XR Series
PowerPC™ VMEmodule
Reference Guide

XRPPCA/IH2

Notice

Restricted Rights Legend

Motorola, Inc.
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Preface

The XR Series PowerPC VMEmodule Reference Guide is written for the person who needs advanced configuration and operation information for VMEmodules in a PowerPC-based XR system.

The manual presents a technical discussion of all the major components of the computer system.

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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. Both AC and DC versions of this equipment require a three-conductor power cable. A supplementary chassis ground is also provided. AC power cables must be plugged into an approved three-contact electrical outlet. The power jack and mating plug of the power cable must 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.

WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Motorola Computer Group could void the user's authority to operate the equipment.

Addition of any user-installed electronics or cabling could be constituted as a modification of the equipment and could limit the user's authority to operate the equipment without additional qualification.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe "A" prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

CE Notice (European Community)

Marking a system with the " CE " symbol indicates compliance of that Motorola system to the EMC and Low Voltage directives of the European Community. A system with the CE marking meets or exceeds the following technical standards:

EN 55022 "Limits and methods of measurement of radio interference characteristics of information technology equipment."

EN 50082-1 "Electromagnetic compatibility - Generic immunity standard Part 1: Residential, commercial, and light industry."

> **IEC 801-2 "Electromagnetic compatibility for industrial process measurement and control equipment Part 2: Electrostatic discharge requirements."**
>
> **IEC 801-3 "Electromagnetic compatibility for industrial-process measurement and control equipment Part 3: Radiated electromagnetic field requirements."**
>
> **IEC 801-4 "Electromagnetic compatibility for industrial - process measurement and control equipment Part 4: Electrical fast transient/ burst requirements."**

EN 60950 "Safety of information technology equipment, including electrical business equipment."

In accordance with European Community directives, a "Declaration of Conformity" has been made and is on file at Motorola, Inc. - Computer Group, 27 Market Street, Maidenhead, United Kingdom, SL6 8AE.

In addition to the above standards, this system has also met the requirements of the following European standards:

EN 60555-2 "Disturbances in supply systems caused by household appliances and similar electrical equipment Part 2: Harmonics."

EN 60555-3 "Disturbances in supply systems caused by household appliances and similar electrical equipment Part 3: Voltage fluctuations."

WARNING

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

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Introduction 1

About this Manual

This manual is directed toward the person who needs advanced configuration and operation information for VMEmodules for XR PowerPC systems. It presents the correct strapping and jumper information for XR PowerPC VMEmodules.

This manual comprises the following topics:

- Chapter 2, *VMEmodule Removal and Installation.*

  Installation and removal procedures for the different types of VMEmodules.

- Chapter 3, *CPU Modules*.

  Describes the various CPU modules available for XR PowerPC systems. It provides strapping and switch setting for each supported CPU module.

- Chapter 4, *PMC Modules*.

  Describes the various PCI Mezzanine Cards available for XR PowerPC systems.

- Chapter 5, *Controller Modules*.

  Describes the various Controller Modules availabe for XR PowerPC systems.

- Chapter 6, *Transition Modules*.

  Describes the various Transition Modules available for XR PowerPC systems.

- Appendix A, *Extended Handle Compatibility*.

  Describes the differences between the original VMEmodule handle design and the extended (VME64) VMEmodule handle design. It contains a discussion on compatibility of the extended handle with the XR series chassis options.

For information about the XR line of chassis, refer to the appropriate manual as listed in *Related Documentation* on page 1-3.

The System Platforms

The VMEmodules presented in this manual are supported on the following PowerPC systems:

- ❑ Original 3-Slot Chassis
- ❑ Original Dual 9-Slot Chassis
- ❑ Original 12-Slot Chassis
- ❑ Original 20-Slot Chassis
- ❑ Extended Dual 9-Slot Chassis
- ❑ Extended 20-Slot Chassis

In cases where a particular VMEmodule is incompatible with a specific chassis or other VMEmodule, the incompatibility is noted in the module's description.

Related Documentation

Detailed information about the hardware components described herein can be found in the following manuals. If not shipped with this product, these manuals may be purchased by contacting your local Motorola sales office.

Although not shown in the following list, each Motorola Computer Group manual publication number is suffixed with characters which represent the revision level of the document, such as /D2 or /UM2 (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).

Document Title	Motorola Publication Number
XR Series Chassis Reference Manual	XRCHASA/IH
XR 900 Series Reference Manual	XR900A/IH
MVME1603/MVME1604 Single Board Computer Installation and Use	V1600-1A/IH
MVME1603/MVME1604 Single Board Computer Programmer’s Reference Guide	V1600-1A/PG
MVME2600 Series Single Board Computer Installation and Use	V2600A/IH
MVME2600 Series Single Board Computer Programmer’s Reference Guide	V2600A/PG
MVME3600 Series Single Board Computer Installation and Use	V3600A/IH
MVME3600 Series Single Board Computer Programmer’s Reference Guide	V3600A/PG
MVME332XT Intelligent Communication Controller User’s Manual	MVME332XT
MVME332XT Intelligent Communication Controller Support Information	SIMVME3323XT
MVME332XT Serial Intelligent Peripheral Controller Firmware User’s Manual	MVME332XTFW
MVME376 Ethernet Communications Controller User’s Manual	MVME376
MVME710B 8-Channel Serial I/O Distribution Module User’s Manual	MVME710B
MVME385-120 High Performance FDDI Node Processor User’s Manual	MVME385-120
PowerCom Installation and Use	VMEPCOMA/IH
MVME762 Transition Module User’s Manual	VME762A/UM
MPMC101 PMC SCSI-2 Adapter User’s Manual	PMC101A/UM
XR342 (T1) Technical Description	800-0800-001
XR343 (E1) Technical Description	800-0801-001

VMEmodule Removal and Installation

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Chapter 2 describes the procedures for removing and re-installing the various XR series VMEmodules installed in your system (described in Table 2-1, below).

These instructions apply to pre-installed modules only. When installing new modules into your system, follow the installation instructions included with the new hardware. Those instructions contain the specific cabling, strapping, and driver configuration instructions.

Table 2-1. Removal and Installation Procedures

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2

VMEmodule Removal and Installation

VMEmodules (including optional VME disk, tape, or floppy drive modules) plug directly into the VME backplane. VME drive modules, if installed, are secured by front panel screws in the same way as other VMEmodules.

Floppy drive modules are attached and cabled to the CPU board prior to being installed in the system (Figure 2-2). The floppy module may be attached to either single- or dual-slot CPU boards. The standoffs are color coded; note their location prior to removal.

The suggested procedure for removal and installation of VMEmodules follows:

Removal

1. Switch the power supply of the affected system to STANDBY and disconnect the system from the AC or DC power source:
   - If the power supply is an AC unit, unplug the power cord from the AC outlet.
   - If the power supply is a DC unit, remove the -48Vdc power from the system and unclamp the DC leads from the terminal block on the power supply.
2. Remove the front bezel, if installed.
3. Identify and disconnect any cables attached to the front of the module being removed.
4. Loosen the screws holding the VMEmodule or drive module to the chassis. These are generally captive screws that remain with the module.

5. Carefully remove the module from the chassis by pulling straight out (Figure 2-1).

Note Some VMEmodules have cable connectors mounted on the surface of the board itself. If this is the case, be sure to mark carefully where those cables go so that they can be reinstalled correctly. Incorrect cabling can damage the equipment.

6. Disconnect any enclosure cabling that is attached to the surface of the module.

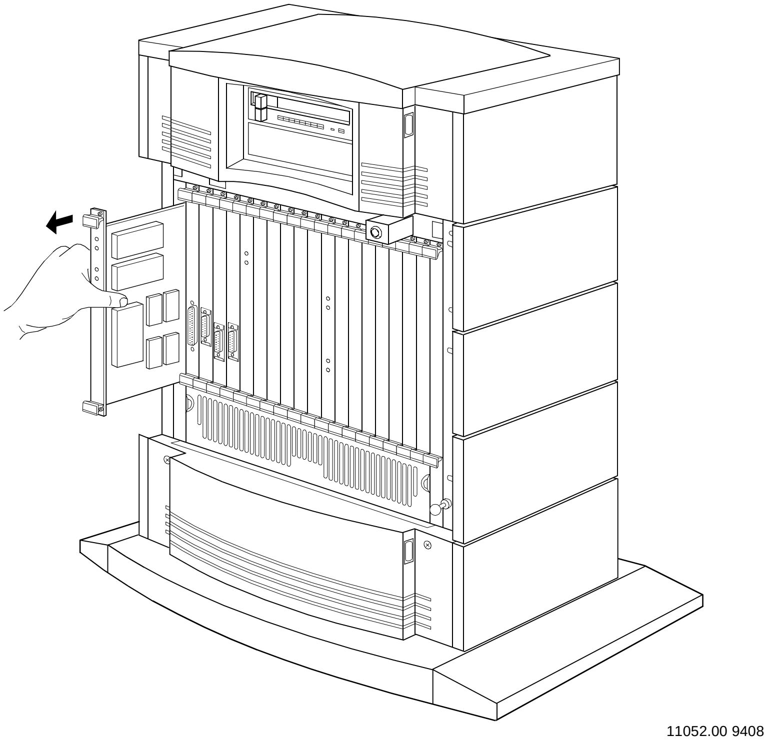


Figure 2-1. Removing a VMEmodule

Caution

When not replacing the removed VMEmodule, install blank VME board panels to ensure ElectroMagnetic Compatibility (EMC) compliance.

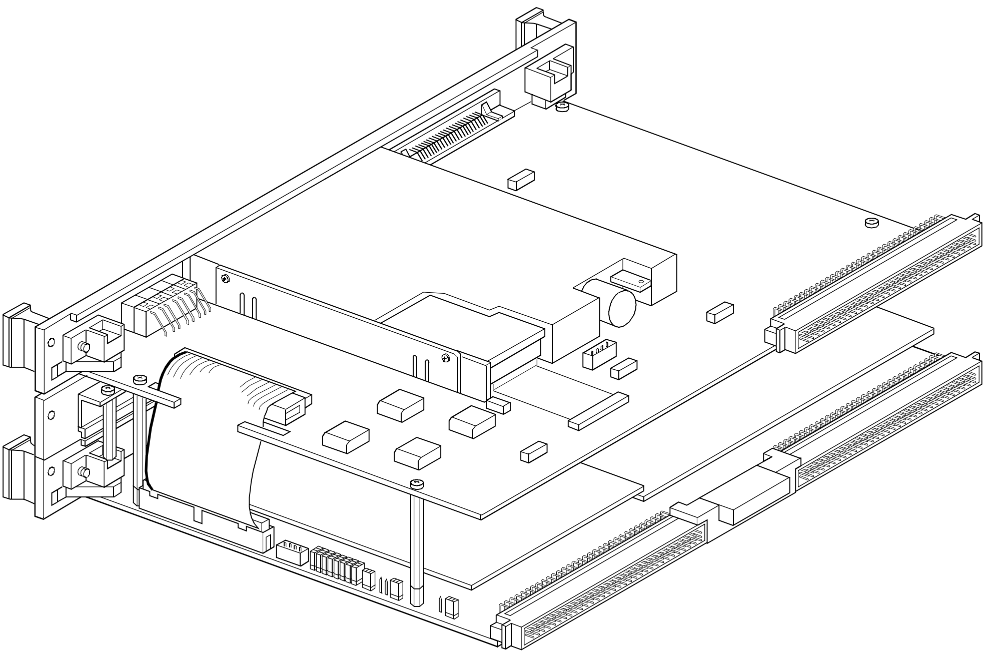


Figure 2-2. Floppy Module Cabled and Attached to Dual-Slot CPU Board

Installation

1. Ensure that power to the affected system is set to STANDBY and the system is disconnected from the AC or DC power source.
2. Slide the replacement VMEmodule partially into the selected card slot. If any cabling is to be routed to the board surface of the module, reconnect those cables at this point.
3. Use firm steady pressure to seat the board connectors properly. Secure the module to the chassis with the captive screws provided.
4. If any cables were attached to the front of the VMEmodule, reconnect them at this point.
5. Reinstall the front bezel, if the installation includes one.
6. Reconnect the system to the AC or DC power source.

Transition Module Removal and Installation

Transition modules are mounted in a transition card cage at the rear of the chassis. They furnish the connection between VMEmodules and equipment external to the chassis. Transition modules usually have few or no active devices, and do not receive forced air cooling.

The P2 connectors on the reverse side of the backplane accommodate MVME700 series plug-in transition modules. There are two transition module connectors, designated XP1 and XP2, provided for the CPU VMEmodule slot. There is one transition module P2 connector for each of the remaining VMEmodule slots. Please note that while Row A and Row C signals are duplicated between the VME P2 and the transition module P2 connectors, the Row B signals are not.

Boards can be keyed, by installing an optional keying kit, to prevent accidental VME/transition module mismatching (see Figure 2-3 on page 2-7).

The suggested procedure for removal and installation of transition modules follows:

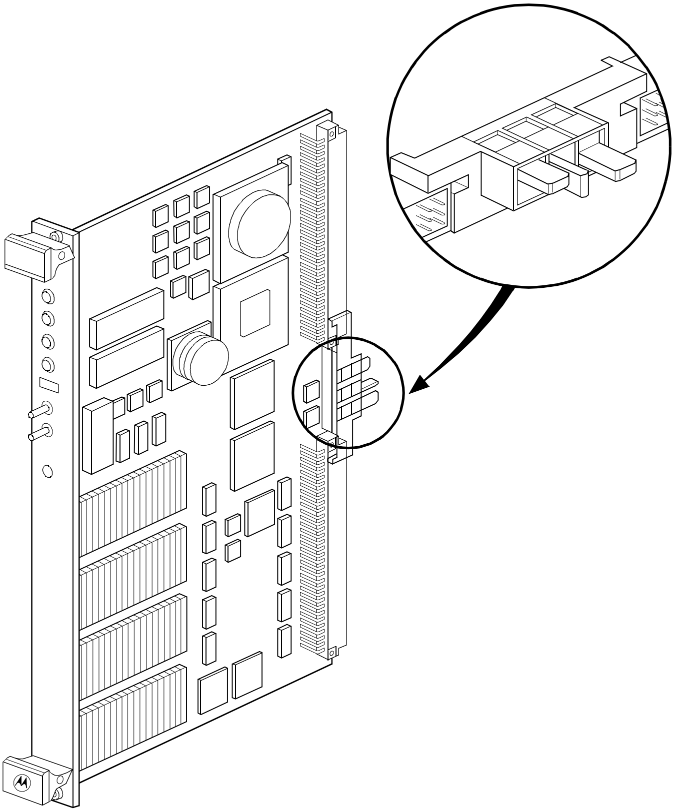


Figure 2-3. Board Keying System

Removal

1. Switch the power supply of the affected system to STANDBY and disconnect the system from the AC or DC power source:
   – If the power supply is an AC unit, unplug the power cord from the AC outlet.
   – If the power supply is a DC unit, remove the -48Vdc power from the system and unclamp the DC leads from the terminal block on the power supply.
2. Identify and remove any cables attached to the front of the transition module (this step may be unnecessary if the module is not being permanently removed from the enclosure).
3. Loosen the screws holding the transition module to the chassis. These are generally captive screws; they remain with the transition module.
4. Remove the transition module from the chassis by pulling straight out (see Figure 2-4 on page 2-9).

Note In a few cases, transition modules have cable connectors mounted on the surface of the board itself. If this is the case, be sure to mark carefully where those cables go, so that they can be reinstalled correctly. Incorrect cabling can damage the equipment.

5. Identify and remove any enclosure cabling that is routed to the transition module surface.

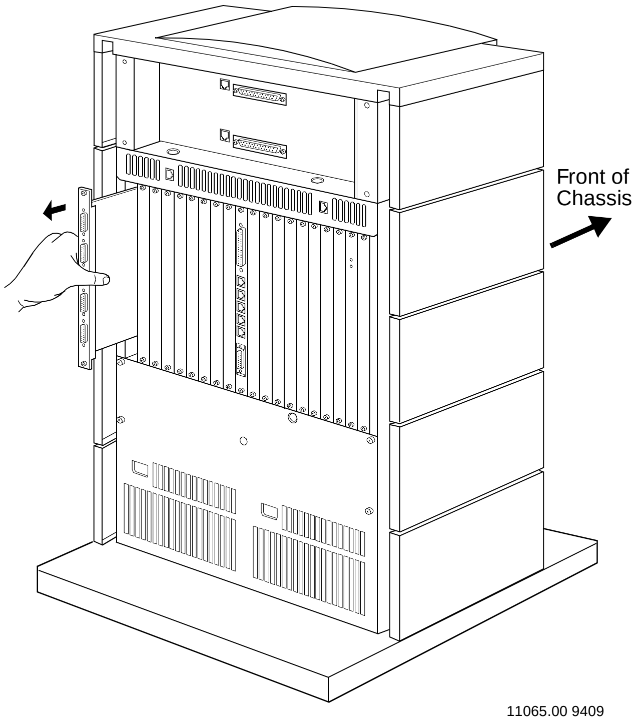


Figure 2-4. Removing a Transition Module

Caution

When not replacing the removed transition module, install blank transition board panels to ensure ElectroMagnetic Compatibility (EMC) compliance. All blank transition board panels are installed with the spring gaskets facing to the left.

Installation

1. Ensure that power to the affected system is set to STANDBY and the system is disconnected from the AC or DC power source.
2. Slide the replacement transition module partially into the appropriate card slot. If any cabling is to be routed to the board surface of the module, reconnect those cables at this point.
3. Use firm steady pressure to seat the board connector properly. Secure the module to the chassis with the captive screws provided.
4. Reconnect the necessary cables to the front of the transition module.
5. Reconnect the system to the AC or DC power source.

PMC Module Removal and Installation

PCI Mezzanine Card (PMC) modules plug into either the CPU module or an optional PMC Expansion Carrier (PMCspan). They come in two sizes: single slot or double slot.

Single-slot PMC modules may be mounted on either a CPU module or a PMCspan module.

Double-slot PMC modules may only be mounted on a PMCspan module.

- ❑ To remove/install the PMC module on single-high CPU boards (the MVME1600 and MVME2600 family of CPU boards), follow the instructions in *Single-High CPU Boards*, below.
- ❑ To remove/install the PMC module on double-high CPU boards (the MVME3600 and MVME4600 family of CPU boards), follow the instructions in *Double-High CPU Boards* on page 2-14.
- ❑ To remove/install the PMC module on a PMCspan, follow the instructions in *PMC Expansion Carrier (PMCspan)* on page 2-19.

Single-High CPU Boards

Follow these steps to remove/install the PMC Module on a single-high CPU board:

1. Place an ESD strap on your wrist and attach the grounding line end of the ESD strap to the chassis as a ground. The ESD strap must be secured to your wrist and to ground throughout the procedure.
2. Shut down the operating system. Turn the AC or DC power off and remove the AC cord or DC power lines from the system. Remove chassis or system cover(s) as necessary for access to the VME module card cage.
3. Remove the CPU module from the system chassis.
4. Lay the CPU module on a level surface with the PMC connectors facing you.
5. To REMOVE a PMC module:

- Turn the CPU module component-side down and remove the four screws from the CPU module and PMC module standoffs.
- Turn the CPU module component-side up and gently pull the rear end of the PMC module away from the board, freeing the P11 and P12 connectors from the CPU module. Once the connectors are freed, pull the PMC module back and away from the CPU module.
- Replace the cover on the PMC connector slot on the CPU module's front panel.

Caution

When not replacing the removed PMC module, install the cover panel on the carrier board to ensure ElectroMagnetic Compatibility (EMC) Compliance.

6. To INSTALL a PMC module:
   - Remove the cover from the PMC connector slot on the CPU module's front panel.
   - Remove the screws from the stand-offs on the component side of the PMC Module.
   - Turn the PMC Module component-side down, and position it above the CPU module as shown in Figure 2-5 on page 2-13 (an MVME160*x* CPU module is shown).

Caution

Avoid touching areas of integrated circuitry; static discharge can damage these circuits.

   - Insert the PMC Module's external connector through the PMC connector slot on the CPU module front panel.
   - Align the guide hole and P11 and P12 connectors on the PMC Module over the guide pin and the PMC connectors on the CPU module.
   - Gently seat the PMC Module onto the CPU module.

– Turn the CPU module component-side down, and fasten the four screws through the CPU module into the stand-offs on the PMC.

7. Re-install the carrier board in the system chassis.

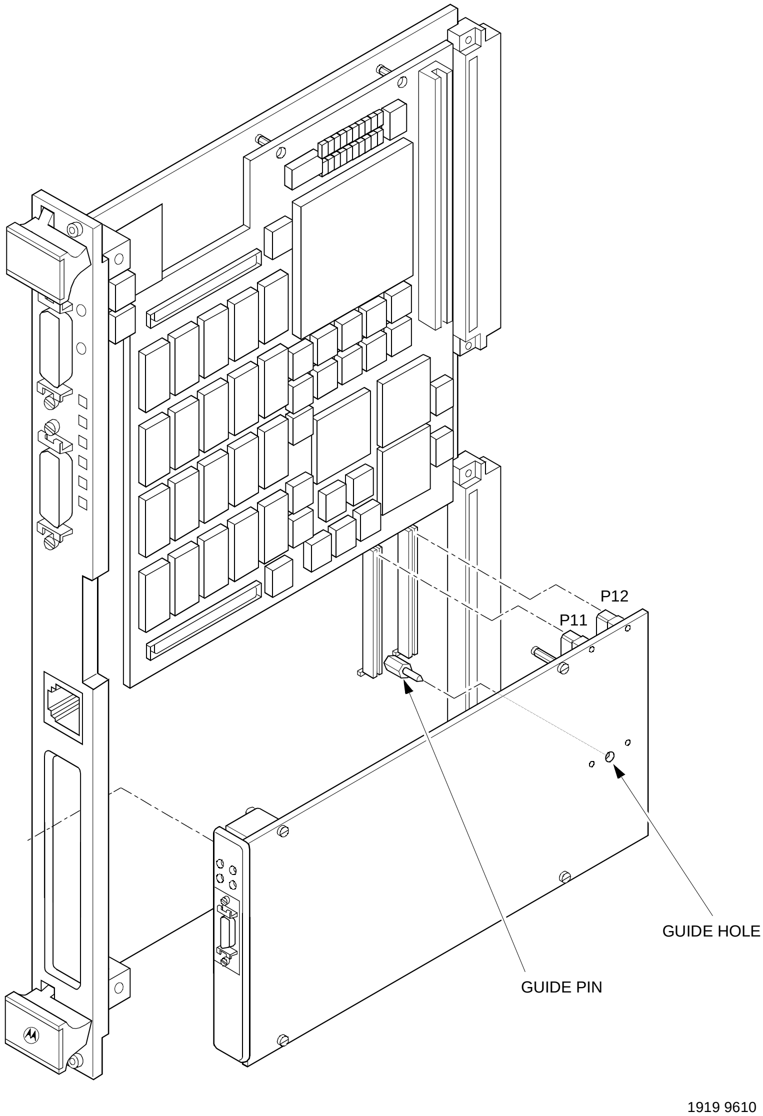


Figure 2-5. Installing the PMC Module on a Single-High CPU Board

Double-High CPU Boards

On double-high CPU boards, the PMC Module mounts on top of the base board, below the processor/memory mezzanine (see Figure 2-8 on page 2-18).

1. Attach an ESD strap to your wrist. Attach the other end of the ESD strap to the chassis as a ground. The ESD strap must be secured to your wrist and to ground throughout the procedure.
2. Shut down the operating system. Turn the AC or DC power off and remove the AC cord or DC power lines from the system. Remove chassis or system cover(s) as necessary for access to the VME module card cage.
3. If the CPU assembly is presently installed in a system, carefully remove the assembly from its VMEbus card slot.
4. Lay the assembly flat, with connectors P1 and P2 facing you.

Caution

Avoid touching areas of integrated circuitry; static discharge can damage these circuits.

5. Remove the Memory Mezzanine (see Figure 2-6 on page 2-15):
   - Remove the four short phillips screws that secure the Memory Mezzanine to the standoffs.
   - Separate the Memory Mezzanine from the processor / memory mezzanine.
6. Remove the Processor / Memory Mezzanine (see Figure 2-7 on page 2-16):
   - Remove the four standoffs and the two short Phillips screws that secure the processor/memory mezzanine to the base board.
   - Separate the mezzanine from the base board.

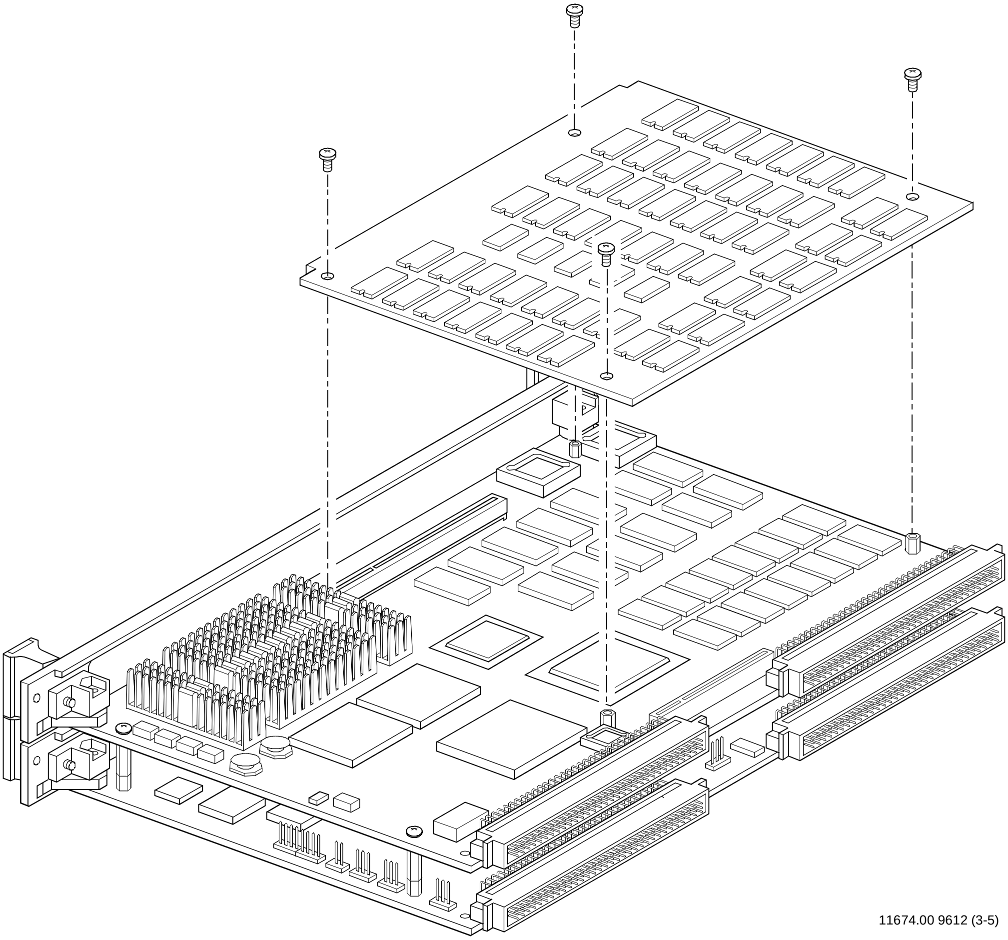


Figure 2-6. Memory Mezzanine Removal

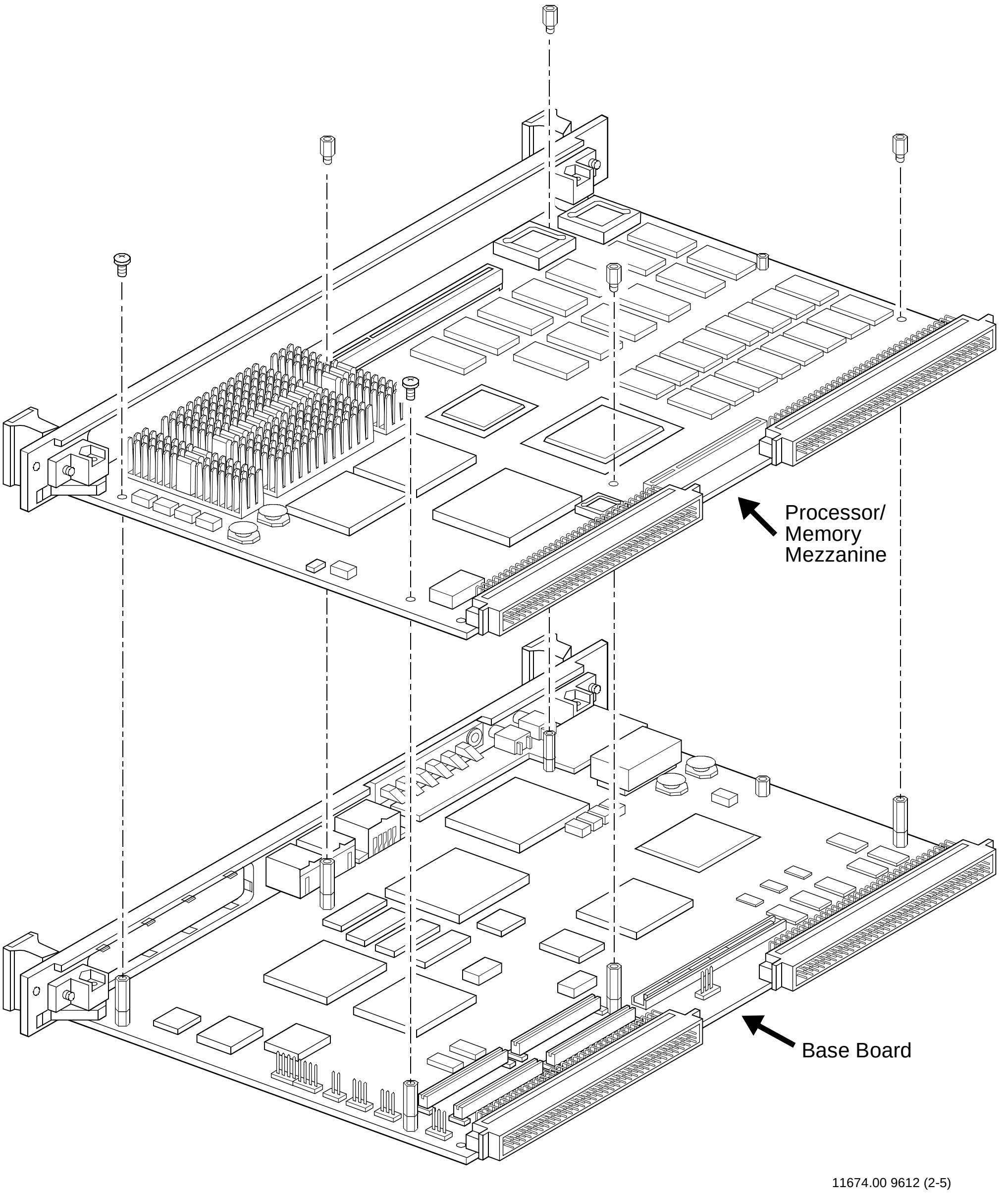


Figure 2-7. Processor/Memory Mezzanine Removal

7. To REMOVE a PMC module:
   - Turn the base board component-side down and remove the four screws from the base board and PMC module standoffs.
   - Turn the base board component-side up and gently pull the rear end of the PMC module away from the board, freeing the P11 and P12 connectors from the base board. Once the connectors are freed, pull the PMC module back and away from the base board.
   - Replace the cover on the PMC connector slot on the base board's front panel.

Caution

When not replacing the removed PMC module, install the cover panel on the carrier board to ensure ElectroMagnetic Compatibility (EMC) Compliance.

8. To INSTALL a PMC module:
   - Remove the cover from the PMC connector slot on the base board's front panel.
   - Remove the screws from the stand-offs on the component side of the PMC Module.
   - Turn the PMC Module component-side down, and position it above the base board as shown in Figure 2-8 on page 2-18.

Caution

Avoid touching areas of integrated circuitry; static discharge can damage these circuits.

   - Insert the PMC Module's external connector through the PMC connector slot on the base board's front panel.
   - Align the guide hole and P11 and P12 connectors on the PMC Module over the guide pin and the PMC connectors on the base board.
   - Gently seat the PMC Module onto the base board.

– Turn the base board component-side down, and fasten the four screws through the base board into the stand-offs on the PMC.

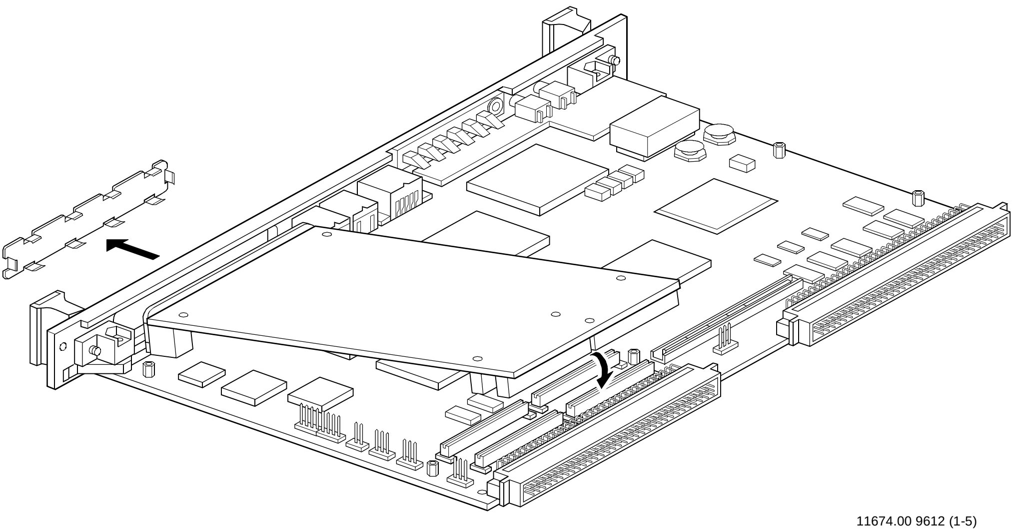


Figure 2-8. PMC Module Placement on Base Board

9. Reinstall the processor and the memory mezzanines on the base board by reversing the steps used to remove them.

10. Reinstall the CPU assembly in its proper card slot. Be sure the module is well seated in the backplane connectors. Do not damage or bend connector pins.

PMC Expansion Carrier (PMCspan)

Removal

1. Attach an ESD strap to your wrist. Attach the other end of the ESD strap to the chassis as a ground. The ESD strap must be secured to your wrist and to ground while you are performing the removal procedure.
2. Perform an operating system shutdown. Remove the power and power leads from the system. Remove the chassis or system cover(s) as necessary to access the VMEmodule card cage.
3. Remove the PMCspan/CPU assembly from the system.
4. If the PMC module to be removed is installed on XRPMCEXP1 in an assembly equipped with two PMCspan modules, remove XRPMCEXP2 from the assembly (refer to *XRPMCEXP2 Removal and Installation* on page 2-26).
5. Turn the PMCspan component-side down and remove the four screws from the base board and PMC module standoffs.
6. Turn the PMCspan component-side up and gently pull the rear end of the PMC module away from the board, freeing the P11 and P12 connectors from the base board. Once the connectors are freed, pull the PMC module back and away from the PMCspan.
7. Replace the cover on the PMC connector slot on the PMCspan's front panel.

Caution

When not replacing the removed PMC module, install the cover panel on the PMCspan to ensure ElectroMagnetic Compatibility (EMC) Compliance.

Installation

You should install the PMC module on the PMCspan prior to installing the PMCspan onto the CPU module.

To install a PMC adapter, refer to Figure 2-9 and proceed as follows:

1. Lay the PMCspan flat, with the P1 and P2 connectors facing you.
2. Remove the PMC slot filler panel from the PMCspan front panel.

Note The PMC adapter may be installed in either slot.

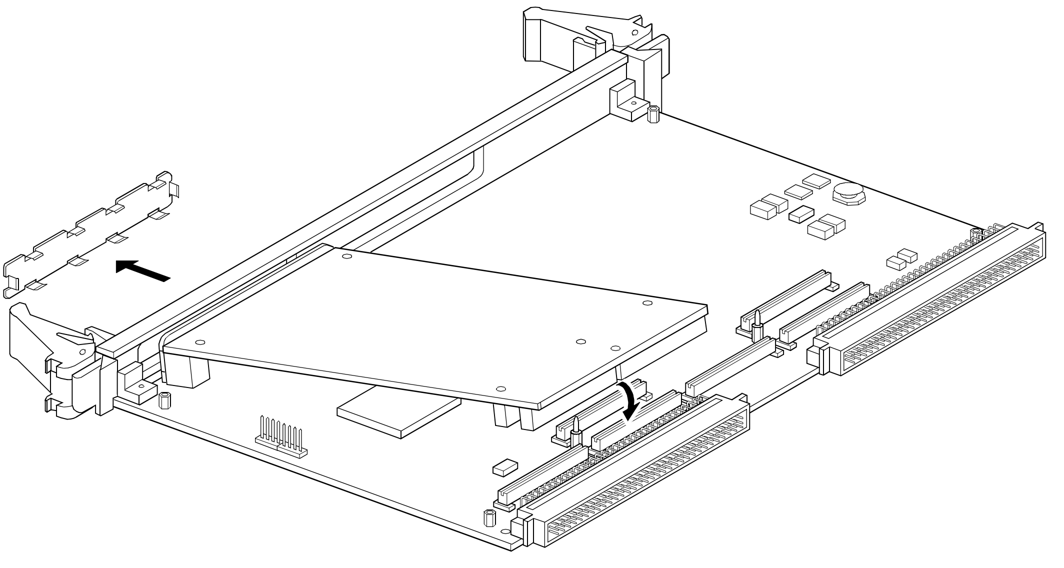


Figure 2-9. PMC Module Placement on PMCspan

3. Slide the PMC module port connector into the PMC slot opening on the PMCspan front panel.
4. Align the PMC adapter over the PMCspan:
   – Align the connectors on the underside of the PMC adapter with the corresponding connectors on the PMCspan.
   – Align the keying hole on the PMC adapter with the keying pin on the PMCspan.

5. Gently press the PMC adapter onto the PMCspan.
6. Turn the PMCspan component-side down.
7. Insert the four short Phillips screws, supplied with the PMC adapter, through the holes on the underside of the PMCspan into the standoffs at the corners of the PMC adapter. (Some PMC adapters take a screw at each corner; others require only two screws at the forward corners.) Tighten the screws.

PMC Expansion Carrier (PMCspan) Removal and Installation

XRPMCEXP1 Removal and Installation

The XRPMCEXP1 mounts on top of the XR series CPU module. To upgrade or install a PMCspan, refer to Figure 2-10 on page 2-25 and proceed as follows:

Note When *installing* an XRPMCEXP1 module, be sure to install the PMC module on the board *before* installing the expansion carrier.

1. Attach an ESD strap to your wrist. Attach the other end of the ESD strap to the chassis as a ground. The ESD strap must be secured to your wrist and to ground while you are performing the installation procedure.
2. Perform an operating system shutdown. Turn the AC or DC power off and remove the AC cord or DC power lines from the system. Remove chassis or system cover(s) as necessary for access to the VME module card cage.
3. Carefully remove the CPU module and lay it flat, with connectors P1 and P2 facing you.
4. To REMOVE an XRPMCEXP1:
   - ❑ If the CPU brick is equipped with an XRMPCEXP2, remove it according to the instructions in *XRPMCEXP2 Removal and Installation* on page 2-26.
   - ❑ Remove the short Phillips screws from the holes at the corners of the PMCspan and the standoffs on the CPU module.
   - ❑ Gently pull the PMCspan and the CPU module apart.

- ❑ Remove the handle pins from the holes in the handles of the CPU and XRPMCEXP1 modules.

5. To INSTALL an XRPMCEXP1:

- ❑ Attach the four long standoffs to the CPU module. For each standoff:
  - – Insert the threaded end into the standoff hole at each corner of the CPU module or processor mezzanine.
  - – Thread the locking nuts onto the standoff tips.
  - – Tighten the nuts with a open-end wrench or a pair of needle nose pliers.

Note On single-slot CPU modules, use the short standoff in the corner with the LED mezzanine module.

- ❑ Insert the handle pins into the holes on the CPU module's handles.
- ❑ Place the PMCspan on top of the CPU module. Be sure to align:
  - – The mounting holes in each corner to the standoffs
  - – The PMCspan connector (P5) with CPU module connector (J5)
  - – The handle pins on the CPU module with the pin holes in the PMCspan's handles.
- ❑ Gently press the PMCspan and the CPU module together, making sure that J5 is fully seated into P5.
- ❑ Insert the four Phillips screws through the holes at the corners of the PMCspan and into the standoffs on the CPU module. Tighten the screws.

