2210 Nways Multiprotocol Router

Installation and
Initial Configuration Guide

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Initial Configuration Guide

> **Note**
>
> Before using this information and the product it supports, be sure to read the general information under
> Appendix B, "Notices" on page 37 and "Electronic Emission Notices" on page 37.

Second Edition (October 1997)

This edition applies to the IBM 2210 Nways Multiprotocol Router.

Order publications through your IBM representative or the IBM branch office serving your locality. Publications are not stocked at the address given below.

Forms for readers' comments appear at the front and back of this publication. If the forms have been removed, address your comments to:

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About This Guide

This guide describes how to set up the IBM 2210, perform the initial configuration, and identify and correct any problems that occur during the installation.
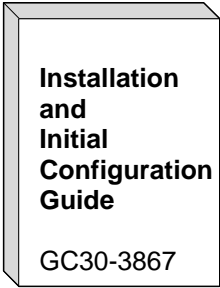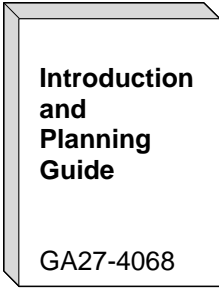
The IBM 2210 has multiple connectors (ports) on the rear of the unit. This guide tells you how to attach the correct cable to each port to complete the physical installation of the IBM 2210.

In order for the IBM 2210 to communicate with other devices in the WAN, it must be configured with some basic information about its location (address). The IBM 2210 may have been pre-configured at the factory and, if so, it will automatically configure itself at the end of the initial power-on. If the IBM 2210 requires manual configuration, this guide describes three alternative ways to configure it.
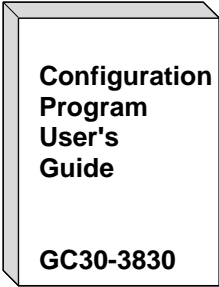
Who Should Use This Guide

This guide is intended for the person responsible for installing the IBM 2210 and performing simple configuration tasks when assisted by a network administrator.
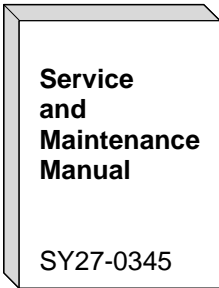
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Planning and Installation

Introduction and Planning Guide	**Installation and Initial Configuration Guide**
GA27-4068	GC30-3867

Configuration

Configuration Program User's Guide

GC30-3830

Configuration Program READ.ME

Configuration Help

Diagnostics/ Maintenance

Service and Maintenance Manual

SY27-0345

Operations and Network Administration

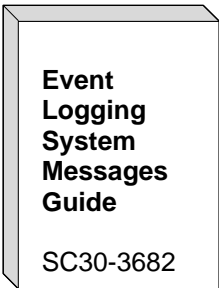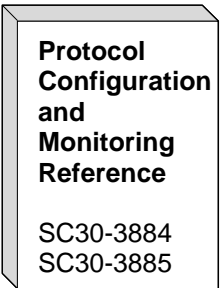|		
Software User's Guide	**Protocol Configuration and Monitoring Reference**	**Event Logging System Messages Guide**
SC30-3886	SC30-3884 SC30-3885	SC30-3682

Figure 1. IBM 2210 Nways Multiprotocol RouterLibrary Overview

Library Description

Introduction and Planning

GA27-4068   *IBM 2210 Nways Multiprotocol Router Introduction and Planning Guide*

This book is shipped with the 2210. It explains how to prepare for your network and for installation.

This book provides translations of danger notices and other safety information.

GC30-3867   *IBM 2210 Nways Multiprotocol Router Installation and Initial Configuration Guide*

It explains how to prepare for installation, install the 2210, perform an initial configuration and verify that the installation is successful.

This book provides translations of danger notices and other safety information.

Diagnostics and Maintenance

SY27-0345   *IBM 2210 Nways Multiprotocol Router Service and Maintenance Manual*

This book is shipped with the 2210. It provides instructions for diagnosing problems with and repairing the 2210.

Operations and Network Management

SC30-3681   *Software User's Guide for Multiprotocol Routing Services*

This book explains how to:

- Configure, monitor, and use the IBM Multiprotocol Routing Services software shipped with the router.

- Use the Multiprotocol Routing Services command-line router user interface to configure and monitor the network interfaces and link-layer protocols shipped with the router.

SC30-3680   *Protocol Configuration and Monitoring Reference Volume 1 for Multiprotocol Routing Services*

SC30-3865   *Protocol Configuration and Monitoring Reference Volume 2 for Multiprotocol Routing Services*

These books describe how to access and use the Multiprotocol Routing Services command-line router user interface to configure and monitor the routing protocol software shipped with the router.

They include information about each of the protocols that the devices support.

SC30-3682   *IBM Nways Event Logging System Messages Guide*

This book contains a listing of the error codes that can occur, along with descriptions and recommended actions to correct the errors.

Configuration

Online help   The help panels for the Configuration Program assist the user in understanding the program functions, panels, configuration parameters, and navigation keys.

GC30-3830   *Configuration Program User's Guide for Multiprotocol Routing Services*

This book discusses how to use the Configuration Program.

GG24-4446   *IBM 2210 Nways Multiprotocol Router Description and Configuration Scenarios*

This book contains examples of how to configure protocols using IBM Multiprotocol Routing Services.

Safety

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

This book provides translations of caution and danger notices applicable to the installation and maintenance of an IBM 2210.

Library Ordering Information

All 2210 publications can be ordered separately.

