RS/6000 7317 Models F3L and D10

Installation and Service Guide

SA38-0537-01

Second Edition (July 1997)

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Contents

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying manuals.

Federal Communications Commission (FCC) Statement

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference,and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial

environments to provide reasonable protection against interference with licensed communication equipment.

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

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Canadian Department of Communications Compliance Statement

This Class A digital apparatus meets the requirements of the Canadian Interference–Causing Equipment Regulations.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

The following is a summary of the VCCI Japanese statement in the box above.

This equipment is in the Class 1 category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc.

Read the instructions for correct handling. VCCI-1.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

Electrical Safety

Observe the following safety instructions any time you are connecting or disconnecting devices attached to the 7317 Model F3L or the 7317 Model D10.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

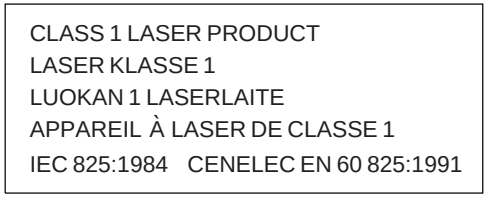
CAUTION:
This product is designed to support dual -48 V dc feeds. Care must be exercised when removing power from the system to ensure both -48 V dc feeds are de-energized.

This product is designed with two ground points. Both may be used, but, at least one must be connected to earth ground.

CAUTION:
This unit has more than one power supply cord. To reduce the risk of electrical shock disconnect two power supply cords before servicing.

Laser Safety Information

The optical drive in this system unit is a laser product. The optical drive has a label that identifies its classification. The label, located on the drive, is shown below.



The optical drive in this system unit is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 (1st edition 1984) and CENELEC EN 60 825:1991 for Class 1 laser products.

CAUTION:
A class 3 laser is contained in the device. Do not attempt to operate the drive while it is disassembled. Do not attempt to open the covers of the drive as it is not serviceable and is to be replaced as a unit.

Class 1 laser products are not considered to be hazardous. The optical drive contains internally a Class 3B gallium-arsenide laser that is nominally 30 milliwatts at 830 nanometers. The design incorporates a combination of enclosures, electronics, and redundant interlocks such that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

About This Book

This book provides maintenance information that is specific to the system unit, adapters, and attached devices that do not have their own service information. It also contains Maintenance Analysis Procedures (MAPs) that are not common to other systems.

MAPs that are common to all systems are contained in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

This book is used by the service technician to repair system failures. This book assumes that the service technician has had training on the system unit.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

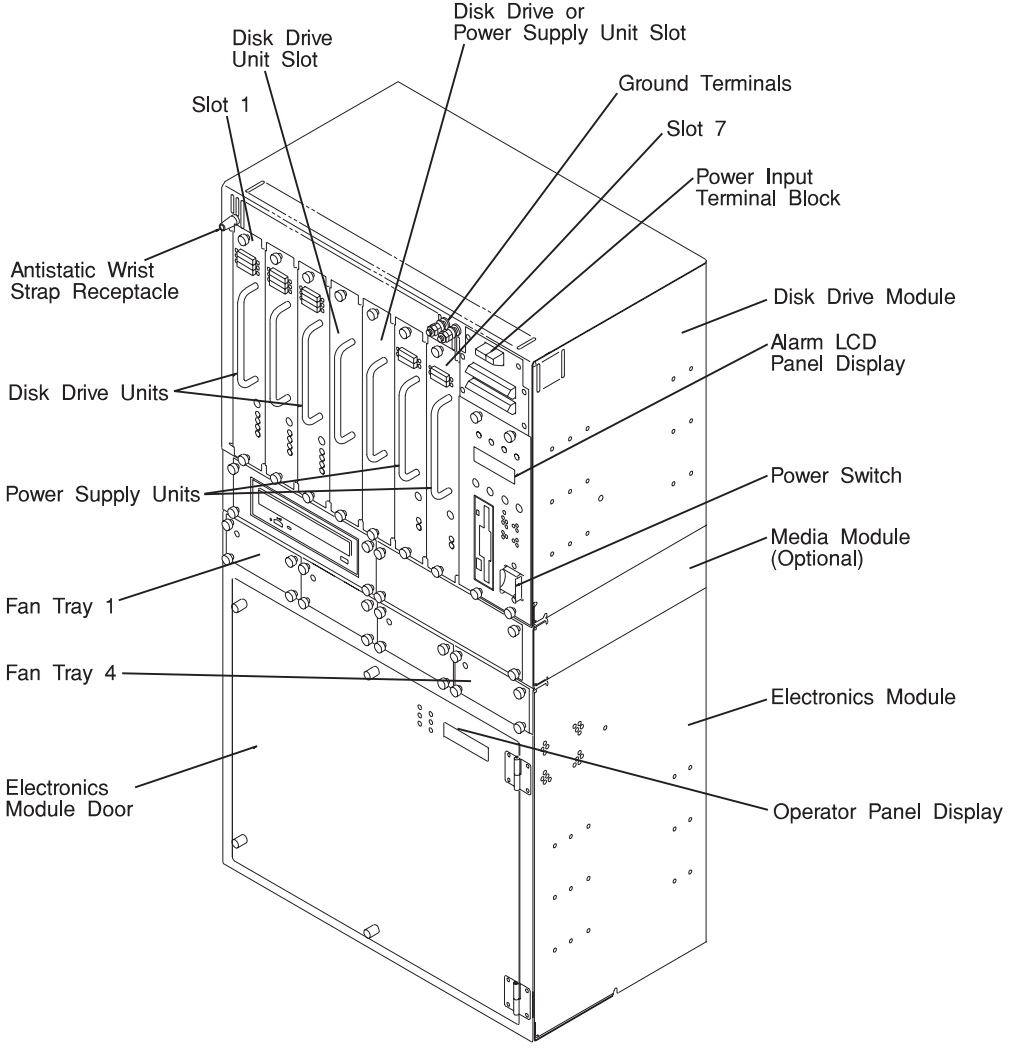
The following publications are available for purchase:

- The *RS/6000 7317 Models F3L and D10 User's Guide*, form number *SA38-0536*, contains information to help users set up, install options, configure, modify, and solve minor problems.
- The *RS/6000 Diagnostic Information for Multiple Bus Systems*, form number *SA38-0509*, contains common diagnostic procedures, error codes, service request numbers, and failing function codes. This manual is intended for trained service technicians.
- The *RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems* form number *SA38-0516*, contains information about adapters, external devices, and cabling. This manual is intended to supplement information found in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
- The *Site and Hardware Planning Information*, form number *SA38-0508*, contains information to help plan for installation of the system hardware.

Chapter 1. Reference Information

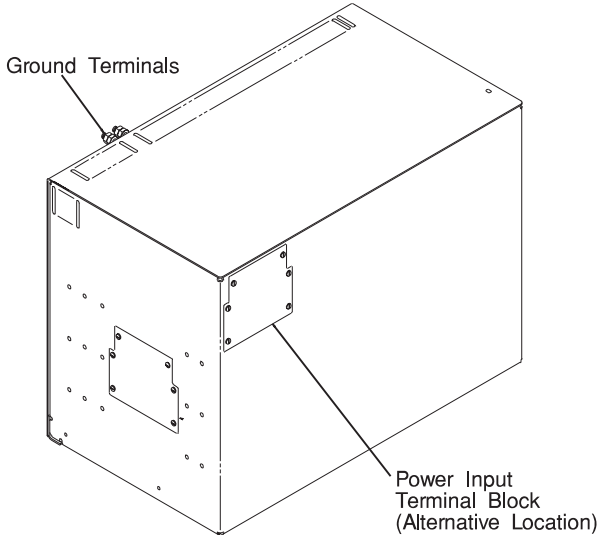
7317 Model F3L System Unit Locations

System Unit with Optional Media Module (Front View)

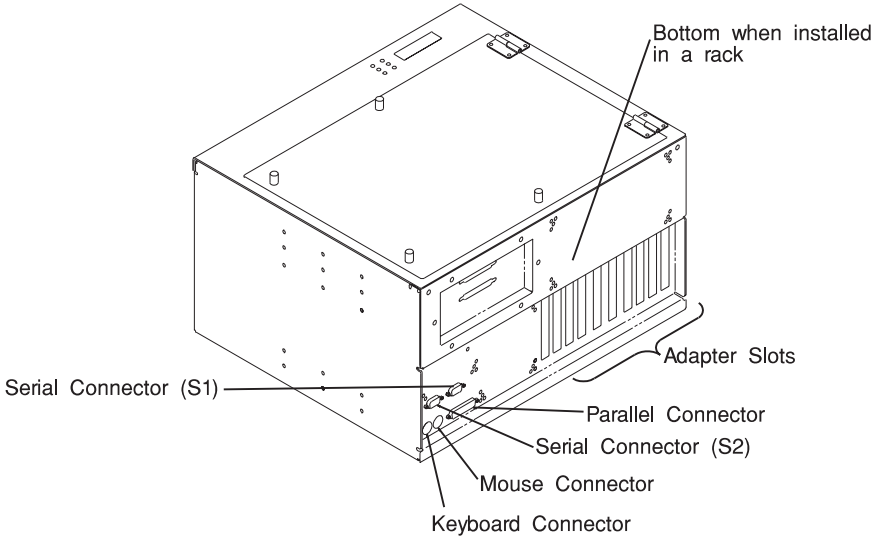


Note: The operator panel display shown above, may be mounted above the electronics module door of your system. See page D-2 for this view of the system.

System Electronics Module (Rear View)

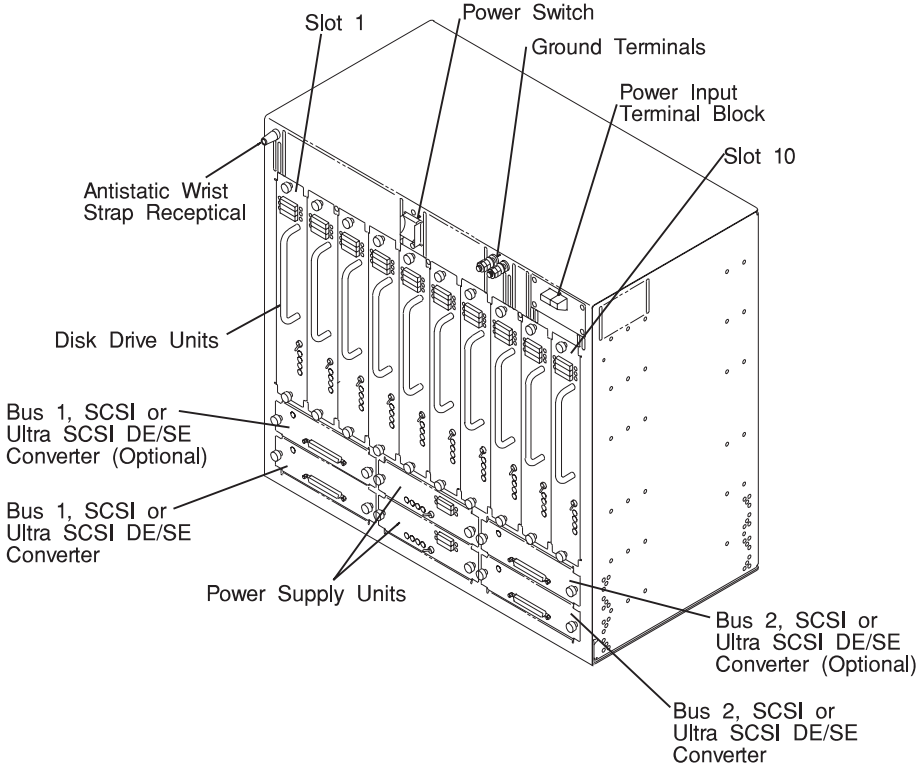


System Electronics Module (Bottom View)

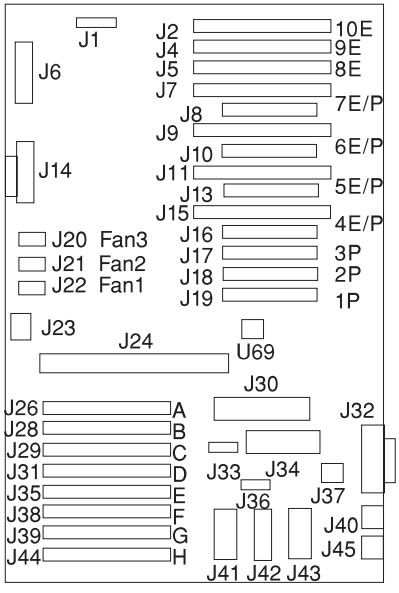


7317 Model D10 DASD Expansion Unit Locations

DASD Expansion Unit (Front View)



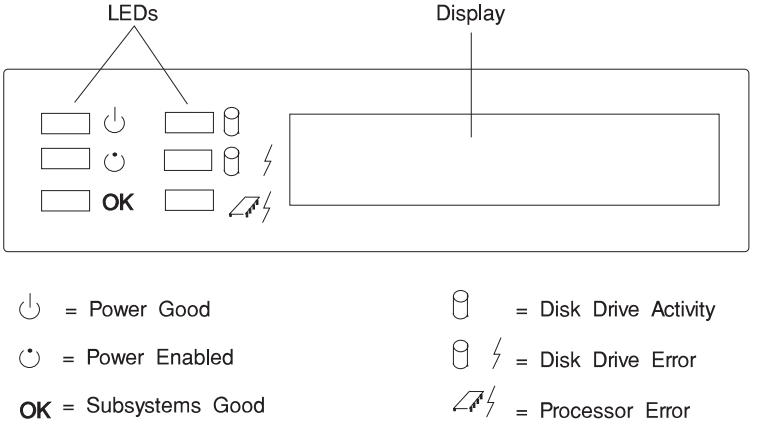
System Board Locations



J1	Operator panel connector
J2, J4, J5	ISA connectors
J6	Diskette drive connector
J7, J8	Shared PCI/ISA connectors
J9, J10	Shared PCI/ISA connectors
J11, J13	Shared PCI/ISA connectors
J14	Internal SCSI connector
J15, J16	Shared PCI/ISA connectors
J17, J18, J19	PCI connectors
J20	Fan power connector
J21	Fan power connector
J22	Fan power connector
J23	Security connector
J24	CPU card connector
J26, J28, J29, J31	Memory module connectors
J35, J38, J39, J44	Memory module connectors

J30	Hardware service processor connector
J32	Parallel port connector
J33	I^2c connector
J34	Serial port connector (9-pin)
J36	Jumpers
J37	Power
J40	Mouse connector
J41, J42, J43	Power
J45	Keyboard connector
U69	VPD module

Operator Panel



Operator Panel LED Status

The following table explains the functions of the operator panel LEDs.

LED Functions		
LED	**Status**	**Definition**
Power Good	On	System power is On
	Off	System power is Off
Power Enabled	On	System power is On
	Off	Power not connected to system
	Blinks slowly	Power is connected to system/standby mode
	Blinks rapidly	AIX memory dump has been initiated by start/stop method
OK	On	System electronics are not reporting errors
	Off	System electronic failures are detected
Disk Drive Activity	On	Disk drive active
		Also used for POST error indications in conjunction with speaker beep and diskette LED
Disk Drive Error		Not used by base system, available for disk drive applications to report errors
Processor Error	On	System experienced (1) heartbeat detection lapse. (2) EPOW condition (fans, temperature, voltage).

The power on/off pushbutton, and light-emitting diodes (LEDs) on the front of your server allow you control power to the server, observe system power status, and observe disk activity.

These features also have other built-in capabilities to assist you in diagnosing system problems and observing system status:

- As soon as the system unit is connected to a power source, the power enabled LED will begin blinking slowly (about 2 flashes per second) to indicate that power is connected to the system, even though the system unit is **not** powered on or running.
- When the system unit is turned on by pressing the power on/off button, the power enabled LED lights steadily.

If the operating system is loaded and running, a memory dump of system information can be requested.

- To enable this function, the **sysdumpdev -K** command must be executed before an error condition exists.
- To request a memory dump, press and hold the start/stop switch for longer than two seconds. Requesting a memory dump directs the operating system to save system information to a predefined file before turning off the system. This feature can be used to assist in recovery from system problems.
- When a memory dump has been requested the power enabled LED will blink quickly (about 10 flashes per second) to indicate that the dump has been started. This blinking will cease after about a minute whether or not the dump is complete, and the LED will return to its steady, lit state until the system turns off or reboots when the dump is complete.
- The memory dump file can be viewed by entering the AIX command **sysdumpdev -L**

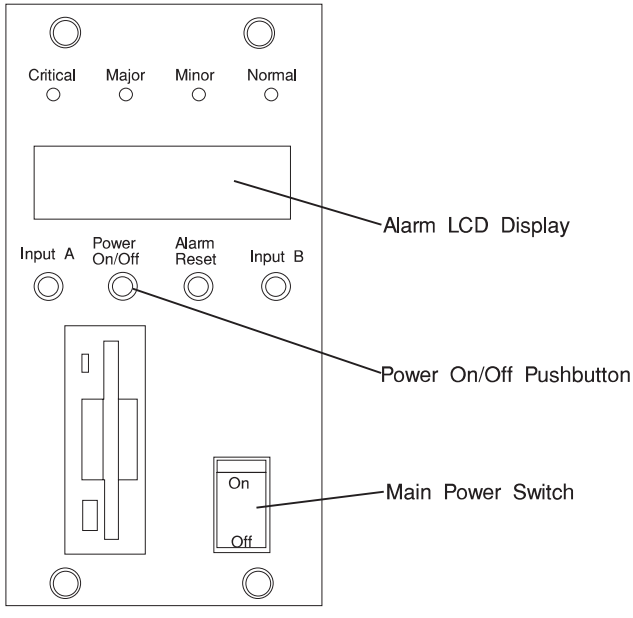
The disk drive activity LED lights whenever the hard disk drives within the server are being used.

The disk drive activity LED also provides basic system diagnostic information:

- If no memory can be found as the system boots, the disk drive activity LED lights and the system stops the boot process.
- If an error is detected in the firmware boot program, this LED will light and the system will stop, and the diskette activity LED will begin blinking. This condition indicates that the system is requesting a Firmware Recovery Diskette, which should be made to facilitate resolution of system problems. For instructions on

creating a Firmware Recovery Diskette, see Chapter 7, “System Management Services” on page 7-1.

Telco Alarm LCD Display Panel



Alarm LCD Display Panel		
Function	**Status**	**Definition**
Normal LED	On	System is operating normally
	Off	An error has been detected
Minor LED	On	Minor error detected
	Off	No minor error detected
Major LED	On	Major error detected
	Off	Major error not detected
Critical LED	On	Critical error detected
	Off	Critical error not detected
Input A	Pushbutton	Not used by system
Power On/Off	Pushbutton	Enables the system to turn power on and load the operating system
Alarm Reset	Pushbutton	Resets the TELCO alarm after it is turned on
Input B	Pushbutton	Not used by system
Main Power Switch	Toggle Switch	Applies or removes power to the system power supplies

Specifications

The mechanical packaging, cooling, power supply, and environmental requirements for the server are shown in the following:

Dimensions

	7317 Model F3L		7317 Model D10
	w/o Media	**with Media**	
Height	746 mm(29.4 in)	823 mm(32.4 in)	464 mm(18.3 in)
Depth	254 mm(10 in)	254 mm(10 in)	250 mm(9.9 in)
Width	440 mm(17.3 in)	440 mm(17.3 in)	490 mm(19.3 in)

Weight (Maximum)

7317 Model F3L	7317 Model D10
72.6 kg (160 pounds)	45.4 kg (100 pounds)

Operating Environment - Class C

Temperature: 10° to 40°C (50° to 104°F)
Humidity: 8 to 80% noncondensing, or 20 to 80% noncondensing relative humidity when magnetic tape media is installed.
Wet Bulb: 27°C (80.6°F)
Maximum Rate of Temperature Change: 15°F (8.3° C) per hour
Altitude: -61 to 1829 m (-200 to +6000 feet)
Random Vibration, 3 Axis: 2.0G's 10 to 2000Hz
Sine Vibration, 3 Axis: 1.0G's. 10 to 2000Hz
Shock, 3 Axis: 12G's, 1/2 Sine, 10 mSec

Non-Operating Environment - Class C

Temperature: 10° to 52°C (50° to 126.5°F)
Humidity: 8 to 80%
Wet Bulb: 27degree.C (80.6°F)
Altitude: -305 to 12,192 m (-1000 to 40,000 feet)

Acoustic Noise Limit

60 dBA

Power Source Loading (maximum)

7317 Model F3L	7317 Model D10
400 watts max	240 watts max

Power Supply

7317 Model F3L	7317 Model D10
180 watts each power supply unit	25 watts each power supply unit
25 watts each disk drive unit	25 watts each disk drive unit

Operating Voltage

-40 V dc to -65 V dc

Heat Output (Maximum)

7317 Model F3L	7317 Model D10
1100 BTU per hour	600 BTU per hour

Power Cables

It is the responsibility of the installing organization to provide all power wiring from the service fuse location to the system unit; using all appropriate telephone company specifications. In addition the following requirements must be met:

1. -48 V power lead must be 14 gauge.
2. Return must be 14 gauge.
3. -48 V must be a fused lead with a fuse not to exceed 12 Amps for each feed.
4. The unit ground lead must be the same gauges as the power and return leads.

CAUTION:
This unit has more than one power supply cord. To reduce the risk of electrical shock disconnect two power supply cords before servicing.

DC Power cables (-48 V dc)

Note: The 7317 F3L and D10 -48 V dc systems must be connected to at least one -48 V dc supply source which is electrically isolated from its AC power source. In addition, the -48 V dc supply source is to be reliably connected to earth (grounded).

A second -48 V dc source may be added. This second source must also be electrically isolated from its AC power source and be reliably connect to earth (grounded).

Power and ground wire used in the United States and Canada should be listed by Underwriters Laboratories (UL) and certified by the Canadian Standards Association (CSA).

Power and ground wires should be a minimum 14 AWG standard copper.

Service Inspection Guide

Perform a service inspection on the system when:

- The system is inspected for a maintenance agreement.
- Service is requested and service has not recently been performed.
- An alterations and attachments review is performed.
- Changes have been made to the equipment that may affect the safe operation of the equipment.
- External devices with their own power cables have those cables attached.

If the inspection indicates an unacceptable safety condition, the condition must be corrected before anyone can service the machine.

Note: The correction of any unsafe condition is the responsibility of the owner of the system.

Perform the following checks:

1. Check the covers for sharp edges and for damage or alterations that expose the internal parts of the system unit.
2. Check the covers for proper fit to the system unit. They should be in place and secure.
3. Gently rock the system unit from side to side to determine if it is steady.
4. Set the power switch of the system unit and disk drive unit to Off.
5. Remove the covers.
6. Check for alterations or attachments. If there are any, check for obvious safety hazards such as broken wires, sharp edges, or broken insulation.
7. Check the internal cables for damage.
8. Check for dirt, water, and any other contamination within the system unit.
9. Check the voltage label on the back of the system unit and disk drive unit to ensure that they match the voltage at the outlet.
10. Check the external power cable for damage.
11. With the external power cable connected to the system unit, check for 0.1 ohm or less resistance between the ground lug on the external power cable plug and the metal frame.
12. Perform the following checks on each device that has its own power cables:
    a. Check for damage to the power cord.

b. Check for the correct grounded power cable.

c. With the external power cable connected to the device, check for 0.1 ohm or less resistance between the ground lug on the external power cable the metal frame of the device.

13. Install the covers.

Chapter 2. Installation:

This chapter provides instructions for installing the 7317 Models F3L and D10 into a standard 19 or 23-inch rack. The 7317 Model D10 can be installed in a 23-inch rack. The 7317 Model F3L is installed first, then in a later part of the procedure the 7317 Model D10 is installed.

Attention: This equipment is intended for installation in a restricted access location over a concrete floor or other noncombustible surface only.

Installation: 7317 Model F3L

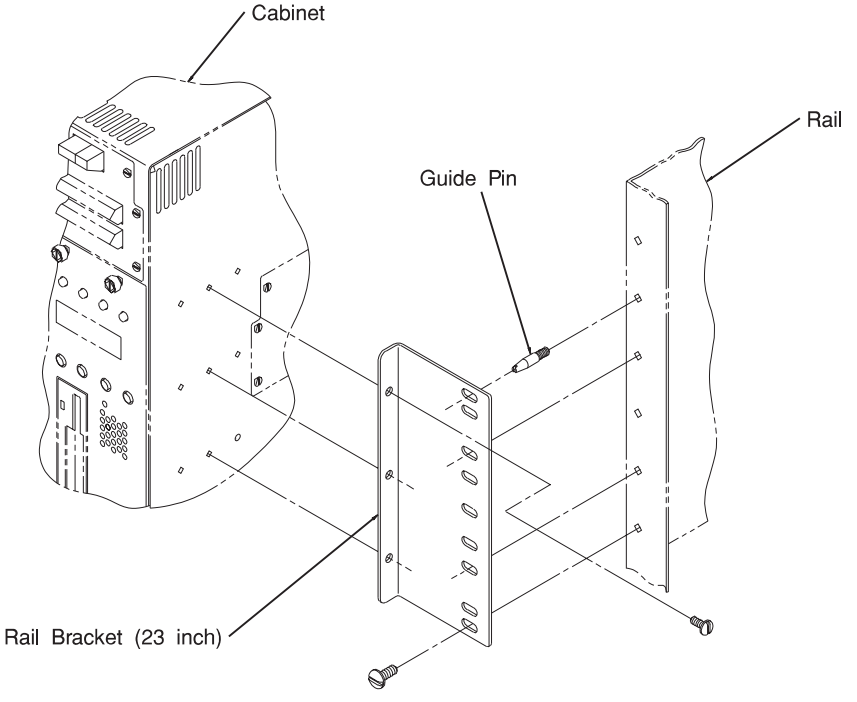
Step 1. Installing the System Unit in the Rack

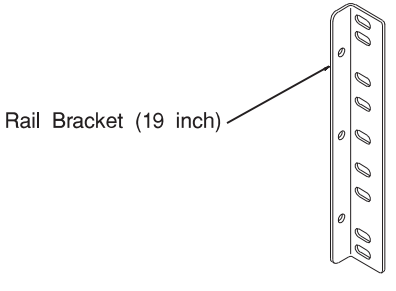
1. Before removing the system from its shipping packaging, remove all disk drive units, blank covers, fan trays, and power supply units by loosening the two thumb screws on each unit and pulling each out using its individual handle. Note the location of each unit for later re-installation.
2. Loosen the four thumb screws on the electronics module door, open the door, (disconnect the cables from the operator panel display if it is mounted on the door), lift the door off its hinges, and set it aside taking care not to damage the EMI gasket magerial around its inside edges.

   CAUTION:
   This unit weighs betweem 18kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less than two persons to move it can result in injury.

   ATTENTION:
   The handles are designed to support the weight of the individual units only, and should not be used to lift or guide the entire system.

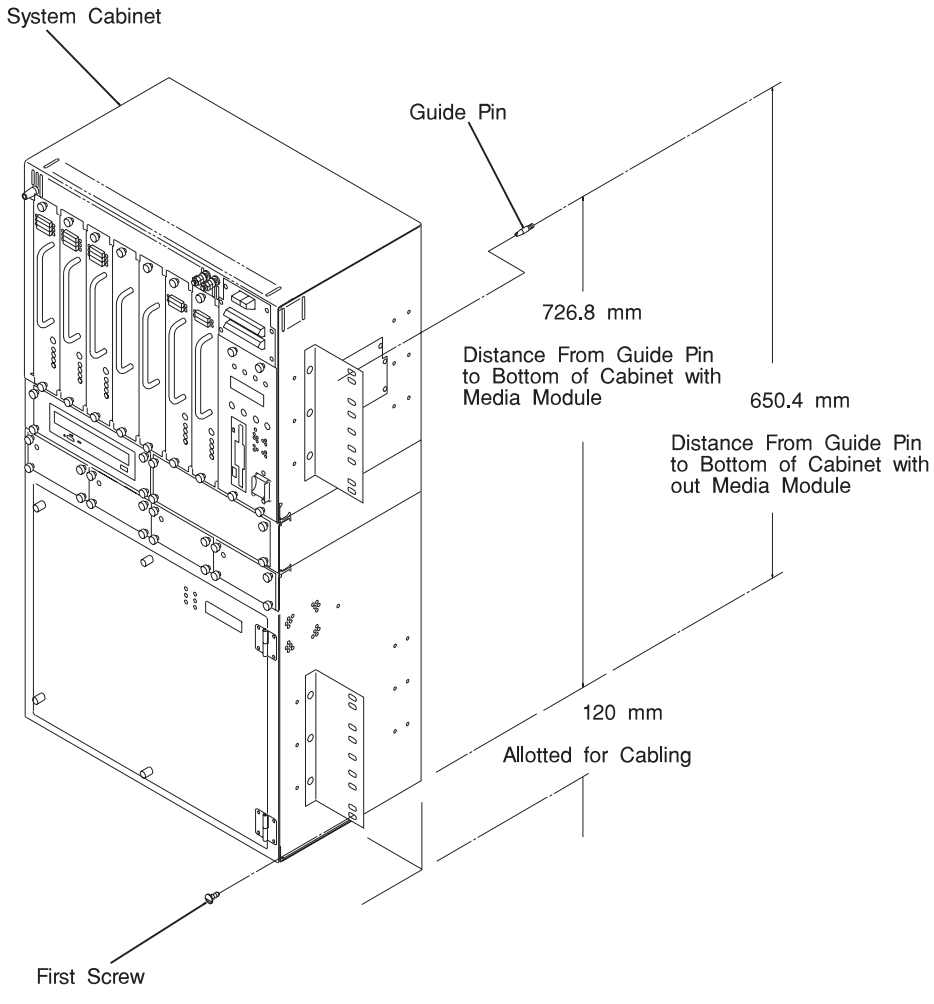
3. Attach the side brackets to the system unit and disk drive unit for the appropriate size rack (19 or 23 inch).





4. Put the guide pins in the rack at the desired height position.

   Note: Locate the system such that there is 120 mm minimum clearance beneath the system electronics unit for cable egress.



5. Lift the system onto the guide pins in the rack.
6. Holding the system on the pins and against the rack, install at least one screw on each side of the system cabinet near the bottom.
7. Install at least four more screws on each side of the system cabinet.
8. Reinstall all disk drives, blank covers, fan trays, and power books into their original locations and insure the switch on all power supply units is in the “on” (upward) position.
9. Reinstall the electronics module door, take care to install the connector for the operator panel display in its original position.

Step 2. Observe this Safety Notice during Installation

Note: For a translation of the following notices, see *System Unit Safety Information*, Order Number SA23-2652.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

CAUTION:
This product is designed to support dual -48 V dc feeds. Care must be exercised when removing power from the system to ensure both -48 V dc feeds are de-energized.

This product is designed with two ground points. Both may be used, but, at least one must be connected to earth ground.

DANGER

To prevent shock hazard, disconnect the power source at the TELCO fuse panel.

Step 3. Restricted Access Area Notice

The 7317 Model F3L system unit must be installed only in restricted access areas such as dedicated equipment rooms or equipment closets in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA No. 70.

Step 4. Setting Up the System Unit

1. Be sure the power cables to the system unit and disk drive unit are disconnected and the power switch is set to the “off” position.
2. Remove the packing material from all media devices installed in the front control panel and from those in the media module, if so configured.
3. Open the door of the electronics unit and insure that the CPU, memory, and adapter cards are properly positioned and fully seated by pushing down on each card.
4. Close the door and tighten the thumb screws finger tight.
5. Ensure power supply units, disk drive units, media, fan trays, and blank covers are fully seated and thumb screws are finger tight.

Step 5. Connecting Devices to Standard I/O Ports

Using the customer planning information, *RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems* or other information supplied by the customer, connect the cables to the standard I/O ports. Start at the left connector and move to the right to make cabling easier. Refer to the bottom view of the electronics unit for location of the I/O ports.

Step 6. Connecting Devices to the Adapters

Refer to the “About Your Machine” document to determine which adapters are installed.

Note: Standard “ground” receptacles are available on the system unit and disk drive unit for attaching an antistatic wrist strap.

1. Using the customer planning information, *RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems* or other information supplied by the customer, connect the cables to the adapter connectors. Start at the left connector and move to the right to make cabling easier.
2. Record the SCSI addresses of the devices attached to the SCSI I/O controllers in Appendix D, “Server Records” on page D-1 of this book. If needed, use the customer planning information, *RS/6000 Adapter, Device, and Cable Information*

for Multiple Bus Systems or other information supplied by the customer to determine the SCSI addresses.

Step 7. Arranging the System Unit and Devices

1. Connect the power cables to the power input terminal blocks on the system unit and DASD expansion unit. See Appendix B, “Terminal Block Definitions” on page B-1 for terminal block connector definitions.
2. Arrange the cables to the side of the system unit.
3. Using the customer's planning information, arrange the system unit and devices.
4. Go to Chapter 7. Using the System Verification Procedure of *RS/6000 7317 Models F3L and D10 User's Guide* to check out the system.

Step 8. Software Installation Considerations

If the operating system was not preloaded on the 7317 Model F3L system unit at the factory, and you are loading it now, the Enhanced Telecommunications Alarm Surveillance Control (ETASC) software should be loaded and run as a daemon on AIX. The ETASC software is shipped on a diskette with the system unit.

For more information about running the ETASC alarm software, refer to Chapter 5, “Alarm Interface and Error Logs” on page 5-1. This information is also contained in the *RS/6000 7317 Models F3L and D10 User's Guide*.

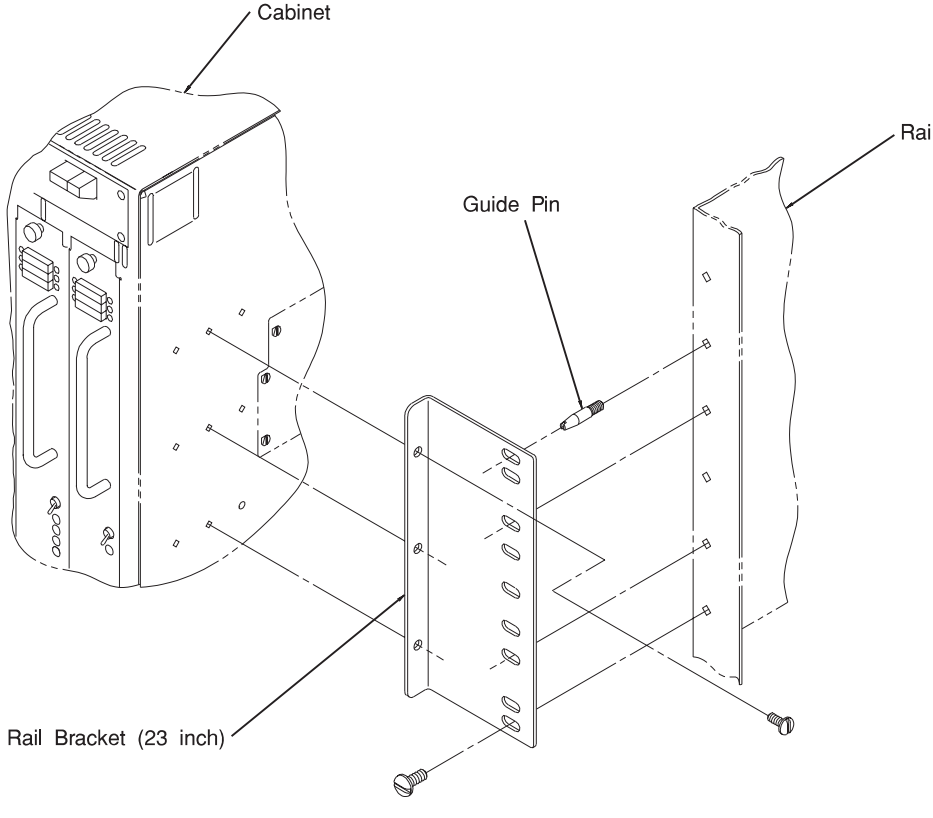
Step 1. Installing the Disk Drive Expansion Unit in the Rack

1. Before removing the cabinet from its shipping packaging, remove all disk drive units and blank covers by loosening the two thumb screws on each and then pulling them out using the individual handle. Note the location of each unit for later re-installation.

   CAUTION:
   This unit weighs betweem 18kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less than two persons to move it can result in injury.

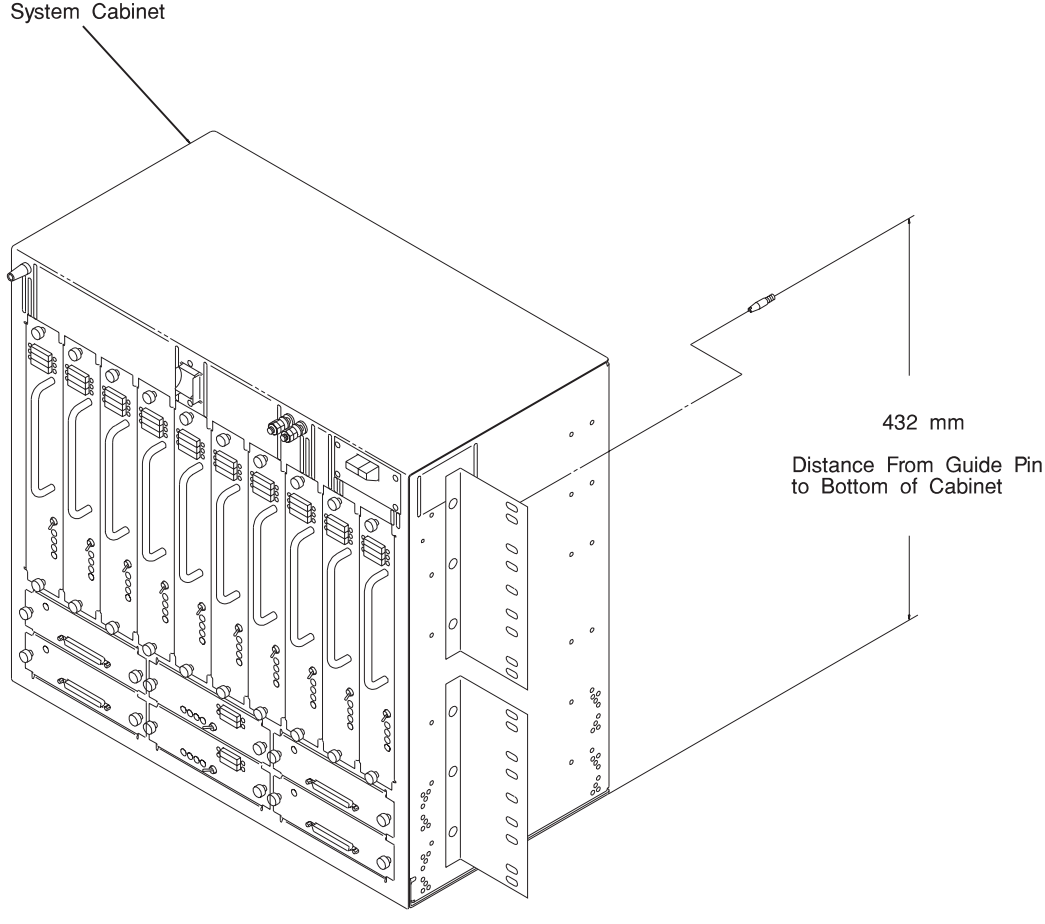
   ATTENTION:
   The handles are designed to support the weight of the individual units only, and should not be used to lift or guide the entire cabinet.

2. Attach the side brackets to the cabinet.



3. Put the guide pins in the rack at the desired height position.

   Note: The distance from the upper most hole for the guide pins to the bottom of the cabinet is 432 mm (17 inches).



4. Lift the cabinet onto the guide pins in the rack.
5. Holding the cabinet on the pins and against the rack, install at least one screw on each side of the cabinet near the bottom.
6. Install at least four more screws on each side of the cabinet.
7. Reinstall all disk drive units and blank covers into their original locations and insure the switches on all disk drive units are in the “on” (upward) position.

Step 2. Observe this Safety Notice during Installation

Note: For a translation of the following notices, see *System Unit Safety Information*, Order Number SA23-2652.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

CAUTION:
This product is designed to support dual -48 V dc feeds. Care must be exercised when removing power from the system to ensure both -48 V dc feeds are de-energized.

This product is designed with two ground points. Both may be used, but, at least one must be connected to earth ground.

DANGER

To prevent shock hazard, disconnect the power source at the TELCO fuse panel.

Step 3. Restricted Access Area Notice

The 7317 Model D10 disk drive expansion unit must be installed only in restricted access areas such as dedicated equipment rooms or equipment closets in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA No. 70.

Step 4. Setting Up the Disk Drive Expansion Unit

1. Be sure the power cables to the system unit and disk drive expansion unit are disconnected and the power switch is set to the “off” position.
2. Ensure power supply units, disk drive units, DE/SE converters, and blank covers are fully seated and thumb screws are finger tight.
3. Record the SCSI addresses of the devices attached to the SCSI I/O controllers in Appendix D, “Server Records” on page D-1. If needed, use the customer planning information, *RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems*, or other information supplied by the customer to determine the SCSI addresses.
4. Connect the power cables to the power input terminal blocks on the disk drive expansion unit. See Appendix B, “Terminal Block Definitions” on page B-1 for terminal block connector definitions.
5. Using the D-shell connectors on the 7317 Model D10 DE/SE convertors as keys, connect the appropriate left-hand-side and right-hand-side 1.5 or 3.0 meter SCSI cables between the 7317 Model D10 converters and the 7317 Model F3L SCSI adapter cards. Route cables outward and then along side and back of the cabinet mounting brackets.
6. Arrange the cables to the side of the system unit.
7. Turn power switch “on.”

Chapter 3. Maintenance Analysis Procedures (MAPs)

Entry MAP

Your system has TELCO specific hardware such as disk drive units, power supply units, and fan trays that can have errors that allow the system to continue to operate. The errors are indicated by fault LEDs on the failing unit, error entries in the AIX hardware error log, or error indications in the TELCO alarm LCD display panel.

Do you have a TELCO specific hardware error indication and the system is still operational?

NO Use the following table to determine your starting point.

YES Go to "MAP 1700: TELCO Specific Hardware Errors" on page 3-36.

Note: When possible, run Online Diagnostics in Service Mode. Online diagnostics perform additional functions, compared to Standalone Diagnostics. This will ensure that the error state of the system is captured in NVRAM for your use in fixing the problem. The AIX error log and SMIT are only available when diagnostics are run from the disk drive.

