

RS/6000 7317 Models F3L and D10



User's Guide

Second Edition (July 1997)

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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 Règlement 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 workstation.

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.

CLASS 1 LASER PRODUCT LASER KLASSE 1 LUOKAN 1 LASERLAITE APPAREIL À LASER DE CLASSE 1 IEC 825:1984 CENELEC EN 60 825:1991

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.

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.

About This Book

This book provides information on how to use the system, use diagnostics, use service aids, and verify system operation. This book also provides information to help you solve some of the simpler problems that might occur.

ISO 9000

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

Related Publications

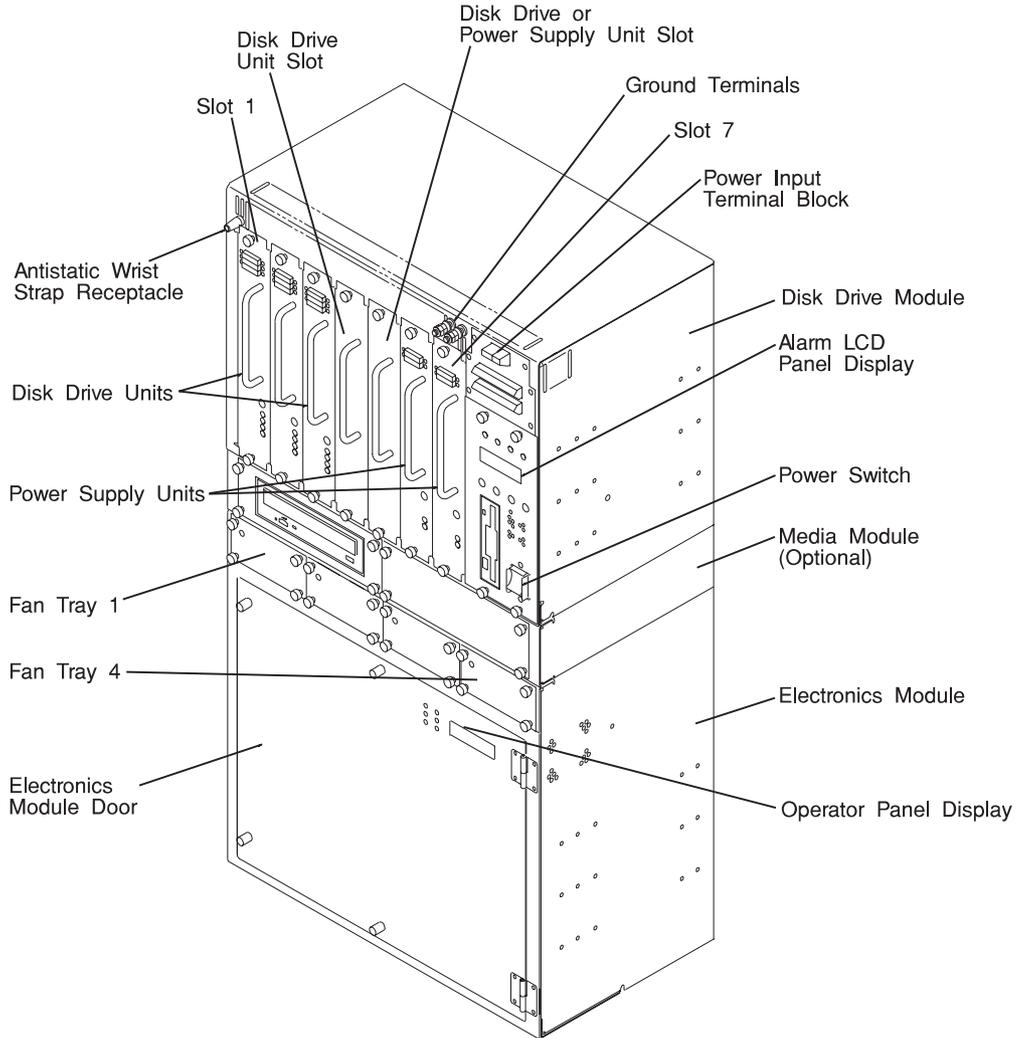
The following publications are available:

- The *RS/6000 7317 Models F3L and D10 Installation and Service Guide* contains reference information, maintenance analysis procedures (MAPs), error codes, removal and replacement procedures, and a parts catalog.
- The *RS/6000 Diagnostic Information for Multiple Bus Systems* contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems* contains information about adapters, devices, and cables for your system. This manual is intended to supplement the service information found in the *RS/6000 Diagnostic Information for Multiple Bus Systems*.
- The *Site and Hardware Planning Information* contains information to help plan for installation of the system hardware.

Chapter 1. System Unit Enclosure Description

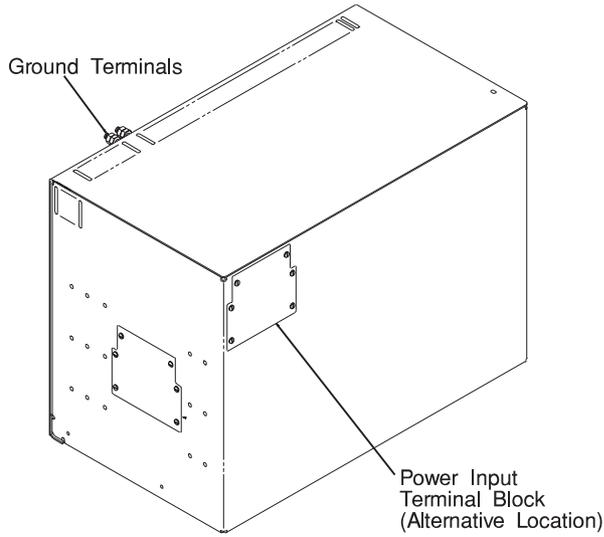
7317 Model F3L System Unit Locations

System Unit with Optional Media Module (Front View)

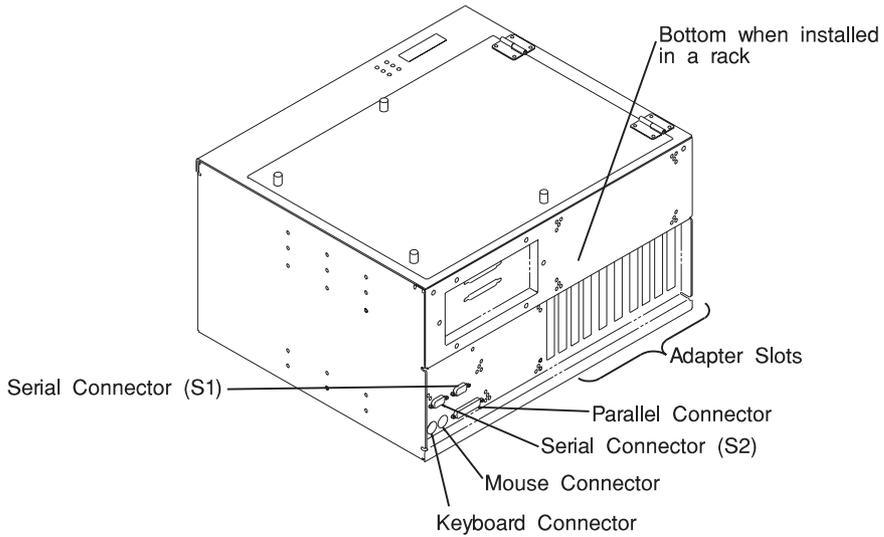


Note: The operator panel display shown above, may be mounted above the electronics module door of your system. See page A-4 for this view of the system.

System Electronics Unit (Rear View)

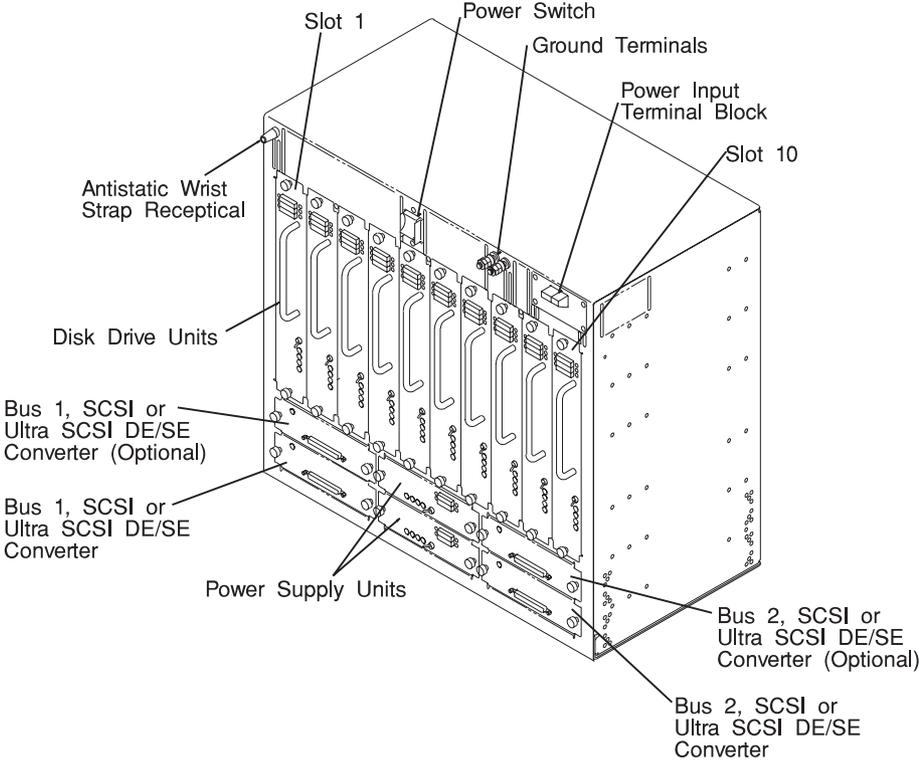


System Electronics Unit (Bottom View)



7317 Model D10 DASD Expansion Unit Locations

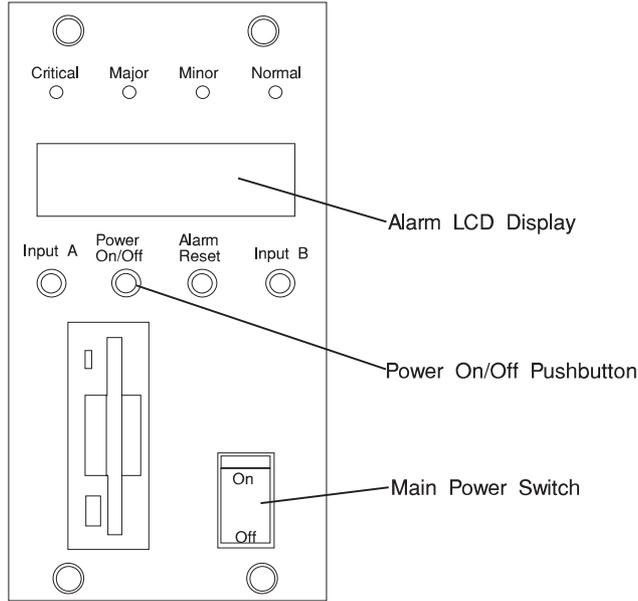
DASD Expansion Unit (Front View)



Chapter 2. Using the System Unit

Starting the System Unit

1. Set the power switches of the attached devices to On.
2. Set the main power switch to the "ON" position.



3. When you see the Power Enabled LED start blinking slowly, start the system unit by pressing the Power On/Off pushbutton.

When you press the Power On/Off pushbutton, the power good LED comes on and the system starts a POST (power-on self test).

During POST, progress codes display in the operator panel display.

4. If power does not come on when you press the power On/Off pushbutton go to Chapter 11, "Hardware Problem Determination" on page 11-1.

Stopping the System Unit

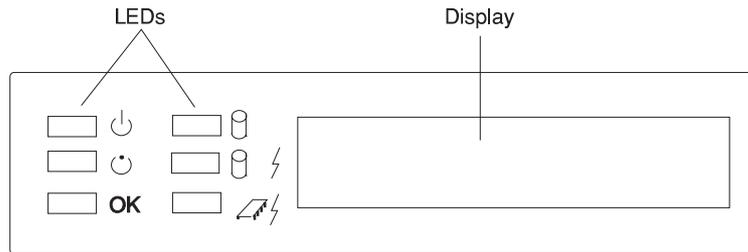
Attention: When using the shutdown procedure for your system, enter the correct command before you stop the system unit. Failure to do so may result in the loss of data. If you need information on the shutdown procedure for your operating system, see your operating system information.

1. Before stopping the system unit, you must first perform a shutdown procedure of the operating system to prevent the loss of data.
2. After you shut down the operating system, set the power switches of the attached devices to Off.
3. Stop the system unit by pressing the Power On/Off pushbutton.

Reading the Operator Panel Display

The operator panel display is used to:

- Track the progress of the system unit self tests and configuration program.
- Display codes when the operating system comes to an abnormal end.
- Display system messages.



☰ = Power Good

☱ = Power Enabled

OK = Subsystems Good

☼ = Disk Drive Activity

☼ ⚡ = Disk Drive Error

☼ ⚡ = Processor Error

During power-on self-test (POST), 3 characters display indicating the progress of the testing. If an error is detected that requires attention, the system unit halts and an 8 digit number displays in the operator panel display to identify the error.

Operator Panel LEDs

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
	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 main power switch, 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 and the main power switch is set to the "On" position, the power enabled LED begins 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 pushbutton, the power enabled LED lights steadily.

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

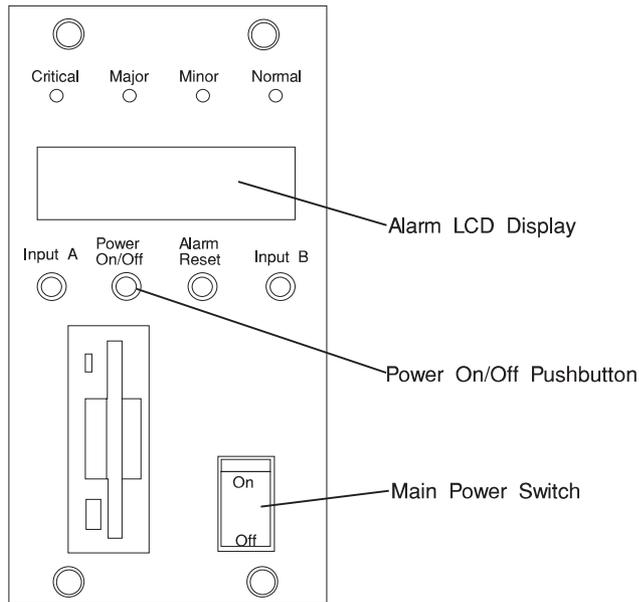
- To enable this function, the **sysdumpdev -K** command must be executed before an error condition exists.
- To request a memory dump, press and hold the power on/off pushbutton for longer than two seconds. Requesting a memory dump directs the operating system to save system information to a predefined 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 blinks quickly (about 10 flashes per second) to indicate that the dump has been started. This blinking ceases after about a minute whether or not the dump is complete, and the LED returns 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 lights and the system stops, and the diskette activity LED begins 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 4, “System Management Services” on page 4-1.

TELCO Alarm LCD Display Panel

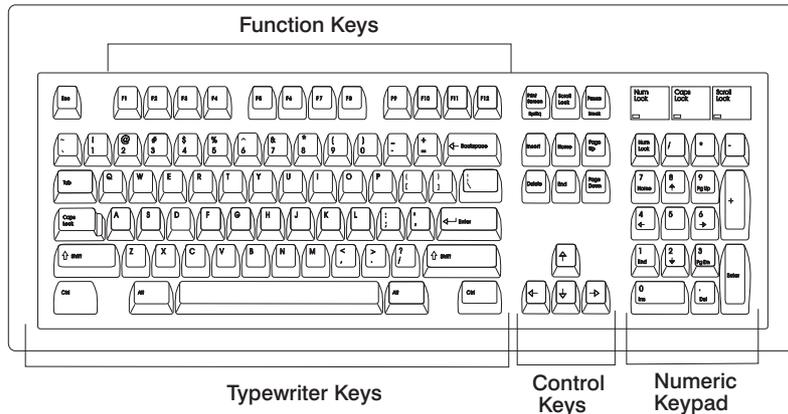


TELCO LCD Display Panel		
Function	Status	Definition
Normal LED	On	System is operating normally
	Off	An error has been detected
Minor LED	On	Minor error detected
	Off	No minor error detected
Major LED	On	Major error detected
	Off	Major error not detected
Critical LED	On	Critical error detected
	Off	Critical 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

Using the Keyboards

There are several keyboards available for the system unit. The keyboards have various keys that enter data and control the cursor location. The keyboards can be engraved for the languages of different countries.

The functions of each keyboard depend on the software used. The character sets for the keyboards are contained and explained in the information for your operating system.

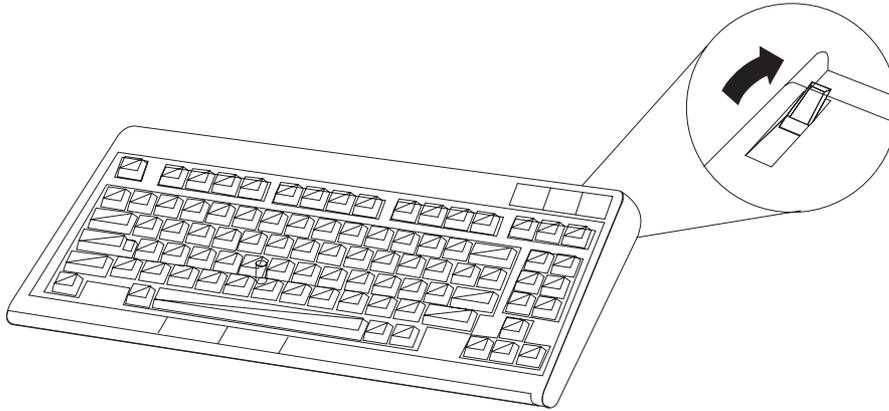


The keyboard is divided into four sections:

- Function keys are multipurpose keys and their function is controlled by the operating system.
- Typewriter keys are similar to a standard typewriter. Their function is controlled by the software.
- Control keys move the cursor on the screen and do programmed control functions. The movement and functions depend upon the application used.
- Numeric keypad is arranged like a calculator to help when typing numbers.

On all of the keyboards, you can adjust the tilt position for typing comfort. To tilt the keyboard, pull out on the keyboard legs. The legs snap into position. To decrease the tilt of the keyboard, rotate the keyboard legs until they snap into the bottom of the keyboard case.

The keyboard cable plugs into the keyboard connector at the rear of the system unit.

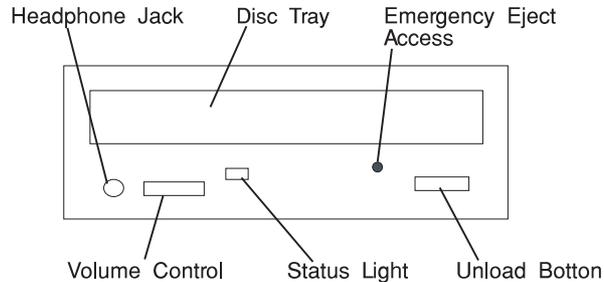


Using the CD-ROM Drive

CAUTION:

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

The optional CD-ROM is located in the media module of the 7317 Model F3L. Your CD-ROM drive looks like the one shown in the illustration, and the controls are located as indicated.



When the CD-ROM is set to On, the status light indicates one of several conditions. The following are status light states and the respective conditions of the CD-ROM drive:

- Off during standby with the tray loaded or unloaded.
- Blinks from insertion of the tray to completion of initialization.
- Blinks slowly when either the lens or disc is dusty (lens should be cleaned by running the cleaning disc).
- Blinks fast when in the audio mode.
- Lights during data transfer operations.
- Lights steady when:
 - No disc is in the tray.
 - The disc is in the tray upside down.
 - Some condition exists that should be checked. If this occurs, contact your service representative.

Loading the CD-ROM Drive

Press the unload button to open the tray. Place the disc, with the printed side away from the tray, into the tray. If the CD-ROM drive is in the vertical position, slip out the tabs to hold the disc in place. Push gently on the load/unload button. The drive automatically pulls the tray into the drive and prepares the disc for reading.

Unloading the CD-ROM Drive

Push and hold the unload button until the drawer comes out and then remove the disc.

Cleaning the CD-ROM Drive

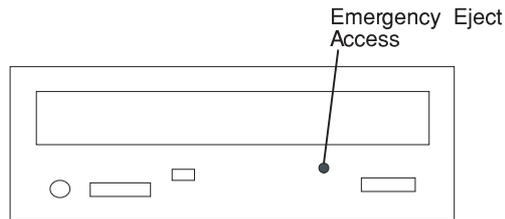
This CD-ROM drive has an internal head-cleaning mechanism, and therefore does not require an external cleaning device. The internal cleaning mechanism cleans the head every time the tray is operated.

Always handle discs carefully by the edges to avoid leaving fingerprints or scratching the disc. (This helps the disc to maintain good readability.) Discs can be wiped with a soft, lint-free cloth or lens tissue. Always wipe in a straight line from the inner hub to the outer rim.

Emergency Eject

Note: Execute the following procedure only in an emergency (caddy will not eject although pressing the unload button).

1. Power-off the CD-ROM drive.
2. Insert a small diameter rod, such as a straightened paper clip, into the emergency eject hole. (Refer to the illustration below for the location of the emergency eject hole.)
3. Push the tool in until some resistance is felt.
4. Maintain a small amount of pressure on the rod while pulling on the tray with your finger nail.
5. Pull the tray open and remove the disc.



Note: Normally the tray makes a ratcheting sound when pulling it open using the above procedure.

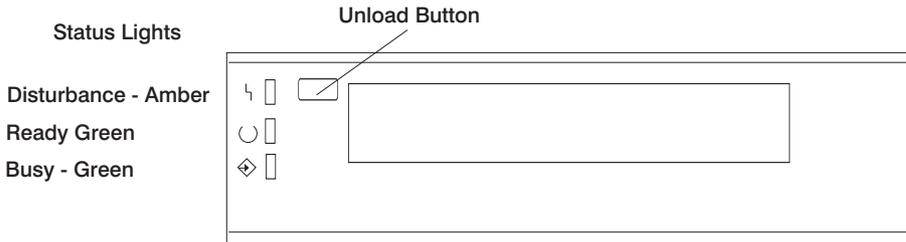
Using the 5.0GB 8-mm Tape Drive

The optional 5.0GB 8-mm tape drive is a half-height device.

Status Lights

The 5.0GB 8-mm tape drive has two green status lights and one amber status light. The on and off combinations of the status lights indicate the conditions of the 8-mm tape drive.

Each of the International Organization for Standards (ISO) symbols located next to a status light indicates a specific condition of the tape drive as follows:



Status Light States

The following table explains the meaning of the green and amber status lights.

Status Lights on the 5.0GB 8-mm Tape Drive			
Status	Ready (green)	Busy (green)	Disturbance (amber)
The power-on self-test (POST) is running or the system has issued a Reset to the drive.	On	On	On
One of the following has occurred: <ul style="list-style-type: none">The power is off.The POST has completed successfully, but no tape cartridge has been inserted.	Off	Off	Off
A tape cartridge has been inserted and the 8-mm tape drive is ready to receive commands from the system.	On	Off	Off
A tape cartridge has been inserted and the 8-mm tape drive is performing a tape load or unload operation.	Off	Flashing	Off
The tape is in motion and the 8-mm tape drive is busy running a device operation.	On	Flashing	Off
The 8-mm tape drive has detected an internal fault that requires corrective action. If this occurs, see the following note.	Off	Off	Flashing
The tape path requires cleaning. Refer to "Cleaning the Tape Path on the 5.0GB 8-mm Tape Drive" on page 2-15.	Off or On	Off or Flashing	On

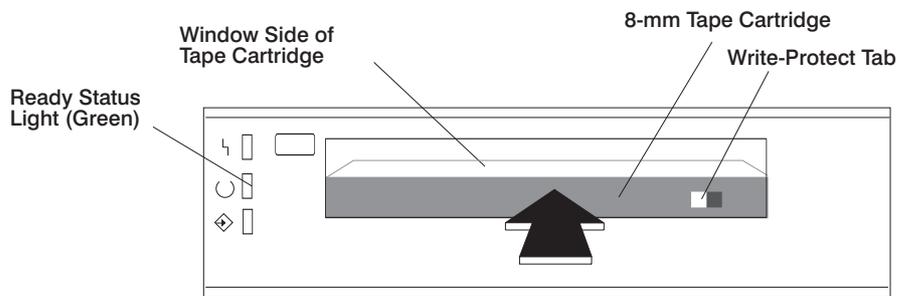
Note: If a fault or an error condition occurs, first try to recover by pressing the unload button. If this does not correct the fault, switch off the power to the 8-mm tape drive and then switch on the power to the drive. If the condition continues, call your service representative.

Loading the 8-mm Tape Cartridge

Before loading the tape cartridge, make sure the power is on and the write-protect tab on the tape cartridge is properly set. Refer to “Setting the Write-Protect Tab on 8-mm Tape Cartridges” on page 2-18. The tape drive loads the tape from the cartridge and prepares it for reading and writing.

To load the 8-mm tape cartridge, do the following:

1. Grasp the edges of the 8-mm tape cartridge with the write-protect tab toward you and the window side of the cartridge facing up.
2. Slide the tape cartridge into the opening on the front of the 8-mm tape drive until the loading mechanism pulls the cartridge into the drive and the drive door closes. The ready status light (green) goes on if the load operation was successful.



The 8-mm tape drive is ready for data operations when the tape cartridge is inserted. After the cartridge is inserted into the tape drive, the tape takes about 25 seconds to load; this does not interfere with beginning the data operations.

Commands can be entered while the tape is loading. Any commands to the tape drive start running once the tape has finished loading. Commands not requiring the tape cartridge are run immediately.

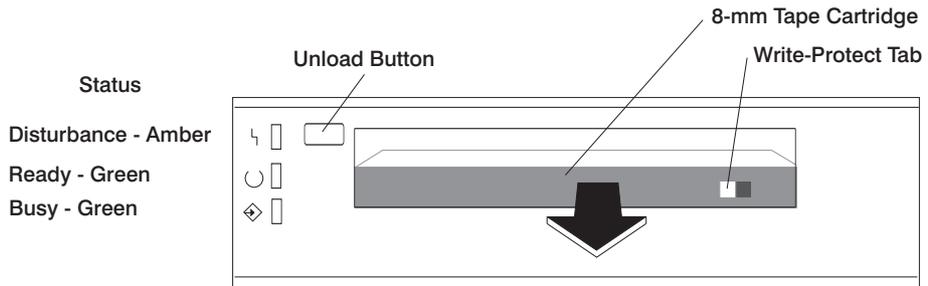
Unloading the 8-mm Tape Cartridge

Before performing the unload operation, make sure the power to the 8-mm tape drive is on.

To unload and eject the tape cartridge, press the unload button. The 8-mm tape drive rewinds the tape and then ejects the tape cartridge from the tape drive.

After pressing the unload button, the following occurs:

1. The ready status light goes off.
2. The busy status light flashes during the unload operation.
3. The busy status light goes off when the cartridge is ejected from the tape drive.



The time required for a tape to rewind and unload is between 18 seconds and 3 minutes, depending on the position of the tape when the unload button is pushed.