These publications are shipped in hardcopy with the 2210:

IBM 2210 Nways Multiprotocol Router Introduction and Planning Guide

IBM 2210 Nways Multiprotocol Router Installation and Initial Configuration Guide

IBM 2210 Nways Multiprotocol Router Service and Maintenance Manual

Caution: Safety Information - Read This First

These publications are shipped with the Configuration Program in softcopy on a CD-ROM:

IBM 2210 Nways Multiprotocol Router Introduction and Planning Guide

IBM 2210 Nways Multiprotocol Router Installation and Initial Configuration Guide

IBM 2210 Nways Multiprotocol Router Service and Maintenance Manual

Software User's Guide for Multiprotocol Routing Services

Protocol Configuration and Monitoring Reference Volume 1 for Multiprotocol Routing Services

Protocol Configuration and Monitoring Reference Volume 2 for Multiprotocol Routing Services

IBM Nways Event Logging System Messages Guide

Configuration Program User's Guide for Multiprotocol Routing Services

IBM Multiprotocol Routing Services and IBM 2210 Softcopy Library

Obtaining Softcopy Information

Softcopy BookManager READ library information is available for many of the 2210 publications in the *IBM Networking Systems Softcopy Collection Kit.* To place a single order for the CD-ROM, use form number SK2T-6012. To place a single order for the 3480 cartridge, use form number SK2T-6013.

Yearly subscriptions to the *IBM Networking Systems Softcopy Collection Kit*, product number 5636-PUB, are available through your branch office representative. Order feature code 2003 and media code 5003 for CD-ROM format. Order feature code 2004 and media code 5004 for 3480 cartridge format.

System Library Subscription Service

The 2210 publications are available via the System Library Subscription Service (SLSS). Use machine type 2210 and program number 5765-B86 to receive 2210 publications.

Visit Our Web Site

Visit the IBM 2210 website at *http://www.networking.ibm.com/220/220prod.html* for:

- Engineering changes, clarifications, and fixes that have been implemented after the manuals were printed,

- PTFs, configuration programs, and MRNS and MRS releases

- Publications

- Questions & Answers

Summary of Changes

The following changes to the IBM 2210 library have been made:

- **Reorganized hardware information**:

  - The title of the *2210 Nways Multiprotocol Router Planning and Setup Guide*, GA27-4086, has been changed to the *2210 Nways Multiprotocol Router Introduction and Planning Guide*

    This book now contains only information that introduces IBM 2210 router and information necessary for planning your network. Installation instructions have been moved into the new *2210 Nways Multiprotocol Router Installation and Initial Configuration Guide*.

  - The title of the *2210 Nways Multiprotocol Router IBM 2210 Models 1Sx and 1Ux Installation Guide*, GC30-3867, has changed to the *2210 Nways Multiprotocol Router Installation and Initial Configuration Guide*.

    It now contains instructions for installing all models of the 2210. In addition, it guides you through the initial configuration once you have installed the 2210 router.

- **Information to support hardware**

  - New adapters:

    - 4-port S/T ISDN BRI adapter
    - 4-port U ISDN BRI adapter

- **Information to support software**

  - New Functions:

    - Dial-In Access to LAN Servers (DIALs)
    - Delete Interface command
    - Full WAN support for concentration adapters
    - Spare interface definition for dynamic reconfiguration
    - Ethernet Local MAC Address Administration

  - Enhanced Functions:

    - Bridging Enhancements

      - SR-TB duplicate MAC address support – allows a duplicate MAC address to exist in an SR domain and also offers a load-balancing feature.

    - DLSw Enhancements:

      - Circuit priority – allows you to set the circuit priority for a range of SAPs and MAC addresses.

      - MAC address list – allows you to build address lists for DLSw sessions to exchange as described in RFC 1795.

      - NetBIOS SesionAlive spoofing – allows you to disable TCP keepalive messages for dial-on-demand circuits.

    - Serviceability Enhancements

      - TFTP disable – to prevent unwanted updates or retrievals of device software from the network

- ICMP redirect disable – prevents the device from transmitting a packet on the same interface on which it received the packet.
- Time-activated load – to allow you to load software into a device in off-peak hours unattended.

– Protocol Enhancements:

- AppleTalk

  - Support for AppleTalk network management applications.

- APPN

  - Support for APPN Branch Extender which decreases the overall size of a topology database.
  - Improved management of topology database by removing database records for resources that are no longer active in the network.
  - Support for an APPN frame relay port that uses BAN.
  - Support for an implicit focal point which will allow you to specify a node with network management responsibilities on the device. The device uses this focal point when it cannot establish a session with an explicit focal point.
  - The ability to configure the size of the held alert queue.

- ATM:

  - RFC 1483 bridging over ATM PVCs and SVCs.
  - Shared RFC 1483 PVCs
  - LAN emulation quality of service.
  - Next Hop Routing Protocol (NHRP) client.
  - ATM virtual interface.
  - Redundant default IP gateways for emulated LANs.
  - Classical IP (CIP) redundancy
  - Distributed ARP server support which provides continuous connectivity across logical IP subnets in the event of an ARP server failure.
  - Support for RFC 1577+ clients.

- BRS

  - The ability to define default circuit traffic classes for BRS.
  - Improvements that allow assigning TCP/IP packets to a BRS class and priority based on a TCP/UDP port number, a TCP/UDP port range, or a TCP/UDP socket.

- Frame Relay:

  - Frame Relay now runs on V.25bis.
  - Data compression supported on Frame Relay.

    Note: If you are currently using compression on PPP interfaces, you will need to configure compression contexts for compression to work.

  - Improved congestion control using BECN, FECN, and CLLM.

- IP:

  - Support for RIP Version 2

  - The ability to define up to 4 static routes for each IP destination host or subnet.

  - The ability to define the same IP subnet on multiple network interfaces.

  - Improved determination of whether a static route will work.

  - Improvements to route filtering and routing policies.

  - OSPF demand circuits for OSPF topology refreshes and hello messages.