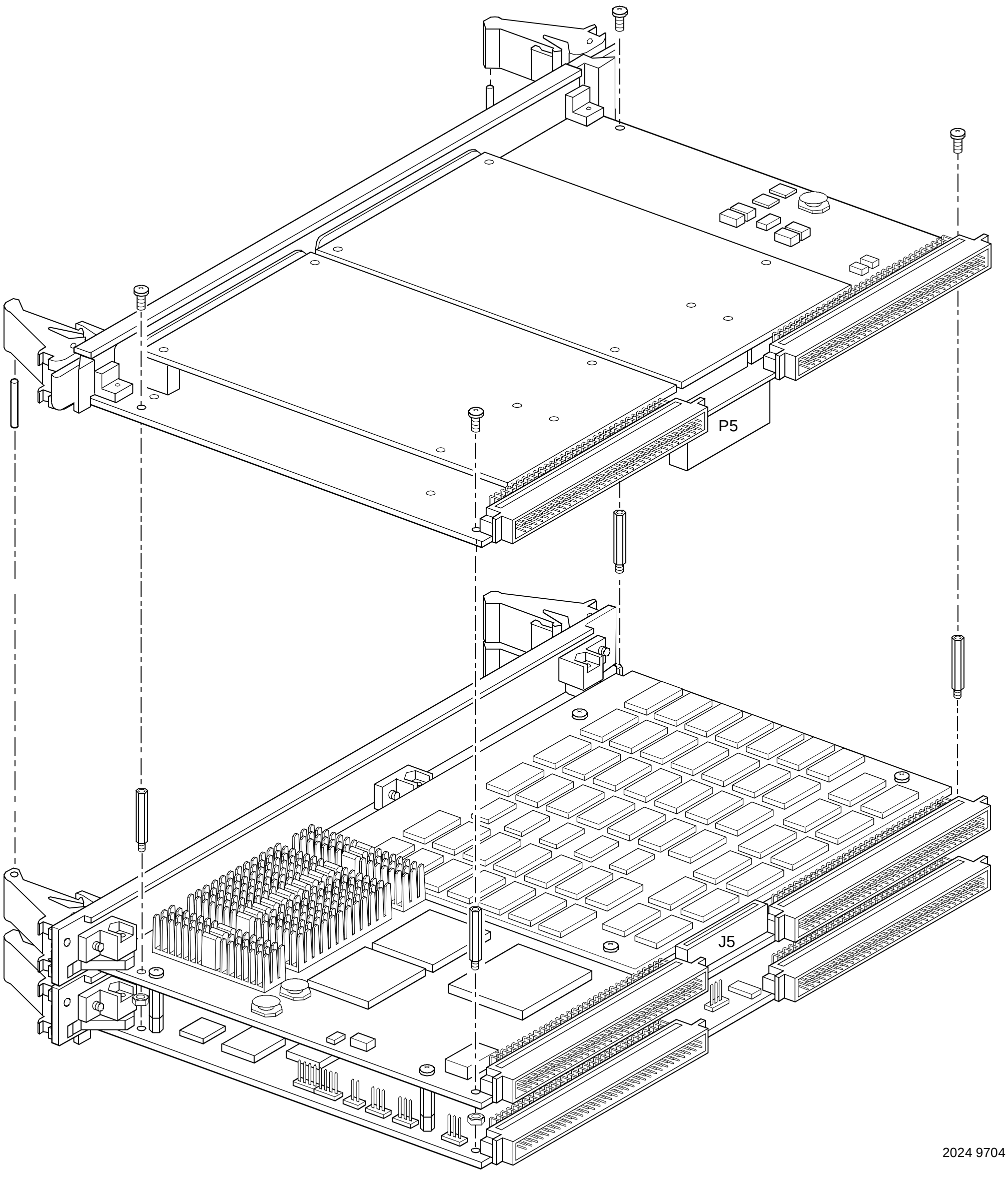


Figure 2-10. XRPMCEXP1 Installation on an XR604E-1D or XR604E-1Y

Note The screws have two different head diameters. Use the screws with the smaller heads on the standoffs next to VMEbus connectors P1 and P2.

❑ If installing an XRPMCEXP2 at this time, go to *XRPMCEXP2 Removal and Installation* on page 2-26.

6. If not installing an XRPMCEXP2 at this time:
   – Install the CPU module and PMCspan into the card slots. Be sure the modules are well seated in the backplane connectors. Do not damage or bend connector pins.
   – Replace the chassis or system cover(s), reconnect the system to the AC or DC power source, and turn the equipment power on.

XRPMCEXP2 Removal and Installation

The XRPMCEXP2 mounts on top of an XRPMCEXP1 PMC Expansion Carrier module. To install an XRPMCEXP2, refer to Figure 2-11 on page 2-29 and proceed as follows:

Note When *installing* an XRPMCEXP1 module, be sure to install the PMC module on the board *before* installing the expansion carrier.

1. Attach an ESD strap to your wrist. Attach the other end of the ESD strap to the chassis as a ground. The ESD strap must be secured to your wrist and to ground while you are performing the installation procedure.
2. Shut down the operating system. Turn the AC or DC power off and remove the AC cord or DC power lines from the system. Remove chassis or system cover(s) as necessary for access to the VME module card cage.
3. Carefully remove the XRPMCEXP1/CPU brick from the VMEbus card slot and lay it flat, with the P1 and P2 connectors facing you.

4. To REMOVE the XRPMCEXP2:

    - ❏ Remove the four short Phillips screws from the holes at the corners of the XRPMCEXP2 and the standoffs on the XRPMCEXP1.
    - ❏ Gently pull the two PMCspan modules apart.
    - ❏ Remove the handle pins from the holes of the handles of the XRPMCEXP1 and XRPMCEXP2.
    - ❏ Remove the four long standoffs from the XRPMCEXP1.
    - ❏ Fasten the four short Phillips screws to the standoffs in each corner of the XRPMCEXP1.

5. To INSTALL the XRPMCEXP2:

    - ❏ Remove the four short Phillips screws from the standoffs in each corner of the XRPMCEXP1.
    - ❏ Attach the four long standoffs supplied with the XRPMCEXP2 to the XRPMCEXP1.
    - ❏ Insert the handle pins into the holes on the XRPMCEXP1's handles.
    - ❏ Place the XRPMCEXP2 on top of the XRPMCEXP1. Be sure to align:
        - – The mounting holes in each corner to the standoffs
        - – The XRPMCEXP2 connector P3 with XRPMCEXP1 connector J3
        - – The handle pins on the XRPMCEXP1 module with the pin holes in the XRPMCEXP2's handles.
    - ❏ Gently press the two PMCspan modules together, making sure that P3 is fully seated in J3.
    - ❏ Insert the four short Phillips screws through the holes at the corners of the XRPMCEXP2 and into the standoffs on the XRPMCEXP1. Tighten the screws.

Note The screws have two different head diameters. Use the screws with the smaller heads on the standoffs next to VMEbus connectors P1 and P2.

6. Install the CPU module/PMCspan assembly into the card slots. Be sure the modules are well seated in the backplane connectors. Do not damage or bend connector pins.
7. Replace the chassis or system cover(s), reconnect the system to the AC or DC power source, and turn the equipment power on.

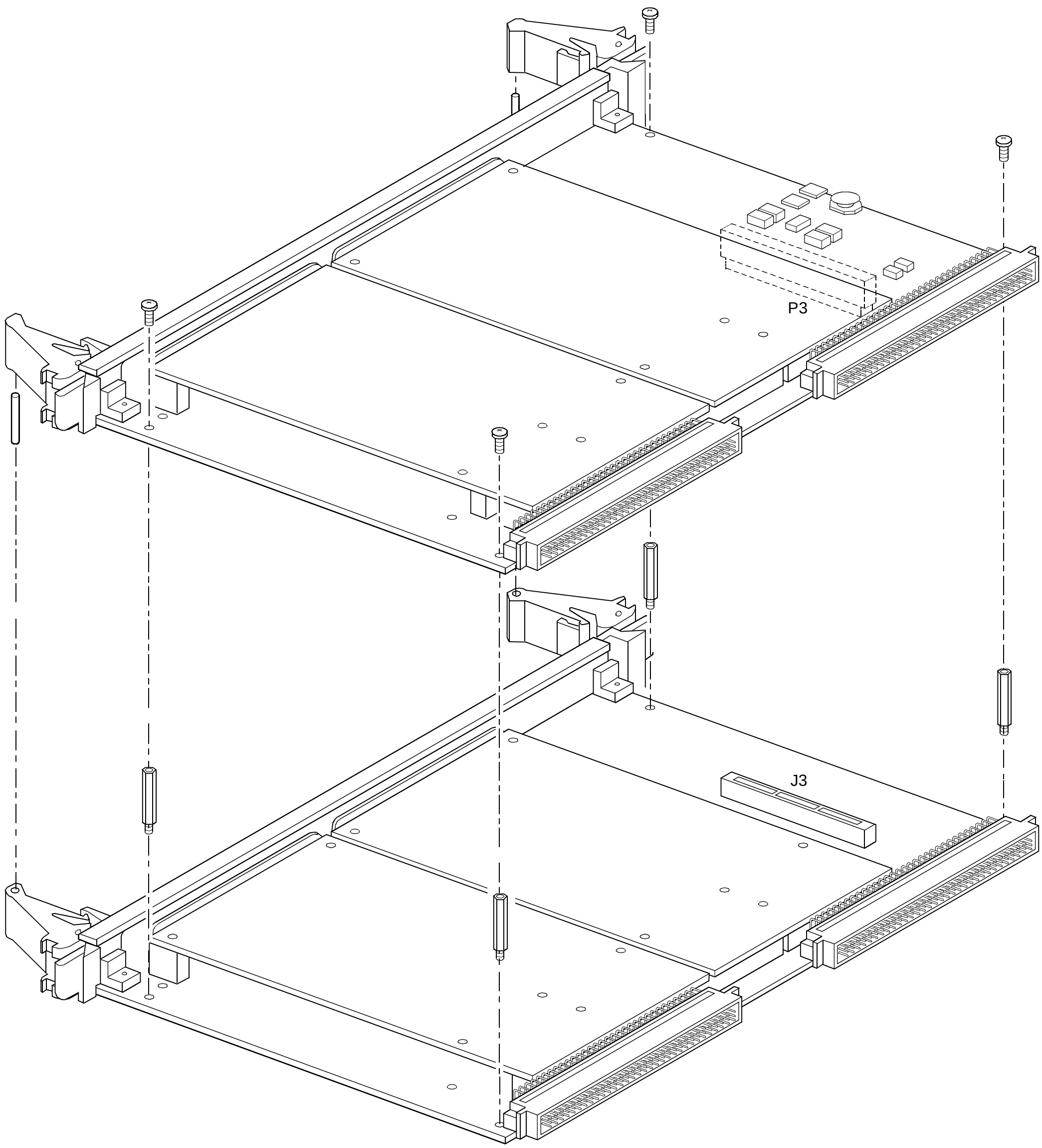


Figure 2-11. XRPMCEXP2 Installation onto a XRPMCEXP1

CPU Modules 3

This section describes the CPU components of the XR system. It gives correct system strapping and switch settings for each supported CPU module.

Detailed information about the boards is contained in the hardware manuals listed in *Related Publications* in Chapter 1.

CPU Module Components

The CPU modules that use the VMEbus backplane in the XR computer systems are listed in the table below. The table provides the model number, a brief description, and the number of slots required for each module.

Table 3-1. CPU ModuleComponents

Module Number	Description	VME Slots Used	Page
XR60*x*-1P (where *x*=3, 4, or 3E)	PowerPC™ CPU Controller (MVME1600)	1 or 2	3-2
XR60*y*E-1X (A) (where *y*=3 or 4)	PowerPC™ CPU Controller (MVME2600)	1 or 2	3-9
XR604E-1D (A)	PowerPC™ CPU Controller (MVME3600)	2	3-14
XR604E-2D (A)	PowerPC™ CPU Controller (MVME4600)	2	3-20

Note The “(A)” designation in the Module Number column denotes CPU modules that are available with the VME64 (extended) injector handles. CPU modules equipped with these handles can only be used in the XR series Extended Chassis (refer to the *XR Series System Chassis Reference Guide*).

XR603-1P/603E-1P/604-1P Family of Single-Board Computers

The XR603-1P (single-high) and the XR604-1P (double-high) is a VMEmodule equipped with a PowerPC™ Series microprocessor. The XR603-1P is equipped with a PowerPC 603 microprocessor; the XR603E-1P carries a PowerPC 603e microprocessor; the XR604-1P has a PowerPC 604 microprocessor.

Note The XR712-101F and XR712-103F together provide the full I/O capability (4 DB-25 serial ports, synchronous Port 3, 68-pin SCSI port, ethernet AUI port, plus a 10Base-T transceiver RJ-45 interface, and a centronics/parallel port).

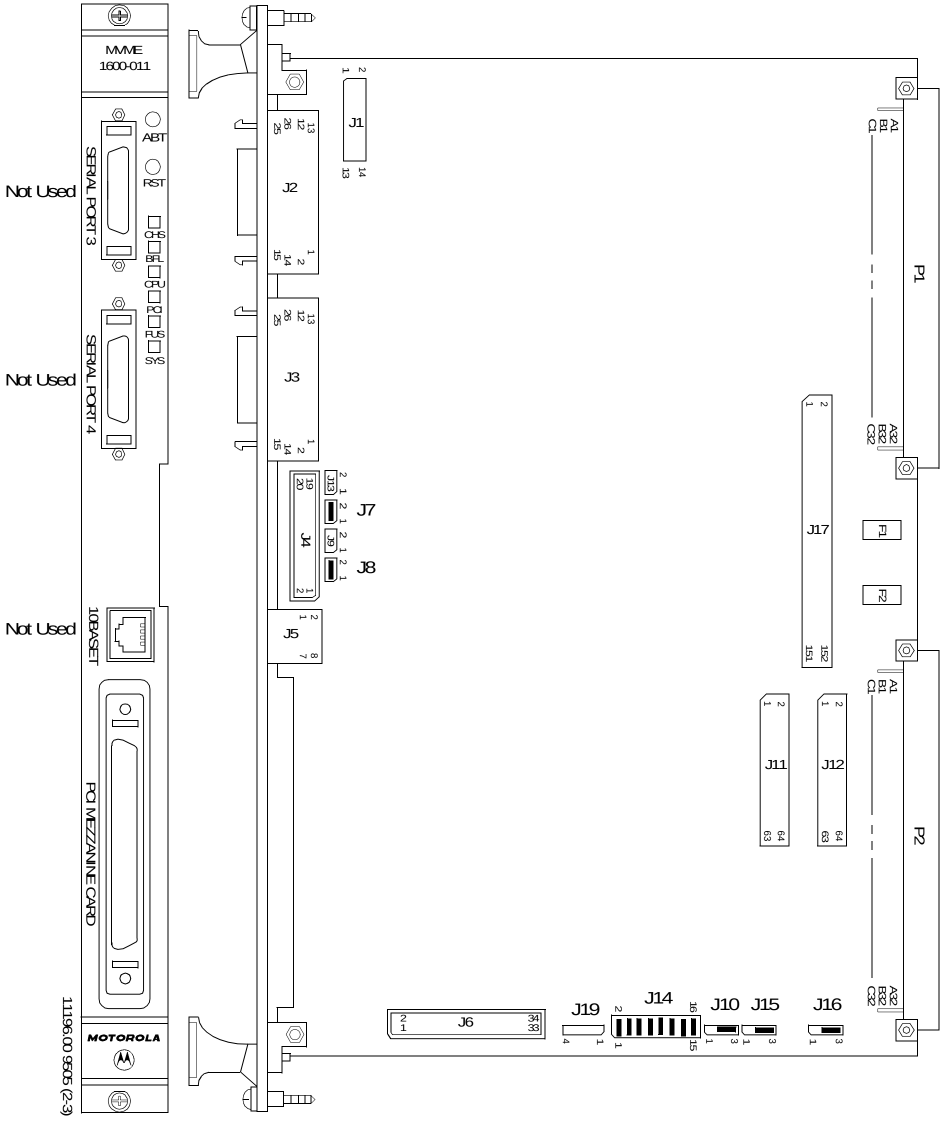


Figure 3-1. XR603-1P/603E-1P/604-1P Switches, Headers, Connectors, Fuses, LEDs

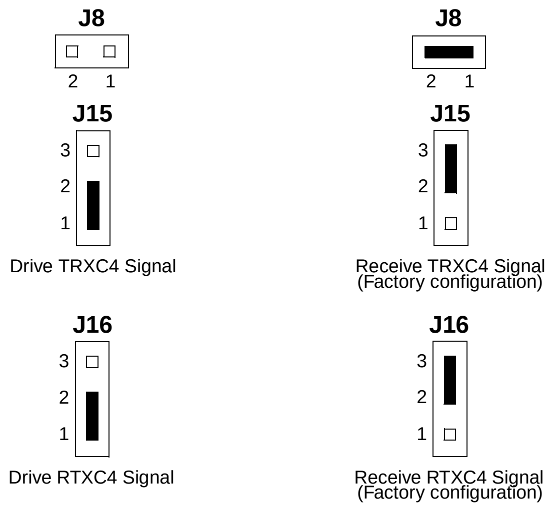
3

Serial Port 4 DCE/DTE Selection (J7)

Serial port 4 is DCE/DTE configurable. Header J7 sets a configuration bit for serial port 4 in the Z8536 ID register. Software reads the bit as either a DCE or DTE value and configures the port accordingly.

Serial Port 4 Clock Selection (J8/15/16)

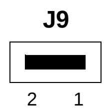
Serial Port 4 is shipped configured for asynchronous communications. Port 4 can be configured for synchronous communications as well. It can either drive (using the internal clock) or receive (using an external clock) the Receive and Transmit clock signals. To select synchronous communications for the Serial Port 4 connection, install jumpers on headers J8, J15, and J16 in one of the configurations shown.



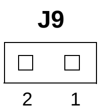
Serial Port 4 I/O Path Selection (J9)

Serial port 4's I/O signals are routed to backplane connector P2 and to front panel connector J3. Header J9 determines the state of the DSR, RI, and TM signals on serial port 4. With a jumper installed on J9, DSR, RI, and TM come from the front panel. XR system configurations require the XR712-101 for synchronous operations.

With the jumper removed, P2 I/O is selected. The DSR, RI, and TM signals are not supported in this case, so DSR is held true while RI and TM are held false.



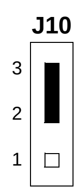
Jumper On = Front Panel I/O
DSR, RI, and TM from front panel
to 8536 device



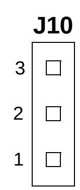
Jumper Off = P2 I/O (factory configuration)
DSR to 8536 device held true
RI and TM to 8536 device held false

VMEbus System Controller Selection (J10)

The module is factory-configured in system controller mode.



System Controller
(factory configuration)



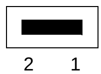
Not System Controller

Serial Port 3 I/O Path Selection (J13)

Serial port 3's I/O signals are routed to backplane connector P2 and to front panel connector J2. Header J13 determines the state of the DSR, RI, and TM signals on serial port 3. With a jumper installed on J13, DSR, RI, and TM come from the front panel. Serial port 3 is not used in XR system configurations.

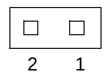
With the jumper removed, P2 I/O is selected. The DSR, RI, and TM signals are not supported in this case, so DSR is held true while RI and TM are held false.

J13



Jumper On = Front Panel I/O
DSR, RI, and TM from front panel
to 8536 device

J13



Jumper Off = P2 I/O (factory configuration)
DSR to 8536 device held true
RI and TM to 8536 device held false

General-Purpose Software-Readable Header (J14)

Header J14 provides eight readable jumpers. These jumpers can be read as a register at ISA I/O address $80000801. Bit 0 is associated with header pins 1 and 2; bit 7 is associated with pins 15 and 16. The bit values are read as a zero when the jumper is installed, and as a one when the jumper is removed. The PowerPC firmware (PPCBug) reserves the four lower-order bits, SRH3 to SRH0. They are defined as shown:

Low-Order Bit	Pins	Definition
Bit #0 (SRH0)	1—2	Reserved for future use.
Bit #1 (SRH1)	3—4	With the jumper installed between pins 3 and 4 (factory configuration), the debugger uses the current user setup/operation parameters in NVRAM. When the jumper is removed (making the bit a **1**), the debugger uses the default setup/operation parameters in ROM instead.
Bit #2 (SRH2)	5—6	Reserved for future use.
Bit #3 (SRH3)	7—8	Reserved for future use.

The four higher-order bits, SRH4 to SRH7, are user-definable. They can be allocated as necessary to specific applications.

The module is shipped with J14 set to all zeros (jumpers on all pins).

	J14		PPCBug INSTALLED
SRH7	16	15	USER-DEFINABLE
SRH6			USER-DEFINABLE
SRH5			USER-DEFINABLE
SRH4			USER-DEFINABLE
SRH3	8	7	RESERVED FOR FUTURE USE
SRH2			RESERVED FOR FUTURE USE
SRH1			SETUP PARAMETER SOURCE (IN=NVRAM; OUT=ROM)
SRH0	2	1	RESERVED FOR FUTURE USE

3

Remote Status and Control

The remote status and control connector, J4, is a keyed double-row 20-pin connector located behind the front panel. Table 3-2 lists the pin numbers, signal mnemonics, and signal descriptions for J4.

Table 3-2. Remote Reset Connector J4 Interconnect Signals

Pin Number	Signal Mnemonic	Signal Name and Description
1	+5VRMT	**+5 Vdc Power**. Fused through fuse F1; +5 Vdc power to a user-supplied external connection.
2	LANLED*	**LAN LED**. Signal goes low when the LAN LED illuminates.
3	FUSELED*	**RPWR LED**. Signal goes low when the FUSE LED illuminates.
4	SCSILED*	**SCSI LED**. Signal goes low when the SCSI LED illuminates.
5	PCILED*	**PCI LED**. Signal goes low when the PCI LED illuminates.
6		10KΩ pullup line.
7	RUNLED*	**RUN LED**. Signal goes low when the RUN LED illuminates.
8	STATLED*	**STATUS LED**. Signal goes low when the STATUS LED illuminates.
9	FAILLED*	**FAIL LED**. Signal goes low when the FAIL LED illuminates.
10		10KΩ pullup line.
11	SCONLED*	**SCON LED**. Signal goes low when the SCON LED illuminates.
12	ABORTSW*	**ABORT Switch**. Signal goes low when the ABORT switch is pressed. It may be forced low externally for a remote abort.
13	RESETSW*	**RESET Switch**. Signal goes low when the RESET switch is pressed. It may be forced low externally for a remote reset.
14, 15	GND	**Ground**.
16		10KΩ pullup line.
17		Not used.
18	IRQ	**Interrupt Request**. General-purpose interrupt input line.
19	SPKR	**Speaker**. Speaker output line.
20	GND	**Ground**.

XR603E-1X (A)/XR604E-1X (A) Family of Single-Board Computers

The XR603E-1X (A)/604E-1X(A) is a VMEmodule single-board computer equipped with a PowerPC™ Series microprocessor. The XR603E-1X (A) is equipped with a PowerPC 603e microprocessor; the XR604E-1X (A) has a PowerPC 604e. 256KB L2 cache (level 2 secondary cache memory) is used.

The (A) version of the boards are equipped with the VME64 (Extended) injector handles. These boards can only be used in the XR Extended Chassis line of chassis. For more information about the VME64 handles, refer to Appendix A.

Note The XR712-123TP and XR712-121 together provide the full I/O capability (4 serial ports, 68-pin SCSI port, 10Base-T/100Base-TX RJ-45 interface, and a parallel port).

3

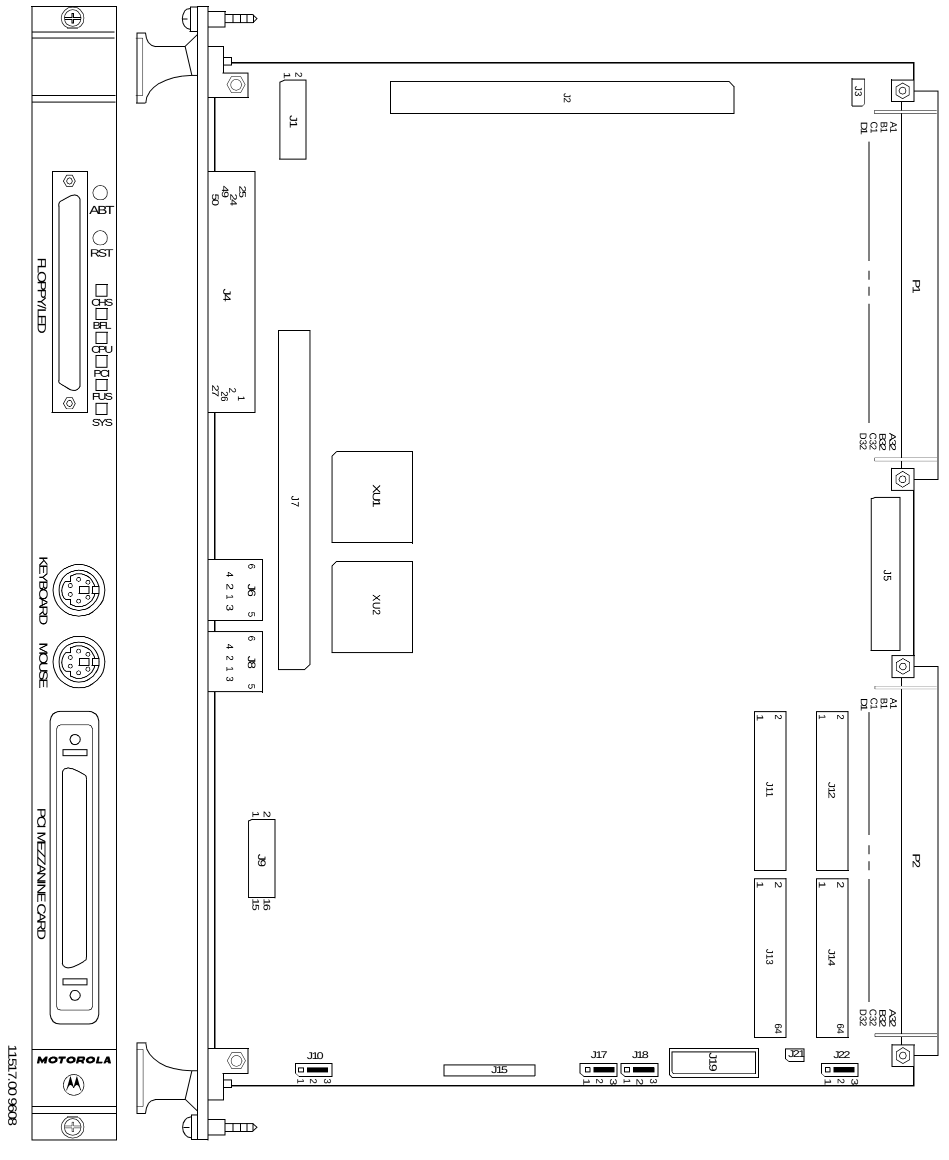
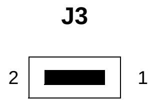


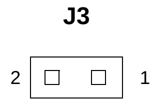
Figure 3-2. XR603E-1X/604E-1X Switches, Headers, Connectors, Fuses, LEDs

Cache Mode Control (J3)

256KB of L2 cache memory is available on the XR603E-1X/604E-1X. L2 cache operation is transparent to users, but its write-through mode is configurable via header J3. With a jumper installed on J3, cache write-through is under CPU control. With the jumper removed, cache write-through occurs in all cases.



Cache Write-Through under CPU Control



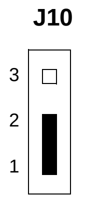
Cache Write-Through Always
(factory configuration)

Flash Bank Selection (J10)

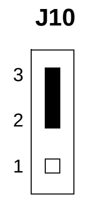
The XR603E-1X/604E-1X base board has provision for 1MB of 16-bit Flash memory. The RAM200 memory mezzanine accommodates 4MB or 8MB of additional 64-bit Flash memory.

The Flash memory is organized in either one or two banks, each bank either 16 or 64 bits wide.

To enable Flash bank A (4MB or 8MB of firmware resident on soldered-in devices on the RAM200 mezzanine), place a jumper across header J10 pins 1 and 2. To enable Flash bank B (1MB of firmware located in sockets on the base board), place a jumper across header J10 pins 2 and 3.



Flash Bank A Enabled (4MB/8MB, Soldered)

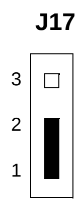


Flash Bank B Enabled (1MB, Sockets)
(factory configuration)

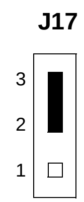
3

Serial Port 4 Transmit Clock Configuration (J17)

In synchronous serial communications, you can configure Serial Port 4 to use the clock signals provided by the TxC signal line. Header J17 configures port 4 to either drive or receive TxC. The factory configuration has port 4 set to receive TxC.



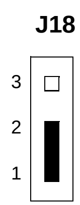
Drive TxC



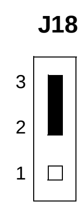
Receive TxC
(factory configuration)

Serial Port 3 Transmit Clock Configuration (J18)

Header J18 configures port 3 to either drive or receive TxC. The factory configuration has port 3 set to receive TxC.



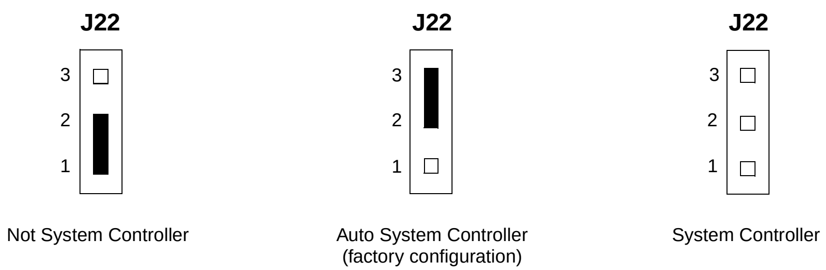
Drive TxC



Receive TxC
(factory configuration)

System Controller Selection (J22)

The module is factory-configured as a VMEbus system controller by jumper header J22. If you select the “automatic” system controller function by placing a jumper on J22 pins 2 and 3, the module determines whether it is the system controller by its position on the bus. If the board is in the first slot from the left, it configures itself as the system controller. If the module is not to be system controller under any circumstances, place the jumper on J22 pins 1 and 2. When the board is functioning as system controller, the SCON LED is turned on.



Remote Status and Control

The front panel LEDs and switches are mounted on a removable mezzanine board. Removing the LED mezzanine makes the mezzanine connector (J1, a keyed double-row 14-pin connector) available for service as a remote status and control connector. The following table lists the pin numbers and signal mnemonics for J1.

1	GND	RESETSW*	2
3	No Connection	ABORTSW*	4
5	PCILED*	FAILLED*	6
7	LANLED*	STATLED*	8
9	FUSELED*	RUNLED*	10
11	SBSYLED*	SCONLED*	12
13	+5V	SPKR	14

XR604E-1D (A) Single-Board Computer

The XR604E-1D (see Figure 3-3 on page 3-15) is a double-high VME module single-board computer equipped with a PowerPC™ 604e microprocessor. 256KB L2 cache (level 2 secondary cache memory) is used.

The XR604E-1D (A) version of the board is equipped with the VME64 (Extended) injector handles. This board can only be used in the XR Extended Chassis line of chassis. For more information about the VME64 handles, refer to Appendix A.

Note The XR712-123TP, XR712-121, and XR712-131*x* together provide the full I/O capability (4 serial ports, single-ended or differential 68-pin SCSI port, Ethernet AUI port, plus a 10Base-T/100Base-TX transceiver RJ-45 interface, and a parallel port).

The XR712-121 and XR712-129TP transition module combination is similar to the XR712-121 and XR712-123 combination with the exception that the XR712-129TP utilizes the parallel interface to implement an alarm interface for the XR series alarm subsystem.

3

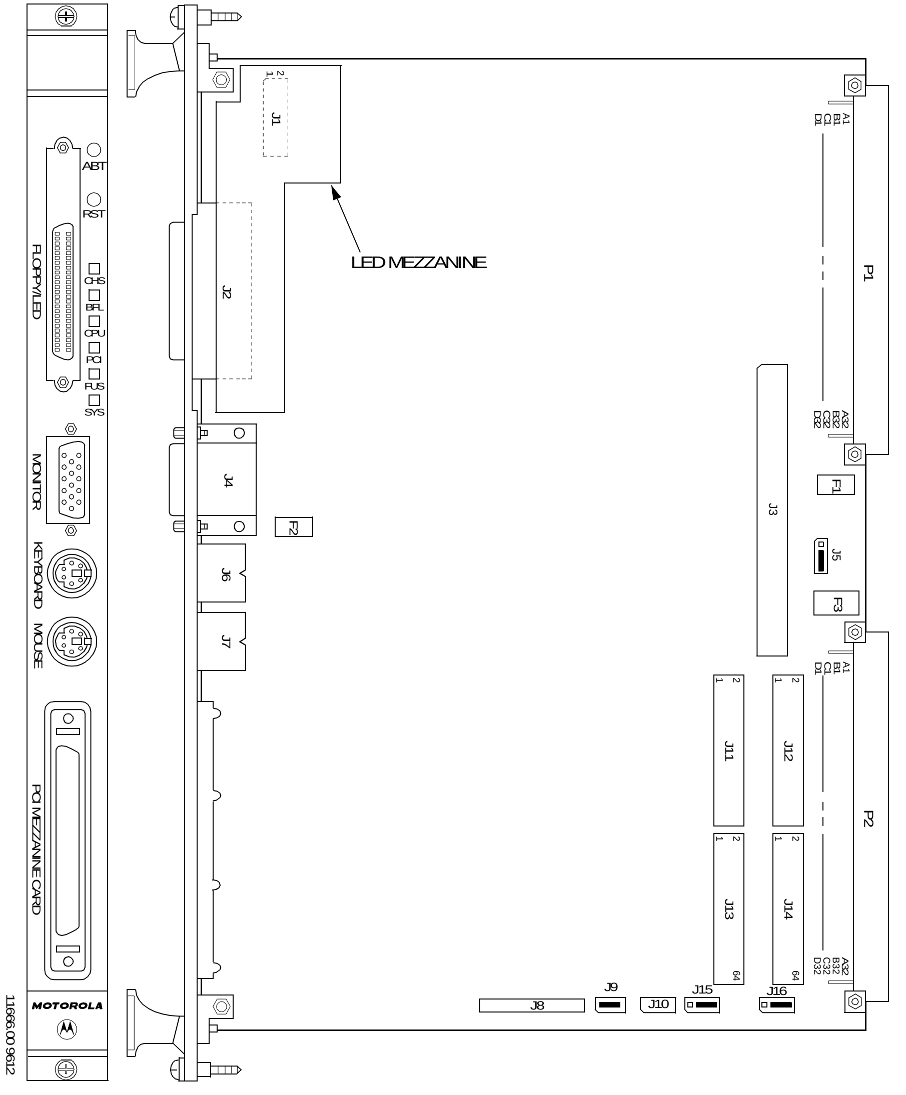
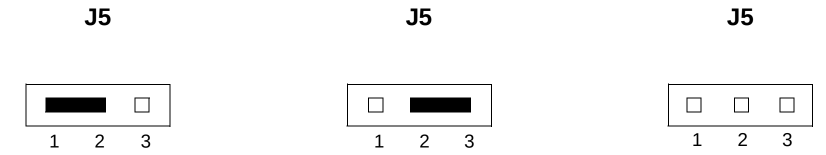


Figure 3-3. XR604E-1D Switches, Headers, Connectors, Fuses, LEDs

3

System Controller Selection (J5)

The module is factory-configured as an autoselective VMEbus system controller.



Not System Controller — Auto System Controller (factory configuration) — System Controller

Serial Port 3 Transmit Clock Configuration (J15)

In synchronous serial communications, you can configure Serial Port 3 to use the clock signals provided by the TxC signal line. Header J15 configures port 3 to either drive or receive TxC. The factory configuration has port 3 set to receive TxC.

Drive TxC — Receive TxC (factory configuration)

Serial Port 4 Transmit Clock Receiver Buffer Control (J9)

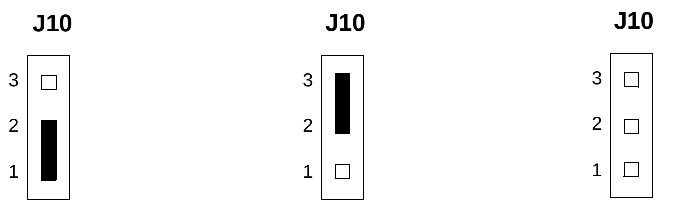
A transmit clock receiver buffer (controlled by header J9) is associated with Serial Port 4. Installing a jumper on J9 enables the buffer. Removing the jumper disables the buffer. The factory configuration has the Serial Port 4 buffer enabled.

Buffer Enabled
(factory configuration)

Buffer Disabled

Serial Port 4 Receive Clock Configuration (J10)

J10 is factory-configured with no jumpers installed.



Drive RxC

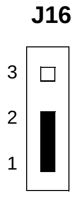
Receive RxC
(factory configuration)

Factory configuration

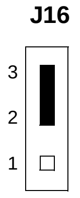
3

Serial Port 4 Transmit Clock Configuration (J16)

In synchronous serial communications, you can configure Serial Port 4 to use the clock signals provided by the TxC signal line. Header J16, located on the base board, configures port 4 to either drive or receive TxC. The factory configuration has port 4 set to receive TxC.



Drive TxC



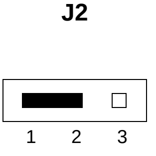
Receive TxC
(factory configuration)

Flash Bank Selection (J2)

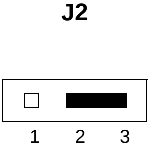
The processor/memory mezzanine has provision for 1MB of 16-bit Flash memory for the on-board firmware (or for customer-specific applications). In addition, it accommodates 4MB or 8MB of 64-bit Flash memory specifically for customer use.

The Flash memory is organized in either one or two banks, each bank either 16 or 64 bits wide.

To enable Flash bank A (4MB or 8MB of firmware resident on soldered-in devices on the processor/memory mezzanine), place a jumper across header J2 pins 1 and 2. To enable Flash bank B (1MB of firmware located in sockets on the processor/memory mezzanine), place a jumper across header J2 pins 2 and 3. The factory configuration uses Flash bank B.



Flash Bank A Enabled (4MB/8MB, Soldered)

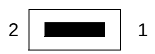


Flash Bank B Enabled (1MB, Sockets)
(factory configuration)

Cache Mode Control (J11)

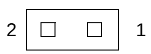
256KB of L2 cache memory is available on the module. L2 cache operation is transparent to users, but its write-through mode is configurable via header J11 on the processor/memory mezzanine. With a jumper installed on J11, cache write-through is under CPU control. With the jumper removed, cache write-through occurs in all cases.

J11



Cache Write-Through under CPU Control

J11



Cache Write-Through Always
(factory configuration)

Remote Status and Control

The front panel LEDs and switches are mounted on a removable mezzanine board. Removing the LED mezzanine makes the mezzanine connector (J1, a keyed double-row 14-pin connector) available for service as a remote status and control connector. In this application, J1 can be connected to a user-supplied external cable to carry the Reset and Abort signals and the LED lines to a control panel located apart from the module. The following table lists the pin numbers and signal mnemonics for J1.

1	GND	RESETSW*	2
3	No Connection	ABORTSW*	4
5	PCILED*	FAILLED*	6
7	LANLED*	STATLED*	8
9	FUSELED*	RUNLED*	10
11	SBSYLED*	SCONLED*	12
13	+5V	SPKR	14

XR604E-2D (A) Single-Board Computer

The XR604E-2D is a double-high, two-slot VMEmodule equipped with twin PowerPC 604 microprocessors and 256KB L2 cache (level 2 secondary cache memory).

The XR604E-2D (A) version of the board is equipped with the VME64 (Extended) injector handles. This board can only be used in the XR Extended Chassis line of chassis. For more information about the VME64 injector handles, refer to Appendix A.

Note The XR712-123 and XR712-121 combination provides the full I/O capabilities for the VMEbus slot 1. This pair of transition modules is required to enable PowerStreams™ host-based X.25 on serial ports 3 and 4.

The XR712-121 and XR712-129TP transition module combination is similar to the XR712-121 and XR712-123 combination with the exception that the XR712-129TP utilizes the parallel interface to implement an alarm interface for the XR series alarm subsystem.

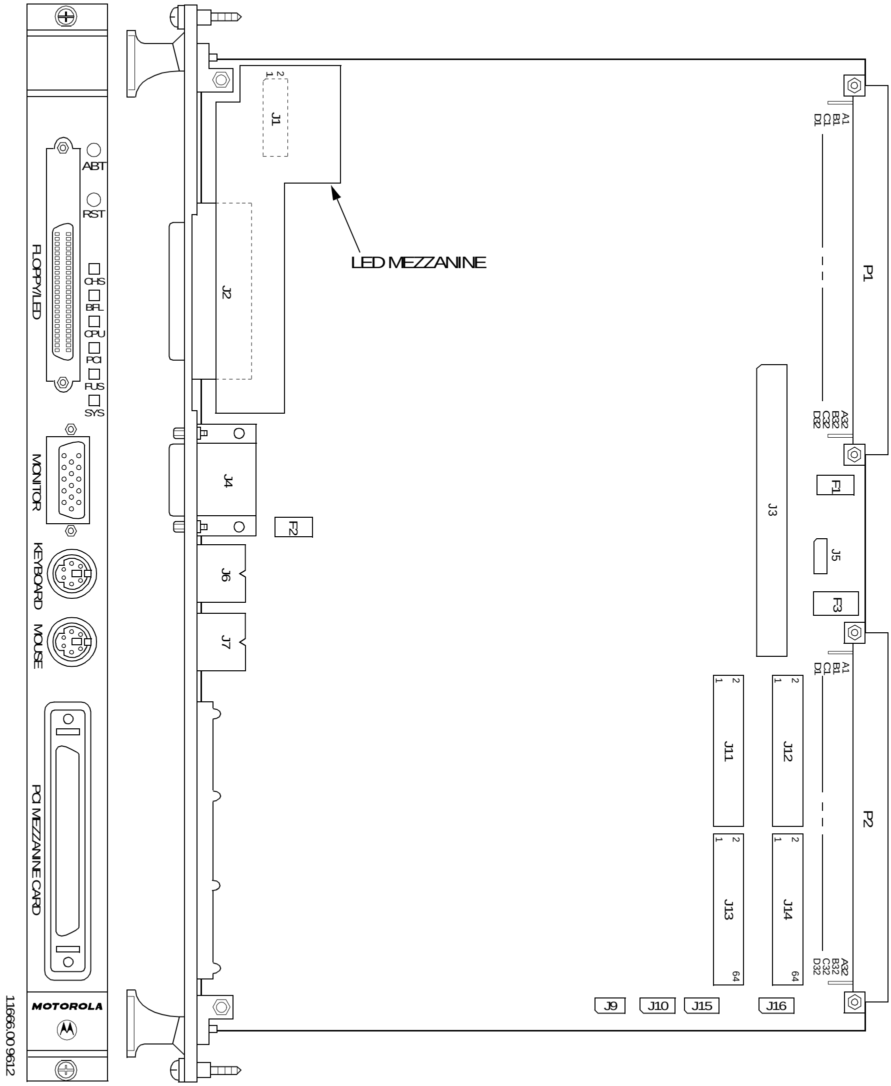


Figure 3-4. Base Board Switches, Headers, Connectors, Fuses, LEDs

3

Jumper Settings

Remote Status and Control (J1)

The XR604E-2D series front panel LEDs and switches are mounted on a removable mezzanine board. Removing the LED mezzanine makes the mezzanine connector (J1, a keyed double-row 14-pin connector) available for service as a remote status and control connector. In this application, J1 can be connected to a user-supplied external cable to carry the Reset and Abort signals and the LED lines to a control panel located apart from the XR604E-2D series VMEmodule. Maximum cable length is 15 feet.

