .1
C304 22 15V
-5 E319 (TP319)
GND
E343 (TP343)
+12
E321
E322
E323
E324
L1 5.6µh
+12D
+12V
+5
E329
E330
E331
E332
E333
E334
L2 5.6µh
+5D
+5V
-5
E319
E320
L3 5.6µh
-5D
-5V
-12
E325
E326
E327
E328
L4 5.6µh
-12D
-12V
115 VOLTS
D 96214 999221
D 999221

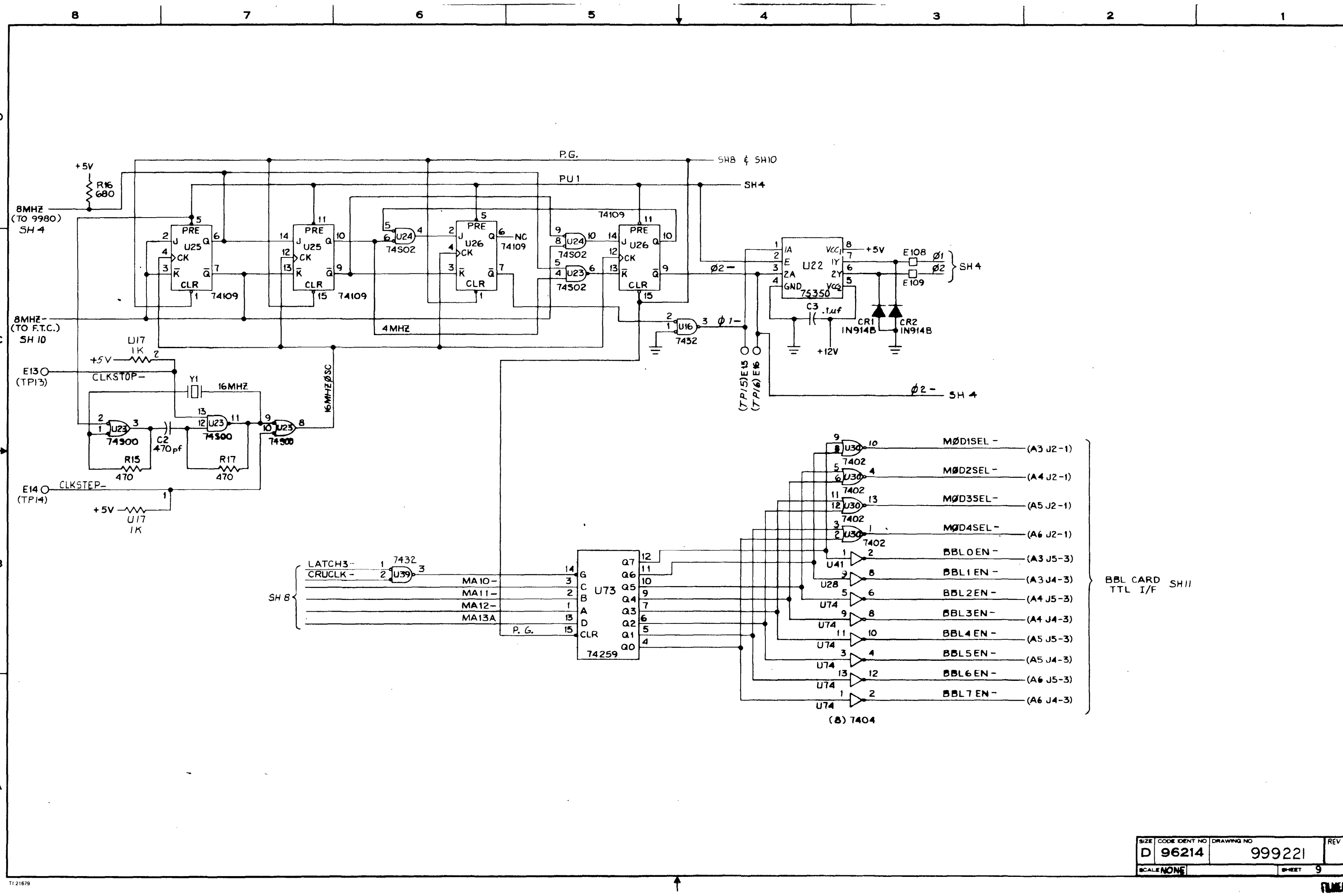

TMS 9980
U80
TMS 9916
U18
MEMORY PROCESSOR
FUNCTION TABLE
INT IC2 IC1 IC0
PUPLS H L L
SHUTDN H H L
COMINT L L H
PROCINT H L H
BBLINT L H H
NONE H H H
NOTE: SEE FUNCTION TABLE (8-1)
SIZE D
CODE IDENT NO 96214
DRAWING NO 999221
REV
SCALE NONE
SHEET 4

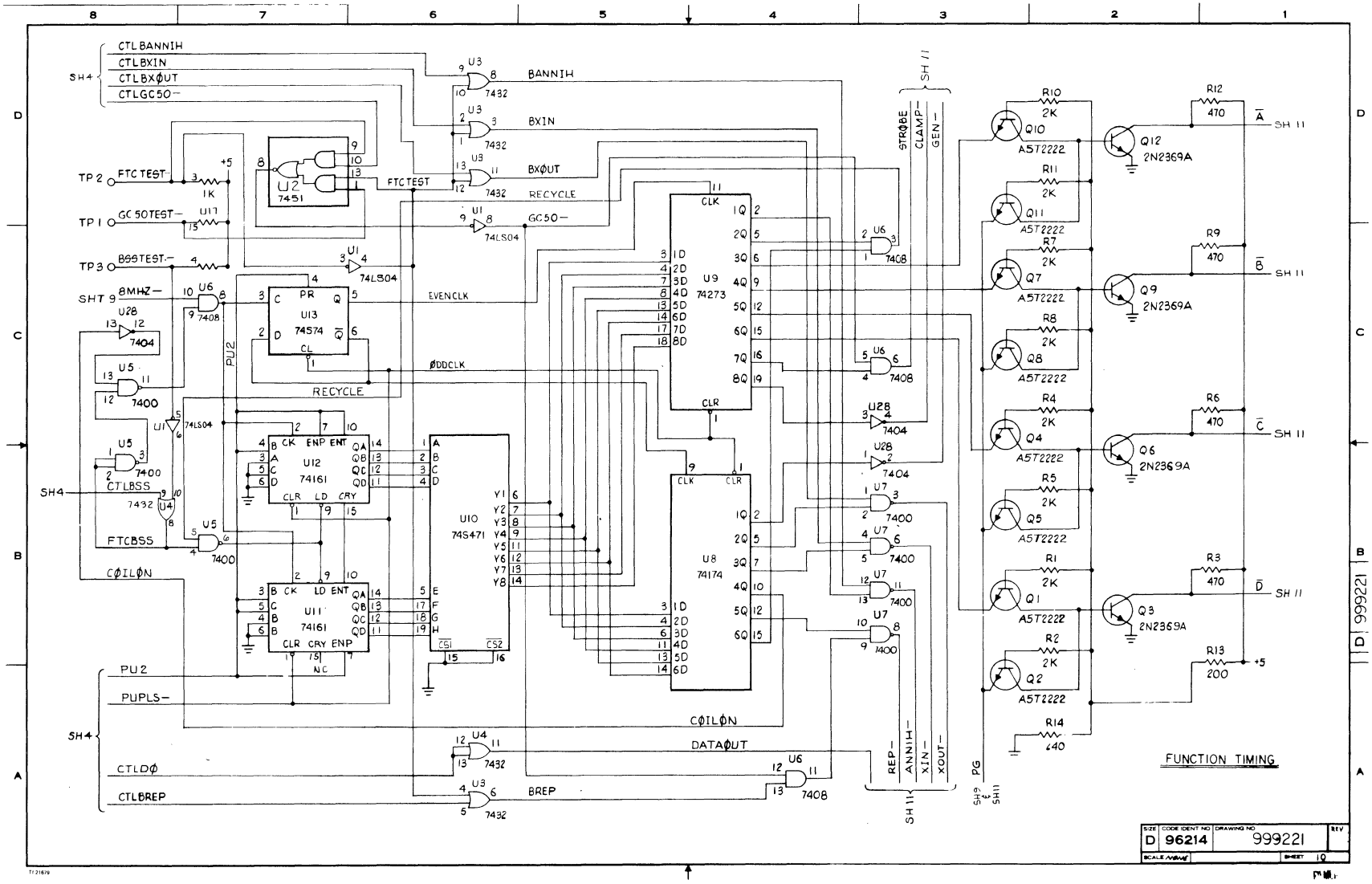

MEMORY BUFFERS
SIZE D
CODE IDENT NO 96214
DRAWING NO 999221
REV
SCALE NONE
SHEET 6
999221
SH 7
SH 4
SH 8
SH 6 & 7
ROMIN-
MEM3-
DBIN
WE-
+5V
74LS00
74LS02
74LS139
U47
U46
U49
U48
U27
U41
U28
(3) 7404

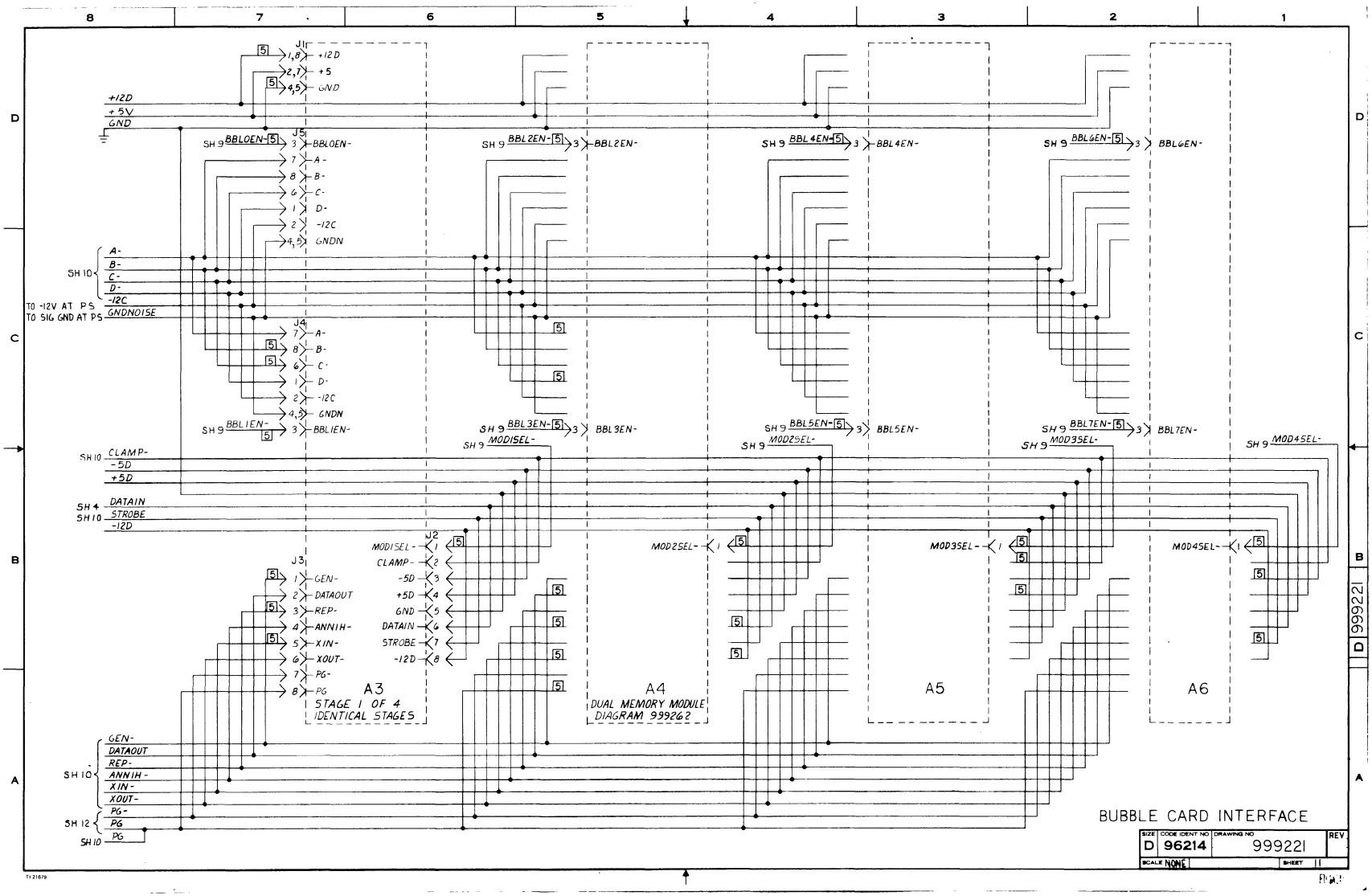

MØV1
MØV0-
MEM2-
MEM1-
MØV0
U68
7432
BANK1-
SH 5
SH 7
U58
TMS4732NL
4K X 8 ROM
U59
TMS4732NL
U60
TMS4732NL
U61
TMS4732NL
U62
TMS4732NL
U67
7432
VCC
GND
U50
TMS4045-45NL
1K X 4 RAM
U54
TMS4045-45NL
U51
TMS4045-45NL
U55
TMS4045-45NL
U52
TMS4045-45NL
MA2
MA3
MA4
MA5
MA6
MA7
MA8
MA9
MA10
MA11
MA12
MA13
RB0
RB1
RB2
RB3
RB4
RB5
RB6
RB7
D0
D1
D2
D3
D4
D5
D6
D7
RAM2-
RAM0-
RAM1-
WE-
CS
MEMORY
SIZE D
CODE IDENT NO 96214
DRAWING NO 999221
REV
SCALE NONE
SHEET 6