Symptom	Starting Point
You do not have a symptom.	Go to MAP 0020 in the *RS/6000 Diagnostic Information for Multiple Bus Systems*
You have an 8-digit error code.	Go to the "Quick Entry MAP" on page 3-2.
The system will not boot.	Go to the "Quick Entry MAP" on page 3-2.
You have an SRN.	Go to the Fast Path MAP in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
You have a problem that does not prevent the system from booting.	Go to the Fast Path MAP in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
The system stops and a 3-digit number is displayed in the operator panel display.	If the number displayed begins with the character "F" then go to Chapter 4, "Error Code to FRU Index" on page 4-1. Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel display, then go to the Fast Path MAP in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Quick Entry MAP Table of Contents

Symptoms	What You Should Do
Service Actions	
You have parts to exchange or a corrective action to perform.	1. Go to the *Removal and Replacement Procedures*. 2. Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
You need to verify that a part exchange or corrective action corrected the problem.	Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
You need to verify correct system operation.	Go to the *System Checkout Procedure* in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
8-Digit Error Codes	
You have an 8-Digit Error Code.	Look up "8-Digit Error" in Chapter 4, “Error Code to FRU Index” and do the listed action.
System Stops With a 8-Digit Number Displayed	
The system stops with an 8-Digit Error Code displayed when booting.	1. Record the 8-Digit Error Code. 2. Look up "8-Digit Error" in Chapter 4, “Error Code to FRU Index” and do the listed action.
There Appears to be a Display Problem (Distortion, Blurring, Etc.)	
A long beep followed immediately by a short beep is heard.	A display adapter problem is indicated. 1. Replace the graphics adapter.
All other display problems.	1. If using a graphics display, go to the *Problem Determination Procedures* for the display. 2. If you do not find a problem then replace the display adapter. 3. If the problem is with the ASCII terminal go to the *Problem Determination Procedures* for the terminal. 4. If you do not find a problem then replace the system board.
Power and Cooling Problems	
You cannot power on the system	Go to “MAP 1520: Power” on page 3-12.
The power light does not come on, or stay on.	Go to “MAP 1520: Power” on page 3-12.

Symptoms	What You Should Do
Intermittent Memory Problems	
"Loop on Memory Test" is provided by SMS. It can be used to test for intermittent memory problems.	Refer to Chapter 7, “System Management Services” on page 7-1 for more information.
Other Symptoms	
The system stops with the disk activity indicator LED OFF and no beep occurred.	The processor POST failed or did not execute. There may be a problem with the CPU card or system board. 1. Replace the CPU card. If the problem still exists after replacing the CPU card, go to “MAP 1540: Minimum Configuration” on page 3-20.
The system stops with the disk activity indicator LED ON continuously and no beep occurred.	No good memory could be found. 1. If there is only one memory module installed, replace it. 2. If there is more than one memory module installed, go to “MAP 1540: Minimum Configuration” on page 3-20.
The system stops after issuing one short beep and the disk activity indicator LED is ON.	Less than 3MB of memory tested good. 1. If there is only one memory module installed, replace it. 2. If there is more than one memory module installed, go to “MAP 1540: Minimum Configuration” on page 3-20.
The disk activity indicator LED is blinking rapidly.	The flash EPROM data is corrupted. The recovery procedure for the flash EPROM should be executed.
The system stops and POST indicators are displayed.	1. Use “MAP 1540: Minimum Configuration” on page 3-20 to isolate the problem.
The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed.	Go to “MAP 1020: Problem Determination” on page 3-7.

Symptoms	What You Should Do
The System Management Services menu is displayed.	The device or media you are attempting to boot from may be faulty. 1. Check the SMS error log for any errors. To check the error log: • Choose tools • Choose error log • If an error is logged, check the time stamp. • If the error was logged during the current boot attempt, record it. • Look up the error in Chapter 4, “Error Code to FRU Index” and do the listed action. • If no recent error is logged in the error log, continue to the next step below. 2. Try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices try the media first). 3. Go to “MAP 1540: Minimum Configuration” on page 3-20.
The system will not respond to the password being entered or the system login prompt is displayed when booting in service mode.	The keyboard or it's controller may be faulty. 1. If entering the password from the keyboard which is attached to the system, replace the keyboard. If replacing the keyboard does not fix the problem, replace the system board. 2. If entering the password from a keyboard which is attached to a ASCII terminal, suspect the ASCII terminal. Use the Problem Determination Procedures for the terminal. Replace the system board if these procedures do not reveal a problem.
A short and long beep are heard. However, nothing is displayed.	1. If using a graphic display, go to the *Problem Determination Procedures* for the display. 2. If you do not find a problem then replace the display adapter. 3. Go to “MAP 1540: Minimum Configuration” on page 3-20.
Only a short beep, disk activity indicator LED is OFF, and no POST indicators are displayed.	Go to “MAP 1540: Minimum Configuration” on page 3-20.

Symptoms	What You Should Do
Miscellaneous Problems	
You suspect a cable problem.	See the *RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems*.
Flashing 888	
Flashing 888 in Operator Panel Display	Go to the Fast Path MAP in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
You Cannot Find the Symptom in this Table	
All other problems.	Go to “MAP 1020: Problem Determination” on page 3-7.

MAP 1020: Problem Determination

Purpose of This MAP

Use this MAP to get a eight-digit error code if you were not provided with one by the customer or you are unable to load diagnostics. If you are able to load the diagnostics, go to MAP 0020 in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Be prepared to record code numbers and use those numbers in the course of analyzing a problem. Go to "Step 1020-1."

Step 1020-1

The following steps analyze a failure to load the diagnostic programs.

Note: You will be asked questions regarding whether the system produced a beep or beeps. You will also be asked to perform certain actions based on displayed POST indicators. Please be observant of these conditions.

1. Turn the power off.
2. Turn the power on.
3. Insert the diagnostic CD-ROM disc into the CD-ROM drive.
4. If the keyboard POST indicator appears, press F5 on the direct attached keyboard or number 5 on an ASCII terminal.

5. Enter any requested passwords.
6. Follow displayed instructions until diagnostic operating instructions are displayed or the system appears to stop.
7. Find your symptom in the following table; then follow the instructions given in the Action column.

Symptom	Action
The disk activity indicator LED is blinking rapidly.	The flash EPROM data is corrupted. The recovery procedure for the flash EPROM should be executed.
The system stops with a prompt to enter a password.	Enter the password. You will not be allowed to continue until a correct password has been entered. When you have entered a valid password go to the beginning of this table and wait for one of the other conditions to occur.
The diagnostic operating instructions are displayed.	Go to MAP 0020 in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
The power good LED does not come on or does not stay on.	Go to “MAP 1520: Power” on page 3-12.
The system stops with an eight-digit error code(s) displayed on the console.	Record the error code(s), then go to “Step 1020-3” on page 3-10.
The system login prompt is displayed.	You may not have pressed the correct key or you may not have pressed the key soon enough when you were to indicate a Service Mode IPL of the diagnostic programs. If this was the case start over at the beginning of this Step. **Note:** Perform the systems shutdown procedure before turning off the system. If you are sure you pressed the correct key in a timely manner, go to “Step 1020-2” on page 3-10.
The system unit produces one long beep immediately followed by a short beep.	Record error code M0GA0000, then go to “Step 1020-3” on page 3-10.
A continuous beep is heard from the system unit.	Record error code M0SPK000, then go to “Step 1020-3” on page 3-10.
A short and long beep are heard. However, nothing is displayed.	1. If using a graphic display, go to the *Problem Determination Procedures* for the display. 2. If you do not find a problem then replace the display adapter. 3. Go to “MAP 1540: Minimum Configuration” on page 3-20.
The system appears to be stopped, the disk activity indicator LED is OFF and a beep was NOT heard from the system unit.	Record error code M0CPU000, then go to “Step 1020-3” on page 3-10.

Symptom	Action
Only a short beep, disk activity indicator LED is OFF, and no POST indicators are displayed.	Go to “MAP 1540: Minimum Configuration” on page 3-20.
The system appears to be stopped and the disk activity indicator LED is ON continuously and a beep was NOT heard from the system unit.	Record error code M0MEM000, then go to “Step 1020-3” on page 3-10.
The system appears to be stopped and the disk activity indicator LED is ON continuously and a beep was heard from the system unit.	Record error code M0MEM001, then go to “Step 1020-3” on page 3-10.
The System Management Services menu is displayed.	Go to “Step 1020-4” on page 3-11.
The system stops and POST indicators are displayed.	Go to “MAP 1540: Minimum Configuration” on page 3-20.
The diagnostics are loaded and there was no beep heard from the system unit during the IPL sequence.	Record error code M0SPK001, then go to “Step 1020-3” on page 3-10.
The system does not respond when the password is entered.	Go to “Step 1020-2” on page 3-10.
The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed or only a cursor is displayed.	Go to “MAP 1540: Minimum Configuration” on page 3-20.
The system stopped and a POST indicator is displayed on the system console and an eight-digit error code is not displayed.	If the POST indicator represents: • a keyboard, record error code M0KBD000. • boot disk, record error code M0HD0000. • memory, record error code M0MEM002. • a diskette drive, record error code M0FD0000. • SCSI, record error code M0CON000. Go to “Step 1020-3” on page 3-10.

Step 1020-2

There is a problem with the keyboard.

Find the type of keyboard you are using in the following table; then follow the instructions given in the Action column.

Keyboard Type	Action
Type 101 keyboard (U.S.). Identify by the size of the Enter key. The Enter key is in only one horizontal row of keys.	Record error code M0KBD001; then go to "Step 1020-3."
Type 102 keyboard (W.T.). Identify by the size of the Enter key. The Enter key extends into two horizontal rows.	Record error code M0KBD002; then go to "Step 1020-3."
Kanji-type keyboard. (Identify by the Japanese characters.)	Record error code M0KBD003; then go to "Step 1020-3."
ASCII terminal keyboard	Go to the documentation for this type of ASCII terminal and continue problem determination.

Step 1020-3

Take the following actions:

1. Find the eight-digit error code in Chapter 4, "Error Code to FRU Index" on page 4-1

   Note: If the eight-digit error code is not listed in Chapter 4, "Error Code to FRU Index," look for it in the following:

   - Any supplemental service manual for the device
   - The diagnostic problem report screen for additional information
   - The Service Hints service aid
   - The CEREADME file (by using the Service Hints service aid).

2. Perform the action listed.

Step 1020-4

1. Check the SMS error log for any errors. To check the error log:
   - Choose tools
   - Choose error log
   - If an error is logged, check the time stamp.
   - If the error was logged during the current boot attempt, record it.
   - Look up the error in the Error-Code-to FRU Index and do the listed action.
   - If no recent error is logged in the error log, go to “MAP 1540: Minimum Configuration” on page 3-20.

MAP 1520: Power

Note: This is not a start of call MAP. Use this Power MAP only if you have been directed here from a MAP step in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

This procedure is used to locate power problems in system units. If a problem is detected, this procedure helps you isolate the problem to a failing unit.

Observe the following safety notice during service procedures.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent and electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use on hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

CAUTION:
This product is equipped with a three–wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.

DANGER

To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

Step 1520-1

You may be directed to this MAP for one of these reasons:

- With the main power switch set to On, there is no indication of activity, even when the on/off pushbutton is pressed. None of the LEDs light and none of the fans, including the fan in the power supply, start to turn.

  Go to "Step 1520-2."

- With the main power switch set to On and the power enabled LED blinking slowly, when the on/off pushbutton is pressed, the system begins to power on, but the power good LED does not stay on.

  Go to "Step 1520-10" on page 3-19.

- With the main power switch set to On and the power enabled LED blinking slowly, when the on/off pushbutton is pressed, the system does not power up.

  The possible faults are as follows:

  – Fuse F3 in the alarm LCD display panel assembly is blown, see "MPX Control Card (7317 Model F3L)" on page 9-16 for the fuse location. Replace the fuse and go to "Step 1790-1" on page 3-62.

  – Voting card failure, replace the voting card and go to "Step 1790-1" on page 3-62.

Step 1520-2

1. Check and make sure the main power switch on the alarm panel is in the "ON" position. Check power switches on all system power supply units to make sure they are on.
2. If the switch is in the "OFF" position, turn it to the "ON" position and return to "Step 1520-1."
3. If the switch is in the "ON" position, turn it to the "OFF" position and then back to the "ON" position.

Did the Power Enable LED start to blink?

NO Go to "Step 1520-6" on page 3-17.

YES Go to "Step 1520-1."

Step 1520-3

Note: Either the power supply unit, system board, voting card, support processor, operator panel electronics, or the Alarm LCD display panel electronics (fuse F3) is defective.

To test each FRU, exchange the FRUs that have not already been exchanged in the following order.

- Power supply units
- System board
- Voting card
- Support processor
- Operator panel electronics
- Alarm LCD display panel electronics (fuse F3)

1. Press the power push-button to turn the system power off.
2. Set the main power switch to the “OFF” position.
3. Exchange one of the FRUs in the list.
4. Set the main power switch to the “On” position.
5. Press the power push-button to turn the system power on.

Does the power good LED come on and stay on?

NO Reinstall the original FRU.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, go to “Step 1520-4” on page 3-15.

YES Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1520-4

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Record the slot numbers of all the ISA and PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the adapters.
4. Remove all the memory modules.
5. Remove the CPU card.
6. Unplug the power cables from all the SCSI devices.
7. Set the main power switch to the “ON” position.
8. Turn the power on.

Does the fan in the power supply turn on and the power good LED come on and stay on?

NO Replace the system board. Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*

YES Go to “Step 1520-5” on page 3-16.

Step 1520-5

One of the parts that was removed or unplugged is causing the problem. Install or connect the parts in the following order.

1. CPU card.
2. Memory modules.
3. SCSI devices, lowest bay to highest bay.
4. PCI cards, lowest slot to highest slot.
5. ISA cards, lowest slot to highest slot.

Turn the power on after each part is installed or connected. If the system does not power on or the power good LED does not stay on, the most recently installed or connected part is causing the failure.

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Install or connect one of the parts in the list.
4. Set the main power switch to the “ON” position.
5. Turn the power on.

Does the power good LED come on and stay on?

NO Replace the last part you installed.

Repeat these steps until all the parts have been installed.

If the symptom did not change and all the parts have been replaced, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1520-1” on page 3-13 in this MAP and follow the instructions for the new symptom.

YES Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1520-6

Measure the voltage on TB1. At least one power feed must be active for the system to work. Make sure it is the correct polarity

Is there power on at least one power feed?

NO Turn off the main power switch and ask a TELCO Craft person to check the circuit fuses that provide power to the system.

Go to "Step 1520-7" after power has been restored to the system.

YES Go to "Step 1520-9" on page 3-18.

Step 1520-7

After the Craft person replaced the fuses and the main power switch was "OFF," did the TELCO Power Feed fuses blow again?

NO Turn the Main Power Switch of the TELCO server to the "ON" position.

Did the TELCO fuses blow again?

NO Go to "Step 1520-1" on page 3-13.

YES Go to "Step 1520-8" on page 3-18.

YES The probable cause is the Power-In Filter Card.

Remove the Alarm Assembly.

Remove the power supply or disk drive units starting in slot 7 and continue left for visibility of this card.

Inspect card for damage. If none can be seen, remove the card and check all capacitors visually.

Replace the power-in filter card and repeat this step.

Step 1520-8

You have reached this step if the TELCO server system blows the main feed fuses on the power feed to TB1.

Visually check the two fan control cards in the bottom electronics module.

Pull all seven modules (disk drive units and power supply units) out of the system unit. You only need to pull them out about one inch.

Turn the main power switch off. Ask the TELCO Craft person to replace the fuses in their power feeds. After the fuses are replaced, turn the main power switch to the "ON" position. If the fuses blow again then the problem is in an internal cable or the two fan control cards in the lower electronics module.

Replace the following FRUs in the order listed.

Fan Control Cards

Fan Control Cable

Power Cable

If the fuses did not blow, then one of the units (disk drive or power supply) is shorted. Plug the units back into the system unit starting with the power supplies and finishing with the disk drives. When the fuse blows, replace the unit that you were plugging in.

Replace the appropriate unit and go to "Step 1520-1" on page 3-13.

Step 1520-9

Check the fans in the fan tray.

Are the Fans in the fan tray turning?

NO This indicates that there is no -48 V dc on the power-in backplane.

Replace the following FRUs in the order listed.

Alarm Module (Defective Power Switch)

Power Control Cable

YES Go to "Step 1520-1" on page 3-13.

Step 1520-10

The TELCO server must have a minimum of two power supplies in order to come up. In many cases the customer will purchase a third supply that will be a redundant spare. When each power supply receives the power-on signal, it starts the process of powering itself up. When all internal voltages in the supply reach the proper value, the power supply issues a power good signal. All of the power good signals from the supply get routed to the voting card through a cable. The voting card makes sure there are at least two power supplies with power good signals. If two supplies vote yes then the CPU card is provided a signal that starts the boot process.

If the system has three power supplies, use the following procedure to locate a power supply unit that may be causing the problem.

1. Turn the main power switch to the “Off” position.
2. Loosen all six screws (2 per power supply unit) completely.
3. Pull the left most power supply out of the system by about five centimeters. Turn the main power switch to the “On” position. Wait for the slow blink of the Power Enable LED. Push the Power-On pushbutton.

Did the system start to boot?

NO Turn the main power switch to the “Off” position. Reinsert the power supply into the system, tighten its screws and repeat the above process for the middle and right supply.

Go to “Step 1520-3” on page 3-14.

YES Replace the defective power supply unit and tighten all power supply unit screws. Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

MAP 1540: Minimum Configuration

Notes:

1. This MAP assumes that a CD-ROM drive is installed and connected to the integrated SCSI adapter, and a Diagnostics CD-ROM disc is available.
2. If a power-on password or privileged-access password is installed, you will be prompted to enter the password before the diagnostic CD-ROM will load.
3. The term "POST indicators" refer to the ICONs (graphic display) or device mnemonics (ASCII terminal) that display while the POST is executing.

Purpose of this MAP

This MAP is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally-configured system. If a failure is detected on the minimally-configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

The MAP steps on the following pages instruct you to reduce the system to one or more of the following configurations:

- System board, CPU card, 1 memory module.

  If no failure is detected, the green power LED will be on and the system will beep twice (one short beep, followed by one long beep up to a minute or more later). Any other response means one of the remaining FRUs is failing.

- System board, CPU card, all memory modules and a terminal attached to the S1 port or a keyboard, display, and graphics adapter.

  If no failure is detected, The power LED will be on and the system will beep twice (one short, followed by one long beep up to a minute or more later). The SMS screen will be displayed.

- System board, CPU card, all memory modules, CD-ROM drive, and a terminal attached to the S1 port or a keyboard, display, and graphics adapter.

  If no failure is detected, The power LED will be on and the system will beep twice (one short, followed by one long beep up to minute or more later). The POST indicators will be displayed. After the CD-ROM loads a screen titled "Please define the System Console" will be displayed. Any other response means one of the remaining FRUs is failing.

Step 1540-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn the power off.
3. Turn the power on.
4. Insert the diagnostic CD-ROM into the CD-ROM drive.
5. While the POST indicators are displayed and before the long beep, press the F5 key (Graphics) or number 5 key (ASCII terminal).
6. Wait until the "Please define the system console" screen is displayed or the system appears to stop.

Is the "Please define the System Console" screen displayed?

NO Go to “Step 1540-2” on page 3-22.

YES Go to “Step 1540-12” on page 3-32.

Step 1540-2

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Record the slot numbers of the ISA and PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the adapters.
4. Record the slot numbers of the memory modules, and then remove all but one of the memory modules.
5. Disconnect the SCSI cable from the SCSI connector on the system board.
6. Disconnect the diskette drive cable from the diskette drive connector on the system board.
7. Disconnect the serial and parallel port cables from the rear of the system unit.
8. Disconnect the keyboard and mouse cables from the rear of the system unit.
9. Set the main power switch to the “ON” position.
10. Turn the power on.
11. Wait until the system beeps twice (one short, followed by one long beep up to a minute or more later) or the system appears to stop.

Did the system beep twice?

NO Go to “Step 1540-3” on page 3-23.

YES Go to “Step 1540-4” on page 3-24.

Step 1540-3

One of the FRUs remaining in the system unit is defective.

If the disk activity indicator LED is ON, exchange FRUs in this order:

1. System board
2. Memory module
3. CPU card

If the disk activity indicator LED is OFF, exchange FRUs in this order:

1. CPU card
2. System board
3. Memory module

The system is working correctly if it beeps twice (one short, and a minute or more later, one long).

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Exchange one of the FRUs in the list, based on the order you determined above.
4. Set the main power switch to the “ON” position.
5. Turn the power on.

Did the system beep twice?

NO Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1540-1” on page 3-21 in this MAP and follow the instructions for the new symptom.

YES Reinstall all removed cables, adapters, and modules. Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-4

No failure was detected with this configuration.

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Install a memory module.
4. Set the main power switch to the “ON” position.
5. Turn the power on.
6. Wait until the system beeps twice or the system appears to stop.
7. The system beeps once (one short).
8. The system does not beep.

Did the system beep twice?

NO Go to “Step 1540-5” on page 3-25.

YES Repeat this step until all the memory modules are installed and tested.

After all the memory modules are installed and tested, turn the power to off.

Go to “Step 1540-7” on page 3-27.

Step 1540-5

The failure may be caused by the last memory module installed. To isolate the failing FRU, do the following:

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Exchange the last memory module installed.
4. Set the main power switch to the “ON” position.
5. Turn the power on.

Did the system beep twice?

NO Go to “Step 1540-6” on page 3-26.

YES Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-6

One of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs that have not already been exchanged in the following order:

- System board
- Power supply.

The system is working correctly if it beeps twice (one short, and a minute or more later, one long).

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Exchange one of the FRUs in the list.
4. Set the main power switch to the “ON” position.
5. Turn the power on.

Did the system beep twice?

NO Reinstall the original FRU.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1540-1” on page 3-21 in this MAP, and follow the instructions for the new symptom.

YES Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-7

If you removed a service processor in “Step 1540-2” on page 3-22, continue with this step.

If you did not remove a service processor in “Step 1540-2” on page 3-22, go to “Step 1540-8” on page 3-28.

1. Turn the power off.
2. Install the service processor.
3. Turn the power on.
4. Wait until the system beeps twice or the system appears to stop.

Did the system beep twice?

NO Replace the service processor.

YES Go to “Step 1540-8” on page 3-28.

Step 1540-8

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Reconnect the system console.
   a. If a terminal attached to S1 or S2 is the system console, plug the terminal cable into the S1 or S2 connector on the rear of the system unit.
   b. If a display attached to a display adapter is the system console, install the display adapter and connect the display to it. Plug the keyboard into the keyboard connector on the rear of the system unit.
4. Set the main power switch to the “ON” position.
5. Turn the power on.
6. Wait until the SMS screen is displayed or the system appears to stop.

Is the SMS screen displayed?

NO One of the FRUs remaining in the system unit is defective.

In the following order, exchange the FRUs that have not been exchanged:

1. Go to the Problem Determination Procedures (test procedures) for the device attached to the SIO serial port or the display attached to the graphics adapter, and test those devices. If a problem is found, follow the procedures for correcting the problem on that device.
2. Graphics adapter (if installed).
3. Cable (async or graphics).
4. System board.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, return to “Step 1540-1” on page 3-21 and follow the instructions for the new symptom.

YES Go to “Step 1540-9” on page 3-29.

Step 1540-9

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Plug the SCSI cable into the SCSI connector on the system board.
4. Disconnect the signal and power connectors from all the SCSI devices except the CD-ROM drive.
5. Set the main power switch to the “ON” position.
6. Turn the power on.
7. Insert the diagnostic CD-ROM into the CD-ROM drive.
8. After the POST indicators are displayed and before the long beep press the F5 key on a direct attached keyboard or the number 5 key on a ASCII terminal keyboard.
9. Wait until the "Please define the System Console" screen is displayed or the system appears to stop.

Is the "Please define the System Console" screen displayed?

NO One of the FRUs remaining in the system unit is defective.

In the following order, exchange the FRUs that have not been exchanged:

1. Last SCSI device connected (CD-ROM drive, tape drive, etc)
2. SCSI cable
3. System board
4. CPU card

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540-1” on page 3-21 in this MAP and follow the instructions for the new symptom.

YES Repeat this step until all the SCSI devices that were attached to the integrated SCSI adapter are connected and tested.

Go to “Step 1540-10” on page 3-30.

Step 1540-10

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed is probably defective.

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Plug the diskette drive cable into the diskette drive connector on the system board.
4. Set the main power switch to the “ON” position.
5. Turn the power on.
6. Insert the diagnostic CD-ROM disc into the CD-ROM drive.
7. After the POST indicators are displayed and before the long beep press the F5 key on a direct attached keyboard or the number 5 key on a ASCII terminal keyboard.
8. Wait until the "Please define the System Console" screen is displayed or the system appears to stop.

Is the "Please define the System Console" screen displayed?

NO One of the FRUs remaining in the system is defective.

In the following order, exchange the FRUs that have not been exchanged.

1. Diskette drive
2. Diskette drive cable
3. System board
4. Power supply

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540-1” on page 3-21 in this MAP and follow the instructions for the new symptom.

YES Go to “Step 1540-11” on page 3-31.

Step 1540-11

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed is probably defective.

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Install a FRU (adapter) and connect any cables and devices that were attached to it.
4. Set the main power switch to the “ON” position.
5. Turn the power on.
6. Insert the diagnostic CD-ROM disc into the CD-ROM drive.
7. After the POST indicators are displayed and before the long beep press the F5 key on a direct attached keyboard or the number 5 key on a ASCII terminal keyboard.
8. Wait until the "Please define the System Console" screen is displayed or the system appears to stop.

Is the "Please define the System Console" screen displayed?

NO Go to “Step 1540-12” on page 3-32.

YES Repeat this step until all of the FRUs (adapters) are installed. If you exchanged all of the FRUs (adapters) and the symptom did not change, go to MAP 0020 in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-12

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Set the main power switch to the “ON” position.
5. Turn the power on.
6. Insert the diagnostic CD-ROM disc into the CD-ROM drive.
7. After the POST indicators are displayed and before the long beep press the F5 key on a direct attached keyboard or the number 5 key on a ASCII terminal keyboard.
8. Wait until the "Please define the System Console" screen is displayed or the system appears to stop.

Is the "Please define the System Console" screen displayed?

NO Repeat this step until the defective device or cable is identified or all the devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. System board
3. Power supply

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540-1” on page 3-21 in this MAP and follow the instructions for the new symptom.

YES The last device or cable that you disconnected is defective.

Exchange the defective device or cable.

Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-13

1. Turn the power off.
2. Set the main power switch to the “OFF” position.
3. Record the slot numbers of the ISA and PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the adapters except the display adapter (if installed and the attached display will be the system console).
4. Disconnect any cables that are plugged into connectors S1, S2, P, K, and M on the rear of the system unit.

   Note: If a terminal attached to S1 or S2 will be the system console, do not disconnect it. If a display attached to a display adapter will be the system console, do not disconnect the keyboard.
5. Set the main power switch to the “ON” position.
6. Turn the power on.
7. Insert the diagnostic CD-ROM disc into the CD-ROM drive.
8. After the POST indicators are displayed and before the long beep press the F5 key on a direct attached keyboard or the number 5 key on a ASCII terminal keyboard.
9. Wait until the "Please define the System Console" screen is displayed or the system appears to stop.

Is the "Please define the System Console" screen displayed?

NO The symptom has changed. Check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540-1” on page 3-21 in this MAP and follow the instructions for the new symptom.

YES Go to “Step 1540-14” on page 3-34.

Step 1540-14

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initial Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification.
6. Start with the first item on the list and test all the adapters and devices.

Did you get an SRN?

NO Go to “Step 1540-16” on page 3-35.

YES Go to “Step 1540-15.”

Step 1540-15

Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes?

NO Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged.

Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

YES If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

Step 1540-16

One of the adapters or devices you removed is causing the problem.

Install the adapters and devices one at a time to determine the failing adapter or device. If the adapter you are installing is an ISA adapter, go to the Service Aids to configure it. If the adapter or device you are installing (ISA or PCI) will not configure or causes the system to stop, replace the adapter or device. Test each adapter or device after installing it.

Repeat this step until all the adapters and devices you removed are installed.

Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

MAP 1700: TELCO Specific Hardware Errors

This MAP deals with the TELCO unique hardware used on the 7317 product family. Check the Telco alarm LCD display panel to find the error information. The LCD display shows you the error type and the location. Using the symptoms shown in the Telco alarm LCD display and errors logged in the AIX hardware error log, check the following table and perform the related action.

Symptom	Action
Errors in the Telco alarm LCD display panel and errors in the AIX hardware error log.	Go to the method marked **Using etasc** in the following table.
You have a known Telco hardware failure (LED indication on a disk drive unit, power supply unit, alarm LCD display panel, or a fan tray). You may or may not have errors logged in the AIX hardware error log.	Go to the method marked **Using testit** in the following table.
You have an error in the AIX hardware error log related to the Telco alarm hardware.	Go to the method marked **Using testit** in the following table.
You have a failure (disk drive unit LED, power supply unit LED, or a fan failure) but there are no other error codes.	Go to the section marked **Manual method** in the following table.

Method	Symptom	Starting Point
Using etasc	FUSE FAILURE	Go to “Step 1710-1” on page 3-37.
	POWER FAILURE	Go to “Step 1720-1” on page 3-38.
	CONTROL FAILURE	Go to “Step 1730-1” on page 3-40.
	FAN FAILURE	Go to “Step 1740-1” on page 3-41.
	Other error indication	Go to “Step 1760-1” on page 3-43.
Using testit	FUSE FAILURE	Go to “Step 1760-1” on page 3-43.
	POWER FAILURE	Go to “Step 1760-1” on page 3-43.
	CONTROL FAILURE	Go to “Step 1760-1” on page 3-43.
	FAN FAILURE	Go to “Step 1760-1” on page 3-43.
	A failing indication exists on Telco hardware but no failure is displayed on the Telco alarm LCD display panel, Telco errors may or may not be logged in the AIX hardware error log. You may have a monitoring system failure.	Go to “Step 1760-1” on page 3-43.
Using manual	A failing indication exists on Telco hardware but no failure is displayed on the alarm LCD display panel, and no Telco errors are logged in the AIX hardware error log.	Go to “Step 1770-1” on page 3-57.

MAP 1710: Fuse Failure

Step 1710-1

Check the alarm LCD display panel for the slot number of the failing unit.

Check the Fuse Fail indicator on the indicated disk drive or power supply unit in that slot.

Is the Fuse Fail LED on?

NO Check the other units for fuse failure indications.

This may indicate a Monitor Function failure. If it is a disk drive unit, back up the data and replace it.

If it is a power supply unit, replace it.

Go to “Step 1790-1” on page 3-62.

YES Find the defective fuse at the top of the disk drive unit or power supply unit.

Replace the fuse or fuses.

Did the fuse or fuses blow a second time?

NO Go to “Step 1790-1” on page 3-62

YES Replace the unit, go to “Step 1790-1” on page 3-62

MAP 1720: Power Failure

Step 1720-1

Check the alarm LCD display panel for the slot number of the failing unit.

Is the slot number indicating a Power Supply unit?

NO This must be a Disk Drive unit, go to "Step 1720-2."

YES Check the power ON/OFF switch on the power supply unit. If the switch is in the on position, and the Normal LED is off, replace the unit.

Go to "Step 1790-1" on page 3-62

Step 1720-2

Check the "Normal" green LED for the indicated unit.

Is the LED on continuously?

NO Go to "Step 1720-3" on page 3-39.

YES The power supply, monitor card, or the disk drive inside the disk drive unit is defective.

Replace disk drive unit.

Go to "Step 1790-1" on page 3-62

Step 1720-3

Check the “Normal” green LED for the indicated unit.

Is the LED flashing?

NO Go to “Step 1720-4.”

YES Set the power switch on the disk drive unit to the “OFF” position and then to the “ON” position.

Is the LED on continuously?

NO Go to “Step 1720-4.”

YES Go to “Step 1790-1” on page 3-62

Step 1720-4

Pull the disk drive unit out of the system approximately five centimeters and then reinsert it into the system. The backplane will sense this reinsertion and reapply power to the disk drive unit.

Did the green “Normal” LED come on and stay on?

NO Try the disk drive unit in another slot.

Did the Green “Normal” LED come on in another slot?

NO Replace the defective disk drive unit, go to “Step 1790-1” on page 3-62

YES Possible cause:

- Defective addressing in the disk drive unit
- Defective SCSI Backplane

Try a known good disk drive unit in the questionable slot.

Does the known good disk drive unit work?

NO Replace the SCSI Backplane, go to “Step 1790-1” on page 3-62.

YES Replace the defective disk drive unit, go to “Step 1790-1” on page 3-62.

YES Go to “Step 1790-1” on page 3-62.

Step 1730-1

This failure is only valid on the disk drive unit. As a disk drive unit is plugged into the SCSI backplane, the back plane senses the disk drive unit presence and causes a reset on the SCSI bus. The reset causes the disk drive unit to go through a power-on cycle. The SCSI backplane powers up the disk drive unit by providing a 5 V dc signal that through an opto-isolator powers up the 48 V dc to +5 and +12 DC-to-DC converter in the disk drive unit. You have received this error because either the backplane is defective or someone has requested the backplane to shutdown the disk drive unit by pressing the power switch on the unit.

Is the green "Normal" LED flashing?

NO Go to "Step 1720-4" on page 3-39.

YES Go to "Step 1720-3" on page 3-39.

MAP 1740: Fan Failure

Step 1740-1

Check the AIX error log information for fan tray failures.

Is more than one fan tray failing?

NO Single fan tray failure, replace the defective fan tray. Go to “Step 1790-1” on page 3-62.

YES Go to “Step 1740-2.”

Step 1740-2

Check the error log information for fan tray failures.

Are all the fan trays failing?

NO Go to “Step 1740-3” on page 3-42.

YES Defective monitor card, replace the monitor card. Go to “Step 1790-1” on page 3-62.

Step 1740-3

Check the error log information for fan tray failures.

Are fan trays 1, 2, and 3 failing?

NO **Are fan trays 2, 3, and 4 failing?**

- **NO** To get here may mean multiple faults. Go to “Step 1740-4.”
- **YES** Replace the fan control module F2. Go to “Step 1790-1” on page 3-62.

YES Replace the fan control module F1. Go to “Step 1790-1” on page 3-62.

Step 1740-4

The fault is in one of the following FRUs:

- Fan Trays
- Fan Control Card F1 and F2
- Fan Monitor Card

Replace the FRUs one at a time until the problem is resolved. Go to “Step 1790-1” on page 3-62.

MAP 1760: Diagnosing Failures Using testit

Step 1760-1

You have arrived at this step because of a major monitoring system fault or you have selected to use the **testit** service aid. The best software to debug this problem is the **testit** service aid. **testit** can be found in the same directory as **etasc**. Use one of the following procedures to run **testit** either from an ASCII terminal connected to the S1 port or from a remote AIX host system using telnet:

Attention: You must shut down the **etasc** error deamon before starting the **testit** service aid. Use the **kill** command to shutdown **etasc**.

Using an ASCII terminal connected to the S1 port

1. To get to the directory, enter:

   ```
   cd /usr/lpp/etasc/bin
   ```

2. Change the ASCII terminal to 25 by 132 format if necessary. Make a note of the customers settings before changing the terminal format.
3. To change the AIX terminal output to 25 by 132 format, enter:

   ```
   stty cols 132
   ```

4. To export the output to your terminal:

   ```
   export TERM=terminal type
   ```

5. To run **testit**, enter:

   ```
   ./testit
   ```

Using another AIX remote host system to telnet into the 7317 Model F3L

1. In a window on the remote host, enter:

   ```
   xterm -geometry 132x25+0+0 -132 &
   ```

2. In the new window, enter:

   ```
   tn systemID
   ```

3. Login to the 7317 Model F3L as root using the root password.
4. Enter:

   ```
   export TERM=xterm
   ```

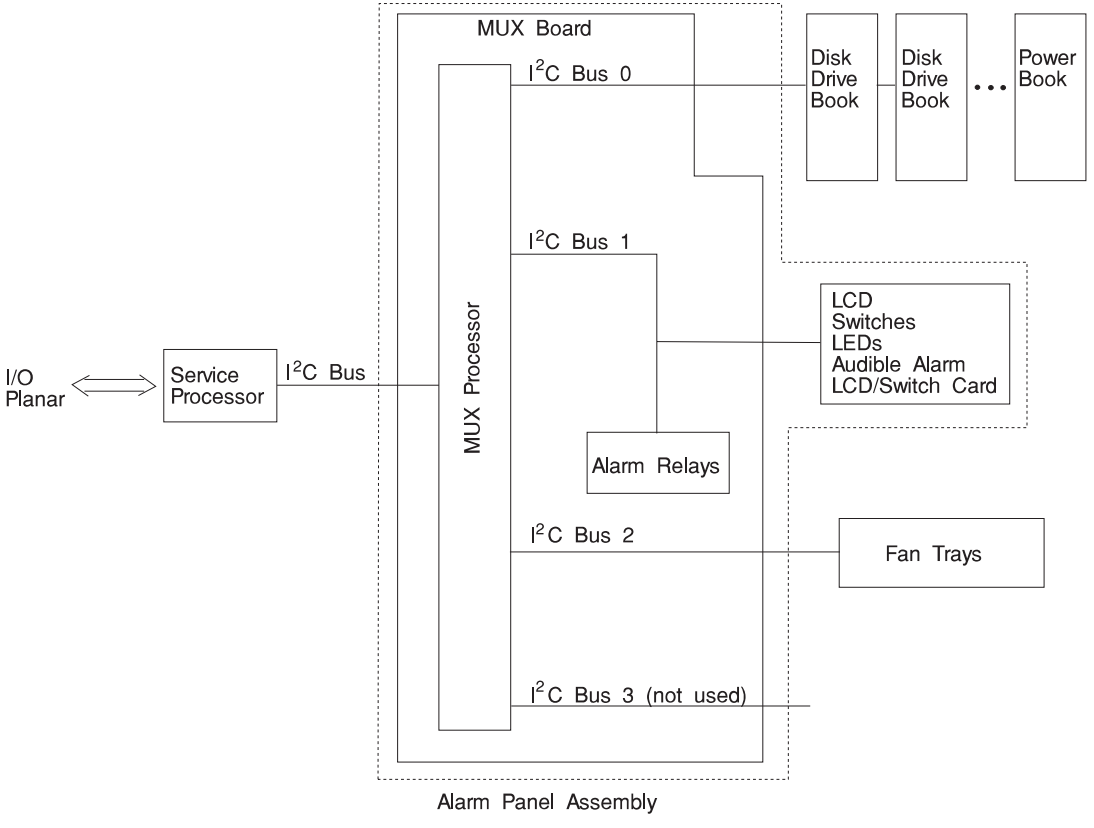
5. Enter:

   ```
   cd /usr/lpp/etasc/bin
   ```

6. To run **testit** enter:

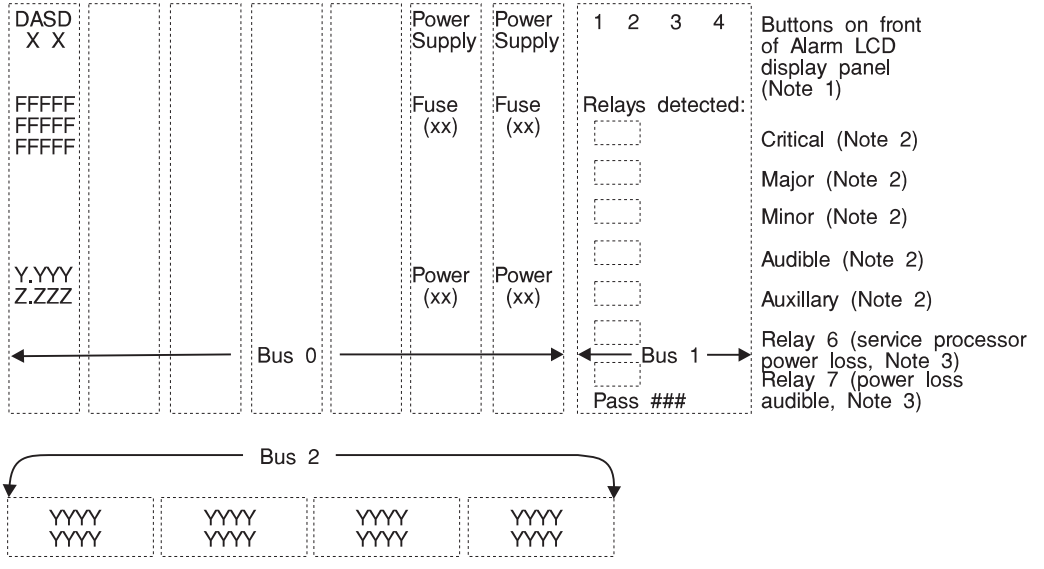
   ```
   ./testit
   ```

The TELCO system uses the external I²C bus on the service processor to interrogate all of the TELCO specific hardware as applicable.



The MUX Processor converts one I²C Bus into four separate buses. The service processor (SP) selects which bus it wants then instructs the MUX processor to switch to that bus. At this point the I²C commands pass through between the main I²C bus and the I²C devices on the other side of the MUX Board. You have reached this section because you have errors in TELCO specific hardware that the system is not detecting, or you are attempting to close TELCO alarm relays output to the alarm LCD display panel, or sense TELCO switches.

Using the procedure outlined in “Step 1760-1” on page 3-43, execute the **testit** service aid. The terminal/display will display the figure below:



Notes:

1. Pushing the switches will put the switch in reverse video. **Do not push button 2**, this will power down the system.
2. Critical, Major, Minor, Audible, and Auxiliary will cycle while **testit** is running.
3. Relay 6 and relay 7 will always be detected unless the relay is bad. These relays are energized by +5 V dc standby, and should always be detected. These will not cycle.

Is status being displayed in any of the three “Bus” areas?

NO Possible FRUs are:

- Alarm LCD display panel assembly
- Service Processor

Replace one of the FRUs and recheck. If this did not fix the problem, reinstall the FRU and replace the next FRU.

Go to “Step 1790-1” on page 3-62.

YES Go to “Step 1760-2” on page 3-47.

Step 1760-2

Is status being displayed on Bus 2?

NO Check fuse F2 on the MUX card (see "MPX Control Card (7317 Model F3L)" on page 9-16 for fuse location).

Is fuse F2 bad?

NO Replace the Monitor card in the electronics module and retest. Go to "Step 1760-3."

YES Replace the bad fuse and go to "Step 1790-1" on page 3-62.

