

RS/6000 High Availability Cluster Server - HA50



Cabling Guide

Second Edition (July 1998)

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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 documentation.

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 is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

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

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

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.

About This Book

This book provides cabling information that is specific to the RS/6000 High Availability Cluster Server - HA50.

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

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

ISO 9000

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

Related Publications

The following publications are available for purchase:

- The *RS/6000 Enterprise Server H50 User's Guide* contains information to help users set up, install options, configure, modify, and solve minor problems regarding the RS/6000 Enterprise Server H50.
- The *RS/6000 Enterprise Server H50 Installation and Service Guide* is used by the service technician to repair system failures in the RS/6000 Enterprise Server H50.
- The *7014 Model S00 Rack Installation and Service Guide* contains information regarding the 7014 Model S00 Rack, in which the RS/6000 Enterprise Server H50 is installed.
- The *Diagnostic Information for Multiple Bus Systems* contains common diagnostic procedures, error codes, service request numbers, and failing function codes. This manual is intended for trained service technicians.
- The *RS/6000 Adapters, Devices, and Cable Information for Multiple Bus Systems* contains information about adapters, external devices, and cabling. This manual is intended to supplement information found in the *Diagnostic Information for Multiple Bus Systems*.
- The *PCI Adapter Placement Reference* contains information regarding slot restrictions for adapters that can be used in this system.

- The *7133 SSA Disk Subsystem: Operator Guide* describes: how to operate the 7133 SSA Disk Subsystem and how to install or replace disk drives to the subsystem, and how to deal with problems encountered when using the subsystem.
- The *7133 SSA Disk Subsystem: Service Guide* describes: is used by the service technician to repair system failures in the 7133 SSA Disk Subsystem.
- The *Site and Hardware Planning Information* contains information to help you plan your installation.

Chapter 1. Reference Information

The RS/6000 High Availability Cluster Server - HA50 is a 2 node high availability cluster consisting of two RS/6000 Enterprise Server H50 drawers and a 7133-020 Serial Disk System mounted in a 7014 Model S00 Rack with two power distribution units. Each RS/6000 Enterprise Server H50 comes with AIX Version 4.2.1 or AIX Version 4.3 system software and HACMP 4.2.2 high availability cluster software. The base HA50 system uses and shares the external SSA disks in the Model 7133-020 SSA Disk Storage Subsystem. An additional Model 7133 SSA Disk Storage Subsystem may be ordered and configured with the RS/6000 High Availability Cluster Server - HA50 for increased protection.

Each Enterprise Server H50 drawer includes one 604e 332 MHz processor, 256 MB of memory, two 4.5 GB internal SCSI disk drives and a redundant AC power supply, two PCI SSA disk adapters, SSA cabling, two 10/100 Mbs Ethernet PCI adapters, one ethernet transceiver, one CD-ROM, one AIX 4.2.1 (1-2 user) license and one HACMP 4.2.2 license. It is highly recommended that a 3153 ASCII terminal (or equivalent) be purchased even if graphics adapters or remote work stations are used as the control console. This will permit a software or service person to work on one of the CPU's through the serial port without affecting the other CPU or applications. If a graphical display is preferred to the 3153 display, a low cost workstation can be connected to one of the ethernet transceivers or into the local network.

The 7133-020 Serial Disk System comes with eight 4.5 GB SSA disk drives on two loops and a redundant AC power supply

Up to four SSA adapters can be put in each RS/6000 Enterprise Server H50. The two base SSA adapters are located in slots 1P and 9P/I. The optional two SSA adapters are located in slots 4P and 7P.

The base HA50 system offers configuration flexibility. Since the HA50 system is comprised of Enterprise Server H50 drawers, all Enterprise Server H50 supported features, except SCSI and Ultra-SCSI HACMP configurations, are supported by the HA50 system.

Configuring the HA50 System With No Single Points of Failure

Redundant adapters and mirrored disks are the only way to guarantee redundancy in the HA50 serial disk system. In this configuration, no single hardware component failure can cause the serial disk system to be unavailable. If single disk adapters are used with mirrored disks, then AIX and HACMP error notification methods must be developed to:

1. Identify all critical adapter errors and
2. Escalate a critical adapter error to an HACMP failover.

The adapter outage in a single adapter configuration will cause a brief application outage while HACMP failover transfers control of the disks and application to a backup node.

It is strongly recommended that both disks and adapters are mirrored if possible. This minimizes both HACMP configuration and application disruption should a disk adapter fail.

The following table describes outages and their impacts for the minimum HA50 configuration with redundant SSA adapters (2 ethernets, 2 SSA adapters, mirrored disk subsystem, HACMP):

Hardware Failure Description	Failure Behavior If HACMP Is Not Configured	Extra Work Required To Provide Recovery Action (in addition to normal HACMP configuration)	Recovery Action and Behavior If HACMP Is Configured
Node Outage or AIX crash.	Node unavailable.	None	HACMP failover. Application(s) unavailable for brief time during failover.
Ethernet adapter failure.	Access to node through ethernet lost. Error log entry.	None	HACMP swap adapter event moves IP address to spare adapter. Node ethernet IP address unavailable for an extremely brief period as address is swapped.
SSA adapter failure.	None seen. Error log entry.	None	N/A (no failover).
Power supply or cord failure.	Node/disks supply feeds made unavailable.	None	N/A (no failover).