If the tape cartridge cannot unload and has to be removed manually from the drive, contact your service representative.

Cleaning the Tape Path on the 5.0GB 8-mm Tape Drive

Attention: Do not use video cleaning cartridges in the 8-mm tape drive. Video cleaning cartridges can damage the 8-mm tape drive.

The 8-mm tape path should be cleaned either approximately every 30 hours of tape motion or once a month, whichever occurs first. The 5.0GB 8-mm tape drive counts the number of hours of tape motion and indicates when the tape path requires cleaning when the lighted disturbance status light (amber) is on.

More frequent cleaning may be required if the drive is operated in a dusty environment or in humid conditions. If the dust is allowed to accumulate, the drive has to perform more reads and writes. This can cause data loss, and may be prevented by regularly scheduled cleaning of the drive.

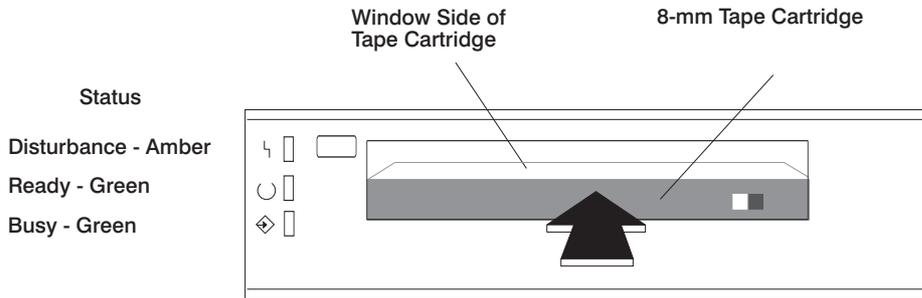
The cleaning cartridge cleans the 8-mm tape drive 12 times before it needs to be discarded. If you attempt to use an 8-mm cleaning cartridge more than 12 times, the tape drive automatically detects the error and ejects the cleaning cartridge with the disturbance status light (amber) remaining on.

Some video cleaning cartridges are extremely abrasive. An 8-mm tape drive may be permanently damaged after only a few cleaning operations using an abrasive-type cleaning cartridge.

Before loading the cleaning cartridge, make sure the power to the 8-mm tape drive is on.

To load the 8-mm cleaning cartridge, do the following:

1. Grasp the edges of the 8-mm cleaning cartridge with the window side of the cartridge facing up.
2. Slide the cleaning cartridge into the opening on the front of the 8-mm tape drive until the loading mechanism pulls the cartridge into the drive.



After the 8-mm cleaning cartridge has been fully inserted into the 8-mm tape drive, the following cleaning operations are performed automatically:

1. The cleaning tape is loaded into the tape path.
2. The drive is cleaned by moving the cleaning tape forward for approximately two minutes.
3. The tape is unloaded and the cleaning cartridge is ejected from the tape drive when the cleaning operation is complete.
4. A successful cleaning operation is indicated when the disturbance status light (amber) goes off.

General Information for 5.0GB 8-mm Tape Drive

Recommendations

- Use only Data Grade 8-mm tape cartridges. These cartridges are identified by either a Data, D, or D8 marking on the data cartridge. Use of video grade cartridges can damage the 8-mm tape drive and can void the warranty of your 8-mm tape drive, and data written on these tapes may be lost over a short period of time.
- Remove the tape cartridge from the tape drive when it is not in use, and store the cartridge in the cartridge case.
- Do not open the door on the data tape cartridge. This door covers and protects the magnetic tape material from dirt, dust, and damage.
- Avoid touching the tape since this can cause loss of data.
- Keep the tape drive door closed except when loading or unloading a tape cartridge.
- Back up and then discard any tape cartridge that repeatedly produces error messages. The error information is in the system error log.
- Clean the tape path regularly according to the cleaning procedure of the 8-mm tape drive. Use only recommended cleaning cartridges; other cleaning cartridges can permanently damage your 8-mm tape drive.

Attention: Do not use video grade cartridges in the 8-mm tape drive. Video grade tapes may be unreliable and may cause permanent damage to the 8-mm tape drive.

Types of 8-mm Tape Cartridges

- **Test Tape Cartridge:** This is a specially labeled tape cartridge that is in the media kit with the 8-mm tape drive. Use this cartridge only when checking the operation of the drive or running diagnostics; do not use it to save programs or data.
- **Data Tape Cartridge:** This is a non-labeled blank tape cartridge that is in the media kit. Use this cartridge for saving your programs or data. The same data tape cartridge can be used in either a 2.3GB 8-mm tape drive or a 5.0GB 8-mm tape drive.
- **Cleaning Tape Cartridge:** Use this cartridge for cleaning the 8-mm tape path. For more information, see “Cleaning the Tape Path on the 5.0GB 8-mm Tape Drive” on page 2-15.

Tape Cartridge Compatibility

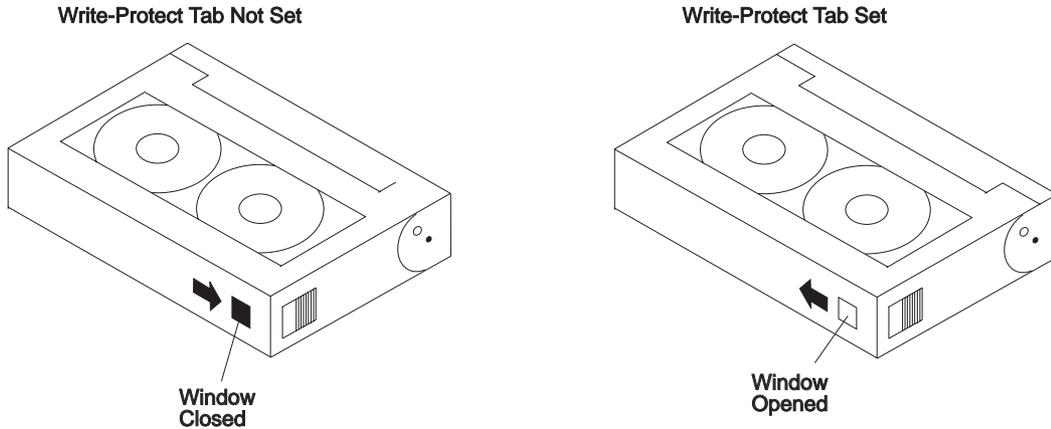
The 8-mm tape drive is compatible with existing 8-mm tape subsystems that comply to the American National Standard (ANSI) X3B5/89-136, Helical-scan Digital Computer Tape Cartridge, 8-mm for Information Exchange. Data compression effectively increases the cartridge capacity and data transfer rate for the 5.0GB tape cartridges.

Format Modes (C=compression mode)				
8-mm Tape Drive	2.3GB	2.3GB (C)	5.0GB	5.0GB (C)
2.3GB	Read/Write			
5.0GB	Read/Write	Read only	Read/Write	Read/Write

Setting the Write-Protect Tab on 8-mm Tape Cartridges

Setting the write-protect tab on a tape cartridge is necessary so that information is not accidentally lost. When the write-protect tab of a tape cartridge is set (window closed), information can be read from the tape, but cannot be written to it.

The window on the tape cartridge controls write-protection.



Environment Considerations for 8-mm Data Cartridges

Information in this section describes operating and storage conditions including temperature, relative humidity, and maximum wet bulb data.

Attention: The manufacturer has specified a set of temperature and humidity ranges in which the 8-mm data cartridge can operate with ease. Only regular cleaning procedures are required when operating the cartridge within this range. The risk of possible data loss is increased if 8-mm tape cartridges are operated, stored, or shipped outside the temperature or humidity ranges shown in the following table.

Before using a cartridge, always let it adjust (acclimate) to the operating environment. Do this by placing the cartridge with its container in the operating environment for as long as it has been away from this environment or for 24 hours, whichever is less.

Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or a temperature change of 11°C or 20°F or more.

	Operating Ranges	Storage	Shipping
Temperature	16°C to 32°C (60°F to 90°F)	5°C to 32°C (40°F to 90°F)	-40°C to 52°C (-40°F to 125°F)
Relative Humidity (non-condensing)	20 to 80%	20 to 80%	5 to 80%
Maximum Wet Bulb	26°C (79°F)	26°C (79°F)	26°C (79°F)

Operating in Harsh Environments

The 8-mm tape drive is ideally suited to streaming operations, as opposed to tape movement operations involving multiple stop/starts and random searches. When the tape is used for frequent stop and start operations, streaming movement is beneficial and should be used whenever possible. This can be accomplished by ensuring that any save or restore operation is the only active operation performed by a device connected to this SCSI I/O controller.

Any tape that has been used outside the ranges specified in the table on 2-19 for an extended period of time (50 passes in 40 hours of nonstop operation) should not be used as an archival tape. Exposure to the environment will deteriorate the magnetic and physical strength of the tape. Do not store important data on a tape that has been used outside the specified ranges; transfer the data to a new tape for reliable archiving.

8-mm Data Cartridge Erasure

Most bulk eraser devices do not have the capability to erase 8-mm data cartridges. To properly erase an 8-mm data cartridge with a bulk eraser device, the erasure rating must be at least 1500 oersted.

The 2.3GB and the 5.0GB 8-mm tape drives erase residual data before writing new data on the data tape.

Tape Cartridge Data Efficiency

The 8-mm tape cartridge efficiency is defined as the amount of data that can be stored on the cartridge. The following variables affect the amount of data that can be stored on a tape cartridge:

- Size of the data file
- Number of file marks per file
- File mark size used
- Compatibility mode (2.3GB or 5.0GB)
- Media rewrites.

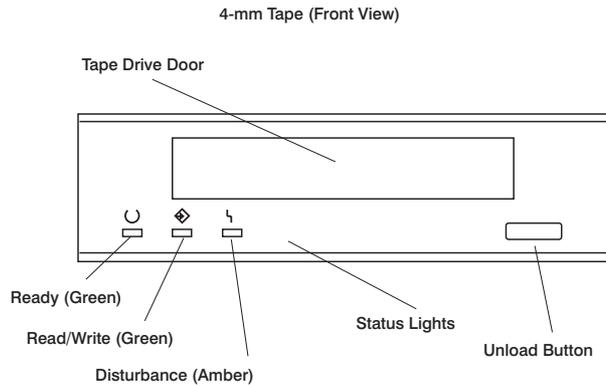
Using the 4.0GB 4-mm Tape Drive

The optional 4.0GB 4-mm tape drive is a half-high device.

Status Lights

The 4.0GB 4-mm tape drive has two green status lights and one amber status light. The on and off combinations of the status lights indicate the conditions of the 4-mm tape drive.

Each of the International Organization for Standards (ISO) symbols located next to a status light indicates a specific condition of the tape drive as follows:



Status Light States

The following tables explain the meaning of the green and amber status lights.

	Ready (green)	Read-Write (green)	Disturbance (amber)
Off	No cartridge installed or error condition	No cartridge or no activity	No error condition
Steady	Cartridge installed or loading/unloading		Cleaning required or worn media
Flashing	Power-on self- test in progress	Cartridge activity	Error condition

Status Lights on the 4.0GB 4-mm Tape Drive			
Status	Ready (green)	Read-Write (green)	Disturbance (amber)
LED test.	On 2 seconds at power on	On 2 seconds at power on	On 2 seconds at power on
The power-on self-test (POST) is running or the Diagnostic Cartridge is running.	Flashing	Off	Off
One of the following has occurred: <ul style="list-style-type: none"> The power is off. The POST has completed successfully, but no tape cartridge has been loaded. 	Off	Off	Off
A tape cartridge has been inserted and the 4-mm Tape Drive is Ready to receive commands from the system.	On	Off	Off
The tape is in motion and the 4-mm Tape Drive is running a device operation or cleaning.	On	Flashing	Off
The 4-mm Tape Drive has detected an internal error that requires corrective action such as tape cartridge failure, high humidity, or no SCSI terminator. Refer to the service guide or contact your service representative. (See note below)	Off	Off	Flashing
The tape path requires cleaning or a poor quality tape cartridge is being used. See "Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive" on page 2-24.	Off or On	Off or Flashing	On

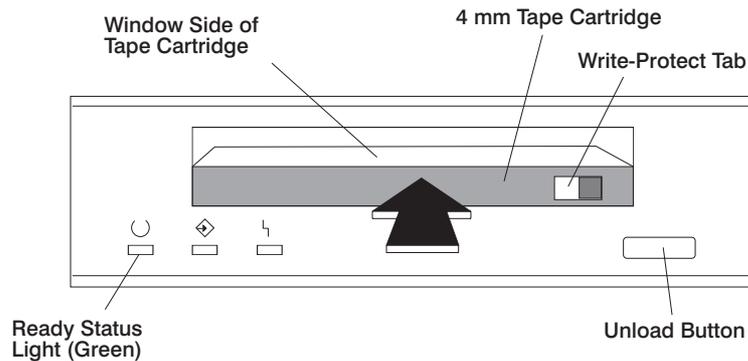
Note: If an error condition occurs, first try to recover by pressing the unload button. If this does not correct the error, switch off the power to the 4-mm tape drive and then switch on the power to the drive. If the condition continues, call your service representative.

Loading the 4-mm Tape Cartridge

Before loading the tape cartridge, make sure the power is on and the write-protect switch on the tape cartridge is properly set. Refer to “Setting the Write-Protect Tab on 4-mm Tape Cartridges” on page 2-29. The tape drive loads the tape from the cartridge and prepares it for reading and writing.

To load the 4-mm tape cartridge, do the following:

1. Grasp the edges of the 4-mm tape cartridge with the write-protect tab towards you and the window side of the cartridge facing up.
2. Slide the tape cartridge into the opening on the front of the 4-mm tape drive until the loading mechanism pulls the cartridge into the drive and the drive door closes. The ready status light (green) goes on if the load operation was successful.



The 4-mm tape drive is ready for data operations when the tape cartridge is inserted. After the cartridge is inserted into the tape drive, the tape takes about 15 seconds to load.

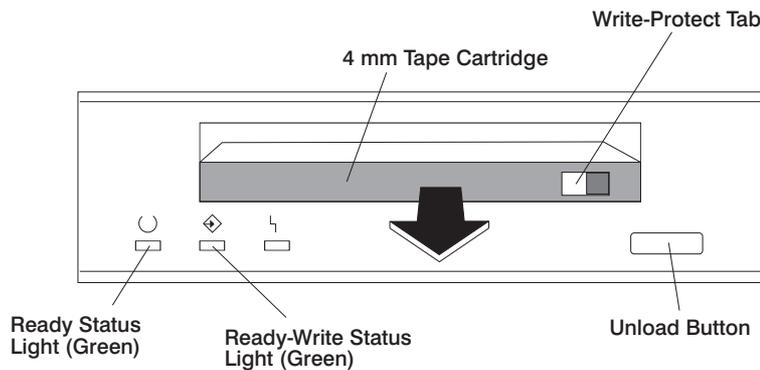
Unloading the 4-mm Tape Cartridge

Before performing the unload operation, make sure the power to the 4-mm tape drive is on.

To unload and eject the tape cartridge, press the unload button. The 4-mm tape drive rewinds the tape and then ejects the tape cartridge from the tape drive.

After pressing the unload button, the following occurs:

1. The Read-Write status light flashes during the unload operation.
2. The Ready status light and the Read-Write status light turns off when the cartridge is ejected from the tape drive.



The time required for a tape to rewind and unload is between 10 seconds and 1.5 minutes, depending on the position of the tape when the unload button is pushed.

If the tape cartridge cannot unload and has to be removed manually from the drive, contact your service representative.

Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive

The 4-mm tape path should be cleaned either approximately every 30 hours of tape motion or once a month, whichever occurs first. The 4-mm tape drive monitors the recording quality of the tape cartridge and indicates that the tape path requires cleaning when the disturbance status light (amber) is on.

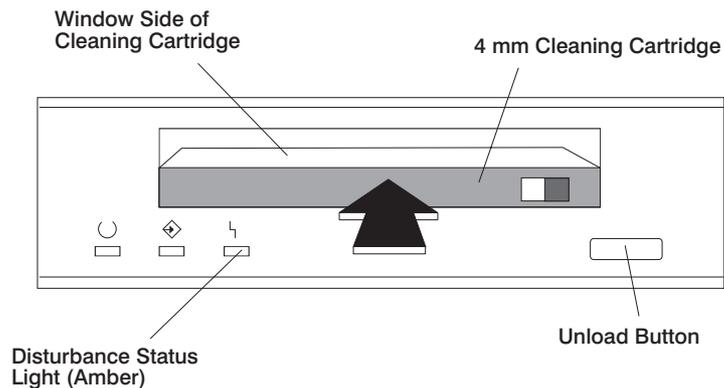
More frequent cleaning may be required if the drive is operated in a dusty environment or in humid conditions. If the dust is allowed to accumulate, the drive has to perform more reads and writes. This can cause data loss, and may be prevented by regularly scheduled cleaning of the drive.

The cleaning cartridge cleans the 4-mm tape drive 50 times before it needs to be discarded. If you attempt to use a 4-mm cleaning cartridge more than 50 times, the tape drive automatically detects the error and ejects the cleaning cartridge with the disturbance status light (amber) remaining on.

Before loading the cleaning cartridge, make sure the power to the 4-mm tape drive is on.

To load the 4-mm cleaning cartridge, do the following:

1. Grasp the edges of the 4-mm cleaning cartridge with the window side of the cartridge facing up.
2. Slide the cleaning cartridge into the opening on the front of the 4-mm tape drive until the loading mechanism pulls the cartridge into the drive.



After the 4-mm cleaning cartridge has been fully inserted into the 4-mm tape drive, the following cleaning operations are performed automatically:

1. The cleaning tape is loaded into the tape path.
2. The drive is cleaned by moving the cleaning tape forward for approximately 30 seconds.
3. The tape is unloaded and the cleaning cartridge is ejected from the tape drive when the cleaning operation is complete.
4. A successful cleaning operation is indicated when the disturbance status light (amber) goes off (if it was activated before the cleaning operation).

General Information for 4.0GB 4-mm Tape Drive

The 4.0GB 4-mm tape drive is a streaming tape drive that is used to:

- Save and restore system data files.
- Archive important records.
- Distribute operating system software upgrades.

The 4-mm tape drive can be attached to any system using a single-ended interface meeting the Small Computer System Interface II (SCSI-II) Standard ANSI X3.131-199X Rev. 10h.

The 4-mm tape drive has the following features:

- Capacity of 4.0 GB per cartridge. 8 GB is typical with data compression and with DDS2 data cartridges.

The actual capacity per cartridge varies depending on the application and the type of data cartridge being used.

- Data transfer rate is 400 KBps. 800 KBps is typical with data compression.

Note: Data compression activated is the default setting from the factory. Data compression is usually controlled by the application software.

- Read and write of DDS|||| tape cartridges in 2.0 GB per cartridge format.
- A status light that indicates when it is time to clean the tape path.
- Internal diagnostics that are activated when the 4 mm Diagnostic Cartridge is inserted and loaded into the drive.
- Media recognition system: Only data grade media can be used with this tape drive.

The 4-mm tape drive uses a 4-mm data cartridge for saving and restoring your system data. The 4-mm tape drive uses only 4-mm Digital Data Storage (DDS) cartridges.

Recommendations

Attention: Tape cartridges that do not carry the proper DDS symbol cannot be written to and their use causes the 4-mm tape drive to report an error.

- Use only 4-mm Digital Data Storage (DDS) cartridges.

Attention: Use of other than recommended cleaning cartridges can damage your tape drive and voids the drive warranty.

- Clean the tape path by using the recommended cleaning cartridge. Follow the instructions on the cartridge.
- Back up and then discard any tape cartridge that repeatedly produces error messages. The error information is in the system error log.
- Do not open the door on the data cartridge that covers the tape. This door protects the magnetic tape material from dirt, dust, and damage.
- Do not operate in a dusty environment.
- Do not touch the tape material. Any substance transferred to the tape by touching it could cause loss of data.

Types of 4-mm Tape Cartridges

The 4-mm tape drive is shipped with three 4-mm cartridges to help start your tape operations immediately.

4-mm Data Cartridge:

Use this non-labeled cartridge for saving or restoring your programs or data. Additional data cartridges can be ordered.

4-mm Diagnostic Cartridge:

Use this specially labeled cartridge to perform diagnostics on the drive. Do not use it to save or restore programs or data.

Cleaning Cartridge:

Use this cartridge for cleaning the 4-mm tape path. For more information, see “Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive” on page 2-24.

Tape Cartridge Compatibility

The 4-mm Tape Drive is compatible with existing 4mm tape subsystems that are designed to operate with Digital Data Storage approved media, which meet the following standards:

- For DDS||||
 - American National Standard (ANSI) standard, X3.203-191, Helical-scan Digital Computer Tape Cartridge, 3.81mm.
 - European Computer Manufacturers Association (EMCA) standard, EMCA-150 , 3.81mm Wide Magnetic Tape Cartridge and DDS|||| format.
- For DDS2
 - European Computer Manufacturers Association (EMCA) standard, EMCA/TC17/93/20, 3.81mm Wide Magnetic Tape Cartridge for Information Interchange Helical Scan Recording, DDS2 format.

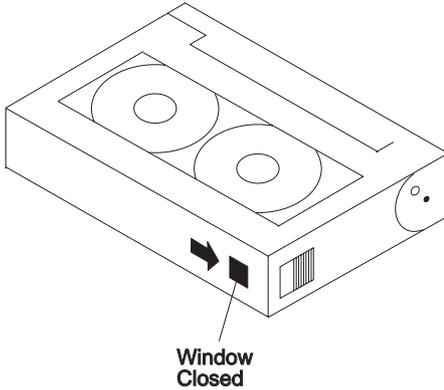
You cannot change the density setting of the drive, because the device reconfigures itself automatically, depending on the media type installed, as follows:

Media Type	Device Configuration
DDS	Read-only
DDS 	Read/write in 2.0GB mode only.
DDS2	Read in either density; write in 4.0GB mode only.
Non-DDS	Not supported. The cartridge ejects.

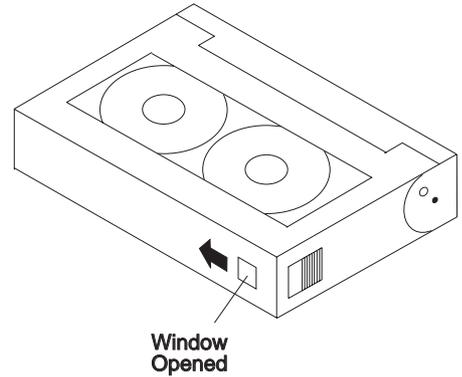
Setting the Write-Protect Tab on 4-mm Tape Cartridges

The window on the tape cartridge controls write-protection. When the write-protect tab of a tape cartridge is set (window open), information can be read from the tape, but cannot be written to it. When the write-protect tab of a tape cartridge is not set (window closed), information can be both written to and read from the tape. Trying to write to a 4-mm data cartridge with the window open causes an error.

Write-Protect Tab Not Set



Write-Protect Tab Set



Environmental Considerations for 4-mm Data Cartridges

Information in this section describes operating and storage conditions including temperature, relative humidity, and maximum wet bulb data.

Attention: The manufacturer has specified a set of temperature and humidity ranges in which the 4-mm data cartridge can operate with ease. Only regular cleaning procedures, as described in “Cleaning the Tape Path on the 4.0GB 4-mm Tape Drive” on page 2-24, are required when operating the cartridge within this range. The risk of possible data loss is increased if 4-mm tape cartridges are operated, stored, or shipped outside the temperature or humidity ranges shown in the following table.

Before using a cartridge, always let it adjust (acclimate) to the operating environment. Do this by placing the cartridge with its container in the operating environment for as long as it has been away from this environment or for 24 hours, whichever is less.

Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or a temperature change of 11°C or 20°F or more.

	Operating Ranges	Storage	Shipping
Temperature	16°C to 32°C (60°F to 90°F)	5°C to 32°C (40°F to 90°F)	-40°C to 52°C (-40°F to 125°F)
Relative Humidity (non-condensing)	20 to 80%	20 to 80%	5 to 80%
Maximum Wet Bulb	26°C (79°F)	26°C (79°F)	26°C (79°F)

Operating in Harsh Environments

The 4-mm tape drive is ideally suited to streaming operations, as opposed to tape movement operations involving multiple stop/starts and random searches. When the tape is used for frequent stop and start operations, streaming movement is beneficial and should be used whenever possible. This can be accomplished by ensuring that any save or restore operation is the only active operation performed by a device connected to this SCSI I/O controller.

Any tape that has been used outside the ranges specified in the previous table for an extended period of time (50 passes in 40 hours of nonstop operation) should not be used as an archival tape. Exposure to the environment deteriorates the magnetic and physical strength of the tape. Do not store important data on a tape that has been used outside the specified ranges; transfer the data to a new tape for reliable archiving.

4-mm Data Cartridge Erasure

Most bulk eraser devices do not have the capability to erase 4-mm data cartridges. To properly erase an 4-mm data cartridge with a bulk eraser device, the erasure rating must be at least 2000 oersted.

The 4-mm tape drive erases residual data before writing new data on the data tape.

Tape Cartridge Data Capacity

The 4-mm tape cartridge capacity is defined as the amount of data that can be stored on the cartridge. The following variables affect the amount of data that can be stored on a tape cartridge:

- Size of the data file
- Number of file marks per file
- Compatibility mode (2GB or 4GB)
- Media rewrites.

Chapter 3. Service Processor (SP) Feature

The 7317 Model F3L server includes a Service Processor (SP) that provides several reliability, availability, and serviceability features built in.

The SP shares serial ports 1 and 2 with the server. This sharing provides direct communications with the SP while the 7317 Model F3L server power is off. When combined with an externally attached user supplied modem, it provides a path for the SP to report a fault condition to a remote location. Also, when serious problems with the server are detected, SP enables several remote power control, reset and boot features, and it enables remote maintenance and diagnostic activities, including console mirroring. The SP participates in and supports the server password structure and language features.

The features of your SP, described here, include the following:

- SP access via local or remote ASCII (TTY) terminals
- Console mirroring with quick disconnect
- Control menus, available locally or via call-in
- Call-out failure reporting ("call home")
- Remote power on via (1) ring detection or (2) direct SP command
- Unattended start after a power failure
- Remote power off/reboot in concert with the operating system
- Mutual surveillance with the system processor when supported by the operating system, including reporting and power-off as necessary.
- Remote SP reset
- Updateable Control Program
- Extended progress and error indicators

Call Out (Call-Home)

The SP can call out (Call-Home) in case it detects one of the following conditions:

- System firmware surveillance failure.
- Operating system surveillance failure (if supported by Operating System using an SP device driver).
- Critical environmental failures.

To enable the call out feature, you need to do the following:

- Have a modem connected to serial port 1 or 2.
- Set up the following using Diagnostic Service Aids:
 - Enable call out for the serial port where the modem is connected.

- Set up serial port line speed. For more information on line speeds, refer to “Line Speed Consideration” on page 3-18.
- Enter the modem configuration filename.
- Set up site specific parameters (i.e. phone numbers for call out, call out policy, etc).

Console Mirroring

Console mirroring allows a person on a local ASCII terminal to monitor the SP activities of a remote user. Console mirroring ends when SP releases control of the serial ports to the system firmware.

