MVME712-10
Transition Module
User's Manual

(MVME712-10/D1)

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Safety Summary
Safety Depends On You

The following general safety precautions must be observed during all phases of operation, service, and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment. Motorola, Inc. assumes no liability for the customer's failure to comply with these requirements.

The safety precautions listed below represent warnings of certain dangers of which Motorola is aware. You, as the user of the product, should follow these warnings and all other safety precautions necessary for the safe operation of the equipment in your operating environment.

Ground the Instrument.

To minimize shock hazard, the equipment chassis and enclosure must be connected to an electrical ground. The equipment is supplied with a three-conductor ac power cable. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter, with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards.

Do Not Operate in an Explosive Atmosphere.

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Keep Away From Live Circuits.

Operating personnel must not remove equipment covers. Only Factory Authorized Service Personnel or other qualified maintenance personnel may remove equipment covers for internal subassembly or component replacement or any internal adjustment. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

Do Not Service or Adjust Alone.

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

Use Caution When Exposing or Handling the CRT.

Breakage of the Cathode-Ray Tube (CRT) causes a high-velocity scattering of glass fragments (implosion). To prevent CRT implosion, avoid rough handling or jarring of the equipment. Handling of the CRT should be done only by qualified maintenance personnel using approved safety mask and gloves.

Do Not Substitute Parts or Modify Equipment.

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification of the equipment. Contact your local Motorola representative for service and repair to ensure that safety features are maintained.

Dangerous Procedure Warnings.

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed. You should also employ all other safety precautions which you deem necessary for the operation of the equipment in your operating environment.

WARNING

Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling, testing, and adjusting.

The computer programs stored in the read only memories of this device contain material copyrighted by Motorola, Inc., first published 1988, and may be used only under a license such as the License for Computer Programs (Article 14) contained in Motorola's Terms and conditions of Sale, Rev. 1/79.

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the documentation for this product, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A Computing Device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at the user's own expense, will be required to take whatever measures necessary to correct the interference.

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May 1993

Preface

The *MVME712-10 Transition Module User's Manual* provides general information, hardware preparation, installation instructions, and support information for the MVME712-10 Transition Module.

The MVME712-10 is used as the interface between Motorola's MVME166 Single Board Computers and their peripheral devices.

This manual is intended for anyone who wants to design OEM systems, supply additional capability to an existing compatible system, or in a lab environment for experimental purposes.

A basic knowledge of computers and digital logic is assumed.

To use this manual, you should be familiar with the publications listed in the related documentation paragraphs on the following page.

Related Documentation

The Motorola publications listed in the table below are referenced in this document. If not shipped with this product, manuals may be purchased by contacting your local Motorola sales office.

Document Title	Motorola Publication Number
MVME166 Single Board Computer User's Manual	MVME166/D
MVME166/MVME167/MVME187 Programmer's Reference Manual	MVME187PG/D

Note **Although not shown in the above table, each Motorola Computer Group manual publication number is suffixed with characters which represent the revision level of the document, such as "/D2" (the second revision of a manual); a supplement bears the same number as the manual but has a suffix such as "/A1" (the first supplement to the manual).**

The SCSI specification referenced in this document is the following:

SCSI-2 (Small Computer Systems Interface - 2), draft document X3.131, Revision 10c; Global Engineering Documents, P.O. Box 19539, Irvine, CA 92714.

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GENERAL INFORMATION 1

Introduction

This manual provides general information, hardware preparation, installation instructions, and support information for the MVME712-10 Transition Module.

The MVME712-10 is used as the interface between Motorola's MVME166 Single Board Computer VMEmodule and its peripheral devices.

Features

The features of the MVME712-10 Transition Module include:

- ❏ Four shielded RJ45 jacks for EIA-232-D serial I/O
- ❏ Shielded DB-25 external parallel or printer port
- ❏ Shielded external DB-15 Ethernet interface port
- ❏ SCSI converter (high-density to low-density):
  - 68-pin high-density, 16-bit-wide SCSI connector and high-density "P cable" for connection to the MVME166
  - 50-pin low-density, 8-bit-wide SCSI connector for connection to the internal SCSI device(s)
- ❏ 100-pin I/O connector and high-density cable for connection to the MVME166 for I/O
- ❏ Radio Frequency Interference (RFI) protection on front panel
- ❏ Electrostatic Discharge (ESD) protection on front panel

Specifications

The MVME712-10 specifications are given in Table 1-1.

Table 1-1: MVME712-10 Specifications

Characteristics		Specifications
Power requirements		+5 Vdc, 150 mA typical +12 Vdc, 50 mA typical -12 Vdc, 50 mA typical
I/O ports	Serial	Four shielded EIA-232-D serial ports with RJ45 connectors SCSI connector converter
	Printer	Shielded parallel port, DB-25
	Ethernet	Shielded parallel port, DB-15
Operating temperature		0 degrees to 55 degrees C at point of entry of forced air (approximately 5 CFM)
Storage temperature		-40 degrees to 85 degrees C
Relative humidity		5% to 90% (non-condensing)
Physical characteristics	Height	9.187 inches (233.35 mm)
	Depth	3.2 inches (80 mm)
	Front panel width	0.8 inches (20.32 mm)

Cooling Requirements

Motorola VMEmodules are specified, designed, and tested to operate reliably with an incoming air temperature range from 0 degrees C to 55 degrees C (32 degrees F to 131 degrees F) with forced air cooling.

Temperature qualification is performed in a standard Motorola MVME900 series chassis. Twenty-five watt load boards are inserted in the two card slots, one on each side, adjacent to the board under test to simulate a high power density system configuration. An assembly of three axial fans, rated at 71 CFM per fan, is placed directly under the MVME card cage. The incoming air temperature is measured between the fan assembly and the card cage where the incoming airstream first encounters the module under test.

Test software is executed as the module is subjected to ambient temperature variations. Case temperatures of critical, high power density integrated circuits are monitored to ensure component vendor specifications are not exceeded.

While the exact amount of airflow required for cooling depends on the ambient air temperature and the type, number, and location of boards and other heat sources, adequate cooling can usually be achieved with 5 CFM flowing over the module. Less air flow is required to cool the module in environments having lower maximum ambients.

Under more favorable thermal conditions it may be possible to operate the module reliably at higher than 55 degrees C with increased air flow. It is important to note that there are several factors, in addition to the rated CFM of the air mover, which determine the actual volume of air flowing over a module.

FCC Compliance

The MVME712-10 transition board was tested in an FCC-compliant chassis, and meets the requirements for Class A equipment. FCC compliance was achieved under the following conditions:

- ❏ Shielded cables on all external I/O ports.
- ❏ Cable shields connected to earth ground via metal shell connectors bonded to a conductive module front panel.
- ❏ Conductive chassis rails connected to earth ground. This provides the path for connecting shields to earth ground.
- ❏ Front panel screws properly tightened.

For minimum RF emissions, it is essential that the conditions above be implemented; failure to do so could compromise the FCC compliance of the equipment containing the modules.

General Description

The MVME712-10 Transition Module is a low-cost I/O transition board for Motorola's MVME166 Single Board Computer VMEmodules and their peripheral devices. Refer to Figure 1-1.

The MVME712-10 routes the signals to the appropriate industry standard connectors on its front panel. This board can be mounted either next to the MVME166 or in the back of the chassis. The board contains four shielded 8-pin RJ45 jacks for EIA-232-D serial interface, a shielded DB-15 connector for Ethernet, and a shielded DB-25 connector for parallel interface.

The MVME712-10 also provides conversion from the 68-pin high-density SCSI connector to a standard 50-pin low-density SCSI connector.

