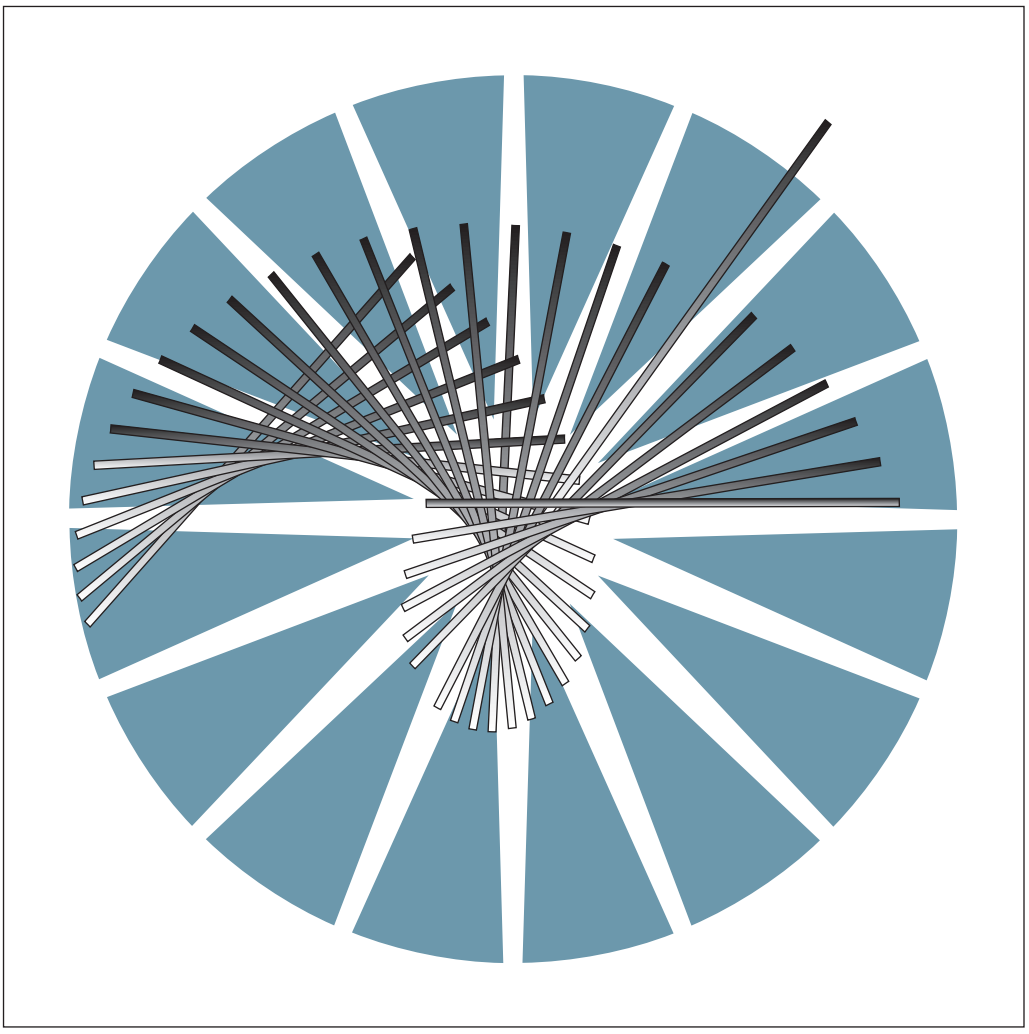
3746 Nways Multiprotocol Controller
Models 900 and 950

Multiaccess Enclosure Installation and Maintenance



SY33-2118-03

3746 Nways Multiprotocol Controller
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SY33-2118-03

Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page xv.

Fourth Edition (April 1998)

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Product Safety Information

General Safety

This product meets IBM safety standards.

Safety Notices

For *Safety Notices* refer to *IBM 3745 Communication Controller All Models*, *IBM 3746 Expansion Unit Model 900*, *IBM 3746 Nways Multiprotocol Controller Model 950*, *Safety Information*, GA33-0400

Safety Notices for United Kingdom

1. The IBM 3746 Expansion Unit Model 900 and IBM 3746 Nways Multiprotocol Controller Model 950 are manufactured according to the International Safety Standard EN 60950 and as such are approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.
2. The network adapter interfaces housed within the IBM 3746 Expansion Unit Model 900 and IBM 3746 Nways Multiprotocol Controller Model 950 are approved separately, each one having its own independent approval number. These interface adapters, supplied by IBM, do not use or contain excessive voltages. An excessive voltage is one that exceeds 42.4 V peak ac or 60 V dc. They interface with the IBM 3746 Expansion Unit Model 900 and IBM 3746 Nways Multiprotocol Controller Model 950 using Safety Extra Low Voltages (SELV) only. In order to maintain the separate (independent) approval of the IBM adapters, it is essential that other optional cards, not supplied by IBM, do not use mains voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by IBM.

Service Inspection Procedures

The Service Inspection Procedures help service personnel check whether the 3746 conforms to IBM safety criteria. They have to be used each time the 3746 safety is suspected. The *Service Inspection Procedures* section is located at the beginning of the:

- *3746-950 Service Guide*, SY33-2108.
- *3746-900 Service Guide*, SY33-2116.

The 3746 areas and functions checked through service inspection procedures are:

1. External covers
2. Safety labels
3. Safety covers and shields
4. Grounding
5. Circuit breaker and protector rating

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6. Input power voltage
7. Test of emergency power OFF/control power switch.
8. Power-ON indicator

About this Book

Who Should Use this Book

The IBM personnel using this book should be:

- Trained to service the IBM 2216, 3746-900, and 3746-950.
- Familiar with the configuration of the 3746-900, and 3746-950.
- Familiar with the IBM 2216 Nways Multiaccess Enclosure service documentation.

How to Use this Book

This book provides procedures for installing and maintaining an IBM 2216. To ensure the most efficient installation:

- Read the instructions carefully before attempting to do them,
- Complete each step before going to the next one,
- Go through the chapters sequentially.

How this Book is Organized

Chapter 1	Presents the procedures to install and connect the multiaccess enclosure. It also gives procedures to customize the multiaccess enclosure parameters.
Chapter 2	Presents the software maintenance procedures for the multiaccess enclosure.
Chapter 3	Gives the procedures for problem determination.
Chapter 4	Gives the procedures for FRU exchange.
Chapter 5	Gives the procedures to access firmware and operational code
Chapter 7	Gives the procedures for adding or removing options.
Chapter 6	Gives the procedures for relocating or removing the multiaccess enclosure.
Appendix A	Gives the component locations of the multiaccess enclosure
Appendix B	Gives the adapter plugging rules.
Appendix C	Provides parameter worksheet for multiaccess enclosure.
Appendix D	Gives the component locations for units installed in a controller expansion.
Appendix E	Gives how to manage the operational code and configuration files.
Appendix F	Gives the common tasks.

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Appendix G Gives hardware error codes.

Appendix H Gives the parts.

Appendix I Gives the external cables characteristics.

Appendix J A service and customer documentation bibliography.

A **Glossary** and an **index** are provided at the end of this book.

Where to Find More Information

For a complete list of the customer and service information manuals, see at the end of this manual. In this *IBM 2216 manual* , references are made to the following publications:

IBM 2216 Nways Multiaccess Connector Setup Guide, GA27-4106

Caution: Safety Information-Read This First, SD21-0030

IBM 2216 Nways Multiaccess Connector Introduction and Planning Guide, GA27-4105

IBM 2216 Maintenance Guide, SY27-0350

3745 Communication Controller Models A and 3746 Models 900 and 950: Planning Guide, GA33-0457

World Wide Web

You can access the latest news and information about IBM network products, customer service and support, and microcode upgrades via the Internet at the URL: http://www.lagaude.ibm.com/3746pe

Online Documentation from CD-ROM

Starting at EC F12380, with the service processor is now shipped a CD which contains the LIC and a copy of the 3746 web site. You will find from this web page, marketing, PE, and all information about CCP products.

To access this page:

1. Insert the CD into the CD disk drive of the SP.
2. From the MOSS-E primary menu, click on **Information**
3. Double click on **CD-ROM documentation**
4. Then if you want to display the CCP documentation, click on **Documentation**
5. Click on **La Gaude Information Development: Communication Controllers Information**

Note: To have the very last version of the web site, connect to Internet at: http://w3.lagaude.ibm.com/ccp/3746.htm

Service Personnel Definitions

See the *3746-950 Service Guide*, SY33-2108, or the *3746-900 Service Guide*, SY33-2116.

Chapter 1. Installing and Setting Up Your MAE

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Overview

The Multiaccess Enclosure (MAE) is based on an IBM 2216, for location refer to Appendix A, “Multiaccess Enclosure Components Location” on page A-1

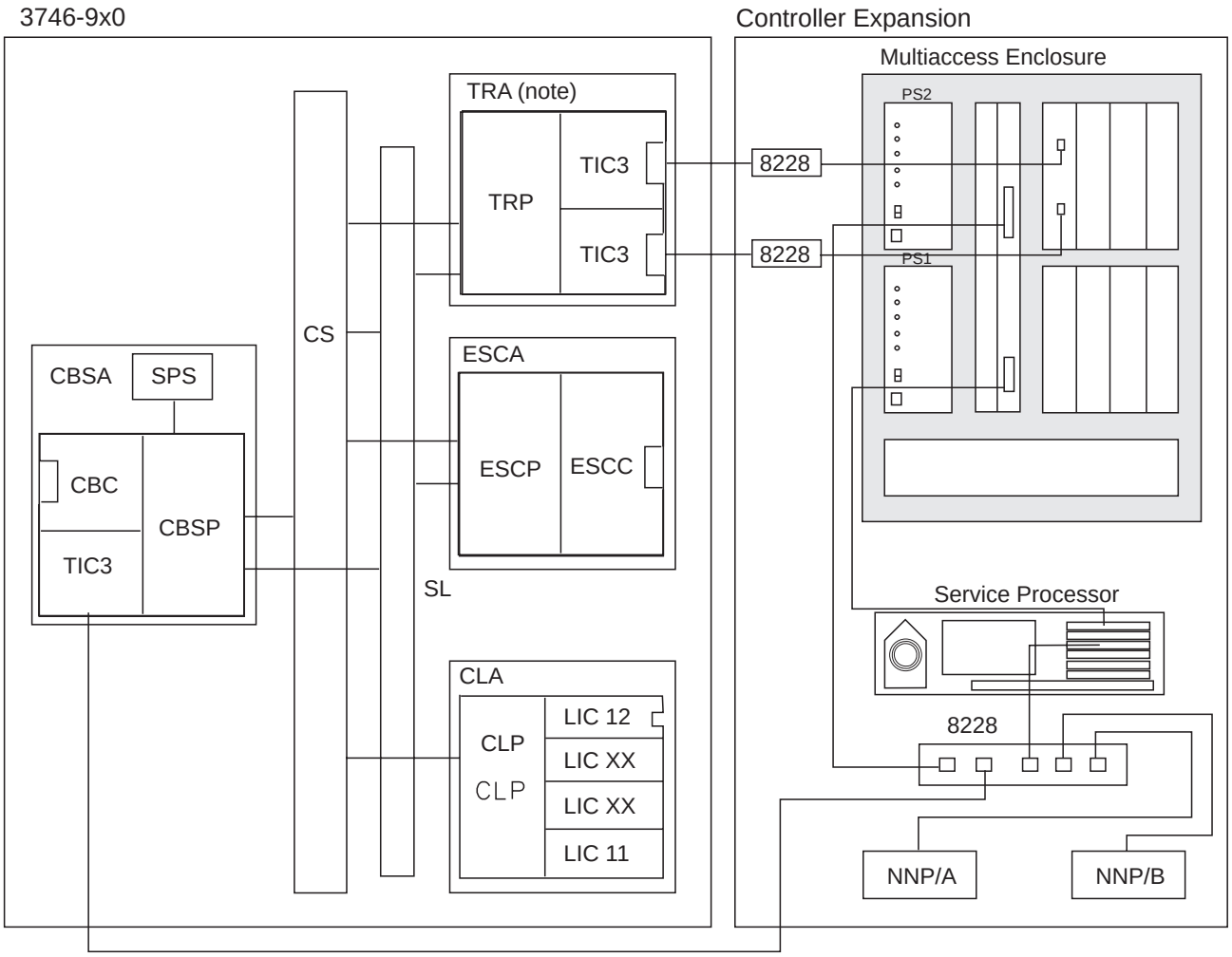


Figure 1-1. Multiaccess Enclosure Environment

Notes:

1. If there is no APPN traffic between the 3746 and the MAE, the link(s) "TRP ---> TIC3 ---> 8228 ---> MAE" is not required. In that case the TRP/TIC3s, 8228, and associated cables are not required.
2. To support APPN traffic between the MAE and the 3746-9X0 you can have:
   - **One link**: TIC3 - 8228 - MAE.
   - Or **two links** can be used to optimize the thruput from the MAE to the 3746-9X0 (the two TIC3s can be plugged on two different TRPs).

Installation Time

The estimated installation time for the multiaccess enclosure is: **2.45** Hours.

Note: A **second CE** is needed to help hold the MAE while is being mounted in the controller expansion.

Multiaccess Enclosure Installation Tasks

TASK	DESCRIPTION	GO TO
1	Installation Preparation	**“Step 1 - Preparing Your Installation” on page 1-4** ..
2	Install the MAE.	**“Step 2 - Installing the MAE” on page 1-5** ..
3	Connect the MAE to the Service Processor	**“Step 3.1 - Connecting the MAE to a 7585” on page 1-11** .. or **“Step 3.2 - Connecting the MAE to a 3172” on page 1-13** .. or **“Step 3.3 - Connecting the MAE to a 9585” on page 1-15** ..
4	Connect the MAE to the 3746-9X0	**“Step 4 - Connecting the MAE to the 3746-9X0” on page 1-17** ..
5	Customize the MAE.	**“Step 5 - Customizing the MAE” on page 1-20**

Go to, “Step 1 - Preparing Your Installation” on page 1-4

Step 1 - Preparing Your Installation

Important Notes

1. If your customer plan to have **only traffic** routing between MAE ports (**inside the MAE**) the note 2 does not apply (refer to “LAN link from the MAE to the 3746” on page C-1).
2. If required and before starting the installation be sure that one or two TIC3 and one or two token-ring cables are available to connect the MAE to the 3746-9X0. Refer to Figure 1-18 on page 1-19, these cables **3** connect the 8228 to the TIC3. The standard cable shipped with a TIC3 is PN 72F1236 (9M, 30Ft).
3. Two **compact disks** are now shipped with the machine and contains the code for the service processor and for the multiaccess enclosure, these two CD-ROM are identical and are duplicated if one of them has been damaged. Store these disks in a safe place (service drawer is fine).
4. Before starting the installation, connect to the following web site: http://www.lagaude.ibm.com/3746pe, and download all mandatory fixes according to the level of the code that you are going to install.

Obtain from the customer the following **Parameter worksheets**:

1. **Parameter definitions for multiaccess enclosure**
2. **LAN link between the MAE and 3746**

These parameter worksheets are part of the *3745 Communication Controller Models A and 3746 Models 900 and 950: Planning Guide*, GA33-0457 Appendix A and must be filled in by the customer. A copy of these parameter worksheets is given at the end of this manual see Appendix C, “Parameter Worksheets” on page C-1 and “LAN link from the MAE to the 3746” on page C-1.

Go to, “Step 2 - Installing the MAE” on page 1-5

Step 2 - Installing the MAE

1. ____ **Unpack** your MAE and verify that, along with this guide, the following items were included:
   - **Documentation**
     - *Caution: Safety Information-Read This First*, SD21-0030
   - **Hardware**
     - One or two 8228 (optional)
     - Any cable ordered
     - One Power cord for each power supply
     - Rack mount installation kit
     - One ac outlet distribution box (if ordered when the MAE has two power supplies)
2. ____ According to the units to be installed in the controller expansion, **determine** the location where your are going to install the MAE in the controller expansion, refer to Figure D-1 on page D-2 and Figure D-7 on page D-8 for help.
3. ____ **Install** two brackets **1** (PN 58G5793) using four screws **2** (PN 2665527) in the controller expansion as shown in Figure 1-2.

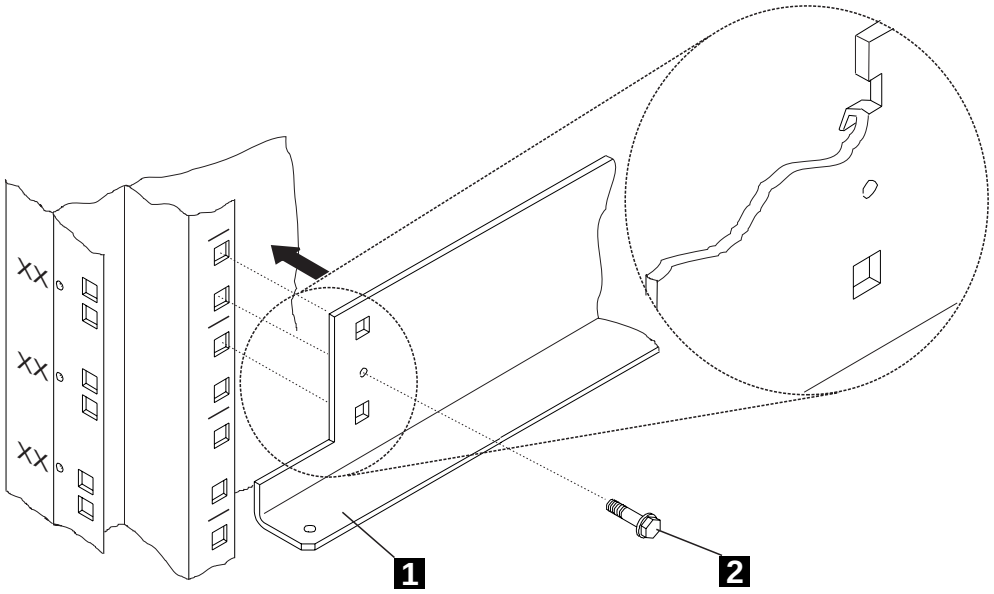


Figure 1-2. Brackets Installation

4. ____ To make the MAE easier to lift, **remove** the fan tray and each power supply.

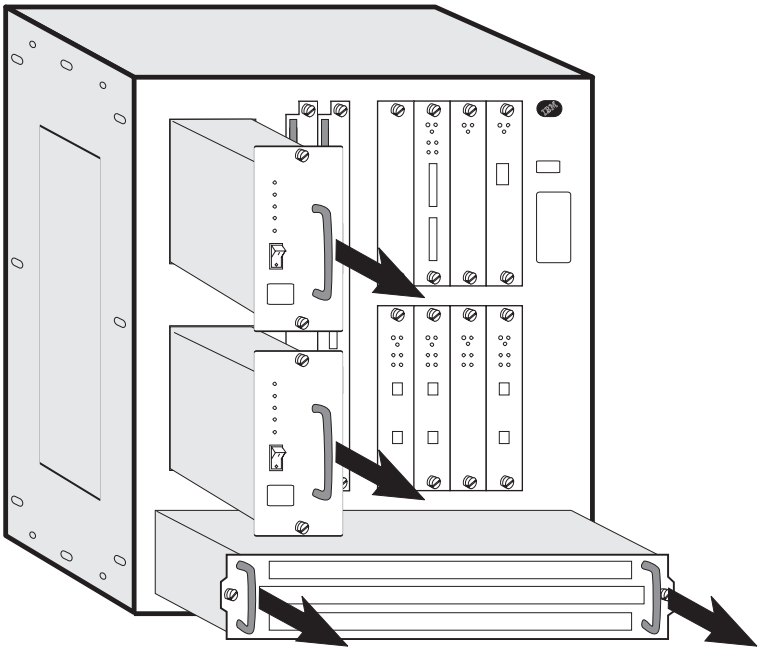


Figure 1-3. Fan Tray and Power Supply Removal.

5. ____ Refer to Figure 1-4, **remove** the four screws **1** installed on the MAE frame, then **install** on the left and right side of the MAE two brackets **2** (PN 0782961) using four screws **3** (PN 1621191).

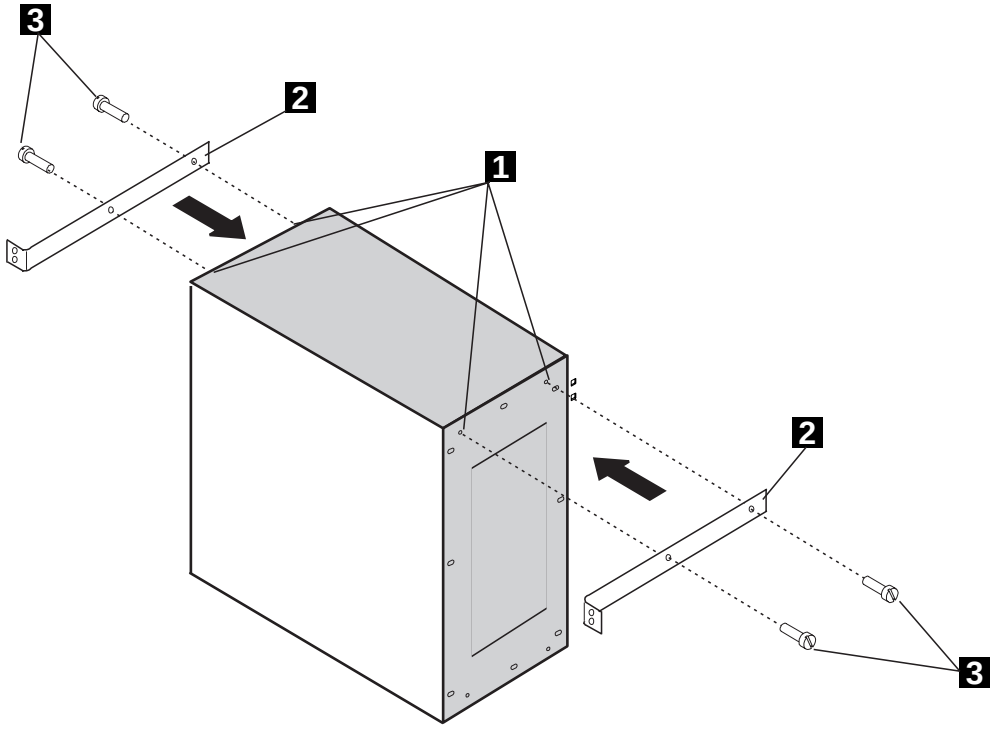


Figure 1-4. MAE Brackets Installation

6. ____ **Install** two captive nuts PN 58G5766 in the rear side of the controller expansion as shown in Figure 1-5, refer also to Figure D-7 on page D-8 to determine the location of the captive nuts from the brackets position.

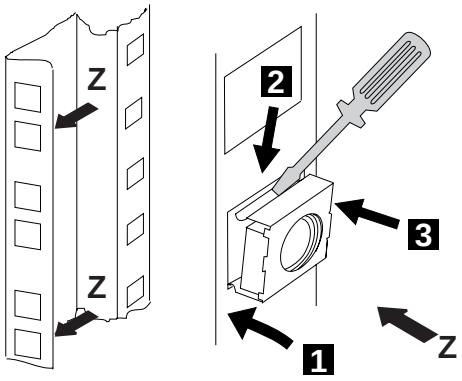


Figure 1-5. Captive Nuts Installation

7. ____ At the back of the controller expansion (with the help of a second CE), **set** the MAE on the brackets and fasten the MAE using two screws **1** (PN 1621230) as shown on Figure 1-6.

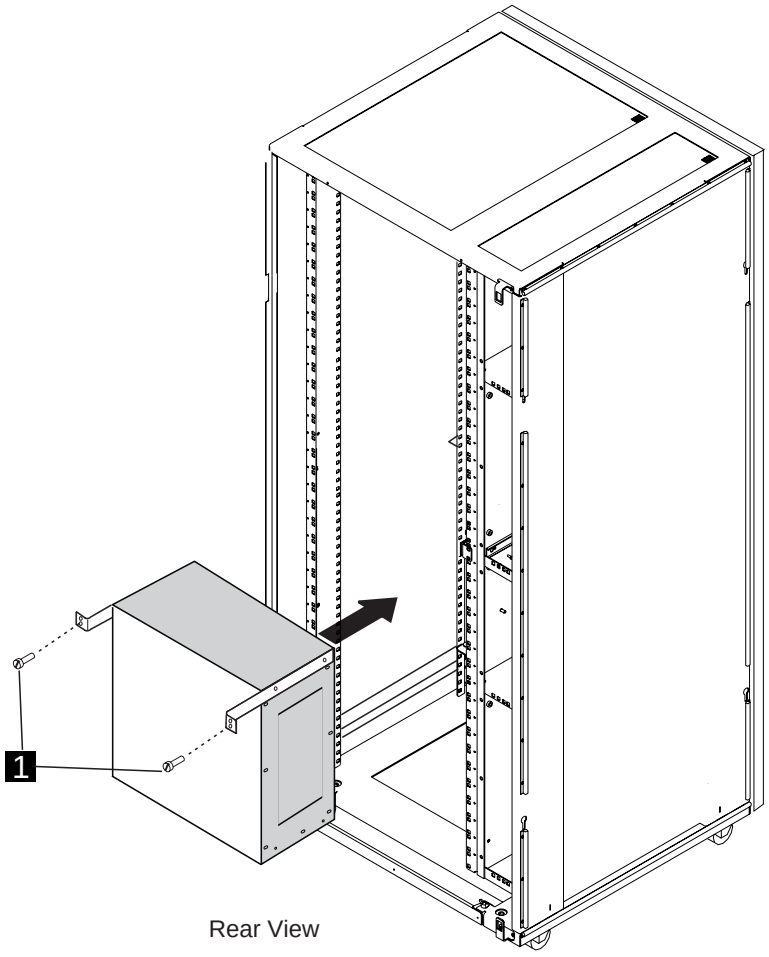


Figure 1-6. Installing MAE in the Controller Expansion

8. ____ **Reinstall** the fan tray and each power supply, making sure the screws are secured, refer to Figure 1-7.

   Note: If you need to reinstall adapters, refer to Appendix B, “MAE Adapters Plugging Rules” on page B-1.

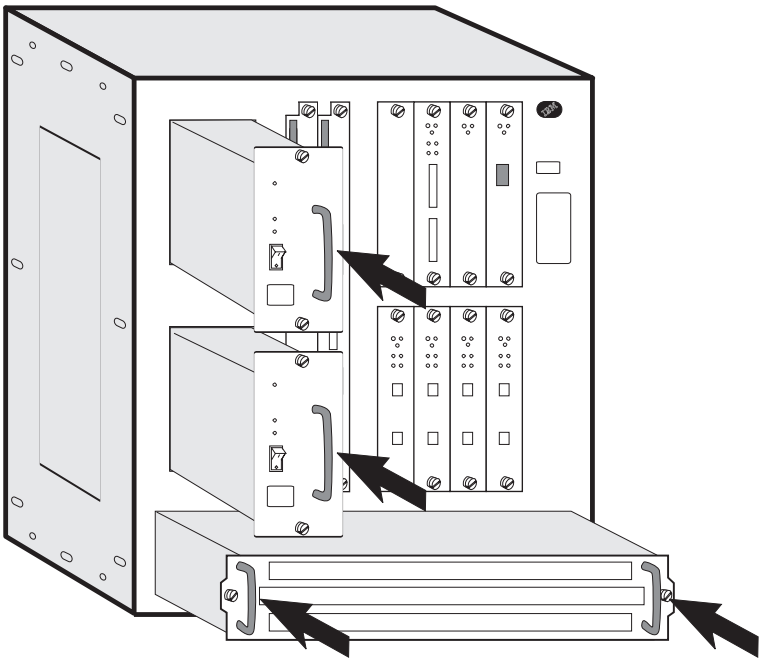
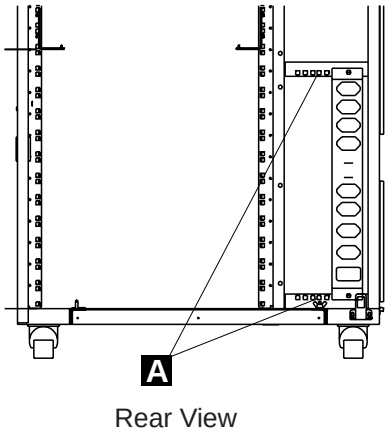


Figure 1-7. Installing Fan Tray and Power Supply

Do you have to install a second **ac outlet distribution box** ?

- **Yes**, go to step 9.
- **No**, go to “Installing the 8228s” on page 1-17.

9. ____ **Identify** the two captive nuts **A** .



Rear View

Figure 1-8. Locating the Captive Nuts

10. ____ Refer to Figure 1-9, and **install** (if necessary) the two captive nuts (PN 58G5766).

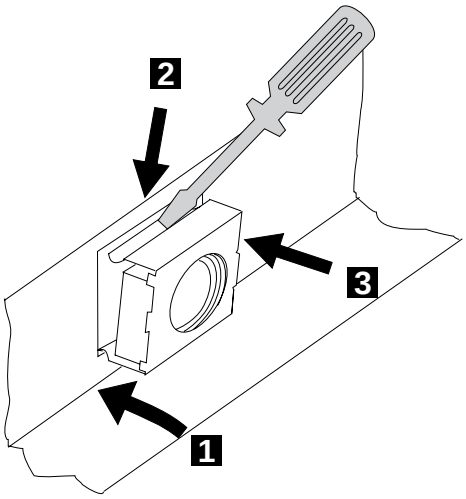


Figure 1-9. Installing the Captive Nuts

11. ____ Refer to Figure 1-10, using one lockwasher (PN 1622319), one starwasher (PN 1622347), and one screw (PN1673983), **connect** the ground jumper **A** (PN 63F2459) to the new ac outlet distribution box.
12. ____ **Install** the ac outlet distribution box **B** close to the first ac outlet distribution box and fasten using two screws **C** (PN 1621230).

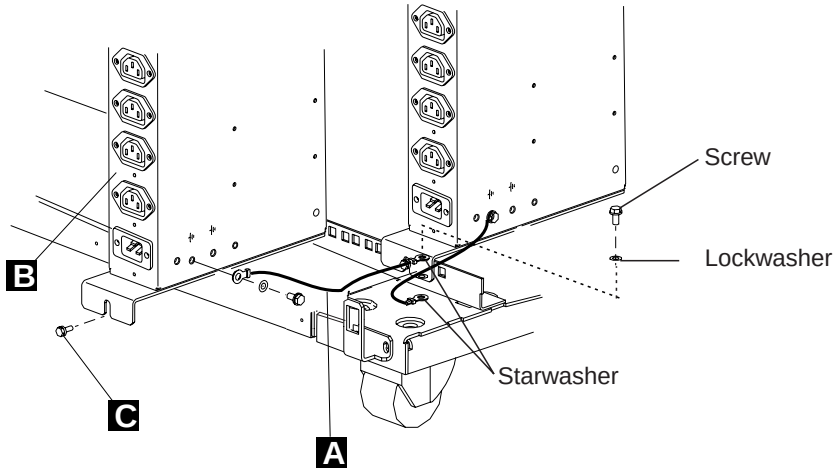


Figure 1-10. Installing the Captive Nuts

13. ____ Using the same washers and screw used to connect the first ac outlet distribution box, **connect** the other lead of the ground jumper **A** to the frame.

14. ____ Connect the ac outlet distribution box to the customer ac power as follows:

    a. ____ Plug the power cord **A** (country dependant) into location **IN** of the ac outlet distribution box.

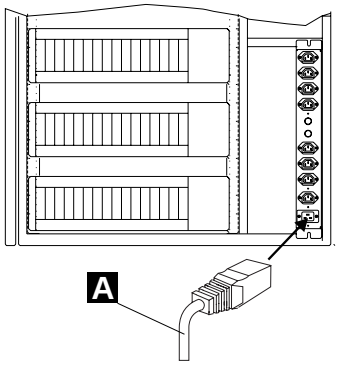


Figure 1-11. Power Cord Installation

    b. ____ Route and connect the other lead of the power cord to the customer's power socket.

15. ____ Switch or ask the customer to switch ON the circuit breaker to be used for the ac outlet distribution box.

16. ____ Verify that the phase is distributed as shown below: **if not, notify the customer and do not proceed until the problem is corrected**.

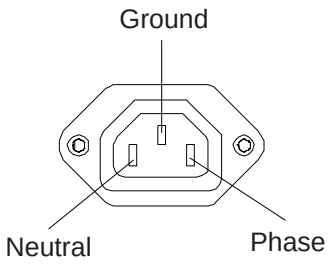


Figure 1-12. Power Distribution

Depending on the service processor type installed, Go to:

- **7585**, “Step 3.1 - Connecting the MAE to a 7585” on page 1-11
- **3172**, “Step 3.2 - Connecting the MAE to a 3172” on page 1-13
- **9585**, “Step 3.3 - Connecting the MAE to a 9585” on page 1-15

Step 3.1 - Connecting the MAE to a 7585

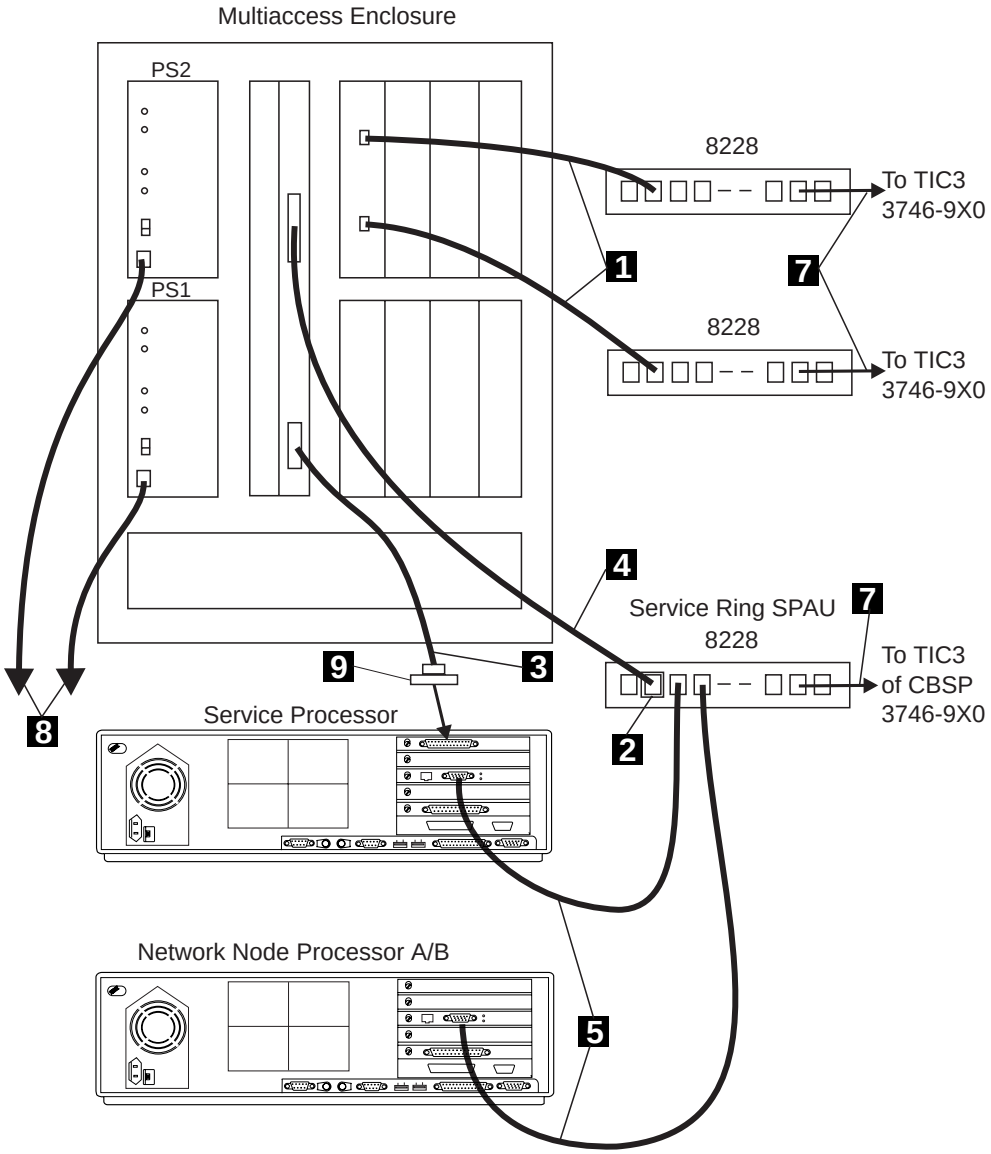


Figure 1-13. Cabling the Multiaccess Enclosure to a 7585

Connect the MAE to the service processor and 3746-9x0 as follows:

1. ____ Plug one adapter **2** (PN 73G8314) into any free location of the service processor access unit (8228, service ring SPAU).
2. ____ Connect cable **4** (PN 782960) on top of the PCMCIA card, then plug the PCMCIA card into the system card (into any of the two slots) and the other lead of the cable to the plug of the 8228 where you installed connector **2** in the previous step.
3. ____ Connect cable **3** (PN 782958) from the connector EIA-232 of the system card to the convertor **9** (PN 782982). And then, plug the convertor and cable to the COM 2 connector (upper slot) of the service processor.
4. ____ Connect power cord **8** (PN 58G5783) from the power supply to any free plug of the ac outlet distribution box.

Note: If you installed in step 9 on page 1-8 a second ac outlet distribution box, install another power cord from this ac outlet distribution box to the second power supply of the MAE.

5. ____ According to the plugging sheets, connect the external cables from slot 2 to 8 of the MAE.

Go to "Step 4 - Connecting the MAE to the 3746-9X0" on page 1-17

Step 3.2 - Connecting the MAE to a 3172

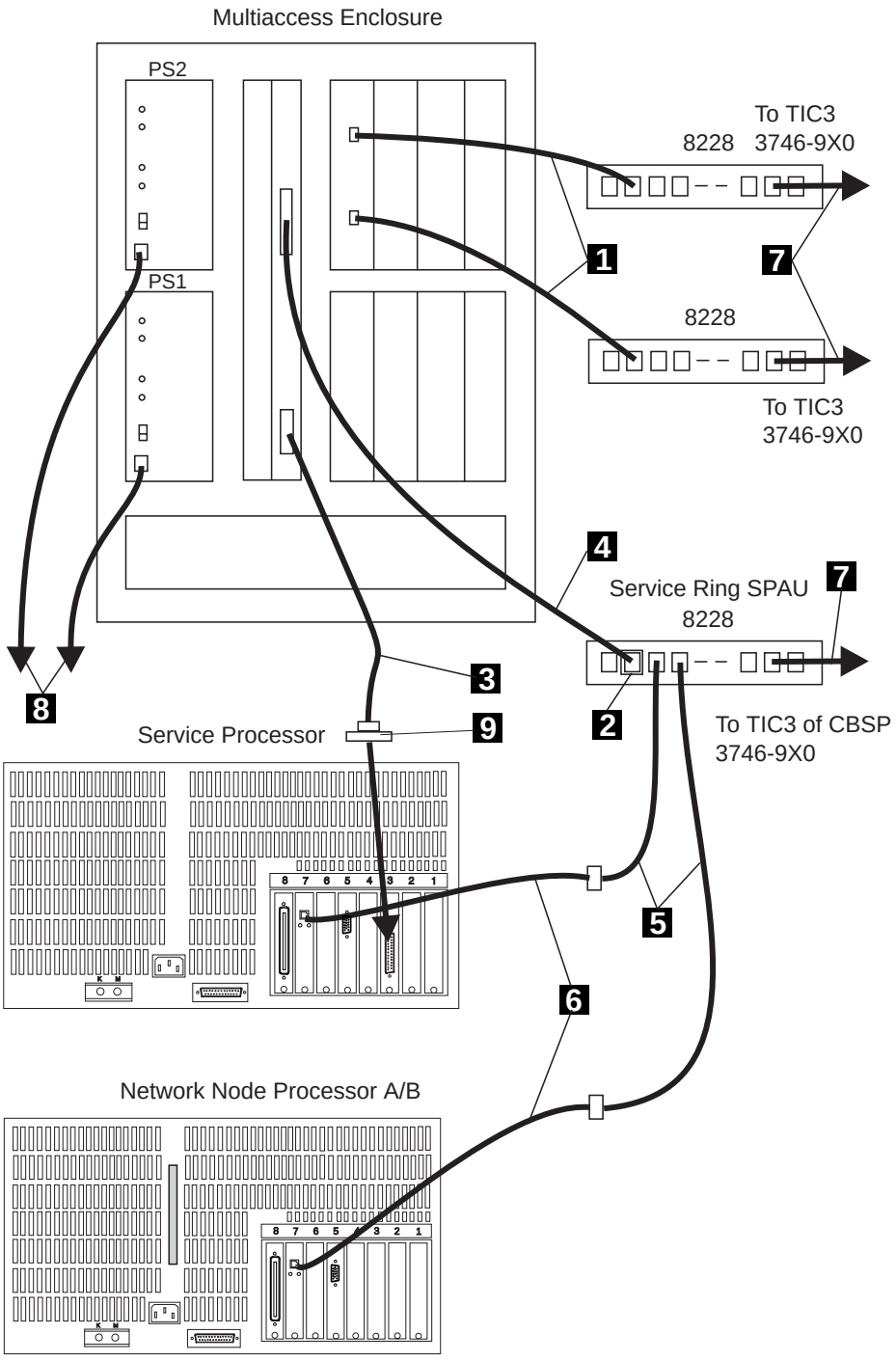


Figure 1-14. Cabling the Multiaccess Enclosure to a 3172

Connect the MAE to the service processor and 3746-9x0 as follows:

1. ____ Plug one adapter **2** (PN 73G8314) into any free location of the service processor access unit (8228, service ring SPAU).
2. ____ Connect cable **4** (PN 782960) on top of the PCMCIA card, then plug the PCMCIA card into the system card (into any of the two slots) and the other

lead of the cable to the plug of the 8228 where you installed connector **2** in the previous step.

3. ____ Connect cable **3** (PN 782958) from the connector EIA-232 of the system card to the convertor **9** (PN 782982). And then, plug the convertor and cable to the COM 2 connector (upper slot) of the service processor.
4. ____ Connect power cord **8** (PN 58G5783) from the power supply to any free plug of the ac outlet distribution box.

   Note: If you installed in step 9 on page 1-8 a second ac outlet distribution box, install another power cord from this ac outlet distribution box to the second power supply of the MAE.
5. ____ According to the plugging sheets, connect the external cables from slot 2 to 8 of the MAE.

Go to "Step 4 - Connecting the MAE to the 3746-9X0" on page 1-17

Step 3.3 - Connecting the MAE to a 9585

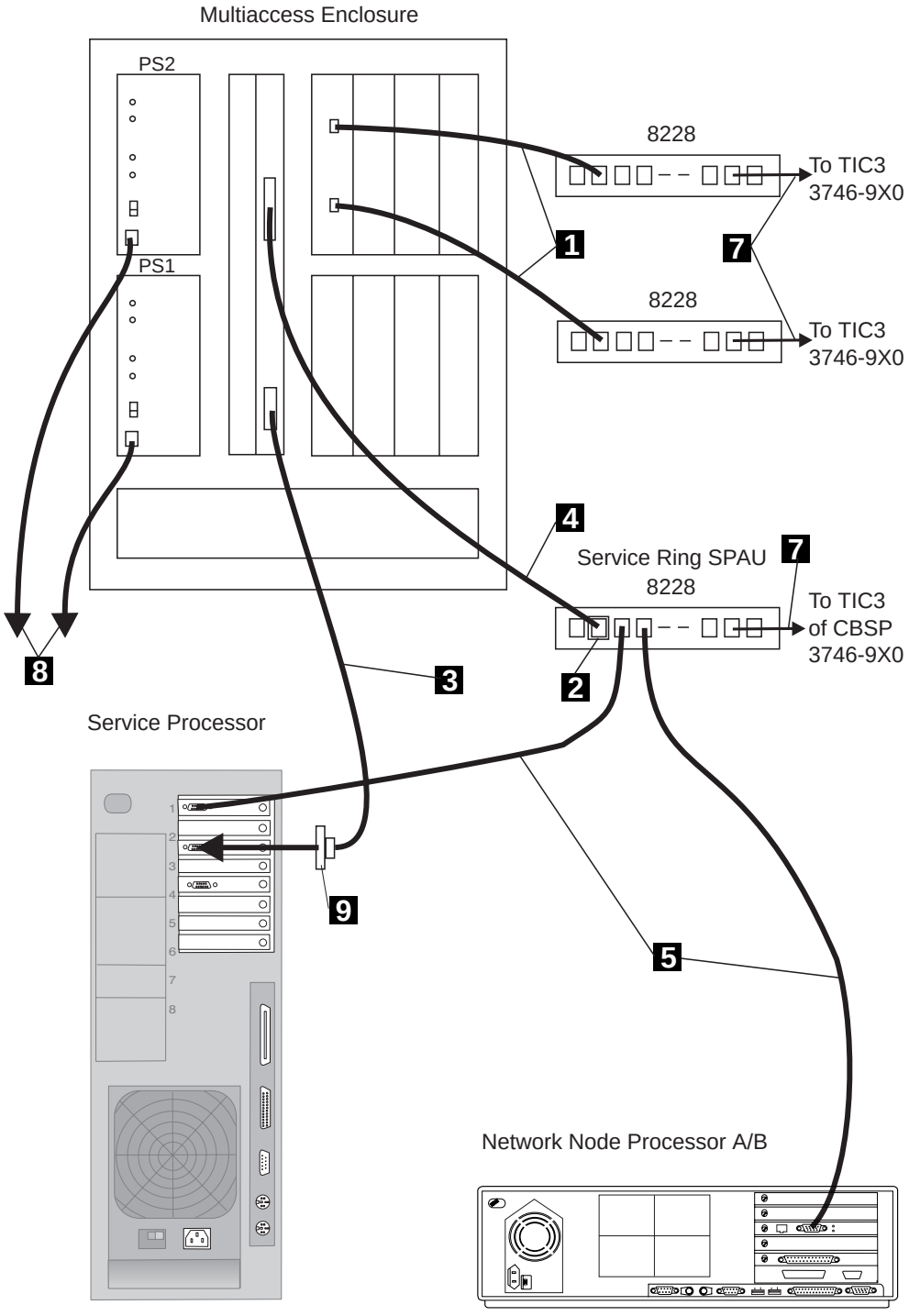


Figure 1-15. Cabling the Multiaccess Enclosure to a 9585

Connect the MAE to the service processor and 3746-9x0 as follows:

1. ____ Plug one adapter **2** (PN 73G8314) into any free location of the service processor access unit (8228, service ring SPAU).

2. ____ Connect cable **4** (PN 782960) on top of the PCMCIA card, then plug the PCMCIA card into the system card (into any of the two slots) and the other lead of the cable to the plug of the 8228 where you installed connector **2** in the previous step.
3. ____ Connect cable **3** (PN 782958) from the connector EIA-232 of the system card to the convertor **9** (PN 782982). And then, plug the convertor and cable to the COM 2 connector (upper slot) of the service processor.
4. ____ Connect power cord **8** (PN 58G5783) from the power supply to any free plug of the ac outlet distribution box.

   Note: If you installed in step 9 on page 1-8 a second ac outlet distribution box, install another power cord from this ac outlet distribution box to the second power supply of the MAE.
5. ____ According to the plugging sheets, connect the external cables from slot 2 to 8 of the MAE.

Go to "Step 4 - Connecting the MAE to the 3746-9X0" on page 1-17

Step 4 - Connecting the MAE to the 3746-9X0

If your customer has ordered one or two TR connection kits (refer to “LAN link from the MAE to the 3746” on page C-1), go to:

- “Installing the 8228s”
- Otherwise, go to “Step 5 - Customizing the MAE” on page 1-20

Installing the 8228s

1. ____ Unpack the 8228, and then reset the 8228 ports as explained in the following steps:

   Note: Use the IBM 8228 Setup Aid after you have installed the 8228 and before you connect any cables to it. Save one Setup Aid to be used later if you relocate an 8228.

2. ____ Before you begin, make sure no cables are connected to the 8228. If a cable bracket has been installed on the 8228, remove it.

3. ____ Insert the aid into receptacle 1 of the 8228. The yellow stripe should be aligned with the edge of the receptacle to ensure that the aid is firmly seated.

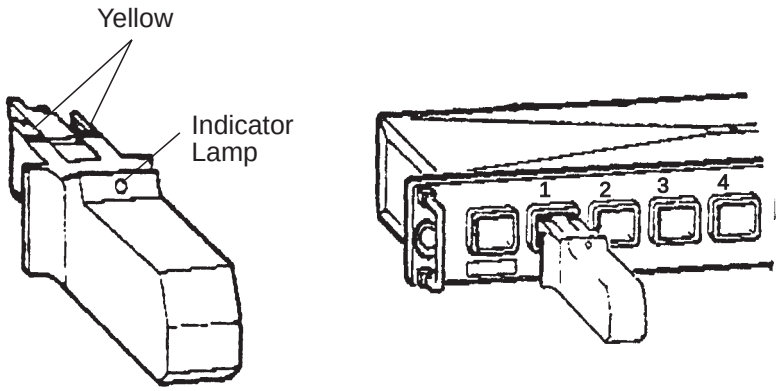


Figure 1-16. Use of the 8228 Setup Aid

   The light will glow brightly when the aid is initially inserted and will gradually dim when the aid is firmly seated in the receptacle.

   If the light does not glow brightly when you insert the Setup Aid, remove the screw from the aid and replace the battery. If the light still does not glow brightly after you have replaced the battery, try another Setup Aid.

4. ____ Leave the aid in the receptacle for four seconds after the light has gone out. Remove the aid from the receptacle and insert it into the next receptacle. The yellow stripe should be aligned with the edge of the receptacle to ensure that the aid is firmly seated.

   Go to the next receptacle and repeat this step until you have set each receptacle, 1 through 8.

5. ____ When you have set receptacle 8, insert the aid into the RI receptacle for four seconds.

The light should glow brightly while the aid is in the receptacle. If the light does not come on or goes out while the aid is connected to the receptacle, the 8228 must be replaced. Notify your network planner or supervisor.

Note: The 8228 Setup Aid is to be used only in setting up the 8228 either initially or after relocating the 8228. It should never be used when the network is operating.

6. ____ Install the 8228s **A** in the controller expansion using two screws (PN 1621232) and two captive nuts (PN 58G5766) see Figure 1-17. Using label **B** (PN 782964), identify the 8228 as MAE Access Unit.

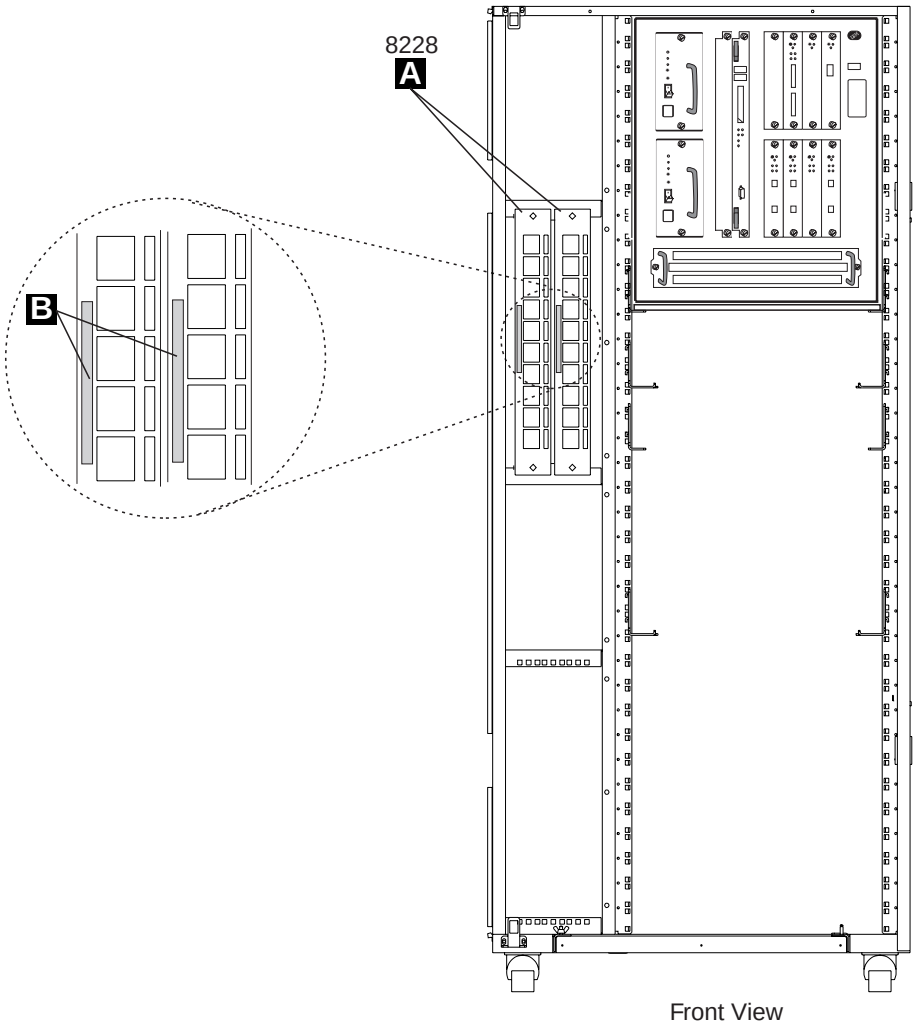


Figure 1-17. Installing the 8228 (Controller Expansion)

Connect the MAE to the 3746-9X0 thru 8228

Notes

1. You can have to install **one** or **two** links (TIC3 - 8228 - TR) from the 3746-9X0 and the MAE.
2. The TIC3(s) can be installed in **any position** in the basic or expansion boards of the 3746-9X0.

1. ____ Connect two cables **4** (PN 43G3953) from the token-ring adapter connectors **2** installed in location 1 of the MAE to any free plugs of the 8228.
2. ____ Obtain from your customer two cables **3** PN 72F1236 (9M, 30 Ft) or any longer token-ring cables. Plug these cables from the MAE 8228 to the TIC3 connectors **1** available in the 3746-9X0.

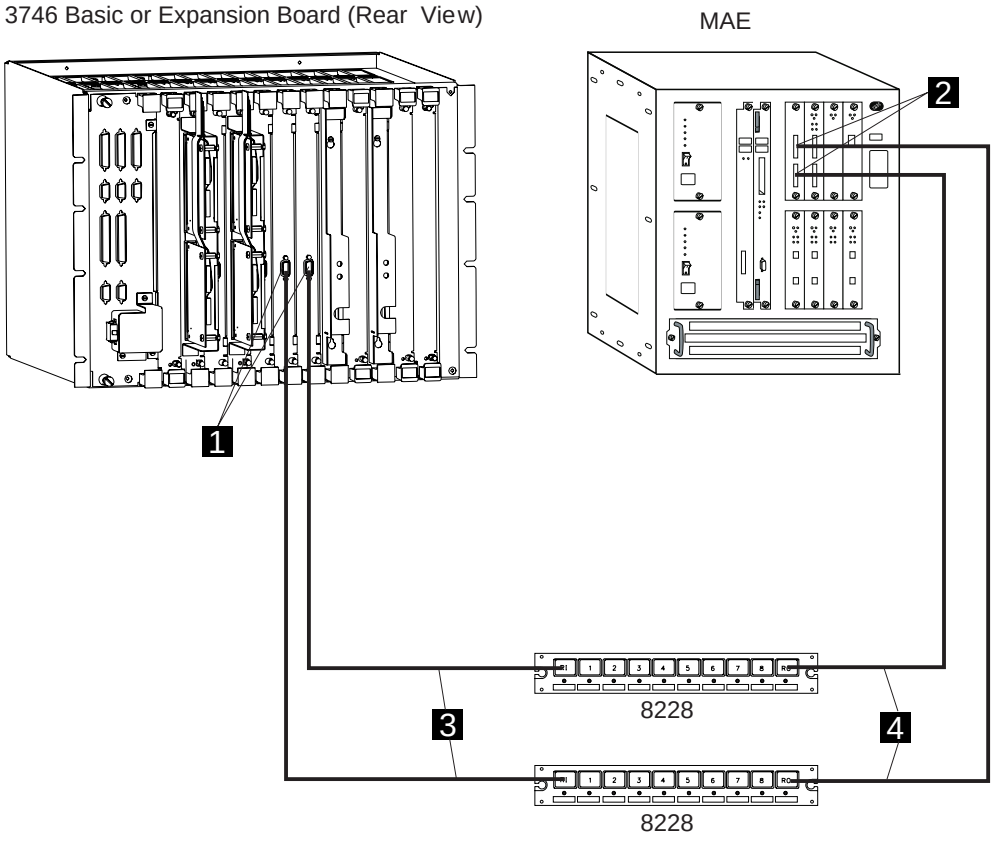


Figure 1-18. Connecting the MAE to the 3746-9X0 Via 8228

Go to,"Step 5 - Customizing the MAE" on page 1-20

Step 5 - Customizing the MAE

Notes

For any unexpected message or error concerning the Multiaccess Enclosure:

- The **START** page of the *3746-900 Service Guide*, SY33-2116, if you are working on a **3746 Model 900**.
- The **START** page of the *3746-950 Service Guide*, SY33-2108, if you are working on a **3746 Model 950**.

During the following procedures do NOT change the speed of the PCMCIA Token Ring card. This procedure must be used ONLY when for repair action you have to exchange the PCMCIA TR card.

1. ____ From the '3746-9x0 Menu', click on **Multiaccess Enclosure (MAE) Management**, then double click on **Manage Multiaccess Enclosure**.

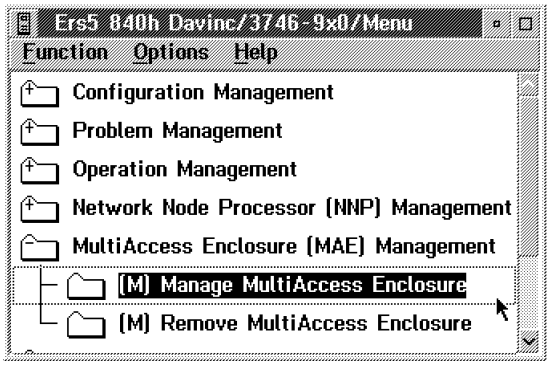


Figure 1-19. 3746-9x0 Menu

2. ____ Read the information message, click on **OK**, then click on **ASCII..."**.

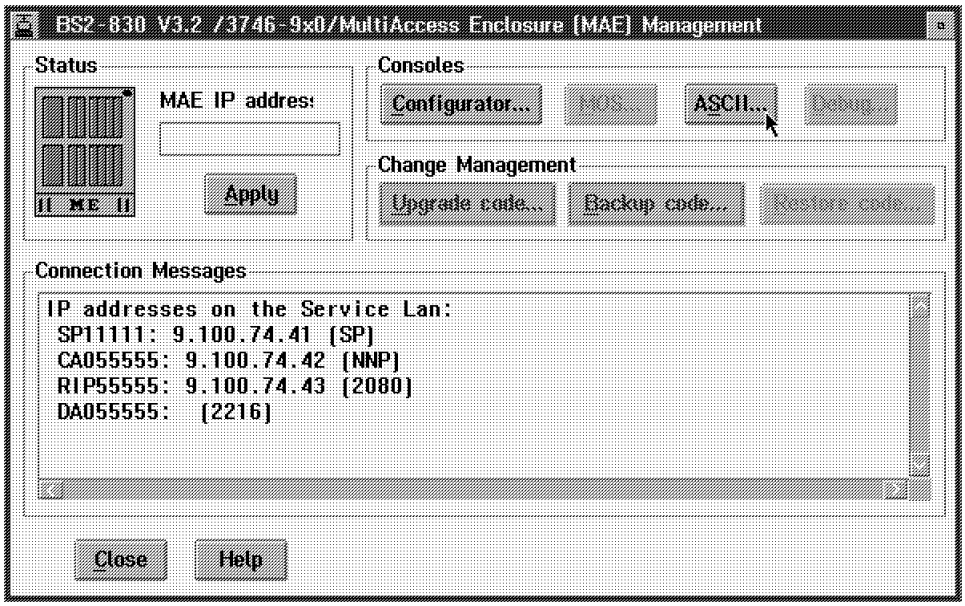


Figure 1-20. Multiaccess Enclosure Management

3. ____ Power **ON** or **Reset** the MAE.

Note: If prompted, the default password is **2216**.

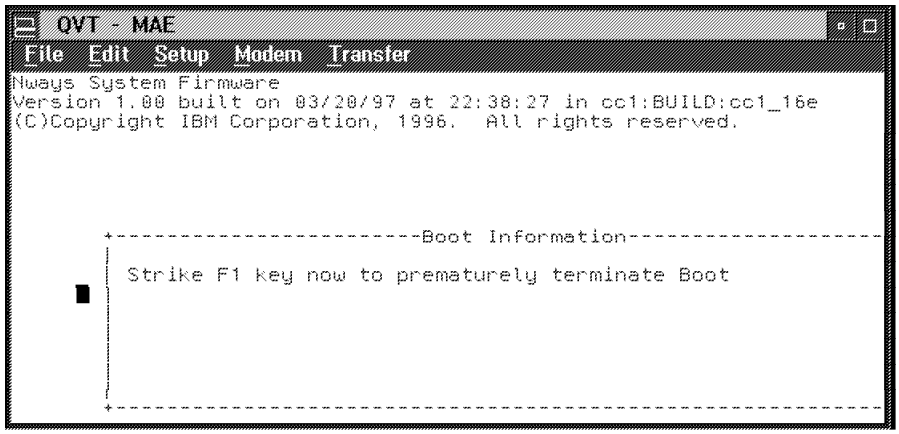


Figure 1-21. QVT - MAE

4. ____ **Watch** the screen **carefully** and when prompted, press **F1** (to prematurely terminate boot)

   Note: If you get the message: 'System programs cannot be entered from warm boot, please turn system off and try again'. Press the MAE reset push button on the system card, and when prompted press F1.

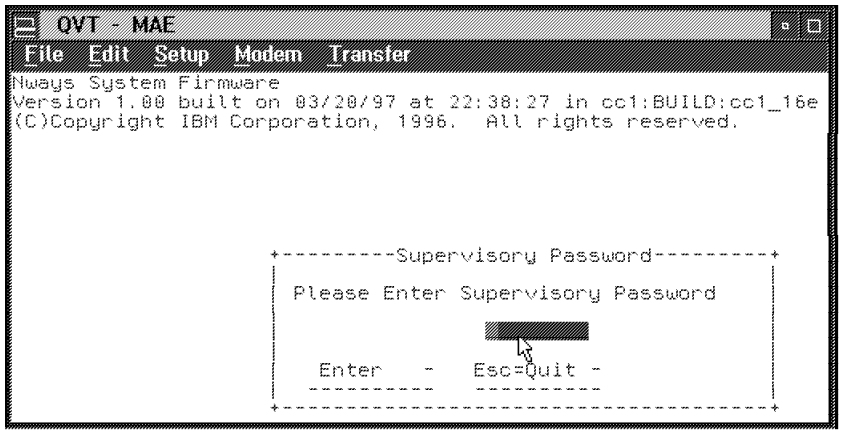


Figure 1-22. QVT - MAE

5. ____ Enter the default password **2216**.

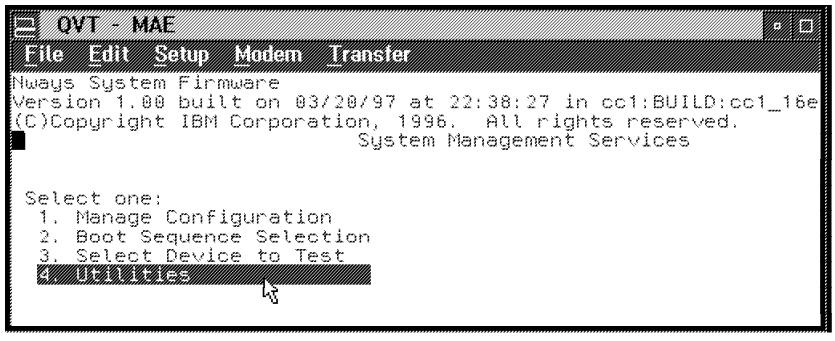


Figure 1-23. QVT - MAE

6. ____ Using the arrows keys, select **Utilities**, then press **Enter**.

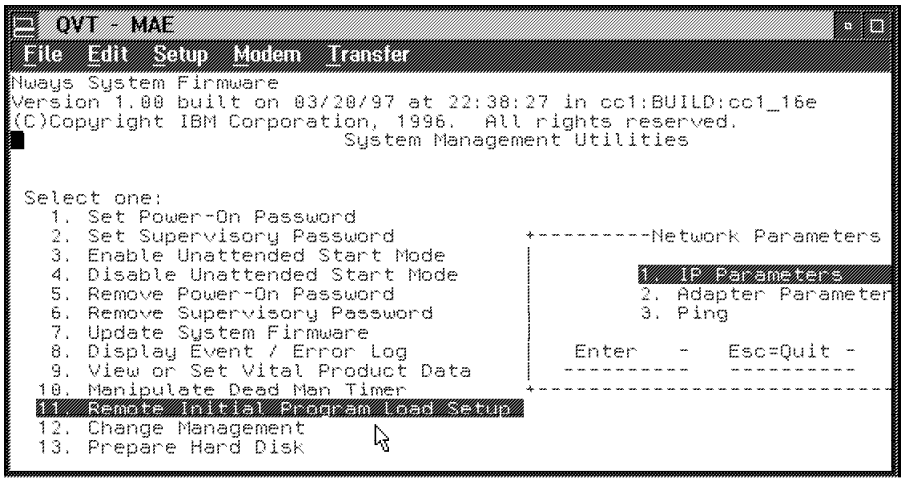


Figure 1-24. QVT - MAE

7. ____ Using the arrows keys, select **(11) Remote Initial Program Load Setup** and press **Enter**, **(1) IP Parameters** is selected, press **Enter** again.

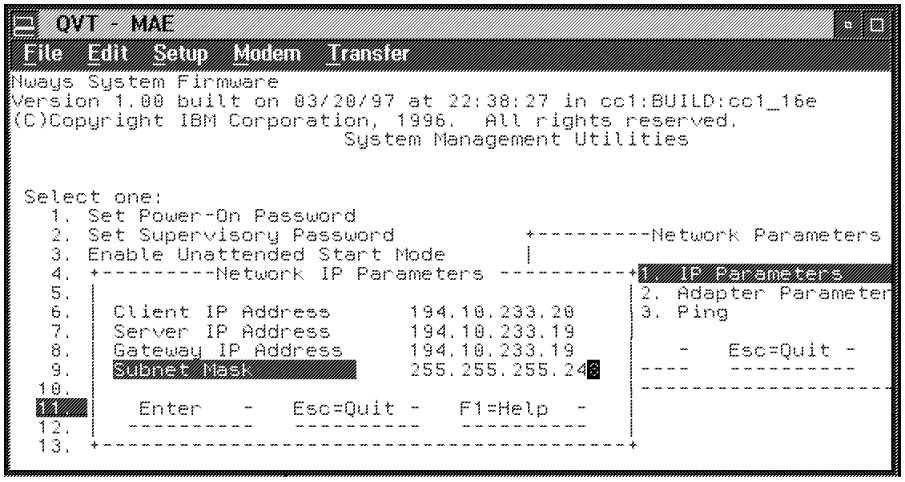


Figure 1-25. QVT - MAE

8. ____ Refer to Figure 1-25, enter the **Client IP address** (MAE address of the PCMCIA card), **Server IP address** (service processor address), **Gateway IP address** (if no router on the ring, enter the service processor IP address), then press **Enter**.

   Note: These IP addresses must be set according to the values given to the service ring IP parameters.

9. ____ Press the **Esc** key twice, then close the ASCII window.

10. ____ Now the Multiaccess Enclosure Management window is displayed, wait for Reading VPD for MAE message to disappear and then enter the **MAE IP address** (same value recorded in step 8 on page 1-22), then click on **Apply**.

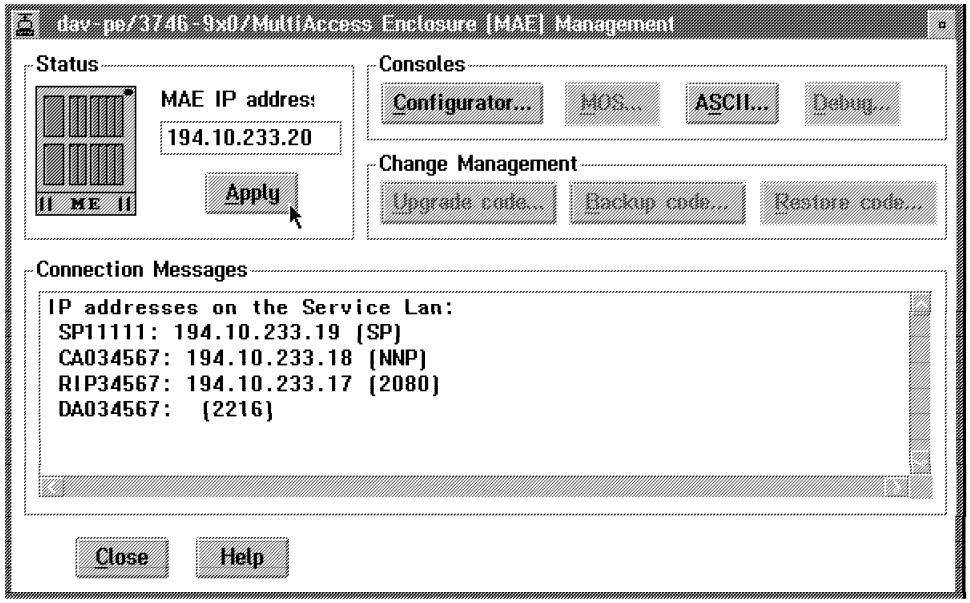


Figure 1-26. Multiaccess Enclosure Management

11. ____ The system is reading the VPDs, when the multiaccess enclosure icon is **green**, click on **Close** to exit.
    If the icon is not becoming green, verify that:

    a. The IP address given to the MAE PCMCIA card is correct.
    b. The yellow led on PCMCIA card is OFF (card or cable misplug).