  - PING enhancements

- IPX:

  - The ability to configure IPX static routes and services to prevent RIP and SAP from activating V.25bis and ISDN demand circuits.

  - The ability to configure a default route to a destination network.

  - PING enhancements

- ISDN:

  - I.430 and I.431 support

- PPP:

  - Increased bandwidth by increasing the number of links through Bandwidth Allocation Protocol/Bandwidth Allocation Control Protocol (BAP/BACP).

  - Enhanced authentication using authentication servers.

  - Support for Encryption Control Protocol (ECP) negotiation using Data Encryption Standard (DES) Cypher Block Chaining (CBC) mode.

- SNMP Enhancements:

  - Upgrade or Addition of the Following MIBs:

    – Appletalk MIB
    – APPN family of MIBs
    – ATM
    – BRS MIB
    – Ethernet
    – HPR
    – Interfaces MIB
    – IP over ATM MIB
    – IPX MIB
    – ISDN MIB
    – LAN Emulation Client
    – NHRP MIB
    – PPP MIB

  - New trap support

    – FR traps for the receipt of FECN, BECN, and CLLM

- WAN Reroute Enhancements:

  - The ability to dial up additional circuits when the primary circuit capacity is exceeded.

  - Allows Frame Relay traffic to use ISDN circuits as alternate circuits.

- X.25 Enhancements:

  - New change commands for XTP.

- **Clarifications and corrections**

  The technical changes and additions are indicated by a vertical line (]) to the left of the change.

Contents

Chapter 1. Installing the 2210

DANGER

> **An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the IBM 2210 or the devices that attach to the IBM 2210. 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 cord for the IBM 2210 is unplugged.**
>
> **When possible, use one hand 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 or disconnect any cables.**

Note: For translations of this safety notice, see "Safety Notices" on page 43.

To install the IBM 2210, you will first install the hardware, and then perform an initial configuration if your router was not configured at the factory.

1. To install the hardware, see the following sections of this guide:

   a. "Preparing for Installation" on page 2
   b. "Installing Options in Models 14T and 24x" on page 25, if needed
   c. "Placing the IBM 2210 on the Table or in the Rack" on page 4
   d. "Connecting the Cables" on page 8
   e. "Connecting the Power Cord" on page 11
   f. "Attaching the IBM 2210 to Devices" on page 11
   g. "Verifying Operation" on page 12

2. If the IBM 2210 was not pre-configured at the factory, see Chapter 4, "Performing the Initial Configuration" on page 19 to perform an initial configuration.

   If your IBM 2210 is configured with just an IP address and a Bootp server address, the IBM 2210 will use the EasyStart feature to obtain a full configuration from the Bootp Server. EasyStart is described in *Software User's Guide for Multiprotocol Routing Services*

   If the IBM 2210 has an IP address and is connected to a network, you can also use the Configuration Program to send a full configuration to the router and restart the router.

To configure protocols, transports, and features you need on the IBM 2210, using the built-in configuration program, refer to the following publications:

- *Software User's Guide for Multiprotocol Routing Services*
- *Protocol Configuration and Monitoring Reference*

To use the Configuration Program, refer to *Configuration Program User's Guide for Multiprotocol Routing Services*.

1

An additional source of information is the *IBM 2210 Nways Multiprotocol Router Description and Configuration Scenarios*, GG24-4446.

Preparing for Installation

Note: Before installing the IBM 2210, be sure to read "Electronic Emission Notices" on page 37.

Before beginning the installation procedure, make sure that the following tasks have been completed:

- If the IBM 2210 is to be placed in a rack, provide a rack that meets the requirements and that has space for the IBM 2210. See "Placing the IBM 2210 on the Table or in the Rack" on page 4 for information about rack requirements. You will also need to provide the mounting hardware appropriate for your rack.

- Verify that appropriate power outlets are available.

- Unpack the IBM 2210 and place it where it is to be installed.

- Provide any network interface cables not ordered with the IBM 2210.

- If the IBM 2210 was not pre-configured at the factory, you will need an ASCII terminal to perform initial configuration. See "Attaching an ASCII Terminal to the Service Port" on page 15 for information about ASCII terminals.

Verifying the Shipment Inventory

Check the components included with your shipment using the following list.

Hardware

- IBM 2210
- Network interface cables (optional)
- Service port cable
- Adhesive-backed feet (not available with all models)
- Cable management bracket (not available with all models)
- AC power cord
- Service kit with wrap plugs and service port converter (optional)

Optional Features

The following models of the 2210 support the following features:

Table 1. IBM 2210 Models

Model	LAN	No. of WANs (see note)	ISDN BRI	Base Flash Memory	Base DRAM	Supports Adapter Features
1S4*	Ethernet	1	1	2 MB	4 MB	No
1S8*	Ethernet	1	1	4 MB	8 MB	No
1U4*	Ethernet	1	1	2 MB	4 MB	No
1U8*	Ethernet	1	1	4 MB	8 MB	No
12T	Token-ring	2	0	4 MB	8 MB	No
12E	Ethernet	2	0	4 MB	8 MB	No
127	Token-ring	2	1	4 MB	8 MB	No
128	Ethernet	2	1	4 MB	8 MB	No
14T	Token-ring	4	0, 1, or 4 (optional)	4 MB	16 MB	Yes
24T	2 Token-ring	4	0, 1, or 4 (optional)	4 MB	16 MB	Yes
24E	2 Ethernet	4	0, 1, or 4 (optional)	4 MB	16 MB	Yes
24M	1 Token-ring 1 Ethernet	4	0, 1, or 4 (optional)	4 MB	16 MB	Yes

Note:

The standard WAN ports on the IBM 2210 will support any of these physical interfaces:

- EIA 232-D/V.24
- V.35
- V.36
- X.21

WAN Net Handlers:

- V.25 bis (not supported on X.21)
- X.25
- PPP
- FR
- SDLC
- SDLC Relay
- V.34 (only supported on EIA-232)

Expandable base DRAM:

- Base DRAM for the 12x can expand to 16 MB.
- Base DRAM for the 14x can expand to 32 MB.