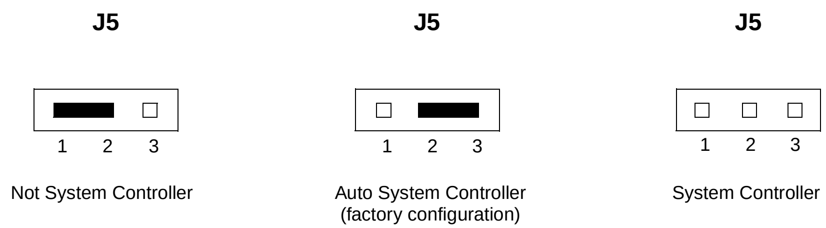
Table 3-3 lists the pin numbers and signal mnemonics for J1.

Table 3-3. LED Mezzanine Connector

1	GND	RESETSW*	2
3	No Connection	ABORTSW*	4
5	PCILED*	FAILLED*	6
7	LANLED*	STATLED*	8
9	FUSELED*	RUNLED*	10
11	SBSYLED*	SCONLED*	12
13	+5V	SPKR	14

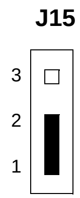
System Controller Selection (J5)

The XR604E-2D series VMEmodule is factory-configured as an autoselective VMEbus system controller.

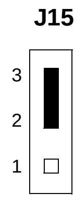


Serial Port 3 Transmit Clock Configuration (J15)

In synchronous serial communications, you can configure Serial Port 3 to use the clock signals provided by the TxC signal line. Header J15 configures port 3 to either drive or receive TxC. The factory configuration has port 3 set to receive TxC.



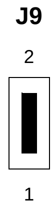
Drive TxC



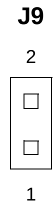
Receive TxC
(factory configuration)

Serial Port 4 Transmit Clock Receiver Buffer Control (J9)

A transmit clock receiver buffer (controlled by header J9) is associated with Serial Port 4. Installing a jumper on J9 enables the buffer. Removing the jumper disables the buffer. The factory configuration has the Serial Port 4 buffer enabled.



Buffer Enabled
(factory configuration)



Buffer Disabled

3

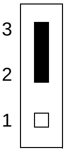
Serial Port 4 Receive Clock Configuration (J10)

The factory configuration has port 4 set to receive RxC. J10 remains open on MVME761-compatible versions.

J10

Drive RxC

J10

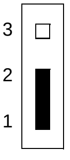


Receive RxC
(factory configuration)

Serial Port 4 Transmit Clock Configuration (J16)

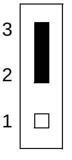
In synchronous serial communications, you can configure Serial Port 4 to use the clock signals provided by the TxC signal line. Header J16, located on the base board, configures port 4 to either drive or receive TxC. The factory configuration has port 4 set to receive TxC.

J16



Drive TxC

J16



Receive TxC
(factory configuration)

Firmware Boot Block Protection (J1)

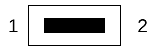
Flash memory on the XR604E-2D series VMEmodule is organized in either one or two banks, each bank either 16 or 64 bits wide.

Flash bank A consists of 4MB or 8MB of firmware resident on soldered-in devices on the processor/memory mezzanine. Flash bank B contains 1MB of firmware located in sockets on the processor/memory mezzanine. Both banks contain the on-board firmware, PPCBug.

The first 16KB of Flash bank A contain the boot block portion of the firmware. Header J1 provides write protection for the boot block.

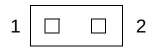
Installing a jumper across header J1 pins 1 and 2 protects the boot block portion of Flash bank A against overwriting. Removing the jumper permits reprogramming of the boot block area along with the rest of Flash memory. The factory configuration uses no jumper on J1, so that Flash bank A is reprogrammable in its entirety.

J1



Boot Block Write-Protected

J1



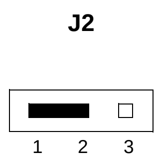
Boot Block Write-Enabled
(factory configuration)

Flash Bank Selection (J2)

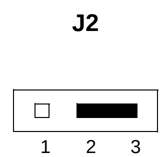
The XR604E-2D series processor/memory mezzanine has provision for 1MB of 16-bit Flash memory for the on-board firmware (or for customer-specific applications). In addition, it accommodates 4MB or 8MB of 64-bit Flash memory specifically for customer use.

The Flash memory is organized in either one or two banks, each bank either 16 or 64 bits wide. Both banks contain the on-board firmware, PPCBug.

To enable Flash bank A (4MB or 8MB of firmware resident on soldered-in devices on the processor/memory mezzanine), place a jumper across header J2 pins 1 and 2. To enable Flash bank B (1MB of firmware located in sockets on the processor/memory mezzanine), place a jumper across header J2 pins 2 and 3. The factory configuration uses Flash bank A.



Flash Bank A Enabled (4MB/8MB, Soldered)
(factory configuration)



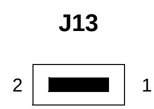
Flash Bank B Enabled (1MB, Sockets)

Secondary SCSI Transfer Rate (J13)

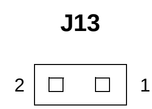
In addition to the primary SCSI interface on the base board, an optional, secondary 16-bit SCSI interface is available on the PM604 processor/memory mezzanine. The secondary SCSI interface features ‘‘Ultra SCSI’’ (Fast-20) technology, permitting a data transfer rate of up to 40MB/s if the equipment supports it.

If that high a transfer rate is not desirable in your application, you can select a ‘‘Fast SCSI’’ speed of 20MB/s by installing a jumper across header J13 pins 1 and 2. Placing a jumper on J13 sets the GPIO1_MASTER line on the secondary SCSI controller chip low, and prevents the operating system from negotiating for ‘‘Ultra’’ speed on secondary SCSI devices.

The factory configuration uses no jumper on J13, so that an ‘‘Ultra’’ transfer rate is the default for secondary SCSI.



GPIO1_MASTER Line Low



GPIO1_MASTER Line High
(factory configuration)

Front Panel Indicators (DS1 - DS6)

3

There are six LEDs on the XR604E-2D front panel: CHS, BFL, CPU, PCI, FUS, and SYS.

- CHS (DS1, yellow). Checkstop; driven by the MPC604 status lines on the XR604E-2D series VMEmodule. Lights when a halt condition from the processor is detected.
- BFL (DS2, yellow). Board Failure; lights when the BRDFAIL* signal line is active.
- CPU (DS3, green). CPU activity; lights when the DBB* (Data Bus Busy) signal line on the processor bus is active.
- PCI (DS4, green). PCI activity; lights when the IRDY* (Initiator Ready) signal line on the PCI bus is active. This indicates that the PCI mezzanine (if installed) is active.
- FUS (DS5, green). Fuse OK; lights when +5Vdc, +12Vdc, and –12Vdc power is available from the base board to the transition module and remote devices.

Note Because the FUS LED monitors the status of several voltages on the XR604E-2D series VMEmodule, it does not directly indicate the condition of any single fuse. If the LED flickers or goes out, check all the fuses (polyswitches).

- SYS (DS6, green). System Controller; lights when the Universe ASIC in the XR604E-2D is the VMEbus system controller.

PMC Modules 4

This section describes the individual PCI Mezzanine Card (PMC) modules available for the XR PowerPC system. It gives correct system strapping and switch settings for each PMC module in the system.

Chapter 2 provides information for removing and installing PMC modules.

System Components

The PMC modules in this chapter are listed in the table below. The table lists the part number, description, and number of PMC slots used for each PMC module.

Note PMC modules that require 2 PMC slots can only be mounted on a PMCspan module.

Table 4-1. PMC Module Components

Module Number	Description	PMC Slots Used	Page
XRPMC100BT	10Base-T/100Base-TX fast ethernet module	1	4-2
XRPMCFDDISAS	Single-attached Fiber Distributed Data Interface module	1	4-5
XRPMCFDDIDAS	Dual-attached Fiber Distributed Data Interface module	1	4-5
XRPMCSCSISW	Single-ended SCSI-2 Module	1	4-9
XRPMCSCSIDW	Differential SCSI-2 Module	1	4-9
XRPMCSYNC6	6-port synchronous communications controller	2	4-15

XRPMC100BT

The XRPMC100BT Fast Ethernet module is a single-wide PMC card which contains a +5V PCI interface through two 64-pin PMC connectors. It is designed to be used on VME carrier boards with PCI Bus functionality.

The XRPMC100BT provides high-performance communication between your Fast Ethernet local area network (LAN) and a PCI bus-based host. It supports Fast Ethernet 10Base-T and 100Base-TX networking with unshielded twisted pair (UTP) RJ-45 cable.

The front panel is equipped with a DB-14 female connector. An RJ-45 adapter cable is provided for connecting a Category 5 Unshielded Twisted Pair (UTP) cable with an RJ-45 connector to the XRPMC100BT. The cable can be routed to a transition panel in the back of the chassis (see XRPMCLANPANL in Chapter 6) for rear-access cabling.

Figure 4-1 on page 4-3 shows the XRPMC100BT board layout and front panel.

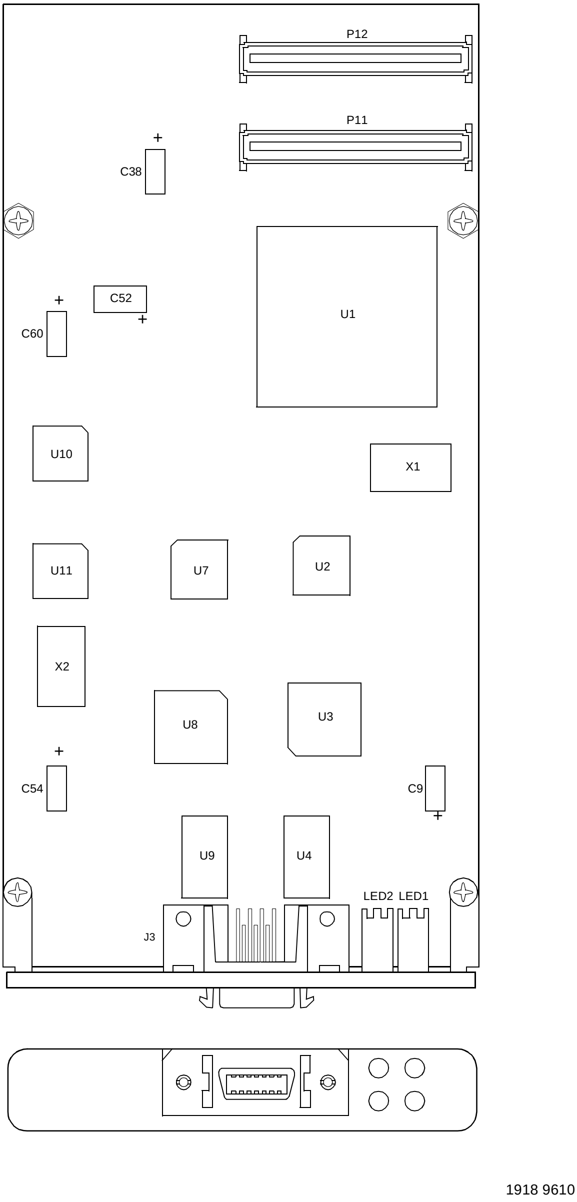


Figure 4-1. XRPMC100BT Board Layout and Front Panel

4

Front Panel LED Activity

Self-adapting LEDs indicate your workstation's connection to your 10Mbps or 100Mbps network and its Tx/Rx activity:

- Yellow LEDs on the front panel of the XRPMC100BT indicate 10Mbps operations.
- Green LEDs on the front panel of the XRPMC100BT indicate100Mbps operations.

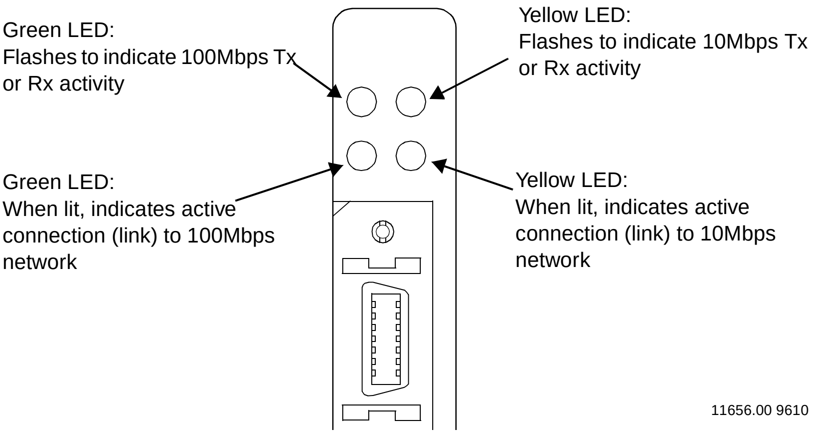


Figure 4-2. LEDs on the XRPMC100BT Front Panel

Note The LED activity on the front panel is not valid until the driver has been installed and configured.

XRPMCFDDISAS / XRPMCFDDIDAS

The XRPMCFDDISAS and XRPMCFDDIDAS Fiber Distributed Data Interface (FDDI) adapters provide high-performance communication between an FDDI local area network (LAN) and a carrier board equipped with PMC (PCI Mezzanine Card) connections.

The XRPMCFDDISAS/XRPMCFDDIDAS support extended FDDI address detection and matching. The XRPMCFDDIDAS provides host software programmable control of an external Optical Bypass Relay (OBR) for dual-attached station (DAS) configurations.

The XRPMCFDDISAS supports single-attached (SAS) workstation configurations with Small Configuration (SC) connectors supporting fiber optic media. This board connects to a single-ring FDDI network.

The XRPMCFDDIDAS supports dual-attached (DAS) workstation configurations with SC connectors supporting fiber optic media and optional optical bypass relay. This board connects to a dual-ring FDDI network. Each ring connection requires one optical transceiver.

The FDDI cables can be routed to a transition panel in the back of the chassis (see XRPMCLANPANL in Chapter 6) for rear-access cabling.

Figure 4-3 shows the XRPMCFDDISAS component layout and front panel. Figure 4-4 shows the XRPMCFDDIDAS component layout and front panel.

4

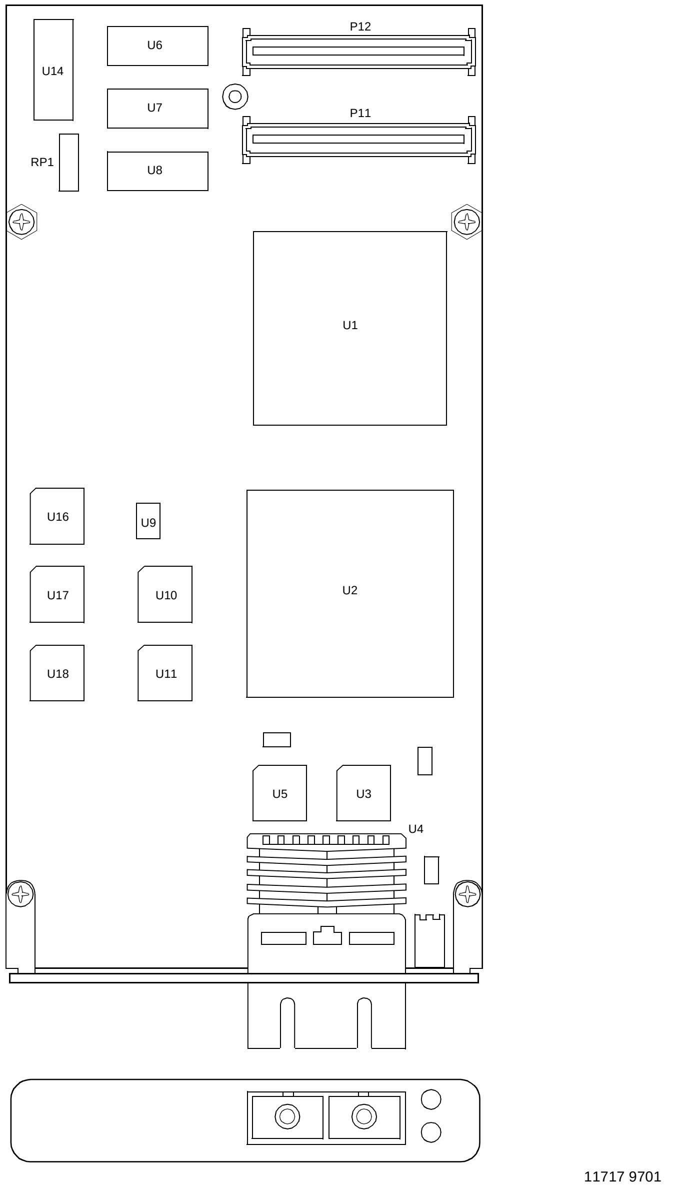


Figure 4-3. XRPMCFDDISAS Board Layout and Front Panel

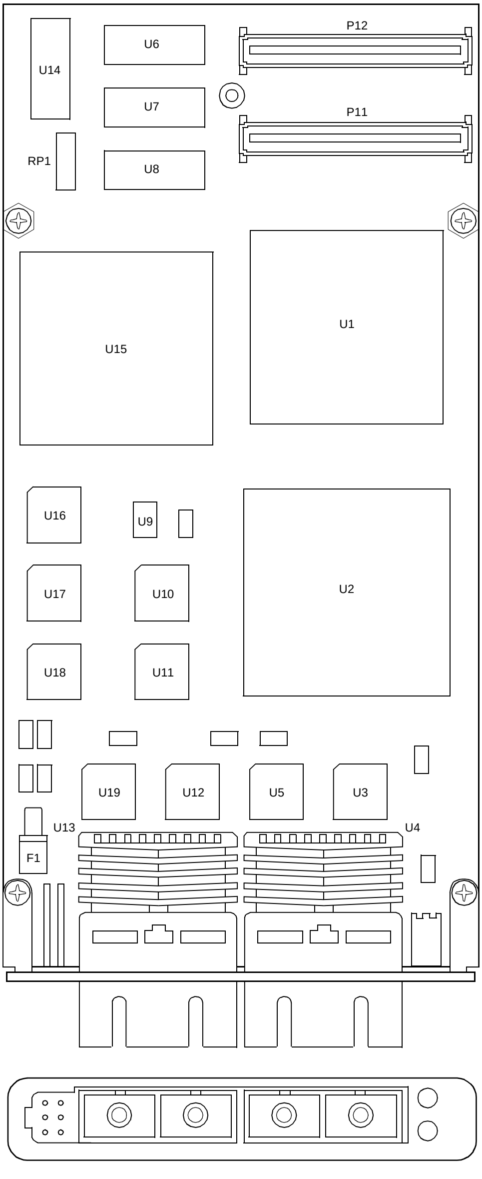


Figure 4-4. XRPMCFDDIDAS Board Layout and Front Panel

Front Panel LEDs

Use the green and yellow LEDs on the XRPMCFDDISAS/XRPMCFDDIDAS to troubleshoot network problems. Use Table 4-2, below, to interpret the LEDs.

Table 4-2. Front Panel LEDs

LED Status		Board Status	Control Register		Description
Yellow	**Green**		**Bit 0**	**Bit 1**	
Off	Off	Fail	0	0	Adapter is not functional, or driver is not installed
Off	On	Ring Op	0	1	Ring operation THRU B (XRPMCFDDIDAS); wrap S (XRPMCFDDISAS)
On	Off	Cable Error	1	0	Adapter is not able to connect; could be a cable problem
On	On	Ring Op/ Wrapped	1	1	Ring operation; wrap A or B (XRPMCFDDIDAS); not used for XRPMCFDDISAS

XRPMCSCSISW/XRPMCSCSIDW

The XRPMCSCSISW and XRPMCSCSIDW provide fast and wide SCSI-2 (Small Computer System Interface-2) high throughput connectivity for host carrier boards equipped with PMC (PCI Mezzanine Card) connections. The XRPMCSCSISW supports single-ended SCSI-2 connections; the XRPMCSCSIDW supports differential SCSI-2 connections.

The PMC adapters are plug-and-play devices with systems that are compliant with the PCI Local Bus Specification (revision 2.0).

The XRPMCSCSISW and XRPMCSCSIDW SCSI-2 adapters have the following capabilities:

- Single-wide PMC module
- 32-bit, zero wait state PCI DMA master
- Up to 132 Mbps burst DMA rate
- 20 Mbps Fast and Wide SCSI-2
- Single-ended (XRPMCSCSISW) or differential (XRPMCSCSIDW) SCSI-2 interfaces
- Support for up to 15 devices from a single slot
- 64K EPROM for Network Boot or BIOS Firmware
- Compliance to PCI local bus specification (Revision 2.0)

Figure 4-5 shows the XRPMCSCSISW component layout and front panel. Figure 4-6 shows the XRPMCSCSIDW component layout and front panel.

Note Single-ended and differential connections are electronically incompatible, and can not be mixed on the same physical bus. The overall performance of the two is about the same.

4

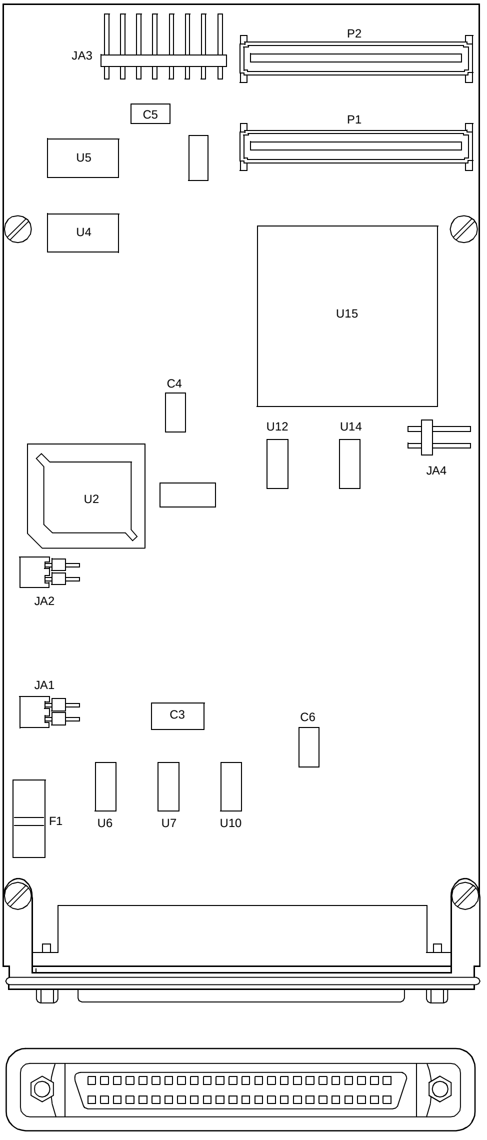


Figure 4-5. XRPMCSCSISW Single-ended SCSI-2 Adapter

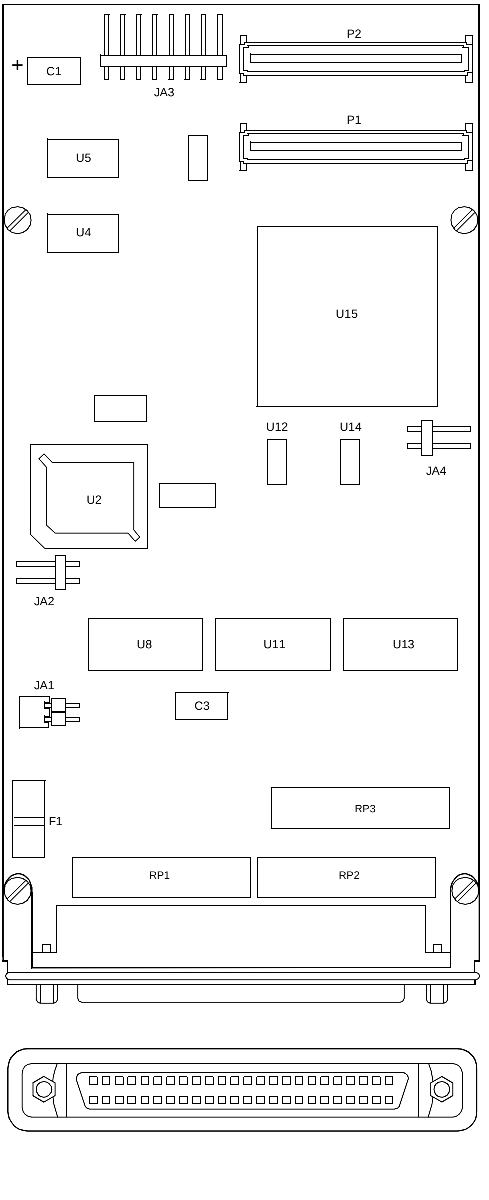


Figure 4-6. XRPMCSCSIDW Differential SCSI-2 Adapter

4

Jumper Settings

Table 4-3. XRPMCSCSISW / XRPMCSCSIDW Adapter Jumper Settings

Jumper	Setting
JA1	When jumper is installed, the adapter supplies terminator power to the SCSI bus. Default = jumper installed
JA2	The SCSI bus terminators are enabled by this jumper, as follows: Default = XRPMCSCSISW jumper installed; XRPMCSCSIDW jumper not installed
JA3	No user capabilities. Default = jumper not installed
JA4	When jumper is installed, the Big Endian mode is enabled. When no jumper is installed (default), Little Endian mode.

Terminators - The SCSI bus (cable) must be properly terminated at each end of the bus. The first and last device on the bus should be the only devices that are set to terminate the bus.

Terminator Power - The SCSI terminators require adequate voltage to properly terminate the SCSI bus. All SCSI host adapters on the bus should be set to supply terminator power; and where possible, be located at the end of the bus and serve as bus terminators.

The terminator resistors must be present on the first and last device on the bus only.

Connector Pin Assignments

The tables on the following pages provide the connector pin assignments for the SCSI connector on the XRPMCSCSISW and XRPMCSCSIDW SCSI PMC adapters. The connector uses a 68-pin Euro style SCSI cable, either shielded for external or internal cabinet applications or non-shielded for internal cabinet applications only.

Table 4-4. XRPMCSCSISW Contact Assignments

Signal name	Connector contact number	Cable conductor number		Connector contact number	Signal name
Ground	1	1	2	35	-DB(12)
Ground	2	3	4	36	-DB(13)
Ground	3	5	6	37	-DB(14)
Ground	4	7	8	38	-DB(15)
Ground	5	9	10	39	-DB(P1)
Ground	6	11	12	40	-DB(0)
Ground	7	13	14	41	-DB(1)
Ground	8	15	16	42	-DB(2)
Ground	9	17	18	43	-DB(3)
Ground	10	19	20	44	-DB(4)
Ground	11	21	22	45	-DB(5)
Ground	12	23	24	46	-DB(6)
Ground	13	25	26	47	-DB(7)
Ground	14	27	28	48	-DB(P)
Ground	15	29	30	49	Ground
Ground	16	31	32	50	Ground
TERMPWR	17	33	34	51	TERMPWR
TERMPWR	18	35	36	52	TERMPWR
Reserved	19	37	38	53	Reserved
Ground	20	39	40	54	Ground
Ground	21	41	42	55	-ATN
Ground	22	43	44	56	Ground
Ground	23	45	46	57	-BSY
Ground	24	47	48	58	-ACK
Ground	25	49	50	59	-RST
Ground	26	51	52	60	-MSG
Ground	27	53	54	61	-SEL
Ground	28	55	56	62	-C/D
Ground	29	57	58	63	-REQ
Ground	30	59	60	64	-I/O
Ground	31	61	62	65	-DB(8)
Ground	32	63	64	66	-DB(9)
Ground	33	65	66	67	-DB(10)
Ground	34	67	68	68	-DB(11)

4

Table 4-5. XRPMCSCSIDW Contact Assignments

Signal name	Connector contact number	Cable conductor number		Connector contact number	Signal name
+DB(12)	1	1	2	35	-DB(12)
+DB(13)	2	3	4	36	-DB(13)
+DB(14)	3	5	6	37	-DB(14)
+DB(15)	4	7	8	38	-DB(15)
+DB(P1)	5	9	10	39	-DB(P1)
Ground	6	11	12	40	Ground
+DB(0)	7	13	14	41	-DB(0)
+DB(1)	8	15	16	42	-DB(1)
+DB(2)	9	17	18	43	-DB(2)
+DB(3)	10	19	20	44	-DB(3)
+DB(4)	11	21	22	45	-DB(4)
+DB(5)	12	23	24	46	-DB(5)
+DB(6)	13	25	26	47	-DB(6)
+DB(7)	14	27	28	48	-DB(7)
+DB(P)	15	29	30	49	-DB(P)
DIFFSENS	16	31	32	50	Ground
TERMPWR	17	33	34	51	TERMPWR
TERMPWR	18	35	36	52	TERMPWR
Reserved	19	37	38	53	Reserved
+ATN	20	39	40	54	-ATN
Ground	21	41	42	55	Ground
+BSY	22	43	44	56	-BSY
+ACK	23	45	46	57	-ACK
+RST	24	47	48	58	-RST
+MSG	25	49	50	59	-MSG
+SEL	26	51	52	60	-SEL
+C/D	27	53	54	61	-C/D
+REQ	28	55	56	62	-REQ
+I/O	29	57	58	63	-I/O
Ground	30	59	60	64	Ground
+DB(8)	31	61	62	65	-DB(8)
+DB(9)	32	63	64	66	-DB(9)
+DB(10)	33	65	66	67	-DB(10)
+DB(11)	34	67	68	68	-DB(11)

XRPMCSYNC6

The XRPMCSYNC6 PCI Mezzanine Card (PMC) module provides WAN connectivity over several interfaces. Full I/O capability is provided by an MVME762 transition module (see Chapter 6). This PMC module is double-wide and can only be installed on a PMCspan module (see Chapter 3); CPU modules only provide one PMC slot.

The XRPMCSYNC6 is based on two MC68360s, and conforms to dimensional requirements specified in Section 3.2 of IEEE-P1386 for a DB_2 type card. It supports a +5V PCI interface through two 64-pin PMC connectors. In addition, there is a PMC connector for the P2 Mux Bus. This connector routes port signals from the XRPMCSYNC6 to the PMCspan, which in turn routes these signals to the MVME762 Transition Module. This connection supports six serial ports.

You may configure Ports 3 through 8 for EIA-232-D, EIA-530, X.21, or V.35 as either a DCE or DTE interface. The configuration is done by installing a Serial Interface Module (SIM) on the MVME762 Transition Module. The choice of interface can made on a port by port basis.

LEDs

Two user-programmable LEDs, RUN and STATUS, are provided for each processor. These LEDs are lit on reset until the Port B control registers are written. When a 1 is written to the corresponding bit in the Port B data register, the LED will turn off. These LEDs are controlled by bits in the Port B register on each MC68360 as shown in Table 4-6.

Table 4-6. LED Bits in Port B Register

LED	Color	Port B Bit
STATUS LED	Yellow	Bit 0 (PB0)
RUN LED	Green	Bit 1 (PB1)

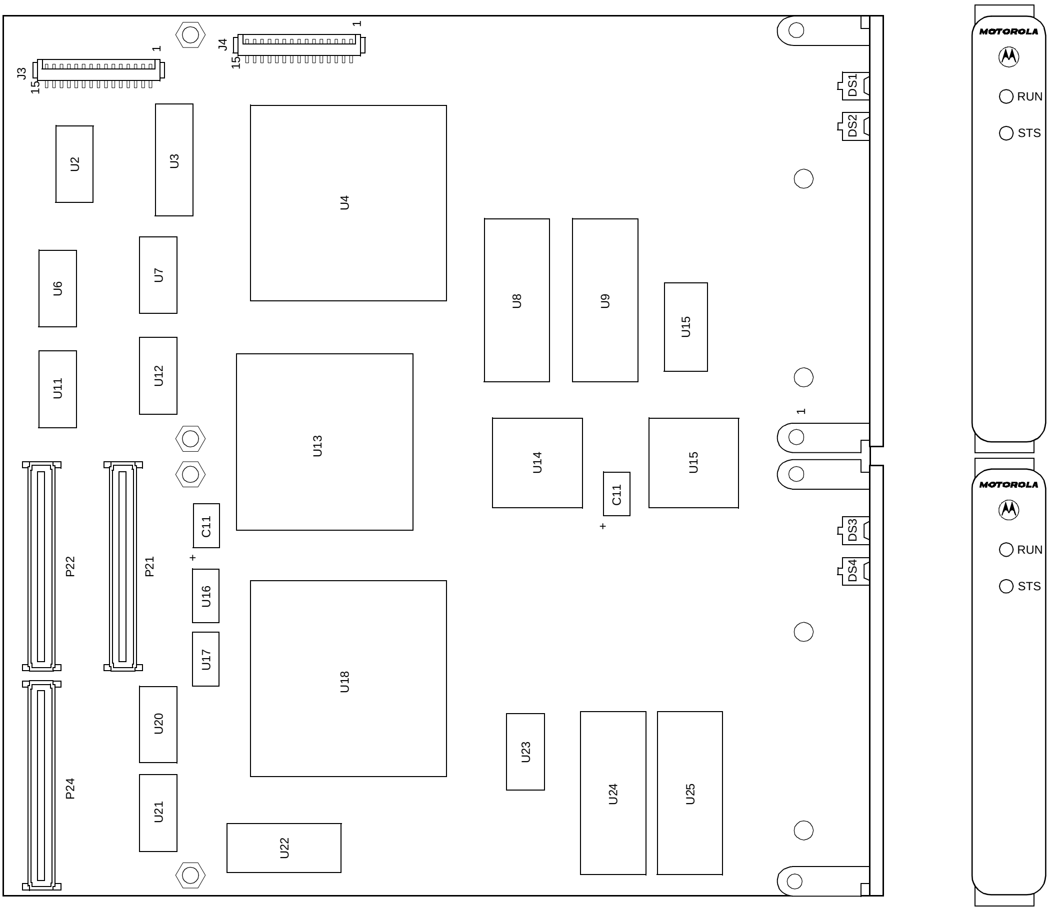


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Figure 4-7. XRPMCSYNC6 PMC Module

Connector Pin Assignments

The XRPMCSYNC6 contains connectors for I/O and for inter-module interfaces. This chapter defines the pin assignments for all connectors on the XRPMCSYNC6.

PMC Connectors (P21, P22, and P24)

The three PMC connectors are 64 pin SMT connectors which provide a 10mm spacing between the XRPMCSYNC6 and the PMC Expansion Carrier. They meet the connector requirements in IEEE-P1386.1, *PCI Mezzanine Card Specification*. The pin assignments for these connectors are shown in Table 4-7 on page 4-17 and Table 4-8 on page 4-18.

Table 4-7. P21 and P22 PMC Connector Pinouts for 32-bit PCI

	P21				**P22**		
1	TCK	-12V	2	1	+12V	TRST*	2
3	GND	INTA*	4	3	TMS	TDO	4
5	Not Used	Not Used	6	5	TDI	GND	6
7	Pull Down	+5V	8	7	GND	Not Used	8
9	Not Used	Not Used	10	9	Not Used	Not Used	10
11	GND	Not Used	12	11	Not Used	+3.3V	12
13	CLK	GND	14	13	RST*	Not Used	14
15	GND	GNT*	16	15	+3.3V	Not Used	16
17	REQ*	+5V	18	17	Not Used	GND	18
19	+5V	AD31	20	19	AD30	AD29	20
21	AD28	AD27	22	21	GND	AD26	22
23	AD25	GND	24	23	AD24	+3.3V	23
25	GND	C/BE3*	26	25	IDSEL	AD23	26
27	AD22	AD21	28	27	+3.3V	AD20	28
29	AD19	+5V	30	29	AD18	GND	30

Table 4-7. P21 and P22 PMC Connector Pinouts for 32-bit PCI (Continued)

	P21				P22		
31	+5V	AD17	32	31	AD16	C/BE2*	32
33	FRAME*	GND	34	33	GND	Not Used	34
35	GND	IRDY*	36	35	TRDY*	+3.3V	36
37	DEVSEL*	+5V	38	37	GND	STOP*	38
39	GND	LOCK*	40	39	PERR*	GND	40
41	Not Used	Not Used	42	41	+3.3V	SERR*	42
43	PAR	GND	44	43	C/BE1*	GND	44
45	+5V	AD15	46	45	AD14	AD13	46
47	AD12	AD11	48	47	GND	AD10	48
49	AD9	+5V	50	49	AD8	+3.3V	50
51	GND	C/BE0	52	51	AD7	Not Used	52
53	AD6	AD5	54	53	+3.3V	Not Used	54
55	AD4	GND	56	55	Not Used	GND	56
57	+5V	AD3	58	57	Not Used	Not Used	58
59	AD2	AD1	60	59	GND	Not Used	60
61	AD0	+5V	62	61	Not Used	+3.3V	62
63	GND	Not Used	64	63	GND	Not Used	64

Table 4-8. P24 PMC Connector Pinouts for VME P2 I/O

	P24		
1	PORT3_DCD*	PORT3_TXD	2
3	TXC3	PORT3_RXD	4
5	PORT3_RXCLK	PORT3_RTS*	6
7	PORT3_TXCLK	PORT3_CTS*	8

Table 4-8. P24 PMC Connector Pinouts for VME P2 I/O (Continued)

	P24		
9	PORT4_DCD*	GND	10
11	TXC4	PORT4_TXD	12
13	PORT4_RXCLK	PORT4_RXD	14
15	PORT4_TXCLK	PORT4_RTS*	16
17	+5V	PORT4_CTS*	18
19	PORT5_DCD*	PORT5_TXD	20
21	TXC5	PORT5_RXD	22
23	PORT5_RXCLK	PORT5_RTS*	24
25	PORT5_TXCLK	PORT5_CTS*	26
27	STR_ADR*	GND	28
29	68KRESETH_A*	STR_DT*	30
31	MUX<3>	MUX<0>	32
33	MUX<4>	MUX<1>	34
35	MUX<5>	MUX<2>	36
37	+12V	PORT6_TXD	38
39	PORT6_DCD*	PORT6_RXD	40
41	TXC6	PORT6_RTS*	42
43	PORT6_RXCLK	PORT6_CTS*	44
45	PORT6_TXCLK	-12V	46
47	PORT7_DCD*	PORT7_TXD	48
49	TXC7	PORT7_RXD	50
51	PORT7_RXCLK	PORT7_RTS*	52
53	PORT7_TXCLK	PORT7_CTS*	54
55	+5V	PORT8_TXD	56

Table 4-8. P24 PMC Connector Pinouts for VME P2 I/O (Continued)

	P24		
57	PORT8_DCD*	PORT8_RXD	58
59	TXC8	PORT8_RTS*	60
61	PORT8_RXCLK	PORT8_CTS*	62
63	PORT8_TXCLK	GND	64

BDM Connectors (J3 and J4)

The 15-pin engineering test connectors provide Background Debug Mode (BDM) interface and access the ISP pins of the Lattice PLD. The pin assignments for these connectors are listed in Table 1.

Table 1. J3 and J4 Engineering Test Connector Pin Assignments

	Processor A **J3**	**Processor B** **J4**
1	DS_A*	DS_B*
2	BERR_A*	BERR_B*
3	GND	GND
4	BKPT_A*	BKPT_B*
5	GND	GND
6	FREEZE_A	FREEZE_B
7	RESETH	RESETH
8	IFETCH_A*	IFETCH_B*
9	+5V	+5V
10	IPIPE0_A*	IPIPE0_B*
11	SDO	SDO
12	SDI	SDI
13	MODE	MODE
14	SCLK	SCLK
15	ISPEN*	ISPEN*

Controller Modules 5

This section describes the individual controller modules of the XR system. It gives correct system strapping and switch settings for each supported VMEmodule in the system.

Detailed information about the boards is contained in the hardware manuals listed in *Related Publications* in Chapter 1.

Controller Module Overview

The XR PowerPC system controller modules are listed in the table below. The table lists the part number, brief description, and the number of slots required for each module.

Table 5-1. VMEmodule Components

Module Number	Description	VME Slots Used	Page
MVME332XTS	8-port Serial/Parallel Controller	1	5-2
XR341A	SS7 Controller	1	5-4
XR342S/XR343S	T1/E1 SS7 Controllers	1	5-5
XR346	X.25 Communication Controller	1	5-8
XR386-ST	FDDI Controller	1	5-25
XRPMCEXP1	Primary PMC Expansion Carrier	1	5-28
XRPMCEXP2	Secondary PMC Expansion Carrier	1	5-28

5

MVME332XTS High Performance Serial I/O Controller

The MVME332XT Serial I/O Controller is a double-high VMEmodule used for serial and printer I/O. The MVME332XT has eight asynchronous serial I/O channels that support up to 38.4 Kbaud, full-duplex operation with either hardware or software handshaking. All the ports are EIA-232-D compatible.

Modem and terminal interface selection is made via jumper arrays on the MVME710B Eight Channel Serial I/O Distribution Module. The MVME332XT supports one Centronics-compatible parallel printer port, accessible via a shielded front panel mounted connector that is extended to a similar connector at the backpanel.

