

**ARIX**  
Corporation

*ARIX System90 Model 25  
Hardware Installation Guide*

ARIX Computer  
Corporation

821 Fox Lane

San Jose, CA 95131



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# Table of Contents

## Preface

---

Definitions of WARNINGS, CAUTIONS, and NOTES.....	xi
Type Conventions in This Document.....	xii

## Chapter 1 Introduction

---

System Description .....	1-1
Primary Cabinet.....	1-2
Peripheral Expansion Cabinet .....	1-3
System Configurations.....	1-4
Power Configuration .....	1-4
System Control.....	1-5
Operator Control Panel.....	1-5
Console Terminal .....	1-6
Remote Console .....	1-7

## Chapter 2 System Installation

---

Installation Requirements .....	2-2
Installation Team Personnel .....	2-2
Tools and Test Equipment .....	2-2
Documentation .....	2-3
Unpacking .....	2-3
Preliminary Procedures .....	2-4
Unpacking System Cabinets.....	2-4
Unit Placement .....	2-7
Single Cabinet Systems .....	2-7
Multicabinet Systems.....	2-8
System Cable Connections .....	2-10
Single Cabinet Systems .....	2-10
Multiple Cabinet Systems.....	2-13
Intercabinet Signal Cables.....	2-13
Cabinet Power Cable Connections .....	2-14

## Chapter 3 Powering the System Up and Down

---

Powering-up the System.....	3-1
Hardware Notes on Bringing the System to Single-User Mode .....	3-1
Powering-down the System .....	3-2
From Multi User Mode.....	3-2
From Single User Mode .....	3-5

---

**Chapter 4 Logic Boards**

---

Logic Board Removal .....	4-2
Logic Board Installation.....	4-6
Service Processor Module (SPM) .....	4-8
Memory Module (MM).....	4-9
Processor Module (PM).....	4-10
Input/Output Processor Module (IOPM).....	4-11

---

**Chapter 5 Interface Boards**

---

Interface Board Removal.....	5-2
Interface Board Installation .....	5-4
Asynchronous Communications Device Board (ACDB).....	5-6
Asynchronous Communications Extender (ACE) Board .....	5-8
ACE Board Removal .....	5-9
ACE Board Installation.....	5-12
ACDB Board Set-Up .....	5-13
Asynchronous Communications Real World (ACRW) interface board. ....	5-15
ACRW Board Removal .....	5-18
ACRW Board Installation.....	5-19
LAN/WAN Device Board (LWDB) .....	5-19
Physical Interface .....	5-20
Dual SCSI Device Board (DSDB) .....	5-24
Setting SCSI Channels for Single-Ended or Differential Operation ..	5-24
SCSI Channel Terminator Fuses.....	5-24
Bus Arbiter Boards .....	5-26
Bus Arbiter Board Removal .....	5-28
Bus Arbiter Board Installation.....	5-29

---

**Chapter 6 Miscellaneous PCBs**

---

5 Volt/12 Volt Power Bus Board .....	6-1
5 Volt/12 Volt Power Bus Board Removal .....	6-3
5 Volt/12 Volt Power Bus Board Installation.....	6-4
Auxiliary Power Supply Board .....	6-4
Auxiliary Power Supply Board Removal .....	6-4
Auxiliary Power Supply Board Installation.....	6-7
LED Display Module .....	6-8
LED Display Module Removal.....	6-9
LED Display Module Installation .....	6-10

---

**Chapter 7 System Disk and Tape Drives**

---

Drive Locations .....	7-1
Magnetic Disk Storage .....	7-2
Hard Disk Storage .....	7-2
Removable Media Storage .....	7-2
Removable Winchester .....	7-2
Removable Magneto Optical .....	7-2
Magnetic Tape Storage .....	7-3
Cartridge Tape .....	7-3
Nine-Track Tape (in Peripheral Expansion Cabinet) .....	7-3
WORM Optical Disk Storage .....	7-3
Primary Cabinet Drive Installation .....	7-3
Drive Installation - Front .....	7-3
Drive Installation - Rear .....	7-8
Cartridge Tape Drive Cleaning .....	7-11
Frequency of Cleaning .....	7-11
Tools Needed .....	7-12
Manual Cleaning Procedure .....	7-12
Docking the Tape Drive Head .....	7-12
Cleaning the Tape Head .....	7-12
Automatic Cleaning Procedure .....	7-13

---

**Chapter 8 Cooling and Ventilation**

---

Air Filter Removal and Cleaning .....	8-1
Cardcage Fan Assembly - Removal and Installation .....	8-2
Peripheral Fan Assembly .....	8-5

---

**Chapter 9 DC Power Supply**

---

DC Power Supply Removal .....	9-1
DC Power Supply Installation .....	9-4

---

**Chapter 10 Power Supply Adjustment**

---

Tools Needed .....	10-2
Supply Locations .....	10-3
Accessing the Power Supplies .....	10-3
Main DC Power Supply Adjustment .....	10-4
+12 Volts DC Adjustment .....	10-5
-12 Volts DC Adjustment .....	10-7
+5 Volts DC Adjustment .....	10-7
Auxiliary Power Supply Adjustment .....	10-8

---

**Appendix A System90 Model 25 Connector Pinouts**

---

Asynchronous Communications Device Board (ACDB) .....	A-1
LAN/WAN Device Board (LWDB) .....	A-3
Dual SCSI Device Board (DSDB) .....	A-7
Asynchronous Communication Real World Interface (ACRW) Board .....	A-10





## List of Figures

---

### Chapter 1

---

Figure 1-1	Primary Cabinet .....	1-2
Figure 1-2	Peripheral Expansion Cabinet .....	1-3
Figure 1-3	Operator Control Panel .....	1-6
Figure 1-4	System Serial Ports .....	1-7

---

### Chapter 2

---

Figure 2-1	System90 Model 25 Cabinet in Packing Crate.....	2-5
Figure 2-2	Cabinet Packing Crate, Exploded View .....	2-6
Figure 2-3	Cabinet Placement, Single Cabinet System .....	2-8
Figure 2-4	Typical Cabinet Arrangement for Multicabinet Systems.....	2-9
Figure 2-5	Communications Terminal Connections.....	2-12
Figure 2-6	Peripheral Expansion Cabinet Signal Cables .....	2-13

---

### Chapter 4

---

Figure 4-1	System90 Card Cage .....	4-1
Figure 4-2	Removing the Front Cover from the Cardcage .....	4-3
Figure 4-3	Logic Board Front Edges .....	4-4
Figure 4-4	Service Processor Module .....	4-8
Figure 4-5	Memory Module (MM).....	4-9
Figure 4-6	Processor Module (PM).....	4-10
Figure 4-7	Input/Output Processor Module (IOPM) .....	4-11

---

### Chapter 5

---

Figure 5-1	System90 Card Cage .....	5-2
Figure 5-2	Interface Board Retaining Bracket .....	5-3
Figure 5-3	DSDB EMI Cover Installation.....	5-6
Figure 5-4	Asynchronous Communications Device Board (ACDB).....	5-7
Figure 5-5	ACE Boards connected to ACDB .....	5-8
Figure 5-6	ACE Board Assembly .....	5-11
Figure 5-7	Female RJ-45 port .....	5-13
Figure 5-8	Asynchronous Communications Real World (ACRW) .....	5-17
Figure 5-9	LWDB Device Board .....	5-21
Figure 5-10	Connector Hardware and AUI Cable Configuration.....	5-22
Figure 5-11	Connector Hardware and AUI Cable Detail.....	5-23

Figure 5-12	Dual SCSI Device Board (DSDB) .....	5-25
Figure 5-13	DSDB EMI Cover Installation.....	5-26
Figure 5-14	8-Slot Bus Arbiter Board.....	5-27
Figure 5-15	Bus Arbiter Board Access.....	5-28

### Chapter 6

---

Figure 6-1	5 Volt/12 Volt Power Bus Boards .....	6-2
Figure 6-2	Auxiliary Power Supply Board.....	6-5
Figure 6-3	Auxiliary Power Supply Board Access.....	6-6
Figure 6-4	Display Board .....	6-8
Figure 6-5	LED Display Module Connector .....	6-10

### Chapter 7

---

Figure 7-1	Removing the System's Front Door and Left Side.....	7-4
Figure 7-2	Drive Installation Kit.....	7-5
Figure 7-3	Drive Filler Panel Removal .....	7-6
Figure 7-4	Drive Installation - Front .....	7-7
Figure 7-5	Rear Drive Area Cover Removal .....	7-9
Figure 7-6	Rear Drive Installation.....	7-10
Figure 7-7	DSDB EMI Cover Installation.....	7-11

### Chapter 8

---

Figure 8-1	Air Filter Access.....	8-1
Figure 8-2	Air Filter Cleaning .....	8-2
Figure 8-3	Removing the Front Cover from the Cardcage .....	8-3
Figure 8-4	Cardcage Fan Assembly.....	8-4
Figure 8-5	Removing the System's Left Side Panel .....	8-5
Figure 8-6	Peripheral Fan Assembly Removal .....	8-6

### Chapter 9

---

Figure 9-1	Removing the System's Left Side Panel .....	9-1
Figure 9-2	DC Power Supply Location.....	9-2
Figure 9-3	Preparing DC Power Supply for Removal.....	9-3

### Chapter 10

---

Figure 10-1	Fully Insulated Potentiometer Adjustment Tool .....	10-2
Figure 10-2	Power Supply Locations .....	10-3
Figure 10-3	Removing the System's Left Side Panel .....	10-4
Figure 10-4	Test Points for the Main DC Power Supply .....	10-5
Figure 10-5	Main DC Supply Potentiometer Locations .....	10-6
Figure 10-6	Test Points for the Auxiliary Power Supply .....	10-9
Figure 10-7	Auxiliary Supply Potentiometer Location .....	10-10

## Appendix A

---

Figure A-1	Female RJ-45.....	A-2
Figure A-2	25-Pin D (Female) .....	A-3
Figure A-3	15-Pin D (Female) .....	A-4
Figure A-4	25-Pin D (Female) .....	A-5
Figure A-5	37-Pin D (Female) .....	A-6
Figure A-6	50-Pin Male Connector.....	A-7
Figure A-7	9-Pin D (Male).....	A-11

## List of Tables

### Chapter 1

---

Table 1-1	Major System FRUs.....	1-1
	Power Configuration Chart for the System90 Model 25.....	1-5
Table 1-2	Control Panel LED Indications .....	1-6

### Chapter 5

---

Table 5-1	RJ-45 to DB-25 Connector Pin/Signal Description for .....	
	DTE Use .....	5-14
Table 5-2	RJ-45 to DB-25 Connector Pin/Signal Description for .....	
	DCE or MODEM Use .....	5-14
Table 5-3	CONSOLE Connector Pin/Signal Description.....	5-16
Table 5-4	Female DB-25 Parallel Printer Port Connector Pinout for .....	
	the ACDB and ACRW.....	5-16

### Appendix A

---

Table A-1	Female RJ-45, DTE, Asynchronous Port Connector .....	
	Pinout.....	A-2
Table A-2	Female DB-25 Parallel Printer Port Connector Pinout for .....	
	the ACDB and ACRW.....	A-3
Table A-3	LWDB Female DB-15 IEEE 802.3 Connector Pinout.....	A-4
Table A-4	LWDB DB-25 Synchronous Port Connector Pinout .....	A-5
Table A-5	LWDB Female DB-37 V.35 Connector Pinout.....	A-6
Table A-6	DSDB SCSI Single-Ended 50-Pin Male Connector Pinout.....	A-8
Table A-7	DSDB SCSI Differential 50-Pin Male Connector Pinout.....	A-9
Table A-8	Female RJ-45, DCE, Asynchronous Port Connector .....	
	Pinout.....	A-10
Table A-9	ACRW Male DB-9 UPS Port Connector Pinout.....	A-11

# *Preface*

This manual contains all the information necessary to perform an initial installation of an **ARIX System90 Model 25** computer. It also contains a general description of the system and procedures for removing and installing all field replaceable units (FRUs) of the system.

The intended users of the manual are field engineers, customer support personnel, and system administrators.

## **Definitions of WARNINGS, CAUTIONS, and NOTES**

WARNINGS, CAUTIONS, and NOTES are defined as follows:

### **WARNING:**

**A WARNING box calls attention to a condition or action that can cause personal injury if allowed to exist or occur.**

### **CAUTION:**

**A CAUTION box calls attention to a condition or action that can cause damage to the equipment or the software if allowed to exist or occur.**

### **NOTE:**

**A NOTE box is used in place of a footnote. It calls attention to or contains amplifying information about or stresses the importance of associated text.**

## **Type Conventions in This Document**

- File and directory names are shown in **this typeface**.
- Commands, when they are referenced in the text, are shown in *this typeface*
- Text that is displayed on the screen is shown in **this typeface**
- Text that you enter on your terminal is shown in **this typeface**
- Titles of things such as books, chapters, sections, and tapes are shown in *this typeface*
- Special keys or key combinations, such as Carriage Return or Control d, are surrounded by the characters « and ». These brackets must not be confused with the greater than > and less than < symbols.  
A Carriage Return looks like «CR».  
A Control d (holding down the Ctrl key while pressing d) looks like «Ctrl d».

# Introduction

This manual contains all the information necessary for installing an **ARIX System90 Model 25** computer. It also contains the procedures for removing and installing all field replaceable units (FRUs) of the system. The major FRUs are listed below in Table 1-1. More detailed descriptions of the FRUs appear in the sections noted.

**Table 1-1 Major System FRUs**

Major System FRU	Discussed in Chapter ...
Logic Boards	4
Interface Boards	5
Miscellaneous PC Boards	6
System Disk and Tape Drives (SCSI)	7
Cooling System	8
Power Supply	9

## **WARNING:**

**All procedures given in this manual must be carried out by trained, technical personnel ONLY!**

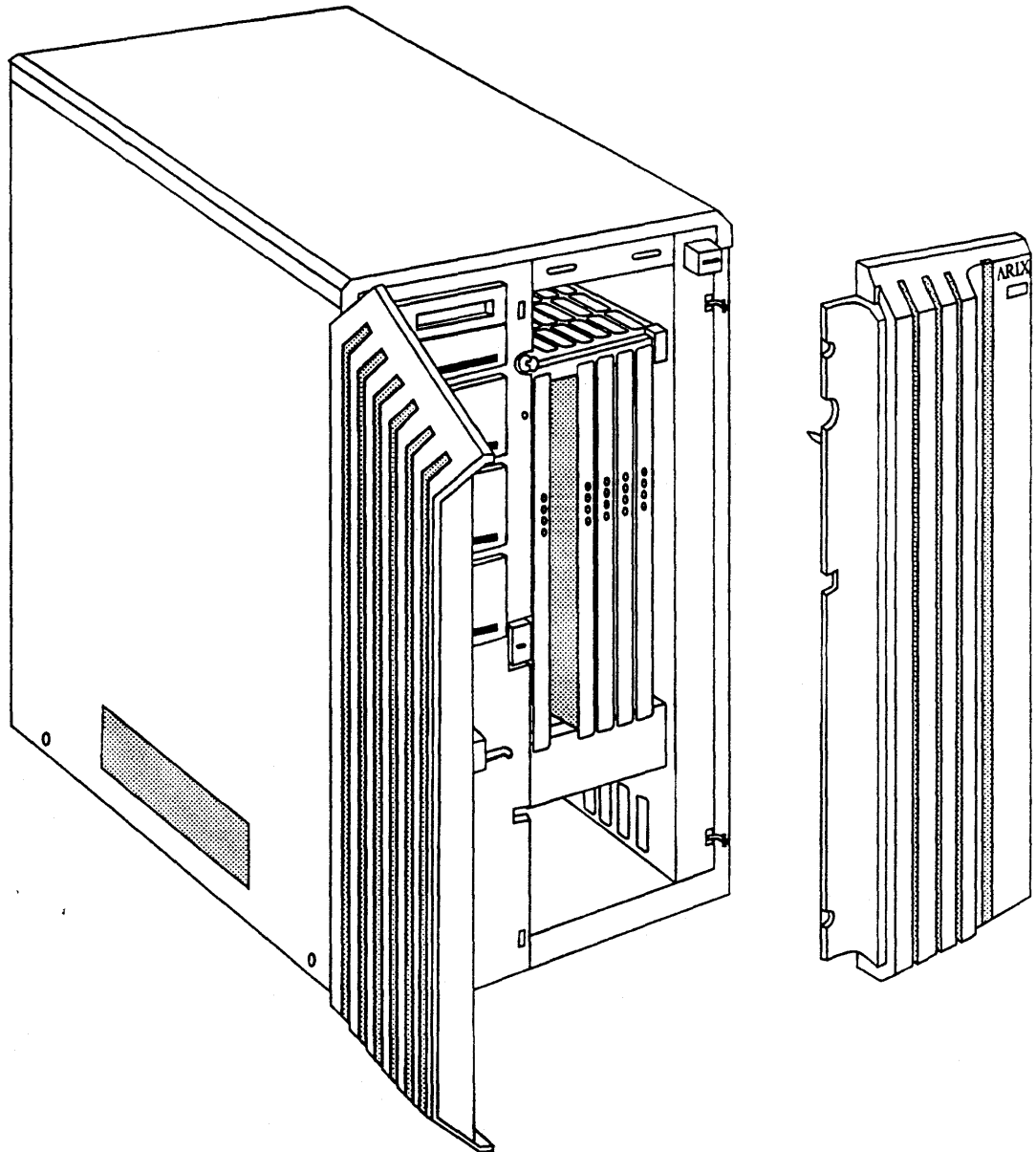
## **System Description**

All functional units and subassemblies of the System90 Model 25 are housed in a maximum of two metal cabinets (except for terminals, printers, and certain other types of peripheral devices). These two cabinets are referred to as the *primary cabinet* (Figure 1-1) and the *peripheral expansion cabinet* (Figure 1-2). Primary cabinets have card cage assemblies with backplanes. All subsystems, computational, and I/O elements are housed in the primary cabinet.

Peripheral expansion cabinets contain mass storage devices for which there is either no room in the primary cabinet, or cannot physically fit into the primary cabinet. Examples of devices that would be placed in the peripheral expansion cabinet are: additional disk drives for which there is no room in the primary cabinet, a nine-track tape drive. Peripheral expansion cabinets do not have a CSS backplane and, therefore, do not contain elements of the major functional subsystem.

### ***Primary Cabinet***

A primary cabinet is the main cabinet in the system. It contains the Computational Subsystem (CSS). It also contains all of the major FRUs listed above.

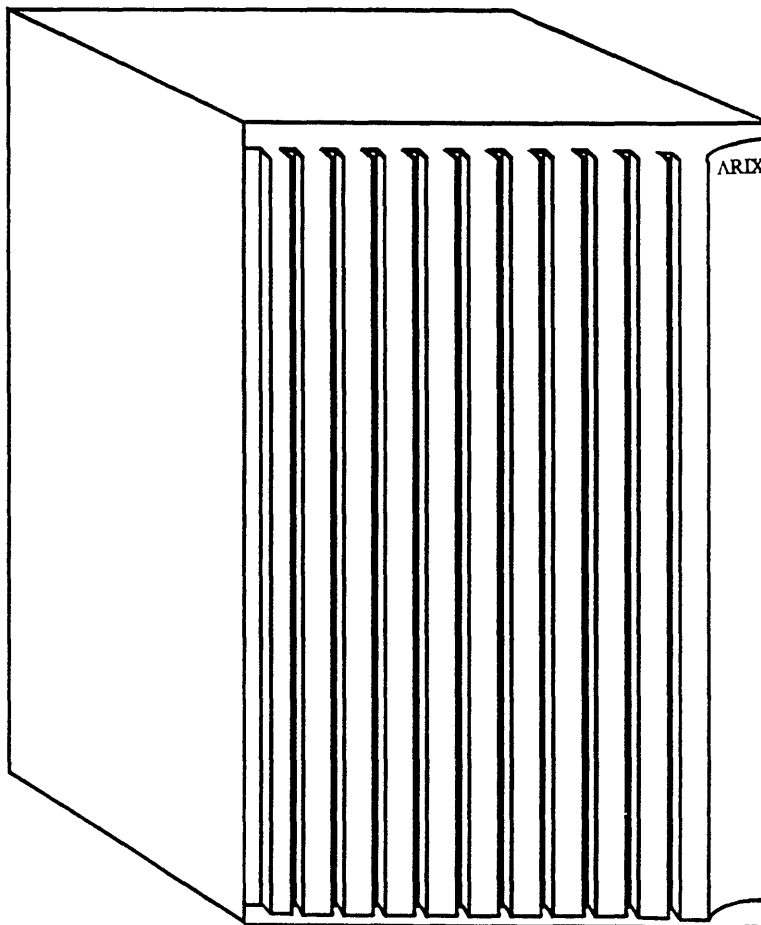


**Figure 1-1 Primary Cabinet**

### ***Peripheral Expansion Cabinet***

A peripheral expansion cabinet is used exclusively to house optional peripheral devices for the system. The peripheral expansion cabinet can house the following peripheral devices:

- A maximum of three SCSI Disk Arrays containing up to six 5 1/4-inch drives in each array.
- A single SCSI nine-track tape drive with two SCSI Disk Arrays.



**Figure 1-2 Peripheral Expansion Cabinet**



## **System Configurations**

Two domestic versions of the Model 25 are available: a 110 Volt version and a 220 volt version. The 110 Volt version uses a NEMA 5-20P type plug, and the 220 Volt version uses a NEMA L6-20P type plug.

Two European 220 Volt versions are also available. The British version uses a BS 1363 type plug, the other uses a CEE 7/7 type plug.

Before installation, ensure that the AC power source for the system has the correct voltage and amperage rating, and that it has the correct receptacle for the system's AC power plug.

All versions can support a single peripheral expansion cabinet.

### **CAUTION**

**It is important to note that the power supplies are NOT field convertible. Once received, the system is either 110 or 220.**

## **Power Configuration**

The following chart will help you determine whether or not your system configuration falls within the power restrictions of the System90 Model 25.

Instructions:

1. Fill in the following chart with your desired configuration of boards and other features in the *Number Installed* column.
2. Multiply the *Number Installed* column by the *Power Required* column and write the result in the *Total Power* column.
3. Add up the total number of boards. It cannot exceed 7.
4. Add up the *Total Power* column. The resultant **Total Power** cannot exceed 180.

**Power Configuration Chart for the System90 Model 25**

<i>Feature</i>	<i>Power Required</i>	<i>X</i>	<i>Number Installed</i>	<i>=</i>	<i>Total Power</i>
Basic System (Includes tape, SPM, ARB, ACRW)	31.6	X	1	=	31.6
<b>Boards:</b>					
MM	7.5	X		=	
PM-20	13.5	X		=	
IOPM/ACDB	13.5	X		=	
ACE	0.6	X		=	
IOPM/DSDB	18.5	X		=	
IOPM/LWDB RS232	17.2	X		=	
IOPM/LWDB V.35	17.5	X		=	
IOPM/LWDB RS449	18.1	X		=	
IOPM/LWDB Combo	17.4	X		=	
<b>Total from Boards: (7 BOARDS MAX.)</b>					
<b>Storage Devices:</b>					
5.25 inch Disk	2.5	X		=	
3.50 inch Disk	0.75	X		=	
CD ROM	0.5	X		=	
Optical WORM	1.8	X		=	
R/W Optical	2.0	X		=	
<b>Total Power: (180 MAX POWER)</b>					

## **System Control**

The operator controls the system from an *operator control panel* (Figure 1-3) and the system *console terminal*.

### **Operator Control Panel**

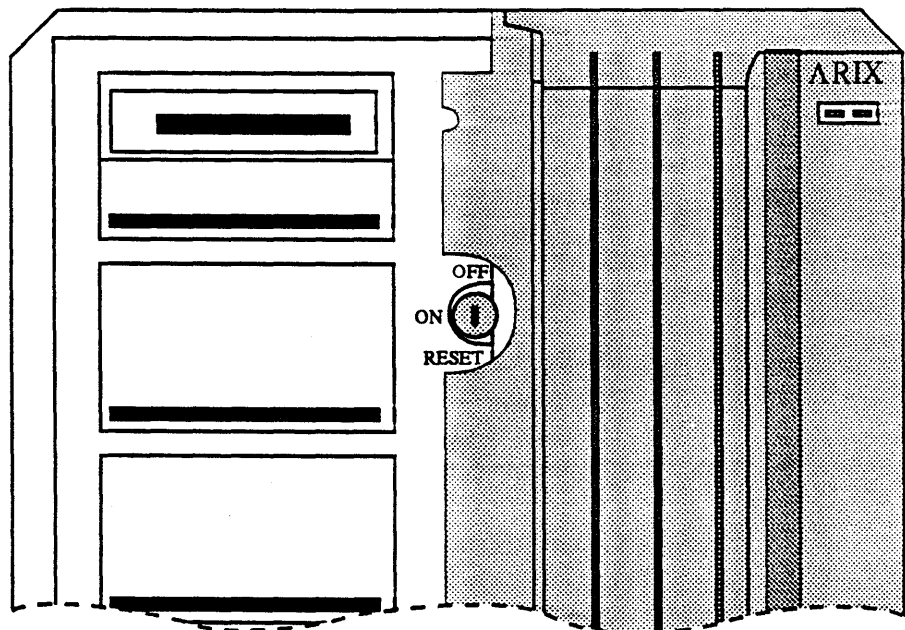
The operator control panel is located in the upper, front portion of the primary cabinet (and only in the primary cabinet). It has a three-position (On, Off, and Reset) keyswitch and two indicator LEDs located in the upper right corner of the cabinet door (see Figure 1-3).

The operator uses the keyswitch to power the system up and down and to perform a system reset.

The indicator LEDs are green and yellow. The states that they indicate are described in the following table.

**Table 1-2 Control Panel LED Indications**

LEDs		Indication
Green	Yellow	
OFF	OFF	No AC power or main circuit breaker off.
OFF	ON	AC power on and SPM active, main system power off.
ON	OFF	Full System has power.
ON	Flashing	Abnormal condition, detailed information displayed on console terminal



**Figure 1-3 Operator Control Panel**

### **Console Terminal**

The primary cabinet has ten (10) serial ports located on the Asynchronous Communications Real World (ACRW) interface board located at the left rear of the cabinet (see Figure 1-4). The number of serial ports can be expanded to 42 through the use of two Asynchronous Communications Extender (ACE) boards.

The console terminal connects to the Console port at the top of the board. All system diagnostics as well as operating system commands can be performed from the console terminal.

### Remote Console

A remote console port is provided for remote system access and diagnostics. To act as a remote console port, a modem should be connected to this serial port (see Chapter 5, subsection *ACDB Board Set-Up* for information on how to configure ACRW or ACE ports for modem use). All functions performed at the main console terminal are supported at the remote console port.

The remote console port can also act as a port for a system serial printer.

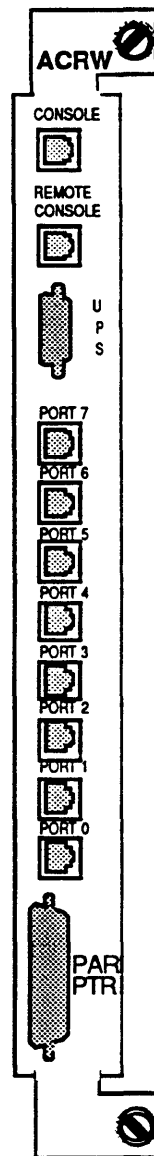


Figure 1-4 System Serial Ports

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# **A** *System Installation* **2**

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Installing a full **ARIX System90 Model 25** computer, single or multiple cabinet, at a new site normally consists of the following operations:

- Gathering the required materials and personnel
- Unpacking the hardware
- Placing the hardware units in their operating positions
- Installing disk and/or tape drives in the peripheral expansion cabinet (if applicable)
- Connecting peripheral hardware units, such as the system console
- Connecting the system power and logic cables
- Powering on the system and performing power-up checks
- Checking the system for correct operation.

Although a console terminal is a system requirement and is shown in figures as an integral part of the system, installation of peripherals other than those shipped by **ARIX** is not covered in this manual. Please refer to the documentation provided by the manufacturer(s).

## **Installation Requirements**

Before beginning the installation, make sure you have all of the material and personnel listed below.

### **CAUTION:**

**Substantial assembly of peripherals may be required at the installation site. This assembly and installation should be performed by *trained personnel ONLY*.**

### **Installation Team Personnel**

A minimum installation team consists of three persons as follows:

- An ARIX field engineer or equivalent -- someone familiar with the ARIX product line
- At least one assistant
- A software specialist -- someone at the system supervisor level

### **Tools and Test Equipment**

You need the following tools and test equipment to install the Model 25:

- A floating bubble level
- A 9/16-inch open end wrench
- A 1/2-inch open end wrench
- A #2 Phillips-head (+) screwdriver
- An *electro-static discharge* (ESD) grounding strap

## **Documentation**

To install the complete system, including peripheral devices, you need the following documentation:

This manual

*ARIX System90 Model 25 Site Preparation Manual*

*Uninterruptible Power Supply Guidelines for the ARIX System90*

*ARIX OS/90 V.3 Release Notes* for your particular release (Release 3.0 minimum)

*ARIX OS/90 V.3 Installation Guide* (Release 3.0 minimum)

A floor plan (preferably the one generated during site preparation time) showing the position of each cabinet and other major units in the system

If cables to terminals, modems, printers, and other external peripheral devices pass from room to room, you may also need the architectural plans for the building in which the system is installed.

If a peripheral expansion cabinet is to be used with the Model 25, you may need to refer to the manual for the device(s) being installed.

<p><b>CAUTION:</b></p>
------------------------

<p><b>Before carrying out any of the procedures or operations described in this manual, read the entire procedure first.</b></p>
--

## **Unpacking**

Model 25 cabinets are crated and packed individually. In multicabinet systems, some of the hardware items are shipped in separate packages as noted in the procedures below. The shipment may also contain units not manufactured by ARIX (terminals, printers, modems, etc.) Unpacking procedures for these devices appear in their respective manufacturer's manuals.

### ***Preliminary Procedures***

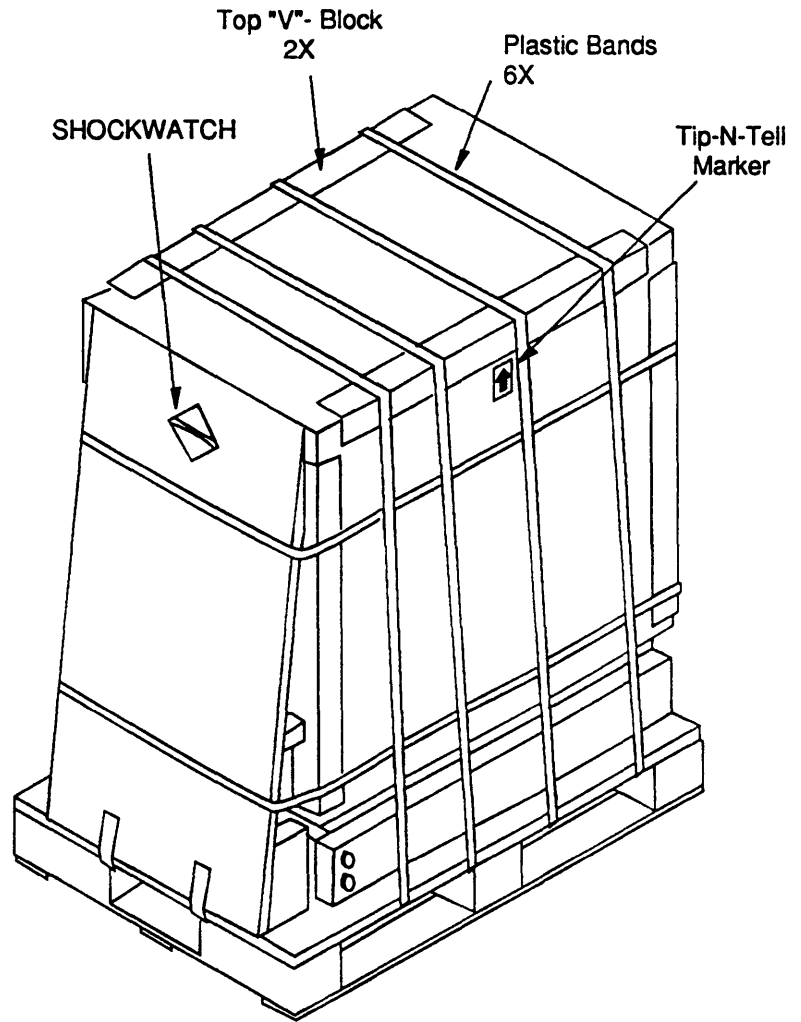
1. Before unpacking each unit, check it for any exterior signs of shipping damage. If you find any such signs or suspect any, report it to the carrier before accepting the shipment.
2. Check the color on the tilt and shock watches on each unit. If any of the watches are displaying the color red, the unit has been tilted excessively or subjected to excessive shock. Report this fact to the carrier before accepting the shipment.
3. After unpacking each unit, again check for signs of damage.
4. Inventory the shipment and check it against the shipment manifest and your purchase order.
5. If you find any damage, items missing, or other irregularities with the shipment, report the facts to the carrier and to your ARIX Customer Support representative.