*The 1S4, 1S8, 1U4, and 1U8 can use either the ISDN BRI or WAN port at any given time.

These items will be installed in your IBM 2210 if ordered with the unit:

- 16 MB Memory Expansion Feature
- 32 MB DRAM Expansion Feature
- 1-Port ISDN Basid Rate Interface Adapter
- 4-Port ISDN BRI Adapter
- 14.4 Kbps Modem Port Feature
- EIA 232 Service Port Feature
- E1 120-ohm ISDN PRI Adapter
- T1/J1 ISDN PRI Adapter
- 4-Port WAN Concentration Adapter
- 8-Port WAN Concentration Adapter
- 25-Mbps ATM Interface Adapter

The following documentation is provided:

- *IBM 2210 Nways Multiprotocol Router Introduction and Planning Guide*
- *IBM 2210 Installation and Initial Configuration Guide* (this book)
- *IBM 2210 Nways Multiprotocol Router Service and Maintenance Guide*

Store the books near the machine.

Placing the IBM 2210 on the Table or in the Rack

Models 1S4, 1S8, 1U4, and 1U8 are for table top use. The other models can be placed on a tabletop or rack. The following figures use a 12x model as an example.

Placement on a Table

If you are placing the IBM 2210on a table:

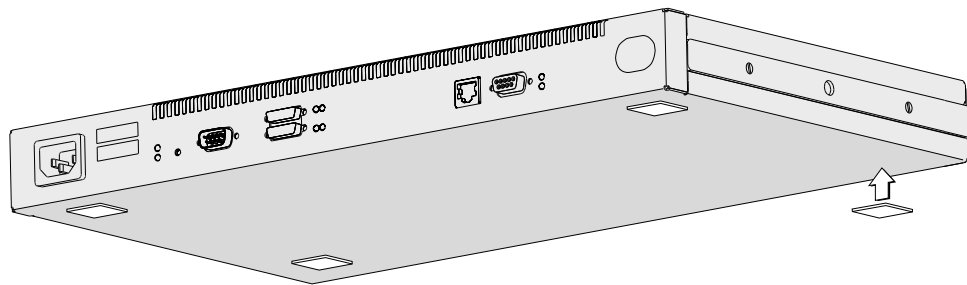**1** Attach the four adhesive-backed feet to the bottom of the IBM 2210 at the corners.

Figure 2. Attaching the Feet to the Bottom of the IBM 2210

2 Place the IBM 2210 on the table and go to "Connecting the Cables" on page 8.

Placement in a Rack

If you choose rack-mounting, you must provide the rack; it is not provided with the 2210.

You can use any EIA standard 19-inch rack. The rack can be open or closed. However, if you choose a closed rack, you must make sure that enough air flows through the 2210. Covers on the front of the rack that would not let air reach the 2210 must be removed or modified to let air pass. Similarly, unvented rear rack covers that would not let air exit the 2210 or would cause back pressure to build up from several machines must not be used.

If you are placing the IBM 2210 in a rack:

1 To install the IBM 2210 with the cables at the back of the rack, go to step 2 on page 6.

To install the IBM 2210 with the cables at the front of the rack, follow these steps for each rack-mounting bracket:

a Remove the outer screws that attach the mounting bracket to the side of the IBM 2210.

Figure 3. Removing the Screws on the Mounting Bracket

b Turn the bracket around so that the ear is in front and is pointed away from the machine.

Figure 4. Turning the Mounting Bracket

c Secure the bracket to the IBM 2210.

Figure 5. Securing the Mounting Bracket

d Go to step 3 on page 7.

2 To install the IBM 2210 with the cables at the back of the rack, follow these steps for each rack-mounting bracket:

a Remove the outer screws that attach the mounting bracket to the side of the IBM 2210.
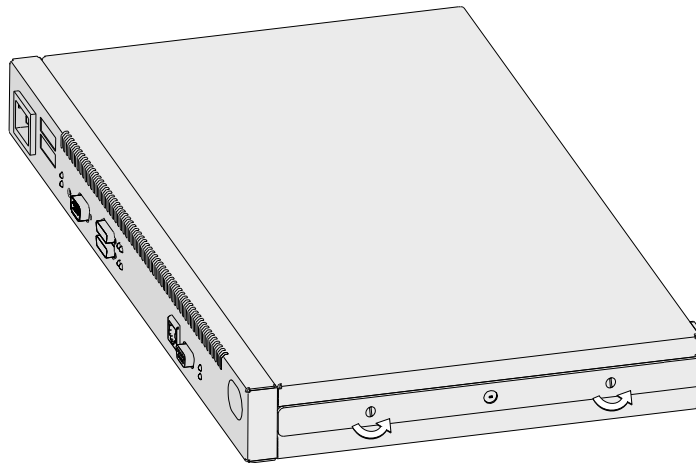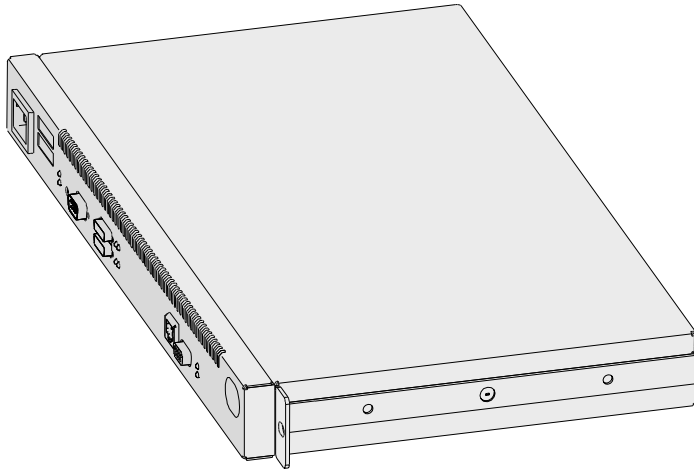
Figure 6. Removing the Screws on the Mounting Bracket