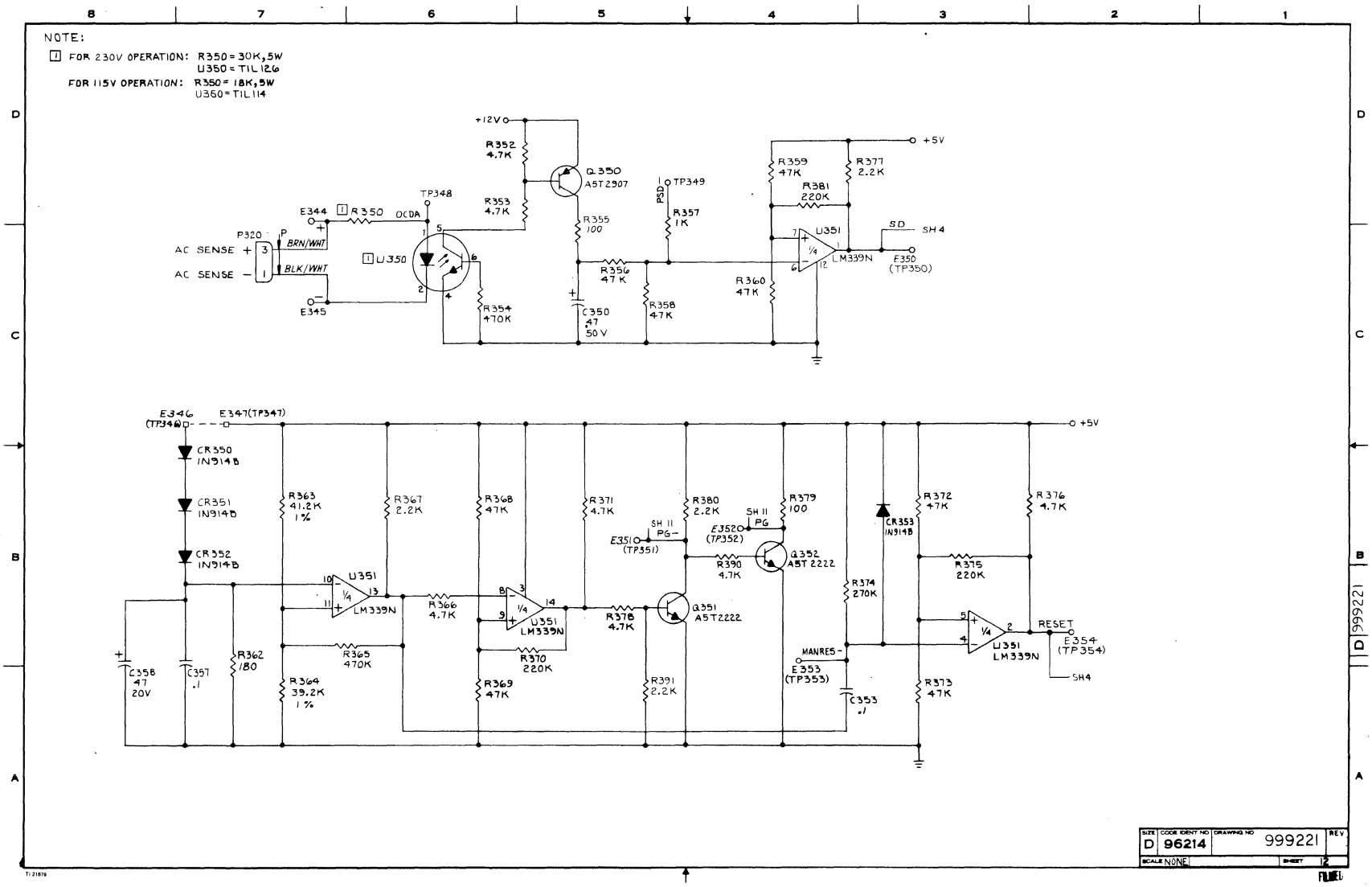

U65
SN74S472N
512 X 8 PROM
U66
SN74S472N
U63
TMS4732NL
4K X 8 ROM
U64
TMS4732NL
U69
7432
U35
U56
TMS4045-45NL
1K X 4 RAM
U53
TMS4045-45NL
U57
TMS4045-45NL
U68
7432
U70
7432
MEM2-
MEM1-
PROM-
BANK 2-
MA2
MA3
MA4
MA5
MA6
MA7
MA8
MA9
MA10
MA11
MA12
MA13
SH6
TO ADDRESS BUFFERS SH 5
RB0
RB1
RB2
RB3
RB4
RB5
RB6
RB7
TO ROM DATA BUFFERS SH 5
D0
D1
D2
D3
D4
D5
D6
D7
TO DATA BUS SH 4
PROM0-
PROM1-
ROM5-
ROM6-
E64 (TP64)
E63 (TP63)
E59 (TP59)
E65 (TP65)
MOV1-
MEM33-
MOV0-
MOV2-
RAM3-
E57 (TP57)
SH 5
RAM 3-
WE-
RAM2-
-12V E125
-5V E126
MEMORY
D 96214 999221
SCALE NONE
SHEET 7


CRUCLK–
COMINT–
PROCINT–
CRUIN
CRUCLK
CLKOUTA–
MA8
MA9
MA10
MA11
MA12
MA13
SH4
SH5
U81 TMS 9902
U44 TMS 9902
U36 SN74LS138
U38 SN7404
U39 7432
U39 SN7432
U72 SN74259
U71 SN74259
U37 SN74251
U75 SN75188
U75 SN75189A
U76 SN75188
U31 SN7451
U40 SN7451
U41 SN7404
U70 SN7432
U68 SN7432
U78 SN75189A
U77 SN75189A
U79 SN75188
RTSTEST–
E44 (TP44)
CDET
RCVD
XMTD
E53 (TP53)
E52 (TP52)
E51 (TP51)
E121
PROCESSOR I/F TO A1 5501 UART–8080 SYSTEM
P404
J1 (COMMUNICATION EIA I/F)
R22 1K
R23 1K
SCT
SCR
CTS
RTS
RCV
RCVDATA
DCD
CARDET
XMT
XMTDATA
E54 (TP54)
E55 (TP55)
E58 (TP58)
SH/SCF
RI
DSR/CCT
C1 68PF
BBLINT–
SHUTDN–
PWRBAD
DA
DTR
ØH/SCA
CTSTEST
RINTEST
E46 (TP46)
E45 (TP45)
LATCH 1–
LATCH 2–
LATCH 3–
INPUT2–
MAI3A
P.G.
MØV0
MØV1
MØV2
E122
E123
E124
CPLRSEL
EIA INTERFACE
SIZE D
CODE IDENT NO 96214
DRAWING NO 999221
REV.
SCALE NONE
SHEET 8


P.G.
SH8 & SH10
PU1
SH4
+5V
R16
680
8MHZ
(TO 9980)
SH 4
8MHZ-
(TO F.T.C.)
SH 10
PRE
CLR
U25
U26
U24
U23
74109
74S02
4MHZ
NC
U22
75350
Ø2-
E108
E109
Ø1
Ø2
CR1
1N914B
CR2
1N914B
C3
.1uf
+12V
U16
7432
ϕ1-
(TP15) E15
(TP16) E16
U17
1K
E13
(TP13)
CLKSTOP-
Y1
16MHZ
16MHZ ØSC
74S00
C2
470pf
R15
470
R17
470
E14
(TP14)
CLKSTEP-
LATCH3-
CRUCLK-
U39
SH 8
MA10-
MA11-
MA12-
MA13A
P. G.
U73
74259
U30
7402
MØD1SEL-
MØD2SEL-
MØD3SEL-
MØD4SEL-
(A3 J2-1)
(A4 J2-1)
(A5 J2-1)
(A6 J2-1)
BBL0EN-
BBL1EN-
BBL2EN-
BBL3EN-
BBL4EN-
BBL5EN-
BBL6EN-
BBL7EN-
(A3 J5-3)
(A3 J4-3)
(A4 J5-3)
(A4 J4-3)
(A5 J5-3)
(A5 J4-3)
(A6 J5-3)
(A6 J4-3)
U41
U28
U74
(8) 7404
BBL CARD
TTL I/F
SH11
D 999221
SIZE D
CODE IDENT NO 96214
DRAWING NO 999221
SCALE NONE
SHEET 9


CTLBANNIH
CTLBXIN
CTLBXØUT
CTLGC50–
SH4
BANNIH
BXIN
BXØUT
RECYCLE
GC50–
FTCTEST
TP2
TP1
TP3
GC50TEST–
BSSTEST–
SHT 9
8MHZ–
EVENCLK
ØDDCLK
RECYCLE
CTLBSS
FTCBSS
CØILØN
PU2
PUPLS–
CTLDØ
CTLBREP
DATAØUT
BREP
U2 7451
U3 7432
U4 7432
U5 7400
U6 7408
U7 7400
U1 74LS04
U13 74574
U12 74161
U11 74161
U10 74S471
U9 74273
U8 74174
U28 7404
5TRØBE
CLAMP–
GEN–
REP–
ANNIH–
XIN–
XOUT–
PG
SH9 & SH11
SH 11
Q10 A5T2222
Q11 A5T2222
Q7 A5T2222
Q8 A5T2222
Q4 A5T2222
Q5 A5T2222
Q1 A5T2222
Q2 A5T2222
Q12 2N2369A
Q9 2N2369A
Q6 2N2369A
Q3 2N2369A
R10 2K
R11 2K
R7 2K
R8 2K
R4 2K
R5 2K
R1 2K
R2 2K
R14 240
R12 470
R9 470
R6 470
R3 470
R13 200
Ā SH 11
B̄ SH 11
C̄ SH 11
D̄ SH 11
FUNCTION TIMING
SIZE D
CODE IDENT NO 96214
DRAWING NO 999221
REV
SHEET 10
D 999221


8
7
6
5
4
3
2
1
D
C
B
A
J1
1,8 +12D
2,7 +5
4,5 GND
+12D
+5V
GND
J5
3 BBL0EN-
7 A-
8 B-
6 C-
1 D-
2 -12C
4,5 GNDN
SH 9 BBL0EN-
SH 9 BBL2EN-
SH 9 BBL4EN-
SH 9 BBL6EN-
BBL2EN-
BBL4EN-
BBL6EN-
SH 10 A-
B-
C-
D-
-12C
GNDNOISE
TO -12V AT PS
TO SIG GND AT PS
J4
7 A-
8 B-
6 C-
1 D-
2 -12C
4,5 GNDN
3 BBLIEN-
SH 9 BBLIEN-
SH 9 BBL3EN-
SH 9 BBL5EN-
SH 9 BBL7EN-
BBL3EN-
BBL5EN-
BBL7EN-
SH 9 MODISEL-
SH 9 MOD2SEL-
SH 9 MOD3SEL-
SH 9 MOD4SEL-
SH 10 CLAMP-
-5D
+5D
SH 4 DATAIN
SH 10 STROBE
-12D
J2
1 MODISEL-
2 CLAMP-
3 -5D
4 +5D
5 GND
6 DATAIN
7 STROBE
8 -12D
J3
1 GEN-
2 DATAOUT
3 REP-
4 ANNIH-
5 XIN-
6 XOUT-
7 PG-
8 PG
A3
STAGE 1 OF 4
IDENTICAL STAGES
A4
DUAL MEMORY MODULE
DIAGRAM 999262
A5
A6
SH 10 GEN-
DATAOUT
REP-
ANNIH-
XIN-
XOUT-
SH 12 PG-
PG
SH 10 PG
BUBBLE CARD INTERFACE
SIZE D
CODE IDENT NO 96214
DRAWING NO 999221
REV
SCALE NONE
SHEET 1
D 999221
TI 21679



SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	999221	
SCALE NONE		SHEET 12	

D 999221

NOTES: UNLESS OTHERWISE SPECIFIED

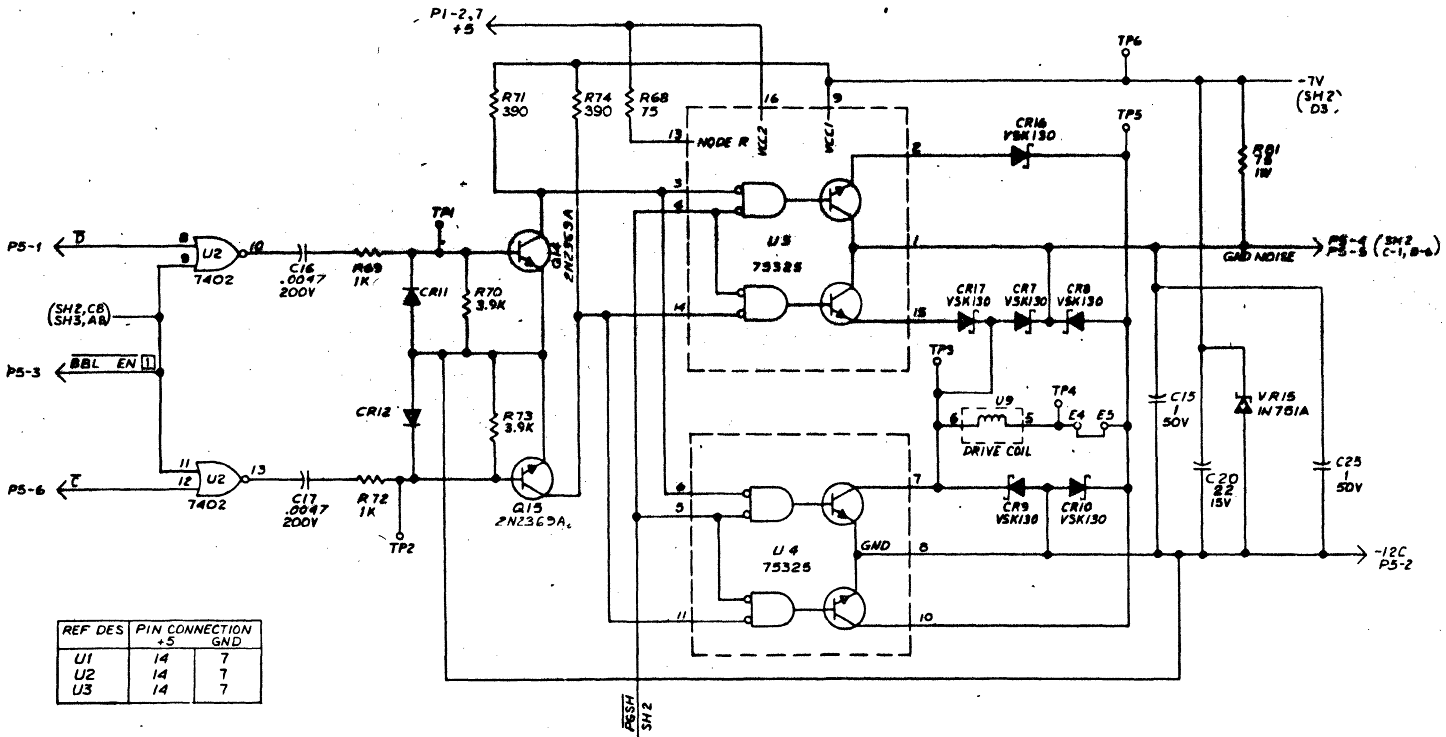
1. CORRECT SIGNATURE DEPENDS UPON TERMINAL CONFIGURATION, CORRECT SIGNATURES ARE BBLOEN, BBLTEN, ETC
2. DIODES ARE IN914B
3. CAPACITANCE VALUES ARE IN MICROFARADS
4. RT54 IS A SILICON TEMPERATURE SENSOR RESISTANCE IS 1K ± 5% AT 25°C
5. RESISTANCE VALUES ARE IN OHMS
6. ALL RESISTORS ARE 1/4 W ± 5%
7. DENOTES BUBBLE MEMORY ELEMENTS
8. DENOTES BUBBLE MEMORY FIELD DRIVE COILS
9. NO REFERENCE DESIGNATION PREFIX ASSIGNED TO THIS BOARD
10. DENOTES SCHOTTKY DIODE
11. THE VALUE OF R48 ON CHEVRON BUBBLE SCHEMATIC, SHEET 4, IS SELECTED FOR BUBBLE PART NO. AS SHOWN:

BIN NO	BUBBLE PART NO	RESISTOR
1	2200046-0101	10.2K Ω
2	2200046-0102	8.45K Ω
3	2200046-0103	11.5K Ω

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	CN425663	8-8-77	
	B	CN425695	7-12-77	
	C	CN429398 (3)	1-13-78	
	D	CN432478 (B)	3-22-78	
	E	CN436072 (D)	5-8-78	
	F	CN434249 (D)	5-26-78	
	G	CN434695 (D)	5-26-78	

Y COIL DRIVE



REF DES	PIN CONNECTION +5	GND
U1	14	7
U2	14	7
U3	14	7

REV STATUS OF SHEETS	REV	G	D	G	G
	SH	1	2	3	4

QTY REQD	ITEM NO	CODE IDENT	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	PROCUREMENT SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED
- REMOVE ALL BURRS AND SHARP EDGES
- CONCENTRICITY SPECIFIED DIAMETERS .010 FIR
- DIMENSIONAL LIMITS APPLY BEFORE FINISH PROCESSING
- IDENTIFYING NUMBERS SHOWN IN PARENTHESES FOR REFERENCE ONLY
- INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100

HOLE TOLERANCE

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN INCHES
- TOLERANCES ANGLES ±1°
- 3 PLACE DECIMALS ± .010
- 2 PLACE DECIMALS ± .02