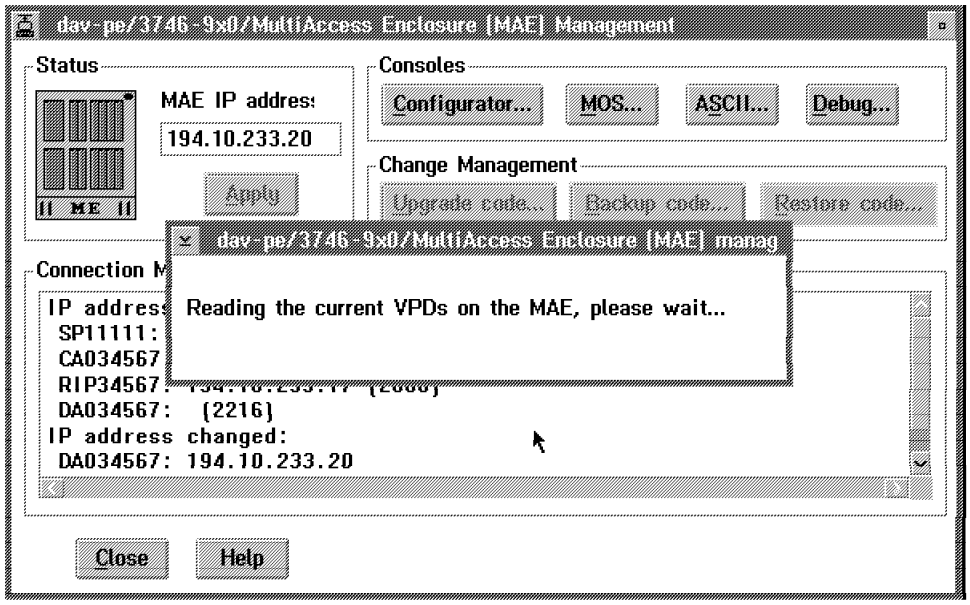


Figure 1-27. Multiaccess Enclosure Management

12. ____ Now **copy the MAE configurator** from the CD-ROM to the service processor hard disk. If not installed, install the CD-ROM in the CD disk drive.
13. ____ Click on **Configurator...**, the MAE configurator is being automatically copied.

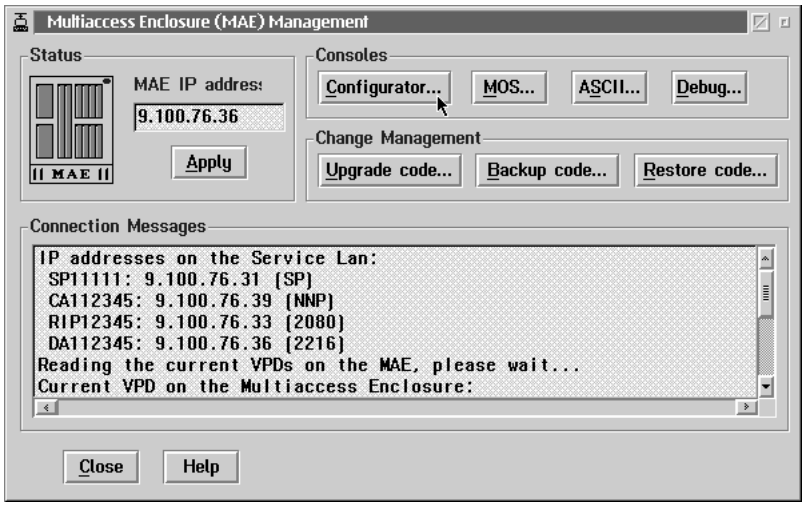


Figure 1-28. MAE Management

14. ____ To complete the installation, **save the MAE code** on the service processor hard disk.
15. ____ Click on **Backup code...**, the MAE code is being copied from the MAE hard disk to the SP hard disk.

    Note: On the MOSS-E, if you **switch** the active and non-active partition you have to resume steps 12 to 14 to copy the MAE configurator and save the MAE code on the new active partition.
16. ____ Complete Your Installation, return to where you left the previous installation procedure using:
    - The *3746-900 Installation Guide*, SY33-2114, if you are installing a **3746-900**.
    - The *3746-950 Installation Guide*, SY33-2107, if you are installing a **3746-950**.
    - Or if you are installing a MAE on a 3746-9X0 already installed, return to your **MES installation instructions**.

Chapter 2. Maintaining the Code on the MAE

Notes

- For any error related to the multiaccess enclosure, go to the **START** page of:
  - the *3746-950 Service Guide*, SY33-2108 (**3746-900**)
  - Or the *3746-900 Service Guide*, SY33-2116 (**3746-950**)

  All the procedures to perform the problem determination, to run diagnostics, or to replace a failing FRU are described in these documents.
- For other customer procedures, refer to:
  - the *3745/17A-61A and 3746-900 Basic Operations Guide*, SA33-0177 (**3746-900**)
  - Or the *3746 Nways Multiprotocol Controller Model 950 User's Guide*, SA33-0356 (**3746-950**)

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Displaying the Level of the Code Installed on the MAE Hard Disk

1. ____ Double click on the **"3746-9x0 object icon"**
2. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**,
3. ____ Using the scroll bar, display the two levels of the code loaded on the MAE hard disk (BANK A and BANK B)

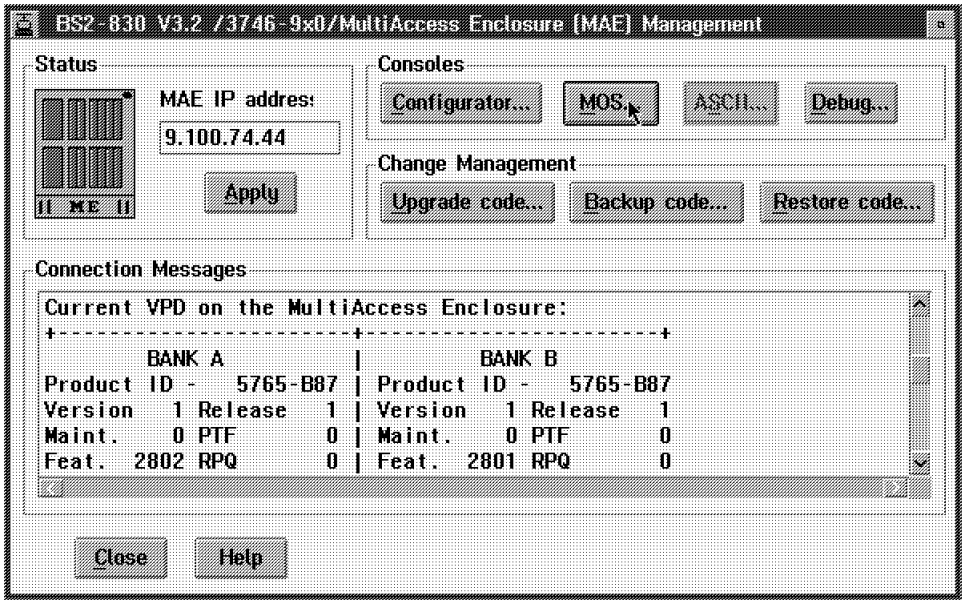


Figure 2-1. Multiaccess Enclosure (MAE) Management

Displaying a MAE Configuration

1. ____ Double click on the **"3746-9x0 object icon"**
2. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**.
3. ____ Click on **"MOS..."** console (this will start a telnet session into the MAE).

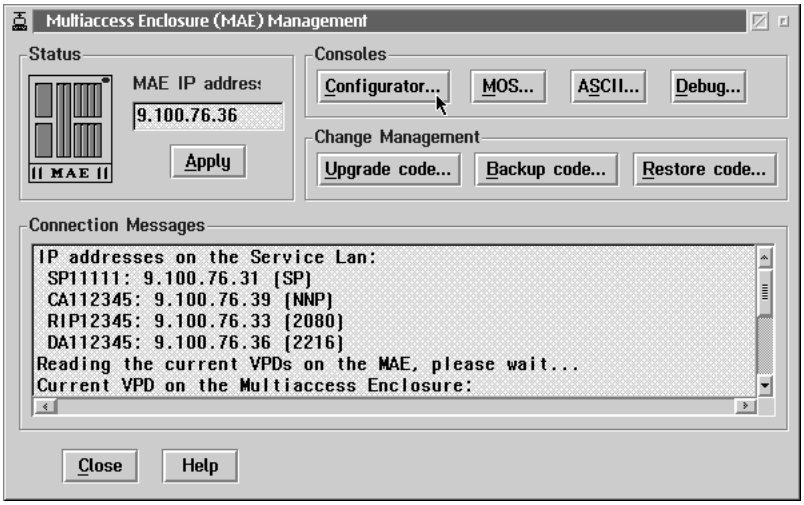


Figure 2-2. Multiaccess Enclosure (MAE) Management

4. ____ Enter **"Talk 6 (or t 6)"**, **list device**, then press **Enter**.

   Note: In this configuration example, one token-ring adapter is plugged in slot 1 the two ports are used. The token-ring adapter plugged in slot 5 has only one port (2) used. The IFC identify the interface number.

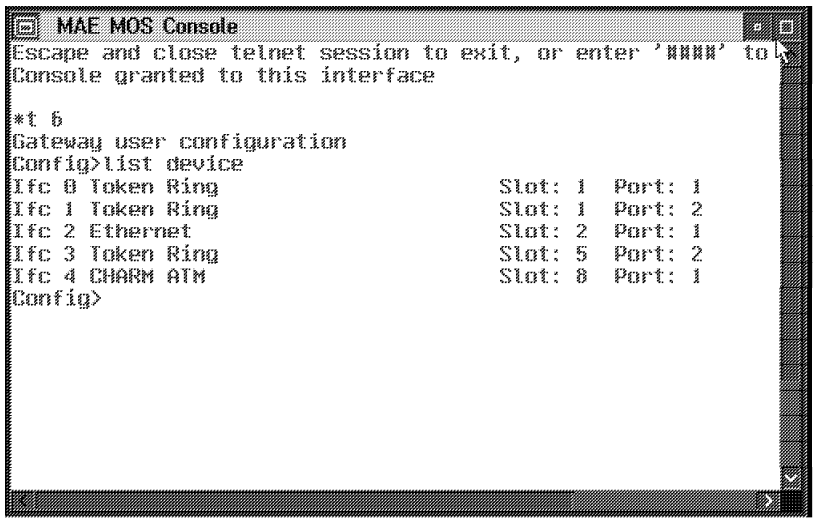


Figure 2-3. MAE Mos Console

Overview of Managing the MAE Code and Configuration Files

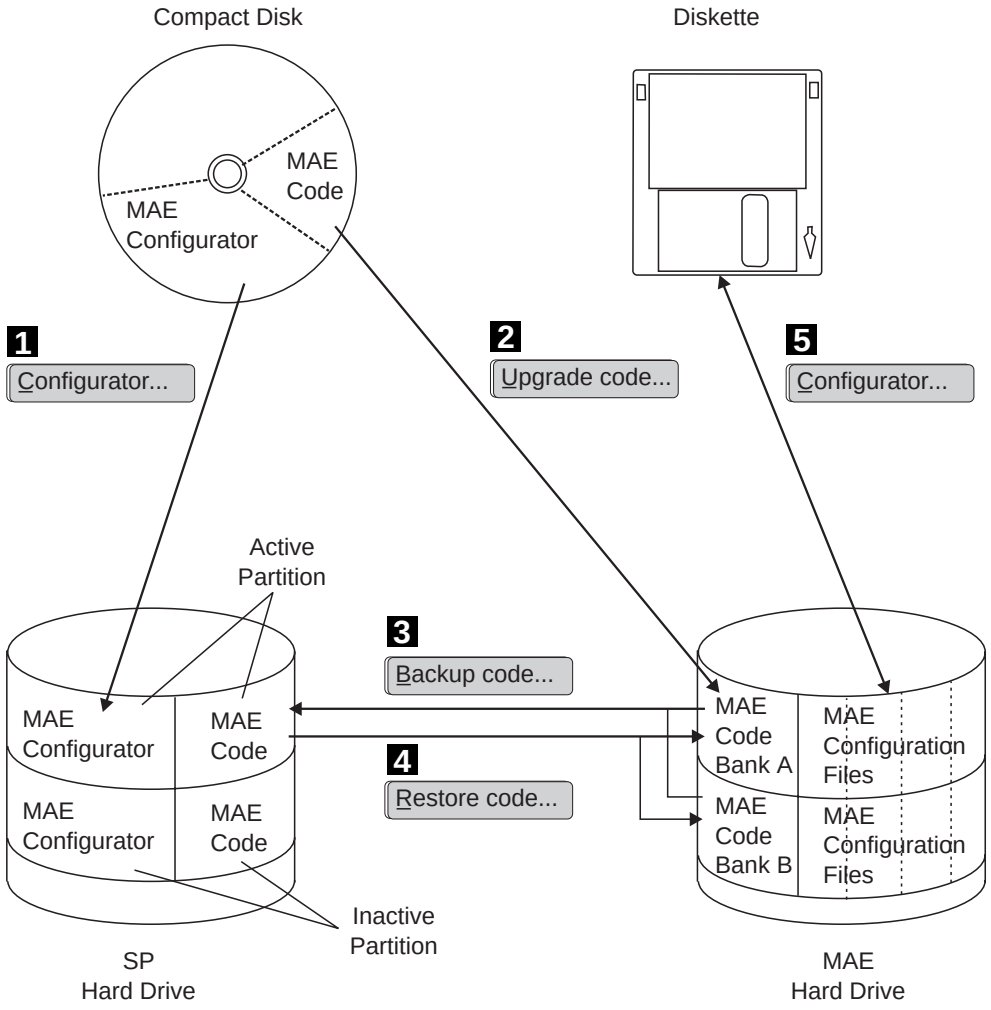


Figure 2-4. Overview of the MAE Code and Configuration Files Management

This drawing represents the different functions accessible from multiaccess enclosure management screen (refer to Figure 2-1 on page 2-2). If you click on:

- **Configurator...** (1) and if the MAE configurator is not installed on the SP hard drive it will be automatically copied. If the configurator is already installed, you will be prompted to update the configurator with the version recorded on the CD.
- **Upgrade code...** (2) the MAE code will be copied from the CD to the MAE hard disk.
- **Backup code...** (3) the MAE code will be saved on the SP hard disk.
- **Restore code...** (4) the MAE code will be restored on the MAE hard disk.
- **Configurator...** (5) if the configurator is installed on the SP hard disk and the CD is not installed in the SP disk drive, you will get the MAE configurator to perform several operations such as save/retrieve the MAE configuration files.

Saving the Image Code of the MAE Hard Disk on the SP Hard Disk

Note

This procedure saves only the image code from the MAE hard disk to the hard disk of the service processor. Refer to Figure 2-4 on page 2-4 detail **3**. To save the configuration files you must use the MAE configurator program.

1. ____ Double click on the **"3746-9x0 object icon"**
2. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**.
3. ____ Click on **"Backup code..."**,

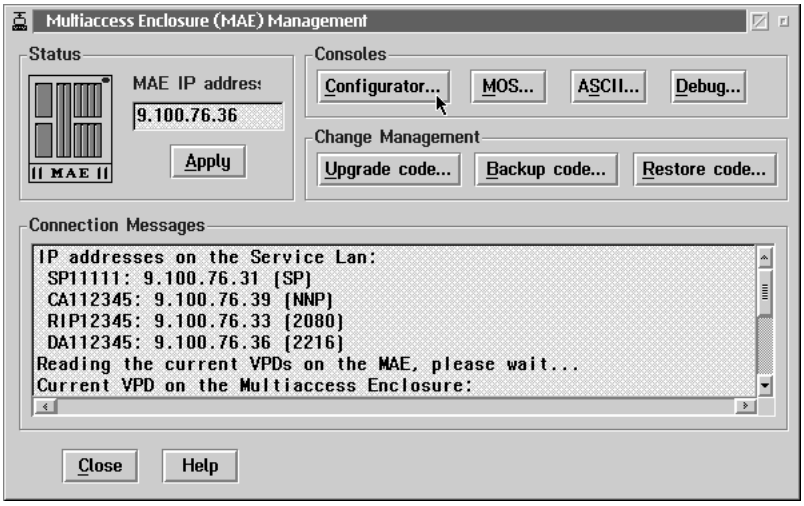


Figure 2-5. Multiaccess Enclosure (MAE) Management

4. ____ Click on **Backup Bank A**, when completed, click on **Backup Bank B**.

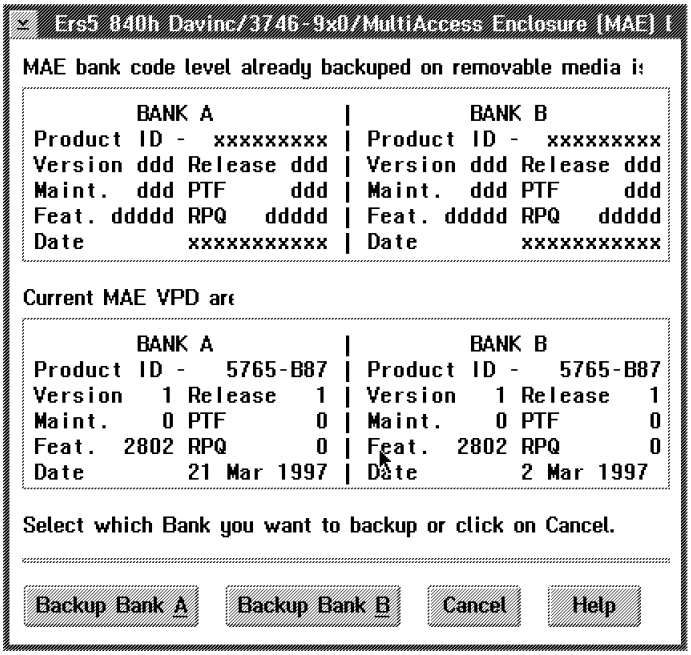


Figure 2-6. Saving Banks

Restoring the Image Code of the MAE Hard Disk from the SP Hard Disk

Note

This procedure restores only the image code from the hard disk of the service processor to the MAE hard disk. Refer to Figure 2-4 on page 2-4 detail **4** . To restore the configuration files you must use the configurator program.

1. ____ Double click on the **"3746-9x0 object icon"**
2. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**.
3. ____ Click on **"Restore code..."**,

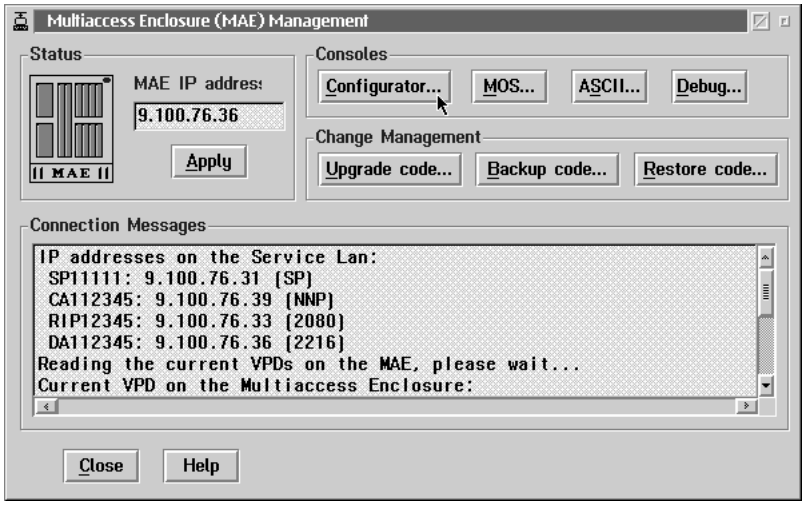


Figure 2-7. Multiaccess Enclosure (MAE) Management

4. ____ Click on **Restore Bank A**, when completed, click on **Restore Bank B**.

   Note: At the end of these procodures, only the files are restored. If you want to activate one of the bank restored, refer to the *IBM 2216 Nways Multiaccess Connector Introduction and Planning Guide*, GA27-4105, chapter 'Set Active Load Image'.

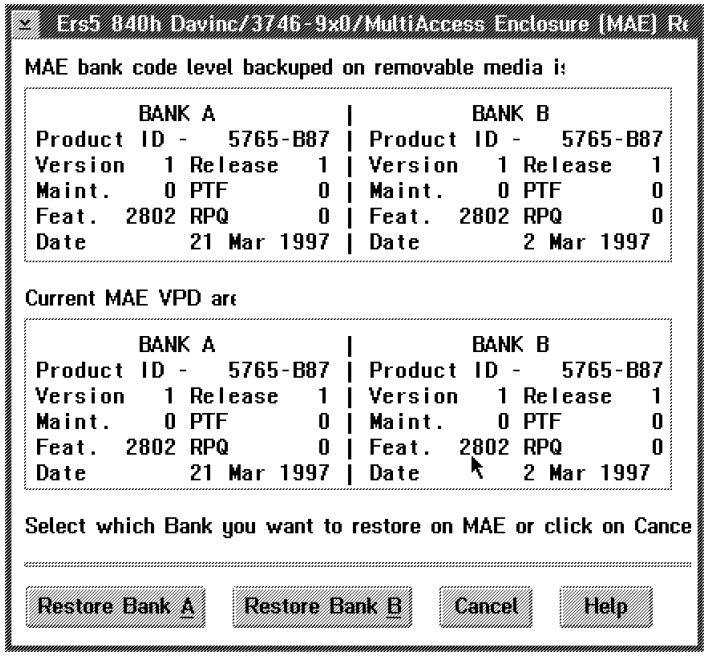


Figure 2-8. Restoring Banks

Installing a New Version of the MAE Code

Notes

1. Refer to Figure 2-4 on page 2-4 detail **2** .
2. You have received a new CD-ROM, replace the old CD-ROM and identify the old disk as **"Back Level"** and store it in a safe place (it can be reused if any problem occurs with the new version of the code).
3. This procedure do not update the MAE configurator, if you want to update the configurator refer to “Installing a New Version of the MAE Configurator” on page 2-13.
4. On the MOSSE, if you switch the active partition you will use the MAE code loaded on this partition which can be different to the version loaded on the inactive partition.

1. ____ Insert the new CD-ROM in the disk drive.
2. ____ Double click on the **"3746-9X0 object icon"**
3. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**.
4. ____ Click on **"Upgrade code..."**,

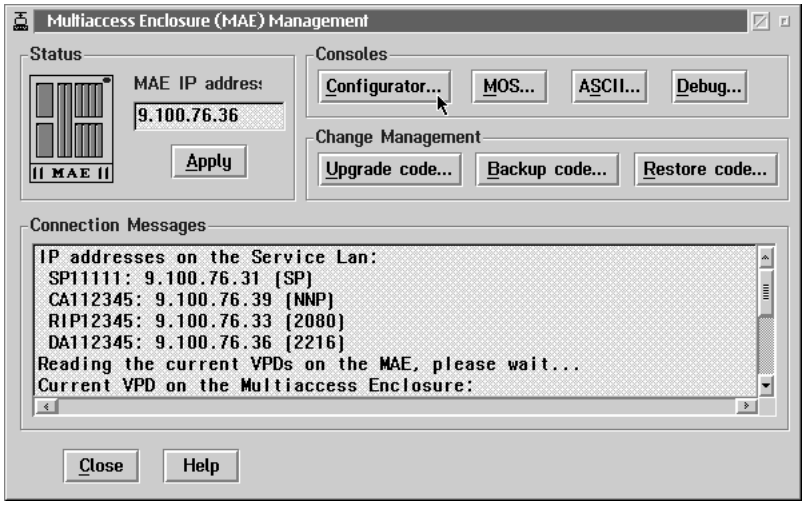


Figure 2-9. Multiaccess Enclosure (MAE) Management

5. ____ Click on **Upgrade Bank A** or **Upgrade Bank B** (It is also possible to upgrade bank A then B).

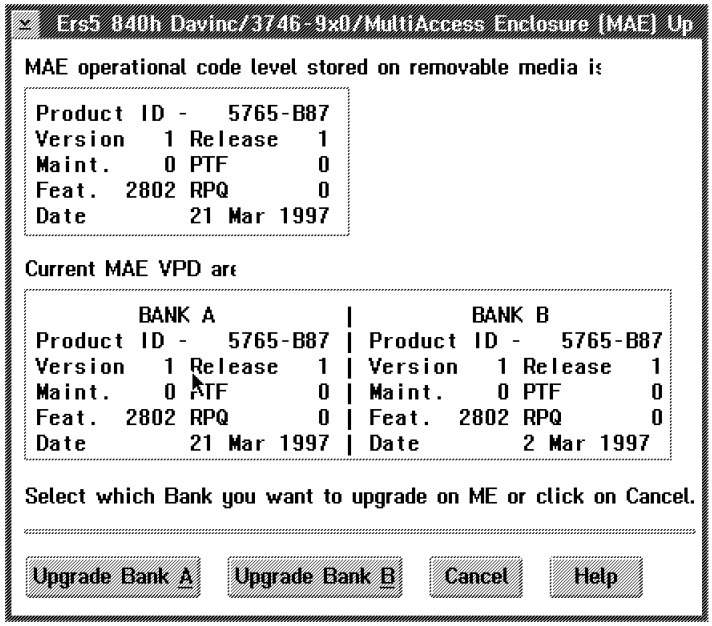
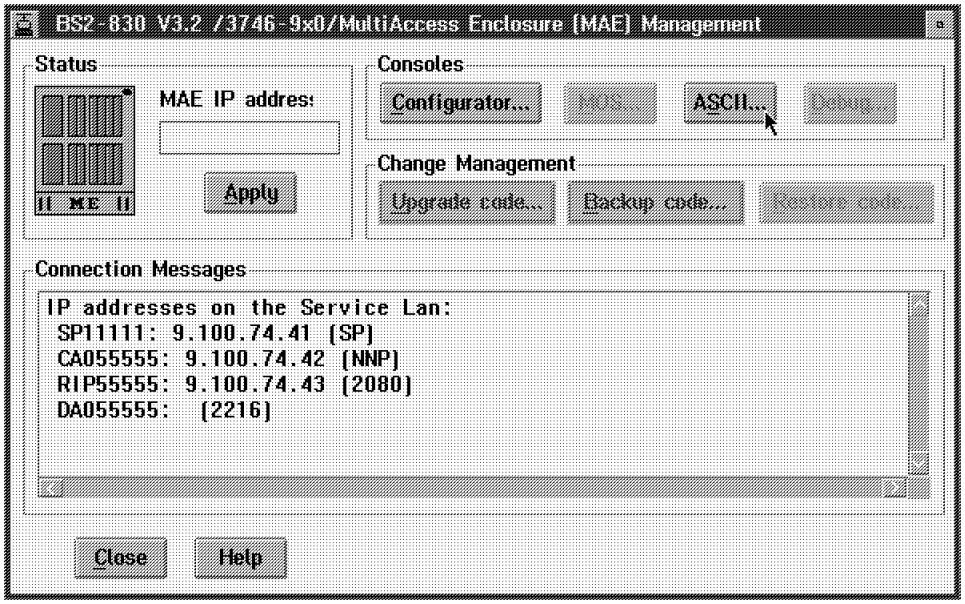


Figure 2-10. Upgrading Banks

Then go to: “Installing a New Version of the MAE Firmware” on page 2-10.

Installing a New Version of the MAE Firmware

1. ____ On the **"Multiaccess Enclosure Management** screen, click on **ASCII..."**.

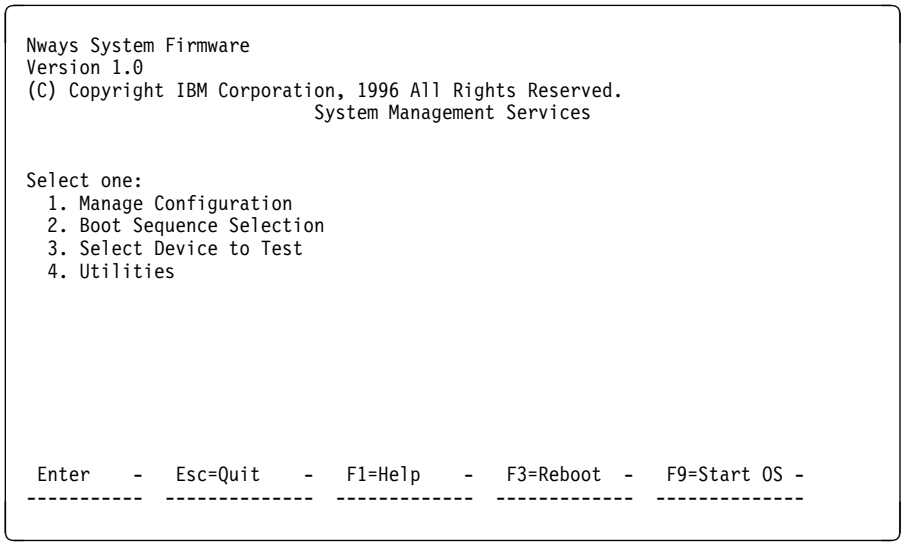


2. ____ When the following screen is displayed, click on **OK**.

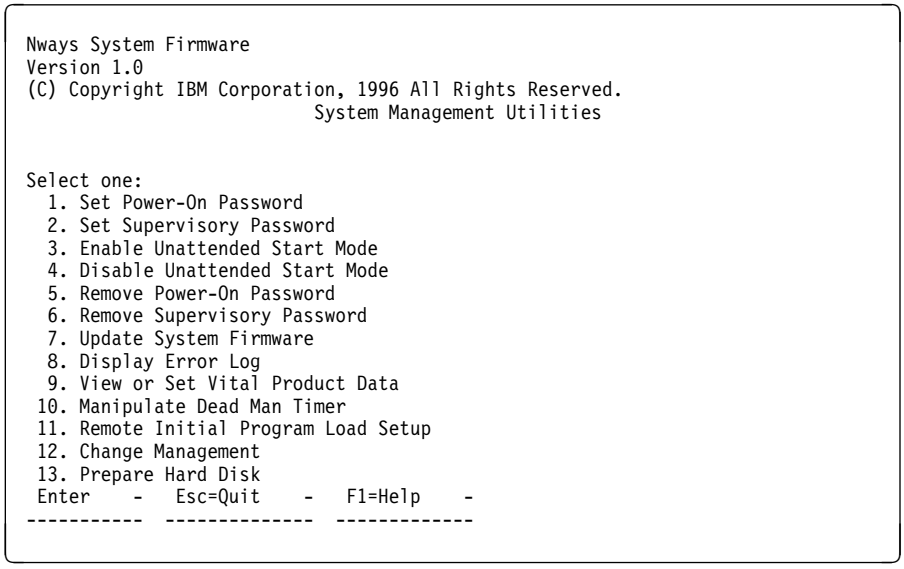
```
                        QV1
                VT220 Terminal Emulator
                     Version 1.00
               (c)Copyright 1989 QPC Software
                   P.O. Box 226
                   Penfield, NY 14526

                          OK
```

3. ____ Press the **Reset** button on the MAE.
4. ____ Several window are displayed during tests. Wait until the **Boot Information** window is displayed.
5. ____ Press **F1** when prompted (to prematurely terminate boot).
6. ____ Enter the Multiaccess Enclosure supervisory password when required: **2216**.

7. ____ On the **System Management Services** window, select **option 4 - Utilities**

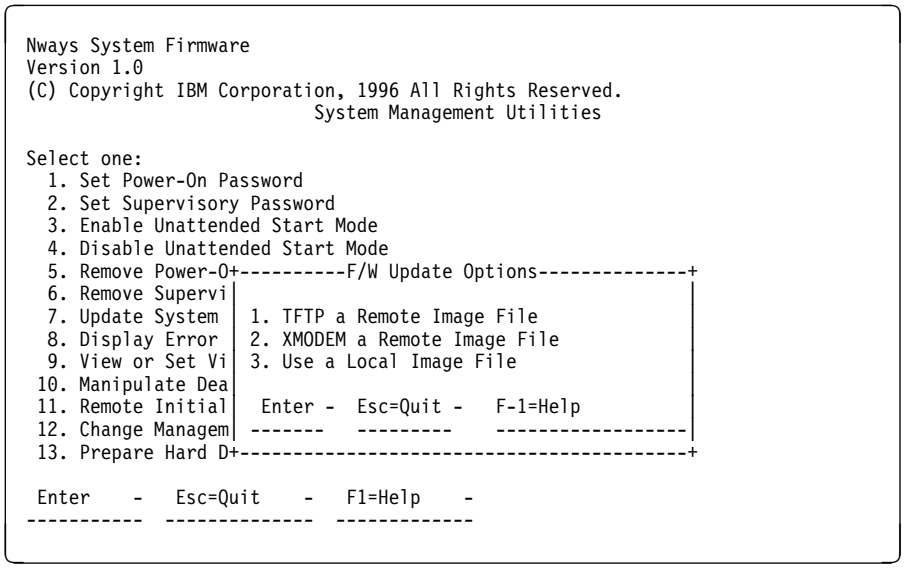


8. ____ On the **System Management Utilitie** window, select **option 7 - Update System Firmware**



9. ____ If not already done, insert the CD-ROM in the Service Processor disk drive.

10. ____ From F/W Update options, select **option 2 - XMODEM a Remote Image File**.



11. ____ When prompted to enter the X modem file name, type **firm.ld** and press **Enter**.

12. ____ On the action bar of the QVT screen, click on **Transfer** and from the pull down menu, select **xmodem send** then type **d:\ldm\firm.ld** and press **Start**.

    Note: The transfer process is time-sensitive and may time out before the process starts. Restart from the F/W Update Options menu if necessary.

    - If characters like '$' appear by the message box, it means that the connection is not established.
    - If 10-12 appears, Xmodem will likely time out and need to be restarted.

13. ____ When the file transfer is completed, click on **OK**. Then if prompted (it depends on the MAE hardware level), select **C:firm.ld** and press **Enter**.

14. ____ After Xmodem completes, a message similar to the following is displayed:

```
This selection will update your
system firmware.  Do you want to
continue?
```

15. ____ Type **Yes** to update the firmware and if prompted press **escape**.

16. ____ Press **Enter** to restart the system and activate the new firmware.

17. ____ Then close the ASCII window.

Installing a New Version of the MAE Configurator

Note

- The MAE configurator is recorded on the SP hard drive but never present on the MAE hard drive.
- On the MOSSE, if you switch the active partition you will use the MAE configurator loaded on this partition which can be different to the version loaded on the inactive partition.
- Refer to Figure 2-4 on page 2-4 detail **1** .

1. ____ Install the CD-ROM which contains the new MAE configurator in the disk drive.
2. ____ Double click on the **"3746-9X0 object icon"**
3. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**.
4. ____ Click on **"Configurator..."**,

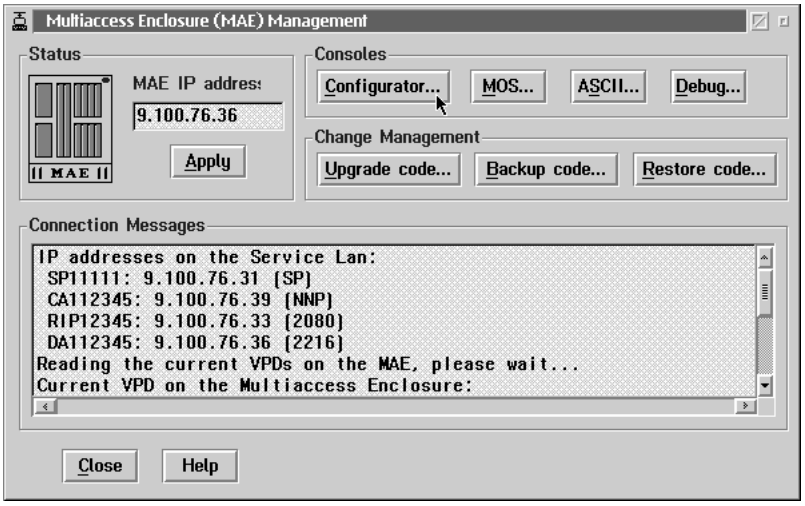


Figure 2-11. Multiaccess Enclosure (MAE) Management

5. ____ Click on **"OK"**, the new configurator is being copied from the CD-ROM to the SP hard drive.

Saving the Active MAE Configuration on Diskette

1. ____ Double click on the **"3746-9X0 object icon"**
2. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**.
3. ____ Click on **"Configurator..."**,

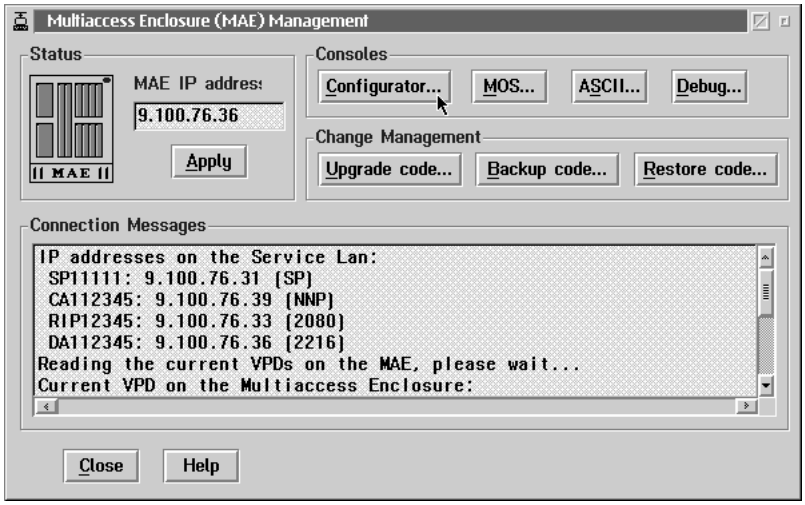


Figure 2-12. Multiaccess Enclosure (MAE) Management

4. ____ In the navigation window, click **Configure**, **Communications**, then **Single router**.

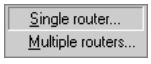


Figure 2-13. Single Router Option

5. ____ Enter the PCMCIA IP address in the **IP address or Name** field, and **PUBLIC** in the **Community** field, select **Retrieve configuration** and click on **OK**.

Figure 2-14. Retrieve a Configuration

6. ____ Click **Configure**, then **Save configuration as**.

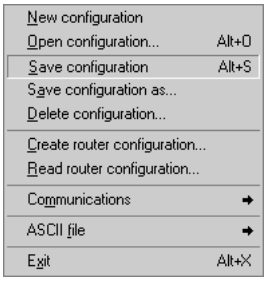


Figure 2-15. Saving a Configuration

7. ____ Fill in the path (A: \ if you want to save it on a diskette), then click on **OK**.

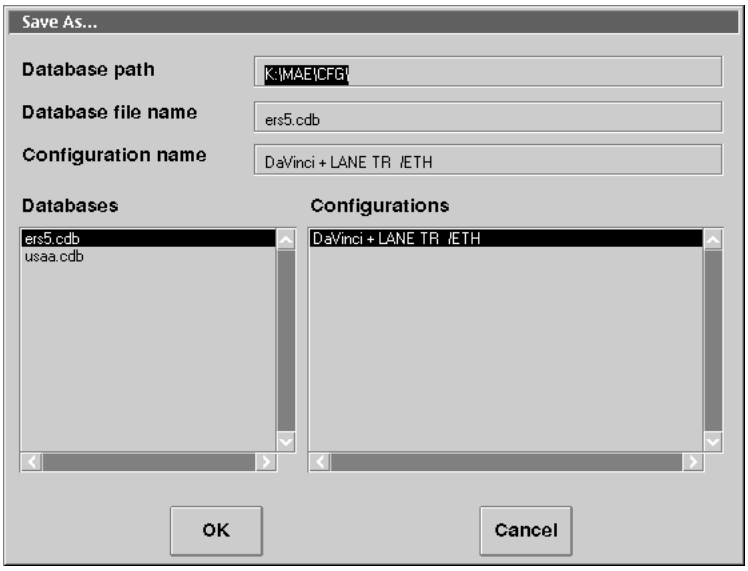


Figure 2-16. Saving as Screen

Restoring a MAE Configuration from Diskette

1. ____ Double click on the **"3746-9X0 object icon"**
2. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Manage Multiaccess Enclosure"**.
3. ____ Click on **"Configurator..."**,

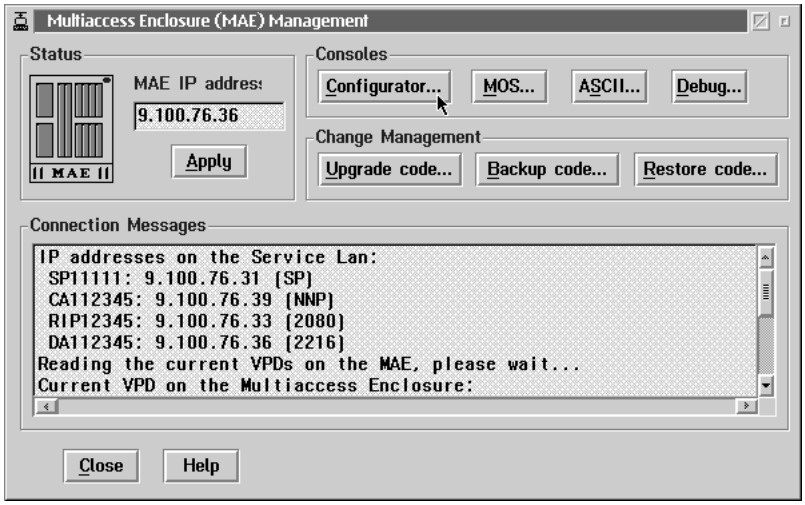


Figure 2-17. Multiaccess Enclosure (MAE) Management

4. ____ In the navigation window, click **Configure** and **Open configuration**.

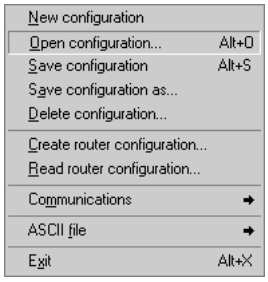


Figure 2-18. Open a Configuration

5. ____ Fill in the path (A: \ if you want to restore from the diskette), click on the configuation you want to retore then click on **OK**.

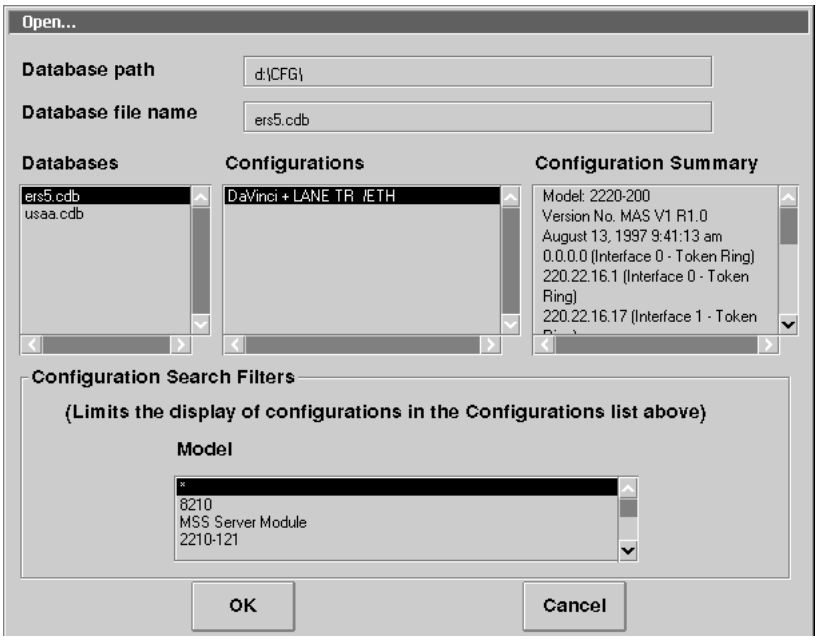


Figure 2-19. Open Screen

6. ____ Then send the configuration to the router to activate the configuration. In the navigation window, click **Configure**, **Communications**, then **Single router**.

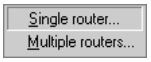


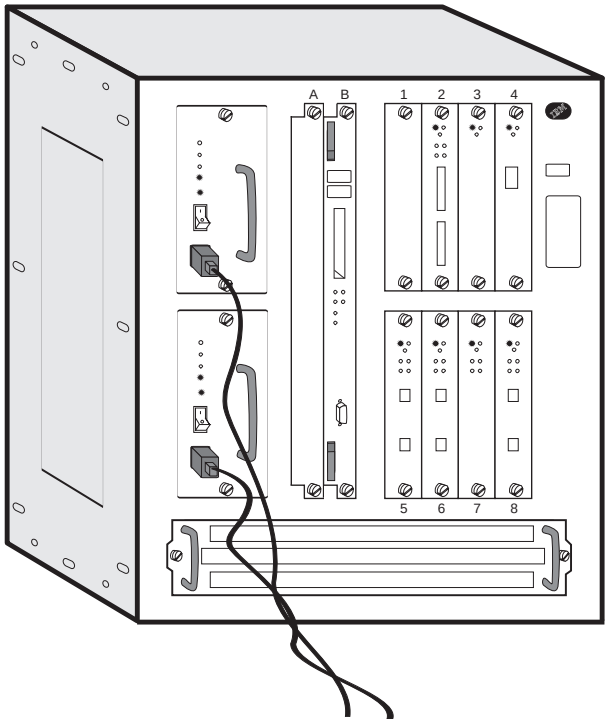
Figure 2-20. Single Router Option

7. ____ Enter the PCMCIA IP address in the **IP address or Name** field, and **PUBLIC** in the **Community** field, select **Send configuration to router** and click on **OK**.

Figure 2-21. Communicate Screen

Chapter 3. Multiaccess Enclosure Problem Determination

Note: The Multiaccess Enclosure service representative can run the diagnostics on site through the service processor connected directly to the Multiaccess Enclosure.



Multiaccess Enclosure Power Supply

The power supply panel contains:

- The power switch, which is used to power ON or OFF the multiaccess enclosure
- The Overcurrent Reset switch, which resets all current-limit circuits for the +12 V and -48 V outputs at the same time.

System Card LEDs

After power-on-reset (POR), the green and yellow LEDs will remain on until successful completion of the power on tests (which will be under 2 minutes). The green LED will begin blinking, which indicates that the code is being loaded into memory. The green LED will be switched on to indicate that the system code is operational.

Note: If the Multiaccess Enclosure is waiting for the power-on password, the green LED is off. If you do not have the console attached, you will not know that the system is waiting. Looking at the LEDs may lead you to believe that you have a hardware problem.

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LED Indicators

The Multiaccess Enclosure has a number of light-emitting diodes (LEDs) that indicate how the unit is functioning.

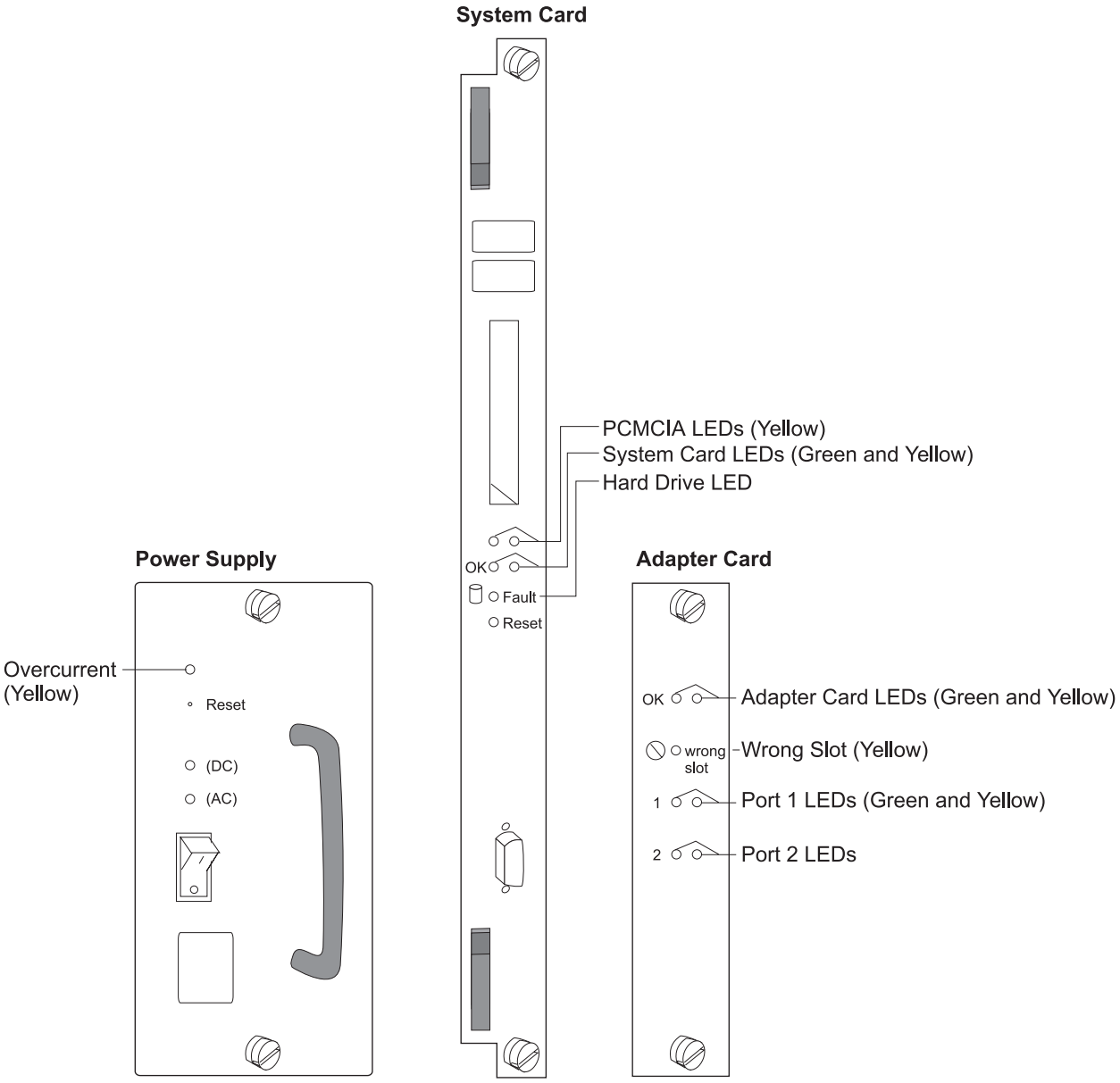


Figure 3-1. Power Supply, System Card, and Adapter Card LEDs

Power Supply Status

LEDs	Meaning
Yellow (Overcurrent)	On - There is an overcurrent condition with the –48 V to one or more of the adapters (slots 1–8) or the +12 V to the fan tray.
Green DC	On - +5 V, +12 V, and –48 V are OK.
Green AC	On - AC source voltage is present and within tolerance.

System Card Status

LEDs	Meaning
PCMCIA 1 or PCMCIA 2 (Yellow)	On - PCMCIA device has a fault, is not installed, or is not seated correctly. Off - Device passed self-tests
OK (Green)	On - Card hardware is operating normally. Blinking - Loading from hard file
OK (Yellow)	On - Card hardware has a fault.
Fault Hard Drive (Yellow)	On - Hard drive has failed.

Adapter Card Status

LEDs	Meaning
OK (Green)	On - Adapter is operating normally.
OK (Yellow)	On - Adapter has a fault.
Wrong slot (Yellow)	On - Adapter is in the wrong slot. The wrong slot LED is ON only when an adapter that is plugged into the multiaccess enclosure violates the plugging rules described in Appendix B, “MAE Adapters Plugging Rules” on page B-1.
Green port[1]	On - Port is operating normally (enabled and configured). Off - Port is not configured or is disabled. For the ESCON adapter: Blinking - The optical power measurement test is running.
Yellow port[1]	On - One or more ports has a hardware fault. Blinking - One or more ports has a port I/O or network failure. Use the Maintenance Analysis Procedures (MAPs) to isolate. Off - No problem detected.

Important Phone Numbers

Contact Name	Telephone Number
System Administrator:	
Service Representative:	

[1] The port LEDs of the multiport WAN adapters (FC 3282, FC 3291, and FC 3292) reflect the status of one or more of the ports.

Troubleshooting

Both hardware and software (operational code and configuration) problems can be affect the multiaccess enclosure. Light-emitting diodes (LEDs), diagnostic programs, and error messages provide information needed for problem determination. This manual is chiefly concerned with diagnosing and correcting hardware problems. Chapter 5, “Multiaccess Enclosure Firmware and Operational Code” on page 5-1 has information about accessing the multiaccess enclosure.

Diagnosing Hardware Problems

Generally, errors that occur ***before*** the operational code is loaded are hardware-related. Light-emitting diodes (LEDs) on the front of the multiaccess enclosure indicate how the hardware components are functioning.

Go to “LED Indicators” on page 3-2 for LED status and indicators for the multiaccess enclosure. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1 for information on removal and replacement procedures for field-replaceable units (FRUs).

See “Using Multiaccess Enclosure Firmware” on page 5-2 to run hardware diagnostics ***before*** the multiaccess enclosure has been configured.

Diagnosing Operational Code and Configuration Problems

Generally, errors that occurs ***after*** the operational code is loaded indicate problems with the operational code or configuration file.

Error codes and corrective action are described in the *Event Logging System Messages Guide*

See “Using Operational Diagnostics” on page 5-30 to run hardware diagnostics ***after*** operational code and configuration files have been loaded.

MAP 0300: Multiaccess Enclosure Basic Verification

You are here because you have a problem on the Multiaccess Enclosure.

001

- Check that the Multiaccess Enclosure unit is powered ON.
- If not switch the power ON button to the ON position.
- Within 2 minutes, check the status of the LEDs on the front of the multiaccess enclosure.
- The LEDs on the multiaccess enclosure should have the following status:

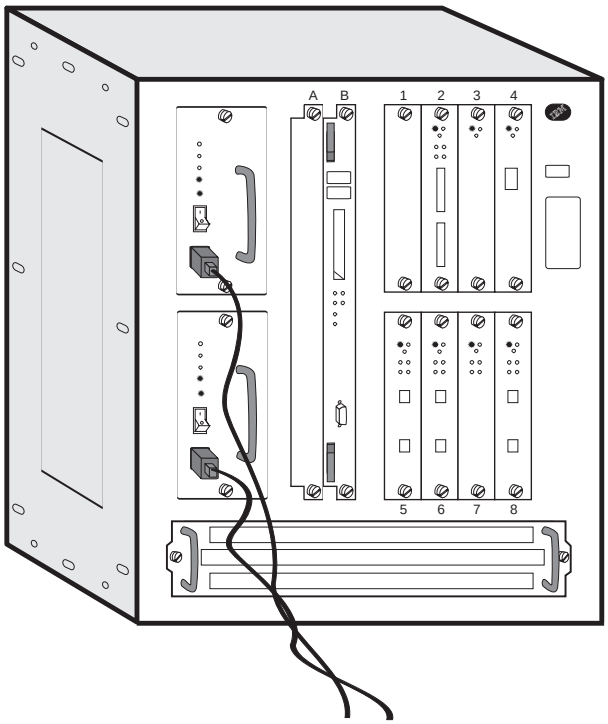


Table 3-1 on page 3-6 shows the desired status of the LEDs. Table 3-2 on page 3-6 shows messages that may appear at the operator console attached to the Multiaccess Enclosure that may indicate a problem.

Table 3-1. Machine LEDs

LED	Normal Status	Comments
ac indicator LED on power supply	ON	ac power is present and within the correct tolerances.
dc indicator LED on power supply	ON	dc output voltage is present.
Yellow LED on power supply	OFF	There is no overcurrent problem with the adapters or fan tray.
Green LED on system card	ON	Card is operational.
Yellow LED on system card	OFF	Card is OK.
PCMCIA Port 1 (yellow) on system card	OFF	Device has passed test.
PCMCIA Port 2 (yellow) on system card	OFF	Device has passed test.
All adapter green LEDs	ON	The adapter is operational.
All adapter yellow LEDs	OFF	ON indicates a hardware fault.
Wrong slot LED	OFF	Adapter is plugged into the correct slot.
All I/O port green LEDs	ON	The port is enabled and configured.
All I/O port yellow LEDs	OFF	• ON indicates that a fault has been detected. • BLINKING indicates a port or network failure.

Table 3-2. Network Management Console Messages

Message	Comments
`Fan motor speed`	Replace the fan assembly. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.
`multiaccess enclosure is overheating`	Check for: • Room air conditionning • Obstruction of airflow • Fan motor problem
`Memory error with DIMM slot` ***y***	Replace the system card. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.

(Step **001** continues)

001 (continued)
Are all LEDs OK?
Yes **No**

002

Go to Step 004

003

The multiaccess enclosure should be functioning. Go to “CE Leaving Procedure” on page 5-49.

004

- On the following table select the symptom that fits your situation.

LED Status	Action
ac indicator LED on a power supply is OFF.	Step 027 on page 3-10
dc indicator LED on a power supply is OFF and the ac indicator is ON.	Step 005
Overcurrent Indicator LED on power supply is ON.	Step 008
Adapter yellow fault indicator LED is ON (adapter is failing).	Step 015 on page 3-8
Adapter **Yellow** Wrong Slot LED is ON.	Step 018 on page 3-9
I/O port **Yellow** indicator is ON or BLINKING.	Step 019 on page 3-9
Yellow indicator on system card is ON	Step 022 on page 3-9
PCMCIA yellow indicator on system card is ON	Step 023 on page 3-9

005

The dc indicator on a power supply is OFF. Replace the power supply. (See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.)
Is the problem corrected?
Yes **No**

006

Contact your support center for assistance.

007

Restart the verification procedure. Go to Step 001 on page 3-5.

008

(Step **008** continues)

008 (continued)
The Overcurrent LED on a power supply is ON.
Are all adapter yellow fault LEDs OFF?
Yes **No**

009

Remove the adapter with a yellow fault LED ON, then press **Reset** on the power supply.
Is the Overcurrent LED now OFF?
Yes **No**

010

Replace the power supply. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1. Restart the verification procedure. Go to Step 001 on page 3-5.

011

Replace the adapter. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1. Restart the verification procedure. Go to Step 001 on page 3-5.

012

The problem may be with the fan tray. Remove it (see “Exchanging the Fan Tray” on page 4-15) and press **Reset**.
Does this correct the problem?
Yes **No**

013

Re-install the fan tray. Contact your support center.

014

- Replace the fan tray. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.
- Restart the verification procedure. Go to Step 001 on page 3-5.

015

A **yellow** fault indicator LED on an adapter is ON. Replace the adapter. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.
Does this correct the problem?
Yes **No**

016

Contact your support center.

017

(Step **017** continues)

017 (continued)
Restart the verification procedure. Go to Step 001 on page 3-5.

018

The **yellow** Wrong Slot LED indicator on an adapter is ON.

- If adapter LIC 280 or LIC 281 is in slot 3, then slot 4 must be empty.
- If adapter LIC 280 or LIC 281 is in slot 4, then slot 3 must be empty.
- If adapter LIC 280 or LIC 281 is in slot 7, then slot 8 must be empty.
- If adapter LIC 280 or LIC 281 is in slot 8, then slot 7 must be empty.

The Wrong Slot LED indicates that one of the above restrictions is not being observed. Relocate the adapter or adapters in slots 3, 4, 7, or 8 accordingly. Restart the verification procedure. Go to Step 001 on page 3-5.

019

A **yellow** LED indicator for an I/O port is ON or BLINKING.
Is the yellow LED indicator BLINKING?
Yes **No**

020

I/O port LED ON - The adapter is defective. Replace it. See Chapter 4, "Multiaccess Enclosure FRU Exchange" on page 4-1. Restart the verification procedure. Go to Step 001 on page 3-5.

021

I/O port LED BLINKING -
There is a problem with the adapter, the cable, or the network. Run an external wrap test on the I/O port.
You must install an external wrap block (plug) prior to the test. See "Adapter Wrap Plugs (Service Kit - Feature Code 3505)" on page 3-14 for the correct wrap plug. See "Running Diagnostics on the New Adapter" on page 5-39 to run diagnostics.

1. If the wrap test is successful, suspect the cable or the network. Correct any problem that you find. Restart the verification procedure. Go to Step 001 on page 3-5.
2. If you suspect a problem with the ESCON adapter, run the light test (see "ESCON Optical Power Measurement Test" on page 5-46).

022

The yellow LED on the system card is ON.
Is the Hard Drive LED ON?
Yes **No**

023

(Step **023** continues)

023 (continued)
Is a PCMCIA Slot 1 or 2 LED ON?
Yes **No**

024

- The system card is defective. Replace it. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.
- Restart the verification procedure. Go to Step 001 on page 3-5.

025

- The LED will be ON if there is no device plugged into slot.
- If a PCMCIA device is plugged into a slot and LED is ON, reseat the PCMCIA device and press reset on system card.
- If the LED is still ON replace the PCMCIA device. Replace it. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.

026

The hard drive LED is ON, indicating a hard drive failure.

- Replace the hard drive. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.
- Restart the verification procedure. Go to Step 001 on page 3-5.

027

You are at this step because the ac indicator on a power supply is OFF.
Check that the ac power cable of the suspected unit is well connect at:

- The rear of the unit
- On the ac outlet distribution box.

Is the problem solved?
Yes **No**

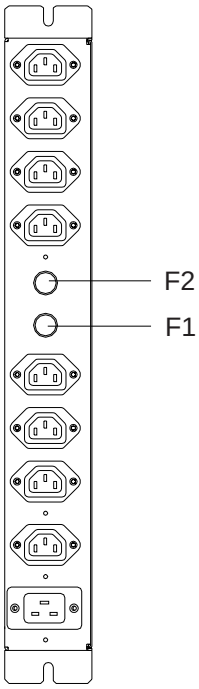
028

Continue with Step 030.

029

Problem solved. Go to “CE Leaving Procedure” on page 5-49.

030



Fuse Location on ac outlet distribution box

- On the ac outlet distribution box:
  - Fuse F1 controls the range of connectors J1 to J4
  - Fuse F2 controls the range of connectors J5 to J8.
- Check if other units are connected to the same range of connectors than the suspected unit.

Are there other units connected to the same range than the suspected unit?

Yes **No**

031

Go to Step 040 on page 3-12.

032

Check that the other units have their power ON/OFF switch to ON.

Are other units powered ON?

Yes **No**

033

Go to Step 035

034

Go to Step 046 on page 3-13.

035

Check the corresponding fuse.

Is the fuse OK?

Yes **No**

036

- Switch to OFF all the units controlled by this fuse.
- Exchange the defective fuse.
- Switch ON all the units controlled by this fuse.

(Step **036** continues)

036 (continued)
Is the fuse blown again?
Yes **No**

037

Problem solved go to “CE Leaving Procedure” on page 5-49.

038

Suspect a power problem in a unit powered through the ac outlet distribution box.

- Switch to OFF all the units controlled by this fuse.
- Exchange the fuse.
- Switch one by one the units controlled by this fuse to identify the unit which has a problem.
- Once you have identified the faulty unit continue with Step 046 on page 3-13.

039

Suspect the ac wall socket.

040

Check the corresponding fuse.
Is the fuse OK?
Yes **No**

041

- Switch to OFF the defective unit controlled by this fuse.
- Exchange the defective fuse.
- Switch ON the unit controlled by this fuse.

Is the fuse blown again?
Yes **No**

042

Problem solved go to “CE Leaving Procedure” on page 5-49.

043

Go to Step 046 on page 3-13

044

Are all other units installed in the controller rack powered ON?
Yes **No**

045

Suspect the ac wall socket.

046

Suspect a power problem in the Multiaccess Enclosure.

- Exchange the suspected power. See Chapter 4, “Multiaccess Enclosure FRU Exchange” on page 4-1.
- After power exchange check the ac LED.

Is the ac Power LED now ON?

Yes **No**

047

Call your Support Center for assistance.

048

Restart the verification procedure. Go to Step 001 on page 3-5.

Adapter Wrap Plugs (Service Kit - Feature Code 3505)

Table 3-3. Multiaccess Enclosure. Adapter Wrap Plugs

Adapter	FRU P/N	Feature Code	Description	Wrap Plugs
LIC 280	85H5543	FC 3280	2-Port Token-Ring	UTP 04H8210
LIC 281	85H5542	FC 3281	2-Port Ethernet	UTP 04H8210 BNC 02G7433
LIC 282	85H4872	FC 3282	8-Port EIA232	CRD 68F7208 CBL 33F8985
LIC 283	85H4882	FC 3283	1-Port ISDN Pri (T1)	57G8097
LIC 284	85H4894	FC 3284	I Port 155Mbps (MMF ATM)	16G5609
LIC 286	86H0967	FC 3286	1-Port FDDI	Two - 16G5609
LIC 287	85H4878	FC 3287	1-Port ESCON Channel	5605670 Fiber-optic jumper cable 14F3797
LIC 288	86H1005	FC 3288	1-Port 100 Mbps Ethernet	UTP 85H7913
LIC 289	85H9703	FC 3289	1-Port HSSI	86H0974 for adapter 86H0973 for cable
LIC 290	85H4874	FC 3290	6 Port V.35/V.36	CRD 72F0168 V.35 BRICK 72F0167 V.36 CBL 73H2508
LIC 291	85H4876	FC 3291	8-Port X.21	CRD 06H3357 CBL 52G3378
LIC 292	85H4884	FC 3292	1-Port ISDN Pri (E1)	57G8097
LIC 293	85H6834	FC 3293	1-Port 155 Mbps (SMF ATM)	16G5609
LIC 294	86H0986	FC 3294	1-Port 155 Mbps (MMF ATM)	16G5609
LIC 295	86H0993	FC 3295	1-Port 155 Mbps (SMF ATM)	16G5609

LIC 282, LIC 290, and LIC 291 External Wraps

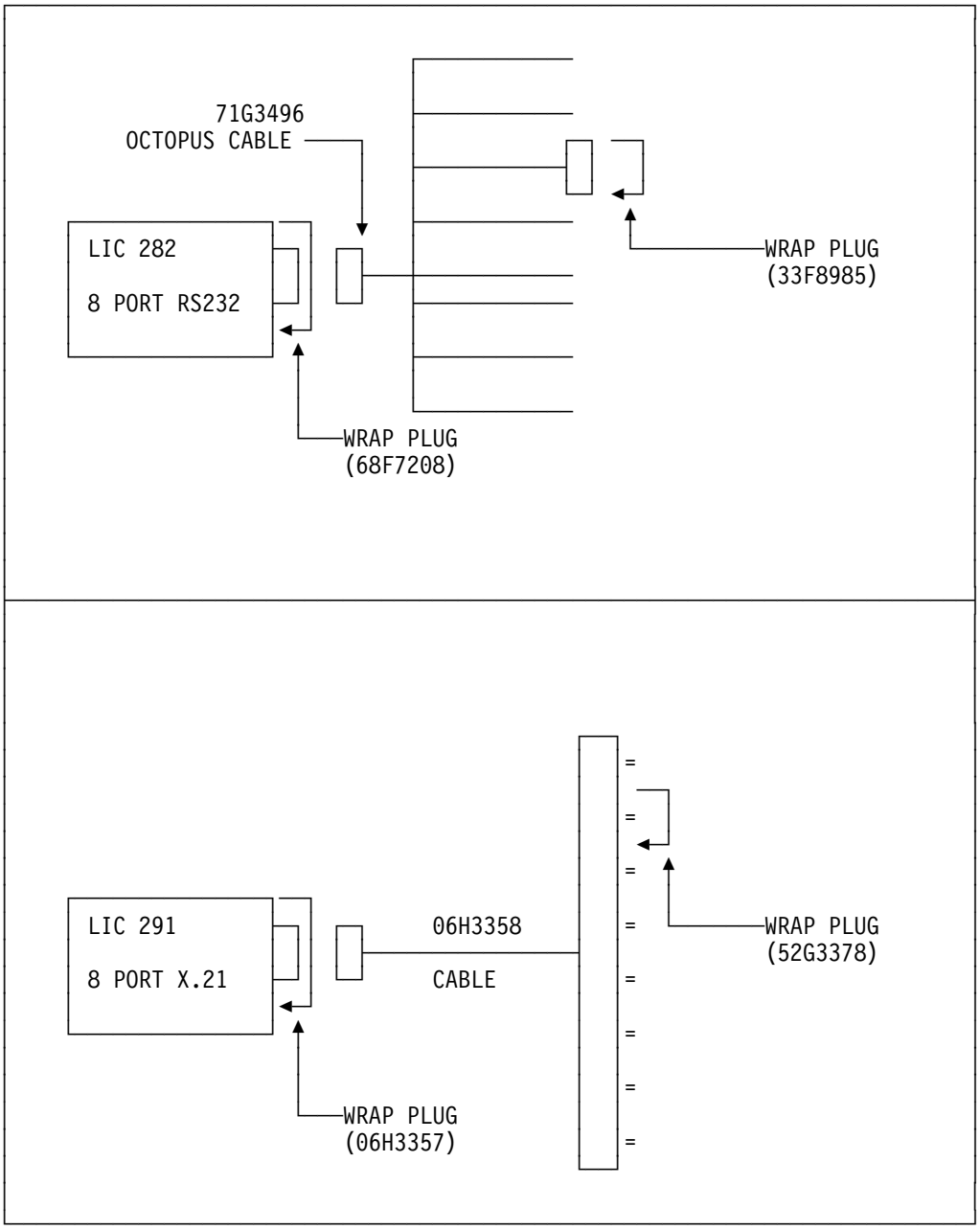


Figure 3-2. LIC 282 and LIC 291 Wrap Support

.