System Configuration:

- Service Processor
- Modem connected to one serial port and enabled for incoming calls
- Local ASCII terminal connected to the other serial port. This local terminal may be connected directly to your server or connected through another modem.

There are two scenarios in which console mirroring can be invoked:

1. Remote session first, then local session added
 - a. Remote session already in progress.
 - b. Remote user uses SP menus to enable console mirroring, allowing both consoles to be active.
2. Local session first, then remote session added
 - a. Local session is already in progress.
 - b. The SP receives a call from the remote user.
 - c. The local user selects the option to enable console mirroring. SP immediately begins mirroring SP menus.

Note: A quick disconnect is accomplished by hitting the key sequence Ctrl+D on either console. Both sessions exit the SP menus.

Service Processor System Monitoring - Surveillance

Surveillance is a function in which the Service Processor (SP) monitors the system, and the system monitors the SP. This monitoring is accomplished by periodic samplings called heartbeats.

Surveillance is available during two phases:

1. System firmware bringup (automatic) and
2. Operating system runtime (optional).

System Firmware Surveillance

Provides the SP with a means to detect boot failures while the system firmware is running.

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled via a user selectable option.

Operating System Surveillance

Provides the SP with a means to detect hang conditions, hardware or software failures while the operating system is running. It also provides the operating system with a means to detect SP failure by the lack of a return heartbeat. This function requires an SP device driver in the operating system, such as AIX (versions later than 4.1.4).

Operating system surveillance is not enabled by default. This is to allow the user to run operating systems that do not support this SP option.

Operating system surveillance can be enabled and disabled via:

- SP Menus
- SP Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable
2. Surveillance interval

This is the maximum time SP should wait for a heartbeat from the operating system before timeout.

3. Surveillance delay

This is the length of time to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance will not take effect until the next time the operating system is started after setting the parameters.

System Firmware Surveillance Failure

If the SP detects no heartbeats during system IPL (for 7 minutes), it cycles the system power to attempt a reboot. If the fail condition repeats, the SP leaves the machine powered on, logs an error and offers menus to the user. If Call-out is enabled, the SP calls to report the failure and displays the operating system surveillance failure code on the operator panel.

Operating System Surveillance Failure

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and SP does not detect any heartbeats from the operating system, the SP assumes the system is hung. The machine is left powered on and SP enters standby phase, displaying the operating system surveillance failure code on the operator panel. If Call-out is enabled, the SP calls to report the failure.

System Power-On Methods

- Power-on Switch - refer to your server's documentation.
- Timed power-on - refer to the shutdown -t command on servers using AIX.
- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page 3-15.
- SP Menu power-on request

You can request a power-on via the SP menus from either a local or remote terminal.

If a remote terminal is to be used, the modem must be connected to serial port 1, and the operating system set up to enable a TTY login session on that port.

Refer to “Seamless Transfer of a Modem Session” on page B-6 for information on transferring modem sessions from SP to the operating system.

- Ring Indicate Power-On

On servers not equipped with the optional SP, this feature allows the user to configure the server to power-on. SP also supports this feature.

Enabling ring indicate power-on disables remote call-in. If ring indicate power-on is enabled, the server powers on at a predetermined number of rings. If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered on.

- Follow-up to a Failed Boot Attempt

The SP initiates a power-on sequence upon detection of a failed boot attempt.

SP Flash EPROM Updates

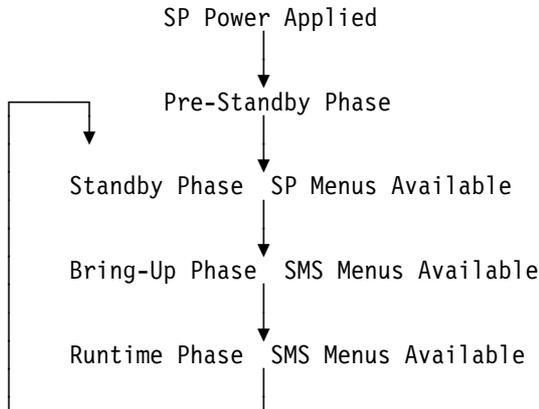
The SP EPROM may need to be updated for two different reasons:

1. The UPDATE (composite) portion of the EPROM has become corrupted.
2. SP firmware upgrades, without any corruption present.

The use of a Flash EPROM allows updates to occur without physically replacing the memory. The update can be initiated via the SP menus or through the SMS menus.

Service Processor Operational Phases

This section provides a high-level flow of the phases of the Service Processor (SP).



Pre-Standby Phase

This phase is entered when the server is connected to a power source. The server may or may not be fully powered on. This phase is exited when the Power-On Self Tests (POSTS) and configurations tasks are completed.

The Pre-Standby phase components are:

- SP Initialization
SP performs any necessary hardware and software initializations.
- SP POST
SP conducts Power-On Self Tests on its various work and code areas.
- SP Unattended Start Mode Checks

To assist fault recovery. If unattended start mode is set, the SP automatically reboots the server. SP does not wait for a user-input or power-on command, but moves straight through the phase and into the Bringup Phase. The unattended start mode can be reset by accessing SMS menus, or SP menus.

Standby Phase

The SP enters a wait state which is exited when the user prompts a menu via the ASCII terminal keyboard, or when the SP detects a power-on request.

The Standby phase components are:

- Modem Configuration

SP configures the modem (if installed) so that incoming calls may be received, or outgoing calls may be placed.

- Dial In

Monitor incoming phone line to answer calls, prompt for a password, verify the password and remotely display the standby menu. The remote session can be mirrored on the local ASCII console if the server is so equipped and the user enables this function.

In order to access the SP menus, the user is prompted for a password. There are two classes of passwords: General User (known as Power-On Password or POP) and Privileged User (known as Privileged Access Password or PAP).

Bring-Up Phase

This phase is entered upon power-on, and exited upon loading of the operating system.

The Bring-up phase components are:

- Retry Request Check

The SP checks to see if the previous IPL attempt failed. If two consecutive fails are detected, the SP displays an error code and places an outgoing call to notify an external party if the user has enabled this option.

- Dial Out

The SP can dial a pre-programmed telephone number in the event of an IPL failure. The SP issues an error report with the last reported IPL status indicated and any other available error information.

- Update Operator Panel

The SP displays Operator Panel data on the ASCII terminal if a remote connection is active.

- Environmental Monitoring

Environmental Monitoring is now controlled by the SP instead of the base system, with expanded error recording and reporting.

- System Firmware Surveillance (Heartbeat Monitoring)

The SP monitors and times the interval between system firmware heartbeats.

- Responding to System Processor Commands

The SP responds to any command issued by the system processor.

Runtime Phase

This phase includes the tasks that the SP performs during steady-state execution of the operating system.

- Environmental Monitoring

The SP monitors voltages, temperatures and fan speeds (on some servers).

- Responding to System Processor Commands

The SP responds to any command issued by the system processor.

- Run-Time Surveillance (Heartbeat Monitoring)

If the device driver is installed and surveillance enabled, the SP monitors the system heartbeat. If the heartbeat times out, the SP places an outgoing call.

This is different from the Bringup Phase scenario where two reboot attempts are made before placing an outgoing call.

SP Startup and Menus

Service Processor (SP) menus are available using an ASCII terminal when the server is powered off and the SP is operating with standby power. SP menus are also available when server power is on and the SP has detected a server problem (such as loss of surveillance).

During the first power up (i.e. power cord is plugged back into the outlet after installing the SP), SP menus are not available for 45 seconds while SP is running self-tests and initializing the server. If the server powers down, SP menus become available after 15 seconds.

The table on page 3-9 summarizes the various SP support menus.

Option/ Menu Description	SP Service Aids (ASCII or graphics terminals)	SP Menus (ASCII terminals)	SMS (ASCII or graphics terminals)
Modem Enable/Disable	Y ¹	Y ²	
Ring Indicate Power-On	Y ¹	Y ²	
Setup Dial-out Phone Numbers	Y ¹	Y ²	
Setup Runtime Surveillance Parameters	Y ¹	Y ²	
Setup Site Specific Parameters	Y ¹		
Setup Modem Configuration Parameters	Y ¹		
Access SP Error Logs		Y ³	
Read NVRAM		Y ³	
Enable/Disable Console Mirroring		Y ²	
Enable/Disable Fast System Boot		Y ²	
Power-on		Y ³	
Power-off System		Y ²	
Read VPD		Y ³	
View Boot Progress Indicators from last IPL		Y ²	
View System Environmental Conditions		Y ³	
Change General/Power-on Password		Y ²	Y ²
Change Privileged Access Password		Y ²	Y ²
Language Selection		Y ²	Y ²
SP Flash Update		Y ²	Y ²
Enable/Disable Unattended Start Mode		Y ²	Y ²

¹ Operating system root password

² Privileged access password

³ General access (power-on) password

SP Menus

The Service Processor (SP) menus are divided into two groups:

- General user menus - the user must know the general access password.
- Privileged user menus - the user must know the privileged access password.

The following section describes these two groups of menus, how to access them, and the functions associated with each option.

When the server is powered down, the SP menus may be accessed locally or remotely.

Maintenance Console

To use SP menus for maintenance functions, you must use serial port 1.

How to access SP menus locally

SP menus may be accessed locally by connecting an ASCII terminal to either serial port. Because the presence of the ASCII terminal cannot be confirmed by the SP, you must press a key on the ASCII terminal to confirm its presence. Next the SP prompts you for a password (if set), and when verified, displays the SP menus.

How to access SP menus remotely

SP menus may be accessed remotely by connecting a modem to either serial port.

- Power off the server, unplug the power cord, and press the power button to drain capacitance while power is disconnected.
- Connect the modem to the appropriate serial port and turn the modem on.
- Plug in the server.

Note: If your modem has not been configured, go to “Configure Support Processor - Modem Configuration” on page 9-29.

With a terminal or terminal emulator, call the server's modem. The SP prompts you for a password (if set), and when verified, displays the SP menus.

General User Menus

The menu options presented to the General user are a subset of the options available to the Privileged user. The user must know the General Access (Power-On) Password (POP) in order to access these menus.

STANDBY MENU

1. Power-on System
2. Read VPD
3. Access Error Logs
4. Read NVRAM
5. View System Environmental Conditions
99. Exit from Stand-By Menus

- **Power-on System**

Allows the user to power-on the system.

- **Read VPD**

Displays manufacturer vital product data, such as serial numbers, part numbers, etc.

- **Access Error Logs**

Displays the SP error logs.

- **Read NVRAM**

Displays Non-Volatile Random Access Memory (NVRAM) content.

- **View System Environmental Conditions**

On selection of this menu, the SP reads all environmental sensors and reports the results to the user. This option is most useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

Privileged User Menus

The following menus are available to privileged users only. The user must know the Privileged Access Password (PAP) in order to access these menus.

MAIN MENU

MAIN MENU

1. SP Setup Menu
2. System Bringup Menu
3. System Maintenance Menu
4. Language Selection Menu
99. Exit from Stand-By Menus

SP SETUP MENU

SP SETUP MENU

1. Change Privileged Access Password
2. Change General Access Password
3. Set Dial-out Telephone Numbers
4. Enable/Disable Modem
5. Enable/Disable Console Mirroring
6. Set Surveillance Parameters
7. Reset Support Processor
98. Return to Previous Menu
99. Exit from Stand-By Menus

Passwords

The General Access (Power-On) Password (POP) can be set from the SP menu, or from the SMS menus. For more information on how to set this password from the SMS menus, refer to the server's documentation.

Note: If the Privileged Access Password (PAP) is set first, then the Power-On Password (POP) is equivalent to the Privileged Access Password (PAP) until the POP is changed. POP cannot be set from the SP menus unless PAP has been set. To set POP, enter either the PAP or the POP (if a previous one exists). Clearing the PAP also clears the POP.

- **Change Privileged Access Password**

Set or change the Privileged Access Password (PAP). It provides the user with the capability to access all SP functions. This password is usually used by the system administrator or **root** user.

- **Change General Access Password**

Set or change the General Access (Power-On) Password (POP). It provides limited access to SP menus, and is usually available to all users who are allowed to power-on the server.

- **Set Dial-out Telephone Numbers**

This option may be used to set or change the telephone numbers for reporting a system failure. SP allows setting or changing telephone numbers for:

- Service Center - The telephone number of the maintenance provider's computer.
- System Administrator - The telephone number of the local system support provider's computer.
- Pager
- Local voice - The telephone number service personnel uses to reach the system user.
- System Call-In - The physical telephone number to which the server's modem is connected.

- **Enable/Disable Modem**

This option may be used to enable or disable Call-in and Call-out from the SP. It also allows the user to enable Ring Indicate Power-on instead of enabling Call-in.

Note: Ring Indicate Power-On is an alternate method of dialing in, but SP does not answer and establish a session with the remote terminal. Ring Indicate Power-On only powers on the server. No feedback to the caller is possible.

- **Enable/Disable Console Mirroring**

When Console Mirroring is enabled, the SP mirrors menus to both serial ports. This capability may be enabled by local or remote users. This provides local users the capability to monitor remote sessions. Console mirroring may be enabled for the current session only.

- **Set Surveillance Parameters**

This option may be used to configure the following operating system surveillance parameters:

- Surveillance Enable/Disable
- Surveillance Interval - Maximum time between heartbeats from the operating system. Valid entries are from 2 to 128 minutes.
- Surveillance Delay - Time to delay, from the time the operating system is in control, before beginning operating system surveillance. Valid entries are from 0 to 128 minutes.

Refer to "Service Processor System Monitoring - Surveillance" on page 3-3 for more information about surveillance.

- **Reset Service Processor** - Allows the user to reinitialize the SP.

Note

Settings become effective when the menu is exited using option 98 or 99.

SYSTEM BRINGUP MENU

SYSTEM BRINGUP MENU

1. Power-on System
2. Enable/Disable Fast System Boot
3. Enable/Disable Unattended Start Mode
4. Power-off System
98. Return to Previous Menu
99. Exit from Stand-By Menus

- **Power-on System**

Allows the user to power-on the system.

- **Enable/Disable Fast System Boot**

When this option is enabled, the system performs a fast memory test instead of the standard memory test.

- **Enable/Disable Unattended Start Mode**

This option may be used to instruct SP to immediately power-on the server after a power failure, bypassing power-on password verification. Unattended Start Mode can also be set via SMS Menus. It is intended to be used on servers that require automatic power-on after a power failure.

- **Power-off System**

Allows the user to power-off the server following a surveillance failure.

SYSTEM MAINTENANCE MENU

SYSTEM MAINTENANCE MENU

1. Read VPD
2. View Boot Progress Indicators from last IPL
3. Access Error Logs
4. Read NVRAM
5. View System Environmental Conditions
6. Reprogram SP Flash Eprom
98. Return to Previous Menu
99. Exit from Stand-By Menus

- **Read VPD**

Displays manufacturer vital product data, such as serial numbers, part numbers, etc.

- **View Boot Progress Indicators from last IPL**

Displays the boot progress indicators (check points), up to a maximum of 80, from the last system initial program load (IPL).

- **Access Error Logs**

Displays error conditions detected by the SP.

- **Read NVRAM**

Displays Non-Volatile Random Access Memory (NVRAM) content.

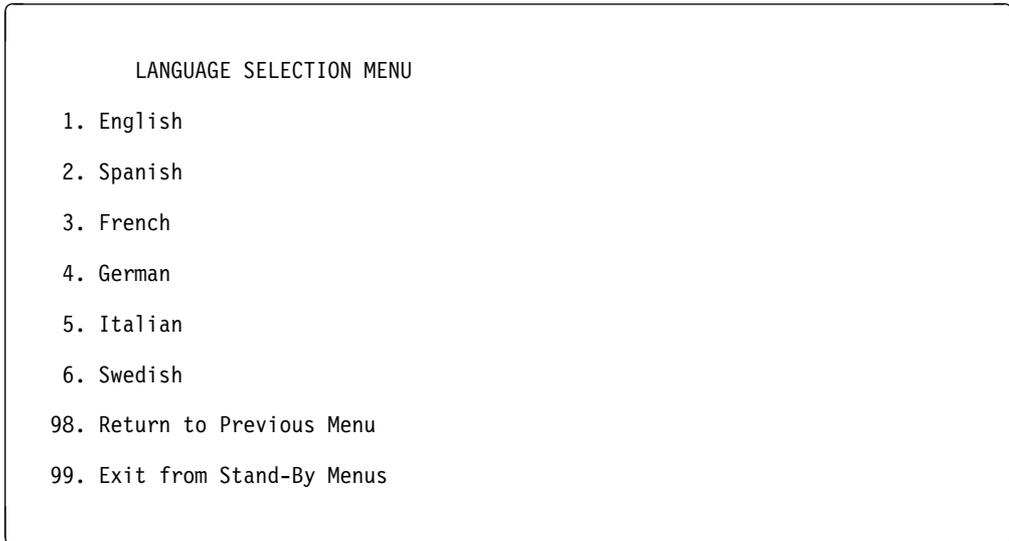
- **View System Environmental Conditions**

SP reads all environmental sensors and reports the results to the user. This option is most useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

- **Reprogram SP Flash Eprom**

This option may be used to program the SP Flash image. On selection of this option, the SP powers-on the system and instruct system firmware to update the SP image from diskette. This option should only be selected if a **new** SP image is to be installed.

LANGUAGE SELECTION MENU



This menu allows selecting languages into which SP and system firmware menus and messages are displayed.

SP Installation Checklist

For your convenience, here is an example SP setup checklist. It is basic. Your setup may include more or less of the available features, so you may wish to adjust this checklist for your own application. This checklist at least provides you with a starting place.

SP Setup Checklist

1. Invoke SP service aid, page 9-25.
2. Select Configure Support Processor Task, page 9-27
3. Enable Surveillance, page 9-28, also see page 3-3
4. Configure modem, page 9-29, also see page B-1

Modem Configuration File selection(s)
Modem's serial port(s)

5. Setup Call-In/Call-Out

Call-In, page 9-30

Call-Out, page 9-30

Line Speed, page 9-30 (consider system firmware usage, page 3-18)

6. Setup site specific parameters, page 9-31

Phone numbers

(Service) Account number

Call-Out policy

RETAIN_ID and RETAIN_PW (optional)

Take defaults for Remote timeout and Remote latency

Number of retries

System name

7. Return to operating system prompt

8. Gracefully shutdown, power off and **unplug** the server

9. Attach modem(s) (if needed), page 3-10

10. Plug in the server

11. Test

Call-In, page 3-19

Call-Out, page 3-19

Your SP is ready to go to work.

Line Speed Consideration

For simplification, the system firmware expects to use the serial ports at the 9600 baud rate. The operating system, the SP and the modem can use the serial ports at higher and lower speeds.

If 9600 baud is satisfactory for your applications, then it is recommended for seamless operation.

If you wish to operate at other speeds, you can do so with the understanding that messages from the system firmware may not be transmitted intelligibly to a remote terminal. This is usually not a problem during an SP initiated system bringup.

Accessing the SMS utilities from a remote terminal has the same result, since they are contained in system firmware. At speeds other than 9600 baud, SMS utilities are not useable from a remote terminal.

Testing the Setup

The following is a sample procedure to assure your setup is working.

Call-In:

1. Go to your remote terminal and call-in to your server. Your server should answer and offer you the SP Main Menu after requesting your privileged access password.
2. Enter item 2, **System Bringup Menu**.
3. Enter item 1, **Power-On System**.
Answer "y" when asked if you wish to continue powering on the system.
4. After the system firmware and operating system have initialized the server, the login prompt should appear at your remote terminal if you set up seamless modem transfer (refer to page B-6 for more information). This may take several minutes. When this occurs, you have successfully called into the SP.
5. Type logout to disconnect from the operating system. The message "No Carrier" displays on your remote terminal.
6. Call your server again. The operating system should answer and offer you the login prompt.

If these tests are successful, call-in is working.

7. Command your server to shutdown and power off. (The AIX command shutdown -F does this.)
8. The message "No Carrier" displays on your remote terminal.

Call-Out:

During the setup, you entered your phone number for the Pager (page 9-32) and Customer Voice (page 9-32) phone numbers. These numbers are used for this test.

1. Your remote terminal should be disconnected as a result of the Call-In test.
2. Call your server again.
3. At the **SP Main Menu**, enter the numbers 81357.
4. After a few moments, a message appears regarding an illegal entry. Press Enter to clear the message and return to the main menu.

5. When your telephone rings, answer the call. You should hear the sound of a telephone being dialed. This is your computer trying to page you.

If this test is successful, call-out is working.

You now need to go back through the **Site Specific Setup** menus on page 9-31 or the **SP Setup** menus on page 3-13 to enter the actual telephone numbers your server uses for reporting problems.

Chapter 4. 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 4-2; the text-based System Management Services is described beginning in “Text-Based System Management Services Programs” on page 4-11; the ASCII terminal is described beginning in “ASCII Terminal System Management Services Programs” on page 4-16.

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.



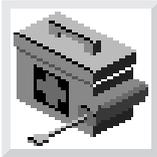
The System Management Services screen contains the following objects.



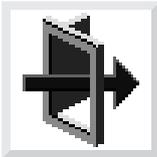
Start Up: This function allows you to define a custom boot list, which defines the sequence in which devices are searched by the operating system for a bootable image.



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



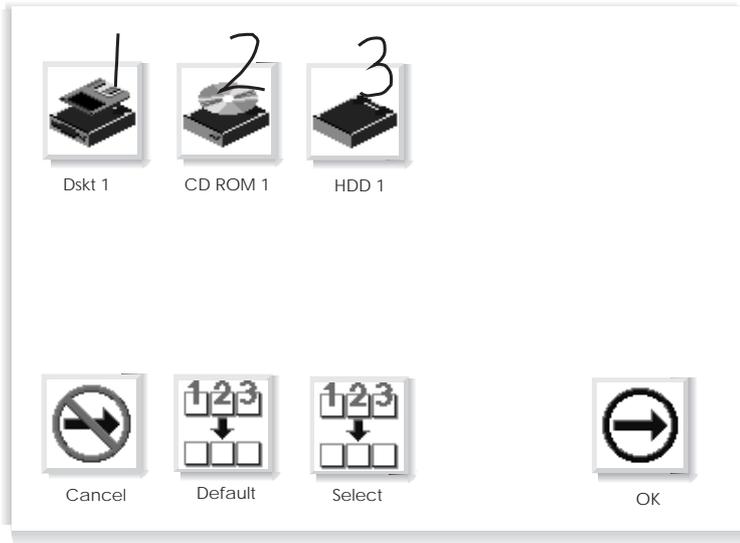
Tools: Enables you to set and remove passwords and to set the unattended start mode. In addition, you can view information about your system and update system programs.



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.

Start Up



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:

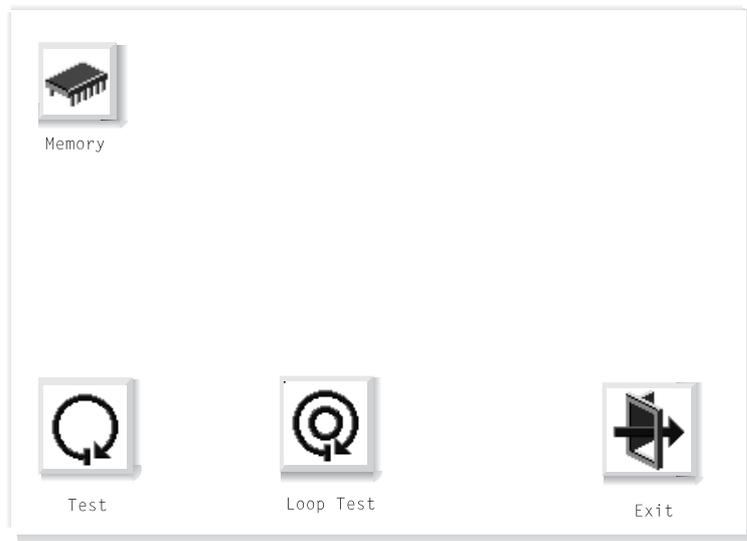
- Diskette drive
- CD-ROM drive
- Hard disk drive
- Tape drive
- Network (if installed)

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.



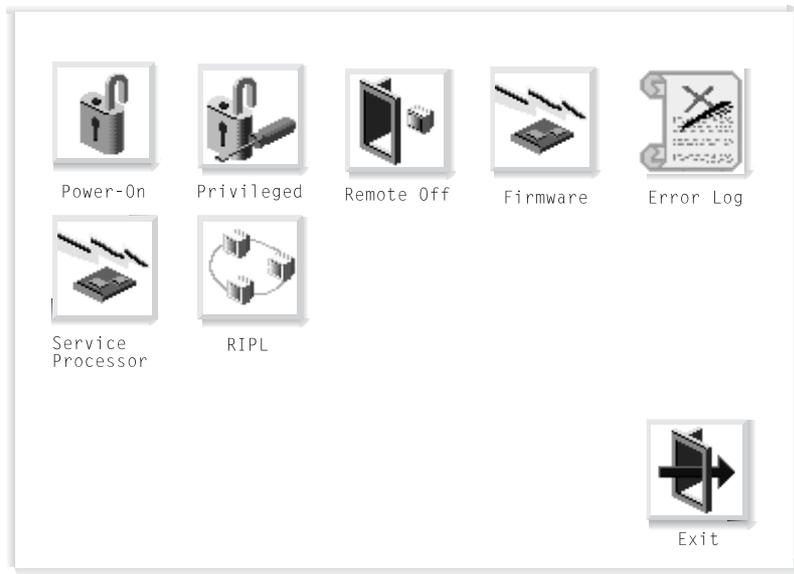
If a problem is detected during testing, an error code similar to the one below will be displayed under the object for the failing device.

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.



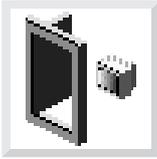
Note: If you *forget* your password, you will have to remove the battery for at least 30 seconds to disable the password. See “Battery (7317 Model F3L)” on page 7-13.

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 4-4. That information is still stored in the system. Pressing **F5** is limited to the current boot.

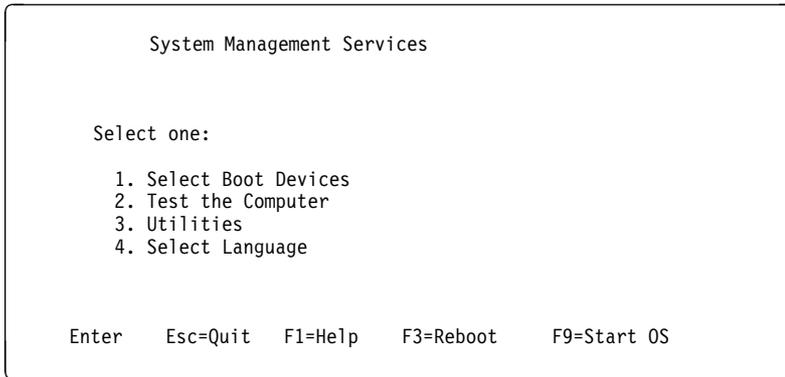
Text-Based System Management Services Programs

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.