NEXT ASSY	USED ON
999236	8738

APPLICATION

DWN 1-27-77 · CHK 7/1/77 · ENGR 7/8/77 · QA 7.22.77

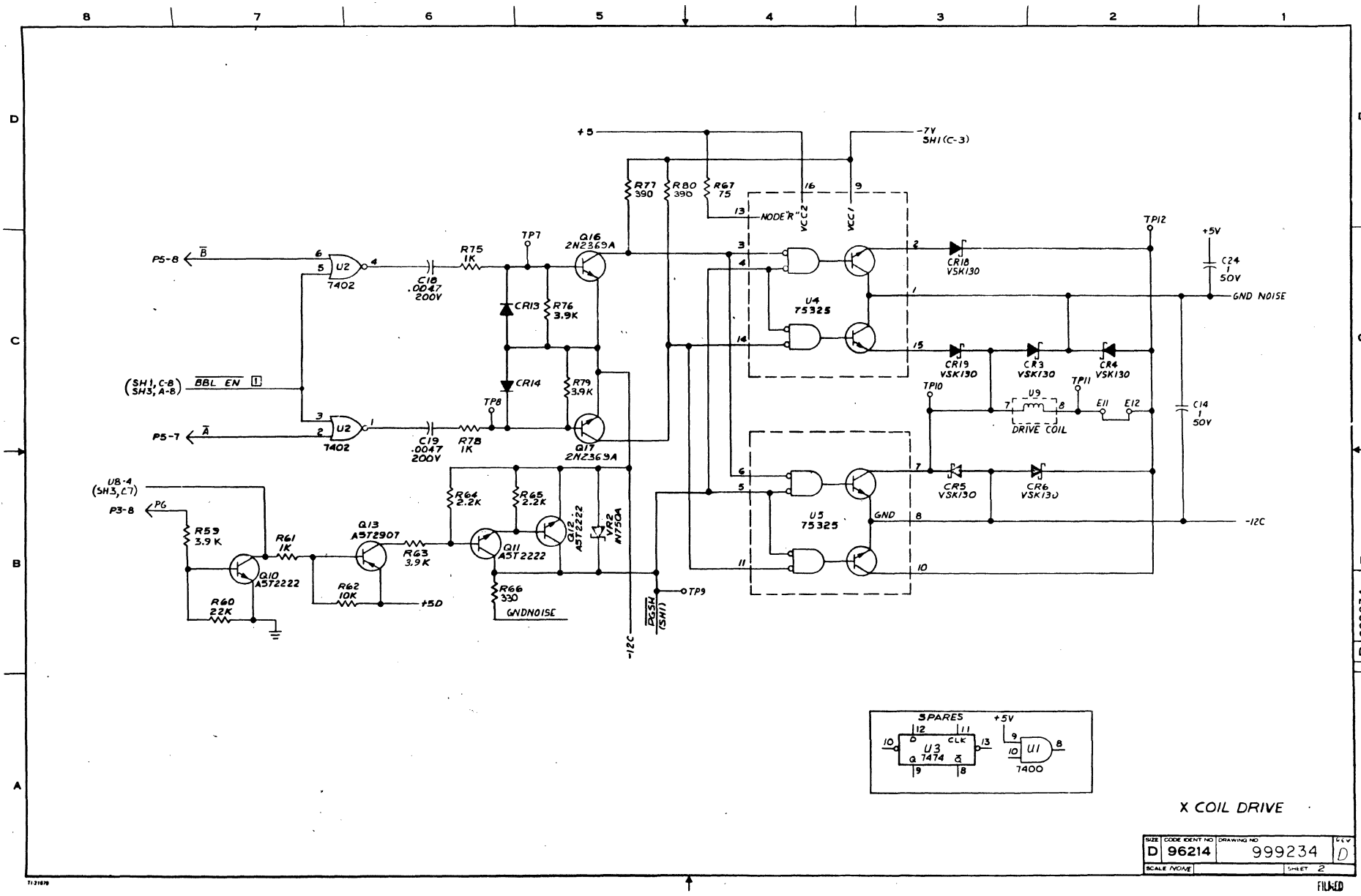
TEXAS INSTRUMENTS INCORPORATED Equipment Group Dallas Texas

ELECTRONIC SCHEMATIC DIAGRAM, DISCRETE MEMORY

SIZE D · CODE IDENT NO 96214 · DRAWING NO 999234

SCALE NONE · SHEET 1 OF 4

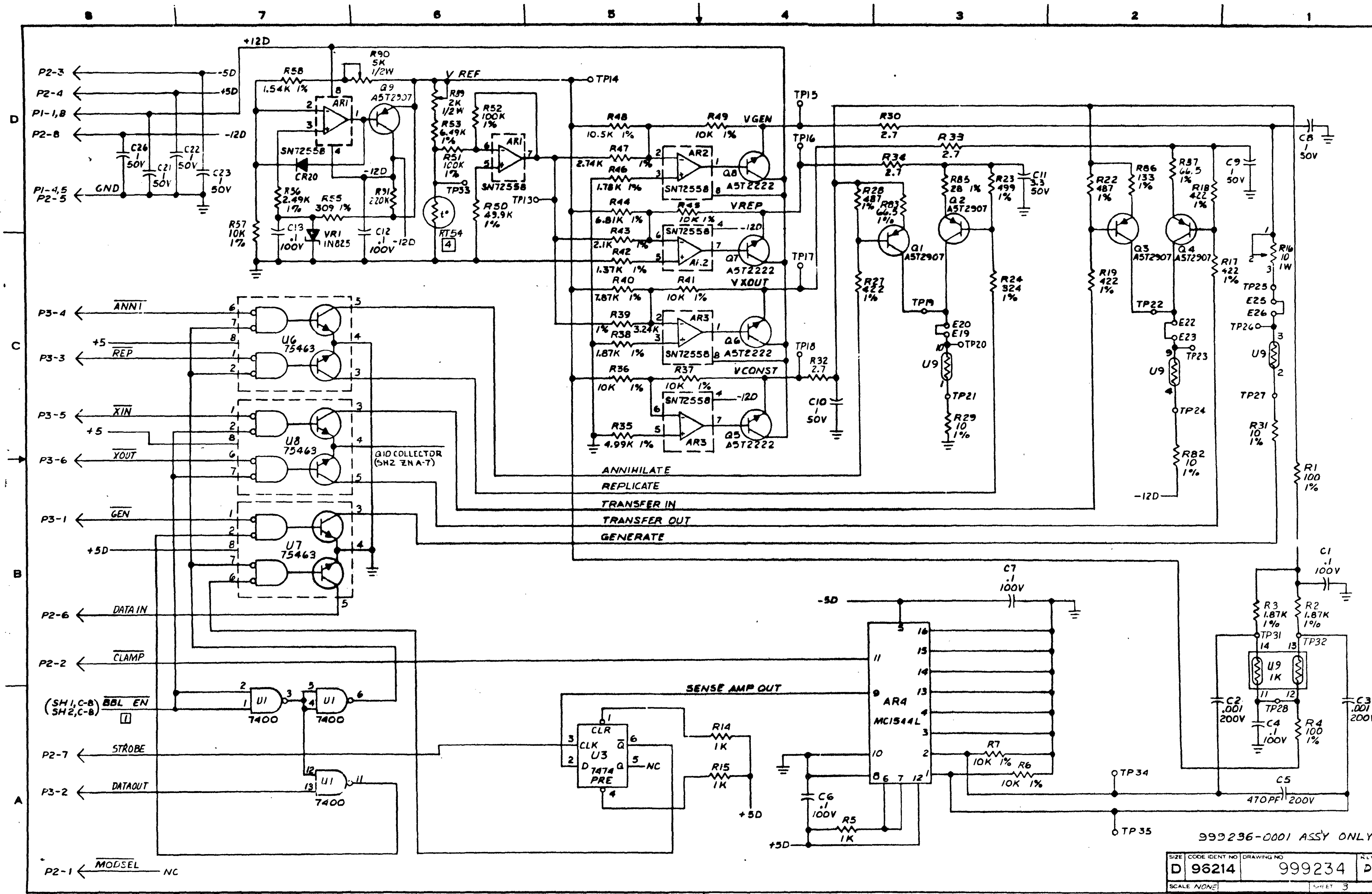
D 999234



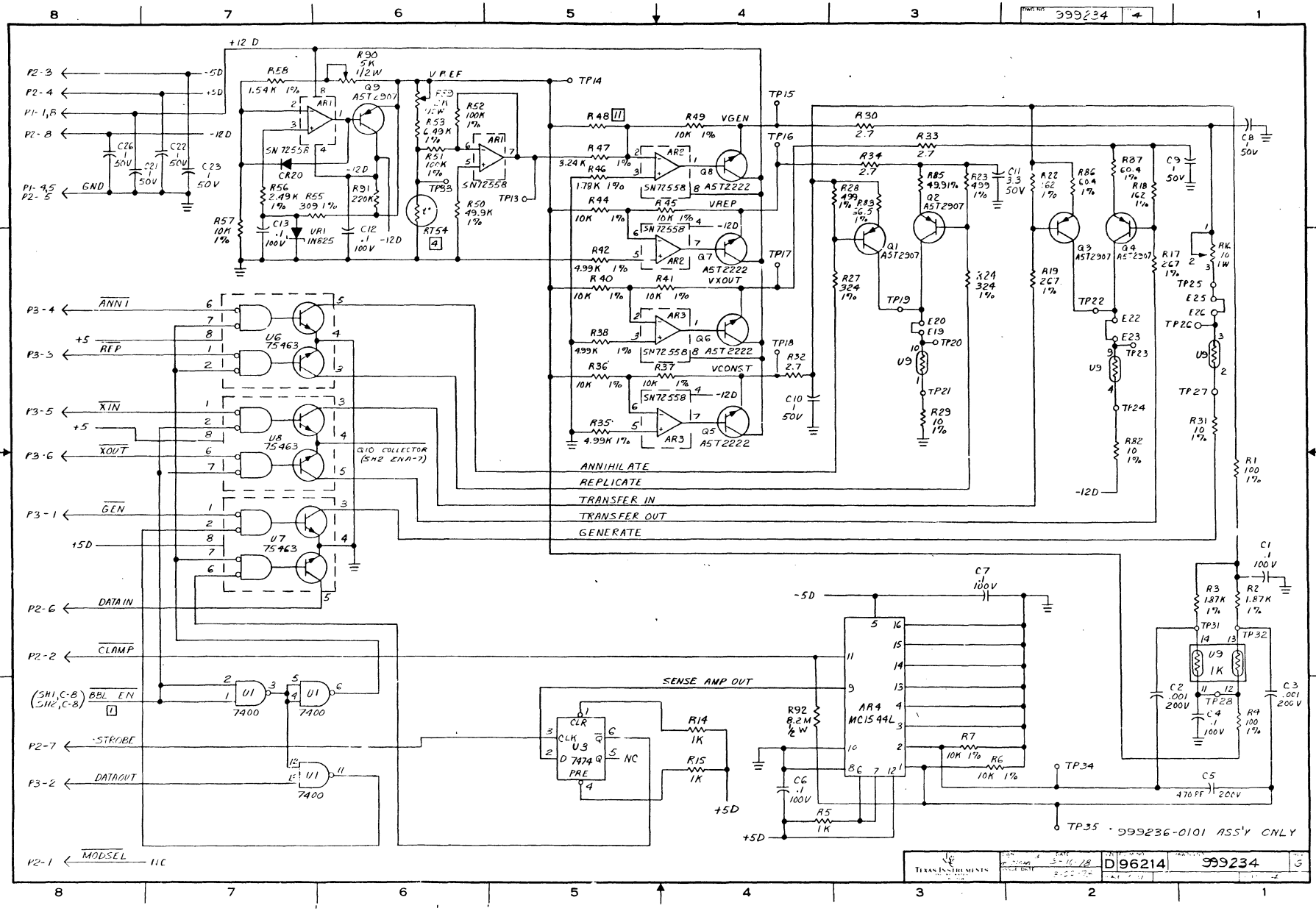
X COIL DRIVE

SIZE	CODE IDENT NO	DRAWING NO	REV
D	96214	999234	D
SCALE NONE		SHEET 2	

FILMED



+12D
P2-3
P2-4
P1-1,8
P2-8
P1-4,5
P2-5
GND
-5D
+5D
-12D
R58 1.54K 1%
R90 5K 1/2W
Q9 A5T2907
V REF
TP14
AR1
SN72558
CR20
R56 2.49K 1%
R55 309 1%
VR1 1N825
R91 220K
R57 10K 1%
C13 .1 100V
C12 .1 100V
R59 2K 1/2W
R53 6.49K 1%
R51 100K 1%
R52 100K 1%
R50 49.9K 1%
RT54
TP33
TP13
TP15
TP16
TP17
TP18
R48 10.5K 1%
R49 10K 1%
VGEN
R47 2.74K 1%
R46 1.78K 1%
AR2
Q8 A5T2222
R44 6.81K 1%
R45 10K 1%
VREP
R43 2.1K 1%
R42 1.37K 1%
Q7 A5T2222
R40 7.87K 1%
R41 10K 1%
VXOUT
R39 3.24K 1%
R38 1.87K 1%
AR3
Q6 A5T2222
R36 10K 1%
R37 10K 1%
VCONST
R35 4.99K 1%
Q5 A5T2222
R32 2.7
C10 1 50V
R30 2.7
R33 2.7
R34 2.7
C8 1 50V
R28 487 1%
R83 66.5 1%
Q1 A5T2907
R85 28 1%
Q2 A5T2907
R23 499 1%
C11 3.3 50V
R27 422 1%
R24 324 1%
TP19
E20
E19
TP20
U9
TP21
R29 10 1%
R22 487 1%
R86 133 1%
R87 66.5 1%
R18 422 1%
C9 1 50V
Q3 A5T2907
Q4 A5T2907
R19 422 1%
R17 422 1%
R16 10 1W
TP22
E22
E23
TP23
TP24
R82 10 1%
TP25
E25
E26
TP26
TP27
R31 10 1%
R1 100 1%
P3-4 ANNI
P3-3 REP
U6 75463
P3-5 XIN
P3-6 XOUT
U8 75463
Q10 COLLECTOR (SH2 ZN A-7)
P3-1 GEN
U7 75463
ANNIHILATE
REPLICATE
TRANSFER IN
TRANSFER OUT
GENERATE
P2-6 DATA IN
P2-2 CLAMP
(SH1, C-8) (SH2, C-8) BBL EN
U1 7400
P2-7 STROBE
P3-2 DATAOUT
P2-1 MODSEL NC
SENSE AMP OUT
U3 7474
CLR
CLK
PRE
NC
R14 1K
R15 1K
+5D
C7 .1 100V
AR4 MC1544L
C6 .1 100V
R5 1K
R7 10K 1%
R6 10K 1%
TP34
TP35
C5 470PF 200V
C1 .1 100V
R3 1.87K 1%
R2 1.87K 1%
TP31
TP32
U9 1K
TP28
C2 .001 200V
C4 .1 100V
R4 100 1%
C3 .001 200V
999236-0001 ASSY ONLY
SIZE D
CODE IDENT NO 96214
DRAWING NO 999234
REV D
SCALE NONE
SHEET 3
D 999234


+12 D
P2-3
P2-4
P1-1,8
P2-8
P1-4,5
P2-5
-5D
+5D
-12D
GND
R90 5K 1/2W
R58 1.54K 1%
Q9 AST2907
SN72558
CR20
R56 2.49K 1%
R55 309 1%
R91 220K
R57 10K 1%
C13 .1 100V
VR1 IN825
C12 .1 100V
VREF
R53 6.49K 1%
R51 100K 1%
R754
R52 100K 1%
R50 49.9K 1%
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP20
TP21
TP22
TP23
TP24
TP25
TP26
TP27
TP28
TP31
TP32
TP34
TP35 · 999236-0101 ASS'Y ONLY
R48 11
R49 VGEN 10K 1%
R47 3.24K 1%
R46 1.78K 1%
R44 10K 1%
R45 VREP
R42 4.99K 1%
R40 10K 1%
R41 10K 1%
R38 499K 1%
R36 10K 1%
R37 VCONST
R35 4.99K 1%
Q8 AST2222
Q7 AST2222
Q6 AST2222
Q5 AST2222
R32 2.7
C10 1 50V
R30 2.7
R33 2.7
R34 2.7
C8 1 50V
C9 1 50V
C11 33 50V
R28 499 1%
R83 36.5 1%
R85 49.9 1%
R23 499 1%
R22 62 1%
R86 60.4 1%
R87 60.4 1%
R18 162 1%
R17 267 1%
R19 267 1%
R27 324 1%
R24 324 1%
Q1 AST2907
Q2 AST2907
Q3 AST2907
Q4 AST2907
RK 10 1W
R29 10 1%
R82 10 1%
R31 10 1%
R1 100 1%
P3-4 ANNI
P3-3 REP
P3-5 XIN
P3-6 XOUT
P3-1 GEN
P2-6 DATAIN
P2-2 CLAMP
P2-7 STROBE
P3-2 DATAOUT
P2-1 MODSEL
+5
15D
U6 75463
U8 75463
U7 75463
G10 COLLECTOR (SM2 ENA-7)
(SH1,C-8) (SH2,C-8) BBL EN
U1 7400
U3 7474
SENSE AMP OUT
R14 1K
R15 1K
NC
ANNIHILATE
REPLICATE
TRANSFER IN
TRANSFER OUT
GENERATE
C7 1 100V
R92 8.2M 1/2W
AR4 MC1544L
R7 10K 1%
R6 10K 1%
C6 .1 100V
R5 1K
C5 470 PF 200V
C1 .1 100V
R3 1.87K 1%
R2 1.87K 1%
U9 1K
C2 .001 200V
C4 .1 100V
C3 .001 200V
R4 100 1%
TEXAS INSTRUMENTS
D96214
999234

ALPHABETICAL INDEX

INTRODUCTION

The following index lists key words and concepts from the subject material of the manual together with the area(s) in the manual that supply major coverage of the listed concept. The numbers along the right side of the listing reference the following manual areas:

- Sections — References to Sections of the manual appear as "Section x" with the symbol x representing any numeric quantity.