YES **Are there fan failures indicated?**

NO Go to "Step 1760-4."

YES Go to "Step 1780-1" on page 3-60.

Step 1760-3

Did replacing the monitor card in the electronics module fix the problem?

NO The fault is in the MUX card in the alarm LCD display panel assembly. Replace the alarm LCD display panel assembly. Retest the bus with **testit** and go to "Step 1790-1" on page 3-62.

YES Go to "Step 1790-1" on page 3-62.

Step 1760-4

Is status being displayed on Bus 1?

NO Replace the Alarm Panel assembly and retest. Go to "Step 1790-1" on page 3-62

YES Go to "Step 1760-5" on page 3-48.

Step 1760-5

Is status being displayed on Bus 0?

NO Check fuse F1 on the MUX card (see "MPX Control Card (7317 Model F3L)" on page 9-16 for fuse location).

Is fuse F1 bad?

NO Go to "Step 1760-8" on page 3-49.

YES Replace the bad fuse and go to "Step 1790-1" on page 3-62.

YES Go to "Step 1760-6."

Step 1760-6

Is one of the disk drive or power supply units not showing status, showing a change of status, or its field is highlighted?

NO Go to "Step 1760-7."

YES Replace the unit and retest. Go to "Step 1790-1" on page 3-62.

Step 1760-7

Does a disk drive or power supply unit show up that is not installed in the system?

NO Go to "Step 1760-9" on page 3-49.

YES If the unit that shows up and is not installed is a disk drive unit, then the problem unit is in one of the disk drive units. Remove and reinstall each disk drive unit one at a time. When you pull the problem unit, the indication will go away. This also applies to a failing power supply unit. Replace the failing unit. Go to "Step 1790-1" on page 3-62.

Step 1760-8

Occasionally a disk drive or power supply unit may lock up Bus 0. To check for this possibility, remove each of the units one at a time.

Did the removal of any one unit bring the bus back?

NO Replace the alarm panel and retest. Go to “Step 1790-1” on page 3-62.

YES Replace the defective unit and retest. Go to “Step 1790-1” on page 3-62.

Step 1760-9

Your have reached this step because you have one unit (disk drive or power supply) that is reporting a failure.

Is the failing unit a power supply unit?

NO Go to “Step 1760-14” on page 3-52.

YES Go to “Step 1760-10.”

Step 1760-10

Verify that the On/Off switch on the power supply unit is in the On position.

Is the switch in the On position?

NO Turn the switch to the on position and verify the green (Normal) LED. If the LED did not come on, then continue to “Step 1760-11” on page 3-50 If the unit did come up, go to “Step 1790-1” on page 3-62.

YES Go to “Step 1760-11” on page 3-50.

Step 1760-11

Does testit have “Fuse Bad” in the display for this unit.

NO Go to “Step 1760-13” on page 3-51.

YES Replace the defective fuse and verify the action corrected the problem. Go to “Step 1760-12.”

Step 1760-12

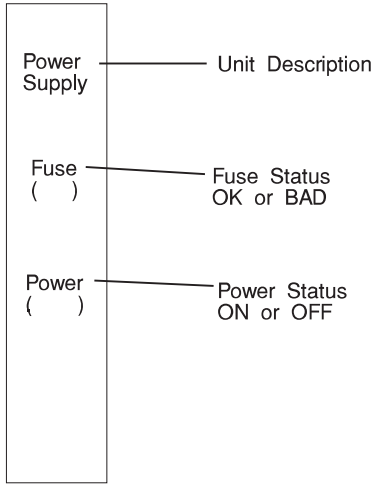
Did replacing the fuse fix the problem?

NO Replace the unit and go “Step 1790-1” on page 3-62.

YES Go to “Step 1790-1” on page 3-62.

Step 1760-13

Does testit have “Power Off” in the display and no “Fuse Failure” indication?



NO To reach this point is an error. You must have taken a wrong branch. Go back to “Step 1760-6” on page 3-48.

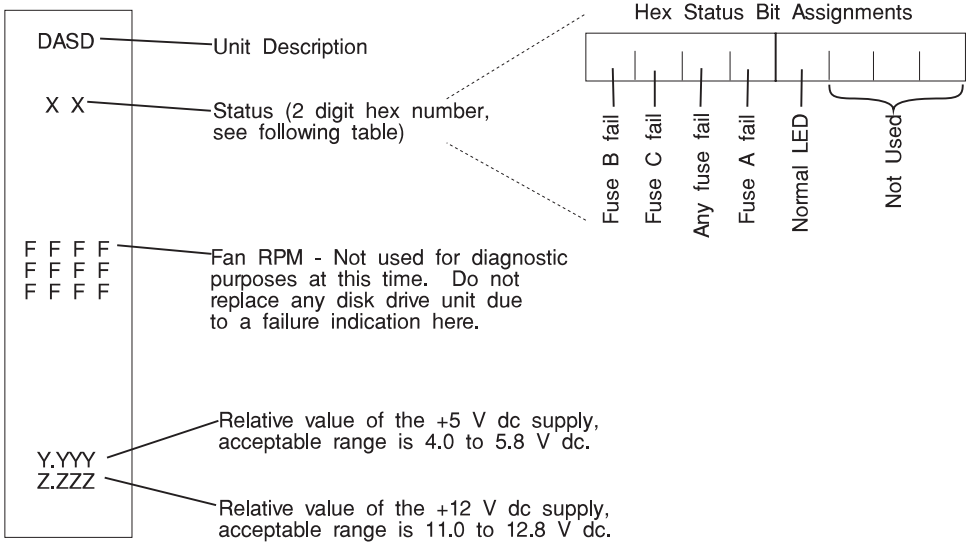
YES Replace the power supply unit, go to “Step 1790-1” on page 3-62.

Fuse	Power	Description
OK	ON	Normal status
Bad	ON	Fuse A or fuse B failure
Bad	Off	Both Fuse A and Fuse B Bad or One Fuse BAD and power switch OFF
OK	OFF	Power switch OFF or Unit failure Both fuses removed or Fuses in backwards

Step 1760-14

You have reached this step because you have a disk drive unit failure.

The disk drive unit has 3 areas of interest on the **testit** status screen.



Status (Hex)	FuseA	FuseB	FuseC	Any Fuse	POWER ENABLED	Description
FF	OK	OK	OK	OK	OFF	Turned OFF for removal or failure
F7	OK	OK	OK	OK	ON	Normal condition
C7	Open	OK	OK	Fail	ON	Single fuse failure
57	OK	Open	OK	Fail	ON	Single fuse failure
97	OK	OK	Open	Fail	ON	Single fuse failure
47	Open	Open	OK	Fail	ON	Major internal power failure
07	Open	Open	Open	Fail	ON	Major internal power failure
CF	Open	OK	OK	Fail	OFF	Single fuse fail, Unit turned off by SCSI backplane
5F	OK	Open	OK	Fail	OFF	Single fuse fail, Unit turned off by SCSI backplane
9F	OK	OK	Open	Fail	OFF	Single fuse fail, Unit turned off by SCSI backplane
4F	Open	Open	OK	Fail	OFF	Major Fault and Unit turned off by SCSI backplane
0F	Open	Open	Open	Fail	OFF	Major Fault and Unit turned off by SCSI backplane

Note: The “Power Enable” status is a control signal from the SCSI backplane to tell the disk drive unit to turn power on.

Note: The green “Normal” LED is an indication of whether the disk drive unit has been told to power on.

LED On Unit told to power up.

LED Flashing Unit told to power off (disk drive unit may now be removed).

Note: When a disk drive unit is inserted into the SCSI backplane the unit is told to power on without pushing the toggle switch.

Is the Green “Normal” LED on?

NO Toggle the switch down and wait 5 seconds for the unit to power up. If the unit powered up, go to “Step 1760-15” on page 3-55

If the unit did not power up, go to “Step 1760-22” on page 3-56.

YES Go to “Step 1760-15” on page 3-55.

Step 1760-15

Are there any fuse failures?

NO Go to “Step 1760-19” on page 3-56.

YES Go to “Step 1760-16.”

Step 1760-16

Is there a single fuse failure?

NO More than one fuse failure, replace the disk drive unit and go to “Step 1790-1” on page 3-62.

YES Replace the fuse and go to “Step 1760-17.”

Step 1760-17

Did replacing the fuse fix the problem?

NO Go to “Step 1760-18.”

YES Go to “Step 1790-1” on page 3-62.

Step 1760-18

Did the fuses blow again?

NO Go to “Step 1760-19” on page 3-56.

YES Replace the disk drive unit and go to “Step 1790-1” on page 3-62.

Step 1760-19

Is the 5 V dc value between 4.0 and 5.8 V dc?

NO Replace the disk drive unit and go to “Step 1790-1” on page 3-62.

YES Go to “Step 1760-20.”

Step 1760-20

Is the 12 V dc value between 11.0 and 12.8 V dc?

NO Replace the disk drive unit and go to “Step 1790-1” on page 3-62.

YES Go to “Step 1760-21.”

Step 1760-21

If you reached this step then you have good status, good fuses, and the only other possible problem could be the SCSI disk drive unit or the SCSI backplane. Try putting the suspect disk drive unit in a different slot.

Are the failures the same?

NO Replace the SCSI backplane.

YES Replace the disk drive unit..

Step 1760-22

Move the disk drive unit to another position and retest.

Did the failures remain the same?

NO Replace the SCSI back plane.

YES Replace the disk drive unit.

MAP 1770: Monitoring System Failure (Using Manual Method)

Step 1770-1

Is the Green "Normal" LED on for all disk drive and power supply units and are the fan trays operating normally?

NO Other failures reported, go to "Step 1770-2."

YES Go to "Step 1770-9" on page 3-59.

Step 1770-2

Have fan tray errors been reported?

NO Go to "Step 1770-7" on page 3-58.

YES Refer to Appendix C, "Fan Control Logic" on page C-1 for a description of fan position and fan control cards. Go to "Step 1770-3."

Step 1770-3

Has a single fan been reported as failing?

NO Go to "Step 1770-4."

YES Replace the fan tray associated with the failing fan. Go to "Step 1790-1" on page 3-62.

Step 1770-4

Has more than one fan controlled by a single fan control card been reported failing (see Appendix C, "Fan Control Logic" on page C-1)?

NO Go to "Step 1770-5" on page 3-58.

YES Replace the appropriate fan control card. Go to "Step 1790-1" on page 3-62.

Step 1770-5

Have fan errors been reported from fans controlled by both F1 and F2 control cards or are all fans showing errors?

NO Go to “Step 1770-6.”

YES Replace the monitor card. Go to “Step 1790-1” on page 3-62.

Step 1770-6

The previous steps starting from 1770-2 through 1770-2c should have isolated the problem to a given single fault. You may have a case of more than one fault. The possible FRUs associated are:

Fan control cards (F1 and F2)
Fan monitor card (verify jumper settings, see Appendix C, “Fan Control Logic” on page C-1)
Fan trays with two fans in each.

It is possible that you could have a fan failure on both of the fan control cards. However, any more than one fan per control would be unusual and not very probable. Generally, if a monitor card goes bad, it will effect all eight fans. If four fans are bad (not running or not reporting) then it is most probably a defective fan control card. Go to “Step 1790-1” on page 3-62.

Step 1770-7

Have disk drive unit and power supply errors been reported?

NO Go to “Step 1770-10” on page 3-59.

YES Replace the monitor card in the system unit module and retest. Go to “Step 1770-8” on page 3-59.

Step 1770-8

Have relay failures been reported?

NO Verify the error and go to “Step 1770-1” on page 3-57.

YES Replace the alarm assembly and retest. Go to “Step 1790-1” on page 3-62.

Step 1770-9

Possible bad FRUs are:

- Alarm Assembly
- Service Processor

Replace one FRU at a time and recheck.

Go to “Step 1790-1” on page 3-62.

Step 1770-10

Occasionally a disk drive unit or a power supply unit may lock up Bus 0. To check for this possibility, remove each of the units one at a time. following the appropriate procedures for Hot-plugging disk drive or power supply units.

Did the removal of any one unit bring the bus back?

NO Replace the alarm LCD display panel assembly and retest. Go to “Step 1790-1” on page 3-62.

YES Replace the defective unit and retest. Go to “Step 1790-1” on page 3-62.

MAP 1780: Fan Failure Isolation

Step 1780-1

Does testit show a single fan failure?

NO Go to "Step 1780-2."

YES Replace the possible failing FRUs listed below in the order of probability:

Bad fan or bad fan tachometer signal, replace the fan tray (90%)

Bad tachometer signal through the fan control card. Replace the fan control card or swap the two fan control cards and see if the problem moves with the card. (5%)

Bad fan monitor card. Replace the monitor card (check jumpers, see Appendix C, "Fan Control Logic" on page C-1)

Go to "Step 1790-1" on page 3-62

Step 1780-2

Are there four fans failing associated one fan control card (See Appendix C, "Fan Control Logic" on page C-1 for assigned fan positions)?

NO Go to "Step 1780-3" on page 3-61.

YES Replace the fan control card. Go to "Step 1790-1" on page 3-62

Step 1780-3

Is testit showing all eight fans failing?

NO Go to "Step 1780-4."

YES The problem may be in one of the two possible areas, replace the cards in the order shown:

Defective fan monitor card (95%)

Defective Telco alarm LCD display panel assembly (5%)

Go to "Step 1790-1" on page 3-62.

Step 1780-4

You may have more than one failure. Replace the possible failing FRUs listed below in the order of probability:

Bad fan or bad fan tachometer signal, replace the fan tray (90%)

Bad tachometer signal through the fan control card. Replace the fan control card or swap the two fan control cards and see if the problem moves with the card. (5%)

Bad fan monitor card. Replace the monitor card (check jumpers, see Appendix C, "Fan Control Logic" on page C-1)

Go to "Step 1790-1" on page 3-62

MAP 1790: Repair Complete

Step 1790-1

Repair complete.

1. Verify that the error has been fixed
2. Return the customer's ASCII terminal to its original settings if you changed them earlier.
3. Check the AIX hardware error log for other TELCO errors.

   Note: Only the last error is displayed in the alarm LCD display panel. The error log must be checked to be sure that all error indications are noted and resolved.
4. Repair any other errors found in the error log. When all TELCO specific and TELCO alarmed errors are fixed, the following should occur:
   - Error indicators are cleared
   - Alarm LCD diplay panel is cleared
   - Normal LEDs should be “On” continuously.
5. Go to “MAP 0410: Repair Checkout” in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Chapter 4. Error Code to FRU Index

The Error Code to FRU Index lists error symptoms and possible causes. The most likely cause is listed first. Use this index to help you decide which FRUs to replace when servicing the system. If you replace FRUs and the problem is still not corrected, go to MAP 0030 in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.

Some three digit Fxx codes may appear to the left of the top row on the Liquid Crystal Display(LCD) which is located on the front panel of the system. The intended use of the three digit Fxx codes is to assure the observer that the Firmware is operational after power on, and before information appears on the console display.

If any action is to be taken, it is listed in column two of the following table. If the three digit Fxx code is not in the following table, and an action is still required, go to "MAP 1540: Minimum Configuration" on page 3-20.

See Appendix A, "Firmware Checkpoint Three-Digit Codes" on page A-1 for the complete list of three digit Fxx codes.

Table 4-1. POST Error Codes

Error Code	F Code / Description		Action / Possible Failing FRU
00010000	An error occurred during the CPU test.		CPU card
0001000A	Machine check occurred.		Go to MAP 1540.
0001500x	An error occurred while erasing the system firmware. Firmware update was not completed.		CPU card
00016000	F46	Interrupt (IRQ13) stuck high	1. System board; swap old VPD module to new system board 2. Service processor, if present
	F47	No system board VPD data. Module missing or bad CRC.	System board; swap old VPD module to new system board
	F49	Environmental condition 40111022/40111082, 5V high/low. EPOW register could not be cleared.	1. Power supply 2. CPU card 3. System board; swap old VPD module to new system board

Table 4-2. POST Error Codes

Error Code	F Code / Description		Action / Possible Failing FRU
00016000 (continued)	F4A	Environmental condition 40111052/401110B2/ 40111062/401110C2, +-12V high/low. EPOW register could not be cleared.	1. Power supply 2. CPU card 3. System board; swap old VPD module to new system board
	F4B	Environmental condition 40200021. CPU card over temperature. EPOW register could not be cleared.	1. Check for cool air flow obstructions to the system 2. System board; swap old VPD module to new system board
	F4F	Environmental condition 40200031/40200041, system board/memory over temprature. EPOW register could not be cleared.	System board; swap old VPD module to new system board
	F51	Environmental condition 40200023. CPU card critical temperature. EPOW register could not be cleared.	1. Check for cool air flow obstructions to the system 2. Replace CPU card if the problem persists 3. System board; swap old VPD module to new system board
	F51	Environmental condition 40200033/40200043, system board/memory critical temperature. EPOW register could not be cleared.	1. Check for cool air flow obstructions to the system 2. System board; swap old VPD module to new system board

Table 4-3 (Page 1 of 14). POST Error Codes

Error Code	F Code / Description		Action / Possible Failing FRU
00016000 (continued)	F52	Environmental condition 40210011/40210014, slow/locked fan. EPOW register could not be cleared.	1. Room operating temperature 2. System fans 3. System board; swap old VPD module to new system board
	F53	Environmental condition 40210011/40210014, slow/locked fan. EPOW register successfully cleared.	1. Fan(s) 2. System board; swap old VPD module to new system board 3. Service processor if present
	F55	Unsupported EPOW	1. System board; swap old VPD module to new system board 2. Service processor if present
	F56	Environmental condition 40111032/40111092/ 40111042/401110A2, 3.3V/2.5V high/low. EPOW register could not be cleared.	1. CPU card 2. Power supply 3. System board; swap old VPD module to new system board 4. Service processor if present
00016010	System VPD access failure		1. System board; swap old VPD module to new system board 2. If problem persists, swap new VPD module onto new system board; also see step 3) 3. If customer has protected licensed software installed then advise customer to contact all protected software suppliers for a licence update.
00017001	CMOS error was detected due to battery drainage.		Replace your battery
00017002	Error was detected in CMOS, CMOS data is gone! CMOS not yet initialized if battery just replaced.		Replace battery if you haven't done so.
00017003	Power interruption occurred during last Boot Sequence update.		Update the Boot Sequence again.
00017006	Tamper Evident is detected or new battery was just being installed.		Security violation possible.

Table 4-3 (Page 2 of 14). POST Error Codes

Error Code	F Code / Description	Action / Possible Failing FRU
00017007	Maximum number of tries was reached!! Time and Date are logged! Computer is stopping.	Turn machine off and back on, re-enter password
00017008	Maximum number of tries was reached!! Computer is stopping.	Turn machine off and back on, re-enter password
00017013	No power on password entered. Unattended mode can not be set.	1. Quit unattended mode 2. Set power-on password 3. Retry operation
00017015	Tamper Evident is detected.	Security violation or Bad CMOS battery.
00018000	Bad flash image discovered during system start-up	CPU card
00020000	An error occurred during the memory test.	Use System Management Services to test the memory.
000210y0	An error occurred during the memory test. y represents memory module slot number	Memory module slot number y (y = 1 to 8) is bad or unsupported.
00031100	The keyboard is in the wrong port.	Check keyboard cable and connector.
00031300	Failed to register keyboard interrupt	1. Keyboard 2. System board; swap old VPD module onto new system board.
00070000	Service processor POST failure	1. Service processor 2. System board; swap old VPD module onto new system board
00070001	CPU card or power supply failure	1. CPU card 2. Power supply
00070006	Slow or stuck fan	1. Fans 2. Service processor, if present 3. System board; swap old VPD module onto new system board
00070007	System over temperature	1. Check for cool air flow obstructions to the system 2. Replace system board if the problem persists; also swap old VPD module onto new system board 3. CPU card

Table 4-3 (Page 3 of 14). POST Error Codes

Error Code	F Code / Description		Action / Possible Failing FRU
00070008	F4F	Environmental condition 40200031/40200041, system board/memory over temperature. EPOW register successfully cleared.	1. Check for cool air flow obstructions to the system 2. Replace system board if the problem persists; also swap old VPD module onto new system board 3. Memory
	F51	Environmental condition 40200033/40200043, system board/memory critical temperature. EPOW register successfully cleared.	1. Check for cool air flow obstructions to the system 2. Replace system board if the problem persists; also swap old VPD module onto new system board 3. Memory
00070009	F4B	Environmental condition 40200021, CPU card over temperature. EPOW register successfully cleared.	1. Check for cool air flow obstructions to the system 2. Replace CPU card if the problem persists 3. System board; swap old VPD module onto new system board
	F51	Environmental condition 40200023, CPU card critical temperature. EPOW register successfully cleared.	1. Check for cool air flow obstructions to the system 2. Replace CPU card if the problem persists 3. System board; swap old VPD module onto new system board
00070010	F48	Environmental condition 40100005. AC loss eminent.	1. Power supply 2. System board; swap old VPD module onto new system board 3. Service processor, if present
	F4A	Environmental condition 40111052/401110B2/ 40111062/401110C2, +-12V high/low. EPOW register successfully cleared.	1. Power supply 2. System board; swap old VPD module onto new system board

Table 4-3 (Page 4 of 14). POST Error Codes		
Error Code	**F Code / Description**	**Action / Possible Failing FRU**
00070011	Environmental condition 40111022/40111082, 5V high/low. EPOW register successfully cleared.	1. Power supply 2. CPU card 3. System board; swap old VPD module onto new system board
00070012	Service processor reports self-test failure	1. Service processor, if present 2. System board; swap old VPD module onto new system board
00070013	Bad NVRAM CRC error	1. Battery 2. System board; swap old VPD module onto new system board
00070014	Bad service processor firmware	Use service processor firmware diskette to re-program firmware
00070015	Bad service processor VPD	1. Service processor, if present 2. System board; swap old VPD module onto new system board
00070016	Service processor firmware failure	1. Retry service processor firmware update 2. Service processor, if present
00070017	Bad or low battery	1. Battery 2. Service processor, if present 3. System board; swap old VPD module onto new system board
00070018	EPOW test failure	1. Service processor, if present 2. System board; swap old VPD module onto new system board
00070019	Interrupt (IRQ13) test failure	1. System board; swap old VPD module onto new system board 2. Service processor, if present

Table 4-3 (Page 5 of 14). POST Error Codes

Error Code	F Code / Description	Action / Possible Failing FRU
0037cyyi	SCSI controller interface error. c = SCSI Controller ID assigned by search order PCI slot 1, 2, integrated controller, PCI slot 3 through last. Example: #1 1st SCSI controller card in slot 2 = ID 0 Integrated SCSI controller = ID 1 Example: #2 Integrated SCSI controller = ID 0 1st SCSI controller card in slot 3 = ID 1 yy = See Table 4-4 on page 4-17 i = SCSI ID(0 to 9 or A through F). F normally indicates the controller.	1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. 2. Ensure SCSI bus terminator is installed properly. 3. Ensure SCSI cable/connector are securely connected and not damaged. 4. SCSI controller or Integrated SCSI Controller on system board as identified by "c" in the error code.
0129100x (x = location of failing simm)	An error occurred during the L2 Cache tests.	1. memory module 2. CPU Card

Table 4-3 (Page 6 of 14). POST Error Codes

Error Code	F Code / Description	Action / Possible Failing FRU
0208cyyi	SCSI device/adapter error. c = SCSI Controller ID assigned by search order PCI slot 1, 2, integrated controller, PCI slot 3 through last. Example: #1 1st SCSI controller card in slot 2 = ID 0 Integrated SCSI controller = ID 1 Example: #2 Integrated SCSI controller = ID 0 1st SCSI controller card in slot 3 = ID 1 yy = See Table 4-4 on page 4-17 i = SCSI ID(0 to 9 or A through F). F normally indicates the controller.	1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. 2. Ensure SCSI bus terminator is installed properly. 3. Ensure SCSI cable/connector are securely connected and not damaged. 4. SCSI device as identified by "i". If the device is not the CD-ROM drive, remove the device. Try loading standalone diagnostics. If the diagnostics load, replace the device identified by "i". If the device is the CD-ROM drive or the diagnostics will not load with the device identified by "i" removed, remove all devices except the CD-ROM drive. Try loading standalone diagnostics. If the diagnostics load, add the devices back one at a time until the failing device is identified. Check each device by loading standalone diagnostics. If the diagnostics do not load, replace the CD-ROM drive. If the diagnostics still do not load, then replace the SCSI controller identified by "c".

Table 4-3 (Page 7 of 14). POST Error Codes

Error Code	F Code / Description	Action / Possible Failing FRU
0210cyyi	SCSI DASD error. c = SCSI Controller ID assigned by search order PCI slot 1, 2, integrated controller, PCI slot 3 through last. Example: #1 1st SCSI controller card in slot 2 = ID 0 Integrated SCSI controller = ID 1 Example: #2 Integrated SCSI controller = ID 0 1st SCSI controller card in slot 3 = ID 1 yy = See Table 4-4 on page 4-17 i = SCSI ID(0 to 9 or A through F). F normally indicates the controller.	1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. 2. Ensure SCSI bus terminator is installed properly. 3. Ensure SCSI cable/connector are securely connected and not damaged. 4. SCSI Disk Device connected to SCSI adapter "c" and assigned SCSI ID="i".
0211cyyi	SCSI tape error. c = SCSI Controller ID assigned by search order PCI slot 1, 2, integrated controller, PCI slot 3 through last. Example: #1 1st SCSI controller card in slot 2 = ID 0 Integrated SCSI controller = ID 1 Example: #2 Integrated SCSI controller = ID 0 1st SCSI controller card in slot 3 = ID 1 yy = See Table 4-4 on page 4-17 i = SCSI ID(0 to 9 or A through F). F normally indicates the controller.	1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. 2. Ensure SCSI bus terminator is installed properly. 3. Ensure SCSI cable/connector are securely connected and not damaged. 4. SCSI Tape Device connected to SCSI adapter "c" and assigned SCSI ID="i".

Table 4-3 (Page 8 of 14). POST Error Codes

Error Code	F Code / Description	Action / Possible Failing FRU
0212cyyi	SCSI CDROM error. c = SCSI Controller ID assigned by search order PCI slot 1, 2, integrated controller, PCI slot 3 through last. Example: #1 1st SCSI controller card in slot 2 = ID 0 Integrated SCSI controller = ID 1 Example: #2 Integrated SCSI controller = ID 0 1st SCSI controller card in slot 3 = ID 1 yy = See Table 4-4 on page 4-17 i = SCSI ID(0 to 9 or A through F). F normally indicates the controller.	1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. 2. Ensure SCSI bus terminator is installed properly. 3. Ensure SCSI cable/connector are securely connected and not damaged. 4. SCSI CDROM Device connected to SCSI adapter "c" and assigned SCSI ID="i".
0215cyyi	SCSI CDROM error. c = SCSI Controller ID assigned by search order PCI slot 1, 2, integrated controller, PCI slot 3 through last. Example: #1 1st SCSI controller card in slot 2 = ID 0 Integrated SCSI controller = ID 1 Example: #2 Integrated SCSI controller = ID 0 1st SCSI controller card in slot 3 = ID 1 yy = See Table 4-4 on page 4-17 i = SCSI ID(0 to 9 or A through F). F normally indicates the controller.	1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. 2. Ensure SCSI bus terminator is installed properly. 3. Ensure SCSI cable/connector are securely connected and not damaged. 4. SCSI CDROM Device connected to SCSI adapter "c" and assigned SCSI ID="i".
0243025y	The Graphics Controller, DAC, Frame Buffer, Graphics Function test failed.	Graphic PCI card in slot y
40100005	A loss of system power detected.	Possible main power loss. If not, replace power supply.
40111002	An unknown power problem detected.	1. Power supply 2. System board; swap old VPD module to new system board 3. Service processor, if present

Table 4-3 (Page 9 of 14). POST Error Codes		
Error Code	**F Code / Description**	**Action / Possible Failing FRU**
40111022	A high 5.0 voltage reading detected.	1. Power supply 2. CPU card
40111032	A high 3.3 voltage reading detected.	1. CPU card 2. Power supply
40111042	A high 2.5 voltage reading detected.	1. CPU card 2. Power supply
40111052	A high +12 voltage reading detected.	1. Power supply 2. System board; swap old VPD module to new system board
40111062	A high –12 voltage reading detected.	1. Power supply 2. System board; swap old VPD module to new system board
40111082	A low 5.0 voltage reading detected.	1. Power supply 2. CPU card
40111092	A low 3.3 voltage reading detected.	1. CPU card 2. Power supply
401110A2	A low 2.5 voltage reading detected.	1. CPU card 2. Power supply
401110B2	A low +12 voltage reading detected.	1. Power supply 2. System board; swap old VPD module to new system board
401110C2	A low –12 voltage reading detected.	1. Power supply 2. System board; swap old VPD module to new system board
40200001	An unknown cooling problem detected.	Cooling problem; check system fans.
40200021	A CPU temperature warning detected.	Over temperature on CPU card.
40200023	A critical CPU temperature condition detected.	Critical temperature on CPU card.
40200031	An I/O planar temperature warning detected.	Over temperature on system board.
40200033	A critical I/O planar temperature condition detected.	Critical temperature on system board.
40200041	A memory temperature warning detected.	Over temperature on system board.
40200043	A critical memory temperature condition detected.	Critical temperature on system board.

Table 4-3 (Page 10 of 14). POST Error Codes		
Error Code	**F Code / Description**	**Action / Possible Failing FRU**
40210011	A slow fan detected.	Check: 1. Room operating temperature 2. System fans
40210014	A stopped fan detected.	Failing fan.
40A00000	System firmware IPL failure.	1. Surveillance mode control is from the Service Processor (SP) Menus. 2. Verify that the system firmware supports SP surveillance. 3. CPU card 4. System board 5. Service processor 6. If the problem still exists, go to MAP 1540. 7. If the problem persists, call the support center for assistance.
40B00000	The operating system surveillance interval exceeded.	1. Surveillance mode control is from the Service Processor(SP) Menus. 2. Verify that the Operating System (OS) Heartbeat Utility is installed and has been activated. 3. Check for errors or unusual conditions that might prevent the OS from reporting Heartbeat messages; such as system dump, machine check or checkstop error. Review the error log. 4. System board; swap old VPD module to new system board 5. Service processor 6. If the problem persists, call the support center for assistance.
40D00003	An unknown slow shutdown commanded.	Critical cooling problem.
40D00004	An unknown fast shutdown commanded.	Locked fan failure detected.

Table 4-3 (Page 11 of 14). POST Error Codes		
Error Code	**F Code / Description**	**Action / Possible Failing FRU**
4B201000	Checkstop	Refer to MAP “MAP 1540: Minimum Configuration” on page 3-20.
4B201010	Machine Check	Refer to MAP “MAP 1540: Minimum Configuration” on page 3-20.
4B201020	TEA Error	Refer to MAP “MAP 1540: Minimum Configuration” on page 3-20.
80001200	The firmware recovery information could not be written to the diskette.	1. Check diskette media write protect tab. 2. Diskette drive
80001300	The firmware update file is the same level as the system firmware. Firmware update cancelled.	1. Obtain new level of firmware 2. Retry operation
80001400	The firmware update file does not support this system. Firmware update cancelled.	1. Obtain the correct firmware file 2. Retry operation
80001500	The firmware update file on the current drive is corrupted. Firmware update cancelled.	1. Obtain new firmware file 2. Retry operation
80001600	The firmware update file could not be located on the current drive. Firmware update cancelled.	Specify the correct drive and path name for firmware file.
80001700	The firmware update file on the current drive is corrupted. Firmware update cancelled.	1. Obtain new firmware file 2. Retry operation
80001800	A valid firmware update file could not be located on the current drive. Firmware update cancelled.	1. Specify the correct drive and path name for firmware file. 2. Obtain new firmware file 3. Retry operation
80001900	The firmware update file does not support this system. Firmware update cancelled.	1. Obtain new firmware file 2. Retry operation
80002000	Two flash images found. User cancelled out of file select	Retry operation
80002100	The firmware update file could not be loaded from the current drive. Firmware update cancelled.	Specify the correct drive and path name for firmware file.

Table 4-3 (Page 12 of 14). POST Error Codes		
Error Code	**F Code / Description**	**Action / Possible Failing FRU**
80002200	The firmware update module is write protected. Firmware update cancelled.	1. Turn the system off and then back on. 2. Retry operation 3. CPU card 4. If problem persists, call support center for assistance.
80002300	This version of the update utility does not support this system. Firmware update cancelled.	1. Turn the system off and then back on. 2. Retry operation 3. CPU card 4. If problem persists, call support center for assistance.
80002400	The firmware module is not supported. Firmware update cancelled.	Flash module on CPU card is malfunctioning.
80002500	The firmware module is not supported. Firmware update cancelled.	Flash module on CPU card is malfunctioning.
80002600	The firmware module is write protected.	1. Turn the system off and then back on. 2. Retry operation 3. CPU card 4. If problem persists, call support center for assistance.
80002700	Backup recovery diskette is not inside the drive.	Insert backup diskette
80002800	Update system firmware diskette is not inside the drive.	Insert diskette
80072000	The service processor is not installed. Service processor update cancelled.	1. Install the service processor 2. Retry operation
91001100	Remote IPL error. Insufficient memory.	1. Run memory test, replace defective memory module. 2. This system has insufficient memory for this operation.
91001200	Remote IPL error. Incorrect IP format for client IP address.	Change/Update IP format
91001300	Remote IPL error. Incorrect IP format for server IP address.	Change/Update IP format
91001400	Remote IPL error. Incorrect IP format for gateway IP address.	Change/Update IP format
91001500	Remote IPL error. Incorrect IP format for netmask.	Change/Update IP format

Table 4-3 (Page 13 of 14). POST Error Codes

Error Code	F Code / Description	Action / Possible Failing FRU
91001600	Remote IPL error. Error writing to NVRAM.	System board; swap old VPD module onto new system board
91001700	Remote IPL error. Ethernet adapter not found.	Ensure network card is properly installed.
91001900	Remote IPL error. Token-Ring adapter not found.	Ensure network card is properly installed.
91002000	Remote IPL error. No network adapters recognized.	Ensure network card is properly installed.
91002200	Remote IPL error. Ping failed.	Possible IP address or network problem.
M0CON000	The system hung during POST.	Go to MAP 1540.
M0CPU000	The CPU POST failed.	1. CPU Card 2. System Board
M0CPU001	Checkstop occurred.	1. CPU card 2. System board
M0FD0000	The system hung during diskette POST.	1. System board 2. Diskette drive.
M0GA0000	Graphics adapter POST failed.	Graphics adapter
M0HD0000	The system hung during boot POST.	Go to MAP 1540.
M0KBD000	The system hung during keyboard POST.	1. System board 2. Keyboard
M00KBD01	The system did not respond to a keyboard entry.	Type 101 keyboard
M0KBD002	The system did not respond to a keyboard entry.	Type 102 keyboard
M0KBD003	The system did not respond to a keyboard entry.	Kanji-type keyboard
M0MC0001	A machine check occurred.	Go to MAP 1540.
M0MEM000	No good memory could be found.	1. Memory 2. System board Note: If only one memory-module kit is installed, replace it. If there are multiple memory-module kits installed, go to MAP 1540.
M0MEM001	No good memory could be found.	1. Memory 2. System board.
M0MEM002	The system hung during memory POST.	Go to MAP 1540.
M0PS0000	Power failure.	Go to MAP 1520.
M0SCSI00	Unable to load diagnostics.	Go to MAP 1540.

Table 4-3 (Page 14 of 14). POST Error Codes		
Error Code	**F Code / Description**	**Action / Possible Failing FRU**
M0SCSI01	Unable to load diagnostics.	Go to Map 1540.
M0SPK000	A continuous beep is heard from the system.	System board
M0SPK001	The system does not beep.	1. System board 2. Speaker

Table 4-4 (Page 1 of 2). POST Error Status Codes	
Error	**Status**
08	Invalid device number
11	No SCSI card
13	Command failed
28	Reservation conflict
29	Device not available
43	Not enough memory
47	Waiting for completion
49	Sense needed
51	Reset needed
55	Not ready or no media
56	Invalid (unsupported) command
57	Write protected
59	Media error
60	Hardware error
61	Unit attention
62	Blank check
63	Command abort
64	Busy
65	Media
66	Script error
67	Invalid address
68	Media changed
69	Device reset
70	Format in progress
71	Format corrupt
72	Start required
73	Device ID conflict
74	Manual intervention
75	Media not found
76	In progress
77	Media eject failed
78	Write protect failed
79	Controller memory to memory transfer test failed
80 - 81	SCSI Controller interface error
82	SCSI bus access error

Table 4-4 (Page 2 of 2). POST Error Status Codes	
Error	**Status**
83	SCSI fuse bad or PTC
84	SCSI Device command failed
85 - 86	SCSI Controller interface error
87	Short record error
88	SCSI bus parity error
89	SCSI device no reset
90	Time out error
91	SCSI no audio
92	SCSI incompatible media
93	Tape requested/actual block size mismatch (normally)
94	Filemark or setmark read on tape device
95	Wide data transfer data miscompare error
96	Wide data transfer error other than data miscompare
97	Command not supported by device (eg. wide data transfer)
99	SCSI Controller interface error

Chapter 5. Alarm Interface and Error Logs

The purpose of the Alarm Interface is to monitor the condition of selected hardware in the 7317 Model F3L and to set or clear alarms and post reports when there is a change in hardware status. In addition, the interface responds to a set of calls from an Application Program Interface (API) to set and clear alarms and post hardware status reports.

Hardware Description

The hardware to be monitored includes the following:

- One to five modules containing disk drives, fans, and power supplies
- One to three modules containing system power supplies
- Four trays containing two fans each
- An alarm reset push button
- The temperature of the system electronics.

A Service Processor (SP) interfaces from the system electronics to a multiplexer (MPX) which then interfaces to a set of sensor/driver cards. In addition to monitoring the status of the devices listed above, the sensor/driver cards interface with a set of relays which close or open to indicate an alarm condition or control an external device. Light Emitting Diodes (LED) are associated with three of the relays and illuminate when the fault condition of the relay is set. One relay has an associated audible alarm which is activated with the relay in the fault state. An LED can also be illuminated on each of the fan trays to indicate a problem. A green LED can be illuminated to indicate normal operation of the product when no faults are detected. A Liquid Crystal Display (LCD) with two lines of 16 characters each may be used to display status information.

Software Description

The 7317 Enhanced Telecommunications Alarm and Surveillance Control (ETASC) Manager writes errors to the AIX error log in response to changes in the status of the 7317 hardware and software. This software is preloaded on the system if the AIX operating system is preloaded. A backup diskette containing the ETASC Manager is also shipped with the system.

The three components of the software are:

- A list of status messages that are added to those that can be displayed in the AIX Hardware Error Log

- A daemon that polls hardware and software for status changes, sets and clears relays and LEDs, and posts messages to the AIX Hardware Error Log and the LCD
- An API that formats the information from its set of user calls and transfers the information to the daemon.

Daemon Operation

The general format of daemon operation is as follows:

1. When started, the daemon determines if it can communicate with the SP and the sensor/driver cards. The daemon then determines the configuration of the seven hardware locations (slots) that may be open, contain a disk drive, or a system power supply.
2. The daemon reads information from the API to determine if there are user software requests to set or clear relays or to post status reports. It also reads the status of the Audible Alarm Relay to determine if an alarm has been acknowledged by a button press.
3. The daemon then polls the hardware for status and determines if relays and LEDs should be cleared or set, and if messages should be posted. The decision on which actions to take is based on the present hardware status, the previous status, alarm acknowledgements received, and user requests.
4. After a composite set of relay requirements is established, the daemon sets or clears the relays as needed, and posts the relay states if a report has been requested.
5. The daemon then "sleeps" for a period of time and resumes at step 2.

The following table shows which items are monitored, the associated alarms, and set/clear definitions:

Alarm Class							
Item daemon monitors	**Minor**	**Major**	**Critical**	**Audible**	**Set**	**Clear**	**Definition for (Set/Clear)**
Fuse in file slot	x			x	x	x	A fuse (is not/is) providing power in a file slot.
Power in file slot		x		x	x	x	A file slot power supply (is not/is) providing proper output voltages.
Power control		x		x	x	x	Power (is not/is) activated for a file slot. (This is a back- plane fault, not a slot fault.)
Slot power supply	x			x	x	x	A redundant system power supply (is not/is) providing proper output voltages.
Power supply fuse	x			x	x	x	A fuse (is not/is) providing power in a power supply slot.
Tray fan	x			x	x	x	A fan (is not/is) running in a fan tray.
Temperature	x			x	x	x	Temperature (is not/is) normal in the lower enclosure.
Critical temp			x	x	x		Critical temperature has been exceeded. Shutdown in 8 minutes.

Alarm Class							
Item daemon monitors	**Minor**	**Major**	**Critical**	**Audible**	**Set**	**Clear**	**Definition for (Set/Clear)**
User defined minor	x				x	x	Software request for (set/clear).
User defined major		x			x	x	Software request for (set/clear)
User defined critical			x		x	x	Software request for (set/clear)
User defined audible				x	x	x	Software request for (set/clear). (Audible clear serves as acknowledgment of existing alarms)
User requested full report							Monitor status.
User requested relay report							Monitor status.
Minor alarm relay/LED							Monitor status for report.
Major alarm relay/LED							Monitor status for report.
Critical alarm relay/LED							Monitor status for report
Auxiliary relay							Monitor status for report.
Audible alarm relay							Monitor status for report. (Clear after being set serves as acknowledgement of existing alarms)

The alarm set definition is as follows:

1. The NORMAL (green) LED is cleared (turned off).
2. The MINOR, MAJOR, or CRITICAL relay and corresponding LED are set.
3. The AUDIBLE relay and local alarm are set.
4. The red LED on the failing device is set if one is present.
5. A statement of the problem is entered on the LCD (See “LCD Error Messages” on page 5-12 for a listing of LCD messages).
6. An error statement is recorded in the AIX hardware error log (See “AIX Hardware Error Log Messages” on page 5-8 for a listing of AIX Hardware Error Log entries).

The alarm clear definition is as follows:

1. An indication of problem resolution is recorded in the AIX hardware error log.

The following actions occur only after the alarm is acknowledged.

2. The MAJOR, or CRITICAL relay and LED are cleared if all fails for that level of alarm are clear.
3. The red LED on the failing device is cleared if one is present.
4. The NORMAL LED is set (turned on) if all fails are clear.
5. The LCD is cleared. (Previous messages are lost.)