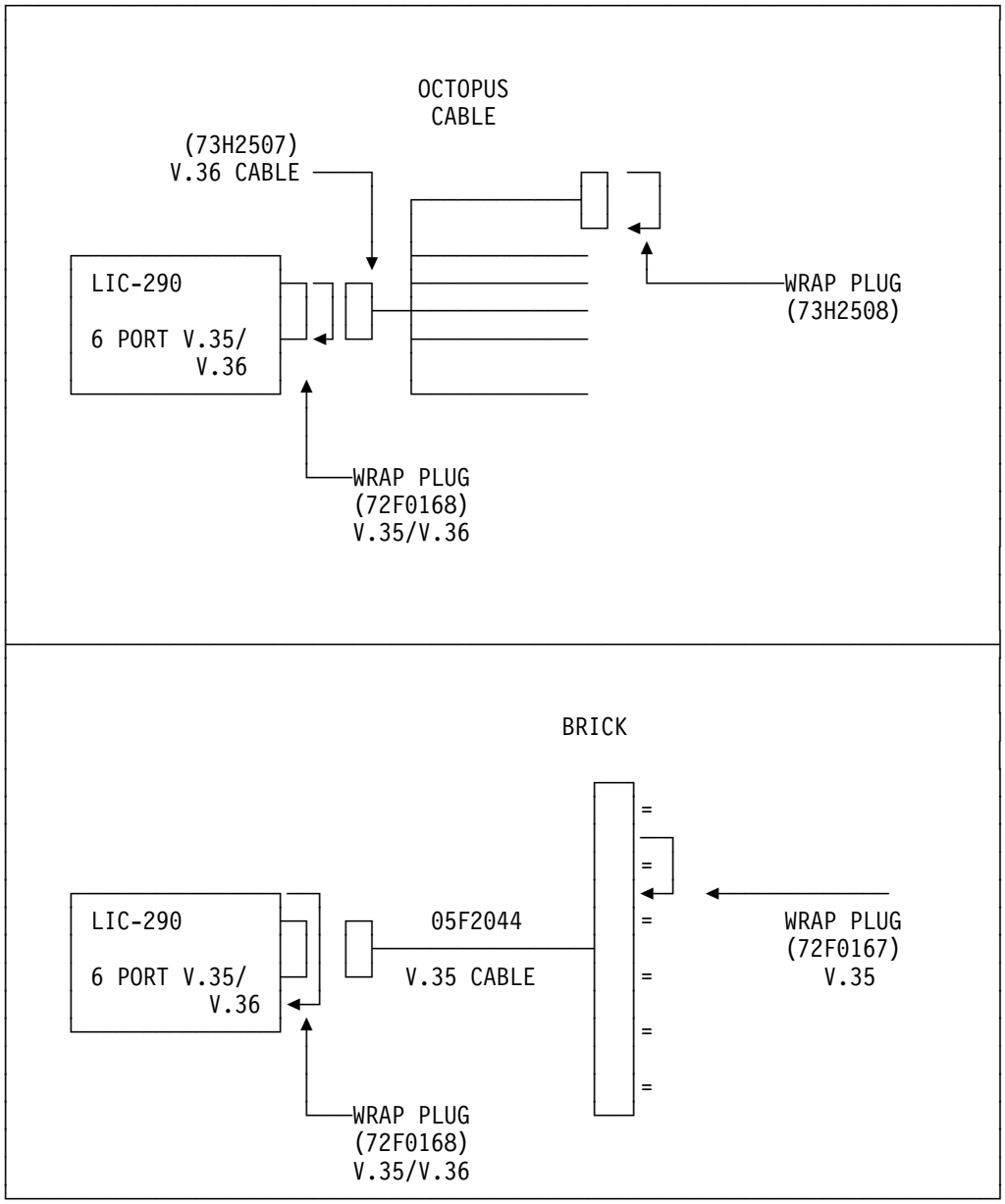


Figure 3-3. LIC 290 Wrap Support

Chapter 4. Multiaccess Enclosure FRU Exchange

Important

The system card and a single power supply are **not** *hot pluggable*. This means that you must switch off power to the adapter when replacing either of them. Other FRUs are hot pluggable and can be exchanged without powering OFF the Multiaccess Enclosure, although the adapter or other FRU must be reset before new configurations can take effect. Follow carefully the procedure described.

Before removing an adapter, be sure that the corresponding resource has been ***disabled*** by the operator at the operator console.

Each time you change a FRU, carefully record its location and check that the attached cables are correctly labeled and reconnected.

In the following table, find the FRU you want to exchange and go to the procedure indicated.

Table 4-1. FRU Exchange

FRU Name	**Go to**
Power Supply	“Exchanging a Power Supply” on page 4-2
System card	“Exchanging the System Card” on page 4-3
Hard drive	“Exchanging the Hard Drive on the System Card” on page 4-6
DIMM	“Exchanging the Memory on the System Card” on page 4-10
PCMCIA Card	“Exchanging the PCMCIA Card” on page 4-13
Fan tray	“Exchanging the Fan Tray” on page 4-15
Adapter type *xxx* (except ESCON adapter)	“Exchanging an Adapter” on page 4-17
ESCON Adapter	“Exchanging the ESCON Adapter” on page 4-20
Backplane	“Exchanging the Backplane” on page 4-23

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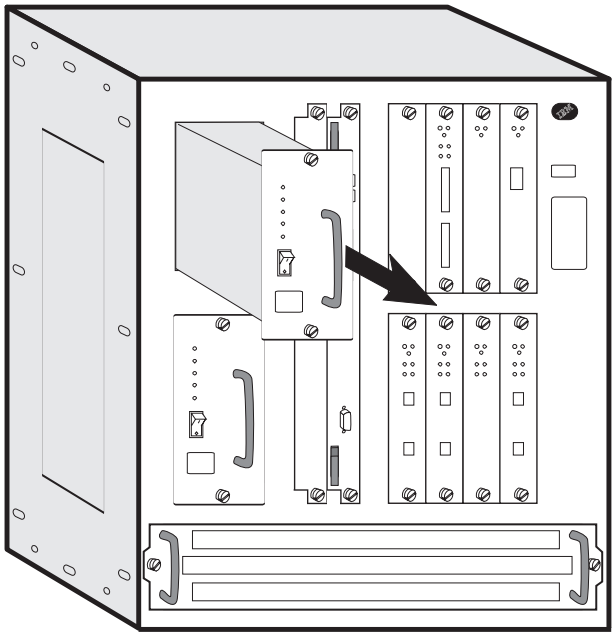
Exchanging a Power Supply

Attention: A power supply is hot pluggable if an optional load-sharing power supply is also installed.

1 Switch OFF the power supply.

2 Unplug the power cord.

3 Remove the power supply by loosening the screws at the top and bottom and pulling the handle.



4 Install the new power supply. The power supply will slide into place on metal rails in the unit.

5 Attach the power cord.

6 Switch ON the power.

7 Verify the LEDs. See “Adapter Card Status” on page 3-3.

8 Notify the network administrator that you are finished repairing the Multiaccess Enclosure.

9 Go to “CE Leaving Procedure” on page 5-49.

Exchanging the System Card

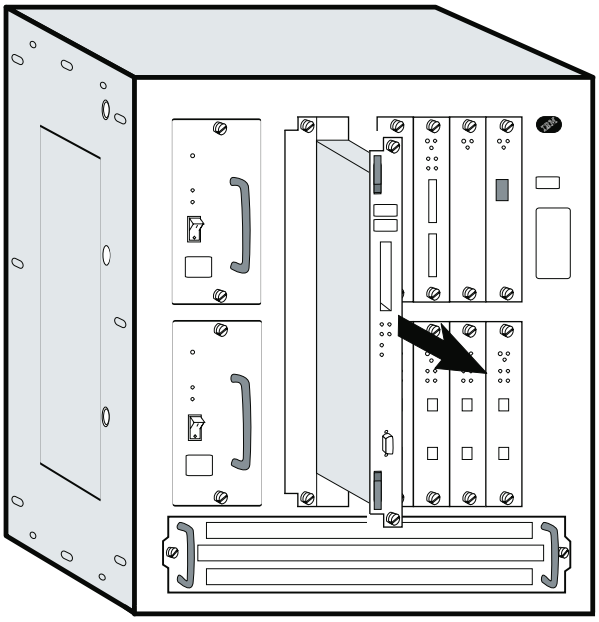
Attention:

1. The System Card is **not** hot pluggable.
2. You will remove and retain the hard file from the old system card. The hard file that comes with the new system card is ***blank***.
3. Make note of the part number of your system card. The old system cards (part number 75H5081 or 85H7916) supported two 32-MB DIMMs (64 MB) of memory, whereas the redesigned system cards supports two 64-MB DIMMs (128 MB) of memory.
   - If you replace the old system (part number 75H5081 or 85H7916) card with the new card, you need to upgrade the firmware to allow the use of the new memory DIMMs.

1 Switch OFF each power supply.

2 Label the cables on the system card. Unplug the cables and the PCMCIA card.

3 Loosen thumbscrews on the system card.



4 Remove the defective system card.

5 Remove the hard drive from the defective system card and install it on a new system card (see “Exchanging the Hard Drive on the System Card” on page 4-6). Return the hard disk drive that came with the new system card with the defective system card. The hard drive that comes with the new system card is blank.

6 If you have the Release 2 system card (PN 85H9682) with two 64-MB DIMMs (128 MB) of memory on the faulty system card, remove one of the DIMMs from the faulty system card (“Exchanging the Memory on the System Card” on page 4-10) and put it on the new system card.

7 If you have 128 MB of memory on your faulty system card, remove one of the DIMMs from the faulty system card (“Exchanging the Memory on the System Card” on page 4-10) and put it on the new system card.

8 Install the new system card. Make sure the card is aligned with the plastic grooves and then slide it in until it is flush with the box. Hold the locking latches so that they are perpendicular to the face of the system card. With the card in full contact with the rear of the Multiaccess Enclosure, press the locking latches into the system card.

9 Tighten the thumbscrews on the face of the adapter card clockwise.

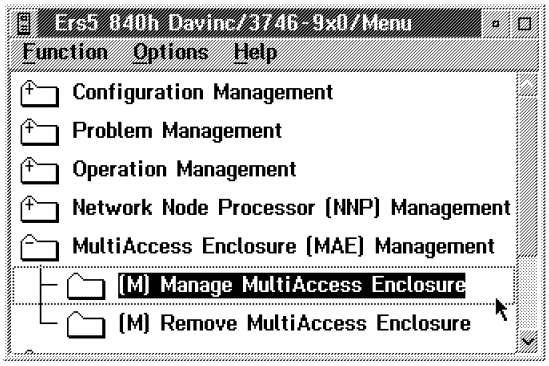
10 Plug the PCMCIA token-ring from the defective system card to the new system card.

11 Plug the cables into the system card.

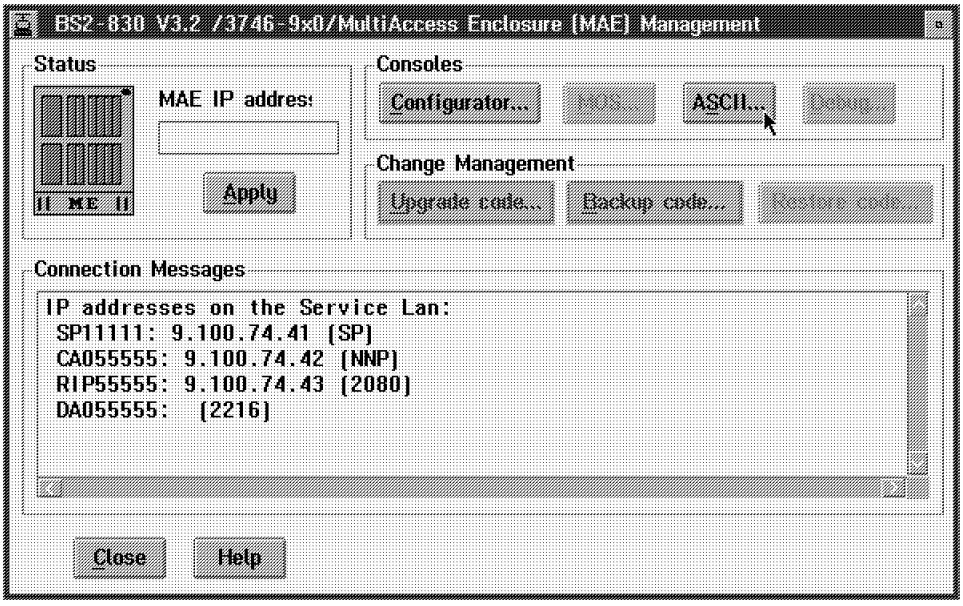
12 Power ON and verify the LEDs. See “Adapter Card Status” on page 3-3.

13 The box serial number must be written into the Vital Product Data on the new system card using the following Steps:

a From the '3746-9x0 Menu', click on **Multiaccess Enclosure (MAE) Management**, then double click on **Manage Multiaccess Enclosure**.



b Read the information message, click on **OK**, then click on **ASCII...**".



c When the following screen is displayed, click on **OK**.

```
                QV1
        VT220 Terminal Emulator
             Version 1.00
      (c)Copyright 1989 QPC Software
          P.O. Box 226
          Penfield, NY 14526

                  OK
```

d Press the **reset** on the front of the system card.

e Several window are displayed during tests. Wait until the **Boot Information** window is displayed.

f Press **F1** when required (to prematurely terminate boot).

g Enter the Multiaccess Enclosure supervisory password when required: 2216.

h In the **System Management Services** window, select **Utilities** and press **Enter**.

i In the **System Management Utilities** window, select **View or Set Vital Product Data** and press **Enter**.

j Select the **Hardware Vital Product Data**.

k Type in the box serial number.

14 Notify the network administrator that you are finished repairing the Multiaccess Enclosure.

15 Go to “CE Leaving Procedure” on page 5-49.

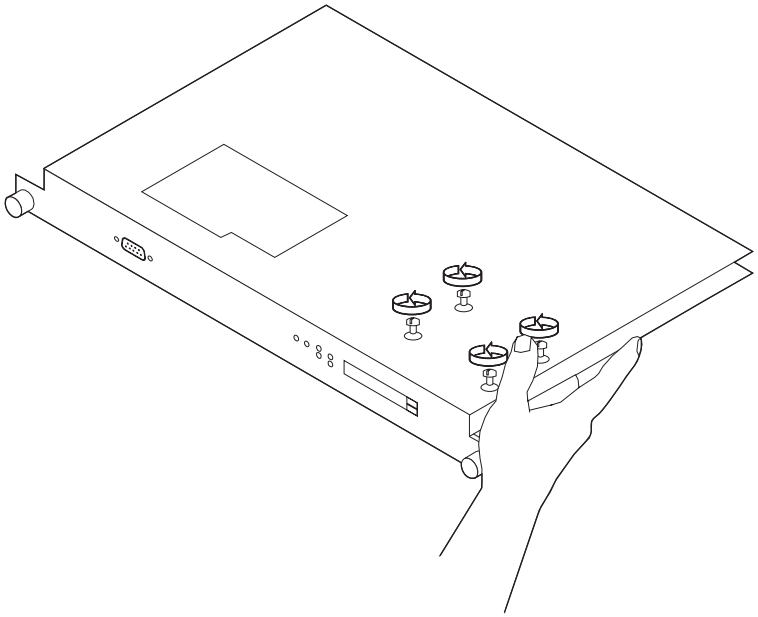
Exchanging the Hard Drive on the System Card

Attention: The System Card is ***not*** hot pluggable.

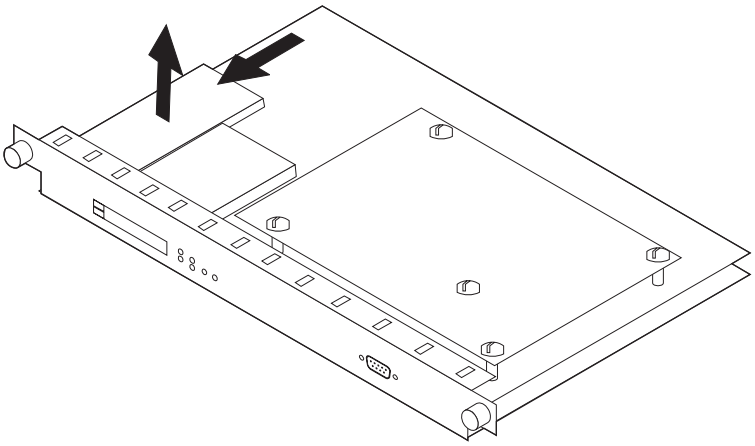
1 Remove the system card as described in steps 1 through 4 in “Exchanging the System Card” on page 4-3.

Attention: In the following step, be sure to support the hard drive to avoid damaging the pins when the screws are removed.

2 Lay the system card on a soft non-conductive surface.



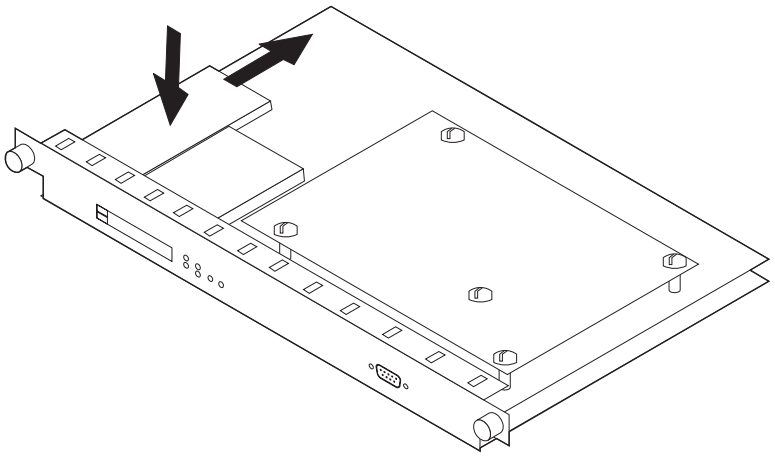
3 On the bottom of the system card, remove the four screws (with a screw starter) while holding the hard drive in place.



4 On the reverse side of the system card, disconnect the drive from the connector and lift it off the system card.

5 Center the new hard drive inside the lines on the system card.

Note: If you do not center the hard drive, the electrical pins on the hard drive will be visible next to the hard drive connector on the system card. Install the new hard drive by reversing Steps 3 and 4 above. Be sure to support the hard drive while installing the screws.



6 Install the system card. Make sure the card is aligned with the plastic grooves and then slide it in until it is flush with the box. Hold the locking latches so that they are perpendicular to the face of the system card. With the card in full contact with the rear of the Multiaccess Enclosure, press the locking latches into the system card.

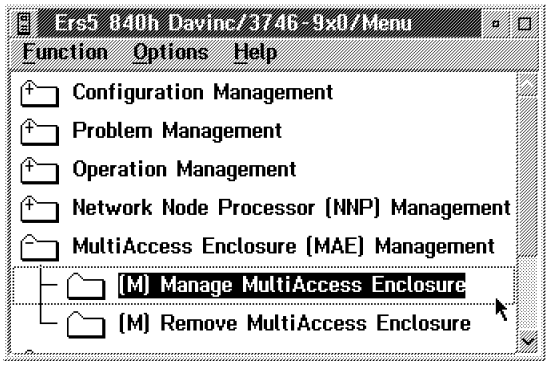
7 Tighten the thumbscrews on the face of the adapter card clockwise.

8 Plug the PCMCIA token-ring from the defective system card to the new system card.

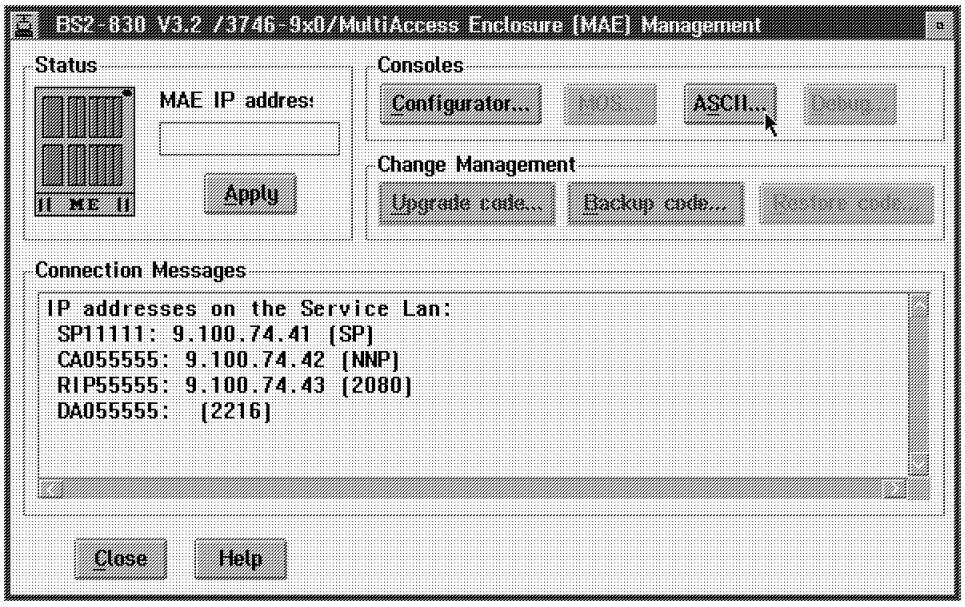
9 Plug the cables into the system card.

10 Power ON and verify the LEDs. See “Adapter Card Status” on page 3-3.

11 From the '3746-9x0 Menu', click on **Multiaccess Enclosure (MAE) Management**, then double click on **Manage Multiaccess Enclosure**.



12 Read the information message, click on **OK**, then click on **ASCII..."**.



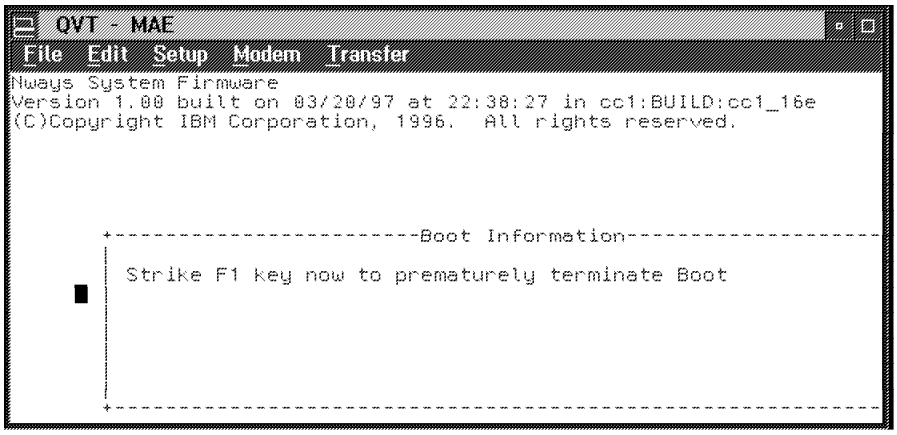
13 When the following screen is displayed, click on **OK**.

```
                QV1
          VT220 Terminal Emulator
               Version 1.00
        (c)Copyright 1989 QPC Software
            P.O. Box 226
            Penfield, NY 14526

                    OK
```

14 Using a pointed tools (paper clip) press the **Reset** button on the multiaccess enclosure system card.

15 Several window are displayed during tests. Wait until the **Boot Information** window is displayed.



16 Press **F1** when required (to prematurely terminate boot) .

17 Enter the Multiaccess Enclosure supervisory password when required: 2216.

18 In the **System Management Services** window, select **Utilities** and press **Enter**.

19 From the menu, select **Prepare Hard Disk** and press **Enter**.

- If no errors occur, continue with Step 20.
- If error code 30002000 occurs during format, do the following:

  a In the **System Management Services** window, select **Select Device to test** and press **Enter**.

  b Select **Test IDE devices**.

  c Press the **F4**

  for Parm Setup

  d Select **Run Interactive Test** and **Stop on Error**.

  e Press **Enter** and **F6** to begin the tests.

  f Several screens are displayed, follow the prompts.

  g In **IDE Subsystem** window, select **Format IDE device**, and press **Enter**.

  Attention- This formats the hard disk and destroys all data on the hard disk.

  h Follow the prompts to start HDD formatting.

  i At the end of formatting the message **Format Complete Successfull** is briefly displayed. Follow the prompts to return to the **System Management Services** menu. When it is done return to Step 19.

20 Select **Utilities**, the **System Management Utilities** is displayed.

21 Reload the firmware to the hard disk using Xmodem (see “Updating System Firmware” on page 5-15). When it is done continue with the next step.

22 Restore the operational software on the new hard disk (see “Restoring the Image Code of the Multiaccess Enclosure Hard Disk” on page 5-24).

23 To restore the configuration use the configurator program, refer to “Restoring a MAE Configuration from Diskette” on page 2-16.

24 Notify the network administrator that you are finished repairing the Multiaccess Enclosure.

25 Go to “CE Leaving Procedure” on page 5-49.

Exchanging the Memory on the System Card

The multiaccess enclosure comes with a minimum of 64 MB (one dual inline memory module [DIMM]). There are slots for two DIMMs on the system card.

This procedure can be used for removing faulty DIMM modules or to install memory upgrades to your multiaccess enclosure.

1 Identify the faulty memory module. Two types of system card are available (see Figure 4-1 and Figure 4-2 on page 4-11). DIMM socket A is positioned in position U14 or U87 according to the system card type.

2 Remove one or both of the DIMMs by pulling down the lever. (Use your thumbnail or a small non-metallic device to gently move the spring latch away from the end of the DIMM.) The DIMM will automatically be pushed partially out of the slot.

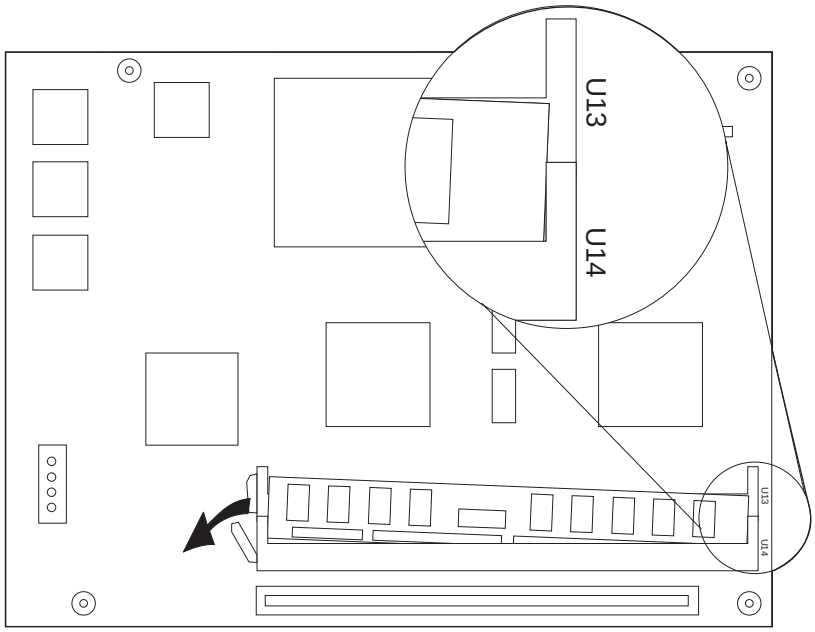


Figure 4-1. Previous System Card

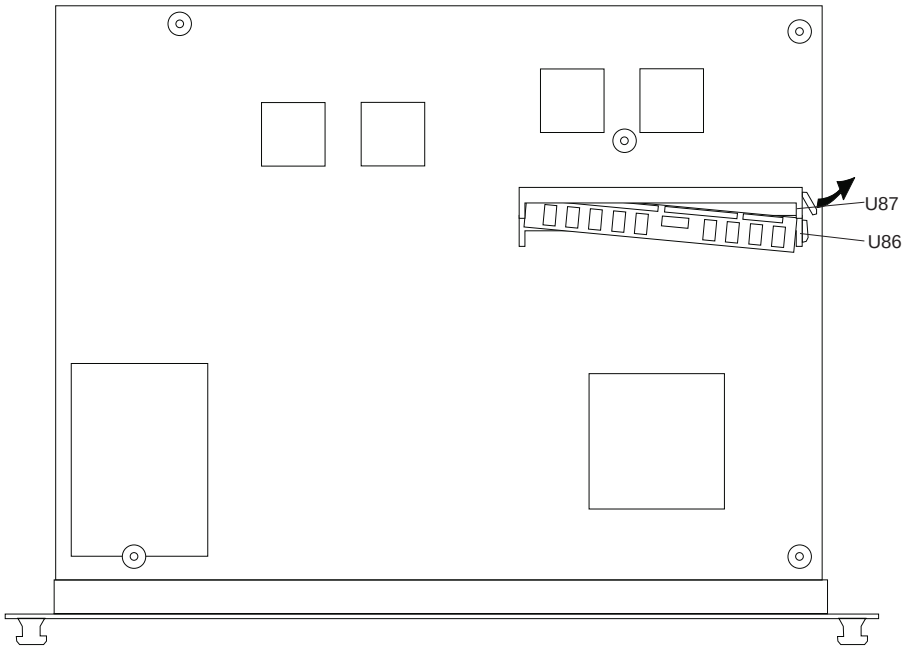


Figure 4-2. New System Card

3 Gently slide the DIMM module out of its connector socket.

4 If you are installing ***new*** memory DIMMs, continue with the following procedure: (If you are replacing DIMMs that you previously removed, go to step 6.)

a Remove the DIMM, in its antistatic bag, from its shipping container.

Attention: Electrostatic discharge (ESD) can damage the static-sensitive devices on circuit boards. To avoid this kind of damage, use the following precautions:

- Do not remove the DIMM until you are ready to insert it into the multiaccess enclosure.
- Use correct grounding techniques when inspecting and installing the DIMM. Use a foot strap or grounding mat, or wear a grounded static discharge wrist strap, or touch a grounded rack or other source of ground before you handle the DIMM.

b Remove the DIMM from the antistatic bag. Inspect it for damage. Always handle the DIMM by the ends (preferably grasp it between the middle finger and thumb; do not touch the components). If the DIMM appears to be damaged, return it to the antistatic bag and contact the supplier.

5 According to the system card type (see Figure 4-3 on page 4-12 and Figure 4-4 on page 4-12) locate either the slot numbered U14 or U87 if you are installing one 64-MB DIMM. Locate the slot numbered U13 or U86 if you have two 64-MB DIMMs.

6 Insert the replacement DIMM into the appropriate slot. (Grasping the DIMM between the middle finger and thumb, place it connector edge down into the DIMM socket. Applying slight pressure to the top edge of the DIMM, move it forward until it is correctly aligned and snaps in place.)

The lever will snap back into place as the DIMM is fully inserted.

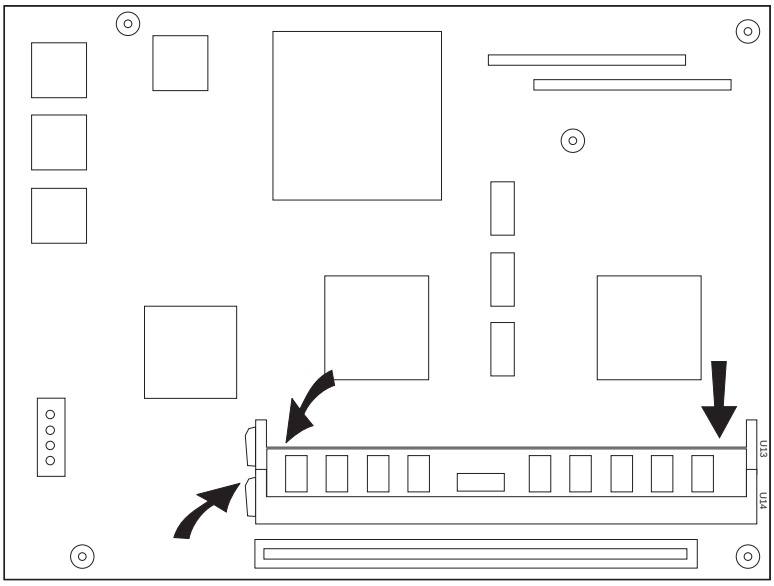


Figure 4-3. Previous System Card

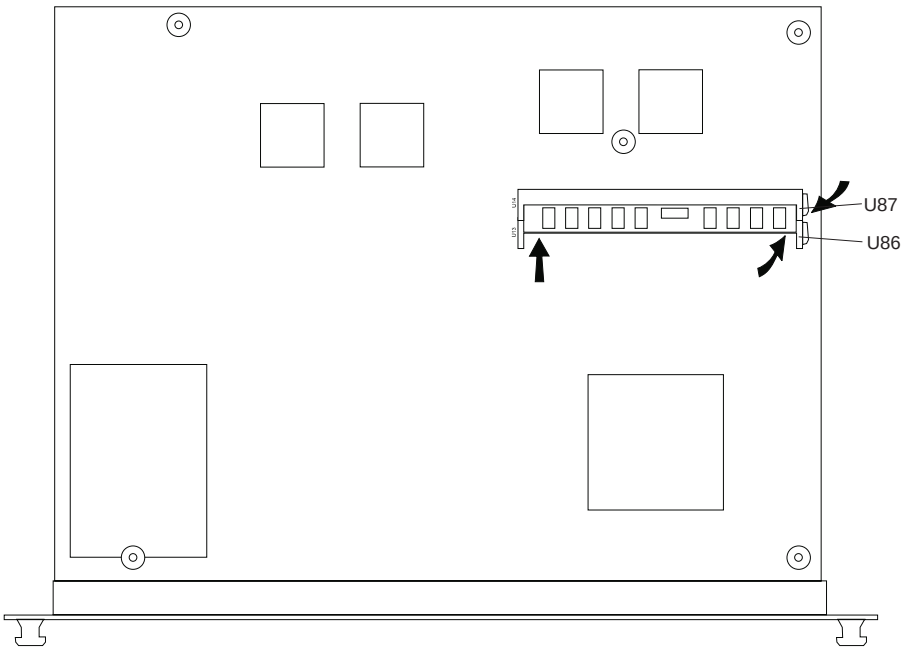


Figure 4-4. Previous System Card

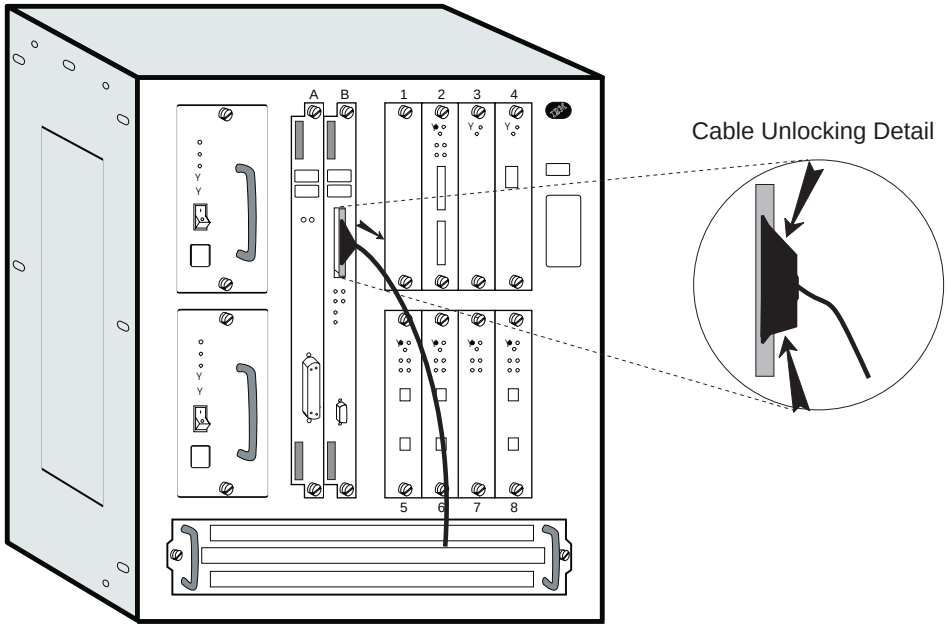
7 If your only task was to remove and replace or initially install a DIMM, you are ready to reinstall the system card. Go to “Exchanging the System Card” on page 4-3.

Exchanging the PCMCIA Card

Attention

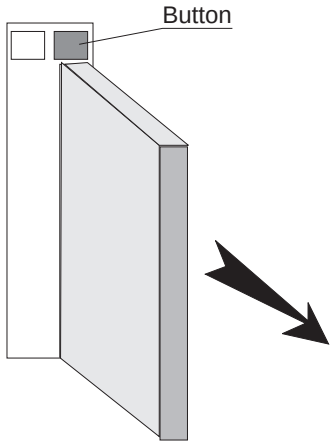
The PCMCIA card is hot pluggable, but the customer traffic must be stopped on the multiaccess enclosure.

1 Remove the cable from the PCMCIA Card. Some cable connector must be pressed on each side for unlocking.



2 Press the upper button to remove the PCMCIA card from the multiaccess enclosure.

Detail of PCMCIA
Card Locking



3 Plug the new PCMCIA card into the system card of the multiaccess enclosure.

4 Reconnect the cable previously removed to the PCMCIA card.

5 Check and modify if necessary the PCMCIA speed setting using the following procedure.

PCMCIA Speed Setting

1 Follow the procedure “Step 5 - Customizing the MAE” on page 1-20 until Step **8**.

2 Select **Adapter Parameter** option, using the arrow keys, then press **Enter**.

3 Select **PCMCIA Token-Ting** option, then press **Enter**.

4 Select **View or Set Parameters** option, then press **Enter**.

5 Select **Ring Speed** option, then press **Enter**.

6 Select speed: **16Mb** via the arrow keys and space bar to validate.

7 Press **Esc** to quit the different windows.

8 When you are again on the **System Management Services** window, press **PF3** to reboot.

9 Follow the prompts until the following message is displayed: "Please press the space bar to obtain the console".

10 Press the **Space bar**, "MOS Operator Control" is displayed.

11 Click on **File** in the title bar, then click on **Exit**.

12 You are now on the **3746-9x0/MultiAccess Enclosure (MAE) Management**.

13 Notify the network administrator that you are finished repairing the Multiaccess Enclosure.

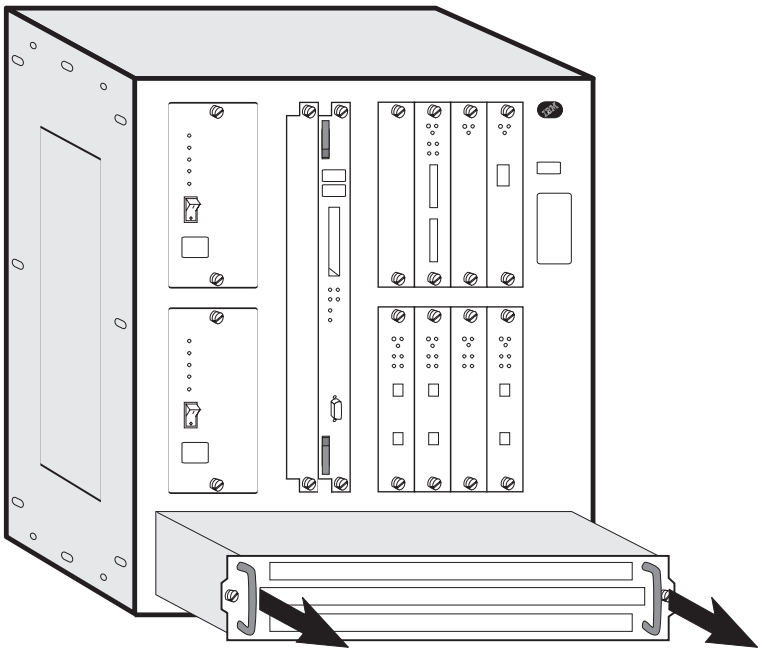
14 Go to “CE Leaving Procedure” on page 5-49.

Exchanging the Fan Tray

Attention: The fan tray is **not** hot pluggable.

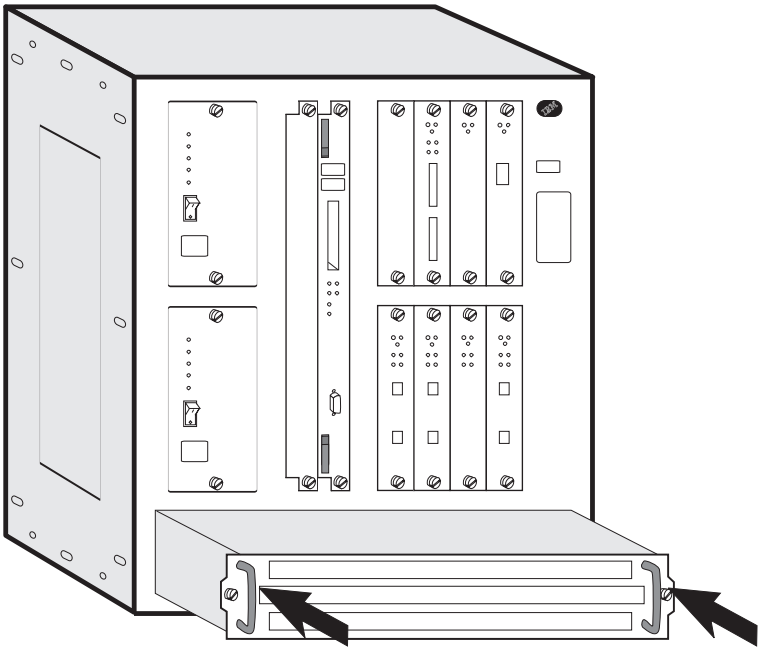
1 Switch OFF each power supply.

2 Loosen the two thumbscrews that secure the fan tray and remove the fan tray.



3 Slide the new fan tray in until the tabs on the back of the fan tray are in the slots. This aligns the connectors with the plugs.

4 When the fan tray is flush with the box, tighten the two thumbscrews.



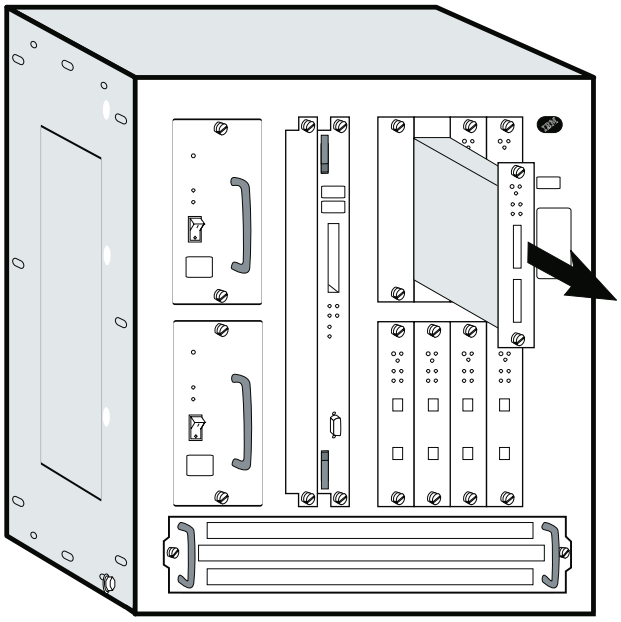
5 Power ON and verify the LEDs. See “Adapter Card Status” on page 3-3.

6 Notify the network administrator that you are finished repairing the Multiaccess Enclosure.

7 Go to “CE Leaving Procedure” on page 5-49.

Exchanging an Adapter

Note: The adapter you replace must be of the same type as the original. Otherwise, you will need to reconfigure. See the *2216 Planning Guide* and the *Software User's Guide*.



1 Locate the adapter module to be replaced.

Attention:

a. Adapters are hot pluggable, but all adapter ports must be disabled before cables are removed. See "Suspend Traffic on an Adapter Port" on page F-6.
b. If an adapter is removed prior to disabling the ports, a machine check can occur.
c. If you are removing a serial adapter (EIA-232E/V.24, V.35/V.36, X.21 which are LICs 282, 290, and 291), you need to disable the WAN Reroute process before you remove the adapter. (See "Disabling Interfaces that Have WAN Reroute Enabled" on page F-8).

2 Label the cables for proper reconnection.

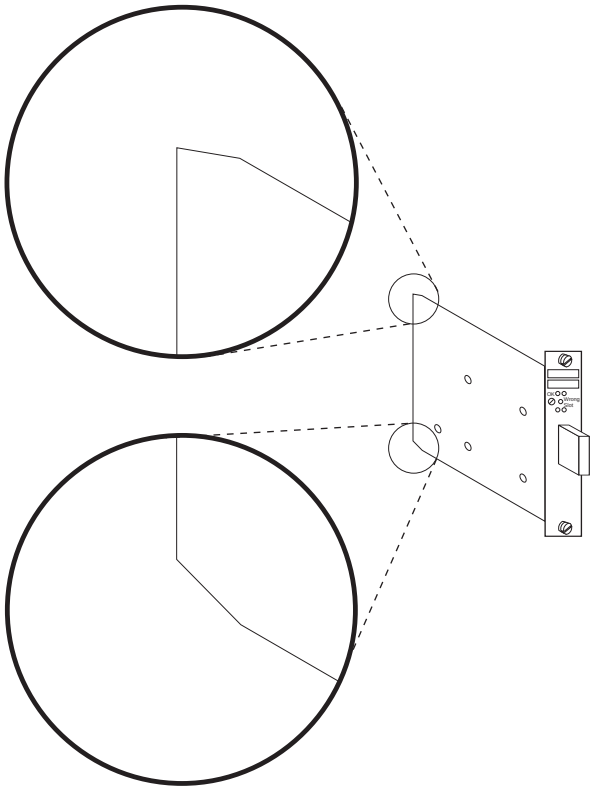
3 Loosen the screws (if present) that secure the cable or cables.

4 Remove the cable or cables.

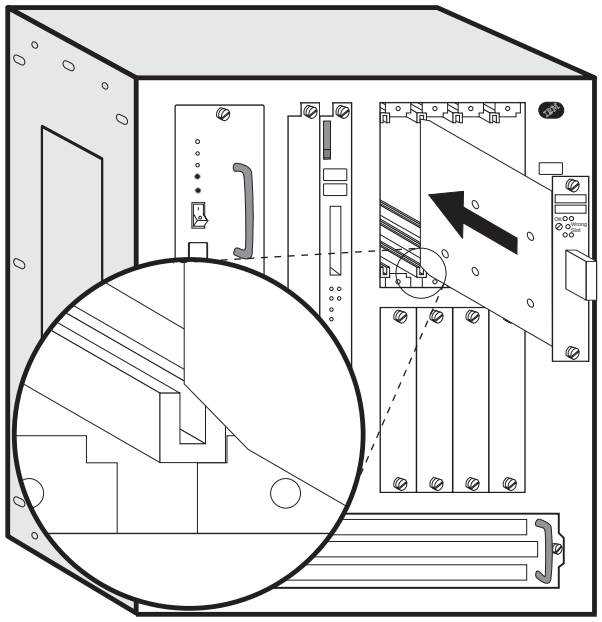
Attention: You must turn the adapter's thumbscrews simultaneously when unseating or seating the adapter during removal or installation. By doing so, you prevent stripping the thumbscrews. If you strip the thumbscrews, you may not be able to seat or reseat the adapter properly.

5 Loosen the screws on the adapter.

6 Remove the adapter from its location.

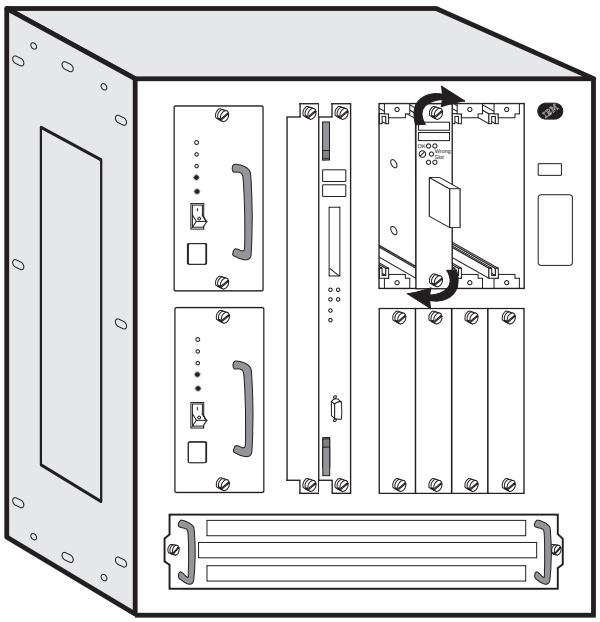


7 Notice the notches at the adapter card's angled corners and position them on the left as illustrated.



8 Carefully position the notches of the adapter card in the appropriate adapter slot's upper and lower rails. Then, guide the adapter forward on the rails as pictured.

9 Make sure the adapter card is aligned with the plastic grooves and then slide it in until it is flush with the box.



When the card makes full contact with the rear of the Multiaccess Enclosure, press and simultaneously turn each thumbscrews on the face of the adapter card clockwise, only until the adapter is firmly seated.

10 Secure the module by tightening the screws.

11 Check that the green LED of the adapter comes ON and that the Wrong Slot LED is OFF. If not, check the adapter installation. If the problem persists call the Network Support Center. Otherwise, continue.

12 If you are replacing/inserting a serial adapter (EIA-232E/V.24, V.35/V.36, X.21 which are LICs 282, 290, and 291) and you went through the WAN Reroute disable procedure (“Disabling Interfaces that Have WAN Reroute Enabled” on page F-8), you need to enable the WAN Reroute process. (See “Enabling WAN Reroute after You Have Disabled it” on page F-8).

13 Replace the removed cable or cables, then tighten the cable screws (if present).

14 Re-enable all adapter ports. See “Resume Traffic on an Adapter Port” on page F-7.

15 Notify the network administrator that you are finished repairing the Multiaccess Enclosure.

16 Go to “CE Leaving Procedure” on page 5-49.

Exchanging the ESCON Adapter

1 Locate the adapter module to be replaced.

2 **Power Off** the multiaccess enclosure.

3 Label the cables for proper reconnection.

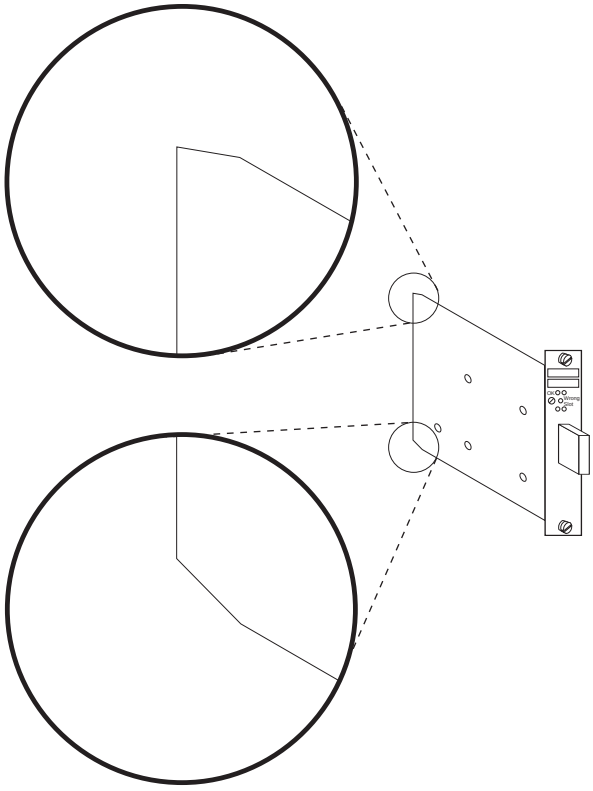
4 Loosen the screws (if present) that secure the cable or cables.

5 Remove the cable or cables.

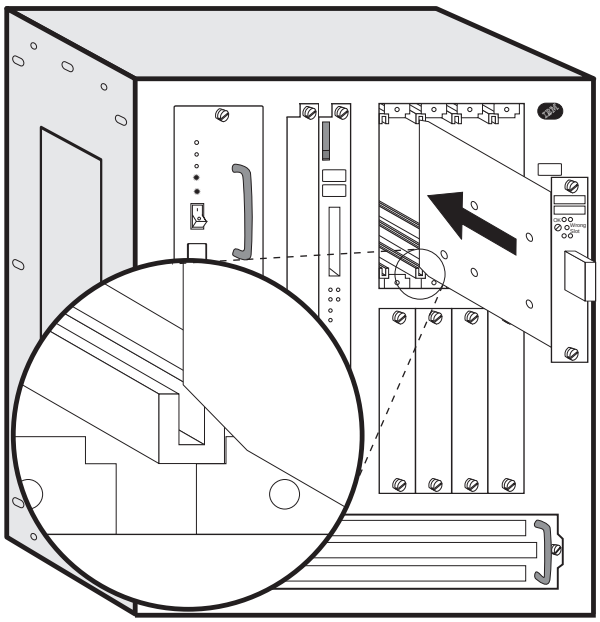
Attention: You must turn the adapter's thumbscrews simultaneously when unseating or seating the adapter during removal or installation. By doing so, you prevent stripping the thumbscrews. If you strip the thumbscrews, you may not be able to seat or reseat the adapter properly.

6 Loosen the screws on the adapter.

7 Remove the adapter from its location.

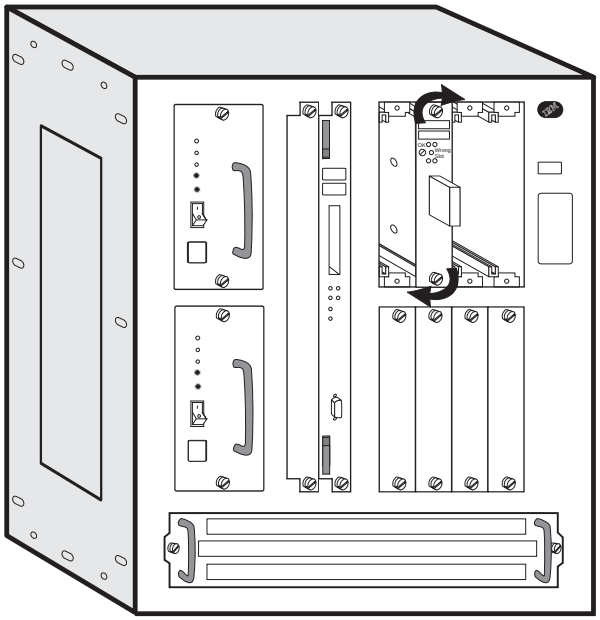


8 Notice the notches at the adapter card's angled corners and position them on the left as illustrated.



9 Carefully position the notches of the adapter card in the appropriate adapter slot's upper and lower rails. Then, guide the adapter forward on the rails as pictured.

10 Make sure the adapter card is aligned with the plastic grooves and then slide it in until it is flush with the box.

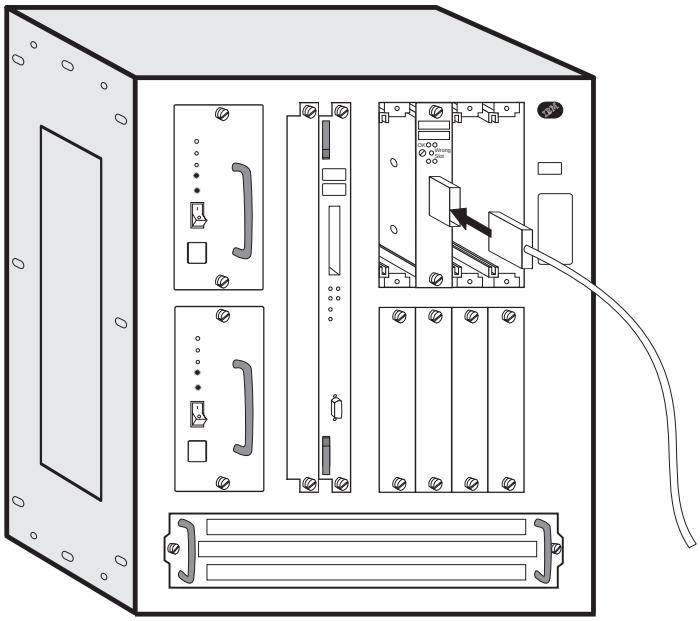


When the card makes full contact with the rear of the Multiaccess Enclosure, press and simultaneously turn each thumbscrews on the face of the adapter card clockwise, only until the adapter is firmly seated.

11 Secure the module by tightening the screws.

12 Connect the ESCON fiber optic cable to the adapter by inserting the connector into the adapter until a snap is heard.

Note: The connector is keyed to prevent inserting it incorrectly.



13 Power **ON** the Multiaccess Enclosure.

14 Check that the green LED of the adapter comes ON and that the Wrong Slot LED is OFF.

- If not, check the adapter installation.
- If the problem persists call the Network Support Center.
- Otherwise, notify the network administrator that you are finished repairing the Multiaccess Enclosure.
- Go to “CE Leaving Procedure” on page 5-49.

Exchanging the Backplane

This procedure requires two people.

1 Switch OFF each power supply.

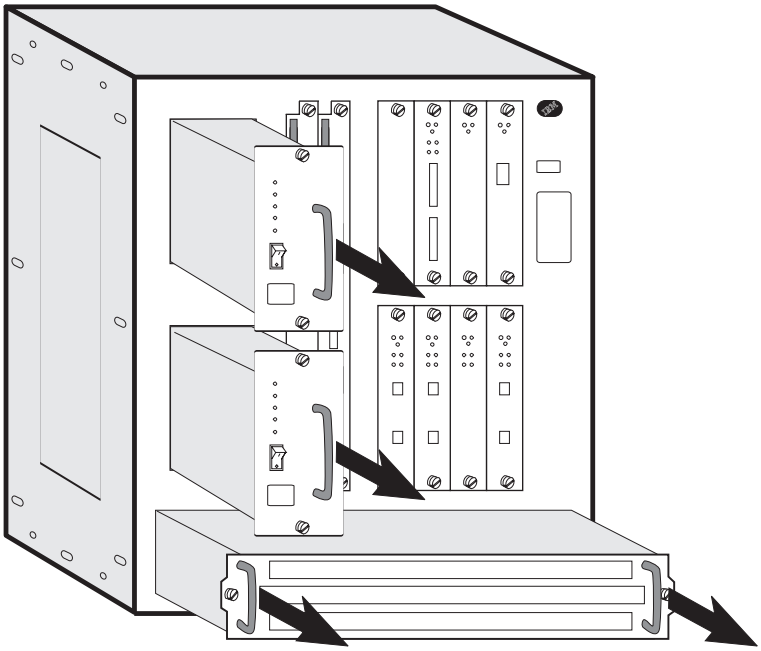
2 Unplug the power cord from the power receptacle.

3 Label the cables with the adapters and ports they plug into. Unplug all the cables.

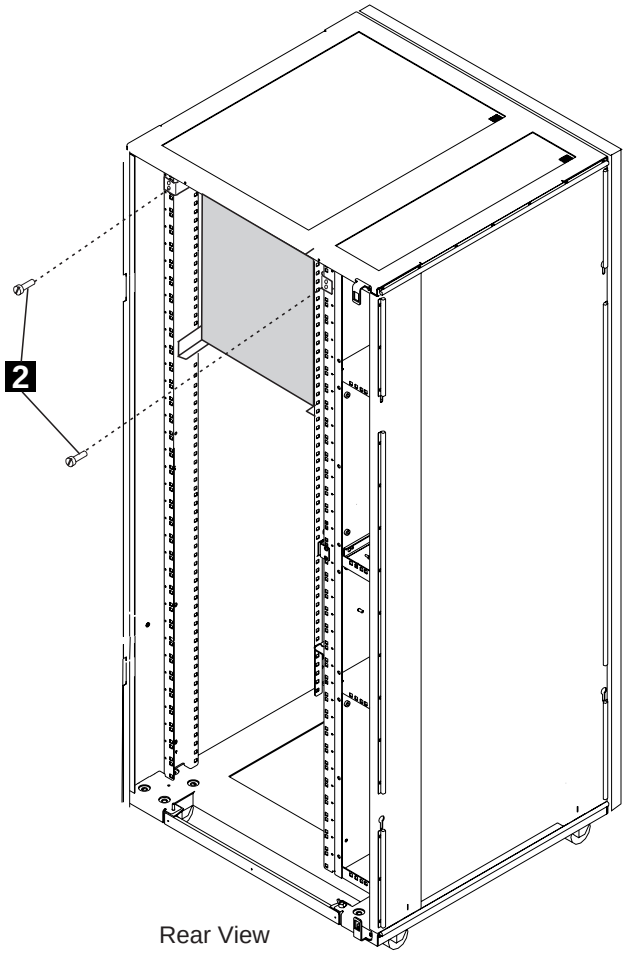
4 The unit is too heavy fully populated.

5 Remove the:

- Power supplies (Loosen the screws on each component and pull the handle)
- System card (see “Exchanging the System Card” on page 4-3)
- Adapters (see “Exchanging an Adapter” on page 4-17)
- Fan tray (see “Exchanging the Fan Tray” on page 4-15).



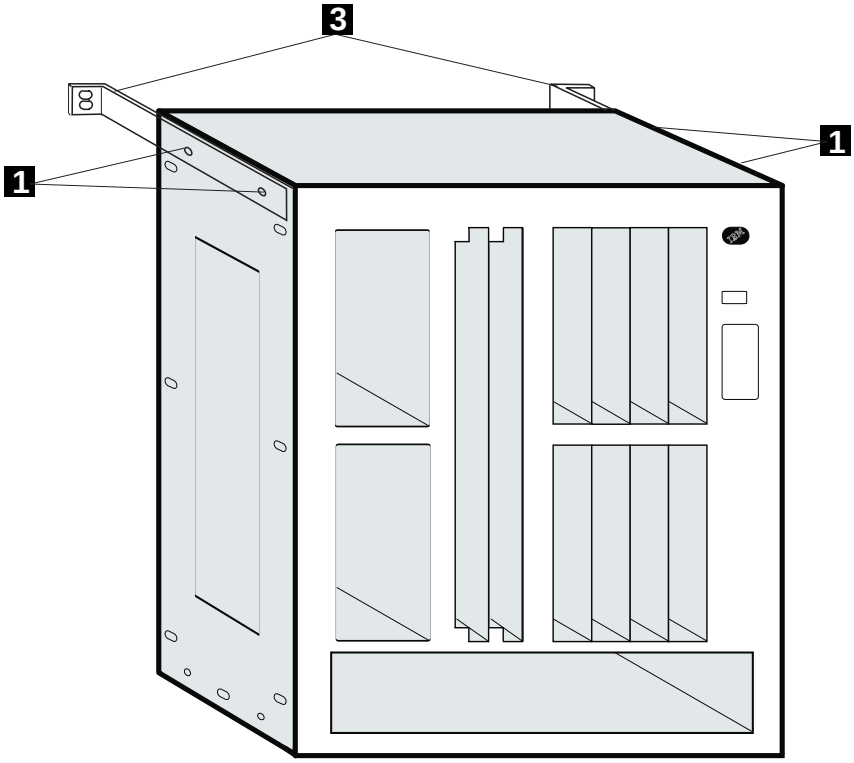
6 At the rear of the rack remove the screws **2** which maintain the multiaccess enclosure.



Rear View

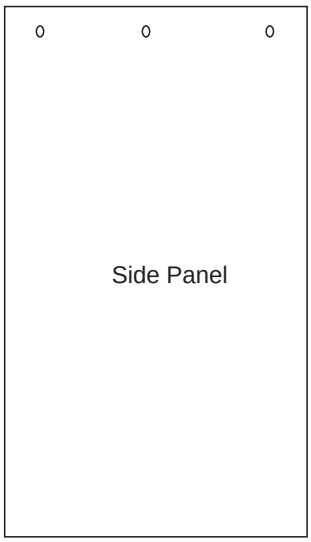
7 Hold the Multiaccess Enclosure from the top of the front and bottom of the back, and then slide it backward out of the rack.

8 Place the Multiaccess Enclosure on a table.



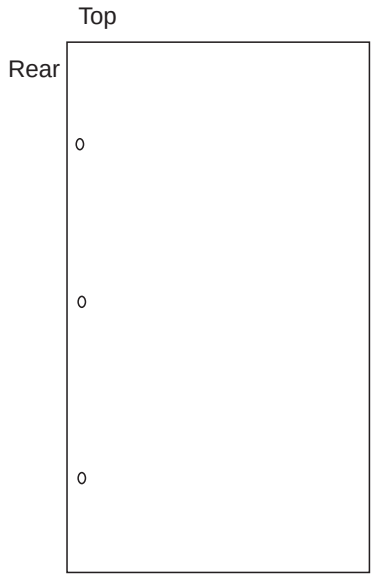
a Remove the ***bottom*** left and right screws on each side first. Do not remove the middle screws. They hold the top and bottom panels in place.

b While holding the side panel and the bracket **3** , remove the ***top*** left and right screws **1** .

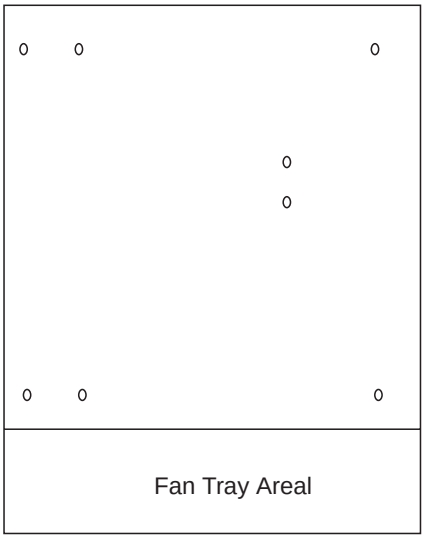


9 Remove the top panel. To do this, go to the rear of the Multiaccess Enclosure. Lift the top panel, and then slide the panel toward you.

10 On each side of the Multiaccess Enclosure, remove the three screws along the rear of the side panels of the Multiaccess Enclosure that hold the backplane in place.

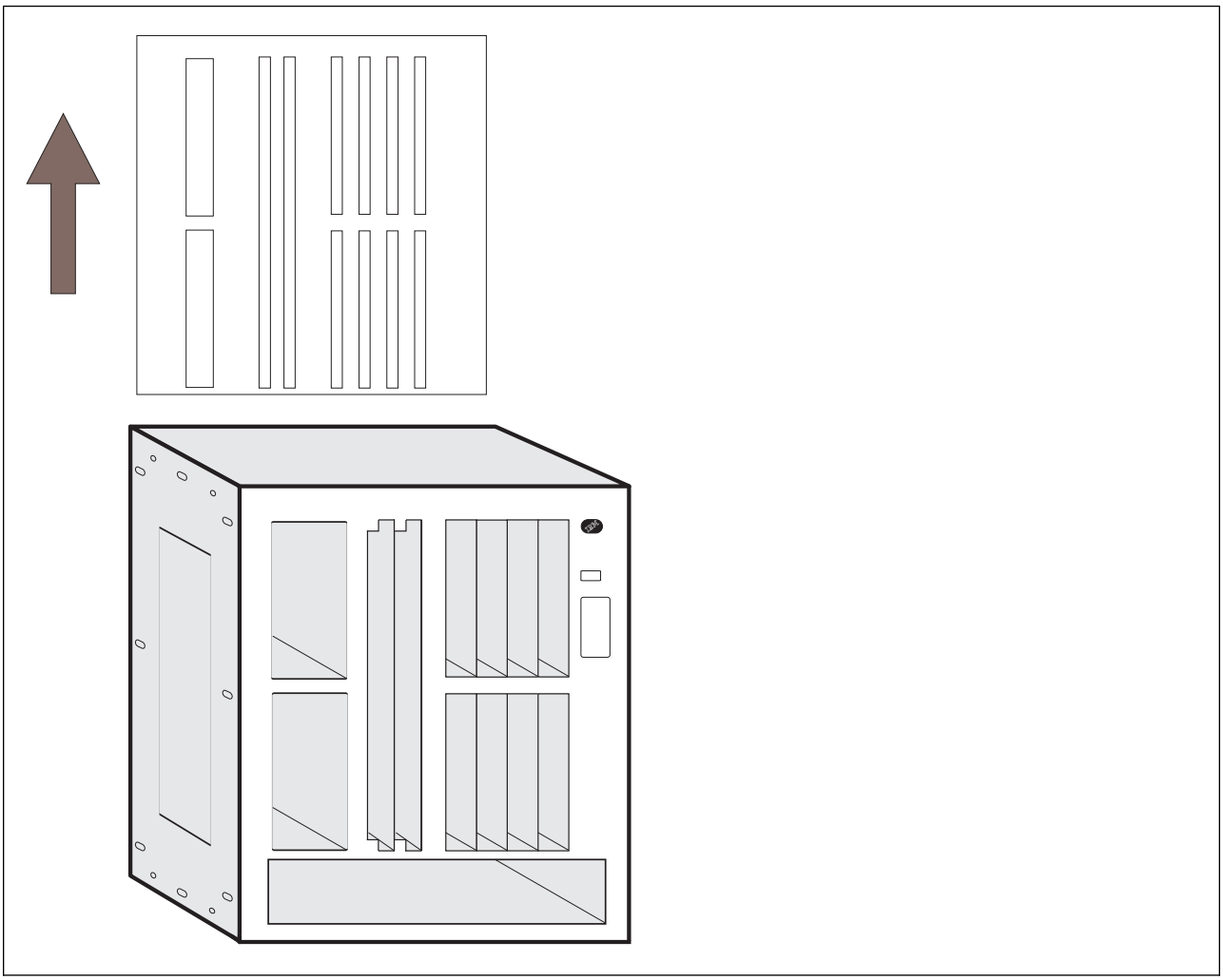


11 Remove the eight nuts and star washers located on the inside of the Multiaccess Enclosure.



Relative locations of the nuts viewed from the front of the box

12 Hold the backplane by the finger holes and lift it straight out of the Multiaccess Enclosure.



13 Hold the new backplane by the finger holes and lower it gently into the Multiaccess Enclosure.

14 Align the screw holes on the backplane with those on the sides of the box.

15 Loosely install the top two screws on each side of the Multiaccess Enclosure.

16 Reach inside the Multiaccess Enclosure, grasp the bottom middle of the backplane's plastic shield, and press it up and toward you until all the bulkhead screws protrude through the chassis.

17 Loosely insert the remaining screws on each side.

18 Install and tighten the eight nuts and star washers inside the Multiaccess Enclosure that secure the backplane to the system.

19 Tighten the screws along the side of the box that hold the backplane in place.

20 Replace the top of the unit.

- **a** Align the five tabs on the top panel with the slots on the top front of the Multiaccess Enclosure.
- **b** Lower the top, and then press it back into place.

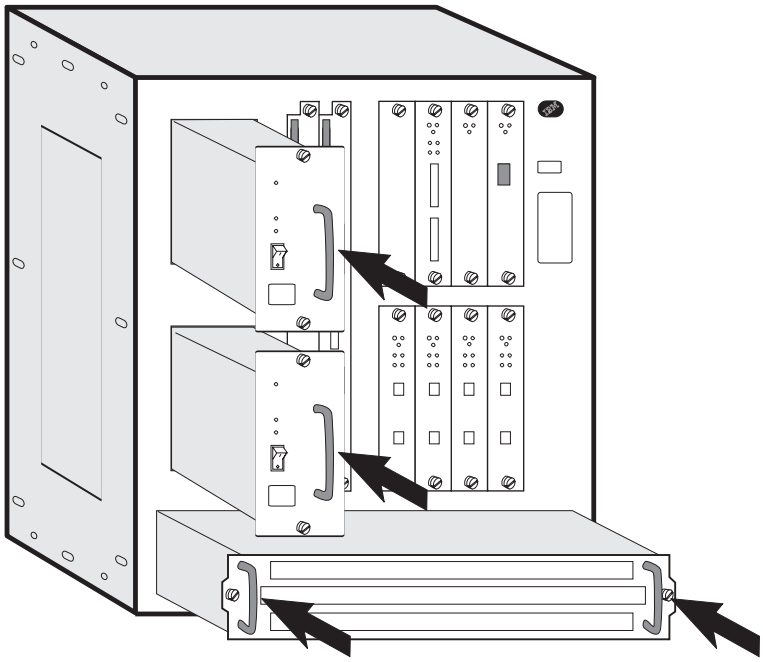
c Reinstall the middle screw on each side.