- Appendices — References to Appendices of the manual appear as "Appendix y" with the symbol y representing any capital letter.

- Paragraphs — References to paragraphs of the manual appear as a series of alphanumeric or numeric characters punctuated with decimal points. Only the first character of the string may be a letter, all subsequent characters are numbers. The first character refers to the section or appendix of the manual in which the paragraph is found.

- Tables — References to tables in the manual are represented by the capital letter T followed immediately by another alphanumeric character (representing the section or appendix of the manual containing the table). The second character is followed by a dash (-) and a number:

  Tx-xx

- Figures — References to figures in the manual are represented by the capital letter F followed immediately by another alphanumeric character (representing the section or appendix of the manual containing the figure). The second character is followed by a dash (-) and a number:

  Fx-xx

- Other entries in the Index — References to other entries in the index are preceded by the word "See" followed by the referenced entry.

APPENDIX A

KEYBOARD LAYOUTS AND SYMBOLIZATION

A.1 INTRODUCTION

This appendix contains illustrations of the keyboard with various combinations of keys depressed and provides a reference of what keyboard functions are available.

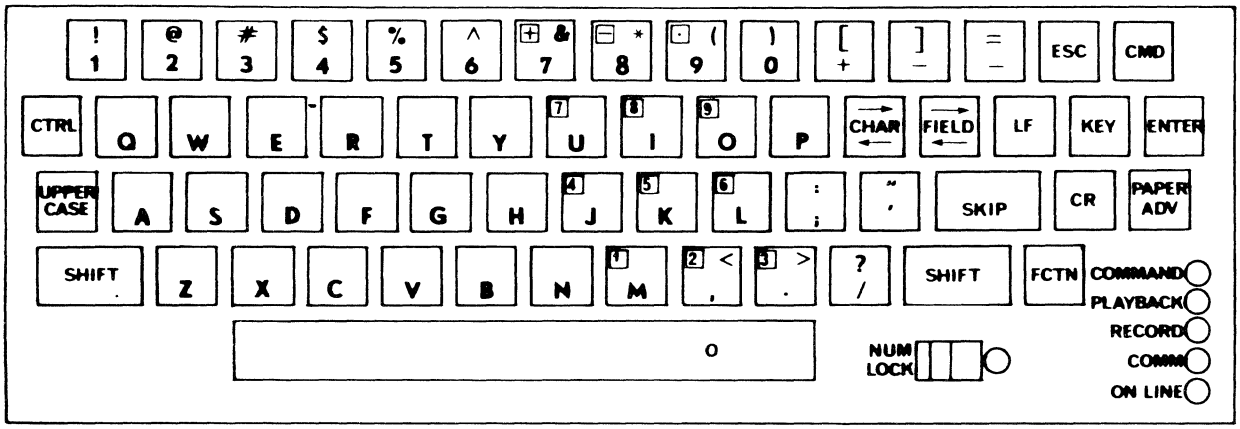


Figure A-1. Standard Keyboard Symbolization

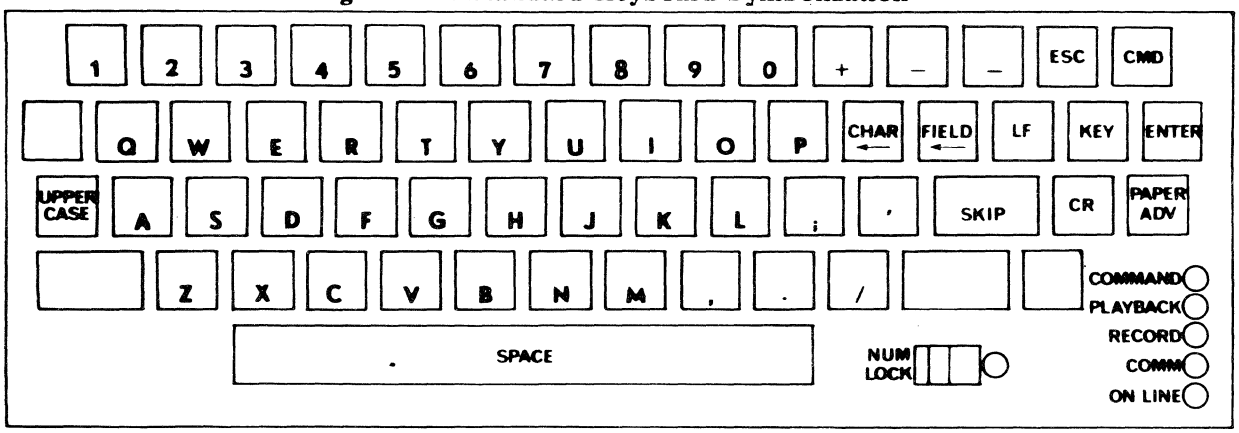


Figure A-2. FCTN, CTRL and SHIFT keys not depressed and NUM LOCK not selected.
UPPER CASE selected: A through Z are upper case.
UPPER CASE not selected: A through Z are lower case.

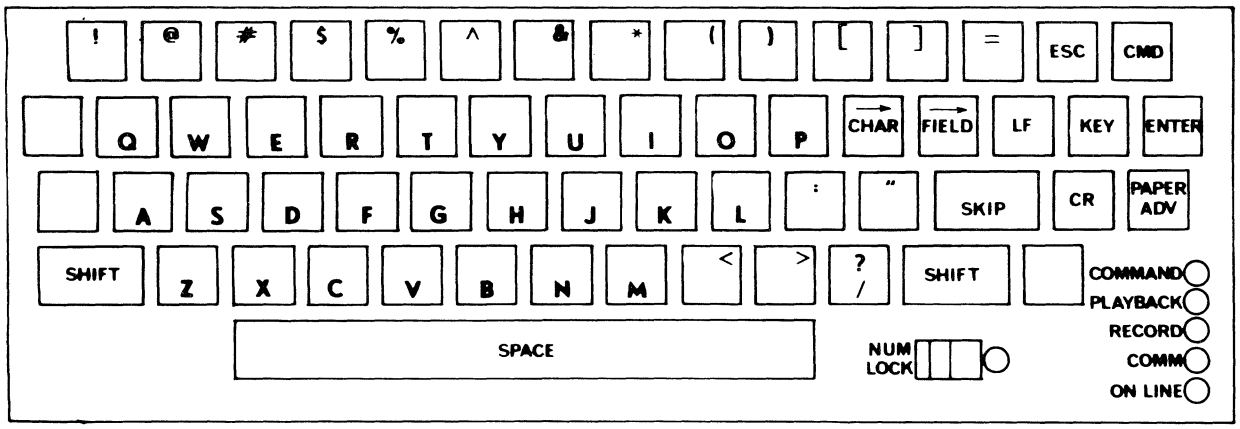


Figure A-3. SHIFT key depresed and NUM LOCK not selected
(Independent of UPPER CASE Lock) A through Z are upper case.

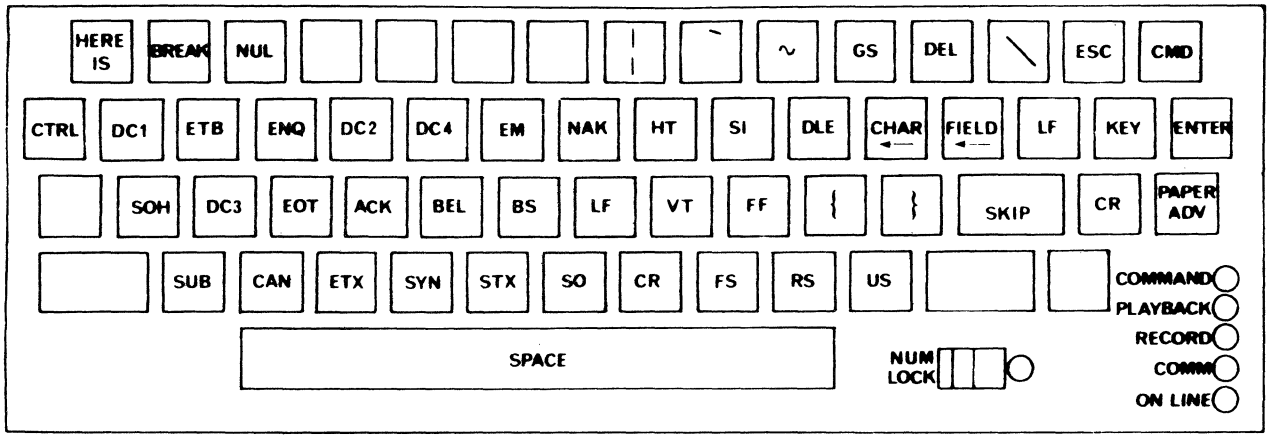


Figure A-4. CTRL key depressed.

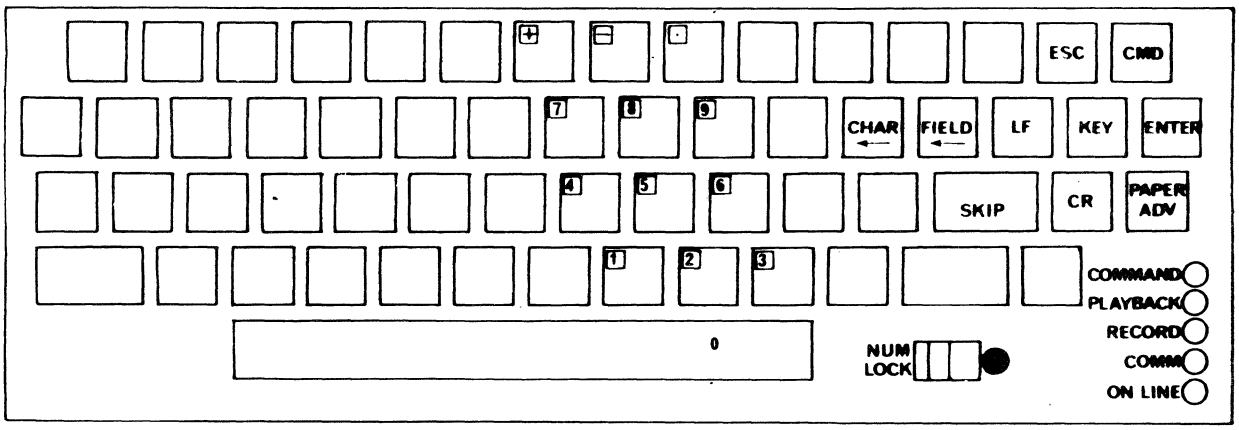


Figure A-5. NUM LOCK selected and SHIFT key not depressed.

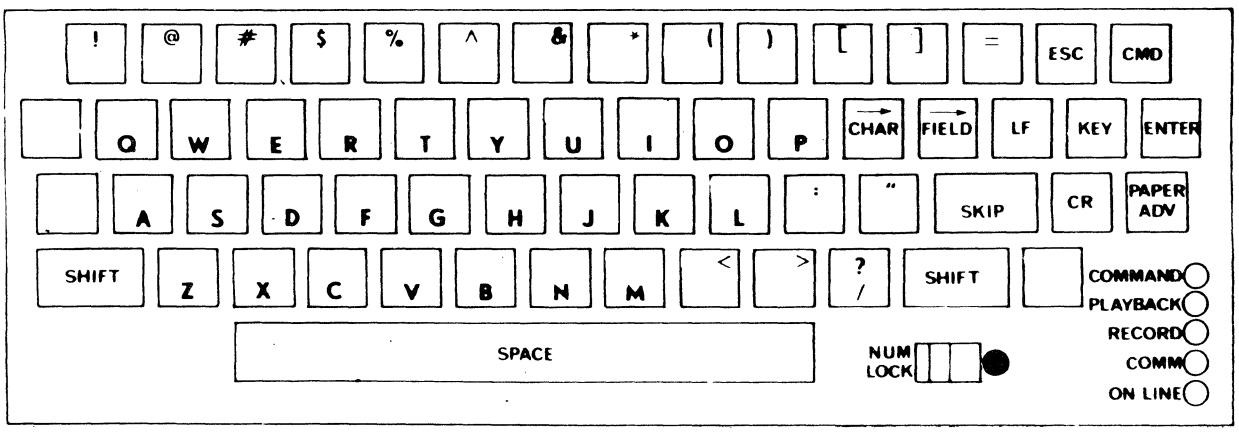


Figure A-6 NUM LOCK selected and SHIFT key depressed.

APPENDIX B

ASCII CODE TABLE

B.1 INTRODUCTION

This appendix provides a table showing the ASCII codes generated by the terminal. Refer to table B-1.

Table B-1. ASCII Code Table

8 7 6 5 / 4 3 2 1	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
0 0 0 0	NUL	DLE	SP	0	@	P	`	p
0 0 0 1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	STX	DC2	"	2	B	R	b	r
0 0 1 1	ETX	DC3	#	3	C	S	c	s
0 1 0 0	EOT	DC4	$	4	D	T	d	t
0 1 0 1	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	ACK	SYN	&	6	F	V	f	v
0 1 1 1	BEL	ETB	'	7	G	W	g	w
1 0 0 0	BS	CAN	(	8	H	X	h	x
1 0 0 1	HT	EM	)	9	I	Y	i	y
1 0 1 0	LF	SUB	*	:	J	Z	j	z
1 0 1 1	VT	ESC	+	;	K	[	k	{
1 1 0 0	FF	FS	,	<	L	\	l	|
1 1 0 1	CR	GS	-	=	M	]	m	}
1 1 1 0	SO	RS	.	>	N	^	n	~
1 1 1 1	SI	US	/	?	O	_	o	DEL

Printable Characters

Printer Control Characters

Codes Generated and Transmitted by the Terminal

ASR Control Codes

Extended Line Control

APPENDIX E

ERROR CODES

E.1 INTRODUCTION

This appendix provides a quick reference of the error codes that may be encountered when using the terminal. The code digits and their meanings are given in table D-1.

Table E-1. Error Codes

Code	Meaning
08	Attempted to transmit when a receive only condition exists or communication is not enabled.
14	Attempted creation of a file with a record length greater than 80 characters.
22	An invalid parameter was entered, i.e., a letter in place of a number.
24	Attempted to create a file whose name already exists in the catalog.
25	Invalid source entry when using a COPY command, i.e., in command, COPY 5file TO data23, the source 5file is not a file in the catalog.
26	Invalid destination entry when using the copy command, i.e., in COPY data23 TO 5file, the destination file is not a file in the catalog.
27	File not found.
30	The structure of the COPY command is not correct.
33	Attempted to use a file already in use.
34	Attempted to delete, erase, lock or free an undefined file.
44	Catalog full, the maximum number of files (16) already exists in the catalog.
53	File undefined.
54	Attempted to create a file that was larger than available memory space.
64	Attempted to create a file of zero or negative size.
69	Attempted to enter too many characters into a record.
73	Attempted to write more characters in a file than were allowed by the CREATE command.