### ***Unpacking System Cabinets***

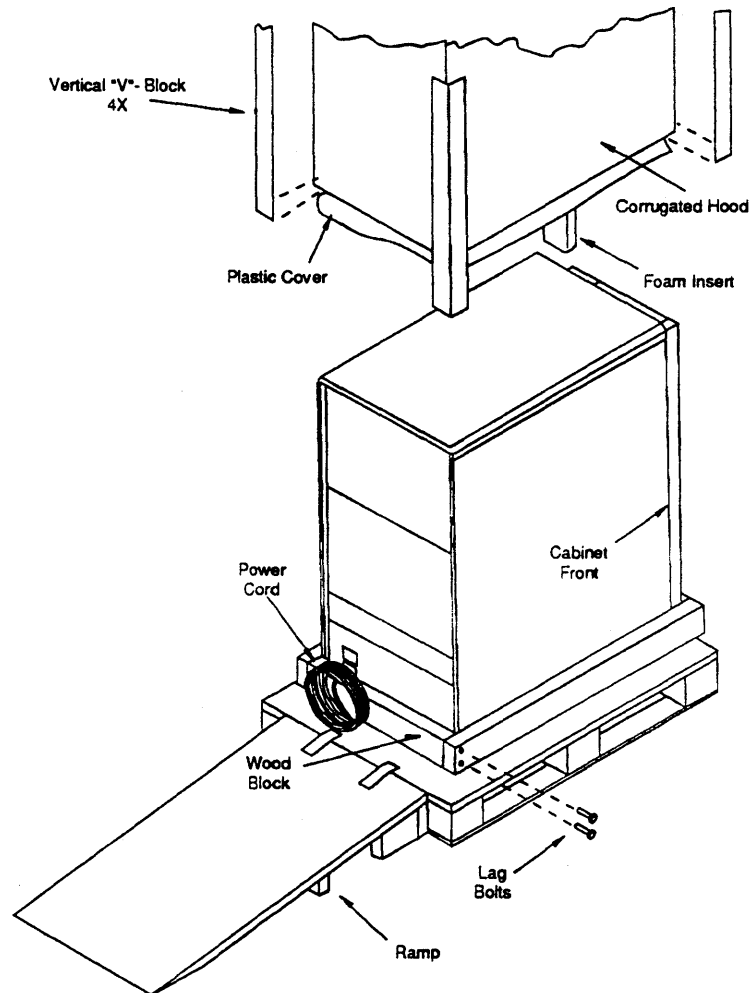
Unpack the system cabinets as follows:

1. Hold the cabinet loading ramp so that it cannot fall. Cut the four plastic binding straps that hold the ramp and crated unit (Figure 2-1).
2. The AC power cord for the cabinet is shipped coiled inside the loading ramp (Figure 2-2).
3. Ease the loading ramp to the floor and lay it to one side temporarily.
4. Remove the shipping edge boards from the edges of the hood.





**Figure 2-1 System90 Model 25 Cabinet in Packing Crate**



**Figure 2-2 Cabinet Packing Crate, Exploded View**

**CAUTION:**

**At least two persons should carry out the next step, one on the ramp side to support and steady the cabinet as it rolls, and one on the opposite side to push on the cabinet.**

7. Gently roll the cabinet off the pallet and down the loading ramp onto the floor.
8. Move the cabinet to its approximate final location.
9. Lift the cardboard hood off the cabinet (Figure 2-2) and set it aside.
10. Remove the plastic shipping bag by pulling it over the top of the cabinet.

11. Store all packing materials and containers for future use (long distance shipment, etc.).
12. If you are installing a multiple cabinet system, the shipment includes some additional hardware items packed in banded, cardboard cartons. Cut the bands, open the cartons, and remove the items.

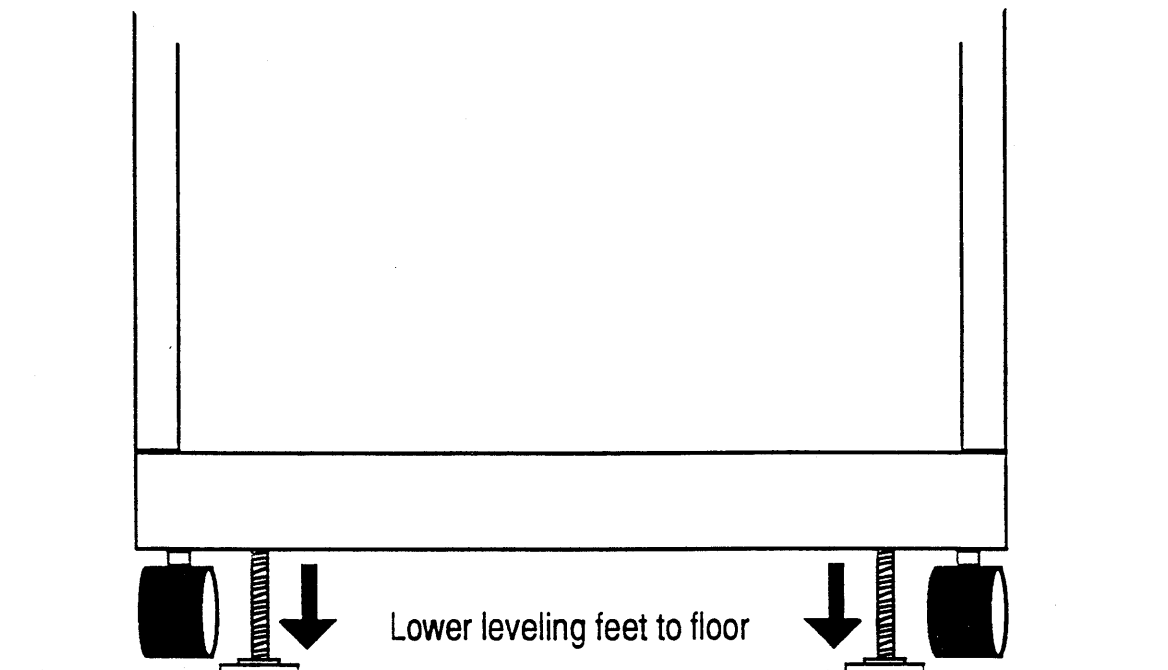
## **Unit Placement**

As you perform the procedures in this section, refer to the floor layout diagram produced for this installation at site preparation time (as described in the *System90 Model 25 Site Preparation* manual). Note that in that diagram, placement of the System90 Model 25 units in their operating positions includes placement of the external peripheral units (system console terminal, printers, etc.). You can find procedures for preparing these peripheral units in their respective manufacturer's documentation.

### **Single Cabinet Systems**

If you are installing a single cabinet system, unit placement consists of placing the primary cabinet in the position from which it will operate and stabilizing it. Proceed as follows:

1. Place the primary cabinet in the position it will occupy during operation.
2. Using a 1/2-inch wrench or suitable adjustable wrench, lower the leveling feet at each of the four corners of the cabinet until all the weight has been transferred from the casters to the leveling feet (see Figure 2-3).
3. Check the level of the cabinet with the bubble level. If necessary, adjust the leveling feet to bring the cabinet into a level condition.
4. Place the console terminal and all other external peripheral devices in their operating positions according to your floor layout diagram.

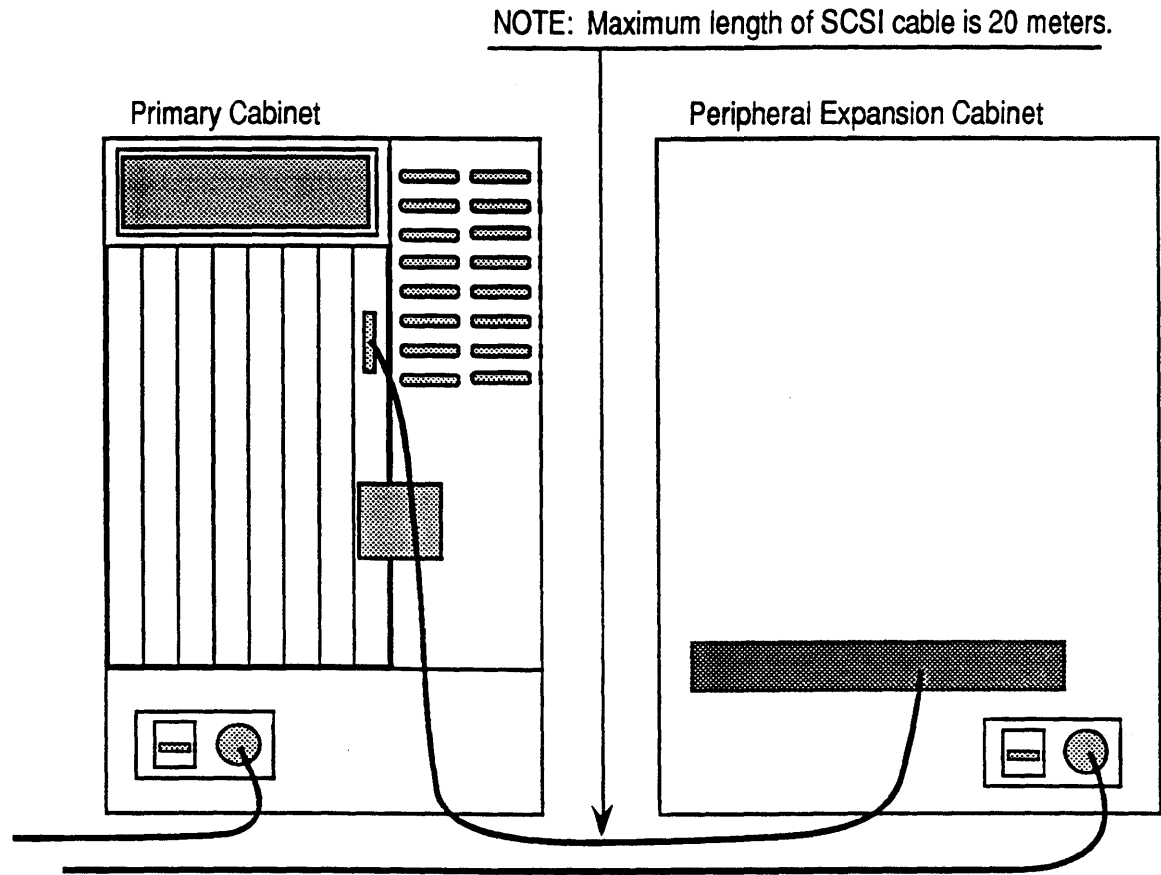


**Figure 2-3 Cabinet Placement, Single Cabinet System**

### ***Multicabinet Systems***

If you are installing a multicabinet system, installation consists of primary cabinet placement, installation of storage devices into the peripheral expansion cabinet (see Chapter 7), peripheral expansion cabinet placement, and cabling of the peripheral expansion cabinet drives to the primary cabinet.

1. Place the primary cabinet in the position it will occupy during operation. You must observe some restrictions with regard to the position of the peripheral expansion cabinet relative to the main cabinet (Figure 2-4).



**Figure 2-4** Typical Cabinet Arrangement for Multicabinet Systems

2. Use a 1/2-inch wrench or suitable adjustable wrench and lower the leveling feet at each of the four corners of the primary cabinet until all the weight is off the casters (see Figure 2-3).
3. Check the level of the cabinet with the bubble level. If necessary, adjust each foot to bring the cabinet into a level condition.
4. Tape and disk drives for the peripheral expansion cabinet are shipped separately. Install the drive(s) into the peripheral expansion cabinet.
5. Roll the peripheral expansion cabinet into position next to the primary cabinet.
6. Use a 1/2-inch wrench or suitable adjustable wrench and lower the leveling feet at each of the four corners of the peripheral expansion cabinet until all the weight is off the casters.
7. Check the level of the cabinet with the bubble level. If necessary, adjust each foot to bring the peripheral expansion cabinet into a level condition.

## **System Cable Connections**

This section contains procedures for connecting the communication and control cables between units of the system and for connecting the main power cables between units of the system and the system AC power source.

### **Single Cabinet Systems**

All internal cables and mass storage devices for primary cabinets are factory installed. Cable connections for single cabinet installations consist of connecting power and communications signal cables to the cabinet. Proceed as follows:

1. Place the system console terminal, printer(s), modems, and all other units of the system in the positions they will operate from.
2. Connect the power cords to these peripheral units in the manner described in the respective unit manufacturer's documentation.

#### **CAUTION:**

**Before connecting the system to the primary AC power source, verify that the voltage, polarity, and grounding of the source are correct and in accordance with the power requirements specified in the *ARIX System90 Model 25 Site Preparation* manual. Verify also that *all system power switches are OFF.***

3. Connect the primary cabinet power cord to its designated AC source.

#### **NOTE:**

For information concerning the connection and use of an Uninterruptible Power Supply (UPS), refer to the *Uninterruptible Power Supply Application Guidelines for the ARIX System90.*

4. Connect the signal cable from the console terminal to the serial port marked CONSOLE (the uppermost port on the back panel of the ACRW).
5. If you will be using a remote console, connect the signal cable from the modem to the remote console terminal to the serial port marked REMOTE CONSOLE on the back panel of the ACRW

6. If your system includes a diagnostic serial printer, connect the RS-232C signal cable from the system serial printer to the serial port marked REMOTE CONSOLE on the back panel of the ACRW. By using the REMOTE CONSOLE port for the serial printer you have removed the remote diagnostic capability from the system. A dedicated *parallel* printer port has been provided on the ACRW back panel. If you would like to retain the remote diagnostic capability, you should connect a parallel printer to the PAR PTR port on the ACRW.
7. Identify and connect all system terminals to their appropriate jacks on either the IOPM/ACDB or the ACRW (Figure 2-5). These communications board(s) have telephone-type (RJ-45) RS-232 connector jacks (Shielded RJ-45 plugs may also be used).

Numbering of the ACRW connectors is from the bottom up: 8-15 on the ACRW, 16-31, 32-47 on the first and second ACE (Asynchronous Communication Extender) boards if they are connected to the ACRW. Although the ACRW board has only ten output ports (REMOTE CONSOLE, CONSOLE, and 8 non-dedicated serial ports), the software assigns 16 ports to the board. Therefore, the numbering sequence of the next asynchronous device board (either ACE or ACDB) begins with port number 16.

Numbering of the IOPM/ACDB connectors is also from the bottom up as shown in the figure.

**NOTE:**

If you intend to set up any of the serial communications ports for modem use, refer to Chapter 5 *Interface Boards* Subsection *ACDB Board Set-Up*.

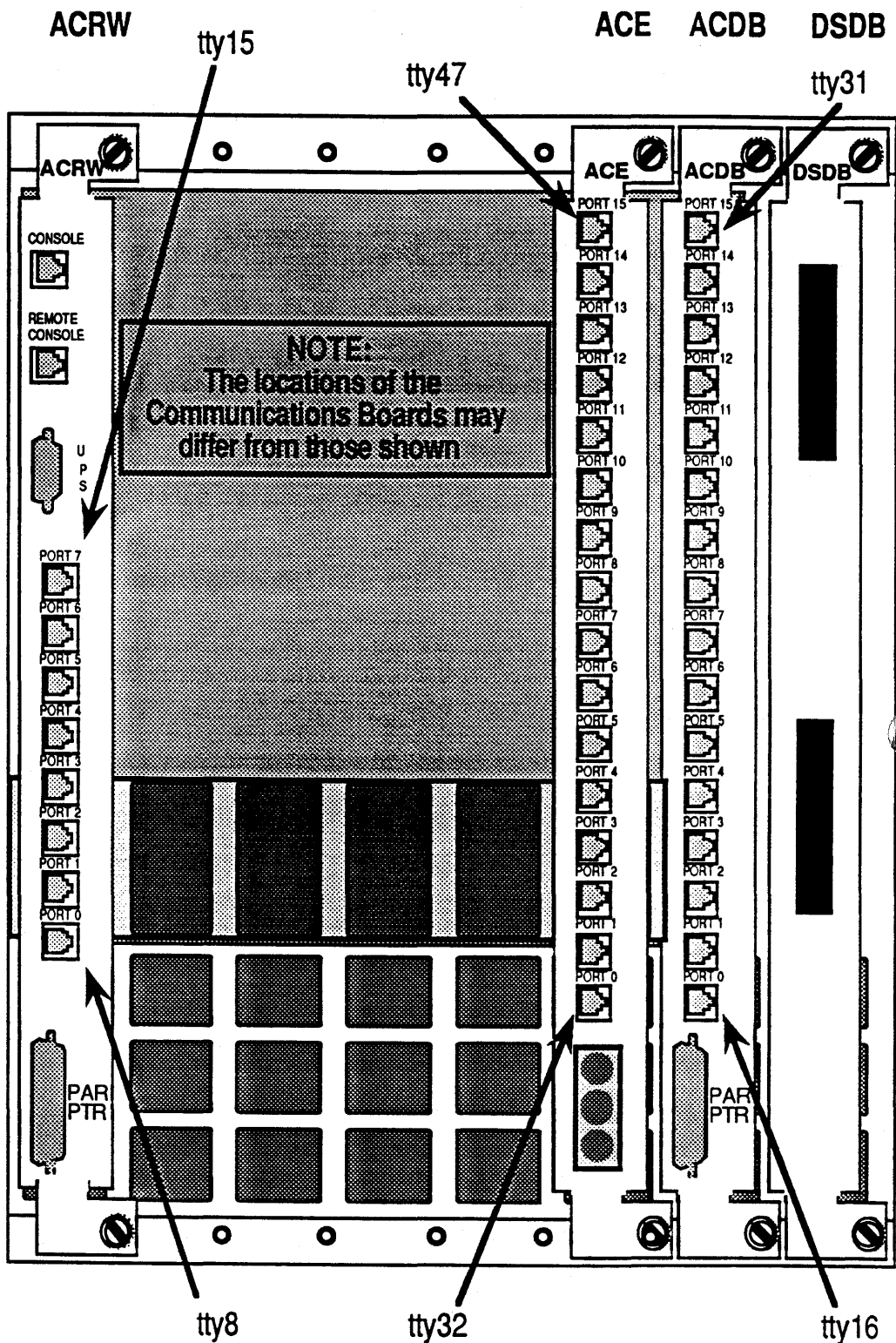


Figure 2-5 Communications Terminal Connections



## Multiple Cabinet Systems

Cable connections for multicabinet installations consist of those given above for single cabinet installation plus those between the several system cabinets.

### Intercabinet Signal Cables

The number and variety of the signal cables depends upon the specific configuration of the system, which is normally defined at the time the system is ordered. The system is shipped with all signal and power cables for *internal* drives (those drives housed in the primary cabinet) already connected. Signal cables for *external* drives are shipped separately and must be connected at the site.

1. Connect the IOPM/DSDB (SCSI) signal cables to the expansion drives as follows (see Figure 2-6):
  - 1a. If necessary, remove any shipping tape or binding material from the cables and unroll them.
  - 1b. Identify the drive or disk array in the peripheral expansion cabinet to which that cable connects, and note or label the drive.
  - 1c. If it has not already been done, route the differential SCSI signal cable from the primary cabinet into the peripheral cabinet as shown in Figure 2-6.
  - 1d. Connect each cable to its drive or disk array. Latch the cable(s) in place.

NOTE: Maximum length of SCSI cable is 20 meters.

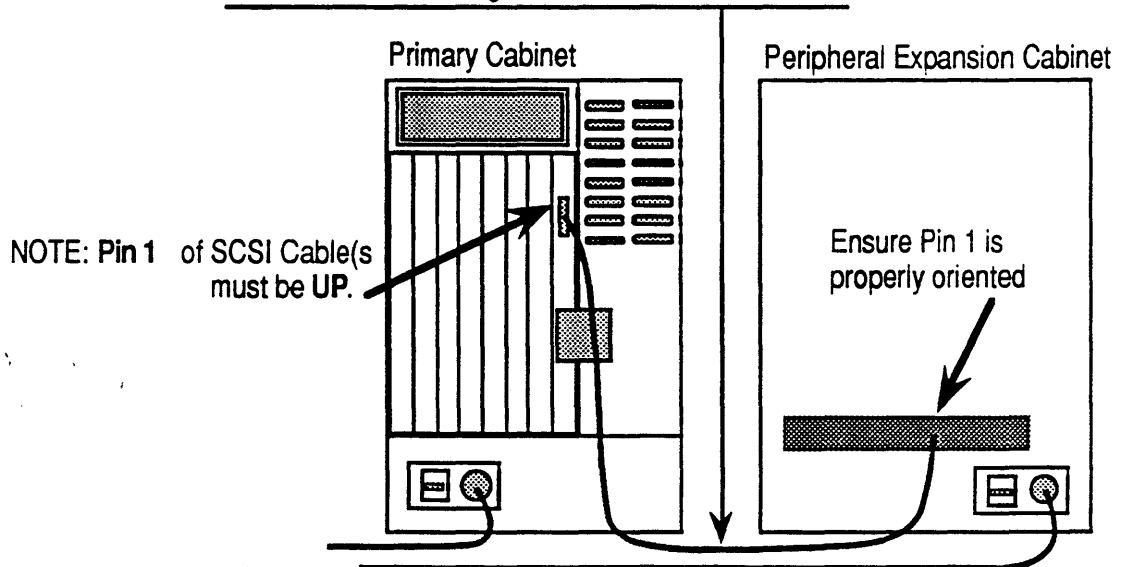


Figure 2-6 Peripheral Expansion Cabinet Signal Cables

2. If applicable, connect the IOPM/LANWAN signal cables to their interfaces.

***Cabinet Power Cable Connections***

Each System90 cabinet requires a dedicated AC power line and circuit breaker as noted in the *ARIX System90 Model 25 Site Preparation* manual.

**CAUTION:**

**Before connecting the system to the primary AC power source, verify that the voltage, polarity, and grounding of the source are correct and in accordance with the power requirements specified in the *ARIX System90 Model 25 Site Preparation* manual. Verify also that *all system power switches are OFF.***

**NOTE:**

For information concerning the connection and use of an Uninterruptible Power Supply (UPS), refer to the *Uninterruptible Power Supply Application Guidelines for the ARIX System90.*

1. Connect each system cabinet to its AC power source.

# **Powering the System Up and Down**

## **Powering-up the System**

Power up for the System90 consists of applying the AC power source to the primary and expansion cabinets and beginning the autoboot process. Proceed as follows:

**CAUTION:**

**Read this entire subsection COMPLETELY and CAREFULLY before you begin.**

1. Turn the power switch of the console terminal to ON.
2. Turn the main circuit breaker on the rear of the cabinet(s) to ON.
3. Turn the keyswitch on the primary cabinet's operator panel to ON.
4. Observe the console terminal. As soon as the autoboot process begins, press any key on the keyboard.

## **Hardware Notes on Bringing the System to Single-User Mode**

The operating system is not installed on the disk when the system is shipped. Therefore, you must install the operating system using the installation tapes supplied with the installation kit. For complete details on how to boot and install the operating system, refer to *ARIX OS/90 V.3 Installation Guide*, the *ARIX OS/90 V.3 Release Notes*, and the *ARIX OS/90 System Administrator's Guide*.

**NOTE:**

Systems are shipped from ARIX with the disks formatted. It is possible that during shipment the format of the disk may have been damaged. If the disk is not formatted or its format has been damaged, refer to "Disk/Tape Management" in the *ARIX-OS/90 V.3 System Administrator's Guide*.

ARIX-OS/90 V.3 operating system is distributed on 1/4 inch cartridge or 9-track tape. The distribution tapes for the release are entitled:

- Bootimage, Root, and Usr -- This is a group of standalone programs plus the root, and usr file systems
- Domestic Overlay -- These are utilities that use encryption algorithms for use at domestic sites
- Maintenance Overlay -- Used to update your system to the most current release

The default names for the cartridge tape drive are `/dev/rmt1` and `/dev/rmt0` for rewind and no-rewind respectively. The default names for the 9-track tape drive are `/dev/9mt1` and `/dev/9mt0` for rewind and no-rewind respectively.

## **Powering-down the System**

Powering down a System90 involves closing or readying all system files and resources before actually interrupting the power to the system. Proceed as follows:

### **From Multi User Mode**

Powering down a System90 that is operating in multi user mode involves first bringing the system to the single user mode then closing or readying all system files and resources before actually interrupting the power to the system. Proceed as follows:

1. Log on to the system as root.
2. Enter the command  
`cd /<CR>`  
(changes working directory to root).

3. Enter the command

```
shutdown [-g#] [-i] [-y]<CR>
```

The -g parameter specifies the number of seconds of grace (the # symbol should be replaced with this number) before the **inittab** file puts the system into single user mode. For explanations of the -i, and -y parameters, refer to *ARIX-OS 190 V.3 System Administrator's Reference Manual*.

A number of script files that issue system shutdown warning messages to ordinary users are normally a part of the *shutdown* script.

**NOTE:**

If you are not shutting down under emergency or urgent conditions, it is customary to allow ordinary users ample time to complete their current operations or to bring them to a convenient stopping point. Thirty minutes is commonly granted for this purpose with warning messages issued every five minutes.

When the shutdown process begins, the following displays appear to which you must reply:

```
SHUTDOWN PROGRAM
```

```
Day of Week: Month: Day:hh:mm:ss:yy
```

```
Do you want to send your own message (y or n)?
```

To send a personalized message type:

1. y<CR>
2. Type your **message** followed by a <CTRL d> (hold down the Ctrl key and press d).

Whether or not you send a personalized message, the following will then be displayed:

```
System maintenance about to begin
```

```
Please log off.
```

(The system will now wait for the number of seconds specified or for the default of 60 seconds)

```
SYSTEM BEING BROUGHT DOWN NOW!!!
```

Busy out (push down) the appropriate phone lines for this system.

Do you want to continue (y or n)?

To quit the **shutdown** program, enter **n<CR>**, and the multiuser prompt will appear. To continue the **shutdown** program, type **y<CR>** and the system will display the following message:

Process accounting stopped

Error logging stopped

all currently running processes will now be killed

(The date may appear here if processes are being killed)

Wait for INIT: SINGLE USER MODE before halting

INIT: SINGLE-USER MODE

\*

INIT:New run level:S

INIT:SINGLE USER MODE

\*

4. Enter the commands

**sync<CR>**

**sync<CR>**

**sync<CR>**

\*

**NOTE:**

If any changes are made to files or processes initiated at this time from single user state, the **sync;sync** command should be issued again to ensure that the changes are flushed from main memory back to disk.

5. Turn the keyswitch on the Operator Control Panel to OFF (Standby)
6. At the rear of the cabinet(s) turn the main circuit breaker(s) to OFF.

***From Single User Mode***

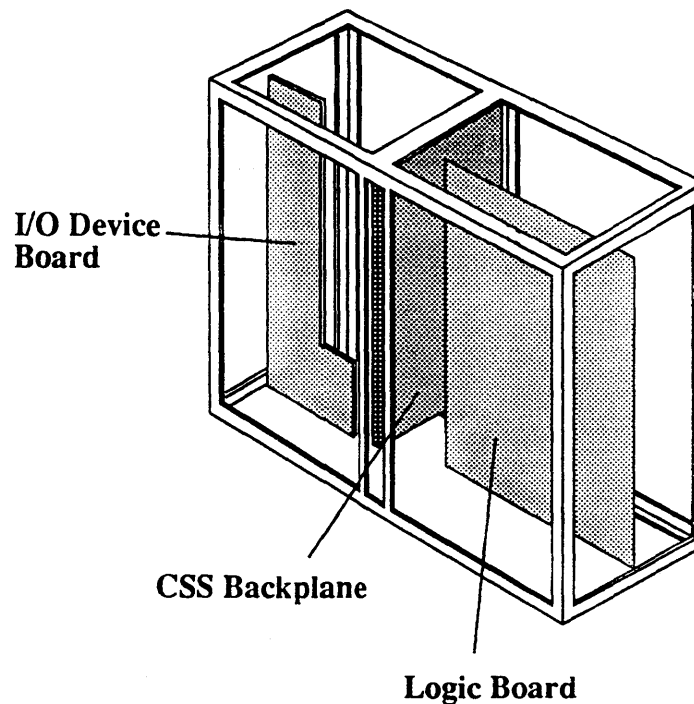
1. Enter the commands  
    **s y n c < C R >**  
    **s y n c < C R >**  
    **\***
2. Turn the keyswitch on the Operator Control Panel to OFF (Standby)
3. At the rear of the cabinet(s) turn the main circuit breaker(s) to OFF.

# Λ *Logic Boards* 4

This chapter contains installation and removal procedures for all field replaceable logic printed circuit boards in the card cage. The field replaceable logic boards and their associated hardware (such as mounting devices) are listed below.

- Service Processor Module (SPM)
- Processor Module (PM)
- Memory Module (MM)
- Input/Output Processor Module (IOPM)

Logic boards are mounted in *slots* in the main compartment of the cardcage (see Figure 4-1) and are fairly easy to remove and install.



**Figure 4-1 System90 Card Cage**

Two types of PC boards occupy the slots in the card cage, *logic boards* and *interface boards* (interface boards are also known as *device boards*). Logic boards occupy slots in the *front* section of the card cage .



Interface boards work in conjunction with certain types of Logic boards. They occupy slots in the *rear* section of the card cage directly behind their corresponding logic board. Interface boards all have the same general shape and height but in some cases differ in depth.

Logic boards occupy the front section of the card cage. The procedures for removing and installing logic boards appear below. Any special requirements for a particular board appear in the subsection covering the specific board.

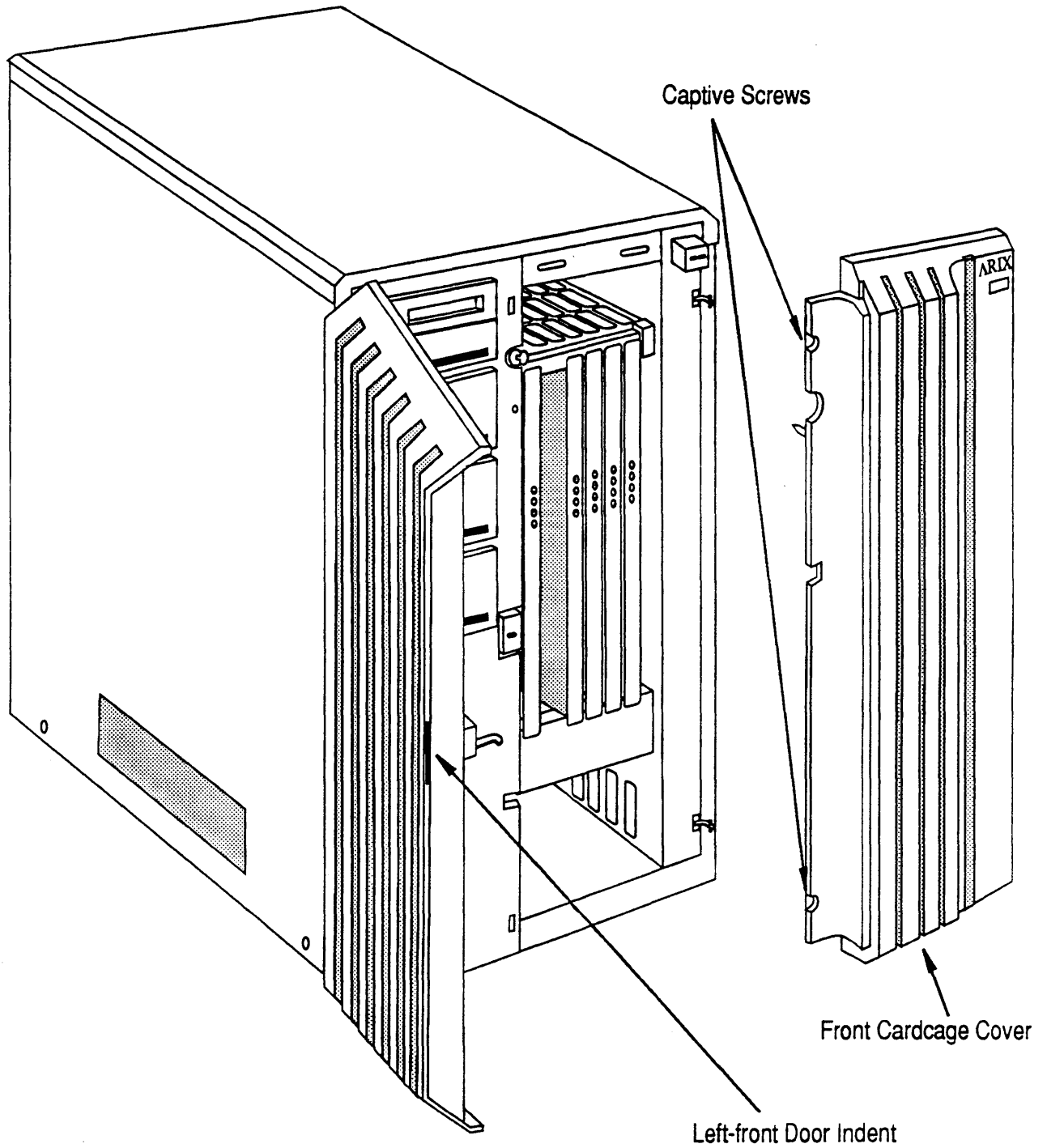
## **Logic Board Removal**

To remove a logic board proceed as follows:

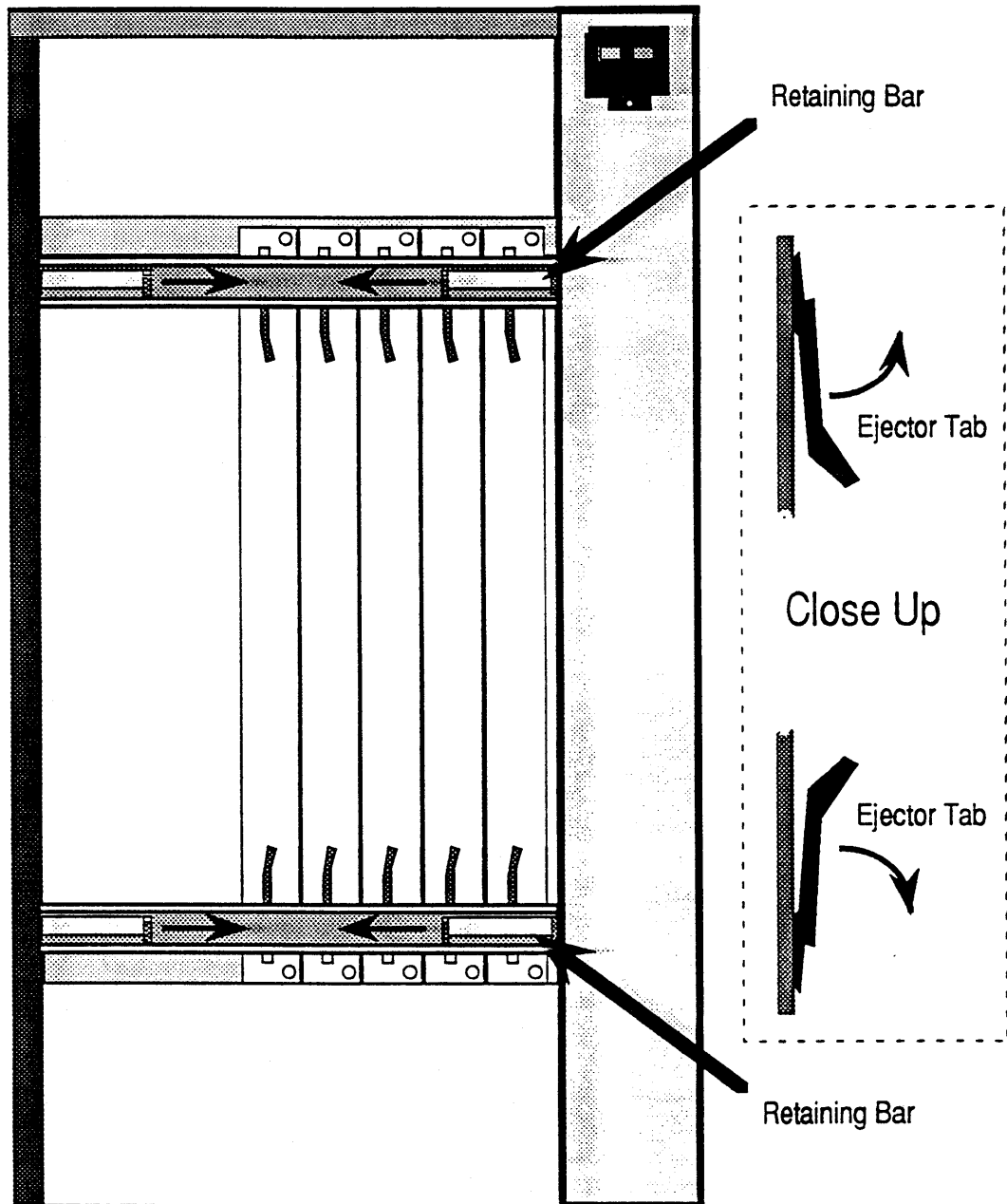
### **WARNING:**

**The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface board have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.**

1. Power down the system as described in Chapter 3.
2. Push on the indent on the front left-hand door of the cabinet and open the door (see Figure 4-2).
3. Unfasten (turn counter clockwise) the two phillips-head, quick-release, captive screws, securing the front cardcage cover to the cabinet.
4. Grasp the cardcage cover on both sides. Pull out slightly on the left-hand edge of the cardcage cover (about three inches).
5. Pull straight back and up on the cardcage cover. The cardcage cover should come completely away from the cabinet and expose the logic boards in the front part of the cardcage.
6. Carefully place the cardcage cover to one side.