21 Reinstall and tighten the three screws that secure the top of the box to each side of the box.

22 Mount the Multiaccess Enclosure in the rack.

a Slide the Multiaccess Enclosure into the rack and secure it with the two screws **2** previoulsy removed.

23 Install the fan tray. Slide the fan tray in until the tabs on the back of the fan tray are in the slots. This aligns the connectors with the plugs. When the fan tray is flush with the box, tighten the two screws.



24 Install the slot cover into slot A.

25 Install the system card in slot B. Make sure the card is aligned with the plastic grooves and then slide it in until it is flush with the box. (See “Exchanging the System Card” on page 4-3 for details). Tighten the screws.

26 Moving from left to right, install the remaining adapters. Slide each adapter along the plastic grooves until it clicks into place. Tighten the screws. (See “Exchanging an Adapter” on page 4-17 for details).

27 Finally, install the power supplies. The power supplies will slide into place by following metal rails in the box.

28 Connect the cables and power cord to the power receptacle.

29 Switch ON the power.

30 Verify the LEDs. See “LED Indicators” on page 3-2 and “MAP 0300: Multiaccess Enclosure Basic Verification” on page 3-5.

31 Notify the network administrator that you are finished repairing the Multiaccess Enclosure.

32 Go to “CE Leaving Procedure” on page 5-49.

Chapter 5. Multiaccess Enclosure Firmware and Operational Code

This chapter explains how:

- To access to multiaccess enclosure and use the firmware or the operational code for running diagnostics.
- To access to multiaccess enclosure and use the firmware for configuration, boot sequence, or utilities.

Running Diagnostics

There are two ways to run diagnostic on the multiaccess enclosure depending the multiaccess enclosure status.

Select in the following table what you intend to do:

What you want to do	Go to
Run diagnostics on the complete multiaccess enclosure after installation (multiaccess enclosure not configured and without operational code).	“Accessing the Firmware from the Service Processor” on page 5-3
Run diagnostics on part of the multiaccess enclosure which is operationnal (multiaccess enclosure configurated and operational code loaded).	“Accessing the Operational Diagnostics from the Service Processor” on page 5-31

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Using Multiaccess Enclosure Firmware

The multiaccess enclosure firmware tests the hardware each time the multiaccess enclosure is powered on. If the multiaccess enclosure has not loaded its operational code, the firmware should be running. The firmware menu will come up and pause when the multiaccess enclosure is set up to boot up in “Attended Mode.” Attended Mode requires direct intervention from console input to complete the boot-up process (a password is required).

Important:

1. You can also access the firmware by stopping the boot process. To do this, you must have a TTY console directly attached to the serial port and a null modem.
2. To access the firmware:
   a. When the multiaccess enclosure starts its boot process, press **F1** at the terminal keyboard.
   b. If the firmware panels do not appear:
      1) Make sure your workstation is connected to the serial port on the multiaccess enclosure
      2) Power off, and power on, the multiaccess enclosure.

Note: Make sure the screen size for your terminal emulation software is set to 80 columns by 24 rows.

Connection in Attended mode is a TTY (using limited VT100, VT220, IBM 3151 or 3161 emulation) connection. You can transfer files using the Xmodem protocol for TTY.

Attended Mode

When the multiaccess enclosure is configured to come up in Attended mode, you are given access to the Firmware command set. (A password is required for access to the firmware.) From this level of commands, you can select the Image Bank from which to load. You can also choose the config file from within that Image Bank. At this point, you can load new config files or image files.

In Attended mode, you can start booting the multiaccess enclosure by pressing **F9** to start the operating system.

Unattended Mode

This is the normal mode for the multiaccess enclosure. (A password is not required to access the firmware in unattended mode.) To do this, you must have a TTY console directly attached to the serial port and a null modem.

Starting Firmware

You are ready to begin using the information in this chapter after you have established connection with the multiaccess enclosure using the “Accessing the Firmware from the Service Processor.”

Accessing the Firmware from the Service Processor

1 You should be logged ON on the service processor. If not go to Step 2. Otherwise continue with Step **3** .

2 To log ON:

a On the **MOSS-E View** window, click on **Program** (in the action bar).

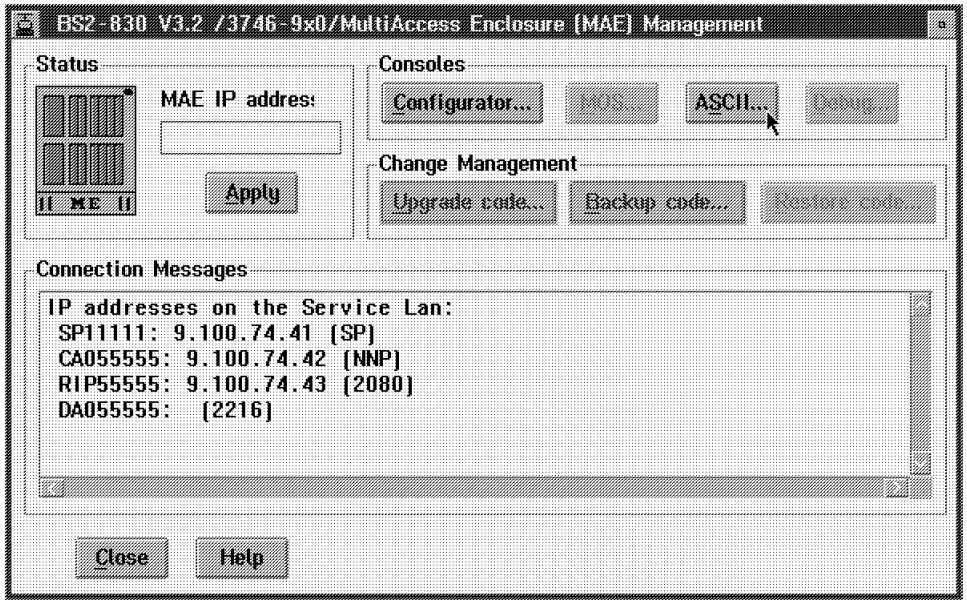
b Click on **Log On MOSS-E**.

c Enter the password and continue with Step **3** .

3 On the **MOSS-E View** window, double click on the 3746 icon.

4 On the **3746-9x0 Menu** double click on the **Multiaccess Enclosure (MAE) Management** option.

5 Double click on the **Manage Multiaccess Enclosure**, the following window is displayed.



6 Click on the **ASCII** button.

7 The firmware menu is displayed. From the menu (as shown in Figure 5-1 on page 5-4), you can select from four services. The following sections explain these services and provide instructions for using the associated panels:

- “Managing the Configuration” on page 5-5.
- “Selecting the Boot Sequence” on page 5-6.

- “Selecting a Device To Test” on page 5-8.
- “Using the Utilities” on page 5-9.

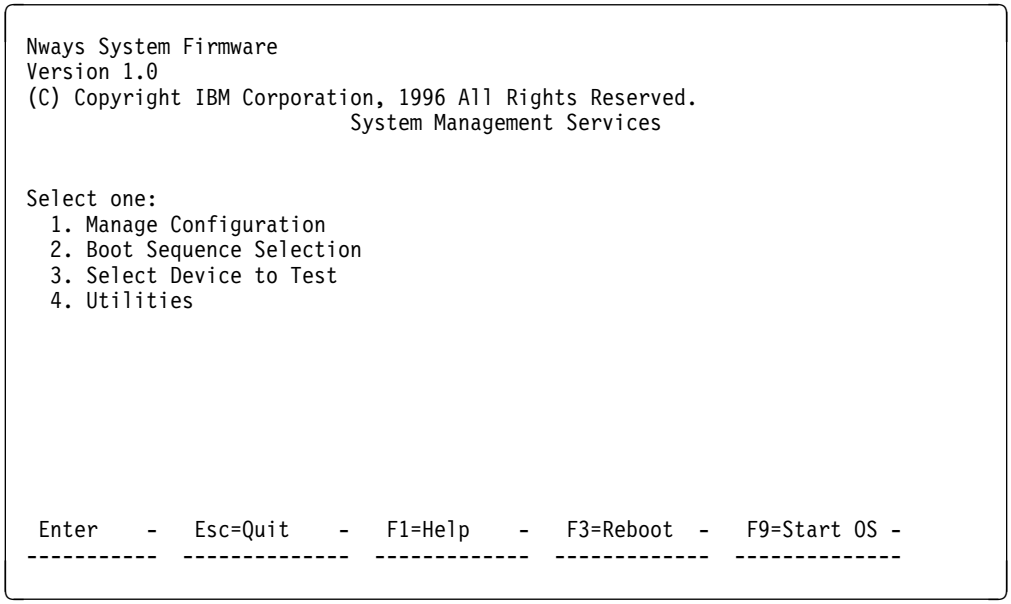


Figure 5-1. Main Menu Panel

The Function Keys

As seen in Figure 5-1, various function keys appear in the lower part of the panel. These keys are common among the firmware panels. On other panels, the function keys are stacked at the right of the panel. Use the F1 Help key to get descriptions for the function keys associated with the firmware.

Obtaining Help

Online helps are available for panels whenever the F1 key is displayed in the lower portion of the panel. Pressing F1 presents a pop-up help window with information relating to the currently active panel.

Managing the Configuration

Managing the configuration involves defining and modifying some configuration values. You can change the operational parameters for the serial ports. For example, you could modify the serial ports or PCMCIA modem's speed, parity, data bits, and so on, by pressing F6.

1 Select **1. Manage Configuration** from the main menu as shown in Figure 5-1 on page 5-4.

2 The System Configuration Information panel is displayed as shown in Figure 5-2.

Note: Only the fields under Serial Ports can be modified. To modify the specifications for a port, move the cursor to the field, press **F6**, and type in the new value.

Use the down arrow (↓) key to scroll to the next panel.

3 Press **F6** to make the change effective.

4 To display/modify serial ports, press **F6** after selecting the processor type.

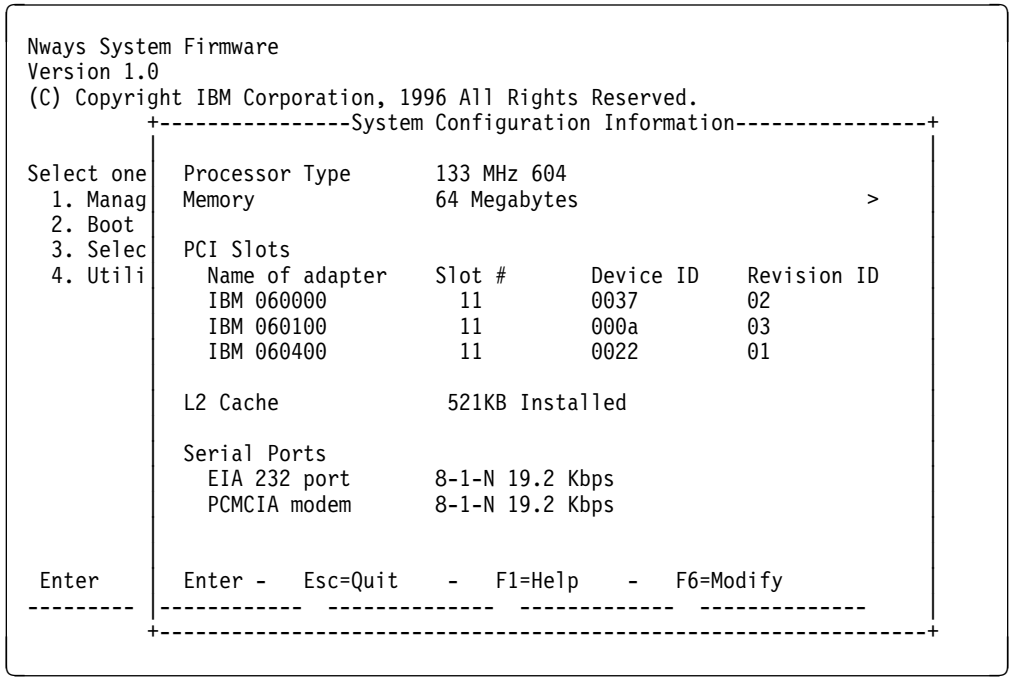


Figure 5-2. System Configuration Information

Selecting the Boot Sequence

This function enables you to select a sequence for the various boot devices, display the current boot device settings, restore the default setting, and boot from other boot devices. To select a boot sequence:

1 Select **2. Boot Sequence Selection** from the main menu.

2 The Boot Sequence Selection panel is displayed as shown in Figure 5-3.

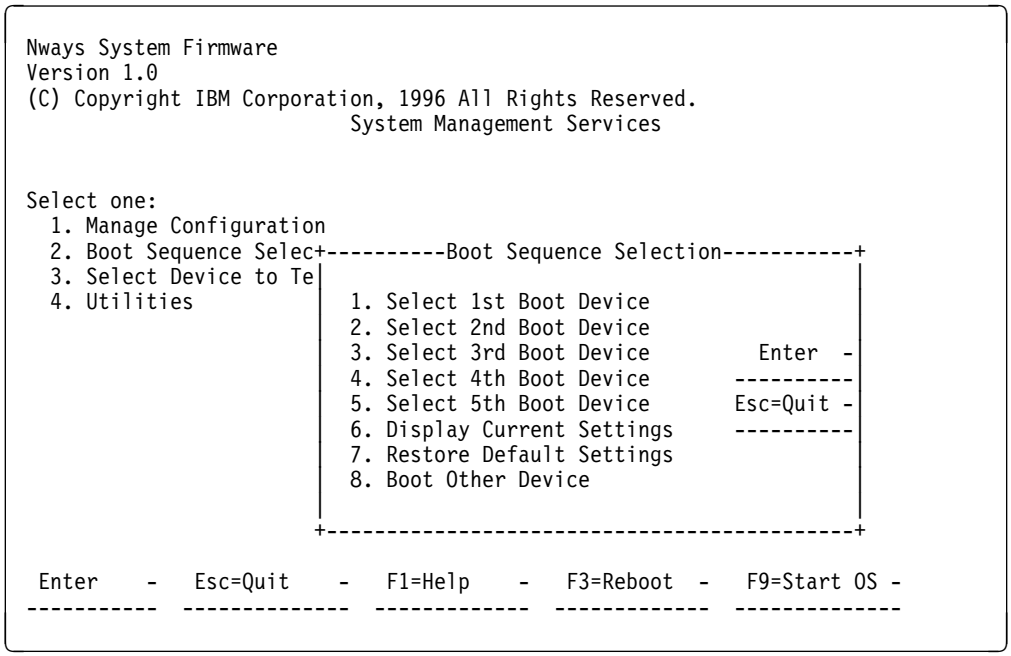


Figure 5-3. Boot Sequence Selection Panel

3 Select one of the options (1 through 5) and press **Enter**. The appropriate Boot Device Selection panel will be displayed. Default boot devices are:

- None
- IDE hard drive
- Network adapter (IBM PCMCIA Modem)
- Network adapter (IBM SLIP, Com 1 Direct)

4 Highlight your choice and press **Enter**.

5 Repeat step 3 and step 4 to select as many boot devices as you want to define.

6 Press **Esc** to exit the boot sequence selection menu.

7 Press **F3** to reboot the multiaccess enclosure and make your boot device change effective.

Note: To restore the defaults, select option 7 before you reboot the multiaccess enclosure. The default boot device settings will then be restored. The Current Boot Sequence will be displayed as in Figure 5-4 on page 5-7.

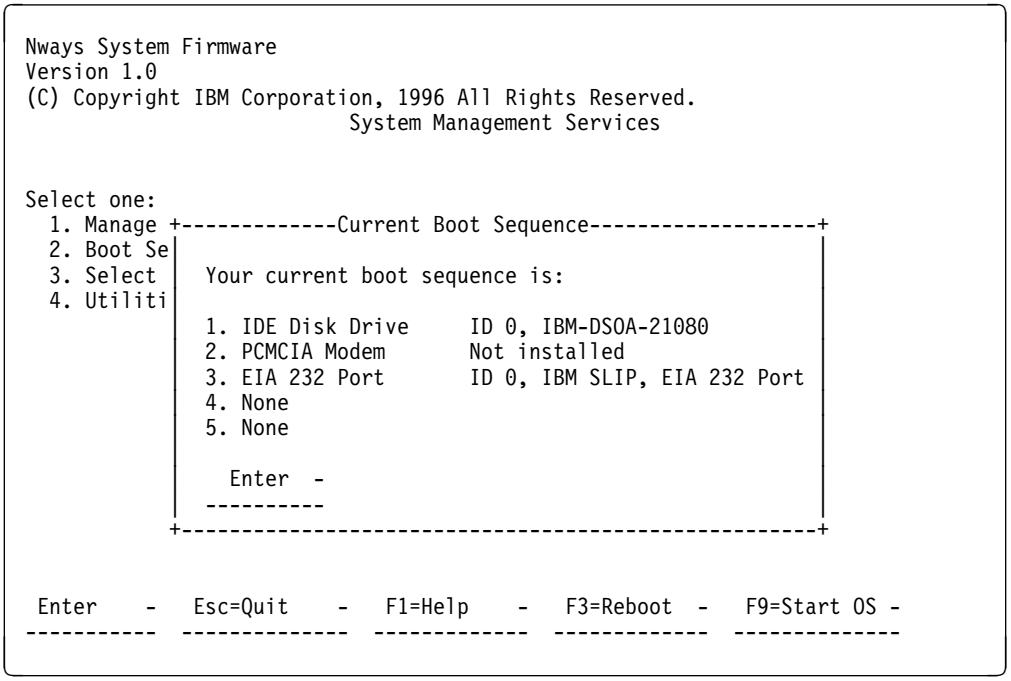


Figure 5-4. Current Boot Sequence

Selecting a Device To Test

Extensive hardware tests are performed by the firmware when the multiaccess enclosure boots up. But there may be times when you have removed and replaced a failing part and you want to run an individual test before a full bootup or reset. The firmware allows you to run these individual tests:

- Test All Subsystems: This test runs all the subsystem tests that are listed on this panel.
- Test Memory: This test searches all available memory regions, tests the regions, and presents a consolidated list of test results.
- Test System Board: This tests the PowerPC CPU, the System Board interrupts, and the PCMCIA controller.

1 Select **3. Select Device to Test** from the main menu.

2 The Select Device to Test panel is displayed (Figure 5-5).

Note: The Select Device to Test panel is created dynamically, depending on what diagnostics have been loaded, but the items shown always appear.

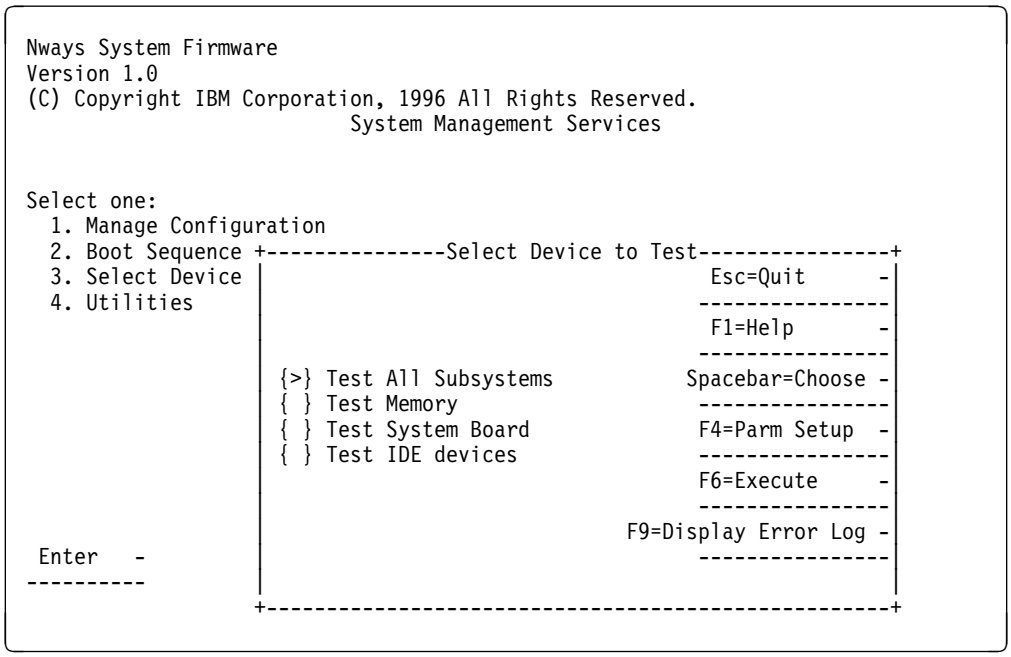


Figure 5-5. Test Selection Panel

3 Use the spacebar and up arrow and down arrow keys to select the test.

4 Press **F4** to define additional test parameters.

Note: Errors encountered during diagnostics are logged in the hardware error log.

5 Press **F6** to start a test.

6 After the test is complete, press **Esc** to return to the main menu panel.

Using the Utilities

To use the utilities:

1 Select **4. Utilities** from the main menu.

2 A menu listing the available utilities is displayed (Figure 5-6).

```
Nways System Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.
                            System Management Utilities


Select one:
  1. Set Power-On Password
  2. Set Supervisory Password
  3. Enable Unattended Start Mode
  4. Disable Unattended Start Mode
  5. Remove Power-On Password
  6. Remove Supervisory Password
  7. Update System Firmware
  8. Display Error Log
  9. View or Set Vital Product Data
 10. Manipulate Dead Man Timer
 11. Remote Initial Program Load Setup
 12. Change Management
 13. Prepare Hard Disk
 Enter    -   Esc=Quit    -   F1=Help    -
-----------  --------------  -------------
```

Figure 5-6. Utilities Selection Panel

3 Make your selection. You will be prompted for additional information, and messages are displayed to indicate that the task was performed.

Setting the Power-On Password

If a password is set/installed and the multiaccess enclosure is not in unattended mode, you must set a power-on password before operational code can be loaded in the multiaccess enclosure. The multiaccess enclosure is initially shipped with a password of **multiaccess enclosure**. This utility allows you to set and change the password.

This function can be performed only if done immediately after switching the power on.

1 Select **1. Set Power-On Password** from the utilities panel. The Set Power-On Password panel is displayed (Figure 5-7).

2 Type your new password and press **Enter**. You are prompted to enter your new password again.

Note: The power-on password can consist of from 1 to 8 characters with no restrictions on which characters can be used.

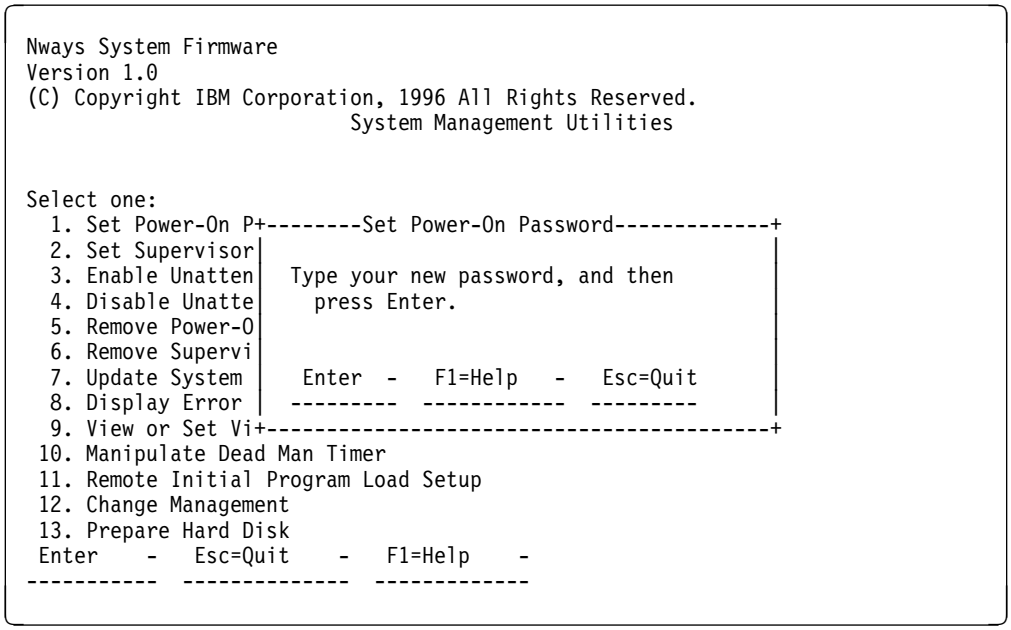


Figure 5-7. Set Power-On Password Panel

3 Type the password again and press **Enter**.

4 The Password Saved panel is displayed with the message that your power-on password has been saved.

Setting the Supervisory Password

If a supervisory password is set, the password must be entered prior being able to access to the “System Management Services.” You must set a supervisory password before operational code can be loaded in the multiaccess enclosure. The multiaccess enclosure is initially shipped with a password of **multiaccess enclosure**. This utility allows you to set and change the password.

This function can be performed only if done immediately after switching the power on.

1 Select **2. Set Supervisory Password** from the utilities panel. The Set Supervisory Password panel is displayed (Figure 5-8).

2 Type your new password and press **Enter**. You are prompted to enter your new password again.

Note: The supervisory password can consist of from 1 to 8 characters with no restrictions on which characters can be used.

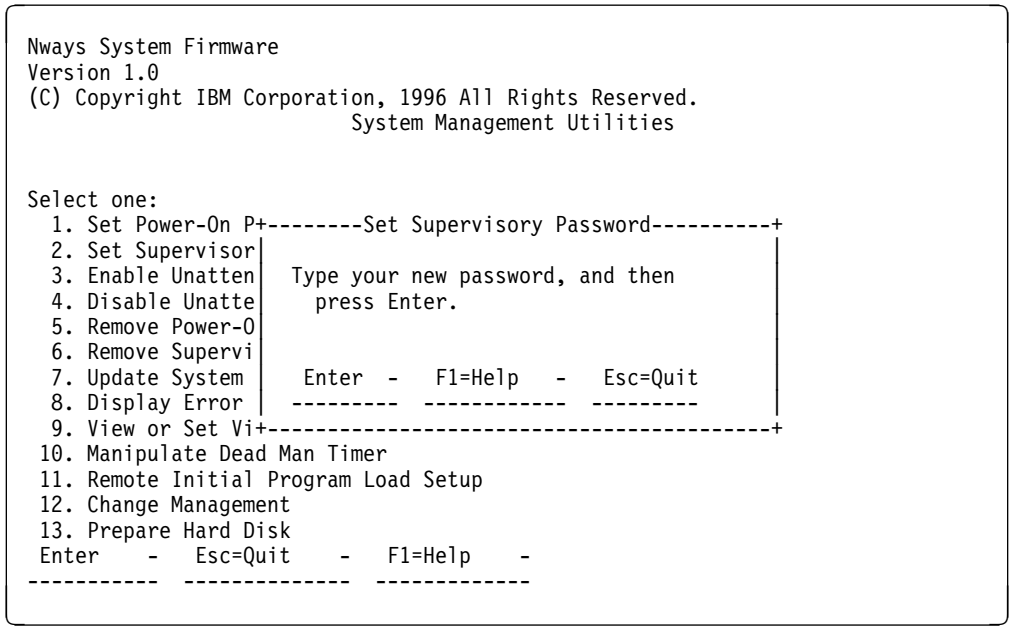


Figure 5-8. Set Supervisory Password Panel

3 Type the password again and press **Enter**.

4 The Password Saved panel is displayed with the message that your supervisory password has been saved.

Enabling Unattended Start Mode

The default is that Unattended start mode is enabled. This causes the multiaccess enclosure to load operational code automatically.

This function can be performed only if done immediately after switching the power on.

1 Select **3. Enable Unattended Start Mode** from the utilities panel. The Unattended Start Mode Changed panel is displayed (Figure 5-9).

2 Press **Enter**.

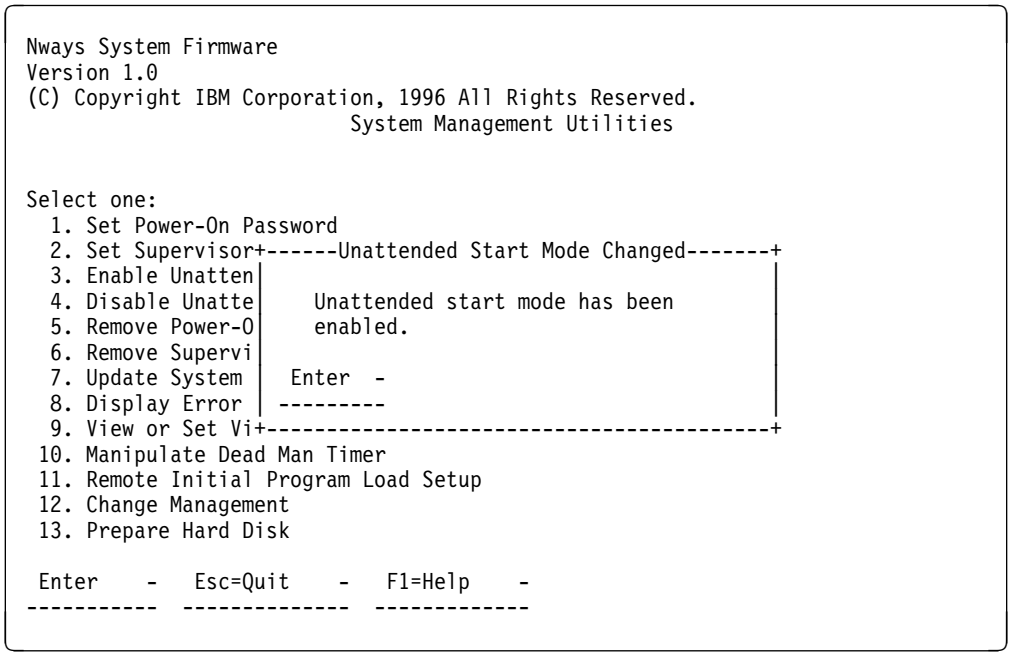


Figure 5-9. Unattended Start Mode Changed (Enabled) Panel

Note: After you have enabled Unattended start mode, you can enter the firmware by pressing and holding **F1** at the terminal keyboard when the boot process begins.

Disabling Unattended Start Mode

The default for the multiaccess enclosure firmware is that the Unattended start mode is enabled. You disable Unattended Start Mode using this utility.

Note: This function can be performed only if done immediately after switching the power on.

1 Select **4. Disable Unattended Start Mode** from the utilities panel. The Unattended Start Mode Changed panel is displayed (Figure 5-10).

2 This panel informs you that the Unattended start mode has been disabled and prompts you to press **Enter**.

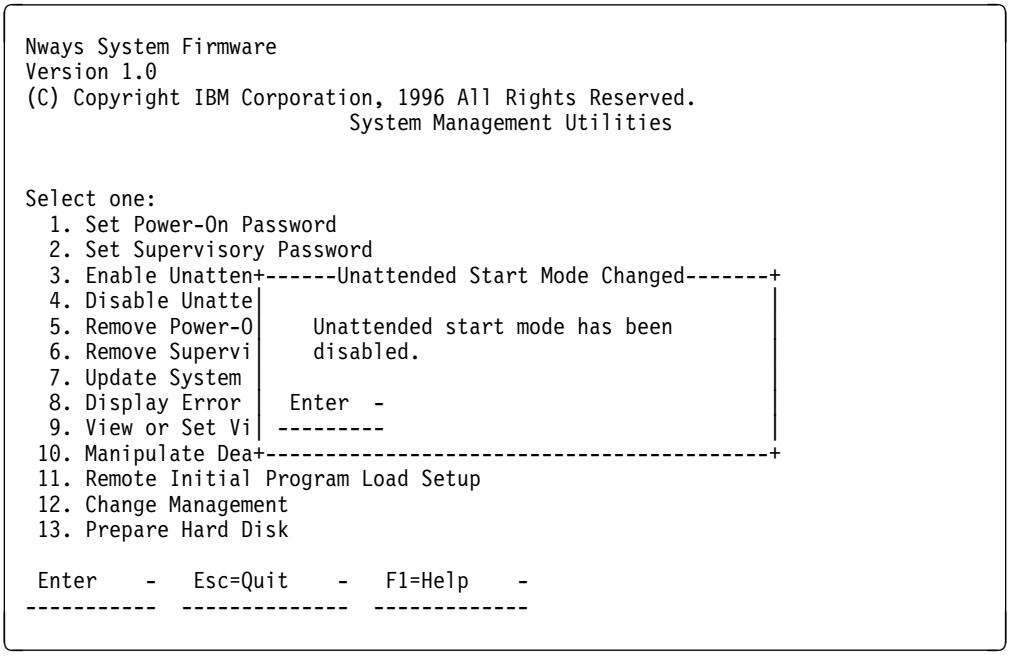


Figure 5-10. Unattended Start Mode Changed (Disabled) Panel

Removing the Supervisory Password

The use of a supervisory password allows you a degree of security by preventing unauthorized access to the multiaccess enclosure. However, removing the enforcement of the password could be a convenience while servicing the multiaccess enclosure.

Note: This function can be performed only if done immediately after switching the power on.

1 Select **6. Remove Supervisory Password** from the utilities panel.

2 The Remove Supervisory Password panel is displayed (Figure 5-11).

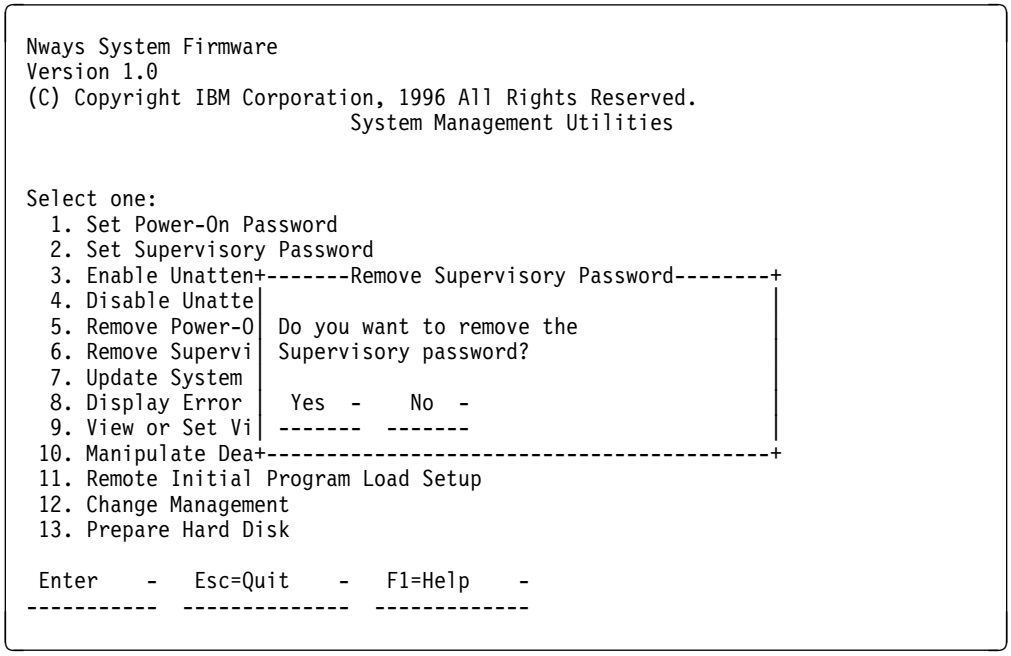


Figure 5-11. Remove Supervisory Password Panel

3 Select **Yes** if you want to remove the supervisory password. Press **Enter**.

4 The Password Removed panel is displayed. This panel informs you that the supervisory password has been removed.

Updating System Firmware

Use this utility to update the multiaccess enclosure firmware. Only full images of the firmware are shipped; therefore, when you select this option you completely replace the previous level of firmware.

1 Select **7. Update System Firmware** from the utilities panel.

2 The System Firmware Update panel is displayed (Figure 5-12).

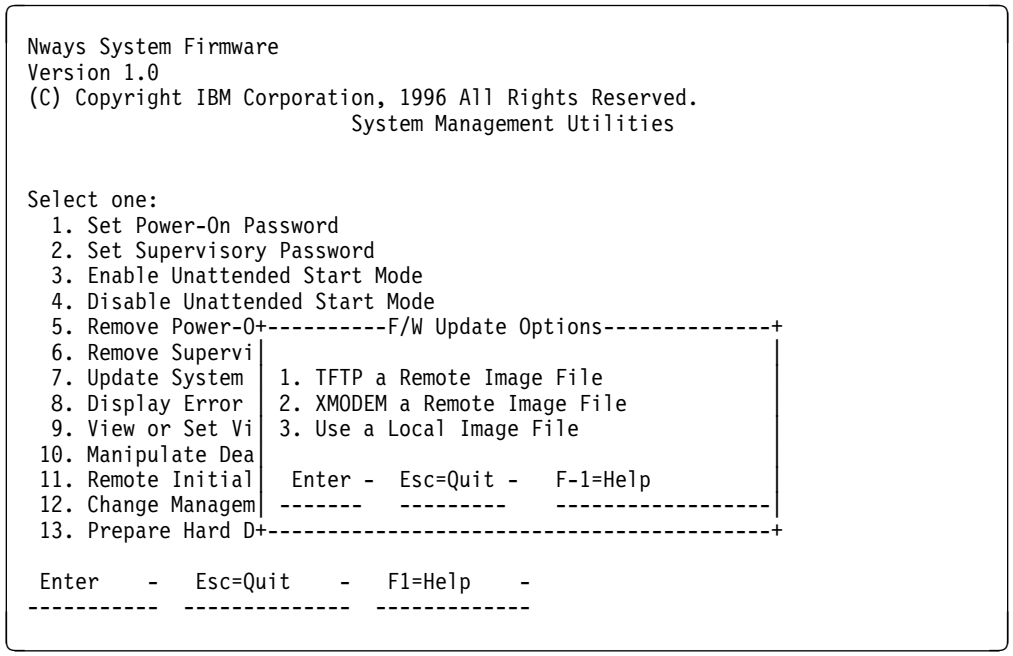


Figure 5-12. System Firmware Update Panel

Attention: Do not power off the multiaccess enclosure during the process of updating the firmware. If the update fails, the multiaccess enclosure will boot a backup firmware image. If this happens, repeat the update procedure to reload the onboard firmware image.

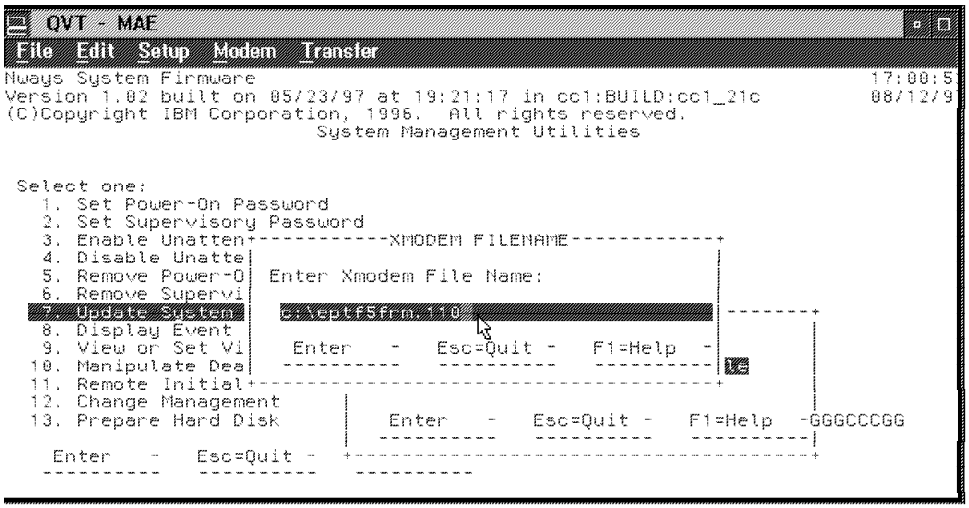
3 From the **F/W Update Options** menu, select **2. XMODEM a Remote Image File**.

This is a two-part process. The firmware image is transferred to the multiaccess enclosure and is then burned into the multiaccess enclosure system flash.

4 In the **Xmodem Filename** window enter the path and the filename that you want to use for the temporary file that will be copied onto the C: drive of the multiaccess enclosure.

Example:

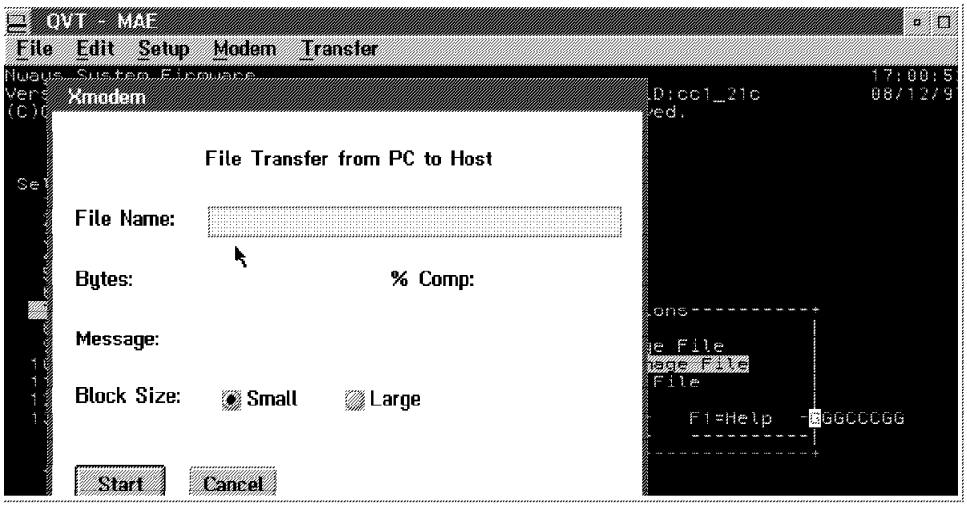
```
C:\firm.ld
```



Attention. Steps 5 and 6 are time dependent. Be prepared to execute them quickly, you have only fews seconds.

A message states to start the Xmodem transfer when the window is closed.

5 As soon this message is closed, from the popup select immediately **Transfer**, then **Xmoden Send** option. The following window is displayed.



6 In the file name field specify the unit address (d:) of the optical disk or CD-ROM followed by the name of the file that you want to use to load onto the C: drive of the multiaccess enclosure.

Example:

```
d:\ldm\firm.ld
```

The transfer process is time-sensitive and may time out before the process starts. Restart from the **F/W Update Options** menu if necessary.

- If characters like '$' appear by the message box, it means that the connection is not established.

- If 10-12 appears, Xmodem will likely time out and need to be restarted.

7 At the end of transmission the following window appears:

Click on **OK**.

8 After Xmodem completes, a message similar to the following is displayed:

```
This selection will update your
system firmware.  Do you want to
continue?
```

The system asks if you want to build a recovery block. It is optional, but recommended.

Note: Be patient, as the system writes from RAM to the hard drive. It may take up to 5 minutes.

9 After building a recovery block, additional messages will be displayed.

10 The system displays the file choices for firmware update. Choose the file that was just uploaded. The choices should look similar to those below:

```
(>) C:firm.ld          05/22/97
( ) C:PRECOVER.IMG     03/20/97
```

11 Answer **yes**, and the system updates the firmware.

Note: Do not switch the system off. The process erases the old firmware and copies the new firmware into flash memory. If the machine is powered off before the process is complete, you will need to reload the firmware from the recovery image.

12 A completed message appears when the firmware is updated.

Displaying the Error Log

The error log is resident in NVRAM (not on the hard drive). See Appendix G, “Hardware Error Codes” on page G-1 to interpret the data that appears in the Error Code field.

1 Select **8. Display Error Log** from the utilities panel.

2 The Error Log panel is displayed (Figure 5-13). See Appendix G, “Hardware Error Codes” on page G-1 for and explanation of the data that appears in the Error Codes field.

```
Nways System Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.
                          System Management Utilities


Select one:
  1. Set Power-On Password
  2. Set Supervisory Password
  3. Enable Unattended Start Mode
  4. Disable Unattended Start Mode
  5. Remove Power-On Password
 +----------------------Event Log-----------------------------------------+
 |                                                                         |
 |  1. Src     1 08/src/arp/sysext/c200/io_int.c:324     00000005,012B     |
 |  2. Bootup  0********************            00-01, 21 01/03/96 16:23:27 |
 |  3. Src     1 08/src/arp/sysext/c200/io_int.c:324     00000005,012B     |
 |                                                                         |
 |    Enter     -     Esc=Quit  -     F1=Help   -   F2=Clear Error Log -    |
 |  -------------   -------------   -------------  ---------------------    |
 +-------------------------------------------------------------------------+
 Enter   -   Esc=Quit   -    F1=Help  -
----------  -------------   -----------
```

Figure 5-13. Error Log Panel

Viewing or Setting Vital Product Data

This utility allows you to view vital product data (VPD) for the multiaccess enclosure. The system serial number is entered at the factory, but can be changed on the panel that appears after you select to view or set the VPD.

1 Select **9. View or Set Vital Product Data** from the utilities panel.

2 The View or Set Vital Product Data panel is displayed (Figure 5-14). From this panel you can select the type of vital product data you want to view or set. The serial number field is the only field (under the "Hardware Vital Product Data" menu) that is modifiable; Firmware Part Number is only viewable.

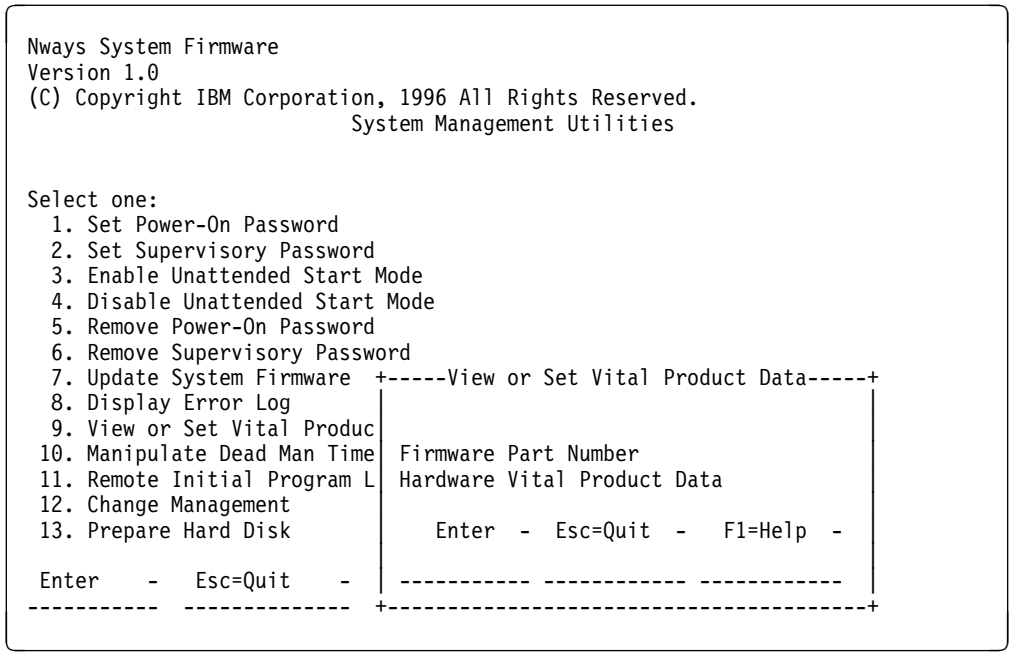


Figure 5-14. View or Set Vital Product Data Panel

3 For each selection, a View or Set Part Number panel is displayed that contains the part number you selected. Version number and dates are provided for the firmware and System Management Services.

4 If you want to view or change vital product data, select **Hardware Vital Product Data**.

5 The hardware VPD is stored in keyword format. The following is a list of the keywords and their meanings. Depending on the configuration of your system, not all of the keywords listed are necessarily present or have meaningful values.

AT - Main logic card type
DS - Text description of card
FN - FRU number
PN - Manufacturing part number
ML - Maintenance level
MF - Manufacturing location
SN - Serial number
BF - Boot flash level and ID
NA - Burned-in MAC Address in ASCII Format
ZB - Burned-in MAC Address in Hex Canonical Format
TM - Machine type and model
F# - Feature Number
BS - Box serial number
RC - Recycle count
Z0 - Vendor ID

Setting Up Remote Initial Program Load

Before you can configure an multiaccess enclosure in the network, it must have an IP address that is recognized within your network, and it must have the addresses of your ATM adapters. Use this utility to dial in with a BOOTP server.

This utility allows you to load this minimum information to install this device in your network so that you can send it a configuration file or otherwise communicate with it. This utility allows you to Ping the multiaccess enclosure, after loading its minimum network parameters, to see if you can communicate with it.

1 Select **11. Remote Initial Program Load Setup** from the utilities panel.

2 The “Network Parameters” panel is displayed (Figure 5-15). From this panel, you can select to enter the IP address of the multiaccess enclosure and the host, input PCMCIA adapter parameters, or Ping from the multiaccess enclosure to the host.

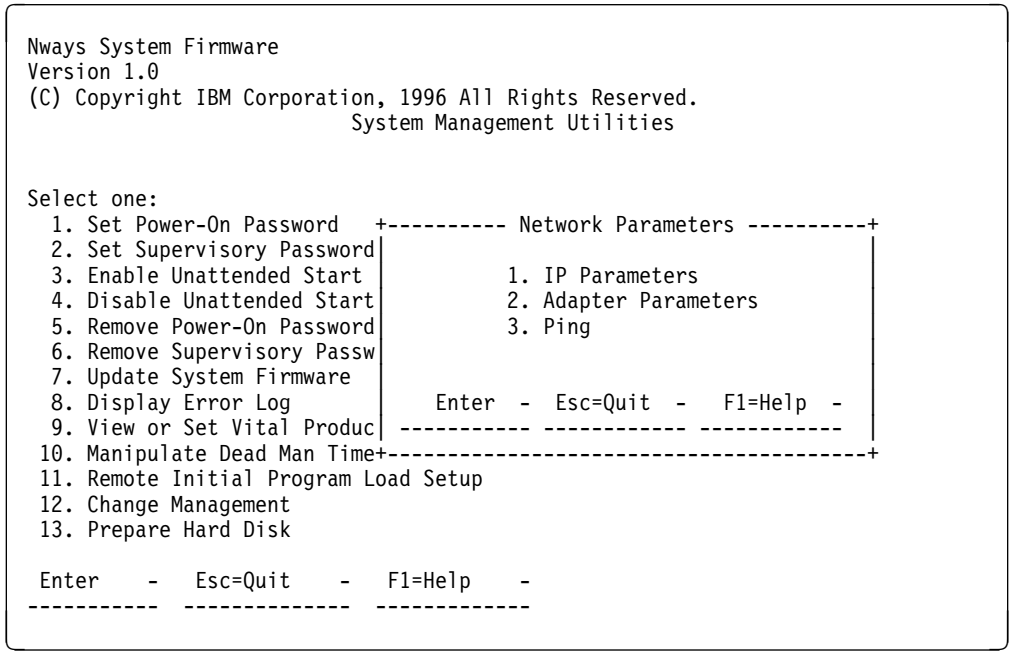


Figure 5-15. Setup Remote Initial Program Load Panel

- If you select **IP Parameters**, a panel will be displayed on which you can enter:
  - Client IP Address (the IP address of the multiaccess enclosure)
  - Server IP Address
  - Gateway IP Address
  - Subnet Mask

  An multiaccess enclosure comes from the factory with the following default IP addresses:

  Client 111.11.11.11
  Server 111.11.11.10
  Gateway 111.11.11.10
  Subnet mask 255.255.255.0

3 The **Ping** option allows you to test connectivity.

Manipulating the Dead Man Timer

This utility allows you to selectively enable or disable the dead man timer. The dead man timer has a granularity of 0.25 seconds and expires in 10 seconds. This tool would be useful in some troubleshooting procedures.

1 Select **10. Manipulate Dead Man Timer** from the utilities panel.

2 A Dead Man Timer Options panel is displayed. From this panel you can enable or disable the timer.

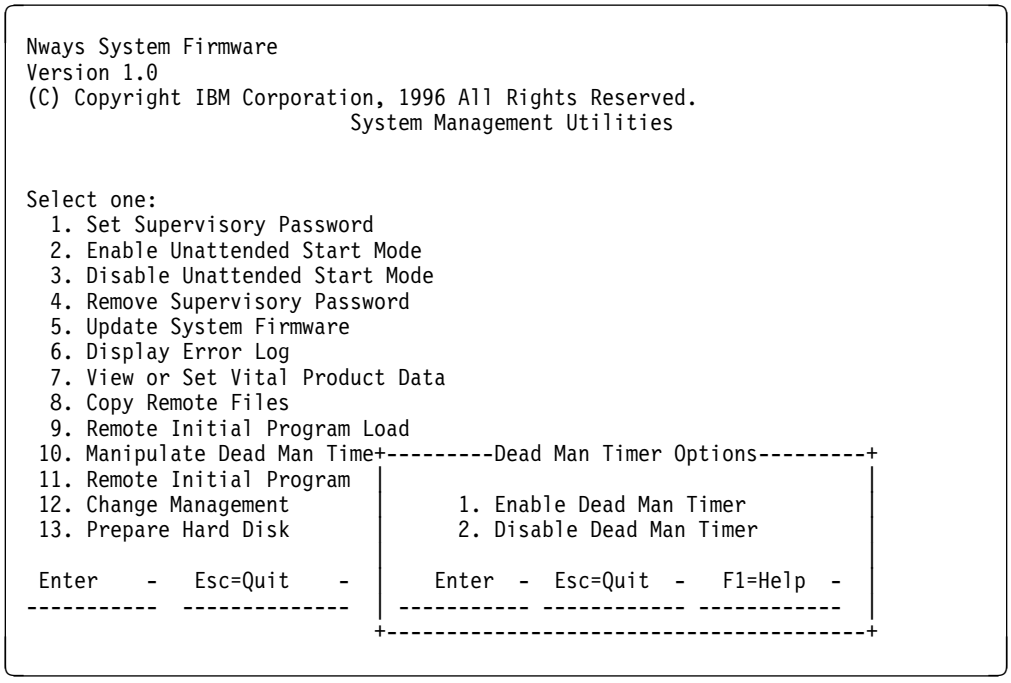


Figure 5-16. Manipulate Dead Man Timer Panel

Change Management

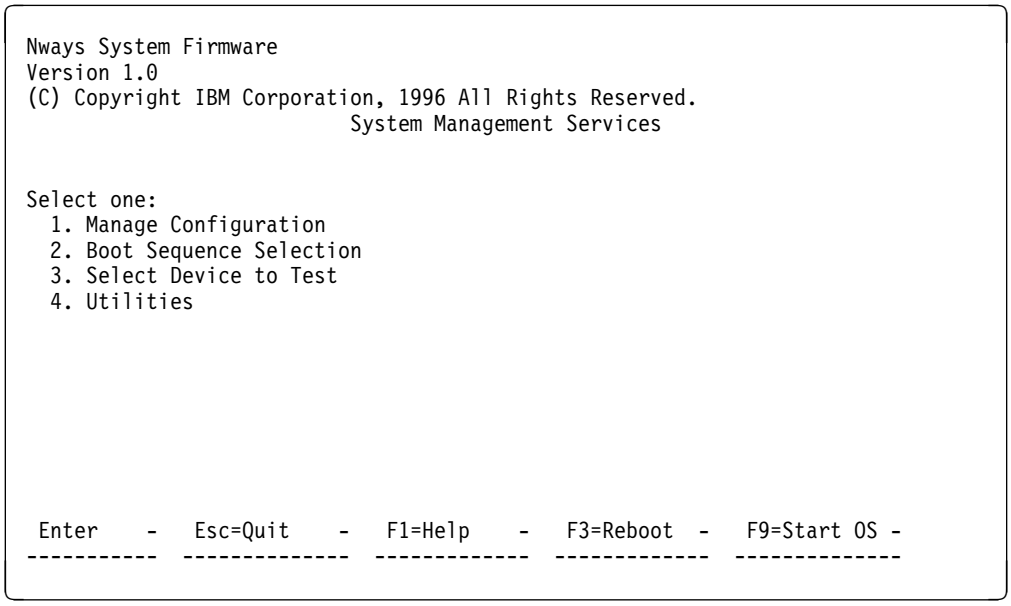
Change Management enables you to manipulate the multiaccess enclosure level of software code that will run on the multiaccess enclosure (Appendix E, “Managing Operational Code and Configuration Files” on page E-1 has additional information about change management.

Xmodem Software Selection

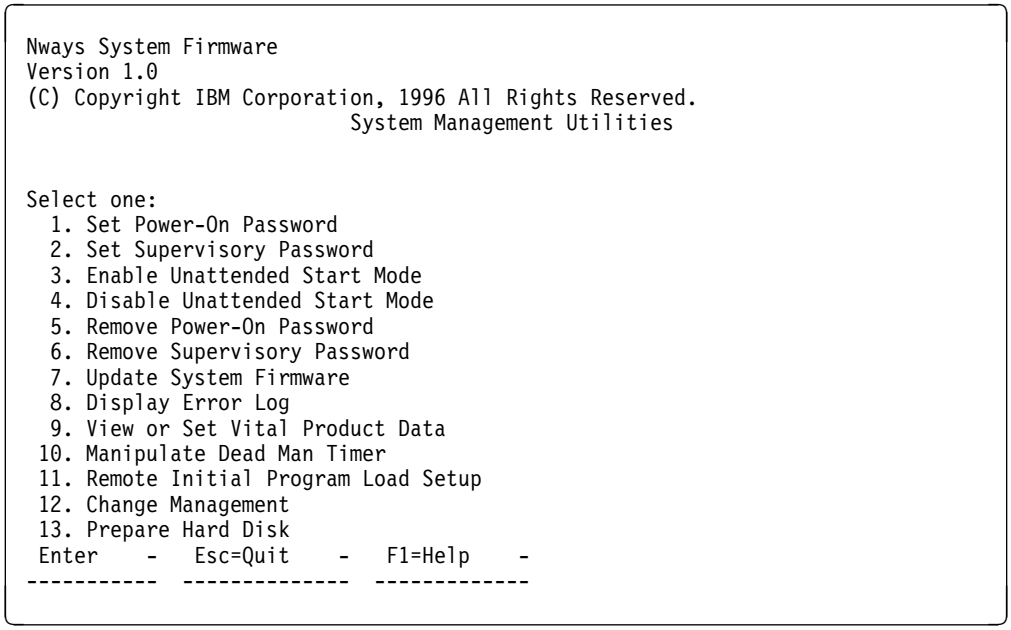
The Xmodem protocol is supported only from the “System Management Services” menu. To access the “System Management Services” menu, you have to either interrupt the boot-up sequence or bring up the multiaccess enclosure in Attended mode. The Change Management command is available from the “System Management Utilities” option of the Main Menu. From that point, the multiaccess enclosure will direct you as to what to transfer in and where to put the image.

Note: When the multiaccess enclosure is in firmware mode, there is no active configuration or image. Therefore, you should use caution when specifying where to write new images or configurations.

Restoring the Image Code of the Multiaccess Enclosure Hard Disk



1 On **System Management Services** window, select **Utilities**.



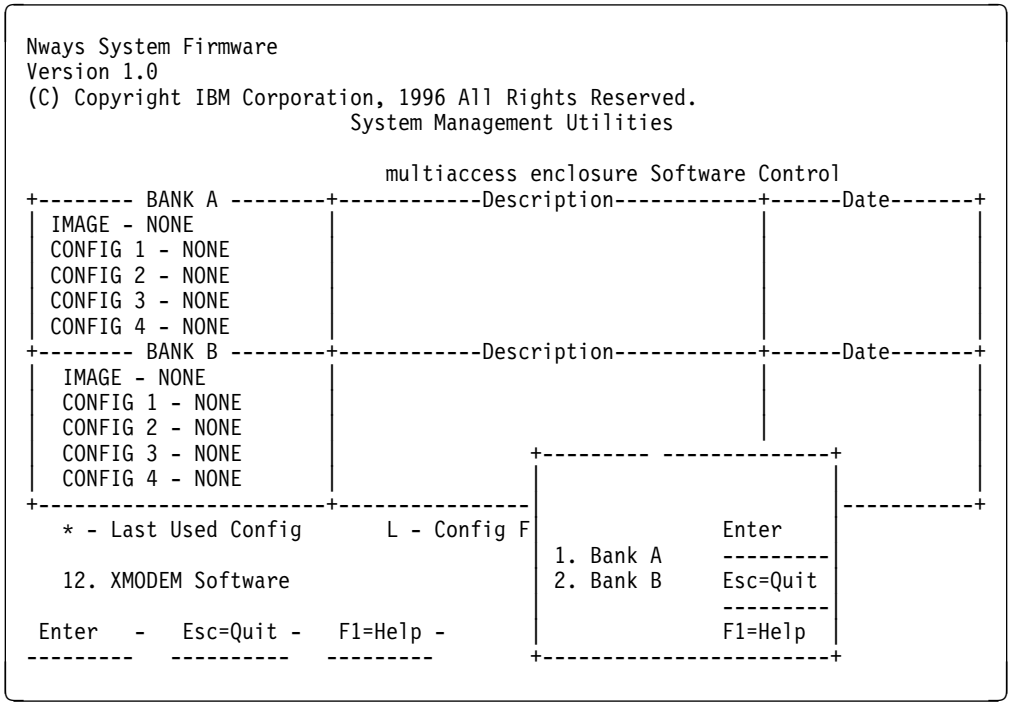
2 On **System Management Utilities** window, select **Change Management**.

```
Nways System Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.

                                    Change Management Software Control

            Select one:
            1.  Add Description Data
            2.  Describe Software
            3.  Control Rebooting of Router
            4.  Control Dumping of Router
            5.  Copy Software
            6.  Erase Software
            7.  List Software
            8.  Lock Config File
            9.  Set Boot Information
            10. TFTP Software
            11. Unlock Config File
            12. XMODEM Software


            Enter   -   Esc=Quit -   F1=Help  -
           ----------   ----------   ----------
```

3 On **Change Management Software Control** window, select **Xmodem Software**.

```
Nways System Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.

                                    Change Management Software Control


            1.  Add Description Data
            2.  Describe Software
            3.  Control Rebooting of Router
            4.  Control Dumping +--------------Select Type-----------------+
            5.  Copy Software   |                                          |
            6.  Erase Software  |             1. Config                    |
            7.  List Software   |             2. Load Image                |
            8.  Lock Config File|                                          |
            9.  Set Boot Informa|      Enter  -  Esc=Quit  -   F1=Help  -  |
            10. TFTP Software   |   ----------- ------------ ------------  |
            11. Unlock Config Fi+------------------------------------------+
            12. XMODEM Software


               Enter   -   Esc=Quit -   F1=Help  -
              ----------   ----------   ----------
```

4 Select **Load Image**.

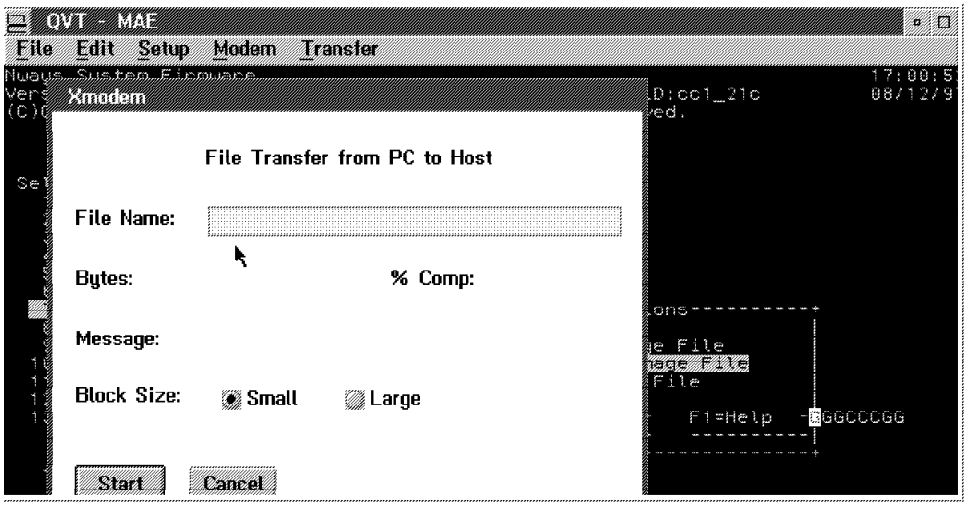


5 Select **Bank A**, then press **Enter**.

Attention. Step 6 and Step 7 are time dependent. Be prepared to execute them quickly, you have only fews seconds.

A message states to start the Xmodem transfer when the window is closed.

6 As soon this message is closed, from the popup select immediately **Transfer**, then **Xmoden Send** option. The following window is displayed.



7 In the file name field specify the unit address (d:) of the optical disk or CD-ROM followed by the name of the directory and the file that you want to load on the multiaccess enclosure hard disk drive.

Example:

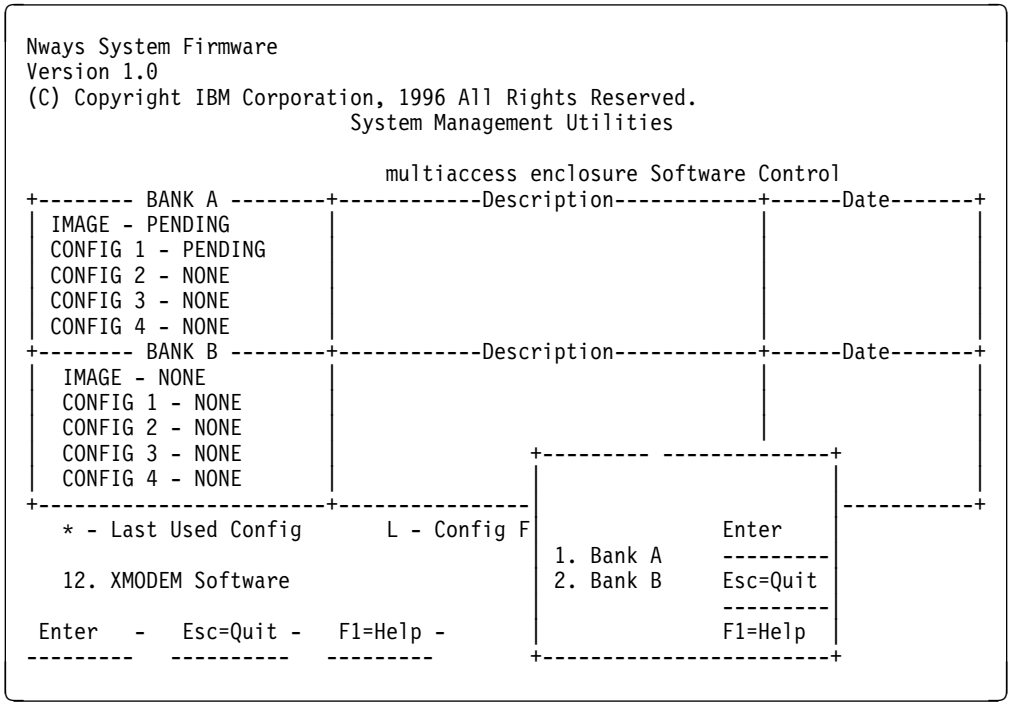
```
T:\ldm\os.ld
```

8 At the end of transmission the following window is displayed:

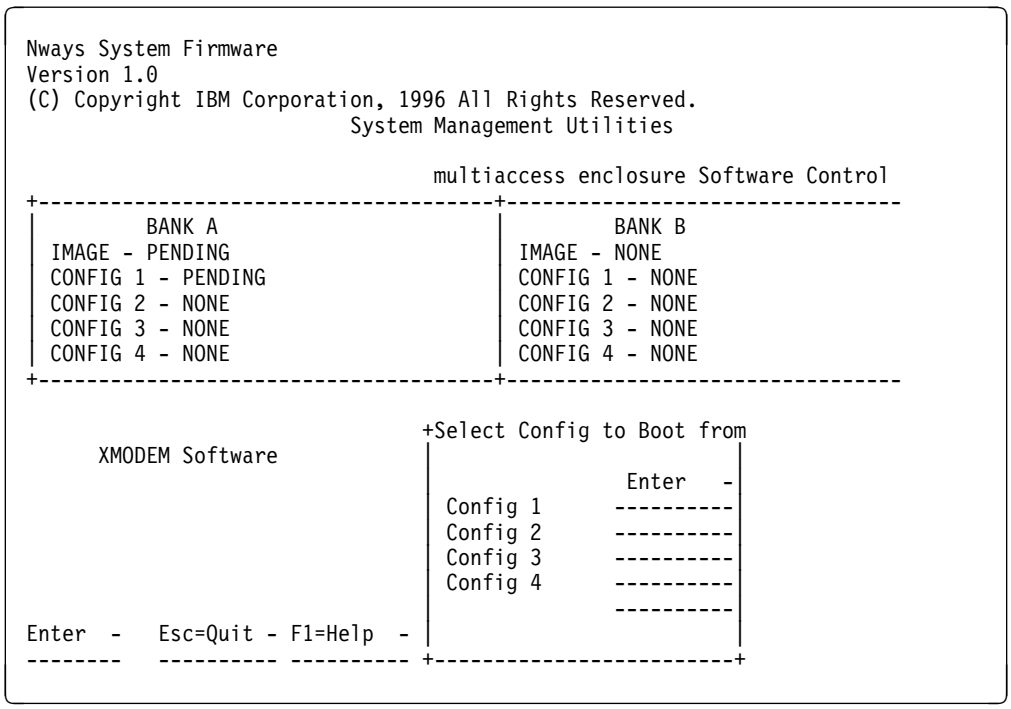
Press on **OK**.

```
Nways System Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.

                                    Change Management Software Control

           Select one:
           1.  Add Description Data
           2.  Describe Software
           3.  Control Rebooting of Router
           4.  Control Dumping of Router
           5.  Copy Software
           6.  Erase Software
           7.  List Software
           8.  Lock Config File
           9.  Set Boot Information
           10. TFTP Software
           11. Unlock Config File
           12. XMODEM Software


           Enter   -   Esc=Quit -   F1=Help  -
          ----------   ----------   ----------
```

9 On **Change Management Software Control** window, select **Set Boot Information**.



10 Select **Bank A**, then press **Enter**.



11 In **Select Config to Boot from** window, select **Config1**, then press **Enter**.

12 In **Select Duration** window select **Permanent**, then press **Enter**.

13 The **Change Management Software Control** window is displayed press **Esc**, to return **System Management Services**.