Table E-1. Error Codes (Continued)

Code	Meaning
77	Record file is full. Record pointer is at the end of the file (rewind is required if data is to be written in the record file).
83	Attempted to read past the end-of-file.
84	Attempted to write into a locked file.
88	Attempted to do an ASR function to a file that has been defined as RECORD or PLAY-BACK but does not exist.
93	Attempted creation of a file with an invalid or reserved name (i.e., file name did not begin with an alphabetic character or was named KEY or TO).
94	Attempted creation of a file or invalid type (i.e., not C or L format).
BSn(l)	Bubble memory synchronization begin attempted by the terminal. The number of the bubble memory module is represented by n. If the l is printed, the bubble module is inaccessible due to lost mask.
BRnm	One of the three mask pages needed regeneration. The bubble memory module number is represented by n and the page number is represented by m.
E132	Default parameters have been installed, possible loss of data.
E176	Bubble memory space has decreased, possible data loss.
E214	Bubble memory system inoperative.

APPENDIX F

INTERNATIONAL KEYBOARD LAYOUTS AND SYMBOLIZATION

F.1 INTRODUCTION

This appendix contains illustrations of the keyboard functions with various combinations of keys depressed for the international keyboards.

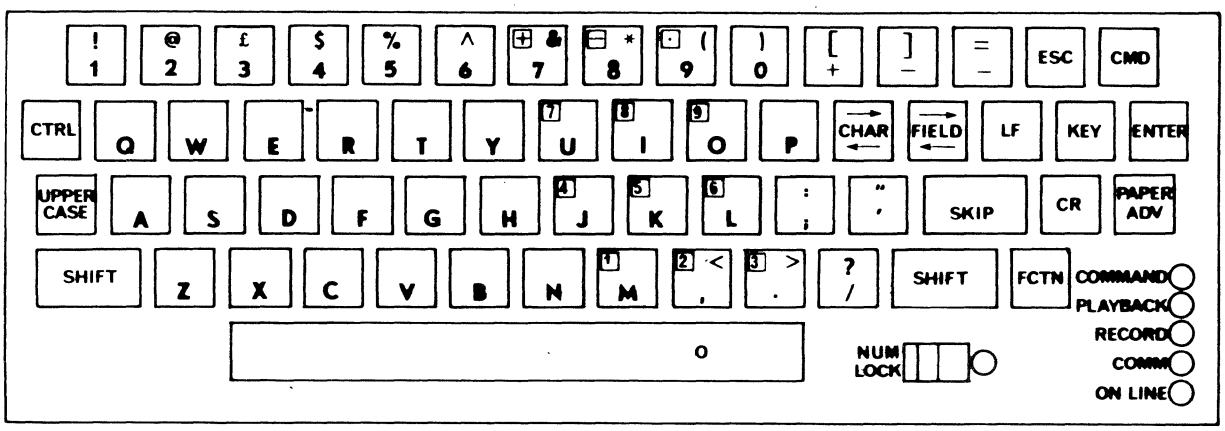


Figure F-1. United Kingdom Keyboard Symbolization

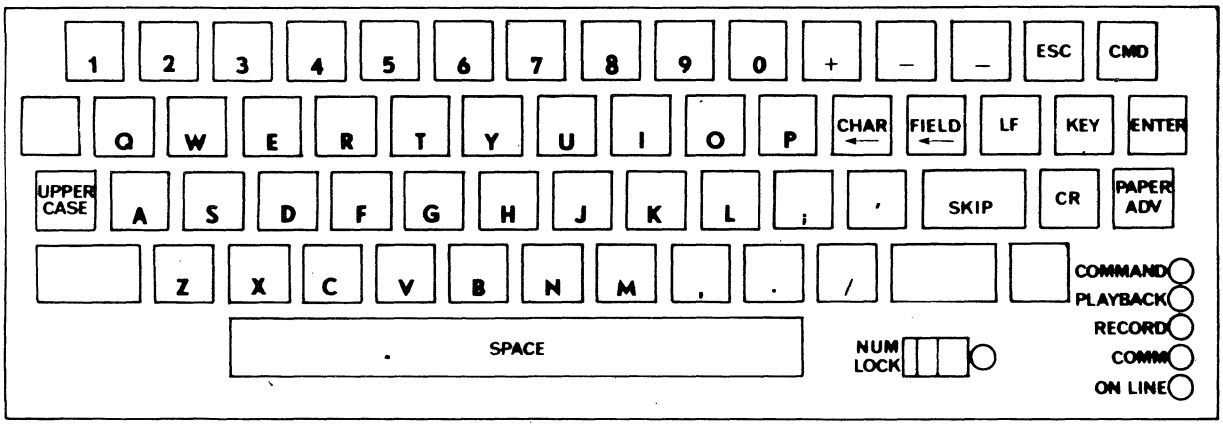


Figure F-2. FCTN and CONTROL and SHIFT not depressed and NUM LOCK not selected.
UPPER CASE not selected: A through Z are lower case.
UPPER CASE selected: A through Z are upper case.

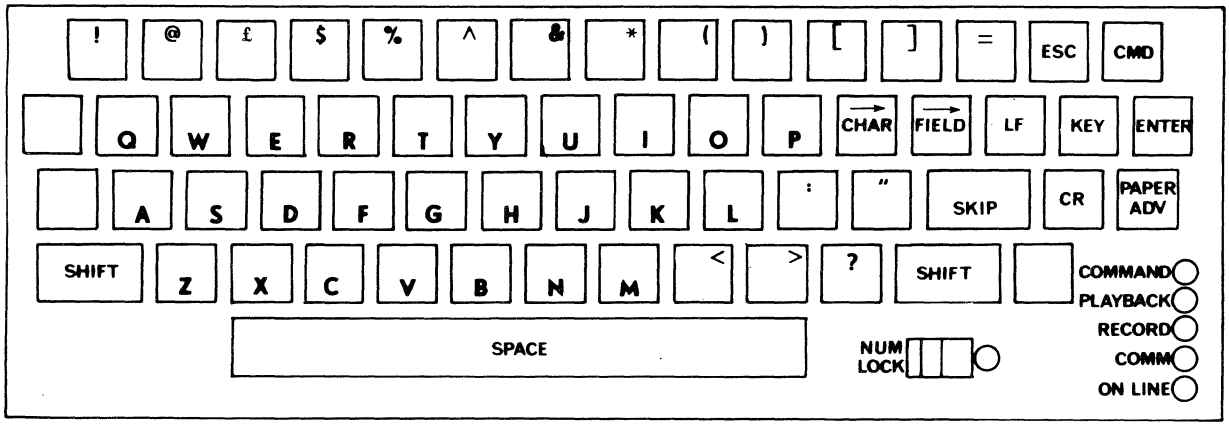


Figure F-3. SHIFT key depressed and FCTN and CONTROL keys not depressed. (Independent of UPPER CASE lock) A through Z are upper case.

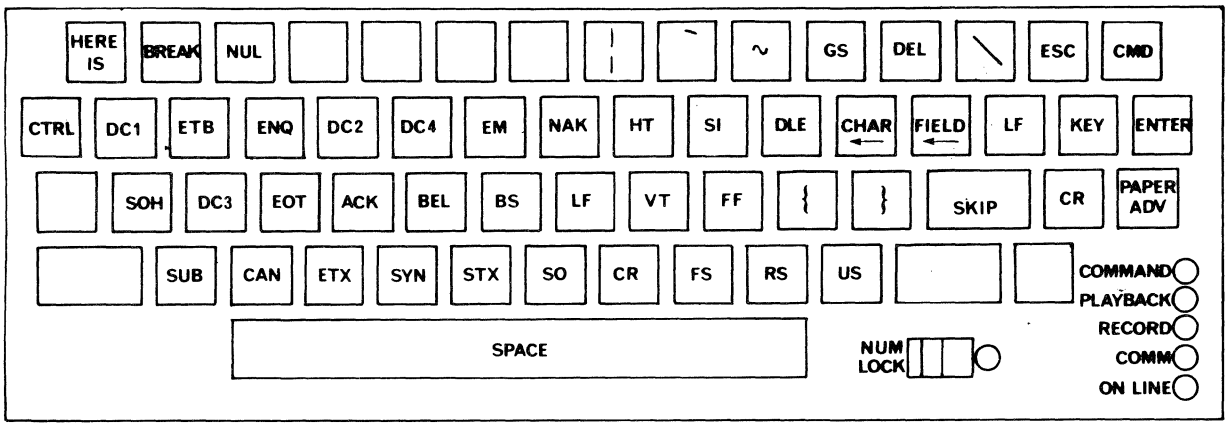


Figure F-4. CONTROL key depressed and FCTN key not depressed.

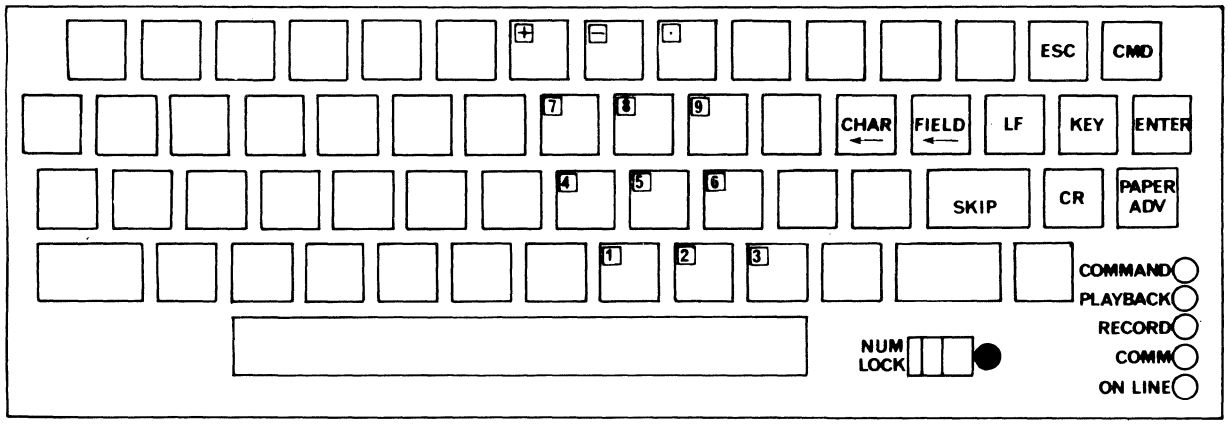


Figure F-5. NUM MODE selected and FCTN, CONTROL, and SHIFT keys not depressed.

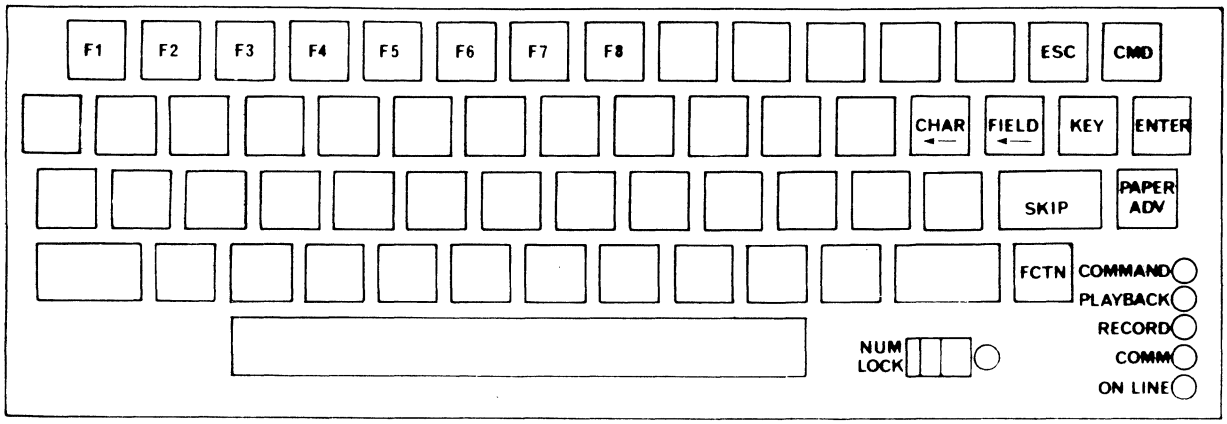


Figure F-6. FUNCTION Key Depressed.

b8b7b6b5 / b4b3b2b1	0 0 0 0	0 0 0 1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1
0 0 0 0	NUL	DLE	SP	0	@	\	p	
0 0 0 1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	STX	DC2	"	2	B	R	b	r
0 0 1 1	ETX	DC3	£	3	C	S	c	s
0 1 0 0	EOT	DC4	$	4	D	T	d	t
0 1 0 1	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	ACK	SYN	&	6	F	V	f	v
0 1 1 1	BEL	ETB	.	7	G	W	g	w
1 0 0 0	BS	CAN	(	8	H	X	h	x
1 0 0 1	HT	EM	)	9	I	Y	i	y
1 0 1 0	LF	SUB	*	:	J	Z	j	z
1 0 1 1	VT	ESC	+	;	K	[	k	{
1 1 0 0	FF	FS	,	<	L	\	l	¦
1 1 0 1	CR	GS	-	=	M	]	m	}
1 1 1 0	SO	RS	.	>	N	^	n	~
1 1 1 1	SI	US	/	?	O	_	o	DEL

Figure F-7. U.K. ASCII and Special Character Set Encoding

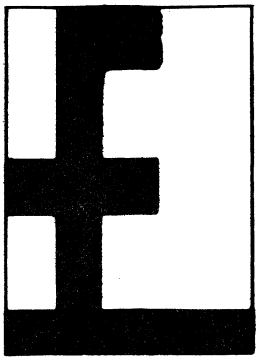


Figure F-8. U.K. Pound Sterling Sign

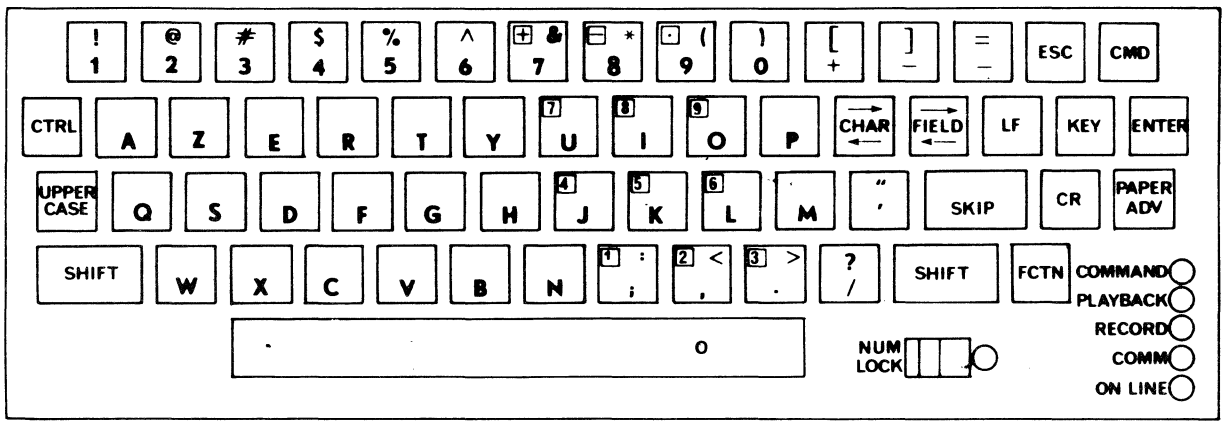


Figure F-9. French Keyboard Arrangement Symbolization

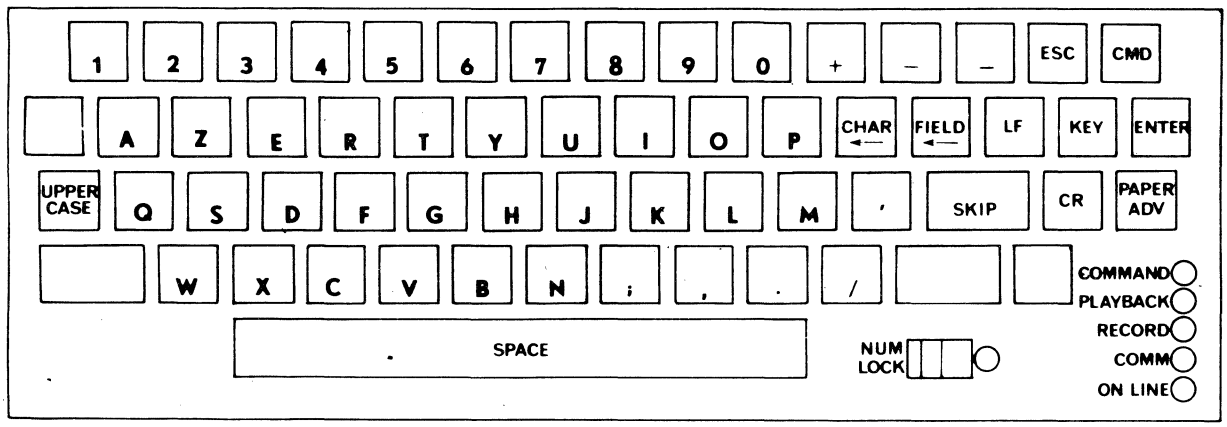


Figure F-10. FCTN and CONTROL and SHIFT not depressed and NUM MODE not selected.
UPPER CASE not selected: A through Z are lower case.
UPPER CASE selected: A through Z are upper case.