Service Processor Operation:

In addition to transferring commands and data between the daemon and the MPX, the SP captures the Alarm Clear button press and clear the audible alarm relay and the local audible alarm. The SP also provides the system temperature status for the daemon. On loss of the heartbeat (communication) with the main processor, the SP sets the critical alarm relay and associated LED and set the audible alarm relay and local audible alarm.

API Operation:

The following set of calls may be made from the user application and will be transmitted to the daemon and interpreted as indicated:

SETMINOR() On its next cycle, the daemon sets the Minor Alarm Relay and illuminate its associated LED. The normal LED is cleared.

RESETMINOR() On its next cycle, the daemon clears the minor alarm relay and its associated LED if there are no other conditions to keep it set.

SETMAJOR() On its next cycle, the daemon sets the major alarm relay and illuminate its associated LED. The normal LED is cleared.

RESETMAJOR() On its next cycle, the daemon clears the major alarm relay and its associated LED if there are no other conditions to keep it set.

SETCRITICAL() On its next cycle, the daemon sets the critical alarm relay and illuminate its its associated LED. The normal LED is cleared.

RESETCRITICAL() On its next cycle, the daemon clears the critical alarm relay and its associated LED if there are no other conditions to keep it set.

SETAUDIBLE()	On its next cycle, the daemon sets the audible alarm relay and turn on the local audible alarm. The normal LED is cleared.
RESETAUDIBLE()	On its next cycle, the daemon clears the Audible Alarm Relay and the local alarm if there are no other conditions to keep it set. In addition, this request is treated as an acknowledgement of any existing alarms.
SETAUXILIARY()	On its next cycle, the daemon sets the auxiliary relay.
RESETAUXILIARY()	On its next cycle, the daemon clears the auxiliary relay.
SETFULLREPORT()	On its next cycle, the daemon posts the status of each item it monitors in the AIX Error Log.
SETRELAYREPORT()	On its next cycle, the daemon posts the status of each relay in addition to the failed or cleared items it would normally report. The relay report is a subset of the full report.

User Software Information

The ETASC software supplied with the 7317 Model F3L should be run to monitor the system hardware during normal operations.

etasc: The daemon which monitors the system hardware is in the file named **etasc**. This file should be installed in the **/etc** directory and the daemon started under root authority. Syntax for initiating the daemon operation is:

```
etasc   {-s  sleep_time}
```

The **-s** flag sets the sleep time between polling cycles and is an optional parameter. Valid inputs for sleep_time are 1 to 99999 and are increments of 0.1 seconds. The default value for sleep_time is 0.5 seconds when the **-s** flag is not used.

An example of the command for starting the daemon is:

```
/etc/etasc -s 10
```

Daemon operation is begun with a 1 second sleep period between polling cycles.

api.o: The C language call routines which interface to the daemon are contained in the **api.0** file. This file should be compiled with the users C language code.

SNMP Trap Generation

The 7317 Enhanced Telecommunications Alarm and Surveillance Control (ETASC) Manager writes errors to the AIX error log in response to changes in the status of the 7317 hardware and software. In order to enhance the operational availability of the 7317, this information can be forwarded to a centralized systems management tool such as NetView for AIX through Simple Network Management Protocol (SNMP) traps.

The AIX error logging subsystem includes entries for all events that might be entered into the hardware error log. One of the attributes associated with each of these error entries is whether the event is *alertable*. Whenever an alertable system log events occurs, infomation about that particular event is passed to an SNMP subagent, which then transmits the error information as an SNMP trap to an SNMP based systems management tool such as NetView for AIX. This enhances operator awareness of situations that may require operator intervention and can improve overall availability.

The **trapgend** component of NetView for AIX is included with the ETASC manager software. Part of the **trapgend** NetView component is the SNMP subagent daemon,

trapgend. The trapgend daemon uses the Netview Subagent Management Information Base (MIB) to send the following SNMP traps.

SNMP Traps

The Netviewsubagent Enterprise MIB identifier is 1.3.6.1.4.1.2.6.4.

Event Name	Specific Trap Number	Description
TEL_POW_OK	491504269	7317 Power supply is normal
TEL_FAN_BAD	569542138	7317 Fan has failed
TEL_FUS_OK	623204904	7317 Fuse is normal
TEL_FAN_OK	1058537819	7317 Fan is normal
TEL_RW_BAD	1270172747	7317 Alarm subsystem terminal error
TEL_TEMP_OK	1777613281	7317 CPU memory and IO temp normal
TEL_CTL_OK	2003283095	7317 Power control is normal
TEL_USR_CLR	-1973864795	7317 Relay was cleared by user
TEL_CTL_BAD	-1729268166	7317 Power control has failed
TEL_FUS_BAD	-1185581505	7317 Fuse has failed
TEL_TEMP_ALRT	-1032317816	7317 CPU IO or memory temp above normal
TEL_ALM_ACK	-903772764	7317 Alarm has been acknowledged
TEL_USR_SET	-856665371	7317 Relay was SET by user
TEL_POW_BAD	-743390628	7317 Power supply has failed
TEL_RLY_SET	-341132040	7317 Relay status is SET
TEL_RLY_CLR	-205752789	7317 Relay status is CLEAR
TEL_TEMP_SDWN	-80432269	7317 CPU IO or memory temp critical

AIX Hardware Error Log Messages

Relay set entry

The same error identification number applies to the Minor, Major, Critical, Audible, and Auxiliary relays. The individual relay is identified on the Resource Name line of the entry. A typical report for a set relay is as follows:

```
ERROR_ID  TIMESTAMP  T C  RESOURCE_NAME  ERROR_DESCRIPTION
EBAABCF8  0307145896 U H  MinorAlarm     7317 Relay
                          MajorAlarm
                          CriticalAlarm
                          AudibleAlarm
                          AuxiliaryRly
```

Relay clear entry

The same error identification number applies to the Minor, Major, Critical, Audible, and Auxiliary relays. The individual relay is identified on the Resource Name line of the entry. A typical report for a clear relay is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
F3BC762B  0307145896 U H  MinorAlarm     7317 Relay Status is Clear
                                         MajorAlarm
                                         CriticalAlarm
                                         AudibleAlarm
                                         AuxiliaryRly
```

Fuse failure entry

The same error identification number applies to a fuse failure in a hard file or power supply module. The individual module (slot) is identified on the Resource Name line of the entry. A typical report for a blown fuse is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
B955763F  0318085796 P H  SlotX          7317 Fuse is normal
                          X = 1 to 7
```

Fuse OK entry

The same error identification number applies to a good fuse in a disc drive or power supply module. The individual module (slot) is identified on the Resource Name line of the entry. A typical report for a good fuse is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
25255A28  0318085796 P H  SlotX          7317 Fuse is normal
                          X = 1 to 7
```

Fan failure entry

The same error identification number applies to a fan failure in any fan tray. The tray is identified on the Resource Name line of the entry. A typical report for a fan failure is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
21F285FA  0411085796 P H  TrayX          7317 Fan has failed
                          X = 1 to 4
```

Fan good entry

The same error identification number applies to a good fan in any fan tray. The tray is identified on the Resource Name line of the entry. A typical report for a good fan is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
3F18015B  0401200196 P H  TrayX          7317 Fan is normal
                          X = 1 to 4
```

Power supply failure entry

The same error identification number applies to a failed power supply in a hard file or power supply module. The individual module (slot) is identified on the Resource Name line of the entry. A typical report for a failed power supply is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
D3B0C25C  0318085796 P H  Slot1          7317 Power supply has failed
```

Power supply good entry

The same error identification number applies to a good power supply in a disk Drive or power supply module. The individual module (slot) is identified on the Resource Name line of the entry. A typical report for a good power supply is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
1D4BC28D  0318085796 P H  SlotX          7317 Power supply is normal
                          X = 1 to 7
```

Power control failure entry

The same error identification number applies to a power control failure for any disk drive module. The individual module (slot) is identified on the Resource Name line of the entry. A typical report for a power control failure is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
98ED763A  0411085796 P H  SlotX          7317 Storage subsystem failed
                         X = 1 to 7
```

Power control good entry

The same error identification number applies to a good power control signal for any disk drive module. The individual module (slot) is identified on the Resource Name line of the entry. A typical report for a good power control signal is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
7767AC87  0401200196 P H  SlotX          7317 Storage subsystem is normal
                          X = 1 to 7
```

Alarm acknowledged entry

The error identification entry for an acknowledged alarm is as follows. The same entry is made for a software or hardware acknowledgement.

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
CA2185A4  0418113096 T H  AlrmAcknwldgd  7317 Alarm has been acknowledged
```

Alert temperature entry

The temperature alert message posted by AIX for CPU, memory, and I/O temperatures exceeding the alert threshold is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
C2781488  0418113096 P H  ServProc       7317 CPU IO or Memory temp
```

Shutdown temperature entry

The system shutdown message by AIX for CPU, memory, and I/O temperatures exceeding the critical threshold is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
FB34B373  0418113096 P H  ServProc       7317 CPU Memory and IO temp
```

Normal temperature entry

The error identification entry for normal system temperatures is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
69F439E1  0418113096 P H  NormalTemprtr  7317 CPU Memory and IO temp
```

Daemon communication failure

The error identification entry for a communications failure from or to the daemon is as follows:

```
ERROR_ID  TIMESTAMP  T CL RESOURCE_NAME  ERROR_DESCRIPTION
4BB54C4B  0418113096 P H  Telco Daemon   7317 Alarm subsystem terminal
```

LCD Error Messages

The error messages displayed are as follows:

SLOT X FUSE FAILURE, where X = 1, 2, 3, 4, 5, 6, or 7

SLOT X POWER FAILURE, where X = 1, 2, 3, 4, 5, 6, or 7

SLOT X CONTROL FAILURE, where X = 1, 2, 3, 4, 5, 6, or 7

TRAY X FAN FAILURE, where X = 1, 2, 3, or 4

HIGH TEMP ON SYSTEM BOARD

Chapter 6. Loading the System Diagnostics

The system unit can be booted either from the default boot list or from the custom boot list. (See Chapter 7, “System Management Services” on page 7-1 for instructions on defining the custom boot list.)

If your system does not have a CD-ROM drive installed you must run the stand-alone CD-ROM diagnostics from an externally attached CD-ROM drive.

To load **Standalone** diagnostics from the default boot list, perform the following procedure:

1. Verify with the system administrator and users that all programs may be stopped, then do so.
2. Turn off the system.
3. Wait 30 seconds, and turn on the system.
4. Immediately insert the diagnostic CD-ROM into the CD-ROM drive.
5. When or after the diskette indicator appears during startup, press the F5 key on a directly-attached keyboard (or the number 5 key on an ASCII terminal).
6. Enter any requested passwords.

Online diagnostics can be loaded by booting from the custom boot list by pressing the F6 key (on a directly-attached keyboard) or the number 6 key on an ASCII terminal.

The procedure for booting from the devices listed in the custom boot list (Online diagnostics) is the following:

1. Verify with the system administrator and users that all programs may be stopped, then do so.
2. Turn off the system.
3. Wait 30 seconds, and turn on the system.
4. When or after the diskette indicator appears during startup, press the F6 key on a directly-attached keyboard (or the number 6 key on an ASCII terminal).
5. Enter any requested passwords.

After any requested passwords have been entered, the system will attempt to boot from the first device of each type found on the list. If no bootable image is found on the first device of each type on the list, the system does not search through the other

devices of that type for a bootable image; instead, it will poll the first device of the next type.

If all types of devices in the boot list have been polled without finding a bootable image, the system will restart, this gives the user the opportunity to start the System Management Services (by pressing the F1 key on a directly attached keyboard or the number 1 on an ASCII terminal) before the system attempts to boot again.

Custom Boot List and Default Boot List

The default boot list is:

1. Diskette
2. CD-ROM
3. Hard File
4. Network
    - Token-Ring
    - Ethernet

Pressing the F5 key on a directly-attached keyboard (or the number 5 key on an ASCII terminal) causes the system to boot in service mode from this list.

Pressing the F6 key on a directly-attached keyboard (or number 6 key on an ASCII terminal) selects a service mode boot from the custom boot list, which is the boot list defined using the System Management Services described in Chapter 7, “System Management Services” on page 7-1. Like the default boot list, the custom boot list can contain four entries. The F6 or 6 keys work like the F5 or 5 keys, with the following exceptions:

- The system will search for a boot record according to the custom boot list.
- If the custom boot list is discovered by a cyclical redundancy check to be corrupted, the system will rebuild the custom boot list according to the default boot list. (The default boot list contains four entries, and for each matching device type found in the system unit, the system makes an entry in the custom boot list.)
- If no custom boot list is present, the system enters "none" in the corresponding location within the custom boot list.

Chapter 7. System Management Services

These programs make it possible for you to view information about your system, run memory tests, and set the storage device from which the server boots.

If you have a graphical display connected to a display adapter in your system unit, then you can use the graphical System Management Services. Otherwise, you must use the text-based version of the System Management Services.

The graphical System Management Services is described in “Graphical System Management Services” on page 7-2; the text-based System Management Services is described beginning in “Text-Based System Management Services Programs” on page 7-11; the ASCII terminal is described beginning in “ASCII Terminal System Management Services Programs” on page 7-16.

To start the programs:

1. Turn on or shutdown and restart the system.
2. When the first screen appears, press the **F1** key to use the graphical System Management Services. To use the text-based System Management Services, press the **F4** key or number 4 key on an ASCII terminal.

   Note: You must press **F1** or **F4** key after the diskette indicator appears on the screen, but before the last indicator appears. After you have pressed the F1 or F4 key, the initialization indicators continue to display, and the System Management Services screen displays after the last indicator.

Note: It is recommended that you create a Firmware Recovery Diskette using the Update Firmware selection in the System Management Services Tools section described in this chapter.

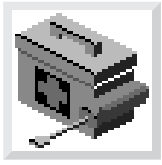
Graphical System Management Services

When the graphical System Management Services program begins, the following screen appears.

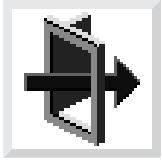
The System Management Services screen contains the following objects.

Start Up: This function allows you to define a custom boot list, which defines the sequence in which devices are searched by the operating system for a bootable image.

Test: Allows you to repeatedly test the memory in your system.

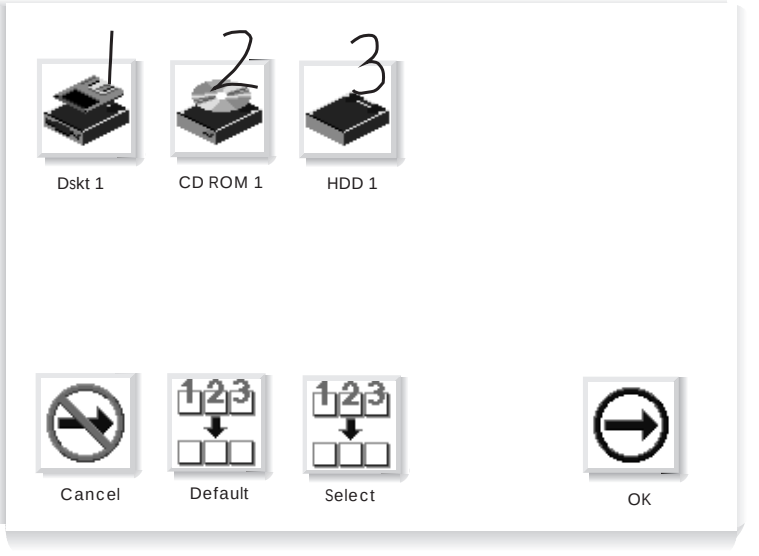


Tools: Enables you to set and remove passwords and to set the unattended start mode. In addition, you can view information about your system and update system programs.



Exit: Returns you to the previous screen.

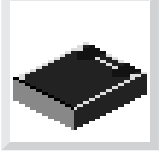
To select an object, use the arrow keys to highlight an object and then press **Enter** or the **Spacebar**. To leave the current screen, either press the **Esc** or select the **Exit** object.



This selection enables you to define a custom boot list or reset default list, which determines the order in which devices are searched by the firmware for a bootable image. The screen may show the following objects.

Diskette: Diskette drive.

CD-ROM: CD-ROM drive.



HDD: Hard disk drive.

Highlight the device which the system will search for first when booting, and press the **Spacebar**. Notice that numbers appear over the objects, indicating the order of the startup sequence. Up to four devices can be specified. To cancel your selection, select the **Cancel** object. The **Default** object sets the sequence to:

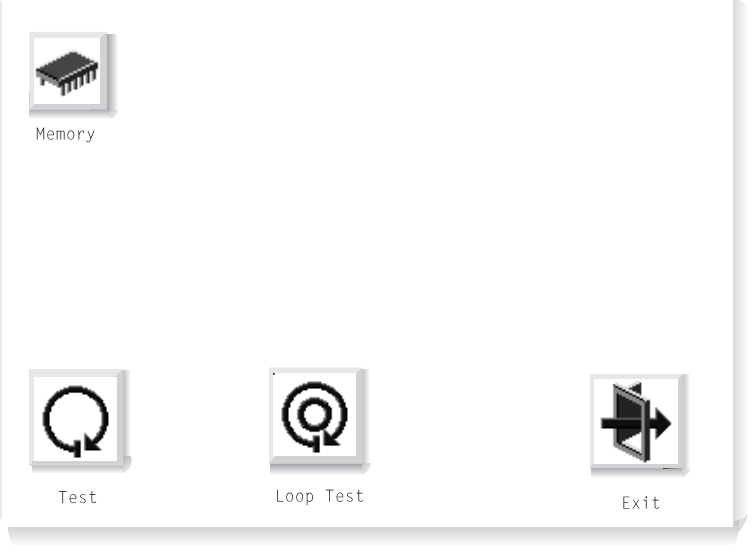
- Diskette drive
- CD-ROM drive
- Hard disk drive
- Tape drive
- Network (if installed)

If your system has more devices than shown in the list, their objects will be displayed after those in the default sequence.

Attention: If you change your custom boot list, you must be extremely careful when doing *write* operations (for example, saving or formatting). You can accidentally overwrite data or programs if you select the wrong drive.

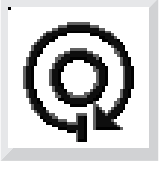
Test

Selecting this object enables you to test the memory in your system unit.



To begin the test, select the **Test** object.

The **Loop Test** object, when selected, allows the memory to be tested in a continuous loop. The test can be stopped by pressing the **S** key.



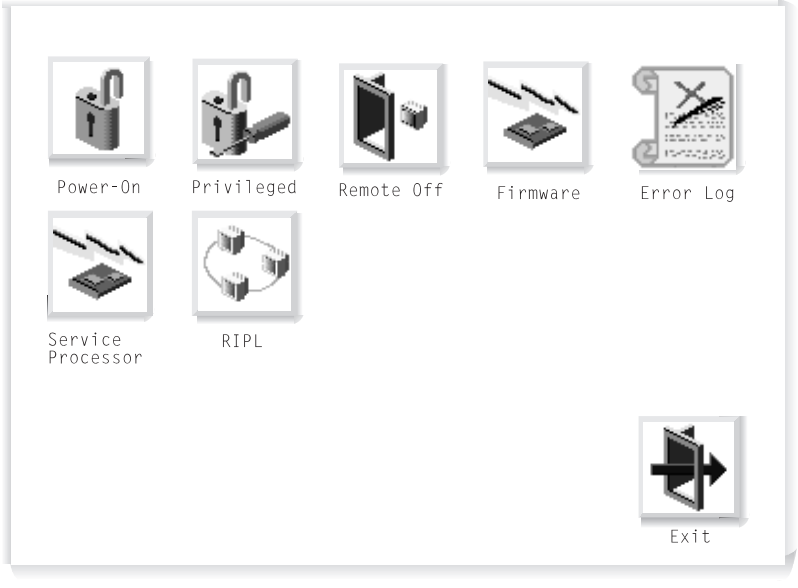
If a problem is detected during testing, an error code similar to the one below will be displayed under the object for the failing device.

00020000

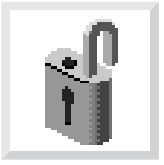
If an error code appears, make a written record of the error code.

Tools

Selecting this object enables you to perform various tasks and view additional information about your system. The following screen appears with objects presented for your selection.



The following describes the objects on this screen.

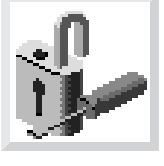


Power-On Password: Setting a power-on password helps protect information stored in your system. When you select this object, a screen with 8 empty boxes appears. Type your password in these boxes. You can use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. As you type a character, a key appears in the box. Press **Enter** when you are finished; you will be required to type the password again for verification. If you make a mistake, select the **Cancel** object and start again.

If you already had set a power-on password and wanted to remove it, select the following object.

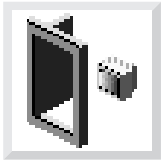
Note: If you *forget* your password, you will have to remove the battery for at least 30 seconds to disable the password. See “Battery (7317 Model F3L)” on page 9-52.

A password can be set only after system power has been turned off and then on again. You cannot set a password after using the **Ctrl**+**Alt**+**Del** combination (or *warm boot*) to restart the system.



Privileged-Access Password: The privileged-access password protects against the unauthorized starting of the system programs. Follow the same procedure described for the power-on password.

As with the power-on password, you must turn system power off and then on again before setting a privileged-access password.



Remote Mode: The remote mode, when enabled, allows the system to start from the defined boot device. This mode is ideal for network servers and other systems that operate unattended. You *must* set a power-on password before you can enable the remote mode. When the remote mode is set, the object changes to **Remote On**.

If you remove the power-on password, the remote mode is automatically reset, and the object returns to **Remote Off**.

Selecting **Remote On** resets the startup mode to the normal startup sequence.

Firmware: Enables you to update system firmware.

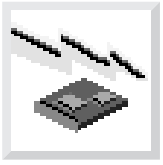
Firmware should be selected only when a change to the system firmware is needed. A *Firmware Update* diskette will be made available to you when such an update is needed.

Firmware updates take several minutes, and you need a DOS formatted 1.44MB diskette. The procedure for updating the firmware is as follows.

Attention: Do not turn off power to your system during this procedure.

1. Select **Tools**, and then **Firmware**.
2. Make a backup copy of the system firmware using a DOS formatted 1.44MB diskette as prompted. This backup is a Firmware Recovery Diskette that may be used later to recover from system problems.
3. When the backup is complete, insert the *Firmware Update* diskette. The system firmware will be updated, and the system will automatically restart upon completion.

Error Log: Enables you to view error log information that is stored if an error occurs.



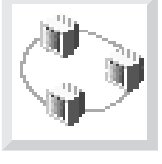
Service Processor: Enables you to update service processor firmware.

Service Processor should be selected only when a change to the service processor firmware is needed. A *Service Processor Update* diskette will be made available to you when such an update is needed.

Service processor updates take several minutes, and you need a DOS formatted 1.44MB diskette. The procedure for updating the service processor firmware is as follows.

Attention: Do not turn off power to your system during this procedure.

1. Select **Tools**, and then **Service Processor**.
2. Make a backup copy of the service processor firmware using a DOS formatted 1.44MB diskette as prompted. This backup is a Service Processor Firmware Diskette that may be used later to recover from system problems.
3. When the backup is complete, insert the *Service Processor Firmware Update* diskette. The service processor firmware will be updated, and the system will automatically restart upon completion.



RIPL: Allows you to select a remote system to load programs from when your system is first powered on.

Overriding the Stored Boot Sequence

In order to override the stored boot sequence for the current boot, press **F5** after the keyboard indicator appears on the screen, but before the last indicator appears. This forces the firmware to search for startup code on the devices listed in the default sequence, either diskette, CD-ROM, hard disk drive, or token-ring (if installed) or ethernet (if token-ring is not installed). Pressing **F5** does not modify what has already been selected through “Start Up” on page 7-4. That information is still stored in the system. Pressing **F5** is limited to the current boot.

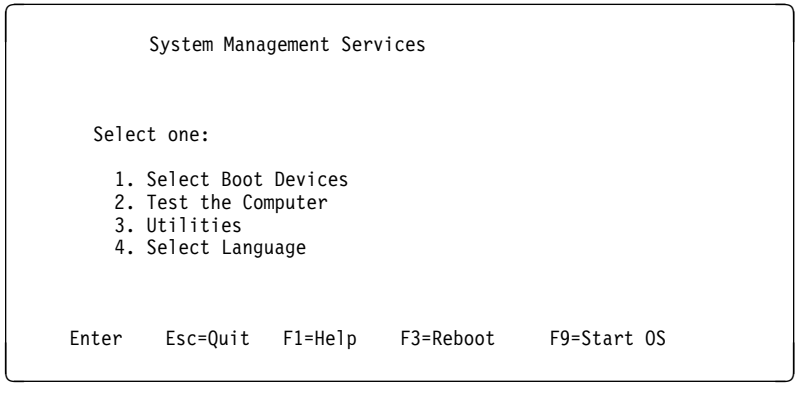
Text-Based System Management Services Programs

To start the programs:

1. Turn on or shutdown and restart the system.
2. As soon as the first screen appears, press the **F4** key.

   Note: You must press **F4** after the diskette indicator appears on the screen, but before the last indicator appears.

   The System Management Services screen appears.



Use the Up Arrow and Down Arrow keys (↑ or ↓) to highlight your selection; then press **Enter**.

You can get help information about any item on a menu by highlighting the item and pressing F1. The bottom of the screen shows which keys are active.

Select Boot Devices

```
          System Management Services


      Select one:

        1. Select Boot Devices
        2. Test the Computer
        3. Utilities
        4. Select Language


    Enter    Esc=Quit   F1=Help    F3=Reboot     F9=Start OS
```

This selection enables you to view and change the sequence in which devices are read at startup time. You also can set or change a particular startup device, or specify the device the system is to start from.

```
          Boot Sequence Selection

     1. Display Current Settings
     2. Restore Default Settings
     3. Configure 1st Boot Device
     4. Configure 2nd Boot Device
     5. Configure 3rd Boot Device
     6. Configure 4th Boot Device
     7. Boot Other Device


    Enter    Esc=Quit   F1=Help    F3=Reboot     F9=Start OS
```

Test the Computer

```
          System Management Services


     Select one:

       1. Select Boot Devices
       2. Test the Computer
       3. Utilities
       4. Select Language


   Enter    Esc=Quit   F1=Help    F3=Reboot     F9=Start OS
```

This selection enables you to test devices and functions of your system. The screen that displays, is similar to the screen that follows.

```
               Select Device to Test

                                                  Esc=Quit

                                                  F1=Help
[ ] Test Memory
                                                  Spacebar=Choose
[ ] Test Memory

                                                  F4=Parm Setup

                                                  F6=Execute

                                              F9=Display Error Log
```

When you have selected the devices you want to test, press **F4** to set the test requirements, such as the number of times the tests are to be run, and whether testing should stop if an error occurs. After you set the requirements, press **Enter** to return to the Select the Device to Test screen; then press **F6** to start the tests.

To see if any errors were recorded in previous tests, press **F9** to display the error log.

```
          System Management Services


      Select one:

        1. Select Boot Devices
        2. Test the Computer
        3. Utilities
        4. Select Language


    Enter    Esc=Quit   F1=Help    F3=Reboot     F9=Start OS
```

Selecting **Utilities** enables you to select from the System Management Utilities window. It has the following choices.

```
          System Management Utilities

   Select one:

      1.  Set Power-On Password
      2.  Set Privileged-Access Password
      3.  Enable Unattended Start Mode
      4.  Disable Unattended Start Mode
      5.  Remove Power-On Password
      6.  Remove Privileged-Access Password
      7.  Update System Firmware
      8.  Display Error Log
      9.  Remote Initial Program Load Setup
     10.  Update Service Processor Firmware

    Enter   Esc=Quit       F1=Help
```

The **Power-On** and **Privileged-Access Password** are security features that help protect your system and stored information.

The **Unattended Start Mode**, when enabled, allows the system to start from the defined boot device.

Update System Firmware enables you to make these changes to the firmware of your system. To receive the latest updates, contact your authorized reseller or marketing representative. Firmware updates take several minutes, and you need a DOS formatted 1.44MB diskette. The procedure for updating the firmware is as follows.

Attention: Do not turn off power to your system during this procedure.

1. Select **Utilities**, and then **Update System Firmware**.
2. Make a backup copy of the system firmware using a DOS formatted 1.44MB diskette as prompted. This backup is a Firmware Recovery Diskette that may be used later to recover from system problems.
3. When the backup is complete, insert the *Firmware Update* diskette. The system firmware will be updated, and the system will automatically restart upon completion.

Display Error Log lets you see what problems have been recorded in previous tests.

Remote Initial Program Load Setup allows you to view parameters.

Update Service Processor Firmware enables you to make changes to the service processor firmware of your system. To receive the latest updates, contact your authorized reseller or marketing representative. Service processor updates take several minutes, and you need a DOS formatted 1.44MB diskette. The procedure for updating the firmware is as follows.

Attention: Do not turn off power to your system during this procedure.

1. Select **Utilities**, and then **Update Service Processor Firmware**.
2. Make a backup copy of the service processor firmware using a DOS formatted 1.44MB diskette as prompted. This backup is a Service Processor Firmware Recovery Diskette that may be used later to recover from system problems.
3. When the backup is complete, insert the *Service Processor Firmware Update* diskette. The service processor firmware will be updated, and the system will automatically restart upon completion.

ASCII Terminal System Management Services Programs

To start the programs:

1. Turn on or shutdown and restart the system.
2. As soon as the first screen appears, press the **1 or 4** key.

   Note: You must press **1 or 4** key before the last indicator (boot .....) appears.

   The System Management Services screen appears.

```
          System Management Services


     Select one:


       1. Select Boot Devices
       2. Test the Computer
       3. Utilities
       4. Select Language



      Enter - q=Quit - h=Help - r=Reboot - s=Start OS - p=prev-item -
      ------- -------- -------- ---------- ------------ -------------
      n=next-item -
      -------------
     Press enter to select item number 1.
```

Use the next (n) and previous (p) keys to make your selection; then press **Enter**.

You can get help information about any item on a menu by pressing the h key. The bottom of the screen shows which keys are active.

Select Boot Devices

```
          System Management Services


       Select one:

         1. Select Boot Devices
         2. Test the Computer
         3. Utilities
         4. Select Language



        Enter - q=Quit - h=Help - r=Reboot - s=Start OS - p=prev-item -
        ------- -------- -------- ---------- ------------ -------------
        n=next-item -
        -------------
       Press enter to select item number 1.
```

This selection enables you to view and change the sequence in which devices are read at startup time. You also can set or change a particular startup device, or specify the device the system is to start from.

```
          Boot Sequence Selection

     1. Display Current Settings       Enter -
     2. Restore Default Settings       -------
     3. Configure 1st Boot Device      q=Quit -
     4. Configure 2nd Boot Device      --------
     5. Configure 3rd Boot Device      h=Help -
     6. Configure 4th Boot Device      --------
     7. Boot Other Device              p=prev-item -
                                       -------------
                                       n=next-item -
                                       -------------

      Press enter to select item number 1.
```

```
          System Management Services


      Select one:

        1. Select Boot Devices
        2. Test the Computer
        3. Utilities
        4. Select Language



       Enter - q=Quit - h=Help - r=Reboot - s=Start OS - p=prev-item -
       ------- -------- -------- ---------- ------------ -------------
       n=next-item -
       -------------
      Press enter to select item number 2.
```

This selection enables you to test devices and functions of your system. The screen that displays, is similar to the screen that follows.

```
                Select Device to Test


                                                 q=Quit -
                                                 --------
                                                 h=Help -
  [>] Test Memory                                --------
                                                Spacebar=Choose -
                                                -----------------

                                                 p=Parm Setup -
                                                 --------------
                                                 E=Execute -
                                                 -----------
   1. Test Memory                             d=Display Error Log -
                                              ---------------------
```

When you have selected the devices you want to test, press **p** to set the test requirements, such as the number of times the tests are to be run, and whether testing should stop if an error occurs. After you set the requirements, press **Enter** to return to the Select the Device to Test screen; then press **E** to start the tests.

To see if any errors were recorded in previous tests, press **d** to display the error log.

```
          System Management Services


    Select one:

      1. Select Boot Devices
      2. Test the Computer
      3. Utilities
      4. Select Language


Enter - q=Quit - h=Help - s=Start OS - p=prev-item - n=next-item -
------- -------- -------- ------------ ------------- -------------
Press enter to select item number 3.
```

Selecting **Utilities** enables you to select from the System Management Utilities window. It has the following choices.

```
         System Management Utilities

Select one:

   1.  Set Power-On Password
   2.  Set Privileged-Access Password
   3.  Enable Unattended Start Mode
   4.  Disable Unattended Start Mode
   5.  Remove Power-On Password
   6.  Remove Privileged-Access Password
   7.  Update System Firmware
   8.  Display Error Log
   9.  Remote Initial Program Load Setup
  10.  Update Service Processor Firmware