b Turn the mounting bracket so that the ear faces away from the machine.
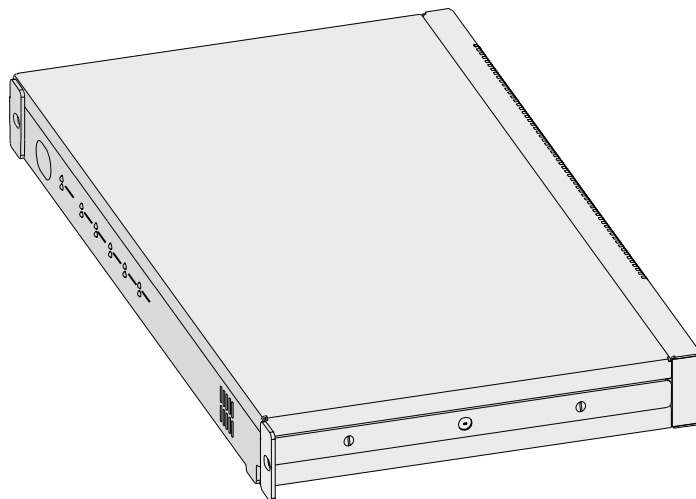
Figure 7. Turning the Mounting Bracket
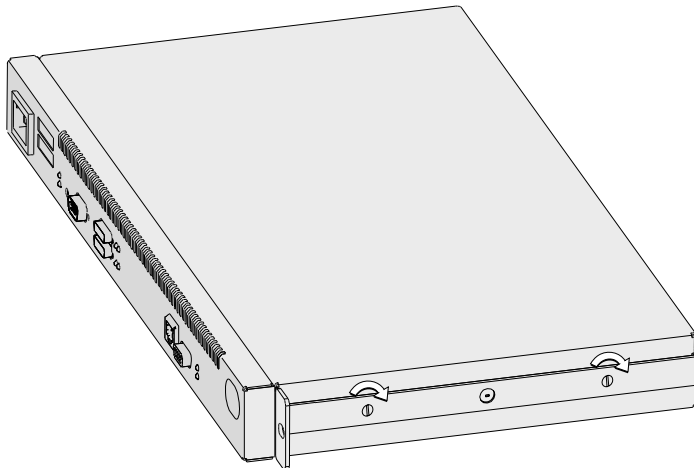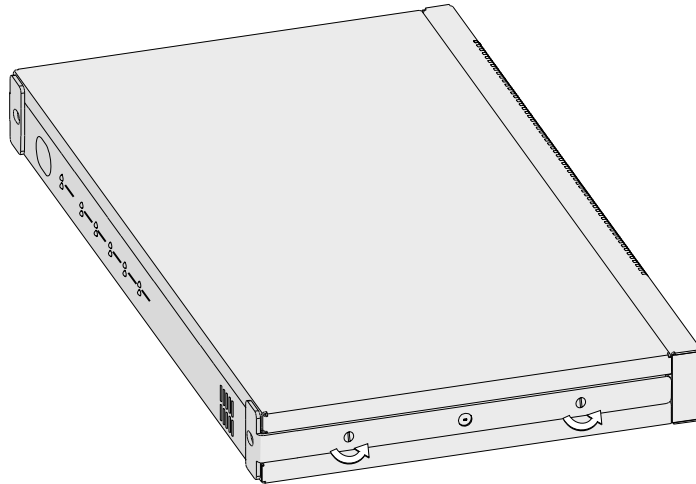
c Secure the bracket to the IBM 2210.

3 Select the desired position for the IBM 2210 in the rack.

4 Attach the IBM 2210 to the rack using mounting hardware appropriate for your rack.

5 A cable management bracket is provided. If you wish to use it, install it as shown here.
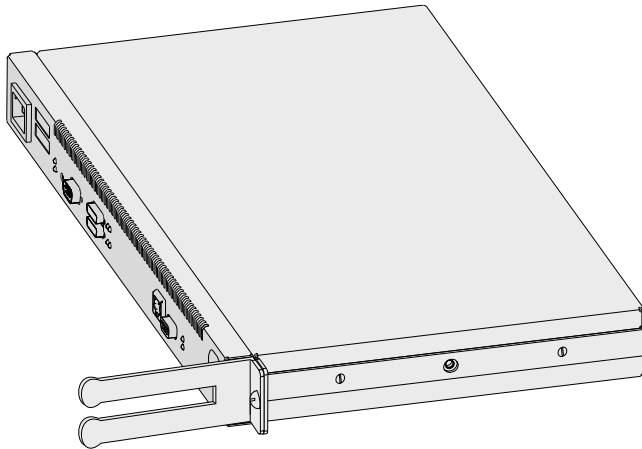
Figure 8. Attaching the Cable Management Bracket

Connecting the Cables

The ports of the different models of the IBM 2210 are shown below. Find the picture of the model you are installing. Connect the cables to the ports.

Notes:

1. If your IBM 2210 was not pre-configured at the factory, you must attach an ASCII terminal to the service port to perform initial configuration of the IBM 2210. For information about attaching an ASCII terminal, go to "Attaching an ASCII Terminal to the Service Port" on page 15.