Table 5-2. MVME332XTS Jumper Settings

Header	Description	Setting
J1	VMEbus Grant/Request Priority Level	1-2, 5-6, 7-9, 8-10, 11-12, 15-17
 J4 J5	ROM/EPROM Size Selection (64K x 8 devices) (MVME332XTS, Revision D and MVME332XT) (MVME332XTS)	1-2
Switch S2	Firmware Mode	S2-1 OFF S2-2 OFF S2-3 ON S2-4 ON
Board Number	**S1 Switch Positions**	**Base Address**
1 2 3 4 5 6 7 8	(See next Figures)	ff780000 ff790000 ff7a0000 ff7b0000 ff7c0000 ff7d0000 ff7e0000 ff7f0000

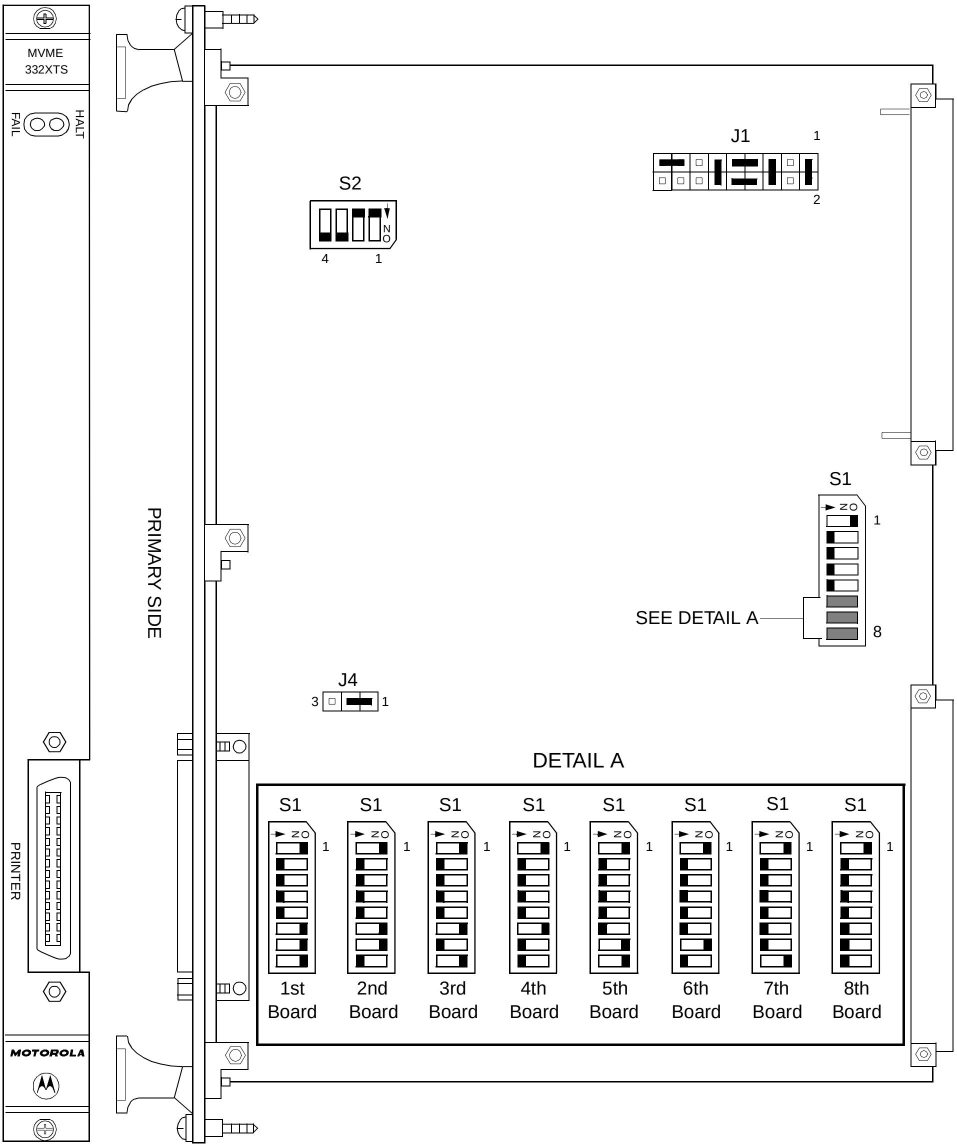


Figure 5-1. MVME332XTS Jumper and Switch Settings

5

XR341A SS7 Controller

5

An ECP VMEbus address must always be established for each active device on the VMEbus. The unique identification of the board must follow the specifications in Table 5-3. The address assignments indicated in the table allocate a 128KB window for each XR341A Controller, which is used as shared memory, based on 24 bit VMEbus address space (A24) allocation.

Note Do not install boards using identical VME addresses (board device number) to avoid conflict with other VME boards in other slots.

Table 5-3. ECP Board Addresses

Board ECP #	XR341A Controller Dial Switch Position	A16 Address	A24 Address	VME[a] Priority Level	VME Interrupt Vector
0	8	0800-08FF	C00000-C1FFFF	3	E0
1	9	0900-09FF	C20000-C3FFFF	3	E1
2	A	0A00-0AFF	C40000-C5FFFF	3	E2
3	B	0B00-0BFF	C60000-C7FFFF	3	E3

a. VME Interrupt Vector is assigned by Operating System

Use the dial switch on the front of the board to configure the VMEbus address. Set the dial according to the values identified in Table 5-3. Make DCE/DTE selections on the XR341ATM transition module (see Chapter 6).

XR342S/XR343S T1/E1 SS7 Controllers

Two parameters can be configured on the XR342S/343S boards. They are:

- VMEbus A16 Base Address
- E1 Line Impedance (for XR343S only)

VMEbus A16 Base Address

The VMEbus A16 base address for the XR342S/343S board is set using the S1 and S2 dial switches on the front panel of the board. The S1 dial switch sets the four highest bits (in hexadecimal). The S2 dial switch sets the next 3 bits. The least significant bit is ignored. The default address is 0xFE00, as shown in the board illustration. Because the least significant bit is ignored, S2 settings to odd numbers become the even number below it (e.g. F becomes E).

The address assignments indicated in Table 5-4 allocate a 128KB window for each controller, which is used as shared memory, based on 24 bit VMEbus address space (A24) allocation. In general, to assign a specific board number (0-3) to a XR342S/343S board, the S1 and S2 switches should be set according to Table 5-4.

Table 5-4. T1/E1 Board Addresses

Board No.	Dial Switch Position (S1, S2)	A16 Address	A32 Address	VME Priority Level	VME Interrupt Vector
0	FE	FE00-FFFF	E0000000-E01FFFFF	3	EF
1	FC	FC00-FDFF	E0200000-E03FFFFF	3	EE
2	FA	FA00-FBFF	E0400000-E05FFFFF	3	ED
3	F8	F800-F9FF	E0600000-E07FFFFF	3	EC

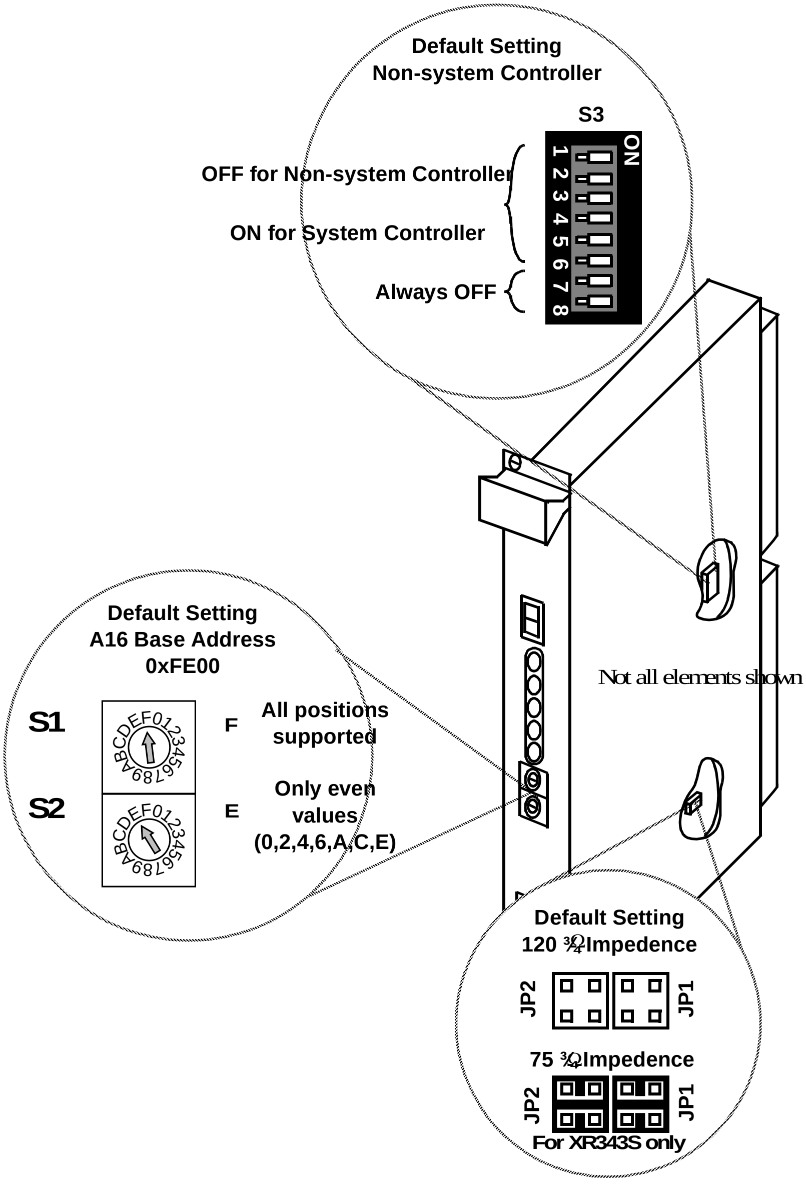
Note Do not install boards using identical VME addresses (board device number) to avoid conflict with other VME boards in other slots.

E1 Line Impedance (XR343S only)

The line impedance for E1s on the XR343S board is selected through the jumper pins identified by JP1 and JP2 in the illustration on the next page. JP1 pins set the impedance for E1A, and JP2 pins set the impedance for E1B. The default settings, with no jumpers between pins, are for 120 ohms. The illustration also demonstrates how to set the impedance to 75 ohms by setting jumpers between the pins.

Note Do not alter the settings of the S3 DIP switch bank, which enables the board as the system controller.

5



Default Setting
Non-system Controller
S3
ON
1 2 3 4 5 6 7 8
OFF for Non-system Controller
ON for System Controller
Always OFF
Default Setting
A16 Base Address
0xFE00
S1
F
All positions supported
S2
E
Only even values (0,2,4,6,A,C,E)
Not all elements shown
Default Setting
120 ¾Impedence
JP2
JP1
75 ¾Impedence
JP2
JP1
For XR343S only

XR346 Communication Controller

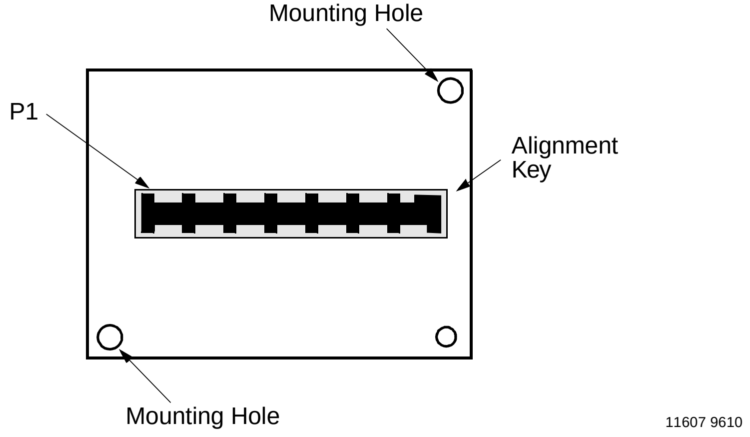
The XR346 is a 6-port synchronous communication controller and transition module. Serial Interface Modules (SIMs) are used to select the desired communications protocol and configuration.

SIM Installation

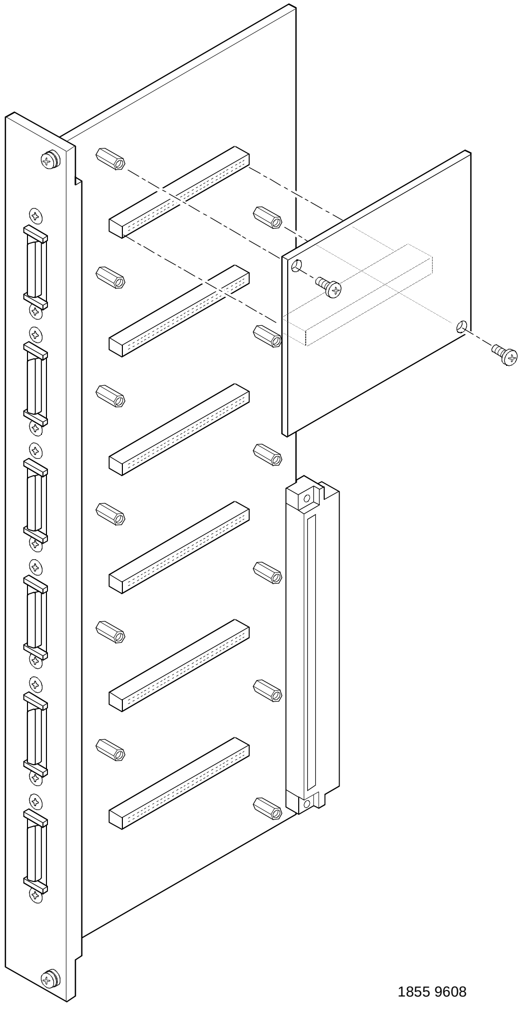
To select the desired communications protocol and configuration, you may install Serial Interface Modules (SIMs) as described in the following sections. Start placing SIMs on port 3 and then place them sequentially down to port 8. When placing SIMs on the board, keep similar SIMs next to each other; e.g., keep V.35 SIMs next to other V.35 SIMs.

The secondary side of each SIM plugs into connector J2, J4, J6, J8, J10, or J12 on the MVME762. Follow this procedure to install the SIM on the MVME762:

1. Align the SIM so that P1 on the SIM lines up with the appropriate SIM connector on the MVME762. Note the position of the alignment key on P1.



2. Starting with port 3 and placing them sequentially down to port 8, place the SIM(s) onto the MVME762 SIM connector, making sure that the mounting holes also line up with the standoffs on the transition module as shown below.



3. Gently press the top of the SIM to seat it on the MVME762 SIM connector. If the SIM does not seat with gentle pressure, re-check the alignment of the mounting holes and the standoffs.

Note Do not attempt to force the SIM on if it is incorrectly oriented.

4. Secure the SIM to the MVME762 standoffs with the two Phillips-head screws provided. Do not over tighten.
5. Affix and center the label for the SIM at the port where the SIM is located. Center the label in the markings at the port. (Figure 5-3 shows the label locations.)

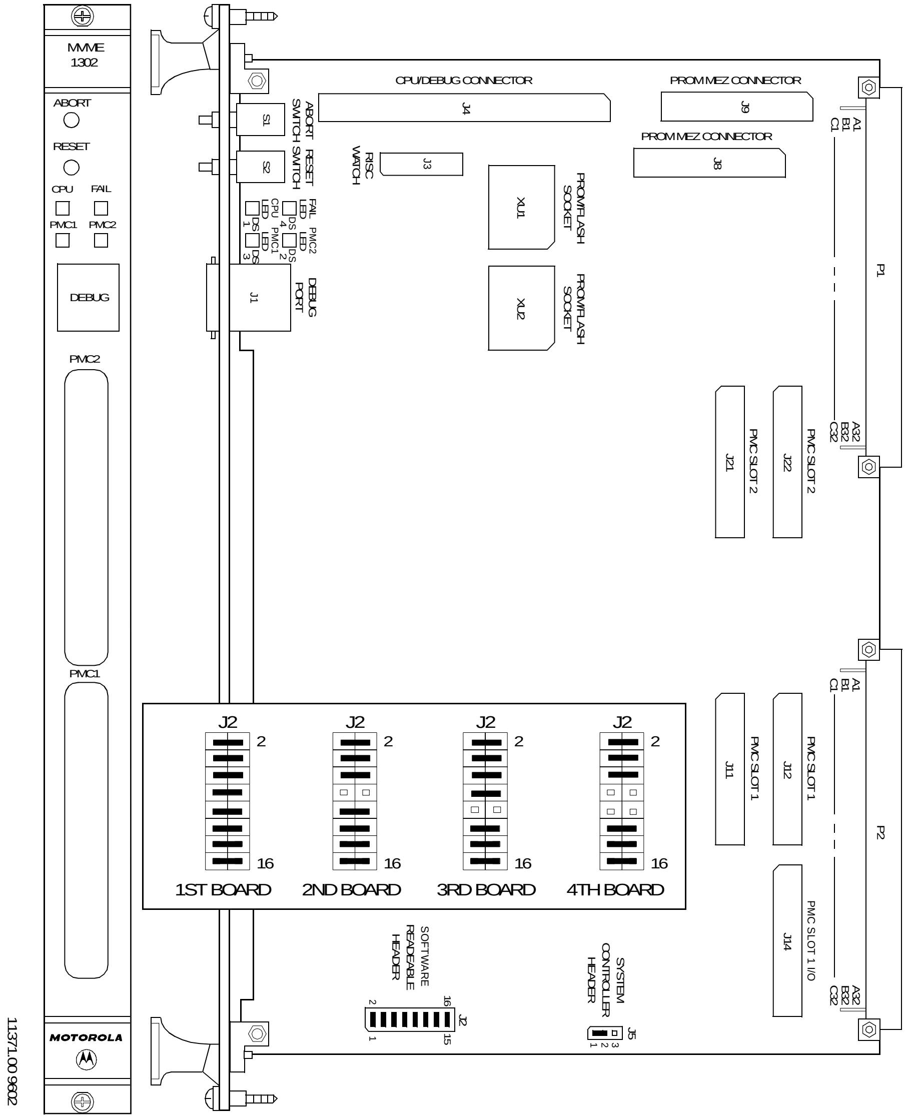


Figure 5-2. MVME1302 Switches, LEDs, Headers, Connectors

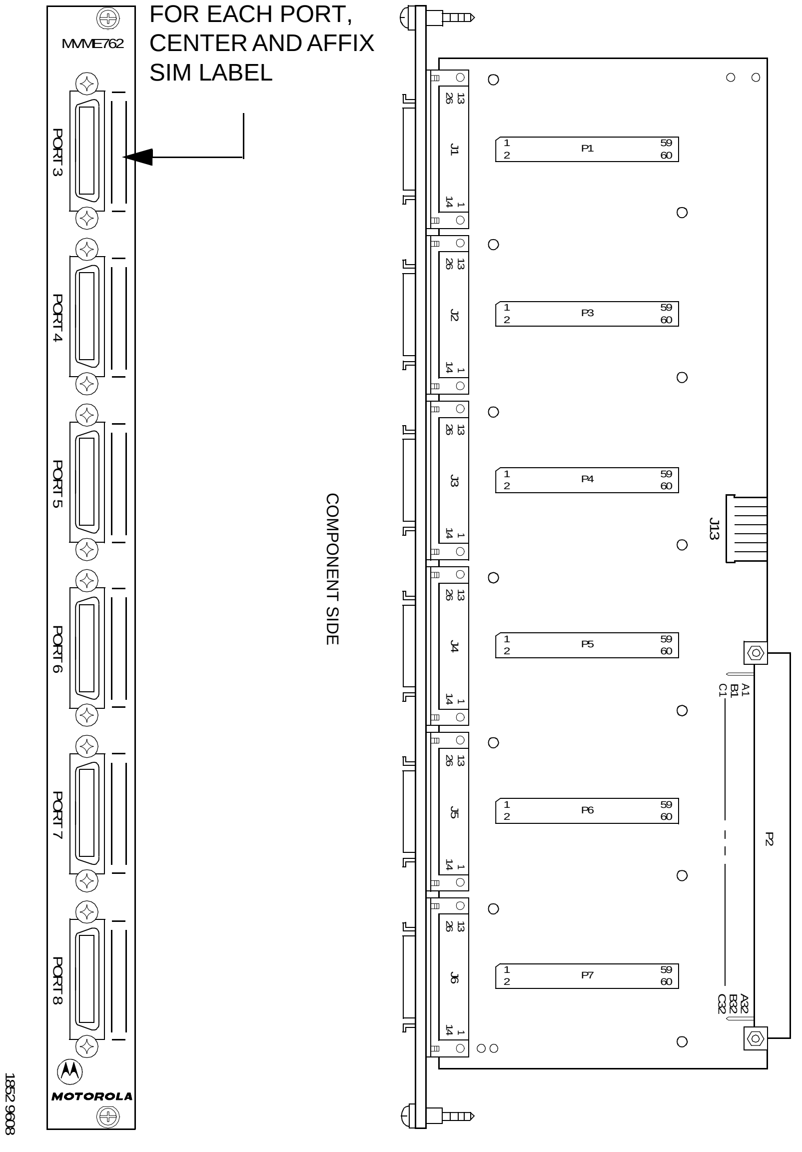


Figure 5-3. MVME762 Transition Board Front Panel and Component Side

Serial Port Signals

Six connectors are provided for the serial ports on the front panel of the MVME762 transition module. The pin assignments and signal mnemonics are listed in the table below.

Pin Number		**Mnemonic**			
Serial Port	**SIM**	**EIA-232**	**EIA-530**	**V.35**	**X.21**
1	19	No Connect	No Connect	No Connect	No Connect
2	21	TXD	TXDA	TXDA	TXDA
3	11	RXD	RXDA	RXDA	RXDA
4	13	RTS	RTSA	RTS	No Connect
5	3	CTS	CTSA	CTS	No Connect
6	5	DSR	DSRA	DSR	No Connect
7	2	GND	GND	GND	GND
8	6	DCD	DCDA	DCD	No Connect
9	4	No Connect	RXCB	RXCB	INDB
10	14	No Connect	DCDB	No Connect	No Connect
11	12	No Connect	ETXCB	ETXCB	CTRLB
12	22	No Connect	TXCB	TXCB	SETB
13	20	No Connect	CTSB	No Connect	No Connect
14	23	No Connect	TXDB	TXDB	TXDB
15	25	TXC	TXCA	TXCA	SETA
16	15	No Connect	RXDB	RXDB	RXDB
17	17	RXC	RXCA	RXCA	INDA
18	7	LL	LL	LL	No Connect
19	9	No Connect	RTSB	No Connect	No Connect

Pin Number		Mnemonic			
Serial Port	**SIM**	**EIA-232**	**EIA-530**	**V.35**	**X.21**
20	1	DTR	DTRA	DTR	No Connect
21	10	RL	RL	RL	No Connect
22	8	RI	DSRB	RI	No Connect
23	18	No Connect	DTRB	No Connect	No Connect
24	16	ETXC	ETXCA	ETXCA	CTRLA
25	26	TM	TM	TM	No Connect
26	24	No Connect	No Connect	No Connect	No Connect

Serial Port Configurations

The serial port configurations for each of the communication protocols are shown in Figure 5-4 through Figure 5-11.

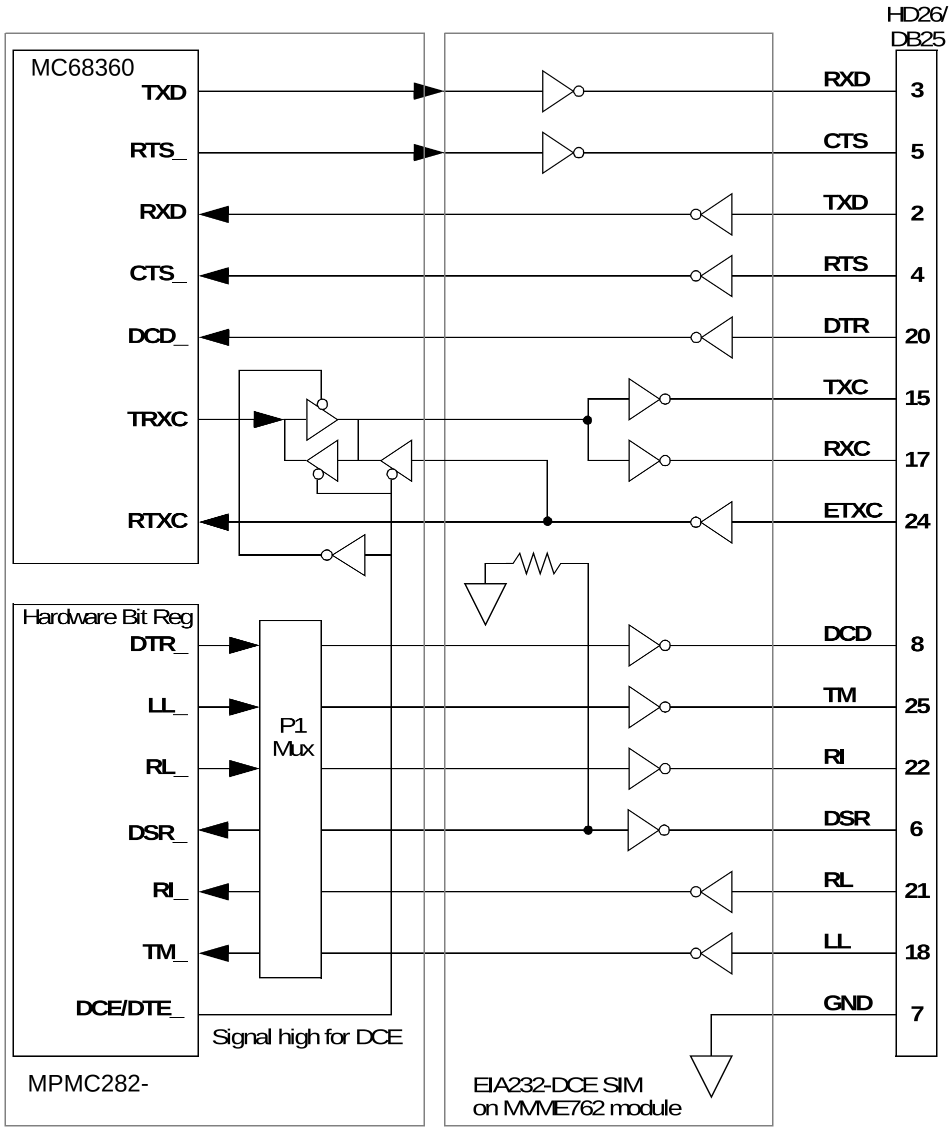


Figure 5-4. EIA232-DCE Serial Port Configuration

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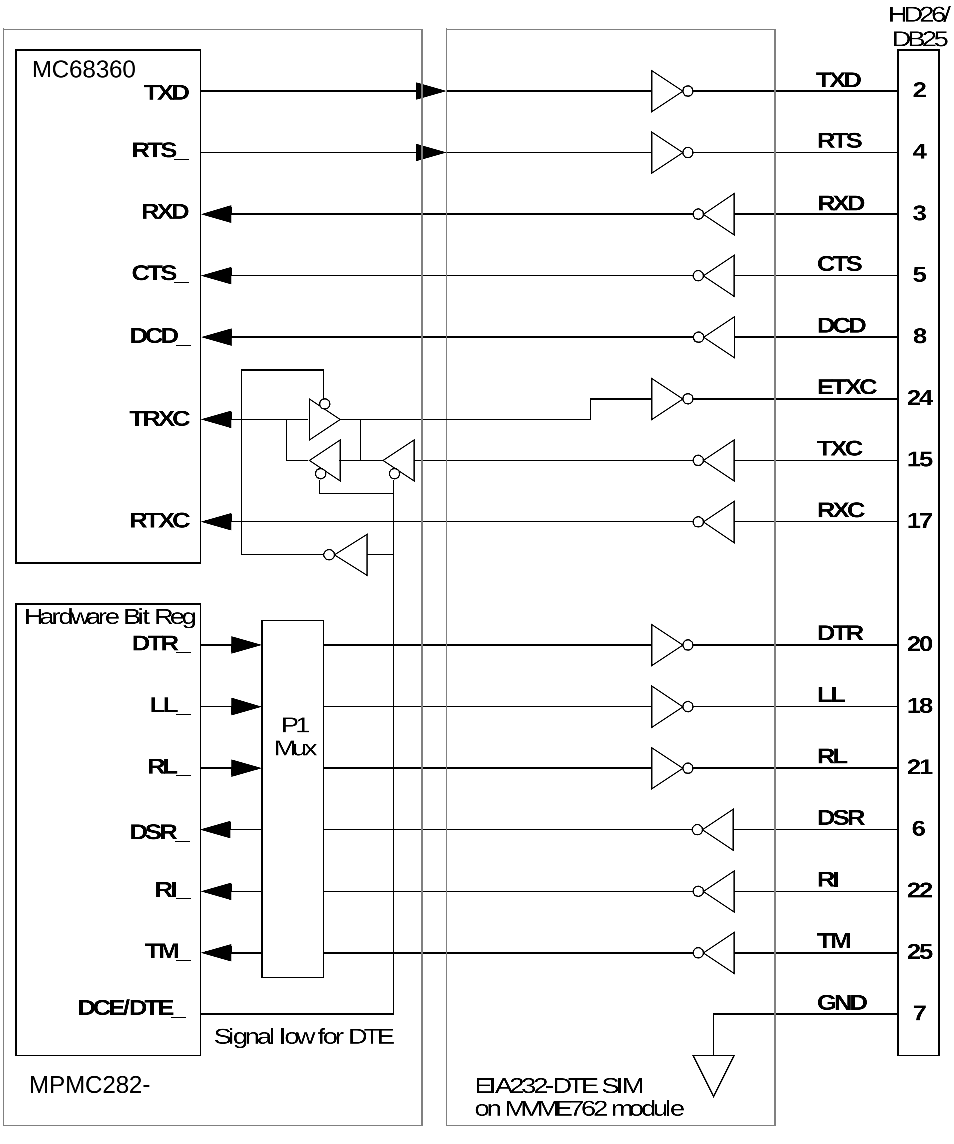

Figure 5-5. EIA232-DTE Serial Port Configuration

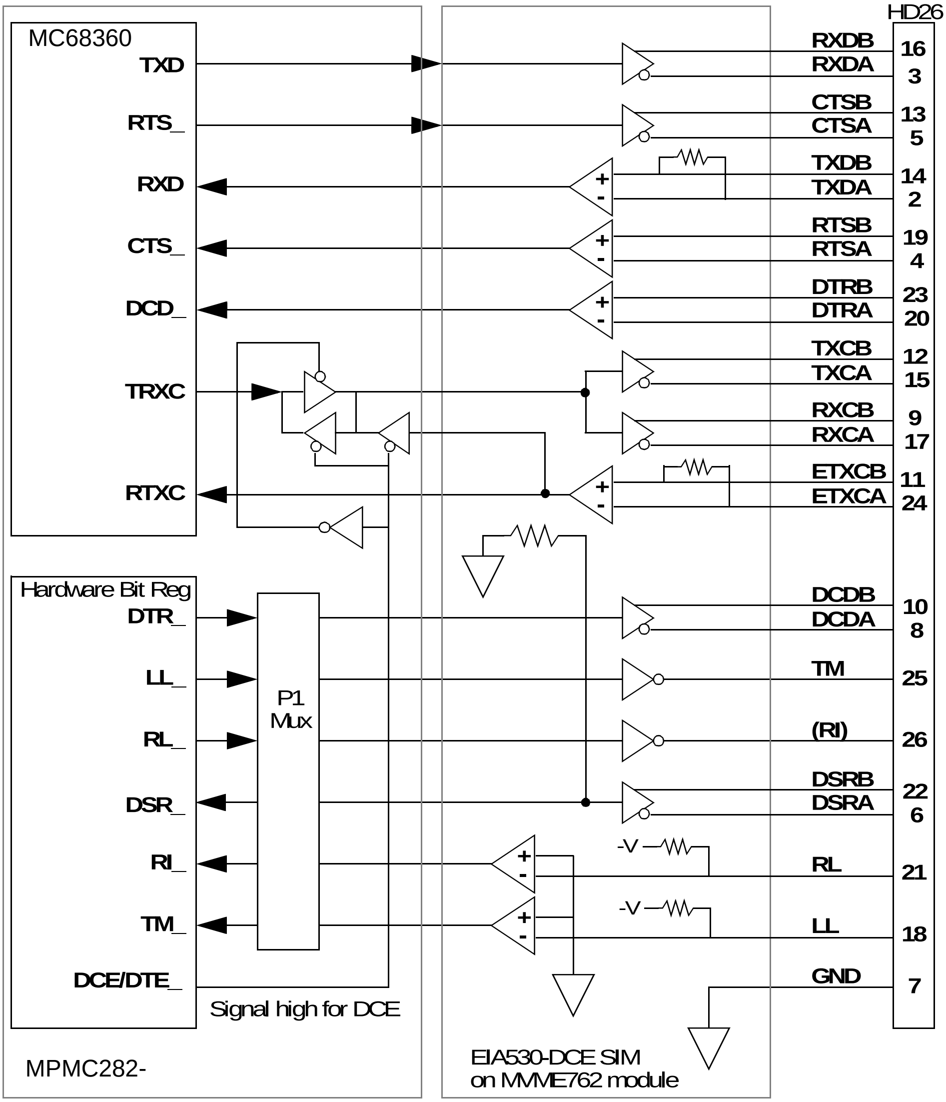

Figure 5-6. EIA530-DCE Serial Port Configuration

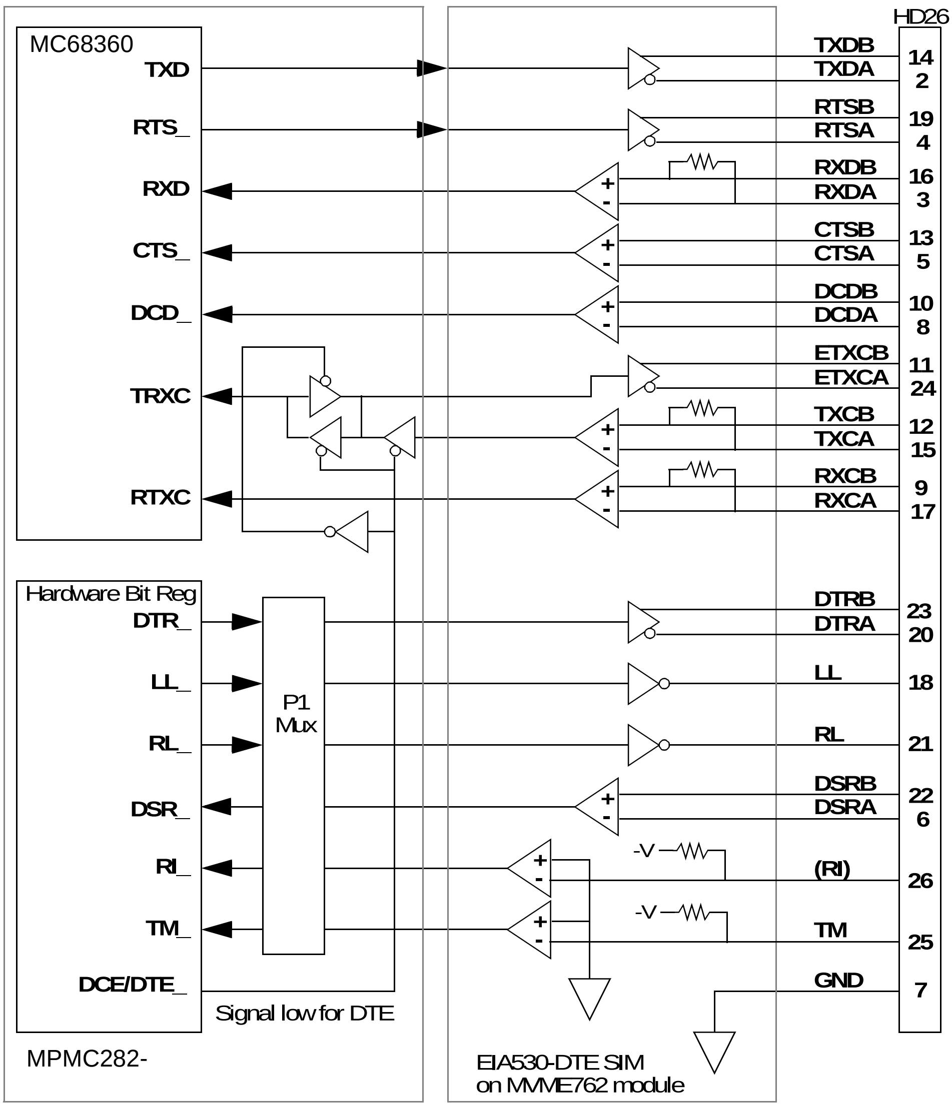

Figure 5-7. EIA530-DTE Serial Port Configuration

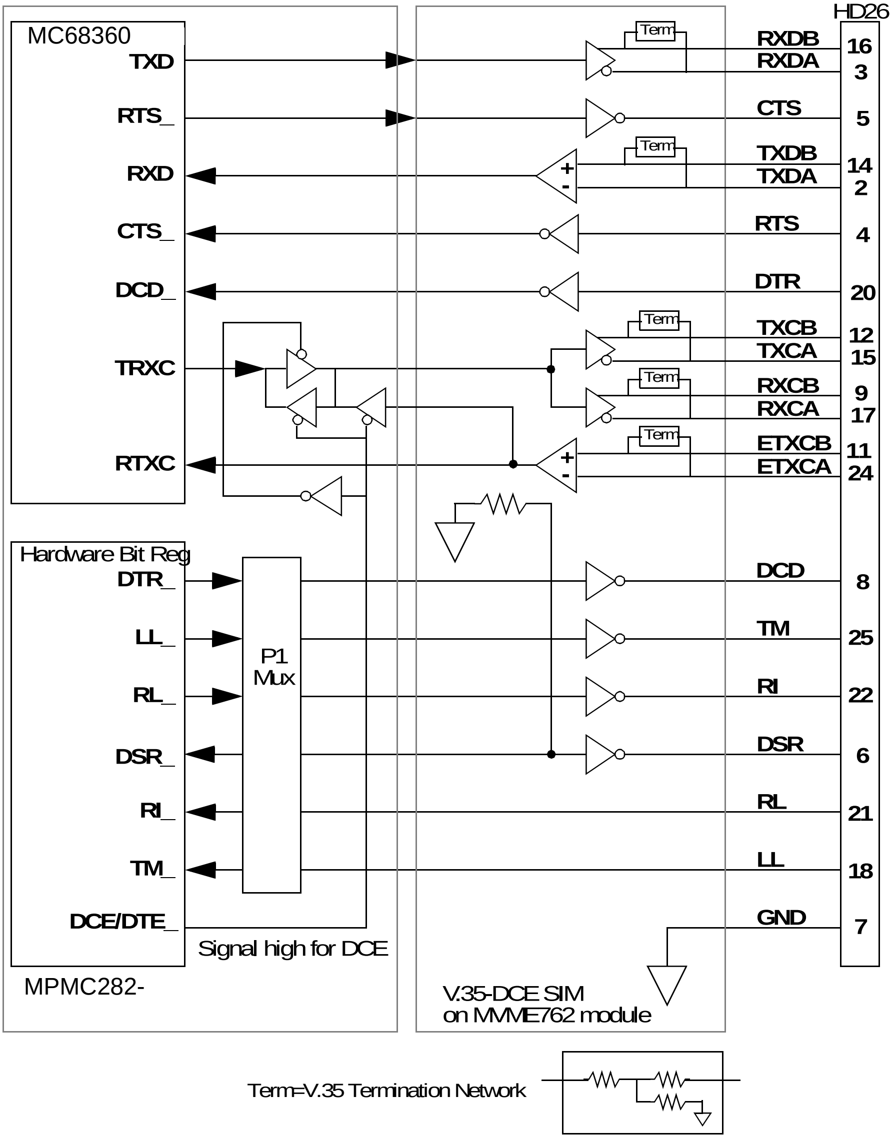

Figure 5-8. V.35-DCE Serial Port Configuration

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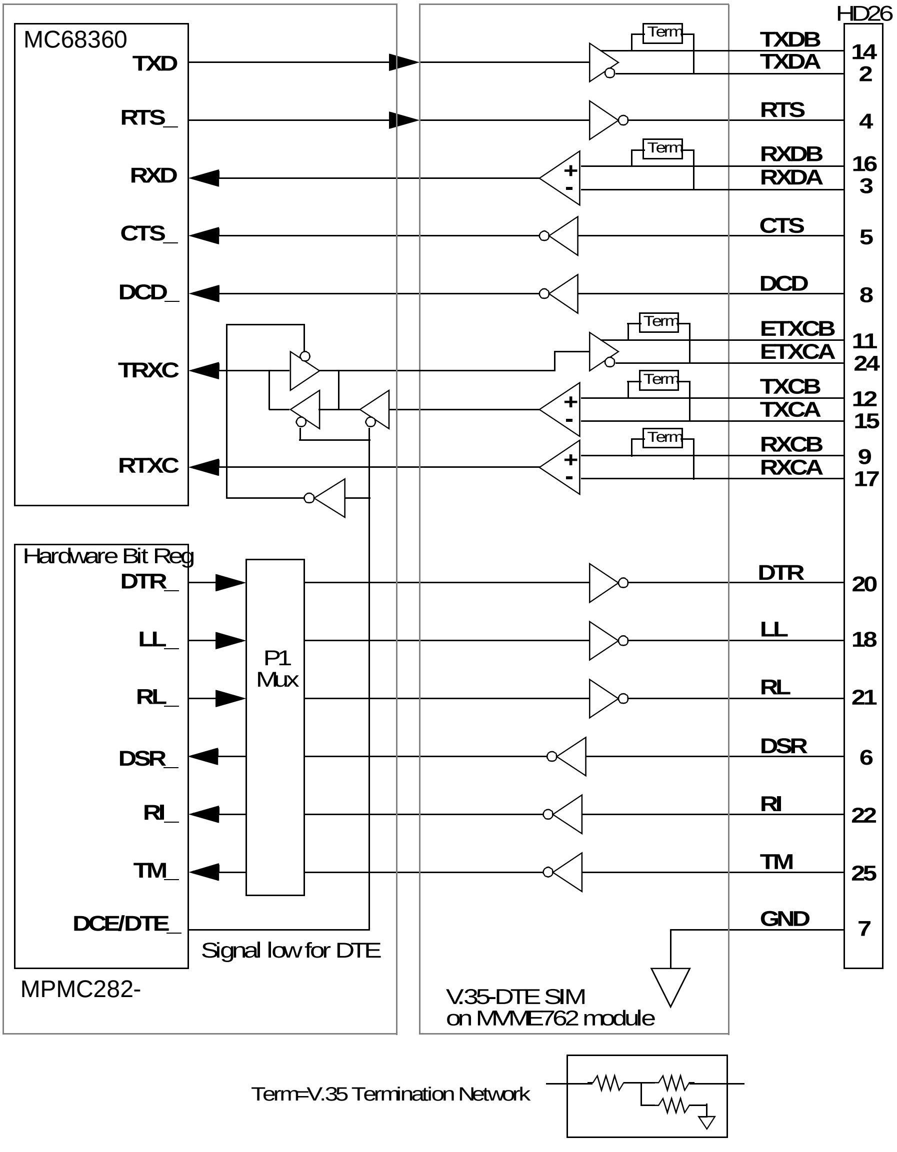