**Figure 4-2 Removing the Front Cover from the Cardcage**



**Figure 4-3 Logic Board Front Edges**

7. While pushing the top retaining bar back towards the cardcage, slide the brackets on the retaining bar towards the middle as shown in Figure 4-3. The retaining bar should now be free of the cardcage.
8. Place the retaining bar to one side.
9. Repeat Steps 7 and 8 for the bottom retaining bar.

10. Record the board type, its serial number, and the slot number from which it is being removed.

**CAUTION:**

**PC boards are susceptible to electrostatic damage. Use an Electro-Static Discharge (ESD) grounding strap when handling PCBs. Do not touch the ICs or components on the circuit boards, and do not handle the boards except by their edges.**

11. To eject the board from the cardcage, pull the ejector tabs in the direction shown in Figure 4-3.
12. Pull gently out on the board, alternately exerting pressure on the top and bottom of the board as you pull on it. This gentle rocking should safely unseat the board from the backplane and interface board connectors.

**CAUTION:**

**If you are planning to operate the system *without* replacing the board you just removed, you must replace the filler plate for that slot, the retaining bars and the front cover of the cardcage before operating the system for any extended period.**

13. When the board is free of the backplane connectors, hold it by its edges and gently slide it out of the card cage.
14. Put the board in an antistatic bag; store it in a cool, dry environment and in an upright position if possible.

## **Logic Board Installation**

If you are also going to install a corresponding interface board, install that board first. Refer to Chapter 5, *Interface Boards*, Section *Interface Board Installation* for the correct procedure.

### **CAUTION:**

**Make certain that you are installing the correct combination of interface board and logic board. Connecting the wrong combination of these boards can result in permanent damage to the boards.**

To install a logic board proceed as follows:

1. Power down the system as described in Chapter 3.

### **WARNING:**

**The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.**

2. Push on the indent on the front left-hand door of the cabinet and open the door (see Figure 4-2).
3. Unfasten (turn counter clockwise) the two phillips-head, quick-release, captive screws, securing the front cardcage cover to the cabinet.
4. Grasp the cardcage cover on both sides. Pull out slightly on the left-hand edge of the cardcage cover (about three inches).
5. Pull straight back and up on the cardcage cover. The cardcage cover should come completely away from the cabinet and expose the logic boards in the front part of the cardcage.

6. Carefully place the cardcage cover to one side.
7. While pushing the top retaining bar back towards the cardcage, slide the brackets on the retaining bar towards the middle as shown in Figure 4-3. The retaining bar should now be free of the cardcage.
8. Place the retaining bar to one side.
9. Repeat Steps 7 and 8 for the bottom retaining bar.
10. Remove the filler plate from its slot.

**CAUTION:**

**PC boards are susceptible to electrostatic damage. Use an Electro-Static Discharge (ESD) grounding strap when handling PCBs. Do not touch the ICs or components on the circuit boards, and do not handle the boards except by their edges.**

11. Grasp the PC board you are going to install by its front metal edge and remove it from its antistatic bag.
12. Inspect all edge connectors and connection plugs for breaks, bends, and foreign matter.

**NOTE:**

**When carrying out the following step, do not force the board into the backplane. If you experience any abnormal resistance or interference, withdraw the board and recheck the connectors in the backplane.**

13. Holding it by its edges with the component side of the board to your right, gently slide the board into its slot in the card cage.
14. Ensure that the ejector tabs on the board are in the UNLOCKED position (sticking out away from the board edge).
15. Push gently in on the board, alternately exerting pressure on the top and bottom of the board as you push on it. This gentle rocking should safely seat the board into the backplane and interface board connectors.
16. Fully depress the ejector tabs to lock the board into its cardcage slot.
17. Replace the retaining bars and the cardcage cover.

## Service Processor Module (SPM)

The Service Processor Module (SPM) provides the central console interface, interrupt dispatcher, CSS bus error registers, system environmental monitoring, time-of-day clock, and nonvolatile RAM. The SPM interfaces to the Asynchronous Communications Real World (ACRW) interface board. The SPM is always installed in the far right-hand slot (when viewed from the front of the cardcage).

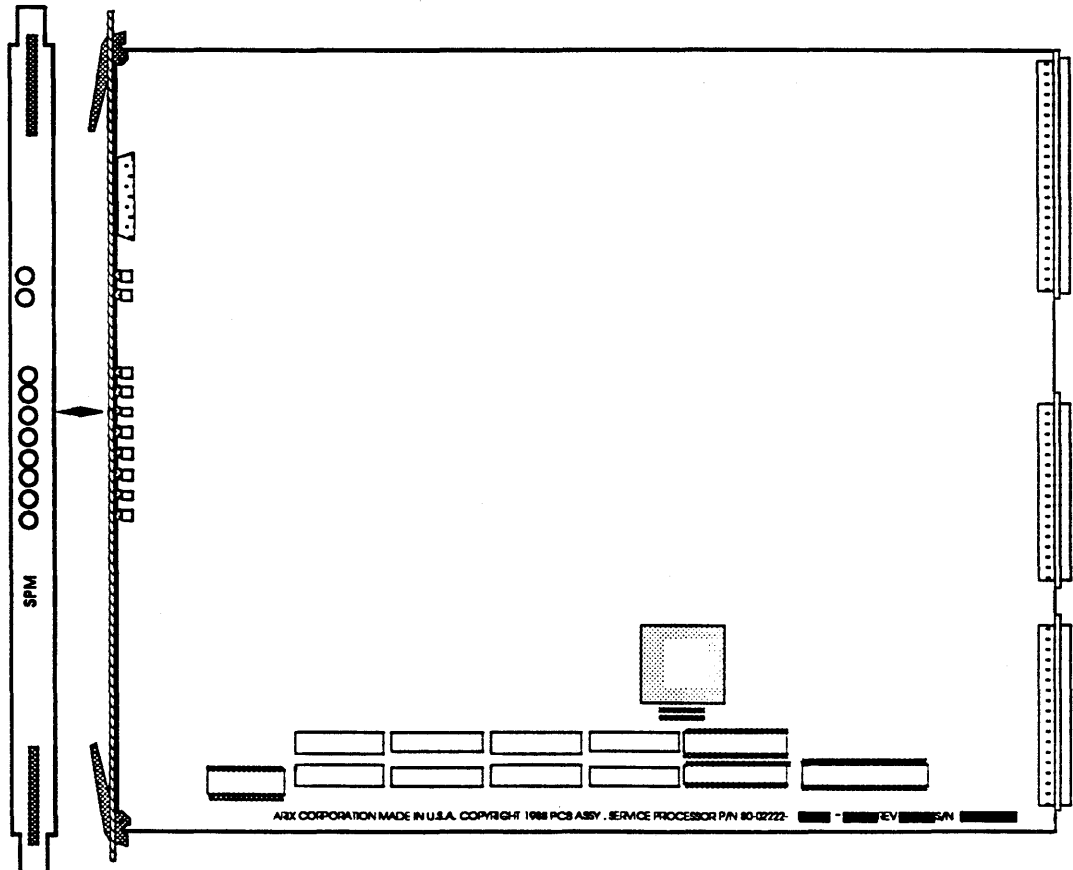


Figure 4-4 Service Processor Module

### WARNING:

The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.

## Memory Module (MM)

The Memory Module (MM) is the main volatile system storage element of the CSS. The MM is available in a number of RAM sizes.

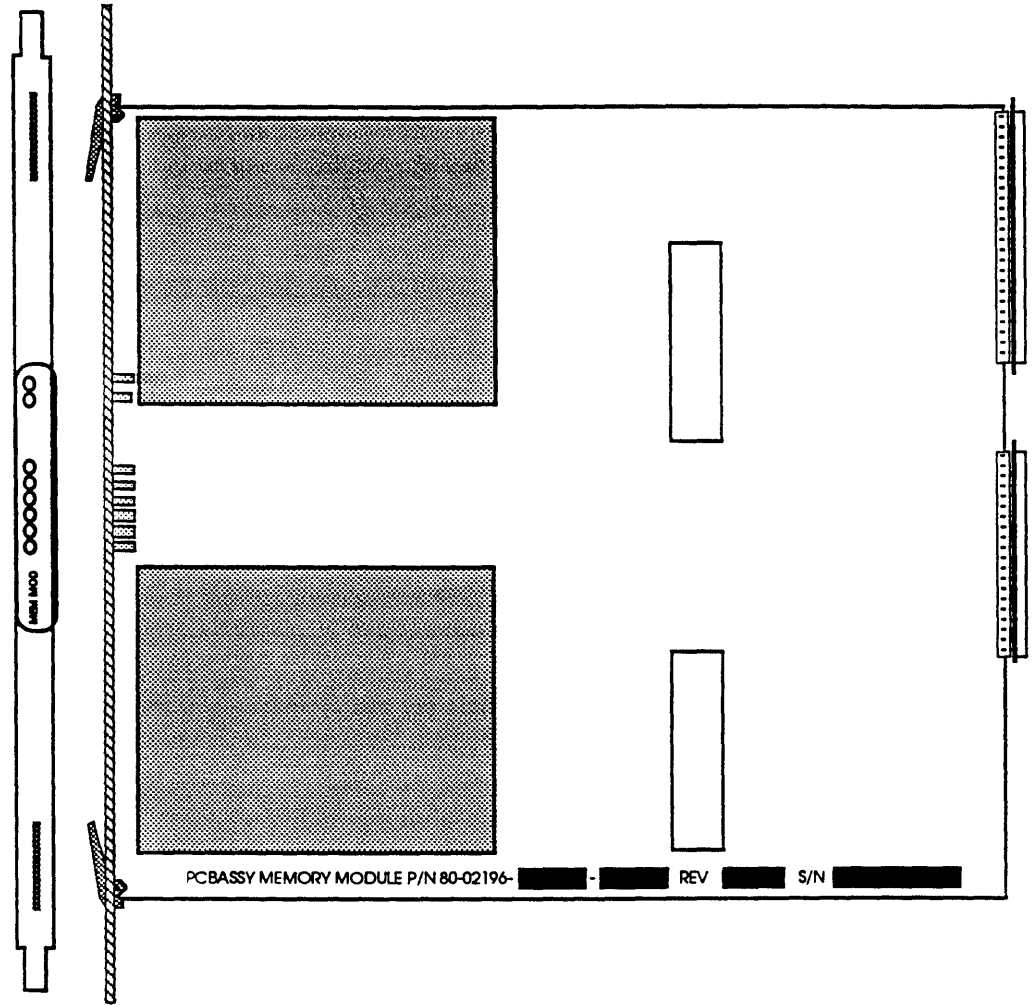
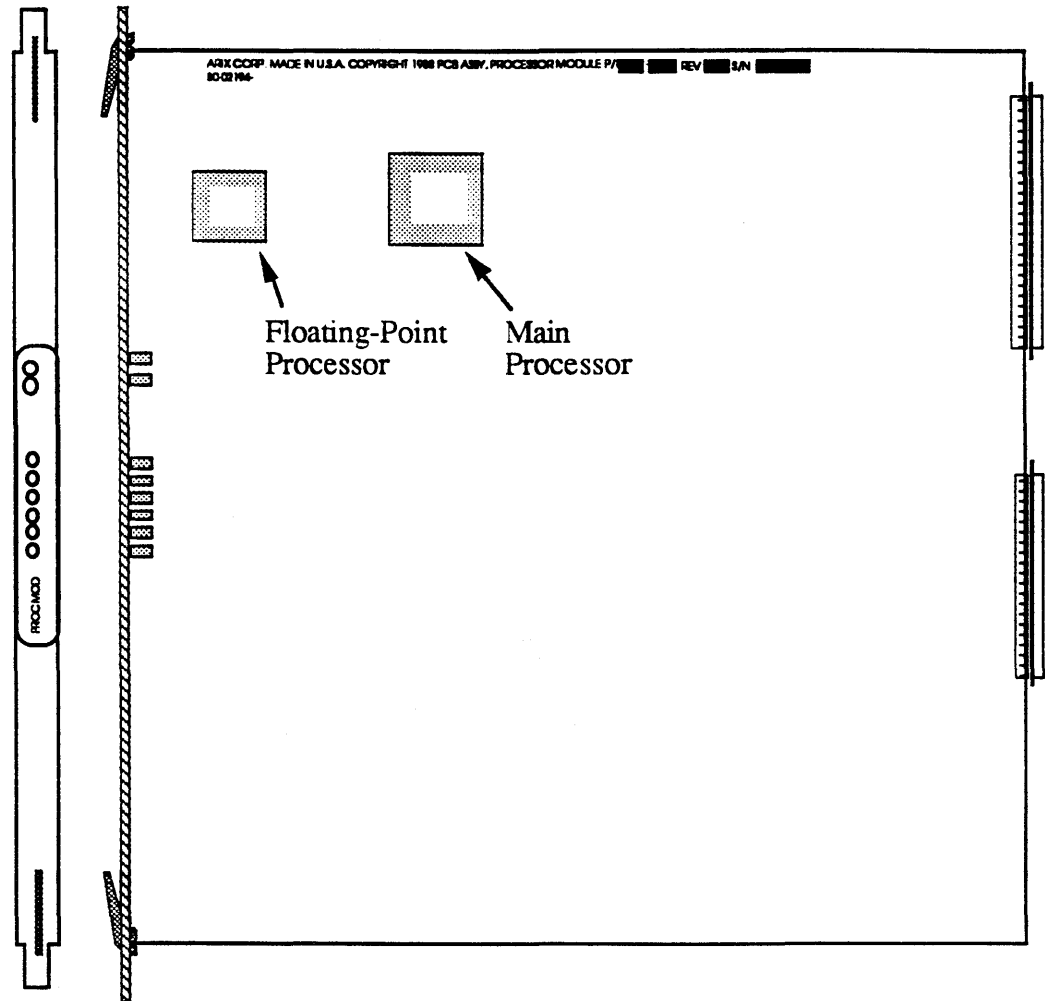


Figure 4-5 Memory Module (MM)



## **Processor Module (PM)**

The Processor Module (PM) is the main computational element in the CSS. Instruction processing is handled by a 25 MHz 68020, 32-bit microprocessor together with a 12.5 - 25 MHz 68881 floating point unit (FPU). The PM also contains a 64 kilobyte virtual cache memory.



**Figure 4-6 Processor Module (PM)**

## Input/Output Processor Module (IOPM)

The Input/Output Processor Module (IOPM) is a high-performance, general purpose controller for the ARIX System90. It is based on a 20 MHz 68030 microprocessor, and has 1 MByte of parity protected DRAM, a CSS bus interface, and a device board interface.

The IOPM is general purpose in the sense that three different interface (device) boards, communicating with three very different environments, can be connected to it. The functions of the three interface boards are: SCSI Disk/Tape Device Board, Local Area/Wide Area Device Board, Asynchronous Communications Device Board. Specifics about these interface boards are discussed in their respective sections in Chapter 5, *Interface Boards*.

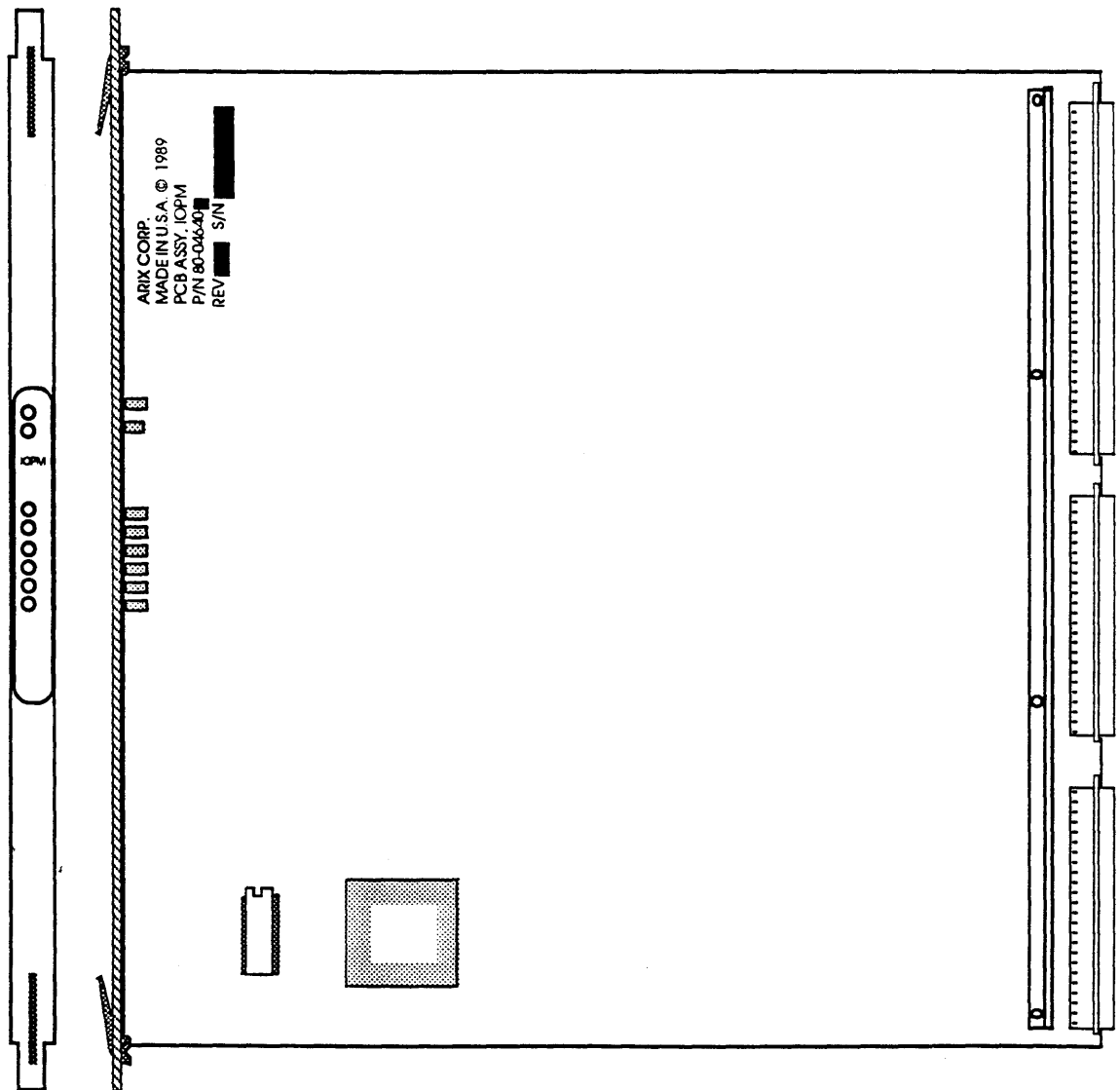


Figure 4-7 Input/Output Processor Module (IOPM)

This chapter contains installation and removal procedures for all field replaceable interface printed circuit boards in the card cage, the Bus Arbiter board, and the CSS backplane (system motherboard). The field replaceable boards and their associated hardware (such as mounting devices) are listed below.

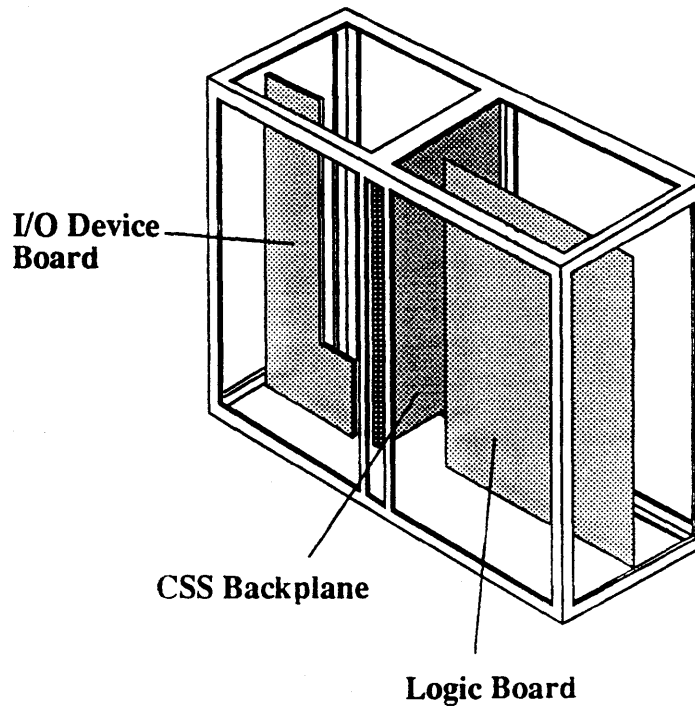
- Asynchronous Communications Real World (ACRW) interface
- Asynchronous Communications Extender (ACE) board
- Asynchronous Communications Device Board (ACDB)
- LAN/WAN Interface Board (LWDB)
- Dual SCSI Device Board (DSDB)
- Bus Arbiter Board

The interface boards are mounted in *slots* in the rear compartment of the card cage (see Figure 5-1) and are fairly easy to remove and install.

Two types of PC boards occupy the slots in the card cage, *logic boards* and *interface boards* (interface boards are also known as *device boards*). Logic boards occupy slots in the *front* section of the card cage .

Interface boards work in conjunction with the IOPM. They occupy slots in the *rear* section of the card cage directly behind their corresponding IOPM logic board. Interface boards all have the same general shape and height but in some cases differ in depth.

Interface boards occupy slots in the rear section of the card cage opposite the front section slot of the corresponding logic board. An interface board does not connect directly to the CSS backplane, but rather to a 96-Pin connector on the rear of its associated logic board. Interface boards all have the same general shape and height but in some cases differ in depth. Except for differences in the output cable connections of specific boards, all interface boards are removed and installed in the same way.



**Figure 5-1 System90 Card Cage**

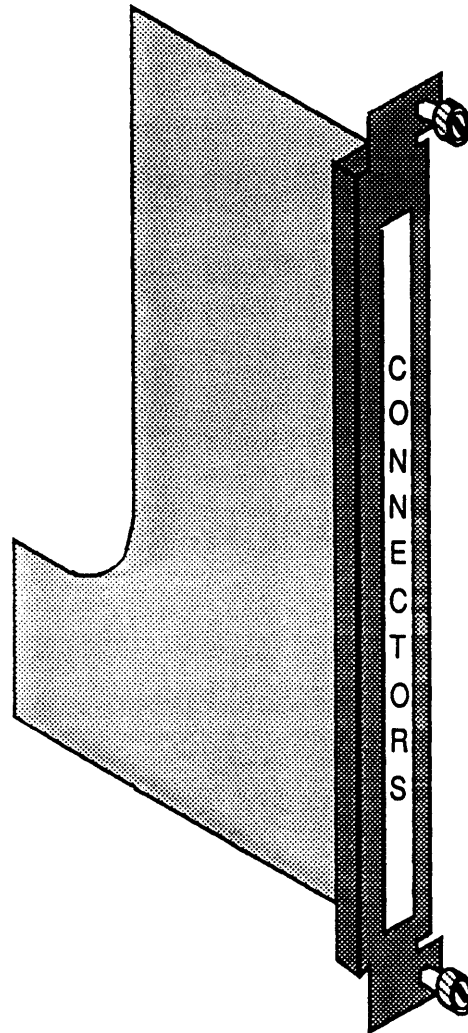
Interface boards occupy the back of the card cage. The basic procedures for removing and installing interface boards appear below. Any special requirements peculiar to a specific board appear in the section dedicated to that board.

## ***Interface Board Removal***

Interface boards are fastened to the back of the card cage by metal retaining brackets. The retaining brackets have two captive, knurled screws (one at the top and one at the bottom of the retaining bracket) that secure the board to the cardcage. Figure 5-2 shows a typical interface board retaining bracket.

### **WARNING:**

**The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.**



**Figure 5-2 Interface Board Retaining Bracket**

1. Power down the system as described in Chapter 3.
2. Record the board type, serial number, and slot number before removing the interface board.
3. If the board you are removing has its connectors extending from the back of the retaining bracket, label and remove the cables from the connectors now.

If you are removing a SCSI disk/tape interface board (DSDB), label and remove the connectors now. If the DSDB you are removing is for the internal drives, you must first unfasten the three captive screws securing the EMI shield, lift the shield away and to the right of the board (See Figure 5-3). Label and remove the connectors.

**CAUTION:**

**PC boards are susceptible to electrostatic damage. Use an Electro-Static Discharge (ESD) grounding strap when handling PCBs. Do not touch the ICs or components on the circuit boards, and do not handle the boards except by their edges.**

4. Loosen the captive screws on the top and bottom of the retaining bracket.
5. Grasp the captive screws of the retaining bracket. *Gently* pull alternately on the top and bottom of the board until it is free from the logic board connector.
6. Pull the board out of the card cage. As you remove the board, ensure that no cables catch on the card cage slots or the protruding edges of the board.
7. Place the interface board in a plastic antistatic bag to protect the components from electrical damage.
8. Store the board in a cool, dry environment until its final disposition. Keep it in the antistatic bag and, if possible, in an upright position.
9. If you are not going to replace the board immediately, install a slot filler plate over the slot from which you removed the board.

## ***Interface Board Installation***

To install an interface board, proceed as follows:

**WARNING:**

**The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.**

**CAUTION:**

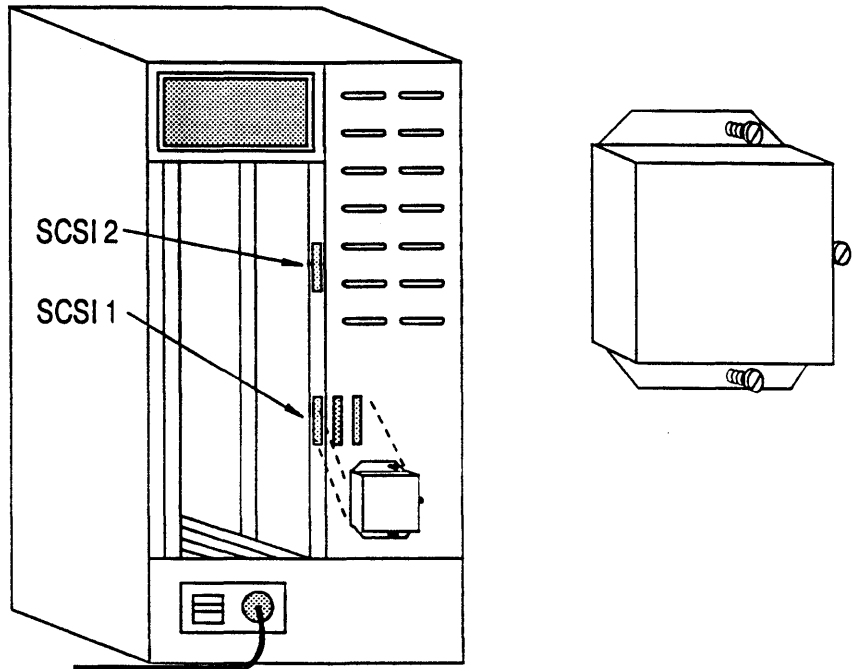
**PC boards are susceptible to electrostatic damage. Use an Electro-Static Discharge (ESD) grounding strap when handling PCBs. Do not touch the ICs or components on the circuit boards, and do not handle the boards except by their edges.**

**CAUTION:**

**Install only one interface board at a time, and make certain that you are installing the correct combination of interface board and logic board. Connecting the wrong combination of these boards can result in permanent damage to the boards.**

1. Power down the system as described in Chapter 3.
2. Verify that the interface board you are installing is the one associated with the logic board in the front of the cardcage.
3. If necessary, loosen the screws that fasten the slot filler plate to the frame and remove the plate.
4. Remove the board from its shipping carton. The board is normally shipped inside a plastic, antistatic bag. Lay the board (still inside the bag) on a table or clean work surface.
5. Grasp the replacement board by its edges and remove it from its antistatic bag. Store the carton and antistatic bag temporarily; you may wish to use them for the board you are replacing.
6. Grasp the captive holding screws of the retaining bracket and position it, component side to the left, in the upper and lower guide tracks of the installation slot.
7. Gently push the board all the way into the cardcage slot and seat it firmly into the bus connector on the associated logic board.
8. If you are installing a board whose signal cable connectors are on the rear of the retaining bracket, connect the tagged signal cables to the corresponding connectors on the board.

If you are installing a SCSI disk/tape interface board (DSDB) for use with internal drives, install the EMI shield over the cable(s) (see Figure 5-3), and tighten the three captive screws that hold the EMI shield to the cabinet.



**Figure 5-3 DSDB EMI Cover Installation**

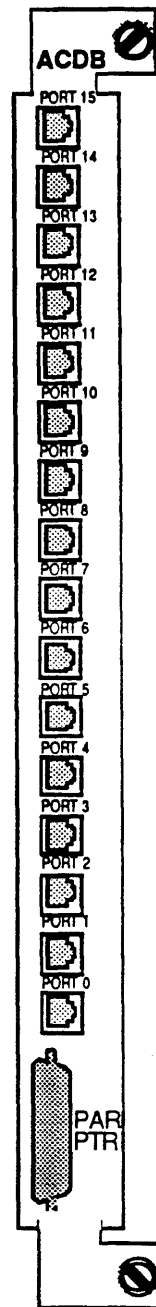
## ***Asynchronous Communications Device Board (ACDB)***

The ACDB provides the asynchronous communications interface for the IOPM. The basic configuration of the ACDB is sixteen (16) asynchronous ports (8-Pin RJ-45 connectors) and one Centronics compatible parallel port (25-Pin DB connector). All of the RS-232 signal lines on the ACDB and ACE have been equipped with RFI noise suppression circuitry so that unshielded external cables may be used; however, all ports are shielded, and the use of shielded RJ-type plugs and cable is highly recommended.