2. Be sure to follow standard CCITT I.430 when connecting cables to the ISDN port on the models that support ISDN, including the correct wall termination for your ISDN network.
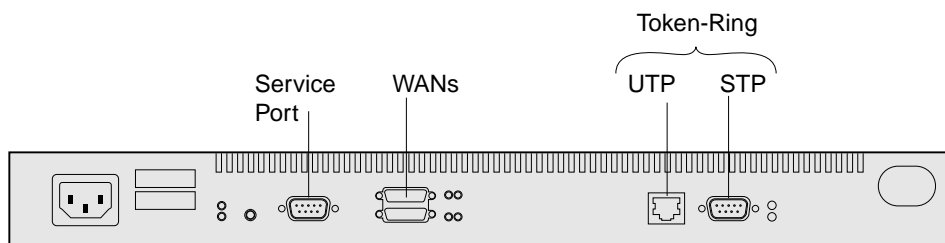
Figure 9. Model 12T
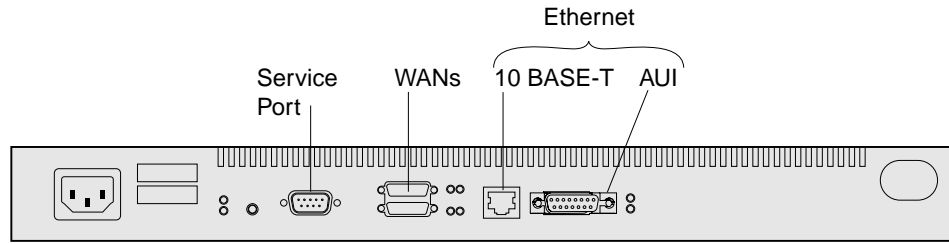
Figure 10. Model 12E
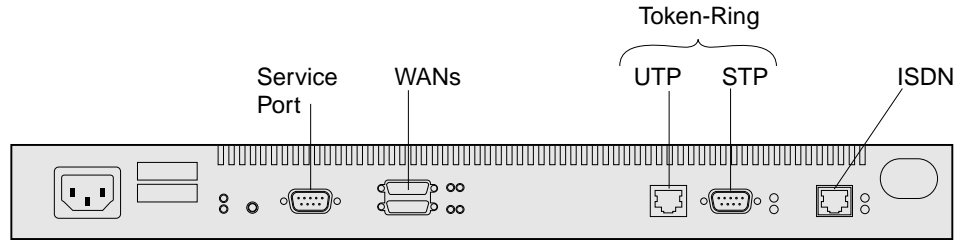
Figure 11. Model 127
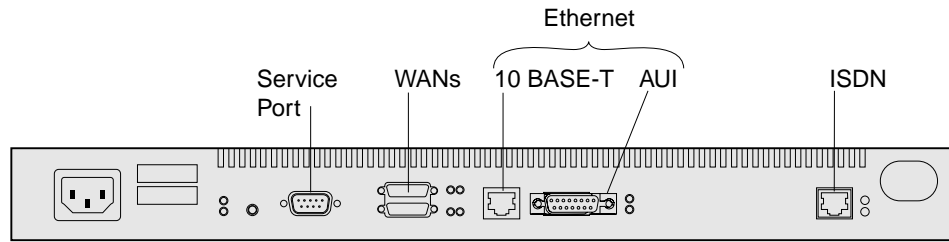
Figure 12. Model 128
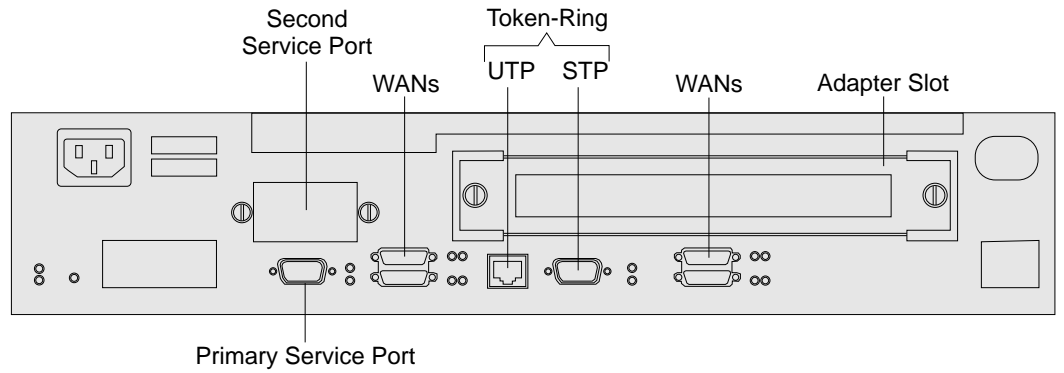
Figure 13. Model 14T
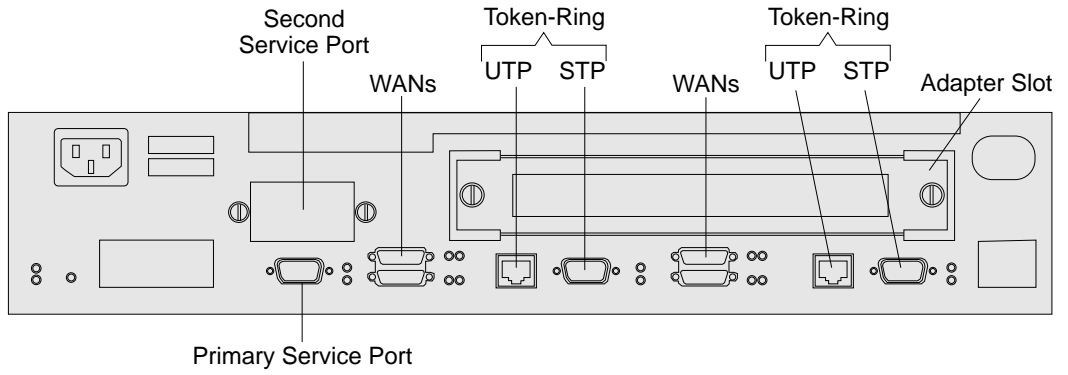
Figure 14. Model 24T
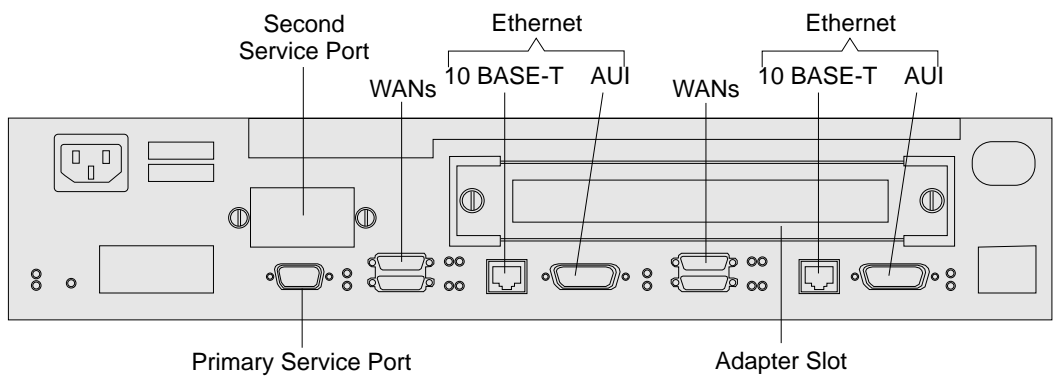
Figure 15. Model 24E
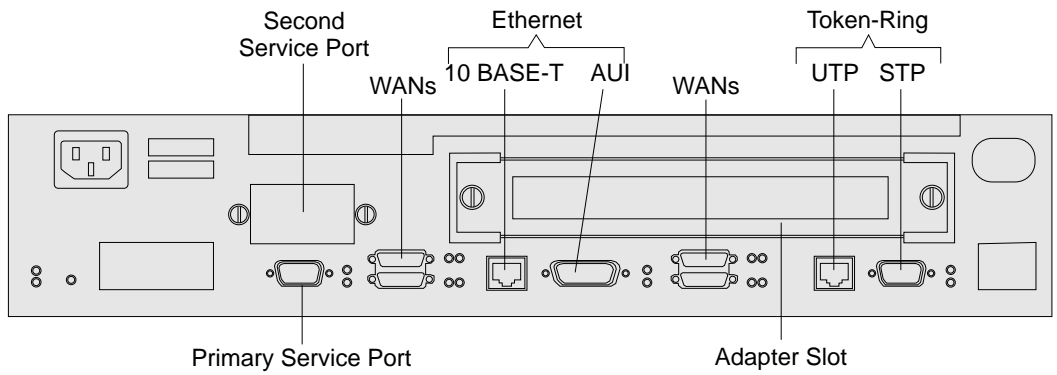
Figure 16. Model 24M
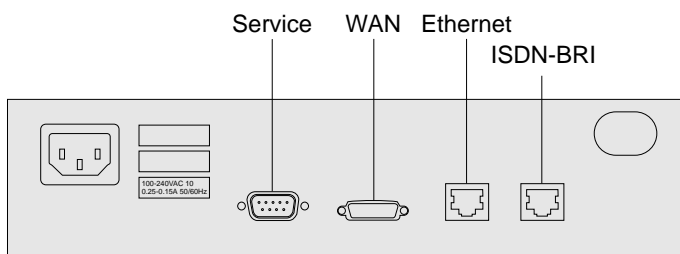
Figure 17. Models 1Sx and 1Ux