14 Press **F9**, to start the operating system. Follow the prompts and press the space bar to obtain the prompt:

```
Config (only)>
```

15 Restore the configuration. If you a backup on diskette go to “Restoring a MAE Configuration from Diskette” on page 2-16. Otherwise use the configurator program, refer to the **Multiaccess Enclosure Configuration** chapter in the *3745 Communication Controller Models A and 3746 Models 900 and 950: Planning Guide*, GA33-0457.

Using Operational Diagnostics

Operational diagnostics for the multiaccess enclosure can be invoked through the command line interface. Invoke the multiaccess enclosure operational diagnostics using the “Accessing the Operational Diagnostics from the Service Processor” on page 5-31.

If the multiaccess enclosure is not configured (booted up and in config-only mode), operational diagnostics cannot be invoked.

This chapter describes general procedures for invoking operational diagnostics and includes sample screens.

Overview of Diagnostic Functions and Status Information

Diagnostics are available to test each adapter. In some cases, you may also be able to test individual ports of multi-port adapters. These tests execute concurrently with normal operation on other adapters and ports.

You can use the following types of diagnostic pages:

- **Device List** to show a summary list of devices.
- **Device Status and Control** to allow you to disable and test a device
- **Test Results** to present the results of the test for a device.
- **Test Options** to allow you to choose specific testing options for a device.
- **Setup for Loop Test** to prompt for the presence of diagnostic aids such as wrap plugs.
- The **Restore from Loop Test** to prompt you to remove diagnostic aids that have been installed prior to testing.

Many of the diagnostic pages have help information that provides definitions of the status fields and testing options.

These diagnostics operate in a multi-tasking environment that allows several diagnostic processes to be active at the same time. The Diagnostic Control Program controls which test processes are active and which one has access to the user interface.

When you make a selection from the Device Status and Control Page for a device, a separate testing process is started that runs independently of the other diagnostic menus. You can then go back to the Device List page or exit the diagnostic menus, returning later to view the results of the test.

When an active test process wants to report results or obtain information from you, the diagnostic status for the device will change to MESSAGE. When you select the device on the Device List page, the testing process will be given access to the console interface and the message will be displayed.

Note: It is necessary to “refresh” the Device List and Device Status and Control pages in order to see the changing status of active test processes.

Accessing the Operational Diagnostics from the Service Processor

1 You should be logged ON on the service processor. If not go to Step 2. Otherwise continue with Step **3** .

2 To log ON:

a On the **MOSS-E View** window, click on **Program** (in the action bar).

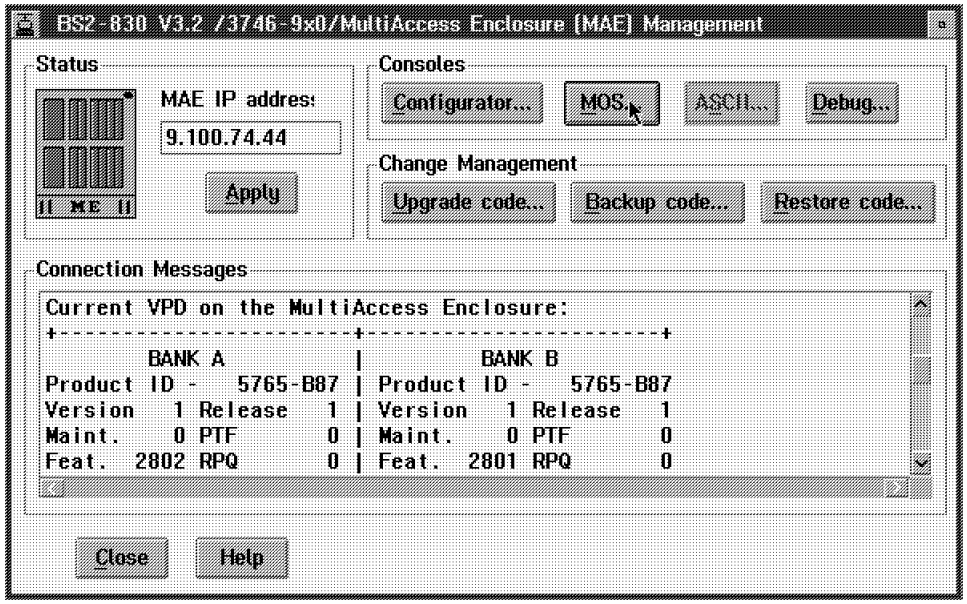
b Click on **Log On MOSS-E**.

c Enter the password and continue with Step **3** .

3 On the **MOSS-E View** window, double click on the 3746 icon.

4 On the **3746-9x0 Menu** double click on the **Multiaccess Enclosure (MAE) Management** option.

5 Double click on the **Manage Multiaccess Enclosure**, the following window is displayed.



6 Click on the **MOS** button.

7 At the asterisk (*****), type **diags** and press **Enter**.

8 The Diagnostic Menu appears (Figure 5-17 on page 5-32). To make your selection, type in the number of your choice and press **Enter**.

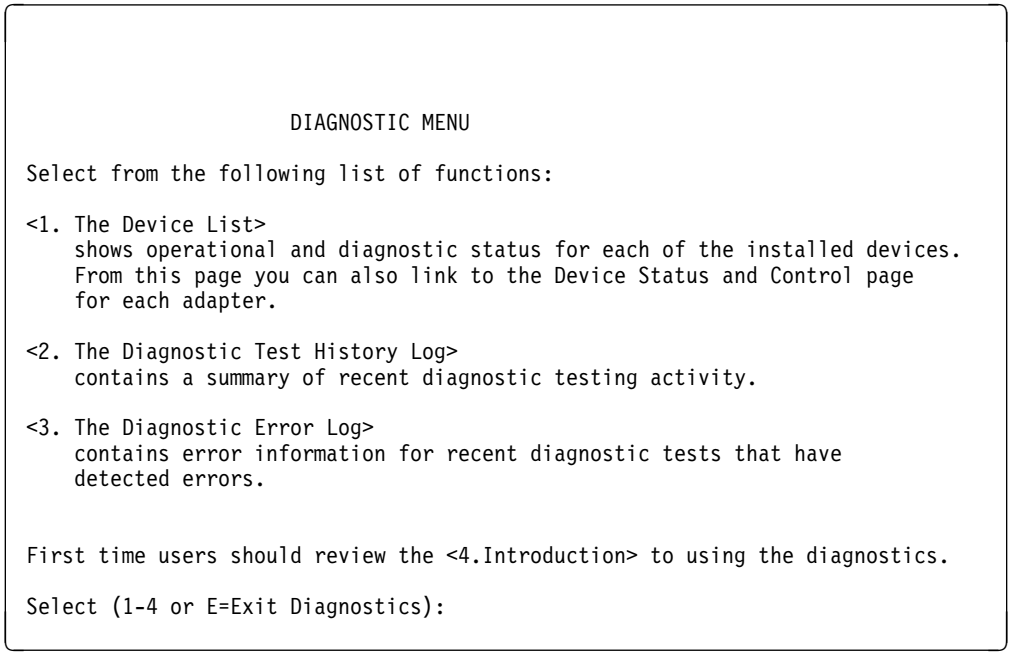


Figure 5-17. Operational Diagnostics Main Menu

Using the Command Line Interface Operational Diagnostics

The following example shows how to access the multiaccess enclosure diagnostics through the command line interface:

1 Select <**1. The Device List** > to view a list of installed devices. (Status and test options for each device are from the Device List page.) The Device Status and Control panel (similar to the one in Figure 5-18) appears.

```
                          Device List

"For more information on each device select from the following list:

   Device       Location                                Status
   Token Ring    Slot 1    Multi-Port   Adapter       ENABLED
< 1. Token Ring> Slot 1      Port 1     Net # 0       ENABLED
   Token Ring    Slot 1      Port 2                   NOT CONFIGURED
< 2. ATM MMF >   Slot 2      Port 1     Net # 1       DISABLED
  < 3. ESCON >   Slot 3   Single Port   Net # 2       ENABLED
  < 4. ESCON >   Slot 4   Single Port      --         NOT CONFIGURED




Some of the devices are note currently available for testing.  This can occur
when a test is not available for the device or when the device must be
configured in order to be tested,

Select (1-4 or D=Down B=Back  R=Refresh h=Help):
```

Figure 5-18. Sample of Device List Panel Showing Interfaces

The Device List is the starting point for running a test. It also provides a check to determine if all of the installed devices are being recognized by the multiaccess enclosure.

The Device List includes a summary status for each device. The devices that are testable or that have additional status available can be selected. Selecting a device will then display the Device Status and Control page for that device.

The Status displayed for a device may have the following values:

ENABLED	Device is enabled for normal operation. For multi-port devices this means that at least one port is enabled.
ENABLE PENDING	Waiting for completion of Enable request.
Special	Device is in a special state that is explained on the Device Status and Control Page.
DISABLED	Device is Disabled. Diagnostic testing can now be performed. For multi-port Devices this means that all ports are disabled.
DISABLE PENDING	Waiting for completion of Disable request.
MESSAGE	Select the device to view and respond to the message.

TESTING The device is being tested.

NOT CONFIGURED The device is not configured for normal operation.

MIS CONFIGURED The configuration does not match the physical device.

HARDWARE ERROR A Hardware Error has been detected which prevents further use of the device.

2 If you select the ATM interface (<**2. ATM MMF**> on the Device List panel), the Device Status and Control panel for the ATM adapter appears (Figure 5-19).

```
                          Device Status and Control

155Mb/s ATM over multi-mode fiber, Slot 2,- Net # 1

 Operational Status   Diagnostic Status  Fault Status   Network Connection
      DISABLED           ACTIVE              OK              UP

Select from the following:
    Disable Device
<1. Enable Device >
<2. Run Default Test >
<3. Run Interactive test >
<4. Loop Test - stop on first error >
<5. Loop Test - Log all errors >
     Stop Test
<6. View Hardware Test Log >
<7. View Hardware Error Log >


-----------------------------------------------------------------

Select (1-7 or B=Back R=Refresh H=Help):
```

Figure 5-19. Device Status and Control Panel (Device Disabled)

The Device Status and Control Page displays status and a menu of actions for the selected device. The status fields that are displayed are dependent on the characteristics of the device.

The menu items that are active on the Device Status and Control panel are dynamically determined depending on the state of the device (that is, whether it is enabled, disabled, or testing).

In this example, the device is disabled. The Enable Device choice and all of the choices to start a test are active and can be selected. If the device were enabled, it would need to be disabled before testing.

When the Device Status and Control panel is displayed (and the status for the device is ENABLED), you can disable the device by selecting the Disable option.

When testing is complete, the device can be enabled using the diagnostic menus or using the router's **talk 5** commands.

Select **Refresh** periodically to update the status information for a device.

The status fields which are displayed for most devices have the following meanings:

- ***Operational Status***

ENABLED	The device is enabled for normal operation. For multi-port devices this means that at least one port is enabled.
ENABLED PENDING	Waiting for completion of Enable request.
See Note	The device is in a special state that is explained on the Page.
DISABLED	The device is Disabled. Diagnostic testing can now be performed. For multi-port Devices this means that all ports are disabled.
DISABLE PENDING	Waiting for completion of Disable request.
DIAGNOSTICS	A configured device is being used by the diagnostics.
NOT CONFIGURED	The device is not configured for normal operation.
MIS CONFIGURED	The configuration does not match the physical device.
HARDWARE ERROR	A hardware error has been detected that prevents further use of the device.

- ***Diagnostic Status***

INACTIVE	Diagnostic for the device is not running.
TESTING	A testing process for the device is active and the device is being tested.
LOOP AND LOG	A testing process for the device is active and will loop and log any errors until stopped.
LOOP UNTIL ERROR	A testing process for the device is active and will loop until an error occurs or it is stopped.
MESSAGE	A testing process for the device is active and it is waiting for user input.

- ***Fault Status***

OK	The last test of the device completed without error.
ISOLATED	A hardware failure has been detected and isolated to the device.
NON-ISOLATED	A problem has been detected, but the failure may be external to the device. This most often occurs with network adapters that have external cables, modems, or LAN connections. Running a diagnostic of the adapter with a wrap plug attached can usually determine if the adapter has failed.

UNKNOWN	No test results are currently available for the device.

- ***Network Status***

UP	The network connection is established.
DOWN	A network connection cannot be detected.
TESTING	The router is attempting to determine if a network connection exists.
UNKNOWN	The state of a network connection cannot be determined at this time.
N/A	Network Status does not apply to this device.

Explanation of menu choices

While all of the menu choices are displayed for each device, only those that are appropriate for the current state of the device will be active for a selection.

Enable Device	The device will be enabled for normal operation. This performs the same function as the **enable** or **test** commands available at the router's monitoring (talk 5) prompt (+).
Disable Device	The device is taken out of its normal operational state. If this menu option is available, then the device must be disabled before any diagnostic test can be started. This performs the same function as the **disable** command available at the router's monitoring (talk 5) console.
Run Default Test	This starts a test which assumes that the device is set up for normal operation. For communication adapters this means that it has a cable attached and is connected to the network.
Run Interactive Test	This starts a test which will present an additional menu of options such as cable attachment and wrap plugs can be specified.
Stop Test	Stops a looping test. Depending on the length of each test loop, this could take up to a minute.
Loop Test - stop on first error	This starts a looping test that will stop when the first error is detected. A menu of additional test options may be presented before the loop is started.
Loop Test - Log all errors	This starts a looping test that will loop until a \"Stop Test\" request is made. All detected errors are logged. A menu of additional test

	options may be presented before the loop is started.
View Test History Log	Displays a history of recent diagnostic tests that have been executed.
View Hardware Error Log	Displays a list of errors detected by diagnostic tests.

3 Type **E** and press **Enter** to exit the diagnostic menus and return to the command line interface prompt (*****).

Testing the Adapters

These tests for the adapters help to determine whether or not the adapter is functioning correctly. Most of the adapters (for example, the EIA 232, X.21, V.35/36, ESCON, and HSSI) contain basic testing functions; however, other adapters may have additional tests such as wrap plug and cable tests. The ESCON adapter also has optical power (page 5-46) and light reception tests (page 5-42).

Complete the following steps to test a faulty (or newly installed) Adapter:

- Power on the multiaccess enclosure.
- Run diagnostics on the new adapter (page 5-39)
- If you have an ESCON adapter, run the light test on the new fiber optic cable (page 5-42).

Refer to “Overview of Diagnostic Functions and Status Information” on page 5-30 for additional information on the use of multiaccess enclosure operational diagnostics.

Powering On the multiaccess enclosure

1 Power on the multiaccess enclosure. Messages equivalent to the following appear on the TTY console after powering on the multiaccess enclosure.

```
PRESENCE_MGR> LIC280 detected in slot 1
PRESENCE_MGR> LIC287 detected in slot 3
PRESENCE_MGR> LIC287 detected in slot 4

Please press the space bar to obtain the console.

Disk Load: Using bank B and config number 3
```

2 Press the space bar.

```
Console granted to this interface

*
```

Note: The operator interface described in this chapter is the *Command Line Interface*, also known as the *Operator Control Module (OPCON)*. This interface appears when you Telnet into the service port of the multiaccess enclosure or when you attach an ASCII terminal emulator to the service port either remotely or locally.

Running Diagnostics on the New Adapter

The following is a sample sequence with sample screens for running the diagnostics. The selections that you see during your test may be different.

Before running the test, disable the adapter (see “Suspend Traffic on an Adapter Port” on page F-6).

1. At the OPCON (*****) prompt, type **diags** and press **Enter**.
2. The Diagnostic Menu appears (Figure 5-17 on page 5-32). To make a selection type in the number of your choice and press **Enter**.
3. Type **1** and press **Enter** to access the Device List Page.
4. Select a device to test (for example, type **4** for ESCON) to test the ESCON channel adapter in slot 4.
5. Select **Run Interactive Test**. The Test Options menu appears:

```
                                                                Screen 1 of 1
                          Test Options

LIC 287 - ESCON Channel Adapter, Slot 4

Operational Status  Diagnostic Status  Fault Status  Network Connection
  NOT CONFIGURED         MESSAGE         UNKNOWN          UNKNOWN

Do not remove this device while testing.
Select one of the following test options:
 * < 1. Run all tests excluding external wrap test >
 * < 2. Run all tests including external wrap test >
   Individual tests:
 * < 3. PCI BUS >
 * < 4. PROCESSOR >
 * < 5. MEMORY >
 * < 6. MEMORY PROT >
 * < 7. TIMER >
 * < 8. AIB >
 * < 9. WRAP PLUG >
 * <10. OPTICAL POWER >
 * <11. LIGHT RECEPTION >


Select (1-11 or   B=Back R=Refresh H=Help ):2
```

6 Type **2** and press **Enter** to run all tests including external wrap test. The following panel appears:

```
                                                                Screen 1 of 1
                      Setup For Wrap Test

LIC 287 - ESCON Channel Adapter, Slot 4

Operational Status  Diagnostic Status  Fault Status  Network Connection
  NOT CONFIGURED         TESTING         UNKNOWN          UNKNOWN

Do not remove this device while testing.

Install the wrap plug (PN 5605670) on the ESCON adapter located in slot 4

Confirm that the wrap plug is installed.
< 1. Start test. >



Select (1 or   B=Back R=Refresh H=Help ):1
```

7 Attach the wrap plug. Type **1** and press **Enter** to start the test.

This is a long-running test. The Device Status and Control Menu is displayed again. Note that the Diagnostic Status is TESTING. This indicates that the tests are running and will take about 3 minutes to complete.

```
                                                                Screen 1 of 1
                            Device Status and Control Menu

LIC 287 - ESCON Channel Adapter, Slot 4

Operational Status  Diagnostic Status  Fault Status  Network Connection
  NOT CONFIGURED         TESTING         UNKNOWN          UNKNOWN

Do not remove this device while testing.

Select from the following:
        Disable Device
        Enable Device
        Run Default Test
        Run Interactive Test
        Loop Test - stop on first error
        Loop Test - Log all errors
        Stop Looping Test
   < 1. View Test History Log >
   < 2. View Hardware Error Log >



Select (1-2 or   B=Back R=Refresh H=Help ):r
```

8 Type **r** and press **Enter** to refresh the display until the Diagnostic Status changes from TESTING to MESSAGE. At this point, the following panel is displayed:

```
                                                                Screen 1 of 1
                            Restore From Wrap Test

LIC 287 - ESCON Channel Adapter, Slot 4

Operational Status  Diagnostic Status  Fault Status  Network Connection
  NOT CONFIGURED         MESSAGE         UNKNOWN          UNKNOWN

Do not remove this device while testing.

Remove the wrap plug on the ESCON adapter located in slot 4.

Reattach the fiber connection.

Select Back to see the results of the test.
Select (  B=Back R=Refresh H=Help ):b
```

9 Remove the wrap plug.

10 Reconnect the network cable to the adapter.

11 Select **b** to view the results of the test. In this example, the system reports test completion with No Errors. If the test fails, you will receive a message directing further action.

```
                                                                Screen 1 of 1
                                 Test Results

LIC 287 - ESCON Channel Adapter, Slot 4

Operational Status  Diagnostic Status  Fault Status  Network Connection
  NOT CONFIGURED        INACTIVE            OK           UNKNOWN

The Test Completed with No Errors.




Select (  B=Back ): b
```

12 Select **b** to return to the Device Status and Controls Menu.

ESCON-only Tests

Run the Light Test on the New Fiber Optic Cable

After you have run diagnostics on the new ESCON adapter and verified that it is functioning correctly, you can test that the fiber optic cable is connected correctly and transmitting light to the adapter.

1 From the Device Status and Controls Menu, select Run Interactive Test to display the Test Options panel.

```
                                                                Screen 1 of 1
                          Test Options

LIC 287 - ESCON Channel Adapter, Slot 4

Operational Status  Diagnostic Status  Fault Status  Network Connection
  NOT CONFIGURED         MESSAGE         OK              UNKNOWN

Do not remove this device while testing.
Select one of the following test options:
 * < 1. Run all tests excluding external wrap test >
 * < 2. Run all tests including external wrap test >
   Individual tests:
 * < 3. PCI BUS >
 * < 4. PROCESSOR >
 * < 5. MEMORY >
 * < 6. MEMORY PROT >
 * < 7. TIMER >
 * < 8. AIB >
 * < 9. WRAP PLUG >
 * <10. OPTICAL POWER >
 * <11. LIGHT RECEPTION >


Select (1-11 or   B=Back R=Refresh H=Help ):11
```

2 Enter **11** on the Test Options Panel to run the light reception test. At this point, the following panel appears.

```
                                                                Screen 1 of 1
                       Setup For Light Reception Test

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     NOT CONFIGURED     TESTING            OK            UNKNOWN

First, be sure that you have successfully run the Wrap Plug Test on slot 4.

Then, remove the wrap plug from the ESCON adapter
(if still installed).

Connect the fiber for an operational ESCON channel to the adapter located in
slot 4.

Confirm that the correct fiber is installed.
< 1. Start test. >









Select (1 or   B=Back R=Refresh H=Help ):1
```

3 Install the fiber, then enter **1** to start the test. Because this is a “long running test,” the Device Status and Control Menu will be displayed again. Notice that the Diagnostic Status is TESTING. This indicates that the test is now running and will take about 20 seconds to complete.

```
                                                                Screen 1 of 1
                            Device Status and Control Menu

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     NOT CONFIGURED     TESTING            OK            UNKNOWN

Do not remove this device while testing.

Select from the following:
        Disable Device
        Enable Device
        Run Default Test
        Run Interactive Test
        Loop Test - stop on first error
        Loop Test - Log all errors
        Stop Looping Test
   < 1. View Test History Log >
   < 2. View Hardware Error Log >



Select (1-2 or   B=Back R=Refresh H=Help ):r
```

4 Keep entering **r** until the Diagnostic Status changes from TESTING to MESSAGE. At this point, the following panel is displayed.

```
                                                                Screen 1 of 1
             Restore From Light Reception Test

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     NOT CONFIGURED     MESSAGE            OK            UNKNOWN

Do not remove this device while testing.

Leave the fiber connected to the ESCON adapter located in slot 4
if it is the fiber intended for this adapter.

If it is not the fiber intended for this adapter,
connect the correct fiber now.

Select Back to see the results of the test.









Select (  B=Back R=Refresh H=Help ):b
```

5 Typically, you do not need to do anything here. If you are testing cables, this simply tells you that the test has completed and that you should ensure that the correct fiber is connected.

6 Select **b** to see the results of the test.

```
                                                                Screen 1 of 1
                                Test Results

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     NOT CONFIGURED     INACTIVE           OK            UNKNOWN

The Test Completed with No Errors.









Select (  B=Back ):
```

If the test completed with no errors, light was detected on the fiber optic cable.

```
                                                                Screen 1 of 1
                Test Results

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     NOT CONFIGURED     INACTIVE       NON-ISOLATED       UNKNOWN

No light is being detected on the ESCON adapter in slot 4.  Ensure that the
ESCON fiber is connected to an ESCON director or an ESCON channel.









Select (  B=Back ):e
```

If light was not detected, an error message is displayed, indicating that the fiber and its connections need to be rechecked.

ESCON Interactive Test Options

The Test Options menu is displayed in response to a Run Interactive Test request on the Device Status and Control Menu. Both test suites and individual tests are available to allow you to examine the entire adapter or isolate its various components.

```
                                                                Screen 1 of 1
                                  Test Options

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     DISABLED           MESSAGE          UNKNOWN          UNKNOWN

Do not remove this device while testing.
Select one of the following test options:
 * < 1. Run all tests excluding external wrap test >
 * < 2. Run all tests including external wrap test >
   Individual tests:
 * < 3. PCI BUS >
 * < 4. PROCESSOR >
 * < 5. MEMORY >
 * < 6. MEMORY PROT >
 * < 7. TIMER >
 * < 8. AIB >
 * < 9. WRAP PLUG >
 * <10. OPTICAL POWER >
 * <11. LIGHT RECEPTION >

Select (1-11 or   B=Back R=Refresh H=Help ):
```

Option 1 on the Test Options menu runs tests 3 through 8. Option 2 runs the first test set and the wrap test. The remaining options, 3 to 11, enable the execution of tests individually.

If you select option 3, 4, 6, or 7, the results will be displayed immediately.

If you select test option 1, 2, 5, 8, 9, or 11 (all long-running tests) the result may not be available for a few minutes. In this case, the test will continue to run and the Device Status and Control Menu will be displayed again.

If you select option 1, 2, 5, 8, 9, or 11, you will also notice that the Operational Status field indicates “TESTING.” In these instances, you will need to refresh the panel until the system displays your test results. Option 10 is also a long-running test, but selection of this option does not invoke the Device Status and Control Menu. Instead, the system displays a panel that allows you to end the test at your convenience.

The individual tests are the same tests that run as part of the default tests. However, there are a few additional tests that are available only from the Test Options menu. They are:

Wrap plug Option 9 runs the AIB test unit and an optical (external) wrap test. The wrap test requires that the fiber be removed and a wrap plug be installed. For an example of using this function, see “Testing the Adapters” on page 5-38.

Optical power Option 10 runs the AIB test unit and allows you to measure the optical output of the adapter. This test requires that the fiber be removed and an optical power meter be attached. See “ESCON Optical Power Measurement Test” on page 5-46 for additional information.

Light reception Option 11 runs the AIB test unit and also tests whether the attached fiber is transmitting light. This test can be used to determine if the remote end of the fiber is connected. For an example of using this function, see “Testing the Adapters” on page 5-38.

ESCON Optical Power Measurement Test

The following example describes the use of option **10**, Optical Power.

Enter **10** on the Test Options panel to run the optical power meter test.

```
                                                              Screen 1 of 1
                                 Test Options

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     DISABLED           MESSAGE          UNKNOWN          UNKNOWN

Do not remove this device while testing.
Select one of the following test options:
 * < 1. Run all tests excluding external wrap test >
 * < 2. Run all tests including external wrap test >
   Individual tests:
 * < 3. PCI BUS >
 * < 4. PROCESSOR >
 * < 5. MEMORY >
 * < 6. MEMORY PROT >
 * < 7. TIMER >
 * < 8. AIB >
 * < 9. WRAP PLUG >
 * <10. OPTICAL POWER >
 * <11. LIGHT RECEPTION >

Select (1-11 or   B=Back R=Refresh H=Help ):10
```

The optical power measurement test verifies that the ESCON channel adapter in the slot indicated is operating correctly and that the receive input level is within tolerance.

This test assumes that you have the following equipment installed:

- Optical Power Meter
- Duplex-to-Duplex Coupler
- Duplex-to-Biconic Test Cable

If you do not have the correct equipment, or wish to bypass this test, reinstall the fiber (if you removed it) and select **B** to return.

Using the materials previously listed to complete the test, perform the following steps:

1 Ensure that the black cap is over the biconic receptacle at the top of the power meter.

2 Press power On/Off. AUTO OFF appears on the display.

3 Allow a 2-minute warmup. The meter turns off if you do not press a button within 10 minutes.

4 If the meter does not display **Optical Power Meter**, repeatedly press the lambda pushbutton until 1300 nm appears.

Note: To ensure that the pushbutton produces the desired results, do not hold down the pushbutton for more than half a second.

5 Press Zero. The following two displays appear:

- A value between 0.30 and 0.70 nanowatts (nW)
- After a short time **0** blinks, indicating that the meter is correctly zeroed.

  If the meter is not correctly zeroed, a Hi or Lo is displayed after you press Zero. Press Zero again, and using a jeweler's screwdriver, adjust the trim pot that is beside the biconic receptacle at the top of the meter until a value between 0.30 and 0.70 nW is displayed. Set the value to 0.50, if possible.

6 Press Zero again to zero the meter.

The meter must also display dBm. If nW is displayed, press dBm/Watt. The optical power meter is now set.

7 After you set the meter, connect the black biconic connector of the test cable to the biconic receptacle on top of the power meter.

8 Enter **1** to start the test as indicated in the following example.

```
                                                                Screen 1 of 1
                            Setup For Optical Test

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
   DISABLED              TESTING         UNKNOWN          UNKNOWN

Do not remove this device while testing.

Install the duplex-to-biconic test cable connector to the ESCON
channel adapter located in slot 4.

Set the optical power meter to the following options:
 * -- Power turned on
 * -- Set for 1300 nanometers (nm)
 * -- Zeroed
 * -- The decibel scale displayed (dBm)

Confirm the meter is set.

< 1. Start > the adapter transmitter.

Select (1 or   B=Back R=Refresh H=Help ):1
```

The green port LED on the multiaccess enclosure ESCON Adapter will start blinking once the adapter has started transmitting the idle sequences. At this point, record the signal level displayed on the power meter. A correctly functioning multiaccess enclosure ESCON adapter should have a power level of -21.0 dBm or more (for example, -18.0 dBm).

9 Replace the ESCON Channel Adapter if its power level is too low.

10 Enter **1** from the Optical Test in Progress panel to Stop the test.

```
                                                                Screen 1 of 1
                          Optical Test In Progress

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
   DISABLED             TESTING         UNKNOWN          UNKNOWN

Do not remove this device while testing.

The green PORT LED should now be flashing on the ESCON channel
adapter in slot 4, indicating that it is transmitting IDLE sequences.
You may now record the power level displayed on the optical power meter
A properly functioning ESCON should have a power level of -21.0dBm or more
(for example -18.0dBm).

Select < 1. Stop > test when you have finished
measuring the signal level.




Select (1 or   B=Back R=Refresh H=Help ): 1
```

11 The following Test Results panel is displayed when you stop the test.

```
                                                                Screen 1 of 1
                                Test Results

LIC 287 - ESCON Channel Adapter, Slot 4, Net # 0

Operational Status  Diagnostic Status  Fault Status  Network Connection
     DISABLED           INACTIVE            OK            UNKNOWN

The Test Completed with No Errors.









Select (  B=Back ):
```

CE Leaving Procedure

Check List

You should use the following list to ensure that the machine is in suitable condition for customer operation and that call information is recorded.

1. If previously, you have worked on 3745 or 3746, be sure to have restore them at a correct status for customer application (MOSS online, 3746 online, FRU active in CDF-E).
2. Ask the customer to restart his application.
3. If you have a problem, call your support for assistance

Chapter 6. Installing Options

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Installing a Dual Power Supply (FC 3500)

BEFORE INSTALLATION

Machines Affected

3746 Models 9X0 with a Multiaccess Enclosure FC 3000, and without a Dual Power Supply (FC 3500).

This feature should only be applied on the machine serial for which it is specified.

Related BMs and ECs

None.

BMs to be Installed

FFBM	Title
86H0248	Dual Power Supply (FC 3500).

Preparation

__ 1. Familiarize yourself with the purpose and details of these installation instructions.

__ 2. Check all the items and count the parts listed on the B/M(s) to be installed to determine that all the parts have been received.

__ 3. Obtain the Hone plugging sheet (provided by the Marketing Representative) or ask to the customer.

Programming

None

Purpose and Description

Purpose

Increase the reliability of the 3746 Nways Multiaccess Enclosure

Description

Install a second Power Supply on the Multiaccess Enclosure.

Installation Time

BM Installed	Machine Hours	System Hours	Nb of CE
86H0248	0.0	0.0	1

Tools/Materials Required

None

INSTALLATION

Safety

Review the **Safety Notices** and the **Safety Inspection Procedures** located at the beginning of the:

- *3746-950 Service Guide*, SY33-2108, or
- *3746-900 Service Guide*, SY33-2116.

Details of Installation

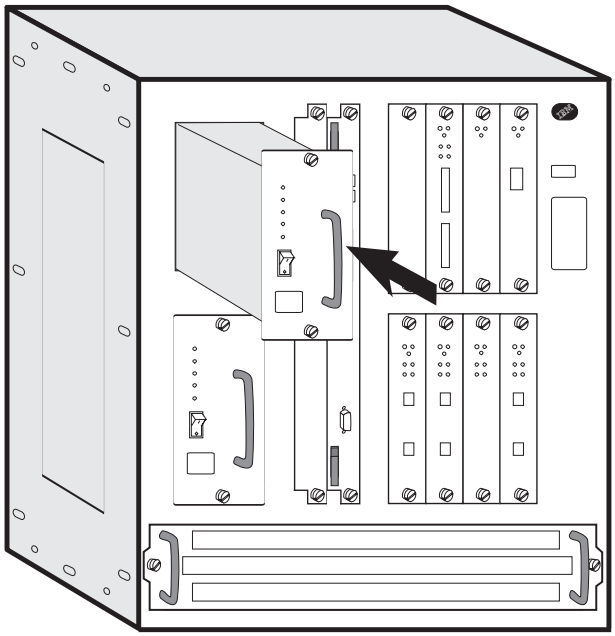
__ 1. Open the front and back doors of the Controller Expansion

__ 2. Identify the location where the second power supply module has to be installed.

__ 3. Remove the filler plate.

__ 4. Unpack the power module and verify that the power switch is set to **OFF (0)**.

__ 5. Insert the power module into the Multiaccess Enclosure.



__ 6. Position the screws, then slide the module into its location.

__ 7. Secure the module by tightening the screws.

__ 8. Plug one side of the power cord (PN 58G5783), provided with the B/M, on the power module, route it to the nearest ac Outlet Distribution Box, then plug the other side of the power cord on a free connector of the ac Outlet Distribution Box

__ 9. Verify that the **AC Indicator** LED is **ON**

If the **AC Indicator** LED is **OFF**, refer to Chapter 3, “Multiaccess Enclosure Problem Determination” on page 3-1.

__ 10. Switch **ON** the power module.

__ 11. Verify that the **DC Indicator** LED is **ON** and the **Overcurrent Indicator** LED is **OFF**.

If the **AC Indicator** LED is **OFF** or the **Overcurrent Indicator** LED is **ON**, refer to Chapter 3, “Multiaccess Enclosure Problem Determination” on page 3-1.

__ 12. Close the front and back doors of the Controller Expansion

__ 13. Notify the Customer that you are finished installing the feature.

Test procedures.

No test required.

Field Updating.

None.

Go to “After Installation.” on page 6-12 .

Installing an Adapter (FC 32XX).

BEFORE INSTALLATION

Machines Affected

3746 model 9X0 with Multiaccess Enclosure FC 3000.

This feature should only be applied on the machine serial for which it is specified.

Related BMs and ECs

None.

BMs to be Installed

FFBM	Title
02L0647	1-Port High-Speed Serial Interface Adapter (FC 3289), or
02L0649	1-Port 10/100-Mbps Ethernet Adapter (FC 3288), or
02L0651	1-Port High Performance ATM 155-Mbps MMF Adapter (FC 3294), or
02L0653	1-Port High Performance ATM 155-Mbps SMF Adapter (FC 3295), or
86H0247	2-Port Token Ring Adapter (FC 3280), or
86H0246	2-Port Ethernet Adapter (FC 3281), or
86H0238	8-Port EIA-232E/V24 Adapter (FC 3282), or
86H0241	1-Port ISDN-PRI T1/J1-Interface Adapter (FC 3283), or
86H0244	1-Port ATM 155-Mbps MMF Adapter (FC 3284), or
85H9681	1-Port FDDI Adapter (FC 3286), or
85H0251	1-Port ESCON Channel adapter (FC 3287), or
86H0239	6-Port V35/V36 Adapter (FC 3290), or
86H0240	8-Port X21 Adapter (FC 3291), or
86H0242	1-Port ISDN-PRI E1-Interface Adapter (FC 3292), or
86H0245	1-Port ATM 155-Mbps SMF Adapter (FC 3293).

Preparation

- Familiarize yourself with the purpose and details of these installation instructions.
- Check all the items and count the parts listed on the B/M(s) to be installed to determine that all the parts have been received.
- Obtain the Hone plugging sheet (provided by the Marketing Representative) or ask to the customer.

Programming

None

Purpose and Description

Purpose
Increase the connectivity capability of the 3746-9x0

Description
Install an adapter in the 3746 Nways Multiaccess Enclosure.

Installation Time

BM Installed	Machine Hours	System Hours	Nb of CE
*	0.5	0.0	1

* See BM to be installed.

Tools/Materials Required
None

INSTALLATION

Safety

Review the **Safety Notices** and the **Safety Inspection Procedures** located at the beginning of the:

- *3746-950 Service Guide*, SY33-2108, or
- *3746-900 Service Guide*, SY33-2116.

Details of Installation

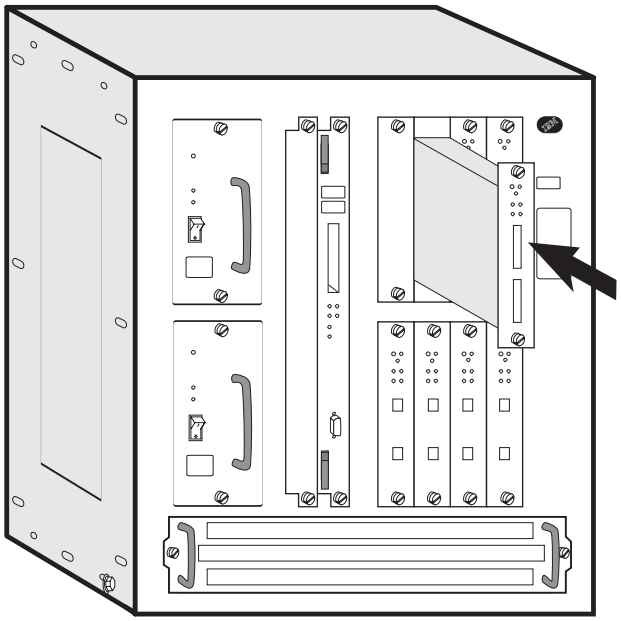
Installing an Adapter

__ 1. Open the front door of the Controller Expansion

__ 2. Using the Hone sheet, the Figure A-1 on page A-1 and refering to Appendix B, “MAE Adapters Plugging Rules” on page B-1, identify the location where the adapter has to be installed.

__ 3. Remove the filler plate.

__ 4. Insert the adapter module into the machine.



__ 5. Position the screws, then slide the module into its location.

__ 6. Secure the module by tightening the screws.

__ 7. Check that the green LED of the adapter comes ON and that the Wrong Slot LED is OFF.

- If not, check the adapter installation.
- If the problem persists call the Network Support Center.
- Otherwise, continue.

__ 8. Connect the cable provided with the B/M on the adapter connector according to the worksheet or ask the customer.

__ 9. Then, tighten the cable screws (if present).

__ 10. Label the cables for proper reconnection.

Configuring the Adapter.

__ 1. You should be logged ON on the service processor. If not go to Step 2. Otherwise continue with Step **3** .

__ 2. To log ON:

  __ a. On the **MOSS-E View** window, click on **Program** (in the action bar).

  __ b. Click on **Log On MOSS-E**.

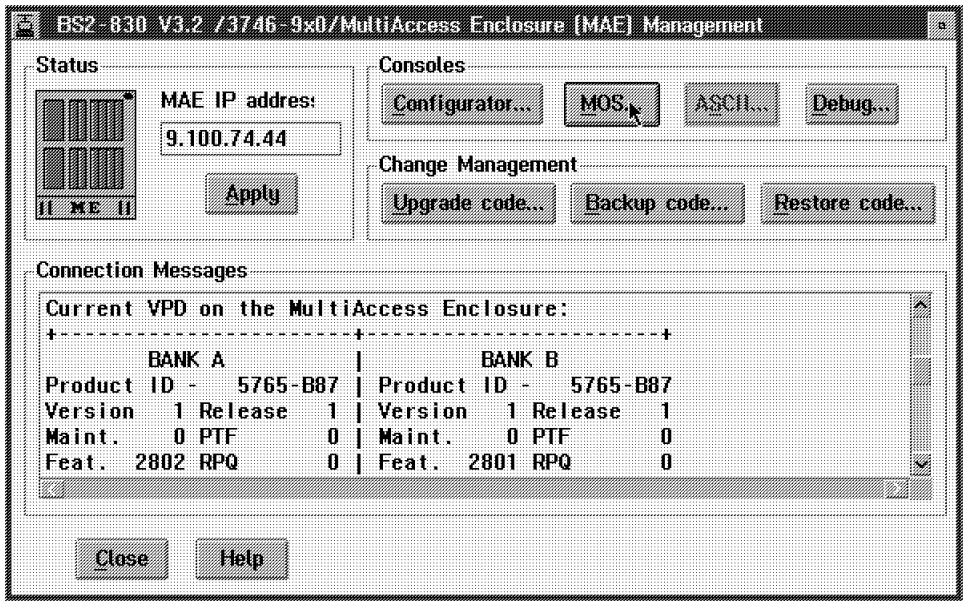
  __ c. Enter the password (default is IBM3745) and continue with Step **3** .

__ 3. On the **MOSS-E View** window, double click on the 3746 icon.

__ 4. On the **3746-9x0 Menu** click on the **Multiaccess Enclosure (MAE) Management** option.

__ 5. Double click on **Manage Multiaccess Enclosure**.

__ 6. Click on **MOS...** push button to access the command line interface (* prompt).



__ 7. Type **talk 6**, then press **Enter** twice to reach the `Config>` prompt.

__ 8. Enter **add device** *type of device*.

- For example, **add device x21**

Note: If you don't know the device type supported, enter **add device ?** and from the list, record the type and the number of port of the adapter that you are installing.

__ 9. Enter the device slot number (1–8).

__ 10. Enter the port number (0–7, depending on the type of adapter)

The range of port numbers supported depends on the multi-port adapter type.

__ 11. On a sheet of paper, write down the interface number to which this port is assigned and the net number.

__ 12. Enter **exit**.

__ 13. Enter **write** to save your changes.

__ 14. Reboot the 3746 Nways Multiaccess Enclosure to make the configuration changes active.

Details of this procedure are in the *Software User's Guide*.

Enabling the Adapter Port

__ 1. You should be logged ON on the service processor. If not go to Step 2. Otherwise continue with Step **3** .

__ 2. To log ON:

__ a. On the **MOSS-E View** window, click on **Program** (in the action bar).

__ b. Click on **Log On MOSS-E**.

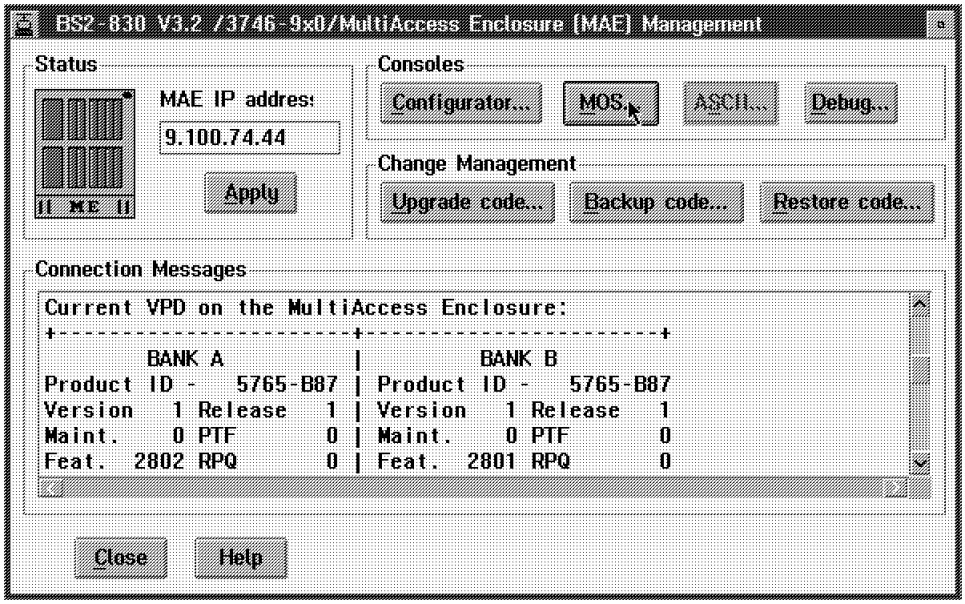
__ c. Enter the password and continue with Step **3** .

__ 3. On the **MOSS-E View** window, double click on the 3746 icon.

__ 4. On the **3746-9x0 Menu** click on the **Multiaccess Enclosure (MAE) Management** option.

__ 5. Double click on the **Manage Multiaccess Enclosure**.

__ 6. Click on **MOS..** push button to access the command line interface (* prompt).



__ 7. Type **talk 6**, then press **Enter** twice to reach the `Config>` prompt.

__ 8. Enter **list device**.

__ 9. A list of adapters is displayed similar to the following:

```
Ifc  0 Token Ring              Slot: 1  Port: 1
Ifc  1 Token Ring              Slot: 1  Port: 2
Ifc  2 Ethernet                Slot: 2  Port: 1
Ifc  3 Token Ring              Slot: 5  Port: 2
Ifc  4 CHARM ATM               Slot: 8  Port: 1
```

Note: On this window **ifc** identifies the interface number of the adapter.

__ 10. On a sheet of paper, write down the interface number of the adapter you wish to enable.

__ 11. Enter **enable interface** *interface number*

__ 12. The following message is displayed: `Interface enabled successfully.`

__ 13. Enter **write** to save your changes.

__ 14. Press **Ctrl/P**.

__ 15. Type **reload**.

__ 16. The following message is displayed: `Are you sure you want to reload the Gateway?.`

__ 17. Type **Yes** to reboot the MAE.

__ 18. Close the front door of the Controller Expansion

__ 19. Notify the Customer the you are finished installing the feature.

Details of this procedure are in the *Software User's Guide*.

Test procedures.

No test required.

Field Updating.

None.

Go to "After Installation." on page 6-12 .

After Installation.

Publications Update

None.

Parts Disposition

- **Purchased Machines**: Refer to the parts ownership matrix to determine the correct owner of removed/unused parts. All parts determined to be the property of IBM should be processed as stated in the rental machine directions below.
  - For EMEA/APG/AG Areas, refer to *Hardware and General Service Code Description*.
  - For Domestic Areas, return parts to the customer.
- **Rental Machines**: Provide all parts to the IBM branch office for potential return in accordance with existing return, recovery, and reclamation programs.

Machine Records

- Install the new **MACHINE HISTORY** supplied.
- Report installation and quality to existing procedures.

Chapter 7. Removing or Relocating Your Multiaccess Enclosure

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Deleting the Configuration Parameters

Delete your multiaccess enclosure parameters from the MOSS-E hard disk as follows:

1. ____ Double click on the **"3746-9x0 object icon"**
2. ____ Click on **"Operation Management"**
3. ____ Click on **"Multiaccess Enclosure Management"**, double click on **"Remove Multiaccess Enclosure"**,

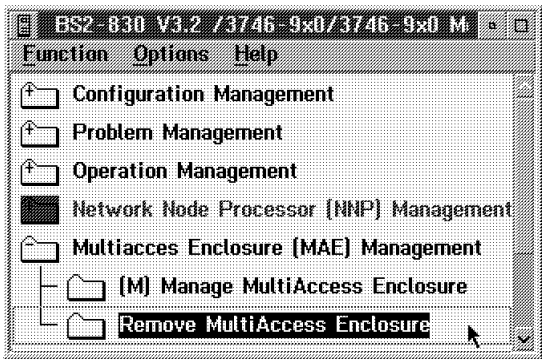

Figure 7-1. 3746-9X0 Multiaccess Enclosure Management

4. ____ Click on **"Yes"**

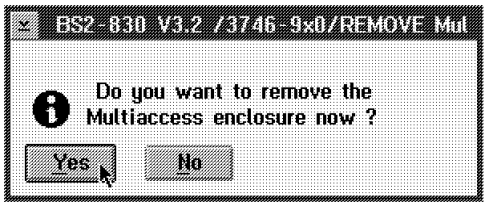

Figure 7-2. Remove Multiaccess Enclosure

5. ____ Click on **"OK"**

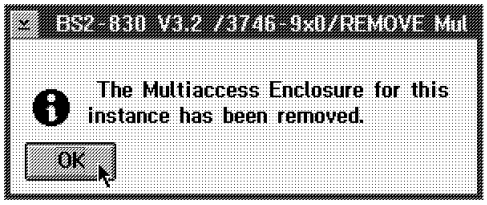

Figure 7-3. Remove Multiaccess Enclosure

Disconnecting the MAE from Power and Removing Cables

1. ____ **Power off** the MAE, then proceed in reverse order as for the installation:
2. ____ **Remove** the external cables, see “Step 3.1 - Connecting the MAE to a 7585” on page 1-11 or “Step 3.2 - Connecting the MAE to a 3172” on page 1-13 or “Step 3.3 - Connecting the MAE to a 9585” on page 1-15.
3. ____ **Remove** inter-machines cables
4. ____ **Remove** the MAE from the controller expansion
5. ____ **Remove** the 8228 from the controller expansion, see “Installing the 8228s” on page 1-17.
6. ____ **Remove** the brackets installed on the MAE and the hardware from the controller expansion, see “Step 2 - Installing the MAE” on page 1-5.
7. ____ If installed, **remove** the second ac outlet distribution box.

Preparing the MAE for Shipment

1. ____ Pack the machine using the pack/unpack instructions.
2. ____ Pack the customer's parts and documentation in one package and label it: "Customer Package".
3. ____ Pack other parts and all maintenance documentation in another package and label it: "Maintenance Package". Hold for use by IBM Service Representative.
4. ____ Coil all removed cables and store them alongside the machine.
5. ____ Complete the removal records according to existing procedures. Inform the IBM Branch Office that the machines are ready for shipment.

Appendix A. Multiaccess Enclosure Components Location

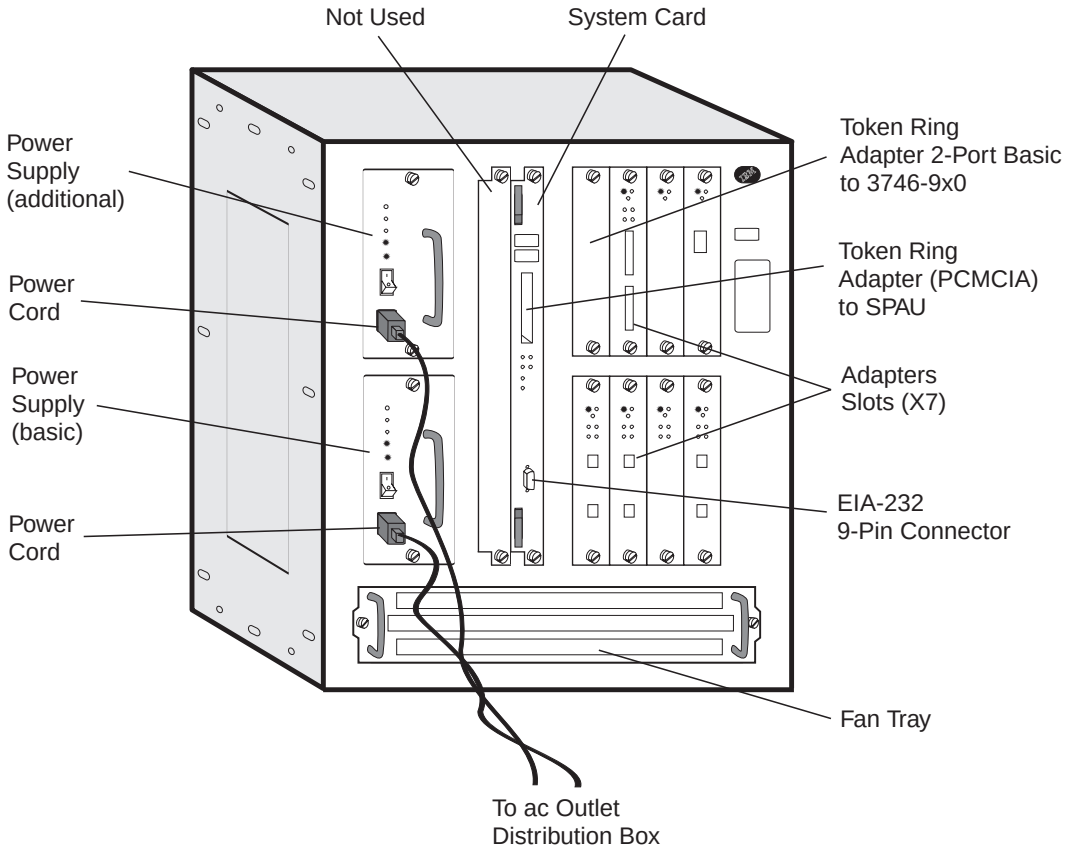

Figure A-1. Multiaccess Enclosure Components Location

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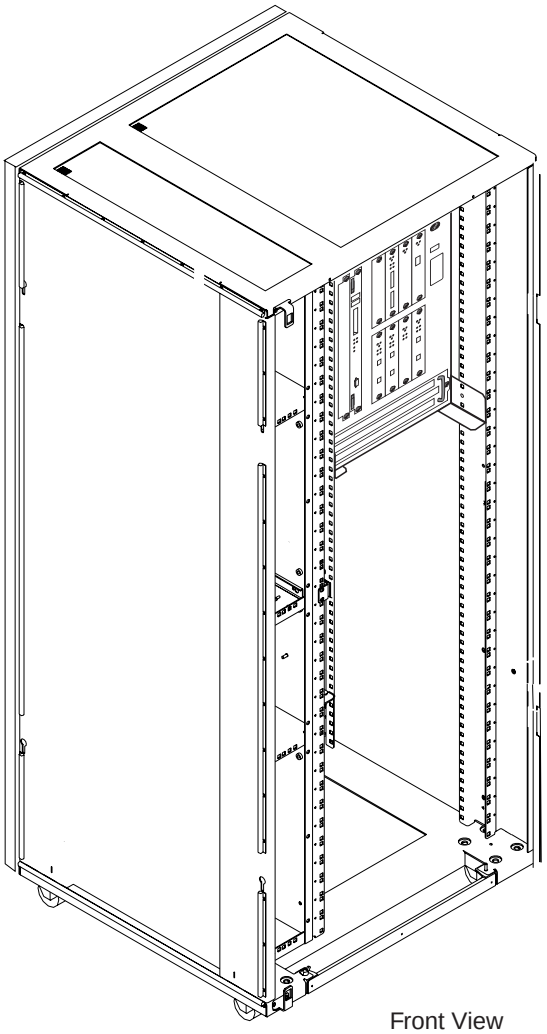

Figure A-2. Multiaccess Enclosure Installed on the Top of the Controller Expansion

Appendix B. MAE Adapters Plugging Rules

Units assembled at the factory follow certain plugging rules, as described below, use the same rules when installing adapters in the field.

Assumptions

Note: If required, to support APPN traffic **one Token-Ring** (FC 3280) adapter is plugged in **slot 1** (link to the 3746-9X0).
For the other slots the following rules applies (one more adapter is authorized when the TR adapter is not plugged in slot 1):

- No more than five of any combination of **Token-Ring** (FC 3280) and Ethernet (FC 3281) adapters will be installed.
- If a combination of *five* 3280 and 3281 adapters are to be installed, no other adapters will be installed.
- If a combination of *four* 3280 and 3281 adapters are to be installed, then one additional adapter can be also be installed.
- A maximum of *four* ESCON adapters (3287) can be installed.
- A maximum of *four* ISDN adapters (3283 or 3292) can be installed.
- A maximum of *two* ATM adapters (3284 and 3293) can be installed.

Plugging Sequences

The following table illustrates how the slots are numbered: two rows of four slots, numbered 1 through 8 (slot 1 is reserved):

Table B-1. Slot Numbering

Slot 1	Slot 2	Slot 3	Slot 4
Slot 5	Slot 6	Slot 7	Slot 8

These tables show the default sequence of installation for the various adapters.

LIC 280s and LIC 281s are installed left to right, beginning with slot 5. A maximum of five may be installed in any single MAE.

Table B-2. FC 3280s (LIC 280s) and FC 3281s (LIC 281s)

Reserved (1)	2 nd	4 th	
1 st	3 rd	5 th	

Note: (1) This slot is reserved for the TR adapter when APPN traffic is required between the MAE and the 3746-9X0.

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Other adapters are installed right-to-left in the first-available slot beginning with slot 8 on the far right.

Table B-3. All Other Adapters

Reserved (1)	6 th	4 th	3 rd
7 th	5 th	2 nd	1 st

Note: (1) This slot is reserved for the TR adapter when APPN traffic is required between the MAE and the 3746-9X0.

Appendix C. Parameter Worksheets

The worksheets in this appendix list the parameters that are needed during the multiaccess enclosure installation.
Default parameter values are included (in parentheses) in the table.

For the multiaccess enclosure

Table C-1. IP Addresses and Subnet Mask	
Client IP address (multiaccess enclosure)	(192.9.200.5)
Server IP address (Service Processor)	(192.9.200.1)
Gateway IP address	(192.9.200.1)
Subnet mask	(255.255.255.240)

LAN link from the MAE to the 3746

Table C-2. LAN link to 3746	
LAN link to 3746 required	□ Yes • □ One link • □ Two links □ No

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Appendix D. Controller Expansion Component Locations

If you want more information about:	Refer to
• Positioning the units in the front side of the controller expansion	• Figure D-1 on page D-2
• Positioning the units in the rear side of the controller expansion	• Figure D-2 on page D-3
• Installing captive nuts and brackets (for 7585)	• Figure D-3 on page D-4
• Installing captive nuts and brackets (for 3172, 9585, or 9577)	• Figure D-4 on page D-5
• Installing captive nuts for LCBs	• Figure D-5 on page D-6
• Installing captive nuts for 8229s	• Figure D-6 on page D-7
• Installing captive nuts and brackets for MAE	• Figure D-7 on page D-8
• Installing brackets for processor type 7585	• Figure D-8 on page D-9
• Installing brackets for processor type 3172	• Figure D-9 on page D-10
• Example of units installation (processor type 7585)	• Figure D-10 on page D-11
• Example of units installation (processor type 7585 + MAE)	• Figure D-11 on page D-11
• Example of units installation (processor type 3172)	• Figure D-12 on page D-12
• Example of units installation (processor type 9585)	• Figure D-13 on page D-12
• Example of units installation (processor type 9577)	• Figure D-14 on page D-13
• Connecting the units to the ac Outlet Distribution Box.	• Figure D-15 on page D-13

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Use this drawing to setup the **units** on the **front side** of the controller expansion, for the units that can be installed on the rear, refer to Figure D-2 on page D-3.

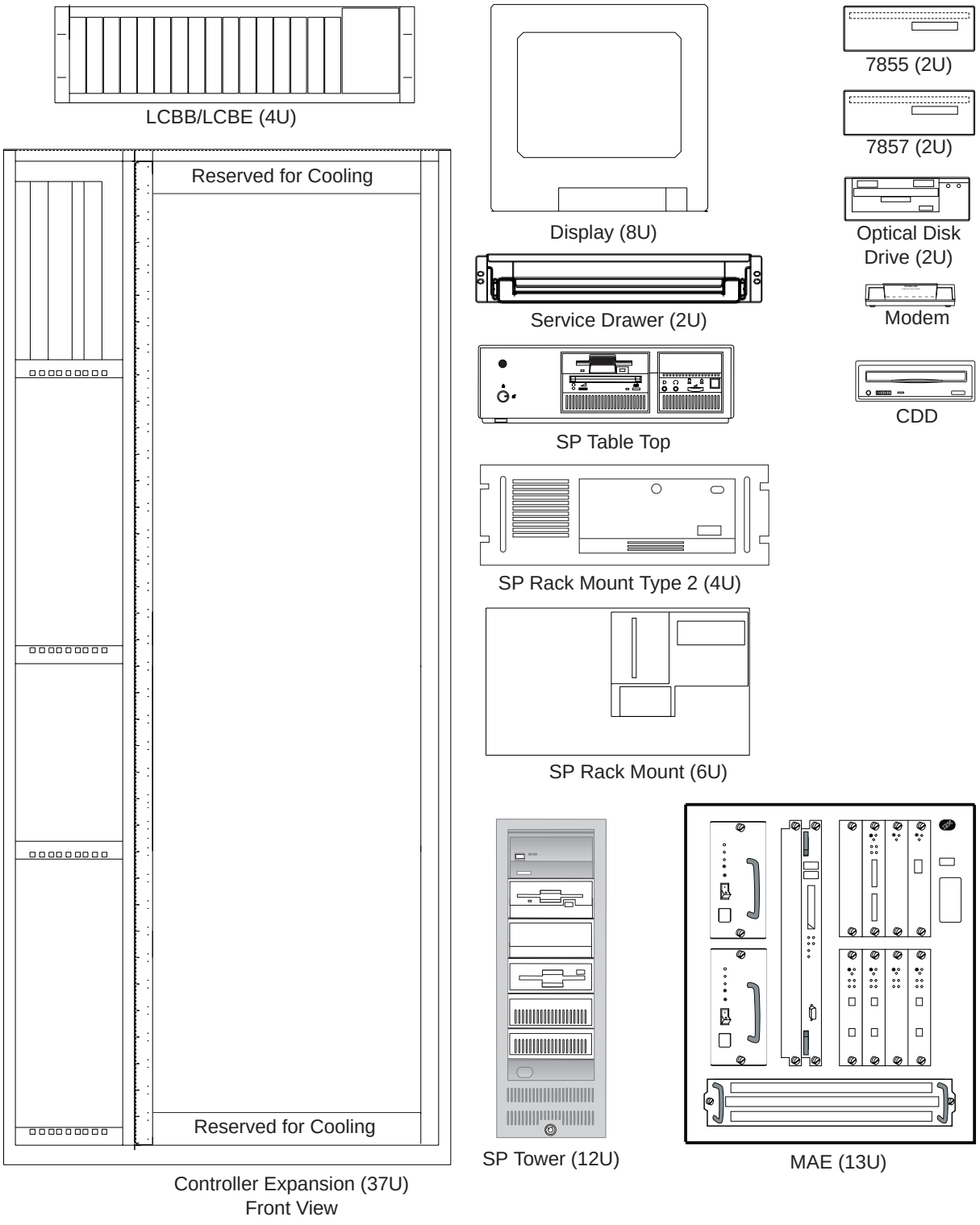

Figure D-1. Controller Expansion Inventory Chart (Front View).

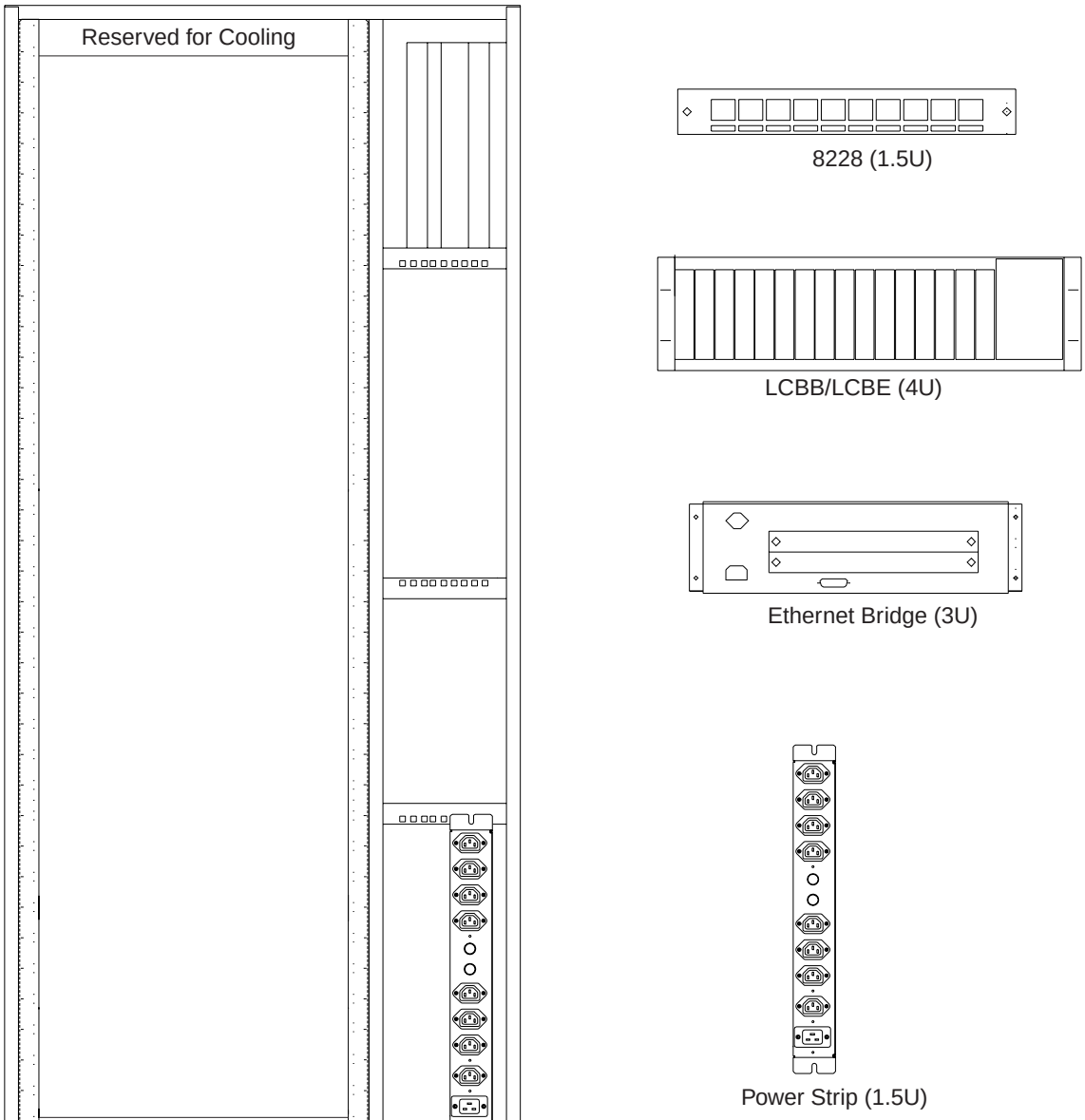

Figure D-2. Controller Expansion Inventory Chart (Rear View).

Notes:

1. The units dimensions are scaled to the size of the controller expansion diagram. The values represent the size used to setup the units in the controller expansion, it is not the size of the units themself.
2. The attachment holes along each side of the controller expansion are divided into units of measure called EIA units. Each EIA unit (U) equals 44.5 millimeters (1.75 inches).
3. The controller expansion is 37 U high but only 35 are usable, one U must be reserved at the top and at the bottom for proper cooling.

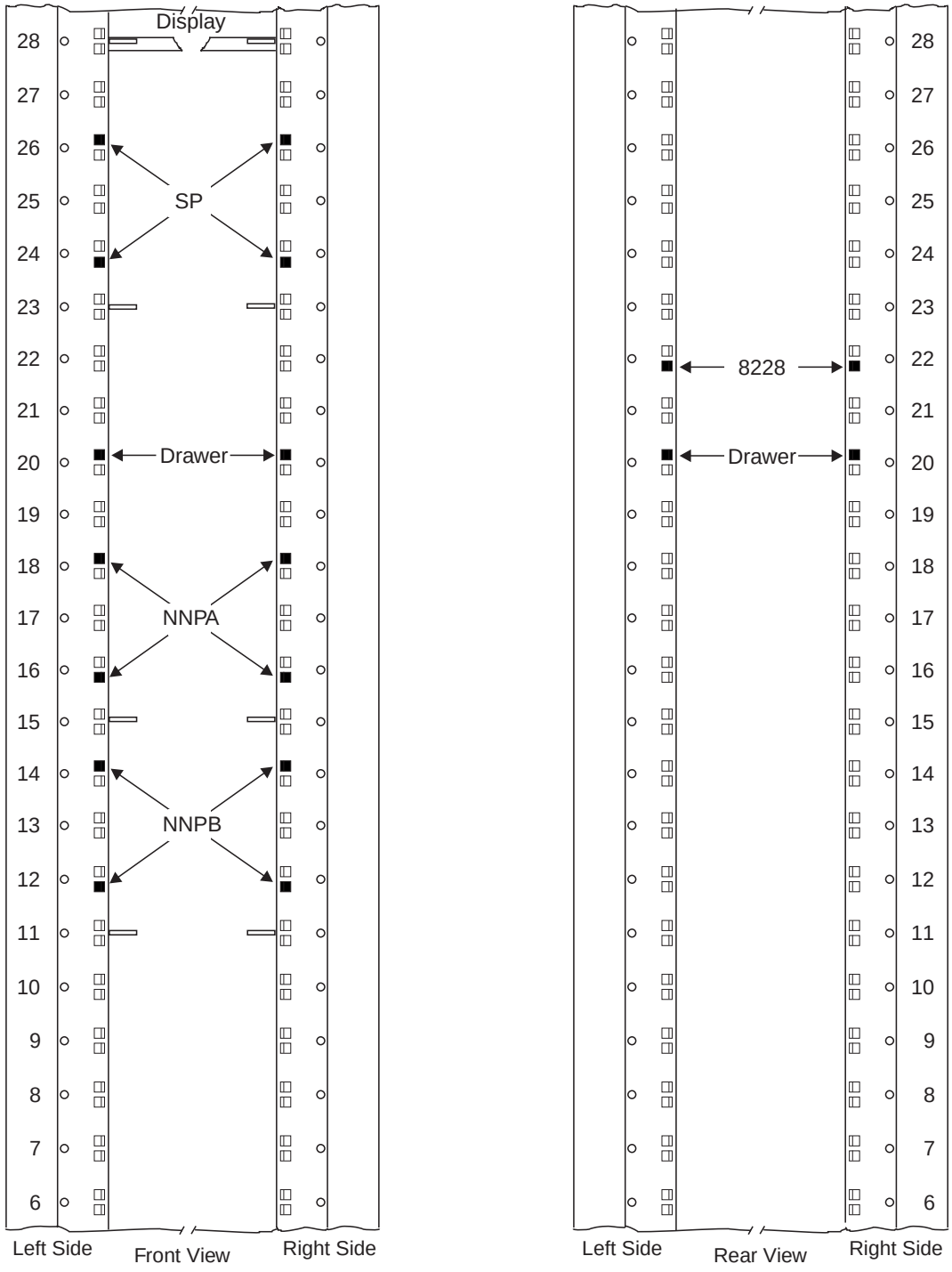

Figure D-3. Installing Captive Nuts and Brackets for the Display, Drawer, SP and NNP Type 7585

Note: This symbol '■' identify the locations to install the captive nuts.