Each EIA-232-D serial port transmits the following signals:

- ❏ Data carrier detect
- ❏ Request to send
- ❏ Transmit data
- ❏ Receive data
- ❏ Clear to send
- ❏ Data terminal ready

Cables Required

The following cables are needed in order to connect the MVME712-10 to the MVME166 and other devices:

- ❏ One 100-conductor, 25 mil pitch cable to connect the MVME712-10 to the MVME166 for I/O (a 1-foot-long cable is furnished by Motorola).
- ❏ One 68-conductor, 25 mil pitch P cable to connect the SCSI port on the MVME712-10 to the SCSI port on the MVME166 (a 1-foot-long cable is furnished by Motorola).
- ❏ One 50-conductor, 50 mil pitch A cable for 8-bit wide SCSI connection to internal SCSI devices (customer-supplied).

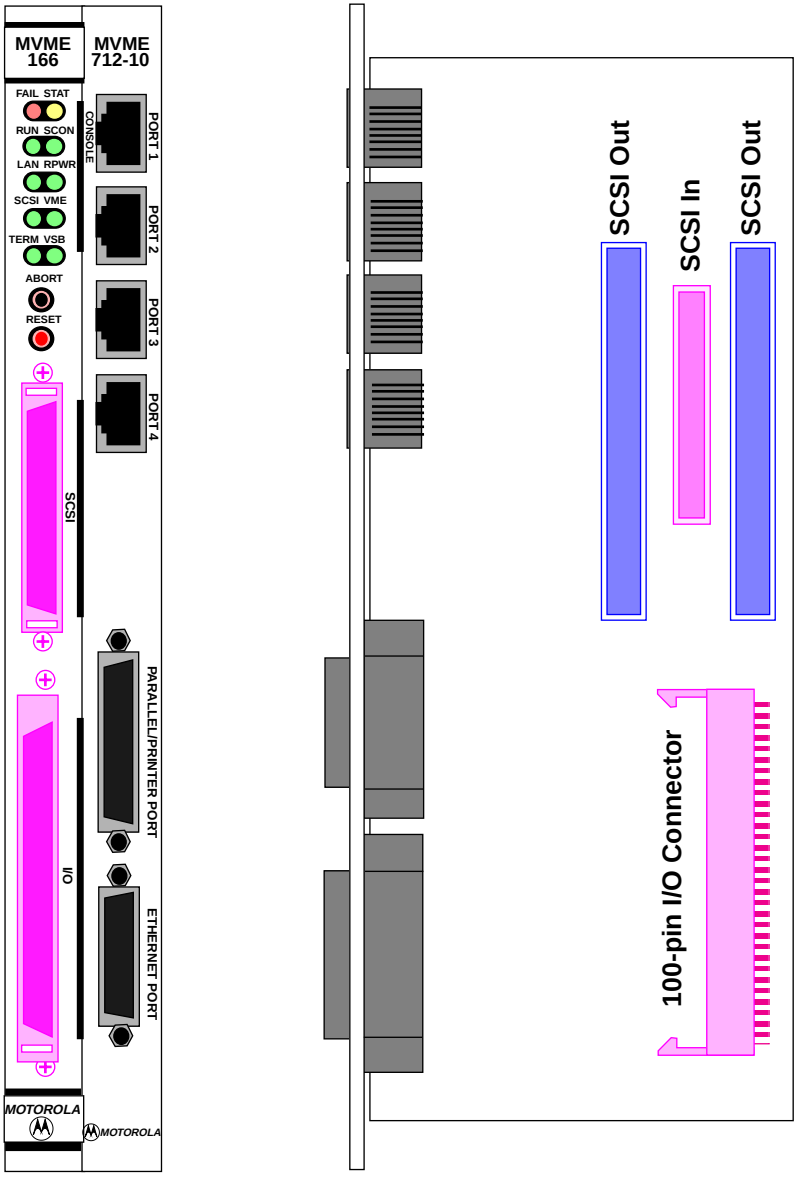


Figure 1-1. MVME712-10 Transition Module with MVME166

HARDWARE PREPARATION AND INSTALLATION INSTRUCTIONS

2

Introduction

This chapter provides unpacking instructions, hardware preparation, and installation instructions for the MVME712-10 Transition Module.

Unpacking Instructions

Note **If the carton is damaged upon receipt, request that carrier's agent be present during unpacking and inspection of the equipment.**

Unpack the equipment from the shipping carton. Refer to the packing list and verify that all items are present. Save the packing material for storing and reshipping of the equipment.

MVME712-10 Module Preparation

The location of the connectors on the MVME712-10 is illustrated in Figure 2-1. The module has been factory tested and is configured for DTE, but can be operated as DCE with an appropriate external adapter if desired. The connectors are:

- ❏ Four RJ45 EIA-232-D serial ports with DTE configuration (J1, J2, J3, J4)
- ❏ SCSI converter connectors (J5, J6, J7)
- ❏ Printer/parallel connector (J8)
- ❏ I/O connector (J9)
- ❏ Ethernet connector (J10)

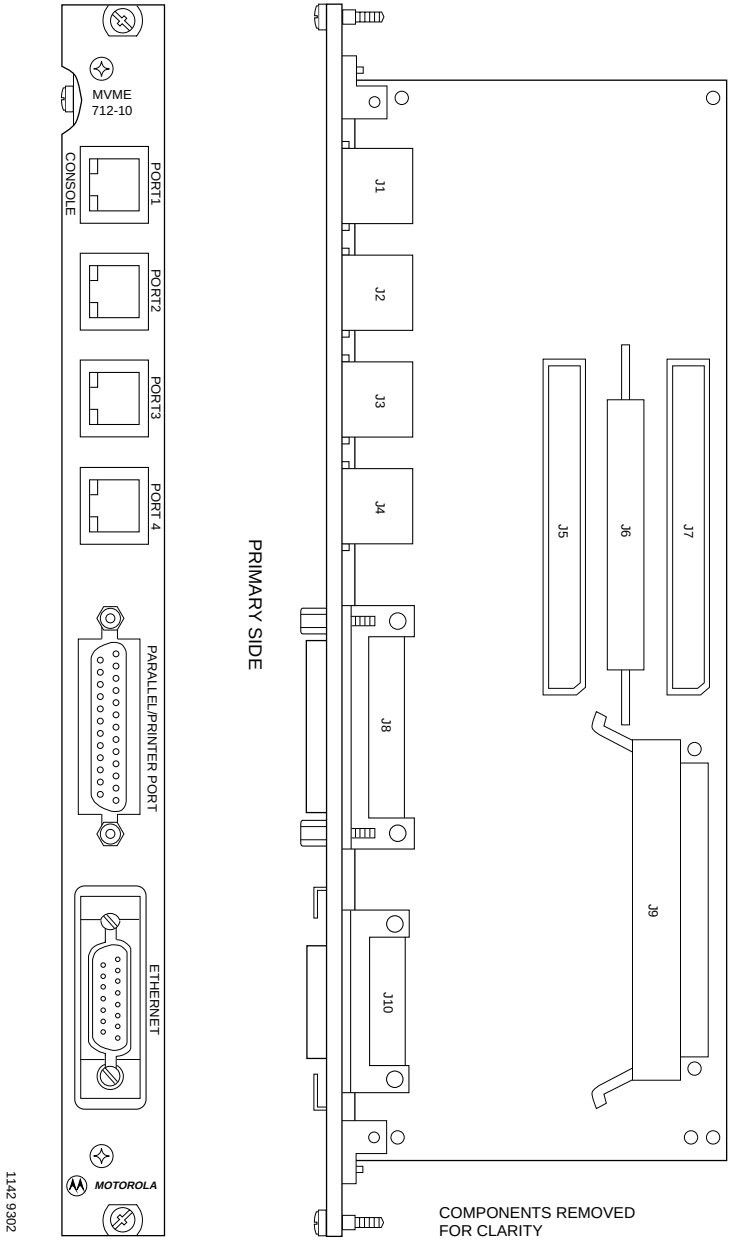


Figure 2-1. MVME712-10 Connector Locations

Serial Port Configuration

The four RJ45 EIA-232-D serial ports are factory configured as terminal (DTE) for connection to modem. However, they can be used as modem-to-terminal (DCE) by using an appropriate user-supplied external DCE adapter.

Serial Port DCE Configuration

Figure 2-2 shows the schematic representation of the DCE configuration of serial ports 1 through 4, using a user-supplied external DCE adapter.