Connecting the Power Cord

Connect the power cord to the IBM 2210. Do not connect the power cord to the power outlet.
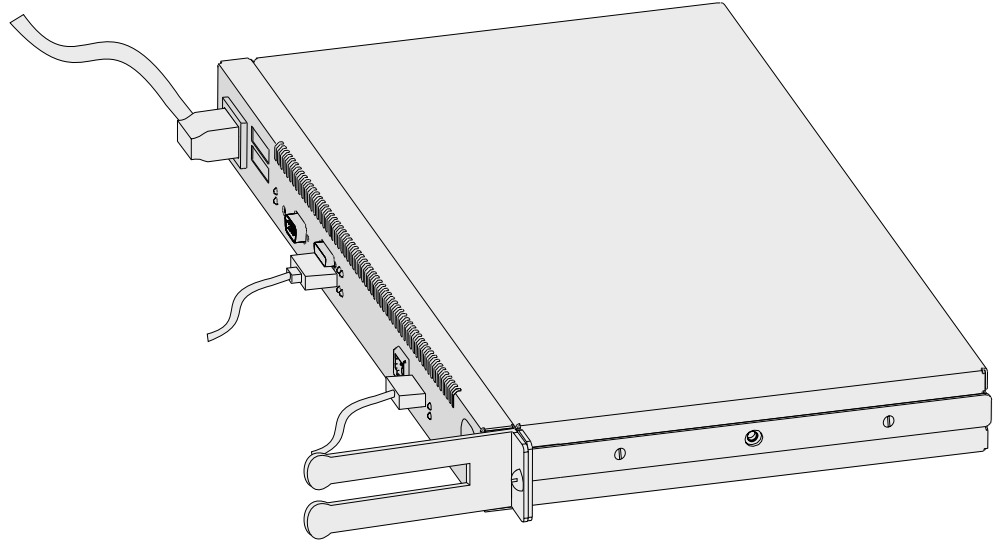
Figure 18. Connecting the Power Cord to the IBM 2210

Attaching the IBM 2210 to Devices

To connect each network interface cable to a device:

1 Identify the correct device.

2 Connect the network interface cable to the device.

Note: Always power off any peripheral device before connecting it to or disconnecting it from a network interface cable. If you connect or disconnect this cable while the peripheral device is powered on, the IBM 2210 may perform an initial program load (IPL).