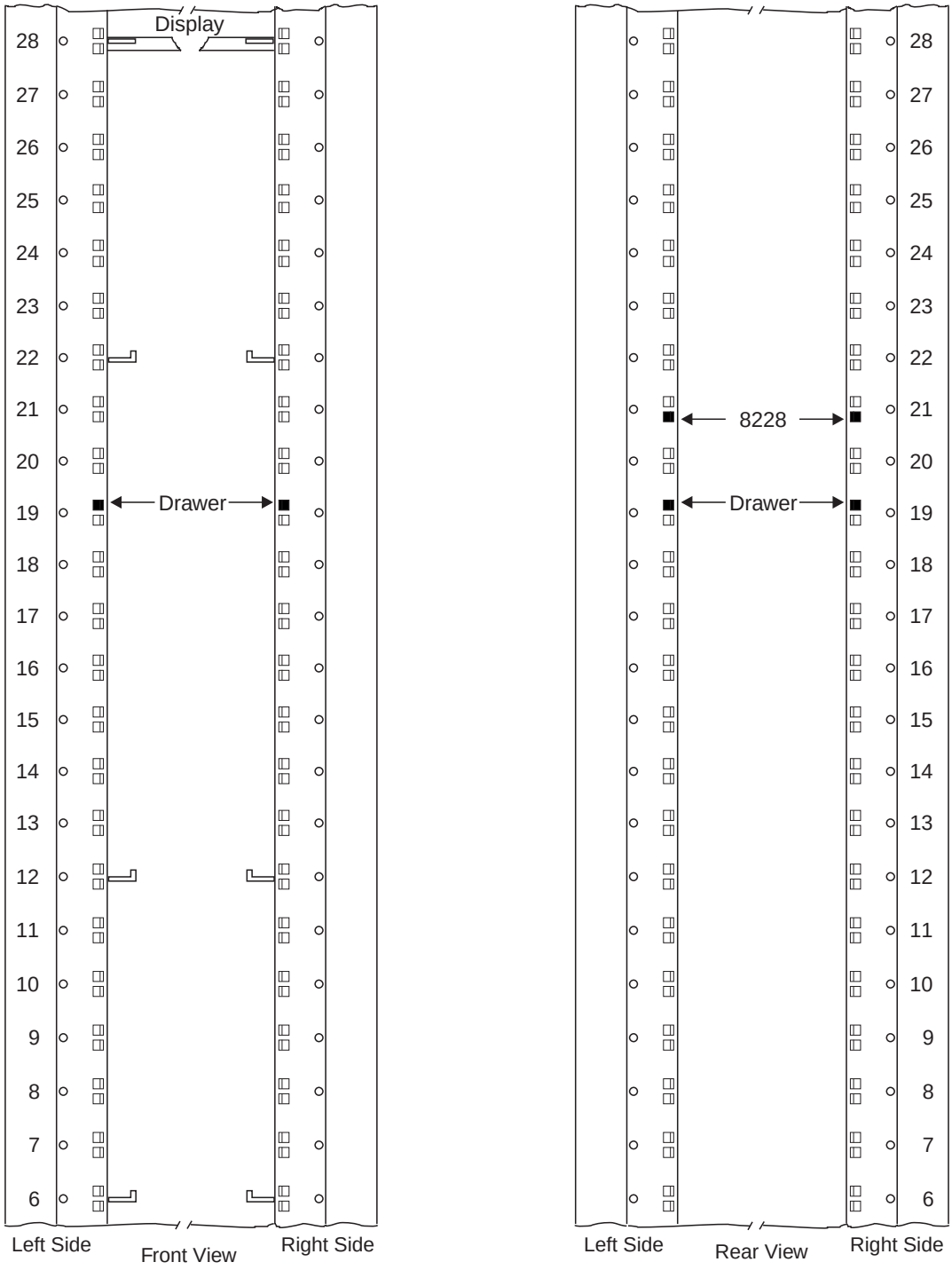

Figure D-4. Installing Captive Nuts and Brackets for the Display, Drawer, SP and NNP Type 3172

Notes:

1. This drawing can be used to setup the SP type **9585** or **9577**
2. This symbol '■' identify the locations to install the captive nuts.

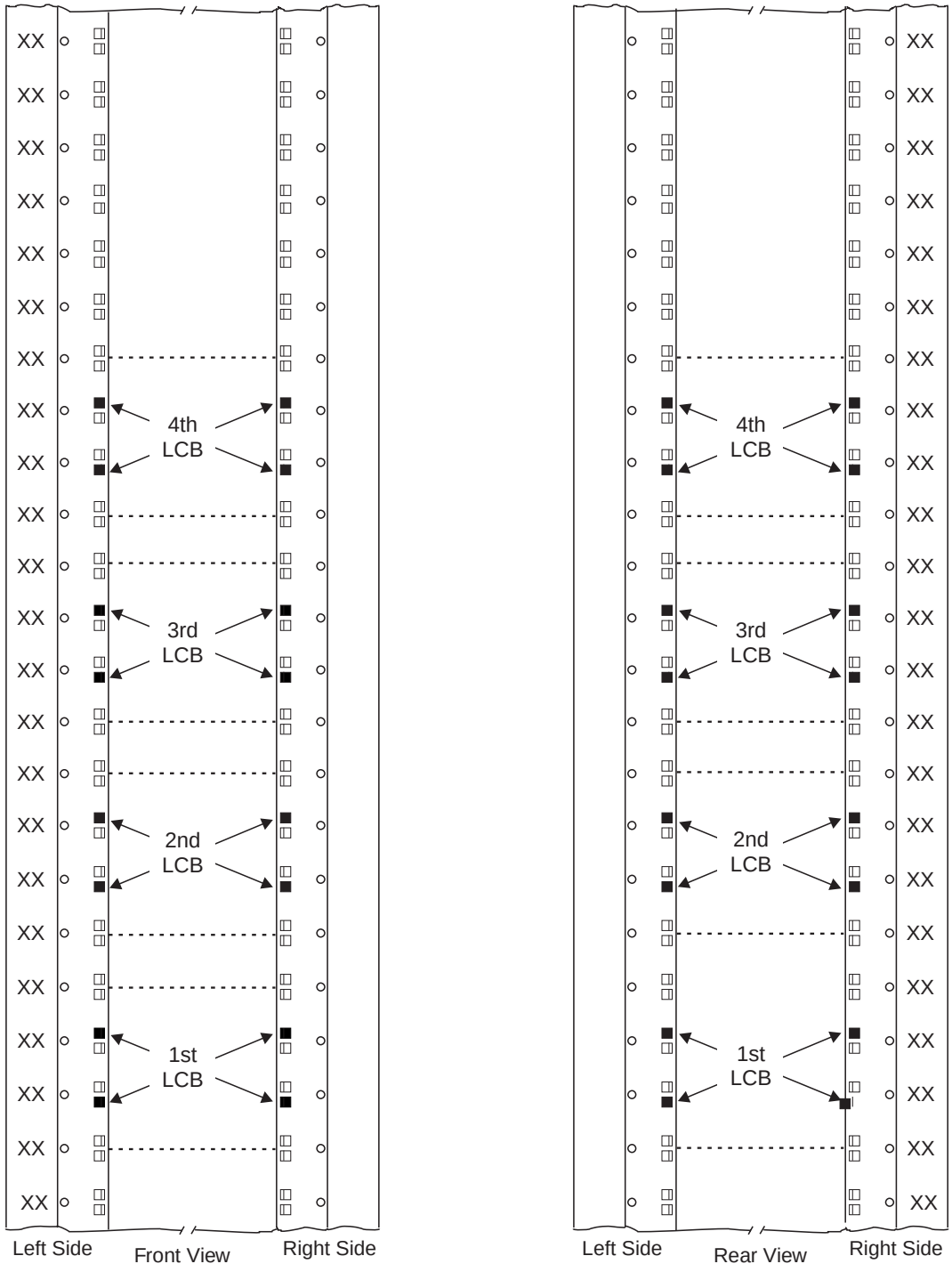

Figure D-5. Installing Captive Nuts for LCBs

Note: This symbol '■' identify the locations to install the captive nuts.

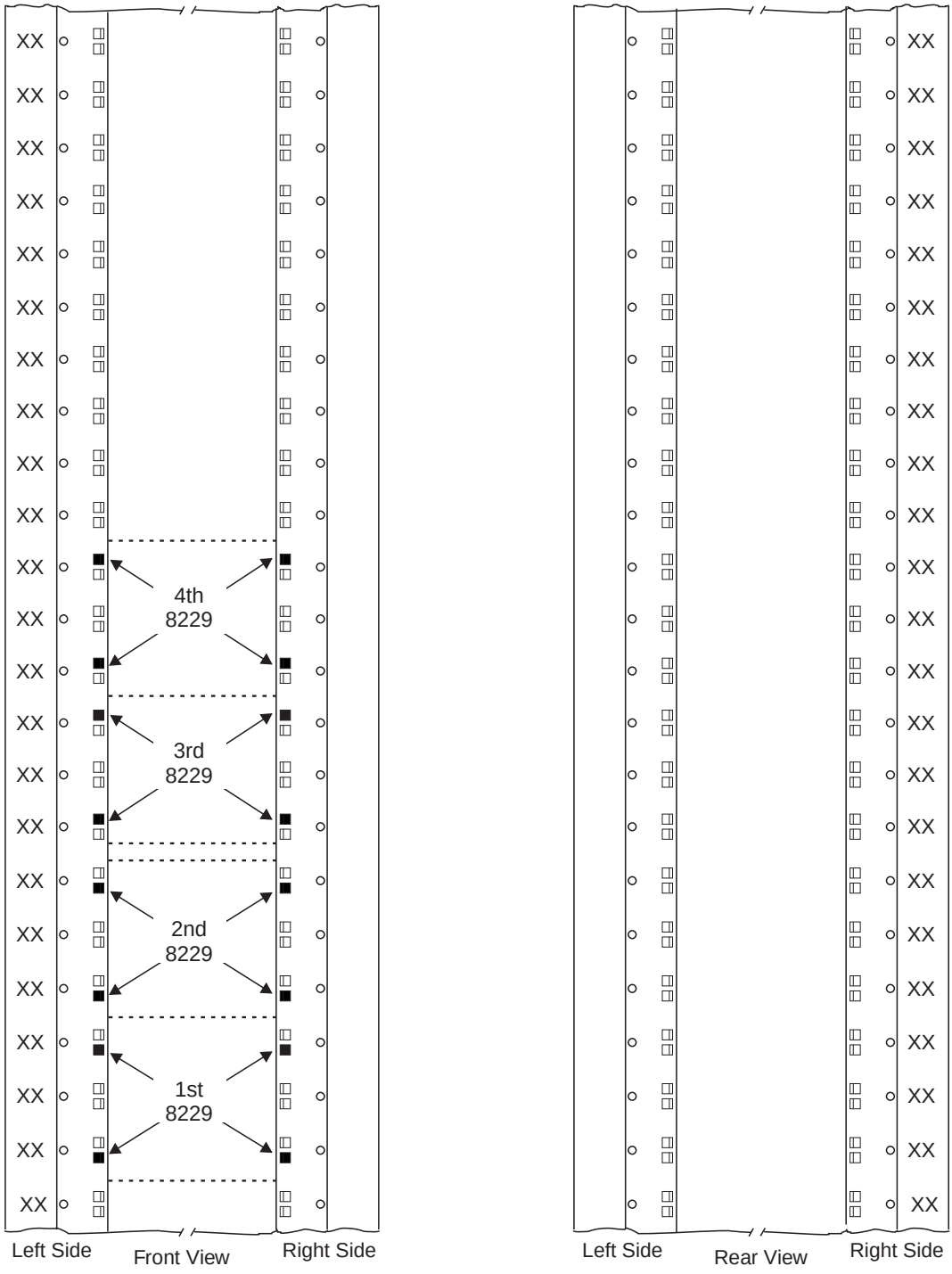

Figure D-6. Installing Captive Nuts for 8229s

Note: This symbol '■' identify the locations to install the captive nuts.

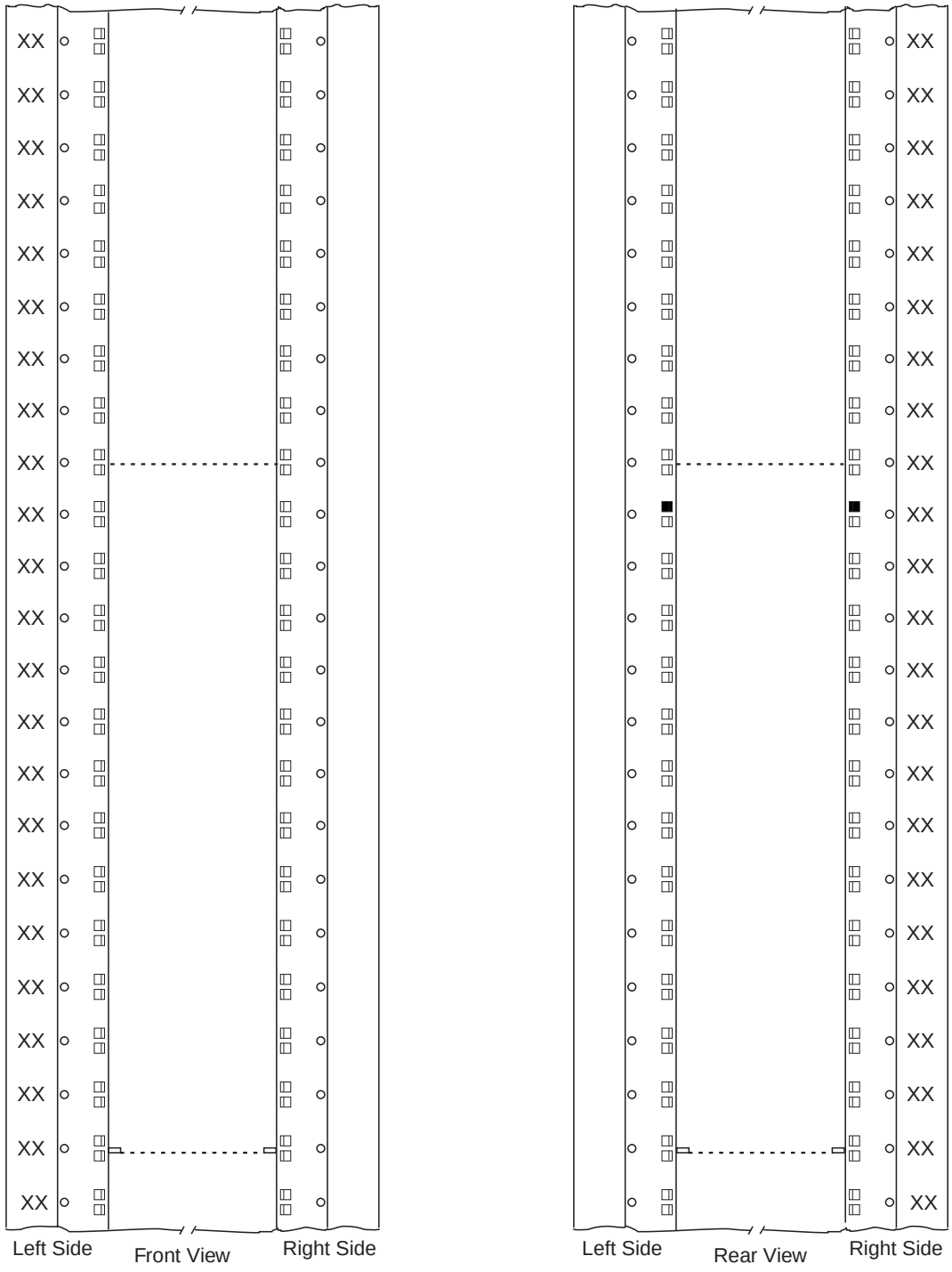

Figure D-7. Installing Captive Nuts and Brackets for MAE

Note: This symbol '■' identify the locations to install the captive nuts.

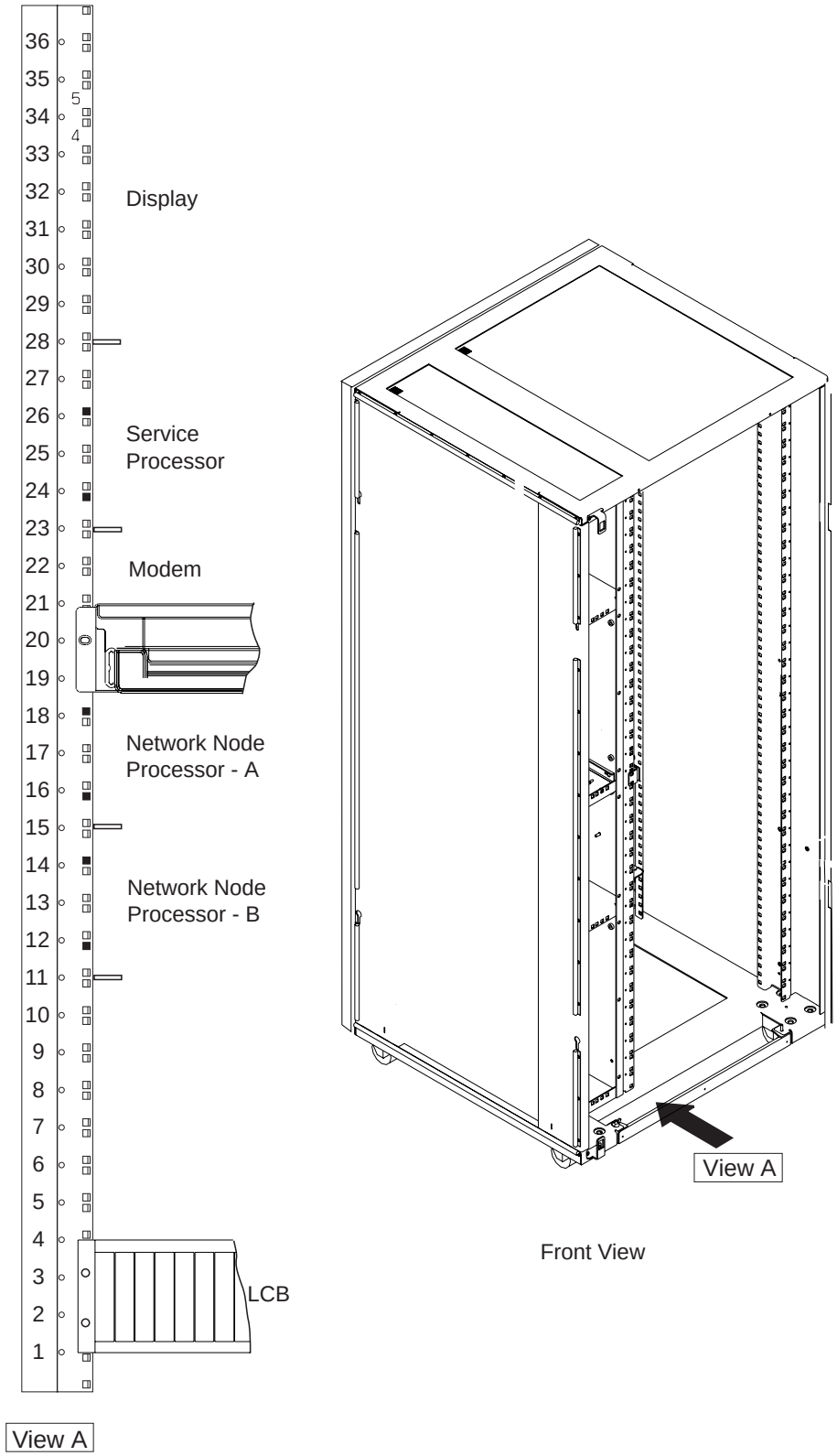

Figure D-8. Installing Brackets (PN 58G5752) for Processor Type 7585

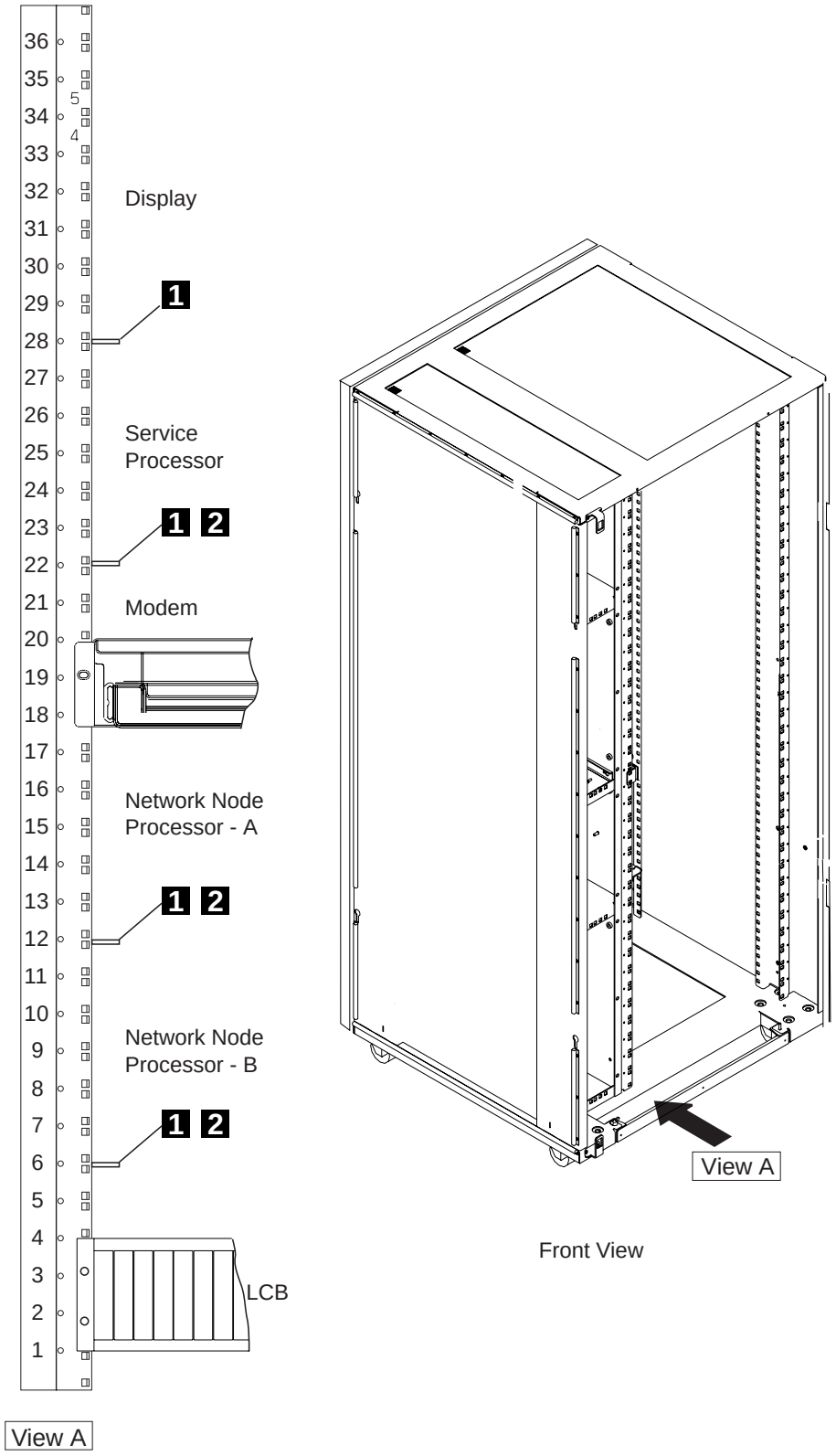

Figure D-9. Installing Brackets for Processor Type 3172

- **1** bracket used to install the display (PN 58G5752)
- **2** screws used to install the SP and NNP (PN 0782986)

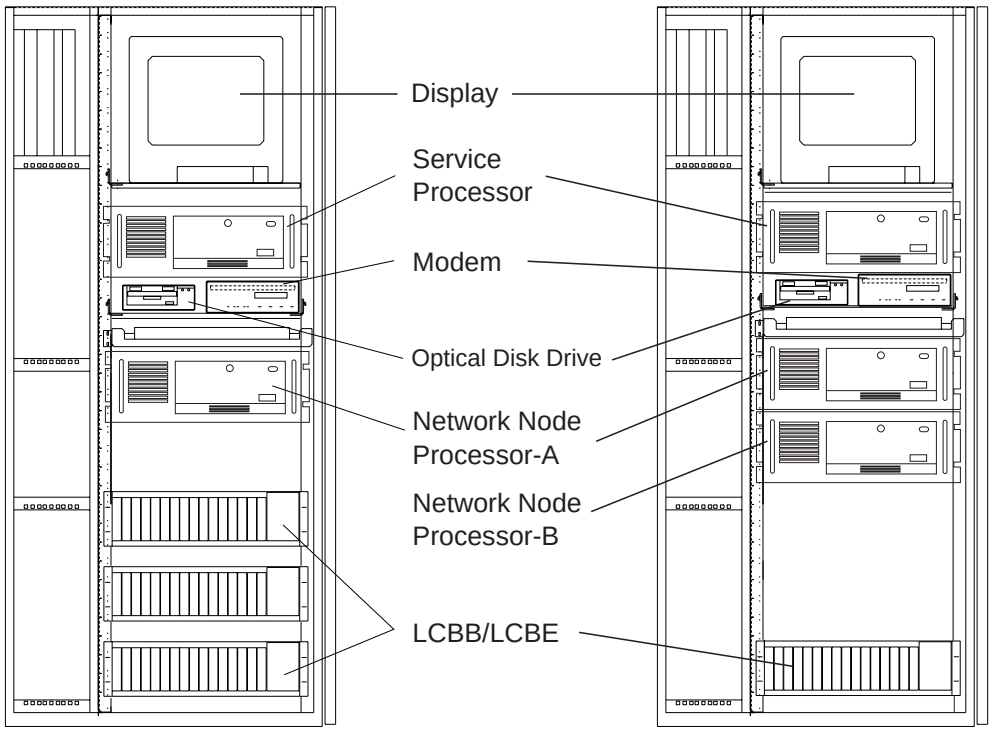

Figure D-10. Units Installation in the Controller Expansion (SP Type 7585)

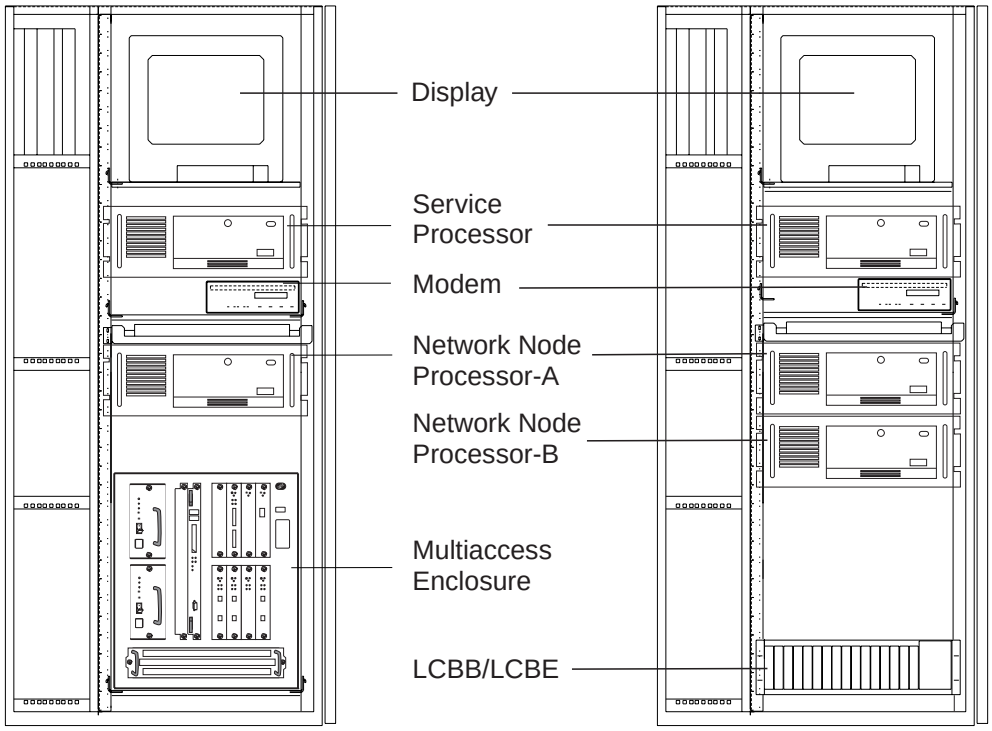

Figure D-11. Units Installation in the Controller Expansion (SP Type 7585 + MAE)

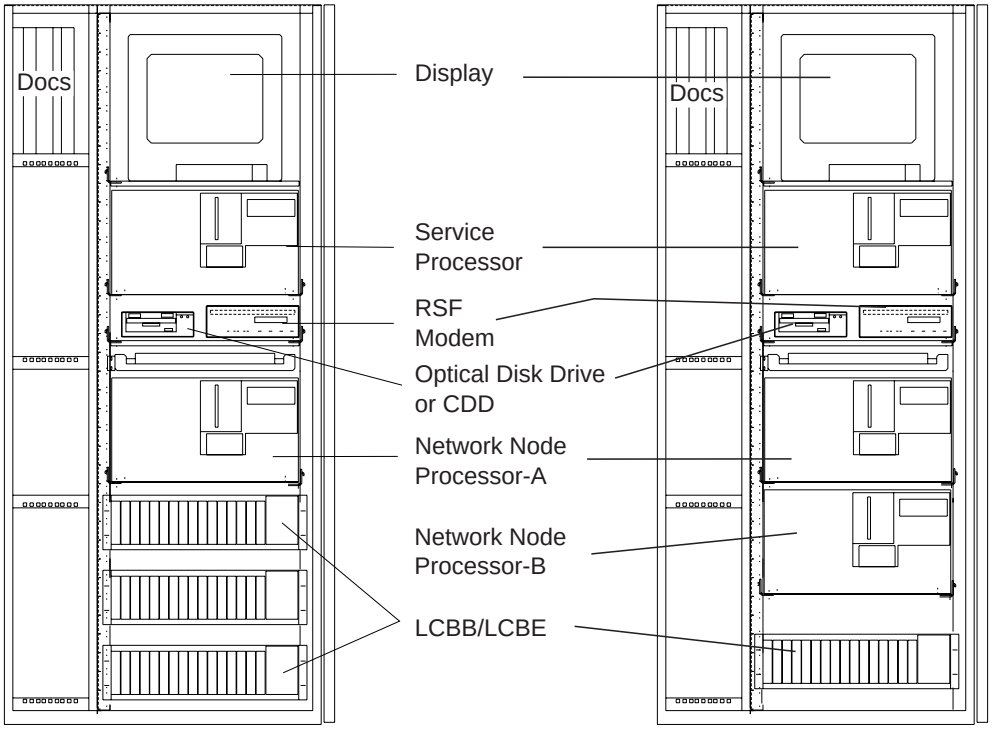

Figure D-12. Units Installation in the Controller Expansion (SP Type 3172)

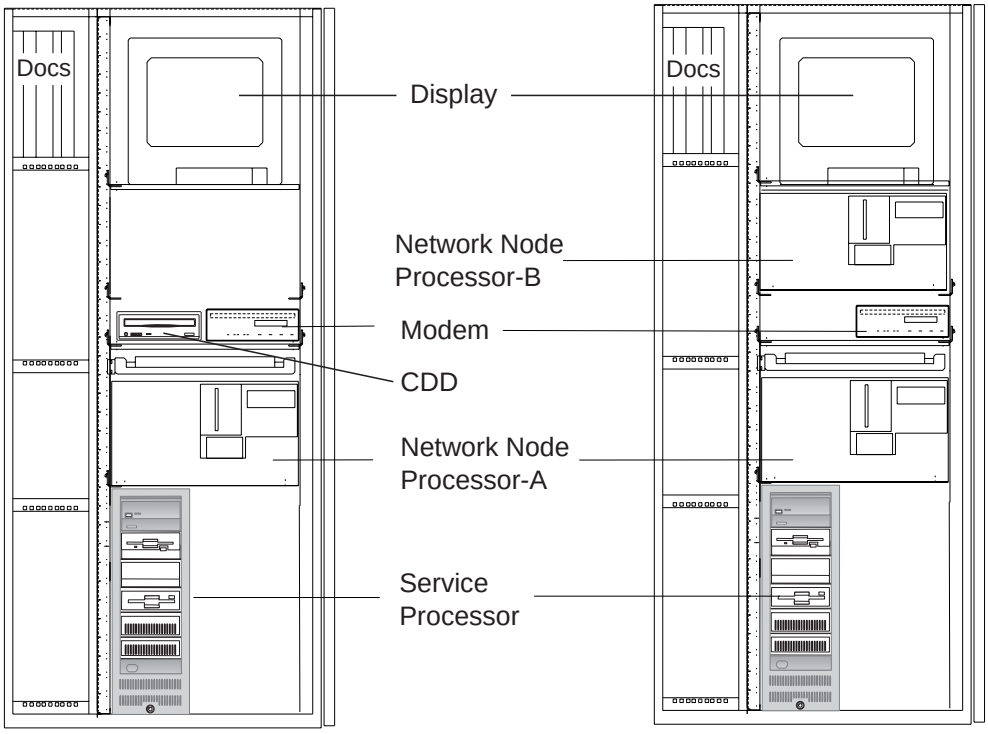

Figure D-13. Units Installation in the Controller Expansion (SP Type 9585)

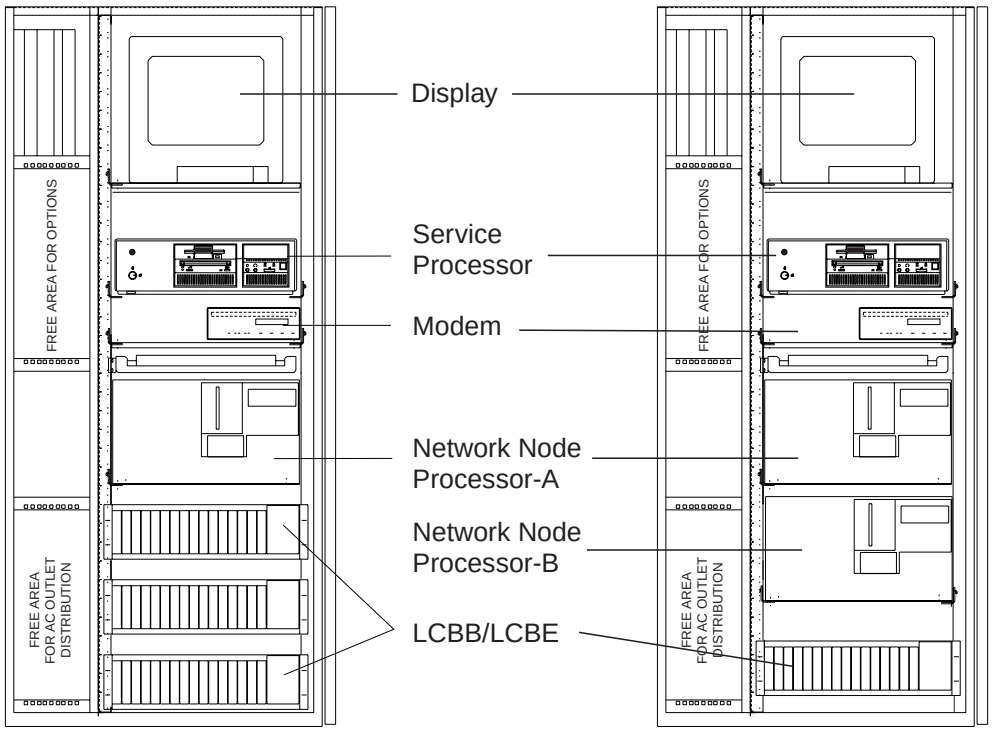

Figure D-14. Units Installation in the Controller Expansion (SP Type 9577)

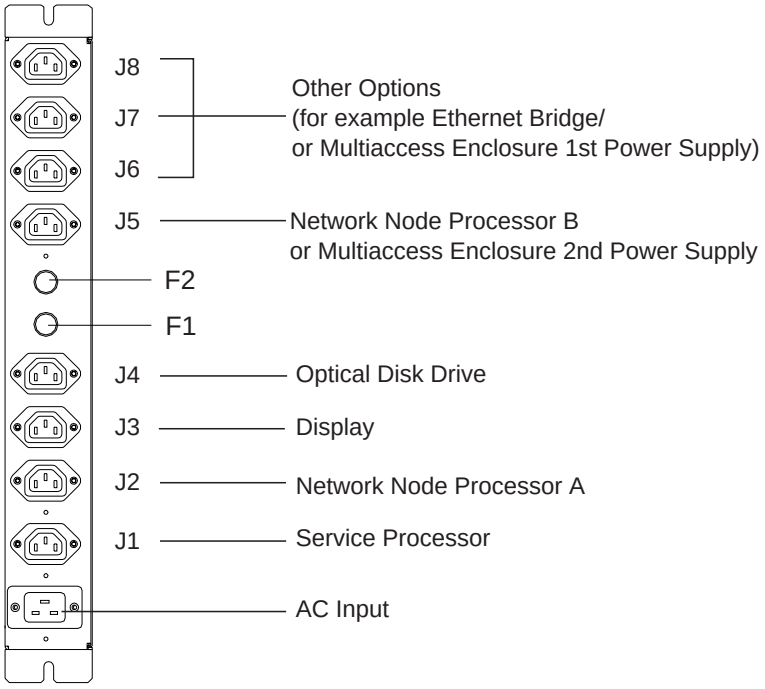

Figure D-15. Connecting the Units to the ac Outlet Distribution Box.

Appendix E. Managing Operational Code and Configuration Files

This chapter explains how to manage the operation code images and configuration files

Reconfiguring

You might find it hard to detect problems caused by configuration errors. A configuration error can initially appear to be a hardware problem because the multiaccess enclosure will not start or data will not flow through a port. In addition, problems with configuration may not result in an error initially; an error may occur only when specific conditions are encountered or when heavy network traffic occurs.

If you cannot resolve a problem after making a few changes to your configuration or after restoring the active configuration file, it is recommended that you generate a new configuration. Too many changes to a configuration often compound the problem, whereas you can usually generate and test a new configuration within a few hours.

How Software Files Are Managed

To help you manage operational software upgrades and configurations, the multiaccess enclosure has a software change management feature. This utility enables you to determine which operational software file and which configuration file is active while the multiaccess enclosure is running.

How to View the Files

To use the change management tool in the command line interface to view the operational software image and the configuration files, follow these steps:

1. From the OPCON prompt, which is an asterisk (*), type **talk 6** and press **Enter**. The `Config>` prompt appears.
2. Type **boot** and press **Enter**. You will see the prompt `Boot config>`.
3. Type **list** and press **Enter**. You will see a list similar to this one:

```
Boot config> list

BANK A                          BANK B
 IMAGE - ACTIVE                  IMAGE - AVAIL
  CONFIG 1 - ACTIVE               CONFIG 1 - AVAIL
  CONFIG 2 - AVAIL                CONFIG 2 - AVAIL
  CONFIG 3 - NONE                 CONFIG 3 - NONE
  CONFIG 4 - NONE                 CONFIG 4 - NONE
```

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Each bank represents one image of the operational code. The images stored in BANK A and BANK B are stored on the hard drive. The Configs represent the configuration files that are stored with each bank. *IMAGE* refers to the status of the operational software and *CONFIG* refers to the status of the configuration files.

The possible IMAGE and CONFIG status:

ACTIVE This file is currently loaded in active memory and is running on the multiaccess enclosure.

Note: The status of this file can be changed only by resetting the multiaccess enclosure. *If a config or an image is active, it is locked and cannot be overwritten or erased.*

AVAIL This is a good file that can be made active.

CORRUPT This file was damaged or was not loaded into the multiaccess enclosure completely.

PENDING This file will be loaded and become active the next time the multiaccess enclosure is reset.

LOCAL This file will become active at the next reset. This reset will cause the currently ACTIVE file to become PENDING. LOCAL is a status that makes a file ACTIVE only for one reset of the multiaccess enclosure.

Only one bank at a time contains an ACTIVE image. Only one configuration file is ACTIVE and it must be within the ACTIVE bank.

How to Reset the Multiaccess Enclosure

Attention: A reset interrupts the function of the multiaccess enclosure for up to 90 seconds. Be sure that the network is prepared for the interruption.

As previously stated, PENDING and LOCAL files are not loaded into active memory until you reset the multiaccess enclosure.

You can reset the multiaccess enclosure using any one of these methods:

- Press the hardware reset button.
- At the `Config only>` prompt, type **reload** and press **Enter**.

  Note: The `Config only>` prompt appears when no file is active. Lack of an active file indicates that an active configuration has become corrupted or that the multiaccess enclosure is not configured.
- At the OPCON prompt (*), type **reload** and press **Enter**.

File Transfer Using TFTP

Use this sequence of commands to transfer a file from a workstation or server to the multiaccess enclosure using TFTP. You will need to substitute your own values for the IP address and path, which are given as examples. The number of bytes received is also an example.

Note: You transfer the files to banks within the multiaccess enclosure. The banks represent the directories that you have created; you do not have to be concerned about transferring the files to a particular directory within the multiaccess enclosure.

TFTP File Transfer using the Operating Software

1. From the OPCON prompt, which is an asterisk (*), type **talk 6** and press **Enter**. The `Config>` prompt appears.

2. Type **boot** and press **Enter**. The `Boot config>` prompt is displayed.

3. To get the MAS software code load:

   - Enter **tftp get load modules** (for MAS software v1r2 or above)
   - Enter **tftp get load single image** (below MAS software v1r2).

   To get a configuration file, enter **tftp get config**

   You cannot overwrite a currently active bank image.

4. When prompted, specify the IP address of the TFTP server.

5. When prompted:

   - Specify the path/file name for a single image

     or
   - Specify just the path for load modules

   With Version 1 Release 2, when you specify that you want load modules to transfer, all of the appropriate load modules in the specified directory will be transferred.

   There could be up to 20 separate load modules. All the load modules must be in the same directory to enable the successful transfer of all the modules.

6. When prompted, enter **Y** to confirm the transfer or anything else to exit.

   The following example shows a V1R2 software code load:

```
* talk 6
Config> boot
Boot config> tftp get load modules
Specify the server IP address (dotted decimal): [1.2.3.4] 192.9.200.1
Specify the remote files directory: :(/u/bin/) /usr/601bin/204img/
Select the destination bank: (A,B): [A] a
TFTP SW load image
     get: /usr/601bin/204img/LML.ld
     from: 192.9.200.1
     to:   bank A.

Operation completed successfully.
```

TFTP File Transfer using the Firmware

1. From the main firmware menu (“Systems Management Services,” select (4. utilities)

2. From the “Systems Management Utilities” menu select (12. Change Management).

3. From the “Change Management Software Control” menu select (10. TFTP software).

4. Select the type of software from the “Select Type” dialog box.

5. Select which bank from “Select Bank” dialog box

6. If you selected 2. Load Image, you will be prompted to select the type of load image (that is, single image or modules).
   - If the code load you want to transfer consists of an LML.ld file plus other load modules ending in .ld, select **modules**.
   - If you want to transfer a single image (the type that existed in MAS Release 1), select **single image**.

7. When prompted, type in either the Directory Path to the modules, or for the path/filename for the single image. The modules should all be in one directory.

8. If you selected modules and the directory path you entered has all read permissions correct for 'anybody' to retrieve, you will see successive message boxes appear as each load module is transferred.

   If you select single image, only one message box will appear to inform you of the file transfer.

File Transfer Using Xmodem

If you use Xmodem, you will get similar prompts that enable you to specify the bank for the image files or the bank and the config number for the configuration files that you transfer. The interface for transferring is designed so that you cannot overwrite any ACTIVE file. (Xmodem is available only from the firmware.)

For transfers via modem, each load module must be separately named and transferred individually.

For XMODEM: When using Xmodem to transfer a multiple load module image (used in Release 2 in the form of several files ending in .ld), ***you must*** transfer each of the modules (.ld files) one by one to get the entire load module image.

When an entire load image has transferred, the status of the bank will change from CORRUPT to AVAIL. Transfer file LML.ld first. Unless you see an information message `ERROR WRITING FILE` appear, assume each individual transfer has been successful.

Migrating to a New Code level

To upgrade from any earlier release of operational code to a later level, do the following:

1. Follow the instructions in “Updating System Firmware” on page 5-15 to update the system firmware to the Release 2 level.

2. After starting the Firmware, select the following sequence of menus:
   - Utilities menu
   - Change Management

   Then, select the TFTP Software option.

3 Respond to the prompt to select which type of load to do (a configuration file or a load image).

4 Respond to the prompt to select which bank to load.

Note: Files to be retrieved from the server should all be in the same directory, and their permissions should be such that read is allowed for anybody.

5 After you selected 2. Load Image, you will be prompted to select the type of load image (that is, single image or modules).

- The code load that you want to transfer consists of an LML.ld file plus other load modules ending in .ld, select **modules**.

6 When the prompt `Enter Directory Path to Remote Load Modules` appears, enter the *pathname* to retrieve all load modules belonging to this load image.

Notes:

a. Information boxes appear as each load module is being transferred using TFTP. Some time will transpire as each transferred load module is written to the disk. An average load may take 10-12 minutes. When the entire load has been transferred, the previous menu is displayed.

b. The Release 2 operational code comes in the form of multiple load modules, headed by LML.ld.

- All load modules for a load must be in the same directory on the server for this transfer.

7 Select the Set Boot Information option on the Change Management menu and select:

- The Bank to boot from
- The Config to boot with
- Permanent or once

Once you have Release 2 operational code, you will be able to use the **tftp get load modules** option under `boot config>` to get any further Release 2 or Release 1 load images.

If you were not able to use TFTP and instead use Xmodem to try to upgrade, select the Xmodem Software option instead of TFTP Software option. In the case of XMODEM file transfers, Xmodem does not retrieve a set of load modules. They must be transferred one by one.

Using the Configuration Program to Manage the Configuration Files

For optimal configuration management, it is recommended that you use the Configuration Program and its configuration database to manage all your multiaccess enclosure configuration files.

The design of change management facilitates good control of the configuration files. Keeping the ACTIVE file and the file that is stored in the configuration database the same assures that a copy of the ACTIVE file is always available.

When you use the Send option to send a new configuration to the multiaccess enclosure, the new configuration is written to the ACTIVE bank and overwrites the file located in the position just below the currently ACTIVE configuration. The new configuration is PENDING if a time is set for a reset. If the configuration file is sent without a specified time for the reset to occur, it gets AVAIL status.

For example, suppose that CONFIG 2 is ACTIVE. The new configuration file is written to CONFIG 3. It has a status of PENDING if a reset time is associated with it; if not, it has a status of AVAIL.

If the file has a status of PENDING, CONFIG 2 becomes AVAIL and CONFIG 3 becomes ACTIVE when a reset occurs. The next file that is sent from the Configuration Program will be placed in CONFIG 4. If a reset time is associated with the file, it will have the PENDING status and will become ACTIVE when the next reset occurs. If another file is then sent, it is placed in CONFIG 1 because the currently ACTIVE file is now in CONFIG 4. This arrangement results in a circular queue.

If the downloaded file has a status of AVAIL, a reset does not change its status. If another file is sent down, it overwrites that file because the ACTIVE file has not changed and the newly downloaded file always occupies the location just behind the ACTIVE file.

Example of Sending a File from the Configuration Program

For example, suppose that this is the view of the software that is displayed by the List command:

```
BANK A                          BANK B
 IMAGE - ACTIVE                  IMAGE - AVAIL
  CONFIG 1 - ACTIVE               CONFIG 1 - AVAIL
  CONFIG 2 - AVAIL                CONFIG 2 - AVAIL
  CONFIG 3 - NONE                 CONFIG 3 - AVAIL
  CONFIG 4 - NONE                 CONFIG 4 - NONE
```

The Configuration Program sends a config file to BANK A, CONFIG 2. If the configuration is marked in the Configuration Program to be loaded immediately, the multiaccess enclosure performs a reset immediately after it received the new configuration. The Send command of the Configuration Program in this situation is composed of these two actions:

1. Send Config to CONFIG 2 as PENDING
2. Reset

After these two actions, the multiaccess enclosure configuration looks like this:

```
Boot Config> list

BANK A                          BANK B
 IMAGE - ACTIVE                  IMAGE - AVAIL
  CONFIG 1 - AVAIL                CONFIG 1 - AVAIL
  CONFIG 2 - ACTIVE               CONFIG 2 - AVAIL
  CONFIG 3 - NONE                 CONFIG 3 - AVAIL
  CONFIG 4 - NONE                 CONFIG 4 - NONE
```

CONFIG 1 has become AVAIL and CONFIG 2 has become ACTIVE.

If the Configuration Program were now used to send down a new configuration to the multiaccess enclosure and the file were not marked to be loaded at any specified time, the view of the software in the multiaccess enclosure would look like this:

```
Boot Config> list

BANK A                          BANK B
 IMAGE - ACTIVE                  IMAGE - AVAIL
  CONFIG 1 - AVAIL                CONFIG 1 - AVAIL
  CONFIG 2 - ACTIVE               CONFIG 2 - AVAIL
  CONFIG 3 - AVAIL                CONFIG 3 - AVAIL
  CONFIG 4 - NONE                 CONFIG 4 - NONE
```

After this action, CONFIG 3 is AVAIL. The new configuration file has been loaded in this location.

Note: You should exercise caution here because any on-board configuration changes could result in overwriting the CONFIG 3 file. Because the configuration file in CONFIG 3 was sent down without any time specified for resetting the server, it is currently not in use. It can be overwritten either when another file is sent from the Configuration Program or when a file is saved using the Write command from the command line interface. You can use the Copy command to move it to another location to protect it (see “Using the Copy Command” on page E-11).

Using the Set Commands

Note: You must be the supervisory user to use the Set commands.

The Set commands allow you to perform the following tasks:

- Set active load image
- Set active configuration
- Set boot list
- Set serial port settings
- Set power-on password
- Set supervisory password
- Set enable unattended mode
- Set disable unattended mode
- Set time and date

Set Active Load Image

To make an image file PENDING, type **set load image** or **set load** at the `Boot config>` prompt.

This command will display the current settings for load as the list command did. However, you can change the setting of an AVAIL file to PENDING. After a file is PENDING, it will be changed to ACTIVE when the multiaccess enclosure is next reset. After the reset, the current ACTIVE file becomes AVAIL.

```
Boot Config> set load

BANK A                          BANK B
 IMAGE - ACTIVE                  IMAGE - AVAIL
  CONFIG 1 - ACTIVE               CONFIG 1 - AVAIL
  CONFIG 2 - AVAIL                CONFIG 2 - AVAIL
  CONFIG 3 - NONE                 CONFIG 3 - NONE
  CONFIG 4 - NONE                 CONFIG 4 - NONE

You may type 'e' at any prompt to exit this command

Please specify the bank to load from (A or B).

BANK A                          BANK B
 IMAGE - ACTIVE                  IMAGE - AVAIL
  CONFIG 1 - ACTIVE               CONFIG 1 - AVAIL
  CONFIG 2 - AVAIL                CONFIG 2 - AVAIL
  CONFIG 3 - NONE                 CONFIG 3 - NONE
  CONFIG 4 - NONE                 CONFIG 4 - NONE

You will need to restart the multiaccess enclosure for these changes to take effect.
```

Set Active Configuration

This command will display the current settings for load as the List command did. However, you can change the current setting of a configuration file that is in an ACTIVE or PENDING bank from AVAIL to PENDING.

To use the Set active configuration command, type **set config image** or **set config** at the `Boot config>` prompt and follow the prompts.

Set Boot List

This command will set up the order of the boot devices when the multiaccess enclosure is loading. Typically you will set this up once and not change it unless the hardware features installed in the multiaccess enclosure are changed.

Note: This is the default order of the boot devices:

1. Hard disk
2. PCMCIA modem (Note)
3. Serial port (service port)

Note: PCMCIA modem not used in this configuration.

```
Boot Config> set boot list
DEVICE   DEVICE                  BOOT
 NUM   DESCRIPTION               ORDER
  1   HARD DISK                   1
  2   PCMCIA MODEM (SLIP)         0
  3   SERIAL PORT (SLIP)          0

Please specify the first boot device 1, 2 or 3>2

Please specify the second boot device 1, 2 or 3>1

Please specify the third boot device 1, 2 or 3>1

The current boot order has been changed to:

DEVICE   DEVICE                  BOOT
 NUM   DESCRIPTION               ORDER
  1   HARD DISK                   2
  2   PCMCIA MODEM (SLIP)         1
  3   SERIAL PORT (SLIP)          0

Please enter Y to commit changes, anything else to exit>y

Boot list changed
```

Set Serial Port

This command enables you to change the serial port parameters in regard to speed, parity, data bits, and stop bits.

```
Boot config> set serial
CURRENT SETTINGS:
 PORTS     SPEED     DATA     PARITY     STOP
SERIAL     19200      8        NONE       1


Available speeds are 19 200, 9600, 4800, 2400

Please enter the speed for serial port> 19 200

Please enter the number of data bits 7 or 8> 8

Please enter the parity, even, odd or none> none

Please enter the number of stop bits 1 or 2> 1

PROPOSED SETTINGS
 PORTS     SPEED     DATA     PARITY     STOP
SERIAL     19200      8        NONE       1

Please enter Y to commit changes, anything else to cancel> n

Your changes have been canceled
```

Other Change Management Functions

These are the other change management commands:

- Describe load images
- Describe config images
- Disable dumping
- Enable dumping
- Erase files

Describe Load Images

At `Boot config>`, type **describe 2216**. The Product ID, microcode version number, release number, maintenance number, PTF, Feature, and RPQ numbers and the date of the operational software image are displayed.

Describe Config Images

At `Boot config>`, type **describe config**. For each configuration file that is loaded, its bank, internal location (for example, CONFIG 1), version, and level is displayed.

Disable Dumping

The multiaccess enclosure can be set up to dump the contents of memory to permanent storage in the unlikely event of a complete system failure. If dumping is enabled, using this selection will cause the multiaccess enclosure ***not*** to dump to disk.

To disable dumping, type **talk 6** or **t 6** at the * prompt, press **Enter**, and then type **disable dump memory** or **dis dump** at the `Config>` prompt. You will see the message:

```
System memory dump function disabled successfully.
```

Enable Dumping

This command enables the dumping of memory without intervention from anyone in the event that the multiaccess enclosure has a catastrophic error. The multiaccess enclosure will dump memory onto the hard disk. Once a successful dump has been taken, the multiaccess enclosure attempts to restart. Depending upon the failure of the multiaccess enclosure, it cannot always restart. In this case, you should restart it manually and call a service person who will dial into the multiaccess enclosure to determine the nature and the causes of the failure.

Before you can enable dumping, you must first enable system rebooting. To enable system rebooting, enter the following commands at the `Config>` prompt.

```
enable reboot-system
enable dump-memory
```

Finally, to enable dumping, type **t 6** at the * prompt, press **Enter**, and then type **enable** or **ena** at the `Config>` prompt. You will see the message:

```
System memory function enabled successfully
```

The default state is to have dumping enabled.

Erase Files

The multiaccess enclosure has a DOS file system structure with user access files in the /sys0 and /sys1 banks. The contents of these banks are the operational software load images and the configuration files. Note that the following rules apply to erasing files from the multiaccess enclosure:

- Image files that are not ACTIVE can be overwritten anytime
- ACTIVE image files ***cannot*** be erased
- ACTIVE configuration files ***cannot*** be erased

To erase a file, at the `Boot config>` prompt, type **erase**. Follow the prompts. If you select a file to erase that is BROKEN or NONE, the erase option is discontinued.

Using the Copy Command

The Copy command allows you to move a file from one location in the storage area to another. This command allows you to change the status as well. The file that you move always receives the status of the storage area that it is moved to. For example, suppose that you have this scenario:

- The configuration file in BANK A CONFIG 1 is AVAIL. The configuration file in BANK B CONFIG 1 is PENDING.
- You copy the configuration in BANK A CONFIG 1 to BANK B CONFIG 1.

In this case, the original configuration file in BANK A CONFIG 1 remains unchanged and AVAIL. The configuration that was in BANK B CONFIG 1 is overwritten by a copy of the configuration file that is in BANK A CONFIG 1. This copy retains the status of the file that it overwrote, in this case, PENDING.

These are the prompts that you would use to perform this copy process.

```
Boot config> copy config

Copy FROM Bank number? A

Copy FROM Config number? 1

Copy TO Bank number? B

Copy TO Config number? 1
```

If you copy an image, the same rules apply except that image files can be copied only from Bank to Bank. These steps describe how the copy of an image affects the image that was previously in the Bank:

1. The copy overwrites the image that was previously in the Bank.
2. The copy acquires the status of the image that was previously in the Bank.

File Transfer

Table E-1 defines the ways in which you can transfer configuration files and operational software files to and from the multiaccess enclosure.

Table E-1. File Transfer

File Transfer Method	Type of Connection
TFTP Get command from the multiaccess enclosure to the workstation that has the binary configuration file, to download operational software images and configuration files to the multiaccess enclosure. Files sent using TFTP must be binary, or the multiaccess enclosure cannot use them. Use the Create command of the Configuration Program to save configuration files in binary format before downloading them to the multiaccess enclosure. After the multiaccess enclosure is operational in the network, you can use the TFTP Put command over IP to upload a file from the multiaccess enclosure to a workstation. The file will be uploaded in binary format. Both operational software and configuration files can be uploaded. Use the Read router configuration option of the Configuration Program to make an uploaded configuration file usable by the Configuration Program so that you can change some parameter values in it. **Note:** Using TFTP Put is a way to retrieve files from the multiaccess enclosure if the Retrieve option of the Configuration Program is not available.	1. SLIP connection (using the TFTP Get command to download files to the multiaccess enclosure). 2. IP connection of operational multiaccess enclosure over functioning network (using the TFTP Get and Put commands to download and upload files).
Xmodem in ProComm or an equivalent communications program from the workstation. This method uses ASCII terminal emulation and can download files to the multiaccess enclosure. The multiaccess enclosure does not have to be operational in the network to use this method. Configuration and operational files must be in binary format to be used by the multiaccess enclosure. **Note:** This is a second way to retrieve files from the multiaccess enclosure if the Retrieve option of the Configuration Program is not available.	Serial connection through a modem (PCMCIA or an external modem) or through a null modem.
The Communications Option of the **Configuration Program** (actually, the protocol for this is SNMP). This method cannot be used until the multiaccess enclosure is operational in the network. The files are not binary, but are in a format that is internal to the Configuration Program. This function can send configuration files to the multiaccess enclosure and retrieve them from the server. **Note:** The Retrieve Option is available only in the version of the Configuration Program that runs in the AIX environment.	IP connection of operational multiaccess enclosure over functioning network.

Appendix F. Common Tasks

This appendix provides a series of questions and answers dealing with common multiaccess enclosure installation, operation, and maintenance tasks, with suggestions as to where to find further help in performing them.

LED States / Adapter Status

Question How do I check the state of the adapters in my multiaccess enclosure?

Answer The LED state on the front of the adapters indicate the status of the adapter. (See “Adapter Card Status” on page 3-3.)

The Firmware Interface

Question What is the firmware interface? How do I access it?

Answer The firmware is the microcode lying underneath the operational code running on the multiaccess enclosure. It is used primarily by service personnel in problem determination. The firmware is accessed by booting the multiaccess enclosure and stopping the boot process with the **F1** key. It displays a menu with a number of options.

See “Accessing the Firmware from the Service Processor” on page 5-3 for more information.

Command Line Interface

Question How do I access the command line interface (the operating code) from within the firmware?

Answer From within the **firmware menu system** (System Management Services), press **F9**. The * prompt is displayed after the system boots.

The command line interface is described in the *Nways Multiprotocol Access Services Software User, SC30-3886*.

Displaying List of Configured Interfaces

Question How do I display a list of active interfaces?

Answer

1. Access the command line interface (the * prompt).
2. Type **talk 6** and press **Enter** twice to reach the `Config>` prompt.
3. Enter **list dev**.
4. Press **Ctrl-p** to return to the OPCON (*) prompt.

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Displaying the Operational State of the Interfaces

Question How do I display the state (up, down, disabled, etc.) of an interface?

Answer

1. Access the command line interface (the * prompt).
2. Type **talk 5** and press **Enter** twice to reach the + (monitoring) prompt.
3. Enter **configuration**.
4. Press **Ctrl-p** to return to the OPCON (*) prompt.

Verifying Connectivity

Question How do I verify that a given IP address is online?

Answer

1. Access the command line interface (the * prompt).
2. Type **talk 5** and press **Enter** twice to reach the + prompt.
3. Type **protocol** and press **Enter**.
4. Type **ip** and press **Enter**. The prompt changes to IP>.
5. Type **ping** *IP address value* and press **Enter**. Press **Enter** to stop the ping process.
6. Type **exit** at the IP> prompt and press **Enter**. The prompt changes to +.
7. Press **Ctrl-p** to return to the OPCON (*) prompt.

Viewing Vital Software Data

Question How do I view vital software data?

Answer

1. At the * prompt, type **talk 6** and press **Enter** twice. The Config> prompt appears.
2. Enter **boot**.
3. Enter **describe**. The vital software data is displayed.
4. Press **Ctrl-p** to return to the OPCON (*) prompt.

Viewing Vital Hardware Data

Question How do I view vital hardware data?

Answer

1. Access the firmware main menu: During boot-up, press **F1** at the `Prematurely terminate boot sequence` prompt.
2. Select **4. Utilities**.
3. Select **9. View or Set Vital Product Data**.
4. Select **Hardware Vital Product Data**. The vital hardware data is displayed.
5. Return to the firmware main menu.
6. Press **F9** to load the operating software.

Adding an Adapter at Initial Configuration

Question How do I add an adapter to the software configuration when the multiaccess enclosure is being initially configured?

Answer First, perform installation of the multiaccess enclosure and install any additional adapters into the multiaccess enclosure.

- When the multiaccess enclosure is initially installed, it does not have any software configuration.
- The operating system will put you at the `Config only>` prompt.

1. Enter **add device** *type of device*.

   Note: The steps only create the interface. You still have to use the **net** command to configure characteristics unique to that interface (for example, T/R, Ethernet, PPP, FR, SDLC, X.25). You also need to use the **protocol** command to configure protocols on the interface.

   For example, **add device token**
   or, **add device ?** to see a list of device choices
2. Enter the device slot number (1–8).
3. If you are adding an interface on a single-port adapter, go to step 4 on page F-4. Otherwise, continue with this step.

   Enter the port number (0–7, depending on the type of adapter).

   The range of port numbers supported depends on the multi-port adapter type:

   - For the Token-Ring (FC 2280) and Ethernet (FC 2281) adapters, port numbers 1 and 2 are supported.
   - For the 8-port EIA-232E/V.24 (FC 2282) and 8-port X.21 adapters, port numbers 0–7 are supported.
   - For the 6-port V.35/V.36 (FC 2290) adapter, port numbers 0–5 are supported.

4. Make a note of the interface number to which this port is assigned and the net number.

Repeat steps 1 to 4 if you have a multi-port adapter and you want to have more than one interface defined on that adapter.

Reboot the multiaccess enclosure to make the configuration changes active.

Adding an Adapter after Initial Configuration

Question How do I add an adapter after the multiaccess enclosure has been initially configured?

Answer First, perform hardware installation of the adapter. Then:

1. Access the command line interface (`*` prompt).
2. Type **talk 6** and press **Enter** twice to reach the `Config>` prompt.
3. Enter **add device** *type of device*.

   For example, **add device x21**
   or, **add device ?** to see a list of device choices

   The following two steps do not apply when a dial-circuit device is being added.
4. Enter the device slot number (1–8).
5. If you are adding an interface on a single-port adapter, go to step 6. Otherwise, continue with this step. Enter the port number (0–7, depending on the type of adapter).

   The range of port numbers supported depends on the multi-port adapter type:

   - For the Token-Ring (FC 2280) and Ethernet (FC 2281) adapters, port numbers 1 and 2 are supported.
   - For the 8-port EIA-232E/V.24 (FC 2282) and 8-port X.21 adapters, port numbers 0–7 are supported.
   - For the 6-port V.35/V.36 (FC 2290) adapter, port numbers 0–5 are supported.
6. Make a note of the interface number to which this port is assigned and the net number.
7. Enter **net** *net number* to enable you to configure interface-unique characteristics.
8. Enter **exit** after configuring the interface.
9. Use the **protocol** command to configure protocols on the interface.
10. Enter **write** to save your changes.
11. Press **Ctrl-p** to return to the OPCON (*) prompt.
12. Use the **activate** command within **talk 5** to bring the new interface online to the network without rebooting the box. There are restrictions to this capability. See the “Configuring Spare

Interfaces" heading in the *Nways Multiprotocol Access Services Software User, SC30-3886*.

Running Quick Configuration

Question How do I run the Quick Configuration program?

Answer First, make sure each adapter has been "added" (see "Adding an Adapter at Initial Configuration"). Then, at the `Config (only)` or `Config>` prompt, enter **qc**.

Disabling an Adapter Port

Question How do I disable a configured adapter port to remove the adapter from the software configuration?

Answer

1. Access the command line interface (`*` prompt) (see "Accessing the Operational Diagnostics from the Service Processor" on page 5-31).
2. Type **talk 6**, then press **Enter** twice to reach the `Config>` prompt.
3. Enter **list device**.
4. A list of adapters is displayed similar to the following:

```
Ifc  0 Token Ring              Slot: 1  Port: 1
Ifc  1 Token Ring              Slot: 1  Port: 2
Ifc  2 Ethernet                Slot: 2  Port: 1
Ifc  3 Token Ring              Slot: 5  Port: 2
Ifc  4 CHARM ATM               Slot: 8  Port: 1
```

   Note: On this window **ifc** identify the interface number of the adapter.

5. On a sheet of paper, write down the interface number of the adapter you wish to disable.
6. Enter **disable interface** *interface number*
7. The following message is displayed: `Interface disabled successfully`.
8. Enter **write** to save your changes.
9. A message similar to the following is displayed:

```
Config save: Using bank A and config number 2
```

10. Press **Ctrl/P** to return to the (*) prompt.
11. If you stop here this procedure the port will be disabled only the next time that you reboot the multiaccess enclosure, otherwise continue with Step 12.
12. Type **reload**.
13. The following message is displayed: `Are you sure you want to reload the Gateway (Yes or No)`.
14. Type **Yes** to reload the multiaccess enclosure.

Enabling an Adapter Port

Question How do I enable a configured adapter port that was disabled using **disabling an Adapter Port** (in “Disabling an Adapter Port” on page F-5)?

Use this procedure to enable the port the next time that you reboot the multiaccess enclosure.

Answer

1. Access the command line interface (* prompt) (see “Accessing the Operational Diagnostics from the Service Processor” on page 5-31).
2. Type **talk 6**, then press **Enter** twice to reach the `Config>` prompt.
3. Enter **list device**.
4. A list of adapters is displayed similar to the following:

```
Ifc  0 Token Ring              Slot: 1  Port: 1
Ifc  1 Token Ring              Slot: 1  Port: 2
Ifc  2 Ethernet                Slot: 2  Port: 1
Ifc  3 Token Ring              Slot: 5  Port: 2
Ifc  4 CHARM ATM               Slot: 8  Port: 1
```

   Note: On this window **ifc** identifies the interface number of the adapter.
5. On a sheet of paper, write down the interface number of the adapter you wish to enable.
6. Enter **enable interface** *interface number*
7. The following message is displayed: `Interface enabled successfully`.
8. Enter **write** to save your changes.
9. A message similar to the following is displayed:

```
Config save: Using bank A and config number 2
```

10. Press **Ctrl/P** to return to the (*) prompt.

Suspend Traffic on an Adapter Port

Question How do I disable a configured adapter port to remove or test an adapter?

Answer

1. Access the command line interface (* prompt).
2. Type **talk 5** and press **Enter** twice to reach the + prompt.
3. Enter the **configuration** command.
4. Make a note of the interface number of the adapter that you want to disable.
5. Enter **disable interface** *interface number*.

Resume Traffic on an Adapter Port

Question How do I enable a configured adapter port (that was disabled using the **talk 5 disable** command in “Suspend Traffic on an Adapter Port” on page F-6) to resume traffic?

Answer

1. Access the command line interface (* prompt).
2. Type **talk 5** and press **Enter** twice to reach the + prompt.
3. Enter the **configuration** command.
4. Make a note of the interface number of the adapter you wish to enable.
5. Enter **test** *interface number*.

   Note: If you use the **test** command to enable an interface that has been configured at the Config> prompt (from **talk 6**) as disabled, when you reboot the multiaccess enclosure the interface will be disabled again.

   Therefore, you should also use the Config> **enable interface** command to ensure that the interface is enabled the next time a reboot does occur.

For details of this procedure, refer to the *Nways Multiprotocol Access Services Software User, SC30-3886*.

Removing and Deleting an Adapter

Question How do I remove and delete an adapter from the configuration?

Answer

1. Access the command line interface (* prompt).
2. Type **talk 6** and press **Enter** twice to reach the Config> prompt.
3. Enter **list device**.
4. Write down the interface number of the adapter that you wish to delete.

   Note: If you are removing a multi-port adapter, then you need to record the interface number of all interfaces configured for that adapter.
5. Enter **delete interface** *interface number*.
6. At the Are you sure? prompt, enter **y**.
7. Enter **write** to save your changes.
8. Reboot the multiaccess enclosure to make the configuration changes active.

For details of this procedure, refer to the *Nways Multiprotocol Access Services Software User, SC30-3886*.

Up-to-Date multiaccess enclosure Information

Question How can I find out the most current information about the multiaccess enclosure?

Answer Point your web browser to **http://www.networking.ibm.com/216/216prod.html**

Disabling Interfaces that Have WAN Reroute Enabled

Question How do I ensure that WAN Reroute does not try to automatically enable an alternate interface that is on an adapter about to be removed?

Answer

1. Access the command line interface (the * prompt).
2. Type **talk 5** and press **Enter** twice to reach the + (monitoring) prompt.
3. Type **disable slot** *slot#* or **disable** *interface#* for each interface on the adapter. For example:

```
+ disable slot 4
Interface 4 is enabled as a WAN Reroute alternate circuit and should be
disabled as an alternate circuit if you will be removing the adapter

Do you want to disable WAN Reroute on this interface? (Yes, No): [No] Yes

Interface 4 has been disabled as a WAN Reroute alternate circuit

  (adapter is removed and replaced)
```

Enabling WAN Reroute after You Have Disabled it

Question How do I enable WAN Reroute to automatically enable an alternate interface that is on an adapter that has be replaced?