Serial Port DTE Configuration

Figure 2-3 shows the schematic representation of the DTE configuration of serial ports 1 through 4, using a user-supplied external DTE adapter.

Configuration Register

Figure 2-4 illustrates the function of the configuration register on the MVME712-10. The application software on the MVME166 can read the configuration information to identify the transition board(s) in the system.

On the MVME166, the MC68230 interrupt level is the same as the CD2401. The interrupt vector is as programmed in the MC68230. The interrupt priority is (1) first the CD2401, and (2) then the MC68230.

To read the configuration information, the MC68230 (PI/T) must be programmed as follows:

- Port A direction must be:
  - Mode 0, submode 1X
  - Bits 7 to 4 as inputs
  - Bits 3 to 0 as outputs.
- Port B direction must be:
  - Mode 0, submode 1X
  - Bit 7 as an output
  - Bits 6 to 0 as inputs

Write port B bits 7 to 0 set configuration mode. Now port A bits 3 to 0 are used to select a port.

Port A Bits 3 to 0	Port Selected
0	0
1	1
2	2
3	3

Port A bits 7 to 4 are the configuration data returned from the port selected:

Configuration Register Port A Bits 7 to 4	Module Type	Module Implemented on
0 1	EIA-232 DCE EIA-232 DTE	MVME712-06 MVME712-06
2-8	Reserved	
9	EIA-232 RJ45 DTE	MVME712-10
A-F	Reserved	

Refer to the *MVME166/MVME167/MVME187 Single Board Computer Programmer's Reference Manual* for more information.

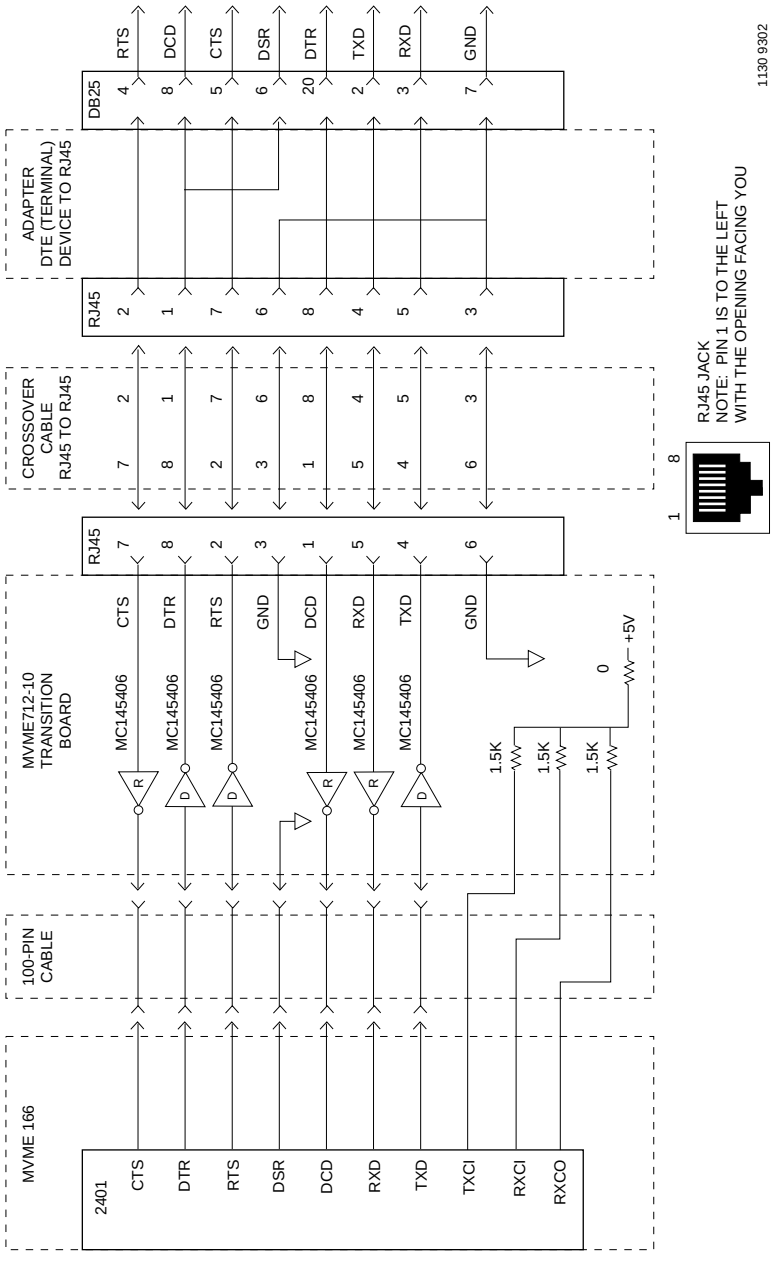


Figure 2-2. MVME712-10 Serial Port Configured as DCE (to Terminal)

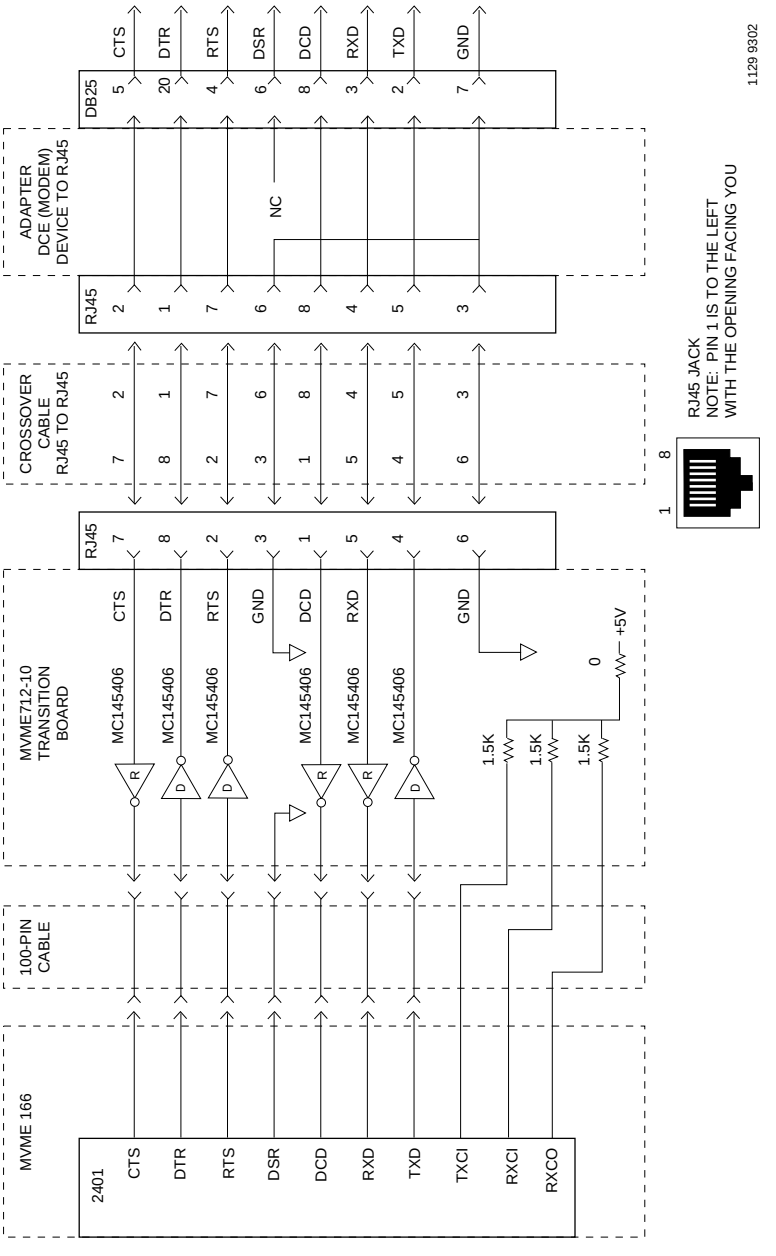


Figure 2-3. MVME712-10 Serial Port Configured as DTE (to Modem)