Enter - q=Quit - h=Help - r=Reboot - p=prev-item - n=next-item -
------- -------- -------- ---------- ------------- -------------
Press enter to select item number 1.
```

The **Power-On** and **Privileged-Access Password** are security feartures that help protect your system and stored information.

The **Unattended Start Mode**, when enabled, allows the system to start from the defined boot device.

Update System Firmware enables you to make these changes to the firmware of your system. To receive the latest updates, contact your authorized reseller or marketing representative. Firmware updates take approximately 30 seconds, and you need a DOS formatted 1.44MB diskette. The procedure for updating the firmware is as follows.

Attention: Do not turn off power to your system during this procedure.

1. Select **Utilities**, and then **Update System Firmware**.
2. Make a backup copy of the system firmware using a DOS formatted 1.44MB diskette as prompted. This backup is a Firmware Recovery Diskette that may be used later to recover from system problems.
3. When the backup is complete, insert the *Firmware Update* diskette. The system firmware will be updated, and the system will automatically restart upon completion.

Display Error Log lets you see what problems have been recorded in previous tests.

Remote Initial Program Load Setup allows you to view parameters.

Update Service Processor Firmware enables you to make these changes to the system processor firmware of your system. To receive the latest updates, contact your authorized reseller or marketing representative. Service processor updates take several minutes, and you need a DOS formatted 1.44MB diskette. The procedure for updating the firmware is as follows.

Attention: Do not turn off power to your system during this procedure.

1. Select **Utilities**, and then **Update Service Processor Firmware**.
2. Make a backup copy of the service processor firmware using a DOS formatted 1.44MB diskette as prompted. This backup is a Service Processor Firmware Recovery Diskette that may be used later to recover from system problems.
3. When the backup is complete, insert the *Service Processor Firmware Update* diskette. The service processor firmware will be updated, and the system will automatically restart upon completion.

Chapter 8. Firmware

The firmware is organized into three major sections:

- **Boot Block:** Receives control at power on, and is able to perform a soft firmware recovery from diskette when necessary.
- **Firmware Core:** Brings the system up to where the compressed image has been decompressed into memory and running.
- **Virtual Disk:** Contains the firmware modules required to support each hardware subsystem.

Boot Block

- Power-On the system, the power **LED** begins to glow on the front panel.
- Hardware passes control to storage address 0xFFF00100, the firmware entry point.

Processor POST

- An uncompressed instruction -- "Branch to the System Environment" resides at address 0xFFF00100. This will test that "Branch" works. If it fails, then the next instruction is executed(which is data). A program check interrupt occurs, where another branch is encountered followed by a program check. The system has essentially come to a **STOP**, with no signs of life (no beep, no hard file LED).
- At the branch target address -- initialize the 60X Processor Registers.
- If the 60X fails, the code will **STOP** by performing a Branch to itself instruction. The system will appear to be doing nothing; but cooling fans might be observed running.

Setup the Firmware Environment

Prepare for the compressed image of the firmware to be uncompressed and run from memory by doing the following:

1. Initialize the memory controller; find a small amount of good memory.
2. When no memory to configure then turn on the hard file **LED** and **STOP**.
3. Setup the C Environment in the small amount of good memory.
4. Everything is going OK so give **One Short Beep** on the speaker.
5. Check CRC of the compressed firmware.

Firmware Core

Establish Active RAM Area

1. Copy a part of the firmware code into the small amount of memory.
2. Run the firmware code now in the memory's C environment. The RAM POST will test and configure larger amount of good memory.
3. When larger amount of memory is not found, then the hard file **LED** is activated and the system is made to **STOP**. At this point there has been a beep and now the hard file LED is has been lit, and the system is halted.
4. The L2 CACHE POST executes. If it passes, everything is OK. If it fails the system does not stop, nor beep, but there is an indicator set so that when the display is available and the RAM POST is testing the remainder of memory, there is an icon with the 8 digit error code -- 01291000 displayed; to see where timing of the icon appears with respect to the firmware flow -- see “Load the Virtual Disk,” item 3g on page 8-3. If a ASCII terminal is present there is a window with the error code.
5. Copy the compressed firmware code into the larger amount of good RAM and uncompress.
6. Setup a new C Environment in the larger amount of good memory; a user stack, an interrupt stack, and a debugger stack, plus a TOC pointer.

Virtual Disk

Initialize Individual Subsystems

- Bring the VDISK Online.
- UART initialization. If NVRAM BAD CRC error -- display with 8 digit error code 0x00016000.
- PCI setup
- Interrupts initialization -- interrupts are not tested. SMS program only tests RAM.
- Real time clock initialization
- Keyboard/Mouse controller (8042 chip) initialization
- Password initialization
- Debugger initialization

Load the Virtual Disk

1. Manager (system level) initialization
2. VDISK file system initialization
3. Run V: autoexec.6md (Resident Monitor) to Load all DEVICE drivers
   a. video -- initialize ASCII terminal and/or VGA adapter
      - as -- Async Console Support (ASCII terminal S1 serial port)

- Execute the VGA adapter POST(s). If there is an error then issue **One Long Beep and One Short Beep** on the Speaker, and continue.
  - PCI graphics POST and initialization.

b. On VGA display the "Brand" Logo, or POST indicators on ASCII terminal.
c. Icons will start appearing on the VGA.
d. Keyboard icon appears -- initialize the keyboard and mouse.
e. The window for pressing the F1 (GUI) or F4 (English) keys is now open.
f. The Diskette icon appears -- initialize the adapter.
g. Extended memory icon -- test the remainder of memory. Memory module failures are displayed on the VGA as a triangle with an "!" inside and an 8 digit error code -- 00020000 or if L2 Cache failed, the same triangle displays with the 8 digit error code 01291000. On an ASCII terminal there is no triangle and an 8 digit error code message will display.
h. The SCSI icon appears while adapters are being initialized. SCSI, Ethernet, pci_c970, trpci, tcpip -- initialize Network when present.
i. The last icon -- the boot disk icon is displayed. If the graphics screen gets cleared, then none of the previous icons will get re-displayed until the next boot of the system.
j. **One Long Beep** on the Speaker.
k. If the "Power-On Password" (**POP**) or the Privileged Access Password (**PAP**) option(s) are in effect then the Password screen appears; enter the password and press enter. Three attempts are allowed to enter the correct password before the system locks up and gives the PAP 8 digit error code 00016004 or the POP 8 digit error code 00016005. The only recovery for password 8 digit error code is to cycle system power. See “Power On Password” on page 8-7 and see “Privileged Utilities Password” on page 8-7 for more information about passwords.

   Attention: If no one is able to provide the password, the only recovery is to remove the NVRAM Battery for awhile; this could be detrimental to the customer, any data in NVRAM could be corrupted, and may have to be regenerated by the customer. One item might be the preferred/service bootlist.

Start of boot sequence boot(0)

- Boot using the custom bootlist set by the SMS utility.
- See “Function Keys” on page 8-5 for information on how to choose a boot path device along with Normal and Service mode.

End of boot sequence boot(0)

- On the VGA only the icons are cleared from the screen.

Firmware Beeps

The firmware will use the speaker as a means to communicate the result of certain tests. The following list describes the type of beeps.

- **No Beeps:** This is a hardware failure not involving the firmware. "The speaker may be bad or disconnected, or the system board may be bad."
- **One Beep and One Long Beep:**
  - **One Short Beep(9/32 sec.):** Is used at Power-On when the hardware passes control to the firmware.
  - **One Long Beep(1 3/4 sec.):** It means initialization completed and no fatal errors occurred, so continue the boot process.
- **Continuous Beep:** This is a hardware failure not involving the firmware. "The system board has a failing component or a failure related to the speaker subsystem has occurred."
- **One Long and One Short Beep:** Firmware "... has detected an error on the video adapter card. ..."

Console Strategy

If the graphics adapter is present, the user interface will be GUI. If the graphics adapter is NOT present AND there is an active device in Serial Port 1, the active device will be assumed ASCII terminal, and the user interface will be text. The user interface will be either the graphics system or the ASCII terminal, but NOT BOTH. Graphics interface will default to GUI with the option to switch to text. ASCII terminal interface will always be text. The PF keys will not be used to initiate Maintenance Mode on ASCII terminal consoles, numeric keys will be used instead (see key equivalent in each PF key definition below).

Normal Mode Boot Responses

The following assumes successful entry of the Power On Password (POP) if set. This applies to both normal and service modes.

In the case that no boot device is found during a normal boot attempt, the firmware will request the PAP if set, then it will initiate the System Maintenance Services (SMS).

If the custom bootlist is discovered to be CRC corrupted, Firmware will rebuild the custom bootlist according to the default boot list. The custom bootlist is four deep, and for each matching device type found to be present in the system, firmware

makes an entry in the custom bootlist. If a default boot list device is missing from the system, firmware enters 'none' in the corresponding location of custom bootlist.

Function Keys

PF1 Key

- PF1, when operated from a directly attached keyboard, will invoke the System Management Services (SMS) GUI interface.
- The "key-switch" will be set to ***Normal mode***.
- Numerical **1 key** will be the equivalent key on an ASCII terminal. The result, however, will be the same as the function of PF4, as described below.

PF4 Key

- PF4, when operated from a graphics console, will invoke the SMS program and present the text interface.
- The "key-switch" will be set to ***Normal mode***.
- Numerical **4 key** will be the equivalent key on an ASCII terminal.

PF5 Key

- The default boot list, located in firmware, will be used.
- The "key-switch" will be set to ***Service mode***.
- Numerical **5 key** will be the equivalent key on an ASCII terminal.

This mode will attempt to boot from the first device of each type found in the list. It will not search for other bootable devices of that type if the first device is not bootable. It will, instead, continue to the next device type in the list. If after one pass through the boot list no boot record is found, Firmware will invoke the SMS program. The firmware supports up to four entries in the boot list.

The default boot order is:

1. Diskette
2. CD ROM
3. Hard File
4. Tape Drive
5. Network
    a. Token Ring
    b. Ethernet

PF6 key: PF6 will work like PF5 with some exceptions

- Firmware will look for a boot record according to the custom bootlist that was setup by System Management Services.

- If after one pass through the custom bootlist no boot record is found, firmware will invoke the SMS program.
- The "key-switch" will be set to ***Service mode***.
- Numerical **6 key** will be the equivalent key on an ASCII terminal.

Password Design Description

Password Design Overview

The owner of the system has the option to limit access to the system. The system limits access by requiring the user to enter a password. There are three categories of restricted access.

The first category is power-on. If this category is enabled, the system will prompt the user to enter the Power-On password (POP) when the system is powered on. The user must supply the Power-On password.

The second category is privileged access. Privileged access is needed to perform functions on the SMS, or boot from a device that isn't in the boot path. When the user attempts to do one of these things, the system will prompt for the Privileged Access Password (PAP). The user must supply the PAP.

The third category is unattended start mode. In unattended start mode, the system will boot from a defined boot device, but the keyboard will be locked until the user enters the Power-On password.

Enabling Security

Utilities are provided to allow the system owner to enable any of the above security modes and to enter or change the Power-On or Privileged-Access passwords. The passwords can be up to 8 characters long. After entering a password, the user is prompted to verify it by entering it a second time. After the password has been entered two consecutive times, it is saved in CMOS.

Storing of Password

The POP and PAP are stored in CMOS. The time that each password was saved, and the time that each password is read is also stored. If for any reason the contents of CMOS are suspect (bad battery or CRC), the passwords will be considered valid, but unusable. The areas in CMOS that contain the password are locked before the operating system is booted. After the passwords have been locked, the user must power off the system before the passwords can be accessed again.

Power On Password

When the system is powered on, it will check whether a Power-On password is present. If there is one present, and unattended start mode (see “Unattended Start Mode” on page 8-7) is not set, the owner has specified that the system cannot be used unless the Power-On password is supplied. The system prompts for the Power-On password. The user is given three attempts to enter the password. If the user fails to supply the password, the system will go to a hang state and must be powered off before continuing.

Privileged Utilities Password

If a user wants to boot, change or remove the Privileged-Access password, or use any of the other “Privileged” utilities, the system will check whether a Privileged Access password exists. If it does, the user is prompted to either enter the Privileged Access password. The user is given three tries to supply the correct password. If the user fails to do so, the system will go to a hang state and must be powered off before continuing.

Unattended Start Mode

If Unattended Start Mode is enabled, the system will boot from the defined boot device without requiring any input from the user. The keyboard controller will be programmed to lock up until the Power-On password is entered.

Firmware Flash Update Design

The firmware flash update can be performed in normal mode and recovery mode. The type of update mode will determine what portions of the flash code is updated, whether the update is done "quietly" (no messages), and whether the original VPD information is merged into the new image before updating.

The default is a "normal" update, where the firmware flash update is performed from the System Management Services Menu. Messages and errors are communicated through the menu pop-up interface. The system user selects the Update Firmware option, and the composite image is loaded using the default file name and default media. The original system VPD information is merged in before the image is programmed. Only the sectors containing the composite image are programmed; those containing the recovery block are considered "read-only".

A "recovery" update, is executed automatically when a bad composite image is detected during early system initialization. Most messages and errors are suppressed; fatal errors are displayed in a serial interface compatible format. The default file name and default flash update media is assumed. The selected media

drive (diskette drive) is continuously polled until a valid firmware image can be found and loaded. The original system VPD information is merged in before the composite image is programmed. The recovery block flash sectors are not modified during a recovery update.

For any update, the firmware flash update routine checks if the system flash part can be updated. The flash ID and sector protection bits are retrieved from the part. If the flash ID could not be read or the flash ID indicates an unsupported part, then the update routine is terminated. If the ID indicates a supported part, then the sector programming data structures are initialized. The sector protection bits are examined, to ensure that the sectors to be updated are not write-protected. If a sector to be updated is write-protected, then the update routine is terminated. If the flash part passes all of these validity tests, then the routine moves onto file operations.

The firmware flash update routine checks the selected flash media for the flash file. If the file is located and loaded successfully from the media, it is then examined to ensure it is a valid firmware image. A firmware image is verified by checking if it has a valid CRC, valid file length, valid flash table/system ID structure. If the firmware image could not be loaded or is invalid, then the update routine is terminated.

For normal or recovery mode, once a valid firmware image is loaded successfully, the VPD information is merged from the flash ROM to the image. The VPD information is duplicated in the recovery block and composite image, which ensures that there is a protected copy of the VPD in case the composite image is corrupted.

Now that the firmware image is ready for programming, the firmware flash update routine begins the section of code that erases and programs the flash part. During this section of code, a system power-down results in a corrupted flash ROM. Notice that for normal and recovery mode, only the composite image sectors are erased and reprogrammed, so those sectors would be the only ones that could be corrupted. Since the recovery block is protected in these modes, the system can still be restored through a recovery flash update. A system power down at the wrong time could result in a completely corrupted flash ROM and a dead system. To minimize the risk when in text mode, the routine displays a message warning the user "Flash update in progress. Do not power down the system...".

Before the flash part can be programmed with the new image, the firmware flash update routine must erase the appropriate sectors. For all modes, the composite image sectors are erased and reprogrammed first. If an erase operation fails, it is retried according to the flash part spec. If the flash part won't erase even after retries, the update routine is terminated. If the erase operation was successful, the firmware flash update routine programs the composite image into the corresponding flash sectors. If a byte in the flash part cannot be programmed with a new value, even after the specified retries, the update routine is terminated. If the composite

image was programmed successfully, the routine checks if it still needs to update the recovery block portion.

The firmware has now been successfully updated. The firmware flash update routine removes any "in process" messages, performs some general clean-up and then reboots the system. Once the system is re-booted, the new flash image is active and executed.

Power On Self Test (POST)

Processor POST:

The firmware tests the processor. If there is a failure the system Check-Stops (stops) and the initial beep of the speaker will not be heard.

Memory Module and L2 cache POST:

The firmware RAM POST will test all of memory; it is done in segments. After the initial short beep, if the system stops with the hard file indicator on solid, then this is the indication that no memory was found.

If any memory is found then a small segment is used. If the segment cannot be found then the system stops with the hard file indicator on solid.

A larger amount of memory is tested for stuck or coupled bits. The L2 cache is tested, if it fails there will be a momentary indication when the display becomes available, the error is also put in the SMS error log.

During system initialization when icons are being displayed for the various components of the system, one of the icons will be the memory module icon. During display of this icon an L2 cache, 8 digit error code would be displayed if L2 is not fully functional; also the remainder of memory is tested and if a failure is detected, an 8 digit error code is posted. This error indicates which memory module slot is at fault.