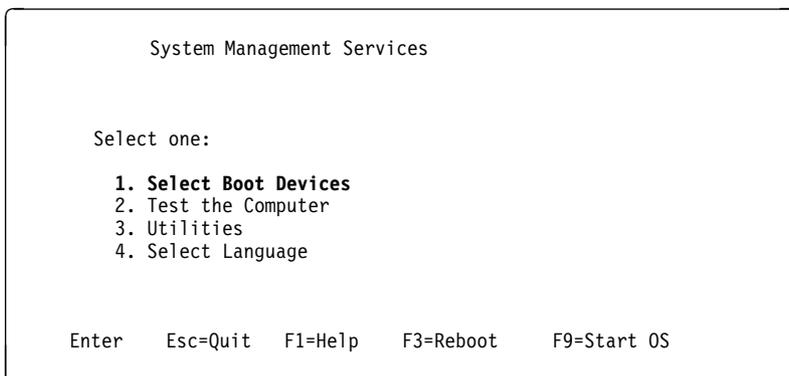
The System Management Services screen appears.



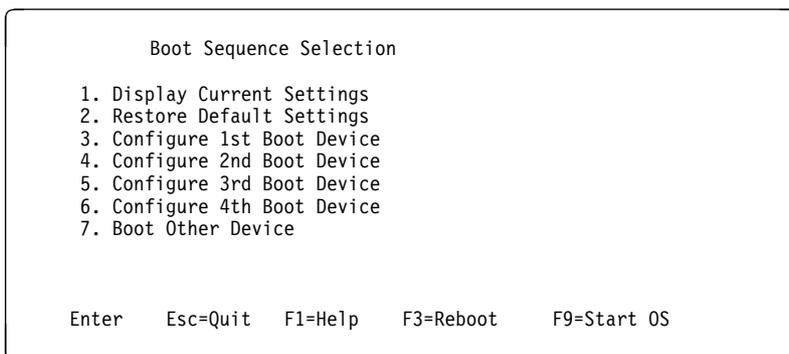
Use the Up Arrow and Down Arrow keys (↑ or ↓) to highlight your selection; then press **Enter**.

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.

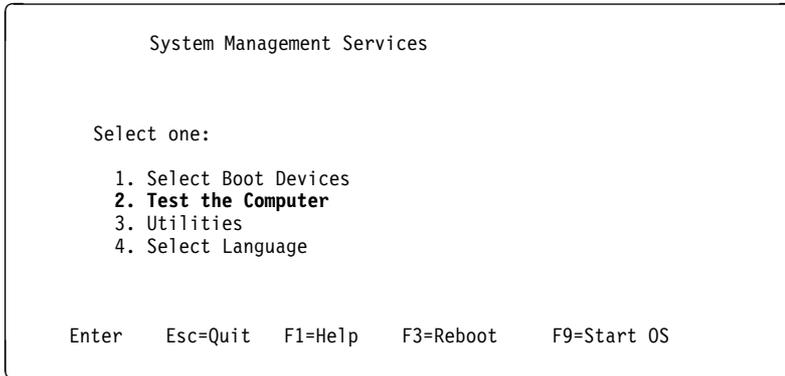
Select Boot Devices



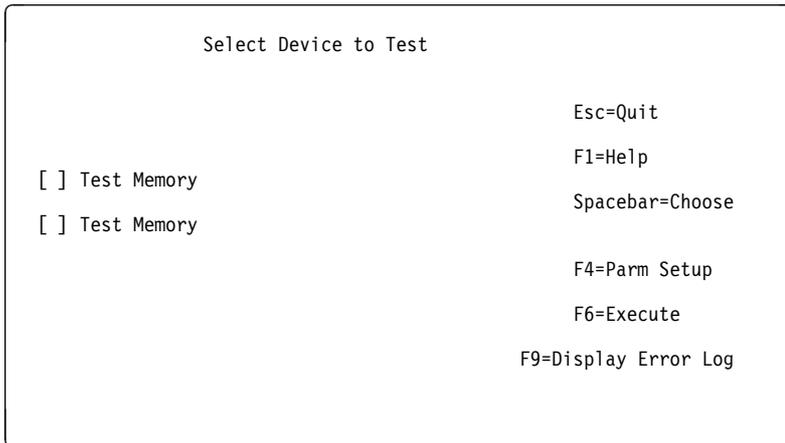
This selection enables you to view and change the sequence in which devices are read at startup time. You also can set or change a particular startup device, or specify the device the system is to start from.



Test the Computer



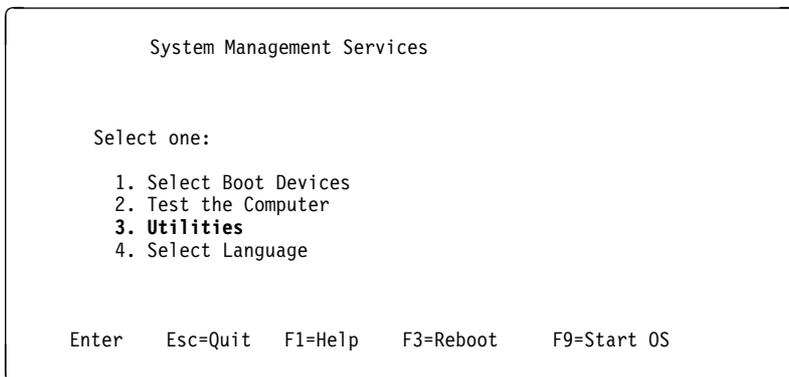
This selection enables you to test devices and functions of your system. The screen that displays, is similar to the screen that follows.



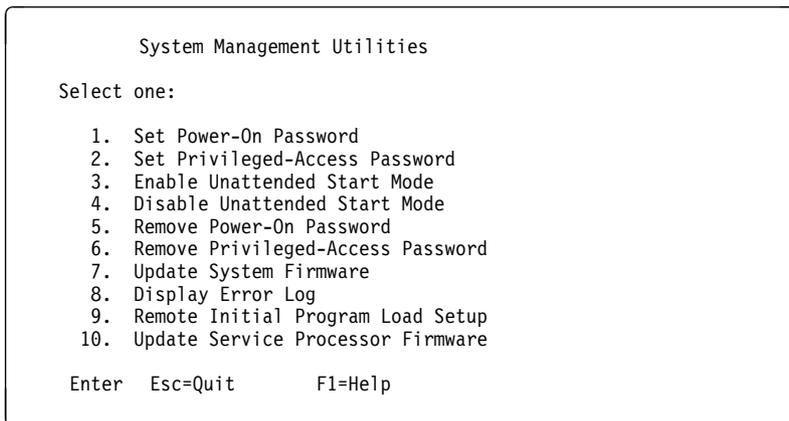
When you have selected the devices you want to test, press **F4** to set the test requirements, such as the number of times the tests are to be run, and whether testing should stop if an error occurs. After you set the requirements, press **Enter** to return to the Select the Device to Test screen; then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

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

Utilities



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



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.
```

Test the Computer

```
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

[>] Test Memory

1. Test Memory

q=Quit -
-----
h=Help -
-----
Spacebar=Choose -
-----

p=Parm Setup -
-----
E=Execute -
-----
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.