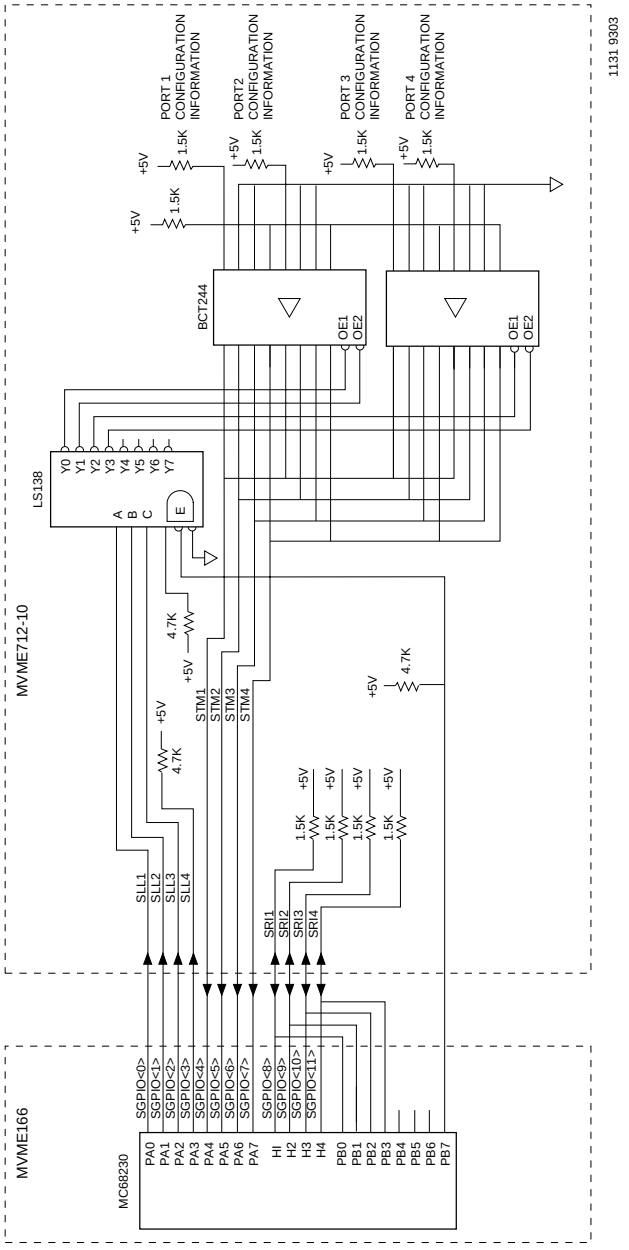


Figure 2-4. MVME712-10 Configuration Register

Installation Instructions

Installation of the MVME712-10 is described in the following paragraphs and illustrations. The basic procedure for installation is as follows:

1. Turn all equipment power OFF and disconnect the power cable from the AC power source.

Caution **Connecting modules while power is applied may result in damage to components on the module.**

Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling, testing, and adjusting.

2. Remove the chassis cover as instructed in the equipment user's manual.
3. Determine whether you wish to install the MVME712-10 at the front of the chassis or at the rear of the chassis.
4. Remove the filler panel(s) from the appropriate card slot(s) at the front of the chassis, or at the rear of the chassis (if the chassis has a rear card cage), depending upon whether you are installing the MVME712-10 at the front or at the back. Other modules in the unit may have to be moved to allow space for the cables for the MVME712-10.
5. Ensure that the MVME166 has been properly installed in the chassis and then proceed with the installation instructions that follow.

MVME712-10 Module Installation

The MVME712-10 can be installed either in the front of the chassis or at the rear, and can be cabled to the MVME166 and to SCSI peripherals in different configurations. The configurations are described and illustrated on the following pages.

The recommended configuration is the MVME712-10 installed in the front of the chassis, connected to the MVME166 using the Motorola-supplied I/O and SCSI P cables, with external SCSI drives connected to the MVME712-10 using a customer-supplied cable, as illustrated in Figure 2-5.

Other configurations may require user-supplied cables designed for the specific chassis and SCSI configuration.

An Ethernet cable, a printer, and/or terminals can be connected to the respective connectors on the front panel of the MVME712-10.

Front Chassis Mount, External SCSI Devices

To mount the MVME712-10 in the front of the chassis with external SCSI devices, proceed as follows and see Figure 2-5.

1. Connect the furnished 100-conductor I/O cable to connector J9 on the MVME712-10.
2. Install the MVME712-10 in a slot to the right of the MVME166 and tighten the screws.
3. Connect the I/O cable to connector J9 on the MVME166.
4. Connect the furnished P cable from connector J8 on the MVME166 to the external SCSI peripheral device.

Caution **SCSI terminators must be installed on the devices that are physically located at each end of the SCSI cable, and must not be on other devices on the cable. Refer to the SCSI specification for detailed instructions.**

5. Install the cover that you previously removed, making sure that it does not pinch any cables.
6. Connect the power cable to the AC power source and turn the unit on.