A separate memory test is provided in the System Management Services (SMS). This test can be made to loop. It tests memory similar to the POST and will also give an 8 digit error indications for the memory module slot. The L2 cache is not retested in the SMS memory test.

Update Flash CRC

The firmware will perform a Cyclic Redundancy Check (CRC) on the update portion of the flash module. If the check is not good, the firmware goes into recovery mode. This mode is recognized by the hard file indicator being on continuously (or blinking), and the diskette drive indicator blinking periodically.

Video/Graphics Adapter POST:

The firmware does test the VGA adapter but not the display. The system gives a speaker beep sequence when the VGA adapter is found to be non-functional. The beep sequence is a one long beep followed by one short beep; the error is logged and the system continues.

SCSI subsystem POST:

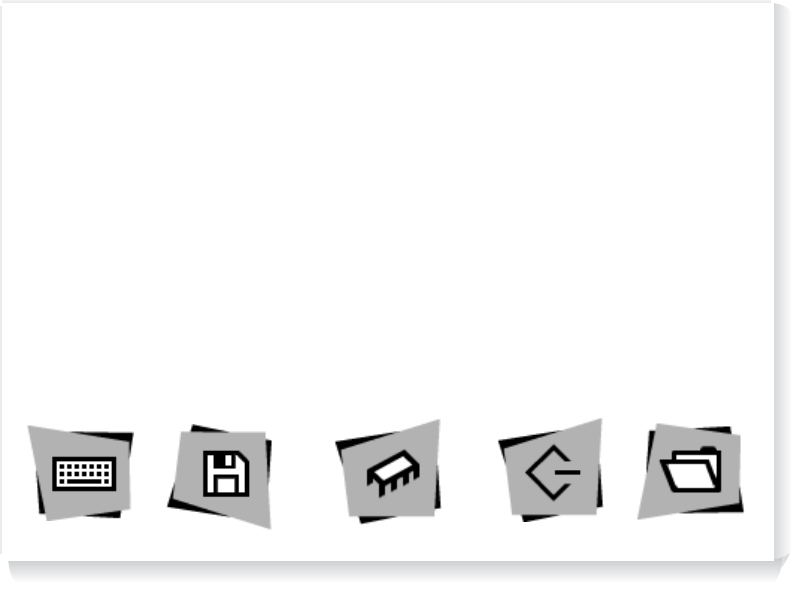
The SCSI POST opens the adapter and runs several test scripts which check and exercise the various functions related to the chips on the SCSI adapter, such as DMA, and simulate mailbox commands. If an error is detected, an 8 digit error code is displayed, and the error is entered in the SMS error log and the system continues.

Keyboard/Mouse Adapter:

The keyboard/mouse adapter has a built in power on test, and the firmware checks the results. If an error is detected, an 8 digit error code is displayed and the error is entered in the SMS error log and the system continues.

Post Indicators

When the POST is finished, the following screen displays.



The POST screen displays the following objects.

Keyboard: Initialize the keyboard and mouse. The window for pressing the F1 (GUI) and F4 (English) keys is now open.

Diskette: Initialize the adapter.

Memory Module: Test all memory greater than 3 Meg.

SCSI: Adapters are being initialized. Network is also initialized if present.

Boot Disk: System is attempting to boot from the default boot list.

If using an ASCII terminal, the following text is displayed.

- dskt .....
- mem .....
- scsi .....
- boot .....

If the POST completes successfully, the text will display "OK" such as dskt ..... OK.

Chapter 9. Removal and Replacement Procedures

Before performing any of the removal or replacement procedures in this chapter, read the following notice.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

CAUTION:
This product is designed to support dual -48 V dc feeds. Care must be exercised when removing power from the system to ensure both -48 V dc feeds are de-energized.

This product is designed with two ground points. Either may be used, but, at least one must be connected to earth ground.

DANGER

To prevent shock hazard, disconnect the power source at the TELCO fuse panel.

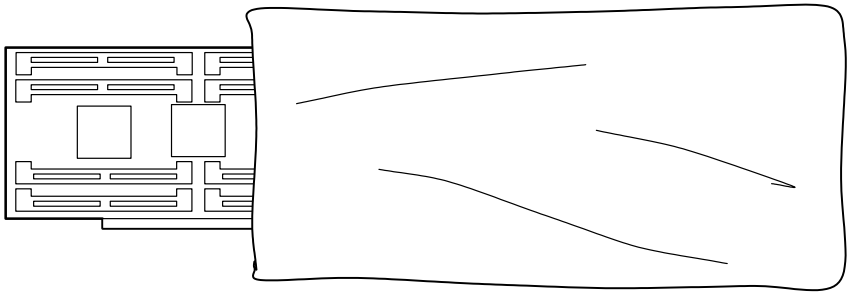
CAUTION:
A class 3 laser is contained in the device. Do not operate the drive while it is disassembled. Do not attempt to open the covers of the drive as it is not serviceable and is to be replaced as a unit.

Handling Static–Sensitive Devices

Attention: Adapters, planars, diskette drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags, as shown in this illustration, to prevent this damage.

Take the following precautions:

- If you have an antistatic wrist strap available, use it while handling the device.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system unit.
- With the device still in its antistatic bag, touch it to a metal frame of the system.
- Grasp cards and boards by the edges. Hold drives by the frame. Avoid touching the solder joints or pins.
- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system unit at the same time.
- Handle the devices carefully in order to prevent permanent damage.



Unconfiguring or Configuring a Disk Drive

There are three conditions where you need to use these procedures:

- You are removing or installing a drive while the system power is turned on.
- You are installing a new drive.
- You are removing a drive from the system.

Unconfiguring

To unconfigure a disk drive:

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Determine the type of drive you want to unconfigure; then select that type drive. When you get to the Keep Definition option, select **Yes**. This retains the details of the drive in the device configuration database.
5. Select the **Do** option to unconfigure the drive.

Configuring

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Select the type of drive you want to configure.
5. Select **Add** for the type of drive you are configuring, then select the type of drive you are adding.

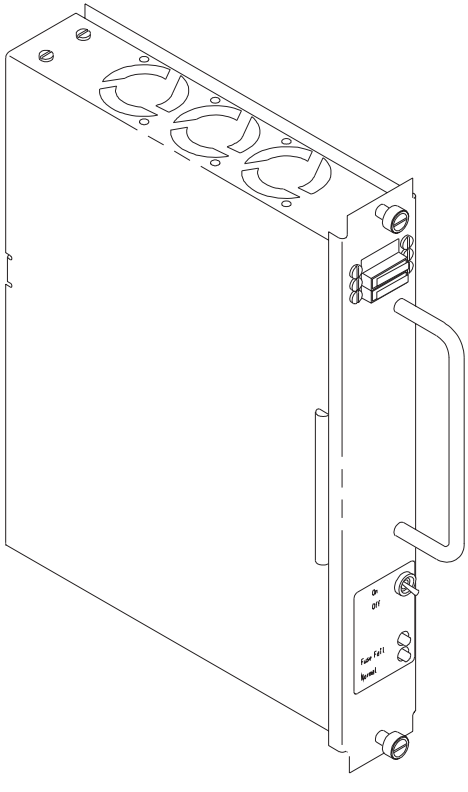
Power Supply Unit (7317 Model F3L)

DANGER

> **Do not attempt to open the covers of the power supply unit. Power supplies are not serviceable and are to be replaced as a unit.**

Removal

1. If just two power supplies are present, turn the system power Off. If at least three power supplies present, system power may be left On.
2. Push the switch on the power supply unit to be removed downward to its Off position.
3. Unscrew the thumb screws at the top and bottom of the power supply unit. Screws will remain captured.
4. Grasp handle and pull power supply unit out of the disk drive module.



Replacement

1. Insure switch on the power supply unit to be installed is in its downward, Off position.
2. Grasp handle, align power supply unit on the plastic guide rails, and slide supply into the disk drive module until fully seated.
3. Tighten top and bottom thumb screws.
4. Push power supply unit switch upward to its On position. Green light will illuminate.
5. If not already on, turn system power switch to On.

SCSI or Ultra SCSI Disk Drive Unit (7317 Model F3L)

Note: Each disk drive unit has four status lights indicating the following:

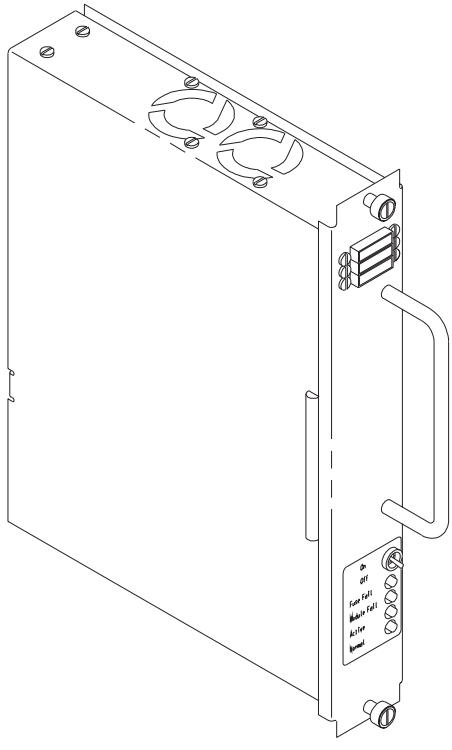
- Red light "on" - Fuse failure.
- Red light "on" - Software indication of system detectable error
- Amber - State condition of the disk drive
- Green light "on" - Normal power-on condition
  Green light "blinking" - Power-off condition, safe to remove.

Removal

Attention: Caution should be used when handling all hard disk drives. Drives are more likely to be damaged during installation and service. Bumping or handling drives roughly causes latent failures. Don't stack drives and always use appropriate ESD practices. A drop of as little as 6.5 mm (.25 inches) can cause latent failures. Media can take 30 seconds to spin down, so ensure at least a 30 second delay has passed after switching off hot-swappable drives for removal.

1. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and unconfigure the disk drive unit you are removing.
2. Momentarily press the switch on the disk drive unit to be removed downward to the Off position. The bottom green status light will blink, indicating power is off and the unit is safe to remove.

   Note: It is not necessary to turn the system power switch off.
3. Unscrew the thumb screws at the top and bottom of the disk drive unit.
4. Grasp the handle and pull the disk drive unit out of the disk drive module.



Replacement

1. Grasp handle, align the disk drive unit on the plastic guide rails, and slide it into the disk drive module until fully seated.
2. Tighten top and bottom thumb screws.
3. The bottom green light should be on continuously.
4. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and configure the disk drive unit you replaced.

Fuse (Power Supply Unit or Disk Drive Unit) (7317 Model F3L)

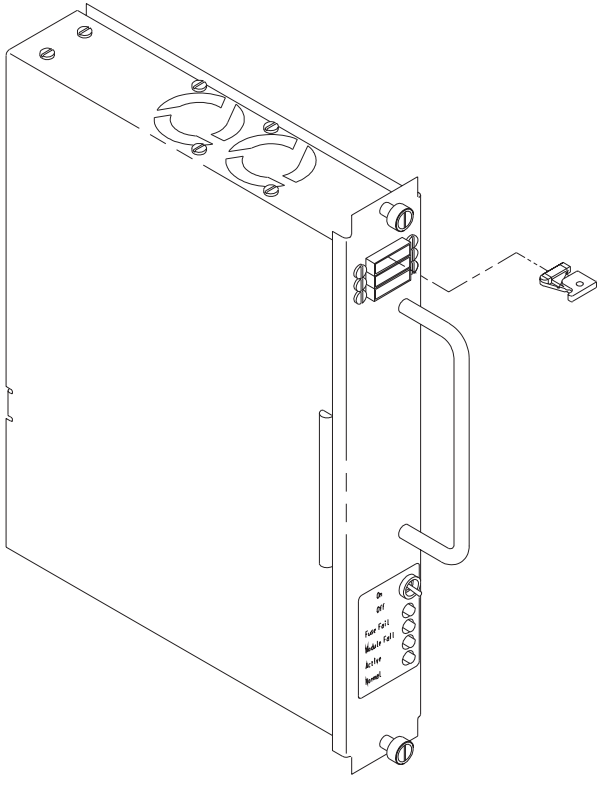
Notes:

1. A fuse failure is electrically indicated by the fuse status light on.
2. Individual fuse failure is mechanically indicated by the plastic tipped spring swung to the side.

Removal

1. Do not power the system or the unit down.
2. Grasp the plastic body of the failed fuse only and pull directly outward.
3. Note the fuse amperage painted on the side of the fuse.

   Note: The fuse amperage is also indicated on the label next to the fuse block.



Replacement

1. Obtain replacement fuse of same amperage as failed fuse. (Power Supply unit fuses are 10 amp, disk drive unit fuses are 2 amp.) A good fuse will not have its plastic tipped spring swung out to the side.
2. Grasp the plastic fuse body and insert it into the same slot of the holder from which the failed fuse was removed. The fuse is keyed and will only go in one way.
3. Press fuse in until fully seated. Fuse failure light will go out.

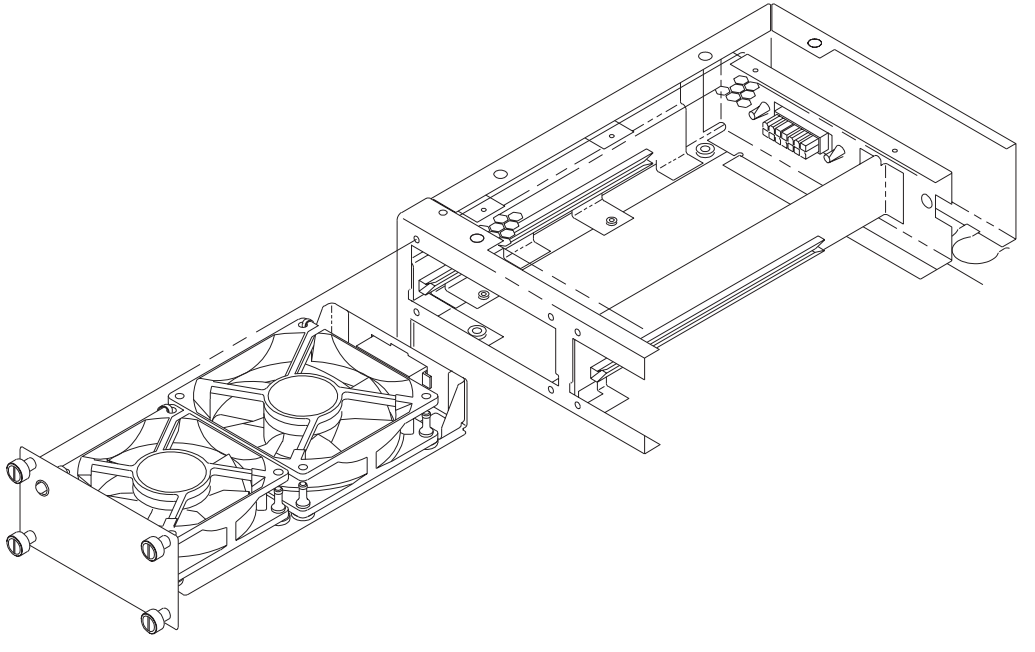
Fan Tray (7317 Model F3L)

Note: Amber status light on indicates fan failure.
Amber status light off indicates fans are OK.

Removal

Note: It is not necessary to turn system power off to remove a fan tray unless you are removing more than one at a time.

1. Unscrew the thumb screws at the corners of the fan tray. Screws will remain captured.
2. Grasp the bottom thumb screws and pull the fan tray out approximately 25 mm (1 inch) to allow fan/s to come to a stop.
3. Continue sliding the fan tray until all the way out.



Replacement

1. Align the fan tray in the plastic guide rails, and slide it into the fan bay until fully seated. The fans should come up to speed and the amber status light should be off.
2. Tighten the thumb screws at the corners of the fan tray.

CD-ROM and Tape Drive (7317 Model F3L)

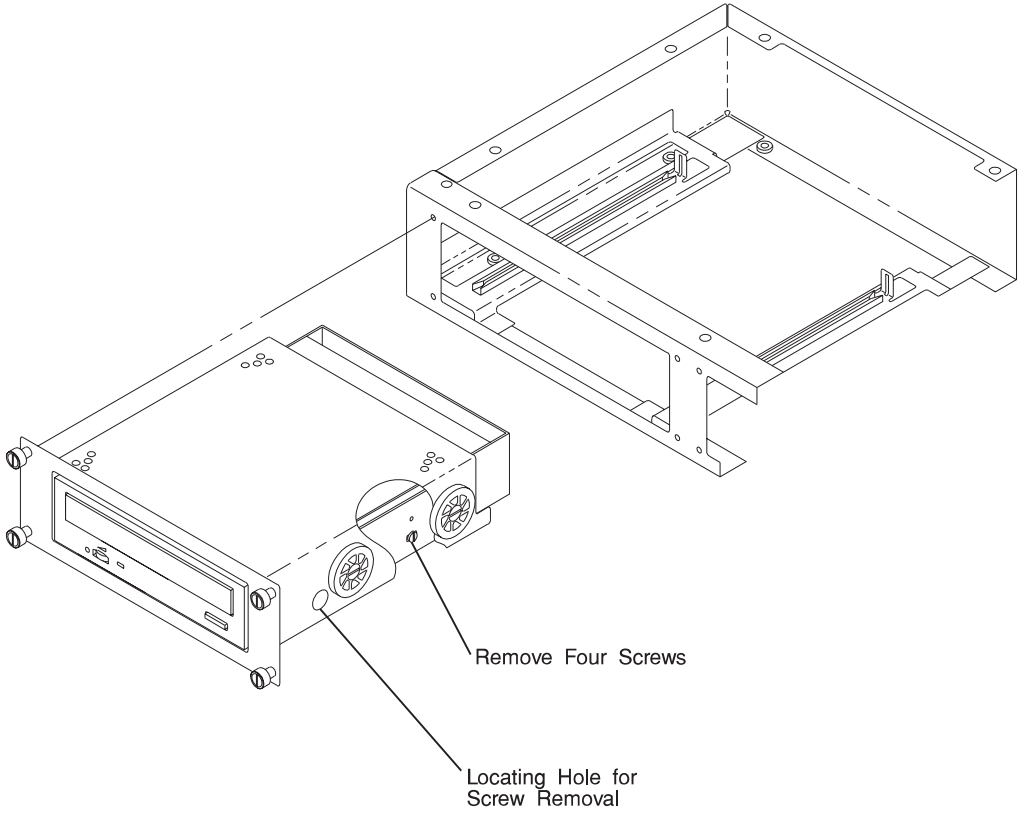
CAUTION:
A class 3 laser is contained in the device. Do not operate the drive while it is disassembled. Do not attempt to open the covers of the drive as it is not serviceable and is to be replaced as a unit.

Note: The CD-ROM drive and tape drive can be installed in either of the two bays of the media module. If only one drive is installed, the left bay should be used first.

Removal

1. Turn system power switch off.
2. Unscrew the four thumb screws at the corners of the drive to be removed. Screws will remain captured.
3. Grasp the two bottom thumb screws and pull the drive out approximately 25 mm (1 inch). Then, grasp the body of the drive, support its weight, and pull it out until the service loop cables become taught.
4. Unplug the power cable and data (SCSI) cable from the back of the drive. The left bay power connector is P11B and the right bay power connector is P11C.
5. Remove the drive assembly from the machine and carry it to a work location.
6. Remove the four pan head screws that fasten the inner bracket to the drive, and slide the drive out the front end of the bracket.

   Note: Because clearance holes are provided in the outer bracket to access the four drive mounting screws, it is not necessary to remove the four shoulder screws going through the rubber shock mounts.
7. Note and record position of address jumper.



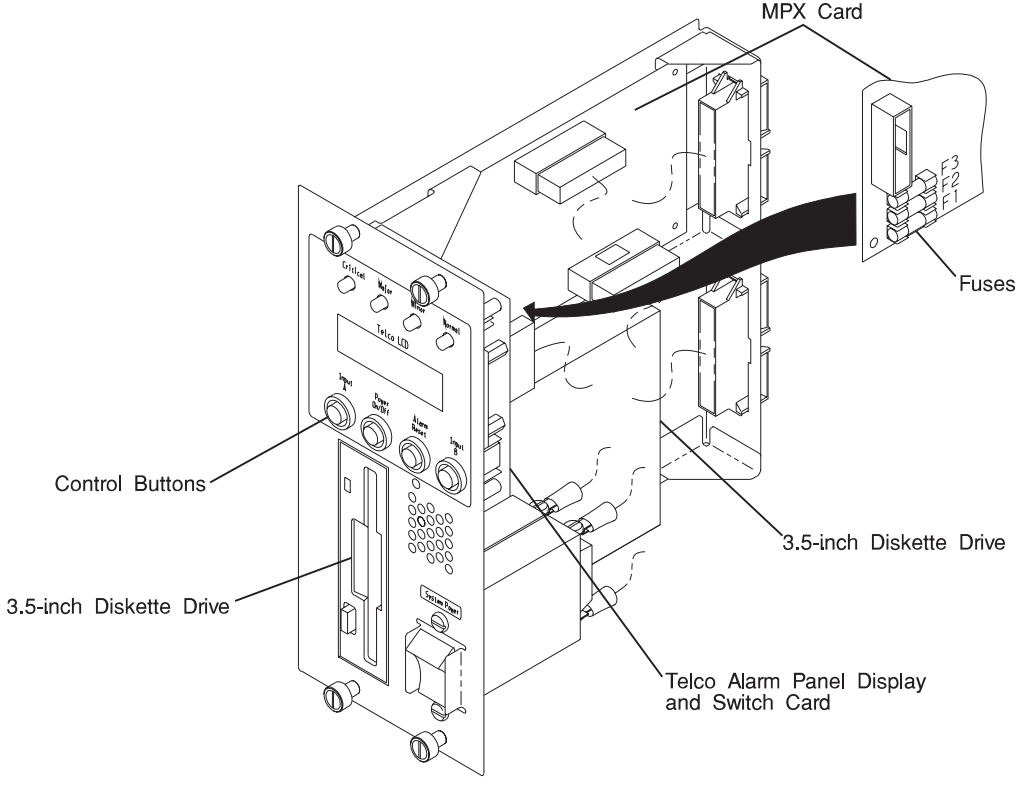
Replacement

1. Set the address jumper as positioned on the drive being replaced. Under no circumstances should the address be set to seven.
2. With the drive brackets removed from the machine, slide the drive into the front end of the bracket and fasten with four pan head screws. Access holes are provided in the outer bracket.
3. Support the drive assembly with one hand and connect the power cable connector and data (SCSI) cable connector into the rear of the drive. The left bay power connector is P11B and the right bay power connector is P11C.
4. Align the drive assembly into the plastic guide rails and slide it into the media bay until fully seated.
5. Tighten the four thumb screws at the corners of the drive.
6. Turn system power switch “On.” Green status light will come on steady.

Diskette Drive (3.5 inch) (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Unscrew the four alarm LCD panel display assembly thumb screws and slide the assembly out of the disk drive module until reaching the end of the cable service loop.
4. Disconnect the diskette data cable from the back of the diskette drive and remove the assembly from the machine.
5. Unplug the diskette power cable from the rear of the drive.
6. Remove the diskette drive mounting screws and slide the drive out the front opening in the assembly.



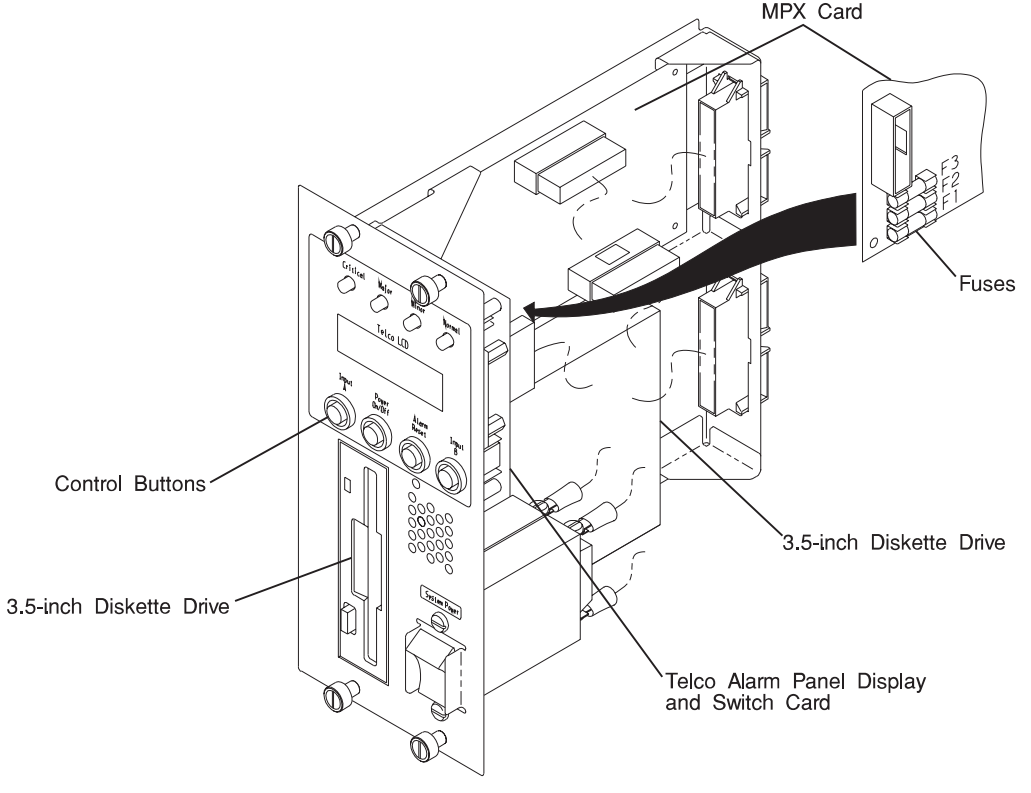
Replacement

1. Insert the replacement drive into the front opening in the assembly, align the front face of the drive flush with the front face of the assembly, and fasten with M3 X 5 mm screws.
2. Connect the power cable within the assembly to the rear of the drive.
3. Connect the data cable coming from the system to the rear of the drive.
4. Align the assembly into the lower and upper plastic guides, and slide the assembly into the machine until fully seated, taking care not to pinch the diskette cable service loop.
5. Tighten the thumbscrews at the corners of the assembly.
6. Remove antistatic wrist strap from ground terminal.
7. Turn system power switch on.

MPX Control Card (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Unscrew the alarm LCD display panel assembly thumb screws and slide the assembly out of the disk drive module until reaching the end of the cable service loop.
4. Disconnect the diskette data cable from the back of the diskette drive and remove the assembly from the machine.
5. Unplug the connectors from the MPX control card at J1, J6, and J7.
6. Remove the four fastening screws at the corners of the card and remove the card.



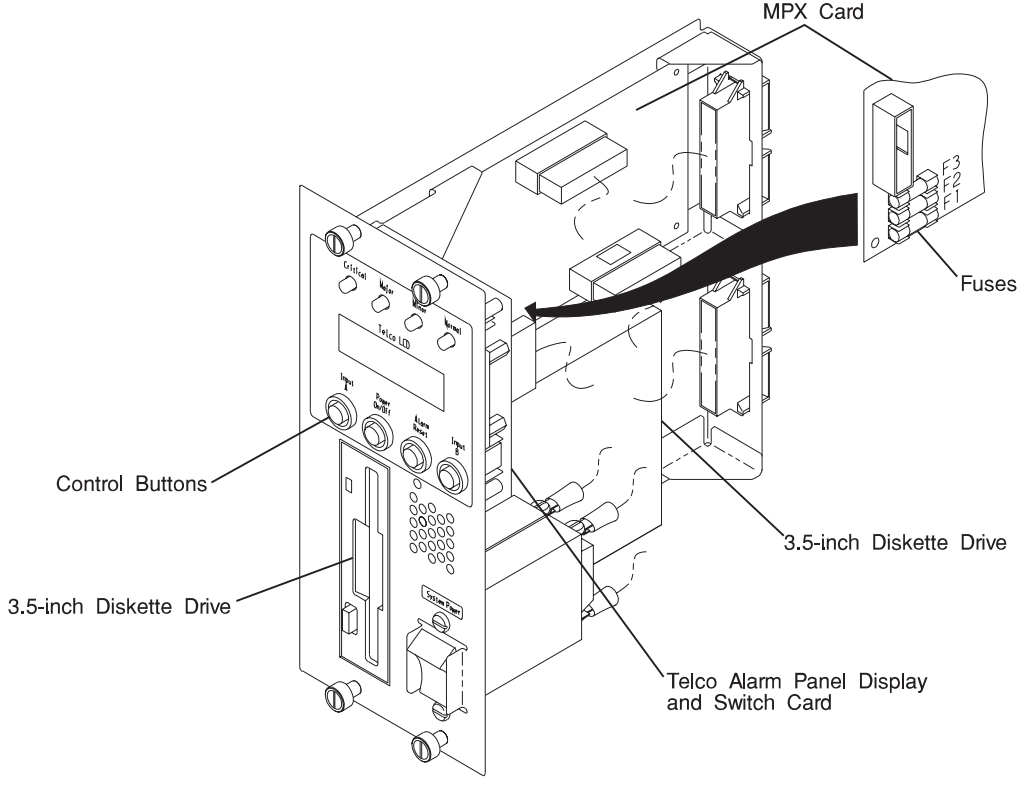
Replacement

1. Align the replacement card on the threaded standoffs, and attach it with 4 M3 X 6 mm screws.
2. Replace cable connectors at J1, J6, and J7.
3. Connect the data cable coming from the machine to the rear of the diskette drive.
4. Align the assembly into the lower and upper plastic guides, and slide the assembly into the machine until fully seated, taking care not to pinch the diskette cable service loop.
5. Tighten the thumbscrews at the corners of the assembly.
6. Remove antistatic wrist strap from ground terminal.
7. Turn system power switch on.

Fuse (MPX Control Card) (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Unscrew the alarm LCD display panel assembly thumb screws and slide the assembly out of the disk drive module until reaching the end of the cable service loop.
4. Disconnect the diskette data cable from the back of the diskette drive and remove the assembly from the machine.
5. Lift and remove blown fuses, F1, F2, or F3.



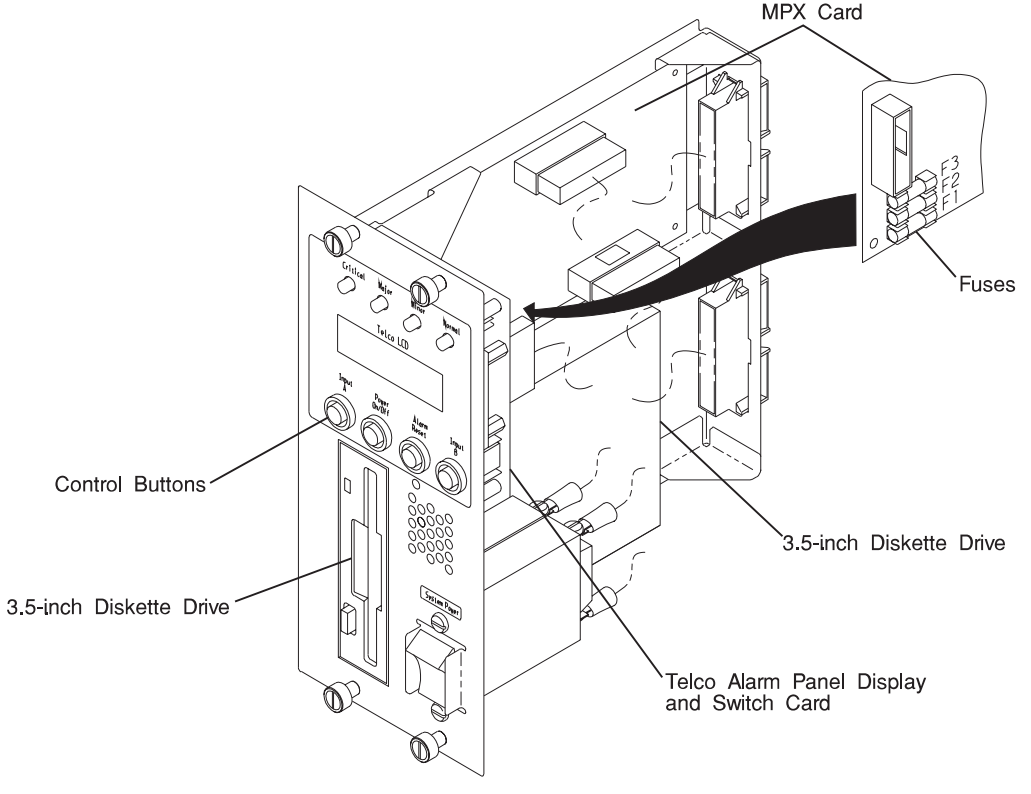
Replacement

1. Replace blown fuses, F1, F2, and/or F3 with equivalent fuses by aligning the replacement fuse with the ends of the fuse holder and pressing downward.
2. Connect the data cable coming from the machine to the rear of the diskette drive.
3. Align the assembly into the lower and upper plastic guides, and slide the assembly into the machine until fully seated, taking care not to pinch the diskette cable service loop.
4. Tighten the thumbscrews at the corners of the assembly.
5. Remove antistatic wrist strap from the ground terminal.
6. Turn system power switch on.

Alarm LCD Display Panel and Switch Card (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Unscrew the alarm LCD display panel assembly thumb screws and slide the assembly out of the disk drive module until reaching the end of the cable service loop.
4. Disconnect the diskette data cable from the back of the diskette drive and remove the assembly from the machine.
5. With long nose pliers, gently grasp and pull the four control buttons off.
6. Remove the cable between the display and switch card at J1 and the MPX control card at J6.
7. Remove the five card fastening screws and remove the card.



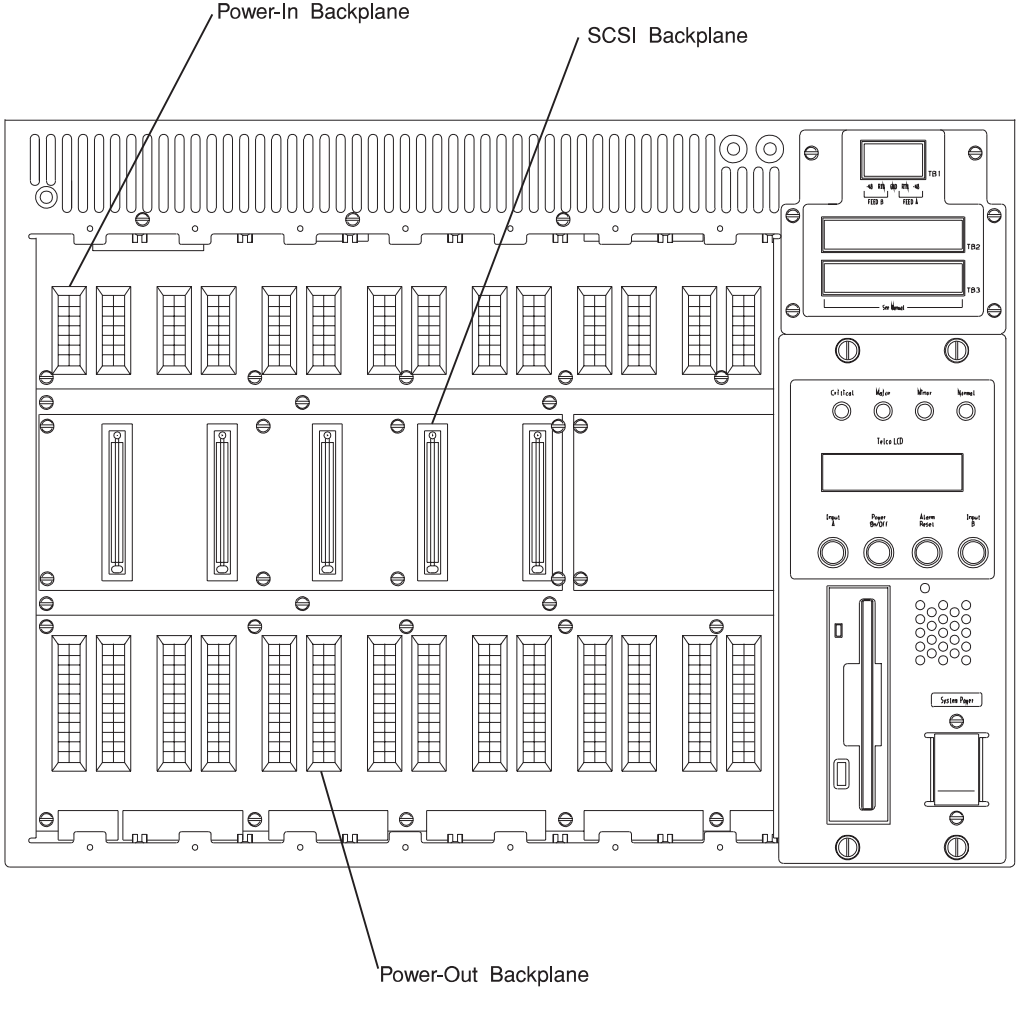
Replacement

1. Pull the four control buttons off the replacement card.
2. If not already done, remove the cable from the MPX control card at J6.
3. Align the replacement card on the threaded standoffs, and attach it with 5 M3 X 6 mm screws.
4. Replace the cable between the display and switch card at J1 and the MPX control card at J6.
5. Push the four control buttons back on from the outside face of the assembly.
6. Connect the data cable coming from the machine to the rear of the diskette drive.
7. Align the assembly into the lower and upper plastic guides, and slide the assembly into the system until fully seated, taking care not to pinch the diskette cable service loop.
8. Tighten the thumbscrews at the corners of the assembly.
9. Remove antistatic wrist strap from ground terminal.
10. Turn system power switch on.

Power-In Backplane (7317 Model F3L)

Removal

1. Turn system power switch off and customer's DC power input breaker off.
2. Connect antistatic wrist strap to ground terminal.
3. Remove all seven disk drive and power supply units and blank covers from the disk drive module, noting locations from which they were removed.
4. The power-in backplane is the upper backplane. Remove all 10 fastening screws.
5. Disconnect cables at J29, J28, and J20 and remove the backplane.



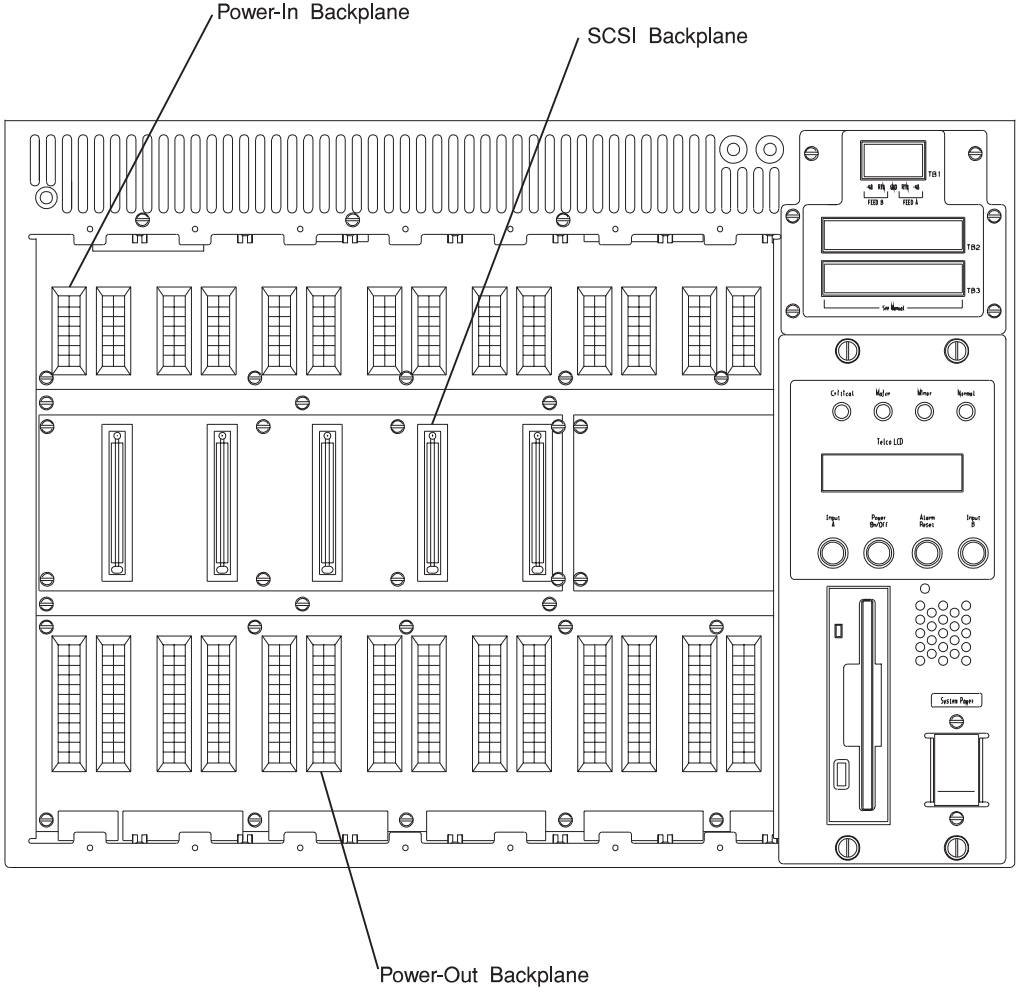
Replacement

1. Connect cables at J29, J28 and J20, left to right along the top edge of the card.
2. Align card to tapped holes in chassis and fasten with 10 M3 X 6 mm screws.
3. Reinstall disk drive and power supply units, and blank covers into the locations from which they were removed.
4. Remove antistatic wrist strap from ground terminal.
5. Turn DC power input breaker on and the system power switch on.

Power-Out Backplane (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Remove all seven disk drive and power supply units, and blank covers from the disk drive module, noting locations from which they were removed. (See appropriate removal procedure.)
4. The power-out backplane is the lower backplane. Remove all 10 fastening screws.
5. Disconnect cables at J30, J38, J39, J41, and J42, and remove the card.



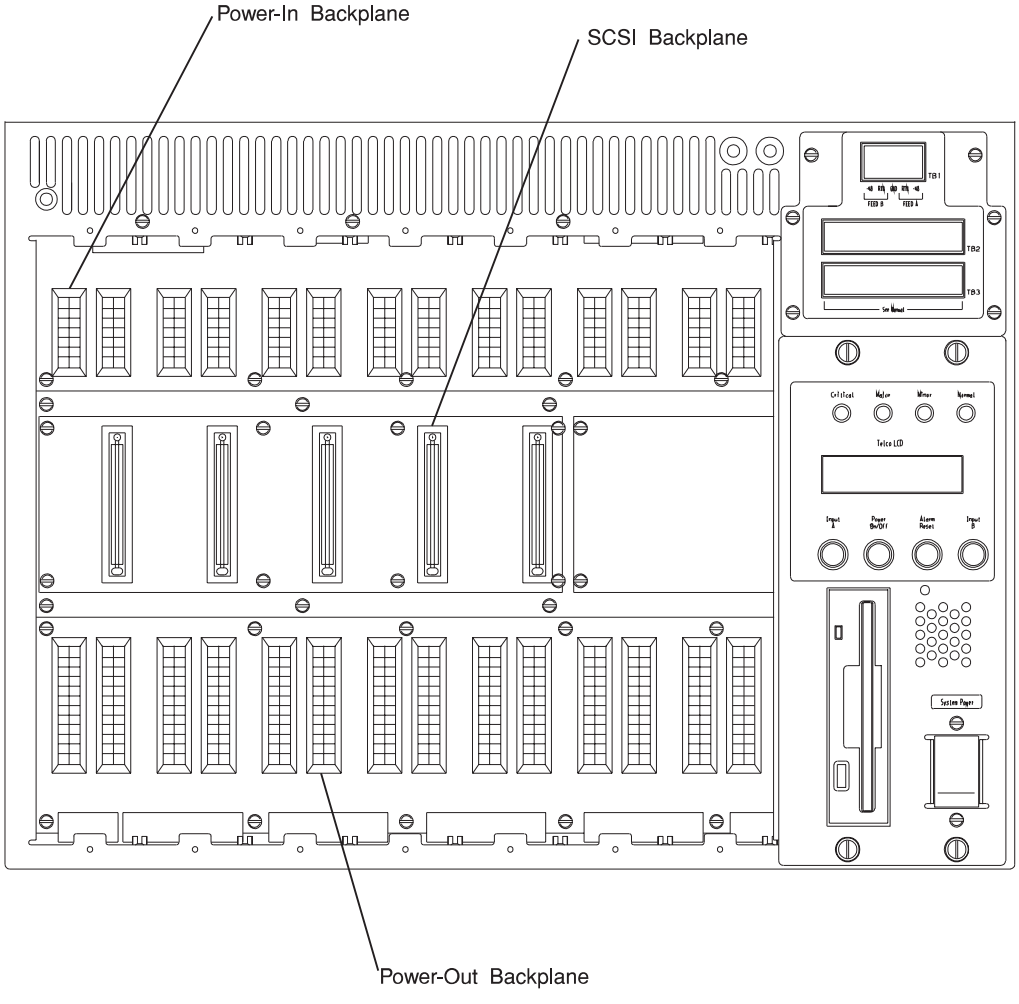
Replacement

1. Connect cables at J30, J38, J39, J41, and J42, left to right along the bottom edge of the card. Note J40 is not used.
2. Align card to tapped holes in chassis and fasten with 10 M3 X 6 mm screws.
3. Reinstall disk drive and power supply units, and blank covers into the locations from which they were removed.
4. Remove antistatic wrist strap from ground terminal.
5. Turn system power switch on.

SCSI Backplane (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Remove all seven disk drive and power supply units, or blank covers from the disk drive module noting locations from which they were removed. (See appropriate removal procedure.)
4. The SCSI backplane is the middle-left backplane. Remove all 8 fastening screws and support card in hand.
5. Disconnect the data cable at J13 and the power cable P11A at J1 or J2 from the back of the card and remove card.



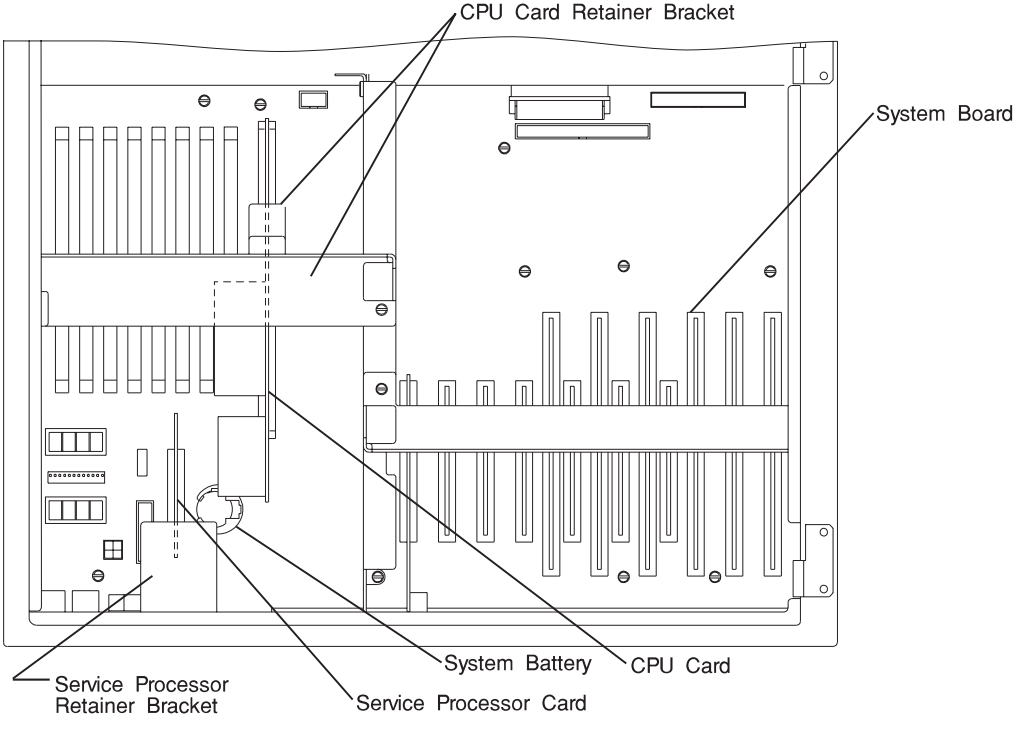
Replacement

1. Connect the data cable at J13 and the power cable P11A into the J1 or J2 socket on the back of the replacement card.
2. Align card to tapped holes in chassis and fasten with 8 M3 X 6 mm screws.
3. Reinstall disk drive units, power supply units, and blank covers into the locations from which they were removed.
4. Remove antistatic wrist strap from ground terminal.
5. Turn system power switch on.

CPU Card (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Remove the left-hand-side CPU card retainer bracket as a unit by removing the two nuts on its left end and single screw on its right end.
5. Grasp the CPU card and pull it out.



Replacement

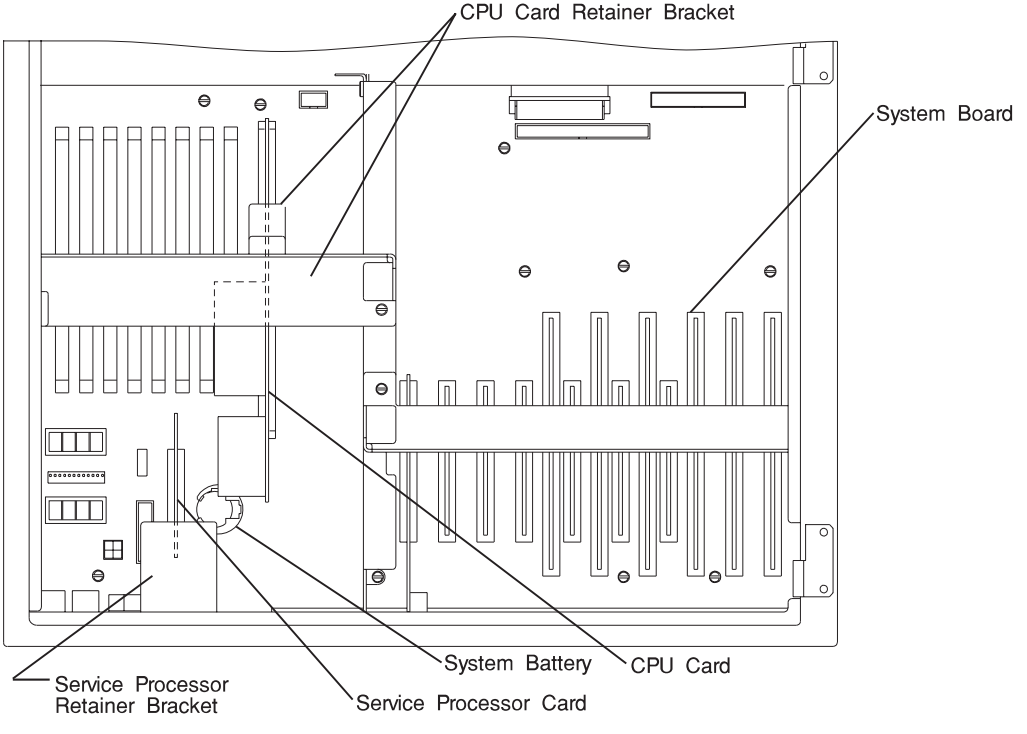
1. Insert the replacement CPU card into its socket on the I/O system planar.
2. Install the left-hand-side retainer bracket support and the CPU card retainer as a unit and install the two nuts on its left end and single screw on its right end.
3. Adjust the CPU card retainer bracket against the edge of the card and tighten the retainer bracket screw (if needed).

4. Close the electronics module door and tighten four thumb screws.
5. Remove antistatic wrist strap from ground terminal.
6. Turn system power switch on.

Service Processor Card (7317 Model F3L)

Removal

1. Turn system switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Remove one service processor card retainer bracket screw, loosen the other one, and twist the bracket away from the card.
5. Grasp the service processor card and pull it out.



Replacement

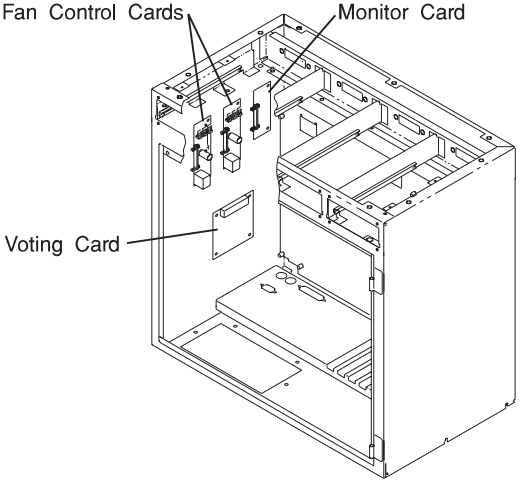
1. With the card retainer bracket out of the way, insert the replacement service processor card into its socket on the I/O system planar.
2. Adjust the card retainer bracket against the edge of the card and tighten the two retainer bracket screws.
3. Close the electronics module door and tighten its four thumb screws.

4. Remove antistatic wrist strap from ground terminal.
5. Turn system power switch on.

Voting Card (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Unplug the voting card cable at the top of the card.
5. Remove the four fastening screws and remove the card from the electronics module.



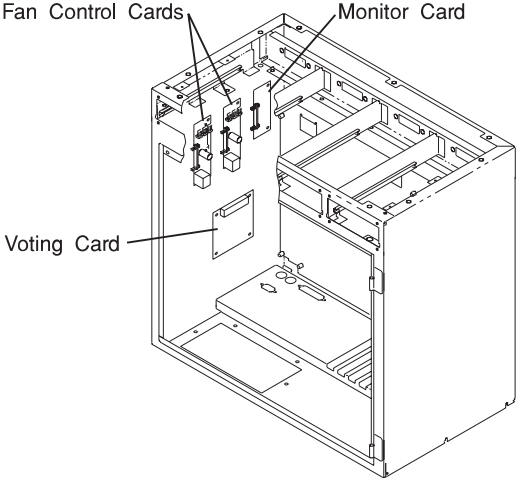
Replacement