The ACDB supports up to three (3) Asynchronous Communications Extender (ACE) boards. The ACE board rides piggy-back on the ACDB providing an extra 16 asynchronous ports per ACE board. The maximum port expansion capability from one IOPM/ACDB/ACE combination is sixty-four (64) asynchronous ports.

Each of the possible 64 channels is full duplex and the baud rate can be set individually for each channel. Selectable baud rates are from 50 to 19.2K (38.4K is available as an option).





**Figure 5-4** Asynchronous Communications Device Board (ACDB)

### Asynchronous Communications Extender (ACE) Board

The Asynchronous Communications Extender Board (ACE) is not installed into the CSS backplane or into the 96-Pin IOPM device connector. The ACE connects directly to the ACDB or ACRW through a stacking, DIN, 96-Pin connector. Each ACE board "piggy-backs" onto the ACDB or ACRW. An ACE does, however, take up the space of one interface board slot, so any ACE assembly should be placed to the right (when viewed from the front of the cardcage) of a group of logic boards (logic boards do not use the space provided in the rear of the cardcage for interface boards). Figure 5-5 gives an example of this concept. The ACDB can have a maximum of three ACE boards (providing an extra 48 ports), the ACRW can have a maximum of two ACE boards. The addition of two ACE boards to the ACRW provides an extra 32 asynchronous ports.

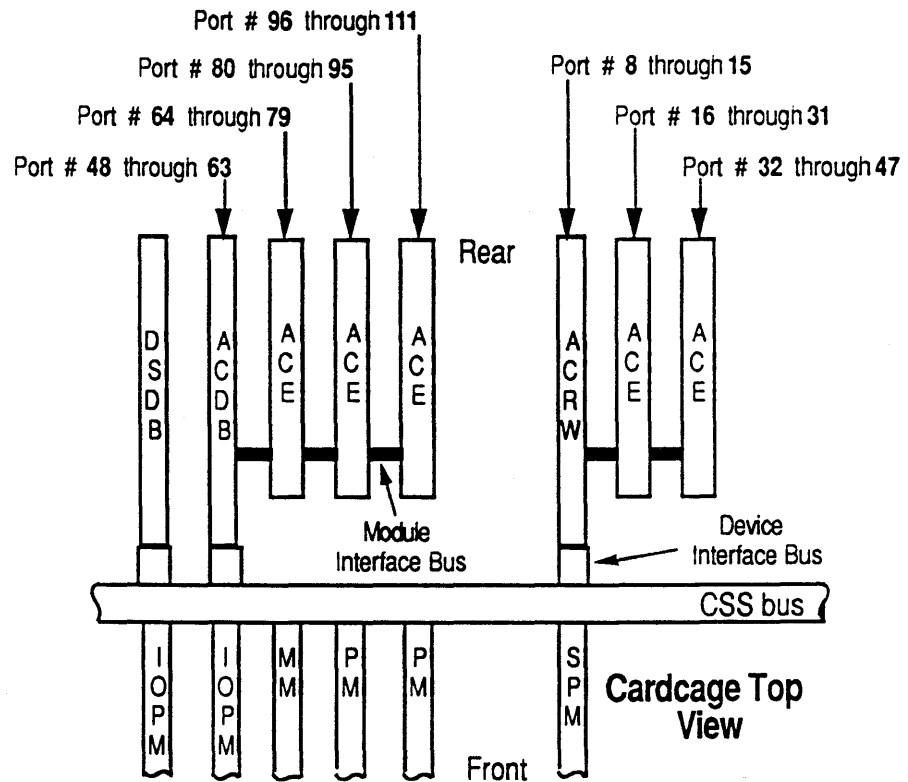


Figure 5-5 ACE Boards connected to ACDB

## **ACE Board Removal**

ACE boards are fastened to the back of the card cage by metal retaining brackets just like a normal interface board. However, *unlike* a normal interface board, ACE boards are also fastened to a parent ACRW or ACDB. Therefore, to remove an ACE board you must also remove its parent asynchronous device board and any other ACE boards physically connected to the ACE board you wish to replace.

This assembly, consisting of the ACE board, an ACRW or ACDB, and any other ACE boards physically connected to the ACE board to be replaced, is described in the following paragraphs as the *ACE assembly*.

### **WARNING:**

The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.

### **CAUTION:**

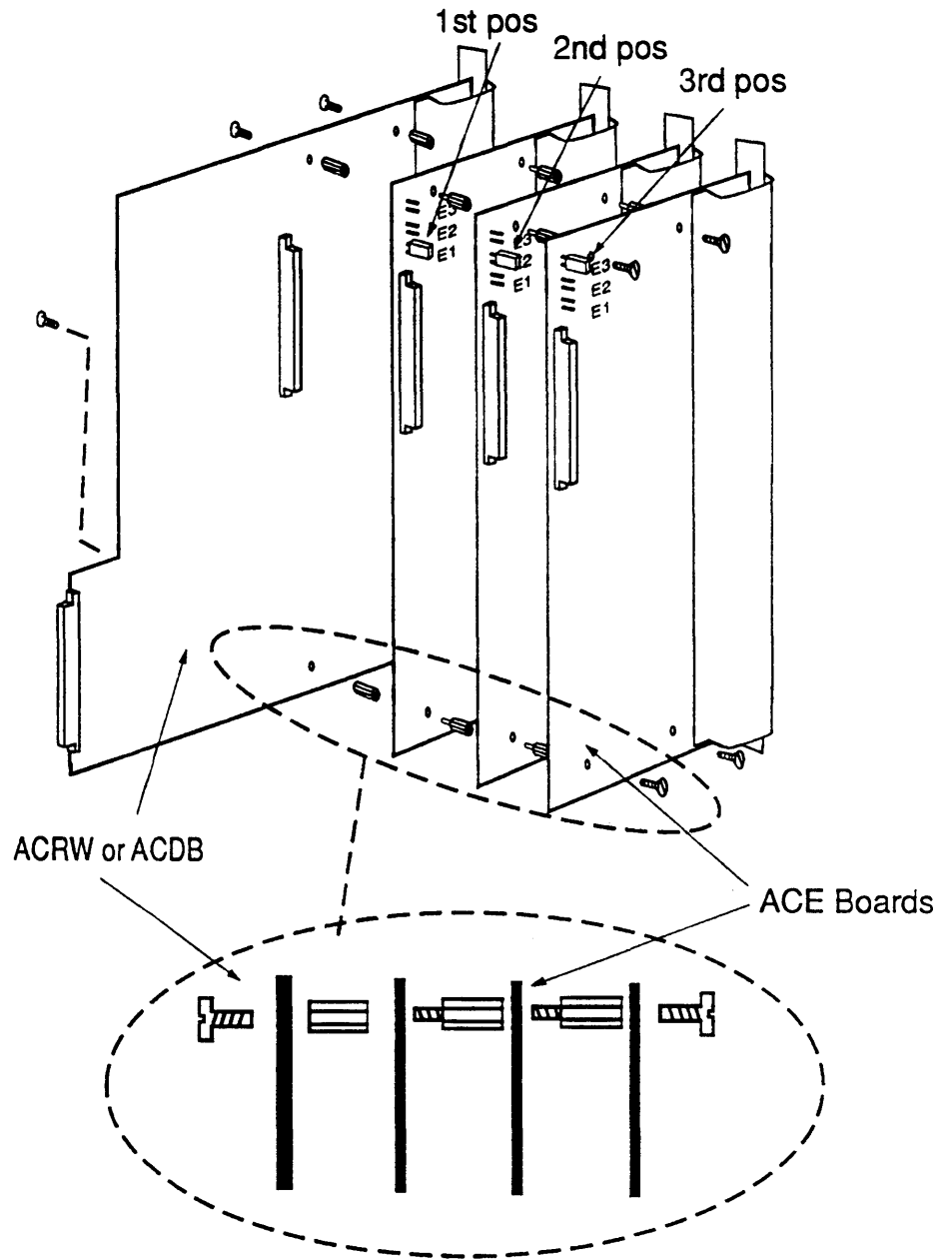
PC boards are susceptible to electrostatic damage. Use an Electro-Static Discharge (ESD) grounding strap when handling PCBs. Do not touch the ICs or components on the circuit boards, and do not handle the boards except by their edges.

Proceed as follows:

1. Power down the system as described in Chapter 3.
2. Record the board types, serial numbers, and slot numbers before removing the ACE assembly. Also record the ACE board IDs (1, 2, or 3) determined by the board ID jumpers (Figure 5-6). When power is applied, the board ID number is also displayed by the LEDs at the bottom of the ACE board retaining brackets.
3. Label and remove the connectors extending from the back of the retaining brackets on the ACE assembly.

4. Loosen the captive screws on the top and bottom of the retaining brackets for the ACE assembly.
5. Grasp the captive screws of the parent asynchronous device board retaining bracket. ***Gently*** pull alternately on the top and bottom of the board until it is free from the logic board connector.
6. Carefully pull the entire ACE assembly out of the card cage. As you remove the assembly, ensure that no cables catch on the card cage slots or the protruding edges of the board.
7. Referring to Figure 5-6, lay the board on a table or clean work surface and unfasten the screws and standoffs necessary to gain access to the ACE board you wish to remove. When separating an ACE board from the Module Interface Bus connector, be especially careful to lift the ACE board *straight* off.
8. Place the interface board in a plastic antistatic bag to protect the components from electrical damage.
9. Store the board in a cool, dry environment until its final disposition. Keep it in the antistatic bag and, if possible, in an upright position.
10. If you are not going to replace the ACE board immediately, reassemble the ACE assembly and install a slot filler panel in the unused slot.

NOTE: Board ID jumpers are to be installed in 1st, 2nd, & 3rd positions to coincide with 1st, 2nd, & 3rd PCB's as shown



**Figure 5-6 ACE Board Assembly**

## **ACE Board Installation**

ACE boards are fastened to the back of the card cage by metal retaining brackets just like a normal interface board. However, *unlike* a normal interface board, ACE boards are also fastened to a parent ACRW or ACDB. Therefore, to install an ACE board you must first remove its parent asynchronous device board and any other ACE boards physically connected to the ACE board you wish to replace.

This assembly, consisting of the ACE board, an ACRW or ACDB, and any other ACE boards physically connected to the ACE board to be replaced, is described in the following paragraphs as the *ACE assembly*.

To install an ACE board, proceed as follows:

### **WARNING:**

The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.

### **CAUTION:**

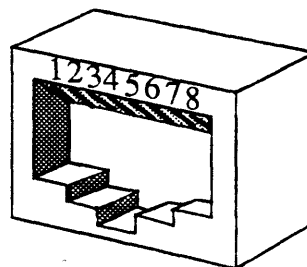
PC boards are susceptible to electrostatic damage. Use an Electro-Static Discharge (ESD) grounding strap when handling PCBs. Do not touch the ICs or components on the circuit boards, and do not handle the boards except by their edges.

1. Power down the system as described in Chapter 3.
2. If necessary, loosen the screws that fasten the slot filler plate to the frame and remove the plate.
3. Remove the ACE board from its shipping carton. The board is normally shipped inside a plastic, antistatic bag. Lay the board (still inside the bag) on a table or clean work surface.

4. Grasp the replacement board by its edges and remove it from its antistatic bag. Store the carton and antistatic bag temporarily; you may wish to use them for the board you are replacing.
5. Refer to the previous section, *ACE Board Removal*, and remove the ACE assembly from the cardcage.
6. Set the Board ID jumper to the correct position (see Figure 5-6). It is **very important** that no two Board IDs on the same Module Interface Bus be the same.
7. Referring to Figure 5-6, install the ACE board onto the Module Interface Bus connector and secure it using the standoffs and screws provided.
8. Grasp the captive screws of the parent asynchronous device board retaining bracket and position the ACE assembly, component side to the left, in the upper and lower guide tracks of the installation slots.
9. Gently push the boards all the way into the cardcage slot and seat the parent asynchronous device board firmly into the bus connector on the associated logic board.
10. Reconnect the tagged signal cables to the corresponding connectors on the boards.

### ***ACDB Board Set-Up***

The ACDB interface board provides sixteen (16) asynchronous communications ports. All 16 ports function as Data Terminal Equipment (DTE). A pin/signal description of a cable for the RJ-45 connectors when used as a Data Terminal Equipment (DTE) interface is shown in Table 5-1. A DB-25 connector is assumed for the Terminal side.



**Figure 5-7 Female RJ-45 port**

**Table 5-1 RJ-45 to DB-25 Connector Pin/Signal Description for DTE Use**

RJ-45 ARIX (DTE)		Direction	DB-25 Terminal (DTE)	
Pin #	Signal Name		Pin #	Signal Name
1	No Connection			
2	DSR	←	20	DTR
3	TX	→	3	RX
4	RX	←	2	TX
5	GND	- - -	7	GND
6	DTR	→	8 6	DCD DSR
7	DCD	←	20	DTR
8	No Connection			

NOTE: Pin 20 on the DB-25 connector is connected to two pins on the RJ-45 connector. Pin 6 on the RJ-45 connector is connected to two pins on the DB-25 connector.

A pin/signal description of a cable for the RJ-45 connectors when used as an interface to Data Communication Equipment (DCE) or a MODEM is shown in Table 5-2. A DB-25 connector is assumed for the Terminal side.

**Table 5-2 RJ-45 to DB-25 Connector Pin/Signal Description for DCE or MODEM Use**

RJ-45 ARIX (DTE)		Direction	DB-25 MODEM (DCE)	
Pin #	Signal Name		Pin #	Signal Name
1	No Connection			
2	DSR	←	6	DSR
3	TX	→	2	TX
4	RX	←	3	RX
5	GND	- - -	7	GND
6	DTR	→	20	DTR
7	DCD	←	8	CAR
8	No Connection			



## ***Asynchronous Communications Real World (ACRW) interface board.***

The Asynchronous Communications Real World (ACRW) interface board contains the system console port, the remote console/diagnostic port, the UPS interface port, the system DC power interfaces, the system AC power interfaces, the system environmental status monitors, the front panel interface, eight (8) asynchronous serial communications ports, and a parallel printer port. The remote console/diagnostic port can also be used as a serial printer port.

A maximum of two (2) Asynchronous Communications Extender (ACE) boards can be used with the ACRW. Each ACE provides an additional sixteen (16) asynchronous ports for a maximum of 40 ports run from the ACRW. The ACE board(s) are daughter boards to the ACRW. That is, they are stacked/connected directly onto the ACRW.

All of the RS-232 signal lines on the ACRW and ACE have been equipped with RFI noise suppression circuitry so that unshielded external cables may be used; however, all ports are shielded, and the use of shielded RJ-type plugs and cable is highly recommended. Each of the possible 40 channels is full duplex and the baud rate can be set individually for each channel. Selectable baud rates are from 50 to 19.2K (38.4K is available as an option). Default baud rates for the System Console and Remote Console ports are 9600 baud and 1200 baud respectively. The System Console port is configured as DCE, the Remote Console port is configured as DTE.

For more information on the UPS port, refer to the *Uninterruptible Power Supply Guidelines for the ARIX System90*.

Refer to Section *ACDB Board Set-Up* in this Chapter for instructions on how to connect the REMOTE CONSOLE and asynchronous communications ports.

Refer to Table 5-4 for the connector pinout of the DB-25 parallel printer port.

The CONSOLE port on the system should be connected as follows:

**Table 5-3 CONSOLE Connector Pin/Signal Description**

RJ-45 ARIX CONSOLE Port (DCE)		Direction	DB-25 Terminal (DTE)	
Pin #	Signal Name		Pin #	Signal Name
1	No Connection			
2	DSR	→	6	DSR
3	TX	←	2	TX
4	RX	→	3	RX
5	GND	- - -	7	GND
6	DTR	←	20	DTR
7	DCD	→	8	DCD
8	No Connection			

**Table 5-4 Female DB-25 Parallel Printer Port Connector Pinout for the ACDB and ACRW.**

Pin Numbers	Descriptions
1	Data Strobe
2-9	Data Lines 1 through 8
10	Acknowledge
11	Busy
12	Paper Empty
13	Select
14-25	Signal Ground

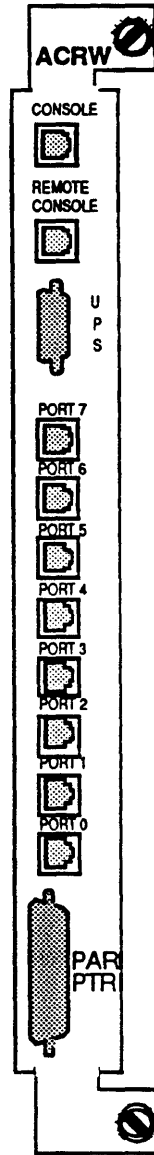


Figure 5-8 Asynchronous Communications Real World (ACRW) Interface Board

## **ACRW Board Removal**

To remove an ACRW, proceed as follows:

**WARNING:**

The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.

1. Your first step should be to *fully power down* the system as described in Chapter 3.
2. Follow the instructions in the section entitled *Interface Board Removal* found at the beginning of this chapter.
3. If there are ACE boards connected to the ACRW, follow the instructions in the subsection entitled *ACE Board Removal* found earlier in this chapter

## **ACRW Board Installation**

To install an ACRW, proceed as follows:

### **WARNING:**

**The Service Processor Module (SPM) and the Asynchronous Communications Real World (ACRW) interface boards have primary power on them any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF when performing any operations with these boards.**

1. Your first step should be to ***fully power down*** the system as described in Chapter 3.
2. Follow the instructions in the section entitled *Interface Board Installation* found at the beginning of this chapter.
3. If there are ACE boards connected to the ACRW, follow the instructions in the subsection entitled *ACE Board Installation* found earlier in this chapter.

## **LAN/WAN Device Board (LWDB)**

The Local Area Network/Wide Area Network (LWDB) Device Board provides the IOPM with a single LAN and four (4) WAN ports.

The communications interfaces available for the WAN ports are:

- EIA RS-232
- EIA RS-449
- CCITT V.35

The single LAN port is standard with each board and complies with the IEEE 802.3 CSMA/CD standard (Ethernet software compatible). The four WAN ports can be any mix of the three protocols mentioned above (see your ARIX sales representative for availability and pricing information). The WAN ports are not configurable in the field, the various configurations can be set only at the factory.

The data transfer rate for the LAN interface is as follows:

- Up to 10 Mbit/second

The data transfer rates for the WAN interfaces are as follows:

- Up to 252 Kbit/second full duplex on one port
- Up to 128 Kbit/second full duplex on two ports
- Up to 64 Kbit/second full duplex on four ports

## **Physical Interface**

The LWDB has five connectors on its retaining bracket as shown in Figure 5-9. Ports 0 through 3 are WAN ports. The fifth and uppermost port is the LAN port. Due to the variability of the WAN connectors, they are shown only as blocks.

The LAN interface complies with the IEEE 802.3 CSMA/CD standard at the Attachment Unit Interface (AUI); however, an external Media Attachment Unit (MAU), better known as a transceiver, that fully complies with the IEEE 802.3 standard is required to interface to one of several LAN mediums. With the appropriate transceiver, the LAN interface supports the following LAN mediums:

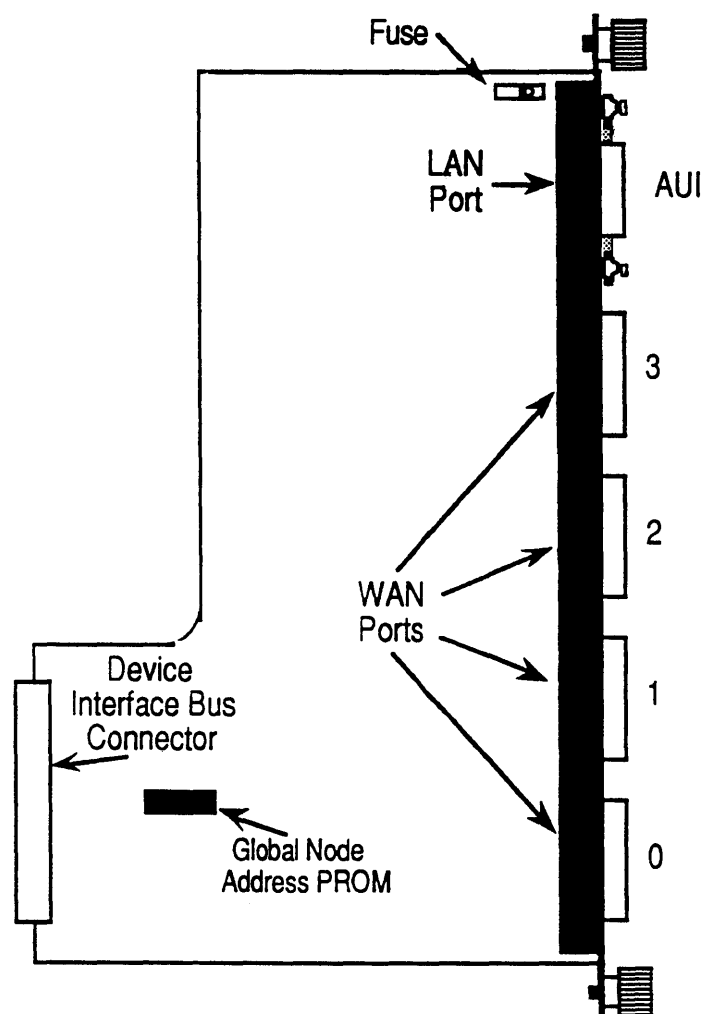
- 10 Base 5                      10 Mbit/sec, baseband, thick coaxial cable
- 10 Base 2                      10 Mbit/sec, baseband, thin coax cable
- 10 Base T                      10 Mbit/sec, twisted pair wiring
- 10 Broad 36                    10 Mbit/sec, broadband, CATV-type cable
- Fiber Optic                    10 Mbit/sec, IEEE 802.3 compatible, fiber optic

The only field serviceable part of the LWDB board is the fuse. The replacement fuse should have a 125 Volt rating at 2 Amps, Fast Blow (Littlefuse part number 273002 or equivalent).

The LWDB provides power to the MAU, and the fuse protects the LWDB in the event the MAU develops a short circuit. If the fuse blows, this indicates a higher than normal current draw from the MAU. The location of the fuse is shown in Figure 5-9.

To replace the fuse, power-down the system (as described in Chapter 3), disconnect the MAU from the AUI, then gently pull the clear section of the fuse assembly towards the outside edge of the board. The clear section of the fuse has two pins that fit into the socket portion of the fuse assembly. Install a new fuse of the correct type and rating into the socket of the fuse assembly.

Determine the cause of the high current draw before placing either the LWDB or the MAU back into operation.



**Figure 5-9 LWDB Device Board**

The AUI external cable and transceiver(s) must comply with the IEEE 802.3 standard.

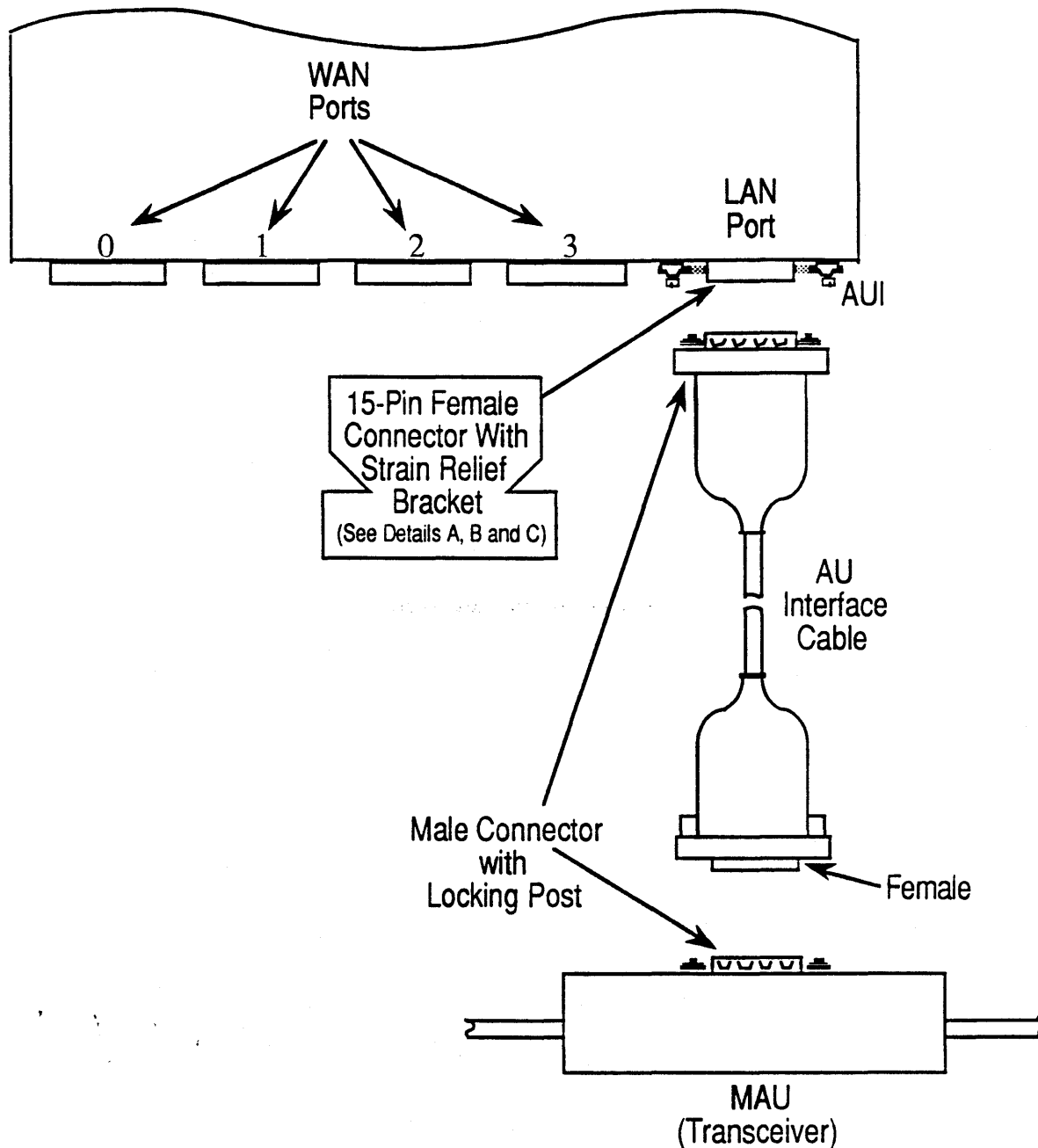
Each LWDB board has a PROM at board location GG-4. This PROM contains a unique 48-bit LAN global node address. This address is never changed, and ARIX maintains a log correlating the address with the board serial number. The upper 24 bits are always the same (C7000 Hex) and have been assigned to ARIX by the IEEE Standards office. The lower 24 bits are for ARIX to administer. The lowest 16 address bits are printed in hexadecimal format on a label affixed to the PROM.

The LAN AUI is a female 15-Pin D-style connector with female threaded nuts. A strain relief bracket is included and must be used to ensure the strength of the connection.

To use the strain relief bracket, perform the following steps (Refer to Figures 5-10 and 5-11):

1. Unscrew the two captive screws holding the strain relief bracket to the AUI.
2. Slide the strain relief bracket onto the cable connector as shown in Details B and C of Figure 5-10.

3. While holding the strain relief bracket in place, thread and tighten the strain relief bracket's two captive screws into the two holes on each side of the AUI connector.
4. The AUI interface cable is now secured to the LAN port.



**Figure 5-10 Connector Hardware and AUI Cable Configuration**



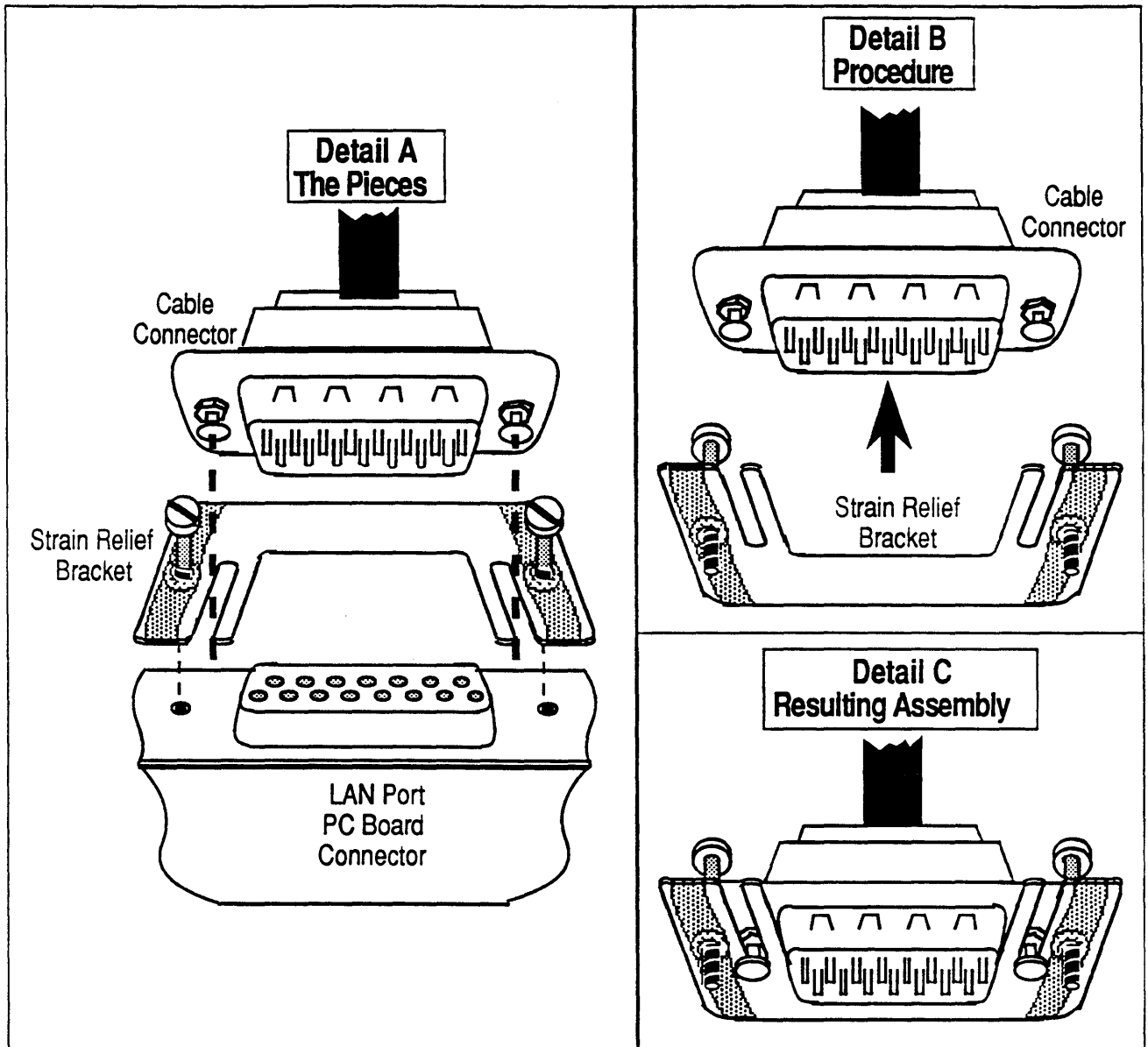


Figure 5-11 Connector Hardware and AUI Cable Detail

**CAUTION:**

If the strain relief bracket is not installed as shown (the *open* portion of the bracket should be on the left-hand side of the board when the board is in a vertical position), the bracket will scrape against any device boards to the left of the LWDB causing damage to the bracket and to the board.

## **Dual SCSI Device Board (DSDB)**

The Dual SCSI Device Board (DSDB) provides two independent SCSI (Small Computer Systems Interface) channels for the IOPM. Each independent channel can control seven (7) SCSI devices for a total of fourteen (14) SCSI devices per DSDB.

The two SCSI channels can be independently configured to use either single-ended or differential signalling. Note, however, that the channel signalling convention is dedicated to that channel and that a mixture of single-ended and differential devices on the same channel *is not allowed*.

The maximum cable length for single-ended data transfers is six (6) meters. The maximum cable length for differential data transfers is twenty-five (25) meters. The single-ended signalling feature is intended for connection to SCSI devices within the primary cabinet *only*.

Figure 5-12 shows SCSI Channel 1 set for single-ended to control SCSI devices in the primary cabinet, and SCSI Channel 2 set for differential to control SCSI devices in an expansion cabinet.

### **Setting SCSI Channels for Single-Ended or Differential Operation**

Note that in the figure SCSI Channel 1 has its Terminator Resistor Packs (RP-29, RP-32, and RP-35) present, and that SCSI Channel 2 has its Terminator Resistor Packs (RP-12, RP-13, and RP-15) removed.

#### **This is very important.**

- **Single-Ended** operation of a SCSI Channel is determined by:  
The **terminator resistor packs** for that channel are **present**  
The SCSI device cable must be connected to the Single-Ended port  
The **jumperblock** for that channel must be shorted between pins 2 and 3.
- **Differential** operation of a SCSI Channel is determined by:  
The **terminator resistor packs** for that channel are **removed**  
The SCSI device cable must be connected to the Differential port  
The **jumperblock** for that channel must be shorted between pins 1 and 2.