Figure 5-9. V.35-DTE Serial Port Configuration

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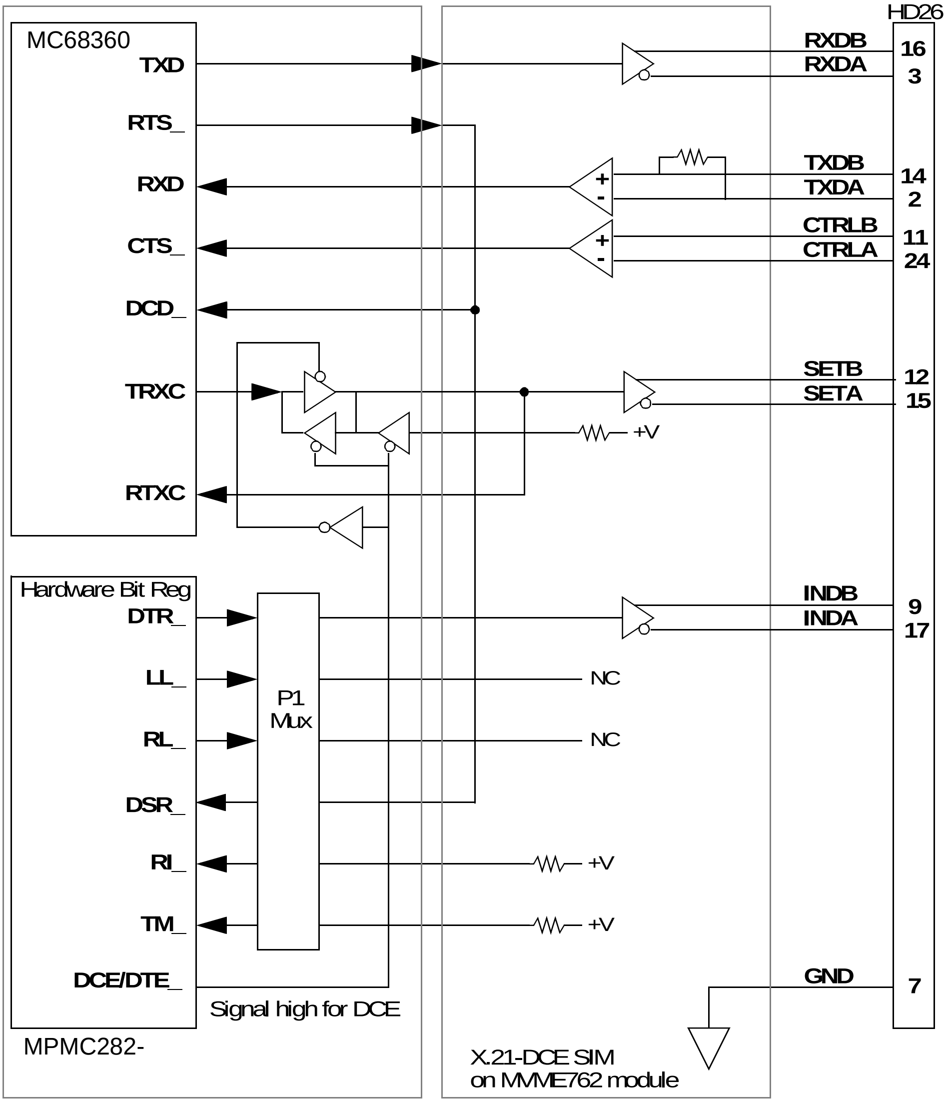

Figure 5-10. X.21-DCE Serial Port Configuration

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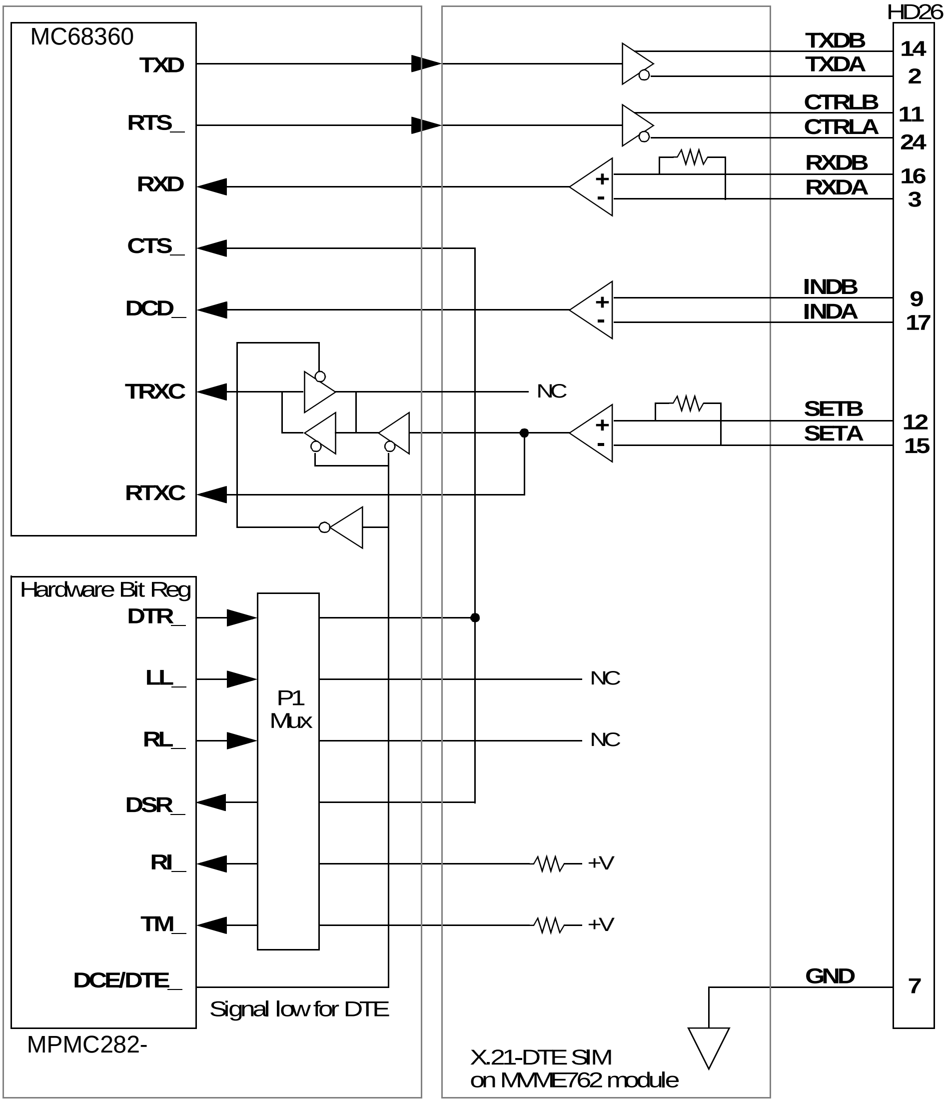
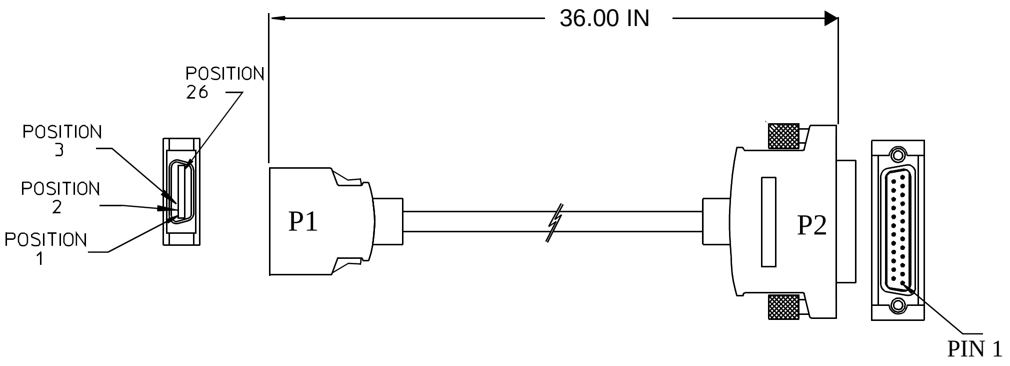


Figure 5-11. X.21-DTE Serial Port Configuration

External Connector Interface

The following optional cable, if purchased, provides an industry standard DB-25 female connector for connection to the external interface. The table below lists the cable wiring needed if you want to make an extension cable.



Note The twisted pair combinations are essential for proper operation and must be maintained in any cable extensions that are used.

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Table 5-5. Cable Wire List

Twisted Pair	From	To
1	P1-2 P1-14	P2-2 P2-14
2	P1-3 P1-16	P2-3 P2-16
3	P1-24 P1-11	P2-24 P2-11
4	P1-17 P1-9	P2-17 P2-9
5	P1-15 P1-12	P2-15 P2-12
6	P1-4 P1-19	P2-4 P2-19
7	P1-5 P1-13	P2-5 P2-13
8	P1-6 P1-22	P2-6 P2-22
9	P1-8 P1-10	P2-8 P2-10
10	P1-20 P1-23	P2-20 P2-23
11	P1-7 P1-18	P2-7 P2-18
12	P1-21 P1-25	P2-21 P2-25

XR386-ST High Performance FDDI Node Processor

The XR386-ST is a high-performance node processor for 100Megabit-per-second fiber option FDDI (Fiber Distributed Data Interface) networks.

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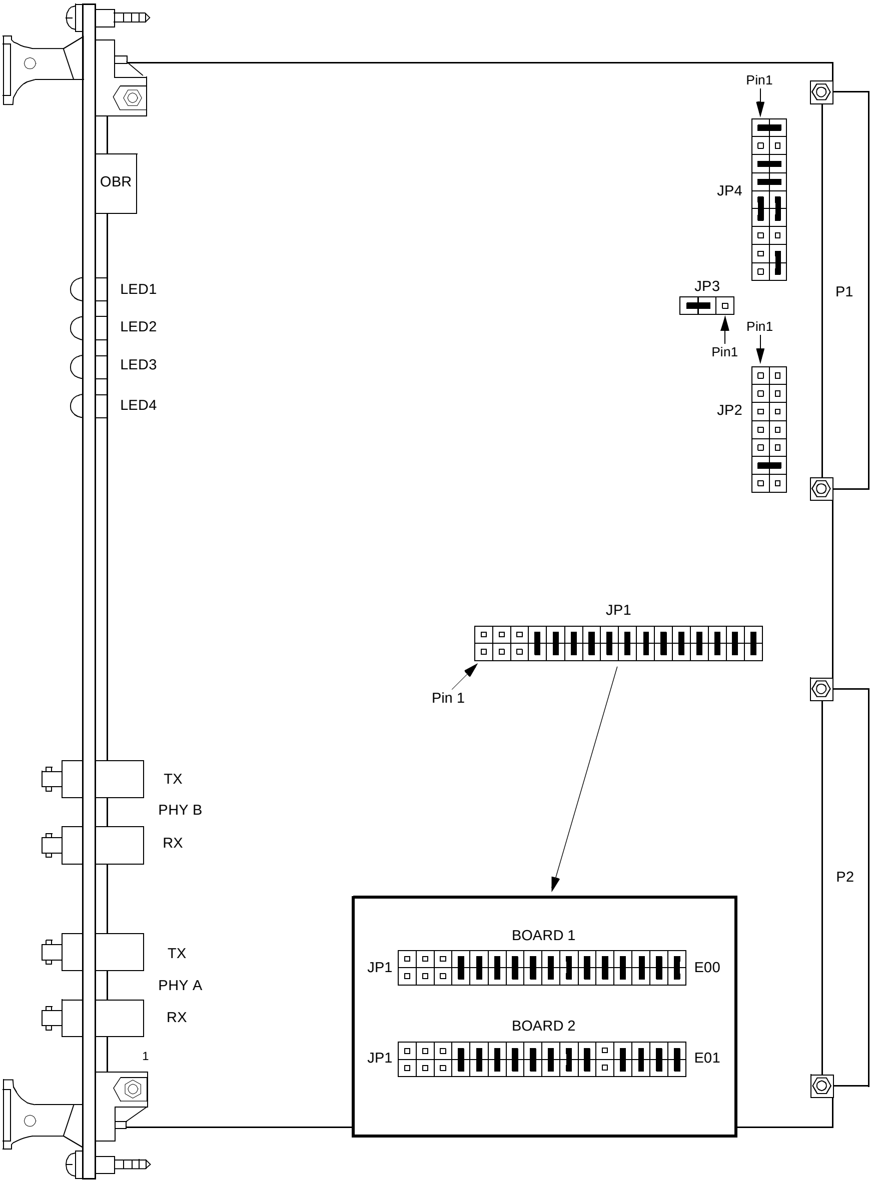

Figure 5-12. XR386-ST Board Layout

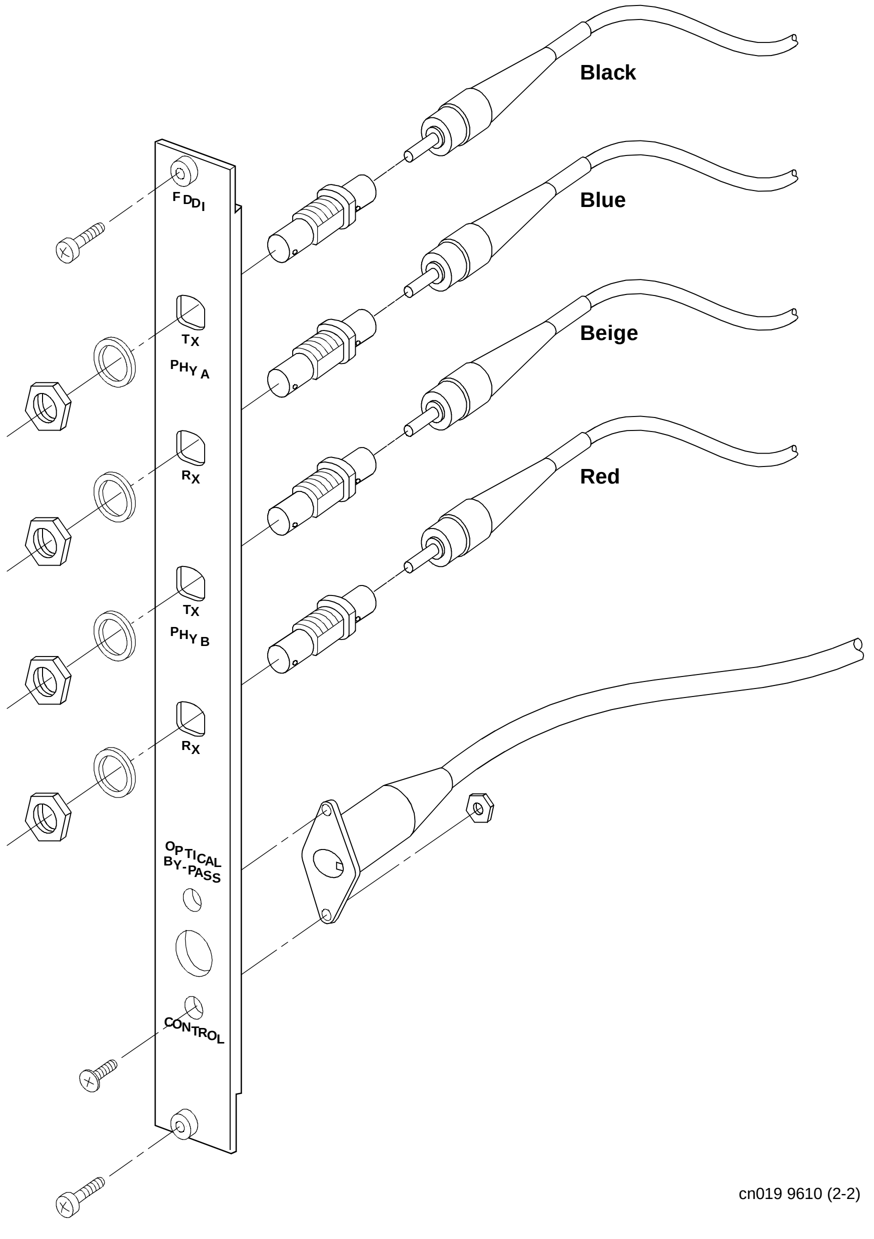

Figure 5-13. FDDI Transition Panel

XRPMCEXP1/XRPMCEXP2 PMC Expansion Carriers

The PMC Expansion Carriers (PMCspans) provide additional PMC slots for the XR family of PowerPC CPU modules. They are equipped with the VME64 (Extended) injector handles and can only be used in the Extended line of XR chassis.

The XRPMCEXP1 (or Primary PMCspan, see Figure 5-15 on page 5-29) provides two additional PMC slots (for two single-slot PMC adapters or one double-slot PMC adapter). It mounts directly on the system's CPU module.

The XRPMCEXP2 (or Secondary PMCspan, see Figure 5-16 on page 5-30) also provides two additional PMC slots (for two single-slot PMC adapters or one double-slot PMC adapter). It mounts directly on thXRPMCEXP1, for a total of four additional PMC slots.

Front Panel LEDs

There are two green LEDs located on the front panel of the PMCspan (see Figure 5-14, below) — one for each PMC adapter. Both LEDs will be illuminated during a system reset. An individual LED will be illuminated whenever a PMC adapter has been granted bus mastership of the secondary PCI bus.

PMC Slot 1 is the PMC slot furthest from the LEDs.

PMC Slot 2 is the PMC slot adjacent to the LEDs.

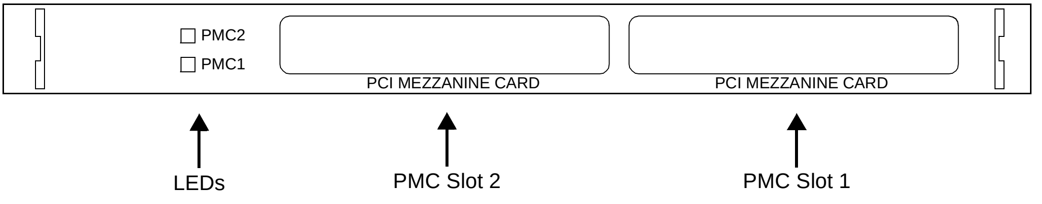

Figure 5-14. Front Panel of the XRPMCEXP1 and XRPMCEXP2

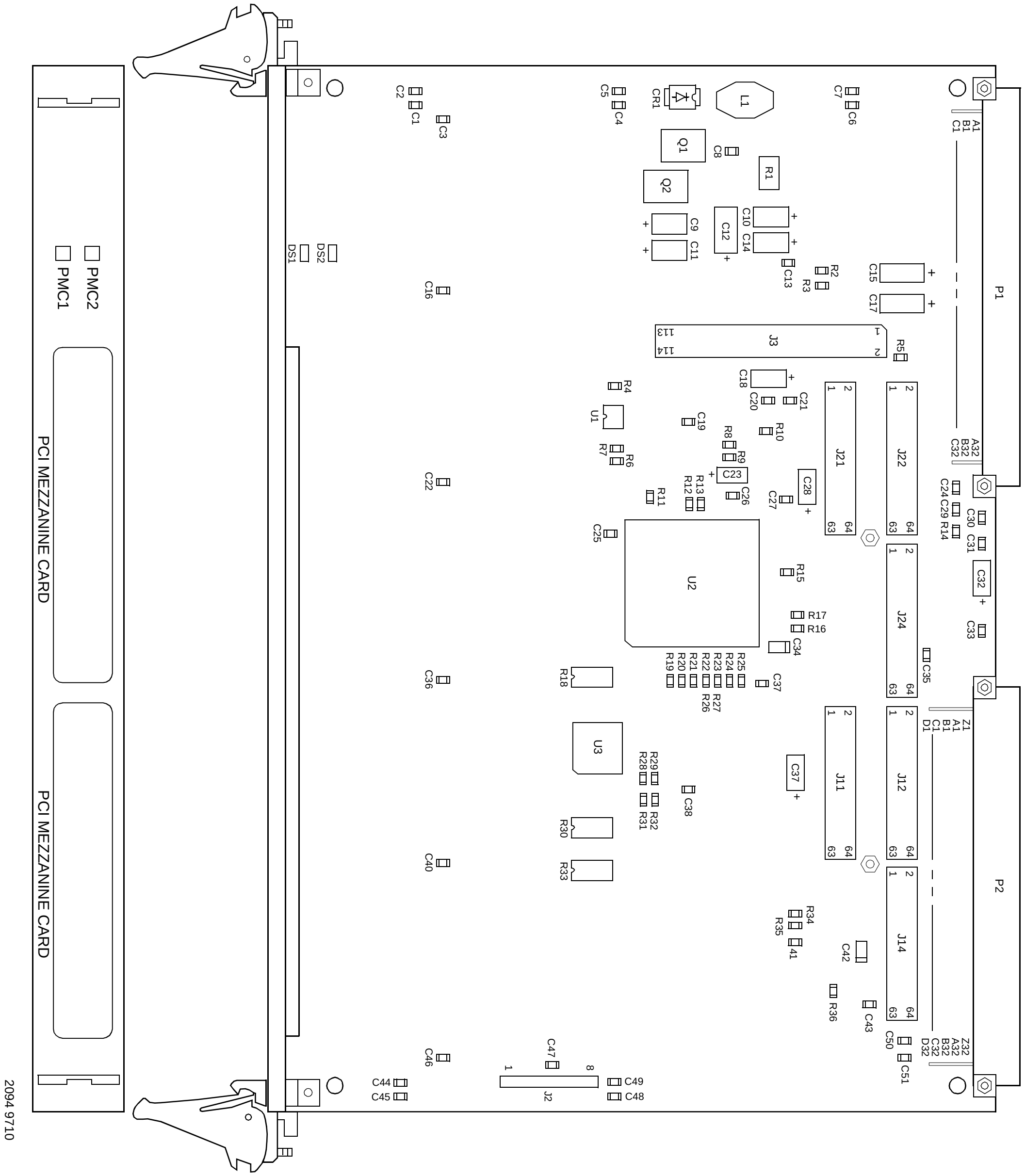

Figure 5-15. XRPMCEXP1 PMC Expansion Carrier

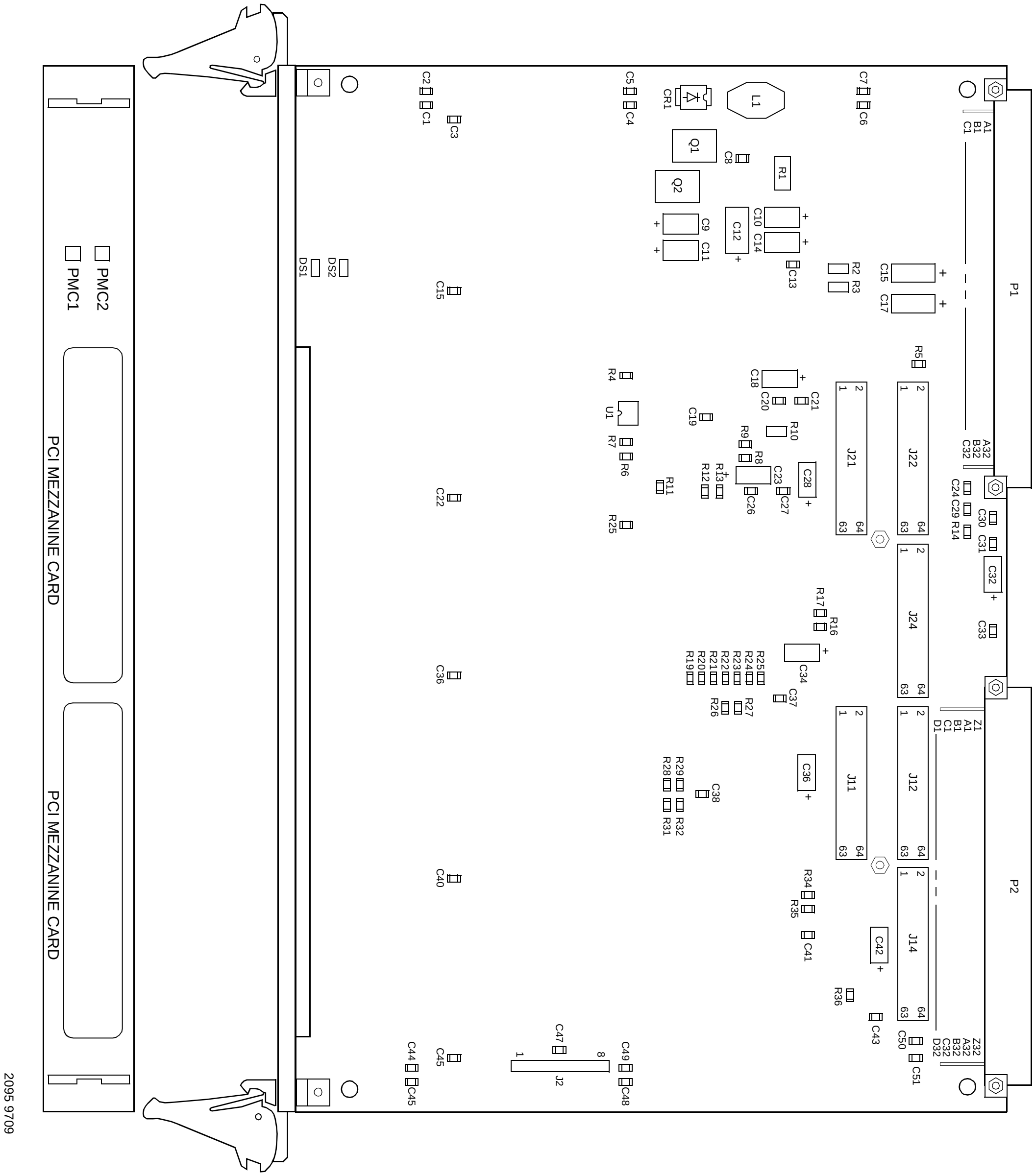

Figure 5-16. XRPMCEXP2 PMC Expansion Carrier

Transition Modules 6

This section describes the transition module components of the XR system. It gives the correct system strapping and switch settings for each supported module.

Detailed information about the transition modules is contained in the hardware manuals listed in *Related Publications* in Chapter One.

Transition Modules Overview

The transition modules presented in this chapter are listed in the table below. The table provides the part number, description, and number of slots required for each module.

Table 6-1. Transition Module Components

Module Number	Description	Transition Slots Used	Page
MVME710B	8 programmable serial ports	2	6-3
MVME712-101	4 serial ports	1	6-5
MVME712-102	1 SCSI, 1 ethernet, 1 10Base-T, and 1 serial port	1	6-5
MVME712-103	1 SCSI, 1 Ethernet, 1 10Base-T, and 1 parallel	1	6-5
MVME712-104	2 SCSI ports	1	6-5
MVME762	6 serial ports	1	6-11
XR341ATM	SS7 Transition Module	1	6-25
XR712-109	Alarm Transition Module	1	6-37
XR712-121	2 sync, 2 sync/async serial ports	1	6-39
XR712-122TP	2 async serial ports, 1 single-ended SCSI, 1 10/100Base-Tx	1	6-45

Table 6-1. Transition Module Components (Continued)

Module Number	Description	Transition Slots Used	Page
XR712-122AUI	2 async serial ports, 1 single-ended SCSI, 1 AUI ethernet, and 1 10Base-T	1	6-45
XR712-123TP	1 narrow SCSI, 1 10/100Base-Tx, 1 25-pin parallel	1	6-52
XR712-129TP	Alarm Transition Module	1	6-58
XR712-131(DIFF or SE)	differential or single-ended SCSI transition module plus 10Base-T and AUI ethernet	1	6-71
XR712-132DIFF	differential SCSI with 10/100Base-Tx	1	6-79
XR332RTM-8	8 Serial Port Transition Module	1	6-83
XRPMCLANPANL	transition panel for FDDI & 10/100Base-Tx	2	6-89
XRT1E1TM	T1/E1 SS7 Transition Module	1	6-90

MVME710B Serial Port Transition Board

The MVME710B provides an adapter between the serial I/O cable connectors and the MVME332XT Serial I/O controller. Each of the eight serial ports on the MVME710B can be configured either DCE for connection to a terminal or DTE for connection to a modem. The MVME710B connects via a ribbon cable to P2 of the MVME332XT. In this system, all eight ports (J1 through J8) of the MVME710B are configured DTE. To connect for DCE, move the associated jumpers to the header labeled “No Jumpers” (see table below).

Table 6-2. MVME710B Jumper Settings (DTE)

Header	Description	Setting
J9	DCE/DTE Select	No Jumpers
J10	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J11	DCE/DTE Select	No Jumpers
J12	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J13	DCE/DTE Select	No Jumpers
J14	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J15	DCE/DTE Select	No Jumpers
J16	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J17	DCE/DTE Select	No Jumpers
J18	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J19	DCE/DTE Select	No Jumpers
J20	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J21	DCE/DTE Select	No Jumpers
J22	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J23	DCE/DTE Select	No Jumpers
J24	DCE/DTE Select	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14

Table 6-3. Serial Port and Associated Header Identification

Serial Port Number	DCE Header	DTE Header
1	J21	J22
2	J23	J24
3	J17	J18
4	J19	J20
5	J13	J14
6	J15	J16
7	J9	J10
8	J11	J12

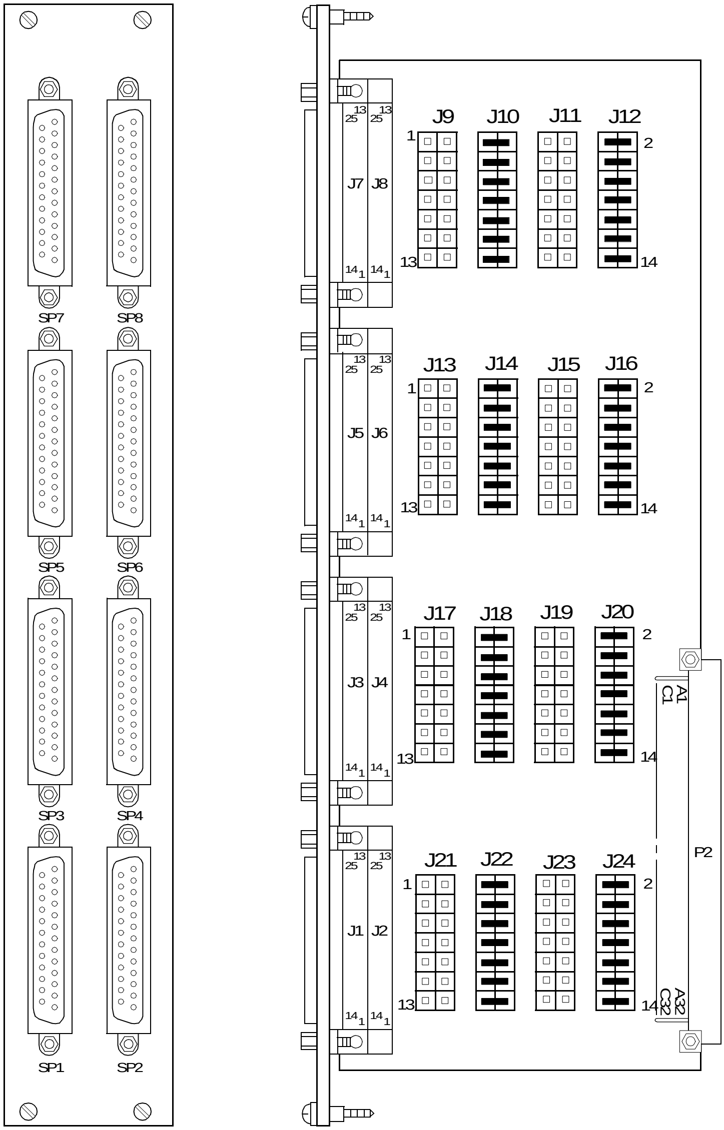

Figure 6-1. MVME710B Jumper Settings (DTE)

MVME712 Series of Transition Modules

The P2 connectors are duplicated on the reverse side of the backplane to accommodate MVME700 series plug-in transition modules. Two transition module connectors, designated XP1 and XP2, are provided for the CPU module. Board slots are keyed to prevent accidental VME/transition module mismatching.

Table 6-4. MVME712-101 Jumper Settings

Header	Description	Setting
J5 J6	Serial Port 1 as DTE (default)	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J6 J5	Serial Port 1 as DCE	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J7 J8	Serial Port 2 as DTE (default)	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J8 J7	Serial Port 2 as DCE	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J9 J10	Serial Port 3 as DTE (default)	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J10 J9	Serial Port 3 as DCE	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J11 J12 J13	Serial Port4 as DTE (default)	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers 1-2, 5-6, 9-10
J12 J11 J13	Serial Port 4 as DCE	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers 1-2, 3-4, 11-12

The following describes J13 jumpers on the XR712-101:

1-2	Connect TRXC4 to DB25, pin 15
3-4	Connect TRXC4 to DB25, pin 17
5-6	Connect TRXC4 to DB25, pin 24
7-8	Connect RTXC4 to DB25, pin 15
9-10	Connect RTXC4 to DB25, pin 17
11-12	Connect RTXC4 to DB25, pin 24

Table 6-5. MVME712-102 Jumper Settings

Header	Description	Setting
J2	Modem Connect (default = on) ON = Modem enable OFF = Modem disable	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14
J3	Monitor Connect (default = off) ON = Monitor enable OFF = Monitor disable	No jumpers
J6	Board/Test (default = off) ON = test OFF = run	No jumper
J8	Oscillator Enable (default = on) ON = run OFF = test	1-2
J9	SCSI Terminators (default = on) ON = enable OFF = disable	1-2

Table 6-6. MVME712-103 Jumper Settings

Header	Description	Setting
J5	Board Test (default = off) ON = test OFF = run	No jumpers
J6	Oscillator Enable (default = on) ON = run OFF = test	1-2
J7	SCSI Terminators (default = on) ON = enable OFF = disable	1-2

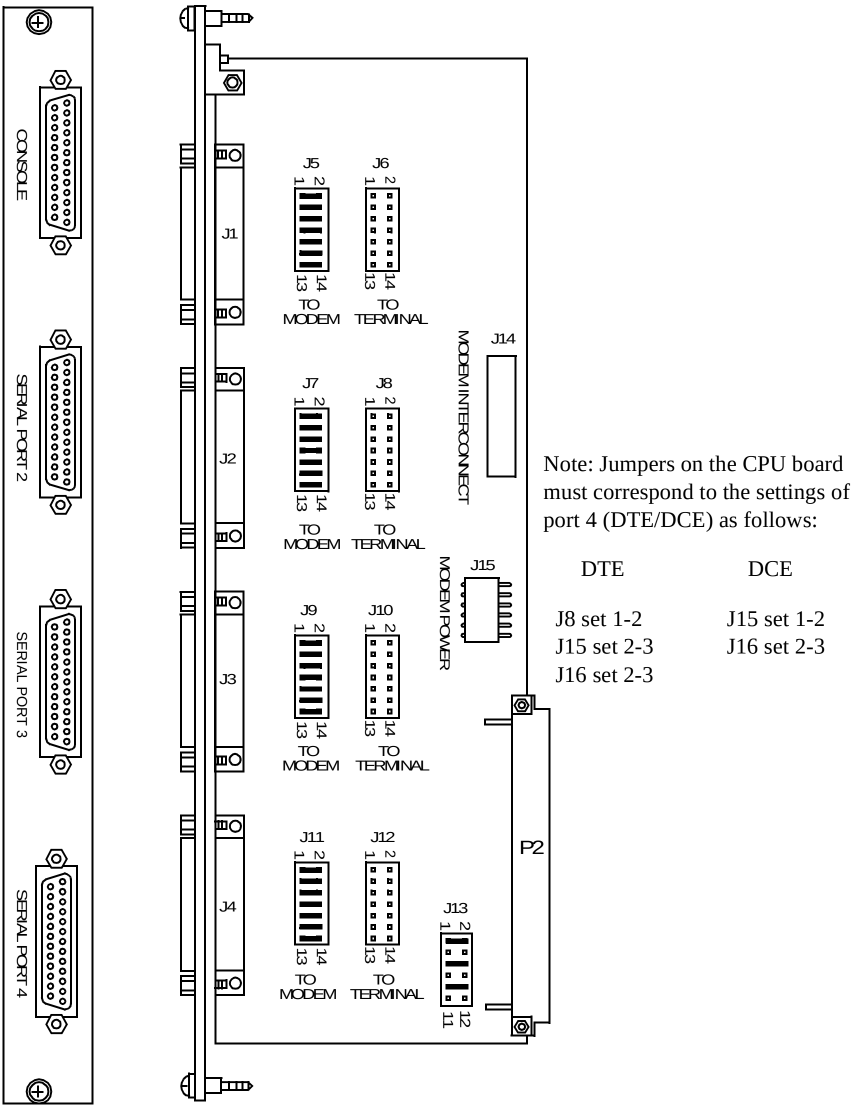

Figure 6-2. MVME712-101 Serial Port Transition Module

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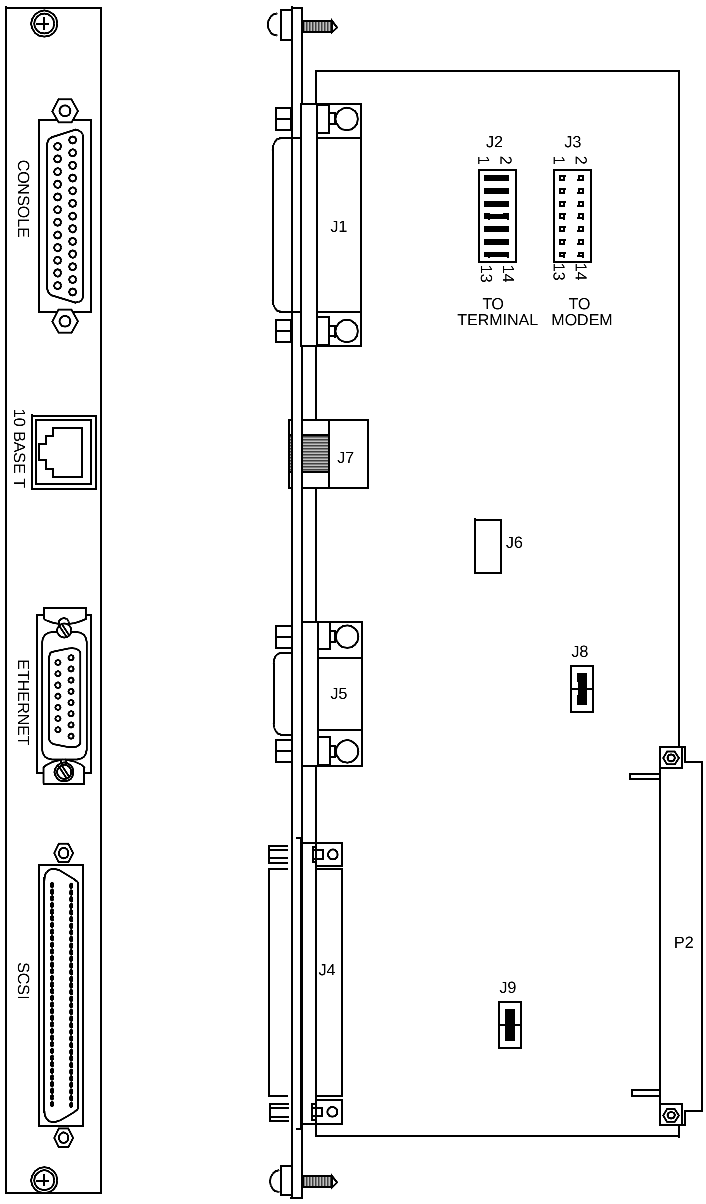

Figure 6-3. MVME712-102 Transition Module

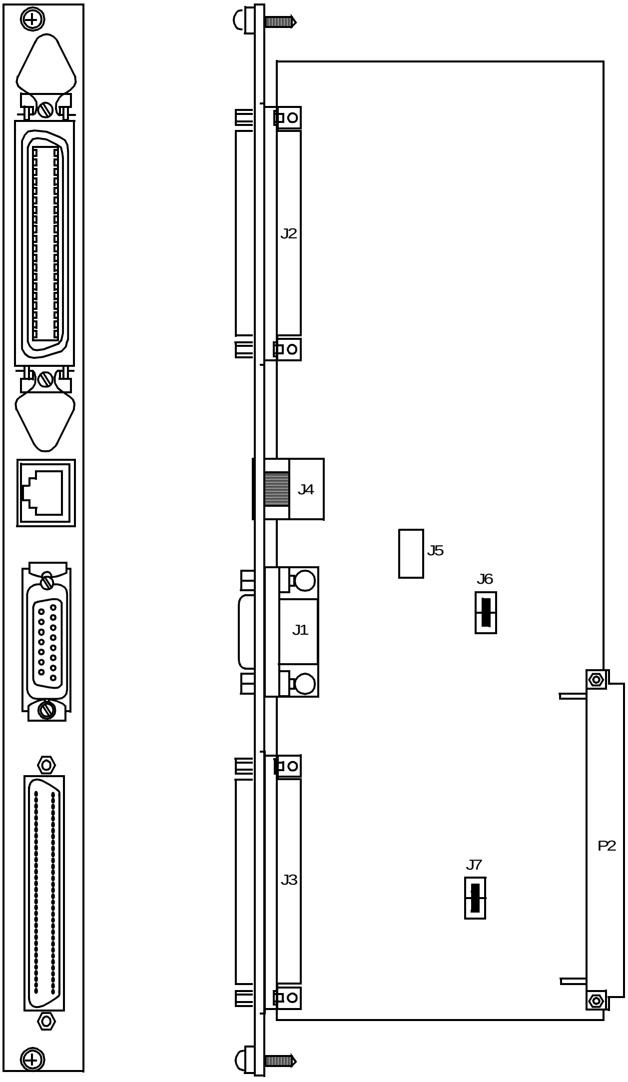

Figure 6-4. MVME712-103 Transition Module

6

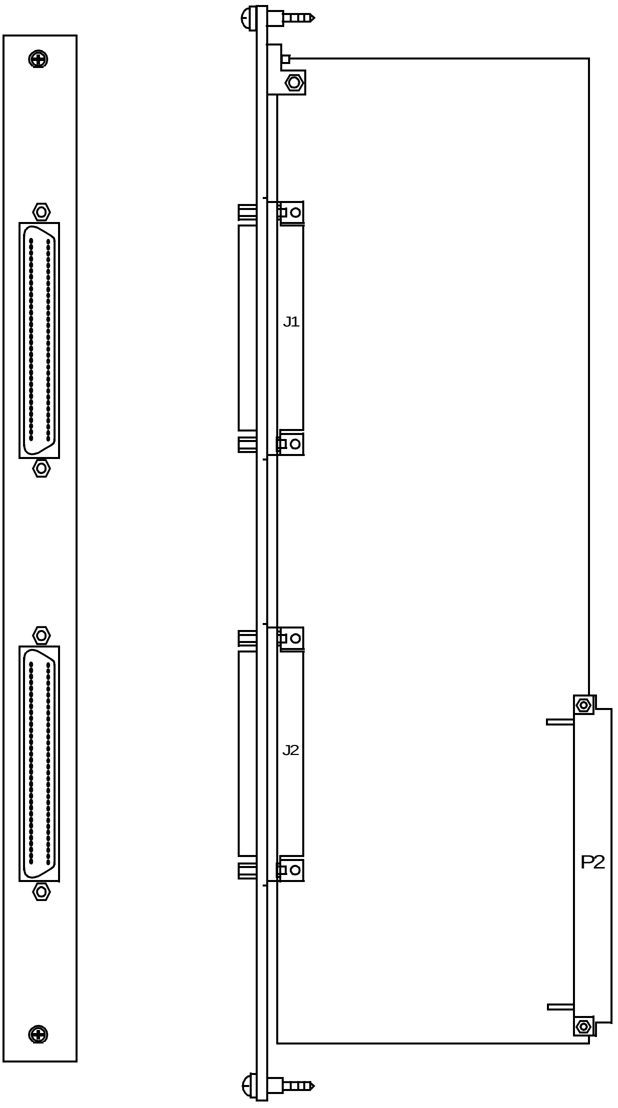

Figure 6-5. MVME712-104 SCSI Drive Transition Module

MVME762

Serial Port Signals

Six HD-26 connectors (female) are provided for the serial ports on the front panel of the MVME762 transition module. The pin assignments and signal mnemonics are listed in the table on the next page.