Utilities

```
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 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 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 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.o** 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, information 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 NormalTempPrtr  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. Firmware

Firmware Beeps

The firmware uses 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 Short 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.):** 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 is a Graphical User Interface (GUI). If the graphics adapter is not present and there is an active device in Serial Port 1, the active device is assumed to be an ASCII terminal, and the user interface is text. The user interface is either the graphics system or the ASCII terminal, but not both. Graphics interface default to GUI with the option to switch to text. ASCII terminal interface are always text. The PF keys are not used to initiate Maintenance Mode on ASCII terminal consoles, numeric keys are 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 case no boot device is found during a normal boot attempt, the firmware requests the Privileged Access Password (PAP) if set, then it initiates the System Maintenance Services (SMS).

If the custom bootlist is discovered to be corrupted, Firmware rebuilds the custom bootlist according to the default sequence. 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, invokes the System Management Services (SMS) GUI interface.
- The "key-switch" is logically set to **Normal mode**.
- Numerical **1 key** is the equivalent key on an ASCII terminal. The result, however, is the same as the function of PF4, as described below.

PF4 Key

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

PF5 Key

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

This mode attempts to boot from the first device of each type found in the list. It does not search for other bootable devices of that type if the first device is not bootable. Instead, it continues to the next device type in the list. If after one pass through the boot list no boot record is found, Firmware invokes 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. Network
 - a. Token Ring
 - b. Ethernet

PF6 key: PF6 works like PF5 with some exceptions

- Firmware looks 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 invokes the SMS program.
- The "key-switch" is set to ***Service mode***.
- Numerical **6 key** is 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 prompts 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 prompts 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 boots from a defined boot device, but the keyboard is 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 non-volatile battery powered 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 are 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 checks whether a Power-On password is present. If there is one present, and unattended start mode (see “Unattended Start Mode”) 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 goes 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 checks 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 goes to a hang state and must be powered off before continuing.

Unattended Start Mode

If Unattended Start Mode is enabled, the system boots from the defined boot device without requiring any input from the user. The keyboard controller is 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 determines 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. To minimize the risk while updating the flash, 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, perform some general clean-up and then reboot 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 is not heard.

Memory Module and L2 cache POST

The firmware RAM POST tests 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 is 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 is 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 also gives 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 performs a Cyclic Redundancy Check (CRC) on the update portion of the flash module. If the check is not good then 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

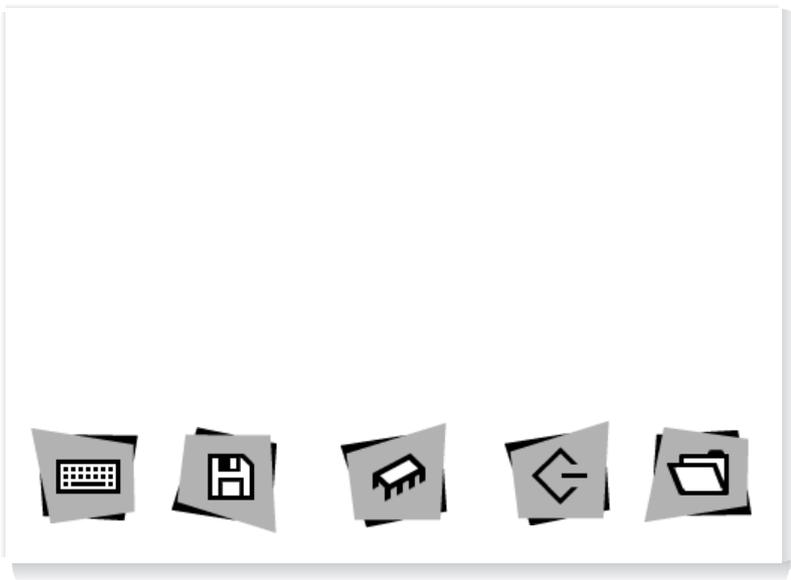
The SCSI POST opens the adapter and runs several test scripts which check and exercise the various functions related to the chips on the SCSI adapter, such as DMA, and simulate mailbox commands. If an error is detected then an 8 digit error code is displayed, and the error is entered in the SMS error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

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

- dsktOK
- memOK
- scsiOK
- bootOK

If the POST does not complete successfully, you will not get an "OK" and an error code will be displayed.

Chapter 7. User Replaceable Hardware

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

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:

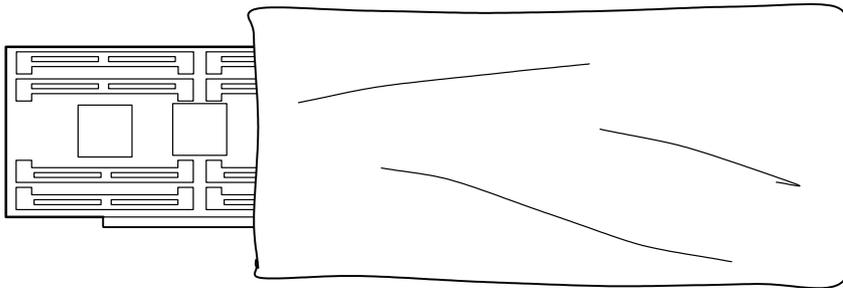
A class 3 laser is contained in the device. Do not operate the drive while it is disassembled. Do not attempt to open the covers of the drive as it is not serviceable and is to be replaced as a unit.

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.

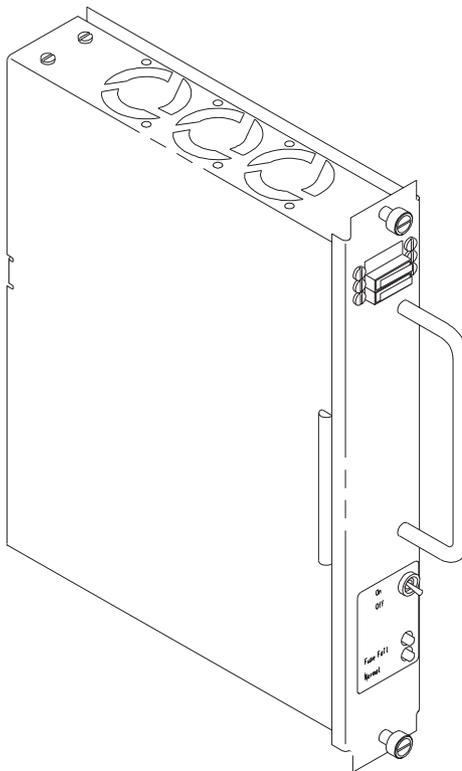
Power Supply Unit (7317 Model F3L)

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 switch "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 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 illuminates.
5. If not already "on," turn system power switch "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.

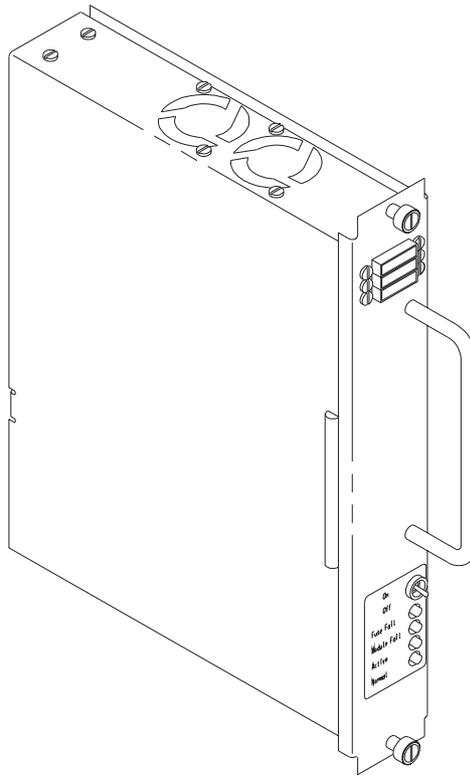
Removal

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 7-3 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 blinks, 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 7-3 and configure the disk drive unit you replaced.

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

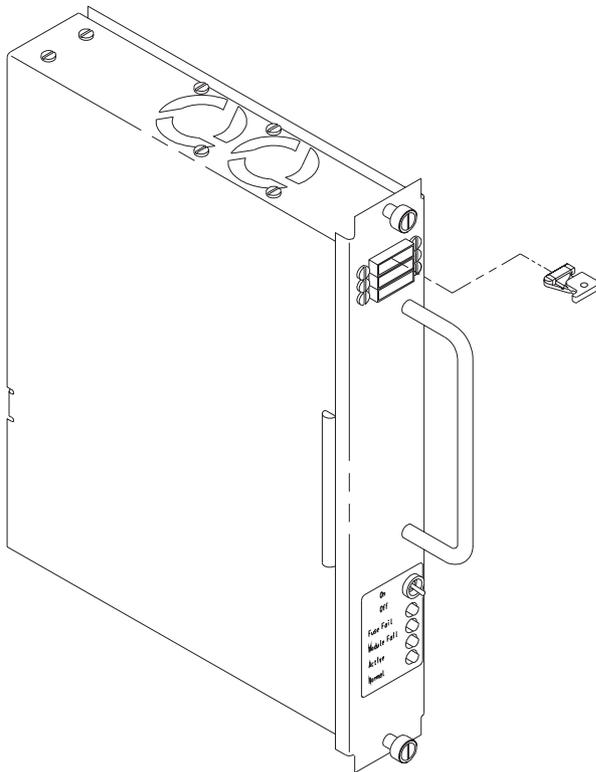
Notes:

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 does 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 only goes in one way.
3. Press fuse in until fully seated. Fuse failure light goes out.

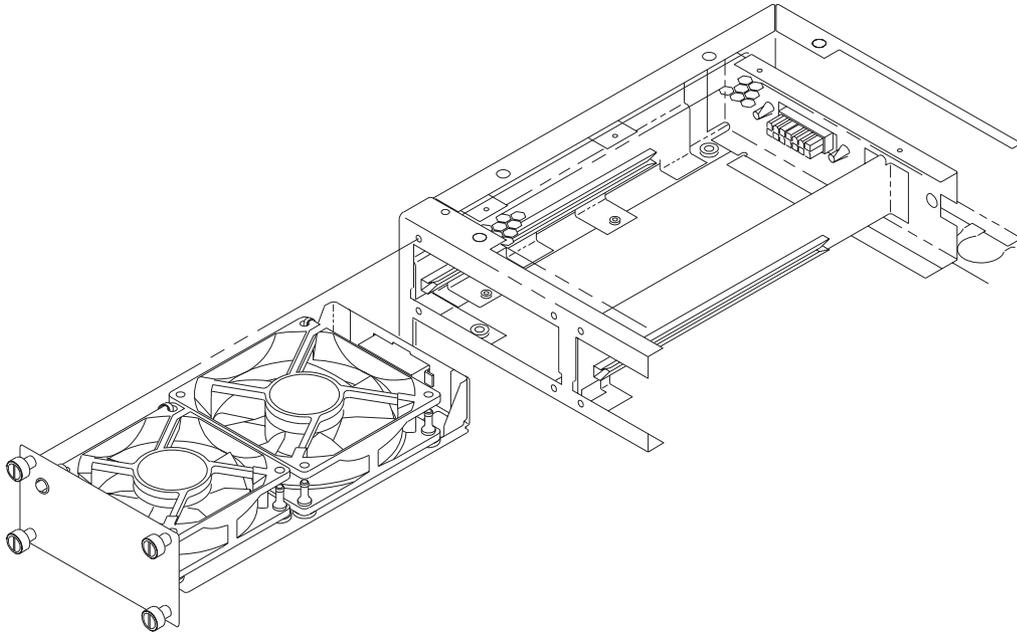
Fan Tray (7317 Model F3L)

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 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. Switch system power switch "off."
2. Unscrew the four thumb screws at the corners of the drive to be removed. Screws 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.

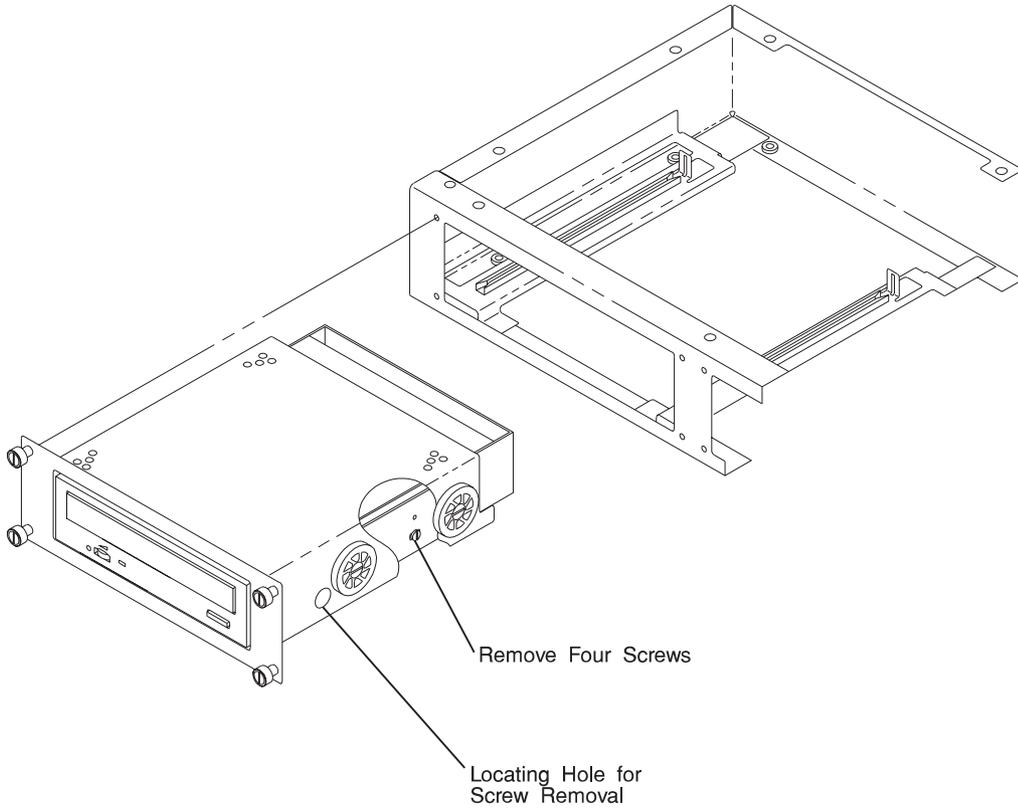
Note: Because clearance holes are provided in the outer bracket to access the four drive mounting screws, it is not necessary to remove the four shoulder screws going through the rubber shock mounts.

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. Switch system power switch "on." Green status light comes on steady.



Battery (7317 Model F3L)

CAUTION:

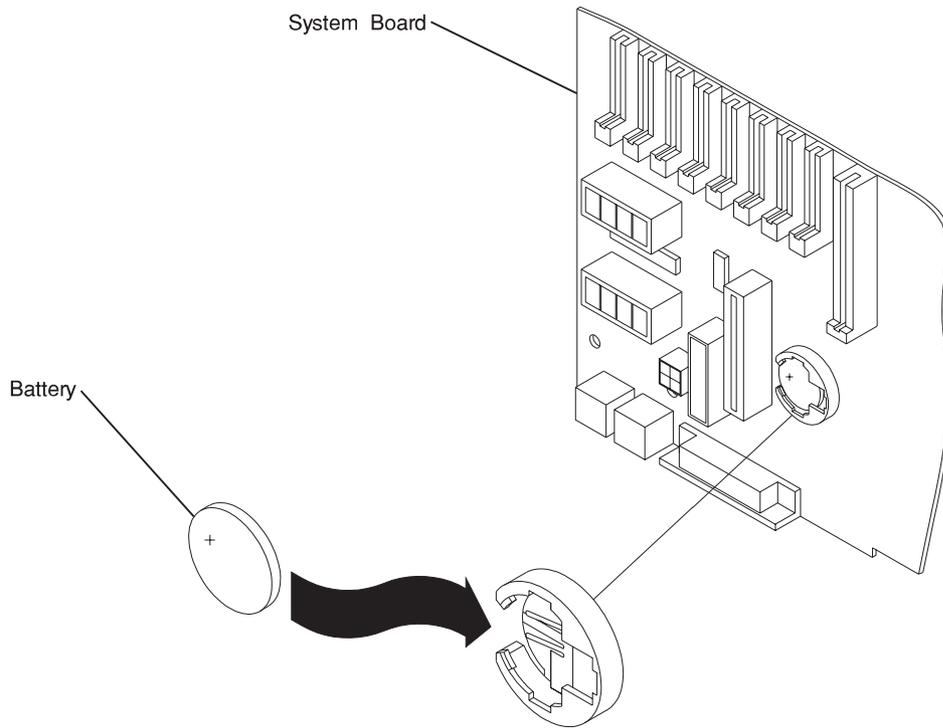
A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another battery 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.

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.

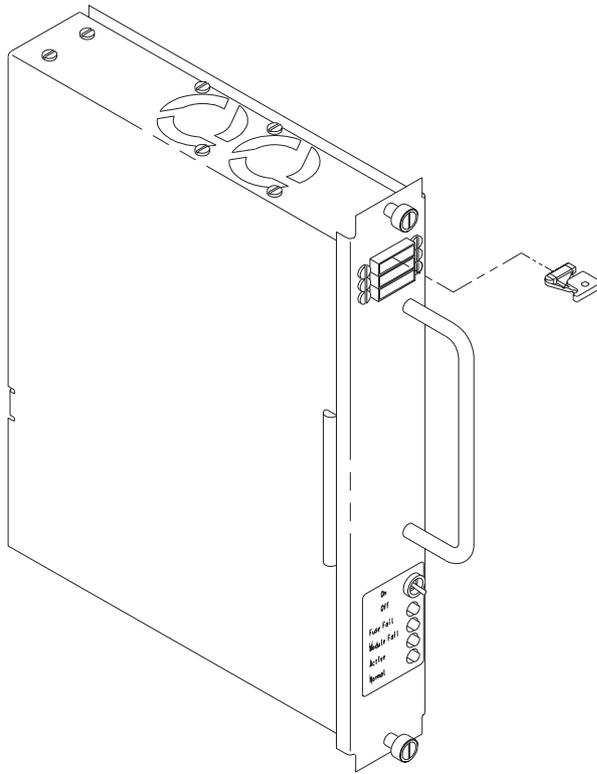
Removal

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. Push the switch on the disk drive unit to be removed downward to its "off" position. The bottom green status light blinks, indicating power is off and the unit is safe to remove.

Note: It is not necessary to turn the system power switch "off."

2. Unscrew the thumb screws at the top and bottom of the disk drive unit.
3. 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.

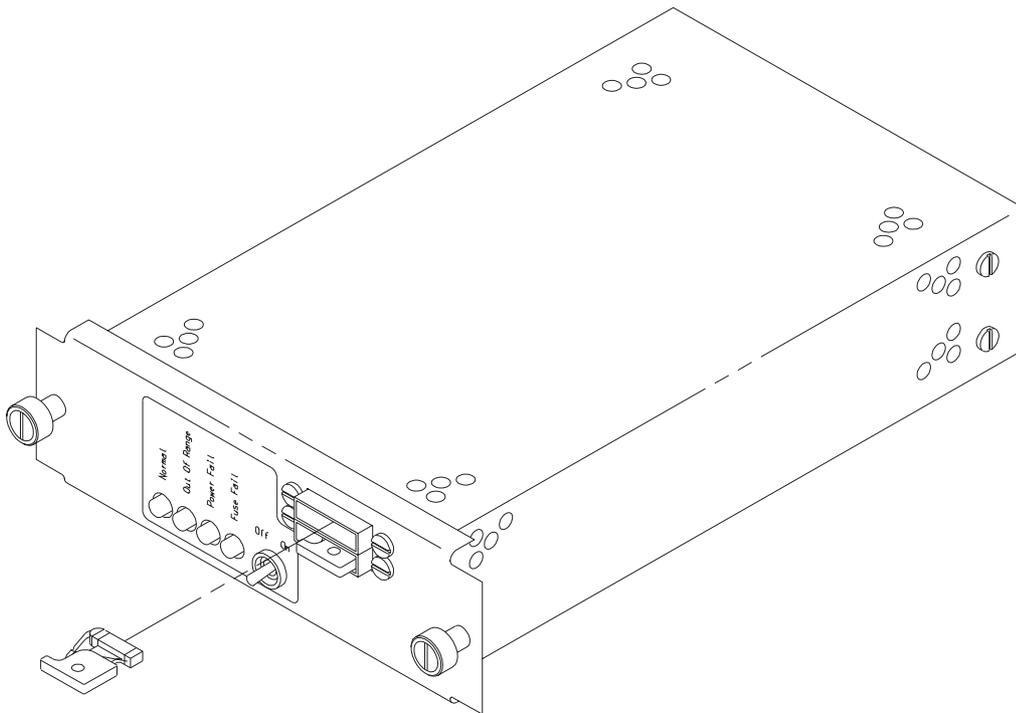
Fuse (Power Supply unit or Disk Drive Unit) (7317 Model D10)

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 does 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 only goes in if the raised plastic boss is facing downward.
3. Press fuse in until fully seated. Fuse failure light goes out.

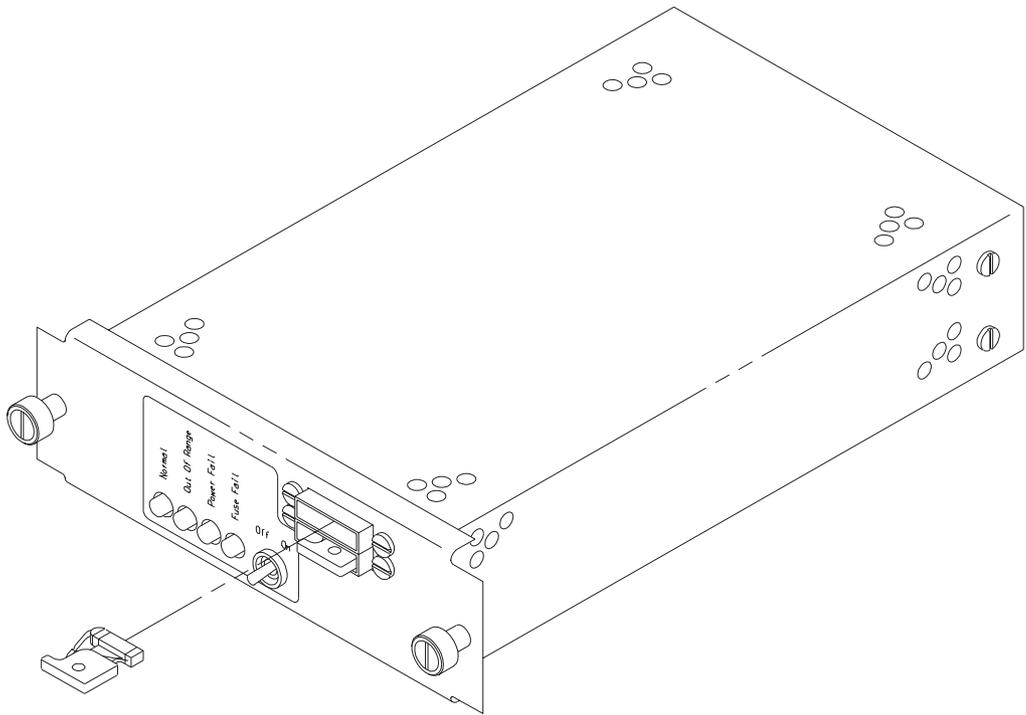
Power Supply Unit (7317 Model D10)

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" (Left) "On" (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 7-3 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 7-3 and configure the disk drive units that are powered by the power supply you replaced.

Chapter 8. Using the Online and Standalone Diagnostics

Sources for the Diagnostics

The diagnostics consist of Standalone Diagnostics and Online Diagnostics. Standalone Diagnostics are packaged on removable media. They must be booted or mounted before they can be run. If booted, they have no access to the AIX Error Log or the AIX Configuration Data. However, if mounted, they have access to the AIX Error Log and the AIX Configuration Data.

Online Diagnostics, when installed, reside with AIX in the file system. They can be booted in single user mode (referred to as service mode), run in maintenance mode (referred to as maintenance mode), or run concurrently (referred to as concurrent mode) with other applications. They have access to the AIX Error Log and the AIX Configuration Data.

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.

Standalone and Online Diagnostics Operating Considerations

The following items identify some things to consider before using the diagnostics.

- Run Online Diagnostics in Service Mode when possible, unless otherwise directed. The Online Diagnostics perform additional functions, compared to Standalone Diagnostics.
- When running Online Diagnostics, device support for some devices may not have been installed. If this is the case, that device does not appear in the resource list.
- When running Standalone Diagnostics, device support for some devices may be contained on supplemental diagnostic media. If this is the case, the device does not appear in the resource list when running diagnostic unless the supplemental media has been processed.
- Support for some TTY terminals is optionally installed. If you attach a TTY terminal to a system to run diagnostics be aware that it may not work properly since the AIX support for the terminal may not be installed.

Selecting a Console Display

When you run Standalone Diagnostics and under some conditions Online Diagnostics, you need to select the console display. The diagnostics display instructions on any graphics display and the terminal attached to the Serial 1 port.

Identifying the Terminal Type to Diagnostics

Note: This is not the same as selecting a console display.

When you run diagnostics, the diagnostics must know what type of terminal you are using. If the terminal type is not known when the FUNCTION SELECTION menu is displayed, the diagnostics do not allow you to continue until a terminal is selected from the DEFINE TERMINAL option menu. Select **lft** for graphical displays.

Undefined Terminal Types

If an undefined terminal type from the DEFINE TERMINAL option menu is entered, the menu prompts the user to enter a valid terminal type, and the menu is redisplayed until either a valid type is entered or the user exits the DEFINE TERMINAL option.

Resetting the Terminal: If the user enters a terminal type that is valid (according to the DEFINE TERMINAL option menu) but is not the correct type for the ASCII terminal being used, difficulty may be encountered in reading the screen, using the function keys or the Enter key. These difficulties can be bypassed by pressing Ctrl-C to reset the terminal. The screen display which results from this resetting action varies with the mode in which the system is being run:

- Online Normal or Maintenance Mode - The command prompt appears.
- Standalone Mode or Online Service Mode -The terminal type is reset to "dumb", the Diagnostic Operating Instruction panel is displayed, and the user is required to go through the DEFINE TERMINAL process again.

Running Standalone Diagnostics

Consider the following when you run Standalone Diagnostics:

- The diagnostic disc must remain in the CD-ROM drive for the entire time that diagnostics are executing.
- The diagnostic CD-ROM disc cannot be ejected from the CD-ROM drive once the diagnostics have loaded. The disc can only be ejected after the system has been turned off and then turned on (standalone mode) or after the diagnostics program has terminated (Online concurrent mode). The disc must be ejected prior to the system attempting to load the diagnostic programs again.
- The CD-ROM drive from which diagnostics were loaded cannot be tested.
- The SCSI adapter (or circuitry) controlling the CD-ROM drive from which diagnostics were loaded cannot be tested.

Running Online Diagnostics

Consider the following when you run the Online Diagnostics from a server or a disk:

- The diagnostics cannot be loaded and run from a disk until the AIX operating system has been installed and configured. After the AIX operating system has been installed, all three modes of operation are available.
- The diagnostics cannot be loaded on a system (client) from a server if that system is not set up to boot from a server over a network, or the server has not been setup to send a service mode IPL of the diagnostics. When the system is set up to IPL from a server, the diagnostics are executed in the same manner as they are from disk.
- If the diagnostics were loaded from disk or a server, you must shutdown the AIX operating system before turning the system unit off to prevent possible damage to disk data. This is done in one of two ways:
 - If the diagnostics were loaded in standalone mode, press the F3 key until DIAGNOSTIC OPERATING INSTRUCTIONS displays; then follow the displayed instructions to shutdown the AIX operating system.
 - If the diagnostics were loaded in maintenance or concurrent mode, enter the shutdown -F command.
- Under some conditions the system may stop, with instructions displayed on attached displays and terminals. Follow the instructions to select a console display.

Running the Diagnostics from a tty Terminal

Consider the following when you run diagnostics using a tty-type terminal as the console display:

- See the operator manual for your type of tty terminal to find the key sequences you need to respond to the diagnostics. For the 3151, refer to the 3151 ASCII Display Station Guide to Operations, form number GA18-2633. For the 3164, refer to the 3164 ASCII Color Display Station Description, form number GA18-2617.
- When the diagnostics present display information through the S1 port, certain attributes are used. These attributes are set as if the diagnostics were using a 3161 display terminal. The following tables list attributes for the 3161 ASCII Display Terminal and for two other ASCII display terminals commonly used with the system.
- If you have a tty terminal other than a 3151, 3161 or 3164 attached to the S1 port, your terminal may have different names for the attributes. Use the attribute descriptions in the following tables to determine the settings for your terminal.

General Attributes Always Required

The following general attributes are the default settings for the diagnostics. Be sure your terminal is set to these attributes.

Note: These attributes should be set before the diagnostics are loaded.

Refer to the following table.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161/3164 Settings	Description
Machine mode	3151	3151 PC	3161 or 3164	The diagnostics are set to emulate use of the 3161 ASCII Display Terminal. If your terminal can emulate a 5085, 3161 or 3164 terminal, use the following attribute settings. Otherwise, refer to your operator's manual, compare the following attribute descriptions with those of your terminal, and set your attributes accordingly.
Generated Code Set		ASCII		
Screen	Normal	Normal		Uses the EIA-232 interface protocol.
Row and filemn	24 x 80	24 x 80		Uses the EIA-232 interface protocol.
Scroll	Jump	Jump	Jump	When the last character on the bottom line is entered, the screen moves down one line.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161/3164 Settings	Description
Auto LF	Off	Off	Off	For the "On" setting, pressing the Return key moves the cursor to the first character position of the next line. For the "Off" setting, pressing the Return key moves the cursor to the first character position of the current line. The CR and LF characters are generated by the New line setting.
CRT saver	Off	Off	10	The "10" setting causes the display screen to go blank if there is no activity for 10 minutes. When the system unit sends data or a key is pressed, the display screen contents are displayed again.
Line wrap	On	On	On	The cursor moves to the first character position of the next line in the page after it reaches the last character position of the current line in the page.
Forcing insert	Off	Off		
Tab	Field	Field	Field	The column tab stops are ignored, and the tab operation depends on the field attribute character positions.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161/3164 Settings	Description
Trace			All	Both inbound data (data to the system unit) and outbound data (data from the system unit) to and from the main port can be transferred to the auxiliary port without disturbing communications with the system unit when the Trace key is pressed.

Additional Communication Attributes

The following communication attributes are for the 3151, 3161, and 3164 terminals.

Communication Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161/ 3164 Settings	Description
Operating mode	Echo	Echo	Echo	Data entered from the keyboard on the terminal is sent to the system unit for translation and then sent back to the display screen. Sometimes called conversational mode.
Line speed	9600 bps	9600 bps	9600 bps	Uses the 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit, and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).
Turnaround character	CR	CR	CR	Selects the carriage return (CR) character as the line turnaround character.
Interface	EIA-232	EIA-232	EIA-232	Uses the EIA-232 interface protocol.
Line control	IPRTS	IPRTS	IPRTS	Uses the permanent request to send' (IPRTS) signal to communicate with system unit.

Communication Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161/ 3164 Settings	Description
Break signal (ms)	500	500	500	The terminal sends a break signal' to the system unit within 500 ms after the Break key is pressed.
Send null suppress	On	On		Trailing null characters are not sent to the system unit.
Send null			On	Trailing null characters are sent to the system unit.
Response delay (ms)	100	100	100	The terminal waits for 100ms for the system unit to respond.

Additional Keyboard Attributes

The following keyboard attributes are for the keyboard attached to the 3151, 3161, and 3164 terminals.

Keyboard Setup Attributes	3151/11/ 31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Enter	Return	Return	Return	The Enter key functions as the Return key.
Return	New line	New line	New line	The cursor moves to the next line when the Return key is pressed.
New line	CR	CR	CR	The Return key generates the carriage return (CR) and the line feed (LF) characters. The line turnaround occurs after the CR and LF characters are generated.
Send	Page	Page	Page	The contents of the current page are sent to the system unit when the Send key is pressed.
Insert character	Space	Space	Space	A blank character is inserted when the Insert key is pressed.

Additional Printer Attributes

The following printer attributes are for a printer attached to the 3151, 3161, and 3164 terminals.

Printer Setup Attributes	3151/11/31/41 Settings	3151/51/61 Settings	3161/3164 Settings	Description
Line speed	9600	9600	9600	Uses 19200 or 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	Even	Even	No	
Stop bit	1	1	1	Places a bit after a data word (byte).
Characters	ALL	ALL		
Line end			CR-LF	
Print			Viewport	
Print EOL			Off	
Print null			Off	

Online Diagnostics Modes of Operation

The Online diagnostics can be run in three modes:

- Service Mode allows checking of most system resources.
- Concurrent Mode allows the normal system functions to continue while selected resources are being checked.
- Maintenance Mode allows checking of most system resources

Service Mode

Service mode provides the most complete checkout of the system resources. This mode also requires that no other programs be running on the system. All system resources except the SCSI adapter, and the disk drives used for paging can be tested. However, note that the memory and processor are only tested during POST.

Error log analysis is done in service mode when you select the Problem Determination option on the DIAGNOSTIC MODE SELECTION menu.

Running the Online Diagnostics in Service Mode

To run Online diagnostics in service mode, take the following steps:

1. Stop all programs including the AIX operating system (get help if needed).
2. Remove all tapes, diskettes, and CD-ROMs.
3. Turn the power off.
4. Turn the power on.
5. After the first POST indicator appears on the system unit's console, press F6 on the directly-attached keyboard or 6 on the tty keyboard to indicate that diagnostics are to be loaded.
Note: The term POST indicator refers to the ICONS (graphic display) or device mnemonics (ASCII terminal) that are displayed while the POST are executing.
6. Enter any requested passwords.
7. Follow any instructions to select a console.
8. After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display.
9. Follow the displayed instructions to checkout the desired resources.
10. When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.

11. Press the F3 key (from a defined terminal) or press 99 (for an undefined terminal) to shutdown the diagnostics before turning off the system unit.

Note: Pressing the F3 key (from a defined terminal) produces a “Confirm Exit” popup menu which offers two options: continuing with the shutdown by pressing F3; or returning to diagnostics by pressing Enter.

For undefined terminals, pressing 99 produces a full screen menu which offers two options: continuing with the shutdown by pressing 99 and then Enter; or returning to diagnostics by pressing Enter.

Concurrent Mode

Concurrent mode provides a way to run Online diagnostics on some of the system resources while the system is running normal system activity.

Because the system is running in normal operation, some of the resources cannot be tested in concurrent mode. The following resources cannot be tested in concurrent mode:

- SCSI adapters connected to paging devices
- The disk drive used for paging
- Some display adapters
- Memory
- Processor.

There are three levels of testing in concurrent mode:

- The **share-test level** tests a resource while the resource is being shared by programs running in the normal operation. This testing is mostly limited to normal commands that test for the presence of a device or adapter.
- The **sub-test level** tests a portion of a resource while the remaining part of the resource is being used in normal operation. For example, this test could test one port of a multiport device while the other ports are being used in normal operation.
- The **full-test level** requires the device not be assigned to or used by any other operation. This level of testing on a disk drive may require the use of the **varyoff** command. The diagnostics display menus to allow you to vary off the needed resource.

Error log analysis is done in concurrent mode when you select the Problem Determination option on the DIAGNOSTIC MODE SELECTION menu.

To run the Online diagnostics in concurrent mode you must be logged onto the AIX operating system and have proper authority to issue the commands (if needed, get help).

The **diag** command loads the diagnostic controller and displays the Online diagnostic menus.

Running the Online Diagnostics in Concurrent Mode

To run Online diagnostics in concurrent mode, take the following steps:

- Log on to the AIX operating system as root or superuser.
- Enter the **diag** command.
- When the DIAGNOSTIC OPERATING INSTRUCTIONS are displayed, follow the instructions to check out the desired resources.
- When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS. Then press the F3 key again to return to the AIX operating system prompt. Be sure to vary on any resource you had varied to off.
- Press the Ctrl-D key sequence to log off from root or superuser.

Maintenance Mode

Maintenance mode runs the Online diagnostics using the customer's version of the AIX operating system. This mode requires that all activity on the AIX operating system be stopped so the Online diagnostics have most of the resources available to check. All of the system resources except the SCSI adapters, memory, processor, and the disk drive used for paging can be checked.

Error log analysis is done in maintenance mode when you select the Problem Determination option on the DIAGNOSTIC MODE SELECTION menu.

The **shutdown -m** command is used to stop all activity on the AIX operating system and put the AIX operating system into maintenance mode. Then the **diag** command is used to invoke the diagnostic controller so you can run the diagnostics. After the diagnostic controller is loaded, follow the normal diagnostic instructions.

Running the Online Diagnostics in Maintenance Mode

To run the Online diagnostics in maintenance mode you must be logged on to the customer's version of the AIX operating system as *root* or *superuser* and use the **shutdown -m** and **diag** commands. Use the following steps to run the Online diagnostics in maintenance mode:

1. Stop all programs except the AIX operating system (get help if needed).
2. Log onto the AIX operating system as *root* or *superuser*.
3. Enter the **shutdown -m** command.
4. When a message indicates the system is in maintenance mode, enter the **diag** command.
Note: It may be necessary to set *TERM* type again.
5. When DIAGNOSTIC OPERATING INSTRUCTIONS is displayed, follow the displayed instructions to checkout the desired resources.
6. When testing is complete; use the F3 key to return to DIAGNOSTIC OPERATING INSTRUCTIONS. Then press the F3 key again to return to the AIX operating system prompt.
7. Press Ctrl-D to log off from *root* or *superuser*.

Standalone Diagnostic Operation

Standalone Diagnostics provide a method to test the system when the Online Diagnostics are not installed and a method of testing the disk drives that cannot be tested by the Online Diagnostics.

No Error Log Analysis is done by the Standalone Diagnostics.

If running from CD-ROM, the CD-ROM drive and the SCSI controller that controls it cannot be tested by the Standalone Diagnostics.

Running the Standalone Diagnostics

To run Standalone diagnostics in service mode, take the following steps:

1. Stop all programs including the AIX operating system (get help if needed).
2. Remove all tapes, diskettes, and CD-ROMs.
3. Insert the Diagnostic CD-ROM into the CD-ROM drive.
4. Turn the system unit's power off.
5. Set the key mode switch to the service position.
6. Turn the system unit's power on.
7. Insert the diagnostic media into the drive.
8. When the keyboard POST indicator appears, press F5 on the direct attached keyboard or 5 on the tty keyboard.

9. Enter any requested passwords.
10. Follow any instructions to select a console.
11. After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display.
12. Follow the displayed instructions to checkout the desired resources.
13. When testing is complete; use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.

General Information About Multiple Systems

This chapter presents guideline information for anyone needing to run the diagnostic programs on a system unit that is attached to another system. These guidelines are intended for both the operator of the system and the service representative.

This guideline is presented by adapter type or by system configuration type.

These considerations and actions are not detailed step-by-step instructions, but are used to ensure that you have considered the attached system before you run diagnostics on this system unit.

You are directed to the detailed procedures for the various activities as needed.

These guidelines generally present considerations for the following:

- Starting and stopping the communications with the other system.
- Considerations before running diagnostics on the system.
- Analyzing the error log information.
- Using the wrap plugs with the diagnostics.

When this system unit is attached to another system, be sure you isolate this system unit before stopping the operating system or running diagnostic programs. Some system cabling changes (such as installing wrap plugs or removing a device from the configuration) may require action by the operator of the attached system before making the cabling changes on this system.

High-Availability SCSI

A high-availability SCSI configuration consists of two system units or CPU drawers connected to a common set of SCSI devices. The configuration provides high-availability because either system unit or CPU drawer can continue to access the common devices while the other system is unavailable.

The actions needed to isolate a particular system unit or device from the configuration depends on the software controlling the systems and devices. Therefore, be sure you use the documentation with the software to prepare the configuration before turning a system unit or device off.

High-Availability Cabling

Refer to *RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems*. additional cabling information

Diagnostic Summary

Memory and Processor Testing

- Memory and Fixed-Point Processors are only tested during POST.
- A complete memory test is run during POST.
- The POST only halts and report problems that prevent the system from booting.
- All other problems are logged into Residual Data and are only analyzed and reported if the Base System or Memory Diagnostic is run.
- The Base System Diagnostic also tests the Floating Point Processor.

Residual Data Analysis

Residual Data is only analyzed if the Base System or Memory Diagnostic is run.

- Residual Data Analysis report problems that are logged by ROS (firmware) during boot.

Error Log Analysis

- Error Log Analysis is analysis of the AIX Error Log.
- Error Log Analysis is part of the diagnostic applications and is invoked by selecting a device form the DIAGNOSTIC SELECTION menu, by using the **diag** command, or selecting the Run Error Log Analysis task.
- Error Log Analysis is only preformed when running online diagnostics.

- Error Log Analysis is NOT performed when running from removable media except for mounted CD-ROM.
- Error Log Analysis only reports problems if the errors have reached defined thresholds. Thresholds can be from 1 to 100 depending upon the error.
- Permanent errors do not necessarily mean a part should be replaced.
- Automatic Error Log Analysis (diagela) provides the capability to do error log analysis whenever a permanent hardware error is logged.

Diagnostic Modes: The Diagnostic Modes consist of Problem Determination Mode and System Verification Mode. The only difference between the two modes is one performs ELA and the other does not.

- Problem Determination Mode runs all tests unless the resource is being used. If a problem is not found, then Error Log Analysis is performed.
- In Problem Determination Mode, Error Log Analysis is performed even if a resource is being used.
- A screen always appears informing the user that the resource needs to be freed if a resource is being used.
- System Verification Mode does not do ELA. This mode should be run when doing a repair verification.
- Residual Data Analysis is done in either mode.

4.2 Diagnostic Changes

Tasks are operations that can be performed on a resource. Running Diagnostics, Displaying VPD, or Formatting a Device, are examples of tasks. Service Aid functionality should also be considered a task.

Resources are devices used by the system unit. Diskette Drive, and CD ROM Drive are examples of resources.

The FUNCTION SELECTION menu was enhanced with two new selections allowing either all resources, or all tasks to be displayed. When Task Selection is made and a task has been selected a list of supporting resources are displayed. Alternatively, when Resource Selection is made, and a resource or group of resources are selected, a list of supporting common tasks are displayed. Also, to aid with backward compatibility the FUNCTION SELECTION menu contains 'Diagnostic' and 'Advanced Diagnostic'.

The 'Display or Change Diagnostic Run Time Options' task can be used to set advanced mode diagnostics, looping capability, and ELA mode when running diagnostics from the Task Selection menu.

The following sections describe the 4.2 Diagnostic Subsystem.

diag Command Line Options:

COMMAND LINE OPTIONS:

diag Command line flags are as follows:

- a Perform missing device analysis.
- c Machine is unattended. No prompts should be displayed.
- d resource Test the named resource.
The "resource" parameter is the /dev entry.
- e Error Log Analysis.
Checks the error log for device specified in "resource" of the -d option.
- s Test the system.
- A Advanced Diagnostics
- B Base system test
- S Test the Test Suite Group
- v System Verification mode.
 - 1 - Base system
 - 2 - I/O Devices
 - 3 - Async Devices
 - 4 - Graphics Devices
 - 5 - SCSI Devices
 - 6 - Storage Devices
 - 7 - Commo Devices
 - 8 - Multimedia Devices

Entering `diag -h` from the command line prints out an appropriate usage statement.

Default execution mode is non-advanced mode.

Location Codes

The basic format of the system unit's location code is:

AB-CD-EF-GH	non-SCSI
G,H	SCSI

For planars, cards, and non-SCSI devices the location code is defined as:

AB-CD-EF-GH	
	Device/FRU/Port ID
	Connector ID
	Slot or Adapter Number
	Bus Type

AB identifies a bus type, CD identifies a slot or adapter number, EF a connector identifier, and GH is a port identifier, address, memory module, device, or FRU. Adapters/cards are identified with just AB-CD.

The possible values for AB are as follows:

00	for processor bus
01	for ISA buses
04	for PCI buses
05	for PCMCIA buses (not supported)

The possible values for CD depend on the adapter or card. For pluggable adapters/cards this is a two digit slot number in the range from 01 to 99. However, in the case of ISA cards these numbers do not actually correspond to the physical slot numbers. They are simply based on the order the ISA cards are defined/configured either by SMIT or the ISA Adapter Configuration Service Aid.

For integrated adapters the first character in CD is a letter in the range from A to Z. This letter is based on the order that the integrated adapters are defined in residual data and ensures unique location codes for the integrated adapters. The D is set to 0.

EF is the Connector ID. It is used to identify the adapter connector that a resource is attached too.

GH is a port identifier, address, memory module, device, or FRU. It identifies a port, device, or a FRU. GH has several meanings depending upon the resource type. They are:

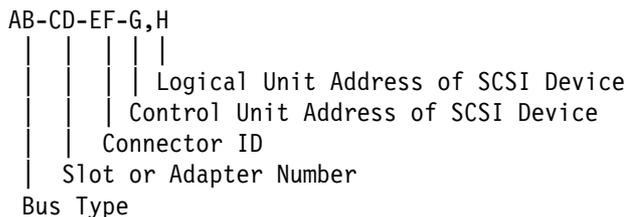
- For memory cards GH defines a memory module. Values for GH are 1 through 16.

For systems that have memory modules that plug directly into the system planar the location code is 00-00-00-GH where GH is the memory module slot. For system that have memory cards with memory modules, the location code is 00-CD-EF-GH where CD is the card slot and GH is the memory module slot.

- For caches GH defines the cache. Values for GH are 01 through 16.
- For PCMIAs GH defines the PCMIA. Values for GH are 01 through 16.
- For async devices GH defines the port on the fanout box. Values are 00 to 15.
- For a diskette drive H defines which diskette drive 1 or 2. G is always 0.
- For all other devices GH is equal to 00.

For integrated adapters, EF-GH is the same as the definition for a pluggable adapter. For example, the location code for a diskette drive is 01-A0-00-00.

For SCSI the Location Code is defined as:



Where AB-CD-EF are the same as non-SCSI devices.

G defines the control unit address of the device. Values of 0 to 15 are valid.

H defines the logical unit address of the device. Values of 0 to 255 are valid.

Examples:

Processor-PCI bus

00-00 PCI bus

Memory module in system planar

00-00-00-01

Memory module in card

00-0A-00-01

Integrated PCI adapters for

04-A0 ISA bus (Integrated PCI-ISA bridge)

04-B0 Secondary PCI bus (Integrated PCI-PCI bridge)

04-C0 Integrated PCI SCSI controller

Non-integrated PCI adapters

04-01 Any PCI card in slot 1

04-02 Any PCI card in slot 2

Integrated ISA adapters

01-A0 Diskette adapter

01-B0 Parallel port adapter

01-C0 Serial port 1 adapter

01-D0 Serial port 2 adapter

01-E0 Keyboard adapter

01-F0 Mouse adapter

Non-integrated ISA adapters

01-01 First ISA card defined/configured

01-02 Second ISA card defined/configured

01-03 Third ISA card defined/configured

01-04 Fourth ISA card defined/configured

Device attached to SCSI controller

04-C0-01-4,0 Device attached to Integrated PCI SCSI controller

Chapter 9. Introduction to Tasks and Service Aids

The AIX Diagnostic Package contains programs that are referred to as either Tasks or Service Aids. These programs are accessed differently depending on the level of AIX diagnostics installed. If you are running AIX Diagnostics version 4.2 or later, the programs are called Tasks. Tasks perform a given function; while service aids act as a subset of the chosen task.