Chapter 2. Error Code to FRU Index

This section supplements the information in chapter 3 of *RS/6000 Enterprise Server H50 Installation and Service Guide*.

Error Code	Description	Action / Possible Failing FRU
25A80xxx	NVRAM problems	<p>NVRAM problem resolution:</p> <ol style="list-style-type: none">1. Errors reported against NVRAM can be caused by low Battery voltage and (more rarely) power outages that occur during normal system usage. With the exception of the 25A80000 error, these errors are warnings that the NVRAM data content had to be re-established and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, any system customization (eg. boot device list) information has been lost, the system may need to be re-configured.2. If the error is persistent, replace the battery.3. If the error is persistent after battery replacement, or the error code is 25A80000, replace the I/O board. (See notes on page 3-1 of <i>RS/6000 Enterprise Server H50 Installation and Service Guide</i>.)

Chapter 3. Modem Configurations

Sample Modem Configuration Files

With hundreds of modems to choose from, and various modem programming standards, configuring a modem for use with the RS/6000 High Availability Cluster Server - HA50 can be challenging. The RS/6000 High Availability Cluster Server - HA50 is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates. Several sample modem configuration files are supplied that either work directly with your modem, or provide a good starting point for a custom setup, if required.

The sample modem configuration files can be found in your RS/6000 Enterprise Server H50 firmware and in the `/usr/share/modems` subdirectory (if your server is using AIX) with the following names. A listing of each specific file is included in appendix B. A listing of each generic file is in *RS/6000 Enterprise Server H50 Installation and Service Guide*.

Generic Modem Configuration Files

AIX File Name	Service Processor Firmware File Name
modem_z.cfg	modem_z_sp
modem_z0.cfg	modem_z0_sp
modem_f.cfg	modem_f_sp
modem_f0.cfg	modem_f0_sp
modem_f1.cfg	modem_f1_sp

Specific Modem Configuration Files

AIX File Name	Service Processor Firmware File Name
modem_m0.cfg	modem_m0_sp
modem_m1.cfg	modem_m1_sp

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

Configuration File Selection

1. Is your modem an IBM 7852-400?

If yes, use modem configuration file `modem_m0.cfg` and go to step 7 on page 3-3 below.

Note: The IBM 7852-400 modem has dip switches on the right hand side of the unit. See “IBM 7852-400 DIP Switch Settings” on page 3-4 for the correct switch settings.

If no, continue with step 2 below.

2. Is your modem an IBM 7857-017?

If yes, use modem configuration file `modem_m1.cfg` and go to step 7 on page 3-3.

Note: The IBM 7857-017 modem has two telephone line connections on the back of the unit. One is marked “LL” (for Leased Line), and the other is marked “PTSN” (for Public Telephone Switched Network). The service processor expects to use the modem on the public network, so the telephone line should attach to the PTSN connector. Also, see the note on page 3-3.

If no, continue with step 3.

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

If yes, go to step 5.

If no, continue with step 4.

4. 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.

Go to step 7 on page 3-3.

5. Does your modem command set include a test for V.42 error correction at the remote modem (often called “Auto-Reliable Mode”)?

If yes, this test must be disabled. Sample configuration files `/usr/share/modem_m0.cfg` or `/usr/share/modem_m1.cfg` can be used as models to help you create a file for your particular modem. See “Customizing the Modem Configuration Files” on page 3-4. Go to 7 on page 3-3.

If no, go to step 6.

6. 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.

7. Selection is complete.

If your modem configuration selection is not available in the Service Processor Modem Configuration Menu, you must access it through the Configure Remote Maintenance Policy Service Aid.

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

Note: 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.

Note: Some modems, such as IBM 7857-017, Some modems are not designed for the paging function. Although they can be used for paging, they return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message causes the Service Processor to retry, continuing to place pager calls for the number of retries specified in the Call-Out Policy Setup Menu. These retries result in redundant pages.

Examples For Using the Generic Sample Modem Configuration Files

Modem	Setup Z	Setup Z0 (Rare)	Setup F	Setup F0	Setup F1
AT&T DataPort 2001 **				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852-10				X	
IBM 7855					X
USRobotics 36.6K Sportster					X
Zoom V.32			X		

Note: ** Ring interrupt only on first ring.

Customizing the Modem Configuration Files

You can create your own modem configuration file(s) or modify the samples provided. After you customize your modem configuration files, you **MUST** access them via the Configure Remote Maintenance Policy Service Aid rather than from the Service Processor menus.

Note: If you have already set up your serial ports, line speeds, authorizations and telephone numbers from the Service Processor menus, specify your customized modem configuration files from the service aid.

If you have not already set up your serial ports, line speeds, authorizations and telephone numbers from the Service Processor menus, you may set them up with the service aids while you specify your customized modem configuration files.

IBM 7852-400 DIP Switch Settings

If you are using a 7852-400 modem to enable service processor communications, for proper operation, the DIP switches must be set according to the following table.