### **SCSI Channel Terminator Fuses**

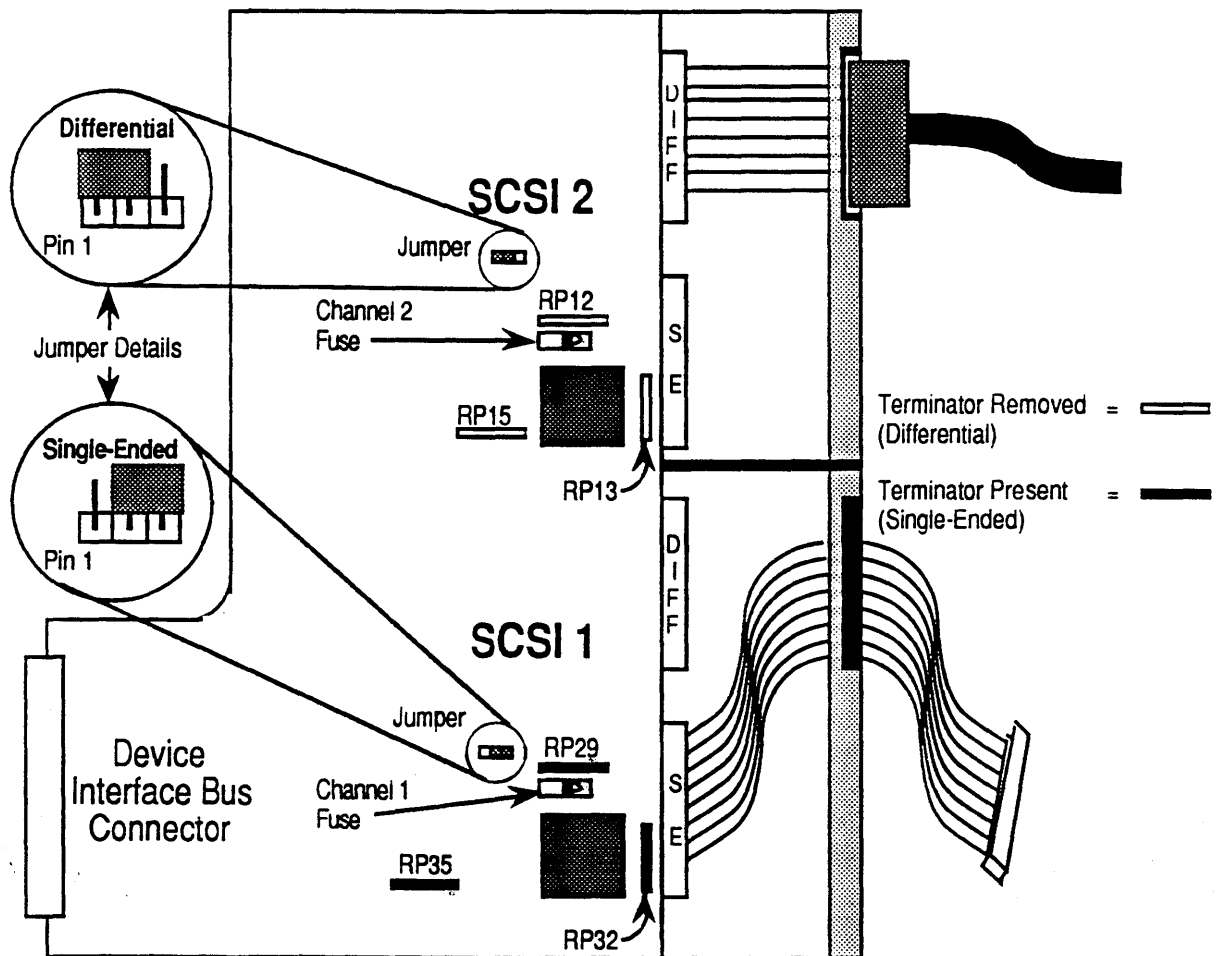
The only field serviceable parts of the DSDB are the fuses. Each SCSI Channel has a fuse for Terminator Power. The replacement fuse should have a 125 Volt rating at 2 Amps, Fast Blow (Littlefuse part number 273002 or equivalent).

The DSDB provides Terminator Power for the SCSI devices, and the fuses protect the DSDB in the event of a short circuit. If the fuse blows, this indicates a higher than normal current draw from a SCSI device on that channel. The location of the fuse is shown in Figure 5-12.

To replace the fuse:

1. Power-down the system as described in Chapter 3.
2. Disconnect the SCSI Channel from the DSDB.
3. Gently pull the clear section of the fuse assembly towards the outside edge of the board.
4. Install a new fuse of the correct type and rating into the socket of the fuse assembly. The clear section of the fuse has two pins that fit into the socket portion of the fuse assembly.
5. Determine the cause of the high current draw before placing the DSDB back into operation.

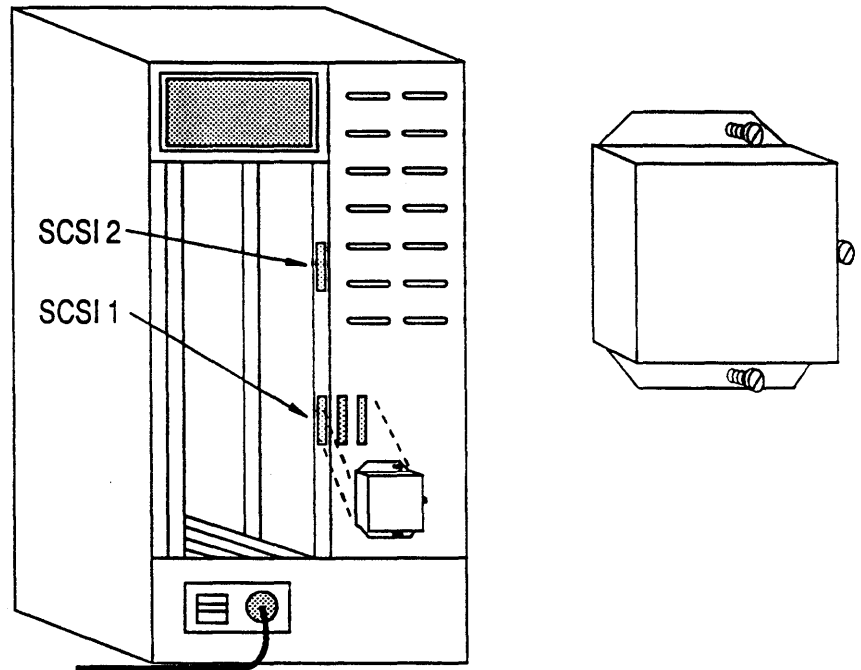
NOTE: Terminator fuses are 125 Volt, 2 Amp, Fast Blow



This illustration shows:  
 SCSI Channel 2 configured as Differential and  
 SCSI Channel 1 configured as Single-Ended

Figure 5-12 Dual SCSI Device Board (DSDB)

When re-installing a DSDB, remember to re-install the EMI shield(s) over the cable(s) for internal drives (see Figure 5-13), and tighten the three captive screws that hold the EMI shield to the cabinet.



**Figure 5-13 DSDB EMI Cover Installation**

## **Bus Arbiter Boards**

The CSS Bus Arbiter attaches to the CSS backplane. System90 uses two versions of the bus arbiter board, depending upon the type of backplane installed. The System90 Model 25 requires the 8-slot bus arbiter. The bus arbiter board is mounted on the rear of the backplane as shown in Figure 5-15.

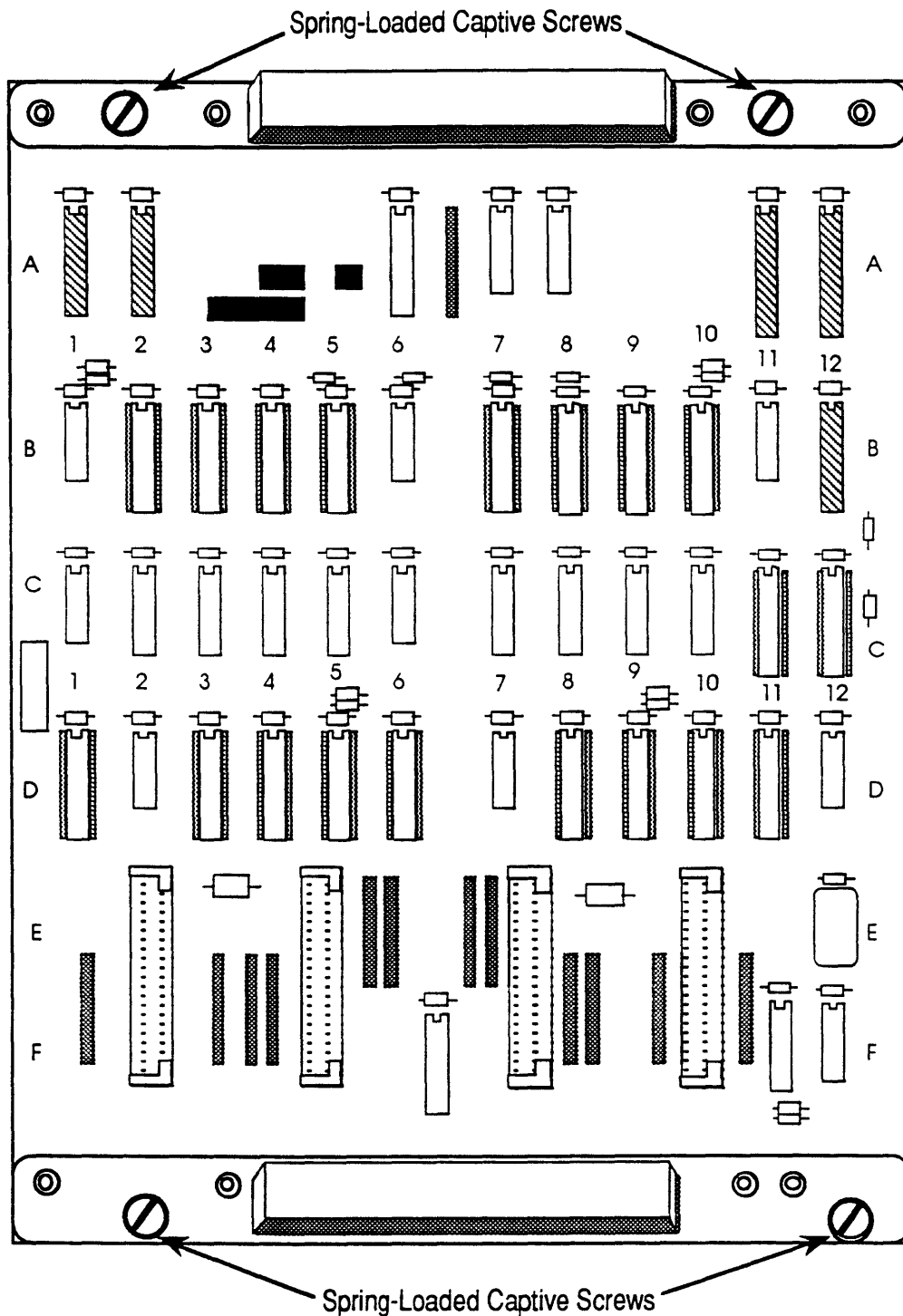
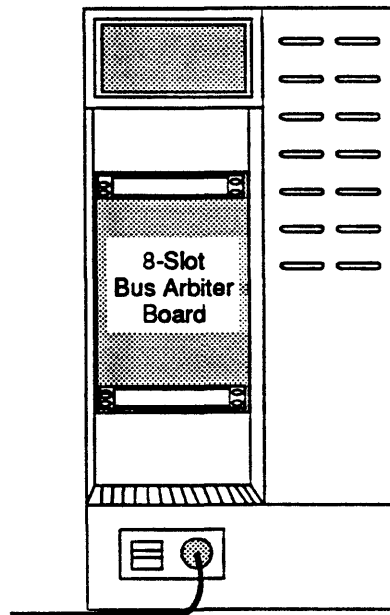


Figure 5-14 8-Slot Bus Arbiter Board



**Figure 5-15 Bus Arbiter Board Access**

### ***Bus Arbiter Board Removal***

Remove the bus arbiter board as follows:

1. **Completely power down the system** as described in Chapter 3.
2. Loosen the retaining bracket holding screws of all interface boards until their threads are completely disengaged from the frame.

#### **CAUTION:**

**PC boards are susceptible to electrostatic damage. Use a correctly grounded ESD wrist strap when handling PCBs; do not touch the chips and components on the circuit boards, and do not handle the boards except by their edges.**

3. Identify the slot number of each interface board and tag the board with the slot number.
4. Identify, tag, and disconnect the signal cables from each board.

5. Remove the tagged interface boards from the card cage and store them in a clean, well protected place until you reinstall them. The ideal storage place is a standard cardboard storage carton for PCBs.
6. Loosen the spring-loaded captive screws that hold the Bus Arbiter board in place. These screws may be only finger tight, but, if necessary, use a slot-head screwdriver to loosen them.
7. Grasp the board by the metal handles at the top and bottom and gently pull it toward you until it is free of the connectors on the backplane.
8. Place the board in a plastic, antistatic bag and store it for shipment to a repair site.

### ***Bus Arbiter Board Installation***

Install the Bus Arbiter board as follows:

1. Unpack the replacement board and set the shipping container aside in case you need it to return the board.
2. Grasp the board by its edges or handles and remove it from its plastic, antistatic shipping bag.

**CAUTION:**

**When carrying out the following step, you will not be able to see the connectors as you push them into the backplane. If you experience any abnormal resistance or interference, withdraw the board and recheck connectors in both the bus arbiter board and the backplane.**

3. Hold the board by its handles and carefully line up the connectors on the board with those on the backplane; then, gently but firmly push on the arbiter board until it is fully seated in the backplane connectors.
4. Thread the captive screws on the arbiter board into the tapped holes in the backplane frame. Tighten the screws snugly with your fingers.
5. Reinstall the interface boards in the same slots from which you removed them.
6. Reconnect the signal cables to the appropriate connectors on the interface boards.
7. Thread and tighten the retaining bracket holding screws on the interface boards into the card cage.

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# **A** *Miscellaneous PCBs* **6**

This chapter contains procedures for removing and installing all field replaceable PCBs other than those residing in the main card cage compartment. These PCBs are as follows:

- 5 Volt/12 Volt Power Bus board
- Auxiliary power supply board
- LED Display Module

## **5 Volt/12 Volt Power Bus Board**

The 5 Volt/12 Volt Power Bus boards (Figure 6-1) are located inside the power supply compartment . Each power bus board is mounted to the wall through six metal standoffs. Each standoff is held in place by a phillips head screw.



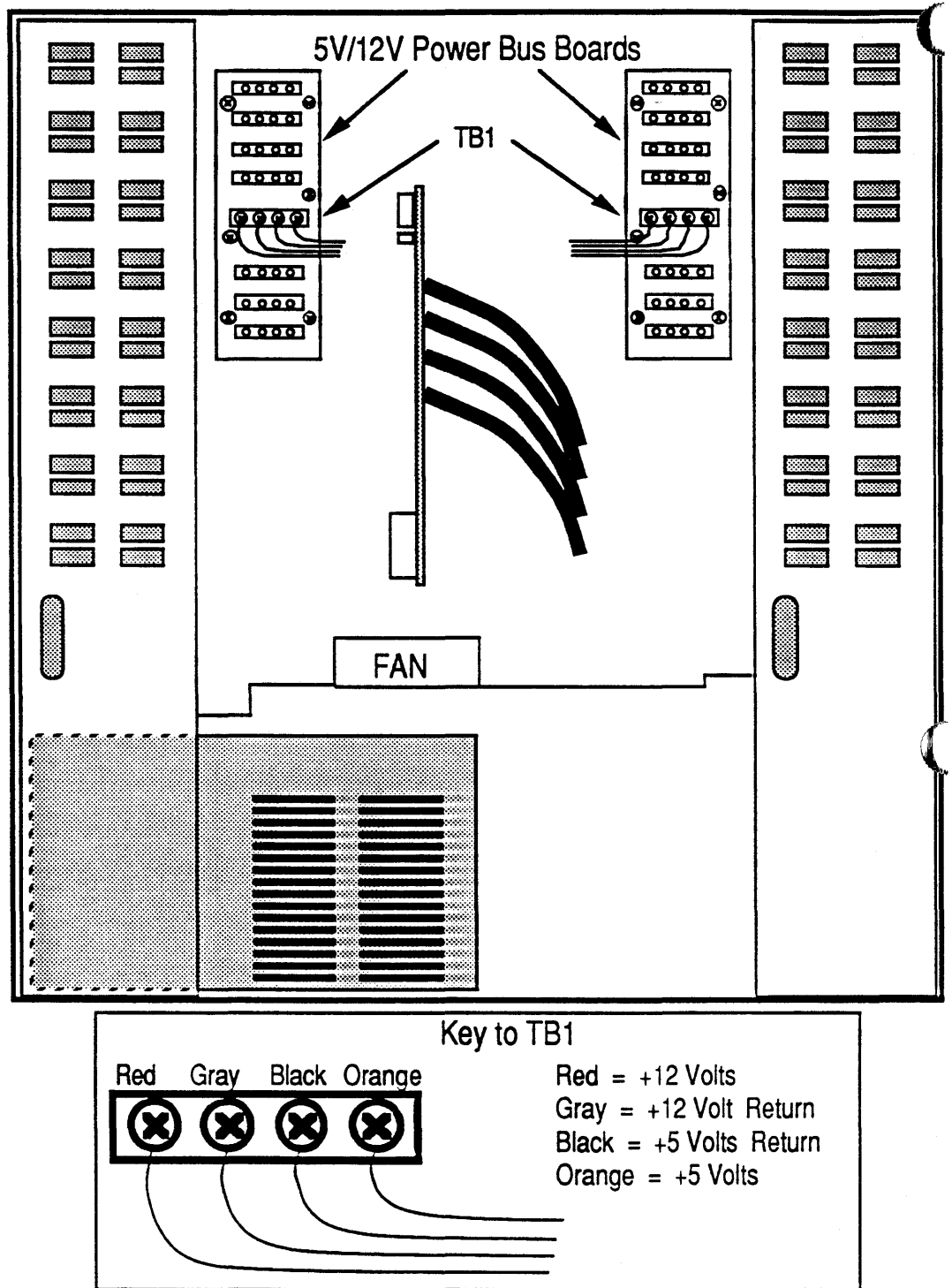


Figure 6-1 5 Volt/12 Volt Power Bus Boards

### **5 Volt/12 Volt Power Bus Board Removal**

Remove the 5 Volt/12 Volt Power Bus board as follows:

**NOTE:**

In the following two steps you are asked to tag leads and connections to the various distribution points on the board. The surest method to avoid mistakes when you reconnect the leads is to make a sketch showing position, color, and any other identifying information for each lead or plug disconnected.

**CAUTION:**

PC boards are susceptible to electrostatic damage. Use a correctly grounded ESD wrist strap when handling PCBs; do not touch the chips and components on the circuit boards, and do not handle the boards except by their edges.

1. Power down the system as described in Chapter 3.
2. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws, securing the left side panel to the cabinet. Pull the left side panel away from the cabinet.
3. Tag and disconnect all plugs (P1 through P7) on the board to be replaced.
4. Tag and disconnect all leads from the terminal TB1.
5. Remove the six (6) phillips-head screws from the Power Bus board to be removed.
6. Holding the board by its edges, lift it away from the standoffs.
7. Put the board in an antistatic bag; store it in a cool, dry environment until its final disposition.

### **5 Volt/12 Volt Power Bus Board Installation**

Install the 5 Volt/12 Volt Power Bus board as follows:

1. Power down the system as described in Chapter 3.
2. Remove the replacement board from its shipping carton. The board is normally shipped inside a plastic, antistatic bag. Lay the board (still inside the bag) on a table or clean work surface. Store the shipping carton temporarily; you may wish to use it for the board you are replacing.
3. If you have not already done so, remove the left side panel of the cabinet.
4. Hold the replacement board by its edges and remove it from its antistatic bag.
5. Hold the board in one hand as you put one of the screws into a mounting hole on the board.
6. Hold this assembly together as you thread the screw into its corresponding standoff in the side of the compartment. Do not tighten the screw more than a turn or so.
7. Install the remaining five screws in a similar way; then tighten all six screws.
8. Reconnect the power distribution leads to terminal board TB1 and reconnect the plugs to P1 through P7.
9. Replace the left side panel of the cabinet

### **Auxiliary Power Supply Board**

The *auxiliary power supply* board (Figure 6-2) is located inside the power supply module of the primary system cabinet above the main DC Power supply. It provides power to the Service Processor Module. The board is screwed to a mounting plate through four insulating standoffs. The mounting plate is fastened to the side of the power supply compartment with two screws. This assembly is enclosed in a metal ventilated cover.

### **Auxiliary Power Supply Board Removal**

Remove the *auxiliary power supply* board as follows:

1. **Completely** power down the system as described in Chapter 3.
2. Unplug the System's AC supply cord from its AC source.
3. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws, securing the left side panel to the cabinet. Pull the left side panel away from the cabinet.

**WARNING:**

This PC board has primary power on it any time the power cord is plugged in and the main circuit breaker is ON. This condition is true regardless of whether the system power switch on the front panel is on or off. Always turn the main circuit breaker to OFF and disconnect the plug from the power source when performing any operations with this board exposed.

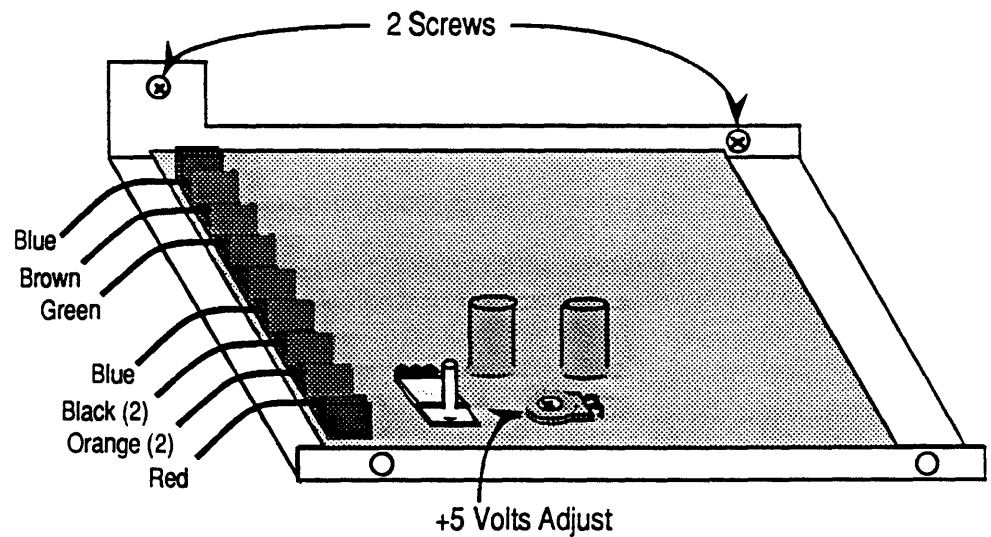
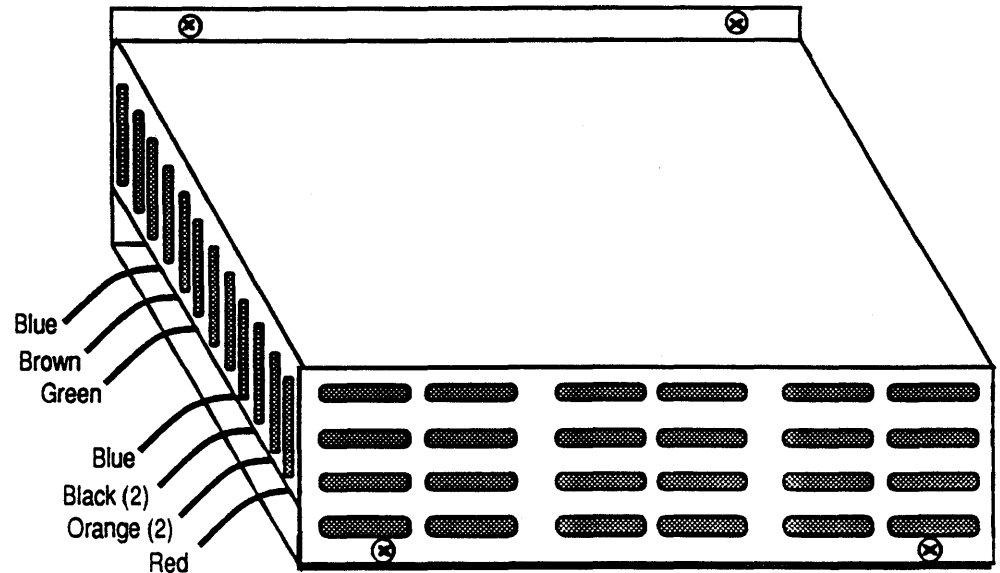


Figure 6-2 Auxiliary Power Supply Board



**Figure 6-3 Auxiliary Power Supply Board Access**

4. Remove the four screws securing the auxiliary power supply's ventilated cover. Lift the cover up and away.

**NOTE:**

In the following step you are asked to tag leads to the terminal strip on the board. The surest method to avoid mistakes when you reconnect the leads is to make a sketch showing position, color, and any other identifying information for each lead disconnected.

5. Tag and disconnect all leads from terminal board TB1.
6. Remove the two screws securing the auxiliary power supply mounting plate to the wall of the power supply enclosure.
7. Lift the auxiliary power supply up and out of the power supply enclosure.

**CAUTION:**

**PC boards are susceptible to electrostatic damage. Use a correctly grounded ESD wrist strap when handling PCBs; do not touch the chips and components on the circuit boards, and do not handle the boards except by their edges.**

8. Hold the mounting bracket/board assembly in one hand as you remove the four screws securing the board to the mounting bracket .
9. Put the board in an antistatic bag; store it in a cool, dry environment until its final disposition.

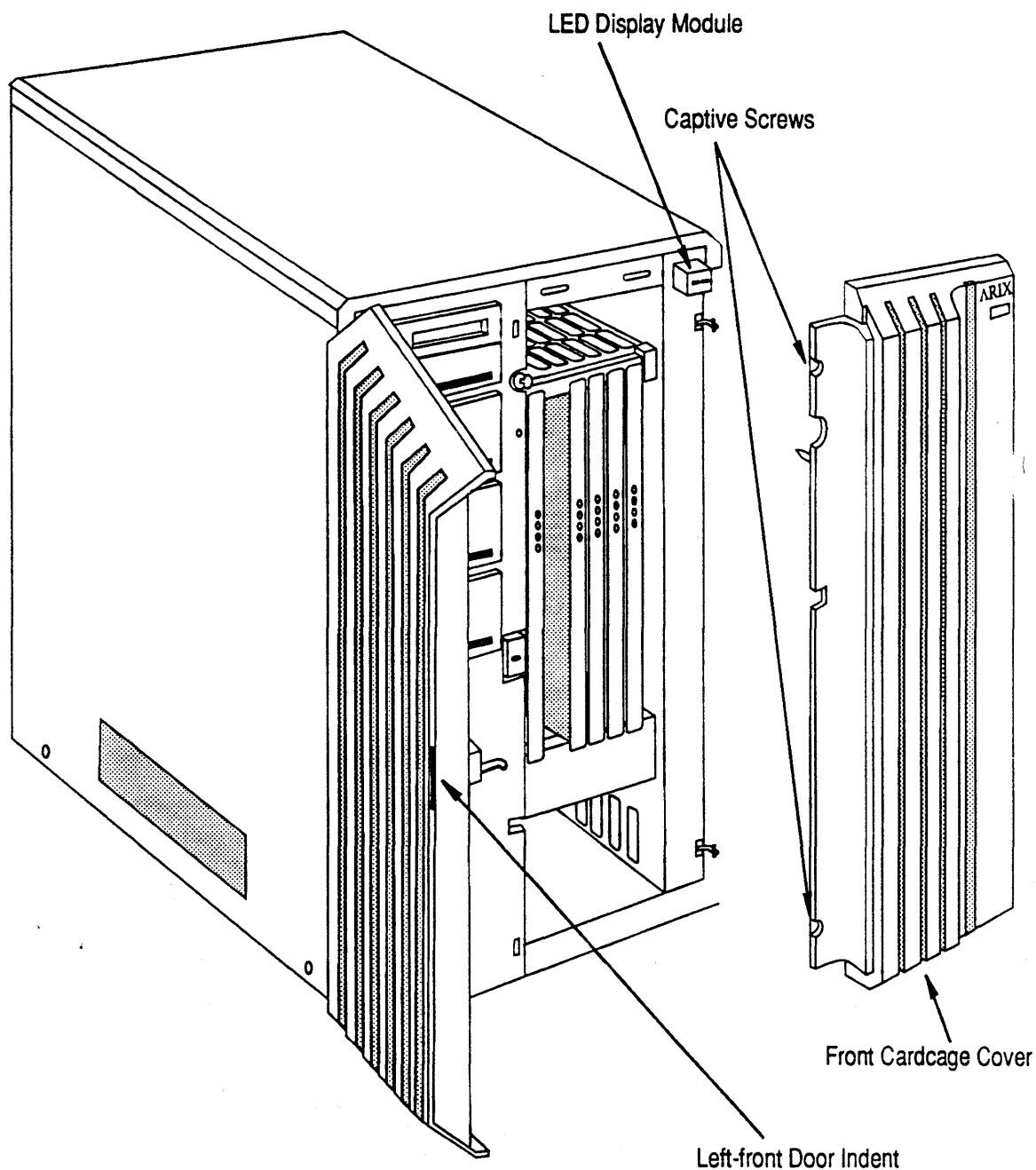
### ***Auxiliary Power Supply Board Installation***

Install the *auxiliary power supply* board as follows:

1. ***Completely*** power down the system as described in Chapter 3.
2. Unplug the System's AC supply cord from its AC source.
3. If you have not already done so, remove the system's left side panel.
4. Remove the board from its shipping carton. The board is normally shipped inside a plastic, antistatic bag. Lay the board (still inside the bag) on a table or clean work surface. Store the shipping carton temporarily; you may wish to use it for the board you are replacing.
5. Hold the board by its edges and remove it from its antistatic bag.
6. Hold the board in one hand as you align and thread one of the screws into a standoff on the board. Do not tighten the screw more than a turn or so. Mount the remaining three screws in a similar way; then tighten all four of them.
7. Using the two screws from Step 6 in the previous section, secure the auxiliary power supply mounting plate to the wall of the power supply enclosure.
8. Reconnect the power distribution leads to terminal board TB1.
9. Replace the four screws securing the ventilated cover.
10. Replace the cabinet's left side panel.

## **LED Display Module**

The *display board* controls the on/off status of the two LEDs on the front of the primary cabinet. The board receives its input from the Service Processor Module through the two-wire cable assembly. The board is located inside the LED Display Module. The LED Display Module is mounted, using two phillips head screws, just behind the front cardcage cover (see Figure 6-4).



**Figure 6-4 Display Board**

### **LED Display Module Removal**

Remove the *LED Display Module* as follows:

1. Power down the system as described in Chapter 3.
2. Push on the indent on the front left-hand door of the cabinet and open the door (see Figure 6-4).
3. Unfasten (turn counter clockwise) the two phillips-head, quick-release, captive screws, securing the front cardcage cover to the cabinet.
4. Grasp the cardcage cover on both sides. Pull out slightly on the left-hand edge of the cardcage cover (about three inches).
5. Pull straight back and up on the cardcage cover. The cardcage cover should come completely away from the cabinet and expose the logic boards and the LED display and board in the front part of the cardcage.
6. Carefully place the cardcage cover to one side.
7. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws, securing the right side panel to the cabinet. Pull the right side panel away from the cabinet.

**CAUTION:**

**PC boards are susceptible to electrostatic damage. Use a correctly grounded ESD wrist strap when handling PCBs; do not touch the chips and components on the circuit boards, and do not handle the boards except by their edges.**

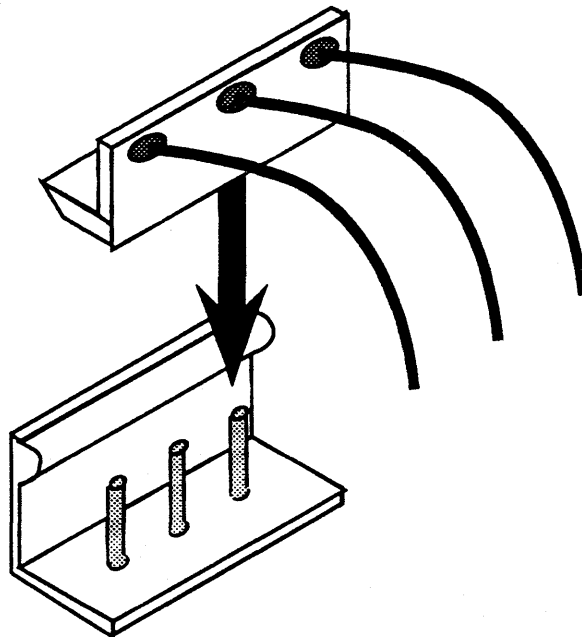
8. *Behind* the LED Display Module you will find two phillips head screws securing the module to the chassis. Remove the screws from the rear of the module.
9. Pull the LED Display Module from the front of the chassis, and disconnect the three-wire cable assembly going to the board inside the module.
10. Put the LED Display Module in an antistatic bag and store it in a cool, dry environment until its final disposition.