6

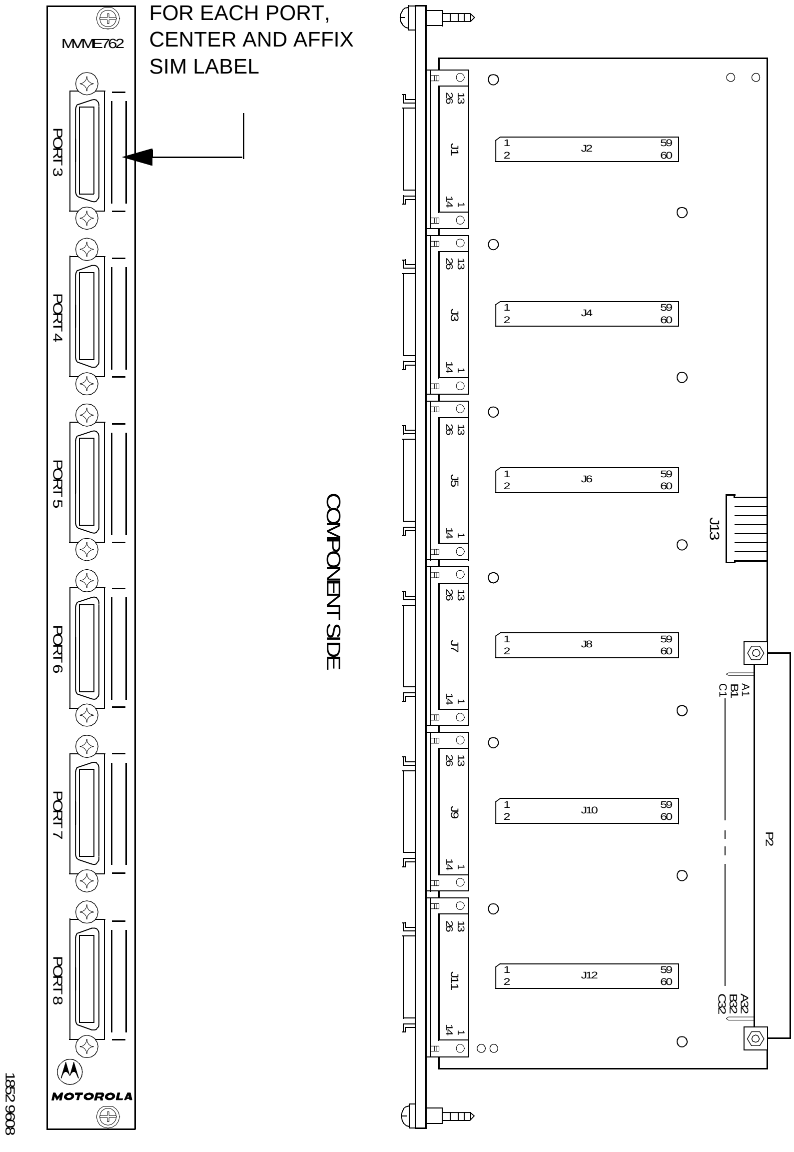

Figure 6-6. MVME762 Transition Module Front Panel and Component Side

Table 6-7. Pin Assignments for the MVME762 Transition Module

Pin Number		Mnemonic			
Serial Port	**SIM**	**EIA-232**	**EIA-530**	**V.35**	**X.21**
1	19	No Connect	No Connect	No Connect	No Connect
2	21	TXD	TXDA	TXDA	TXDA
3	11	RXD	RXDA	RXDA	RXDA
4	13	RTS	RTSA	RTS	No Connect
5	3	CTS	CTSA	CTS	No Connect
6	5	DSR	DSRA	DSR	No Connect
7	2	GND	GND	GND	GND
8	6	DCD	DCDA	DCD	No Connect
9	4	No Connect	RXCB	RXCB	INDB
10	14	No Connect	DCDB	No Connect	No Connect
11	12	No Connect	ETXCB	ETXCB	CTRLB
12	22	No Connect	TXCB	TXCB	SETB
13	20	No Connect	CTSB	No Connect	No Connect
14	23	No Connect	TXDB	TXDB	TXDB
15	25	TXC	TXCA	TXCA	SETA
16	15	No Connect	RXDB	RXDB	RXDB
17	17	RXC	RXCA	RXCA	INDA
18	7	LL	LL	LL	No Connect
19	9	No Connect	RTSB	No Connect	No Connect
20	1	DTR	DTRA	DTR	No Connect
21	10	RL	RL	RL	No Connect
22	8	RI	DSRB	RI	No Connect
23	18	No Connect	DTRB	No Connect	No Connect
24	16	ETXC	ETXCA	ETXCA	CTRLA
25	26	TM	TM	TM	No Connect
26	24	No Connect	No Connect	No Connect	No Connect

Serial Port Configurations

The serial port configurations for each of the communication protocols are shown in Figures 5 through 12.

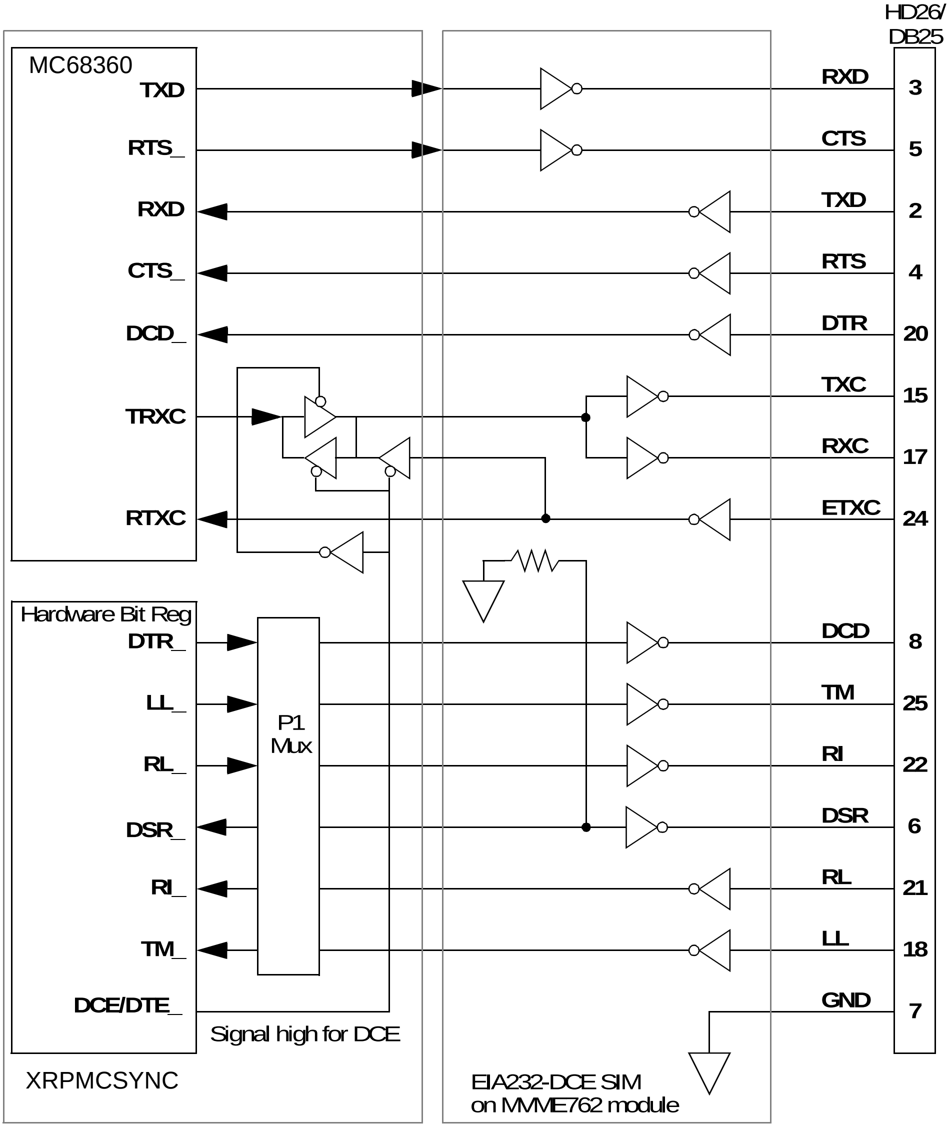

Figure 6-7. EIA232-DCE Serial Port Configuration

6

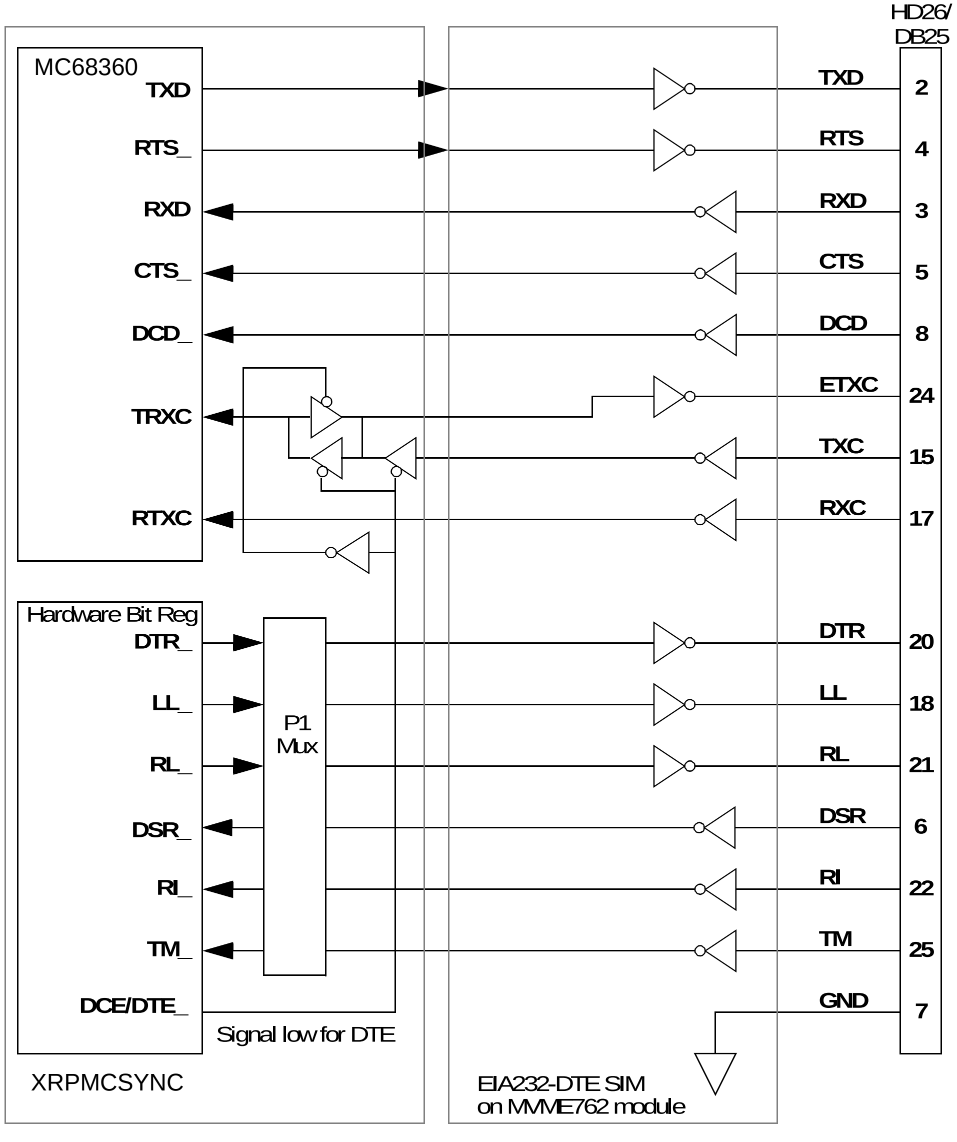

Figure 6-8. EIA232-DTE Serial Port Configuration

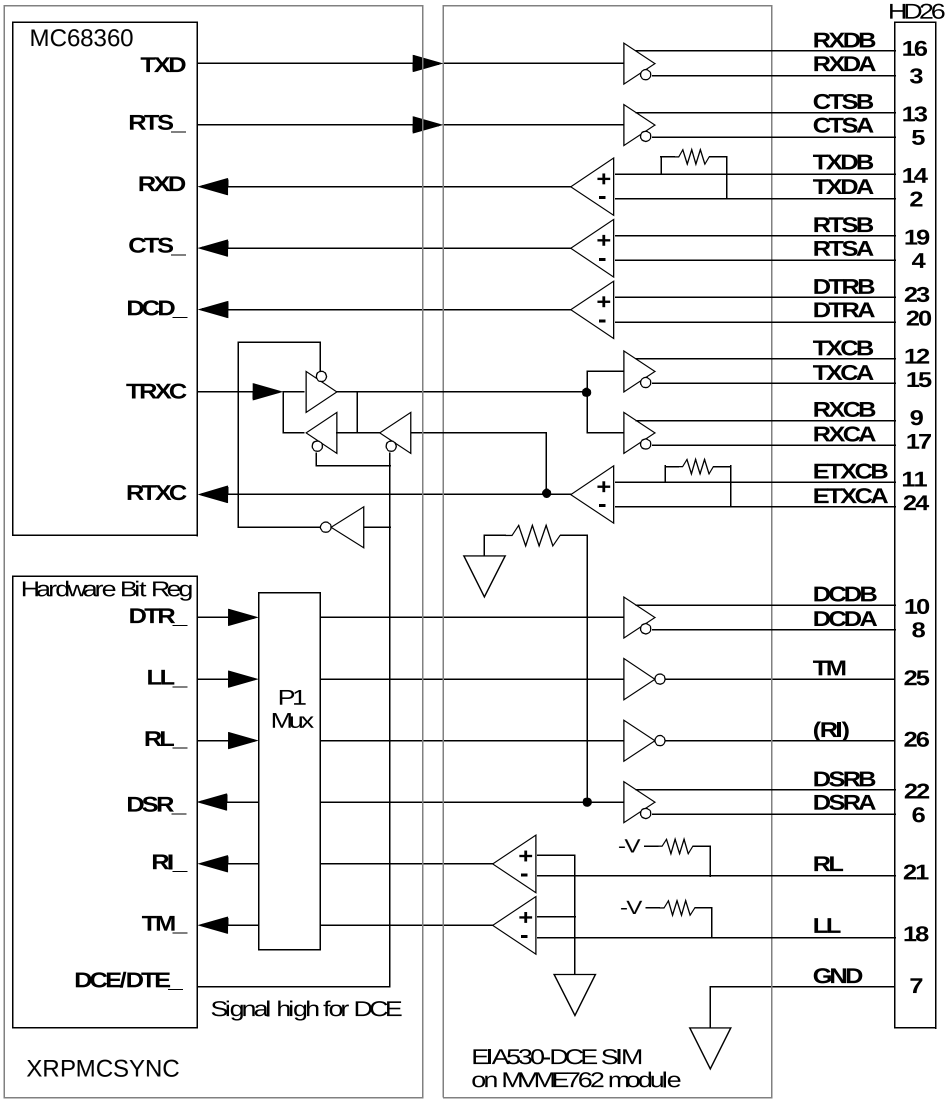

Figure 6-9. EIA530-DCE Serial Port Configuration

6

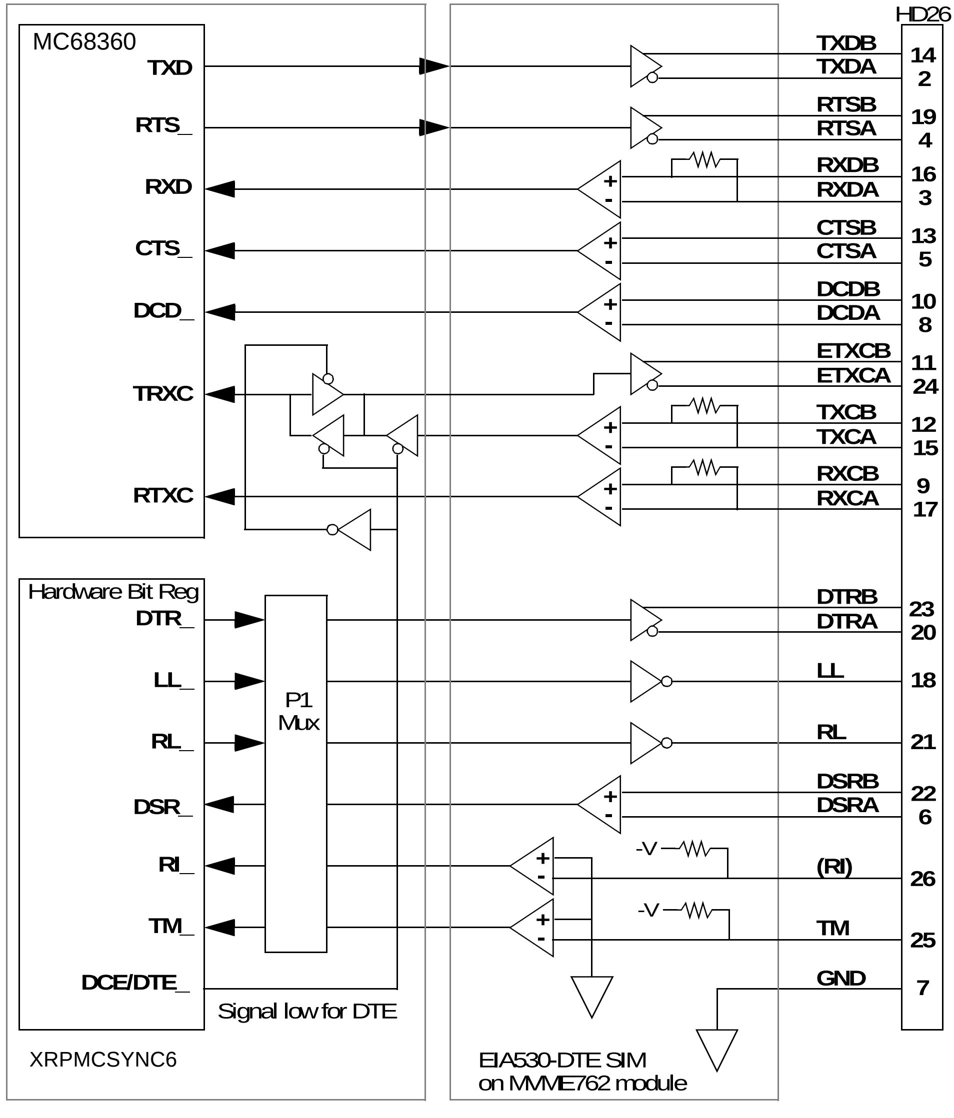

Figure 6-10. EIA530-DTE Serial Port Configuration

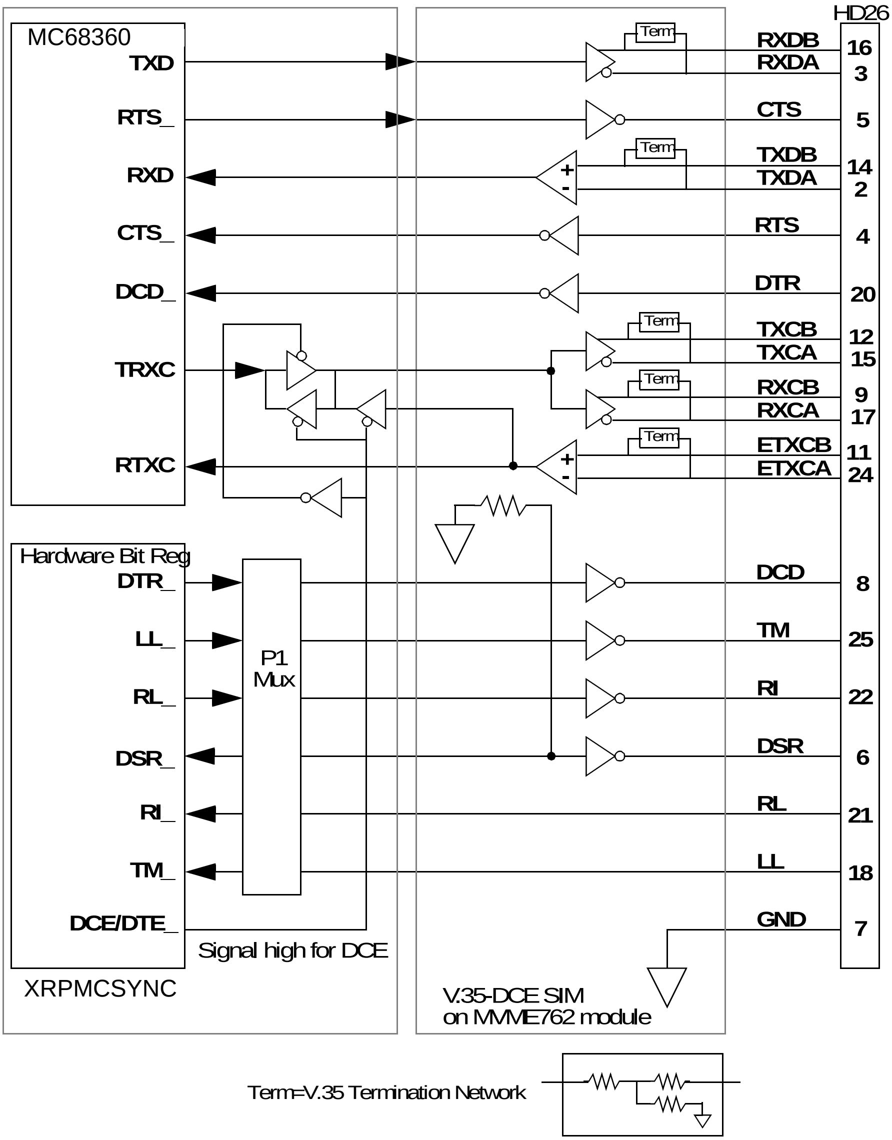

Figure 6-11. V.35-DCE Serial Port Configuration

6

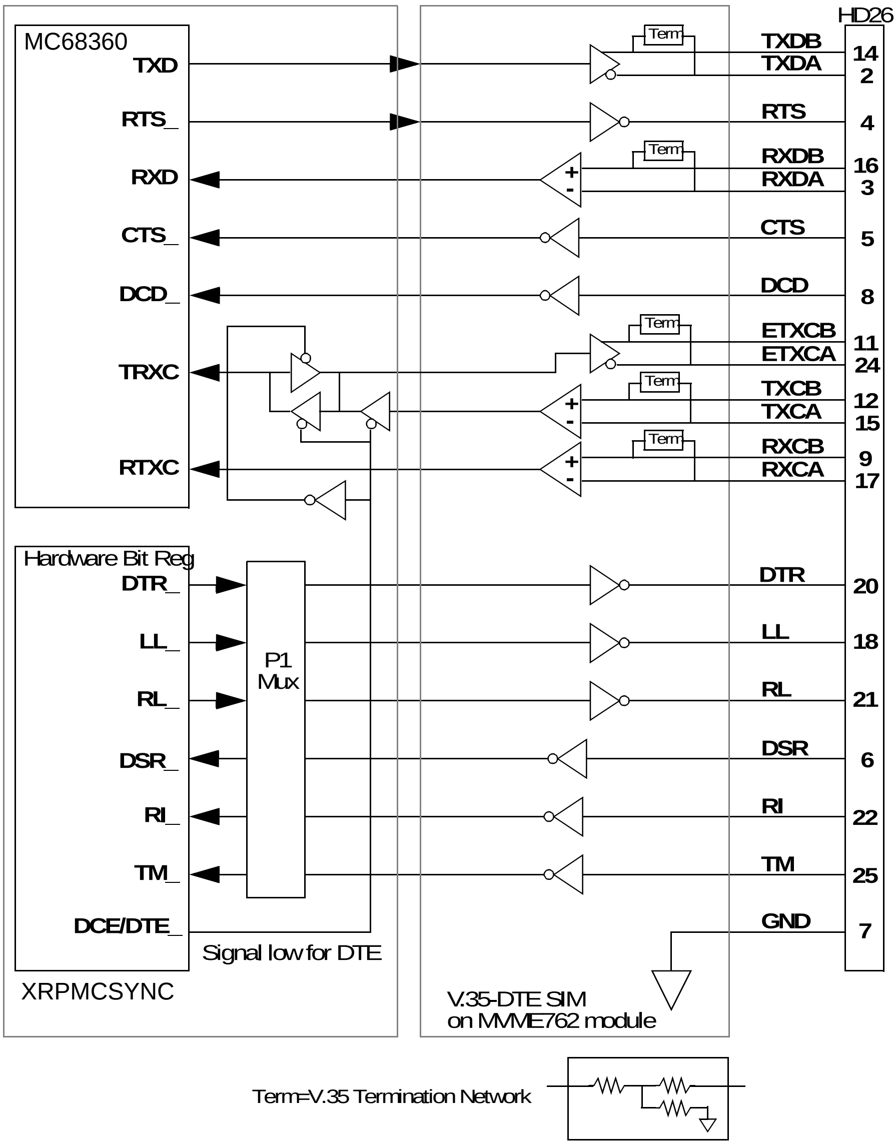

Figure 6-12. V.35-DTE Serial Port Configuration

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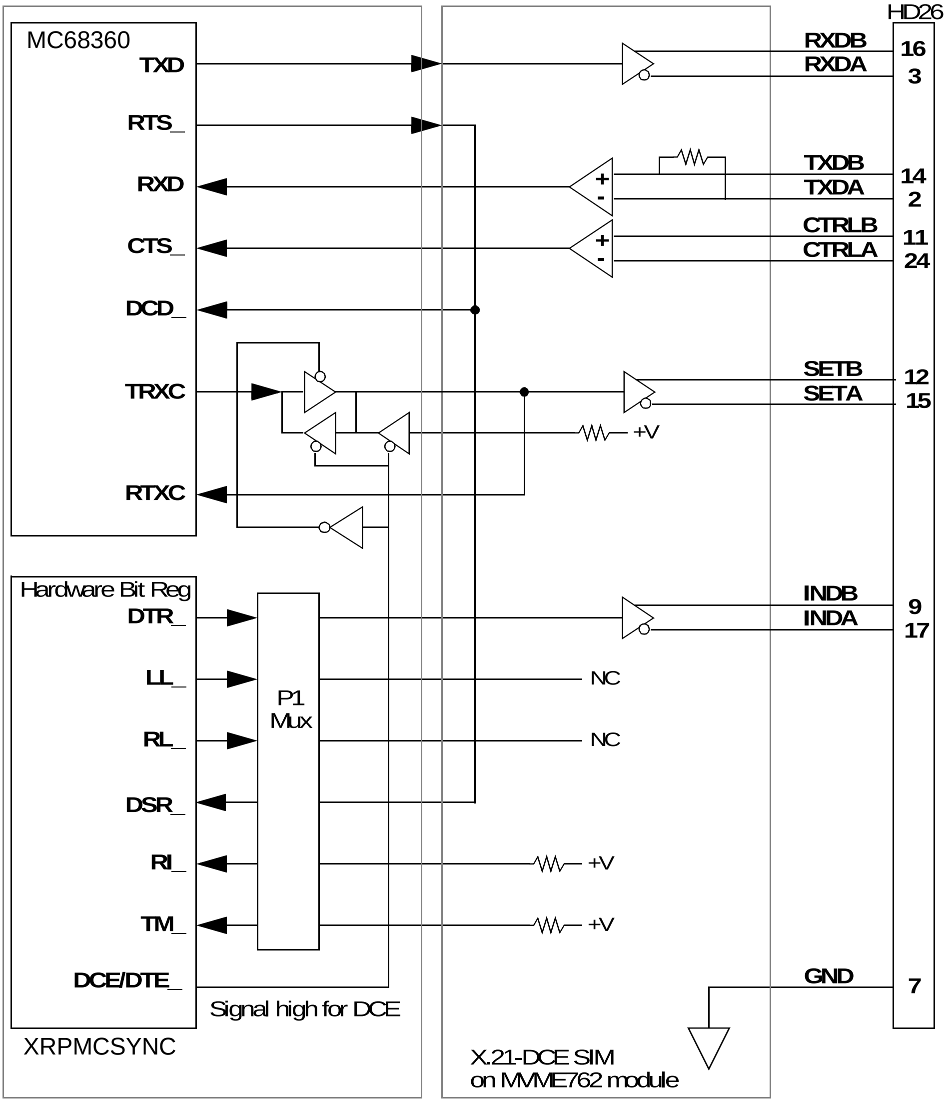

Figure 6-13. X.21-DCE Serial Port Configuration

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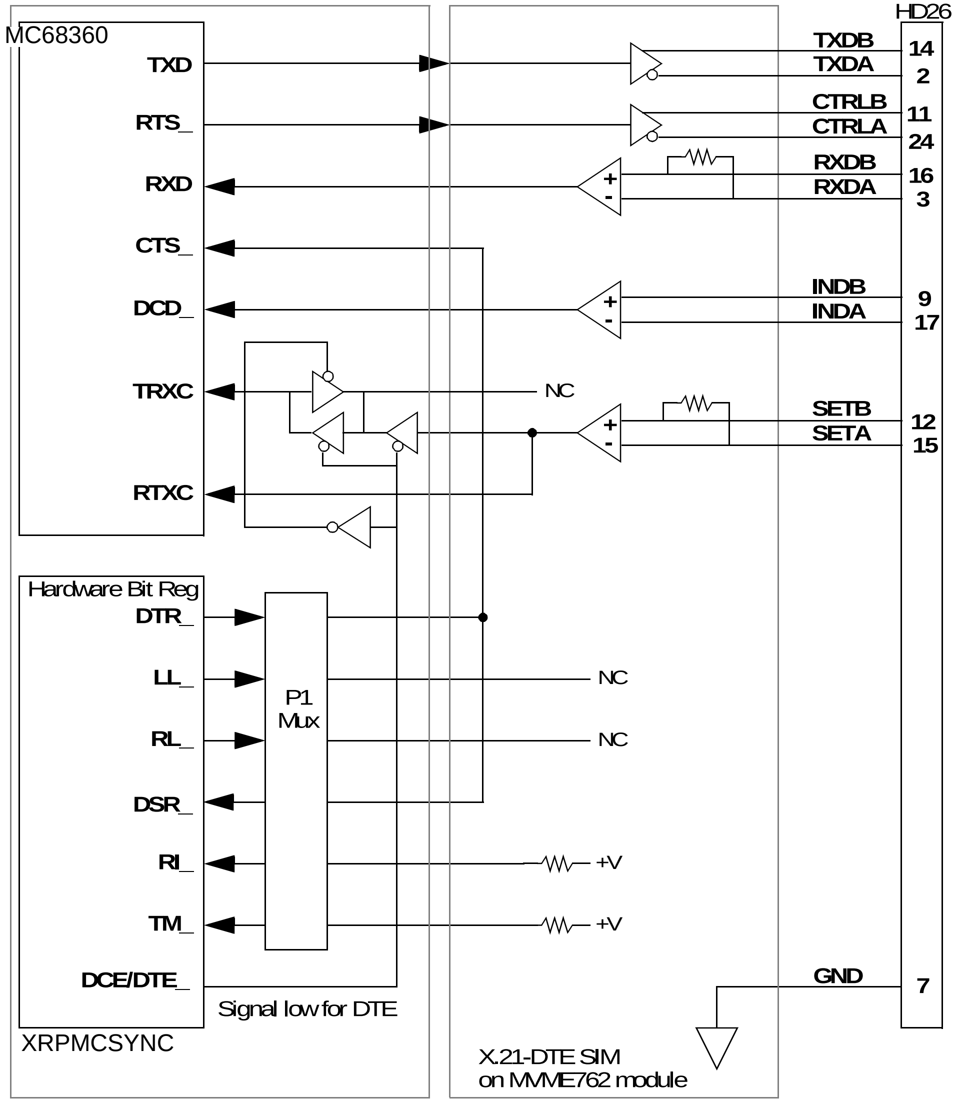
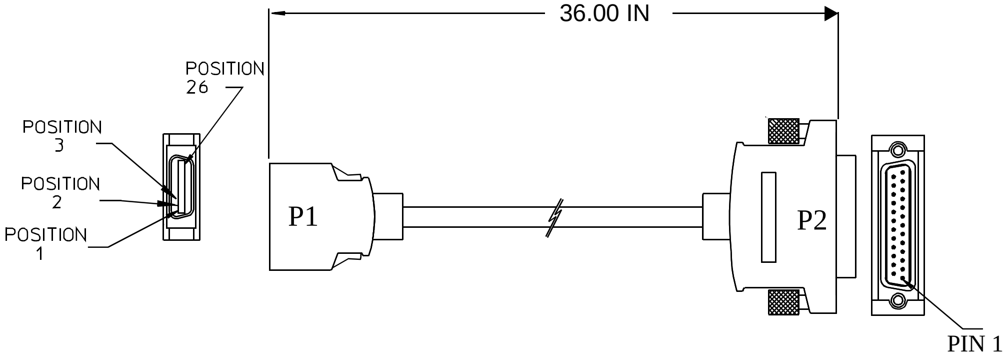


Figure 6-14. X.21-DTE Serial Port Configuration

External Connector Interface

The following optional cable, if purchased, provides an industry standard DB-25 female connector for connection to the external interface. Table 6-8 on page 6-24 lists the cable wiring needed if you want to make an extension cable.



Note The twisted pair combinations are essential for proper operation and must be maintained in any cable extensions that are used.

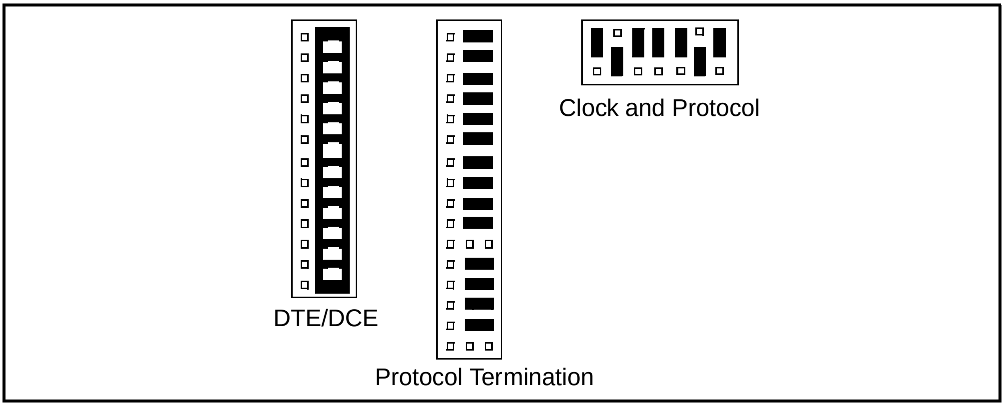
Table 6-8. Cable Wire List

Twisted Pair	From	To
1	P1-2 P1-14	P2-2 P2-14
2	P1-3 P1-16	P2-3 P2-16
3	P1-24 P1-11	P2-24 P2-11
4	P1-17 P1-9	P2-17 P2-9
5	P1-15 P1-12	P2-15 P2-12
6	P1-4 P1-19	P2-4 P2-19
7	P1-5 P1-13	P2-5 P2-13
8	P1-6 P1-22	P2-6 P2-22
9	P1-8 P1-10	P2-8 P2-10
10	P1-20 P1-23	P2-20 P2-23
11	P1-7 P1-18	P2-7 P2-18
12	P1--21 P1-25	P2-21 P2-25

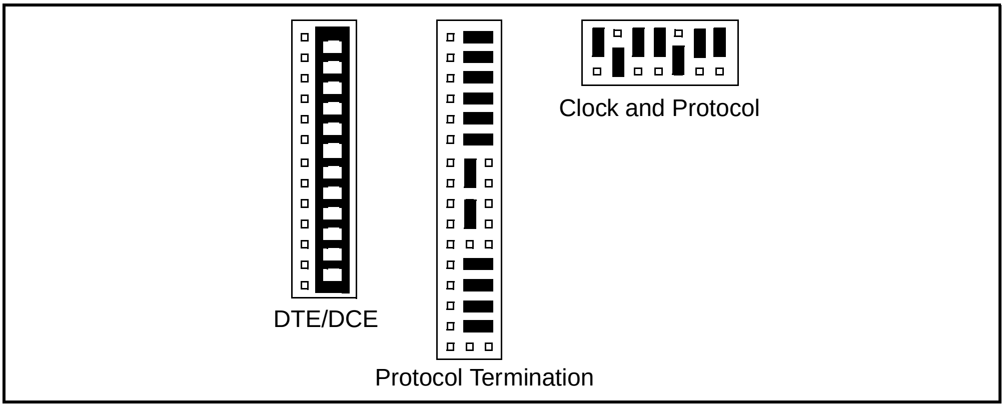
XR341ATM

The XR341ATM provides full I/O capabilities for the XR341A SS7 controller.

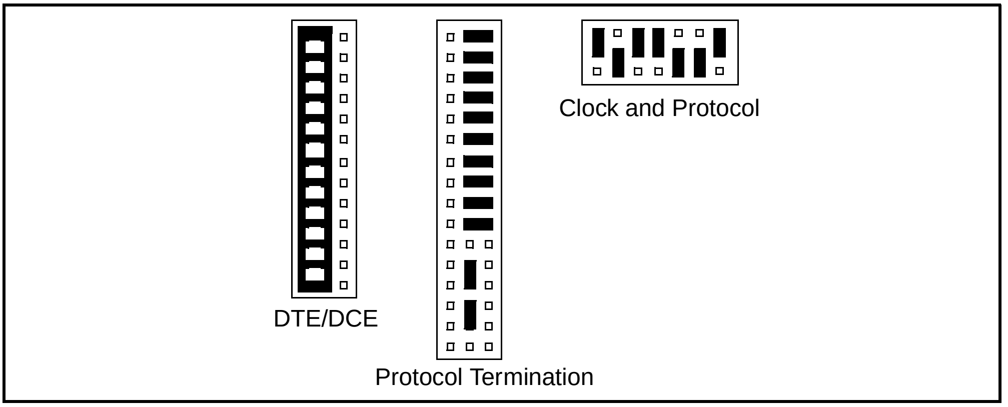
The transition module has jumpers for DTE/DCE selection, protocol termination, and clocking DTE transmit type. The supported protocols are EIA422, EIA232, and V.35. A set of jumpers exists for each of four ports, SP0 to SP3. The position of the jumpers for specific DTE/DCE type, protocol type, and clocking type combinations are shown below.