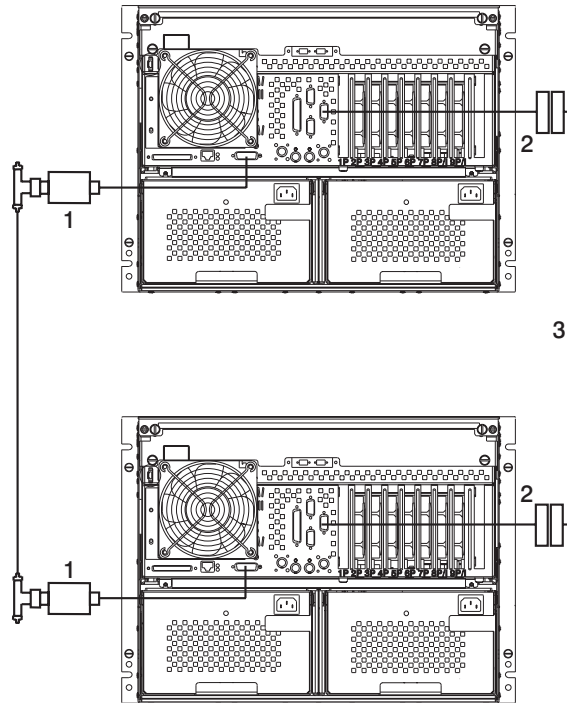
Switch	Position	Function
1	Up	Force DTR
2	Up	Flow Control &E4
3	Down	Result Codes Enabled
4	Down	Modem Emulation Disabled
5	Up	Auto Answer Enabled
6	Up	Maximum Throughput Enabled
7	Up	RTS Normal Functions
8	Down	Enable Command Mode
9	Down	Remote Digital Loopback Test Enabled
10	Up	Dial-Up Line Enabled
11	*Up	AT Responses Enabled (Extended Responses Disabled)
12	*Down	Asynchronous Operation
13	UP	28.8KB Line Speed
14	Up	
15	Up	CD and DSR Normal Functions
16	Up	2-Wire Leased Line Enabled

* Only switches 11 and 12 are changed from the factory default settings.

Chapter 4. Basic HA50 System Cabling Diagrams and Parts List

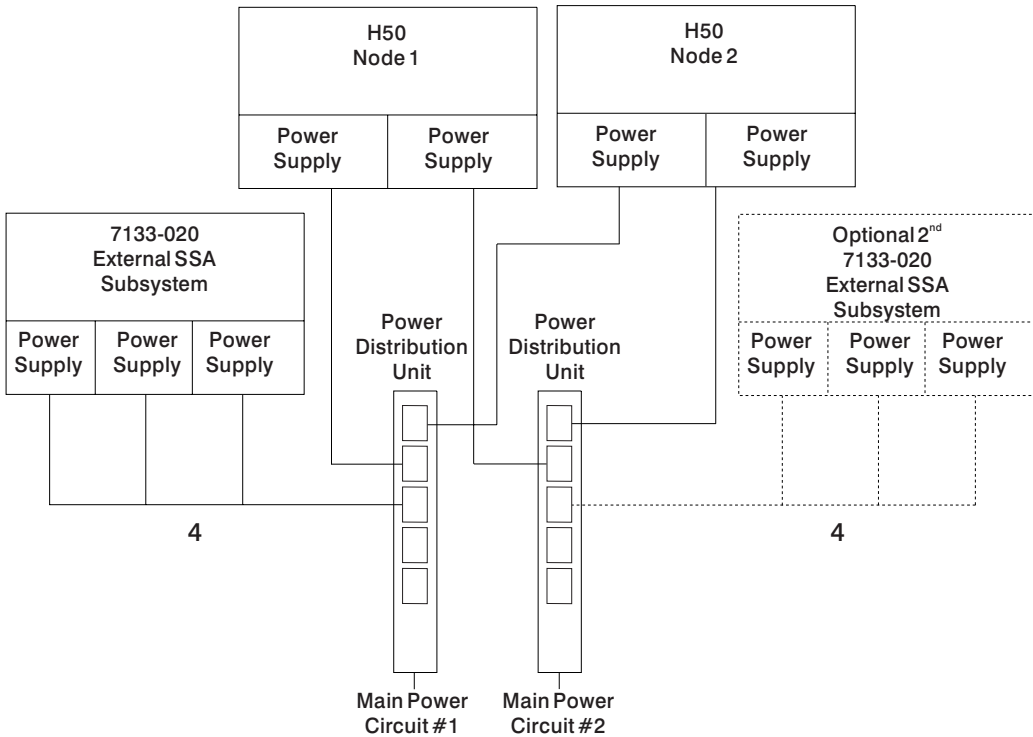
This section shows the heartbeat connections of the RS/6000 High Availability Cluster Server - HA50, the power cable locations, the SSA cable connections, and the cabling for serversystem consoles and cluster administration stations.