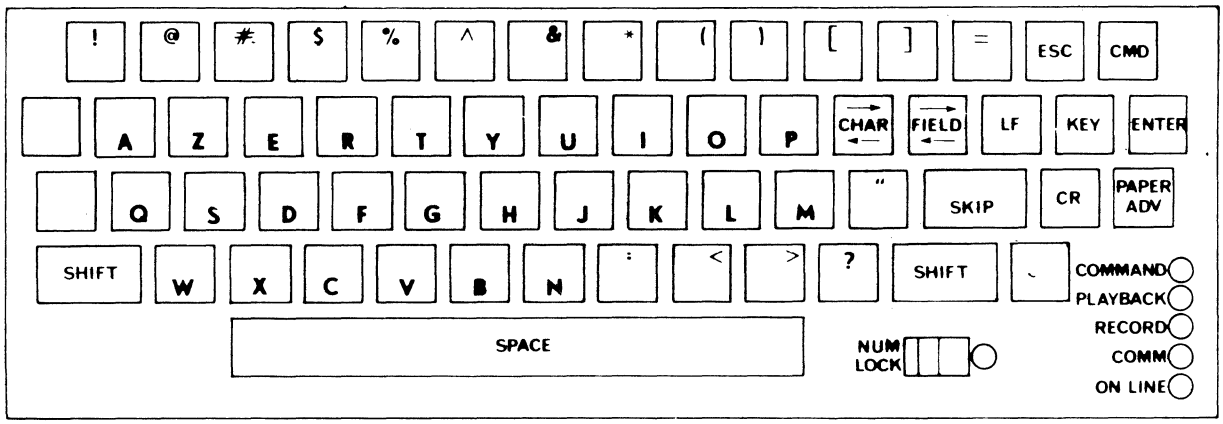


Figure F-11. SHIFT key depressed and FCTN and CONTROL keys not depressed. (Independent of UPPER CASE Lock)A through Z are upper case.

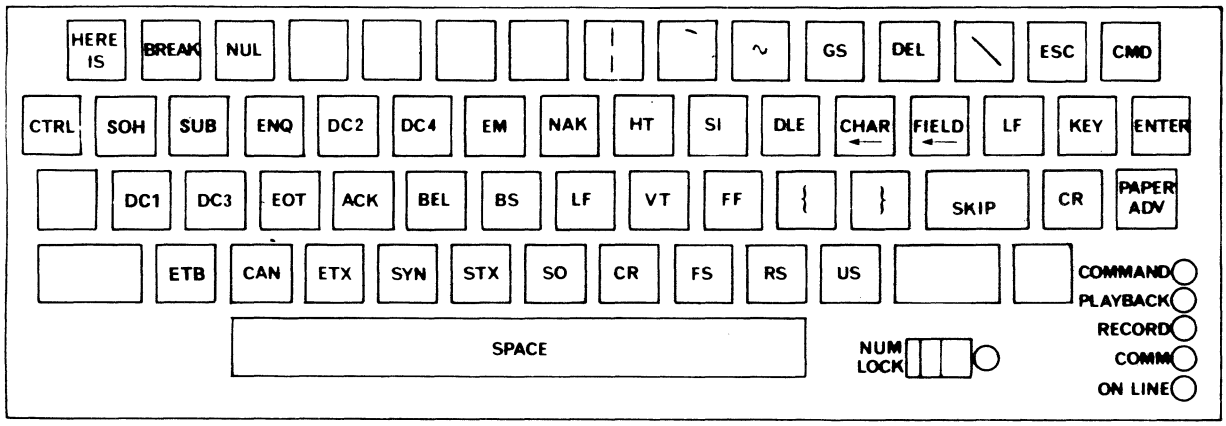


Figure F-12. CONTROL key depressed and FCTN key not depressed.

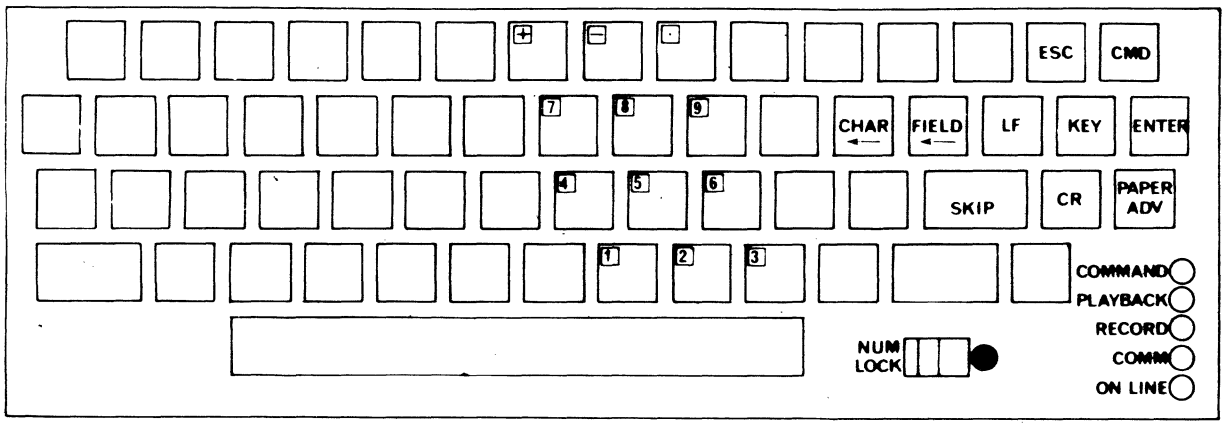


Figure F-13. NUM MODE selected and FCTN, CONTROL, and SHIFT keys not depressed.

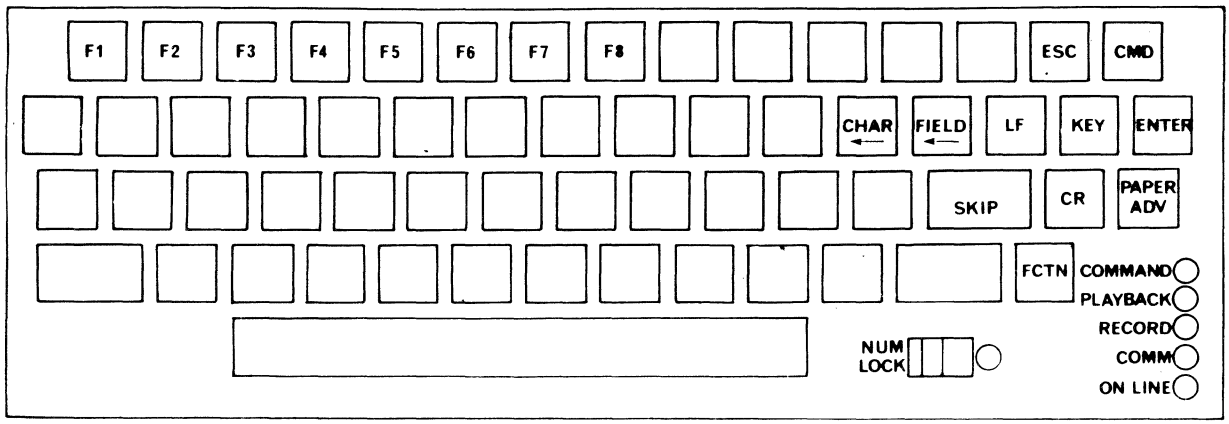


Figure F-14. FUNCTION Key Depressed

b4b3b2b1 \ b8b7b6b5	0 0 0 0	0 0 0 1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1
0 0 0 0	NUL	DLE	SP	0	@	P	\	p
0 0 0 1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	STX	DC2	"	2	B	R	b	r
0 0 1 1	ETX	DC3	#	3	C	S	c	s
0 1 0 0	EOT	DC4	$	4	D	T	d	t
0 1 0 1	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	ACK	SYN	&	6	F	V	f	v
0 1 1 1	BEL	ETB	'	7	G	W	g	w
1 0 0 0	BS	CAN	(	8	H	X	h	x
1 0 0 1	HT	EM	)	9	I	Y	i	y
1 0 1 0	LF	SUB	*	:	J	Z	j	z
1 0 1 1	VT	ESC	+	;	K	[	k	
1 1 0 0	FF	FS	,	<	L		l	
1 1 0 1	CR	GS	-	=	M	]	m	
1 1 1 0	SO	RS	.	>	N		n	~
1 1 1 1	SI	US	/	?	O		o	DEL

Figure F-15. French ASCII and Special Character Set Encoding

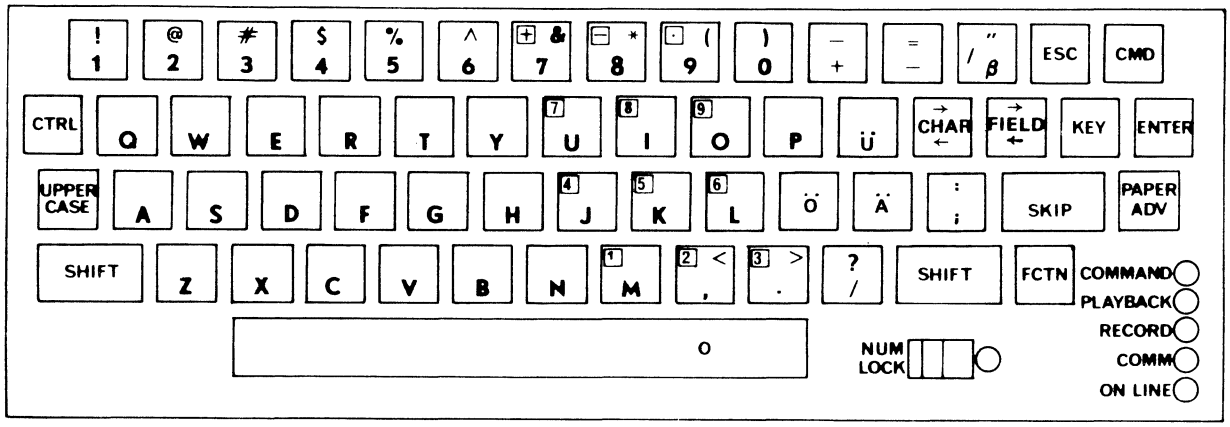


Figure F-16. Germany Keyboard Arrangement Symbolization

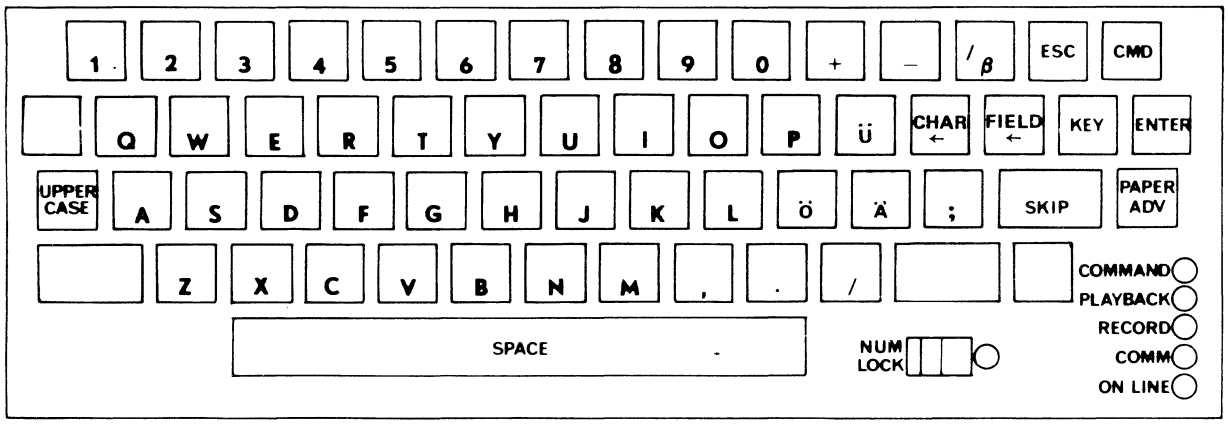


Figure F-17. FCTN and CONTROL and SHIFT not depressed and NUM MODE not selected.
UPPER CASE not selected: A through Z, A, O, U are lower case, β
UPPER CASE selected: A through Z, A, O, U are upper case,

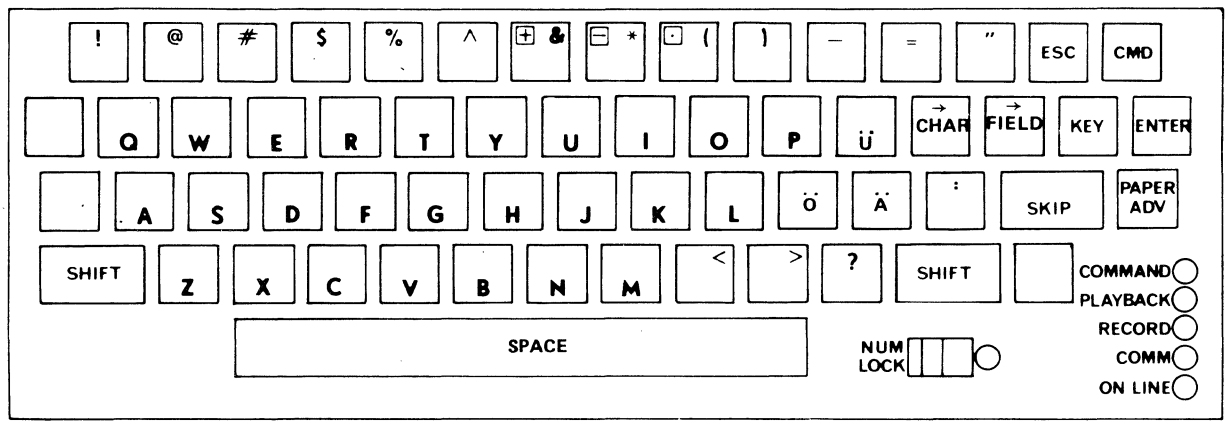


Figure F-18. SHIFT key depressed and FCTN and CONTROL keys not depressed. (Independent of UPPER CASE lock) A through Z, A, O, U are upper case.

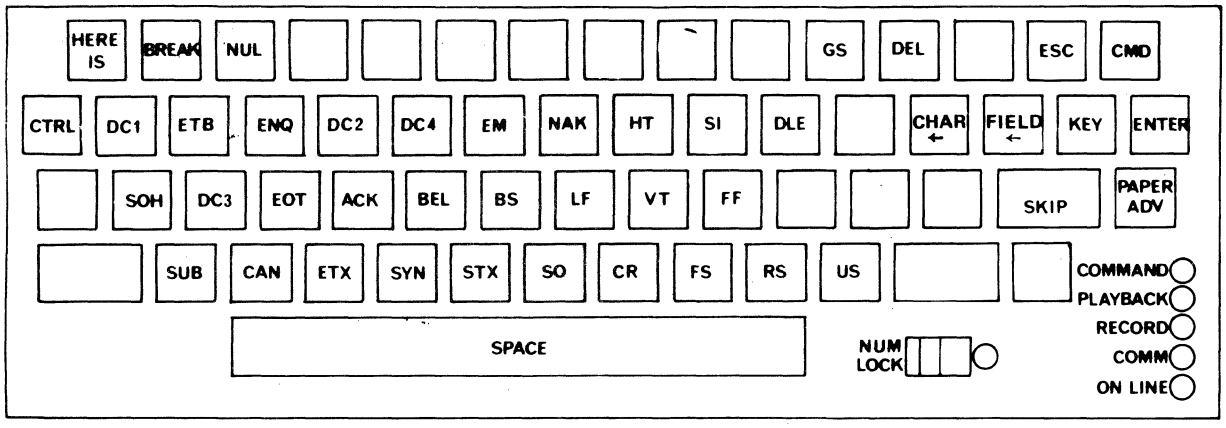


Figure F-19. CONTROL key depressed and FCTN key not depressed.