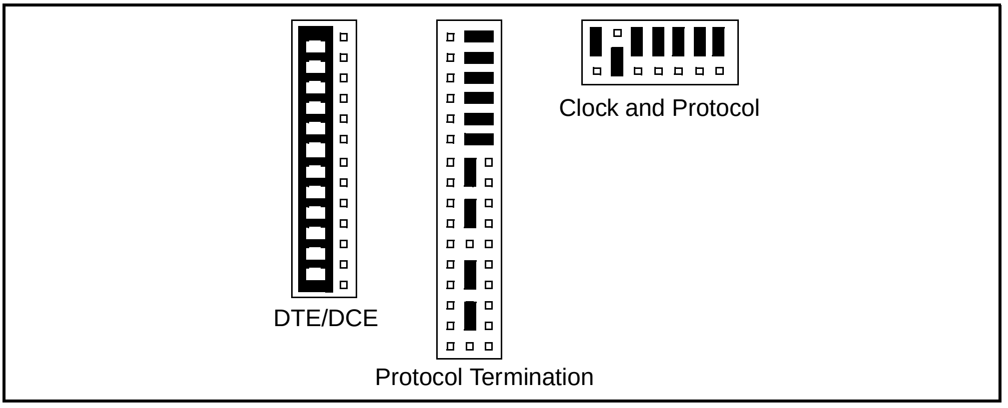
Transition Module Jumpers (DTE Type, EIA422 Protocol, DCE Clocking DTE Transmit Data)



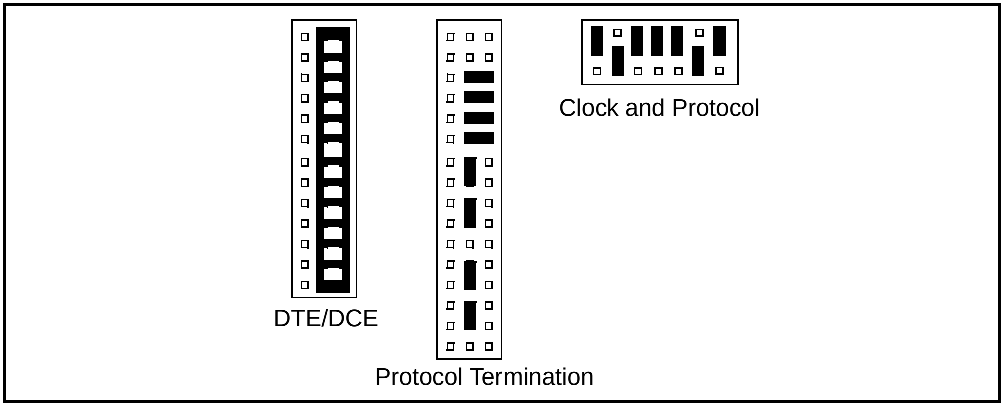
Transition Module Jumpers (DTE Type, EIA422 Protocol, DTE Clocking DTE Transmit Data)



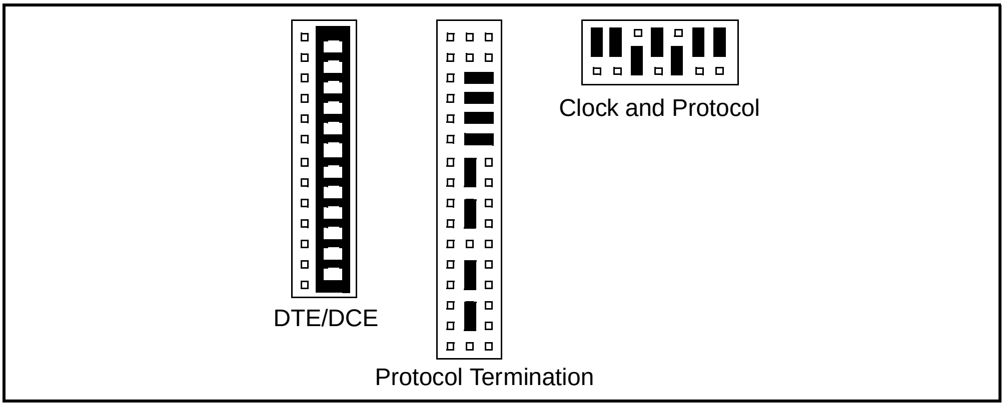
Transition Module Jumpers (DCE Type, EIA422 Protocol, DTE Clocking DTE Transmit Data)



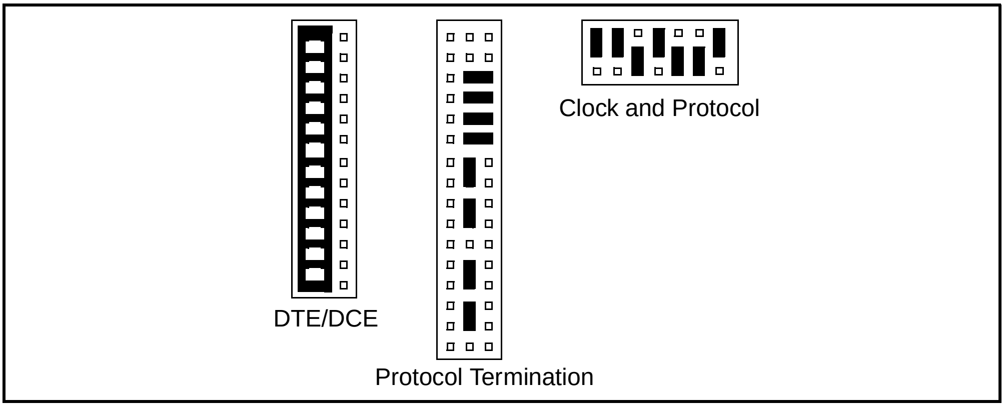
Transition Module Jumpers (DCE Type, EIA422 Protocol, DCE Clocking DTE Transmit Data)



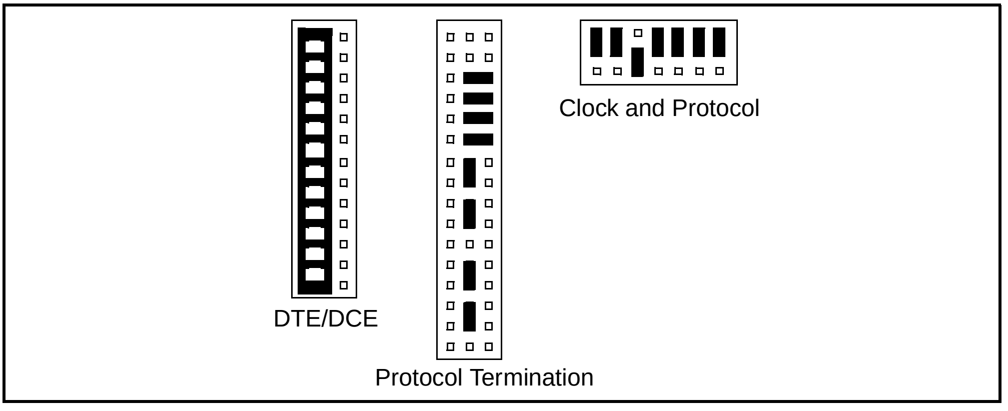
Transition Module Jumpers (DTE Type, EIA232 Protocol, DCE Clocking DTE Transmit Data)



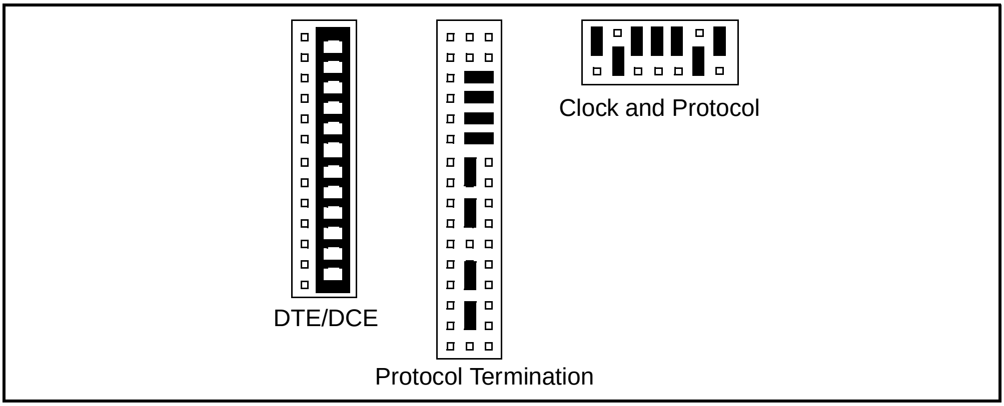
Transition Module Jumpers (DTE Type, EIA232 Protocol, DTE Clocking DTE Transmit Data)



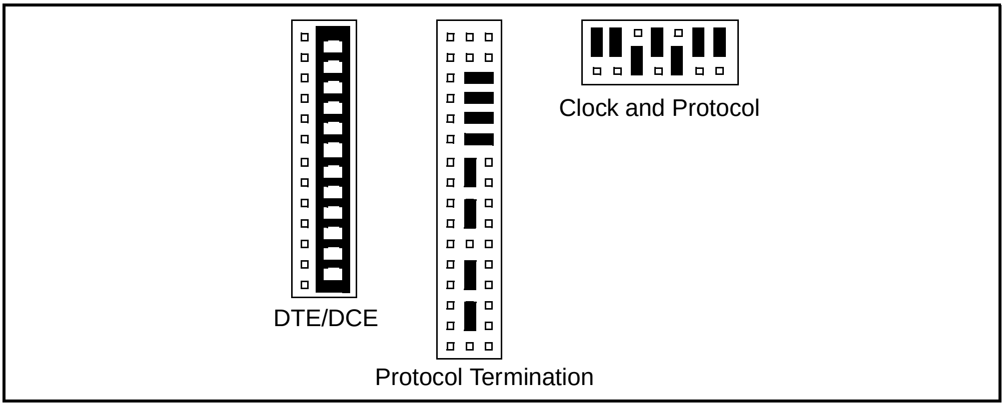
Transition Module Jumpers (DCE Type, EIA232 Protocol, DTE Clocking DTE Transmit Data)



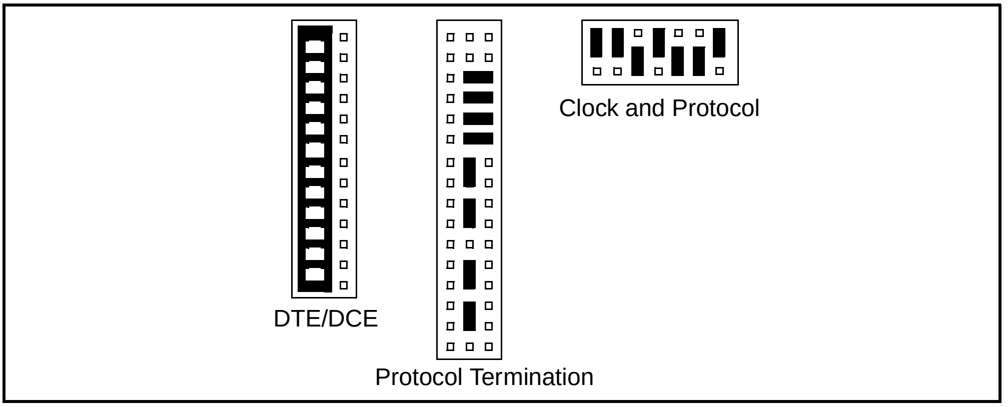
Transition Module Jumpers (DCE Type, EIA232 Protocol, DCE Clocking DTE Transmit Data)



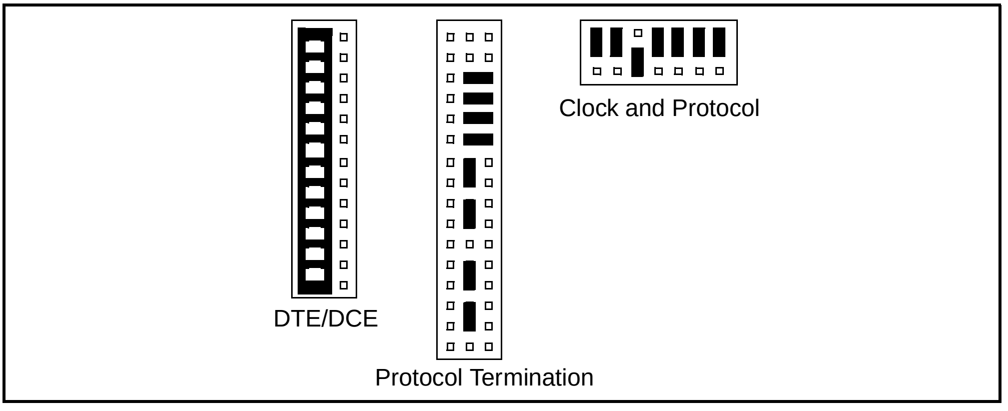
Transition Module Jumpers (DTE Type, EIA232 Protocol, DCE Clocking DTE Transmit Data)



Transition Module Jumpers (DTE Type, EIA232 Protocol, DTE Clocking DTE Transmit Data)



Transition Module Jumpers (DCE Type, EIA232 Protocol, DTE Clocking DTE Transmit Data)



Transition Module Jumpers (DCE Type, EIA232 Protocol, DCE Clocking DTE Transmit Data)

External Connector Interfaces

A DB-25 connector connects each port to the external interface. Each protocol and clock option combination has a different DB-25 pinout. Table 6-9 through Table 6-12 lists the pinouts of each protocol for the specified clocking option.

The first column identifies the signal from which the interface generates data or onto which it put its received data. The DTE with DTE clocking, DCE with DCE clocking, and DCE with DTE clocking options have a clock signal generated from the BAUD signal. The signal also goes to the signal specified in parentheses next to ‘BAUD’.

The second column identifies the pin number, while the third column specifies input or output. Finally, the last columns identify the signals for the particular protocol.

6

Table 6-9. External Interface (DTE with DCE Clocking DTE Transmit Data)

P2 Signal	DB-25 Pinout	I/O	External Interface DB-25		
			EIA422	EIA232	V.35
-	1	-	NC	NC	NC
XMT	2	O	XMT-P	XMT-P	XMT-P
RCV	3	I	RCV-P	RCV-P	RCV-P
RTS*	4	O	RTS*-P	RTS*-P	RTS*-P
CTS*	5	I	CTS*-P	CTS*-P	CTS*-P
READYIN*	6	I	READYIN*-P	READYIN*-P	READYIN*-P
-	7	-	SIGNAL GND	SIGNAL GND	SIGNAL GND
-	8	-	NC	NC	NC
RCLK	9	I	RCLK-N	NC	RCLK-N
-	10	-	NC	NC	NC
-	11	-	NC	NC	NC
TCLK	12	I	TCLK-N	NC	TCLK-N
CTS*	13	I	CTS*-N	NC	NC
XMT	14	O	XMT-N	NC	XMT-N
TCLK	15	I	TCLK-P	TCLK-P	TCLK-P
RCV	16	I	RCV-N	NC	RCV-N
RCLK	17	I	RCLK-P	RCLK-P	RCLK-P
-	18	-	NC	NC	NC
RTS*	19	O	RTS*-N	NC	NC
READYOUT*	20	O	READYOUT*-P	READYOUT*-P	READYOUT*-P
-	21	-	NC	NC	NC
READYIN*	22	I	READYIN*-N	NC	NC
READYOUT*	23	O	READYOUT*-N	NC	NC
-	24	-	NC	NC	NC
-	25	-	NC	NC	NC

RCV=receive data; XMT=transmit data, RCLK*=receive clock, TCLK*=transmit clock, CTS*=clear to send, RTS*=ready to send, READYIN*=DTE/DCE ready, READYOUT*=DCE/DTE ready, BAUD=generated clock

Table 6-10. External Interface (DTE with DTE Clocking DTE Transmit Data)

P2 Signal	DB-25 Pinout	I/O	External Interface DB-25		
			EIA422	EIA232	V.35
-	1	-	NC	NC	NC
XMT	2	O	XMT-P	XMT-P	XMT-P
RCV	3	I	RCV-P	RCV-P	RCV-P
RTS*	4	O	RTS*-P	RTS*-P	RTS*-P
CTS*	5	I	CTS*-P	CTS*-P	CTS*-P
READYIN*	6	I	READYIN*-P	READYIN*-P	READYIN*-P
-	7	-	SIGNAL GND	SIGNAL GND	SIGNAL GND
-	8	-	NC	NC	NC
RCLK	9	I	RCLK-N	NC	RCLK-N
-	10	-	NC	NC	NC
-	11	-	NC	NC	NC
BAUD (TCLK*)	12	O	TCLK-N	NC	TCLK-N
CTS*	13	I	CTS*-N	NC	NC
XMT	14	O	XMT-N	NC	XMT-N
BAUD (TCLK*)	15	O	TCLK-P	TCLK-P	TCLK-P
RCV	16	I	RCV-N	NC	RCV-N
RCLK	17	I	RCLK-P	RCLK-P	RCLK-P
-	18	-	NC	NC	NC
RTS*	19	O	RTS*-N	NC	NC
READYOUT*	20	O	READYOUT*-P	READYOUT*-P	READYOUT*-P
-	21	-	NC	NC	NC
READYIN*	22	I	READYIN*-N	NC	NC
READYOUT*	23	O	READYOUT*-N	NC	NC
-	24	-	NC	NC	NC
-	25	-	NC	NC	NC
RCV=receive data; XMT=transmit data, RCLK*=receive clock, TCLK*=transmit clock, CTS*=clear to send, RTS*=ready to send, READYIN*=DTE/DCE ready, READYOUT*=DCE/DTE ready, BAUD=generated clock					

6

6

Table 6-11. External Interface (DCE with DCE Clocking DTE Transmit Data)

P2 Signal	DB-25 Pinout	I/O	External Interface DB-25		
			EIA422	EIA232	V.35
-	1	-	NC	NC	NC
RCV	2	I	RCV-P	RCV-P	RCV-P
XMT	3	O	XMT-P	XMT-P	XMT-P
CTS*	4	I	CTS*-P	CTS*-P	CTS*-P
RTS*	5	O	RTS*-P	RTS*-P	RTS*-P
READYOUT*	6	O	READYOUT*-P	READYOUT*-P	READYOUT*-P
-	7	-	SIGNAL GND	SIGNAL GND	SIGNAL GND
-	8	-	NC	NC	NC
BAUD (TCLK*)	9	O	TCLK-N	NC	TCLK-N
-	10	-	NC	NC	NC
-	11	-	NC	NC	NC
BAUD (RCLK*)	12	O	RCLK-N	NC	RCLK-N
RTS*	13	O	RTS*-N	NC	NC
RCV	14	I	RCV-N	NC	RCV-N
BAUD (RCLK*)	15	O	RCLK-P	RCLK-P	RCLK-P
XMT	16	O	XMT-N	NC	XMT-N
BAUD (TCLK*)	17	O	TCLK-P	TCLK-P	TCLK-P
-	18	-	NC	NC	NC
CTS*	19	I	CTS*-N	NC	NC
READYIN*	20	I	READYIN*-P	READYIN*-P	READYIN*-P
-	21	-	NC	NC	NC
READYOUT*	22	O	READYOUT*-N	NC	NC
READYIN*	23	I	READYIN*-N	NC	NC
-	24	-	NC	NC	NC
-	25	-	NC	NC	NC
RCV=receive data; XMT=transmit data, RCLK*=receive clock, TCLK*=transmit clock, CTS*=clear to send, RTS*=ready to send, READYIN*=DTE/DCE ready, READYOUT*=DCE/DTE ready, BAUD=generated clock					

Table 6-12. External Interface (DCE with DTE Clocking DTE Transmit Data)

P2 Signal	DB-25 Pinout	I/O	External Interface DB-25		
			EIA422	**EIA232**	**V.35**
-	1	-	NC	NC	NC
RCV	2	I	RCV-P	RCV-P	RCV-P
XMT	3	O	XMT-P	XMT-P	XMT-P
CTS*	4	I	CTS*-P	CTS*-P	CTS*-P
RTS*	5	O	RTS*-P	RTS*-P	RTS*-P
READYOUT*	6	O	READYOUT*-P	READYOUT*-P	READYOUT*-P
-	7	-	SIGNAL GND	SIGNAL GND	SIGNAL GND
-	8	-	NC	NC	NC
BAUD (TCLK*)	9	O	TCLK-N	NC	TCLK-N
-	10	-	NC	NC	NC
-	11	-	NC	NC	NC
RCLK*	12	I	RCLK-N	NC	RCLK-N
RTS*	13	O	RTS*-N	NC	NC
RCV	14	I	RCV-N	NC	RCV-N
RCLK*	15	I	RCLK-P	RCLK-P	RCLK-P
XMT	16	O	XMT-N	NC	XMT-N
BAUD (TCLK*)	17	O	TCLK-P	TCLK-P	TCLK-P
-	18	-	NC	NC	NC
CTS*	19	I	CTS*-N	NC	NC
READYIN*	20	I	READYIN*-P	READYIN*-P	READYIN*-P
-	21	-	NC	NC	NC
READYOUT*	22	O	READYOUT*-N	NC	NC
READYIN*	23	I	READYIN*-N	NC	NC
-	24	-	NC	NC	NC
-	25	-	NC	NC	NC
RCV=receive data; XMT=transmit data, RCLK*=receive clock, TCLK*=transmit clock, CTS*=clear to send, RTS*=ready to send, READYIN*=DTE/DCE ready, READYOUT*=DCE/DTE ready, BAUD=generated clock					

6

Loopback Cabling

Loopback cabling is used to connect the AccessMANAGER system back to back. This connection allows multiple signaling points on the system to communicate with each other over SS7 links. Multiple signaling points are possible on AccessMANAGER systems equipped with the Intelligent Network Emulator (INE) option.

Use a straight through DB-25 connector as the loopback cable from port SP0 to port SP2, and port SP1 to port SP3 on the transition module. Set one of the two ports that are connected to DTE, and set the other to DCE. Change the settings as described in the previous section.

XR712-109 Alarm Transition Module

The XR712-109 Alarm Transistion Module converts fault detection and alarm reporting signals to Bellcore-type dry contact relay outputs and remote system reset capability for the XR series system.

An RJ-45 connector on the face plate of the transition module provides alarm input from the chassis. A DB-9 connector on the face plate of the transition module provides alarm signal output to remote monitoring equipment. A 6-pin header on the board itself provides remote reset capabilities.

Connector Pin Assignments

Table 6-13. Reset/Power Input (6-pin header)

J1-	Signal Name
1	+5VDC
2	NC
3	NC
4	GND
5	Voided Key
6	Reset

6

Table 6-14. RJ-45 Alarm Input

J2-	Signal Name
1	Power Fail In
2	Thermal Fail In
3	GND
4	NC
5	NC
6	NC
7	NC
8	NC

Table 6-15. DB-9 External Alarm Output

J3-	Signal Name
1	Reset Power In
2	Power Fail Out
3	GND
4	NC
5	Thermal Fail Out
6	Reset Return In
7	Power Fail Out
8	Reset Out
9	Thermal Fail Out

XR712-121

The XR712-121 single-slot transition module (Figure 6-15) is a four serial port module that provides two asynchronous and two synchronous/asynchronous serial ports.

Serial Interface Modules (SIMs) are used to select the desired communications protocol and configuration for ports 3 and 4. The secondary side of each SIM plugs into connector J8 or J9 on the XR712-121.

Jumper Settings

The asynchronous serial ports, ports 1 and 2, use the EIA-232 protocol and are jumper-configurable DTE or DCE. Headers J2 through J25 are used to configure serial port 1. Headers J27 through J44 are used to configure serial port 2. The jumper block for these ports also allows you to use either all eight signals or just those used by the XR712-101 transition board. This allows you to emulate the XR712-101 in order to maintain backward compatibility with existing cables and software. The transition module ships from the factory in XR712-101 emulation mode.

Headers J46 and J47 are used to configure serial ports 3 and 4, respectively. With the jumper in position 1-2, the ports are configured as DTE. With the jumper in position 2-3, the ports are configured as DCE. The jumper setting of the port should match the configuration of the corresponding SIM module. The factory configuration comes with ports 3 and 4 set up as DTE ports.

The jumper positions for the XR712-101 emulation mode are shown in Table 6-17. The full signal set jumper settings are shown in Table 3-21.

Note Jumpers on the CPU board must correspond to the settings of ports 3 and 4 (DTE/DCE) and correspond to the type of SIM module installed.

On XR60*x*E-1S (MVME2600) boards, Headers J18 and J17 are used to configure serial ports 3 and 4, respectively. On XR604E-1D (MVME3600) boards, Headers J15 and J16 are used to configured serial ports 3 and 4, respectively. With the jumper in position 1-2, the ports are configured as DCE. With the jumper in position 2-3, the ports are configured as DTE.

Table 6-16. XR712-121 Jumper Settings for XR712-101 Emulation

Header	Description	Setting
J2, J10, J12, J14, J16, J18, J20, J22, J24	Serial Port 1 as DTE (default)	1-2
J3, J11, J13, J15, J17, J19, J21, J23, J25		No jumpers
J3, J11, J13, J15, J17, J19, J21, J23, J25	Serial Port 1 as DCE	1-2
J2, J10, J12, J14, J16, J18, J20, J22, J24		No jumpers
J27, J29, J31, J33, J35, J37, J39, J41, J43	Serial Port 2 as DTE (default)	1-2
JJ28, J30, J32, J34, J36, J38, J40, J42, J44		No jumpers
JJ28, J30, J32, J34, J36, J38, J40, J42, J44	Serial Port 2 as DCE	1-2
J27, J29, J31, J33, J35, J37, J39, J41, J43		No jumpers
J46	Serial Port 3 as DTE (default)	1-2 (see note)
J46	Serial Port 3 as DCE	2-3
J47	Serial Port 4 as DTE (default)	1-2 (see note)
J47	Serial Port 4 as DCE	2-3

Table 6-17. XR712-121 Jumper Settings

Header	Description	Setting
J2, J10, J12, J14, J16, J18, J20, J22, J24	Serial Port 1 as DTE (default)	2-3
J3, J11, J13, J15, J17, J19, J21, J23, J25		No jumpers
J3, J11, J13, J15, J17, J19, J21, J23, J25	Serial Port 1 as DCE	2-3
J2, J10, J12, J14, J16, J18, J20, J22, J24		No jumpers
J27, J29, J31, J33, J35, J37, J39, J41, J43	Serial Port 2 as DTE (default)	2-3
JJ28, J30, J32, J34, J36, J38, J40, J42, J44		No jumpers
JJ28, J30, J32, J34, J36, J38, J40, J42, J44	Serial Port 2 as DCE	2-3
J27, J29, J31, J33, J35, J37, J39, J41, J43		No jumpers
J46	Serial Port 3 as DTE (default)	1-2 (see note)
J46	Serial Port 3 as DCE	2-3
J47	Serial Port 4 as DTE (default)	1-2 (see note)
J47	Serial Port 4 as DCE	2-3

Connector Pin Assignments

The connector pin assignments for the serial ports are shown in the following tables.

Table 6-18. Console/Serial Port 1 Connector Pin Assignments

Pin #	Signal Name	
	712-101 Emulation	Full Signal Set
1	Not Used	Not Used
2	TXD1	TXD1
3	RXD1	RXD1
4	RTS1	RTS1
5	CTS1	CTS1
6	Not Used	DSR1
7	GND	GND
8	Not Used	DCD1
9 through 19	Not Used	Not Used
20	Not Used	DTR1
21	Not Used	Not Used
22	Not Used	RI1
23 through 25	Not Used	Not Used

Table 6-19. Serial Port 2 Connector Pin Assignments

Pin #	Signal Name	
	712-101 Emulation	Full Signal Set
1	Not Used	Not Used
2	TXD2	TXD2
3	RXD2	RXD2
4	RTS2	RTS2
5	CTS2	CTS2
6	Not Used	DSR2
7	GND	GND
8	DCD2	DCD2
9 through 19	Not Used	Not Used
20	DTR2	DTR2
21	Not Used	Not Used
22	Not Used	RI2
23 through 25	Not Used	Not Used

The *XR346 Communication Controller* section in Chapter 5contains a *Serial Port Signals* section. Refer to it for pin assignments and signal mnemonics for ports 3 and 4. Following that section is a *Serial Port Configuration* section that illustrates the serial port configurations for each communication protocol.

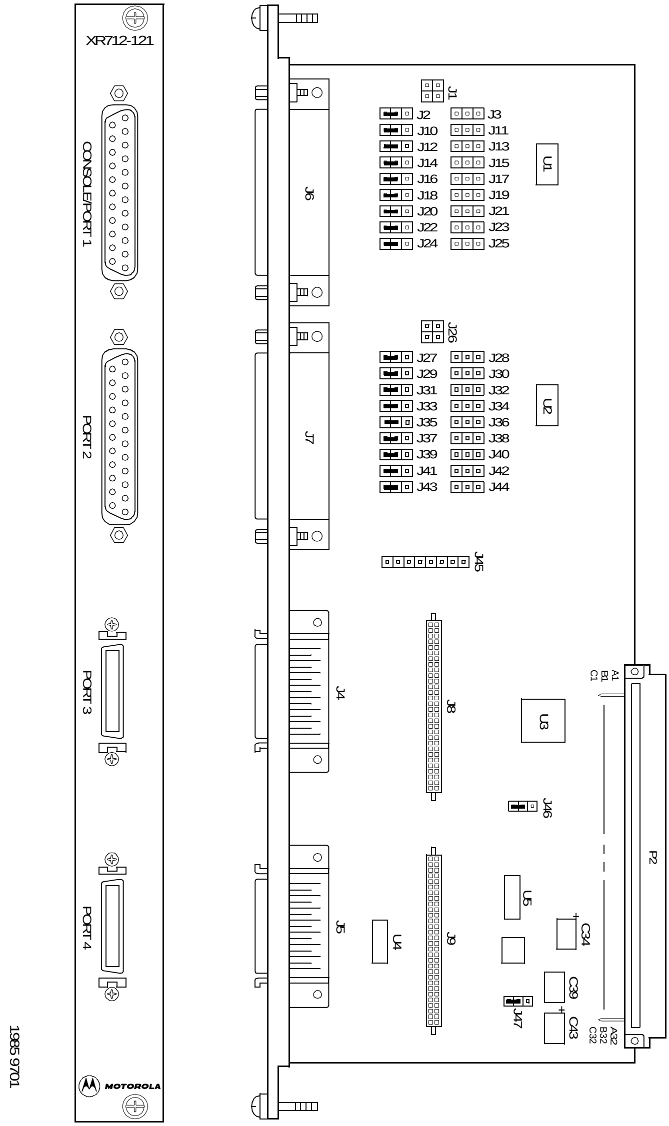


Figure 6-15. XR712-121 Transition Module

XR712-122TP and XR712-122AUI

The XR712-122TP single-slot transition module (Figure 6-16) provides two asynchronous serial ports, a 68-pin (narrow) single-ended SCSI port, and a Twisted Pair 10Base-T/100Base-TX port.

The XR712-122AUI single-slot transition module (Figure 6-17) provides two asynchronous serial ports, a 68-pin (narrow) single-ended SCSI port, an AUI Ethernet port, and a Twisted Pair 10Base-T port.

Note The Twisted Pair interface may not be used at the same time as the AUI interface. There should be only one type of network connector attached at a time, since there is only one set of data lines.

Jumper Settings

The asynchronous serial ports, ports 1 and 2, use the EIA-232 protocol and are jumper-configurable DTE or DCE. Headers J1 and J3 are used to configure serial port 1. Headers J5 and J6 are used to configure serial port 2. The jumper positions are shown in Table 6-20.

On the XR712-122AUI transition module, Headers J9 and J10 are jumper-configurable. Header J9 is used to enable the signal quality error test. Header J10 is used to enable the auto-select logic clock. The jumper positions are shown in Table 6-21.

Table 6-20. XR712-122TP/XR712-122AUI Jumper Settings

Header	Description	Setting
J1 J3	Serial Port 1 as DTE (default)	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J3 J1	Serial Port 1 as DCE	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J5 J6	Serial Port 2 as DTE (default)	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J6 J5	Serial Port 2 as DCE	1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 No jumpers
J13	Enable SCSI Bus Termination	1-2

The factory configuration comes with ports 1 and 2 set up as DTE ports. Jumper J13 has pins 1 and 2 set. This enables SCSI bus termination.

Table 6-21. XR712-122AUI Jumper Settings

Header	Description	Jumper On	Jumper Off
J9	Signal Quality Error Test	Enable	Disable (factory default)
J10	Auto-Select Logic Clock	Enable	Disable (factory default)

Connector Pin Assignments

The connector pin assignments for the 10Base-T/100Base-TX port, console/serial port 1, serial port 2, and SCSI port are shown in the following tables.

Table 6-22. 10Base-T/100Base-TX Port Connector Pin Assignments

Pin #	Signal Name
1	TD+
2	TD–
3	RD+
4	Not Used
5	Not Used
6	RD–
7	Not Used
8	GND

Table 6-23. Console/Serial Port 1 Connector Pin Assignments

DB 9 Pin #	Signal Name
1	DCD1[1]
2	RXD1
3	TXD1
4	DTR1[2]
5	GND
6	DSR1[1]
7	RTS1
8	CTS1
9	RI1[3]

[1]Pulled high in DCE mode.
[2]Pulled high in DTE mode.
[3]Not Used.

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Table 6-24. Serial Port2 Connector Pin Assignments

DB 9 Pin #	Signal Name
1	DCD2[1]
2	RXD2
3	TXD2
4	DTR2[2]
5	GND
6	DSR2[1]
7	RTS2
8	CTS2
9	RI2[3]
[1]Pulled high in DCE mode. [2]Pulled high in DTE mode. [3]Not Used.	

Table 6-25. SCSI Port Connector Pin Assignments

Pin #	Signal Name
1 through 16	GND
17 through 18	TermPwr
19	Reserved
20 through 34	GND
35 through 38	Not Used
39	DBP1_L
40	DB0_L
41	DB1_L
42	DB2_L
43	DB3_L
44	DB4_L
45	DB5_L
46	DB6_L
47	DB7_L

Table 6-25. SCSI Port Connector Pin Assignments (Continued)

Pin #	Signal Name
48	DBP_L
49 through 50	GND
51 through 52	TermPwr
53	Reserved
54	GND
55	ATN_L
56	GND
57	BSY_L
58	ACK_L
59	RST_L
60	MSG_L
61	SEL_L
62	D/C_L
63	REQ_L
64	I/O_L
65 through 68	Not Used
Note: the suffix _L denotes an active low signal.	

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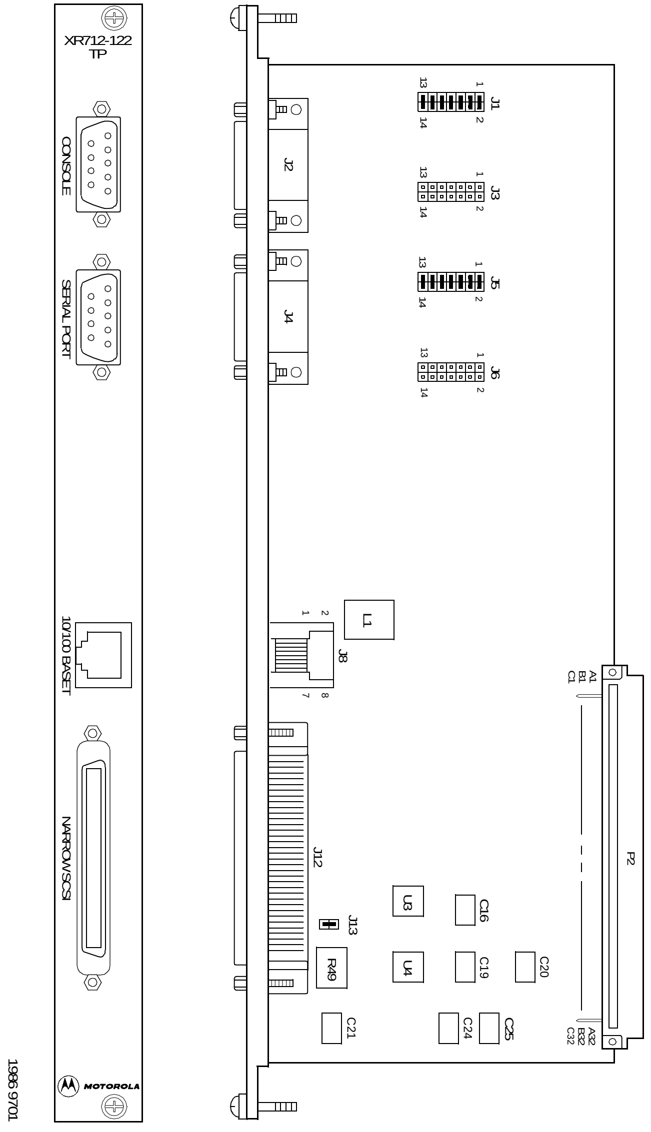

Figure 6-16. XR712-122TP Transition Module

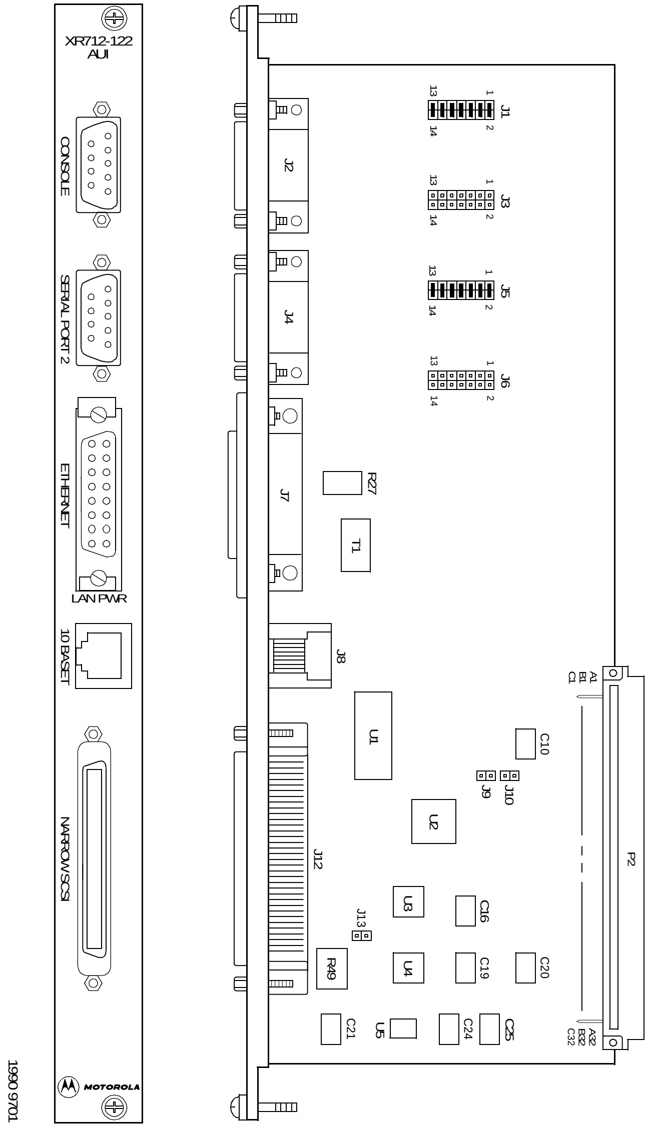

Figure 6-17. XR712-122AUI Transition Module

XR712-123TP

The XR712-123TP single-slot transition module (Figure 6-18 on page 6-57) provides one 68-pin narrow SCSI port, a 25-pin parallel I/O port, and a Twisted Pair 10Base-T/100Base-TX port.

The XR712-123TP must be inserted into the first or second transition module slot.

Jumper Settings

Header J4 is used to enable SCSI bus termination. The jumper position is shown in Table 6-26.

Table 6-26. XR712-123TP Jumper Settings

Header	Description	Setting
J4	Enable SCSI Bus Termination	1-2

Jumper J4 has pins 1 and 2 set. This enables SCSI bus termination.

Connector Pin Assignments

The connector pin assignments for the 10Base-T/100Base-TX, parallel I/O port, and SCSI port are shown in the tables below.

Table 6-27. 10Base-T/100Base-TX Port Connector Pin Assignments

Pin #	Signal Name
1	TD+
2	TD–
3	RD+
4	Not Used
5	Not Used
6	RD–
7	Not Used
8	Not Used

Table 6-28. Parallel I/O Port Connector Pin Assignments

Pin #	Signal Name
1	PRSTB_
2	PRD0
3	PRD1
4	PRD2
5	PRD3
6	PRD4
7	PRD5
8	PRD6
9	PRD7
10	PRACK_
11	PRBSY
12	PRPE
13	PRSEL
14	AUTOFD_
15	PRFAULT_
16	PRINIT_
17	PRSELIN_
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND

Table 6-29. SCSI Port Connector Pin Assignments

Pin #	Signal Name
1 through 16	GND
17 through 18	TermPwr
19	Reserved
20 through 34	GND
35 through 38	Not Used
39	DBP1_L
40	DB0_L
41	DB1_L
42	DB2_L
43	DB3_L
44	DB4_L
45	DB5_L
46	DB6_L
47	DB7_L
48	DBP_L
49 through 50	GND
51 through 52	TermPwr
53	Reserved
54	GND
55	ATN_L
56	GND
57	BSY_L
58	ACK_L
59	RST_L
60	MSG_L
61	SEL_L
62	C/D_L

Table 6-29. SCSI Port Connector Pin Assignments (Continued)

Pin #	Signal Name
63	REQ_L
64	I/O_L
65 through 68	Not Used
Note: the suffix _L denotes an active low signal.	