Answer

1. Access the command line interface (the * prompt).
2. Type **talk 5** and press **Enter** twice to reach the + (monitoring) prompt.
3. Type **enable slot** *slot#* to start a self-test for each interface on the adapter ***or*** type **test** *interface#* for each interface that you want to bring up.

   If you start a self-test for an alternate interface and the self-test is successful, the alternate interface will remain up even though it may not be needed to back-up a primary interface. If this happens, you can issue the talk 5 **disable** *interface#* command to put the alternate interface back into the standby (disabled) state.

   The following is a sample:

```
+ enable slot 4

Interface 4 is configured as a WAN Reroute alternate circuit.
Do you want to enable WAN Reroute on this interface? (Yes, No):[No] Yes

Interface 4 is enabled as a WAN Reroute alternate circuit.
Are you sure that you want to test this interface? (Yes, No): [No] Yes
Testing net 4 ATM/0...successful
+
```

Remote File Download

Question How do I download a configuration file to the multiaccess enclosure using the Firmware Menu System?

Answer Use the Systems Management Services.

1. Using a local console, select **4. Disable Unattended Mode** from the Systems Management Utilities menu in the firmware to put the multiaccess enclosure in ATTENDED mode. (Be sure to remember the password)

2. To put the multiaccess enclosure into the correct monitor mode for the remote console that is going to be used, reboot the multiaccess enclosure and press **Y** at the `DO YOU WANT TO CHANGE THE MONITOR TYPE?` prompt. Select the number next to the option for the Monitor type.

3. Remove the local console connection and reboot the multiaccess enclosure again. Do a hardware reset to put the multiaccess enclosure in ATTENDED mode. (Do not use the **reload** command.)

4. Wait at least 90 seconds for the multiaccess enclosure to reach the POWER-ON PASSWORD after rebooting before attempting to remotely connect to the multiaccess enclosure.

5. Dial in to the multiaccess enclosure's PCMCIA modem with a TTY console. The console settings must be:

```
    Speed = 19200 bps
Data bits = 8
   Parity = No
Stop bits = 1
```

6. Once the connection is established, type in the password and press **Enter**. The password will not be displayed, but you should get an * on your screen for every character that you enter.

7. Press **F1** to terminate the boot sequence and enter the firmware Systems Management Services menu.

8. Select **4. Utilities** from the Systems Management Services menu.

9. Select **12. Change Management** from the Systems Management Utilities menu.

10 For MODEM: Configuration file must be on remote console, but no IP addresses are needed.

a. Select **12. Xmodem software** from the Change Management Software Control menu.

b. Select **1. Config** from the Select Type dialog box.

c. Select the Bank to send the configuration file to from the Select Bank dialog box.

d. Select the config # to send the configuration file to from the Select Config dialog box.

e. When the BEGIN FILE TRANSFER dialog box closes, use your Xmodem software to transfer the files. For example, with PROCOMM:

```
-Press the PAGE UP key when the dialog box disappears.
-Press X for xmodem mode.
-Type in the path and file name of the configuration
     you are going to transfer to the multiaccess enclosure.
-Press ENTER.
```

11 For TFTP: You must have a PCMCIA networking card in the PCMCIA slot before booting the multiaccess enclosure and be connected to a network that has the configuration file you are going to transfer to the multiaccess enclosure.

Note: IP addresses need to be set up on the PCMCIA slot using the System Management Utilities menu and select **11. Remote Initial Program Load Setup** before a TFTP can be done.

a. Select **10. TFTP software** from the Change Management Software Control menu.

b. Select **1. Config** from the Select Type dialog box.

c. Select the Bank to send the configuration file to from the Select Bank dialog box.

d. Select the config # to send the configuration file to from the Select Config dialog box.

e. Type in the path and name of the Configuration file to be downloaded onto the multiaccess enclosure and press **Enter**.

Spare Interfaces

Question Can I move traffic from a defective adapter to another adapter without restarting the multiaccess enclosure?

Answer Yes. Use the spare interface function of the multiaccess enclosure. See "Configuring Spare Interfaces" in the *Nways Multiprotocol Access Services Software User, SC30-3886*.

Appendix G. Hardware Error Codes

The error log that is displayed when you use the Displaying the Error Log firmware utility (see “Displaying the Error Log” on page 5-18) contains error codes. This appendix contains explanations for those error codes.

Error Code	Physical Location	Software Subsystem	Explanation
00010000	Processor	Processor	Processor Test Failure
00011000	PPC Board	NVRAM	128KB Non-volatile RAM Test Failure
00015001	PPC Board	Flash	An error occurred while erasing the system firmware.
00015002	PPC Board	Flash	An error occurred while updating the system firmware.
00015500	PPC Board	Interrupts	PPC board interrupt test failure.
00015501	PPC Board	Interrupts	Interrupt test of the processor’s timing register failed.
00015502	PPC Board	Interrupts	Interrupt test of the PPC board clock failed.
00015503	PPC Board	Interrupts	Interrupt test of the PPC board programmable timer failed.
00016002	PPC Board	RTC-NVRAM	Read/Write test failure for PPC board clock.
00017001	PPC Board	Security	CMOS Battery drained. Replace RTC/8KB NVRAM.
00017002	PPC Board	Security	CMOS Error—data is gone. Replace RTC/8KB NVRAM.
00017003	PPC Board	Security	Power Interruption during last boot sequence update.
00017007	PPC Board	Security	Maximum unsuccessful attempts to enter password was reached. Time and date are logged.
00020000	Memory	Memory	Memory test error; run further tests.
000210y0	SIMM slot y	Memory	Memory error with SIMM slot y (where y=1 or 2); 1=U13 2=U14.
01291000	L2 Cache	L2 Cache	For later release
1msceddd	PPC Board	Octal Uart	Octal Uart error.
2msceddd	PPC Board	I^2C	I^2C controller, bus, or device error
3msceddd	PPC Board	GCOM	GCOM controller error
30002000	System Card	—	Hard disk error. Format hard disk.
5msceddd	PPC Board	PCMCIA	PCMCIA controller error
50000000	PPC Board	PCMCIA	PCMCIA controller error
80001300	—	Flash	Firmware update file is at the same level as current firmware. Update canceled.
80001400	—	Flash	Firmware update file does not support this system. Update canceled.
80001500	—	Flash	The firmware update file is corrupted. Update canceled.
80001600	—	Flash	The firmware update file is corrupted. Update canceled.
80001700	—	Flash	See 80001500.
80001700	—	Flash	See 80001500.
80001800	—	Flash	A valid firmware update file cannot be located. Update canceled.
80001900	—	Flash	See 80001500.
80002100	—	Flash	The firmware update file cannot be loaded. Update canceled.
80002400	—	Flash	See 80001400
80002500	—	Flash	See 80001400
90001600	—	Copy Utility	Not enough VDISK space. Unable to copy files.

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Appendix H. Parts Listing

This parts listing contains reference drawings and a corresponding index for all field-replaceable parts. The index provides the part number, the quantity required (units), and a description of the part.

Listed below is additional information about the parts assembly index.

SIMILAR ASSEMBLIES: If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts specific to one or the other of the assemblies are listed separately and identified by description.

AR: (As Required) in the Units column indicates that the quantity is not the same for all machines.

NP: (Non-Procurable) in the Units column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.

NR: (Not Recommended) in the Units column indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.

R: (Restricted) in the Units column indicates that the part has a restricted availability.

INDENTURE: The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

Indenture	**Relationship of Parts**
(No dot)	MAIN ASSEMBLY
(One dot)	• Detail parts of a main assembly
(One dot)	• Subassembly of the main assembly
(Two dot)	• • Detail part of a one-dot subassembly
(Two dot)	• • Subassembly of a one-dot subassembly
(Three dots)	• • • Detail part of a two-dot subassembly

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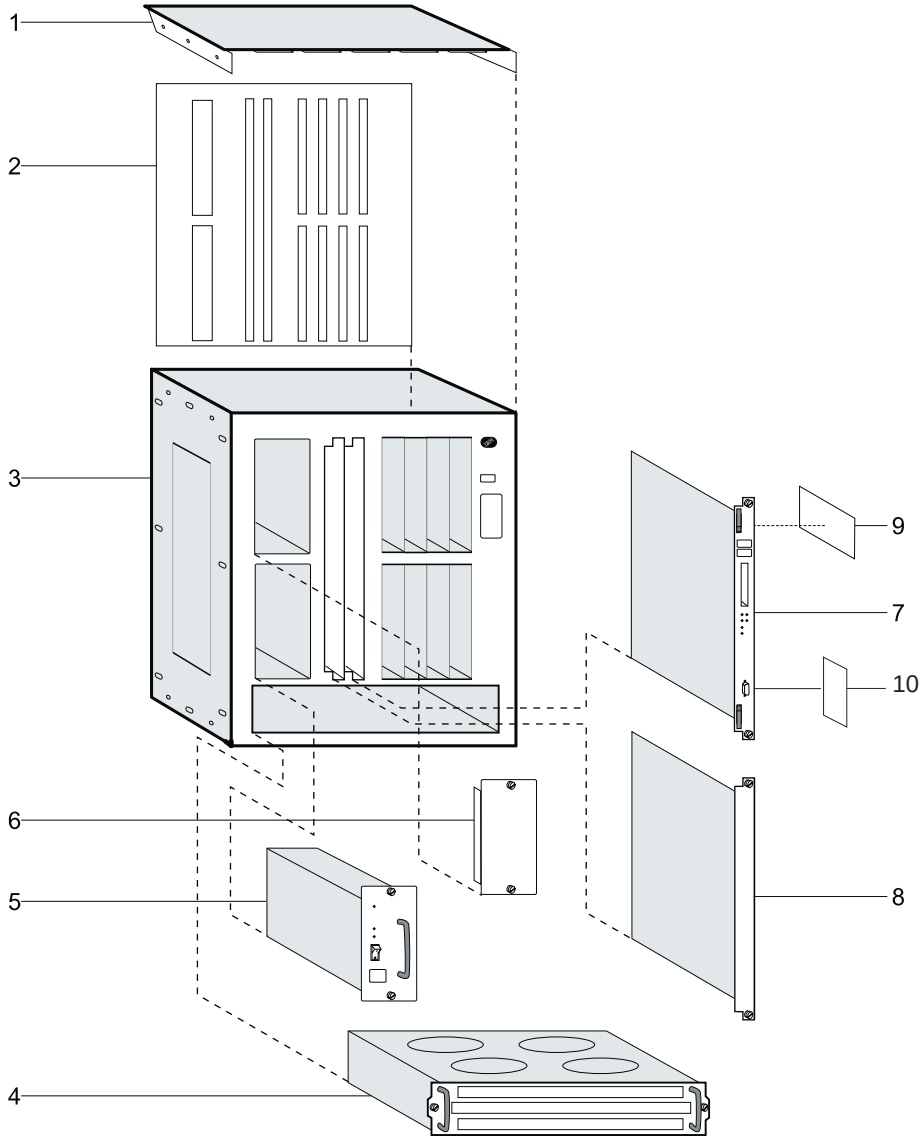
Assembly 1: Final Assembly, Multiaccess Enclosure



Asm–Index	Part Number	Units	Description
1–		NP	Final Assembly
–1	13H4931	1	• Cover, Top
–2	85H7860	1	• Backplane multiaccess enclosure
–3	72H5099	1	• Enclosure
–4	85H6840	1	• Fan Tray Assembly
–5	72H5081	1	• Power Supply -- FC 3871
–6	41H7701	1	• Power Supply Filler Plate
–7	85H7916	1	• System Card (release 1)-- FC 3851
–	85H9682	1	• System Card (release 2)-- FC 3855
–8	72H5101	1	• Filler Plate
–9	39H2221	1	• Hard Drive (IDE 1.08G Hardfile)
–	85H7917	1	• Hard Drive (IDE 1.6GB 2.5" Hardfile)
–10	95H9688	1	• 64-MB DIMM Memory
–	85H5543	1	• LIC 280 (Not Illustrated) 2 Port Token Ring -- FC 3280
–	85H5542	1	• LIC 281 (Not Illustrated) 2 Port Ethernet -- FC 3281
–	85H4872	1	• LIC 282 (Not Illustrated) 8 Port RS-232 -- FC 3282
–	85H4882	1	• LIC 283 (Not Illustrated) 1 Port ISDN Pri (T1) -- FC 3283
–	85H4894	1	• LIC 284 (Not Illustrated) 1 Port 155Mbps (MMF ATM) -- FC 3284
–	86H0967	1	• LIC 286 (Not Illustrated) 1 Port FDDI
–	85H4878	1	• LIC 287 (Not Illustrated) 1 Port ESCON Channel -- FC 3287
–	86H1005	1	• LIC 288 (Not Illustrated) 1 Port 100Mbps Ethernet -- FC 3288
–	85H9703	1	• LIC 289 (Not Illustrated) 1 Port HSSI -- FC 3289
–	85H4874	1	• LIC 290 (Not Illustrated) 6 Port V.35/V.36) -- FC 3290
–	85H4876	1	• LIC 291 (Not Illustrated) 8 Port X.21 -- FC 3291
–	85H4884	1	• LIC 292 (Not Illustrated) 1 Port ISDN Pri (E1) -- FC 3292
–	85H6834	1	• LIC 293 (Not Illustrated) 1 Port 155Mbps (SMF ATM) -- FC 3293
–	86H0986	1	• LIC 294 (Not Illustrated) 1 Port 155Mbps (MMF ATM) -- FC 3294
–	86H0993	1	• LIC 295 (Not Illustrated) 1 Port 155Mbps (SMF ATM) -- FC 3295
–25	85H7923	1	• Wrap Plug Service Kit multiaccess enclosure (Not Illustrated) -- FC 3505

Appendix I. Multiaccess Enclosure Cables for Connection to 3746 Models 900 / 950 and Service Processor

Cables Between the Multiaccess Enclosure, 3746 Models 900/950 and Service Processor (based on 7585)

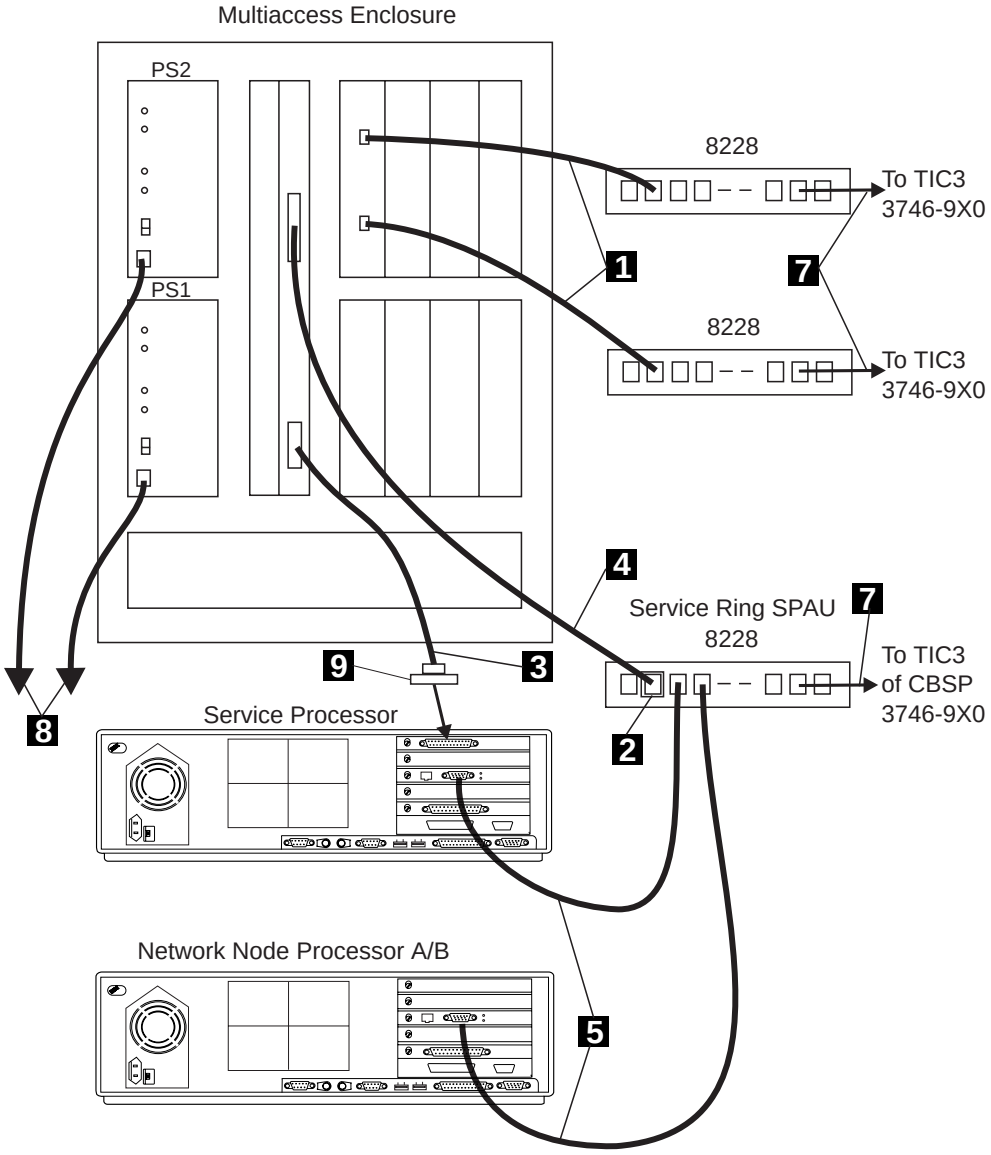


Figure I-1. Cables for Connection Between the Multiaccess Enclosure, 3746 Models 900/950, and to Service Processor (based on 7585)

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Cables Between the Multiaccess Enclosure, 3746 Models 900/950 and Service Processor (based on 3172)

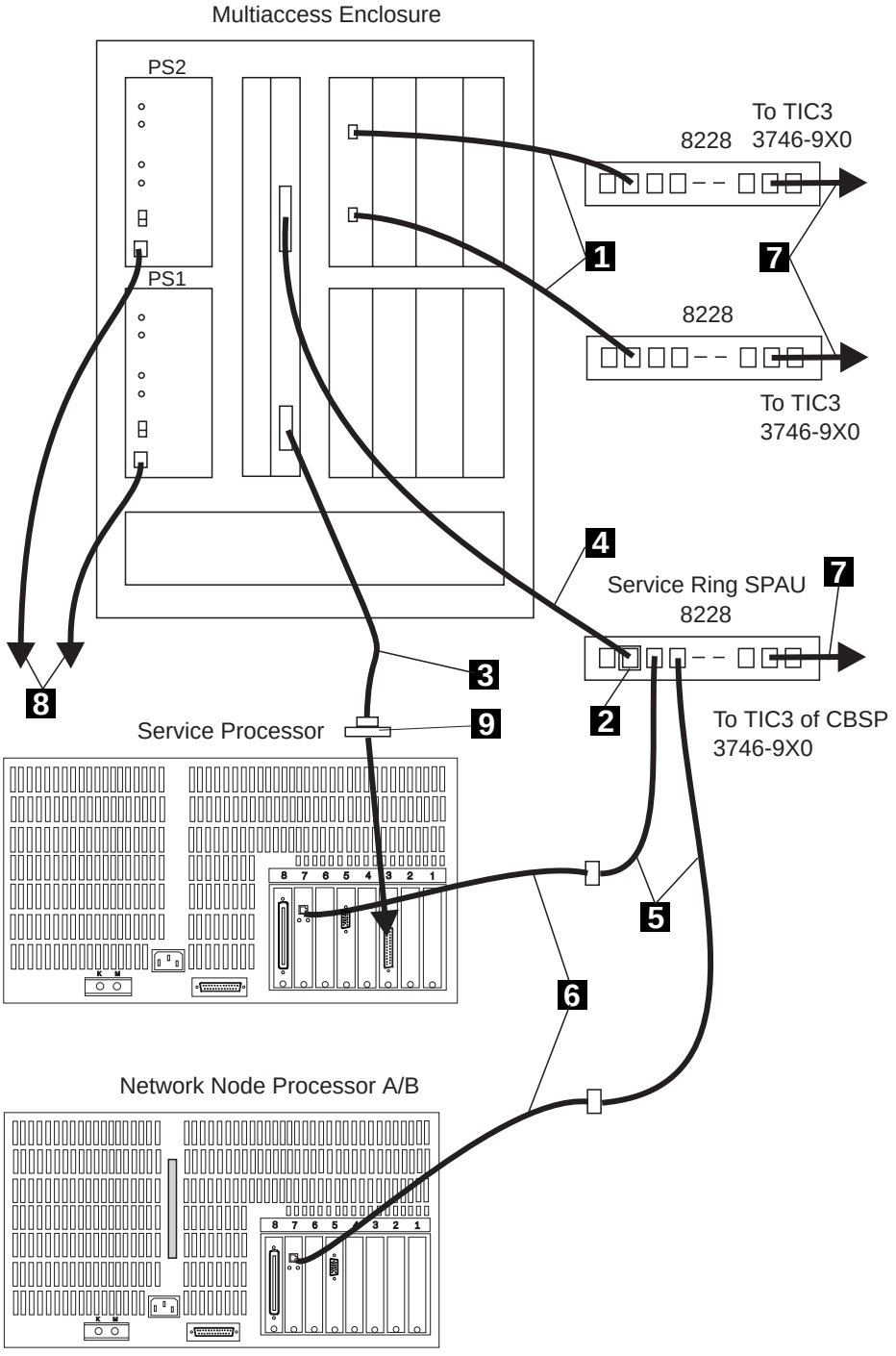


Figure I-2. Cables for Connection Between the Multiaccess Enclosure, 3746 Models 900/950, and to Service Processor (based on 3172)

Cables Between the Multiaccess Enclosure, 3746 Models 900/950 and Service Processor (based on 9585)

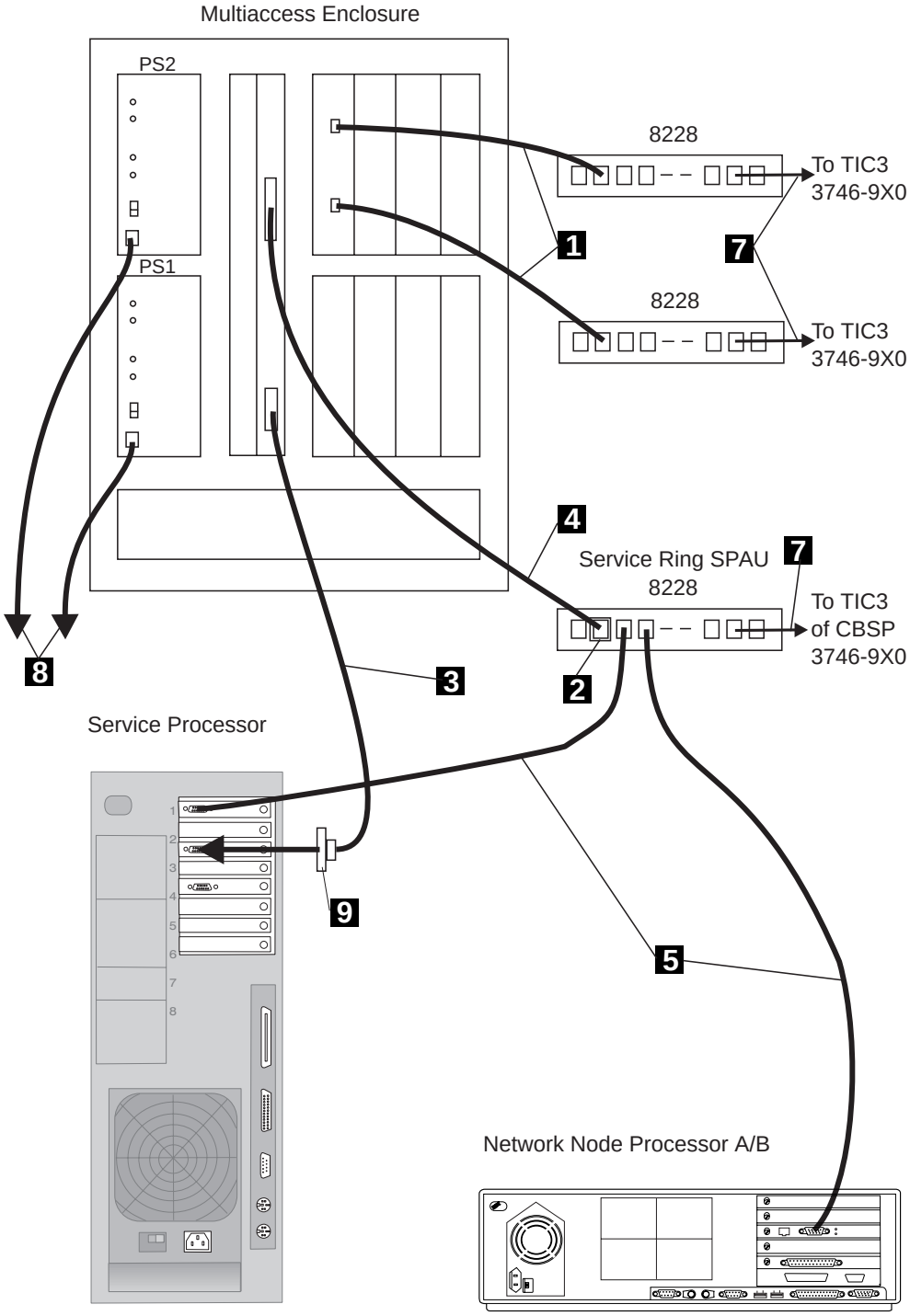


Figure I-3. Cables for Connection Between the Multiaccess Enclosure, 3746 Models 900/950, and to Service Processor (based on 9585)

Note: With a service processor based on 9585 the network node processor may be based on 7585 (as in the preceding figure) or based on 3172.

Cable From the Multiaccess Enclosure Lan Adapter to the 8228

Refer to Figure I-1 on page I-1 or Figure I-2 on page I-2 reference **1**.

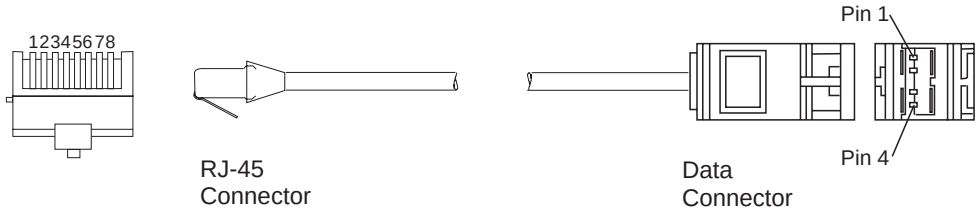


Figure I-4. Cable (Part Number 43G3953)

Pin Assignment

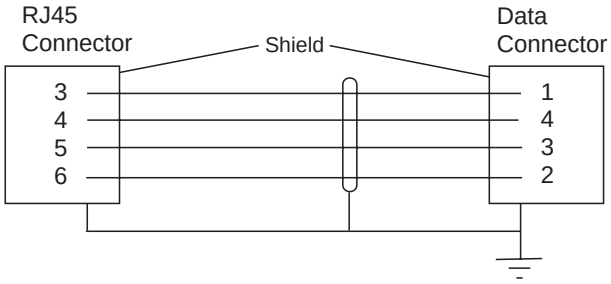


Figure I-5. Cable Pin Assignment (Part Number 43G3953)

Table I-1. Cable from the Multiaccess Enclosure Lan Adapter to a 8228

Cable Type	Length, m (ft)	Cable Part Number
Standard Fixed	9 m (27)	43G3953

Cable from the Multiaccess Enclosure System Card PCMCIA Token-Ring Adapter to Service Processor

Refer to Figure I-1 on page I-1, Figure I-2 on page I-2, or Figure I-3 on page I-3 reference **4** and **2**. The cable **4** needs a Balun assembly **2** for connecting to the 8228 (Service Ring).

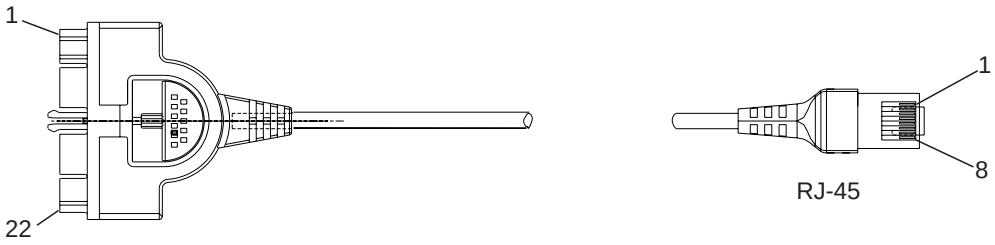


Figure I-6. Cable between the Multiaccess Enclosure PCMCIA Card and the Service Processor

Interchange Circuits for the Cable between the Multiaccess Enclosure and the Service Processor

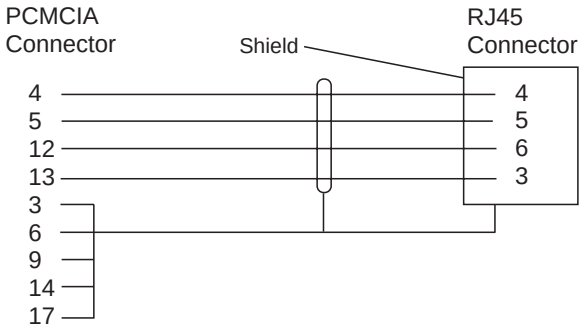
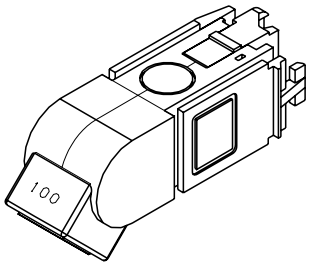


Figure I-7. Cable Pin Assignment (Part Number 782960)

Table I-2. Cable between the Multiaccess Enclosure and the Service Processor

Cable Type	Length	Part Number
Standard Fixed	9 m (27 ft.)	782960

Balun



Top ISO
RJ-45 END
Number 73G8314)

Figure I-8. Balun for Connecting Cable with RJ45 Connector to 8228 (Part

Balun Pin Assignment

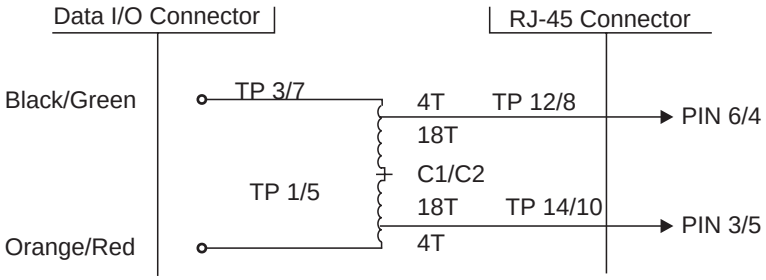


Figure I-9. Balun Pin Assignment

Cable from the Multiaccess Enclosure EIA-232 Connector to the Service Processor

Refer to Figure I-1 on page I-1, Figure I-2 on page I-2, or Figure I-3 on page I-3 reference **3** . An adapter cable **9** is necessary for connection to the service processor (see “Adapter Cable” on page I-8).

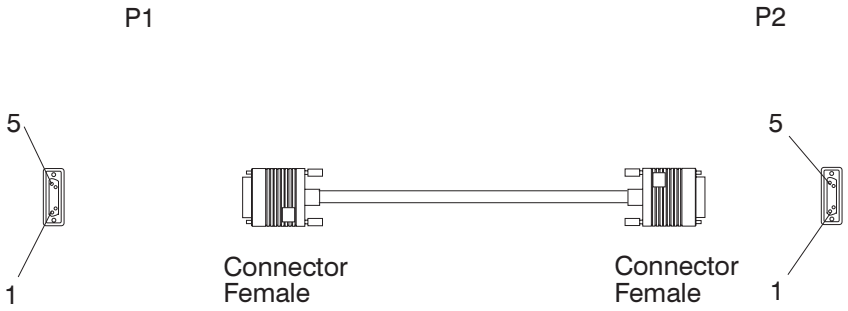


Figure I-10. Cable Pin (Part Number 782958)

Interchange Circuits for the Cable between the Multiaccess Enclosure and the Service Processor

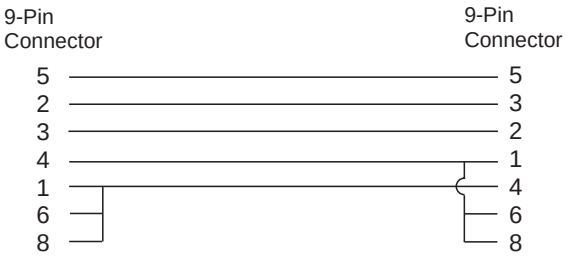


Figure I-11. Cable Pin Assignment (Part Number 782958)

Table I-3. Cable from the Multiaccess Enclosure EIA-232 Connector to the Service Processor

Cable Type	Length, m (ft)	Cable Part Number
Standard Fixed	9 m (27)	782958

Adapter Cable

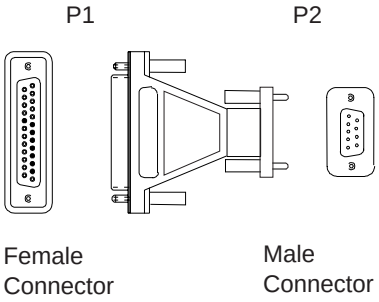


Figure I-12. Adapter cable (Part Number 782982)

Cable From the Service Processor or Network Node Processor to the 8228

Refer to Figure I-1 on page I-1, Figure I-2 on page I-2, or Figure I-3 on page I-3 reference **5** and Figure I-15 on page I-11 for details.

Note: Some LAN adapter cards (with a RJ45 connector) need an additional adapter cable **6** (part number 60G1066) to connect the standard LAN cable.

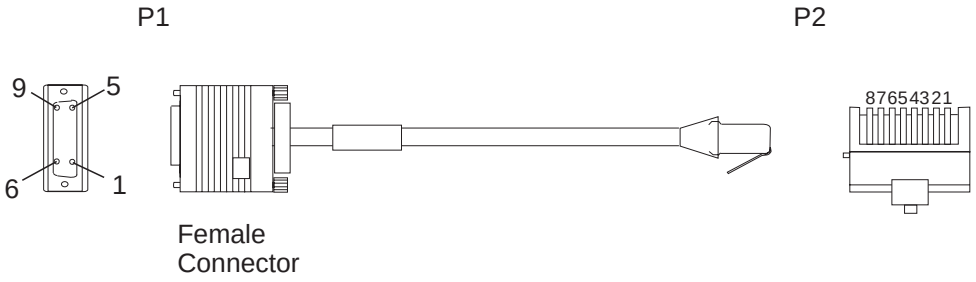


Figure I-13. Adapter Cable (Part Number 60G1066)

Pin Assignment

Table I-4. Adapter Cable Pin Assignment

9 Pin D Connector (P1)	RJ45 Connector (P2)	Wire color
9	6	ORN
5	3	BLK
1	4	RED
6	5	GRN

Table I-5. Standard Cable from a Service Processor to a 8228

Cable Type	Length, m (ft)	Cable Part Number
Standard Fixed	9 m (27)	782959

Multiaccess Enclosure Unit Power Cables

Special power cables are provided to connect power units of the Multiaccess Enclosure to the ac outlet distribution box of the Controller Expansion. Refer to Figure I-1 on page I-1 or Figure I-2 on page I-2 reference **8** for details.

IEC-320-C-14 IEC-320-C-13/15

Figure I-14. Power Cable for Units Connected to the ac Outlet Distribution Box

Table I-6. Power Cable for Units Installed in the Controller Expansion Connected to the ac Outlet Distribution Box

Cable Type	Length	Cable PN
Standard Fixed	2.5 m (8 ft.)	58G5783

Local Area Network Cable

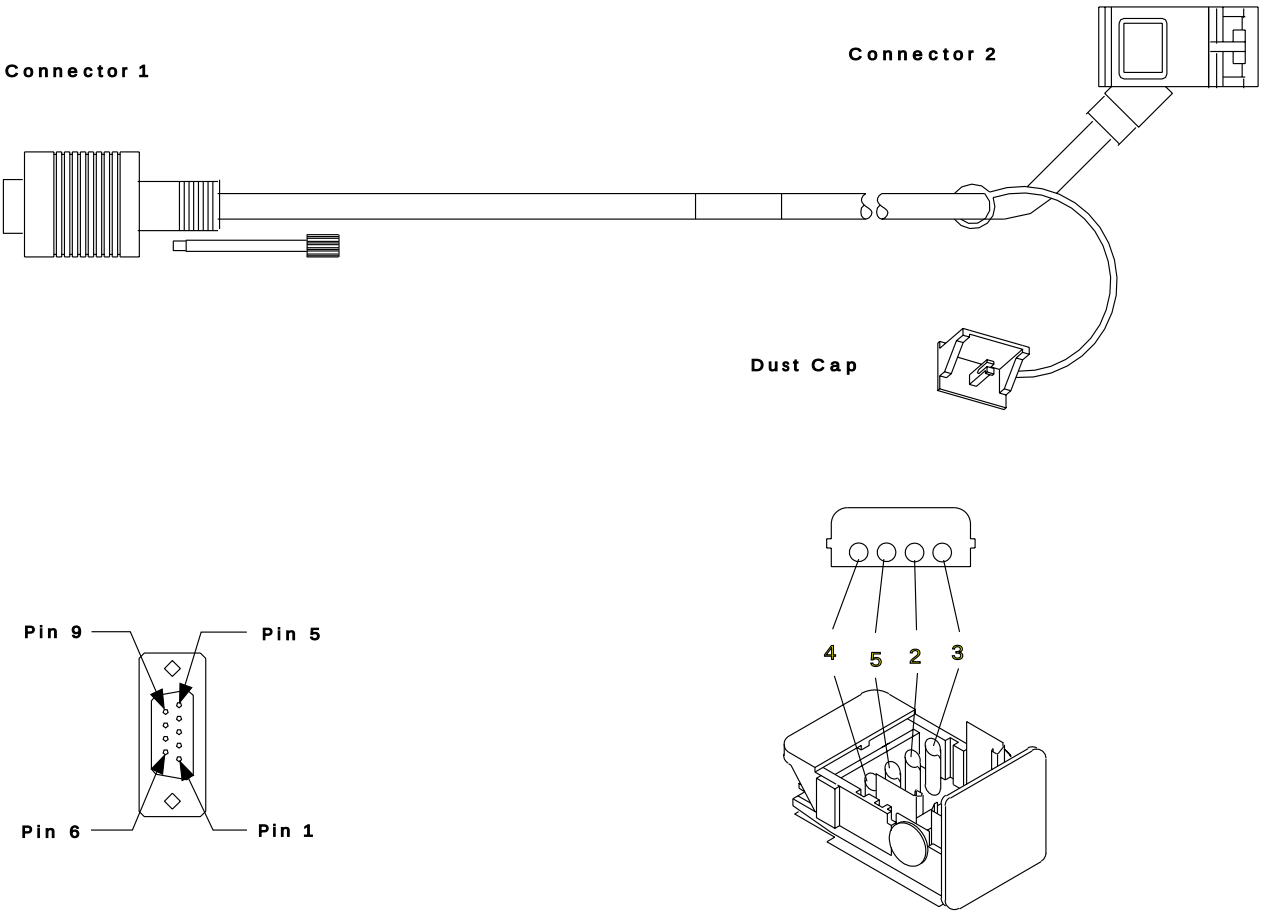


Figure I-15. LAN Cable

Table I-7. LAN Cable Pin Assignment			
Wire Nbr	**Wire Color**	**Connector 1 Position**	**Connector 2 Position**
1	SHIELD	GND	SHIELD
2	ORN	9	ORN
3	BLACK	5	BLACK
4	RED	1	RED
5	GREEN	6	GREEN

Table I-8. Cable Length Ordering Information for EMEA		
Part Number	**Feature Code**	**Length (Meters/Feet)**
72F1236	5601	9/30 Fixed length
72F1236	5601	9/30 (max) Custom length
72F1236	5601	44/144 (max) Custom length

Table I-9. Cable Length Ordering Information for U.S

Part Number	Feature Code	Length (Meters/Feet)
72F1236	5601	22/70 Fixed length
72F1242	5601	22/70 Plenum Fixed length
72F1236	5601	22/70 (max) Custom length
72F1242	5601	22/70 (max) Plenum Custom length
72F1236	5601	44/144 (max) Custom length
72F1242	5601	44/144 (max) Plenum Custom length

Multiaccess Enclosure LIC Cables

V.24 / EIA-232 Fanout Cable

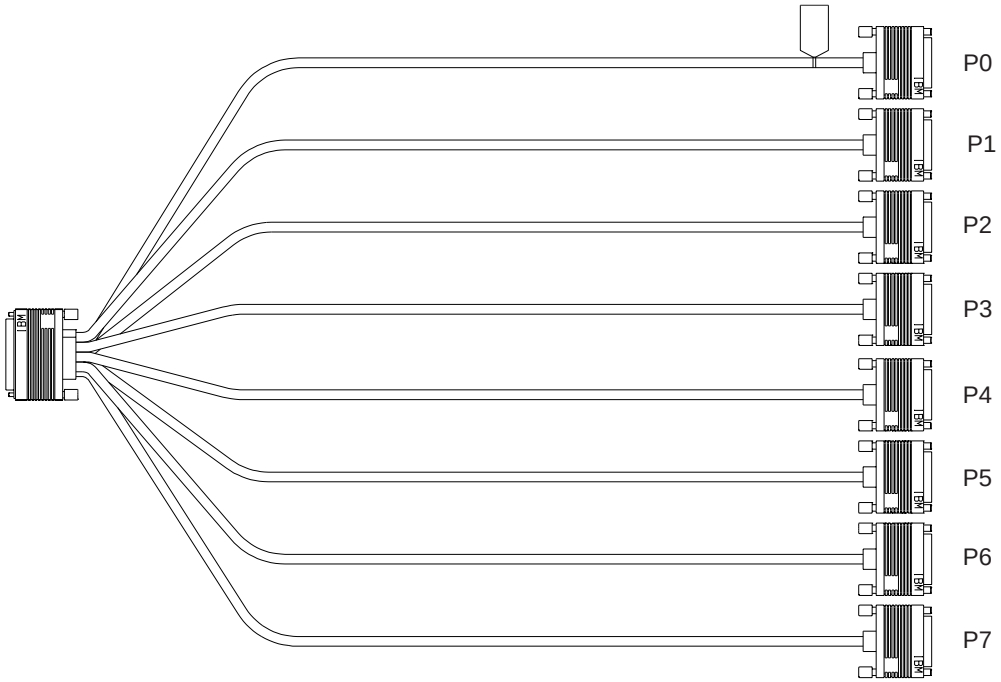


Figure I-16. V.24 / EIA-232 Fanout Cable

Interchange Circuits

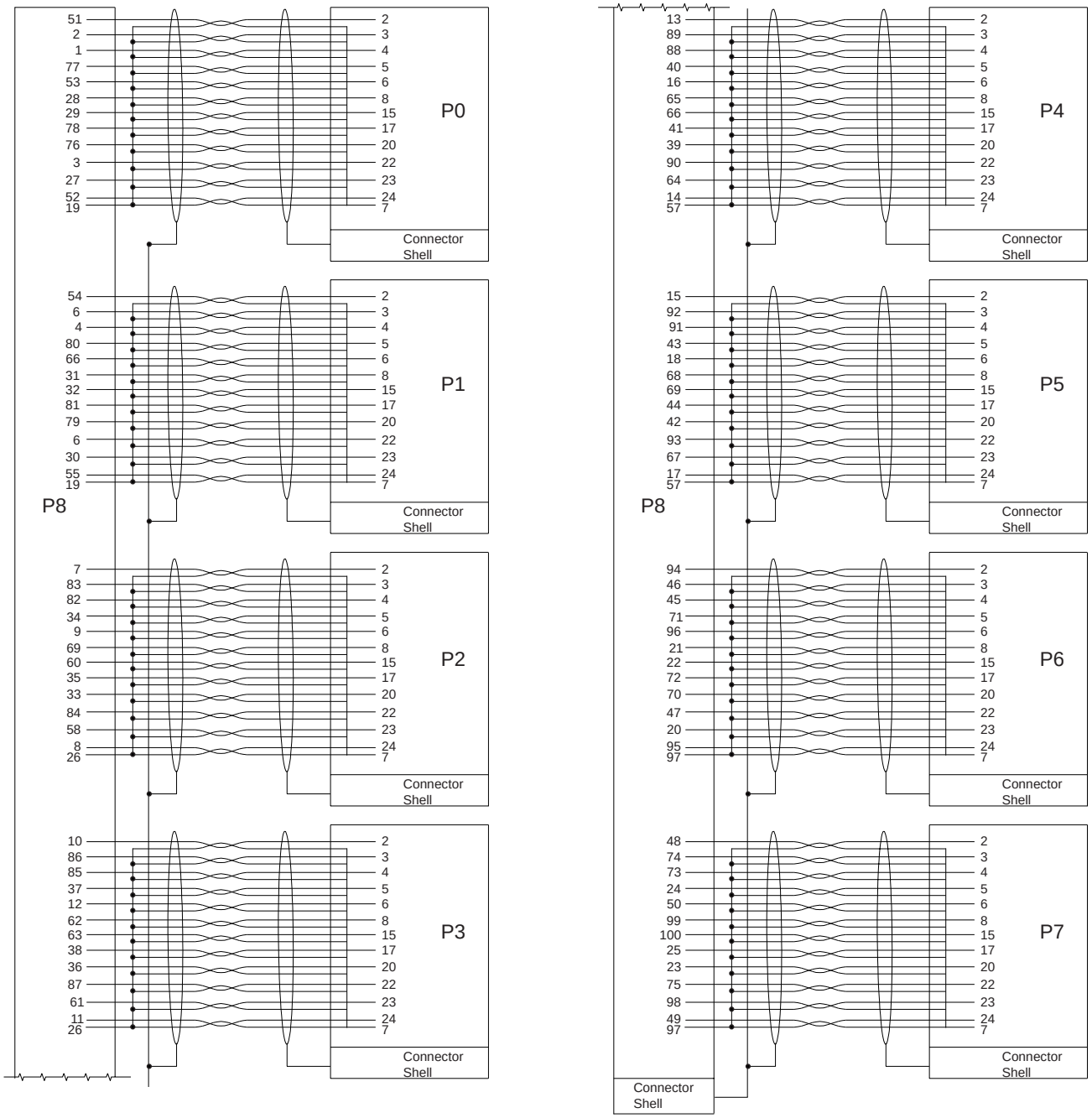


Figure I-17. V.24 / EIA-232 Fanout Cable Pin Assignment

Cable List

Table I-10. V.24/EIA-232 Fanout Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	1.8 (6)	3701	71G3496

V.35 Fanout Cable

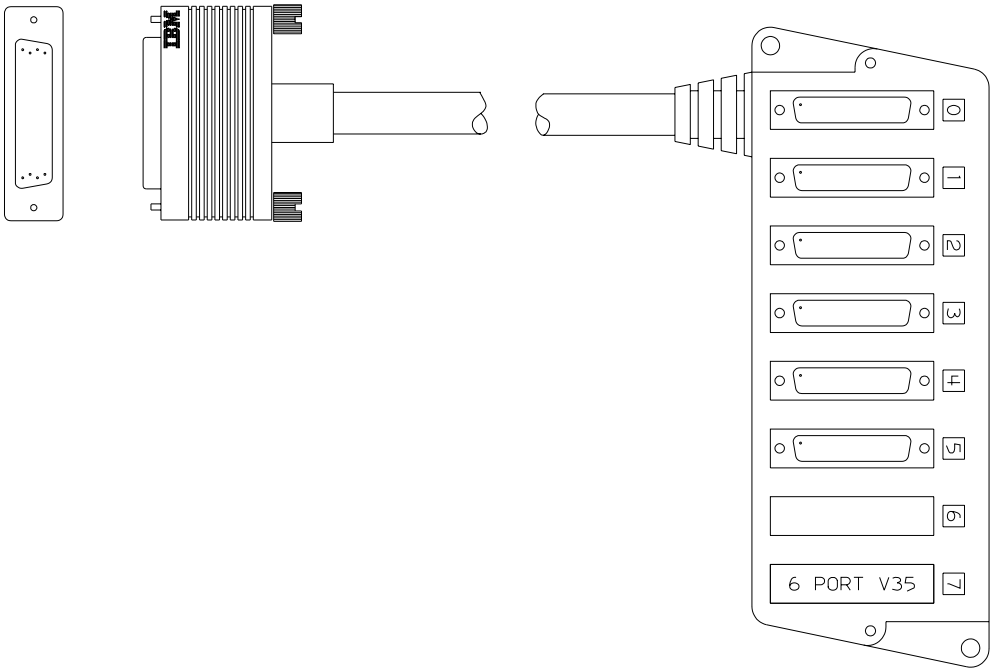


Figure I-18. V.35 Fanout Cable

Interchange Circuits

CABLE PAIRS NBER	SIGNAL NAME	100 PIN CONNECTOR	25 PIN "D" CONNECTORS	
		CONNECTOR PIN NO.	CONN. NO.	PIN NO.
1	TXDA	94	0	02
	TXDB	70	0	14
2	RDA	8	0	03
	RDB	33	0	16
3	TCLKA	76	0	15
	TCLKB	52	0	12
4	RCLKA	20	0	17
	RCLKB	45	0	09
5	EXTCKA	24	0	24
	EXTCKB	49	0	11
6	DSR	66	0	06
	GND	34	0	07
7	DTR	18	0	20
	CTS	15	0	05
8	RTS	42	0	04
	CD	89	0	08

CABLE PAIRS NBER	SIGNAL NAME	100 PIN CONNECTOR	25 PIN "D" CONNECTORS	
		CONNECTOR PIN NO.	CONN. NO.	PIN NO.
1	TXDA	71	3	02
	TXDB	95	3	14
2	RDA	29	3	03
	RDB	04	3	16
3	TCLKA	56	3	15
	TCLKB	80	3	12
4	RCLKA	19	3	17
	RCLKB	44	3	09
5	EXTCKA	25	3	24
	EXTCKB	50	3	11
6	DSR	64	3	06
	GND	67	3	07
7	DTR	68	3	20
	CTS	87	3	05
8	RTS	93	3	04
	CD	61	3	08

CABLE PAIRS NBER	SIGNAL NAME	100 PIN CONNECTOR	25 PIN "D" CONNECTORS	
		CONNECTOR PIN NO.	CONN. NO.	PIN NO.
1	TXDA	21	1	02
	TXDB	46	1	14
2	RDA	54	1	03
	RDB	78	1	16
3	TCLKA	06	1	15
	TCLKB	31	1	12
4	RCLKA	41	1	17
	RCLKB	16	1	09
5	EXTCKA	73	1	24
	EXTCKB	97	1	11
6	DSR	90	1	06
	GND	17	1	07
7	DTR	91	1	20
	CTS	65	1	05
8	RTS	43	1	04
	CD	40	1	08

CABLE PAIRS NBER	SIGNAL NAME	100 PIN CONNECTOR	25 PIN "D" CONNECTORS	
		CONNECTOR PIN NO.	CONN. NO.	PIN NO.
1	TXDA	72	4	02
	TXDB	96	4	14
2	RDA	28	4	03
	RDB	3	4	16
3	TCLKA	27	4	15
	TCLKB	2	4	12
4	RCLKA	32	4	17
	RCLKB	7	4	09
5	EXTCKA	99	4	24
	EXTCKB	75	4	11
6	DSR	60	4	06
	GND	01	4	07
7	DTR	14	4	20
	CTS	59	4	05
8	RTS	37	4	04
	CD	35	4	08

CABLE PAIRS NBER	SIGNAL NAME	100 PIN CONNECTOR	25 PIN "D" CONNECTORS	
		CONNECTOR PIN NO.	CONN. NO.	PIN NO.
1	TXDA	47	2	02
	TXDB	22	2	14
2	RDA	58	2	03
	RDB	82	2	16
3	TCLKA	77	2	15
	TCLKB	53	2	12
4	RCLKA	38	2	17
	RCLKB	13	2	09
5	EXTCKA	98	2	24
	EXTCKB	74	2	11
6	DSR	88	2	06
	GND	63	2	07
7	DTR	69	2	20
	CTS	86	2	05
8	RTS	92	2	04
	CD	62	2	08

CABLE PAIRS NBER	SIGNAL NAME	100 PIN CONNECTOR	25 PIN "D" CONNECTORS	
		CONNECTOR PIN NO.	CONN. NO.	PIN NO.
1	TXDA	23	5	02
	TXDB	48	5	14
2	RDA	57	5	03
	RDB	81	5	16
3	TCLKA	55	5	15
	TCLKB	79	5	12
4	RCLKA	30	5	17
	RCLKB	05	5	09
5	EXTCKA	26	5	24
	EXTCKB	51	5	11
6	DSR	85	5	06
	GND	83	5	07
7	DTR	12	5	20
	CTS	09	5	05
8	RTS	39	5	04
	CD	84	5	08

Figure I-19. V.35 Fanout Cable Pin Assignment

Cable List

Table I-11. V.35 Fanout Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	1.2 (4)	3702	05F2044

V.36 Fanout Cable

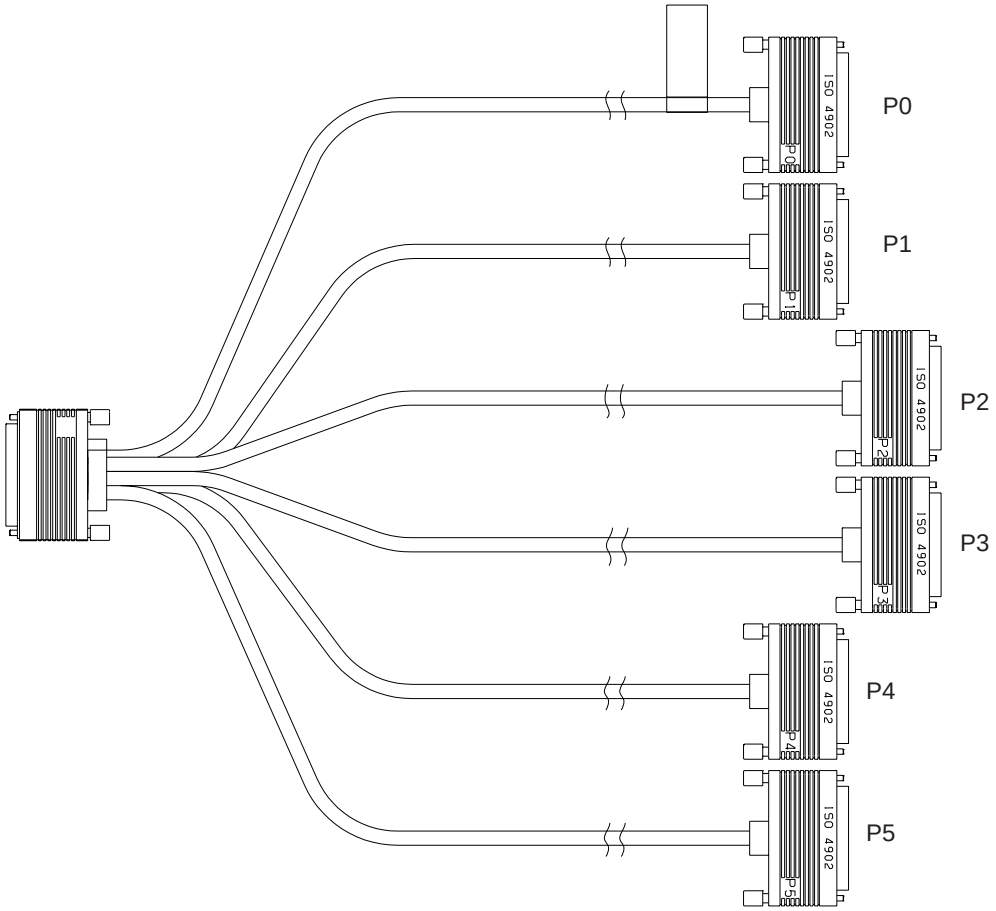


Figure I-20. V.36 Fanout Cable

Interchange Circuits

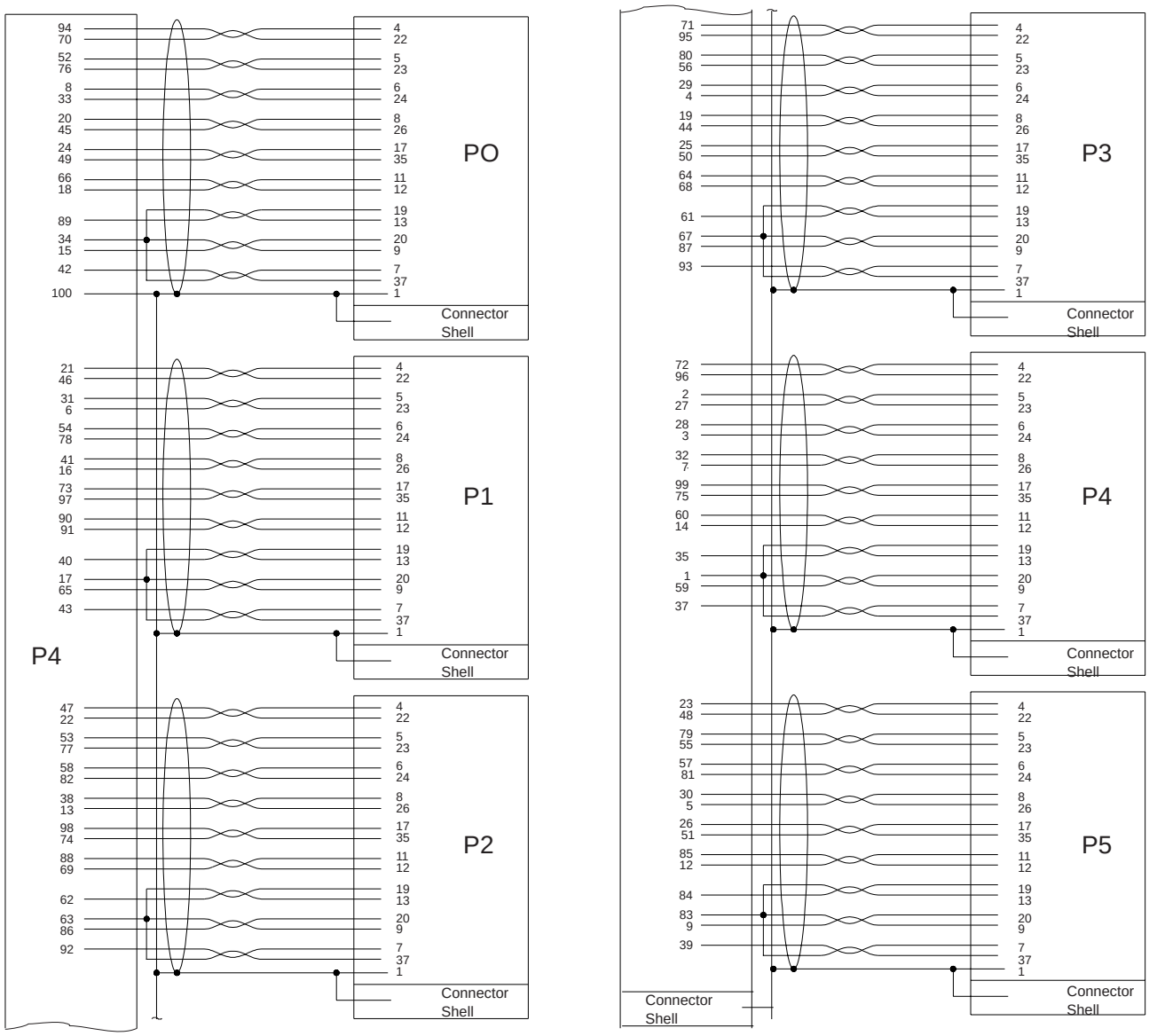


Figure I-21. V.36 Fanout Cable Pin Assignment

Cable List

Table I-12. V.36 Fanout Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3703	37H2507

X.21 Fanout Cable

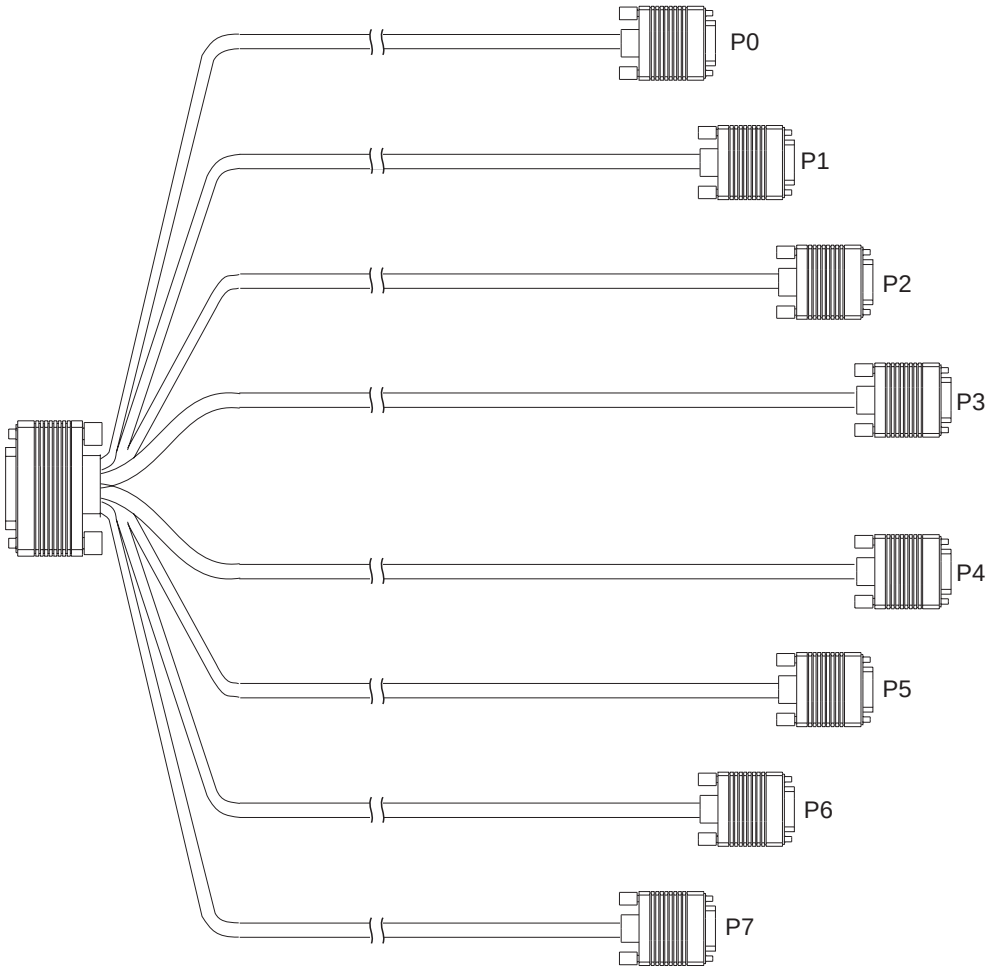


Figure I-22. X.21 Fanout Cable

Interchange Circuits

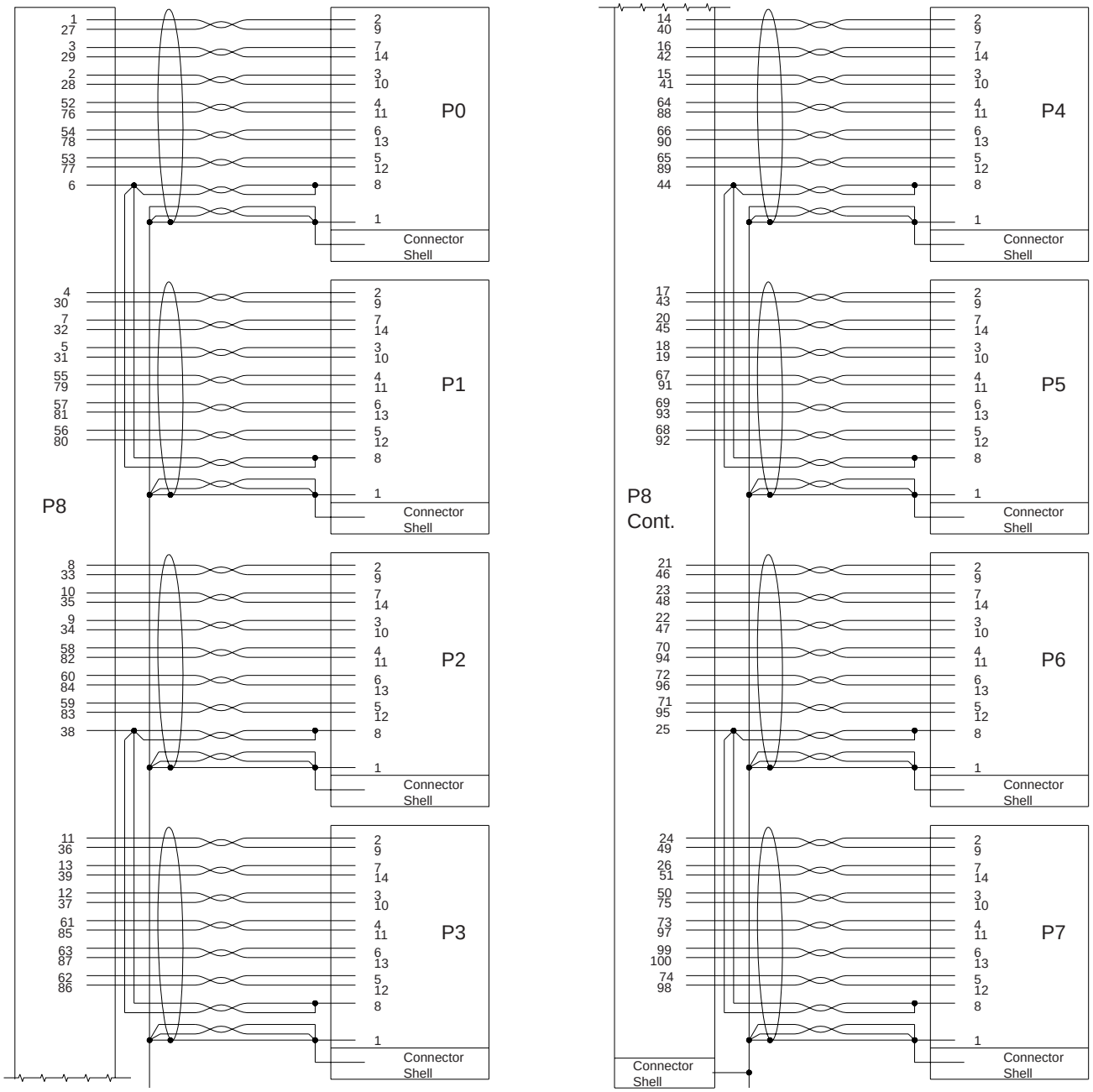


Figure I-23. X.21 Fanout Cable Pin Assignment

Cable List

Table I-13. X.21 Fanout Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	1.8 (6)	3704	06H4648

V.24 / EIA-232 Serial Cable

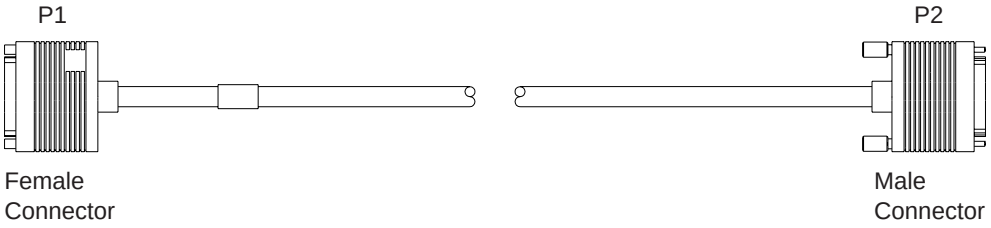


Figure I-24. V.24 / EIA-232 Serial Cable

Interchange Circuits

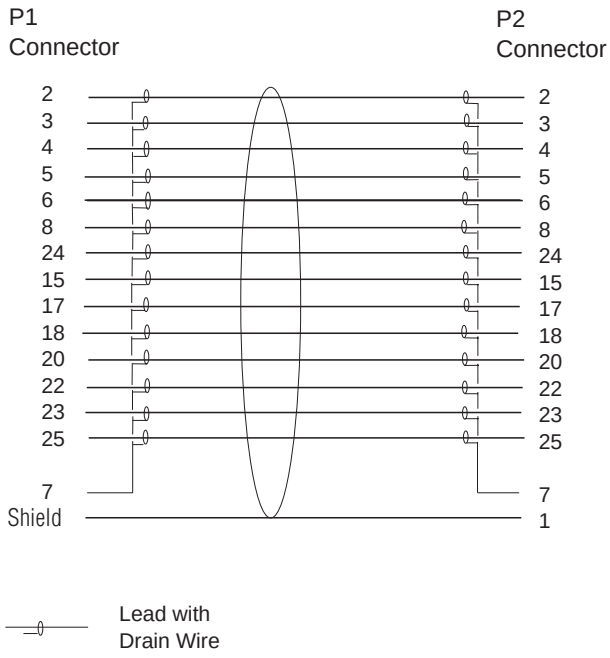


Figure I-25. V.24 / EIA-232 Serial Cable Pin Assignment

Cable List

Table I-14. V.24/EIA-232 Serial Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3705	38H7071

V.24 / EIA-232 Direct Attachment Cable

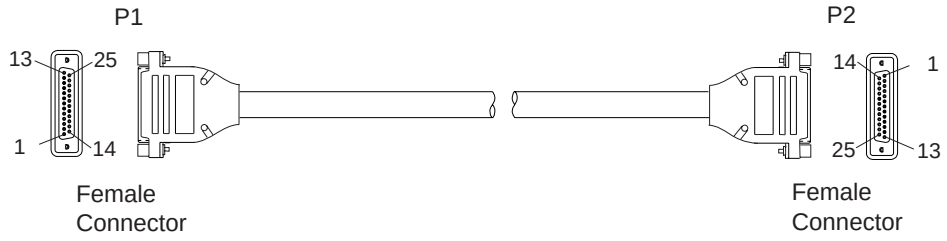


Figure I-26.