Base HA50 Heartbeat Connections



Index	Part/Feature Number	Units Per	Description
1	4223	2	Ethernet Transceiver 10Base2 (D Shell to BNC). The customer is responsible for furnishing the T Connector, co-axial cable and terminator for the Ethernet connections.
2	40H6328	2	1 Foot Adapter DB9f--DB25M (supplied with H50)
3	3124	1	HACMP, Serial to Serial Port Cable (Drawer to Drawer)

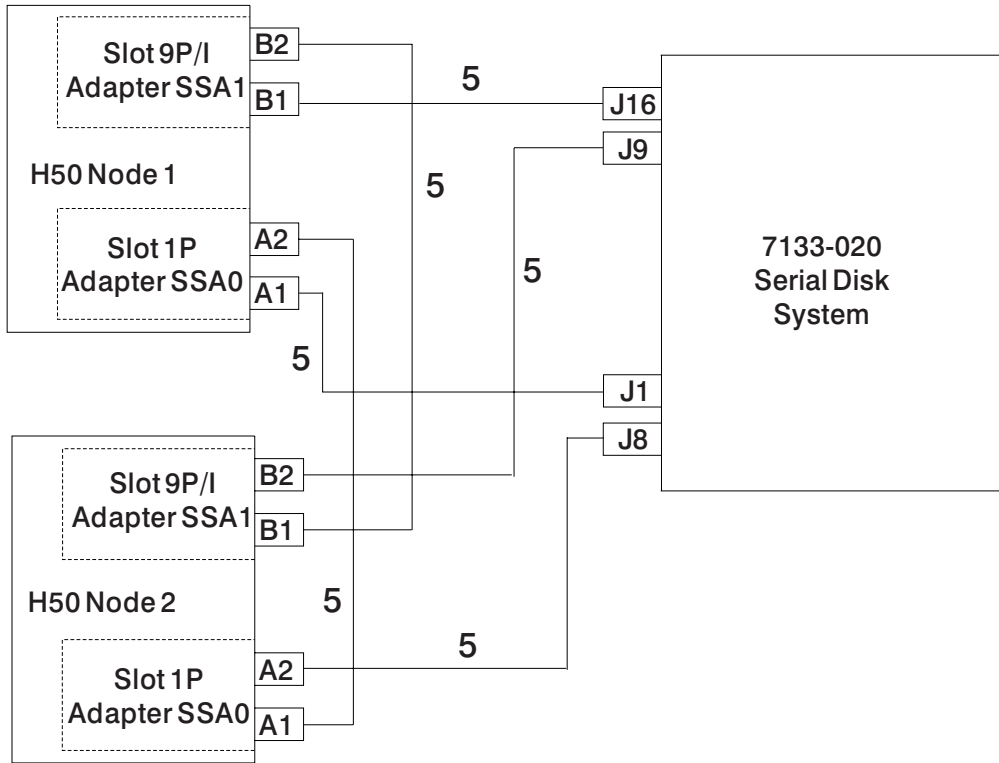
Base HA50 AC Power Connections



Index	Part/Feature Number	Units Per	Description
4	67G1246	1 or 2	Power Cable, PDU to 7133-020

Note: The only way to ensure a truly robust HA operation is to connect the optional second 7133-020 Serial Disk System, as shown in the dotted lines above.

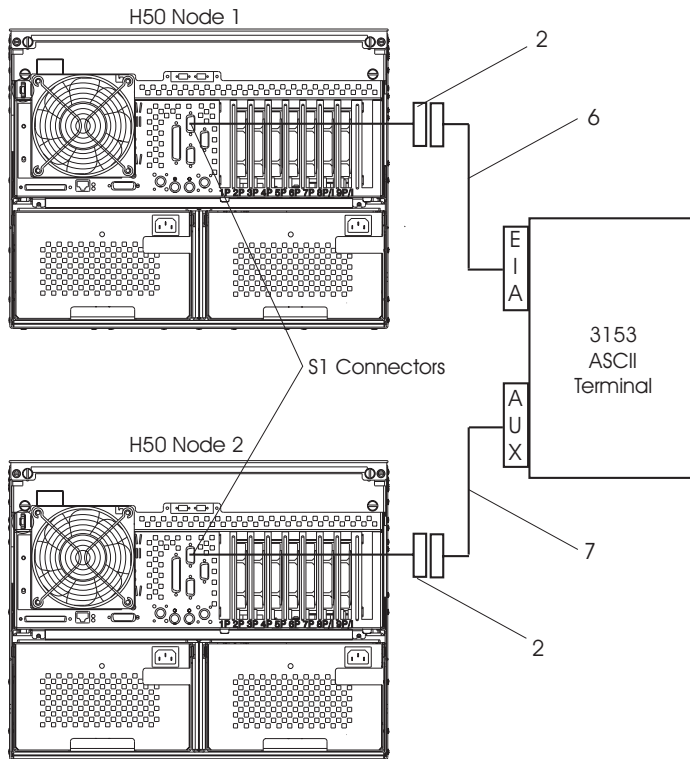
Base HA50 Logical Configuration



Index	Part/Feature Number	Units Per	Description
5	5050	6	7133 SSA Cable

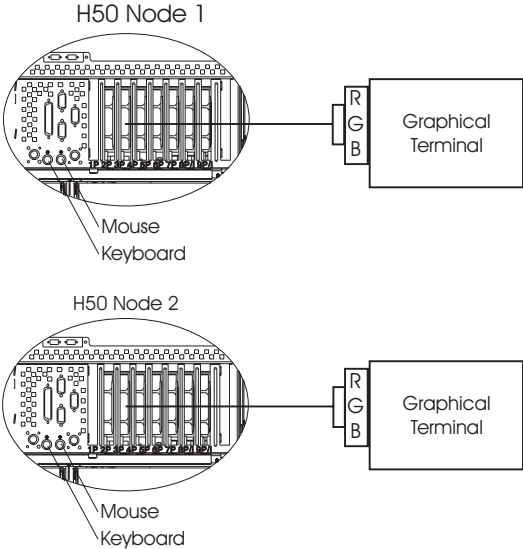
Cabling For Server System Consoles and Cluster Administration Stations