### **LED Display Module Installation**

Install the *LED Display Module* as follows:

1. If you have not already done so, power down the system as described in Chapter 3 and remove the cardcage cover.
2. Remove the replacement module from its shipping carton. The module is normally shipped inside a plastic, antistatic bag. Lay the module (still inside the bag) on a table or clean work surface. Store the shipping carton temporarily.
3. Hold the module by its edges and remove it from its antistatic bag.
4. Ensuring the correct connector orientation (see Figure 6-5), reconnect the three-wire cable assembly to the display board.
5. Insert the two phillips head screws that hold the module in place through the front of the chassis from behind.
6. Hold the module in position against the chassis and align the holes in the module with those in the chassis. Thread the screws into the module's mounting holes and tighten them.
7. Replace and secure the right side panel.
8. Replace and secure the cardcage cover.
9. Close the door.



**Figure 6-5 LED Display Module Connector**

# *System Disk and Tape Drives*

Various on-line and archival storage devices are supported by the System90 Model 25. Small Computer Systems Interface (SCSI) disk drives of 5 1/4" and 3 1/2" form factor provide a range of high-density and high-performance on-line, main system storage. A SCSI device ID label is attached to each drive that leaves ARIX. Legal device IDs are 0 through 6. The DSDB controller must always have the highest priority and, therefore, has device ID 7 reserved for its exclusive use.

Below is a brief outline of the types of SCSI devices that can be used in a Model 25.

- High capacity winchester disk drives
- Erasable optical disk drives provide large capacity, medium performance removable media storage
- Removable winchesters provide low capacity removable media storage.
- 1/4-inch cartridge tape drives provide low performance and low to medium capacity archival storage
- Write-once optical disk drives provide write-once removable media capability

## **Drive Locations**

The front of the Model 25 contains four full-height slots for 5 1/4-inch peripherals which require removal or insertion of media. Any device can be installed in these slots, but these accessible front slots are ideal for SCSI devices which require removal or insertion of media because these slots are accessible to an operator when the left front door of the system is open.

Each of these slots can contain either one full-height 5 1/4-inch peripheral, or two peripherals of either 5 1/4-inch half-height or 3 1/2-inch form factor.

These front slots can support from zero to six SCSI devices in any combinations which meet the above restrictions.

The internal SCSI bus serving these front slots has 6 connectors for the attachment of SCSI devices.

The rear of the system also has a six connector SCSI bus and supports three full-height 5 1/4-inch peripheral slots. Each slot can support one full-height 5 1/4-inch disk drive or two drives of either 5 1/4-inch half high or 3.5 inch full-high form factor.

Total internal support in the Model 25 for peripherals is a maximum of 12 devices, with a maximum of 6 on each of two SCSI channels from an IOPM-DSDB controller board. Once configured to be internal to the system, these SCSI channels cannot then be extended outside the system to take advantage of any unused SCSI IDs. All peripherals on these internal channels are single ended and may be either synchronous or asynchronous.

## ***Magnetic Disk Storage***

Hard magnetic disk storage is provided for on-line, main system storage. Removable winchester storage is provided for low capacity removable media requirements. Magneto-Optic storage is provided for high-capacity removable media requirements.

### ***Hard Disk Storage***

The System 90 Model 25 supports 5 1/4-inch SCSI interface and 3 1/2-inch SCSI interface disk drives. Combinations of both drive types can be accommodated, with the strategy being replacement of a single 5 1/4-inch drive with two 3 1/2-inch drives.

The basic system contains all the necessary power and cooling to support these 5 1/4-inch and 3 1/2-inch hard drives.

### ***Removable Media Storage***

Two types of removable media storage are supported: a low-capacity, removable winchester and a high-capacity, removable optical.

#### ***Removable Winchester***

A removable winchester disk drive of half high 5 1/4-inch form factor is supported. This device has a minimum formatted capacity of 40 MBytes and has medium performance characteristics. This drive can be located in any of the six half-height slots (3 full-height) in the front of the system.

#### ***Removable Magneto Optical***

A removable optical drive of full high 5 1/4-inch form factor is supported. This device has a minimum formatted capacity of 300 MBytes and has medium to low performance characteristics. The device is based on magneto-optical technology and is an erasable re-writable device. It can be located in any of the three full-height slots in the front of the system.

## **Magnetic Tape Storage**

An inexpensive, low-performance cartridge tape drive is provided for archival purposes.

### **Cartridge Tape**

A 1/4-inch cartridge tape is provided for low-priced, low-performance backup. Streaming tape drives using the SCSI interface supporting up to 150 MB of storage are used.

Data is written to the tape in the QIC-150 or QIC-120 format depending upon the cartridge type used. The density is automatically selected by the drive. Tapes written in QIC-150, QIC-120, and QIC-24 formats can be read by the tape drive.

This half high 5 1/4-inch device is typically located in the topmost peripheral slot at the front of the model 25.

### **Nine-Track Tape (in Peripheral Expansion Cabinet)**

A high-performance, front loading, 9-track tape drive is available in the optional peripheral expansion cabinet.

## **WORM Optical Disk Storage**

The model 25 supports a 5 1/4-inch full-height WORM (Write Once Read Many) disk drive. This drive meets the industry standard recording format and has a per side capacity of 300 MBytes. It may be located in any of the three full-height peripheral slots in the front of the system.

## **Primary Cabinet Drive Installation**

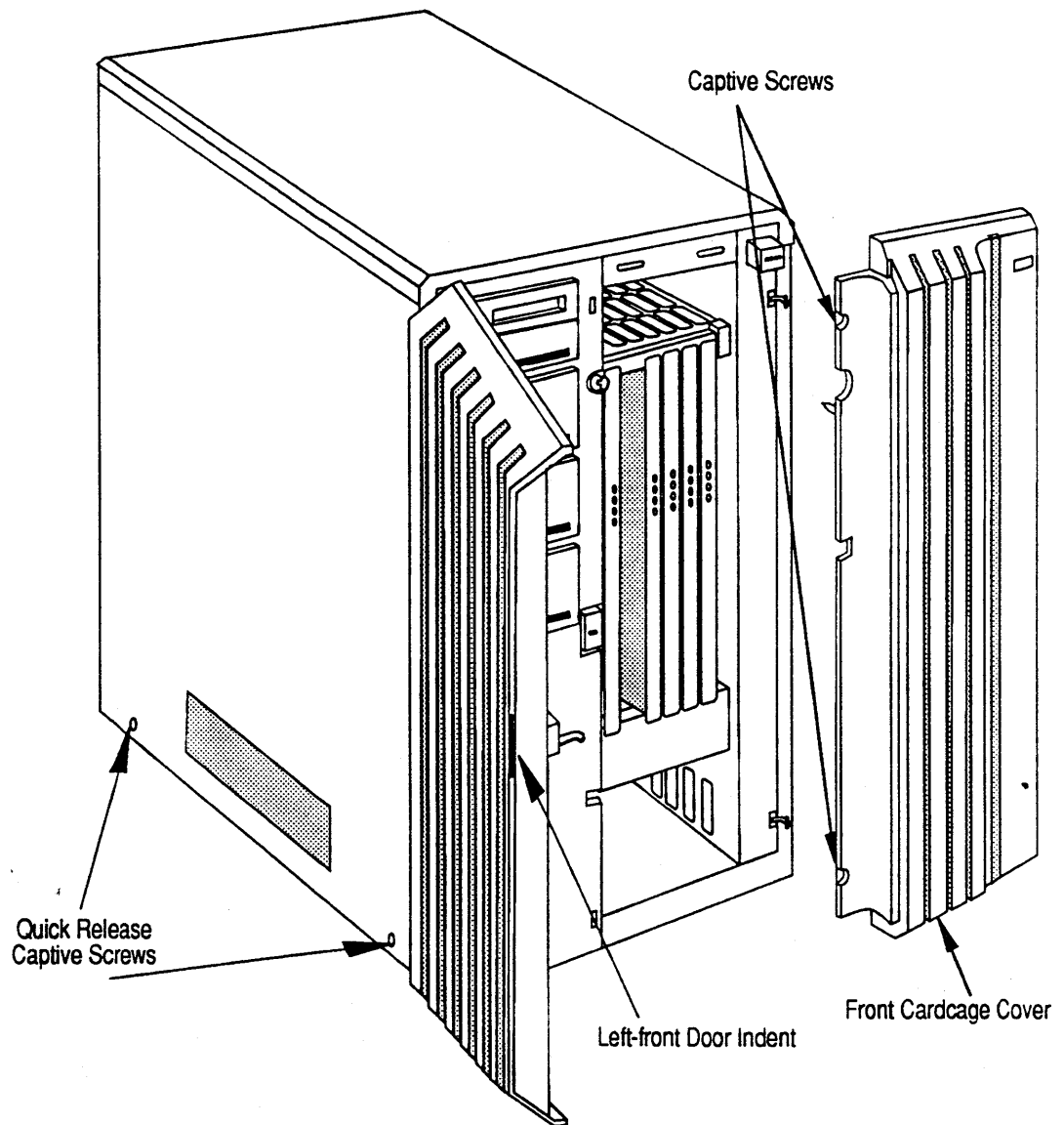
The Model 25 has an area on the left-hand side of the primary cabinet dedicated to the housing of tape or disk drives. The following subsections describe how to install a disk or tape drive into either the front or rear of the drive area.

### **Drive Installation - Front**

The front of the Model 25 contains four full-height slots for 5 1/4-inch peripherals which require removal or insertion of media. Any peripheral device can be installed in these slots, however, these front slots are ideal for SCSI devices which require removal or insertion of media because these slots are accessible to an operator when the left front door of the system is open

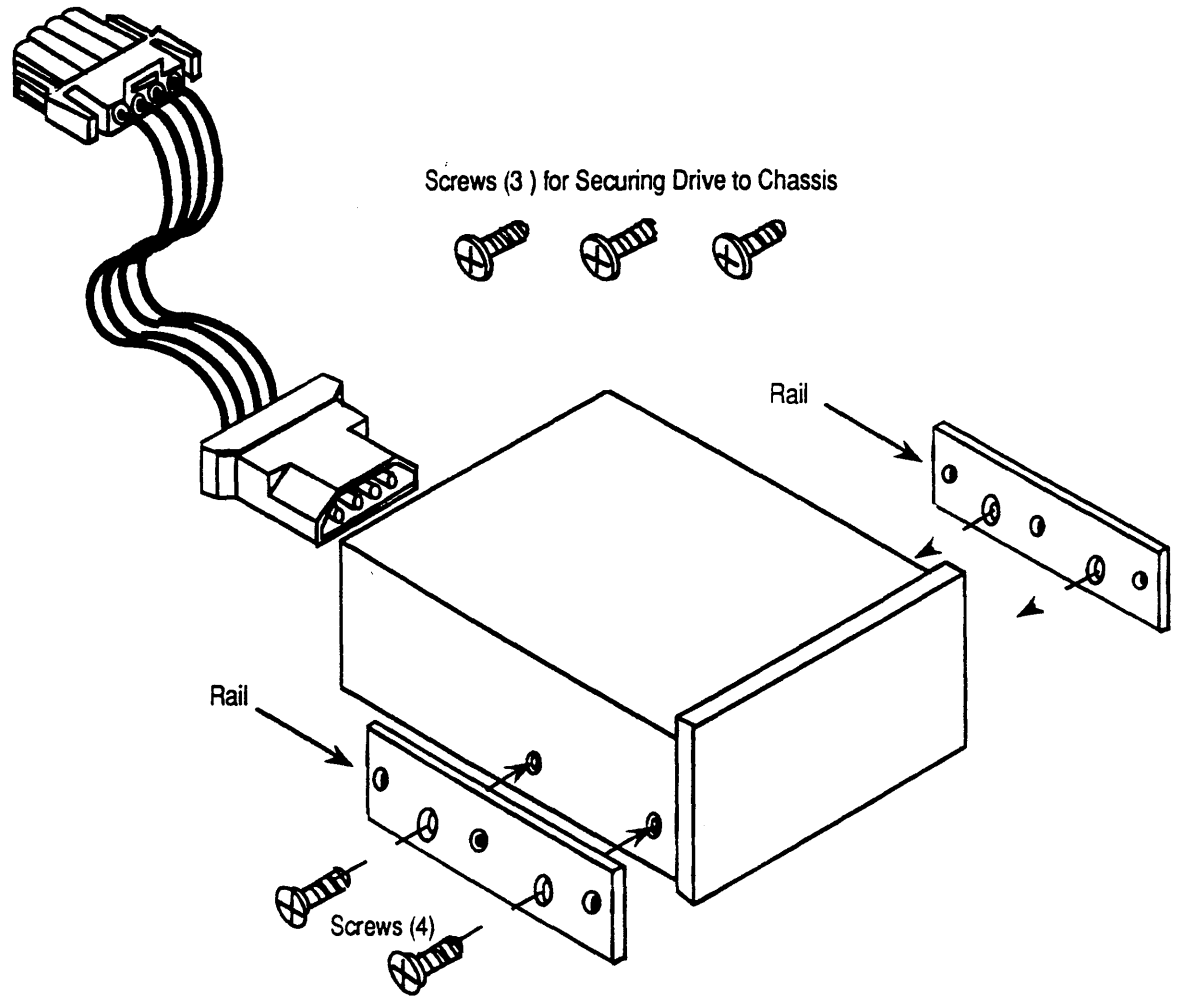
To install a drive proceed as follows:

1. Power down the system as described in Chapter 3.
2. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws, securing the left side panel to the cabinet. Pull the left side panel away from the cabinet.
3. Push on the indent on the front left-hand door of the cabinet and open the door (see Figure 7-1).
4. Lift the front left-hand door up and away from the chassis.
5. Carefully place the door to one side.



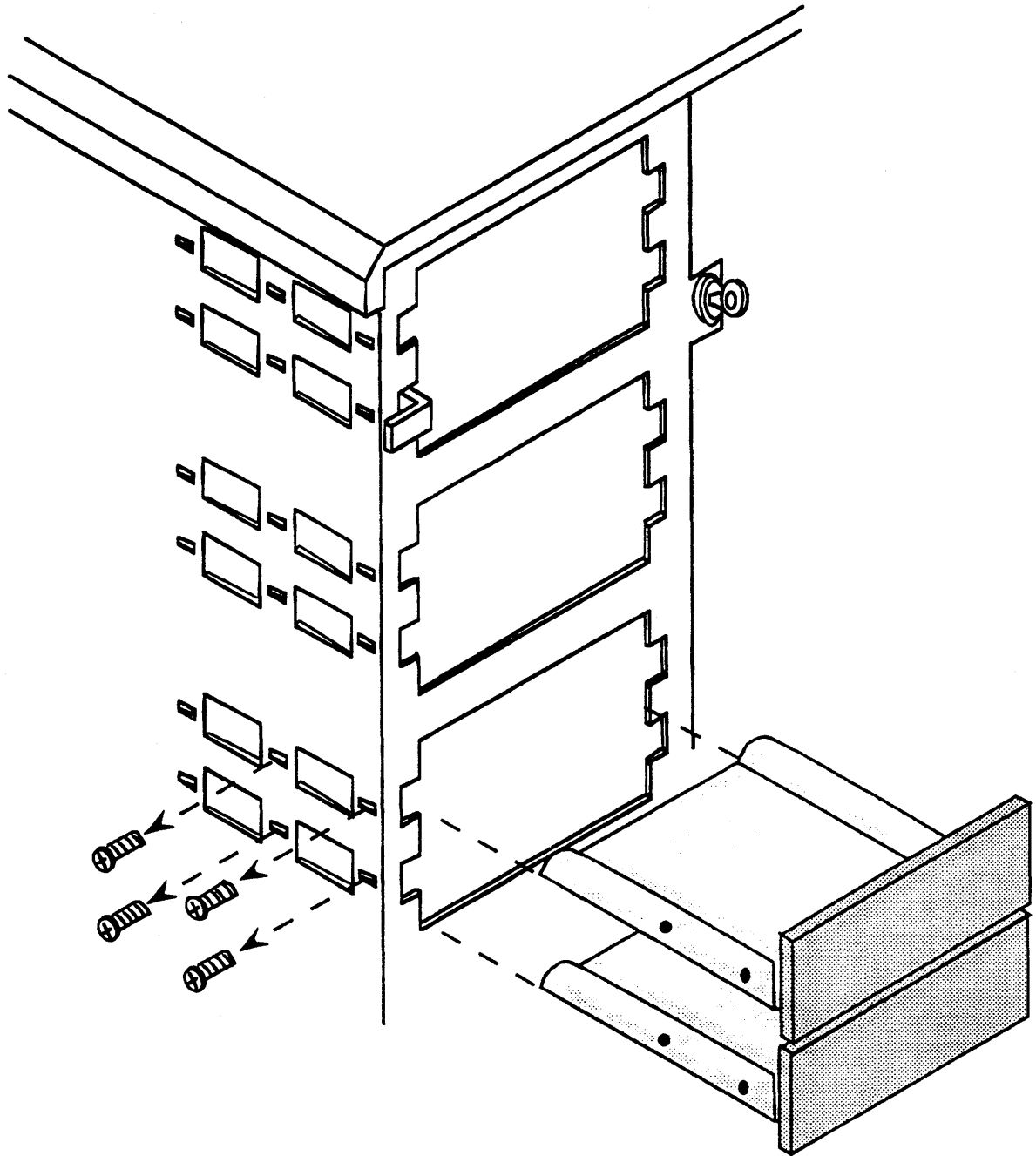
**Figure 7-1 Removing the System's Front Door and Left Side**

6. Figure 7-2 shows the drive with its installation kit.
7. Install the rails from the drive installation kit onto the drive.
8. Connect the four-wire cable from the installation kit to the back of the drive as shown.



**Figure 7-2 Drive Installation Kit**

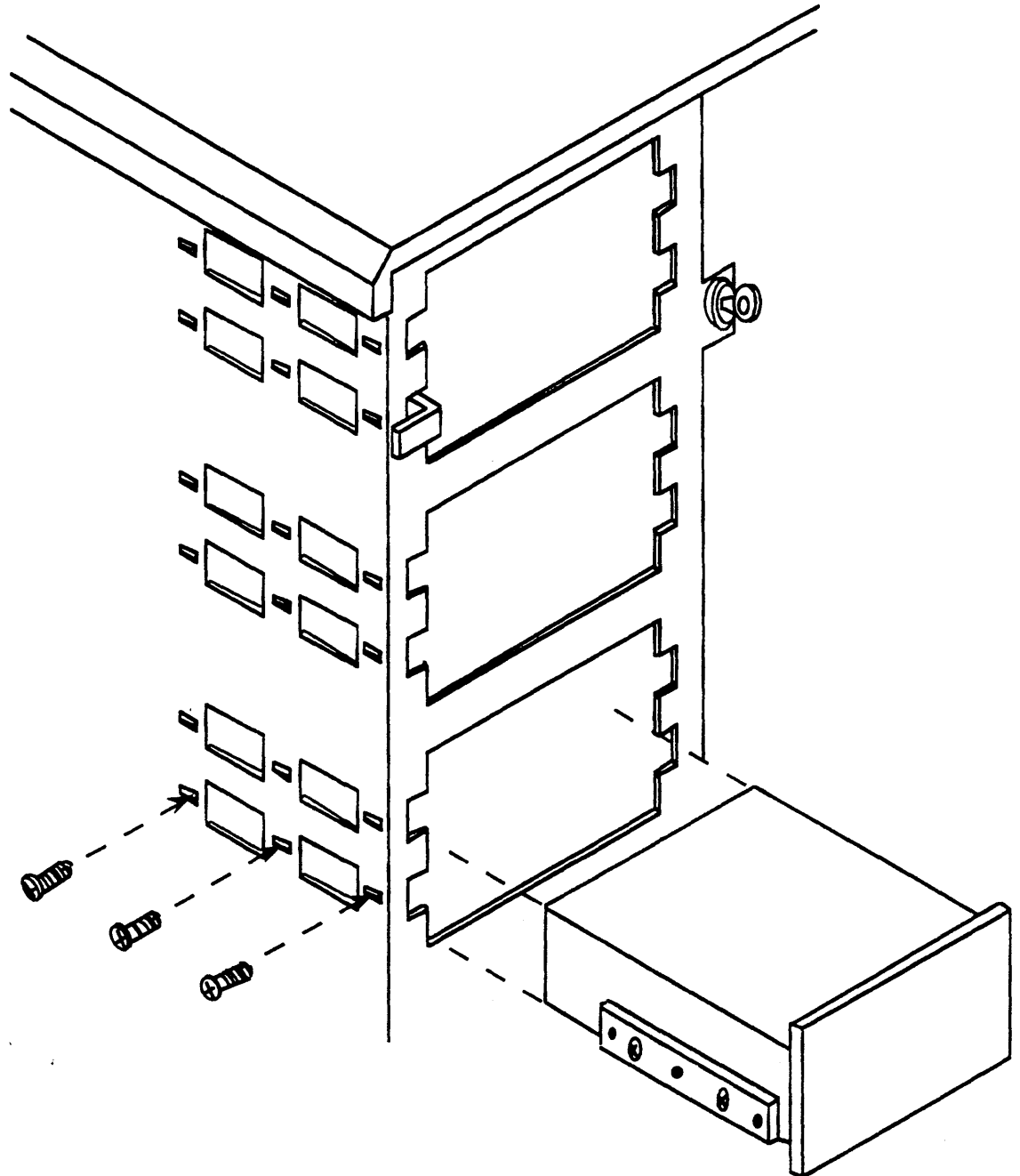
9. Verify that no SCSI bus terminators are installed on the drive. The SCSI bus is terminated inside the cabinet.
10. Remove the filler panel(s) necessary to install the drive(s) as shown in Figure 7-3. Each filler panel covers an area the size of a half-height drive.



**Figure 7-3 Drive Filler Panel Removal**

11. Insert the drive into the chassis as shown in Figure 7-4.
12. With the drive fully inserted in the chassis, secure it by inserting the three screws through the chassis and into the three matching holes in the left-hand drive rail as shown in Figure 7-4.
13. Connect the four-wire cable to any available connector on the 5 Volt/12 Volt Power Bus boards (if necessary, see Figure 6-1 for more information).

14. Connect the appropriate daisy-chained ribbon cable connector (i.e. the third connector down for the third drive from the top) to the SCSI port on the back of the drive.
15. Replace the the left side panel and the front door.



**Figure 7-4 Drive Installation - Front**

**NOTE:**

If a half-height device is installed, a half-height filler plate must be installed in the remaining half-height space.

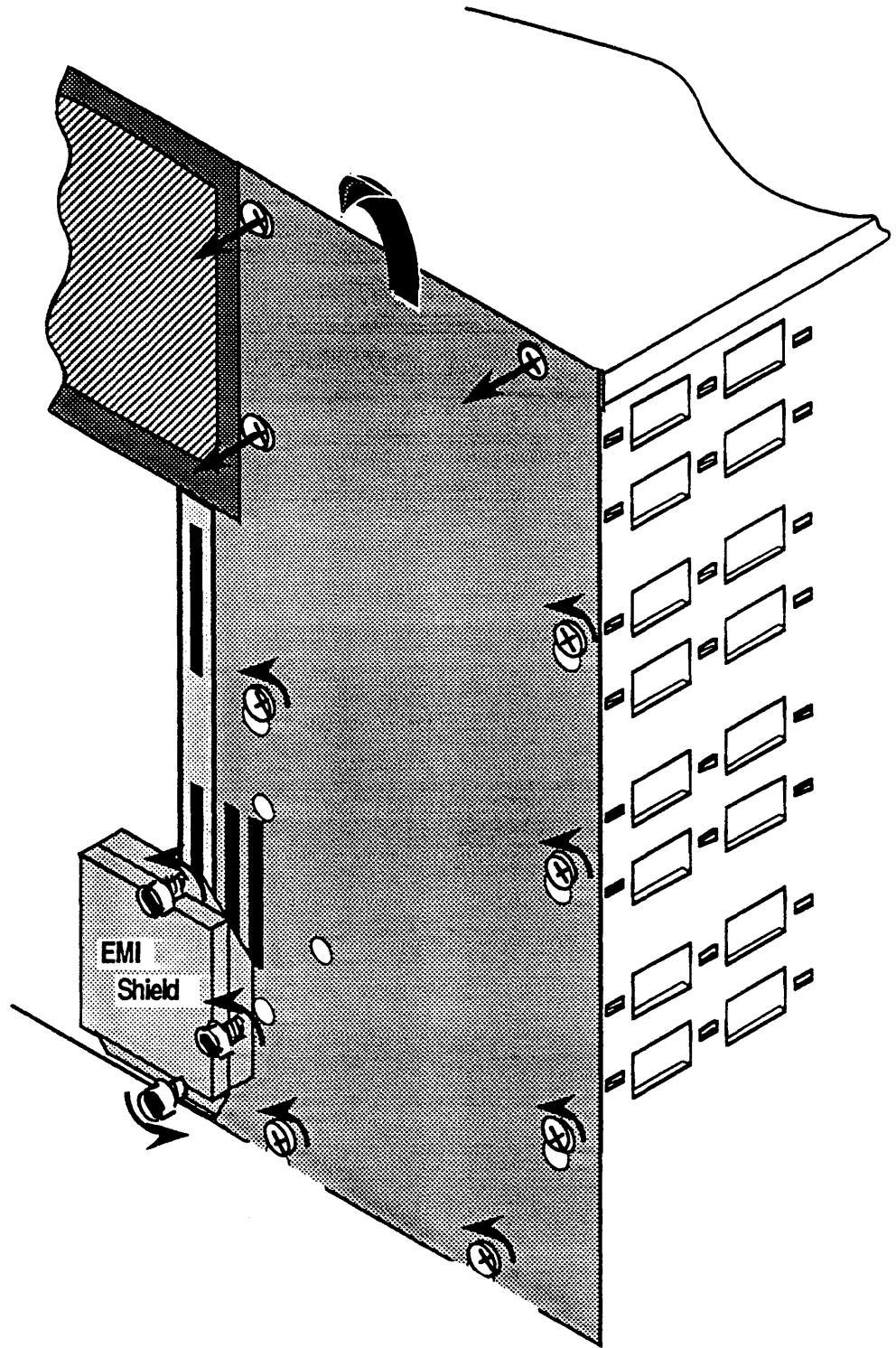


### **Drive Installation - Rear**

The rear of the Model 25 contains three full-height slots for 5 1/4-inch full-high peripherals which *do not* require removal or insertion of media. The bottom (fourth) slot in the rear of the cabinet is not used.

To install a drive proceed as follows:

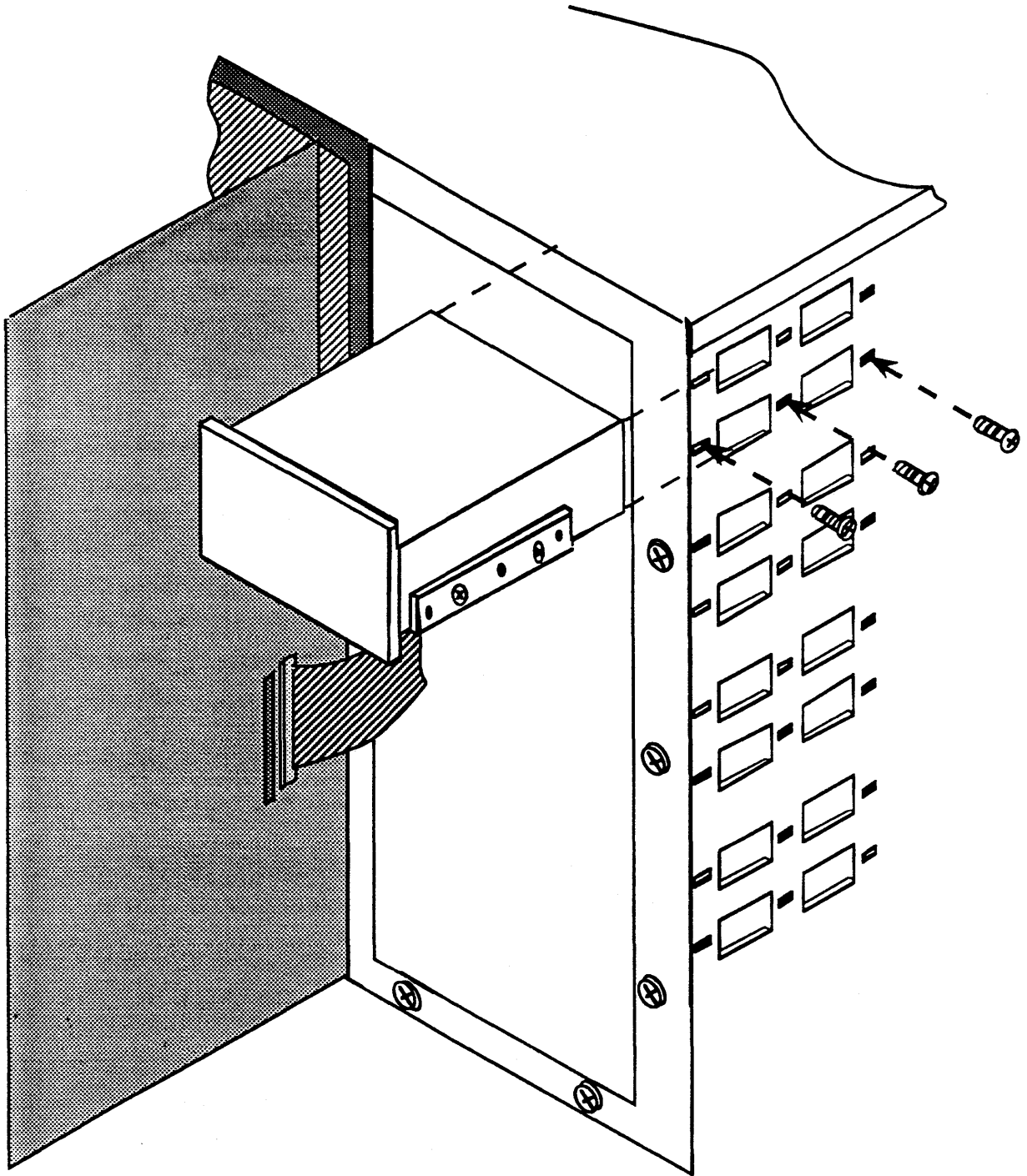
1. Power down the system as described in Chapter 3.
2. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws, securing the left side panel to the cabinet. Pull the left side panel away from the cabinet.
3. Unfasten the three captive screws securing the DSDB's EMI shield. Lift the shield away from the board (See Figure 7-5). Label and remove the connectors from the DSDB.
4. *Remove* the top two left-hand screws and the screw in the upper right corner of the cover as shown in Figure 7-5.
5. *Loosen* the other six securing the cover to the chassis.
6. Carefully slide the cover up and off of the six screws. Rotate the rear cover to the left and support it. You will need to support the rear cover during the rest of the drive installation due to the fairly short cables attached to the inside of the cover.
7. Figure 7-2 shows the drive with its installation kit.
8. Install the rails from the drive installation kit onto the drive.
9. Verify that no SCSI bus terminators are installed on the drive. The SCSI bus is terminated inside the cabinet.
10. Connect the four-wire cable from the installation kit to the back of the drive as shown.



**Figure 7-5 Rear Drive Area Cover Removal**

11. Insert the drive into the chassis as shown in Figure 7-6.

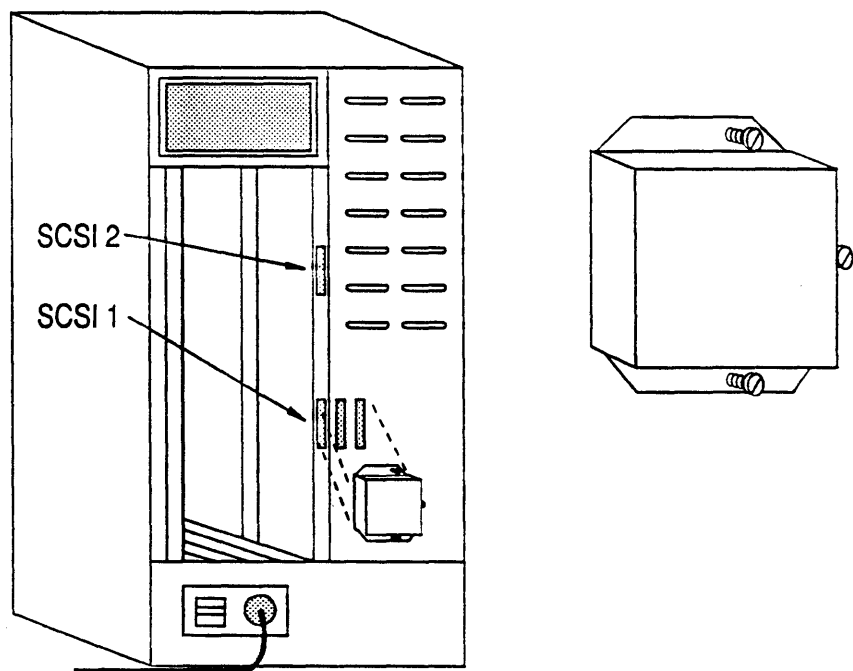
12. With the drive fully inserted in the chassis, secure it by inserting the three screws through the chassis and into the three matching holes in the left-hand drive rail as shown in Figure 7-6.