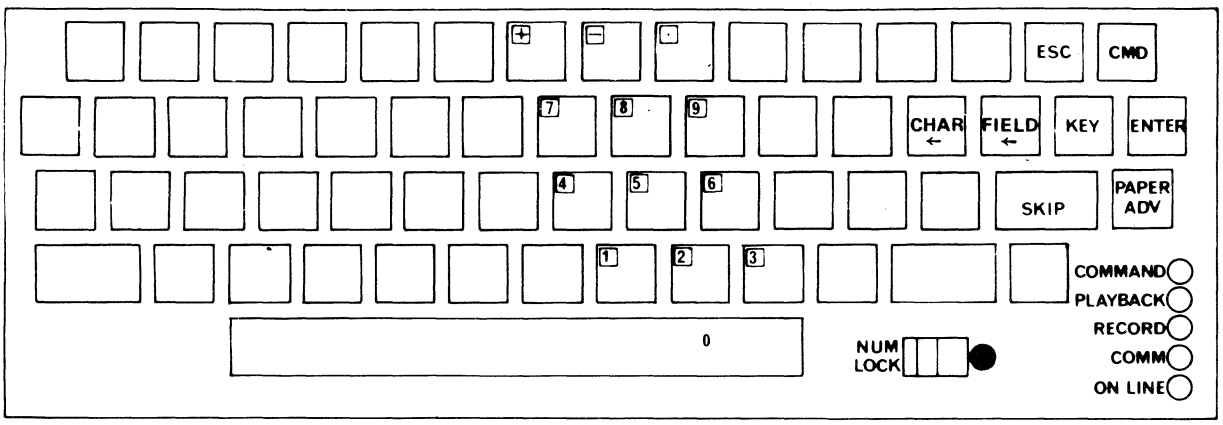


Figure F-20. NUM MODE selected and FCTN, CONTROL, and SHIFT keys not depressed.

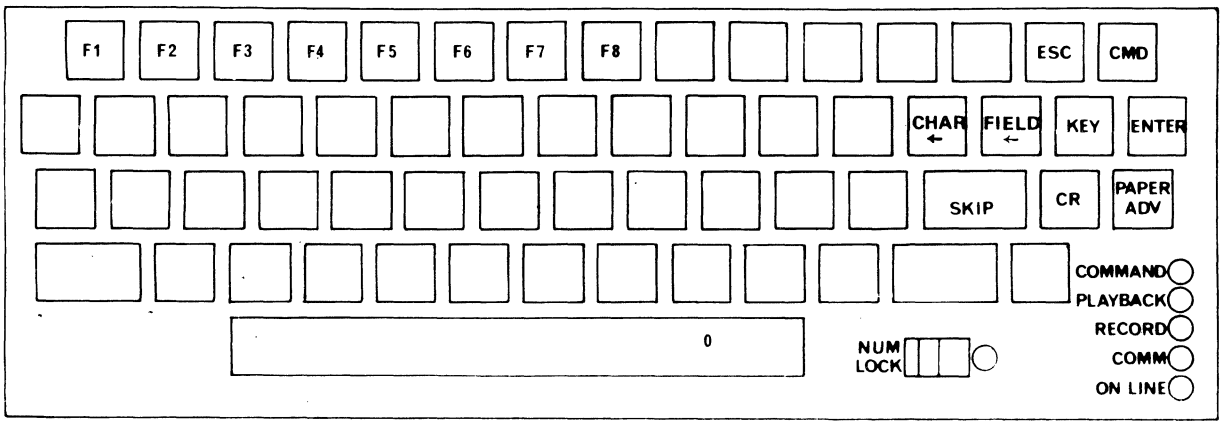


Figure F-21. FUNCTION Key Depressed

b8b7b6b5 / b4b3b2b1	0 0 0 0	0 0 0 1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1
0 0 0 0	NUL	DLE	SP	0	@	P	\	p
0 0 0 1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	STX	DC2	"	2	B	R	b	r
0 0 1 1	ETX	DC3	#	3	C	S	c	s
0 1 0 0	EOT	DC4	$	4	D	T	d	t
0 1 0 1	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	ACK	SYN	&	6	F	V	f	v
0 1 1 1	BEL	ETB	'	7	G	W	g	w
1 0 0 0	BS	CAN	(	8	H	X	h	x
1 0 0 1	HT	EM	)	9	I	Y	i	y
1 0 1 0	LF	SUB	*	:	J	Z	j	z
1 0 1 1	VT	ESC	+	;	K	A	k	ä
1 1 0 0	FF	FS	,	<	L	O	l	o
1 1 0 1	CR	GS	-	=	M	U	m	u
1 1 1 0	SO	RS	.	>	N		n	
1 1 1 1	SI	US	/	?	O		o	DEL

Figure F-22. Germany Keyboard

Figure F-23. German Characters

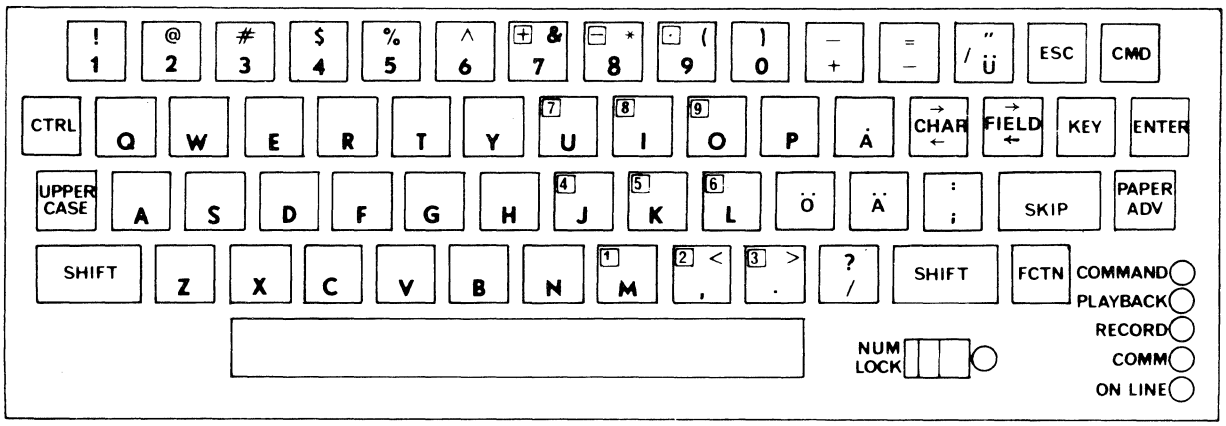


Figure F-24. Sweden/Finland Keyboard Arrangement Symbolization

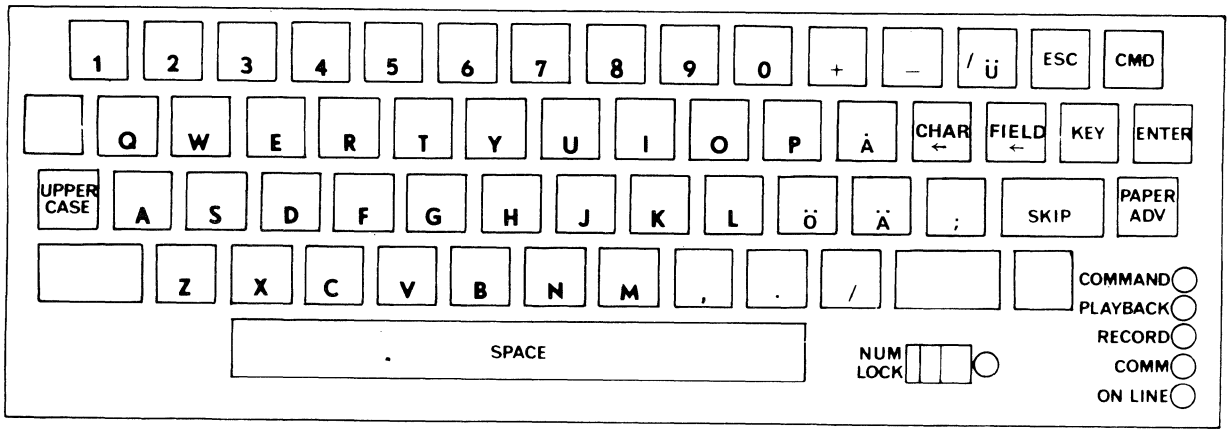


Figure F-25. FCTN and CONTROL and SHIFT not depressed and NUM MODE not selected. UPPER CASE not selected: A through Z, A, O, A are lower case, U. UPPER CASE selected: A through Z, A, O, A are upper case, '.

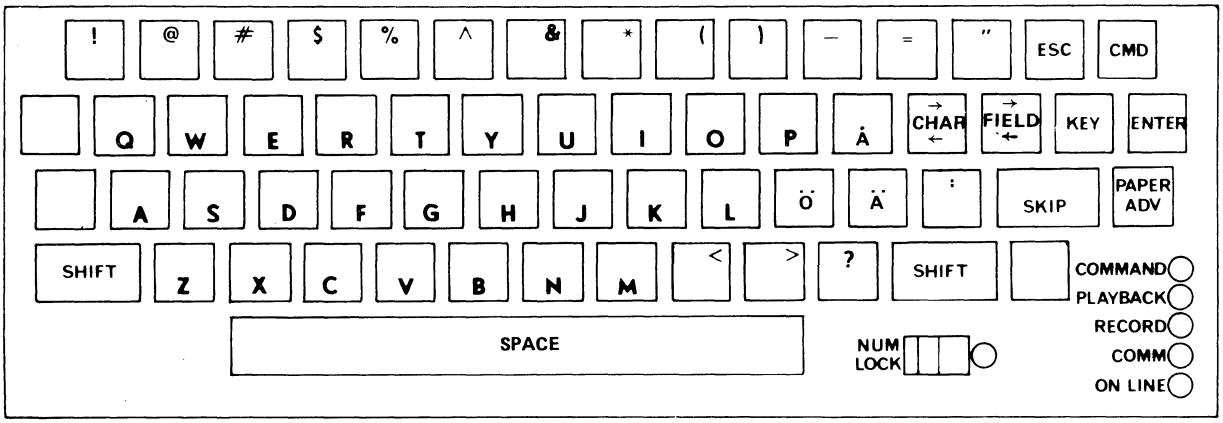


Figure F-26. SHIFT key depressed and FCTN and CONTROL keys not depressed. (Independent of UPPER CASE lock) A through Z are A, O, A are upper case.

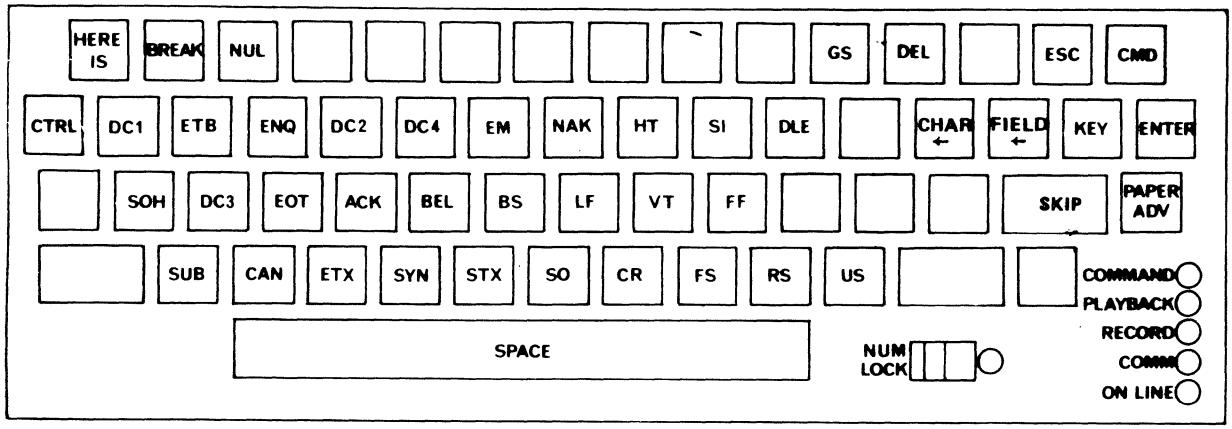


Figure F-27.CONTROL key depressed and FCTN key not depressed.

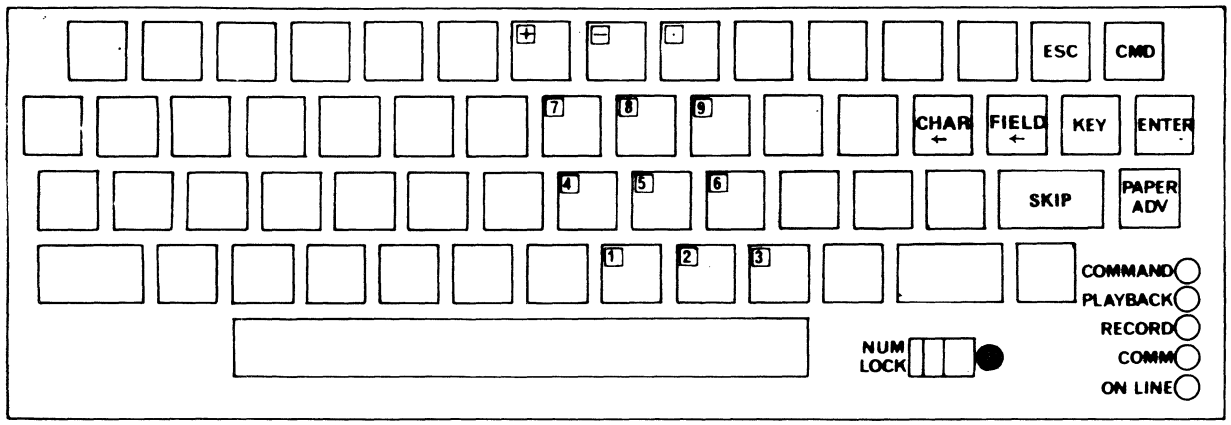


Figure F-28. NUM MODE selected and FCTN, CONTROL, and SHIFT keys not depressed.

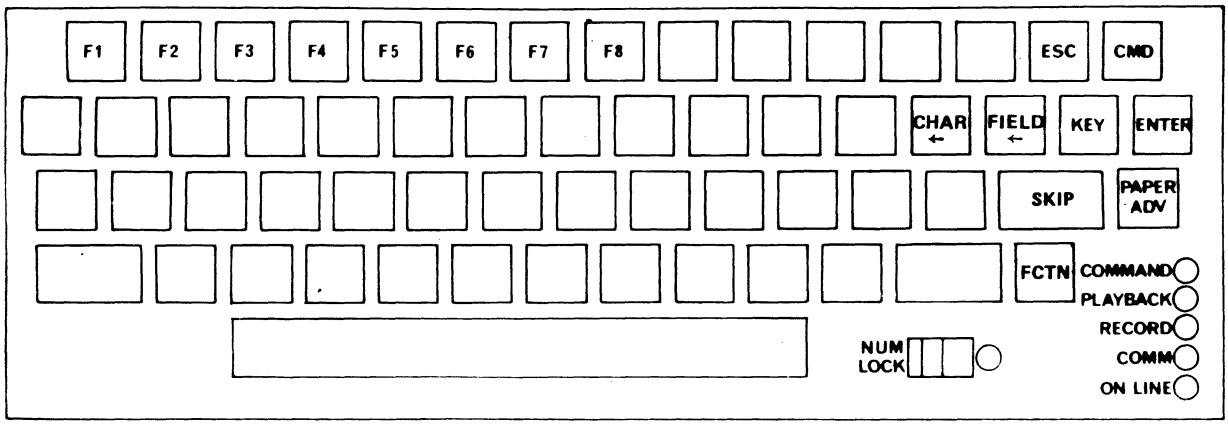


Figure F-29. Function Key Depressed.