HA50 with ASCII System Console

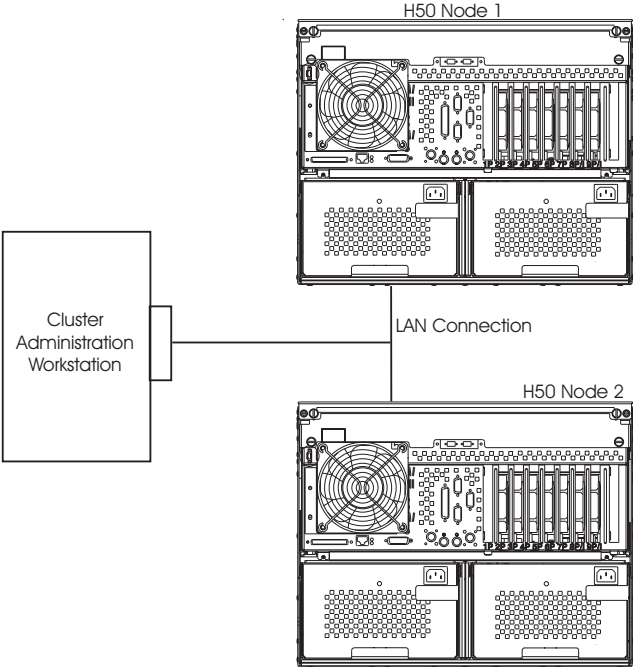


Index	Part Number	Units Per	Description
6	12H1204	1	Serial Cable with Internal Null Modem
7	88G0093	1	Serial Cable without Internal Null Modem
2	40H6328	2	1 Foot Adapter DB9f--DB25M (supplied with H50)

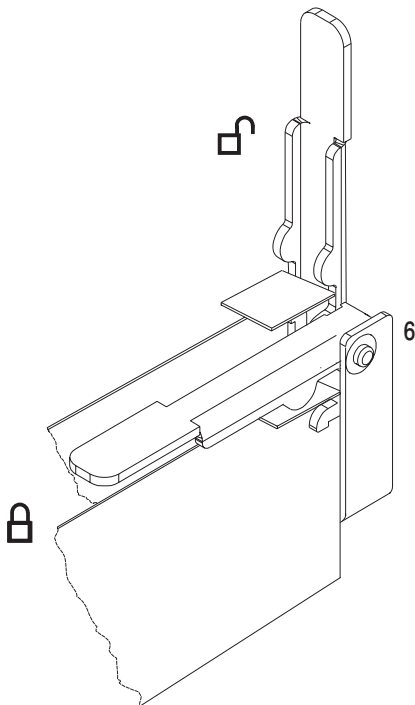
HA50 With Graphical System Console



HA50 With Graphical Cluster Administration Station



Whenever you remove or replace the CPU or memory cards in the Enterprise Server H50, refer to the following diagram for the correct positioning of the locking latches that hold the cards in position.



The following tables list the internal SSA and other cables and associated part numbers for the RS/6000 Enterprise Server H50. This information is not listed in the *RS/6000 Enterprise Server H50 Installation and Service Guide*

Assemblies, Retainers, Etc.

Index	Part Number	Units Per	Description
	00G1007		Screw
	00G1268		Planar Screw
	07L7319		Nut Plate
	07L8357		Service Processor (Replaces 93H4214)
	11H9760		Ethernet Slide Snap Latch
	33G3907		Screw
	42G4932		SCSI Screw
	73H3531		Memory Guide
	73H3768		Standoff
	78X8993		Screw
	81F9137		Stud Slider
	81F9178		Ethernet Latch
	88G3977		16 Bit Terminator Adapter
	93H0083		EMC Gasket
	93H4574		Cable Clamp
	93H6015		Fan Guide
	93H6016		92mm Fan Guard
	93H6017		Plastic Rivet
	93H6321		SSA Backplane Assembly
	59H7210		SSA Blank Carrier
6	93H8549		CPU Levers, Rear
6	93H8554		Front Lever Assembly
6	93H8558		Memory Levers, Rear
	93H8954		Power Supply Blank
	94H0136		Bezel
	94H0137		Plate
	94H0824		Operator Panel
	0257984		Washer
	1621180		Screw M3.5
	1621182		Screw
	6410857		Screw