1. Align the replacement voting card onto the four threaded stand-offs and fasten with M3 x 6 mm screws.
2. Connect voting card cable at the top of card.
3. Close the electronics module door and tighten its four thumb screws.
4. Remove antistatic wrist strap from ground terminal.
5. Turn system power switch on.

Fan Monitor Card (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Disconnect the fan monitor card cable from the fan monitor card.
5. Remove the two fastening screws and lift the card from the hex stand-off.



Replacement

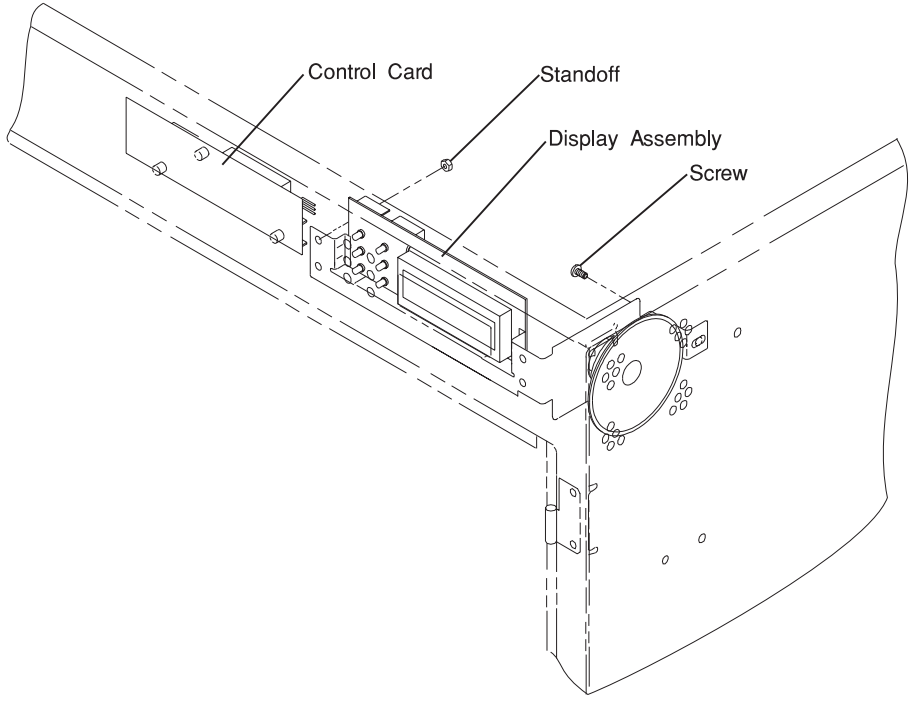
1. With the CPU card removed, align the replacement fan monitor card onto the two threaded hex stand-offs and fasten with 2 M3 x 6 mm screws.
2. Reconnect the fan monitor card cable to the fan monitor card.
3. Close the electronics module door and tighten its four thumb screws.
4. Remove antistatic wrist strap from ground terminal.
5. Turn system power switch on.

Operator Panel Display LCD (7317 Model F3L Cabinet Mounted)

Note: If your system has the Operator Panel Display LCD mounted on the door of the electronics module, follow the procedure on page 9-37.

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Disconnect the speaker wire connector from the operator panel control card.
5. Remove the one screw and four hex stand-offs (used as nuts) holding the display bracket to the cabinet.
6. Remove the display bracket with the speaker and the display LCD captured within the bracket.



Replacement

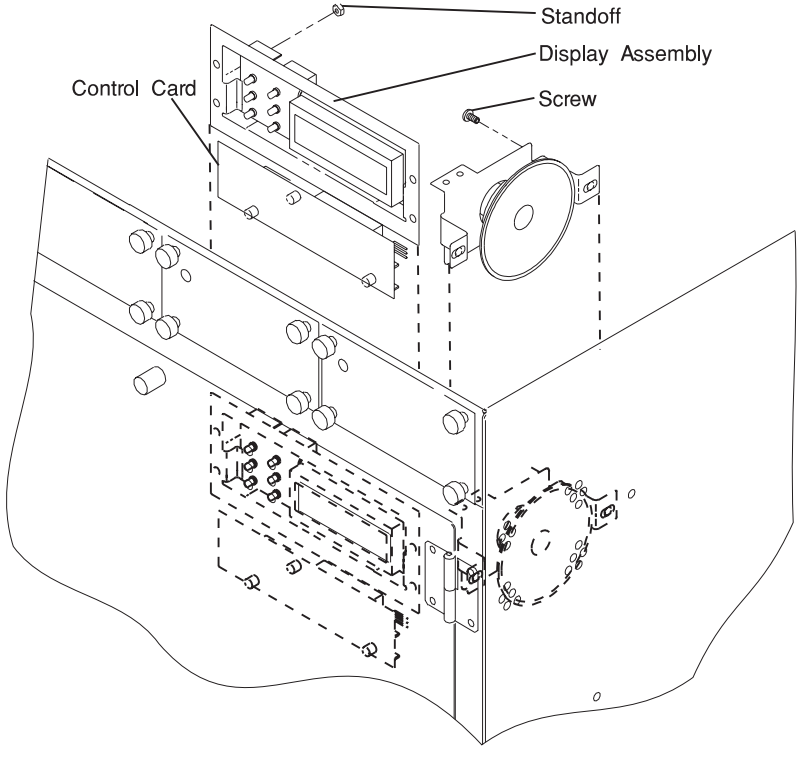
1. Place the replacement display LCD within the display bracket and position the bracket over the four threaded studs on the inside of the cabinet.
2. Fasten the bracket to the cabinet with four hex stand-offs used as nuts, and one M3 x 6 mm screw.
3. Reconnect the speaker wire connector and the LED cable connector to the Operator Panel Control Card.
4. Close the electronics module door and tighten its four thumb screws.
5. Remove antistatic wrist strap from ground terminal.
6. Turn system power switch on.

Operator Panel Display LCD (7317 Model F3L Door Mounted)

Note: If your system has the Operator Panel Display LCD mounted on the cabinet of the electronics module, follow the procedure on page 9-35.

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Disconnect the operator panel cable connector from the operator panel control card.
5. Remove the four nuts holding the operator panel display bracket to the door.
6. Remove the operator panel display LCD and bracket assembly from the door.



Replacement

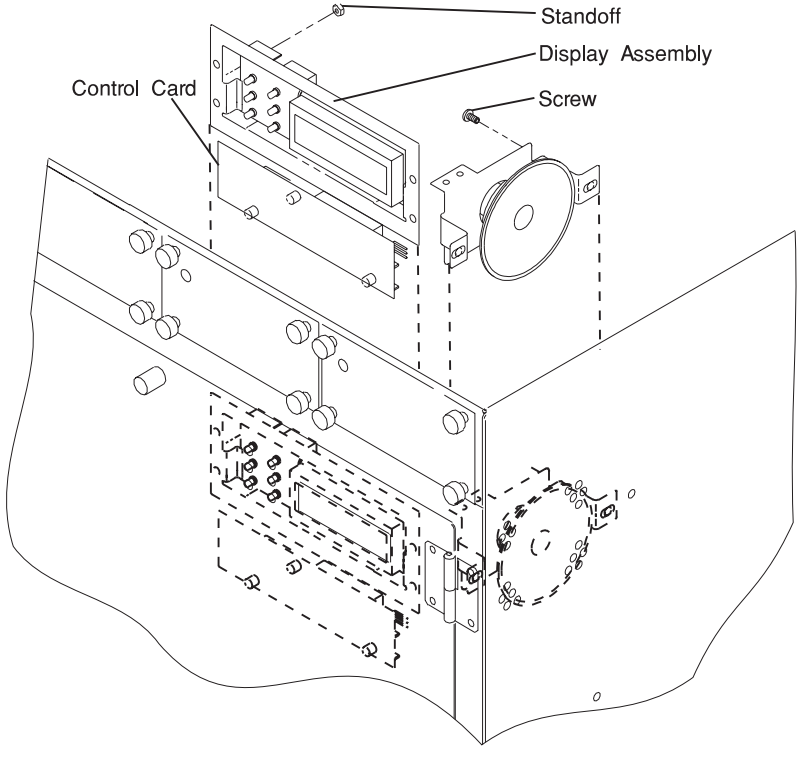
1. Position the replacement operator panel display assembly on the door over the threaded studs.
2. Fasten the bracket to the cabinet with four nuts.
3. Reconnect the speaker wire connector and the operator panel cable connector to the operator panel control card.
4. Close the electronics module door and tighten its four thumb screws.
5. Remove antistatic wrist strap from ground terminal.
6. Turn system power switch on.

Speaker (7317 Model F3L)

Note: If the operator panel display LCD is mounted on the cabinet of the electronics module, the speaker is removed as part of the operator panel display LCD assembly, see page 9-35.

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Disconnect the speaker wire connector at the operator panel control card.
5. Remove the screws holding the speaker bracket to the inside of the cabinet.
6. Remove the speaker and bracket assembly.



Replacement

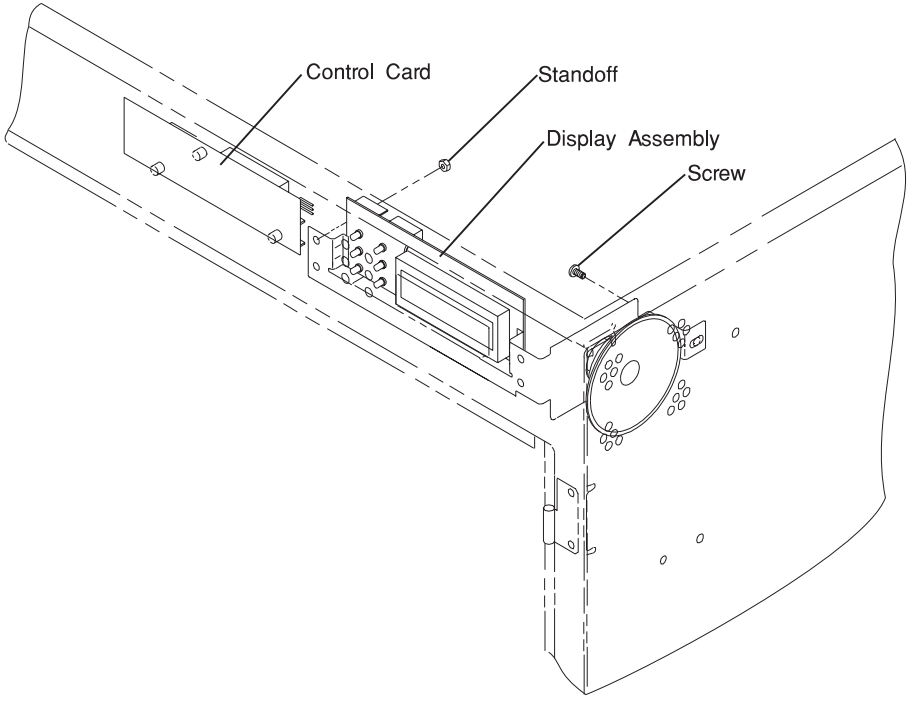
1. Position the speaker and bracket assembly in the cabinet.
2. Fasten the bracket to the cabinet with two screws.
3. Reconnect the speaker wire connector to the operator panel control card.
4. Close the electronics module door and tighten its four thumb screws.
5. Remove antistatic wrist strap from ground terminal.
6. Turn system power switch on.

Operator Panel Control Card (7317 Model F3L Cabinet Mounted)

Note: If your system has the operator panel control card mounted on the door of the electronics module, follow the procedure on page 9-43.

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Disconnect the speaker wire connector at the operator panel control card.
5. Disconnect the operator panel control cable from the I/O system planar at J1.
6. Disconnect the LED cable at the front of the control card.
7. Remove the three screws holding the control card to the inside of the cabinet.
8. Remove the control card.



Replacement

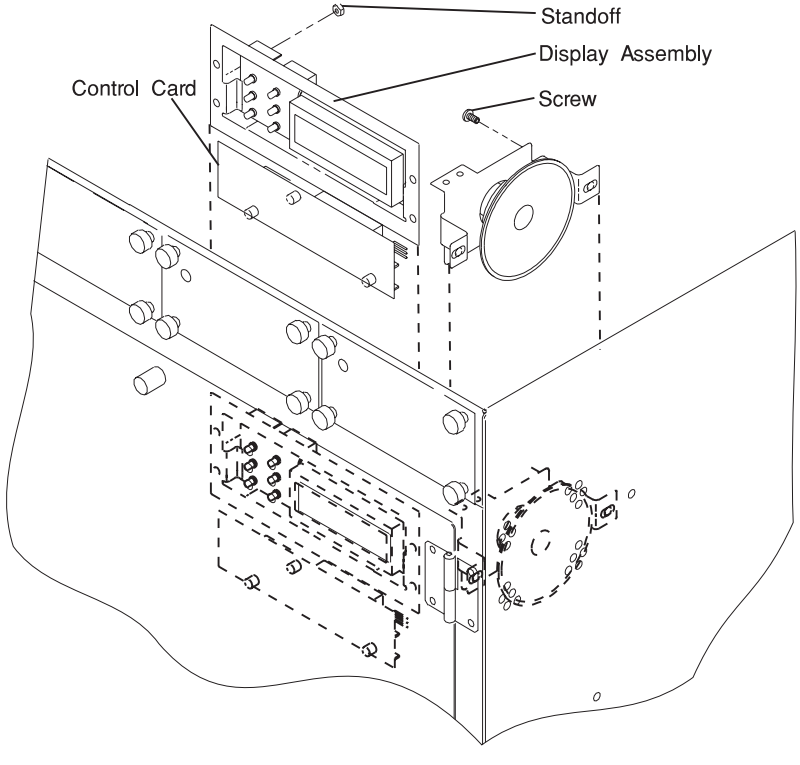
1. Place the replacement control card over the threaded studs on the inside of the cabinet.
2. Fasten the card to the cabinet with three M3 x 6mm screws.
3. Reconnect the speaker wire connector to the operator panel control card.
4. Reconnect the operator panel control cable connector to the I/O system planar at J1.
5. Reconnect the LED cable at the front of the control card.
6. Close the electronics module door and tighten its four thumb screws.
7. Remove antistatic wrist strap from ground terminal.
8. Turn system power switch on.

Operator Panel Control Card (7317 Model F3L Door Mounted)

Note: If your system has the operator panel control card mounted on the cabinet of the electronics module, follow the procedure on page 9-41.

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Disconnect the operator panel control cable connector from the I/O system planar at J1.
5. Disconnect the speaker wire connector from the operator panel control card.
6. Disconnect the operator panel LED cable from the operator panel control card.
7. Remove the two screws holding the control card to the display assembly bracket.
8. Remove the control card.



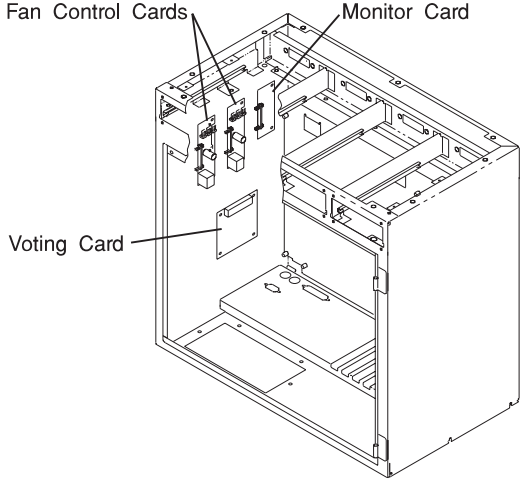
Replacement

1. Place the replacement control card over the threaded standoffs on the display assembly bracket.
2. Fasten the operator panel control card door with two M3x6mm screws.
3. Reconnect the operator panel control cable connector to the I/O system planar at J1.
4. Reconnect the LED cable to the control card.
5. Reconnect the speaker wire connector to the operator panel control card.
6. Close the electronics module door and tighten its four thumb screws.
7. Remove antistatic wrist strap from ground terminal.
8. Turn system power switch on.

Fan Control Cards (7317 Model F3L)

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Remove the lower front and rear attaching screws, and support the fan control card in hand.
5. Remove cable connector.
6. Remove fan control card from machine.



Replacement

Attention: Connect cable connector to the fan control card with the yellow wire toward the bottom (lower) end of the cards. Incorrect orientation will cause the cards to fail!

1. Plug connector into the replacement rear fan control card, insuring yellow wire is toward the bottom (lower) end of the card.
2. Align the fan control card on the threaded studs and fasten it using two M3 x 6 mm screws in each lower corner of the card.
3. Close the electronics module door and tighten its four thumb screws.
4. Remove antistatic wrist strap from ground terminal.
5. Turn system power switch on.

System Board (7317 Model F3L)

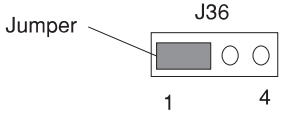
Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, open door.
4. Disconnect the cable to the operator panel control card at J1 on the system board and also disconnect the speaker wire connector from the operator panel control card.

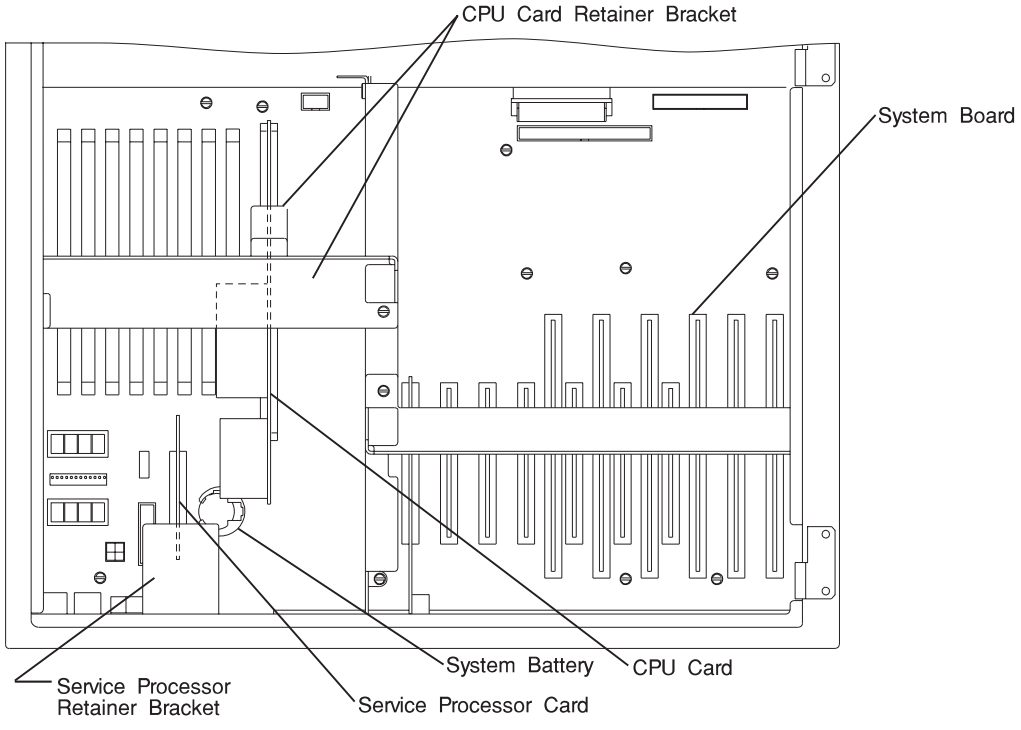
   Note: You do not need to remove the speaker wire connector if the operator panel control card is mounted on the electronics module cabinet and not mounted on the door.
5. Lift the door off its hinges and set it aside taking care not to damage the EMI gasket material around its inside edges.
6. Note the positions for all adapters, and then remove them from the system board.
7. Remove the left-hand-side CPU retainer bracket support and the CPU card retainer as a unit by removing the two nuts on its left end and single screw on its right end.
8. Remove the center divider and the right-hand-side retainer bracket support as a unit by removing the nut and screw at the bottom of the divider, the nut at the top of the divider, and the two nuts at the right of the retainer bracket support.
9. Remove the CPU card from the system board.
10. Remove the service processor card retainer and the processor card from the system board
11. Remove all memory SIMMs from the system board.
12. Unplug all cables from the system board, noting from where they came.
13. Remove the 15 system board attaching screws and the two parallel port jack screws, and remove the system board from the machine.
14. Swap the old VPD module (U69) to the new system board.

Replacement

1. Verify the jumper (J36) is in the correct position as shown.



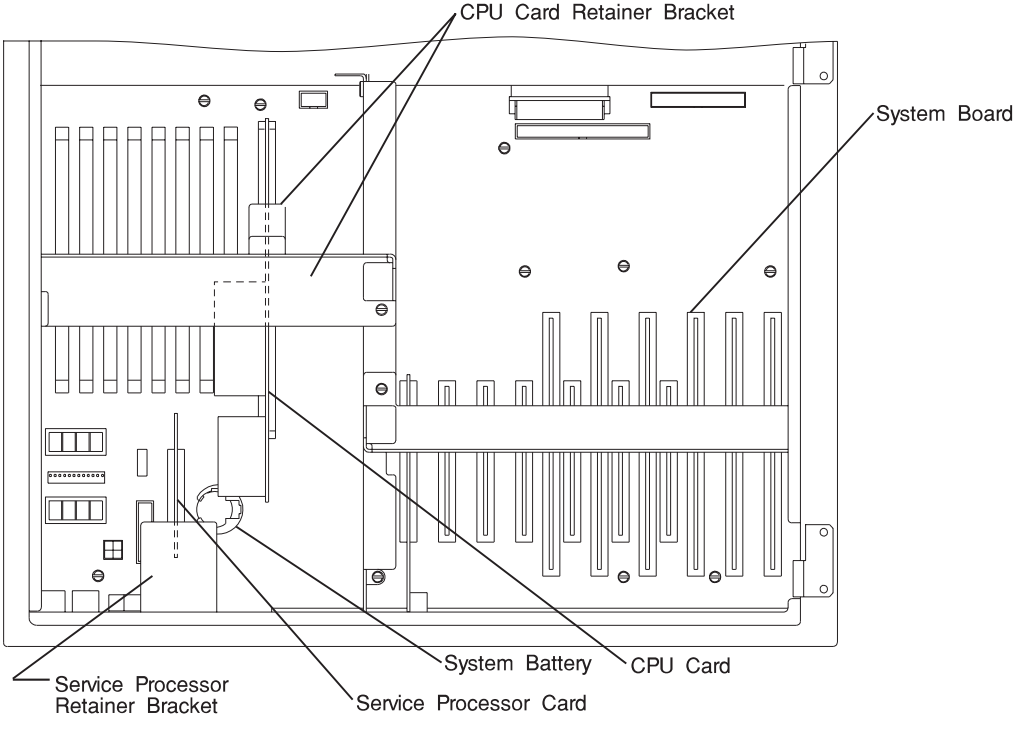
2. With electronics module door removed, align the replacement system board onto the threaded inserts in the back of the electronics module and fasten with 15 M3 x 6 mm screws.
3. Attach the two jack screws at the parallel port.
4. Plug cables into the system board at the appropriate locations.
5. Replace memory SIMMs, and adaptor, CPU, and service processor cards into the system board.
6. Replace the service processor card retainer.
7. Replace center divider and right-hand-side retainer bracket support as a unit, insuring adapter card retainers are aligned and in contact with appropriate adapter cards.
8. Replace the left-hand-side retainer bracket support and CPU card retainer as a unit, insuring the retainer is aligned and in contact with the CPU card.
9. Replace electronics module door on its hinges.
10. Reconnect cables to the operator panel control card.
11. Close door and tighten its four thumb screws.
12. Remove antistatic wrist strap from ground terminal.
13. Turn system power switch on.


CPU Card Retainer Bracket
System Board
System Battery
CPU Card
Service Processor
Retainer Bracket
Service Processor Card

Adapter Card (7317 Model F3L)

Removal

1. Turn system switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Loosen the four thumb screws on the electronics module door, and open door. (The thumb screws will remain captured.)
4. Remove any cables that may be attached to the adapter card.
5. Remove the adapter card retainer screw and retainer bracket.
6. Grasp the adapter card and pull it straight out.



Replacement

1. With the adapter card retainer bracket out of the way, insert the replacement adapter card into its socket on the system board.
2. Adjust the adapter card retainer bracket against the edge of the adapter cards and tighten the two retainer bracket screws. Install the adapter card retainer screw.

3. Close the electronics module door and tighten its four thumb screws.
4. Remove antistatic wrist strap from ground terminal.
5. Turn system power switch on.

Battery (7317 Model F3L)

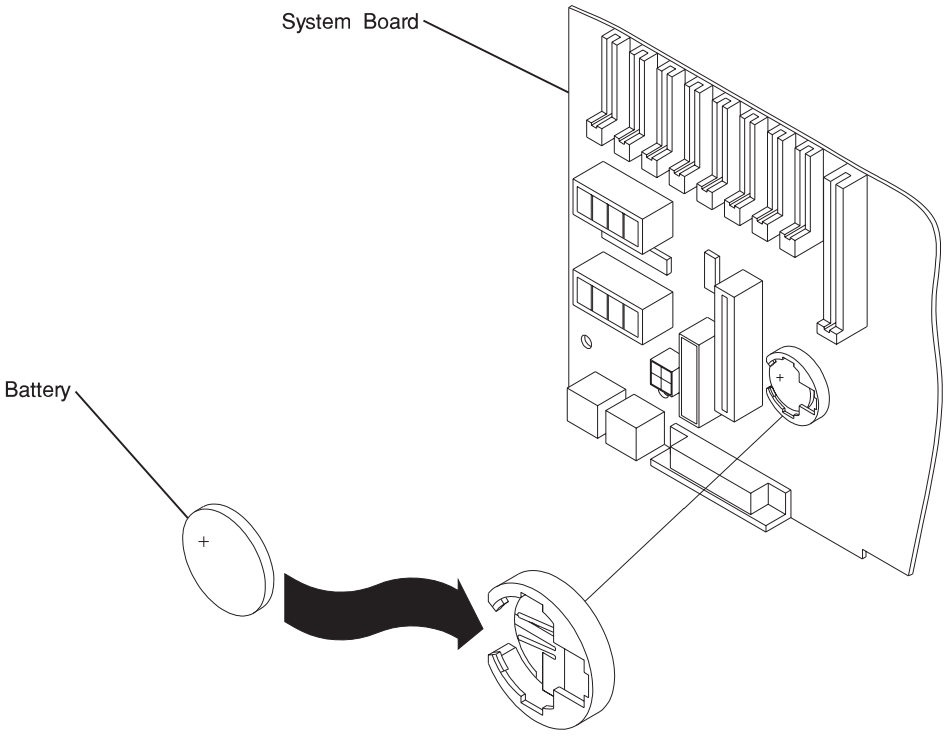
CAUTION:
A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another battery may present a risk of fire or explosion.

The battery connector is polarized; do not attempt to reverse polarity.

Dispose of the battery according to local regulations.

Removal

1. Turn system power switch off.
2. Connect antistatic wrist strap to ground terminal.
3. Open electronic module door.
4. The battery is located near the lower left corner of the system board.
5. Remove the service processor retainer bracket.
6. Remove the service processor card.
7. Press inward on the edge of the battery, and lift the battery out of its socket.



Replacement

1. With positive (+) side of battery facing upward, tilt the battery downward, slide it into the socket, and push it downward until fully seated.
2. Replace the service processor card.
3. Replace the service processor retainer bracket.
4. Close and secure electronics module door.
5. Remove antistatic wrist strap from ground terminal.
6. Turn system power switch on.
7. Reset time and date on the system.

SCSI or Ultra SCSI Disk Drive Unit (7317 Model D10)

Note: Each disk drive unit has four status lights indicating the following:

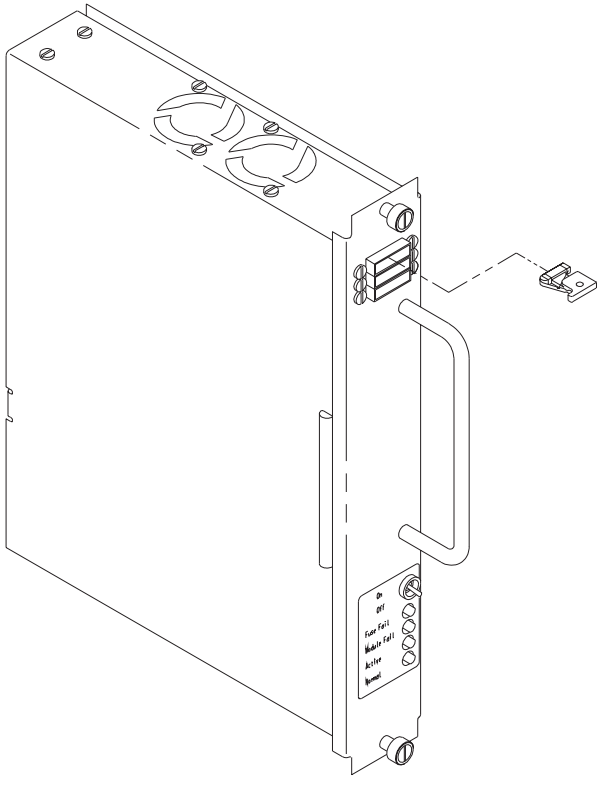
- Red light "on" - Fuse failure
- Red light "on" - Software indication of system detectable error
- Amber - State condition of the disk drive unit
- Green light "on" - Normal power-on condition.
  Green light "blinking" - Power-off condition, safe to remove.

Removal

Attention: Caution should be used when handling all hard disk drives. Drives are more likely to be damaged during installation and service. Bumping or handling drives roughly causes latent failures. Don't stack drives and always use appropriate ESD practices. A drop of as little as 6.5 mm (.25 inches) can cause latent failures. Media can take 30 seconds to spin down, so ensure at least a 30 second delay has passed after switching off hot-swappable drives for removal.

1. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and unconfigure the disk drive unit you are removing.
2. Push the switch on the disk drive unit to be removed downward to its Off position. The bottom green status light will blink, indicating power is off and the unit is safe to remove.

   Note: It is not necessary to turn the system power switch off.
3. Unscrew the thumb screws at the top and bottom of the disk drive unit.
4. Grasp handle and pull the unit out of the disk drive module.



Replacement

1. Grasp handle, align the unit on the plastic guide rails, and slide it into the disk drive module until fully seated.
2. Tighten top and bottom thumb screws.
3. The momentary switch should be in its upward On position, and the bottom green light on steadily.
4. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and configure the disk drive unit you are replacing.

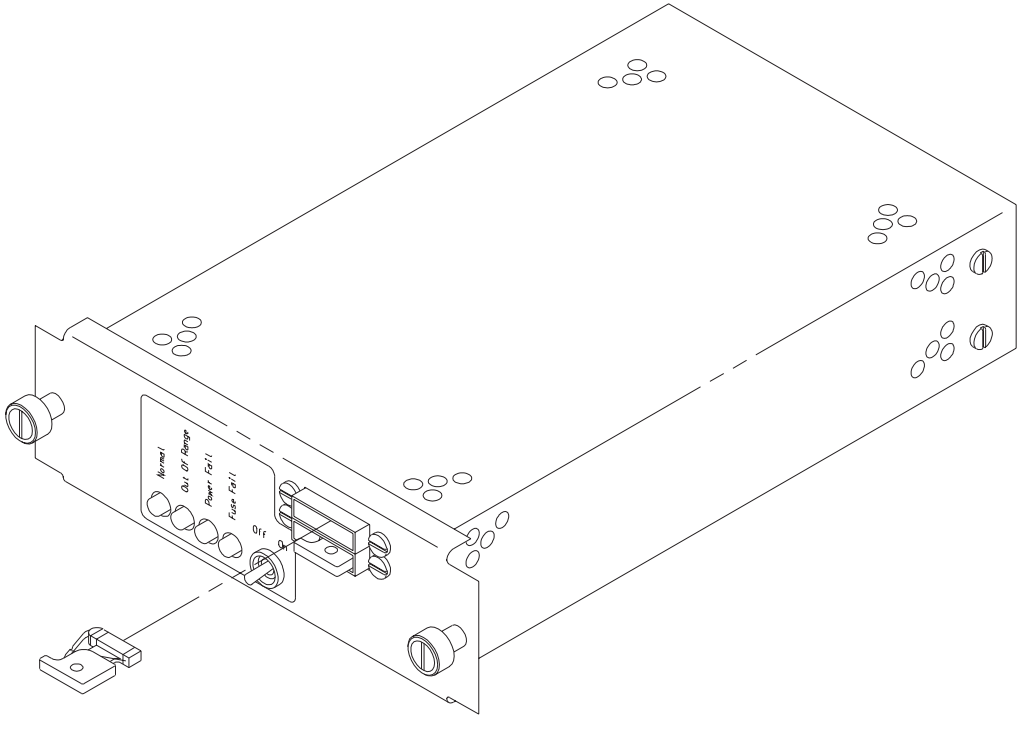
Fuse (Power Supply Unit or Disk Drive Unit) (7317 Model D10)

Notes:

1. Unit fuse failure is electrically indicated by the fuse status light on.
2. Individual fuse failure is mechanically indicated by the plastic tipped spring swung to the side.

Removal

1. Do not power system or the unit down.
2. Grasp the plastic body of the failed fuse only and pull directly outward.
3. Note the fuse amperage painted on the side of the fuse.



Replacement

1. Obtain replacement fuse of same amperage as failed fuse. (Power Supply unit fuses are 10 amp, disk drive unit fuses are 2 amp.) A good fuse will not have its plastic tipped spring swung out to the side.
2. Grasp the plastic fuse body and insert it into the same slot of the holder from which the failed fuse was removed. The fuse is keyed and will only go in if the raised plastic boss is facing downward.
3. Press fuse in until fully seated. Fuse failure light will go out.

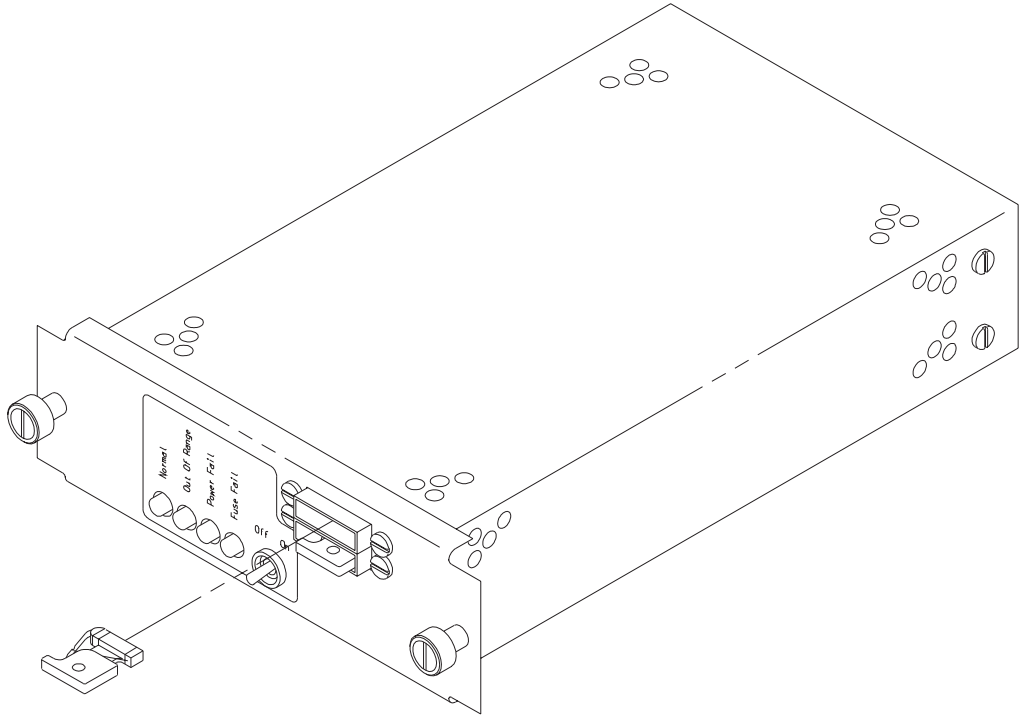
Power Supply Unit (7317 Model D10)

Note: Upper unit powers the five left most disk drive unit locations and the lower unit powers the five right most locations.

Indicators and Switches:				
0 Green	0 Yellow	0 Red	0 Red	"Off" "On" (Left) (Right)
Normal Condition	1 of 2 power devices is out of range. Replace at convenient time.	Power Supply Unit Failure	Fuse Failure	Power Switch

Removal

1. Leave 7317 Model D10 System power switch on.
2. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and unconfigure the disk drive units that are powered by the power supply you are removing.
3. Turn the power switch on the power supply unit to be removed to the Off (left) position.
4. Loosen the thumb screws at the corners of the power supply unit and slide unit out.



Replacement

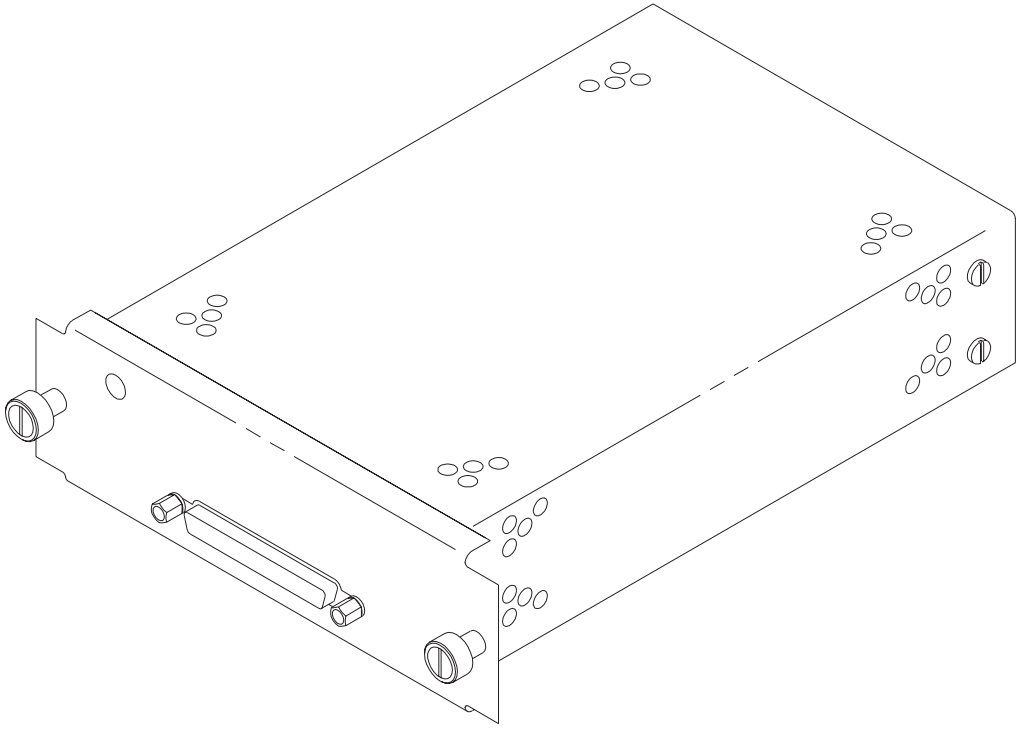
1. Align the replacement power supply unit into the left and right plastic guides.
2. Push the unit in until fully seated.
3. Tighten the thumb screws at the corners of the unit.
4. Turn the power supply unit switch to the On (right) position.
5. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and configure the disk drive units that are powered by the power supply you replaced.

SCSI DE/SE Converter (7317 Model D10)

Removal

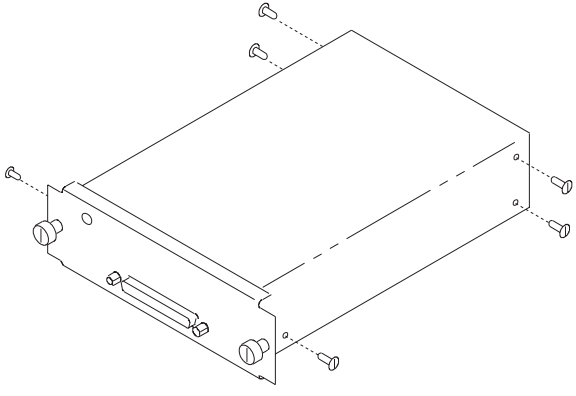
1. Leave 7317 Model D10 System power switch on.
2. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and unconfigure the disk drive units that are connected to the SCSI DE/SE Converter you are removing.
3. Turn the appropriate power supply unit off.

   Note: The upper power supply unit powers the five leftmost disk drive unit locations and the lower unit powers the five rightmost disk drive unit locations.
4. Connect antistatic wrist strap to ground terminal.
5. Remove the SCSI cable from the front of the SCSI DE/SE converter to be removed.
6. Loosen the thumb screws at the corners of the converter.
7. Slide the converter out until the end of the cable and support in hand while removing the SCSI data cable at J1 and the power cable at J5.
8. Remove the converter.

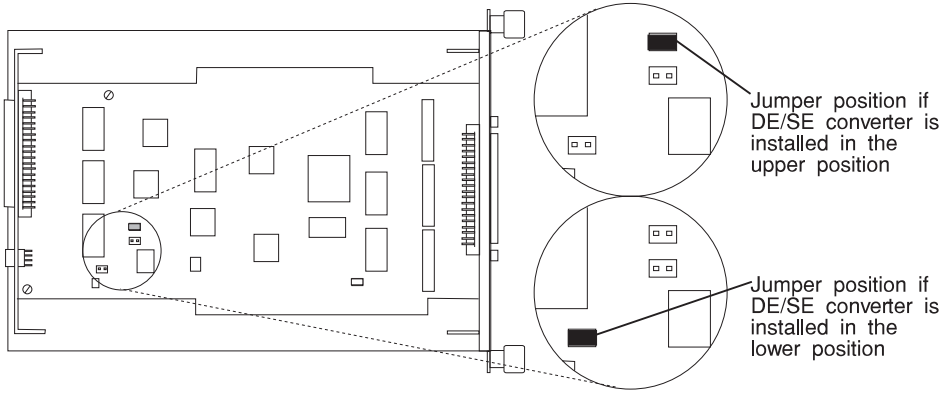


Replacement

1. Remove the cover from the new SCSI DE/SE converter by removing the screws and sliding the cover off.



2. Set the jumper on the SCSI DE/SE converter card. Refer to the following figure to set the jumper. The jumper must be set according to whether the SCSI DE/SE converter is installed in the upper position or the lower position in the 7317 Model D10.



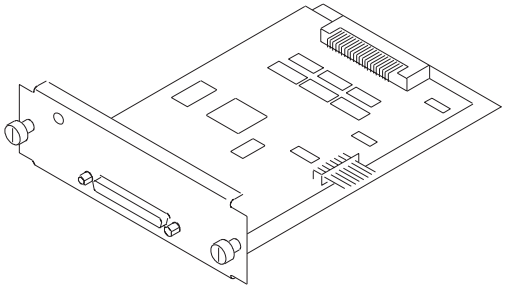
3. Connect the SCSI data cable and the power cable coming from the system to the replacement SCSI DE/SE converter at J1 and J5, respectively.
4. Align the replacement converter into the left and right plastic guides, and push the converter in until fully seated.
5. Tighten the thumb screws at the corners of the converter.
6. Attach the SCSI cable to the front of the SCSI DE/SE converter.
7. Remove antistatic wrist band from ground terminal.
8. Turn power supply unit switch to the On (right) position.

9. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and configure the disk drive units that are connected to the SCSI DE/SE Converter you replaced.

Removal

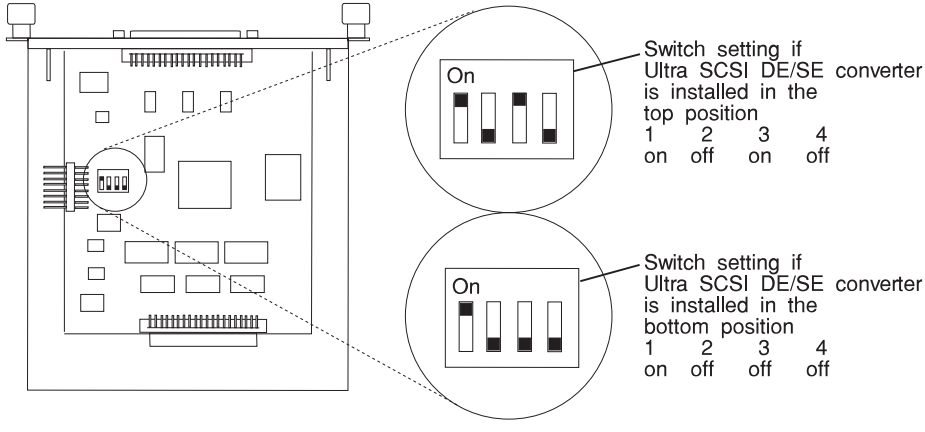
1. Leave 7317 Model D10 System power switch on.
2. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and unconfigure the disk drive units that are connected to the Ultra SCSI DE/SE Converter you are removing.
3. Turn the appropriate power supply unit off.

   Note: The upper power supply unit powers the five leftmost disk drive unit locations and the lower power supply unit powers the five rightmost disk drive unit locations.
4. Connect antistatic wrist strap to ground terminal.
5. Remove the SCSI cable from the front of the Ultra SCSI DE/SE converter to be removed.
6. Loosen the thumb screws at the corners of the converter.
7. Slide the converter out until the end of the cable and support in hand while removing the Ultra SCSI data cable at J1 and the power cable (with jumper) at J5.
8. Remove the converter.



Replacement

1. Set the switches on the Ultra SCSI DE/SE converter card. Refer to the following figure to set the switches. The switches must be set according to whether the Ultra SCSI DE/SE converter is installed in the upper position or the lower position in the 7317 Model D10.

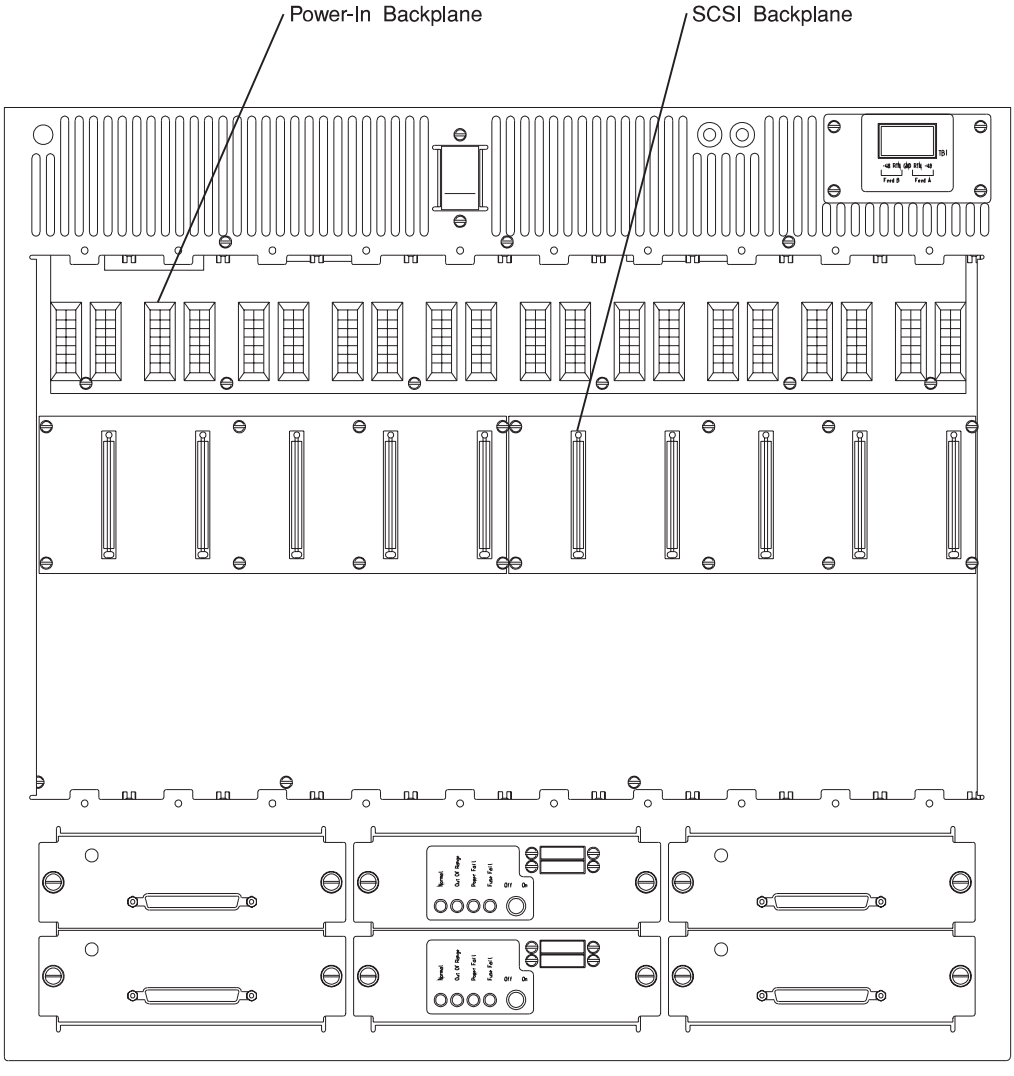


2. Connect the Ultra SCSI data cable and the power cable (with jumper) coming from the system to the replacement Ultra SCSI DE/SE converter at J1 and J5, respectively.
3. Align the replacement converter into the left and right plastic guides, and push the converter in until fully seated.
4. Tighten the thumb screws at the corners of the converter.
5. Attach the SCSI cable to the front of the Ultra SCSI DE/SE converter.
6. Remove antistatic wrist band from ground terminal.
7. Turn power supply unit switch to the On (right) position.
8. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and configure the disk drive units that are connected to the Ultra SCSI DE/SE Converter you replaced.

Power-In Backplane (7317 Model D10)

Removal

1. Turn system power switch off and customer's DC power input breaker off.
2. Connect antistatic wrist strap to ground terminal.
3. Remove all ten disk drive units and blank covers from the Model 7317 Model D10, noting locations from which they were removed.
4. The power-in backplane is the upper backplane. Remove all 12 fastening screws.
5. Disconnect cables at J82, J83, and J70 and remove the card.



Replacement

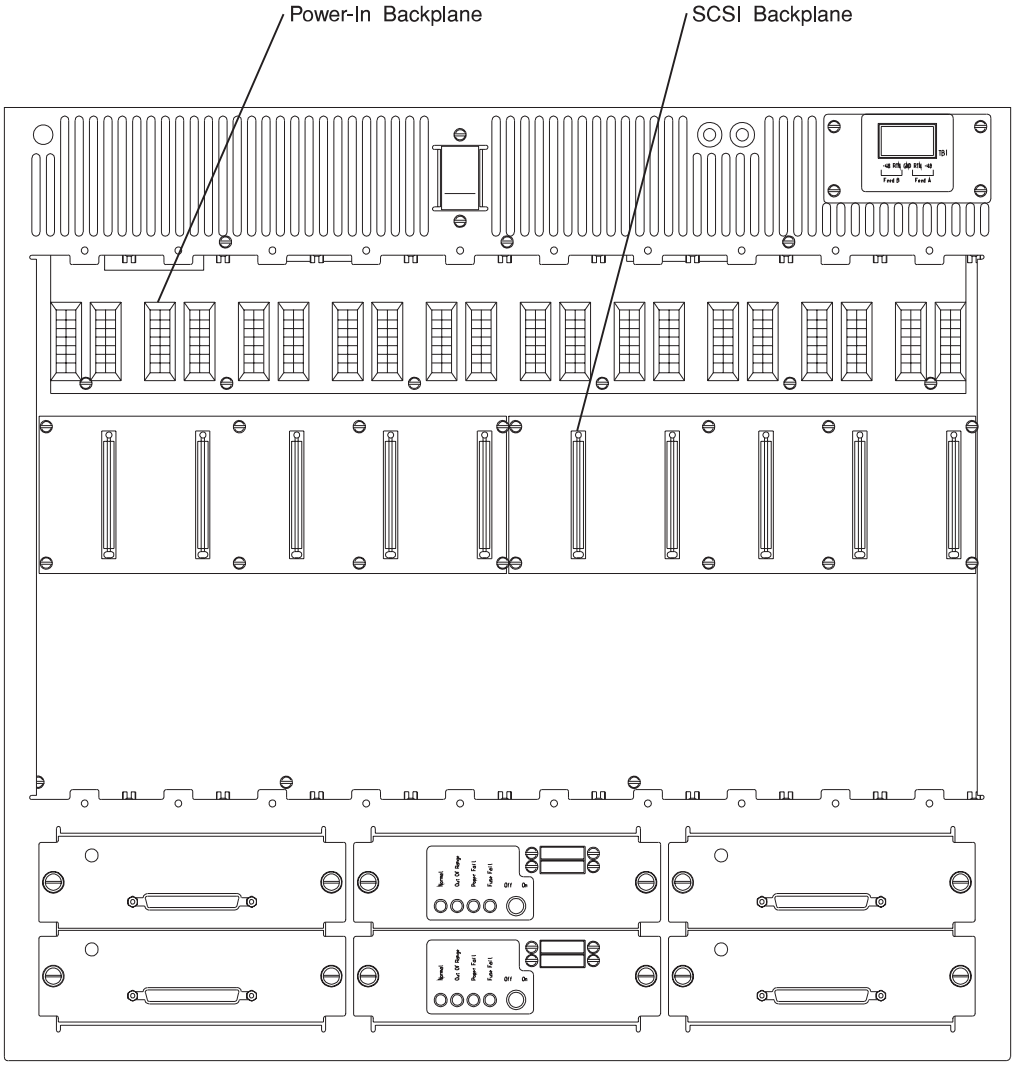
1. Connect cables at J82, J83, and J70, left to right along the top edge of the card.
2. Align card to tapped holes in chassis and fasten with 12 M3 x 6 mm screws.
3. Reinstall disk drive units and blank covers into the locations from which they were removed.
4. Remove antistatic wrist strap from ground terminal.
5. Turn DC power input breaker on and the system power switch on.

SCSI Backplane (7317 Model D10)

Removal

1. Leave the 7317 Model D10 System power switch on.
2. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and unconfigure the disk drive units that are connected to the backplane you are removing.
3. Turn the appropriate power supply unit switch off.

   Note: The upper power supply unit powers the left five disk drive unit locations, and the lower power supply unit powers the right five locations.