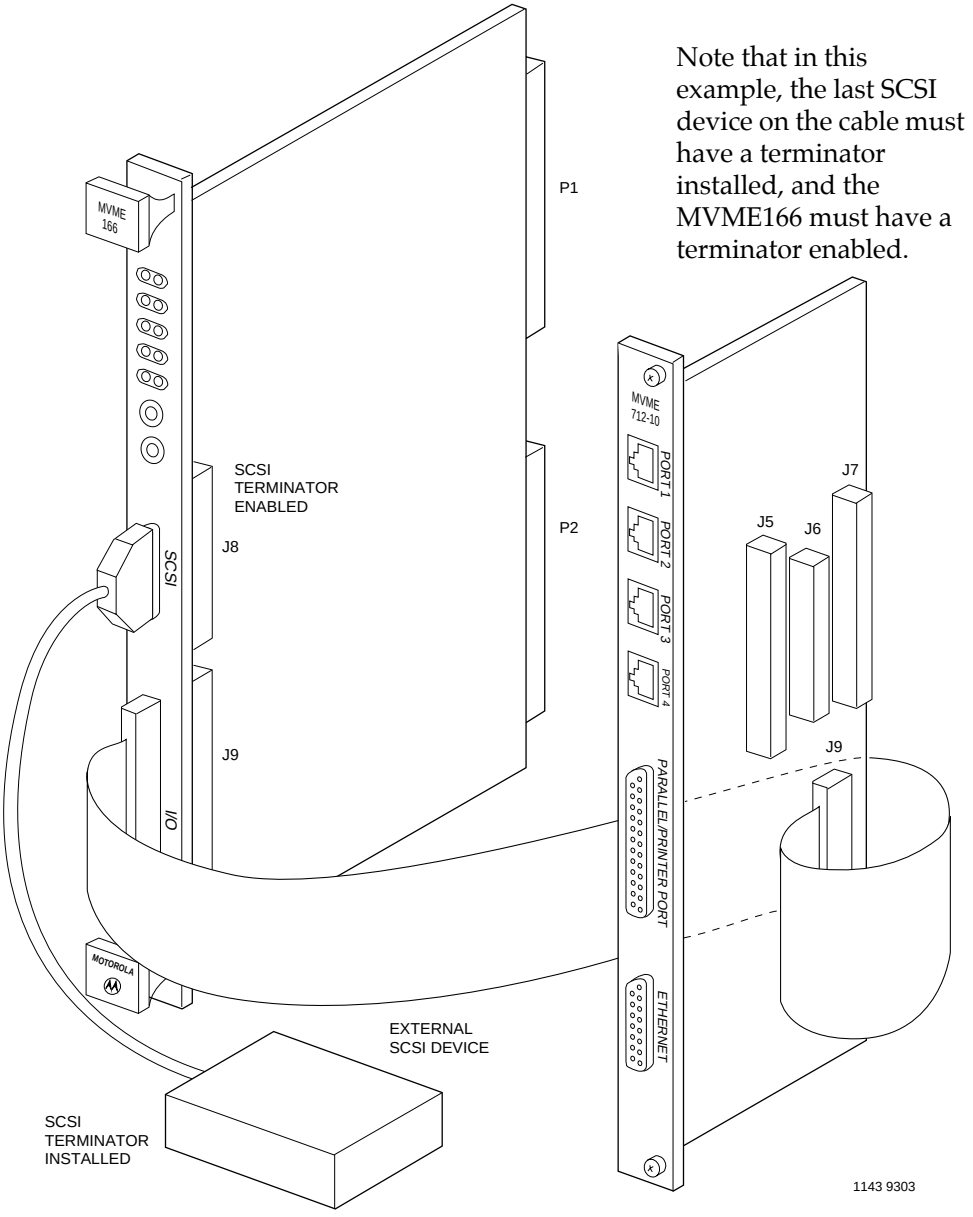


Figure 2-5. Typical MVME712-10 Installation at Front of Chassis

Front Chassis Mount, Internal SCSI Devices

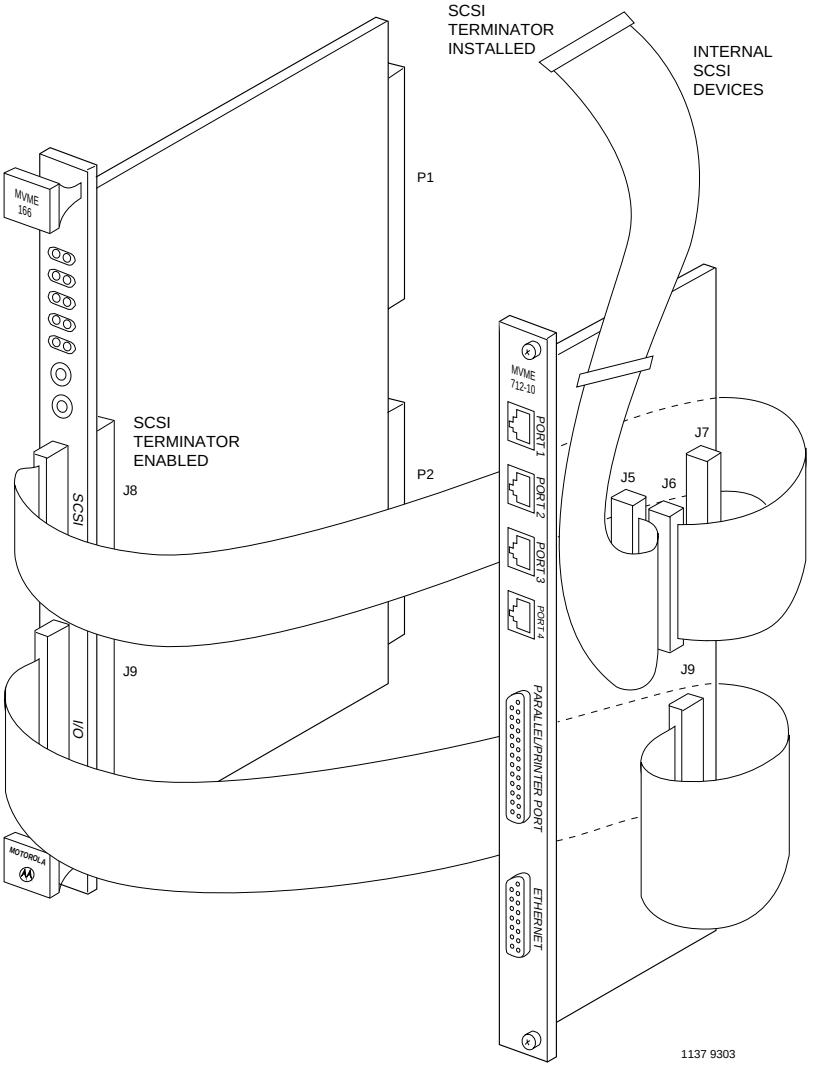
To mount the MVME712-10 at the front of the chassis with internal SCSI devices, proceed as follows and see Figure 2-6.

1. Insert the MVME712-10 module into the selected slot at the front of the chassis and tighten the attaching screws.
2. Connect the furnished P cable from connector J6 on the MVME712-10 to connector J8 on the front of the MVME166.
3. If the P cable at J6 on the MVME712-10 covers connector J5, connect a user-supplied cable with compatible pinouts from connector J7 on the MVME712-10 to the internal SCSI device. If connector J7 is covered, connect the cable to J5.

Caution **J5 and J7 are functionally the same. Do NOT use both at the same time, because to do so would create a SCSI stub greater than .1 meter.**

Caution **SCSI terminators must be installed on the devices that are physically located at each end of the SCSI cable, and must not be on other devices on the cable. Refer to the SCSI specification for detailed instructions.**

4. Connect the furnished 100-conductor I/O cable from connector J9 on the MVME712-10 to I/O connector J9 on the MVME166.
5. Install the cover that you previously removed, making sure that it does not pinch any cables.
6. Connect the power cable to the AC power source and turn the unit on.



Note that in this example, the last SCSI device on the cable must have a terminator installed, and the MVME166 must have a terminator enabled. No terminator would be required on the MVME712-10.

Figure 2-6. Typical MVME712-10 Installation at Front of Chassis

Rear Chassis Mount, Internal SCSI Devices

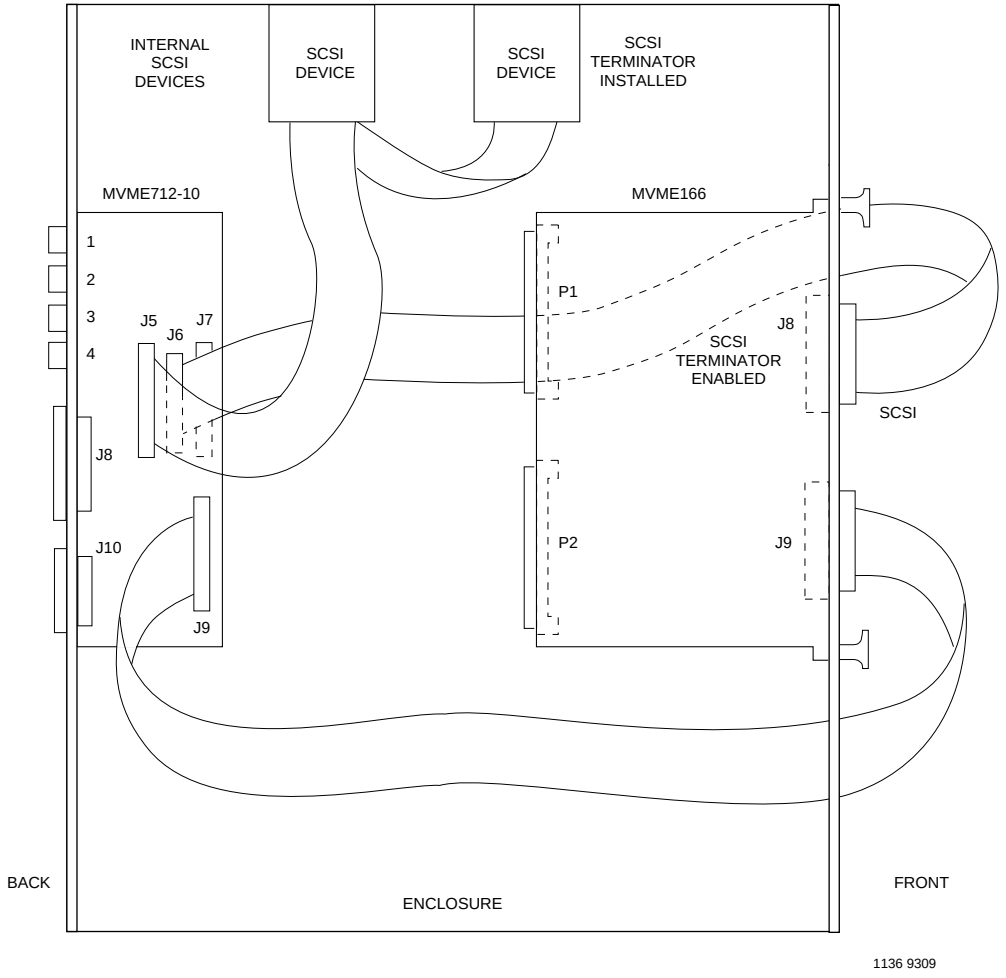
To mount the MVME712-10 at the rear of the chassis with internal SCSI devices, proceed as follows and see Figure 2-7.