$b_8b_7b_6b_5$ / $b_4b_3b_2b_1$	0 0 0 0	0 0 0 1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1
0 0 0 0	NUL	DLE	SP	0	@	P	`	p
0 0 0 1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	STX	DC2	"	2	B	R	b	r
0 0 1 1	ETX	DC3	#	3	C	S	c	s
0 1 0 0	EOT	DC4	$	4	D	T	d	t
0 1 0 1	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	ACK	SYN	&	6	F	V	f	v
0 1 1 1	BEL	ETB	'	7	G	W	g	w
1 0 0 0	BS	CAN	(	8	H	X	h	x
1 0 0 1	HT	EM	)	9	I	Y	i	y
1 0 1 0	LF	SUB	*	:	J	Z	j	z
1 0 1 1	VT	ESC	+	;	K	A	k	a
1 1 0 0	FF	FS	,	<	L	O	l	o
1 1 0 1	CR	GS	-	=	M	A	m	a
1 1 1 0	SO	RS	.	>	N		n	U
1 1 1 1	SI	US	/	?	O		o	DEL

Figure F-30. Sweden/Finland ASCII and Special Character Set Encoding

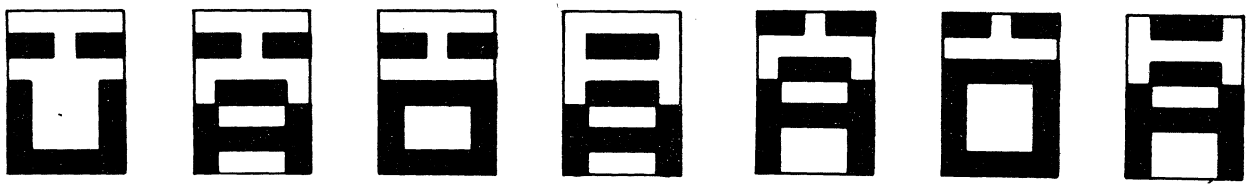


Figure F-31. Sweden/Finland Keyboard Characters

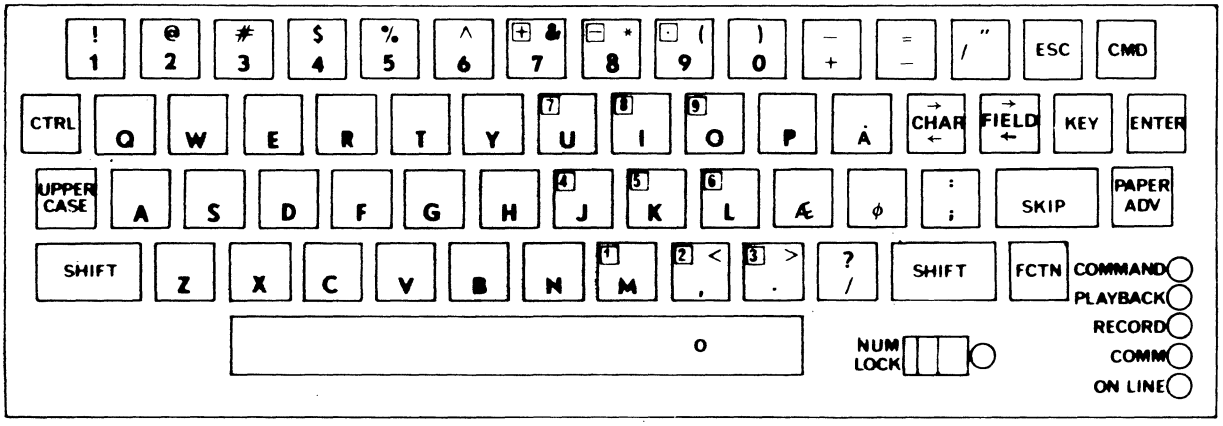


Figure F-32. Denmark/Norway Keyboard Arrangement Symbolization

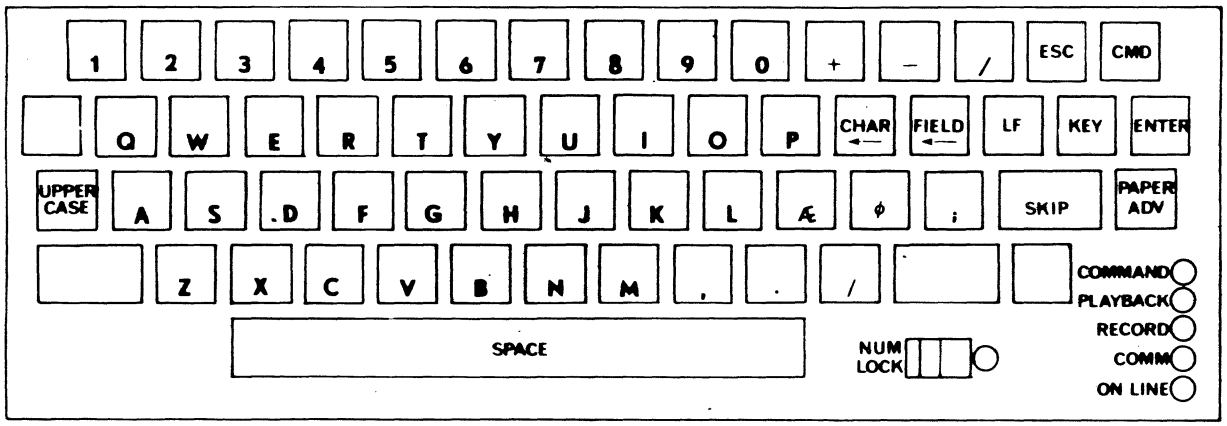


Figure F-33. FCTN and CONTROL and SHIFT not depressed and NUM MODE not selected. UPPER CASE not selected: A through Z,Æ, O, A are lower case. UPPER CASE selected: A through Z,Æ, O, A are lower case.

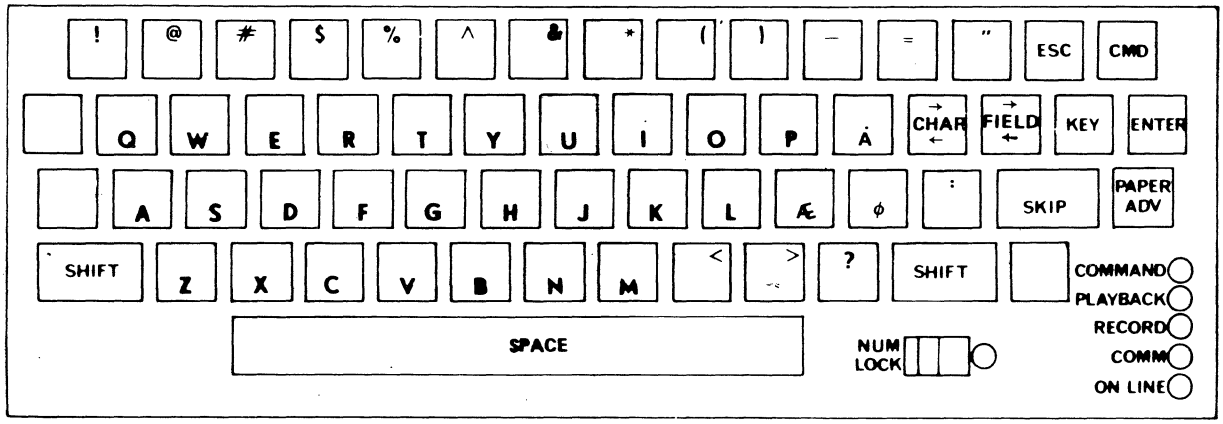


Figure F-34.SHIFT key depressed and FCTN and CONTROL keys not depressed. (Independent of UPPER CASE lock) A through Z are upper case.

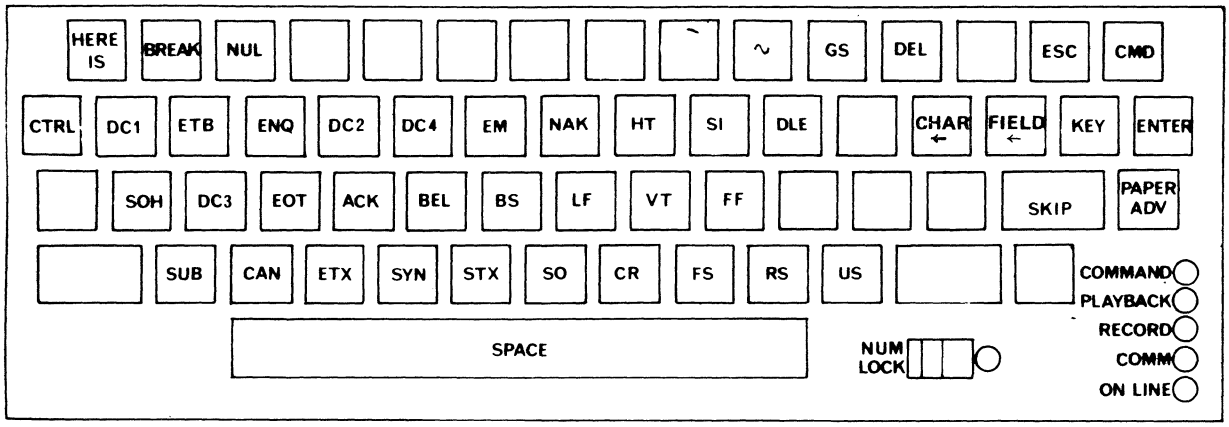


Figure F-35. CONTROL key depressed and FCTN key not depressed.

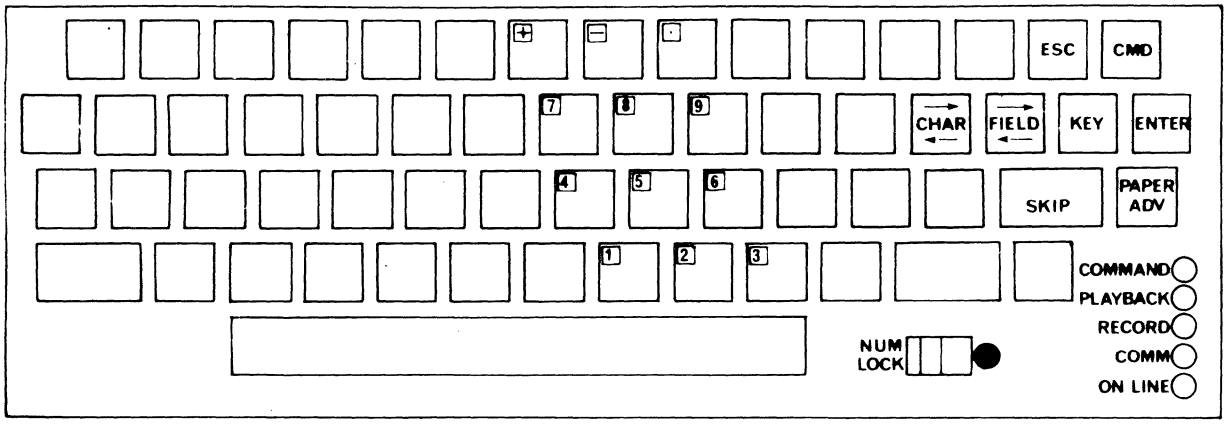


Figure F-36. NUM MODE selected and FCTN, CONTROL, and SHIFT keys not depressed.

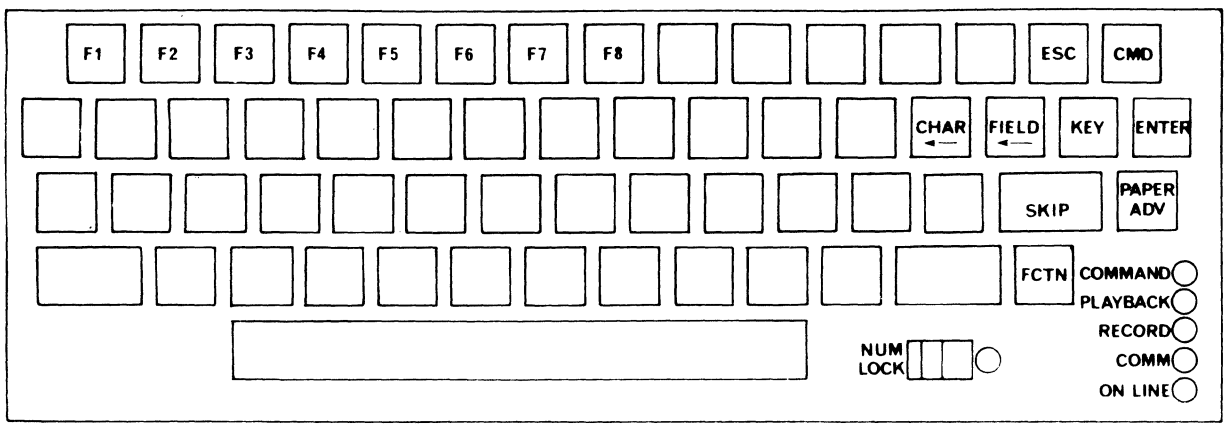


Figure F-37. FUNCTION Key Depressed

b8b7b6b5 / b4b3b2b1	0 0 0 0	0 0 0 1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1
0 0 0 0	NUL	DLE	SP	0	@	P	`	p
0 0 0 1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	STX	DC2	"	2	B	R	b	r
0 0 1 1	ETX	DC3	#	3	C	S	c	s
0 1 0 0	EOT	DC4	$	4	D	T	d	t
0 1 0 1	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	ACK	SYN	&	6	F	V	f	v
0 1 1 1	BEL	ETB	'	7	G	W	g	w
1 0 0 0	BS	CAN	(	8	H	X	h	x
1 0 0 1	HT	EM	)	9	I	Y	i	y
1 0 1 0	LF	SUB	*	:	J	Z	j	z
1 0 1 1	VT	ESC	+	;	K	A	k	A
1 1 0 0	FF	FS	,	<	L	ϕ	l	ϕ
1 1 0 1	CR	GS	-	=	M	A	m	a
1 1 1 0	SO	RS	.	>	N		n	~
1 1 1 1	SI	US	/	?	O		o	DEL

Figure F-38. Denmark/Norway ASCII and Special Character Set

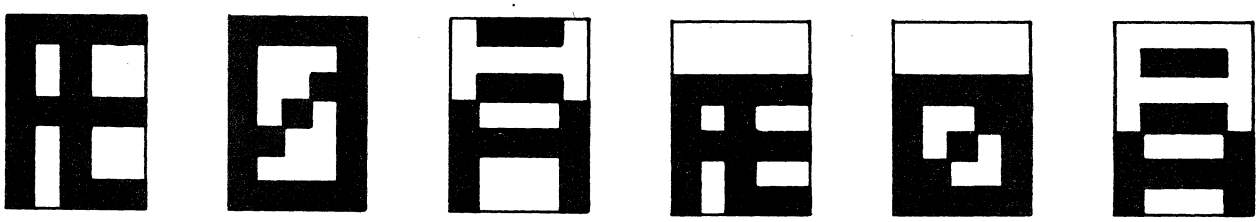


Figure F-39. Denmark/Norway Characters

APPENDIX G

Table G-1. Models 763/765 Optional Internal Electronics Jumpers (Upper PWB)

Use	Signals	PWB Jumper Points
SIGNAL GROUND/ CHASSIS GROUND OPTION	SIGNAL and CHASSIS GROUNDS ISOLATED (STANDARD)	E366-E367
	SIGNAL GROUND TO CHASSIS GROUND	E365-E366
CARRIER DETECT DELAY	LONG (STANDARD) 3 to 7 SECONDS	E425-E426
	SHORT 1 to 2 SECONDS	NO JUMPER

Upper Board (937300).

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