4. Connect antistatic wrist strap to ground terminal.
5. Remove the five disk drive units and blank covers over the backplane to be removed, noting locations from which they were removed.
6. The backplanes are the two lower 2 backplanes. Remove all eight fastening screws of the backplane to be removed and support it in hand.
7. Disconnect the data cable at the J13 and the power cable at either J1 or J2 and remove the card.

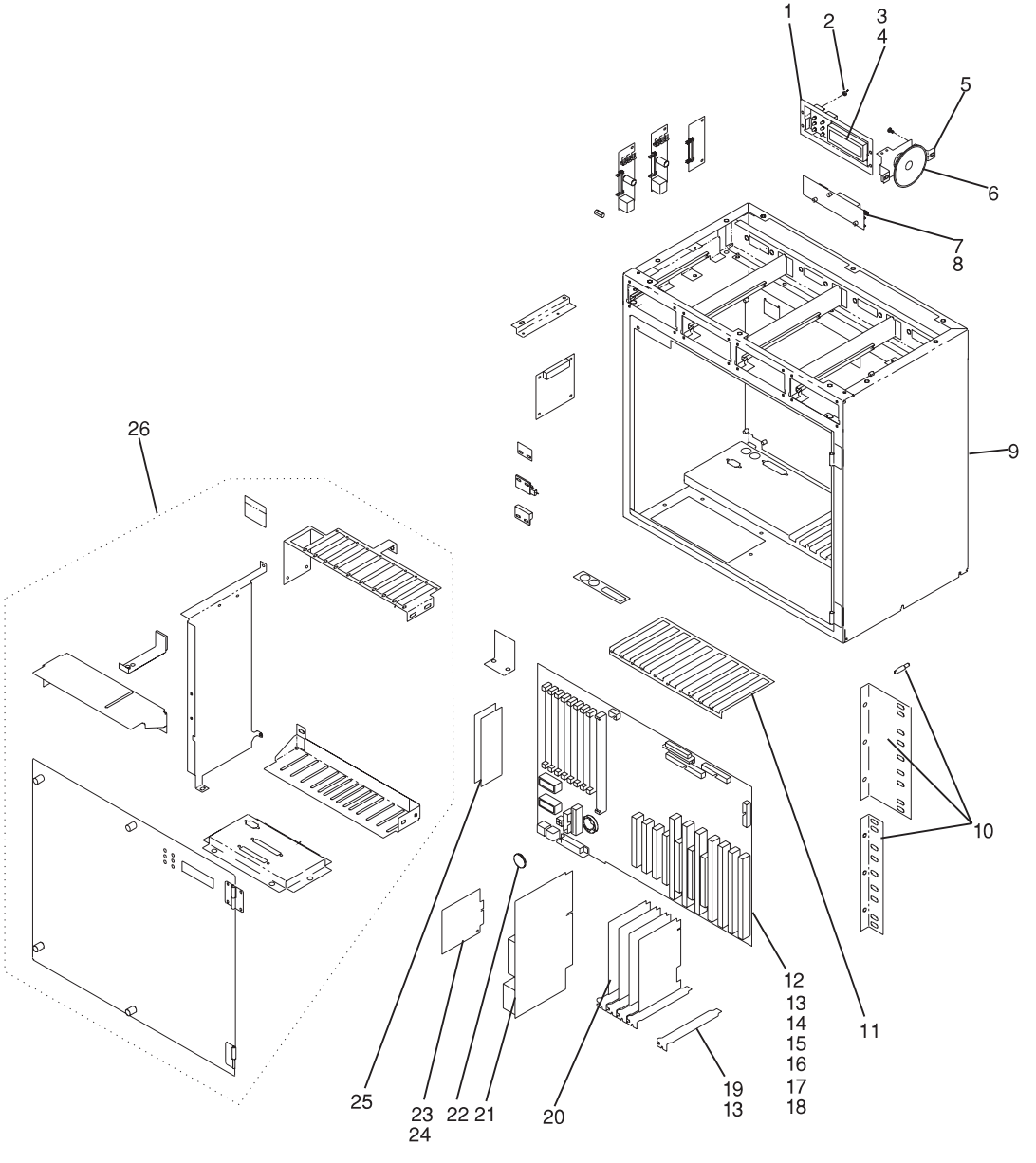

Power-In Backplane
SCSI Backplane

Replacement

1. Connect the data cable at J13 and the power cable at either J1 or J2 on the back of the replacement card.
2. Align the card on the tapped holes in the chassis and fasten with 8 M3 x 6 mm screws.
3. Reinstall the disk drive units and blank covers into the locations from which they were removed.
4. Remove the antistatic wrist strap from the ground terminal.
5. Turn appropriate power supply unit on.
6. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-3 and configure the disk drive units that are connected to the backplane you replaced.

Chapter 10. Parts Information

7317 Model F3L System Electronic Module Parts (1 of 3)

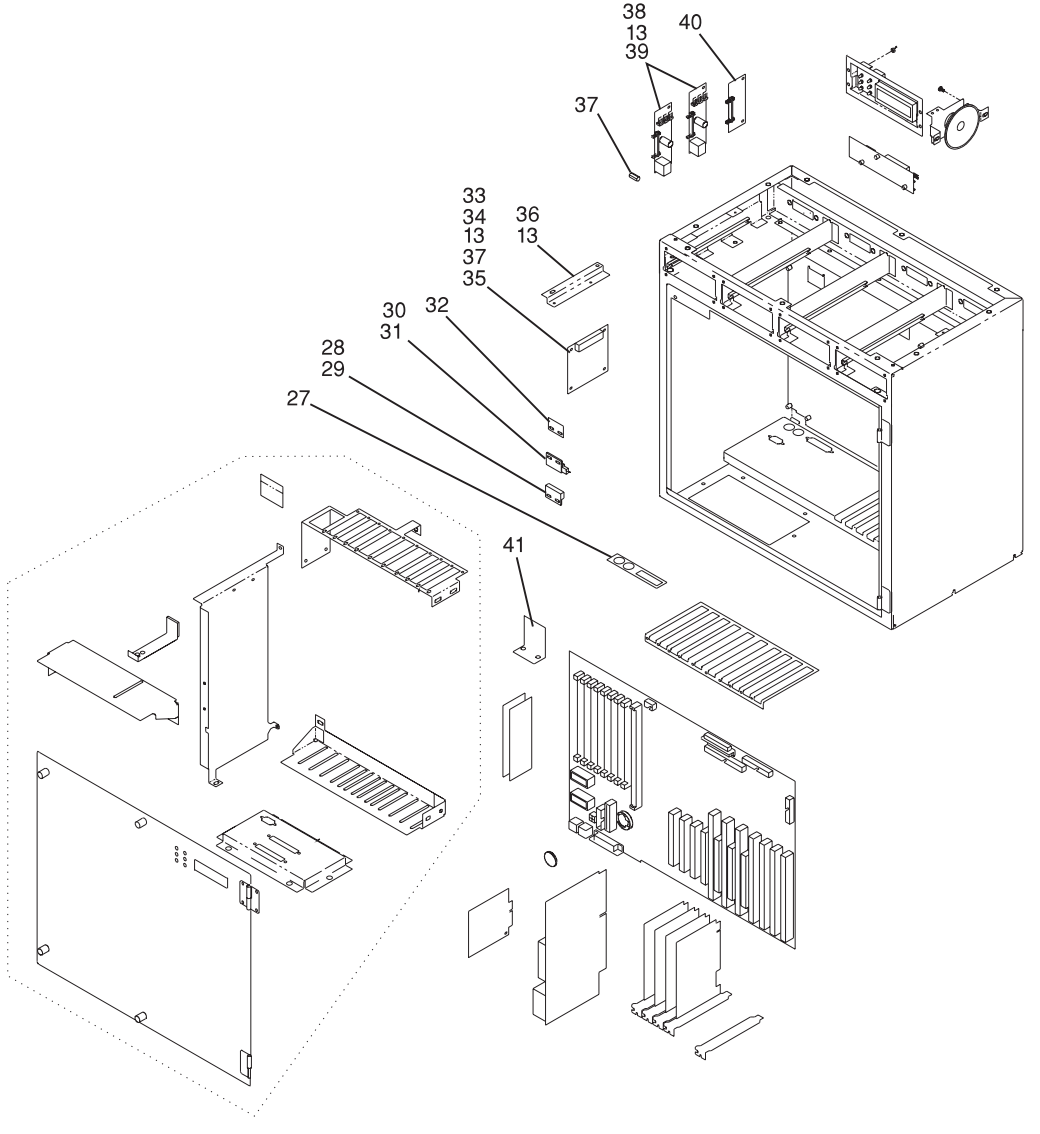


Index Number	Part Number	Units Per Assy	Description
1	93H7672	1	Operator panel bracket
2	1621176		Screw
3	06H7082	1	Operator LCD panel card
4	93H7679	1	Operator LCD panel cable
5	93H7673	1	Speaker mounting bracket
6	73H4997	1	Speaker
7	93H4152	1	LCD Driver Card (cable attached)
8	93H1960	1	Mounting standoff
9	See note[1]	1	Electronics chassis
10	11H3449	1	Rack mounting bracket kit
11	40H5408	1	EMC gasket
12	93H8371	1	System board
13	1621170		Screw
14	73H4865	1	Power cable
15	93H8972	1	SCSI cable, 16-bit
	88G3977	1	SCSI terminator 16-bit
15	06H6876	1	Ultra SCSI cable, adapter to backplane
16	82G4799	1	Serial port cable
17	62X0388		Jack screws
18	73H4937	1	Diskette drive cable
19	75H8319	1	Blank slot cover
20	See note*	Up to 10	Adapter card
21	73H3614	1	CPU card (133 Mhz)
	93H2431	1	CPU card (166 Mhz)
	93H3456	1	CPU card (233 Mhz)
22	33F8354	1	Battery
23	93H4215	1	Service processor card
24	73H4870	1	Power control cable
25	65G4615	Up to 8	8MB memory-module kit
	19H0288	Up to 8	16MB memory-module kit
	65G4617	Up to 8	32MB memory-module kit
	39H9837	Up to 8	64MB memory-module kit
	73H3451	Up to 8	128MB memory-module kit
26	See note[1]	1	Chassis hardware

*See *RS/6000 Diagnostic Information for Multiple Bus Systems* for part numbers.

[1]Not available for field replacement.

7317 Model F3L System Electronic Module Parts (2 of 3)

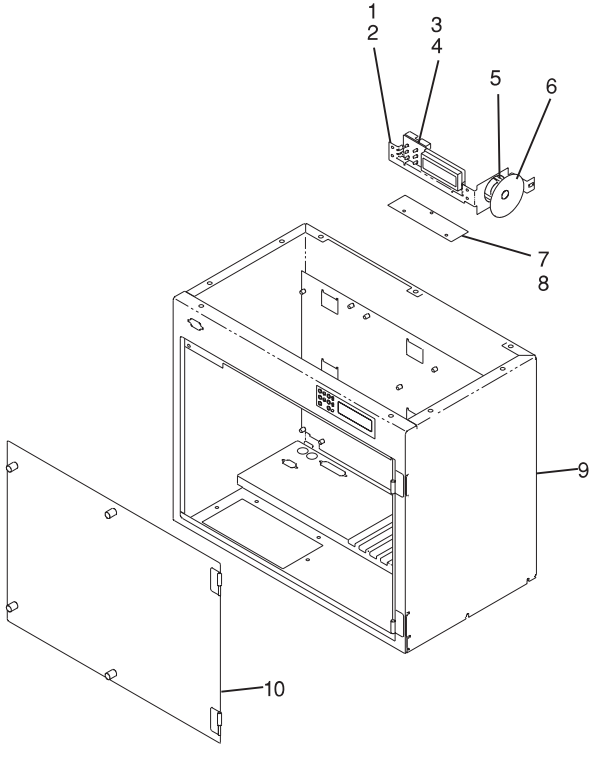


Index Number	Part Number	Units Per Assy	Description
27	40H5389	1	EMC gasket
28	93H2839	1	Cover interlock Switch Actuator
29	1622401		Nut
30	93H2840	1	Cover interlock switch
31	1622401		Nut
32	73H4899	1	Plate
33	93H2163	1	Voting Card
34	1622401		Nut
35	73H4867	1	Voting card cable
36	93H1960	1	Mounting standoff
37	93H2230	2	Fan control card
38	73H4945	2	Fan control cable
39	93H2231	1	Fan Monitor card
40	93H1831	1	Processor support bracket

*See *RS/6000 Diagnostic Information for Multiple Bus Systems* for part numbers.

[1]Not available for field replacement.

7317 Model F3L System Electronic Module Parts (3 of 3)

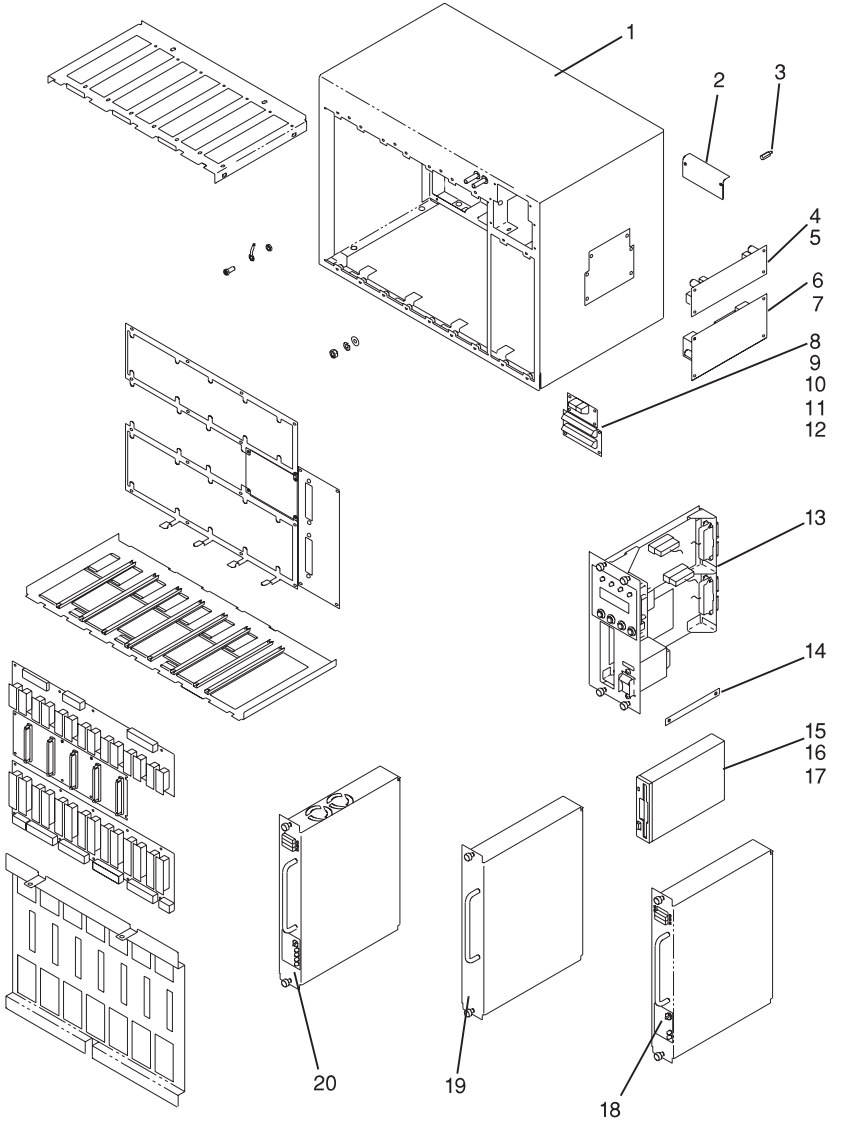


Index Number	Part Number	Units Per Assy	Description
1	73H4875	1	Operator panel bracket
2	1621176		Screw
3	06H7082	1	Operator LCD panel card
4	71G6290	1	Operator LCD panel cable
5	71G6353	1	Speaker mounting bracket
6	73H4997	1	Speaker
7	93H4152	1	LCD Driver Card (cable attached)
8	93H1960	1	Mounting standoff
9	See note[1]	1	Electronics chassis (early systems)
9	See note[1]	1	Electronics chassis door (early systems)

*See *RS/6000 Diagnostic Information for Multiple Bus Systems* for part numbers.

[1]Not available for field replacement.

7317 Model F3L Disk Drive Module Parts (1 of 2)

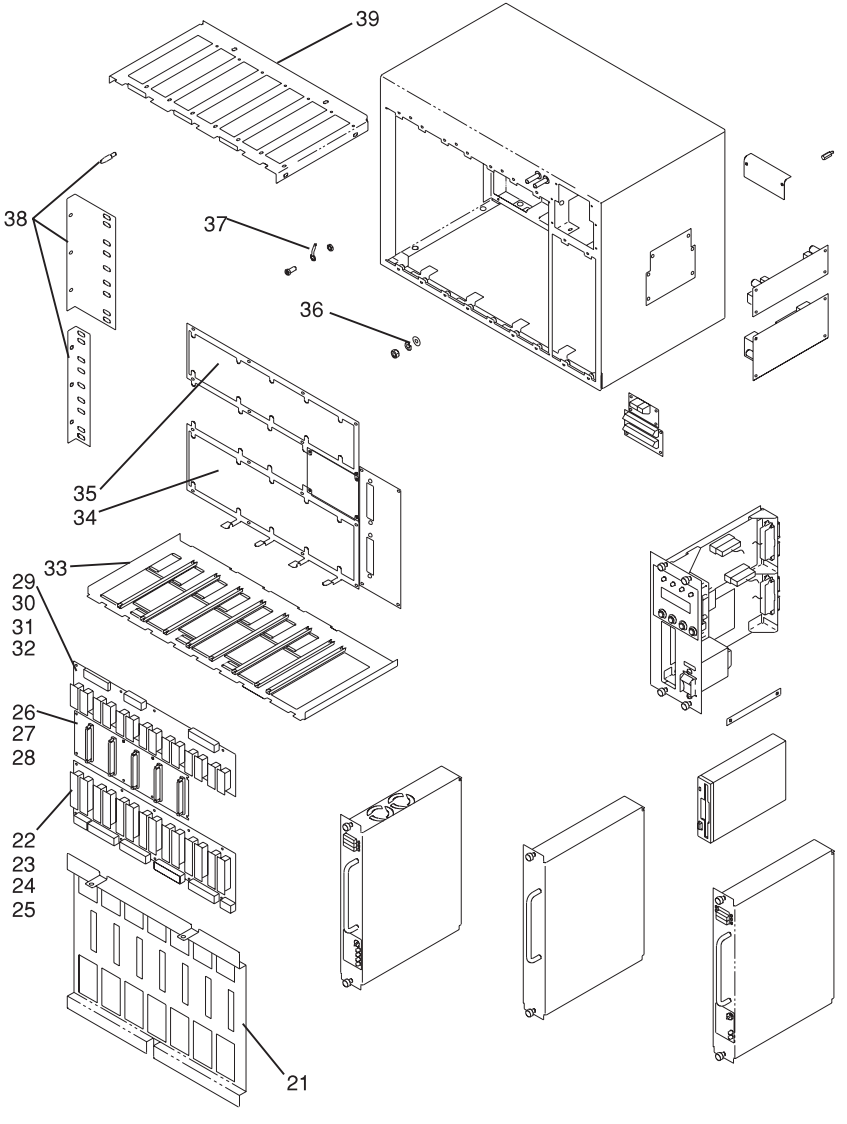


Index Number	Part Number	Units Per Assy	Description
1	See note[1]	1	Disk drive and power unit chassis
2	93H1832	1	Shield
3	93H1960	1	Mounting standoff
4	73H4991	1	Filter alarm card
5	1621170		Screw
6	93H2026	1	Filter power card
7	1621170		Screw
8	93H2140	1	Power connector
9	93H2139	1	Terminal block
10	73H4868	1	-48 V dc input cable
11	73H4869	1	Power block cable
12	1622401		Nut
13	93H3355	1	Alarm LCD display panel assembly
14	93H2459	1	Diskette shield
15	93F2361	1	Diskette drive
16	73H4937	1	Diskette drive cable
17	1621170		Screw
18	93H2232	Up to 3	Power supply unit
	93H3354	1	Fuse kit (7317 Model F3L fuses)
19	93H3356	Up to 4	Blank cover
20	93H9004	Up to 5	2.2GB disk drive unit
	93H9005	Up to 5	4.5GB disk drive unit
	93H3354	1	Fuse kit (7317 Model F3L fuses)

*See *RS/6000 Diagnostic Information for Multiple Bus Systems* for part numbers.

[1]Not available for field replacement.

7317 Model F3L Disk Drive Module Parts (2 of 2)

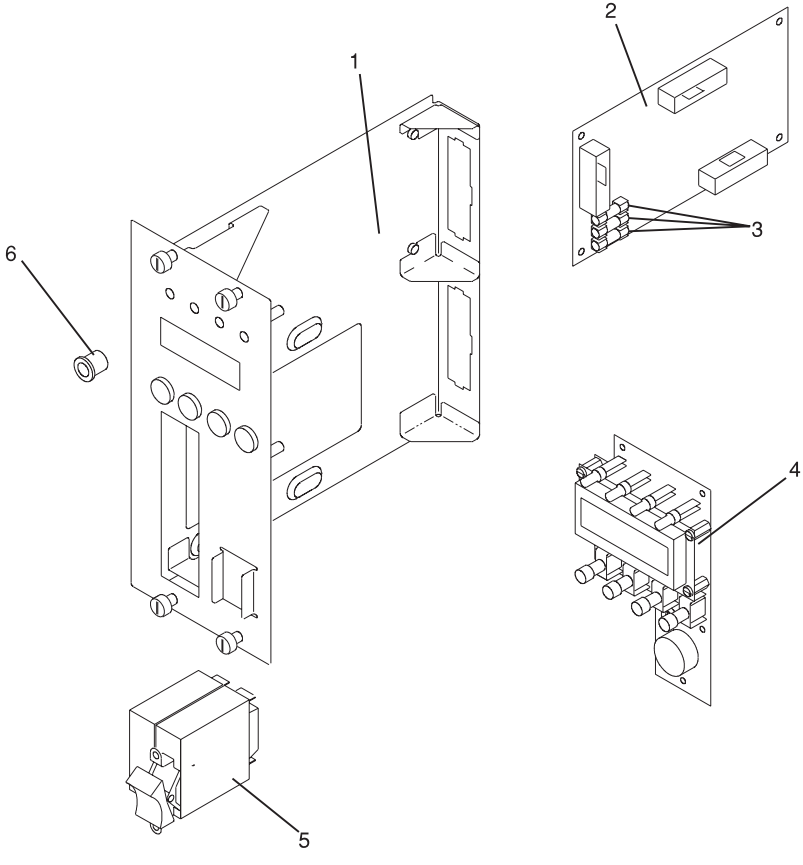


Index Number	Part Number	Units Per Assy	Description
21	93H1959	1	Backplane shield
22	93H2141	1	Power-out backplane
23	73H4865	1	I/O power cable
24	73H4867	1	Voting card cable
25	1621170		Screw
26	93H2025	1	SCSI backplane
27	93H8972	1	SCSI cable, 16-bit
27	93H8972	1	Ultra SCSI cable, adapter to backplane
28	1621170		Screw
29	93H2160	1	Power-in backplane
30	73H4870	1	Power control cable
31	73H4945	1	Fan control cable
32	1621170		Screw
33	See note[1]	1	Upper guide plate
34	See note[1]	1	Plate
35	See note[1]	1	Plate
36	See note[1]	1	Mounting hardware
37	See note[1]	1	Mounting hardware
38	11H3449	1	Rack mounting bracket kit
39	See note[1]	1	Upper guide plate

*See *RS/6000 Diagnostic Information for Multiple Bus Systems* for part numbers.

[1]Not available for field replacement.

7317 Model F3L Telco Alarm LCD Display Panel Parts

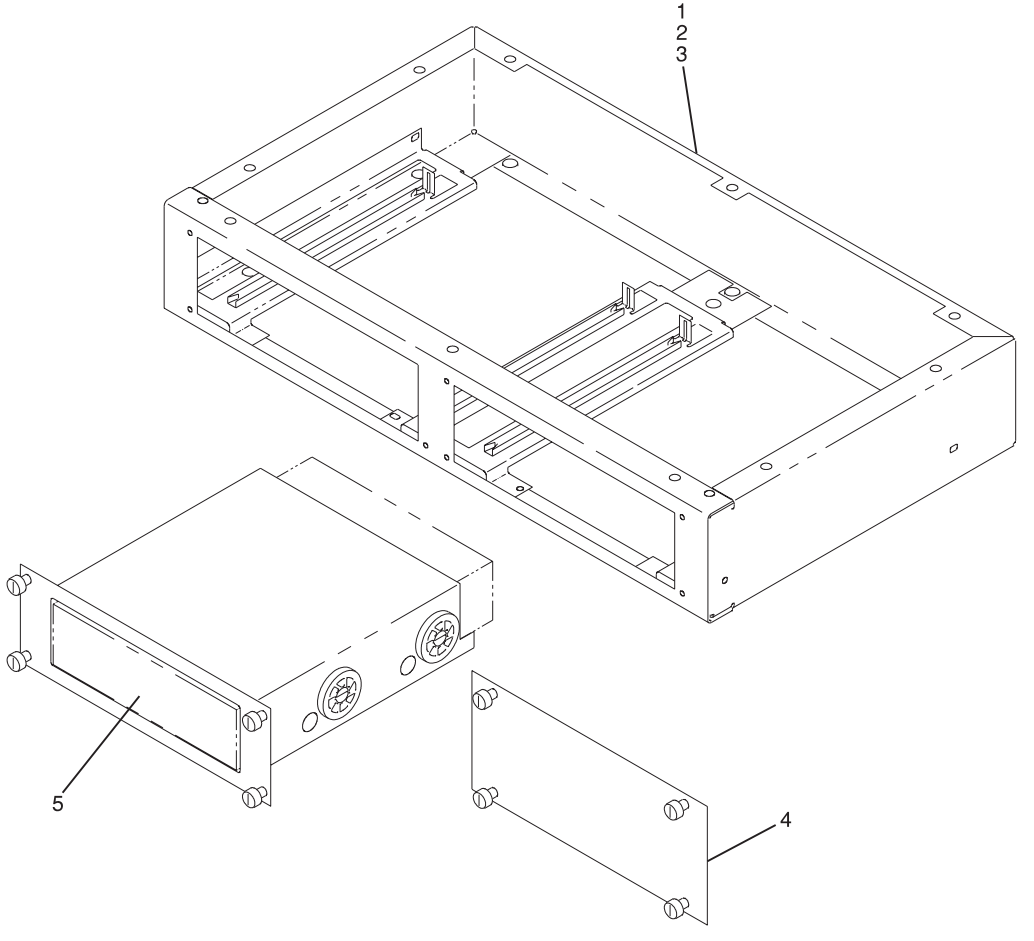


Index Number	Part Number	Units Per Assy	Description
1	See Note[1]	1	Alarm LCD panel frame
2	93H2162	1	I^2C MUX card
3	05L0138	3	Fuse, 3.15 Amp slowblow, 5 x 20 mm
4	93H2161	1	LCD Switch Card
5	11H3427	1	Power Switch
6	93H2860	1	Bushing for diskette drive mounting
	93F2361	1	Diskette drive

*See *RS/6000 Diagnostic Information for Multiple Bus Systems* for part numbers.

[1]Not available for field replacement.

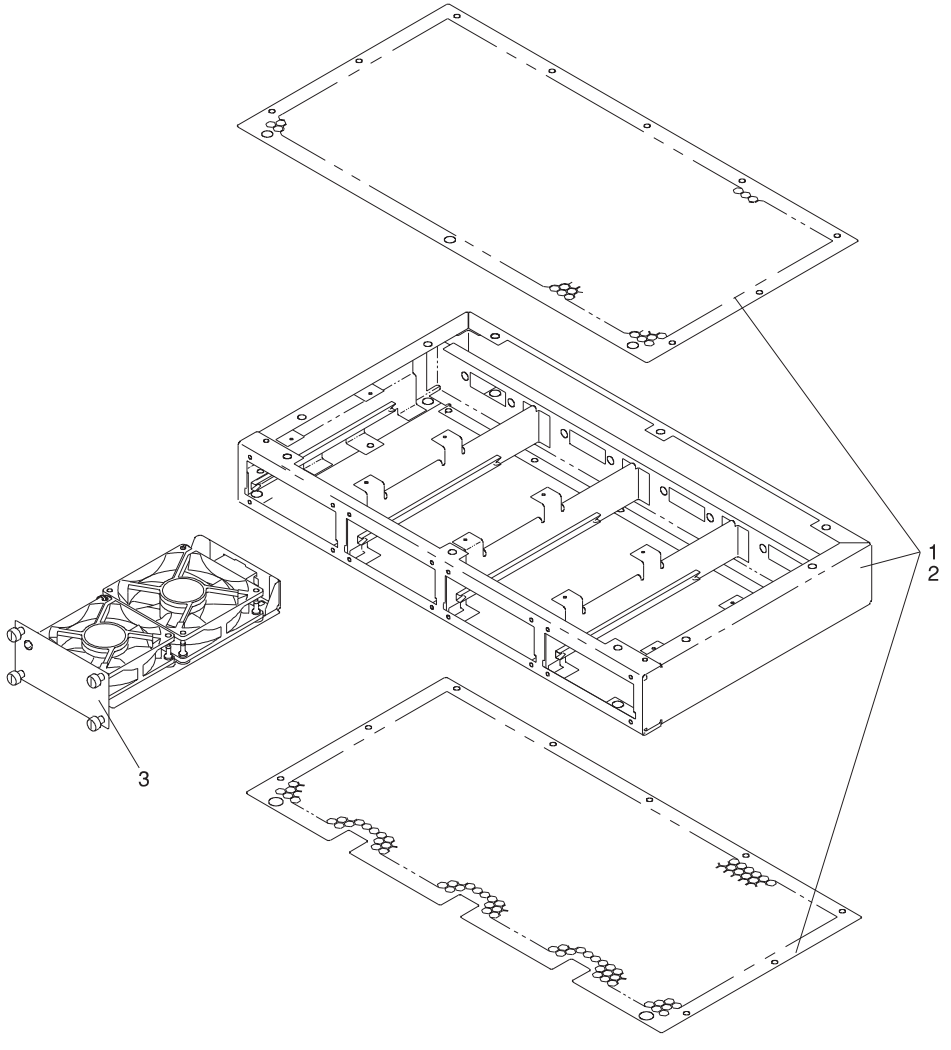
7317 Model F3L Media Module Parts



Index Number	Part Number	Units Per Assy	Description
1	See Note[1]	1	Media module chassis
2	73H4865	1	I/O power cable
3	93H8972	1	SCSI cable, 16-bit
4	See note[1]	1	Blank cover plate
5	See note[1]	1	Media carrier bracket assembly
	73H1513	1	4X CD-ROM drive
	73H2601	1	8X CD-ROM drive
	06H6890	1	Adapter, 50 to 60 pin
	21H5172	1	4MM tape drive
	59H3159	1	8MM tape drive

[1]Not available for field replacement.

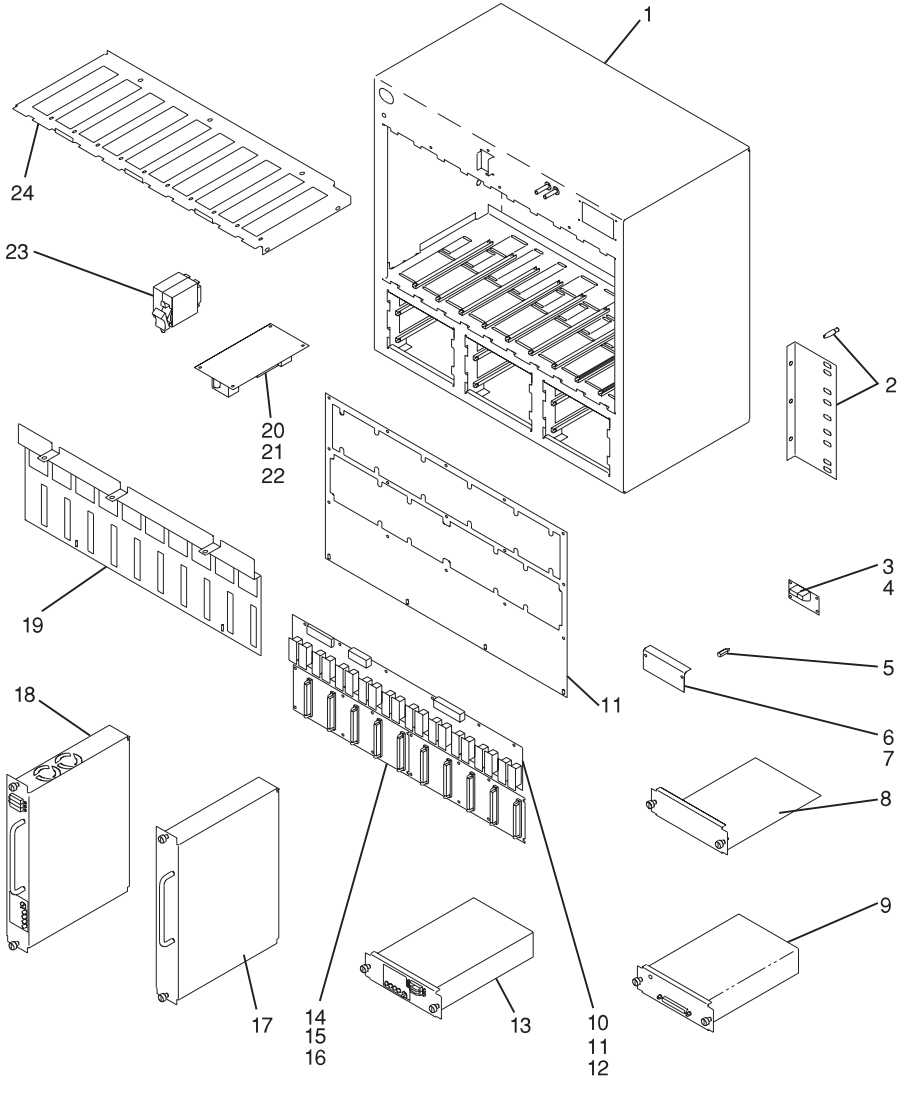
7317 Model F3L Fan Module Parts



Index Number	Part Number	Units Per Assy	Description
1	See note[1]	1	Fan module chassis
2	73H4945	1	Fan cable
3	93H3353	1	Fan tray assembly

[1]Not available for field replacement.

7317 Model D10 DASD Expansion Unit Parts



Index Number	Part Number	Units Per Assy	Description
1	See note[1]	1	Chassis assembly
2	73H4862	1	Mounting bracket kit
3	93H2140	1	Power block card
4	1622401		Nut
5	93H1960	1	Mounting standoff
6	93H1832	1	Shield
7	1621170		Screw
8	73H4973	1	Blank cover
9	93H3358	Up to 4	SCSI DE/SE converter
	93H9007	Up to 4	Ultra SCSI DE/SE converter
10	93H2138	1	Power-in backplane
11	1621170		Screw
12	73H4958	1	Power-in cable
	73H4964	1	Docking plate
13	93H3352	2	Power supply Unit
	93H3354	1	Fuse kit (7317 Model F3L fuses)
14	93H2025	2	SCSI Backplane
15	1621170		Screw
16	73H4959	2	SCSI cable, converter to backplane
	93H8011	2	Ultra SCSI cable, converter to backplane
17	93H3356	Up to 9	Blank slot cover
18	93H9004	Up to 10	2.2GB DASD Book
	93H9005	Up to 10	4.5GB DASD Book
	93H3354	1	Fuse kit (7317 Model F3L fuses)
19	93H1958	1	Backplane shield, SCSI
20	93H2026	1	Input-power filter card
21	1621170		Screw
22	73H4966	1	-48 V dc power cable
23	11H3427	1	Power switch
24	See note[1]	1	Guide bracket
	93H1572	1	SCSI Cable 1.5M left (7317 Model F3L to 7317 Model D10)
	93H1573	1	SCSI Cable 1.5M right (7317 Model F3L to 7317 Model D10)
	93H1574	1	SCSI Cable 3.0M left (7317 Model F3L to 7317 Model D10)
	93H1575	1	SCSI Cable 3.0M right (7317 Model F3L to 7317 Model D10)

[1]Not available for field replacement.

Index Number	Part Number	Units Per Assy	Description
1	82G3278	1	Keyboard, United States English
	1391402	1	Keyboard, French
	1393395	1	Keyboard, Italian
	1391403	1	Keyboard, German/Austrian
	1391406	1	Keyboard, United Kingdom English
	1391405	1	Keyboard, Spanish
	79F0167	1	Keyboard, Japanese
	64F7707	1	Keyboard, Brazilian Portuguese
	82G3279	1	Keyboard, Canadian French
	1391526	1	Keyboard, Belgian French/Dutch
	1391411	1	Keyboard, Finnish
	1391407	1	Keyboard, Danish
	1399583	1	Keyboard, Bulgarian
	1395881	1	Keyboard, Swiss French
	1385882	2	Keyboard, Swiss German
	1391409	1	Keyboard, Norwegian
	1391511	1	Keyboard, Dutch
	1391410	1	Keyboard, Portuguese
	1399046	1	Keyboard, Greek
	1391408	1	Keyboard, Hebrew
	1399581	1	Keyboard, Hungarian
	1391407	1	Keyboard, Icelanic
	1399580	1	Keyboard, Polish
	1399582	1	Keyboard, Romanian
	1399571	1	Keyboard, Slovakian
	1399570	1	Keyboard, Czechoslovakian
	1393286	1	Keyboard, Turkish (ID 179)
	8125409	1	Keyboard, Turkish (ID 440)
	8131596	1	Keyboard, Arabic
	06H5286	1	Keyboard, Korean
	1393990	1	Keyboard, Chinese
	006H3048	1	Keyboard, United States (OEM)
2	11H4878	1	Mouse, 3-button

Appendix A. Firmware Checkpoint Three-Digit Codes

These three digit codes will appear to the left of the top row on the Liquid Crystal Display(LCD) which is located on the front panel of the system. The intended use of the three digit codes is to assure the observer that the Firmware is operational after power on, and before information appears on the console display; there is no other diagnostic intent implied by the values of the three digit codes. If an Fxx code requires any action, it will be listed in Chapter 4, “Error Code to FRU Index” on page 4-1.

Checkpoint (hex)	Description
A01	Setting up default SP values
A02	SP configuring NVRAM parameters
A04	SP detected environmental failure; attempting Call-out
A05	SP disconnecting modem
A07	SP configuring modem
A08	SP detected system firmware surveillance failure; attempting Call-out
A09	SP detected operating system surveillance failure; attempting Call-out
F00	Manufacturing - Reserved for Parallel port download protocol
F01	Clear the EPOW register
F02	Determine system bus speed, set ISA divisor
F04	Set memory refresh
F06	Jump to set environment or check flash
F08	Run recovery block base memory, test 2k, then set stack
F09	Copy CRC verification code to RAM
F0A	Turn on cache
F0B	Flush cache
F0C	Jump to CRC verification code in RAM
F0D	Compute composite image CRC
F0E	Jump back to ROM
F0F	Turn off cache
F10	Check if composite image CRC is valid
F11	GOOD CRC - jump to composite image
F12	BAD CRC - initialize base memory, stack
F13	BAD CRC - copy uncompressed recovery block code to RAM
F14	BAD CRC - jump to code in RAM
F15	BAD CRC - turn on cache
F16	BAD CRC - copy recovery block data section to RAM
F17	BAD CRC - Invalidate and flush cache, set TOC
F18	BAD CRC - branch to high level recovery control routine
F19	Initialize base memory, stack
F1A	Copy uncompressed recovery block code to RAM
F1B	Jump to code in RAM
F1C	Turn on cache
F1D	Copy recovery block data section to RAM
F1E	Invalidate and flush cache, set TOC
F1F	Branch to high level control routine
F20	Initialize System I/O
F21	Run a console diagnostic routine

Checkpoint (hex)	Description
F22	No memory found
F23	No DIMM found in the socket
F24	Remove bad DIMM found from DIMM information
F25	Unsupported DIMM detected
F26	Check valid image - start
F27	Check valid image - successful
F28	Wait for interrupt
F29	Transfers information to the business audio chip
F2B	Wait till sound chip has been initialized
F2C	Initialize the current input/pointer device
F2D	Initialize the current output
F2E	Register a console driver
F30	Set up early memory allocation heap, Initialize Super I/O
F31	Determine system bus speed, set ISA divisor
F32	Resync to SP (Composite Image)
F33	Set memory refresh
F35	Jump to set environment
F40	Initialize interrupt subsystem and 8259s
F41	SP command setup
F42	SP Mailbox interface
F43	get_vpd entry
F44	init_sp entry
F45	sp_recovery -> resync SP & CPU
F46	IRQ13 stuck high
F47	Entry to error checking routine
F48	Power Supply or System Board problem
F49	Voltage problem. System Board, Power Supply or CPU
F4A	Voltage problem. System Board or Power Supply
F4B	CPU over temperature or bad System Board
F4C	Start bit-map display function
F4D	Bit-map file read into memory, start processing
F4E	End bit-map display function
F4F	IO/MEM over temperature or bad System Board
F50	Initialize CMOS RTC periodic interrupt
F51	System Board or System over temperature
F52	Bad System Board (Fan Fail reported)
F53	Bad System Board
F54	Fan fail warning
F55	Bad System Board (Unsupported EPOW)
F56	Voltage problem. System Board, Power Supply or CPU
F57	Bad or low battery
F58	IRQ13 test failure
F59	EPOW test failure
F5A	Spurious IRQ 7 interrupt (ie: interrupt glitch)
F5B	Fan failure warning
F5C	Clear EPOW register failure
F5D	Clear EPOW register failure
F60	Initialize keyboard/mouse controller, and password
F61	Extended memory initialization command
F62	Diskette initialization command
F64	Test of day routine

Checkpoint (hex)	Description
F6A	SCSI Initialization command
F70	Initialize debugger
F71	Start Checking whether CMOS contents are valid
F72	End Checking whether CMOS contents are valid
F73	Dumps contents of CMOS data area to a file
F74	CMOS Initialization
F75	Loads contents of CMOS from file
F77	Resync to SP (Recovery Image)
F79	Dumps contents of NVRAM data area to a file
F7A	NVRAM Initialization
F7B	Check NVRAM validity CRC
F7C	Loads contents of CMOS from file
F80	Initialize system call table
F82	Register a manager for use by the system
F88	Halt. System locked by error condition -- power off.
F90	Initialize VDISK file system
F91	Low-level initialize VDISK file systems
F94	Start SCSI initialization
F96	SCSI bus scan start
F97	SCSI polling interrupt
F98	SCSI device detected
F9F	Exit SCSI initialization
FA0	Start resident monitor, run V:autoexec.6md - initializes various subsystems - video, keyboard/mouse, extended memory, diskette, SCSI, etc.
FA1	Enter resident monitor
FA2	Resident monitor process
FA3	Resident monitor process
FA4	Exit resident monitor
FA5	ASCII terminal initialization
FA6	ASCII terminal initialization exit
FA9	p9 driver initialization
FAA	p9 driver exit
FAB	Keyboard driver initialization
FAC	Keyboard driver exit
FAD	Mouse driver initialization
FAE	Mouse driver exit
FB0	Initialize rest of file system
FB1	Diskette initialization
FB2	Diskette drive type determination
FB3	Diskette initialization complete
FC0	Check if flash ROM OK
FCA	Build boot table - Networks
FCB	Build boot table - DASD
FCC	Build boot table - CD ROM
FCD	Build boot table - diskettes
FCE	No Operating System boot, exit normal boot sequence
FD0	Start of boot sequence
FD2	No Operating System boot - ensure CMOS RTC periodic clock updates displayed
FD4	Initialize console for loading diagnostics
FD8	Exit from diagnostic - run resident monitor
FDA	IRQ 15

Checkpoint (hex)	Description
FDB	Unexpected processor exception
FDC	Unexpected external interrupt exception
FDD	Early processor exception
FDE	Shutdown entire file system
FE1	Test Timeout
FE2	Initialize System I/O
FE4	Initialize Super I/O with default values
FE6	Set up early memory allocation heap
FE8	Initialize primary diskette drive in polled mode
FEA	Try to load in recovery image from diskette
FEB	Verify recovery image is valid
FEC	Get recovery image entry point
FED	Invalidate instruction cache
FEE	Jump to composite image
FF0	Manufacturing - Check for Parallel Port hook
FF4	Manufacturing - Start flag not received
FF5	Manufacturing - Invalid Start flag received
FF6	Manufacturing - Receive character timeout
FF7	Manufacturing - CRC value mismatch
FFA	Error during flash update
FFC	Operating System boot - No errors reported by IPL ROS
FFD	Operating System boot - Non-critical errors reported by IPL ROS
FFE	No boot - Critical error(s) reported by IPL ROS or “F1” key pressed

Appendix B. Terminal Block Definitions

TERMINAL BLOCK 1 (TB1)	
TB1-1	-48 Volts Feed B
TB1-2	RETURN FEED B
TB1-3	GROUND
TB1-4	RETURN FEED A
TB1-5	-48 Volts FEED A

TERMINAL BLOCK 2 (TB2)	
TB2-1	Normally Open Minor Alarm Relay
TB2-2	Common Minor Alarm Relay
TB2-3	Normally Closed Minor Alarm Relay
TB2-4	Normally Open Major Alarm Relay
TB2-5	Common Major Alarm Relay
TB2-6	Normally Closed Major Alarm Relay
TB2-7	Normally Opened Critical Alarm Relay
TB2-8	Common Critical Alarm Relay
TB2-9	Normally Closed Critical Alarm Relay
TB2-10	Not assigned at this time
TB2-11	Not Used Make No Connection
TB2-12	Not Used Make No Connection

TERMINAL BLOCK 3 (TB3)	
TB3-1	Common Audible Alarm
TB3-2	Norm.Open/Norm.Closed Audible Alarm
TB3-3	Common ESP Pwr. Loss
TB3-4	Norm.Open/Norm.Closed ESP Pwr. Loss
TB3-5	Common Auxiliary Relay
TB3-6	Norm.Open/Norm.Closed Auxiliary Relay
TB3-7	Common Power Loss Audible Alarm
TB3-8	N.O./N.C. Power Loss Audible Alarm
TB3-9	Not assigned at this time
TB3-10	Not assigned at this time
TB3-11	Not Used Make No Connection
TB3-12	Not Used Make No Connection

7317 Terminal Block Definitions

Notes:

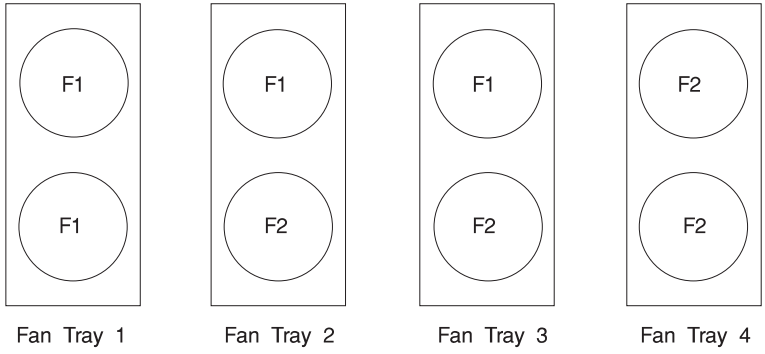
1. All Relay contacts rated for 60 watts Max. switching. This would be 1 Amp at 60 Volts or 2 Amps at 30 Volts DC. Maximum switching DC current is 2 Amps, maximum switching voltage is 220 VDC.
2. ESP Power Loss (TB3-3 & 4) are a set of relay contacts that are energized by the existence of 5 volts to the ESP processor. Should this 5 volts go away this will cause the relay to open providing another alarm indication that may be used by the customer.
3. Relay contacts that are specified as either Normally Open or Normally Closed are selected by jumpers internal to the system. These jumpers are easily changed with the system powered off. Details of this procedure will be documented in the Supplemental Service Manual.
4. Power Loss Audible Alarm (TB3-7 & 8) are a set of relay contacts that are energized by the existence of 5 volts to the ESP processor. Should this 5 volts go away, this will cause the relay to open providing another set of contacts to create an audible alarm in the Central Office. These contacts will actuate at the same time as those identified in Note 2 above.

Power Feeds

TB1 - FEED A and FEED B - 14 gauge standard wire 15 Amp Service, wired in accordance with accepted TELCO specifications.

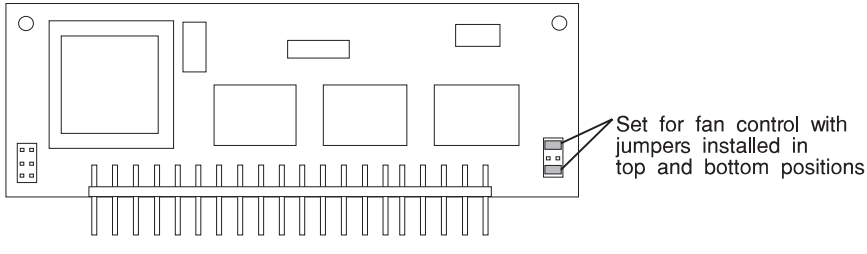
Note: This is the maximum service that can be provided to the power inputs of the 7317 Model F3L.

Appendix C. Fan Control Logic



The two fan control cards are located in the system unit module along with a single monitor card. Both F1 and F2 control cards provide fan signals to the monitor card. The control cards provide signals for four fans each, for a total of eight fans in the system. The monitor card is capable of monitoring eight fans.

The following figure shows a fan control card. The jumpers shown are set for fan control operation.



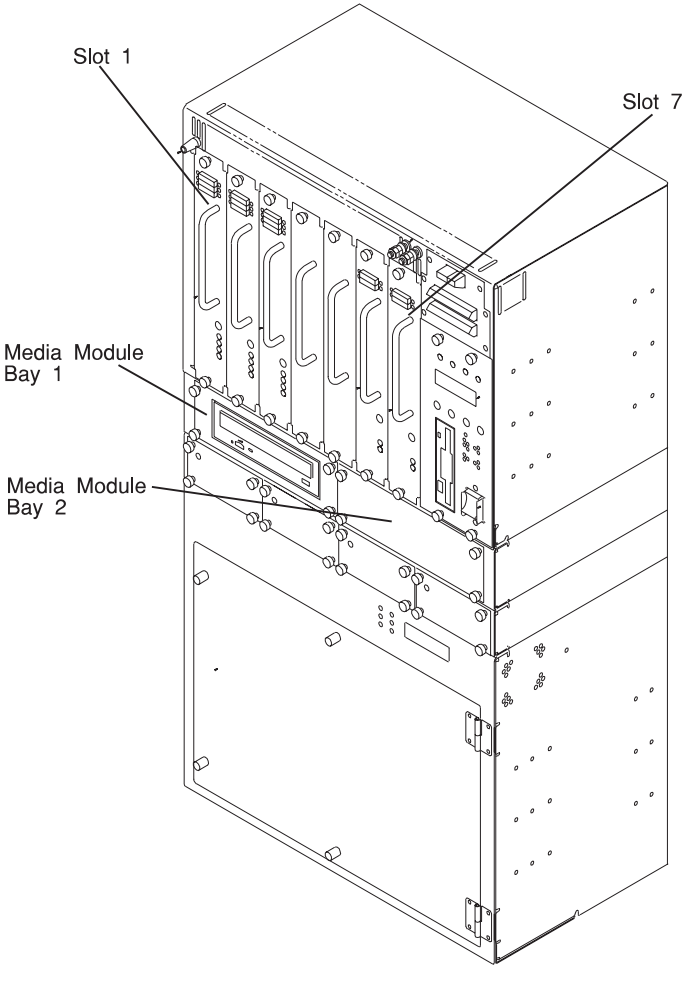
Appendix D. Server Records

Use the tables in this section to keep a record of the devices installed in or attached to the system. This information can be helpful when you install additional devices in the system or perform service.

Location	Option Description
Memory (J26)	16MB □ 32MB □ 64MB □ 128MB □
Memory (J28)	16MB □ 32MB □ 64MB □ 128MB □
Memory (J29)	16MB □ 32MB □ 64MB □ 128MB □
Memory (J31)	16MB □ 32MB □ 64MB □ 128MB □
Memory (J35)	16MB □ 32MB □ 64MB □ 128MB □
Memory (J38)	16MB □ 32MB □ 64MB □ 128MB □
Memory (J39)	16MB □ 32MB □ 64MB □ 128MB □
Memory (J44)	16MB □ 32MB □ 64MB □ 128MB □
Mouse Connector	IBM Mouse □ Other:_____
Keyboard Connector	Space Saving □ Enhanced □ Other:_____
Expansion Slot 10	
Expansion Slot 9	
Expansion Slot 8	
Expansion Slot 7	
Expansion Slot 6	
Expansion Slot 5	
Expansion Slot 4	
Expansion Slot 3	
Expansion Slot 2	
Expansion Slot 1	
Parallel Port	
Serial Port 1	
Serial Port 2	

Device Records

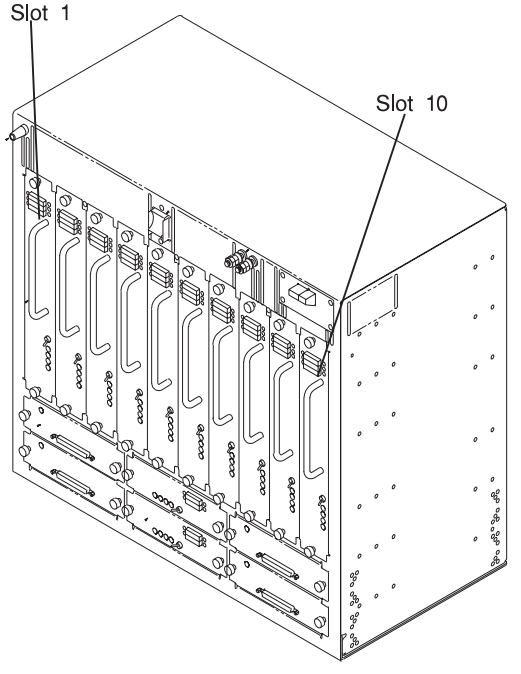
Refer to the following diagram of the system's slots when completing the table on the following page.



Installed Disk Drive and Power Supply Units - 7317 Model F3L

Location	SCSI ID	Drive Description
Slot 1	0/8	_____
Slot 2	1/9	_____
Slot 3	2/10	_____
Slot 4	3/11	_____
Slot 5	4/12	____MB Disk Drive Unit □ Power Supply Unit □
Slot 6	N/A	Power Supply Unit
Slot 7	N/A	_____
Media Module Bay 1	_____	_____
Media Module Bay 2	_____	_____

Refer to the following diagram of the 7317 Model D10 expansion unit's slots when completing the table below.



Installed Disk Drive and Power Supply Units - 7317 Model D10

Location	SCSI ID	Drive Description
Slot 1 (Bus 1)	0/8	
Slot 2 (Bus 1)	1/9	
Slot 3 (Bus 1)	2/10	
Slot 4 (Bus 1)	3/11	
Slot 5 (Bus 1)	4/12	
Slot 6 (Bus 2)	0/8	
Slot 7 (Bus 2)	1/9	
Slot 8 (Bus 2)	2/10	
Slot 9 (Bus 2)	3/11	
Slot 10 (Bus 2)	4/12	

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