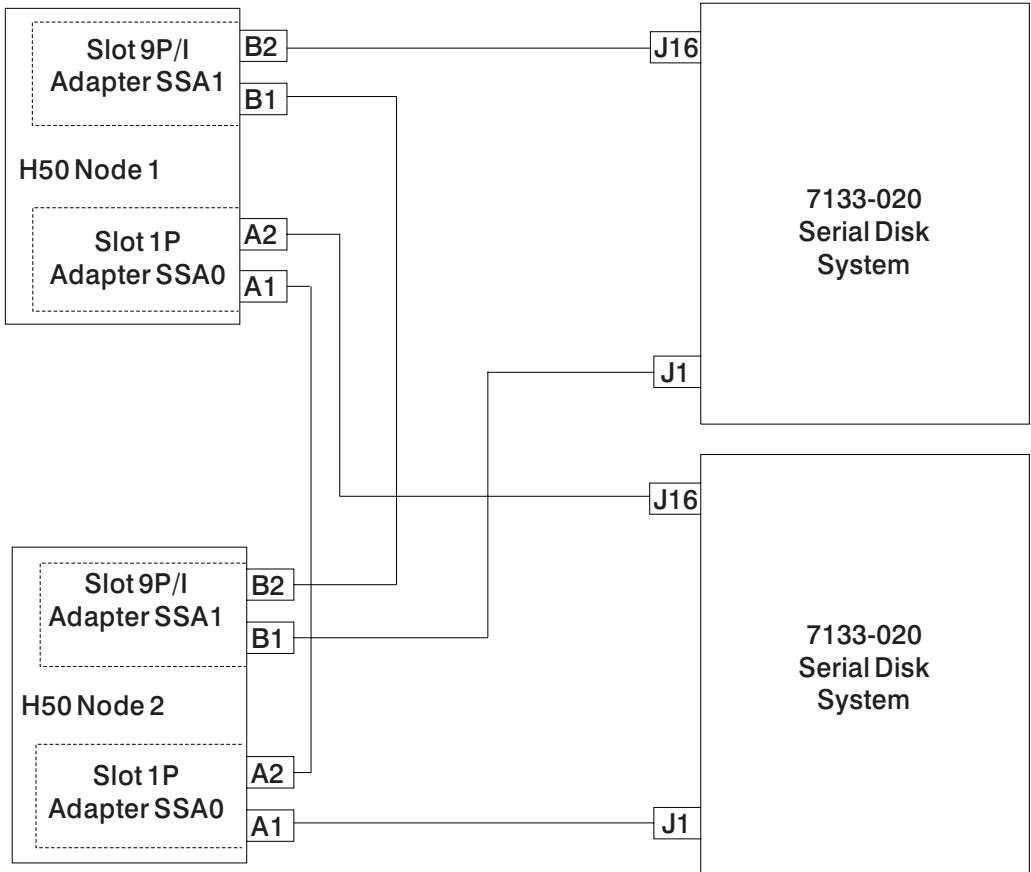
Cables and Related Parts

Index	Part Number	Units Per	Description
	06H6660	Up to 2	Cable (SCSI adapter to backplane)
	73H1894	1	Cable (diskette)
	39H9994	1	Cable (Power 2-drop)
	92F1294	3	Cable clamp
		A/R	Screw (3.5 x 6)
	6952300	1-2	Power cable
	93H4339	1	Int. Signal Cable, Bulkhead to SSA Backplane
	93H4340	1	Int. Signal Cable, SSA Adapter to Bulkhead
	93H4341	1	Int. Signal Cable, SSA Backplane to SSA Backplane
	93H8561	1	Power Cable, PDB to I/O Board
	93H8562	1	Power Cable, PDB to CPU Card 2
	93H8563	1	Power Cable, FMC to Right Blower (Fan 6)
	93H8564	1	Power Cable, FMC to Left Blower (Fan 5)
	93H8565	1	Power Cable, PDB to I/O Board
	93H8566	1	Power Cable, FMC to CPU Fan (Fan 7)
	93H8567	1	Power Cable, PDB to FMC
	93H8568	1	Power Cable, PDB to CPU Card 1
	93H8569	1	Signal Cable, I/O Board to FMC
	93H8571	1	Power Cable, PDB to DASD Docking Bulkhead
	93H8572	1	Power Cable, PDB to Media Docking Bulkhead
	93H8875	1	Power Cable, Media Devices to Media Docking Bulkhead
	93H8876	1	Power Cable, DASD Devices to DASD Docking Bulkhead
	93H9613	1	Signal Cable, I/O Board to Internal SCSI Devices
	93H9653	1	PCI Signal Cable, FMC to Bulkhead
	07L6763	1	EPO Signal Cable, I/O Board to DASD Backplanes
	93H1816	1	Signal Cable, Operator Panel Assembly to LCD

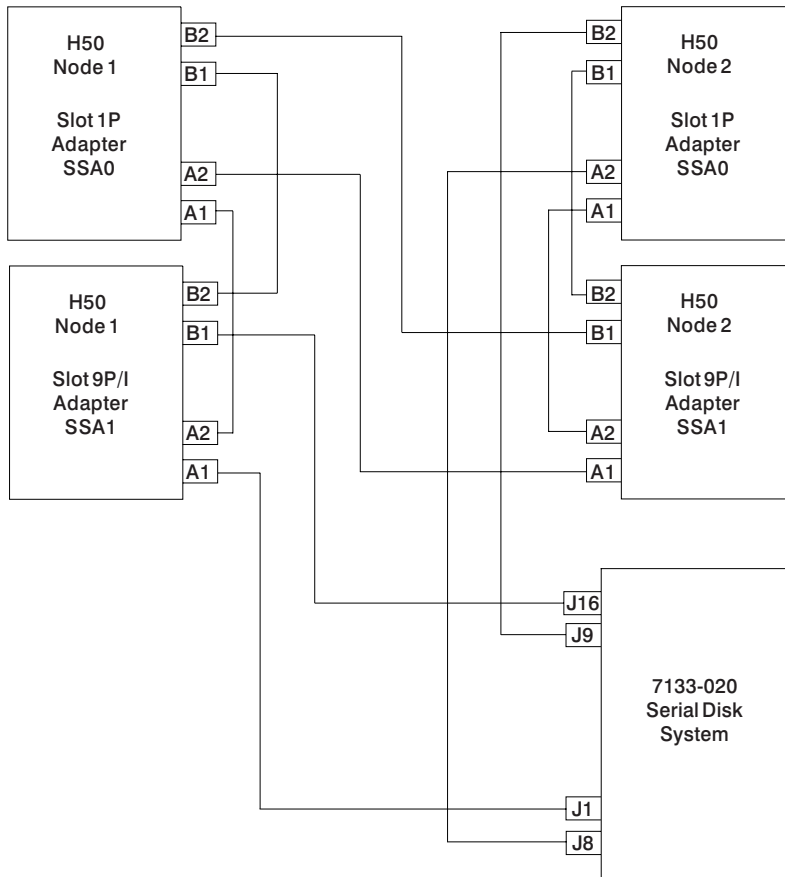
Appendix A. Supplemental Cabling Information