1. Insert the MVME712-10 module into the selected slot at the rear of the chassis and tighten the attaching screws.
2. Connect the furnished P cable from connector J6 on the MVME712-10 to connector J8 on the front of the MVME166. A longer cable may be needed for some chassis configurations.
3. If the P cable at J6 on the MVME712-10 covers connector J5, connect a user-supplied cable with compatible pinouts from connector J7 on the MVME712-10 to the internal SCSI device. If connector J7 is covered, connect the cable to J5.

Caution **J5 and J7 are functionally the same. Do NOT use both at the same time, because to do so would create a SCSI stub greater than .1 meter.**

Caution **SCSI terminators must be installed on the devices that are physically located at each end of the SCSI cable, and must not be on other devices on the cable. Refer to the SCSI specification for detailed instructions.**

4. Connect the furnished 100-conductor I/O cable between connector J9 on the MVME712-10 and I/O connector J9 on the MVME166. A longer cable may be needed for some chassis configurations.
5. Install the cover that you previously removed, making sure that it does not pinch any cables.
6. Connect the power cable to the AC power source and turn the unit on.



Note that in this example, the last SCSI device on the cable must have a terminator installed, and the MVME166 must have a terminator enabled. No terminator would be required on the MVME712-10.

Figure 2-7. Typical MVME712-10 Installation at Rear of Chassis

SUPPORT INFORMATION 3

Introduction

This chapter provides the interconnection signals, parts lists with parts location illustrations, and schematic diagrams for the MVME712-10 Transition Module.

Manual Terminology

An asterisk (*) following the signal name for signals which are level significant denotes that the signal is true or valid when the signal is low.

An asterisk (*) following the signal name for signals which are edge significant denotes that actions initiated by that signal occur on high to low transition.

Interconnect Signals

80-pin connectors J1 through J4 on the MVME712-10 correspond to the RJ45 EIA-232-D serial ports on the MVME712-10 front panel.

J5 and J7 are identical 50-pin connectors for low-density 8-bit-wide SCSI cable (one is accessible from the front and one from the back of the board) and are connected internally to J6, a high-density 16-bit-wide SCSI connector for the P cable. Connector J6 is cabled to connector J8 on the MVME166.

Caution **J5 and J7 are functionally the same. Do NOT use both at the same time, because to do so would create a SCSI stub greater than .1 meter.**

J8 is a 25-pin connector for the printer port, and J10 is a 15-pin connector for the Ethernet interface.

J9 is a 100-pin connector that is cabled to connector J9 on the MVME166 SBC for I/O.

All front panel connectors have metal shells and jack posts that are electrically connected to the front panel. If the front panel is electrically connected to the chassis ground then the shells and jack posts are connected to chassis ground. This allows shielded cable to be used for effective reduction of EMI and RFI problems.

EIA-232-D Connectors J1, J2, J3, and J4

Connectors J1, J2, J3, and J4 are 8-pin connectors that correspond to the RJ45 EIA-232-D serial ports 1, 2, 3, and 4, respectively, on the front of the MVME712-10. Each pin connection, signal mnemonic, and signal characteristic for the connectors is listed in Table 3-1.

Table 3-1: EIA-232-D Connectors J1, J2, J3, and J4 Interconnect Signals

Pin Number	Signal Mnemonic	Signal Name and Description
1	DCD	DATA CARRIER DETECT - Sent by the modem to the terminal to indicate that a valid carrier is being received.
2	RTS	REQUEST TO SEND - RTS is supplied by the terminal to the modem when it is required to transmit a message. With RTS off, the modem carrier remains off. When RTS is turned on, the modem immediately turns on the carrier.
3	GND	GROUND
4	TXD	TRANSMIT DATA - data to be transmitted is furnished on this line to the modem from the terminal.
5	RXD	RECEIVE DATA - data that is demodulated from the receive line is presented to the terminal by the modem.
6	GND	GROUND
7	CTS	CLEAR TO SEND - CTS is a function supplied to the terminal by the modem, and indicates that it is permissible to begin transmission of a message. When using a modem, CTS follows the off-to-on transition of RTS after a time delay.
8	DTR	DATA TERMINAL READY (serial port 1) - A signal from the terminal to the modem indicating that the terminal is ready to send or receive data.

SCSI Connectors J5 and J7

Connectors J5 and J7 are identical; two connectors are provided for convenience of access. They convert low-density 8-bit-wide SCSI connectors to the high-density 16-bit-wide connector J6 (theP cable connector). Each pin connection, signal mnemonic, and signal characteristic for the connectors is listed in Table 3-2. Refer also to the schematic diagram for SCSI interconnect lines.

Table 3-2: SCSI Connectors J5 and J7 Interconnect Signals

Pin Number	Signal Mnemonic	Signal Name and Description
1	GND	GROUND
2 - 21	SCSI06-SCSI25	SCSI interconnect lines.
22	GND	GROUND
23, 24		Not used.
25, 26	TERMPWR*	TERMINATOR POWER
27, 28		Not used.
29, 30	SCSI26, SCSI27	SCSI interconnect lines.
31	GND	GROUND - This ground isolated from rest of board for SCSI only.
32-48	SCSI28-SCSI44	SCSI interconnect lines.
49	GND	GROUND - This ground isolated from rest of board for SCSI only.
50	SCSI45	SCSI interconnect lines.

SCSI Connector J6

Connector J6 is a high-density 16-bit-wide SCSI P cable connector that is connected internally to the low-density 8-bit wide SCSI connectors J5 and J7. Each pin connection, signal mnemonic, and signal characteristic for the connector is listed in Table 3-3. Refer also to the schematic diagram for SCSI interconnect lines.

Table 3-3: SCSI Connector J6 Interconnect Signals

Pin Number	Signal Mnemonic	Signal Name and Description
1-10		Not connected.
11	GND	GROUND - This ground isolated from rest of board for SCSI only.
12-31	SCSI06-SCSI25	SCSI interconnect lines.
32	GND	GROUND - This ground isolated from rest of board for SCSI only.
33-36	TERMPWR	TERMINATOR POWER
37, 38		Not used.
39, 40	SCSI26, SCSI27	SCSI interconnect lines.
41	GND	GROUND - This ground isolated from rest of board for SCSI only.
42-58	SCSI28-SCSI44	SCSI interconnect lines.
59	GND	GROUND - This ground isolated from rest of board for SCSI only.
60	SCSI45	SCSI interconnect lines.
61-68		Not connected.

Printer/Parallel Connector J8

Connector J8 is the Printer/Parallel port on the MVME712-10. Each pin connection, signal mnemonic, and signal characteristic for the connector is listed in Table 3-4.

Table 3-4: Printer/Parallel Connector J8 Interconnect Signals

Pin Number	Signal Mnemonic	Signal Name and Description
1	PRSTB*	DATA STROBE (Printer) - an active low output pulse used to clock data from the system to the printer.
2-9	PRD0-PRD7	DATA (bits 0-7) (Printer)
10	PRACK*	DATA ACKNOWLEDGE (Printer) - a low level input pulse indicating that the next character may be sent.
11	PRBSY	BUSY (Printer) - an input signal indicating that the printer cannot receive data.
12	PRPE	PAPER EMPTY (Printer) - out of paper.
13	PRSEL	SELECTED (Printer) - an input signal indicating that the printer is selected.
14		Not used.
15	PRFAULT*	FAULT (Printer) - an input signal that indicates a printer fault condition.
16	INPRIME*	INPUT PRIME (Printer) - an output signal that clears the printer buffer and initializes the logic.
17		Not used.
18-25	GND	GROUND

I/O Connector J9

Connector J9 on the MVME712-10 is used to cable to the MVME166. Each pin connection, signal mnemonic, and signal characteristic for the connector is listed in Table 3-5.