**Figure 7-6 Rear Drive Installation**

13. Connect the four-wire cable to any available connector on the 5 Volt/12 Volt Power Bus boards (if necessary, see Figure 6-1 for more information).

14. Connect the appropriate daisy-chained ribbon cable connector (i.e. the third connector down for the third drive from the top) to the SCSI port on the back of the drive.
15. Carefully rotate the rear cover back against the chassis and slide it back onto the six screws.
16. Replace the top two left-hand screws and the screw in the upper right corner of the cover. Tighten all cover securing screws.
17. Install the EMI shield over the cable(s) (see Figure 7-7), and tighten the three captive screws that hold the EMI shield to the cabinet.
18. Replace the the left side panel.



**Figure 7-7 DSDB EMI Cover Installation**

## ***Cartridge Tape Drive Cleaning***

Cleaning the tape drive head assures that the tape head has the proper tape to head compliance and prevents loss of data.

### ***Frequency of Cleaning***

The cartridge tape drive head should be cleaned after every two (2) hours of use with a new tape, and after every eight (8) hours of use thereafter.

### ***Tools Needed***

- Lint-free cotton swabs
- Freon TF or IBM tape head cleaner
- OR
- A Drive Head Cleaning Kit

### ***Manual Cleaning Procedure***

#### ***Docking the Tape Drive Head***

It may be necessary to dock the head (put the tape head into the "tape loaded" position) to access the head for cleaning.

Docking the head is performed differently on different tape drives. The important characteristic of a tape drive when the heads are docked is that it believes the tape is inside the drive. This can often be accomplished by pushing the tape drive's lever into the "tape loaded" position. Almost all tape drives have one of these levers on the front of the drive.

One of the Wangtek drives is a possible exception. It has no lever, but the act of inserting the tape fully into the drive places the heads into the docked position. To dock the head on the Wangtek drive, press inward on the carriage plate (the plate that holds the tape while it resides within the drive) until resistance is met. The tape head on the Wangtek drive is now in the docked position.

#### ***Cleaning the Tape Head***

After docking the head, clean the tape head using the cotton swab soaked in head cleaning solution.

<b>CAUTION:</b>
-----------------

<b>NEVER clean the capstan with the head cleaner solution. If it becomes necessary to clean the capstan roller(s), use a cotton swab soaked with water only.</b>
--

### ***Automatic Cleaning Procedure***

An alternative to cleaning the head by hand is to use a commercially available Drive Head Cleaning Kit. The kit consists of a tape cleaning cartridge of the correct form factor and a quantity of cleaning solution. The tape cleaning cartridge is simply inserted in the drive (usually after the application of a few drops of cleaning solution to the cartridge) as if it were a normal cartridge.

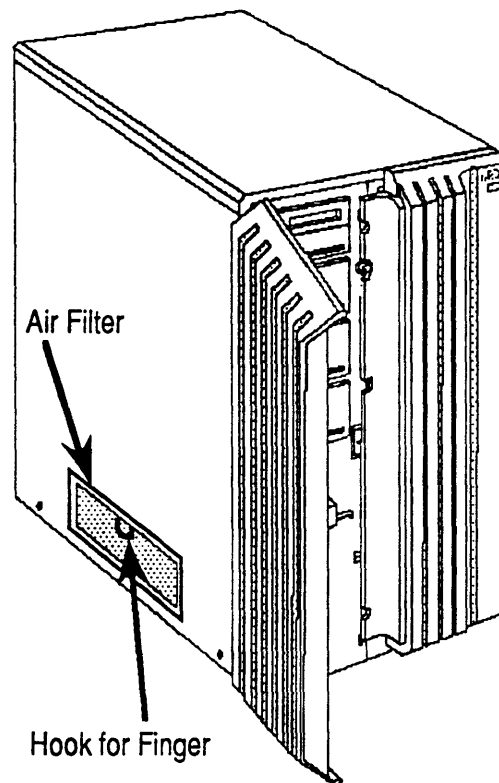
The exact method used by the Drive Head Cleaning Kit varies with the manufacturer. Please refer to the Drive Head Cleaning Kit manufacturer's instructions for further information.

## **Air Filter Removal and Cleaning**

Two air filters are provided in the Model 25. They are located in the left and right side panels. The side panels do not need to be removed to gain access to the air filters for cleaning. The following procedure shows how to access and clean the air filters. The procedure is the same for both the left and right sides.

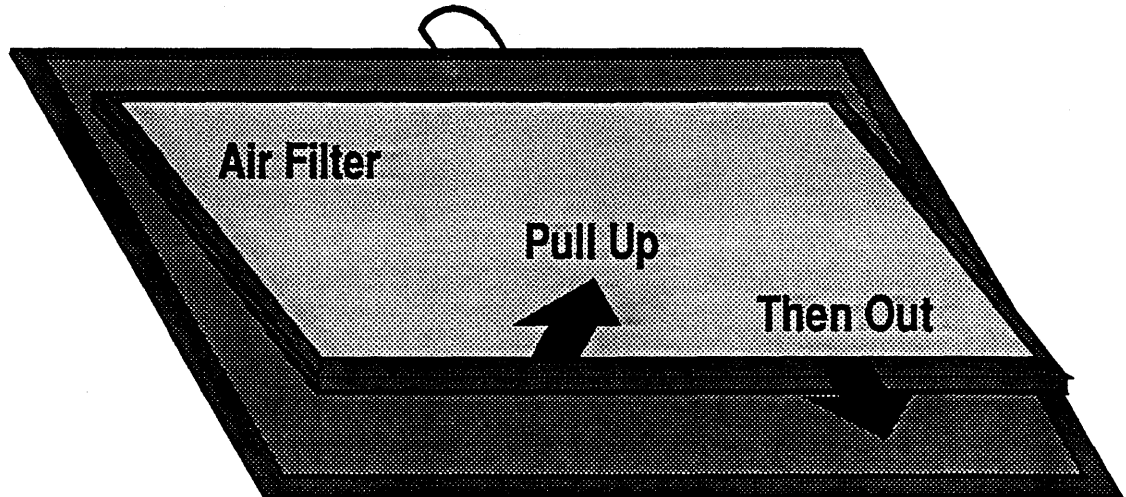
To remove an air filter, proceed as follows:

1. Referring to Figure 8-1, grab the hook on the air filter and pull up and out.



**Figure 8-1 Air Filter Access**

2. Place the air filter on a suitable work surface. Referring to Figure 8-2, lift up the bottom of the air filter and pull it up and out.



**Figure 8-2 Air Filter Cleaning**

3. Clean the air filter thoroughly (water is an acceptable cleaning agent). The air filter should not be cleaned in the same room as the Model 25.

**CAUTION:**

**Do not clean the air filter with any type of flammable solvents.**

**CAUTION:**

**If using water to clean the filter, be very sure that the filter is completely dry before reinstalling it into the Model 25.**

4. To reinstall the air filter, perform steps 1 and 2 in reverse order.

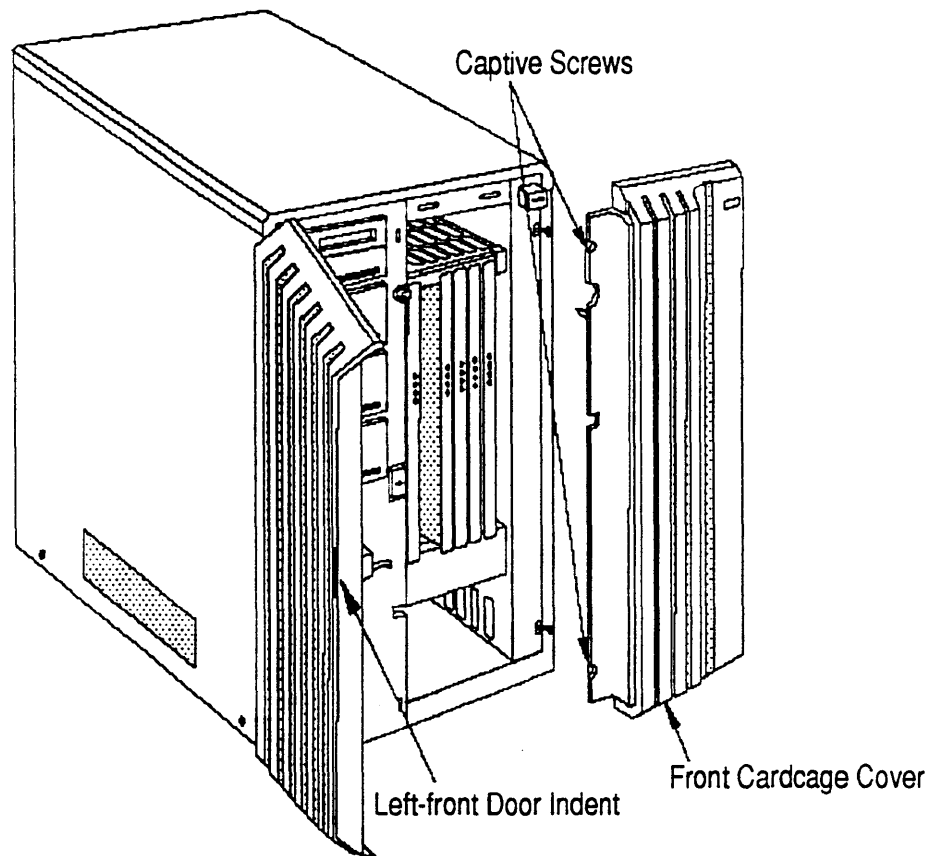
## ***Cardcage Fan Assembly - Removal and Installation***

The cardcage fan assembly is a tray containing four fans that cool the system cardcage. The assembly is located directly below the system cardcage (see Figure 8-4).

To replace the cardcage fan assembly, proceed as follows:

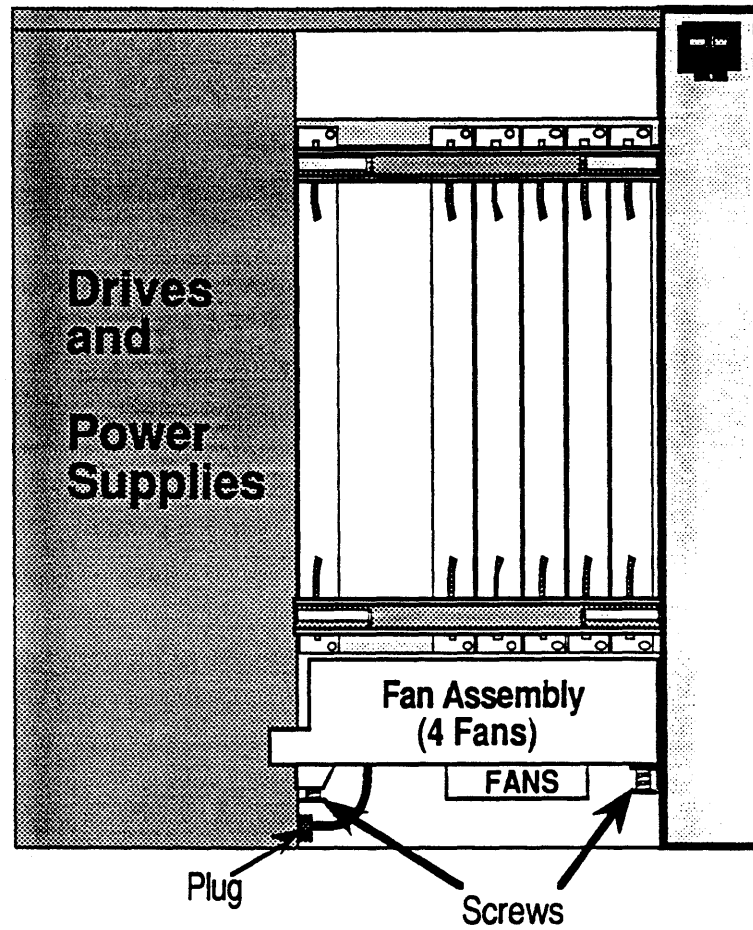


1. Power down the system as described in Chapter 3.
2. Push on the indent on the front left-hand door of the cabinet and open the door (see Figure 8-3).
3. Unfasten (turn counter clockwise) the two phillips-head, quick-release, captive screws, securing the front cardcage cover to the cabinet.
4. Grasp the cardcage cover on both sides. Pull out slightly on the left-hand edge of the cardcage cover (about three inches).
5. Pull straight back and up on the cardcage cover. The cardcage cover should come completely away from the cabinet exposing the cardcage.
6. Carefully place the cardcage cover to one side.



**Figure 8-3 Removing the Front Cover from the Cardcage**

7. Referring to Figure 8-4, disconnect the plug from its connector under the lower left corner of the cardcage fan assembly.
8. Remove the two screws securing the cardcage assembly to the chassis.
9. From the bottom, grasp the front fan and pull straight out on the entire fan assembly.



**Figure 8-4 Cardcage Fan Assembly**

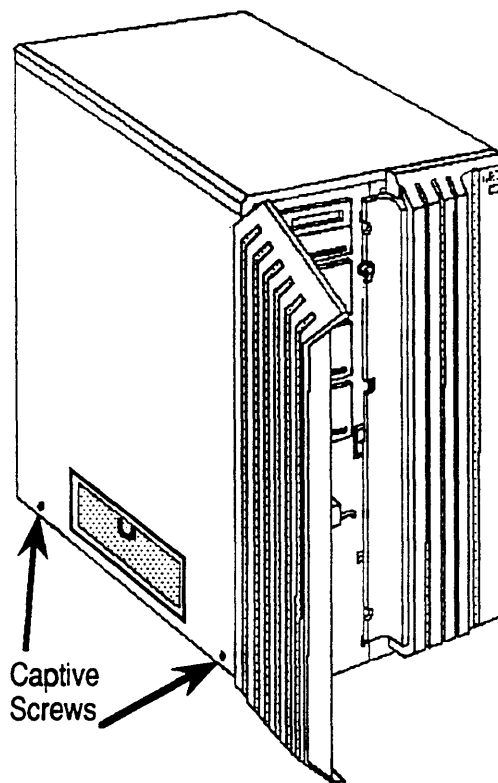
10. To replace the cardcage fan assembly, perform step 1 and then perform steps 2 through 9 in reverse order.

## **Peripheral Fan Assembly**

The Peripheral Fan assembly is a single fan that cools the left-hand peripheral section of the primary cabinet. The assembly is located directly below the peripheral section of the primary cabinet(see Figure 8-6).

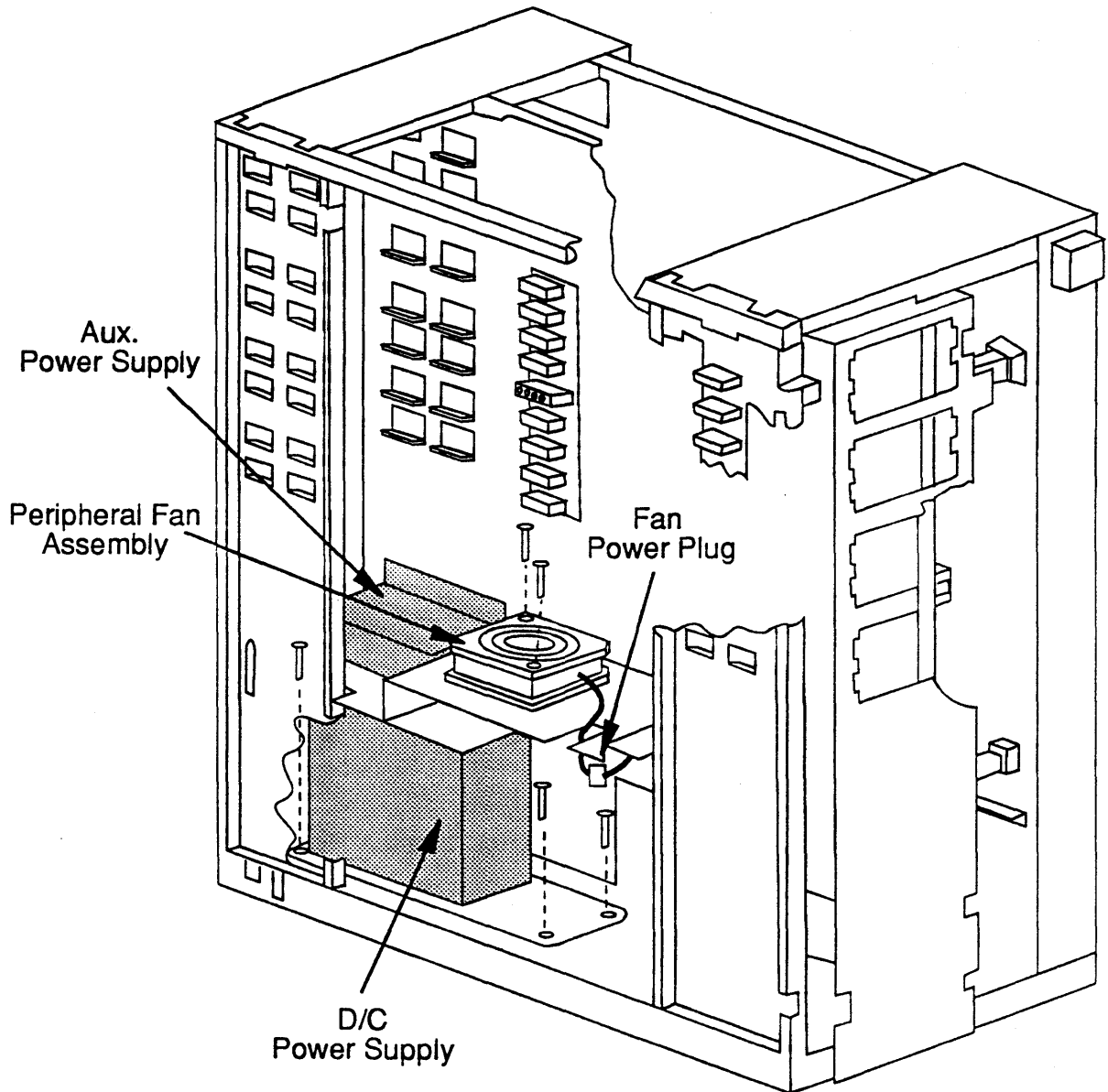
To replace the peripheral fan assembly, proceed as follows:

1. Power down the system as described in Chapter 3.
2. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws securing the left side panel to the cabinet. Pull the left side panel away from the cabinet.



**Figure 8-5 Removing the System's Left Side Panel**

3. Referring to Figure 8-6, locate the peripheral fan.
4. Disconnect the three-wire cable assembly at the plug and remove the two screws securing the peripheral fan assembly to chassis.



**Figure 8-6 Peripheral Fan Assembly Removal**

5. To install a peripheral fan assembly, be sure to perform step 1 and then perform steps 2 through 4 in reverse order.

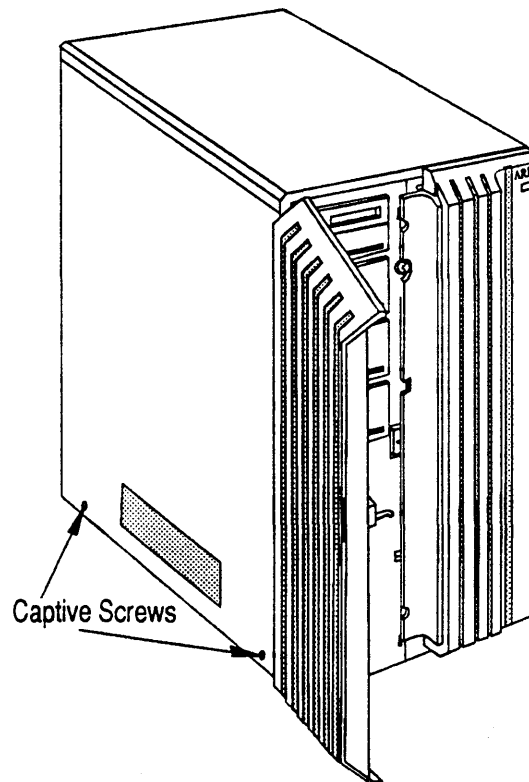
# **A** *DC Power Supply* **9**

The DC Power Supply provides DC power to the primary cabinet . The DC Power Supply is located directly below the peripheral section of the primary cabinet (see Figure 9-2).

## **DC Power Supply Removal**

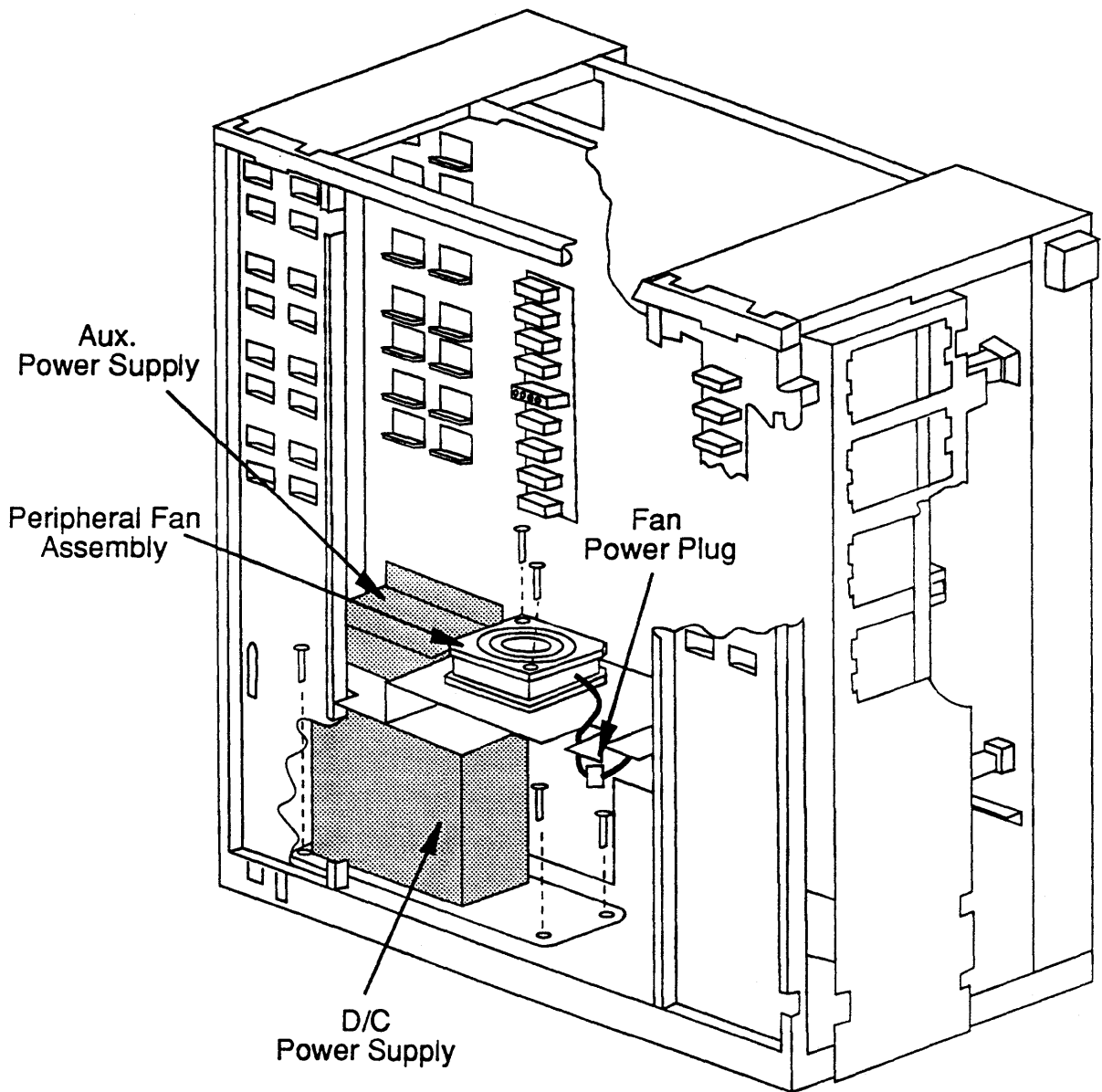
To replace the DC Power Supply, proceed as follows:

1. Power down the system as described in Chapter 3. **UNPLUG** the system as well.
2. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws securing the left side panel to the cabinet. Pull the left side panel away from the cabinet.



**Figure 9-1 Removing the System's Left Side Panel**

3. Referring to Figure 9-2, locate the DC Power Supply .



**Figure 9-2 DC Power Supply Location**

4. Referring to Figure 9-3, tag and disconnect all cable assemblies from the power supply (Do *not* remove the wires shown as permanent in Figure 9-3.). Cable assemblies that have connectors within them should be disconnected at the in-line connector. Move all of these wires and leads to one side and clear of the power supply.

**CAUTION:**

Take particular care to identify correctly each of the wires connected to these terminals. If you reconnect them incorrectly, severe damage to the machine can result. To ensure correct tagging, make a sketch or map of the terminal boards and label each lead as you disconnect it. Include all identifying information you can, such as color, size, terminal board connection, etc.

5. Remove the four screws securing the four corners of the DC Power Supply to the chassis and remove the supply from the chassis.

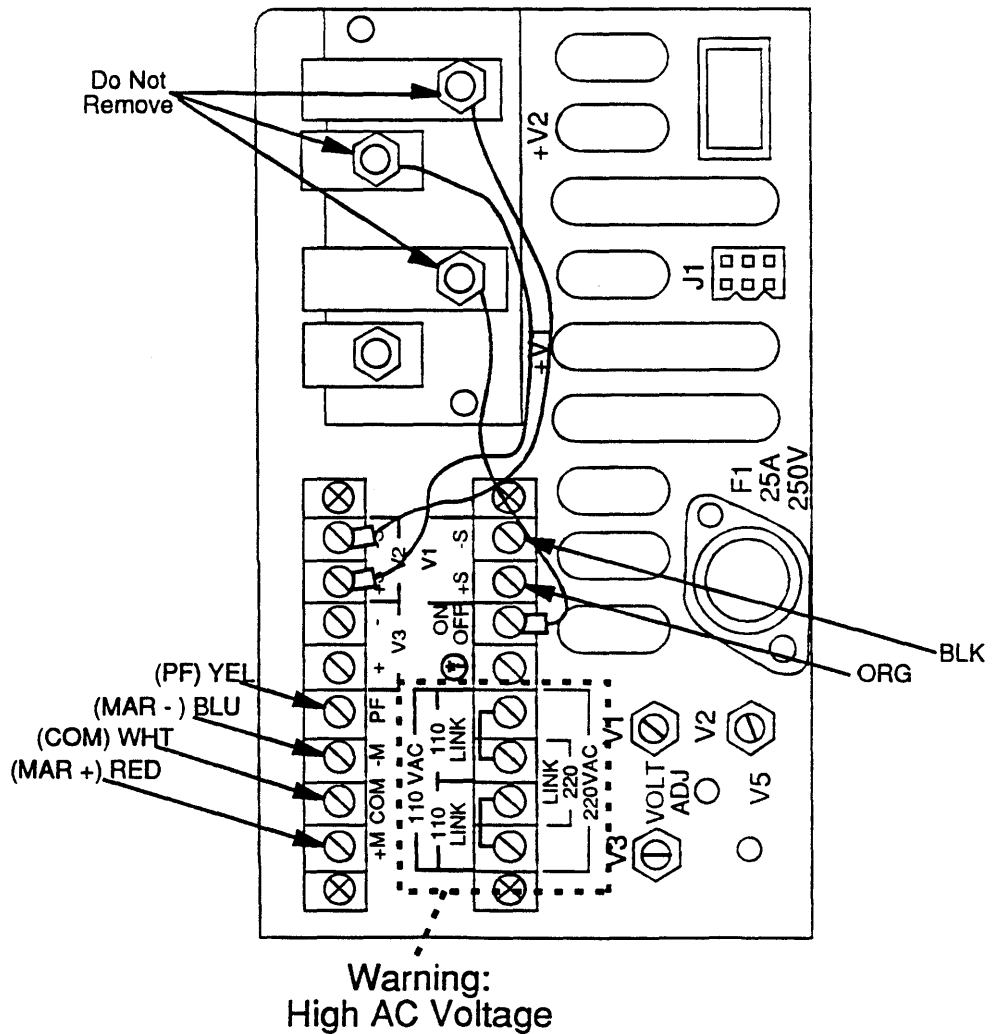


Figure 9-3 Preparing DC Power Supply for Removal

## ***DC Power Supply Installation***

To install a DC Power Supply assembly perform the following steps.

1. Check the outside of the shipping carton for signs of damage. Check the contents of the carton against the invoice or manifest. If you find any discrepancies or irregularities in either case, report the matter to the carrier and to your ARIX representative.
2. Open the shipping carton and remove the power supply unit. Save the packing materials until you are sure that the unit does not have to be returned.
3. Verify that the AC Voltage Selection jumpers on the new DC Power Supply are positioned correctly for your system's AC input voltage.
4. Referring to the steps in the previous section, be certain to perform step 1 before proceeding.
5. Perform steps 2 through 5 of the previous section in reverse order.

New or replacement DC power supply assemblies from the factory have already been checked and adjusted under full load and should require nothing but installation and hookup.

If you need information about power supply adjustment procedures, please refer to *Chapter 10 - Power Supply Adjustment*.



# *Power Supply Adjustment* 10

It is recommended that you verify the power supply voltages annually and adjust them only if required. If you find that the supply needs to be adjusted more frequently than once per year, you should call your ARIX representative.

**NOTE:**

Adding and removing PC boards DOES NOT require a power supply adjustment.

**WARNING:**

All procedures described in this chapter must be carried out by trained, technical personnel ONLY!

**WARNING:**

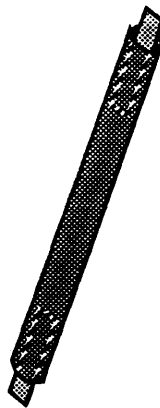
The procedures described in this chapter are virtually the only procedures that need to be performed with the system power ON.

**EXTREME CAUTION IS ADVISED!**

Irrespective of the severe damage that can be caused to the system, there are very dangerous voltages present in the power supplies that could cause SEVERE INJURY or DEATH.

## **Tools Needed**

- Fully insulated potentiometer adjustment tool (a.k.a. pot tweaker - see Figure 10-1).
- No. 2 Phillips Screwdriver
- 4-digit Digital Voltmeter with probes
- 3/8 inch box wrench or small, adjustable wrench



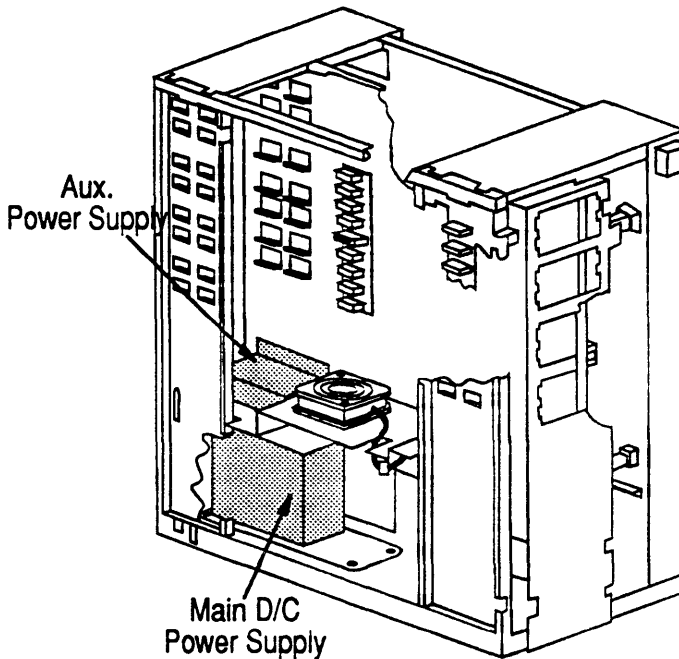
**Figure 10-1 Fully Insulated Potentiometer Adjustment Tool**

Ideally, the entire tool will be made of an insulating material. At the very least, the dark grey areas of the tool should be made of an insulating material.

The lighter grey areas, if metallic, **must** be two separate pieces.

## **Supply Locations**

The Main DC and Auxiliary Power Supplies are located directly below the peripheral section of the primary cabinet (see Figure 10-2).