Because the basic cabling information in this document is not the only way to configure the HA50, this appendix shows some other ways to configure the HA50.

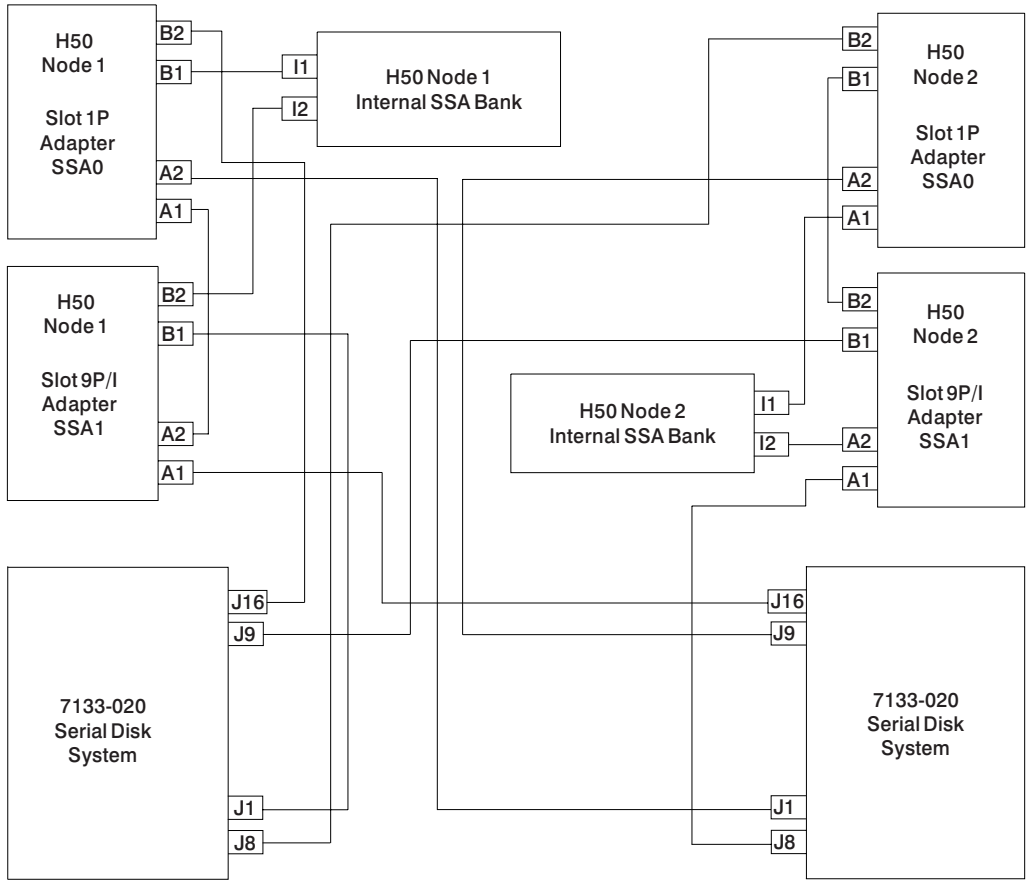
HA50 Configuration with Optional Second Serial Disk System



HA50 Configuration with Redundant Internal SSA Adapters



HA50 With Redundant Internal SSA Adapters, Optional Second Serial Disk System and Optional Internal SSA Banks



Appendix B. Sample Modem Configuration Files

modem_m0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP: modem_m0
#
# FUNCTIONS: Modem configuration file specifically for IBM 7852-400
# modem with Auto-Reliable feature. This feature must be turned off
# for Catcher calls. This example uses the AT&F reset command to
# choose the factory defaults.
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#
#
# The modem has configuration switches. They should be set to the
# factory default settings, except switches 11 and 12. These must be
# to UP ("AT" responses) and DOWN (Asynchronous operation), respectively.