Table 3-5: I/O Connector J9 Interconnect Signals

Pin Number	Signal Mnemonic	Signal Name and Description
1	C+	COLLISION + (Input) (Ethernet) - a signal to indicate that multiple stations are contending for access to the transmission medium.
2	C-	COLLISION - (Input) (Ethernet) - part of a differential pair.
3	T+	TRANSMIT + (Output) (Ethernet) - this line is intended to operate into terminated transmission lines.
4	T-	TRANSMIT - (Output) (Ethernet) - part of a differential pair.
5	R+	RECEIVE + (Input) (Ethernet) - a data input sourced by the MAU.
6	R-	RECEIVE - (Input) (Ethernet) - part of a differential pair.
7	GND	GROUND
8-15	PRD0-PRD7	DATA (bits 0-7) (Printer)
16	GND	GROUND
17	PRSTB*	DATA STROBE (Printer) - an active low output pulse used to clock data from the system to the printer.
18	INPRIME*	INPUT PRIME (Printer) - an output signal that clears the printer buffer and initializes the logic.
19	GND	GROUND

Table 3-5: I/O Connector J9 Interconnect Signals (Continued)

Pin Number	Signal Mnemonic	Signal Name and Description
20	PRACK*	DATA ACKNOWLEDGE (Printer) - a low level input pulse indicating that the next character may be sent.
21	PRBSY	BUSY (Printer) - an input signal indicating that the printer cannot receive data.
22	PRPE	PAPER EMPTY (Printer) - out of paper.
23	PRSEL	SELECTED (Printer) - an input signal indicating that the printer is selected.
24	PRFAULT*	FAULT (Printer) - an input signal that indicates a printer fault condition.
25	GND	GROUND
26	STXD1B	TRANSMIT DATA (serial port 1) - data to be transmitted is furnished on this line to the modem from the terminal.
27	SRTS1B	REQUEST TO SEND (serial port 1) - RTS is supplied by the terminal to the modem when it is required to transmit a message. With RTS off, the modem carrier remains off. When RTS is turned on, the modem immediately turns on the carrier.
28	SDTR1B	DATA TERMINAL READY (serial port 1) - a signal from the terminal to the modem indicating that the terminal is ready to send or receive data.
29	SRXCO1B	RECEIVE CLOCK OUT (serial port 1) - this line can be configured to clock input data from a terminal to a modem.
30	GND	GROUND
31	SRXD1	RECEIVE DATA (serial port 1) - data that is demodulated from the receive line is presented to the terminal by the modem.

Table 3-5: I/O Connector J9 Interconnect Signals (Continued)

Pin Number	Signal Mnemonic	Signal Name and Description
32	SCTS1	CLEAR TO SEND (serial port 1) - CTS is a function supplied to the terminal by the modem, and indicates that it is permissible to begin transmission of a message. When using a modem, CTS follows the off-to-on transition of RTS after a time delay.
33	SDCD1	DATA CARRIER DETECT (serial port 1) - sent by the modem to the terminal to indicate that a valid carrier is being received.
34	SDSR1	DATA SET READY (serial port 1) - DSR is a function supplied by the modem to the terminal to indicate that the modem is ready to transmit data.
35	GND	GROUND
36	STXCI1	TRANSMIT CLOCK (serial port 1) - this line can be configured to clock output data to the modem from the terminal.
37	SRXCI1	RECEIVE CLOCK IN (serial port 1) - this line can be configured to clock input data from a terminal to a modem.
38	GND	GROUND
39	STXD2B	TRANSMIT DATA (serial port 2) - data to be transmitted is furnished on this line to the modem from the terminal.
40	SRTS2B	REQUEST TO SEND (serial port 2) - RTS is supplied by the terminal to the modem when it is required to transmit a message. With RTS off, the modem carrier remains off. When RTS is turned on, the modem immediately turns on the carrier.
41	SDTR2B	DATA TERMINAL READY (serial port 2) - a signal from the terminal to the modem indicating that the terminal is ready to send or receive data.

Table 3-5: I/O Connector J9 Interconnect Signals (Continued)

Pin Number	Signal Mnemonic	Signal Name and Description
42	SRXCO2B	RECEIVE CLOCK OUT (serial port 2) - this line can be configured to clock input data from a terminal to a modem.
43	GND	GROUND
44	SRXD2	RECEIVE DATA (serial port 2) - data that is demodulated from the receive line is presented to the terminal by the modem.
45	SCTS2	CLEAR TO SEND (serial port 2) - CTS is a function supplied to the terminal by the modem, and indicates that it is permissible to begin transmission of a message. When using a modem, CTS follows the off-to-on transition of RTS after a time delay.
46	SDCD2	DATA CARRIER DETECT (serial port 2) - sent by the modem to the terminal to indicate that a valid carrier is being received.
47	SDSR2	DATA SET READY (serial port 2) - DSR is a function supplied by the modem to the terminal to indicate that the modem is ready to transmit data.
48	GND	GROUND
49	STXCI2	TRANSMIT CLOCK (serial port 2) - this line can be configured to clock output data to the modem from the terminal.
50	SRXCI2	RECEIVE CLOCK IN (serial port 2) - this line can be configured to clock input data from a terminal to a modem.
51	GND	GROUND
52	STXD3B	TRANSMIT DATA (serial port 3) - data to be transmitted is furnished on this line to the modem from the terminal.

Table 3-5: I/O Connector J9 Interconnect Signals (Continued)

Pin Number	Signal Mnemonic	Signal Name and Description
53	SRTS3B	REQUEST TO SEND (serial port 3) - RTS is supplied by the terminal to the modem when it is required to transmit a message. With RTS off, the modem carrier remains off. When RTS is turned on, the modem immediately turns on the carrier.
54	SDTR3B	DATA TERMINAL READY (serial port 3) - a signal from the terminal to the modem indicating that the terminal is ready to send or receive data.
55	SRXCO3B	RECEIVE CLOCK OUT (serial port 3) - this line can be configured to clock input data from a terminal to a modem.
56	GND	GROUND
57	SRXD3	RECEIVE DATA (serial port 3) - data that is demodulated from the receive line is presented to the terminal by the modem.
58	SCTS3	CLEAR TO SEND (serial port 3) - CTS is a function supplied to the terminal by the modem, and indicates that it is permissible to begin transmission of a message. When using a modem, CTS follows the off-to-on transition of RTS after a time delay.
59	SDCD3	DATA CARRIER DETECT (serial port 2) - sent by the modem to the terminal to indicate that a valid carrier is being received.
60	SDSR3	DATA SET READY (serial port 4) - DSR is a function supplied by the modem to the terminal to indicate that the modem is ready to transmit data.
61	GND	GROUND
62	STXCI3	TRANSMIT CLOCK (serial port 3) - this line can be configured to clock output data to the modem from the terminal

Table 3-5: I/O Connector J9 Interconnect Signals (Continued)

Pin Number	Signal Mnemonic	Signal Name and Description
63	SRXCI3	RECEIVE CLOCK IN (serial port 4) - this line can be configured to clock input data from a terminal to a modem.
64	GND	GROUND
65	STXD4B	TRANSMIT DATA (serial port 3) - data to be transmitted is furnished on this line to the modem from the terminal.
66	SRTS4B	REQUEST TO SEND (serial port 4) - RTS is supplied by the terminal to the modem when it is required to transmit a message. With RTS off, the modem carrier remains off. When RTS is turned on, the modem immediately turns on the carrier.
67	SDTR4B	DATA TERMINAL READY (serial port 3) - a signal from the terminal to the modem indicating that the terminal is ready to send or receive data.
68	SRXCO4B	RECEIVE CLOCK OUT (serial port 4) - this line can be configured to clock input data from a terminal to a modem.
69	GND	GROUND
70	SRXD4	RECEIVE DATA (serial port 4) - data that is demodulated from the receive line is presented to the terminal by the modem.
71	SCTS4	CLEAR TO SEND (serial port 4) - CTS is a function supplied to the terminal by the modem, and indicates that it is permissible to begin transmission of a message. When using a modem, CTS follows the off-to-on transition of RTS after a time delay.