Interchange Circuits

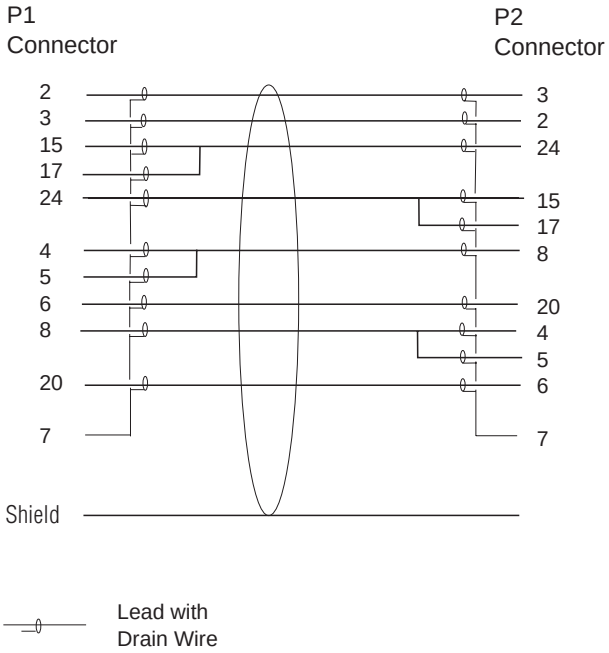


Figure I-27.

Cable List

Table I-15. V.24/EIA-232 Direct Attachment Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3706	59G7195

V.35 Serial Cable

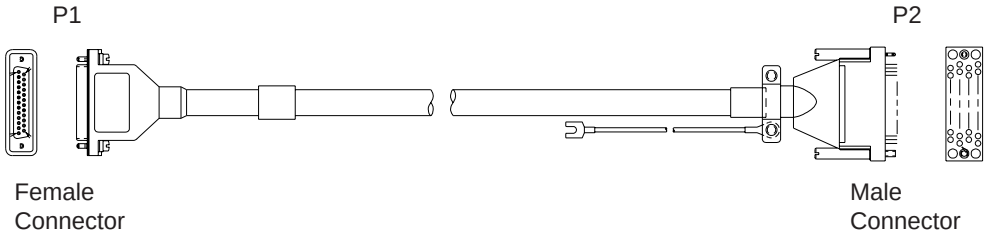


Figure I-28. V.35 Serial Cable

Interchange Circuits

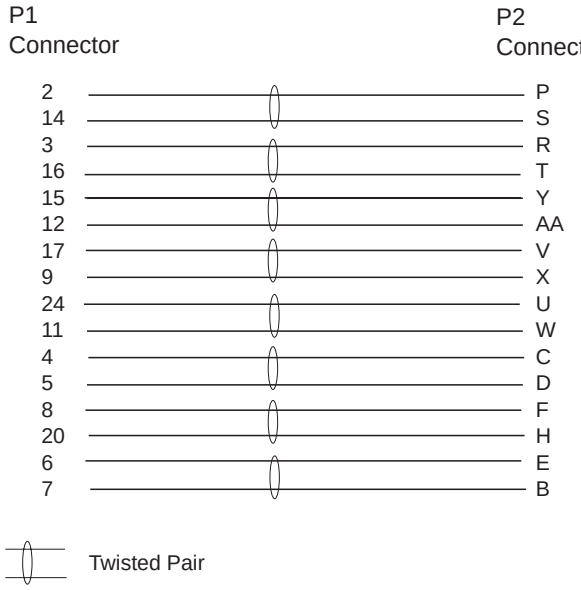


Figure I-29. V.35 Serial Cable Pin Assignment

Cable List

Table I-16. V.35 Serial Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	2 (6)	3707	11H4958

V.35 Direct Attachement Cable

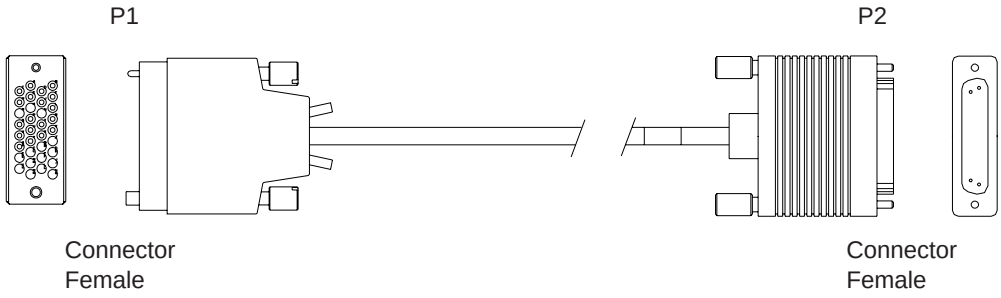


Figure I-30. V.35 Direct Attachement Cable

Interchange Circuits

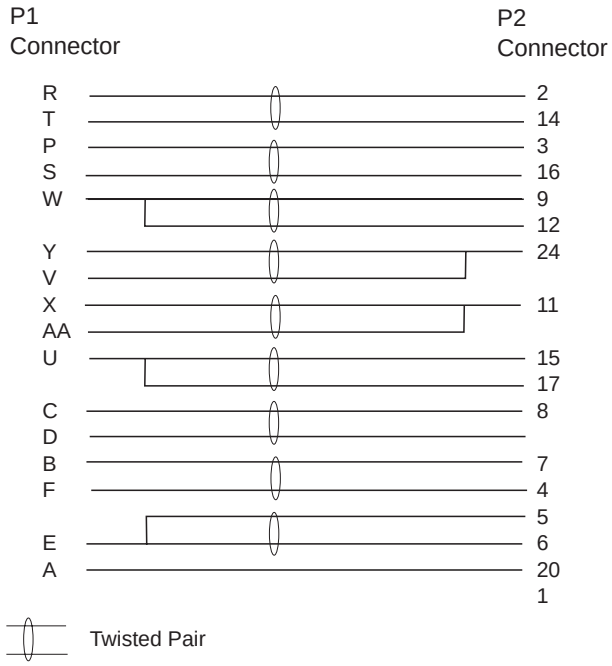


Figure I-31. V.35 Direct Attachement Cable Pin Assignment

Cable List

Table I-17. V.35 Direct Attachment Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3708	38H7075

V.36 Serial Cable

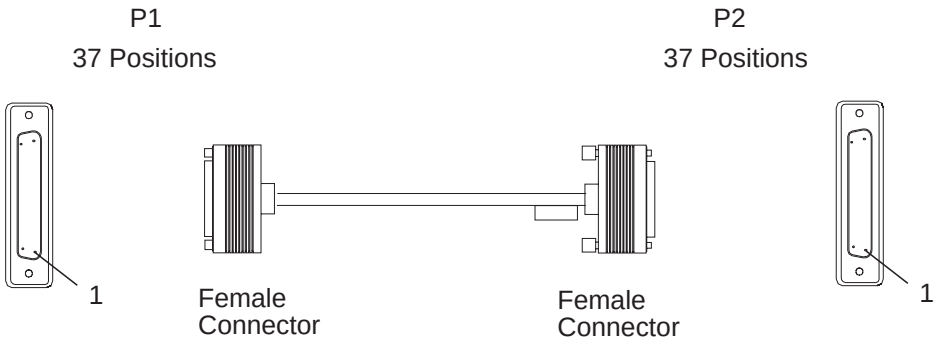


Figure I-32. V.36 Serial Cable

Interchange Circuits

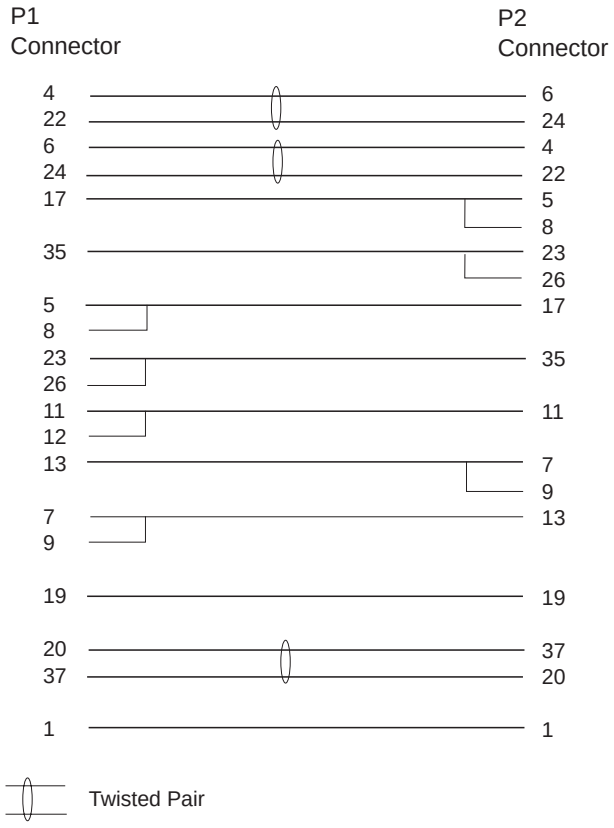


Figure I-33. V.36 Serial Cable Pin Assignment

Cable List

Table I-18. V.36 Serial Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3709	38H7079

V.36 Direct Attachment Cable

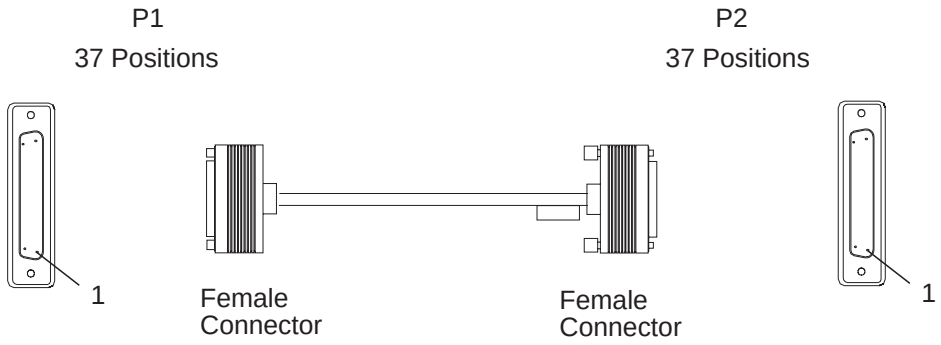


Figure I-34. V.36 Direct Attachement Cable

Interchange Circuits

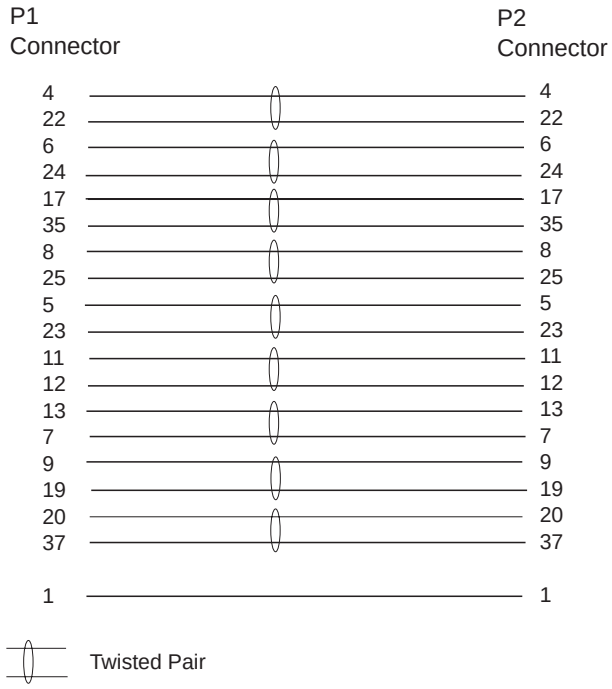


Figure I-35. V.36 Direct Attachement Cable Pin Assignment

Cable List

Table I-19. V.36 Direct Attachment Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3710	38H7077

X.21 Serial Cable

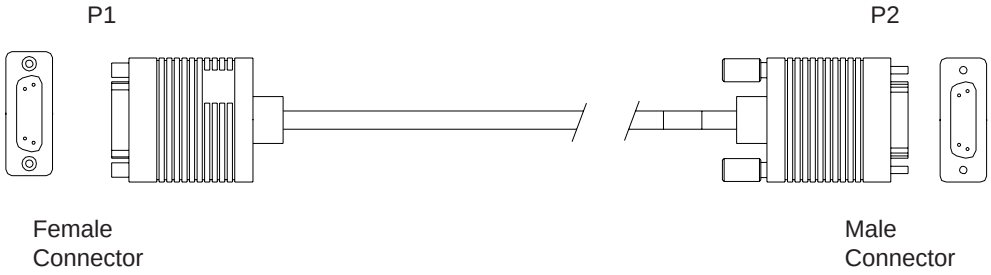


Figure I-36. X.21 Serial Cable

Interchange Circuits

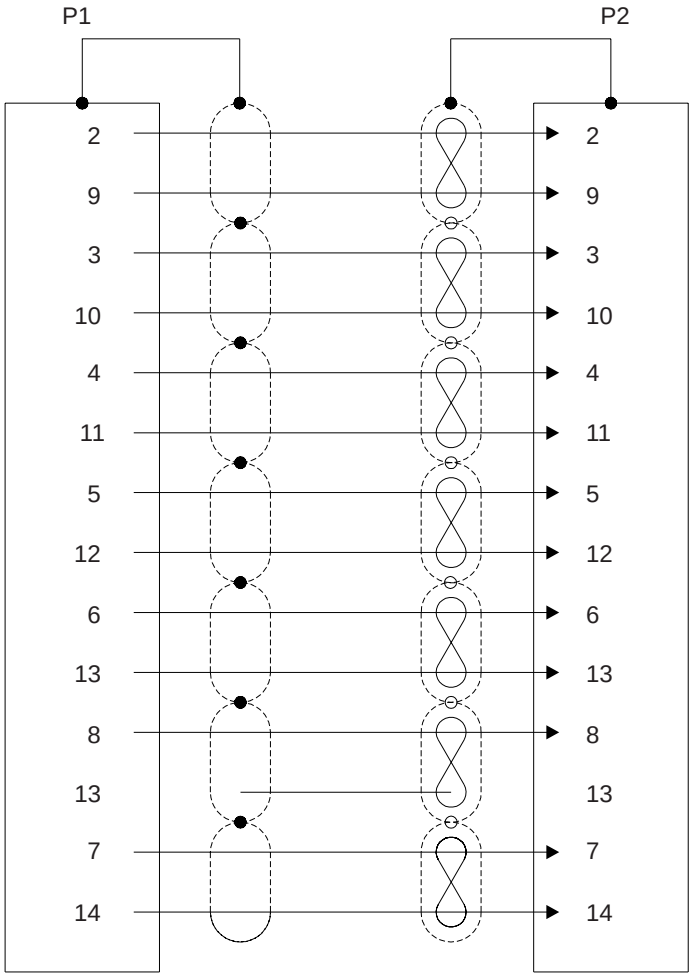


Figure I-37. X.21 Serial Cable Pin Assignment

Cable List

Table I-20. X.21 Serial Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3711	38H7070

X.21 Direct Attachement Cable

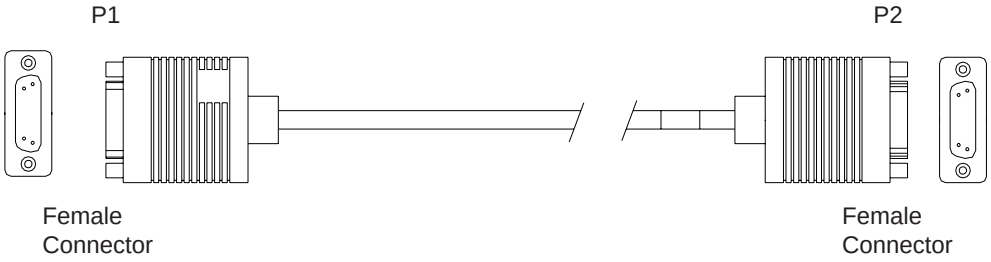


Figure I-38. X.21 Direct Attachement Cable

Interchange Circuits

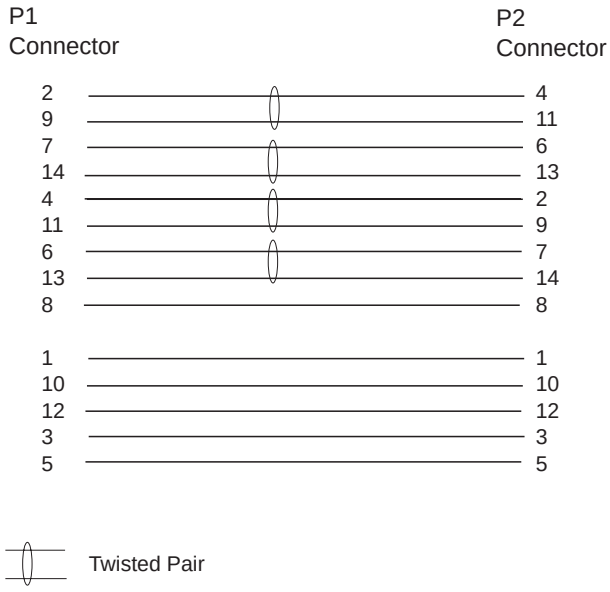


Figure I-39. X.21 Direct Attachement Cable Pin Assignment

Cable List

Table I-21. X.21 Direct Attachment Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	3 (10)	3712	38H7073

Multi-Purpose RJ-45 Cable

Figure I-40. Multi-Purpose RJ-45 Cable

Interchange Circuits

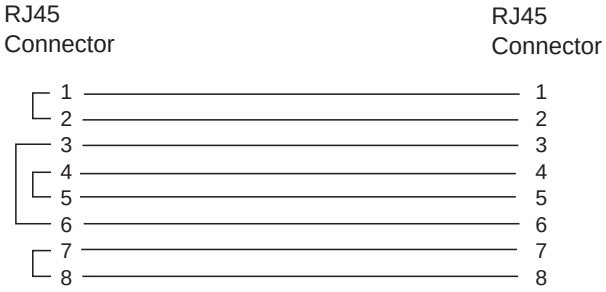


Figure I-41. Multi-Purpose RJ-45 Cable Pin Assignment

Cable List

Table I-22. Multi-pupose RJ-45 Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	8 (25)	3713	41H9082

RJ-48 T1 ISDN Pri Cable

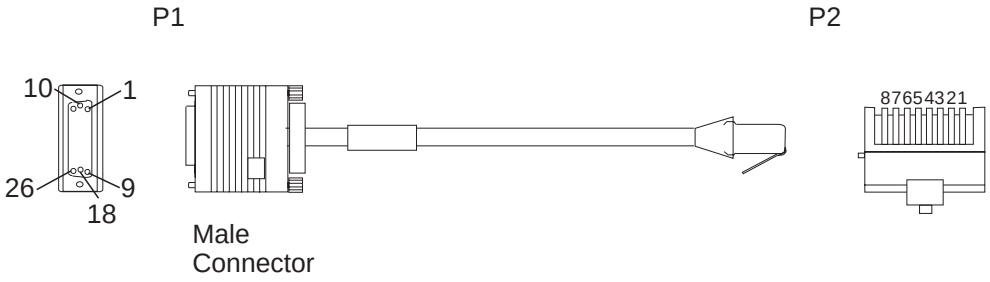


Figure I-42. RJ-48 T1 ISDN Pri Cable

Interchange Circuits

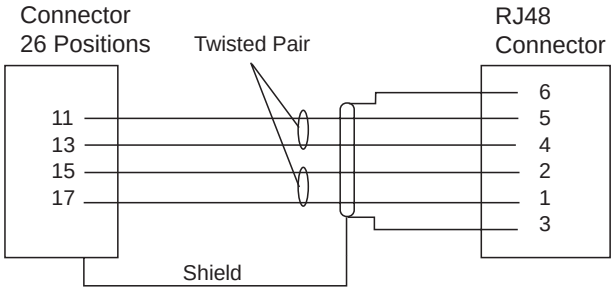


Figure I-43. RJ-48 T1 ISDN Pri Cable Pin Assignment

Cable List

Table I-23. RJ-48 T1 ISDN Pri Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	15 (50)	3714	85H3509

E1 ISDN Pri Cable

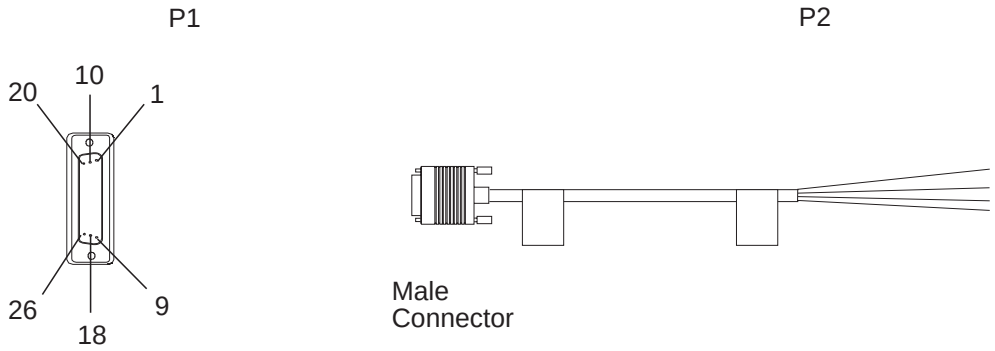


Figure I-44. E1 ISDN Pri Cable

Interchange Circuits

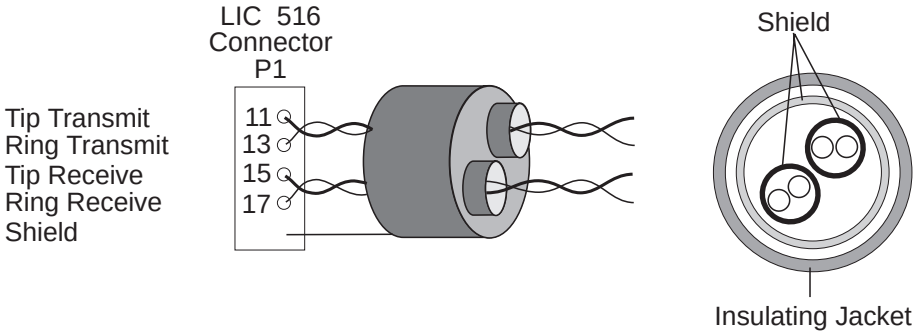


Figure I-45. E1 ISDN Pri Cable Pin Assignment

Cable List

Table I-24. E1 ISDN Pri Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	30 (100)	3715	80G3984

RJ-45 J1 ISDN Pri Cable

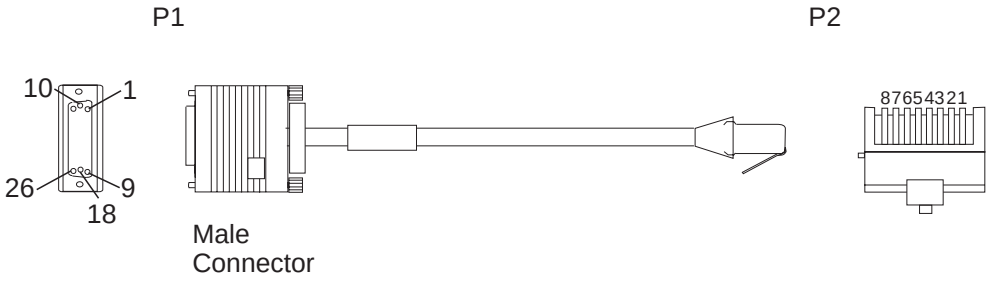


Figure I-46. RJ-45 J1 ISDN Pri Cable

Interchange Circuits

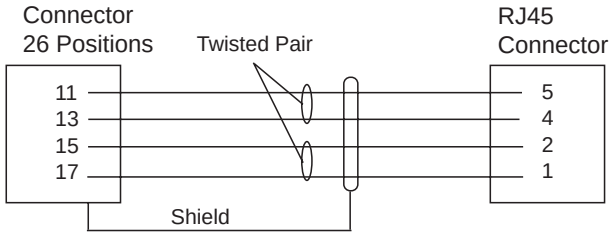


Figure I-47. RJ-45 J1 ISDN Pri Cable Pin Assignment

Cable List

Table I-25. RJ-45 J1 ISDN Pri Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	15 (50)	3716	57G8042

V.35 Serial Cable - France

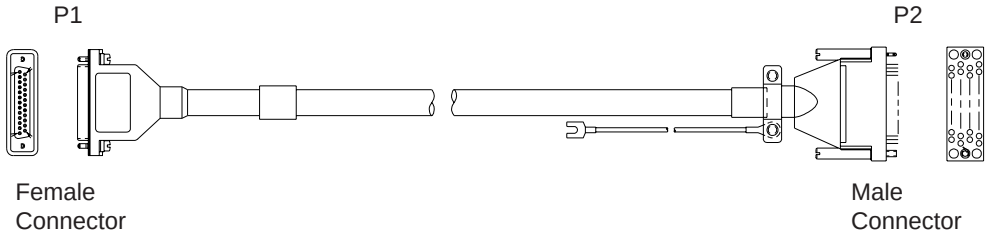


Figure I-48. Cable (PN 11H4958)

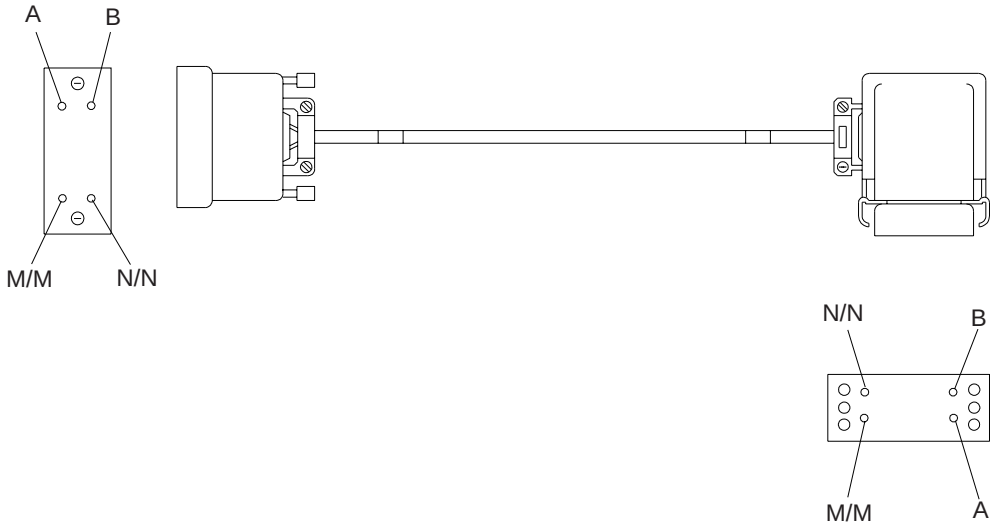


Figure I-49. Extension Cable (PN 1749352)

Interchange Circuits

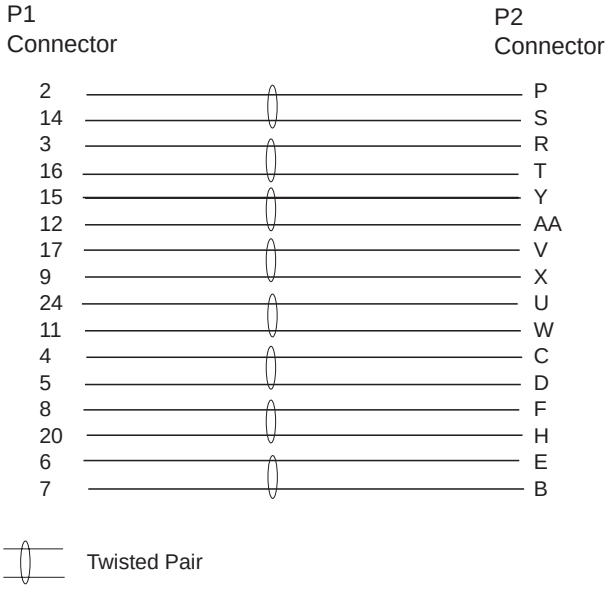


Figure I-50. Interchange Circuit for Cable (PN 11H4958)

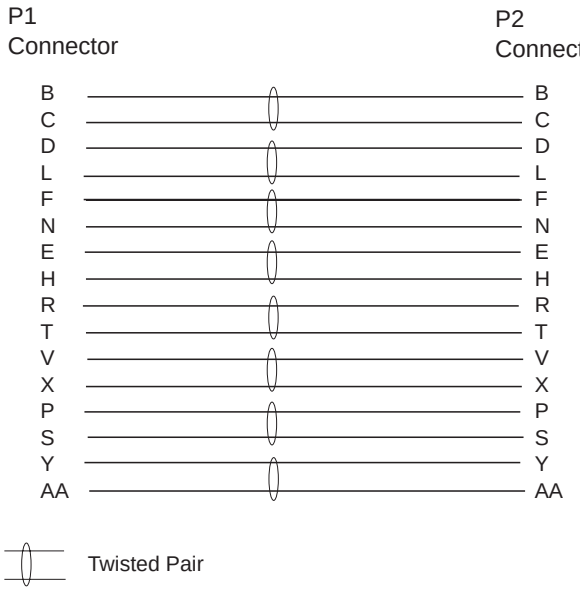


Figure I-51. Interchange Circuit for Extension Cable (PN 1749352)

Cable List

Table I-26. V.35 Serial Cable - France

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	2 (6)	3799	11H4958
Extension Cable	0.3 (1)	3799	1749352

MMF ATM External Cable

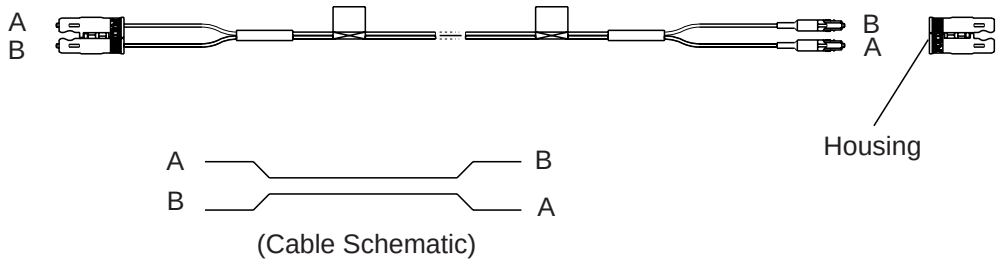


Figure I-52. MMF ATM External Cable

Cable List

Table I-27. MMF ATM External Cable

Cable Type	Length m (ft)	Feature code	Part Number
Optical Cable	10 (40)	5710	19G4866
Optical Cable	40 (131)	5715	19G4868

SFM ATM External Cable

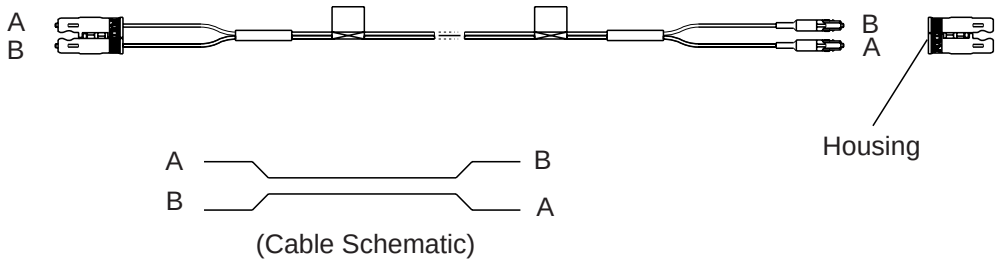


Figure I-53. SFM ATM External Cable

Cable List

Table I-28. SFM ATM External Cable

Cable Type	Length m (ft)	Feature code	Part Number
Optical Cable	10 (40)	5720	19G4757
Optical Cable	40 (131)	5725	19G4759

HSSI DTE/DCE Cable

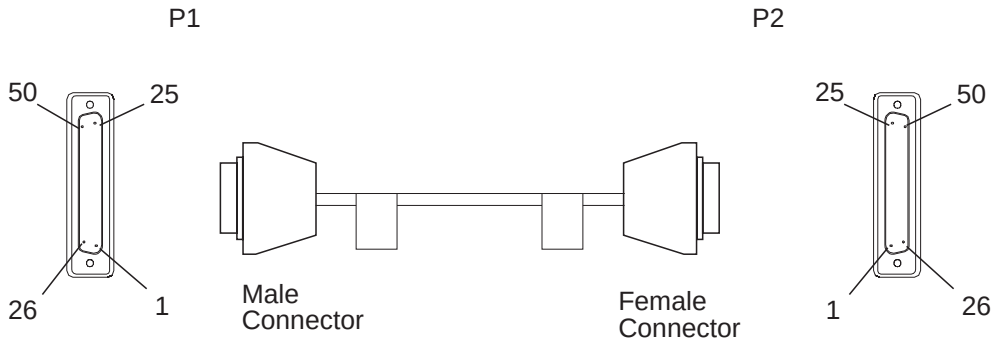


Figure I-54. HSSI DTE/DCE Cable

Interchange Circuits

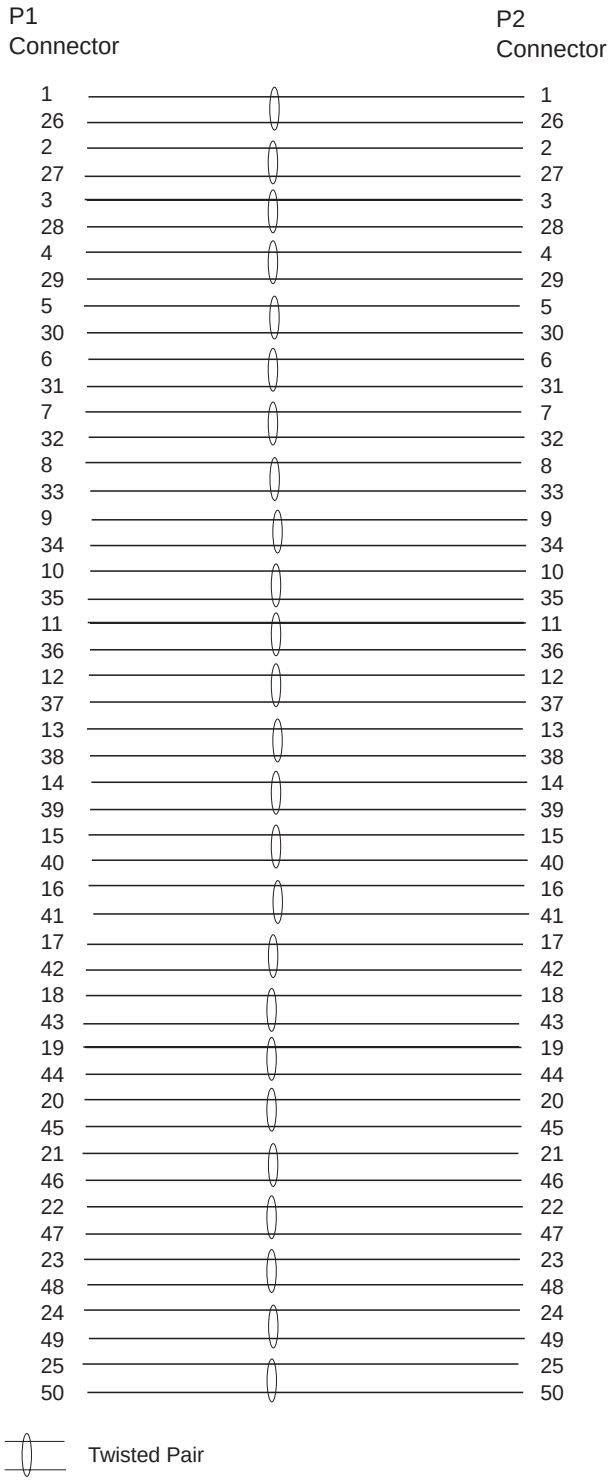


Figure I-55. Interchange Circuit for Cable (PN 86H0971)

Cable List

Table I-29. HSSI DTE/DCE Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	5 (17)	No feature code	86H0971

HSSI Null Modem Cable

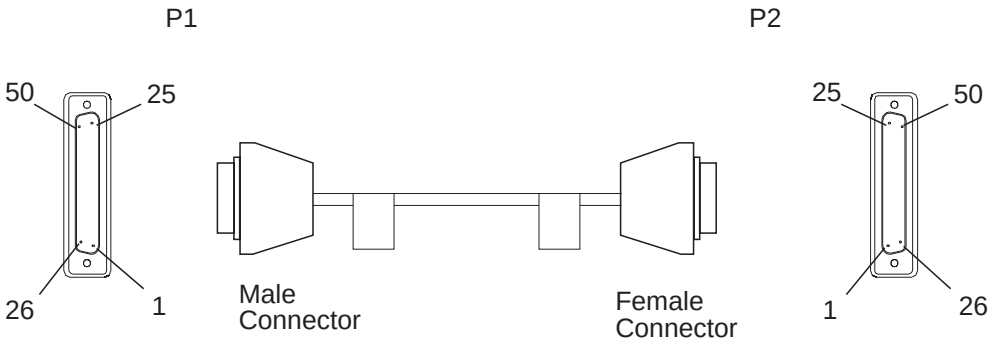


Figure I-56. HSSI Null Modem Cable

Interchange Circuits

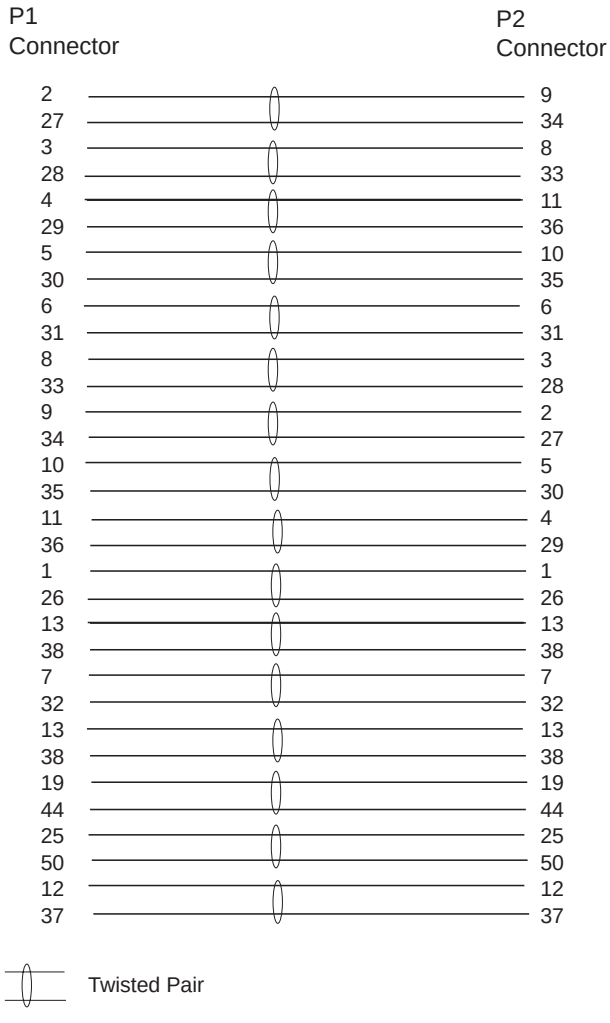


Figure I-57. Interchange Circuit for Cable (PN 86H0970)

Cable List

Table I-30. HSSI Null Modem Cable

Cable Type	Length m (ft)	Feature code	Part Number
Standard Fixed	5 (17)	No feature code	86H0970

Other Cables

For cables not documented in this appendix see the *3746 Nways Multiprotocol Controller Models 900 and 950 External Cable References*, SY33-2117

Multiaccess Enclosure LIC Cables.

Appendix J. Bibliography

Customer Documentation for the 3746 Model 950

Table J-1 (Page 1 of 2). Customer Documentation for the 3746 Model 950

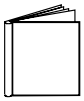
This customer documentation has the following formats:

Finding Information

3745 Models A and 3746 Books

Starting with engineering change (EC) F12380, all of the books in the 3745 Models A and 3746 library are available on the CD-ROM that contains the Licensed Internal Code (LIC) for this EC.

Preparing for Operation



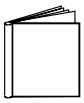
GA33-0400

IBM 3745 Communication Controller All Models[1]
IBM 3746 Expansion Unit Model 900
IBM 3746 Nways Multiprotocol Controller Model 950

Safety Information[2]

Provides general safety guidelines

Evaluating and Configuring

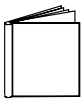


GA33-0180

IBM 3745 Communication Controller Models A[3]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Overview

Gives an overview of connectivity capabilities within SNA, APPN, and IP networking.



GA33-0457

IBM 3745 Communication Controller Models A[2]
IBM 3746 Expansion Unit Model 900
Models 900 and 950

Planning Guide

Planning for:

- Field upgrades
- Service processor and alert management configuration
- Network integration (NCP, APPN, and IP control)
- Physical installation.

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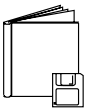
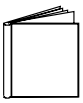
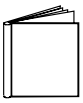
Table J-1 (Page 2 of 2). Customer Documentation for the 3746 Model 950

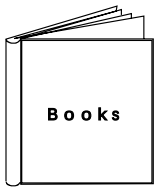
Operating and Testing		
	SA33-0356	***IBM 3746 Nways Multiprotocol Controller Model 950*** ***User's Guide***[2] Explains how to: • Carry out daily routine operations on Nways controller • Install, test, and customize the Nways controller after installation • Configure user's workstations to remotely control the service processor using: – DCAF program – Telnet client program.
	On-line information	***Controller Configuration and Management Application*** Provides a graphical user interface for configuring and managing a 3746 APPN/HPR network node and IP Router, and its resources. Is also available as a stand-alone application, using an OS/2 workstation. Defines and explains all the 3746 Network Node and IP Router configuration parameters through its on-line help.
	SH11-3081	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Controller Configuration and Management: User's Guide***[2] Explains how to use CCM and gives examples of the configuration process.
Managing Problems		
	On-line information	***Problem Analysis Guide*** An on-line guide to analyze alarms, events, and control panel codes on: • IBM 3745 Communication Controller Models A[3] • IBM 3746 Nways Multiprotocol Controller Models 900 and 950.
	SA33-0175	***IBM 3745 Communication Controller Models A***[3] ***IBM 3746 Expansion Unit Model 900*** ***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Alert Reference Guide*** Provides information about events or errors reported by alerts for: • IBM 3745 Communication Controller Models A[3] • IBM 3746 Nways Multiprotocol Controller Models 900 and 950.

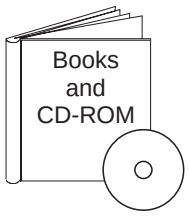
[1] Models 130 to 61A.
[2] Documentation shipped with the 3746-950
[3] 3745 Models 17A to 61A.

Service Documentation for the IBM 3746 Model 950

Table J-2 (Page 1 of 2). Service Documentation for the 3746 Model 950

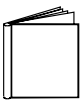
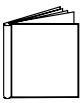
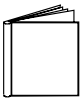
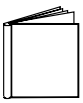
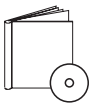
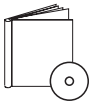
This service documentation has the following formats:





SY33-2107	***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Installation Guide***[1] Provides instructions for installing or relocating the Nways Controller.
SY33-2108	***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Service Guide***[1] Provides procedures for isolating and fixing the IBM 3746-950 problems.
SY33-2115	***IBM 3745 Communication Controller Models A***[2] ***IBM 3746 Expansion Unit Model 900*** ***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Service Processor Installation and Maintenance***[3] ***(Based on the 7585, 3172, 9585, or 9577)*** Provides information on installing and maintaining the service processor based on PS/2 Types 7585, 3172, 9585, or 9577. Can be for systems with microcode that has up to and including EC D46130 (any level) installed.
SY33-2120	***IBM 3745 Communication Controller Models A***[3] ***IBM 3746 Expansion Unit Model 900*** ***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Service Processor Installation and Maintenance***[4] ***(Based on the 7585, 3172, or 9585)*** Provides information on installing and maintaining the service processor based on PS/2 Types 7585, 3172, or 9585. Can be for systems with microcode EC F12380 or higher installed.
SY33-2118	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Multiaccess Enclosure Installation and Maintenance***[4] Provides information on installing and maintaining the Multiaccess Enclosure (MAE).

Table J-2 (Page 2 of 2). Service Documentation for the 3746 Model 950

 SY33-2112	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Network Node Processor Installation and Maintenance***[3] ***(Based on the 7585 or 3172)*** Provides information on installing and maintaining the network node processor based on the PS/2 Type 7585 or 3172.
 SY33-2117	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***External Cable Reference***[4] Provides references to console and line cables used for connecting the IBM 3746 Models 900 and 950.
 S135-2015	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Parts Catalog***[4] Provides reference information for ordering parts for the IBM 3746 Models 900 and 950.
 S135-2014	***IBM Controller Expansion*** ***Parts Catalog*** Provides reference information for ordering parts for the controller expansion attached to the IBM 3745 Models A[2], and 3746 Models 900 and 950.
CD-ROM Bibliography	
 ZK2T-8214	***IBM Networking Softcopy Collection Kit*** Allows service manuals consulting via CD-ROM viewer. EMEA version.
 ZK2T-8187	***IBM Networking Softcopy Collection Kit*** Allows service manuals consulting via CD-ROM viewer. US version.

[1] Documentation shipped with the 3746 Model 950
[2] 3745 Models 17A to 61A
[3] Documentation shipped with the processor
[4] Documentation shipped with the 3746 Models 900 and 950

Customer Documentation for the 3745 (Models 210, 310, 410, 610, 21A, 31A, 41A, and 61A), and 3746 (Model 900)

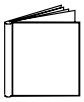
Table J-3 (Page 1 of 4). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

This customer documentation has the following formats:

Finding Information

3745 Models A and 3746 Books

Starting with engineering change (EC) F12380, all of the books in the 3745 Models A and 3746 library are available on the CD-ROM that contains the Licensed Internal Code (LIC) for this EC.



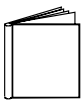
SA33-0172

IBM 3745 Communication Controller
Models 210 to 61A
IBM 3746 Expansion Unit Model 900

Customer Master Index[1]

Provides references for finding information in the customer documentation library.

Evaluating and Configuring



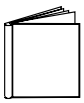
GA33-0092

IBM 3745 Communication Controller
Models 210, 310, 410, and 610

Introduction

Gives an introduction of the IBM Models 210 to 610 capabilities.

For Models A refer to the *Overview*, GA33-0180.



GA33-0180

IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Overview

Gives an overview of connectivity capabilities within SNA, APPN, and IP networking.

Table J-3 (Page 2 of 4). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

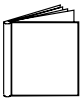
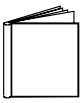
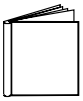
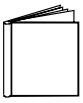
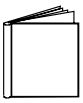
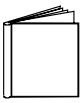
	GA33-0457	***IBM 3745 Communication Controller Models A***[2] ***IBM 3746 Expansion Unit Model 900*** ***Models 900 and 950*** ***Planning Guide*** Planning for: • Field upgrades • Service processor and alert management configuration • Network integration (NCP, APPN, and IP control) • Physical installation.
Preparing Your Site		
	GC22-7064	***IBM System/360, System/370, 4300 Processor*** ***Input/Output Equipment Installation Manual-Physical Planning*** (Including Technical News Letter GN22-5490) Provides information for physical installation for the 3745 Models 130 to 610. For 3745 Models A and 3746 Model 900, refer to the *Planning Guide*, GA33-0457.
	GA33-0127	***IBM 3745 Communication Controller*** ***Models 210, 310, 410, and 610*** ***Preparing for Connection*** Helps for preparing the 3745 Models 210 to 610 cable installation. For 3745 Models A refer to the *Connection and Integration Guide*, SA33-0129.
Preparing for Operation		
	GA33-0400	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Safety Information***[1] Provides general safety guidelines.
	SA33-0129	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 Nways Multiprotocol Controller Model 900*** ***Connection and Integration Guide***[1] Contains information for connecting hardware and integrating network of the 3745 and 3746-900 after installation.
	SA33-0416	***Line Interface Coupler Type 5 and Type 6*** ***Portable Keypad Display*** ***Migration and Integration Guide*** Contains information for moving and testing LIC types 5 and 6.

Table J-3 (Page 3 of 4). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

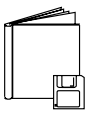
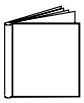
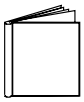
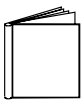
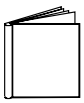
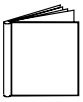
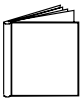
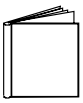
	SA33-0158	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 Nways Multiprotocol Controller Model 900*** ***Console Setup Guide***[1] Provides information for: • Installing local, alternate, or remote consoles for 3745 Models 130 to 610 • Configuring user workstations to remotely control the service processor for 3745 Models A and 3746 Model 900 using: – DCAF program – Telnet Client program.
Customizing Your Control Program		
	SA33-0178	***Guide to Timed IPL and Rename Load Module*** Provides VTAM procedures for: • Scheduling an automatic reload of the 3745 • Getting 3745 load module changes transparent to the operations staff.
Operating and Testing		
	SA33-0098	***IBM 3745 Communication Controller All Models***[4] ***Basic Operations Guide***[1] Provides instructions for daily routine operations on the 3745 Models 130 to 610.
	SA33-0177	***IBM 3745 Communication Controller Models A***[2] ***IBM 3746 Nways Multiprotocol Controller Model 900*** ***Basic Operations Guide***[1] Provides instructions for daily routine operations on the 3745 Models 17A to 61A, and 3746 Model 900 operating as an SNA node (using NCP), APPN/HPR Network Node, and IP Router.
	SA33-0097	***IBM 3745 Communication Controller All Models***[3] ***Advanced Operations Guide***[1] Provides instructions for advanced operations and testing, using the 3745 MOSS console.
	On-line Information	***Controller Configuration and Management Application*** Provides a graphical user interface for configuring and managing a 3746 APPN/HPR Network Node and IP Router, and its resources. Is also available as a stand-alone application, using an OS/2 workstation. Defines and explains all the 3746 Network Node and IP Router configuration parameters through its online help.

Table J-3 (Page 4 of 4). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

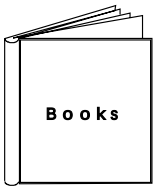
	SH11-3081	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Controller Configuration and Management: User's Guide***[5] Explains how to use CCM and gives examples of the configuration process.
Managing Problems		
	SA33-0096	***IBM 3745 Communication Controller All Models***[3] ***Problem Determination Guide***[1] A guide to perform problem determination on the 3745 Models 130 to 61A.
	On-line Information	***Problem Analysis Guide*** An online guide to analyze alarms, events, and control panel codes on: • IBM 3745 Communication Controller Models A[2] • IBM 3746 Nways Multiprotocol Controller Models 900 and 950.
	SA33-0175	***IBM 3745 Communication Controller Models A***[2] ***IBM 3746 Expansion Unit Model 900*** ***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Alert Reference Guide*** Provides information about events or errors reported by alerts for: • IBM 3745 Communication Controller Models A[2] • IBM 3746 Nways Multiprotocol Controller Models 900 and 950.

[1] Documentation shipped with the 3745.
[2] 3745 Models 17A to 61A.
[3] 3745 Models 130 to 61A.
[4] Except 3745 Models A.
[5] Documentation shipped with the 3746-900.

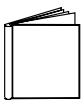
Additional Customer Documentation for the 3745 Models 130, 150, 160, 170, and 17A

Table J-4. Additional Customer Documentation for the 3745 Models 130 to 17A

This customer documentation has the following format:



Finding Information



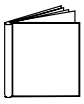
SA33-0142

IBM 3745 Communication Controller
Models 130, 150, 160, 170, and 17A
IBM 3746 Nways Multiprotocol Controller Model 900

Customer Master Index[1]

Provides references for finding information in the customer documentation library.

Evaluating and Configuring



GA33-0138

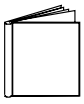
IBM 3745 Communication Controller
Models 130, 150, and 170

Introduction

Gives an introduction about the IBM Models 130 to 170 capabilities, including Model 160.

For Model 17A refer to the *Overview*, GA33-0180.

Preparing Your Site



GA33-0140

IBM 3745 Communication Controller
Models 130, 150, 160, and 170

Preparing for Connection

Helps for preparing the 3745 Models 130 to 170 cable installation.

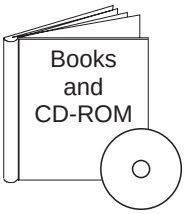
For 3745 Model 17A refer to the *Connection and Integration Guide*, SA33-0129.

[1] Documentation shipped with the 3745.

Service Documentation for the IBM 3745 (Models 210, 21A, 310, 31A, 410, 41A, 610, and 61A) and 3746 (Model 900)

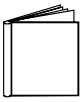
Table J-5 (Page 1 of 4). Service Documentation for the 3745 Models x10 and x1A, and 3746 Model 900

This service documentation has the following formats:



3745 Models A and 3746 Books

Starting with engineering change (EC) F12380, all of the books in the 3745 Models A and 3746 library are available on the CD-ROM that contains the Licensed Internal Code (LIC) for this EC.

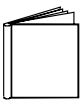


SY33-2080

IBM 3745 Communication Controller
Models 210 to 61A

Service Master Index[1]

Provides references for finding information in the IBM 3745 Models X10 and X1A shipping group documentation.

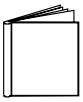


SY33-2057

IBM 3745 Communication Controller
Models 210 to 61A

Installation Guide[1]

Provides instructions for installing or relocating the IBM 3745 Models X10 and X1A.

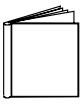


SY33-2114

IBM 3746 Nways Multiprotocol Controller
Model 900

Installation Guide[2]

Provides instructions for installing or relocating a 3746-900.

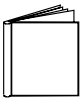


SY33-2116

IBM 3746 Nways Multiprotocol Controller
Model 900

Service Guide[2]

Provides procedures for isolating and fixing the IBM 3746-900 problems.



SY33-2055

IBM 3745 Communication Controller
Models 210, 310, 410, and 610

IBM 3746 Expansion Units
Models A11, A12, L13, L14, and L15

Service Functions[1]

Describes MOSS functions using the IBM 3745 Models X10 and X1A consoles.

Table J-5 (Page 2 of 4). Service Documentation for the 3745 Models x10 and x1A, and 3746 Model 900

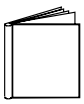
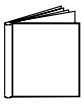
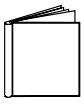
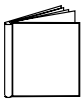
 SY33-2054	***IBM 3745 Communication Controller Models 210 to 61A*** ***Maintenance Information Procedures***[1] Provides procedures for isolating and fixing the IBM 3745 Models X10 and X1A problems.
 SY33-2115	***IBM 3745 Communication Controller Models A***[3] ***IBM 3746 Expansion Unit Model 900*** ***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Service Processor Installation and Maintenance***[4] ***(Based on the 7585, 3172, 9585, or 9577)*** Provides information on installing and maintaining the service processor based on PS/2 Types 7585, 3172, 9585, or 9577. Can be for systems with microcode that has up to and including EC D46130 (any level) installed.
 SY33-2120	***IBM 3745 Communication Controller Models A***[3] ***IBM 3746 Expansion Unit Model 900*** ***IBM 3746 Nways Multiprotocol Controller Model 950*** ***Service Processor Installation and Maintenance***[4] ***(Based on the 7585, 3172, or 9585)*** Provides information on installing and maintaining the service processor based on PS/2 Types 7585, 3172, or 9585. Can be for systems with microcode EC F12380 or higher installed.
 SY33-2118	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Multiaccess Enclosure Installation and Maintenance***[4] Provides information on installing and maintaining the Multiaccess Enclosure (MAE).
 SY33-2112	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Network Node Processor Installation and Maintenance***[4] ***(Based on the 7585 or 3172)*** Provides information on installing and maintaining the network node processor based on the PS/2 Type 7585 or 3172.
 SY33-2056	***IBM 3745 Communication Controller Models 210 to 61A*** ***Maintenance Information Reference***[1] Provides in-depth hardware reference information on the IBM 3745 Models X10 and X1A.

Table J-5 (Page 3 of 4). Service Documentation for the 3745 Models x10 and x1A, and 3746 Model 900

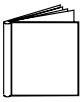
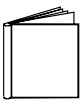
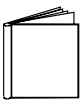
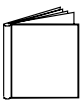
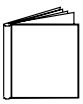
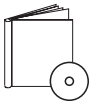
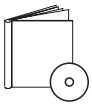
	SY33-2075	***IBM 3745 Communication Controller*** ***All Models***[5] ***External Cable References***[1] Provides references to console and line cables used for connecting the IBM 3745 Models 130 to 61A.
	SY33-2117	***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***External Cable Reference***[6] Provides references to console and line cables used for connecting the IBM 3746 Models 900 and 950.
	S135-2015	***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Parts Catalog***[6] Provides reference information for ordering parts for the IBM 3746 Models 900 and 950.
	S135-2010	***IBM 3745 Communication Controller*** ***Models 210 to 61A*** ***Parts Catalog***[1] Provides reference information for ordering IBM 3745 Models X10 and X1A parts.
	S135-2014	***IBM Controller Expansion*** ***Parts Catalog*** Provides reference information for ordering parts for the controller expansion attached to the IBM 3745 Models A[3], and 3746 Models 900 and 950.

Table J-5 (Page 4 of 4). Service Documentation for the 3745 Models x10 and x1A, and 3746 Model 900

CD-ROM Bibliography

 ZK2T-8214	***IBM Networking Softcopy Collection Kit*** Allows service manuals consulting via CD-ROM viewer. EMEA version.
 ZK2T-8187	***IBM Networking Softcopy Collection Kit*** Allows service manuals consulting via CD-ROM viewer. US version.

[1] Documentation shipped with the 3745.
[2] Documentation shipped with the 3746-900.
[3] 3745 Models 17A to 61A.
[4] Documentation shipped with the processor.
[5] 3745 Models 130 to 61A.
[6] Documentation shipped with the 3746 Models 900 and 950.

Additional Service Documentation for the IBM 3745 Models 130, 150, 160, 170, and 17A

Table J-6. Additional Service Documentation for the 3745 Models 1x0 and 17A

This service documentation has the following formats:

SY33-2079	***IBM 3745 Communication Controller Models 130, 150, 160, 170, and 17A*** ***Service Master Index***[1] Provides references for finding information in the IBM 3745 Models 1X0 and 17A shipping group documentation.
SY33-2067	***IBM 3745 Communication Controller Models 130, 150, 160, 170, and 17A*** ***Installation Guide***[1] Provides instructions for installing or relocating the IBM 3745 Models 1X0 and 17A.
SY33-2069	***IBM 3745 Communication Controller Models 130, 150, 160, and 170*** ***Service Functions***[1] Describes MOSS functions using the IBM 3745 Models 1x0 and 17A consoles.
SY33-2070	***IBM 3745 Communication Controller Models 130 to 17A*** ***Maintenance Information Procedures***[1] Provides procedures for isolating and fixing the IBM 3745 Models 1X0 and 17A problems.
S135-2012	***IBM 3745 Communication Controller Models 130 to 17A*** ***Parts Catalog***[1] Provides reference information for ordering IBM 3745 Models 1X0 and 17A parts.
SY33-2066	***IBM 3745 Communication Controller Models 130, 150, 160, and 170*** ***Hardware Maintenance Reference***[1] Provides in-depth hardware reference information on the IBM 3745 Models 1X0 and 17A.

[1] Documentation shipped with the 3745.

Glossary

ac. alternating current

ACPW. AC power (box)

AFD. airflow detector

alarm. A message sent to the MOSS console. In case of an error a reference code identifies the nature of the error.

alert. A message sent to the host console. In case of an error a reference code identifies the nature of the error.

AMD. air moving device

APPN. advanced peer-to-peer networking

ARC. active remote connector

ARC1A1. ARC V.24 DCE attachment with 5 meter tethered cable

ARC1A2. ARC V.24 DCE attachment with 15 meter tethered cable

ARC1B. ARC V.24 DTE attachment with 15 meter tethered cable

ARC1C. ARC V.24 DCE 3745 interface with 5 meter tethered cable

ARC1D. ARC V.24 DTE 3745 interface with 5 meter tethered cable

ARC1E. ARC V.24 3174 AEA interface (1)

ARC1F. ARC V.24 3174 PCA EIA interface (1)

ARC2A. ARC V.25 autocall interface with 5 meter tethered cable

ARC2C. ARC V.25 autocall interface 3745 with 5 meter tethered cable

ARC3A1. ARC V.35 DCE attachment with 5 meter tethered cable

ARC3A2. ARC V.35 DCE attachment with 15 meter tethered cable

ARC3B. ARC V.35 DTE attachment with 15 meter tethered cable

ARC3C. ARC V.35 DCE 3745 interface with 5 meter tethered cable

ARC3D. ARC V.35 DTE 3745 interface with 5 meter tethered cable

ARC4A1. ARC X.21 DCE attachment with 5 meter tethered cable

ARC4A2. ARC X.21 DCE attachment with 15 meter tethered cable

ARC4B. ARC X.21 DTE attachment with 15 meter tethered cable

ARC4C. ARC V.21 DCE 3745 interface with 5 meter tethered cable

ARC4D. ARC V.21 DTE 3745 interface with 5 meter tethered cable

ARC5A. Reserved

ARC5B. Reserved

ARC5C. ARC RS-422 3708 interface (or RJ-11 connection) (1)

ARC5D. ARC RS-422 IBM Cabling System interface (1)

ARC6A. ARC V.25 autocall interface with 15 meter tethered cable

ARC6C. ARC V.25 autocall 3745 interface with 15 meter tethered cable

BA. basic access

BAS. basic board

BATS. basic assurance tests

BER. box event record

BLPU. basic level packaging unit

BMI. bit multiplex interface

box event record (BER). Information about an event detected by the controller. It is recorded on the disk/diskette and can be displayed on the operator console for event analysis.

bps. bits per second

BSC. binary synchronous communication

BSI. bus synchronism interface

C. Celsius

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C&SM. customer and service information

CA. channel adapter

cache. A high-speed buffer storage that contains frequently accessed instructions and data; it is used to reduce access time.

CB. circuit breaker

CBA. controller bus adapter

CBC. controller bus coupler

CBR. circuit burst request

CBSA. controller bus and service adapter (CBSP+CBC+TIC3)

CBSP. controller bus and service processor

CBTRA. controller bus and token-ring adapter (TRP+CBC+TIC3)

CBTRM. cable terminator (IOC and DMA buses)

CCITT. Comite Consultatif International Telephonique et telegraphique

CCU. central control unit

CDF. configuration data file (3745)

CDF-E. configuration data file extended (37CS)

CE. customer engineer

CEPT. Comite Europeen des Postes et Telecommunications

CLA. communication line adapter (CLP+LICnn)

CLDP. controller load/dump program

clear channel. Mode of data transmission where the data passes through the DCE and network, and arrives at the receiving communication controller (for example, the IBM 3745) unchanged from the data transmitted. The DCE or network can modify the data during transmission because of certain network restrictions, but must ensure the received data stream is the same as the transmitted data stream.

CLP. communication line processor

CMIP. common management interface protocol

CNM. communication network management

CP. 1.communication processor 2.control program 3.circuit protector 4.control point

CPLR. coupler

CPN. customer problem number

CPx. FRU name of circuit protector

CRC. cyclic redundancy check character

CS. connectivity switch

CSA. common subassembly

CSB. connectivity switch bus

CSC. connectivity switch cable

CSCE. connectivity switch cable extension

CSM. centralized support module

CSP. central service point

CSS. control subsystem (3745)

CTDA. configuration target device (processor) address

dc. direct current

DCAF. Distributed Console Access Facility (licensed program)

DCCS. DC to connectivity subsystem

DCE. data circuit-terminating equipment

DCDP. DC distribution and protection (box)

DCM. diagnostic control monitor

DCPW. DC power box

DICO. DMA IOC connection card

DM. distribution manager

DMA. direct memory access

DS. data storage

DSB. data storage bus

DSI. data storage interface

DSM. data storage manager

DSS. data storage interface for SBA

DSU. data service unit (DCE-like for high-speed communication lines)

DTE. data terminal equipment

EC. engineering change

EE. extended edition

EIA. Electronic Industries Association

EPO. emergency power-off

EPROM. eraseable PROM

ESCA. ESCON adapter

ESCC. ESCON coupler

ESCON*. Enterprise Systems Connection

ESCP. ESCON processor

ESD. electrostatic discharge

EXP. expansion enclosure

EXP1. first expansion enclosure

EXP2. second expansion enclosure

FCS. frame check sequence

FRU. field-replaceable unit

HCS. Hardware Central Service

HDLC. high-level data link control

hex. hexadecimal

host processor. (1) A processor that controls all or part of a user application network. (2) In a network, the processing unit in which the access method for the network resides. (3) In an SNA network, the processing unit that contains a system services control point (SSCP). (4) A processing unit that executes the access method for attached communication controllers. Also called *host.*

HPPB. high-performance parallel bus

HSC. hardware support center

HSF. hardware service facility

Hz. Hertz

IBM service representative. An individual in IBM who performs maintenance services for IBM products or systems.

IEEE. Institute of Electrical and Electronics Engineers

IML. initial microcode load

initial microcode load (IML). The process of loading the microcode into a scanner or into MOSS.

initial program load (IPL). The initialization procedure that causes the 3745 control program to commence operation.

IO. input/output

IOC. input/output control

IOCB. input/output control bus

IPL. initial program load

IRAM. instruction random access memory

ISO. International Organization for Standardization

kbps. kilobits per second

LA. line adapter

LAN. local area network

LCB. line connection box

LED. light-emitting diode

LIC. line interface coupler

LICx. FRU name of line interface coupler type x (3745)

LLC. logical link control

LS. local storage

LSA. link service architecture

LSCT. LIM software configuration table

LSM. local storage manager

LSSD. level-sensitive scan design (total hardware latches chain collection)

LU. logical unit

MAC. medium access control

MAE. Multiaccess enclosure

MAP. maintenance analysis-procedure

MAU. multistation access unit

MB. megabyte; 1 048 576 bytes

MCF. microcode fix

MCL. microcode change level

MES. miscellaneous equipment specification

MG. motor generator

MI. maskable interrupt

microcode. A program, that is loaded in a processor (for example, the MOSS processor)

MLA. MOSS LAN adapter

MMIO. memory mapped input/output

maintenance and operator subsystem (MOSS). The part of the controller that provides operating and servicing facilities to the customer's operator and the IBM service representative.

MOSS. maintenance and operator subsystem (3745)

MOSS-E. maintenance and operator subsystem extended (37CS)

NA. network addressable

NCP. Network Control Program

NDM. netview distribution manager

NetView. An IBM licensed program used to monitor a network, manage it, and diagnose its problems.

Network Control Program (NCP). An IBM licensed program that provides communication controller support for single-domain, multiple-domain, and interconnected network capability.

NMI. non-maskable interrupt

NMVT. network management vector transport

NNP. network node processor

NODA. next origin device (processor) address

NPM. NetView performance monitor

NTDA. next target device (processor) address

OEMI. original equipment manufacturer's interface

OLT. online test

online tests. Testing of a remote data station concurrently with the execution of the user's programs (that is, with only minimal effect on the user's normal operation).

OSI. open system interconnect

PA. primary access

PBC. packet burst control

PBG. packet burst grant

PCR. 1.pico-processor command register 2.power check reset

PICA. process and intertask communication architecture

PMH. problem management hardware

PN. part number

PNL. control panel

POR. power-ON reset

PP. pico-processor

PPB. primary power box

PRC. processor

PRDA. packet request device (processor) address

PROM. programable read-only memory

PS. power supply

PSI. packet switch interface

PSN. public switched network

PTCE. product-trained CE

PTF. program temporary fix

PTT. Post, Telephone and Telegraph (agency)

PU. physical unit

RETAIN. Remote Technical Assistance Information Network

RNR. receiver not ready

RPL. remote program load

RPO. remote power-off

RSC. remote service center

RSF. remote support facility

RVX. stands for RS232, RS422, V.24-35, X.21-2x connections

SAC. switch adapter card

SATS. specific assurance tests

SBA. switch bus adapter

SBI. switch bus interface

SC. switch control

SDLC. synchronous data link control

SEI. switch extension interface

SL. service logic

SNA. Systems Network Architecture

SNMP. Simple network management protocol

SPD1. signal and power distribution type 1

SPD2. signal and power distribution type 2

SPDL. signal and power distribution card in LCB

SPS. service and power support

SQL. structured query language

SRC. system reference code

SSA. system service architecture

SSCP. system services control point

STCn. signal transfer card n

SSS. subsystem support service

Systems Network Architecture (SNA). The description of the logical structure, formats, protocols, and operational sequences for transmitting information through a user application network. The structure of SNA allows the users to be independent of specific telecommunication facilities.

TB. terminator block

TDM. time division multiplexing

TDR. technical data record

TERC. terminator card

TIC1. token-ring interface coupler type 1 (3745) running at speed of 4 Mbits

TIC2. token-ring interface coupler type 2 (3745) running at speed of 4 or 16 Mbits

TIC3. token-ring interface coupler type 3 (37CS) running at speed of 4 or 16 Mbits

time out. The time interval allotted for certain operations to occur.

TPS. two-processor switch

TR. token-ring

TRA. token-ring adapter (TRP+TIC3)

TRFM. transformer

TRP. token-ring processor

TRS. transmitter/receiver subassembly

UEPO. unit emergency power-off

URSF. universal remote support facility

UTP. Unshielded twisted pair cable

V. volt

V.24. CCITT V.24 recommendation

V.25. CCITT V.25 recommendation

V.28. CCITT V.28 recommendation

V.35. CCITT V.35 recommendation

VPD. vital product data

VTAM*. Virtual Telecommunications Access Method

VTL. vendor technology logic

W. watt

X.21. CCITT X.21 recommendation

X.25. CCITT X.25 recommendation

YZxxx. wiring diagram

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3746 Nways Multiprotocol Controller
Models 900 and 950
Multiaccess Enclosure
Installation and Maintenance

Publication No. SY33-2118-03

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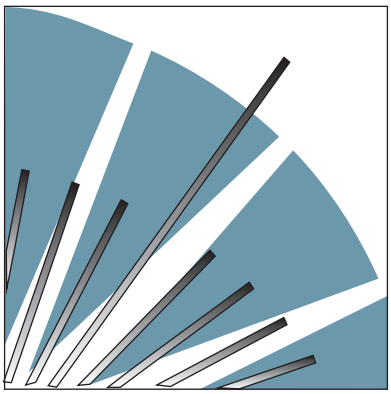

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