ICDelay 1
DefaultT0 10
CallDelay 120
#
# %N Call-Out phone number %R Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F&E2E0T\r" # Reset to factory defaults
# Reliable mode
# Echo off
ignore "\0\r" or "\0K\r\n" timeout 2 # Ignore modem response.
send "AT&E12&E14\r" # Disable pacing
# Disable data compression
expect "\0\r" or "\0K\r\n" timeout 2 # Confirm commands successful.
send "AT&SF1&S0S9=1\r" # DSR independent of CD
# Force DSR on.
# CD respond time=100ms
expect "\0\r" or "\0K\r\n" timeout 2 # Confirm commands successful.
send "ATV0S0=0\r" # Numeric response code
# Auto-Answer off
expect "\0\r" or "\0K\r\n" timeout 2 # Confirm commands successful.
done

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

```

                                # Expect a connection response.
                                expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
                                timeout 60
                                done

retry:      send "A/"                                # Repeat the previous command.
                                # Expect a connection response.
                                expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\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&F&E2E0T\r"                    # Reset to factory defaults.
                                                    # Reliable mode
                                                    # Echo off
            ignore "0\r" or "OK\r\n" timeout 2    # Ignore modem response.
            send "AT&E12&E14\r"                  # Disable pacing
                                                    # Disable data compression
            expect "0\r" or "OK\r\n" timeout 2    # Confirm commands successful
            send "AT&SF1&S0S9=1\r"                # DSR independent of CD.
                                                    # Force DSR on.
                                                    # CD respond time=100ms
            expect "0\r" or "OK\r\n" timeout 2    # Confirm commands successful.
            send "ATV0S0=2\r"                    # Numeric response code
                                                    # Answer on 2nd ring
            expect "0\r" timeout 2                # Confirm commands successful.
            done

waitcall:  ignore "2\r" timeout 1                 # Ignore first ring.
            expect "2\r" timeout 10              # Pickup 2nd ring or timeout
                                                    # Expect a connection response.
            expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\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.

```

```

expect "0\r" timeout 60      # %R = paging number
delay 2                     # Confirm successful command.
send "ATH0\r"              # Wait before hanging up.
expect "0\r" timeout 2      # Hang up.
done                        # Confirm successful command.

ribo:  send "AT&F&E2E0\r"    # Reset to factory defaults.
                                           # Reliable mode
                                           # Echo off
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT&E12&E14\r"        # Disable pacing
                                           # Disable data compression
expect "0\r" or "OK\r\n" timeout 2 # Confirm successful command.
send "AT&SF1&S0S9=1\r"     # DSR independent of CD.
                                           # Force DSR on.
                                           # CD respond time=100ms
expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
send "ATV0S0=0\r"         # Numeric response code
                                           # Auto Answer OFF
expect "0\r" timeout 2     # Confirm commands successful.
done                        #

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

modem_m1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP modem_m1
#
# FUNCTIONS: Modem configuration file specifically for IBM 7857-017 modem with
# Auto-Reliable feature. This feature must be turned off for Catcher calls.
# This example uses the AT&F reset command to choose the factory defaults.
#
# To allow dial commands for digital pagers, it is necessary to reduce
# the number of characters in the dial command. Each comma (delay) has
# been set to 6 seconds (S8=6) for that reason.
#
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#

ICDelay 1
DefaultT0 10
CallDelay 120
#
# %N Call-Out phone number %R Return phone number
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled
ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2S8=6\r" # Trellis modulation disabled
# Retrain with adaptive rate
# Set ,=6second
expect "\r" or "OK\r\n" timeout 2 # Confirm commands successful
send "ATV0X0S0=0\r" # Numeric response code
# AT compatible messages
# Auto-Answer disabled
expect "\r" or "OK\r\n" timeout 2 # Confirm commands successful.
done

connect: send "ATDT%N\r" # Tone dialing command.
# %N from Call Home setup.
expect "1\r" busy "7\r" timeout 60 # Expect a connection response.
done

retry: send "A/" # Repeat the previous command.
expect "1\r" busy "7\r" timeout 60 # Expect a connection response.
```

```

done

disconnect:
delay 2 # Separate from previous data.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0\r" # Set modem switch-hook down
# (i.e., hang up).

ignore "\0\r" or "\0K\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
# Disable responses.

ignore "\0\r" timeout 1
done

condin:
send "AT&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled

ignore "\0\r" or "\0K\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2\r" # Trellis modulation disabled
# Retrain with adaptive rate

expect "\0\r" or "\0K\r\n" timeout 2 # Confirm commands successful
send "ATV0X0S0=2\r" # Numeric response code
# AT compatible messages
# Answer on 2nd ring

expect "\0\r" timeout 2 # Confirm commands 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 "\1\r" timeout 60
done

page:
send "ATD%N,%R\r" # %N = pager call center number
# commas=6sec wait time to
# enter paging number.
# %R = return number

expect "\0\r" or "\3\r" timeout 30 # Confirm successful command.
delay 2 # Wait before hanging up.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0\r" # Hang up.
expect "\0\r" timeout 2 # Confirm successful command.
done

ripo:
send "AT&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled

ignore "\0\r" or "\0K\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2\r" # Trellis modulation disabled
# Retrain with adaptive rate

```

```

expect "0\r" or "OK\r\n" timeout 2 # Confirm successful command.
send "ATV0X0S0=0\r"                # Numeric response code
                                     # AT compatible messages
                                     # Auto-Answer disabled
expect "0\r" timeout 2              # Confirm commands successful.
done                                  #

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

```

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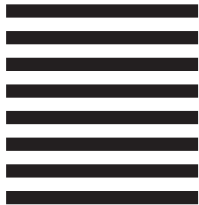
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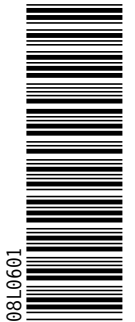


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