Table 3-5: I/O Connector J9 Interconnect Signals (Continued)

Pin Number	Signal Mnemonic	Signal Name and Description
72	SCD4	DATA CARRIER DETECT (serial port 4) - sent by the modem to the terminal to indicate that a valid carrier is being received.
73	SDSR4	DATA SET READY (serial port 4) - DSR is a function supplied by the modem to the terminal to indicate that the modem is ready to transmit data.
74	GND	GROUND
75	STXCI4	TRANSMIT CLOCK (serial port 4) - this line can be configured to clock output data to the modem from the terminal.
76	SRXCI4	RECEIVE CLOCK IN (serial port 4) - this line can be configured to clock input data from a terminal to a modem.
77	GND	GROUND
78-81	SLL1B-SLL4B	LOCAL LOOPBACK (serial ports 1 through 4) - reroutes signal within modem.
82	GND	GROUND
83-86	STM1-STM4	TEST MODE (serial ports 1-4) - used by modem.
87	GND	GROUND
88-91	SRI1-SRI4	RING INDICATOR (serial ports 1 through 4) - used by modem.
92	RDCONFG*	READ CONFIG - reads configuration for transition board serial I/O test mode.
93,94	-12V	-12 Vdc POWER - fused on MPU board.
95,96	+12VF	+12 Vdc POWER - fused on MPU board.
97-100	+5V	+5Vdc POWER - fused on MPU board.

Ethernet Connector J10

Connector J10 is the Ethernet port on the MVME712-10. Each pin connection, signal mnemonic, and signal characteristic for the connector is listed in Table 3-6.

Table 3-6: Ethernet Connector J10 Interconnect Signals

Pin Number	Signal Mnemonic	Signal Name and Description
1	GND	GROUND
2	C+	COLLISION + (Input) - a signal to indicate that multiple stations are contending for access to the transmission medium.
3	T+	TRANSMIT + (Output) - this line is intended to operate into terminated transmission lines.
4	GND	GROUND
5	R+	RECEIVE + (Input) - a data input sourced by the MAU.
6	GND	GROUND
7		Not used.
8	GND	GROUND
9	C-	COLLISION - (Input) - part of a differential pair.
10	T-	TRANSMIT - (Output) - part of a differential pair.
11	GND	GROUND
12	R-	RECEIVE - (Input) - part of a differential pair.
13	+12VF	+12 Vdc POWER - fused on MPU board.
14	GND	GROUND
15		Not used.

Parts List

The components of the MVME712-10 are listed in Table 3-7. The parts locations of the MVME712-10 are shown in Figure 3-1. These parts reflect the latest issue of hardware at the time of printing.

Table 3-7: MVME712-10 Module Parts List

Reference Designation	Motorola Part Number	Description
	84-W8825B01C	Printed wiring board
C1-C14, C19-C22	21NW9711A02	Capacitor, SMD, ceramic, .1 uF @ 50 Vdc
C15-C17	23NW9712A06	Capacitor, SMD, tantalum,33 uF @ 16 Vdc
C18,C23	21NW9711A14	Capacitor, SMD, ceramic, 330 pF @ 50 Vdc
CR1-CR24	48NW9644A01	Diode, zener
CR25,CR26	48NW9638A04	Diode, Schottky, SMT, 1 A
J1-J4	29NW9802K05	Modular jack, 8 pin, shielded, right-angle
J5,J7	28NW9802F67	Connector, 50-pin IDC
J6	28NW9802J78	Connector, 68-pin socket
J8	28NW9802H21	Connector, 25-pin socket, right-angle
J9	28NW9802J79	Connector, 100-pin, right-angle
J10	28NW9802J64	Connector, 15-pin socket, right-angle
R1,R4,R10, R12,R48	06SW-967A25	Resistor, SMD, 100 ohm, 5%, 1/4 W
R2,R5,R13, R14,R20,R22-R24,R26-R28, R30,R31,R33-R35,R37,R39-R41	06SW-965A22	Resistor, SMD, 1.5K ohm, 5%, 1/8 W
R3,R6,R8,R9	51NW9635A28	Resistor, 16-pin, 8-100 ohm

Table 3-7: MVME712-10 Module Parts List

Reference Designation	Motorola Part Number	Description
R7,R11,R36	51NW9635A13	Resistor, 16-pin, 8-22 ohm
R15-R19,R38, R42-R47,R49, R50	06SW-965A11	Resistor, SMD, 4.7K ohm, 1/8 W, 5%
R21,R25,R29, R32	29NW9814A01	Resistor, 0 ohm
U1, U3-U5	51NW9615Z19	IC, MC145406DW, 16-pin SOL package
U2,U6,U8,U9	51NW9637D11	IC, SN74BCT244DB, 20-pin, SSOP
U7	51NW9615U11	IC, SN74LS138D, 16-pin, SO package

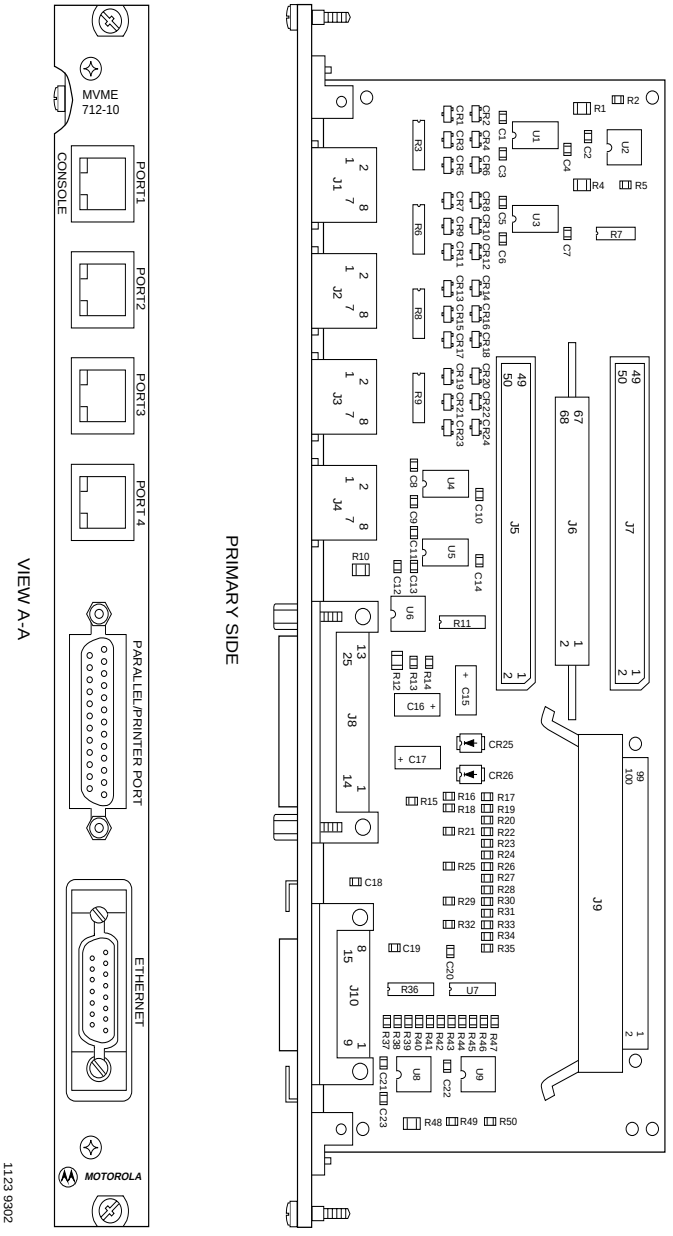


Figure 3-1. MVME712-10 Parts Location

Schematic Diagram

The MVME712-10 schematic diagram is illustrated in Figure 3-2.

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