To perform a Task, use the following from the Function Selection Menu:

- Task Selection (Diagnostics, Advanced Diagnostics, Service Aids, etc).

This selection lists the tasks supported by these procedures. Once a task is selected, a resource menu may be presented showing all resources supported by the task.

If you are running AIX Diagnostics prior to and including version 4.1.x, the programs are called Service Aids.

To perform a Service Aid, use the following from the Function Selection Menu:

- Service Aids

This selection looks at the machine configuration, exercises external interfaces, formats media, looks at past diagnostic results, controls what resources are tested, checks out media, etc.

Tasks

Service Aids are invoked via a task selection from the following list:

Note:

- Add or Delete Drawer Configuration
- Add Resource to Resource List
- AIX Shell Prompt
- Backup and Restore Media
- Change Hardware Vital Product Data
- Check Spare Sectors Service
- Configure Dials and LPFKeys
- Configure ISA Adapters
- Configure Ring Indicate Power On

- Configure Service Processor
- Create Customized Diagnostic Configuration Diskette
- Delete Resource from Resource List
- Disk Maintenance
- Disk Media
- Display/Alter Bootlist
- Display Configuration and Resource List
- Display Hardware Error Report
- Display Hardware Vital Product Data
- Display Machine Check Error Log
- Display or Change Diagnostic Run Time Options
- Display Previous Diagnostic Results
- Display Resource Attributes
- Display Service Hints
- Display Software Product Data
- Display Test Patterns
- Generic Microcode Download
- Local Area Network Analyzer
- Microcode Download
- Periodic Diagnostics
- PCI RAID Physical Disk Identify
- Process Supplemental Media
- Run Diagnostics
- Run Error Log Analysis
- SCSI Bus Analyzer
- SCSI Device Identification and Removal
- SCSI Tape Utility
- SSA Service Aid
- Update Disk Based Diagnostics
- 7135 RAIDiant Array Service Aids

- 7318 Serial Communication Network Server

AIX Shell Prompt Service Aid

This service aid allows access to the AIX command line. In order to use this service aid the user must know the root password (when a root password has been established).

Backup/Restore Media Service Aid

This service aid allows verification of backup media and devices. It presents a menu of tape and diskette devices available for testing and prompts for selection of the desired device. It then presents a menu of available backup formats and prompts for selection of the desired format. The supported formats are tar, backup, and cpio. After the device and format are selected, the service aid backs up a known file to the selected device, restores that file to /tmp, and compares the original file to the restored file. The restored file is also left in /tmp to allow for visual comparison. All errors are reported.

Configure Ring Indicate Power On Service Aid

This service aid allows the user to display and change the NVRAM settings for the Ring Indicate Power On capability of the service processor.

The settings allows the user to:

- Enable/Disable power on from Ring Indicate
- Read/Set the number of rings before power on

Configure Service Processor Service Aid

This service aid allows you to display and change the NVRAM settings for the service processor.

Enter one of the following service aids:

- Surveillance Setup
- Modem Configuration
- Call In/Call Out Setup
- Site Specific Call In/Call Out Setup

Surveillance Setup Service Aid

This service aid allows you to display and change the NVRAM settings for the surveillance capability of the service processor.

The settings allow you to:

- Enable/disable surveillance
- Set the surveillance time interval, in minutes
- Set the surveillance delay, in minutes

The current settings are read from NVRAM and displayed on the screen. Any changes made to the data shown are written to NVRAM.

Modem Configuration Service Aid

Use this service aid when setting the NVRAM for a modem attached to any of the Service Processor's serial ports. The user inputs the file name of a modem configuration file and the serial port number. The formatted modem configuration file is read, converted for NVRAM then loaded into NVRAM. Refer to the "Service Processor Installation and User's Guide" for more information.

Call In/Out Setup Support Service Aid

This service aid allows the user to display and change the NVRAM settings for the Call In/Call Out capability of the service processor.

The settings allows the user to:

- Enable/Disable call in on either serial port.
- Enable/Disable call out on either serial port.
- Set the line speed on either serial port.

Site Specific Call In/Out Setup Support Service Aid

This service aid allows you to display and change the NVRAM settings that are site specific for the call in/call out capability of the service processor.

The site specific NVRAM settings allow you to:

- Set the phone number for the service center
- Set the phone number for the customer administration center
- Set the phone number for a digital pager

- Set the phone number for the customer system to call in
- Set the phone number for the customer voice phone
- Set the customer account number
- Set the call out policy
- Set the customer RETAIN id
- Set the customer RETAIN password
- Set the remote timeout value
- Set the remote latency value
- Set the number of retries while busy
- Set the system name

The current settings are read from NVRAM and displayed on the screen. Any changes made to the data shown are written to NVRAM.

Create Customized Diagnostic Configuration Diskette

This service aid provides a means of creating a diagnostic diskette from the diagnostics on the disk. This service aid is only supported on version 2.x.

Diagnostic Package Utility Service Aid

The Diagnostic Package Utility Service Aid allows the user to perform the following actions:

- Format a 1, 2, or 4MB diskette

This function was moved to the Format Media Task at version 4.2.

- Create a Standalone Diagnostic Package Configuration Diskette

The Standalone Diagnostic Package Configuration Diskette allows the following to be changed from the console:

- Default refresh rate for a LFT

The refresh rate used by the standalone diagnostic package is 60Hz. If the display's refresh rate is 77Hz, then set the refresh rate to 77.

- Different async terminal console

A console configuration file that allows a terminal attached to any RS232 or RS422 adapter to be selected as a console device can be created using this

service aid. The default device is a RS232 tty attached to the first standard serial port (S1).

Dials and LPFK Configuration Service Aid

This service aid provides a tool for configuring and removing dials/LPFKs to the standard serial ports.

Since version 4.1.3 a tty must be defined on the async port before the Dials and LPFKs can be configured on the port. Before version 4.2 the Dials and LPFKs could only be configured on the standard serial ports. At version 4.2 the Dials and LPFKs can be configured on any async port.

Dials and LPFKs Configuration Service Aid Before version 4.2

The Dials and LPFKs Configuration Service Aid provides a tool for configuring and removing dials/LPFKs to the standard serial ports.

Configure Dials and LPFKs Task Version 4.2+

The Dials and LPFKs can be configured on any async port. A tty must be in the available state on the async port before the Dials and LPFKs can be configured on the port. The task allows an async adapter to be configured, then a tty port defined on the adapter, and then Dials and LPFKs can be defined on the port.

Disk Based Diagnostic Update Service Aid and Update Disk Based Diagnostic Task

This service aid allows fixes (APARs) to be applied.

Disk Based Diagnostic Update Service Aid Before Version 4.2

Prior to version 4.2 this service aid is used to update the diagnostics on the disk drive. The updates may be new diagnostics or an update to the existing diagnostics. It uses the **installp** command to do this.

Update Disk Based Diagnostic Task Version 4.2

Beginning with version 4.2 this service aid is replaced by the Update Disk Based Diagnostics task. The task invokes the SMIT Update Software by Fix (APAR) task. The task allows the input device and APARs to be selected. Any APAR can be installed using this task.

Disk Media Service Aids

This service aid consists of a Format, Certify, and Erase service aid for each type of hard disk supported, and Optical Disk service aid for supported optical disks.

- Certify

Certify reads all of the ID and data fields. It checks for bad data and counts all errors encountered. If more than 10 hard data errors or more than 1 hard equipment error is found, the user is prompted to replace the drive. One or less recovered data errors per megabyte is normal. More than one recoverable data error per megabyte indicates that the disk should be formatted and certified. Disk errors are not logged during certify.

- Format

Format writes all the disk. The pattern put on the disk is device dependent, i.e. some drives may put all 0s, while some may put hexadecimal number 5F. No bad block reassignment occurs

- Format and Certify

Format and Certify does the same as format does. After the Format is completed, Certify is run. This Certify reassigns all bad blocks encountered.

- Erase Disk

This option can be used to overwrite (remove) all data currently stored in user-accessible blocks of the disk. The Erase Disk option writes one or more patterns to the disk. An additional option allows data in a selectable block to be read and displayed on the system console.

To use the Erase Disk option, specify the number (0-3) of patterns to be written. Select the patterns to be written; the patterns are written serially. That is, the first pattern is written to all blocks. Then the next pattern is written to all blocks, overlaying the previous pattern. A random pattern is written by selecting the "Write random pattern?" option.

The Erase Disk service aid has not been certified as meeting the Department of Defense or any other organizations security guidelines. The following steps should be followed if the data on the drive is to be overwritten:

1. Run the "Erase Disk" Service Aid to overwrite the data on the drive.
2. Do a format without certify.
3. Run a second pass of the erase service aid.

For a newly installed drive, you can insure that all blocks on the drive are overwritten with your pattern if you use the following procedure:

1. Format the drive.
2. Check the defect map by running the Erase Disk Service Aid.
Note: If you use the "Format and Certify" option, there may be some blocks which get placed into the grown defect map.
3. If there are bad blocks in the defect map, record the information presented and ensure that this information is kept with the drive. This data is used later when the drive is to be overwritten.
4. Use the drive as you would normally.
5. When the drive is no longer needed and is to be erased, run the same version of the Erase Disk Service Aid which was used in step 2.
Note: Using the same version of the service aid is only critical if there were any bad blocks found in step 3.
6. Compare the bad blocks which were recorded with the drive in step 3 with those which now appear in the grown defect map.
Note: If there are differences between the saved data and the newly obtained data, then all of the sectors on this drive cannot be overwritten. The new bad blocks are not overwritten.
7. If the bad block list is the same, continue running the service aid to overwrite the disk with the chosen pattern(s).

Before version 4.2 the Disk Media Service Aid is entered via the Disk Media selection from the Service Aid Selection Menu. At version 4.2+ the Disk Media service aid is entered via the Format Media or Certify Media options from the Task Selection Menu.

Optical Disk Service Aids

The Optical Disk Service Aids consist of Initialize, Format and Certify, and Spare Sector Availability service aids.

- Initialize

This service aid is used to format the optical disk without certifying it. This option does not reassign the defective sectors; however, it is a quick way of formatting after cleaning the disk.

- Format and Certify

This service aid is used to format the optical disk and certify it. The certification process is drive specific and performs the surface analysis of all user data and spare sectors. The defective sectors are reassigned.

- Spare Sector Availability

This service aid checks the number of spare sectors available on the optical disk. The spare sectors are used to reassign when defective sectors are encountered during normal usage or during a format and certify operation. Low availability of spare sectors indicates that the disk needs to be backed up and replaced. Formatting the disk does not improve the availability of spare sectors.

Disk Maintenance Service Aid

- Disk to Disk Copy Service Aid
- Display/Alter Sector Service Aid

Disk to Disk Copy Service Aid

The service aid allows you to recover data from an old drive when replacing it with a new drive. The service aid only supports copying from a drive to another drive of similar size. This service aid cannot be used to update to a different size drive. The **migratepv** command should be used when updating drives. The service aid recovers all LVM software reassigned blocks. To prevent corrupted data from being copied to the new drive, the service aid aborts if an unrecoverable read error is detected. To help prevent possible problems with the new drive, the service aid aborts if the number of bad blocks being reassigned reaches a threshold.

The procedure for using this service aid requires that both the old and new disks be installed in or attached to the system with unique SCSI addresses. This requires that the new disk drive SCSI address must be set to an address that is not currently in used and the drive be installed in an empty location. If there are no empty locations, then one of the other drives has to be removed. Once the copy is complete, only one drive may remain installed. Either remove the target drive to return to the original configuration, or perform the following procedure to complete the replacement of the old drive with the new drive.

1. Remove both drives.
2. Set the SCSI address of the new drive to the SCSI address of the old drive.
3. Install the new drive in the old drive's location.
4. Install any other drives that were removed into their original location.

To prevent problems that may occur when running this service aid from disk, it is suggested that this service aid be run from the diagnostics that are loaded from removable media when possible.

Display/Alter Sector Service Aid

This service aid allows the user to display and alter information on a disk sector. Care must be used when using this service aid because inappropriate modification to some disk sectors may result in total loss of all data on the disk. Sectors are addressed by their decimal sector number. Data is displayed both in hex and in ASCII. To prevent corrupted data from being incorrectly corrected, the service aid does not display information that cannot be read correctly.

Diskette Media Service Aid

This service aid provides a way to verify the data written on a diskette. When this service aid is selected, a menu asks you to select the type of diskette being verified. The program then reads all of the ID and data fields on the diskette one time and displays the total number of bad sectors found. Diskette format support was added in version 4.2.

Prior to version 4.2 the Diskette Media Service Aid was entered via the Diskette Media selection from the Service Aid Selection Menu. At version 4.2 and later the Diskette Media Service Aid is entered via the Format Media or Certify Media options from the Task Selection Menu.

Display/Alter Bootlist Service Aid

This service aid allows the bootlists to be displayed, altered, or erased.

The system attempts to perform an IPL from the first device in the list. If the device is not a valid IPL device or if the IPL fails, the system proceeds in turn to the other devices in the list to attempt an IPL.

Display or Change Configuration or Vital Product Data (VPD) Service Aid

This service aid allows the user to display, change configuration, data and vital product data (VPD).

Prior to version 4.2 this service aid was entered via the Service Aid Selection Menu. From version 4.2 on, this service aid is entered via the Task Selection Menu.

The following are the task selections which appear on the Task Selection Menu:

- Display Configuration and Resource List
- Display Hardware Vital Product Data
- Change Hardware Vital Product Data
- Add or Delete Drawer configuration

Display Vital Product Data (VPD) Service Aid and Display Hardware Vital Product Data Task

This service aid displays all installed resources along with any VPD for those

resources. Use this service aid when you want to look at the VPD for a specific resource.

Display Software Product Data Prior to Version 4.2

This service aid displays information about the installed software.

Display Software Product Data beginning with Version 4.2

This service aid displays information about the installed software and provides the following functions:

- List Installed Software
- List Applied but Not Committed Software Updates
- Show Software Installation History
- Show Fix (APAR) Installation Status
- List Fileset Requisites
- List Fileset Dependents
- List Files Included in a Fileset
- List File Owner by Fileset

Display Configuration Service Aid and Display Configuration and Resource List Task

This service aid displays the item header only for all installed resources. Use this service aid when there is no need of seeing the VPD. (No VPD is displayed.)

Change Hardware Vital Product Data Task

Use this service aid to display the Display/Alter VPD Selection Menu. The menu lists all resources installed on the system. When a resource is selected a menu is displayed that lists all the VPD for that resource.

Note: The user cannot alter the VPD for a specific resource unless it is not machine readable.

Add Resource to Resource List Task

Use this task to add resources back to the resource list.

Delete Resource from Resource List Task

Use this task to delete resources from the resource list.

Change Configuration Service Aid and Add or Delete Drawer Configuration Task

Use this service aid to add or delete features to the system configuration.

Note: Drawers are the only features that can be added or deleted.

Add or Delete Drawer Configuration Task

This task provides the following options:

- List all Drawers
- Add a Drawer
- Remove a Drawer

The supported drawer types are:

- Media SCSI Device Drawer
- DASD SCSI DASD Drawer

Display and Change Diagnostic Test List Service Aid

Note: Beginning with version 4.2 this service aid is no longer supported. The Display Configuration and Resource List, Add Resource to Resource List, and Delete Resource from Resource List Tasks have replaced it.

This service aid provides a way to:

- Display the Diagnostic Test List

This selection lists all of the resources tested by the diagnostics.

- Add a resource to the Diagnostic Test List

This selection allows resources to be added back to the Diagnostic Test List. The Diagnostic Test List Menu lists all resources that can be added back to the Diagnostic Test List.

Note: Only resources that were previously detected by the diagnostics and deleted from the Diagnostic Test List is listed. If no resources are available to be added, then none are listed.

- Delete a resource from the Diagnostic Test List

This selection allows resources to be deleted from the Diagnostic Test List. The Diagnostic Test List Menu lists all resources that can be deleted from the Diagnostic Test List.

Note: Only resources that were previously detected by the diagnostics and have not been deleted from the Diagnostic Test List are listed. If no resources are available to be deleted, then none are listed.

Display Machine Check Error Log Service Aid

Note: The Machine Check Error Log Service Aid is available only on Standalone Diagnostics.

When a machine check occurs, information is collected and logged in a NVRAM error log before the system unit shuts down. This information is logged in the AIX error log and cleared from NVRAM when the system is rebooted from either hard disk or LAN. The information is not cleared when booting from Standalone Diagnostics. When booting from Standalone Diagnostics, this service aid can take the logged information and turn it into a readable format that can be used to isolate the problem. When booting from the hard disk or LAN, the information can be viewed from the AIX error log using the Hardware Error Report Service Aid. In either case the information is analyzed when running the `sysplanar0` diagnostics in Problem Determination Mode.

Display Previous Diagnostic Results Service Aid

Note: This service aid is not available when you load the diagnostics from a source other than a disk drive or from a network.

Each time the diagnostics produce a service request number (SRN) to report a problem, information about that problem is logged. The service representative can look at this log to see which SRNs are recorded. This log also records the results of diagnostic tests that are run in loop mode.

When this service aid is selected, information on the last problem logged is displayed. The Page Down and Page Up keys can be used to look at information about previous problems.

This information is *not* from the error log maintained by the AIX operating system. This information is stored in the **/etc/lpp/diagnostics/data/*.dat** file.

Display Resource Attributes

This task displays the Customized Device Attributes associated with a selected resource. This task is similar to running the **lsattr -E -I resource** command.

Display or Change Diagnostic Run Time Options Task

The Display or Change Diagnostic Run Time Options task allows the diagnostic run time options to be set.

Note: The run time options are used only when running the Run Diagnostic task.

The run time options are:

- Display Diagnostic Mode Selection Menus
This option allows the user to select whether the DIAGNOSTIC MODE SELECTION MENU is displayed or not (the default is yes).
- Include Advanced Diagnostics
This option allows the user to select if the Advanced Diagnostics should be included or not (the default is no).
- Include Error Log Analysis
This option allows the user to select if the Error Log Analysis (ELA) should be included or not (the default is no).
- Run Tests Multiple Times

This option allows the user to select if the diagnostic should be run in loop mode or not (the default is no).

Note: This option is only displayed when running Online Diagnostics in Service Mode.

Display Test Patterns Service Aid

This service aid provides a means of making adjustments to system display units by providing displayable test patterns. Through a series of menus the user selects the display type and test pattern. After the selections are made the test pattern is displayed.

Generic Microcode Download Service Aid

This service aid provides a means of restoring a diskette (or other media) and executing a restored program. This program does whatever is required to download the microcode onto the adapter or device.

This service aid is supported in both concurrent and standalone modes from disk, LAN, or loadable media.

When entered, this service aid displays information about what it does. It then asks for a microcode diskette to be inserted into the diskette drive. The diskette is in backup format. The service aid then restores the diskette to the **/tmp** directory and execute a program called **diagucode**. Once **diagucode** has completed, you are then returned to the service aid.

Hardware Error Report Service Aid and Display Hardware Error Log Task

This service aid provides a tool for viewing the hardware error log. It uses the **errpt** command.

The Display Error Summary and Display Error Detail selection provide the same type of report as the **errpt** command. The Display Error Analysis Summary and Display Error Analysis Detail selection provide additional analysis. The Error Analysis and Error Analysis Detail options were removed at version 4.1.3.

ISA Adapter Configuration Service Aid

The ISA Adapter Configuration Service Aid allows the identification and configuration of ISA adapters on systems that have an ISA bus and adapters.

This service aid also displays all ISA adapters supported by diagnostics. Diagnostic support for ISA adapters not shown in the list may be supported from a Supplemental Diskette. ISA adapter support can be added from a Supplemental Diskette with this service aid.

Whenever an ISA adapter is installed, this Service Aid must be run and the adapter configured before the adapter can be tested. This Service Aid must also be run (and the adapter removed) whenever an ISA adapter is physically removed from the system.

If diagnostics are run on an ISA adapter that has been removed from the system, the diagnostics fail.

This service aid is only supported by the Standalone Diagnostics. SMIT should be used to configure ISA adapters for AIX.

ISA adapters cannot be detected by the system.

Note: When using this service aid choose the option that places the adapter in the "Defined State". Do not select the option that places the device in the "Available State".

Local Area Network Service Aid and Local Area Network Analyzer Task

This service aid and task are used to exercise the LAN communications adapters (Token-Ring, Ethernet, and Fiber Distributed Data Interface (FDDI)). The following services are available:

- Connectivity testing between two network stations. Data is transferred between the two stations. This requires the user to input the Internet Addresses of both stations.
- Monitoring ring (Token-Ring only). The ring is monitored for a period of time. Soft and hard errors are analyzed.

Additional information about this service aid can be found in the Local Area Network Service Aids CIS.

Prior to version 4.2 this service aid was accessed via the Local Area Network Service Aids selection of the Service Aid Selection Menu. Beginning with version 4.2 this service aid is accessed via the Local Area Network Analyzer options from the Task Selection Menu.

Microcode Download Service Aid

This service aid provides a way to copy device microcode to a device. It is used to update the microcode on a device. It presents a list of devices that use microcode. The device on which the microcode is to be installed is selected. The service aid instructs the user on its use.

PCI RAID Physical Disk Identify

This selection identifies physical disks connected to a PCI SCSI-2 F/W RAID adapter.

Periodic Diagnostics Service Aid

This service aid provides a tool for configuring periodic diagnostics and automatic error log analysis. A hardware resource can be chosen to be tested once a day, at a user specified time. If the resource cannot be tested because it is busy, error log analysis is performed. Hardware errors logged against a resource can also be monitored by enabling Automatic Error Log Analysis. This allows error log analysis to be performed every time a hardware error is put into the error log. If a problem is detected, a message is posted to the system console and a mail message sent to the user(s) belonging to the system group with information about the failure such as Service Request Number.

The service aid provides the following functions:

- Add or delete a resource to the periodic test list
- Modify the time to test a resource
- Display the periodic test list
- Modify the error notification mailing list
- Disable Automatic Error Log Analysis

Process Supplemental Media Task

Notes:

- This task is supported in Standalone Diagnostics only.
- Process and test one resource at a time.
- Do not process multiple supplements at a time.

Diagnostic Supplemental Media contain all the diagnostic programs and files required to test a resource. Supplemental media is normally released and shipped with the resource.

When prompted, insert the supplemental media. Then press Enter. After processing has completed, go to the resource selection list to find the resource to test.

This prompts for either diskette or tape media, reads in media using `cpio`, and executes **diagstart** shell script.

Run Diagnostics Task

The Run Diagnostics task invokes the Resource Selection List menu. When the commit key is pressed, Diagnostics are run on all selected resources.

The procedures for running the diagnostics depends on the states of the Diagnostics Run Time Options. The run time options are:

- Display Diagnostic Mode Selection Menus

If this option is on, the Diagnostic Mode Selection Menu displays when the commit key is pressed.

- Include Advanced Diagnostics

If this option is on, Advanced Diagnostics is be included.

- Include Error Log Analysis

If this option is on, Error Log Analysis is included.

- Run Tests Multiple Times

If this option is on, diagnostic are run in loop mode. This option is only valid when running Online Diagnostics in Service Mode.

Run Error Log Analysis Task

The Run Error Log Analysis task invokes the Resource Selection List menu. When the commit key is pressed, Error Log Analysis is run on all selected resources.

SCSI Bus Service Aid and SCSI Bus Analyzer Task

This service aid provides a means to diagnose a SCSI Bus problem in a free-lance mode.

Prior to version 4.2 the SCSI Bus Service Aid was accessed via the SCSI Bus selection from the Service Aid Selection Menu. Beginning with version 4.2 the SCSI Bus Service Aid is accessed via the SCSI Bus Analyzer option from the Task Selection Menu.

To use this service aid, the user should have an understanding of how a SCSI Bus works. This service aid should be used when the diagnostics cannot communicate with anything on the SCSI Bus and cannot isolate the problem. Normally the procedure for finding a problem on the SCSI Bus with this service aid is to start with a single device attached, ensure that it is working, then start adding additional

devices and cables to the bus ensuring that each one works. This service aid works with any valid SCSI Bus configuration.

The SCSI Bus Service Aid transmits a SCSI Inquiry command to a selectable SCSI Address. The service aid then waits for a response. If no response is received within a defined amount of time, the service aid displays a timeout message. If an error occurs or a response is received, the service aid then displays one of the following messages:

- The service aid transmitted a SCSI Inquiry Command and received a valid response back without any errors being detected.
- The service aid transmitted a SCSI Inquiry Command and did not receive any response or error status back.
- The service aid transmitted a SCSI Inquiry Command and the adapter indicated a SCSI bus error.
- The service aid transmitted a SCSI Inquiry Command and an adapter error occurred.
- The service aid transmitted a SCSI Inquiry Command and a check condition occur.

When the SCSI Bus Service Aid is entered a description of the service aid is displayed.

Pressing the Enter key displays the Adapter Selection menu. This menu allows the user to enter which address to transmit the SCSI Inquiry Command.

When the adapter is selected the SCSI Bus Address Selection menu is displayed. This menu allows the user to enter which address to transmit the SCSI Inquiry Command.

Once the address is selected the SCSI Bus Test Run menu is displayed. This menu allows the user to transmit the SCSI Inquiry Command by pressing the Enter key. The Service Aid then indicates the status of the transmission. When the transmission is completed, the results of the transmission is displayed.

Notes:

- A Check Condition can be returned when there is nothing wrong with the bus or device.
- AIX does not allow the command to be sent if the device is in use by another process.

SCSI Device Identification and Removal

This service aid allows the user to choose a SCSI device or location from a menu and to identify a device, located in the system unit.

The service aid also does the following:

- Generate a menu which displays all SCSI devices.
- Lists the device and all of its sibling devices.
- List all SCSI adapters and their ports.
- List all SCSI devices on a port.

SCSI Tape Utilities Service Aid

This service aid provides a means to obtain the status or maintenance information from a SCSI tape drive. Only some models of SCSI tape drive are supported.

The service aid provides the following options:

- Display time since a tape drive was last cleaned.

The time since the drive was last cleaned is displayed onto the screen. In addition, a message whether the drive is recommended to be cleaned is also displayed.

- Copy a tape drive's trace table.
- The trace table of the tape drive is written to diskettes.

The required diskettes must be formatted for DOS. Writing the trace table may require several diskettes. The actual number of required diskettes is determined by the service aid based on the size of the trace table. The names of the data files is of the following format:

'TRACE<X>.DAT' where 'X' is the a sequential diskette number. The complete trace table consists of the sequential concatenation of all the diskette data files.

- Display or copy a tape drive's log sense information.

The service aid provides options to display the log sense information to screen, to copy it to a DOS formatted diskette or to copy it to a file. The file name "LOGSENSE.DAT" is used when the log sense data is written on the diskette. The service aid prompts for a file name when the log sense data is chosen to be copied to a file.

Service Hints Service Aid

This service aid reads and displays the information in the CEReadME file from the diagnostics source (diskettes, disk, or CD-ROM). This file contains information that is not in the publications for this version of the diagnostics. It also contains information about using this particular version of diagnostics.

Use the Enter key to page forward through the information or the - (dash) and Enter keys to page backward through the file.

SSA Service Aids

This service aid provides tools for diagnosing and resolving problems on SSA attached devices. The following tools are provided:

- Set Service Mode
- Link Verification
- Configuration Verification
- Format and Certify Disk

7135 RAIDiant Array Service Aid

The 7135 RAIDiant Array service aids contain the following functions:

- Certify LUN
This selection reads and checks each block of data in the LUN. If excessive errors are encountered the user is notified.
- Certify Spare Physical Disk
This selection allows the user to certify (check the integrity of the data) on drives designated as spares.
- Format Physical Disk
This selection is used to format a selected disk drive.
- Array Controller Microcode Download
This selection allows the microcode on the 7135 controller to be updated when required.
- Physical Disk Microcode Download
This selection is used to update the microcode on any of the disk drives in the array.

- Update EEPROM

This selection is used to update the contents of the EEPROM on a selected controller.

- Replace Controller

Use this selection when it is necessary to replace a controller in the array.

7318 Serial Communications Network Server Service Aid

This service aid provides a tool for diagnosing terminal server problems.

7317 Enhanced Telecommunications Alarm and Surveillance Control

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.

Service Processor Service Aid

The SP Service Aid is invoked by the diagnostic controller program through a local ASCII or graphics terminal with the system power on.

This service aid consists of two tasks: Configure Ring Indicate Power-on Task and Configure Support Processor Task. These tasks are further explained in this chapter. Values shown in the menus are default values.

Starting the Diagnostic Controller Program

To start the program

1. Invoke the diagnostic controller. On AIX systems, type `diag` at a system prompt and press Enter. If you are using stand-alone diagnostics, refer to your server's User's Guide for instructions on starting the diagnostic controller.
2. At the first screen, press Enter to continue to the FUNCTION SELECTION screen.
3. Select "Task Selection," and press Enter.
4. Move the cursor down the list of tasks to select:
 - a. "Configure Ring Indicate Power-On."
 - b. "Configure Support Processor."

Selecting the "Configure Ring Indicate Power-On" option allows you to enable or disable Ring Indicate Power-On.

Selecting the "Configure Support Processor" option allows you to do Surveillance Set-up, Modem Configuration, Call-In/Call-Out Set-up.

The screens used to perform the above tasks are described in the remainder of this chapter.

Configure Ring Indicate Power-On

Ring Indicate Power-On is an alternate method of dialing in, without establishing an SP session. If the system is powered off, and Ring Indicate Power-On is enabled, the server powers on at a predetermined number of rings. If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered on.

Configure Ring Indicate Power-On Task Selection - Stand By: The following screen displays for a short time when you choose menu task "Configure Ring Indicator Power-On." Then the Ring Indicate Power-On menu displays.

Note: This selection may be accessed directly from the AIX command line while in the /usr/lpp/diagnostics/bin subdirectory by entering:

```
./usp -r
```

```
CONFIGURE RING INDICATE POWER-ON          802450
```

```
Please stand by.
```

```
F3=Cancel
```

```
F10=Exit
```

Configure Ring Indicate Power-on:

```
CONFIGURE RING INDICATE POWER-ON          802451
```

The following information lists the current Ring Indicate Power-on settings from NVRAM. Any data in brackets [] may be changed or added at this time.

When finished, use 'Commit' to accept the data.

```
Ring Indicate Power-on          [off]
Number of Rings to Power-on     [ 6]
```

```
F1=Help    F3=Cancel    F4=List    F7=Commit    F10=Exit
```

Ring Indicate Power-on may be set to 'on' or 'off'

Number of Rings to Power-on may be set to any number from 1 to 255.

Configure Support Processor

Configure Support Processor - Stand By: The following screen displays for a short time when you choose task selection "Configure Support Processor." Then the Support Processor selection menu displays.

Note: This selection may be accessed directly from the AIX command line while in the /usr/lpp/diagnostics/bin subdirectory by entering:

```
./usp -s
```

```
CONFIGURE SUPPORT PROCESSOR          802450
```

Please stand by.

```
F3=Cancel    F10=Exit
```

Configure Support Processor - Selection:

```
CONFIGURE SUPPORT PROCESSOR                802452

Move cursor to selection, then press Enter.

  Surveillance Setup
  Modem Configuration
  Call-In/Call-Out Setup
  Site Specific Call-In/Call-Out Setup

F3=Cancel   F10=Exit   Enter
```

Configure Support Processor - Surveillance Setup:

```
CONFIGURE SUPPORT PROCESSOR                802453

Surveillance Setup

The following information lists the current Surveillance settings
from NVRAM. Any data in brackets [ ] may be changed
or added at this time.

When finished, use 'Commit' to accept the data.

  Surveillance                               [off]
  Surveillance time interval, in minutes     [ ]
  Surveillance delay, in minutes             [ ]

F1=Help   F3=Cancel   F4=List   F7=Commit   F10=Exit
```

Surveillance may be set to 'on' or 'off'.

Surveillance time interval, in minutes may be set to any number from 2 to 128

Surveillance time delay, in minutes may be set to any number from 0 to 128

Note: When surveillance is configured or modified using this menu, the changes takes place beginning with the next system boot. For more information on

Surveillance, see “Service Processor System Monitoring - Surveillance” on page 3-3.

Configure Support Processor - Modem Configuration:

```
CONFIGURE SUPPORT PROCESSOR                802454

Modem Configuration

A modem is configured by reading a specially formatted file and
loading the settings into NVRAM.  If a file name is specified,
then a serial port must also be specified.  Type the required
items in the brackets [ ].

Use 'Help' to see the names of sample files.

Use 'Commit' to begin loading the modem configuration.

Modem Configuration File Name              [ ]
Serial Port for Modem                      [ ]

F1=Help   F3=Cancel   F4=List   F7=Commit   F10=Exit
```

Modem Configuration File Name must be the path and filename of a correctly formatted modem configuration file. Some example files are:

```
/usr/share/modems/modem_f0.cfg
/usr/share/modems/modem_z.cfg
```

Refer to Appendix B, “Modem Configurations for Service Processor” on page B-1 for more information.

Serial Port for Modem must be serial port 1 or 2 (where a modem, if any, is connected). Refer to “How to access SP menus remotely” on page 3-10 for more information on connecting modems.

Configure Support Processor - Modem Configuration Stand By: This menu displays while the modem configuration file is read, converted, and loaded into non-volatile random access memory (NVRAM). If an error occurs, a pop-up error message allows you to try again from the modem configuration menu, cancel to the setup selection menu, or exit. A confirming pop-up message appears and instructs you to press Enter to continue to the setup selection menu.

```
CONFIGURE SUPPORT PROCESSOR                802455
```

```
Loading modem configuration file in NVRAM.  
Please stand by.
```

Configure Support Processor - Call-In/Call-Out Setup:

```
CONFIGURE SUPPORT PROCESSOR                802456
```

```
Call-In/Call-Out Setup
```

```
The following information lists the current Call-In/Call-Out  
settings from NVRAM. Any data in brackets [] may be  
changed or added at this time.
```

```
When finished, use 'Commit' to accept the data.
```

```
Serial Port 1 Call-In                [off]  
Serial Port 1 Call-Out                [off]  
Serial Port 1 line speed              [9600]  
Serial Port 2 Call-In                [off]  
Serial Port 2 Call-Out                [off]  
Serial Port 2 line speed              [9600]
```

```
F1=Help    F3=Cancel    F4=List    F7=Commit    F10=Exit
```

Serial Port 1 Call-In may be set to 'On' or 'Off'.

Call-In allows SP to receive a call from a remote terminal.

Serial Port 1 Call-Out may be set to 'On' or 'Off'.

Call-Out allows SP to place calls for maintenance.

Serial Port 2 Call-In may be set to 'On' or 'Off'.

Call-In allows SP to receive a call from a remote terminal.

Serial Port 2 Call-Out may be set to 'On' or 'Off'.

Call-Out allows SP to place calls for maintenance.

Serial Port 1 Line Speed and **Serial Port 2 Line Speed** may be any of the following line speeds: 300, 600, 1200, 2000, 2400, 3600, 4800, 9600, 19200, 38400. For more information about line speeds, refer to "Line Speed Consideration" on page 3-18.

Configure Support Processor - Site Specific Setup:

```
CONFIGURE SUPPORT PROCESSOR                802457

Site Specific Setup

The following information lists the current Site Specific
Call-In/Call-Out settings from NVRAM. Any data in brackets
[] may be changed or added at this time.

When finished, use 'Commit' to accept the data.

Service center phone number                [ ]
Customer Admin Center phone number        [ ]
Pager phone number                        [ ]
Customer System phone number              [ ]
Customer voice phone number               [ ]
Customer Account number                   [ ]
Call Out policy                           [first]
Customer RETAIN login id                  [ ]
Customer RETAIN login password            [ ]
Remote timeout, in seconds                 [120]
Remote latency, in seconds                 [2]
Number of retries while busy               [2]
System name (System Administrator aid)    [ ]

F1=Help   F3=Cancel   F4=List   F7=Commit   F10=Exit
```

Service Center phone number is the number of the service center computer. The service center usually includes a computer that takes calls from servers with call-out capability. This computer is referred to as "the catcher." The catcher expects messages in a specific format to which SP conforms. For more information about the format and catcher computers, refer to the README file in the AIX

/usr/samples/syscatch directory. Contact your service provider for the correct telephone number to enter here. Until you have that number, leave this field blank.

Customer Admin Center phone number is the number of the System Administration Center computer (catcher) that receives problem calls from servers. Contact your system administrator for the correct telephone number to enter here. Until you have that number, leave this field blank.

Pager phone number is the number for a pager carried by someone who responds to problem calls from your server. Contact your administration center representative for the correct telephone number to enter here. For test purposes, enter your telephone number here. You can change it later when testing is complete.

Customer System phone number is the telephone number to which your server's modem is connected. The service or administration center representatives need this number to make direct contact with your server for problem investigation. This is also referred to as the **call-in** phone number.

Customer voice phone number is the telephone number of a phone near the server or answered by someone responsible for the server. This is the telephone number left on the pager for callback. For test purposes, enter your telephone number here. You can change it after testing is completed.

Customer Account Number is assigned by your service provider for record keeping and billing. If you have an account number, enter it here. Otherwise, leave this field blank.

Call Out policy may be set to 'first' or 'all'. If call out policy is set to 'first', the SP stops at the **first successful** call out to one of the following numbers in the order listed:

1. Service Center
2. Customer Admin Center
3. Pager

If call out policy is set to 'all', the SP attempts a call out to **all** the following numbers in the order listed:

1. Service Center
2. Customer Admin Center
3. Pager

Customer RETAIN login id and **Customer RETAIN login password** apply to a service function to which your service provider may or may not have access. Leave these fields blank if you do not use RETAIN.

Remote timeout and **Remote latency** are functions of your service provider's catcher computer. Contact your service provider for recommended settings.

Number of retries while busy is the number of times you want the server to retry calls that resulted in busy signals.

System name (System Administrator aid) is the name your server can report in the problem messages. This helps your support team more quickly identify the location, configuration, history, etc., of your server. Contact your system administrator or service provider for this name or leave this field blank.

Chapter 10. Using the System Verification Procedure

The system verification procedure is used to check the system for correct operation.

When you are analyzing a hardware problem, you should use Chapter 11, “Hardware Problem Determination” on page 11-1.

Step 1. Considerations before Running This Procedure

Notes:

1. If this system unit is directly attached to another system unit or attached to a network, be sure communications with the other system unit is stopped.
2. This procedure requires use of all of the system resources. No other activity can be running on the system while you are doing this procedure.
 - This procedure requires a display connected to the video port or an ASCII terminal attached to the S1 port.
 - Before starting this procedure, you should stop all programs and the operating system.
 - This procedure runs the Online Diagnostics in Service mode or Standalone Diagnostics. If the Online Diagnostics are installed, they should be run. See the operator manual for your type of ASCII terminal to find the key sequences you need in order to respond to the diagnostics.
 - If you need more information about diagnostics see Chapter 8, “Using the Online and Standalone Diagnostics” on page 8-1.
 - If a console display is not selected, the diagnostics stop. The instructions for selecting a console display are displayed on all of the graphic displays and any terminal attached to the S1 port. Follow the displayed instructions to select a console display.
 - ISA adapters cannot be detected by the system. The ISA adapter Configuration Service Aid allows the identification and configuration of ISA adapters when running standalone diagnostics.
 - Go to Step 2.

Step 2. Loading the Diagnostics

1. Stop all application programs running on the operating system.
2. Stop the operating system.
3. Turn the power off.
4. If you are loading the Standalone Diagnostics and running them from an ASCII terminal:
 - The attributes for the terminal must be set to match the defaults of the diagnostics.
 - If you need to change any settings, record the normal settings, and be sure the terminal attributes are set to work with the diagnostics. If needed, see “Running the Diagnostics from a tty Terminal” on page 8-3.
 - Return to substep 5 when you finish checking the attributes.
5. Turn the power on.
 - a. When the keyboard indicator appears, press F5 on the direct attached keyboard (5 on the ASCII keyboard) to load the Standalone Diagnostics or F6 on the directly-attached keyboard (6 on the ASCII terminal keyboard) to load the Online Diagnostics.
 - b. Enter any requested passwords.
 - c. Follow any instructions to select a console.
6. When the Diagnostic Operating Instructions display, go to Step 3. If you are unable to load the diagnostics, go to “Problem Determination When Unable to Load Diagnostics” on page 11-10.

Step 3. Running System Verification

The Diagnostic Operating Instructions should be displayed.

1. Press the Enter key.
2. If the terminal type has not been defined, you must use the `Initialize Terminal` option on the Function Selection menu to initialize the operating system environment before you can continue with the diagnostics.
3. If you want to do a general checkout without much operator action, Select the `Diagnostic Routines` option on the Function Selection menu.

If you want to do a more complete checkout including the use of wrap plugs, select the `Advanced Diagnostics` option on the Function Selection menu. The advanced diagnostics are primarily for the service representative; they may instruct you to install wrap plugs to better isolate a problem.

4. Select the `System Verification` option on the Diagnostic Mode Selection menu.
5. If you want to run a general checkout of all installed resources, Select the `System Checkout` option, if displayed, otherwise select the `All Resources` option on the Diagnostic Selection menu.

If you want to check one particular resource, select that resource on the Diagnostic Selection menu.

6. Go to Step 4.

Step 4. Additional System Verification

The checkout programs end with either the `Testing Complete` menu and a message stating `No trouble was found` or the `A Problem Was Detected On (Time Stamp)` menu with an SRN.

1. Press Enter to return to the Diagnostic Selection menu.
2. If you want to check other resources, select the resource. When you have checked all of the resources you need to check, go to Step 5.

Step 5. Stopping the Diagnostics

1. If running Online diagnostics, the system first should be shut down using the following procedure:
 - a. Press F3 repeatedly until you get to the Diagnostic Operating Instructions, then follow the displayed instructions.
 - b. Press F3 once, and then follow the displayed instructions to shut down system.
2. If you changed any attributes on your ASCII terminal to run the diagnostics, change the settings back to normal.
3. This completes the system verification. Report the SRN to the service organization if you received one. To do a normal boot, turn off the system unit and wait 30 seconds, and then set the power switch of the system unit to On.

Chapter 11. Hardware Problem Determination

Problem Determination Using the Standalone or Online Diagnostics

Use this procedure to obtain a service request number (SRN) when you are able to load the Standalone or Online Diagnostics. If you are unable to load the Standalone or Online Diagnostics, go to “Problem Determination When Unable to Load Diagnostics” on page 11-10. The service organization uses the SRN to determine which field replaceable units (FRUs) are needed to restore the system to correct operation.

Step 1. Considerations before Running This Procedure

Note: See the operator manual for your ASCII terminal to find the key sequences you need to respond to the diagnostic programs.

- The diagnostics can use a display connected to the video port or a ASCII terminal attached to a serial port.
 - This procedure asks you to select the type of diagnostics you want to run. If you need more information about the types, see “Standalone and Online Diagnostics Operating Considerations” on page 8-1.
 - ISA adapters cannot be detected by the system. The ISA adapter Configuration Service Aid allows the identification and configuration of ISA adapters for Standalone Diagnostics. ISA adapters must be identified and configured before they can be tested.
 - Go to “Step 2.”
-

Step 2

Are the Online Diagnostics installed on this system?

NO Go to “Step 15.”

YES Go to “Step 3.”

Step 3

Determine if the operating system is accepting commands.

Is the operating system accepting commands?

- NO** The system must be turned off in order to run diagnostics.
1. Verify with the system administration and users that the system may be turned off. If so, then turn off the system unit and go to "Step 6."
- YES** Go to "Step 4."
-

Step 4

Diagnostic tests can be run on many resources while the operating system is running. However, more extensive problem isolation is obtained by running Online diagnostics in Service mode.

Do you want to run the Online diagnostics in Service mode?

- NO** Go to "Step 5."
- YES** Do the following to shut down your system:
1. At the system prompt, stop the operating system using the proper command for your operating system.
 2. After the operating system is stopped, power off the system unit.
 3. Go to "Step 6."

Step 5

This step invokes the Online Diagnostics in concurrent mode.

1. Log on as root or as superuser.
2. Enter the diag command.
3. Wait until the Diagnostic Operating Instructions are displayed, or wait for three minutes.

Are the Diagnostic Operating Instructions displayed without any obvious console display problems?

- NO** Do the following to shut down your system:
1. At the system prompt, stop the operating system using the proper command for your operating system.
 2. After the operating system is stopped, power off the system unit.
 3. Go to "Step 6."
- YES** Go to "Step 9."

Step 6

This step loads Online diagnostics in service mode. If you are unable to load the diagnostics, go to "Step 7."

1. Turn the power on.
2. When the keyboard indicator (icon or text) appears, press F6 on the directly-attached keyboard or 6 on the ASCII terminal keyboard to indicate that diagnostics are to be loaded.
3. Enter any requested passwords.
4. Follow any instructions to select a console.

Did the Diagnostics Operating Instructions display without any obvious display problem?

- NO** Go to "Step 7."
- YES** Go to "Step 9."

Step 7

Starting at the top of the following table, find your symptom and follow the instructions given in the Action column.

Symptom	Action
Display problem.	Go to "Step 8."
All other symptoms.	Go to "Problem Determination When Unable to Load Diagnostics" on page 11-10.

Step 8

The following steps analyze a console display problem.

Find your type of console display in the following table, then follow the instructions given in the Action column.

Console Display	Action
Display Device	Go to the display documentation for problem determination.
ASCII terminal	Go to the documentation for problem determination for this type of terminal.

Step 9

The diagnostics loaded correctly.

Press the Enter key.

Is the Function Selection menu displayed?

NO Go to "Step 10."

YES Go to "Step 11."

Step 10

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
101-key keyboard. Identify by the type of Enter key used. The Enter key is within one horizontal row of keys.	Record error code M0KBD001 and report the problem to the service organization.
102-key keyboard. Identify by the type of Enter key used. The Enter key extends into two horizontal rows of keys.	Record error code M0KBD002 and report the problem to the service organization.
Kanji keyboard. Identify by the Japanese characters.	Record error code M0KBD003 and report the problem to the service organization.
ASCII-terminal keyboard. This applies to all attached terminals.	Go to the documentation for problem determination for this type terminal.

Step 11

1. If the terminal type has not been defined, you must use the `Initialize Terminal` option on the Function Selection menu to initialize the operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.
2. Select `Diagnostic Routines`.
3. Press the Enter key.
4. In the following table, find the menu or system response you received when you selected `Diagnostics`. Follow the instructions given in the Action column.

System Response	Action
The Diagnostic Mode Selection menu is displayed.	Select Problem Determination and go to "Step 12."
The Missing Resource menu is displayed.	Follow the displayed instructions until either the Diagnostic Mode Selection menu or an SRN is displayed. If the Diagnostic Mode Selection menu is displayed, select Problem Determination and go to "Step 12." If you get an SRN, record it, and go to "Step 14."
The New Resource menu is displayed.	Follow the displayed instructions. Note: Devices attached to serial ports S1 or S2 do not appear on the New Resource menu. Also, ISA adapters do not appear unless they have been identified and configured. If the Diagnostic Mode Selection menu is displayed, select Problem Determination and go to "Step 12." If you get an SRN, record it, and go to "Step 14." If you do not get an SRN, go to "Step 17."
The system does not respond to selecting diagnostics	Go to "Step 10."

Step 12

Did the Diagnostic Selection Menu display?

- NO** If Problem Determination was selected from the Diagnostic Mode Selection menu, and if a recent error has been logged in the error log, the diagnostics will automatically begin testing the resource.
- Follow the displayed instructions.
- If the No Trouble Found screen is displayed, press Enter.
- If another resource is tested, repeat this step.
- If the Diagnostic Selection menu is displayed, go to “Step 13.”
- If an SRN is displayed, record it, and go to “Step 14.”
- YES** Go to “Step 13.”
-

Step 13

The System Checkout or the All Resources option checks most of the configured adapters and devices.

Notes:

1. System checkout is only supported in Online Diagnostics in Service Mode.
2. ISA adapters cannot be detected by the system. The ISA adapter Configuration Service Aid allows the identification and configuration of ISA adapters for Standalone Diagnostics. ISA adapters must be identified and configured before they can be tested.

Select and run the diagnostic tests on the resources you are having problems with or select either the System Checkout or All Resources to check all of the configured resources. Find the response in the following table and take the Action for it.

Diagnostic Response	Action
An SRN is displayed.	Go to "Step 14."
The system hangs.	Report SRN 109-200.
The Testing Complete menu and the No trouble was found message is displayed, and you have not tested all of the resources.	Press Enter and continue with the testing.
The Testing Complete menu and the No trouble was found message displayed and you have tested all of the resources.	Go to "Step 17."

Step 14

The diagnostics produced an SRN for this problem.

1. Record the SRN and other numbers read out.
2. Report the SRN to the service organization.
3. **STOP.** You have completed these procedures.

Step 15

When you are loading the Standalone Diagnostics, the attributes for the terminal must be set to match the defaults of the diagnostic programs. The ASCII terminal must be attached to serial port 1 on the system unit.

Are you going to load Standalone Diagnostics and run them from a ASCII terminal?

NO Go to "Step 16."

YES Go to "Running the Diagnostics from a tty Terminal" on page 8-3 and be sure your terminal attributes are set to work with the diagnostic programs.

Return to "Step 16" when you finish checking the attributes. Record any settings that are changed.

Step 16

This step loads the Standalone Diagnostics. If you are unable to load the diagnostics, go to “Step 7.”

1. Turn the power on.
2. Insert the diagnostic CD-ROM into the CD-ROM drive.
3. When the keyboard indicator appears, press F5 on the direct attached keyboard or 5 on the ASCII keyboard to indicate that diagnostics are to be loaded.
4. Enter any requested passwords.
5. Follow any instructions to select a console.

Did the Diagnostics Operating Instructions display without any obvious display problem?

NO Go to “Step 7.”

YES Go to “Step 9.”

Step 17

The diagnostics did not find a hardware problem. If you still have a problem, contact your software support center.

Problem Determination When Unable to Load Diagnostics

Use this procedure to obtain an error code. The service organization uses the error code to determine which field replaceable units (FRUs) are needed to restore the system to correct operation.

Step 1. Considerations before Running This Procedure

- The diagnostics can use a display connected to the video port or a ASCII terminal attached to a serial port.
 - Go to “Step 2.”
-

Step 2

Are the Online Diagnostics installed on this system?

NO Go to “Step 4.”

YES Go to “Step 3.”

Step 3

This step attempts to load Online diagnostics in service mode.

1. Turn the power to off.
2. Turn the power on.
3. If the keyboard indicator appears, press F6 on the direct attached keyboard or 6 on the ASCII keyboard to indicate that diagnostics are to be loaded.
4. Enter any requested passwords.
5. Follow any instructions to select a console.
6. Wait until the diagnostics load or the system appears to stop.

Did the diagnostics load?

NO Go to "Step 5."

YES Go to "Step 6."

Step 4

This step attempts to load the Standalone diagnostics.

1. Turn the power to off.
2. Turn the power to on.
3. Insert the diagnostic CD-ROM into the CD-ROM drive.
4. If the keyboard indicator appears, press F5 on the direct attached keyboard or 5 on the ASCII keyboard to indicate that diagnostics are to be loaded.
5. Enter any requested passwords.
6. Follow any instructions to select a console.
7. Wait until the diagnostics load or the system appears to stop.

Did the diagnostics load?

NO Go to "Step 5."

YES Go to "Step 6."

Step 5

Starting at the top of the following table, find your symptom and follow the instructions given in the Action column.

Symptom	Action
The power enable LED is off with the system connected to -48 V dc and the main power switch is on.	Check the -48 V dc power cable at the power input terminal block. Check the circuit breakers and check for power at the -48 V dc power supply. If you do not find a problem, record error code M0PS0000 and report the problem to the service organization.
The power good LED does not come on, or comes on and does not stay on.	Check the -48 V dc power cable at the power input terminal block. Check the circuit breakers and check for power at the -48 V dc power supply. Assure the room temperature is within 60 - 90°F. If you do not find a problem, record error code M0PS0000 and report the problem to the service organization.
The system appears to be stopped, the disk activity light is off and a beep was NOT heard from the system unit.	Processor POST failure. Report error code M0CPU000.
The system appears to be stopped and the disk activity light is on continuously and a beep was NOT heard from the system unit.	No good memory could be found. Report error code M0MEM000.
The system appears to be stopped and the disk activity light is on continuously and a beep was heard from the system unit.	No good memory could be found. Report error code M0MEM001.
The diagnostics are loaded and there was no beep heard from the system unit during the IPL sequence.	Record error code M0SPK001.
The system stops with the Diagnostic Operating Instructions displayed.	Go to "Step 6."
The disk drive activity light is blinking rapidly.	The flash EPROM data is corrupted. The recovery procedure for the flash EPROM should be executed.

Symptom	Action
The system stops with a prompt to enter a password.	Enter the password. You are not allowed to continue until a correct password has been entered. When you have entered a valid password, wait for one of the other conditions to occur.
The system stops with an eight-digit error code(s) displayed on the console.	Record the error code(s) and report the problem to the service organization.
The system login prompt is displayed.	<p>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 boot of diagnostic programs. If this was the case, start over at the beginning of this step.</p> <p>If you are sure you pressed the correct key in a timely manner go to Step 7.</p>
One long beep followed immediately by a short beep was heard from the system unit.	Record error code M0GA0000 and report the problem to the service organization.
A continuous beep is heard from the system unit.	Record error code M0SB0000 and report the problem to the service organization.
The system does not respond when the password is entered.	Go to Step 7.
The system stopped and an indicator is displayed on the system console and an eight-digit error code is not displayed.	<p>If the indicator (text or icon) represents:</p> <ul style="list-style-type: none"> • a keyboard, record error code M0KBD000 and report the problem to the service organization. • boot disk, record error code M0HD0000 and report the problem to the service organization. • memory, record error code M0MEM002 and report the problem to the service organization. • a diskette drive, record error code M0MEM002 and report the problem to the service organization. • SCSI, record error code M0CON000 and report the problem to the service organization.

Symptom	Action
<p>The System Management Services menu is displayed.</p>	<p>The device or media you are attempting to boot from may be faulty.</p> <ol style="list-style-type: none"> 1. Check the SMS error log for any errors. To check the error log: <ul style="list-style-type: none"> • 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 and report it to your service person. • If no recent error is logged in the error log, continue to the next step below. 2. If you are attempting to load the Online Diagnostics, try loading the Standalone Diagnostics. Otherwise, record error code M0SCSI01 and report to the service organization.
<p>The system appears to be stopped, the disk activity light is on continuously, and a beep was heard from the system unit.</p>	<p>Record error code M0MEM001 and report the problem to the service organization.</p>
<p>The system stops and the message "STARTING SOFTWARE PLEASE WAIT ..." is displayed.</p>	<p>Report error code M0SCSI01.</p>
<p>The message "The system will now continue the boot process" is displayed continuously on the system unit's console.</p>	<p>Report error code M0SCSI01.</p>

Step 6

The diagnostics loaded correctly.

Go to “Problem Determination Using the Standalone or Online Diagnostics” on page 11-1.

Step 7

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
101-key keyboard. Identify by the type of Enter key used. The Enter key is within one horizontal row of keys.	Record error code M0KBD001 and report the problem to the service organization.
102-key keyboard. Identify by the type of Enter key used. The Enter key extends into two horizontal rows of keys.	Record error code M0KBD002 and report the problem to the service organization.
Kanji keyboard. Identify by the Japanese characters.	Record error code M0KBD003 and report the problem to the service organization.
ASCII-terminal keyboard. This applies to all attached terminals.	Go to the documentation for problem determination for this type terminal.

Appendix A. Server Records

Record the Identification Numbers

Record and retain the following information.

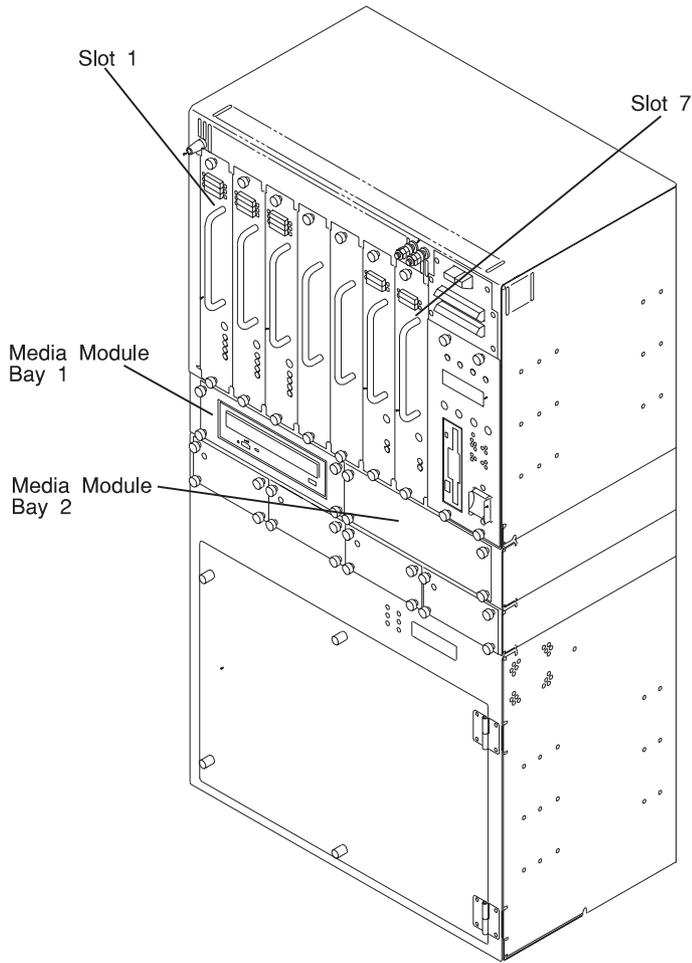
Product Name	RS/6000 7317 Models F3L and D10
Machine Type/Model	7317 Model F3L
Serial Number	_____
Machine Type/Model	7317 Model D10
Serial Number	_____

Device 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)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J28)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J29)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J31)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J35)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J38)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J39)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Memory (J44)	<u>16MB</u> <input type="checkbox"/> <u>32MB</u> <input type="checkbox"/> <u>64MB</u> <input type="checkbox"/> <u>128MB</u> <input type="checkbox"/>
Mouse Connector	<u>IBM Mouse</u> <input type="checkbox"/> Other: _____
Keyboard Connector	<u>Space Saving</u> <input type="checkbox"/> <u>Enhanced</u> <input type="checkbox"/> 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	_____

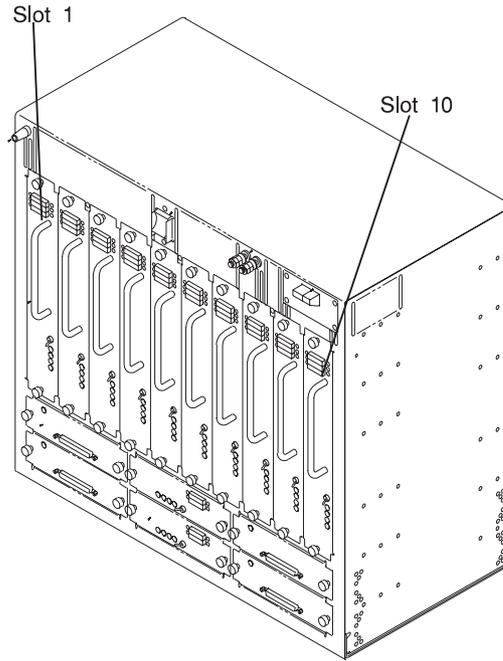
Refer to the following diagram of the system's slots when completing the table on the following page.



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 <input type="checkbox"/> Power Supply Unit <input type="checkbox"/>
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	_____

Appendix B. Modem Configurations for Service Processor

Supplemental Diagnostics Diskette

If you are using the Stand-alone diagnostics CD-ROM to configure your SP, you must make the Diagnostics Controller aware that there is a supplemental diagnostics diskette needed for the modem configuration. This is achieved by doing the following:

1. Insert the Stand-alone Diagnostics CD-ROM in the CD-ROM drive.
2. Reboot your system from the CD-ROM.
3. When prompted, define the system console.
4. Press Enter at the Diagnostics Operating Instructions menu.
5. From the Function Select menu, select option 3 and press Enter.
6. Define the terminal type.
7. From the New Resource menu, select option 1 and press Enter.
8. Select Diagnostic Mode and press Enter.
9. Select System Verification and press Enter.
10. Go to the bottom of the list and select 'Read Supplemental Diskette.'
11. Insert the supplemental diskette into the diskette drive and follow the prompts on the display screen.

The modem configuration files are loaded, and you are now ready to configure the Support Processor. Return to "Service Processor Service Aid" on page 9-25 to continue the configuration process.

Sample Modem Configuration Files

With nearly 1000 modems to choose from, and various programming standards, configuring a modem for use with the SP can be challenging. The SP is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates. Several sample modem configurations files are supplied that either work directly with your modem, or provide a good starting point for a custom setup, if required. These files are included on the Sample Modem Configuration Files diskette with the following names:

- modem_z.cfg
- modem_z0.cfg
- modem_f.cfg

- modem_f0.cfg
- modem_f1.cfg

When you loaded the sample modem configuration files from the diskette, they were placed in the /usr/share/modems subdirectory, if your server is using AIX. A listing of each file is included at the end of this appendix.

With the following selection procedures and your modem manual, one of these configuration files should be suitable for your use.

Configuration File Selection

1. Does your modem respond to the extended command set (prefixed with &)?

If yes, go to step 3.

If not, continue with step 2 below.

2. Does your modem respond to:
 - a. ATZ reset command, or
 - b. ATZn reset commands, where n can be 0, 1, etc.?

If ATZ, configuration file modem_z.cfg is recommended.

If ATZn, configuration file modem_z0.cfg is recommended.

Selection is complete. If you find it necessary to adjust either of these configuration files, do so with reference to the manual that came with your modem.¹ Choose settings that enable hardware flow control and respond to DTR.

3. Does your modem respond to:

a. AT&F reset command, or

b. AT&Fn reset commands, where n can be 0, 1, etc.?

If AT&F, configuration file modem_f.cfg is recommended.

If AT&Fn, configuration file modem_f0.cfg or modem_f1.cfg is recommended, depending on which provides the hardware flow control profile.

Selection is complete. If you find it necessary to adjust any of these configuration files, do so with reference to the manual that came with your modem.¹ Choose settings that enable hardware flow control and respond to DTR.

Examples

Modem	Setup Z	Setup Z0 (Rare)	Setup F	Setup F0	Setup F1
AT&T DataPort 2001 ²				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852			X		
IBM 7855					X
USRobotics 14.4K Sportster					X
Zoom V.32			X		

¹ Some older modems do not respond to the commands X0 or &R1. You should edit out these commands from the modem configuration file if yours is such a modem. See your modem manual for more information.

² Ring interrupt only on first ring.

Xon/Xoff Modems

Some modems of the mid-80's vintage assume software flow control (Xon/Xoff) between the computer and the modem. Modems with this design send extra characters during and after the transmitted data. SP cannot tolerate these extra characters. If your configuration includes such a modem, your functional results may be unpredictable.

The sample modem configuration files included in this package do not support these modems, so custom configuration files would be necessary. Anchor Automation 2400E is an example of such a modem.

Most newer modems do not use this design. It is recommended you use modems of newer vintage if you experience unexplainable performance problems that may be due to Xon/Xoff characters.

Ring Detection

Most modems produce an interrupt request each time they detect a ring signal. Some modems generate an interrupt only on the first ring signal they receive. AT&T DataPort 2001 is an example of such a modem.

The SP uses the ring interrupt request to count the number of rings when Ring Indicate Power-On (RIPO) is enabled. If your modem produces an interrupt on only the first ring, set Ring Indicate Power-On to start on the first ring. Otherwise, you may choose to start Ring Indicate Power-On on any ring count that makes your operation convenient.

Terminal Emulators

The SP is compatible with simple ASCII terminals, and therefore compatible with most emulators. It is for the cases when a remote session is handed off from SP to the operating system that agreeing terminal emulators becomes important.

The server's operating system has some built-in terminal emulators. You may also have a commercially available terminal emulation. It is important that the local and host computers select the same or compatible terminal emulators so the key assignments and responses match. This assures successful communications and control.

For best formatting, choose line wrap in your terminal emulator setup.

Recovery Procedures

Line noises, power surges, etc., can sometimes cause your modem to enter an undefined state. When it is being used for dial in, dial out or Ring Indicate Power-On, your modem is initialized each time one of these actions is expected. If one of these environmental conditions occur after your modem has been initialized, it may be necessary to recover your modem to a known state.

If your modem communicates properly with remote users, it is probably in control. It may be wise to occasionally change some of the functional settings and then change them back, just for the sense of security that the modem is communicating, and to assure it has been initialized recently.

Another strategy, particularly if your system is difficult to access physically, is to protect it with an Uninterruptable Power Source (UPS) and a phone-line surge protector.

In case recovery becomes necessary, your system should be shut down as gracefully as possible. Disconnect the power cable and press the power button to drain capacitance while power is disconnected. Disconnect and reconnect modem power, then reconnect system power to allow complete reinitialization of your system.

Seamless Transfer of a Modem Session

There are about as many modem command variations as there are modems. The sample modem configuration files have been written to capture the largest number of workable modem settings.

The modem command `&Dn` (where 'n' is a number) generally sets the modem response to the Data Terminal Ready (DTR) signal from the server's serial port. The desired response is that the modem holds a connection while DTR is enabled, and drop the connection when DTR is released. This is the mechanism by which the server "hangs up" on a connection under normal conditions.

Usually the command `&D2` works, but not always. The sample modem configuration files¹ take this high percentage position. You should consult your modem's manual for its specific response scheme for the `&Dn` command.

There are two methods for dealing with the modem's response to DTR:

1. Recovery
2. Prevention

Before proceeding with one of these strategies, you need to determine if your server's modem is set up properly to respond to DTR.

With the remote terminal connected to serial port 1 and defined as the **primary** console device, there are two tests you can perform:

1. Does the modem **drop** the connection after the "System initialization complete" message appears at the remote terminal?

If yes, this is the correct response. The modem is set up correctly.

If no, try another &Dn setting for your server's modem. See your modem manual for this information. The &Dn command appears in three places each in three of the sample modem configuration files¹.

2. Does the server's modem **disconnect** when the power drops? You can make this observation at the remote terminal by commanding your server to shutdown and power off, the AIX command shutdown -F does this. Watch for the message NO CARRIER on your remote terminal.

If yes, this is the correct response. The modem is set up correctly.

If no, try another &Dn setting for your server's modem. See your model manual for this information. The &Dn command appears in three places each in three of the sample modem configuration files¹.

Recovery Strategy

The recovery strategy consists of making **two** calls to establish a remote session. This is the easiest solution to implement, and allows more freedom for configuring your server's serial ports.

To set up a remote terminal session, dial into the SP and start the system. After the operating system is loaded and initialized, the connection is dropped. At this point, you call the server back and the operating system answers and offers you the login prompt.

¹ Only the following sample modem configuration files contain the &Dn command (in three places each):

- modem_f.cfg
- modem_f0.cfg
- modem_f1.cfg

If you are using modem_z.cfg or modem_z0.cfg, you cannot control DTR response. If your remote terminal does not disconnect after logging off, you must command the remote terminal emulator to hang up. This then breaks the connection.

Prevention Strategy

The disconnect is caused by the operating system when it initializes the **primary** console. The tests listed above are conducted with the remote terminal selected as the primary console to manifest the modem's response to DTR transitions.

If a local ASCII terminal or a graphics console is to be a permanent part of your server, then make one of them the primary console. Your remote terminal no longer experiences the connection loss.

If a local console is not a permanent part of your server, you can still assign either the unused graphics console or the unused serial port as the primary console. This gives you the desired seamless connection at your remote terminal.

If you choose to use the unused serial port as the primary console, some initialization traffic is sent to any serial device attached to that port. As a result, that serial device's connection and function could be affected. These impacts may make that port unattractive for devices other than a temporary local ASCII terminal.

Modem Configuration Samples

Sample File modem_z.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z
#
# FUNCTIONS: Modem configuration file for many early Hayes* compatible modems.
# This example uses the ATZ reset command to choose the factory defaults.
# This setup will work for many modems, but it is required for early vintage
# modems which respond to neither the ATZ0 reset command nor the extended (&)
# commands. Refer to your modem manual.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# Z Reset to factory defaults Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

connect: send "ATZQ0T\r" # Reset to factory defaults.
         ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r" # Initialize modem: Echo OFF,
         expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0T\r" # Limit response codes.
         expect "0\r" timeout 2 # Confirm commands successful.
         send "ATS0=0\r" # Set AutoAnswer OFF
         expect "0\r" timeout 2 # Confirm command successful.
         done

connect: send "ATDT%N\r" # Tone dialing command.
         # %N from Call Home setup.

         # Expect a connection response.
         expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
         timeout 60
         done
```

```

retry:      send "A/"                                # Repeat the previous command.

                                                    # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2                                           # Separate from previous data.
send "+++"                                       # Assure command mode.
delay 2                                           # Allow mode switching delay.
send "ATH0T\r"                                   # Set modem switch-hook down
                                                    # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2                # Ignore modem response.
send "ATE0Q1\r"                                  # Initialize modem: Echo OFF,
                                                    # Disable responses.

ignore "0\r" timeout 1
done

condin:     send "ATZQ0T\r"                        # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2    # Ignore modem response.
            send "ATE0T\r"                        # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2    # Enable responses (Numeric),
            send "ATQ0V0T\r"                    # Limit response codes.
            expect "0\r" timeout 2               # Confirm commands successful.
            send "ATS0=2\r"                      # Set AutoAnswer ON
            expect "0\r" timeout 2               # Confirm command successful.
done

waitcall:   ignore "2\r" timeout 1                # Ignore first ring.
            expect "2\r" timeout 10              # Pick up second ring
                                                    # or timeout.
                                                    # Expect a connection response.
            expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:       send "ATDT%N,,,%R;\r"                # %N = pager call center number
                                                    # Add enough commas to wait for
                                                    # time to enter paging number.
                                                    # %R = paging number

                                                    # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                               # Wait before hanging up.
            send "ATH0T\r"                       # Hang up.
            expect "0\r" timeout 2               # Confirm successful command.
done

ripo:       send "ATZQ0T\r"                        # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2    # Ignore modem response.
            send "ATE0T\r"                        # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2    # Enable responses (Numeric),
            send "ATQ0V0T\r"                    # Limit response codes.
            expect "0\r" timeout 2               # Confirm commands successful.
            send "ATS0=0\r"                      # Set AutoAnswer OFF
            expect "0\r" timeout 2               # Confirm command successful.
done                                               # RI Power On enabled.

error:      # Handle unexpected modem
            # responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
done