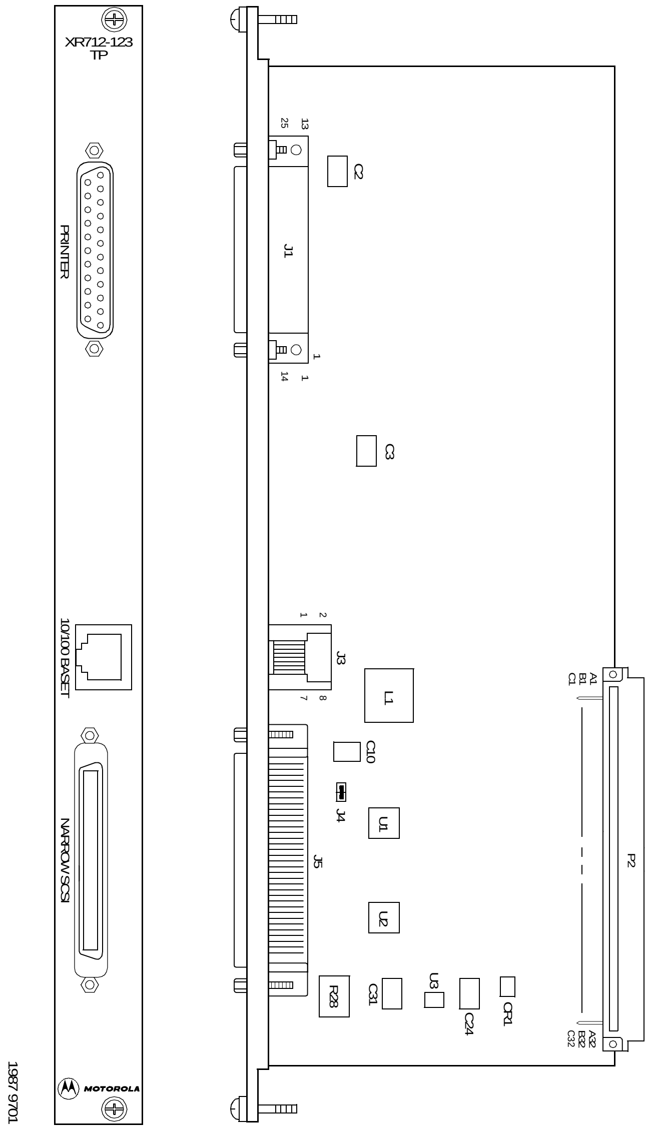

Figure 6-18. XR712-123TP Transition Module

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XR712-129TP

The XR712-129 single-slot transition module (see Figure 6-19 on page 6-59) provides the interface to the alarm subsystem for the XR Series PowerPC system. It also provides:

- (1) 68-pin (narrow) single-ended SCSI port
- (1) Twisted Pair 10/100 Base-TX port
- (1) SCSI Environment port
- (1) VME Environment port
- (1) 7-pin DIN Alarm Output port

The XR712-129 Alarm Transition Module can *only* be used with the MVME2600, MVME3600, or MVME 4600 series processor modules in an XR chassis. It must be inserted directly behind the processor module in transition module slot 0 or slot 1. Motorola strongly recommends inserting the XR712-129 Transition Module in slot 0 and using slot 1 for the XR712-121 Transition Module. The XR712-129 includes the XR712-123 functionality, but utilizes the parallel interface for the alarm functions.

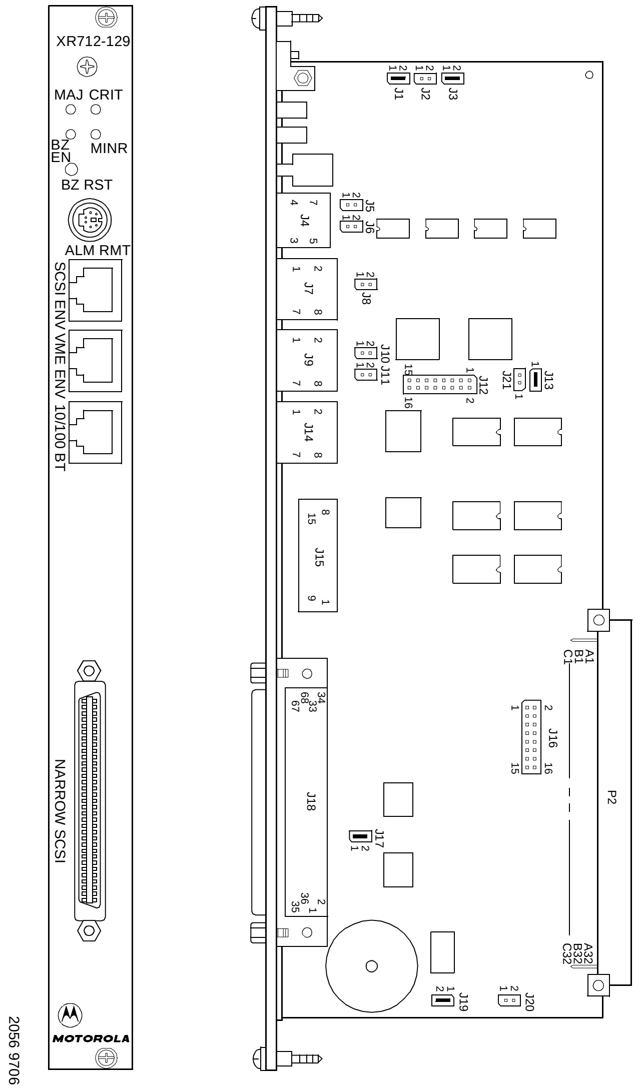

Figure 6-19. XR712-129 Alarm Transition Module

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Jumper Settings

Table 6-30. XR712-129 Jumpers

Jumper	Function when ON	Default
J1	Enables audible alarm	on
J2	Selects 3.2 sec. (approx.) watchdog time-out	off
J3	Selects 1.6 sec. (approx.) watchdog time-out	on
J5	Reserved for Future Use (Remote reset signal)	off
J6	Connects rack alarm return to board signal ground (needed when remote reset connected)	off
J8	Enables SCSI power enable signal	off
J10	Enables VME power enable signal	off
J11	Reserved for Future Use (VME system reset signal)	off
J13	Enables watchdog timer refresh (only removed for verifying watchdog operation)	on
J17	Enables SCSI bus termination	on
J19	Powers audible alarm (only removed for debug)	on
J21	Pulls VME temperature sense line high to disable (used if J9 not connected)	off

Connector Pin Assignments

The SCSI ENV, VME ENV, and 10/100BT connectors use standard RJ-45 cables. The Alarm Relay Output Connector provides compatibility with remote alarm systems. It uses a 7-pin DIN connector.

The connector pin assignments for all external connectors are shown in the tables below.

Table 6-31. Alarm Relay Output Connector (J4)

Pin #	Pin Name
1	Rack_ALM_Return
2	Rack_ALM
3	Cr/Mj/Mn_ALM_Return
4	Minor_ALM
5	Major_ALM
6	Critical_ALM
7	Remote_RST_L*

**This signal is for future use.*

Note A 1.5 meter, 7-pin extension cable (part number FTX9-TACY-KA) is available from Motorola. To purchase the extension cable, contact your local Motorola sales office.

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Table 6-32. Pin Assignments for SCSI Chassis Environmental Connector (J7)

Pin #	Pin Name	Description
1	SCSI_PWR_Bad_L	Indicates SCSI chassis power failure
2	SCSI_Hot_L	Indicates SCSI chassis cooling failure
3	GND	
4	SCSI_PWR_EN _L	Enables SCSI chassis power supply (future use)
5	SCSI_PWR_EN_L	
6	GND	
7	SCSI_Hot_L	Indicates SCSI chassis cooling failure
8	SCSI_PWR_Bad_L	Indicates SCSI chassis power failure

Table 6-33. Pin Assignments for VME Chassis Environmental Connector (J9)

Pin #	Pin Name	Description
1	VME_PWR_Bad_L	Indicates VME chassis power failure
2	VME_Hot_L	Indicates VME chassis cooling failure
3	GND	
4	VME_PWR_EN_L	Enables VME chassis power supply (future use)
5	VME_SYS_RST_L	Asserts VME system reset
6	GND	
7	VME_Hot_L	Indicates VME chassis cooling failure
8	VME_PWR_Bad_L	Indicates VME chassis power failure

Table 6-34. Connector Pin Assignments for Twisted Pair Ethernet Port (J14)

Pin #	Signal Name
1	TD+
2	TD-
3	RD+
4	Not Used
5	Not Used
6	RD-
7	Not Used
8	Not Used

Table 6-35. Connector Pin Assignments for SCSI Connector (J18)

Pin #	Signal Name		Pin #
1	GND	not used	35
2	GND	not used	36
3	GND	not used	37
4	GND	not used	38
5	GND	not used	39
6	GND	DB0_L	40
7	GND	DB1_L	41
8	GND	DB2_L	42
9	GND	DB3_L	43
10	GND	DB4_L	44
11	GND	DB5_L	45
12	GND	DB6_L	46
13	GND	DB7_L	47
14	GND	DBP_L	48
15	GND	GND	49
16	GND	GND	50
17	TermPwr	TermPwr	51
18	TermPwr	TermPwr	52
19	Reserved	Reserved	53
20	GND	GND	54
21	GND	ATN_L	55
22	GND	GND	56
23	GND	BSY_L	57
24	GND	ACK_L	58
25	GND	RST_L	59
26	GND	MSG_L	60
27	GND	SEL_L	61
28	GND	D/C_L	62

Table 6-35. Connector Pin Assignments for SCSI Connector (J18) (Continued)

29	GND	REQ_L	63
30	GND	I/O_L	64
31	GND	not used	65
32	GND	not used	66
33	GND	not used	67
34	GND	not used	68

Alarm Conditions

When an alarm condition is met, the XR712-129:

1. Illuminates the appropriate LED,
2. Closes the appropriate Remote Relay connector,
3. Sets the appropriate alarm bit in the status register, and
4. Activates the audible alarm (if enabled).

Note During Power-Off conditions, the critical and rack alarm relays will close. This provides remote alarms for complete loss of power to the chassis.

Table 6-36 on page 6-67 lists the conditions under which the XR712-129 Alarm Transition Module activates a given alarm.

Table 6-36. Alarm Activation Conditions

Alarm Type	Condition Resulting in Alarm
Critical	Over-temperature trip-point reached in VME chassis. Cooling failure in SCSI chassis. *VCC voltage (backplane) is out of regulation. *Watchdog timer expired. *Critical alarm set through software.
Major	*Major alarm set through software.
Minor	*Minor alarm set through software.
Rack	Over-temperature trip-point reached in VME chassis. Cooling failure in SCSI chassis. *VCC voltage (backplane) is out of regulation. *Watchdog timer expired. *Rack alarm set through software.
Audible	Over-temperature trip-point reached in VME chassis. Cooling failure in SCSI chassis. *Critical, Major, or Minor alarm set through software. *Watchdog timer expired. *Audible alarm set through software.

**These conditions will not generate alarms unless specifically enabled through software.*

Alarm Hierarchy

The XR712-129 alarm transition provides three levels of alarm condition: Critical, Major, and Minor. Only the highest level of alarm condition is displayed, allowing the operator to focus on the most crucial failure within the system:

1. While a Critical alarm condition is in effect, Major and Minor alarm indicators are cleared until all Critical alarm conditions are resolved.

2. While a Major alarm condition is outstanding (and if there are no outstanding Critical Alarms), the Minor alarm indicators are cleared until all Major alarm conditions are cleared.

Alarm Notification

Four LEDs on the face of the XR712-129 Alarm Transition Module provide notification of alarm conditions.

Table 6-37. XR712-129 Front Panel LEDs

Label	LED Color	When Lit
CRIT	Red	Indicates a Critical alarm condition
MAJ	Red	Indicates a Major alarm condition
MINR	Yellow	Indicates a Minor alarm condition
BZ_EN	Green	Indicates that the audible alarm is enabled

Figure 6-20, below, shows the arrangement of the LEDs on the face of the Transition Module.

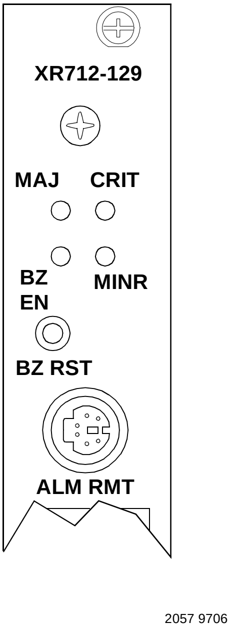

Figure 6-20. XR712-129 LEDs and Audible Alarm Reset Button

Manually Resetting the Audible Alarm

A button, labeled BZ RST, on the face of the XR712-129 transition module allows the audible alarm to be manually reset (see Figure 6-20 on page 6-69). Pressing this button disables the audible alarm for the current alarm condition only. If a subsequent alarm condition that activates the audible alarm occurs, the audible alarm will sound and need to be reset again.

XR712-131DIFF and XR712-131SE

The XR712-131DIFF single-slot transition module (Figure 6-21) provides an AUI Ethernet port, a Twisted Pair 10Base-T port, and two 68-pin (wide) differential SCSI connectors. It contains a built-in 10Base-T transceiver.

The XR712-131SE single-slot transition module (Figure 6-22) provides an AUI Ethernet port, a Twisted Pair 10Base-T port, and two 68-pin (wide) single-ended SCSI connectors. It contains a built-in 10Base-T transceiver.

Note The Twisted Pair interface may not be used at the same time as the AUI interface. There should be only one type of network connector attached at a time, since there is only one set of data lines.

The XR712-131DIFF and XR712-131SE can only be used with the XR604E-1D single-board computer and must be inserted directly behind the Processor Module of the XR604E-1D (third transition module slot in rear of chassis).

Jumper Settings

Headers J9 and J10 are jumper-configurable. Header J9 is used to enable the signal quality error test. Header J10 is used to disable the 10Base-T on-board transceiver. The jumper positions are shown in Table 6-38.

Table 6-38. XR712-131DIFF/XR712-131SE Jumper Settings

Header	Description	Jumper On	Jumper Off
J9	Signal Quality Error Test	Enable	Disable (factory default)
J10	10Base-T Transceiver	Disable	Enable (factory default)

Connector Pin Assignments

The connector pin assignments for the 10Base-T port, AUI Ethernet port, and differential and single-ended SCSI ports are shown in the tables below.

Table 6-39. 10Base-T Port Connector Pin Assignments

Pin #	Signal Name
1	TD+
2	TD–
3	RD+
4	Not Used
5	Not Used
6	RD–
7	Not Used
8	Not Used

Table 6-40. AUI Ethernet Port Connector Pin Assignments

Pin #	Signal Name
1	GND
2	C+
3	T+
4	GND
5	R+
6	GND
7	Not Used
8	GND
9	C–
10	T–
11	GND
12	R–
13	+12V
14	GND
15	Not Used

Table 6-41. SCSI Differential Port Connector Pin Assignments

Pin #	Signal Name
1	+DB12
2	+DB13
3	+DB14
4	+DB15
5	+DBP1
6	GND
7	+DB0
8	+DB1
9	+DB2
10	+DB3
11	+DB4
12	+DB5
13	+DB6
14	+DB7
15	+DBP
16	GND
17 through 18	TermPwr
19	Reserved
20	+ATN
21	GND
22	+BSY
23	+ACK
24	+RST
25	+MSG
26	+SEL
27	+C/D
28	+REQ
29	+I/O

Table 6-41. SCSI Differential Port Connector Pin Assignments (Continued)

Pin #	Signal Name
30	GND
31	+DB8
32	+DB9
33	+DB10
34	+DB11
35	DB12_L
36	DB13_L
37	DB14_L
38	DB15_L
39	DBP1_L
40	GND
41	DB0_L
42	DB1_L
43	DB2_L
44	DB3_L
45	DB4_L
46	DB5_L
47	DB6_L
48	DB7_L
49	DBP_L
50	GND
51 through 52	TermPwr
53	Reserved
54	ATN_L
55	GND
56	BSY_L
57	ACK_L
58	RST_L
59	MSG_L

Table 6-41. SCSI Differential Port Connector Pin Assignments (Continued)

Pin #	Signal Name
60	SEL_L
61	C/D_L
62	REQ_L
63	I/O_L
64	GND
65	DB8_L
66	DB9_L
67	DB10_L
68	DB11_L
Note: the suffix _L denotes an active low signal.	

Table 6-42. SCSI Single-Ended Port Connector Pin Assignments

Pin #	Signal Name
1 through 16	GND
17 through 18	TermPwr
19	Reserved
20 through 34	GND
35	DB12_L
36	DB13_L
37	DB14_L
38	DB15_L
39	DBP1_L
40	DB0_L
41	DB1_L
42	DB2_L
43	DB3_L

Table 6-42. SCSI Single-Ended Port Connector Pin Assignments (Continued)

Pin #	Signal Name
44	DB4_L
45	DB5_L
46	DB6_L
47	DB7_L
48	DBP_L
49 through 50	GND
51 through 52	TermPwr
53	Reserved
54	GND
55	ATN_L
56	GND
57	BSY_L
58	ACK_L
59	RST_L
60	MSG_L
61	SEL_L
62	C/D_L
63	REQ_L
64	I/O_L
65	DB8_L
66	DB9_L
67	DB10_L
68	DB11_L
Note: the suffix _L denotes an active low signal.	

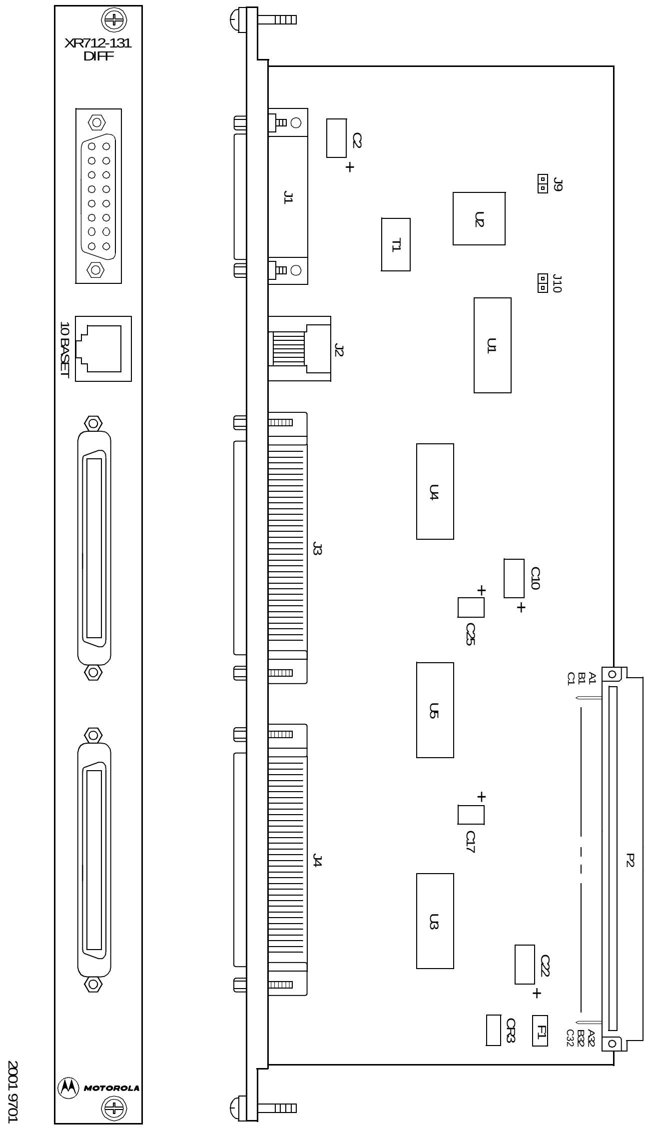

Figure 6-21. XR712-131DIFF Transition Module

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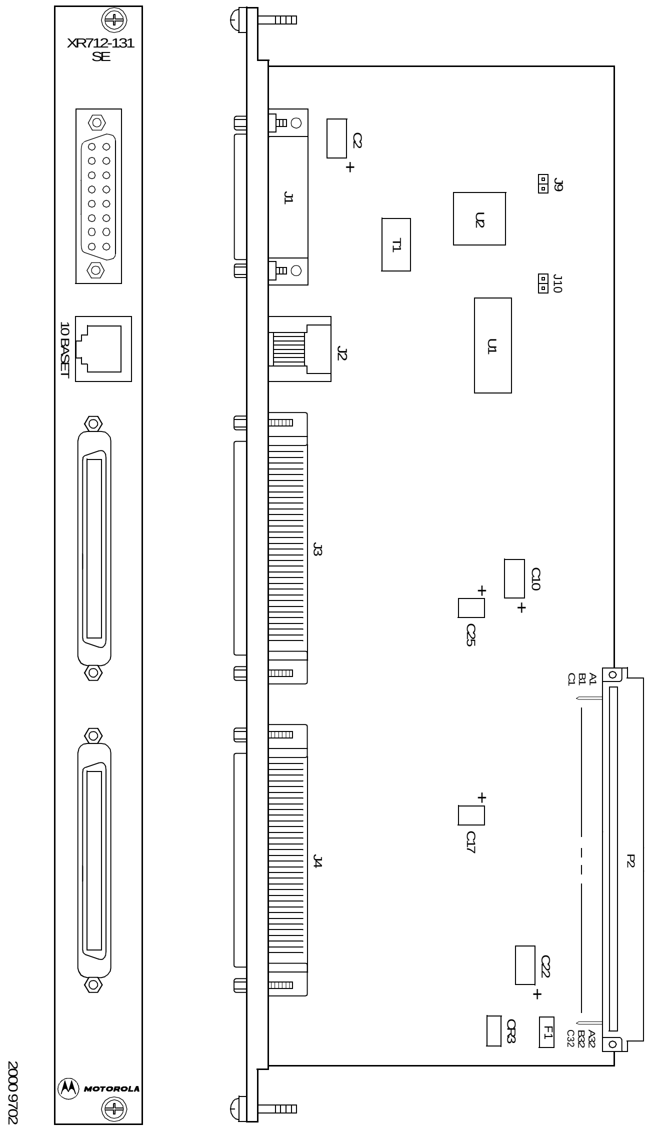

Figure 6-22. XR712-131SE Transition Module

XR712-132DIFF

The XR712-132DIFF single-slot transition module provides a 10Base-T/100 Base-T Ethernet port and two 68-pin (wide) differential SCSI ports.

Connector Pin Assignments

The connector pin assignments for the 10Base-T/100Base-T Ethernet port and SCSI ports are shown in the tables below.

Table 6-43. 10Base-T/100Base-T Ethernet Port Connector Pin Assignments

Pin #	Signal Name
1	TD+
2	TD–
3	RD+
4	Not Used
5	Not Used
6	RD–
7	Not Used
8	Not Used

Table 6-44. SCSI Port Connector Pin Assignments

Pin #	Signal Name
1	+DB12
2	+DB13
3	+DB14
4	+DB15
5	+DBP1
6	GND
7	+DB0
8	+DB1
9	+DB2

Table 6-44. SCSI Port Connector Pin Assignments (Continued)

Pin #	Signal Name
10	+DB3
11	+DB4
12	+DB5
13	+DB6
14	+DB7
15	+DBP
16	GND
17 through 18	TermPwr
19	Reserved
20	+ATN
21	GND
22	+BSY
23	+ACK
24	+RST
25	+MSG
26	+SEL
27	+C/D
28	+REQ
29	+I/O
30	GND
31	+DB8
32	+DB9
33	+DB10
34	+DB11
35	–DB12
36	–DB13
37	–DB14
38	–DB15
39	–DBP1

Table 6-44. SCSI Port Connector Pin Assignments (Continued)

Pin #	Signal Name
40	GND
41	–DB0
42	–DB1
43	–DB2
44	–DB3
45	–DB4
46	–DB5
47	–DB6
48	–DB7
49	–DBP
50	GND
51 through 52	TermPwr
53	Reserved
54	–ATN
55	GND
56	–BSY
57	–ACK
58	–RST
59	–MSG
60	–SEL
61	–C/D
62	–REQ
63	–I/O
64	GND
65	–DB8
66	–DB9
67	–DB10
68	–DB11

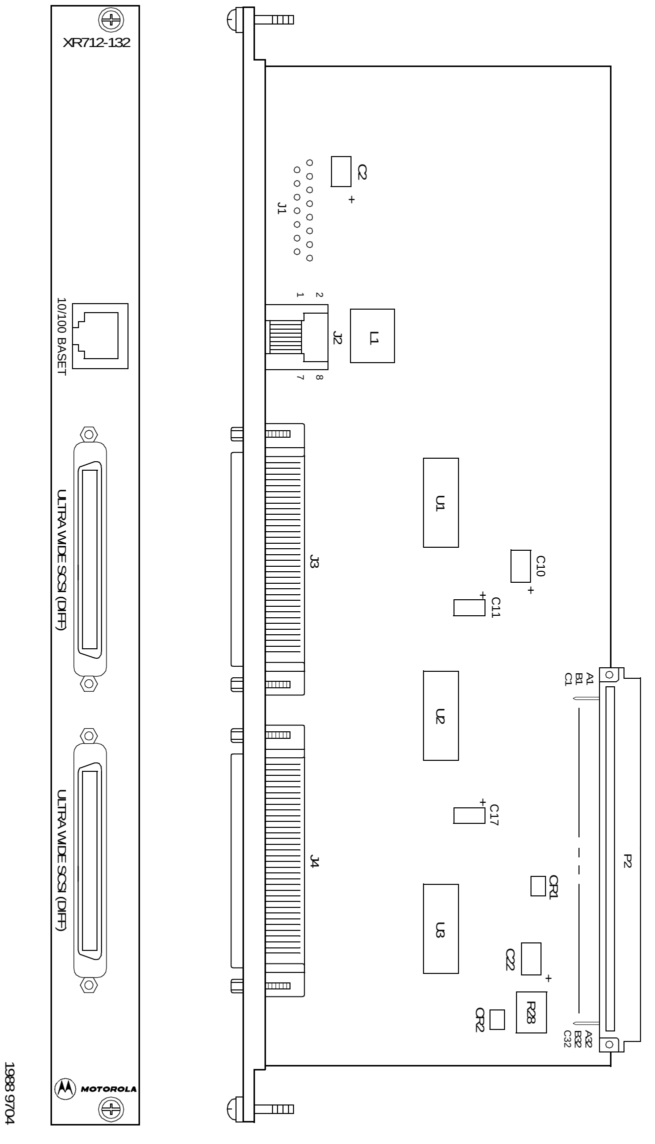

Figure 6-23. XR712-132DIFF Transition Module

XR332RTM-8 Transition Module

Overview

The XR332RTM-8 Eight-Port, Single-Slot Transition Board (see Figure 6-24 on page 6-84) provides eight asynchronous serial port connectors for the MVME332XTS Asynchronous Serial Communications Controller. The XR332RTM-8 provides line protection and jumpers to allow the user to select DTE or DCE. The MVME332XTS only provides EIA-232 signals, so the serial ports on the XR332RTM-8 can only be EIA-232 ports.

To provide the eight serial ports in a single-slot form, the XR332RTM-8 uses a single female DB62 connector that connects to an “octopus cable,” which has cables from eight female DB25 connectors converging to a single male DB62 connector. All connectors in this arrangement can be securely fastened using the standard screws and stand-offs on D-subminiature connectors.

Jumpers

The XR332RTM-8 features two jumper blocks for each serial port. These jumpers will be used to configure each port as DTE or DCE. It comes factory configured as DCE.

Figure 6-24 on page 6-84 shows the proper jumper settings for DTE or DCE. Table 6-45 on page 6-85 lists the connection options provided for each serial port using these jumpers.

This arrangement mimics that of the MVME710B in order to ensure compatibility.

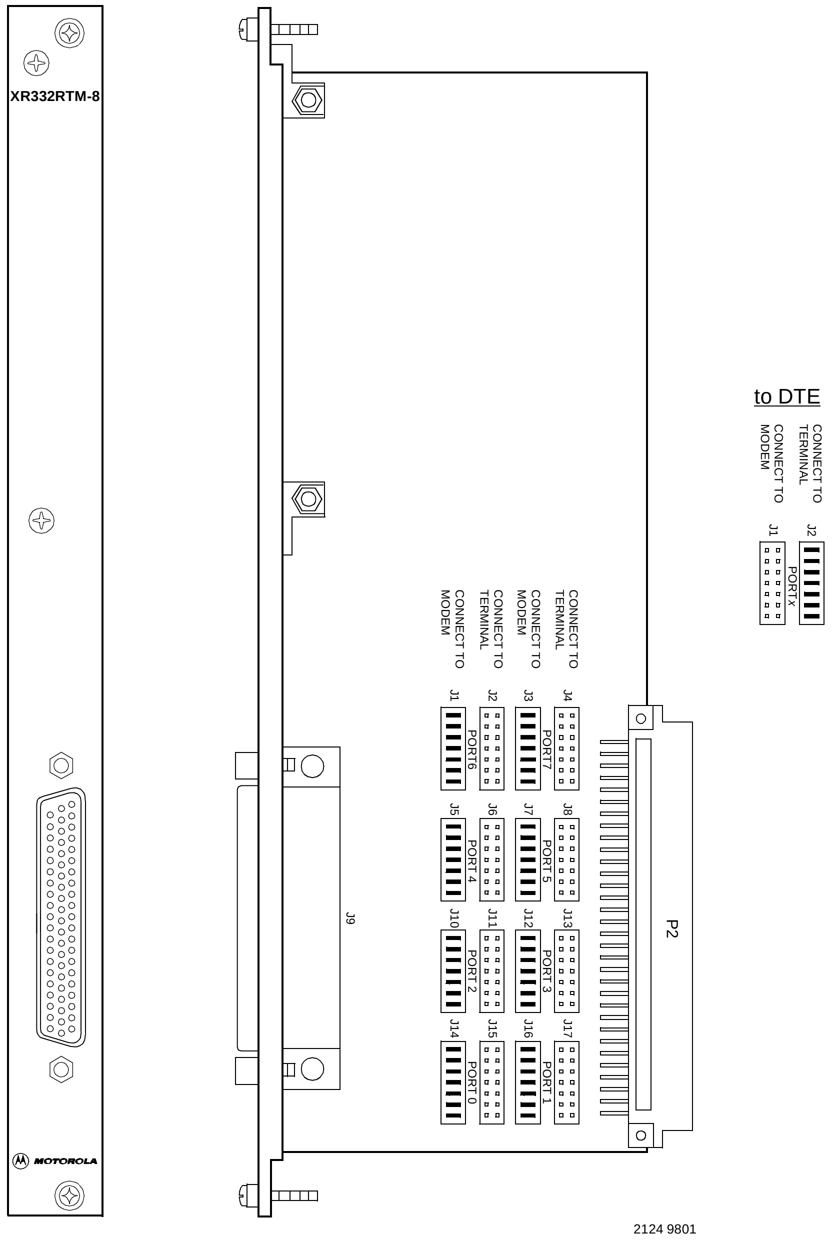

Figure 6-24. XR332RTM-8 Transition Module

Table 6-45. Jumper Functional Descriptions for Each XR332RTM-8 Serial Port

DTE (connect to modem)			DCE (connect to terminal)		
P2 Signal	Dir.*	DB25 Signal	P2 Signal	Dir.*	DB25 Signal
TXD	→	TXD	TXD	→	RXD
RXD	←	RXD	RXD	←	TXD
RTS	→	RTS	RTS	→	CTS
CTS	←	CTS	CTS	←	RTS
MC	←	DSR	DCD	←	DTR
DCD	←	DCD		→	DCD
DTR	→	DTR	DTR	→	DSR

*The arrow points from the driver to the receiver.

DB62 Connector Pin Assignments

The pin definitions for the DB62 connector are listed in Table 6-46 on page 6-86.

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Table 6-46. Pin Connections for DB62 Connector on XR332RTM-8

Pin #	Signal Name		Pin #
1	TXD0	CTS4	32
2	RXD0	DSR4	33
3	RTS0	DCD4	34
4	CTS0	DTR4	35
5	DSR0	TXD5	36
6	DCD0	RXD5	37
7	DTR0	RTS5	38
8	TXD1	CTS5	39
9	RXD1	DSR5	40
10	RTS1	DCD5	41
11	CTS1	DTR5	42
12	DSR1	TXD6	43
13	DCD1	RXD6	44
14	DTR1	RTS6	45
15	TXD2	CTS6	46
16	RXD2	DSR6	47
17	RTS2	DCD6	48
18	CTS2	DTR6	49
19	DSR2	TXD7	50
20	DCD2	RXD7	51
21	DTR2	RTS7	52
22	TXD3	CTS7	53
23	RXD3	DSR7	54
24	RTS3	DCD7	55
25	CTS3	DTR7	56
26	DSR3	GND	57
27	DCD3	GND	58
28	DTR3	GND	59
29	TXD4	GND	60
30	RXD4	GND	61
31	RTS4	GND	62

Octopus Cable

A single female DB62 connector on the front panel of the XR332RTM-8 provides access to all eight serial ports. An octopus cable can then be plugged into this connector; this cable splits off into eight different cables, one for each serial port, which go to DB25 connectors.

The pin definitions for the DB62 connector are listed in Table 6-46 on page 6-86.

Those for the DB25 connectors at the other ends of the octopus cable are provided in Table 6-47 on page 6-88.

Table 6-47. Pin Connections for Octopus Cable DB25 Connectors

Pin #	Signal Name
1	Not Used
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	GND
8	DCD
9	Not Used
10	Not Used
11	Not Used
12	Not Used
13	Not Used
14	Not Used
15	Not Used
16	Not Used
17	Not Used
18	Not Used
19	Not Used
20	DTR
21	Not Used
22	Not Used
23	Not Used
24	Not Used
25	Not Used

XRPMCLANPANL

The 2-slot XRPMCLANPANL (see Figure 6-25, below) allows you to duplicate FDDI, Optical Bypass Relay (OBR), and 10/100Base-T port connections from front PMC modules (see Chapter 4) to a transition panel in the rear of the XR chassis.

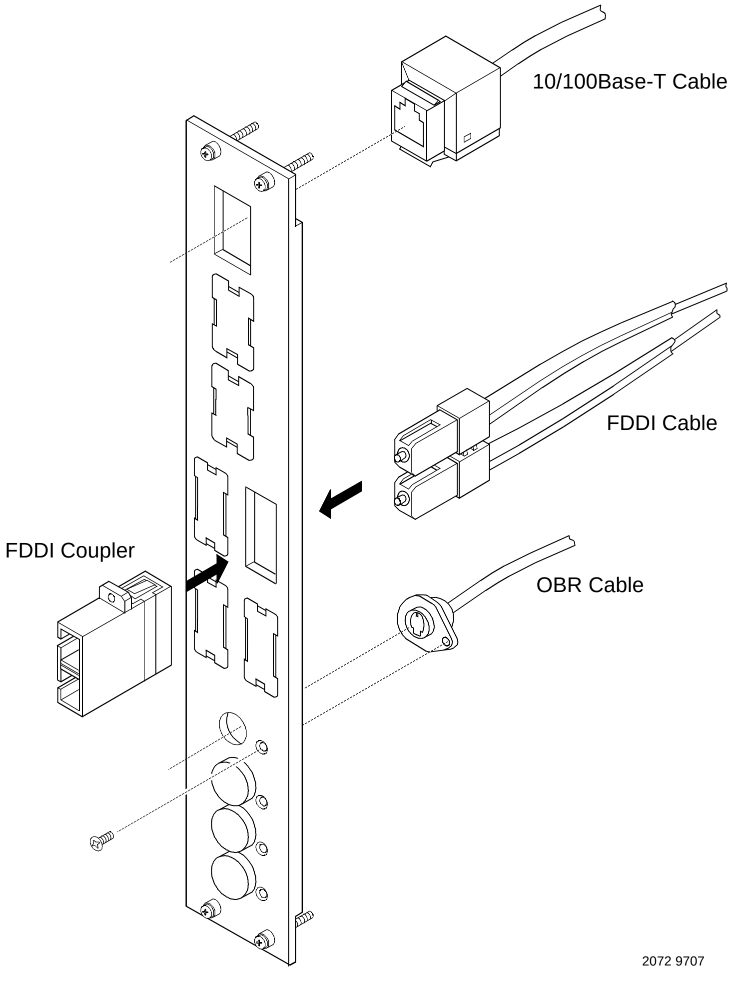


Figure 6-25. The XRPMCLANPANL Transition Panel

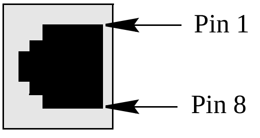
XRT1E1TM

The XRT1E1TM provides full I/O capabilities for the XR342S/XR343S T1/E1 SS7 communications controllers (see Chapter 5).

Two 8-pin modular connectors on the rear panel of the transition module (XRT1E1TM) provide the T1/E1 interface for one span. The pin assignments are shown in Table 6-48.

Note When connecting an E1/T1 span, use the E1B or T1B connector.

Table 6-48. T1B and E1B Pin Assignments

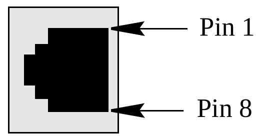
T1/E1B Pin	Signal Name	
1	Receive Ring (B)	
2	Receive Tip (B)	
3	*no connection*	
4	Transmit Ring (B)	
5	Transmit Tip (B)	
6	*no connection*	
7	*no connection*	
8	*no connection*	

Note A DB-25 connector is present on the front panel of the transition module. This is a debug port for factory authorized use only.

Loopback Cable

For troubleshooting and debugging purposes, a loopback cable can be used to connect the A and B spans of a transition module together in a back-to-back configuration. This connection allows multiple signaling points on the system to communicate with each other over SS7 links. Multiple signaling points are possible on AccessMANAGER systems equipped with the Intelligent Network Emulator (INE) option. A wiring schedule for this cable is shown in Table 6-49.

Table 6-49. Loopback Cable Wiring

T1 or E1 Span A Pin	Signal Name	T1 or E1 Span B Pin	Signal Name	
1	Receive Ring	4	Transmit Ring	
2	Receive Tip	5	Transmit Tip	
3	*no connection*	3	*no connection*	
4	Transmit Ring	1	Receive Ring	
5	Transmit Tip	2	Receive Tip	
6	*no connection*	6	*no connection*	
7	*no connection*	7	*no connection*	
8	*no connection*	8	*no connection*	

Extended Handle Compatibility A

The XR series system VMEmodules can be equipped with two types of injector handles, the original, short handles and the VME64, or Extended, handles (see Figure A-1 on page A-2).

The VME64 handle was developed to aid in the insertion of 4-board bricks (such as the XR604E-2D CPU module equipped with the XRPMCEXP1 and XRPMCEXP2 PMC expansion carriers) into the system.

Handle Compatibility

VMEmodules equipped with the Original injector handle are compatible with both the Original and Extended XR chassis.

VMEmodules equipped with the VME64 handles can only be installed in the Extended XR chassis—they will not fit into the Original chassis. For further discussion on the differences between the chassis, refer to the *XR Series System Chassis Guide*.

Table A-1, below, outlines the compatibility of the handle styles with the chassis styles.

Table A-1. Handle Compatibility Matrix

	Chassis Style	
Handles	**Original**	**Extended**
Original	X	X
Extended		X

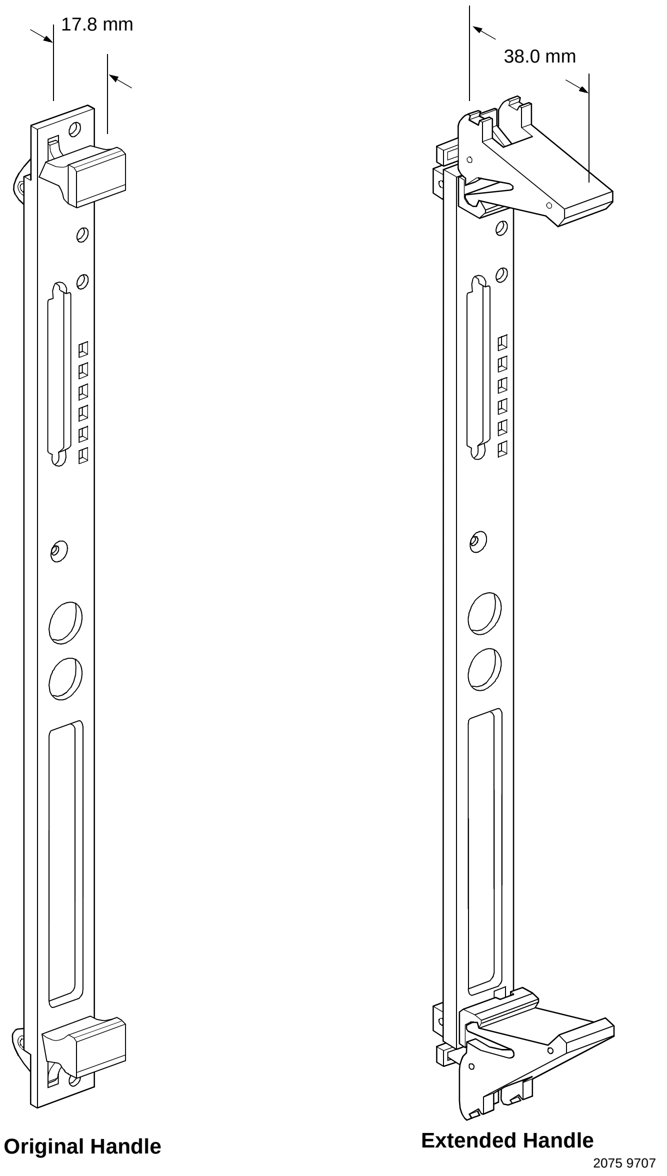


Figure A-1. Original and Extended Injector Handles

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