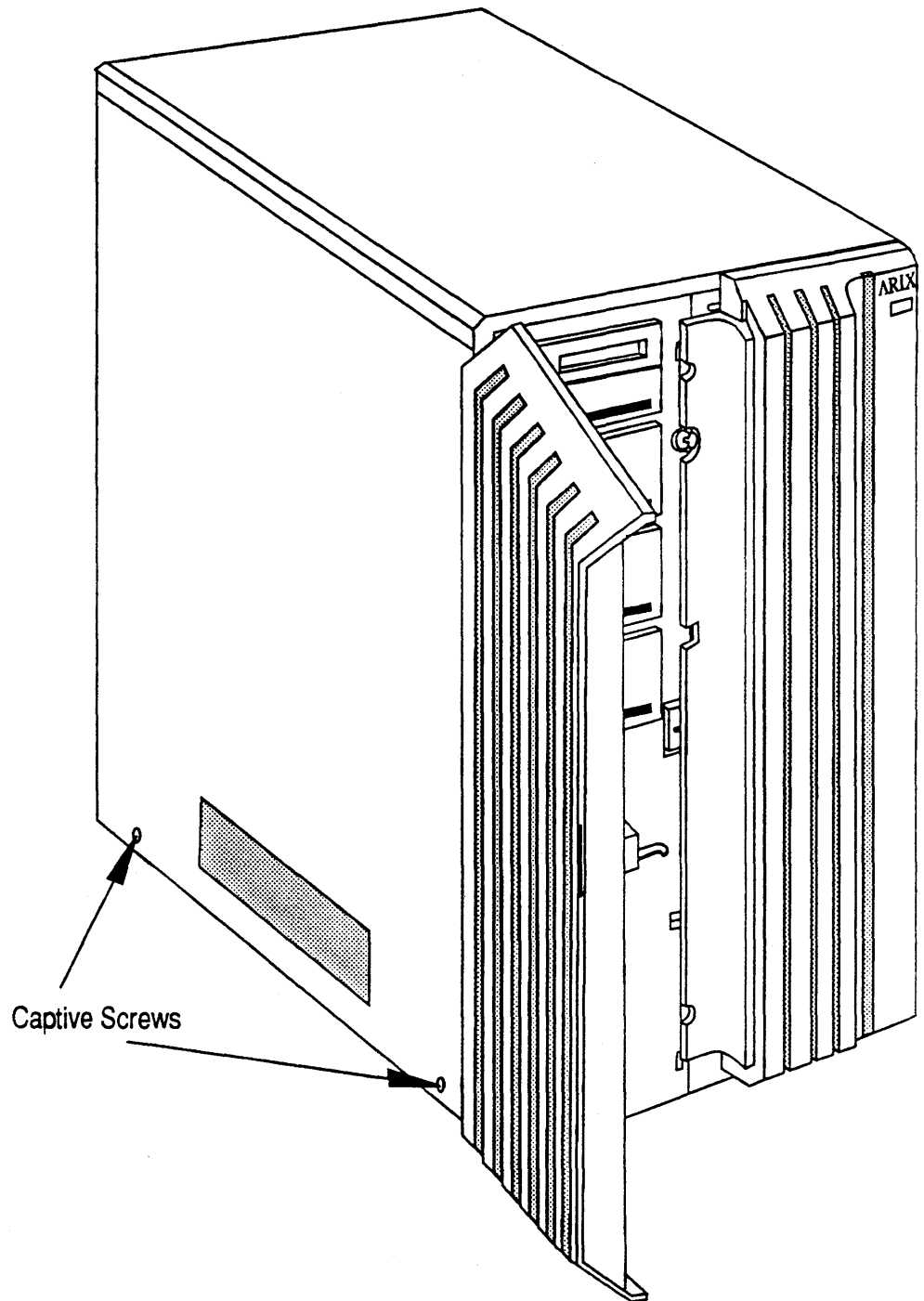
**Figure 10-2 Power Supply Locations**

The Main DC Power Supply provides DC power to the primary cabinet when the system is fully powered on. The Auxiliary Power Supply provides DC power to the SPM and ACRW whenever the AC line cord is connected to an AC source and the circuit breaker on the rear of the system is in the ON position.

## **Accessing the Power Supplies**

To gain access to the power supply area:

1. Unfasten (turn counter-clockwise) the two phillips-head, quick-release, captive screws securing the left side panel to the cabinet.
2. Pull the left side panel away from the cabinet (see Figure 10-3).



**Figure 10-3 Removing the System's Left Side Panel**

## **Main DC Power Supply Adjustment**

The main DC power supply provides +5, +12 and -12 Volts DC to the system as a whole.

To set the main DC power supply voltages, proceed as follows:

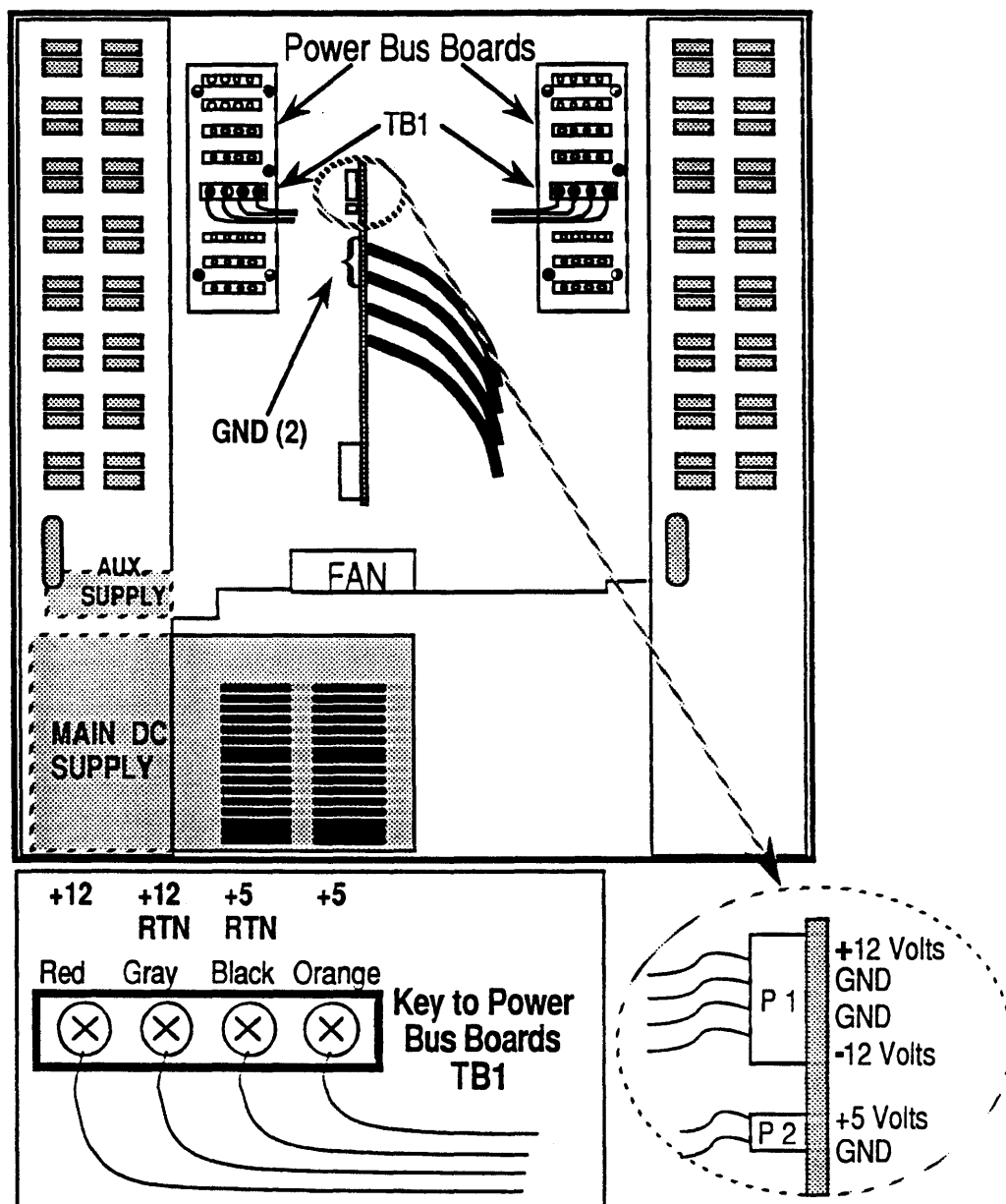
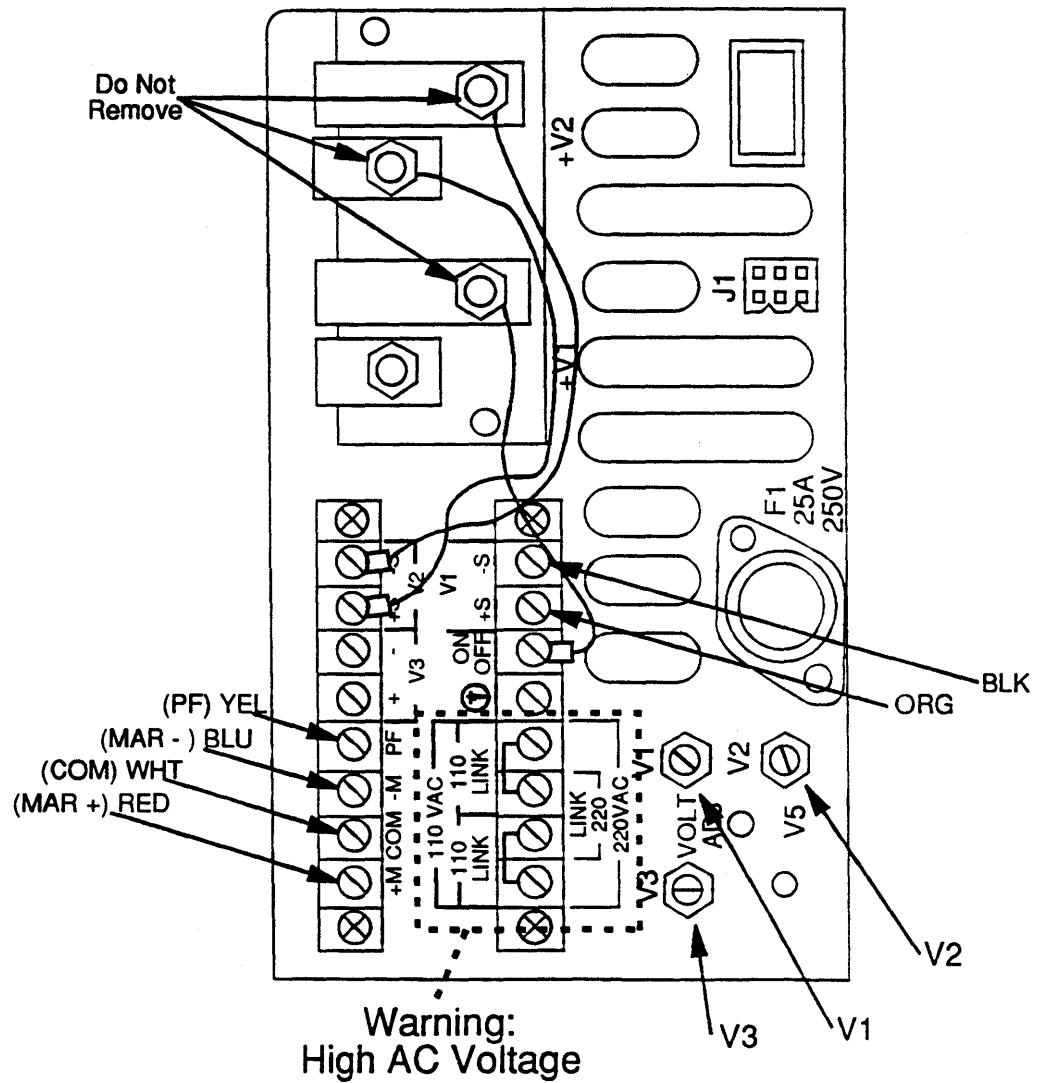


Figure 10-4 Test Points for the Main DC Power Supply

### +12 Volts DC Adjustment

1. Referring to Figure 10-4, connect a voltmeter to the Power Bus Board between +12 (positive lead) and +12 RTN (negative lead). The meter should read between +11.88 and +12.12 Volts ( $\pm 1\%$ ). The nominal voltage is 12.00 volts.
2. If the voltmeter reading is correct, go on to the next section.

3. If the voltage read is not within the limits specified, you will need to adjust potentiometer V2 on the Main DC Power Supply (see Figure 10-5).



**Figure 10-5 Main DC Supply Potentiometer Locations**

4. With the small wrench, loosen the top nut around potentiometer V2.
5. While reading the voltmeter connected to the test points, use the adjusting tool to turn potentiometer V2 until the meter reads +12.0 Volts.
6. Tighten the top nut around potentiometer V2.
7. Verify the voltage reading.

### **-12 Volts DC Adjustment**

1. Referring to Figure 10-4, connect a voltmeter to **P1** on the edge of the cardcage backplane between **-12 Volts** (positive lead) and **GND** (negative lead). The meter should read between -11.88 and -12.12 Volts ( $\pm 1\%$ ). The nominal voltage is -12.00 Volts.
2. If the voltmeter reading is correct, go on to the next section.
3. If the voltage read is not within the limits specified, you will need to adjust potentiometer **V3** on the Main DC Power Supply (see Figure 10-5).
4. With the small wrench, loosen the top nut around potentiometer **V3**.
5. While reading the voltmeter connected to the test points, use the adjusting tool to turn potentiometer **V3** until the meter reads -12.0 Volts.
6. Tighten the top nut around potentiometer **V3**.
7. Verify the voltage reading.

### **+5 Volts DC Adjustment**

1. Referring to Figure 10-4, connect a voltmeter to **P2** on the edge of the cardcage backplane between **+5 Volts** (positive lead) and **GND** (negative lead). The meter should read between +5.00 and +5.10 Volts ( $\pm 1\%$ ). The nominal voltage is +5.05 Volts.
2. If the voltmeter reading is correct, go on to the next section.
3. If the voltage read is not within the limits specified, you will need to adjust potentiometer **V1** on the Main DC Power Supply (see Figure 10-5).
4. With the small wrench, loosen the top nut around potentiometer **V1**.
5. While reading the voltmeter connected to the test points, use the adjusting tool to turn potentiometer **V1** until the meter reads +5.05 Volts.

<p style="text-align: center;"><b>CAUTION:</b> <b>Overshoot (<i>maximum</i> allowable voltage) on this adjustment is 5.5 Volts. Voltages higher than this will DAMAGE SYSTEM COMPONENTS.</b></p>
--

6. Tighten the top nut around potentiometer **V2**.
7. Verify the voltage reading.

## **Auxiliary Power Supply Adjustment**

The Auxiliary Power Supply provides +5 Volts DC power to the SPM and ACRW whenever the AC line cord is connected to an AC source and the circuit breaker on the rear of the system is in the ON position.

Refer to Figure 10-2 for the location of the Auxiliary Power Supply.

To set the Auxiliary Power Supply, proceed as follows:

1. Access the circuit side of the ACRW.

**CAUTION:**

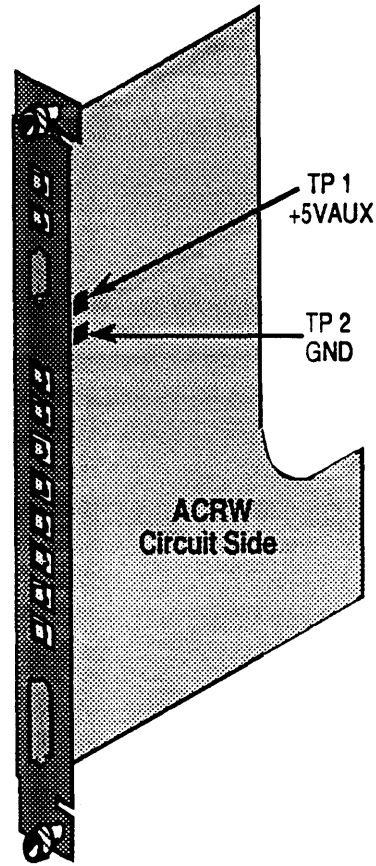
To gain access to the ACRW's circuit side, you may need to remove the PC board to the right of the ACRW.

If a PC board must be removed, you **MUST** completely power down the system before removing the PC board.

Once the PC board has been removed, power the system back up and proceed with step 2.

2. Referring to Figure 10-6, connect the voltmeter's positive lead to TP 1 (+5V AUX) and the voltmeter's negative lead to TP 2 (GND). The meter should read between +4.95 and +5.05 Volts ( $\pm 1\%$ ).





**Figure 10-6 Test Points for the Auxiliary Power Supply**

3. If the voltmeter reading is correct, Power Supply adjustment is now complete.

**CAUTION:**

**If you needed to remove a PC board to perform step 1 of this procedure, you MUST completely power down the system before placing that board back into the system.**

4. If the voltage read is not within the limits specified, you will need to adjust the potentiometer **+5 Volts Adjust** inside the Auxiliary Power Supply (see Figure 10-7).

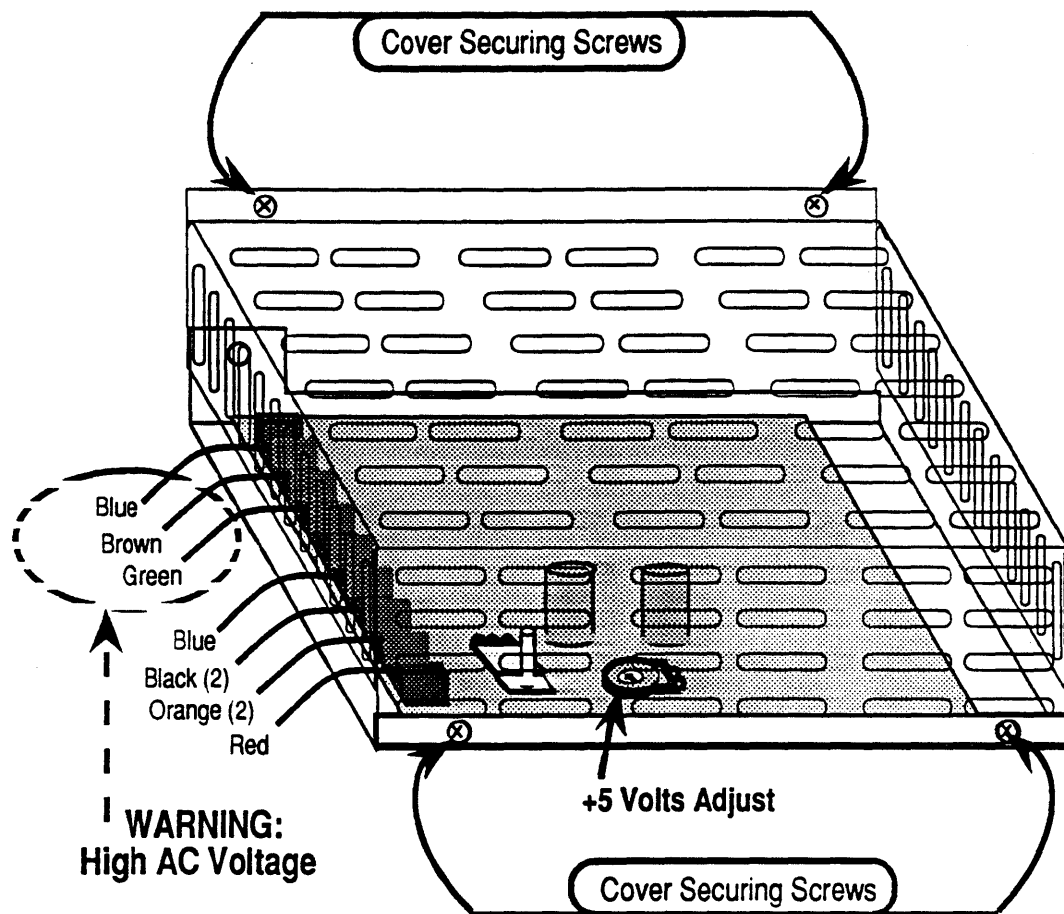


Figure 10-7 Auxiliary Supply Potentiometer Location

5. Most potentiometer adjusting tools can be inserted *through* the Auxiliary Power Supply cover. However, if the adjustment tool you are using does not permit this, remove the four (4) cover securing screws.

**CAUTION:**

**Overshoot (*maximum* allowable voltage) on this adjustment is 5.5 Volts. Voltages higher than this will DAMAGE SYSTEM COMPONENTS.**

6. While reading the voltmeter connected to the test points, use the adjusting tool to turn the potentiometer until the meter reads +5.00 Volts.
7. Verify the voltage reading.
8. If the supply cover was removed, replace it now.

**CAUTION:**

**If you needed to remove a PC board to perform this procedure, you MUST completely power down the system before placing that board back into the system.**

9. Replace the left side panel of the cabinet.
10. Power Supply adjustment is now complete.

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# ***System90 Model 25***

## ***Connector Pinouts***

The ARIX System90 Model 25 provides interfaces to a wide variety of peripherals and communication devices. The following interface definitions are being supplied to ensure system compatibility. All models of the multiuser system provide the same interfaces except for the system console.

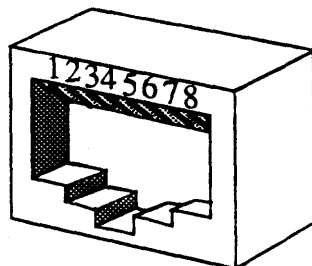
### ***Asynchronous Communications Device Board (ACDB)***

There are seventeen (17) ports on the ACDB. Sixteen RJ-45 asynchronous ports and one (1) DB-25 parallel printer port. The RJ ports are shown in Figure A-1. All of the RJ-45 signal lines on the ACDB and ACE have been equipped with RFI noise suppression circuitry so that unshielded external cables may be used; however, all ports are shielded, and the use of shielded RJ-type plugs and cable is highly recommended.

The parallel port is shown in Figure A-2. The pinouts for the RJ ports are described in Table A-1. The pinouts for the DB-25 parallel port is described in Table A-2.

**NOTE:**

The RJ ports exist on the ACDB, the ACRW, and the ACE. The pin/signal descriptions are identical for all three boards except for the CONSOLE port on the ACRW.

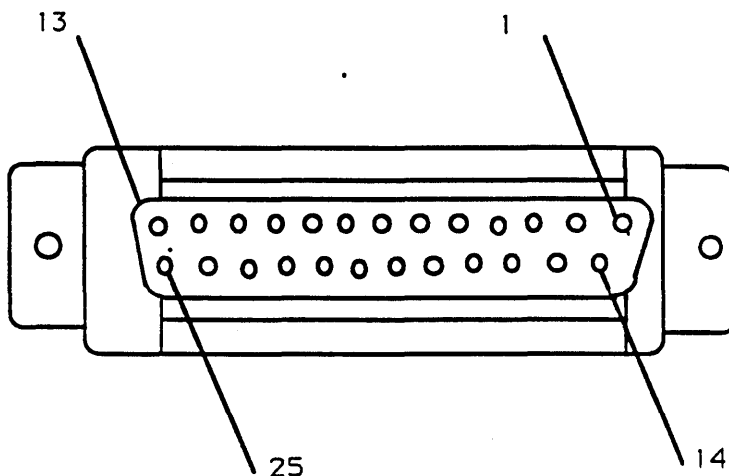


**Figure A-1 Female RJ-45**

**Table A-1 Female RJ-45, DTE, Asynchronous Port Connector Pinout**

RJ-45 ARIX (DTE)		Direction	DB-25 Terminal (DTE)	
Pin #	Signal Name		Pin #	Signal Name
1	No Connection			
2	DSR	←	20	DTR
3	TX	→	3	RX
4	RX	←	2	TX
5	GND	- - -	7	GND
6	DTR	→	8	DCD
7	DCD	←	6	DSR
8	No Connection		20	DTR

NOTE: Pin 20 on the DB-25 connector is connected to two pins on the RJ-45 connector. Pin 6 on the RJ-45 connector is connected to two pins on the DB-25 connector.



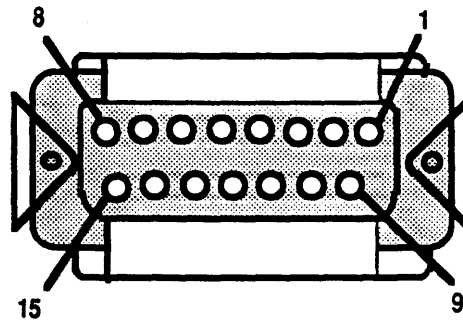
**Figure A-2 25-Pin D (Female)**

**Table A-2 Female DB-25 Parallel Printer Port Connector Pinout for the ACDB and ACRW.**

<i>Pin Numbers</i>	<i>Descriptions</i>
1	Data Strobe
2-9	Data Lines 1 through 8
10	Acknowledge
11	Busy
12	Paper Empty
13	Select
14-25	Signal Ground

## ***LAN/WAN Device Board (LWDB)***

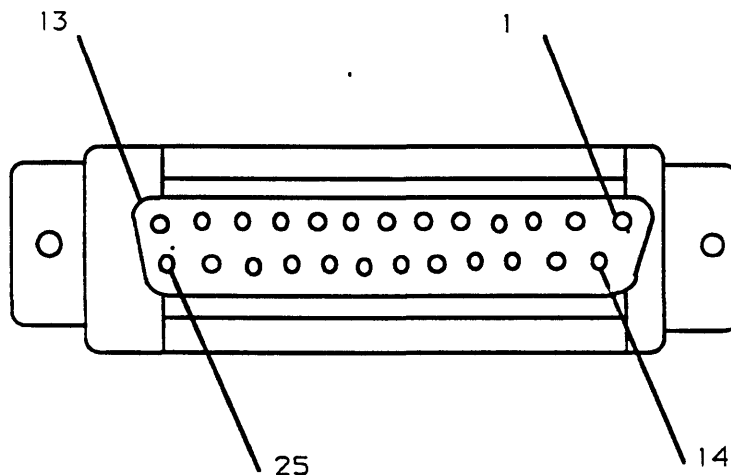
There are three types of external interfaces on the LWDB. The first is a female DB-15 connector (see Figure A-3) to connect to an IEEE 802.3 network. The second is a female DB-25 connector (Figure A-4) used for synchronous RS-232 communications. The third is a female DB-37 connector (Figure A-5) to provide V.35 connection to an X.25 network. The pinouts of these connectors are described in Tables A-3, -4, and -5.



**Figure A-3 15-Pin D (Female)**

**Table A-3 LWDB Female DB-15 IEEE 802.3 Connector Pinout**

<i>Pin Numbers</i>	<i>Descriptions</i>
1	Control IN Signals Shield
2	Collision Presence (+)
3	Transmit (+)
4	Data in Signals Shield
5	Receive (+)
6	Power Return (Ground)
7	Reserved
8	Control OUT Signals Shield
9	Collision Presence (-)
10	Transmit (-)
11	Data OUT Signals Shield
12	Receive (-)
13	Power (+12 VDC fused)
14	Power Shield
15	Reserved

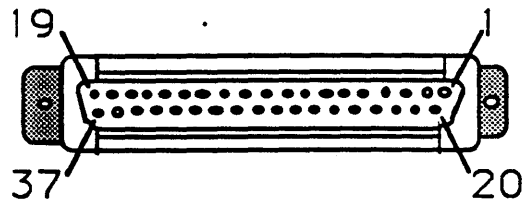


**Figure A-4 25-Pin D (Female)**

**Table A-4 LWDB DB-25 Synchronous Port Connector Pinout**

<i>Pin Number(s)</i>	<i>Description</i>
1	Chassis Ground
2	Transmit Data
3	Receive Data
4	Request to Send
5	Clear to Send
6	Data Set Ready
7	Signal Ground
8	Data Carrier Detected
9-14	No Connection
15	Transmitter Clock
16	No Connection
17	Receiver Clock
18 19	No Connection
20	Data Terminal Ready
21	No Connection
22	Ring Detector
23	No Connection
24	Tx Sig Element Timing
25	No Connection





**Figure A-5 37-Pin D (Female)**

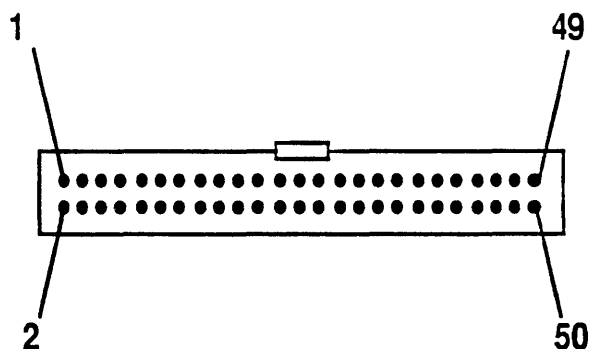
**Table A-5 LWDB Female DB-37 V.35 Connector Pinout**

<i>Pin Number(s)</i>	<i>Description</i>
1	Chassis Ground
2-3	No Connection
4	Transmit Data BA(A)
5	Transmit Clock DB(A)
6	Receive Data BB(A)
7	Request to Send
8	Receive Clock DD(A)
9	Clear to Send
10	Local Loopback
11	Data Set Ready
12	Terminal Ready
13	Remote Loopback
14	Data Carrier Detected
15-16	No Connection
17	External Transmit Clock
18	Test Mode
19	Signal Ground
20	Receive Common
21	No Connection
22	Transmit Data BA(B)
23	Transmit Clock DB(B)
24	Receive Data BB(B)
25	Request to Send
26	Receive Clock DD(B)
27	Clear to Send
28	No Connection
29	Data Mode
30	Terminal Ready
31	Receive Ready
32-34	No Connection
35	Terminal Timing
36	No Connection
37	Send Common

## **Dual SCSI Device Board (DSDB)**

The DSDB provides two independent SCSI channels, in two different formats: single-ended and differential. Since these two formats require different pinouts, the DSDB was designed with four 50-pin male connectors (Figure A-6). The first and third connectors from the top of the board, P1 and P3, are single-ended SCSI channels. The second and fourth connectors, P2 and P4, are differential SCSI channels. P1 and P2 are SCSI channel 1. P3 and P4 are SCSI channel 2.

Only one of the two connectors per SCSI channel may be used at a time. The pinouts for both types of SCSI connections are described in Tables A-6 and A-7.



**Figure A-6 50-Pin Male Connector**

**Table A-6 DSDB SCSI Single-Ended 50-Pin Male Connector Pinout**

Pin Number	Function	Pin Number	Function
1	Ground	26	TERM +5V DC
2	SD(0)	27	Ground
3	Ground	28	Ground
4	SD(1)	29	Ground
5	Ground	30	Ground
6	SD(2)	31	Ground
7	Ground	32	ATN
8	SD(3)	33	Ground
9	Ground	34	Ground
10	SD(4)	35	Ground
11	Ground	36	BSY
12	SD(5)	37	Ground
13	Ground	38	ACK
14	SD(6)	39	Ground
15	Ground	40	RST
16	SD(7)	41	Ground
17	Ground	42	MSG
18	SD(P)	43	Ground
19	Ground	44	SEL
20	Ground	45	Ground
21	Ground	46	C/D
22	Ground	47	Ground
23	Ground	48	REQ
24	Ground	49	Ground
25	Not Used	50	I/O

**Table A-7 DSDB SCSI Differential 50-Pin Male Connector Pinout**

Pin Number	Function	Pin Number	Function
1	Not Used	26	TERM +5V DC
2	Ground	27	Ground
3	SD(0)	28	Ground
4	SD*(0)	29	ATN
5	SD(1)	30	ATN*
6	SD*(1)	31	Ground
7	SD(2)	32	Ground
8	SD*(2)	33	BSY
9	SD(3)	34	BSY*
10	SD*(3)	35	ACK
11	SD(4)	36	ACK*
12	SD*(4)	37	RST
13	SD(5)	38	RST*
14	SD*(5)	39	MSG
15	SD(6)	40	MSG*
16	SD*(6)	41	SEL
17	SD(7)	42	SEL*
18	SD*(7)	43	C/D
19	SD(P)	44	C/D*
20	SD*(P)	45	REQ
21	DIFFSENSE	46	REQ*
22	Ground	47	I/O
23	Ground	48	I/O*
24	Ground	49	Ground
25	TERM +5V DC	50	Ground

## **Asynchronous Communication Real World Interface (ACRW) Board**

Four types of external interfaces exist on the ACRW board. The first is a female RJ-45 connector (Figure A-1) used for DTE asynchronous communications. Refer to Table A-1 for a description of the connector pinouts. The second is the ACRW CONSOLE port. It is a female RJ-45 connector (Figure A-1) used for DCE asynchronous communications. Refer to Table A-8 for a description of the connector pinouts. The third connector is a female DB-25 connector (Figure A-2) which is used to interface to a parallel printer. Refer to Table A-2 for a description of the pinouts for the connector. The fourth type of connector is a male DB-9 (Figure A-7) used to connect to the Uninterruptible Power Supply (UPS) port. Pinouts for this connector are described in Table A-9.

**Table A-8 Female RJ-45, DCE, Asynchronous Port Connector Pinout**

RJ-45 ARIX CONSOLE Port (DCE)		Direction	DB-25 Terminal (DTE)	
Pin #	Signal Name		Pin #	Signal Name
1	No Connection			
2	DSR	→	6	DSR
3	TX	←	2	TX
4	RX	→	3	RX
5	GND	---	7	GND
6	DTR	←	20	DTR
7	DCD	→	8	DCD
8	No Connection			

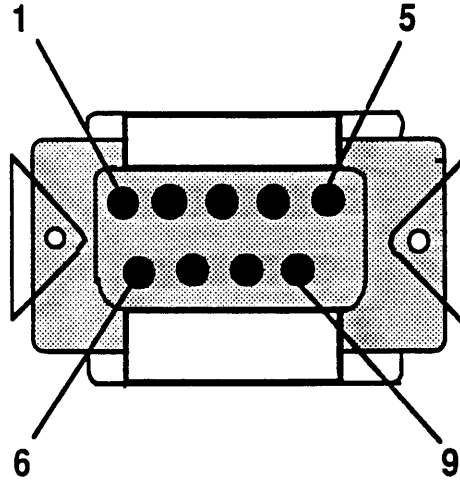


Figure A-7 9-Pin D (Male)

Table A-9 ACRW Male DB-9 UPS Port Connector Pinout

Pin Number	Description
1	AC Fail (active low)
2	No Connection
3	UPS Off (active low)
4	No Connection
5	Low Battery (active low)
6	No Connection
7	Signal Ground
8	No Connection
9	No Connection

For more information on the UPS interface, refer to *Uninterruptible Power Supply Application Guidelines for the ARIX System90*.