```

Sample File modem_z0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z0
#
# FUNCTIONS: Modem configuration file for some early Hayes* compatible modems.
# This example uses the ATZ0 reset command to choose the factory defaults.
# This setup is recommended for modems that will respond to the ATZ0 command
# and which do not respond to the extended (&) commands. Refer to your modem
# manual.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# Z0  Reset. Restore Profile 0 Q0  Turn on responses
# E0  Turn echo off           Q1  Turn off responses
# V0  Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode  S0=2 Answer on second ring
# H0  Hang-up                 X0=0 Limit modem response codes
#                               T = Tone mode. When used as T\r, it is a
#                               no op to maintain program synchronization
#                               when modem may/will echo the commands.
#
# %N Call-Out phone number    %P  Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "ATZ0Q0T\r"           # Reset modem. Select profile 0
          ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"             # Initialize modem: Echo OFF,
          expect "\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r"         # Limit response codes.
          expect "\r" timeout 2       # Confirm commands successful.
          send "ATS0=0\r"            # Set AutoAnswer OFF
          expect "\r" timeout 2       # Confirm command successful.
          done

connect:  send "ATDT%N\r"            # Tone dialing command.
          # %N from Call Home setup.

          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
          timeout 60
          done

retry:    send "A/"                  # Repeat the previous command.

          # Expect a connection response.
```

```

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2 # Separate from previous data.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0T\r" # Set modem switch-hook down
# (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
# Disable responses.

ignore "0\r" timeout 1
done

condin: send "ATZ0Q0T\r" # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=2\r" # Set AutoAnswer ON
expect "0\r" timeout 2 # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1 # Ignore first ring.
expect "2\r" timeout 10 # Pick up second ring
# or timeout.
# Expect a connection response.

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page: send "ATDT%N,,,%R;\r" # %N = pager call center number
# Add enough commas to wait for
# time to enter paging number.
# %R = paging number

# Confirm successful command.

expect "0\r" timeout 60
delay 2 # Wait before hanging up.
send "ATH0T\r" # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo: send "ATZ0Q0T\r" # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=0\r" # Set AutoAnswer OFF
expect "0\r" timeout 2 # Confirm command successful.
done # RI Power On enabled.

error: # Handle unexpected modem
# responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done

```

Sample File modem_f.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), setup file
# F0 or F1 is recommended.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# &F Reset to default profile Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up X0=0 Limit modem response codes
# T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# &C1 Detect CD &D2 Respond to DTR (often the default)
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

conout: send "AT&FQ0T\r" # Reset to factory defaults.
        ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
        send "ATE0T\r" # Initialize modem: Echo OFF,
        expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
        send "ATQ0V0X0T\r" # Limit response codes.
        expect "0\r" timeout 2 # Confirm commands successful.
        send "ATS0=0\r" # Set AutoAnswer OFF
        expect "0\r" timeout 2 # Confirm command successful.
        send "AT&C1&D2\r" # Detect carrier and DTR.
        expect "0\r" timeout 2 # Confirm command successful.
        done

connect: send "ATDT%N\r" # Tone dialing command.
        # %N from Call Home setup.

        # Expect a connection response.
        expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
        timeout 60
```

```

done

retry:    send "A/"                                # Repeat the previous command.

                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2                                         # Separate from previous data.
send "+++"                                     # Assure command mode.
delay 2                                         # Allow mode switching delay.
send "ATH0T\r"                                 # Set modem switch-hook down
                                                # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2              # Ignore modem response.
send "ATE0Q1\r"                                # Initialize modem: Echo OFF,
                                                # Disable responses.

ignore "0\r" timeout 1
done

condin:   send "AT&FQ0T\r"                      # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2           # Ignore modem response.
send "ATE0T\r"                                # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2          # Enable responses (Numeric),
send "ATQ0V0X0T\r"                          # Limit response codes.
expect "0\r" timeout 2                      # Confirm commands successful.
send "ATS0=2\r"                              # Set AutoAnswer ON
expect "0\r" timeout 2                      # Confirm command successful.
send "AT&C1&D2\r"                          # Detect carrier and DTR.
expect "0\r" timeout 2                      # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1              # Ignore first ring.
expect "2\r" timeout 10                     # Pick up second ring
                                                # or timeout.
                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:     send "ATDT%N,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
expect "0\r" timeout 60
delay 2                                       # Wait before hanging up.
send "ATH0T\r"                               # Hang up.
expect "0\r" timeout 2                      # Confirm successful command.
done

```

```

ripo:      send "AT&FQ0T\r"           # Reset to factory defaults.
           ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
           send "ATE0T\r"         # Initialize modem: Echo OFF,
           expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
           send "ATQ0V0X0T\r"     # Limit response codes.
           expect "\0\r" timeout 2  # Confirm commands successful.
           send "ATS0=0\r"        # Set AutoAnswer OFF
           expect "\0\r" timeout 2  # Confirm command successful.
           send "AT&C1&D2\r"      # Detect carrier and DTR.
           expect "\0\r" timeout 2  # Confirm command successful.
           done                   # RI Power On enabled.

error:    # Handle unexpected modem
           # responses.
           expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
           delay 2
           done

```

Sample File modem_f0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F0
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F0 reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), but doesn't
# work properly with this setup file, setup F1 is recommended.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# &F0 Reset. Restore profile 0 Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up X0=0 Limit modem response codes
#
# T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# &C1 Detect CD &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F0Q0T\r" # Reset modem. Select profile 0
         ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r" # Initialize modem: Echo OFF,
         expect "\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0X0T\r" # Limit response codes.
         expect "\r" timeout 2 # Confirm commands successful.
         send "ATS0=0\r" # Set AutoAnswer OFF
         expect "\r" timeout 2 # Confirm command successful.
         send "AT&C1&D2&R1\r" # Detect carrier and DTR,
         # Ignore RTS.
         expect "\r" timeout 2 # Confirm command successful.
         done

connect: send "ATDT%N\r" # Tone dialing command.
         # %N from Call Home setup.

         # Expect a connection response.
```

```

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

retry:    send "A/"                # Repeat the previous command.

# Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2                # Separate from previous data.
send "+++"            # Assure command mode.
delay 2                # Allow mode switching delay.
send "ATH0T\r"        # Set modem switch-hook down
# (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r"        # Initialize modem: Echo OFF,
# Disable responses.

ignore "0\r" timeout 1
done

condin:  send "AT&F0Q0T\r"        # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"            # Limit response codes.
expect "0\r" timeout 2        # Confirm commands successful.
send "ATS0=2\r"                # Set AutoAnswer ON
expect "0\r" timeout 2        # Confirm command successful.
send "AT&C1&D2&R1\r"          # Detect carrier and DTR,
# Ignore RTS.
expect "0\r" timeout 2        # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1    # Ignore first ring.
expect "2\r" timeout 10           # Pick up second ring
# or timeout.
# Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:    send "ATDT%N,,,%R;\r"     # %N = pager call center number
# Add enough commas to wait for
# time to enter paging number.
# %R = paging number

# Confirm successful command.
expect "0\r" timeout 60
delay 2                # Wait before hanging up.
send "ATH0T\r"        # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo:   send "AT&F0Q0T\r"        # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"            # Limit response codes.
expect "0\r" timeout 2        # Confirm commands successful.
send "ATS0=0\r"                # Set AutoAnswer OFF
expect "0\r" timeout 2        # Confirm command successful.
send "AT&C1&D2&R1\r"          # Detect carrier and DTR,
# Ignore RTS.
expect "0\r" timeout 2        # Confirm command successful.

```

```
done                                # RI Power On enabled.
error:                               # Handle unexpected modem
                                     # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

Sample File modem_f1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F1
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F1 reset command to choose the factory defaults.
# This set up is for modems with extended (&) commands and which do not work
# properly with setup F0. For early vintage modems, setup Z or Z0 is
# recommended.
#
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# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# &F1 Reset. Restore profile 1 Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 X0=0 Limit modem response codes
#                             T = Tone mode. When used as T\r, it is a
#                             no op to maintain program synchronization
#                             when modem may/will echo the commands.
#
#
# &C1 Detect CD               &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number   %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "AT&F1Q0T\r"           # Reset modem. Select profile 1
          ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"             # Initialize modem: Echo OFF,
          expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r"         # Limit response codes.
          expect "\0\r" timeout 2     # Confirm commands successful.
          send "ATS0=0\r"            # Set AutoAnswer OFF
          expect "\0\r" timeout 2     # Confirm command successful.
          send "AT&C1&D2&R1\r"       # Detect carrier and DTR,
          # Ignore RTS.
          expect "\0\r" timeout 2     # Confirm command successful.
          done

connect:  send "ATDT%N\r"            # Tone dialing command.
          # %N from Call Home setup.
          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
```

```

timeout 60
done

retry:      send "A/"                                # Repeat the previous command.
                                                    # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2      # Separate from previous data.
send "+++"   # Assure command mode.
delay 2      # Allow mode switching delay.
send "ATH0T\r" # Set modem switch-hook down
                                                    # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
                                                    # Disable responses.

ignore "0\r" timeout 1
done

condin:     send "AT&F1Q0T\r" # Reset modem. Select profile 1
            ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
            send "ATE0T\r" # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
            send "ATQ0V0X0T\r" # Limit response codes.
            expect "0\r" timeout 2 # Confirm commands successful.
            send "ATS0=2\r" # Set AutoAnswer ON
            expect "0\r" timeout 2 # Confirm command successful.
            send "AT&C1&D2&R1\r" # Detect carrier and DTR,
            # Ignore RTS.
            expect "0\r" timeout 2 # Confirm command successful.
done

waitcall:   ignore "2\r" timeout 1 # Ignore first ring.
            expect "2\r" timeout 10 # Pick up second ring
            # or timeout.
            # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:       send "ATDT%N,,,%R;\r" # %N = pager call center number
                                                    # Add enough commas to wait for
                                                    # time to enter paging number.
                                                    # %R = paging number

            # Confirm successful command.
            expect "0\r" timeout 60
            delay 2 # Wait before hanging up.
            send "ATH0T\r" # Hang up.
            expect "0\r" timeout 2 # Confirm successful command.
done

ripo:       send "AT&F1Q0T\r" # Reset modem. Select profile 1
            ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
            send "ATE0T\r" # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
            send "ATQ0V0X0T\r" # Limit response codes.
            expect "0\r" timeout 2 # Confirm commands successful.
            send "ATS0=0\r" # Set AutoAnswer OFF
            expect "0\r" timeout 2 # Confirm command successful.
            send "AT&C1&D2&R1\r" # Detect carrier and DTR,
            # Ignore RTS.
            expect "0\r" timeout 2 # Confirm command successful.
            # RI Power On enabled.
done

```

```
error:                                     # Handle unexpected modem
                                           # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

Appendix C. Trademarks and Acknowledgements

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