Verifying Operation

As soon as you plug in the IBM 2210, the power-on self-test (POST) begins. During the POST, the LEDs light in various combinations. The POST and boot will require about 1 minute. At the end of the boot, the green LEDs for the system (**OK**) and for any port that is active should be on or blinking. Figure 19 shows the LED states for a IBM 2210 Model 12T after a successful boot.

Green LEDs on / blinking
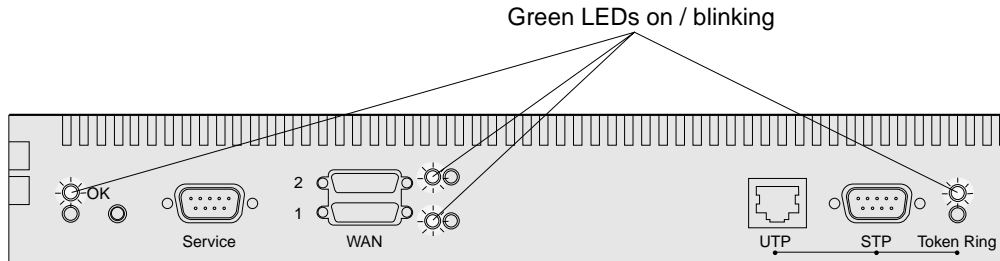
Figure 19. LEDs On or Blinking on Port Side after Successful Boot

Note: The port LEDs will not light for any port that is not being used.

An example of the LED states after a successful boot on the side of the machine opposite the ports is shown in Figure 20.

Green LEDs on / blinking
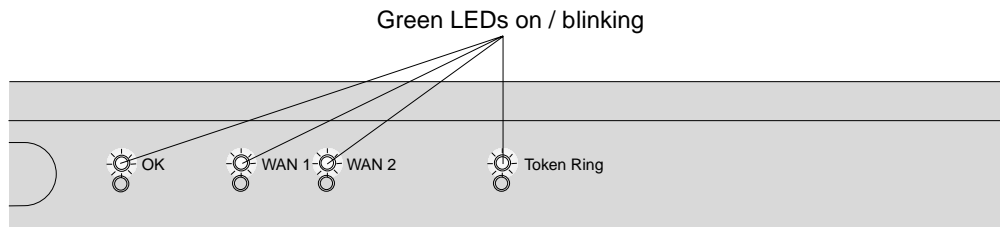
Figure 20. LEDs On or Blinking on Non-Port Side after Successful Boot

If the LEDs indicate a successful power-on and the IBM 2210 was pre-configured at the factory, your installation is complete. At this point, you should contact your network administrator and request that person to back up your base code. Instructions for this task are in the *IBM Multiprotocol Routing Services Software User's Guide*.

If the IBM 2210 was not pre-configured at the factory and the boot was successful, both system (OK) LEDs blink and all port LEDs are off. Continue with Chapter 4, "Performing the Initial Configuration" on page 19.

If the LEDs do not indicate a successful power-on, continue with the Chapter 2, "Problem Solving" on page 13.

When power to the 2210 adapter slot fails, look at the adapter status LED located at the lower side of the adapter bracket near the right thumbscrew. If the adapter status LED is off, there is a slot power failure. Continue with the Chapter 2, "Problem Solving" on page 13.

Chapter 2. Problem Solving

LED Status and Trouble Shooting Checklist

LED Status

Table 2. System LED States		
Green	**Amber**	**Action**
On	Off	Router loaded and operational.
On or Off	On	Replace the system board. If this is a 1Sx or 1Ux model, replace the unit.
Off	Blinking	Replace the DRAM SIMM. If this is a 1Sx or 1Ux model, replace the unit.
On	Blinking	Either: • There is no router load module available, no boot configuration has been entered, or the configured boot path is not available. Additional information can be obtained by attaching a service terminal to the IBM 2210. If the problem cannot be resolved locally, call the network administrator. • The router is in the process of loading from the network. If this is the case, the green port LED on the port that is being used for the load will also be blinking.
Blinking	On	Replace the flash SIMM on models 14T and 24x. For 12x models, refer to the "Nways Multiprotocol Router Service and Maintenance Guide" publication. If this is a 1Sx or 1Ux model, replace the unit.
Blinking	Blinking	Load from the IBD is in process.

TroubleShooting Checklist

Table 3. Troubleshooting Checklist	
Symptom	**Action**
No LEDs are on	• Make sure the power cord is plugged into an outlet • Verify that your power outlet is good
The system LED (**OK**) is green, but a port LED is amber	If you are not using the port with the amber LED on, you may continue. If you are using the port: • Make sure the cable for that port is securely connected • Contact the network administrator to make sure the network is set up correctly
Adapter status LED is OFF	• Is the adapter enablement feature installed? • Check for correct power cables? • Check the adapter slot power supply. • Check the adapter. • Contact IBM service.

If you locate the problem, execute the POST again by unplugging the power cord from the wall outlet and then plugging it in again. If the LEDs indicate a successful power-on and the IBM 2210 was pre-configured at the factory, your installation is complete; if the IBM 2210 was not pre-configured, continue with Chapter 4, "Performing the Initial Configuration" on page 19.

If you cannot determine the problem, call your service representative.

Chapter 3. Accessing Your IBM 2210

If your router was not pre-configured, or if you did not use the EasyStart function, you will need to configure the router manually. To do this, you must first attach an ASCII terminal to the IBM 2210.

Attaching an ASCII Terminal to the Service Port

Attach an ASCII terminal or emulator (with the appropriate emulation software) to the service port to provide local or remote access to the IBM 2210 as shown in Figure 21.
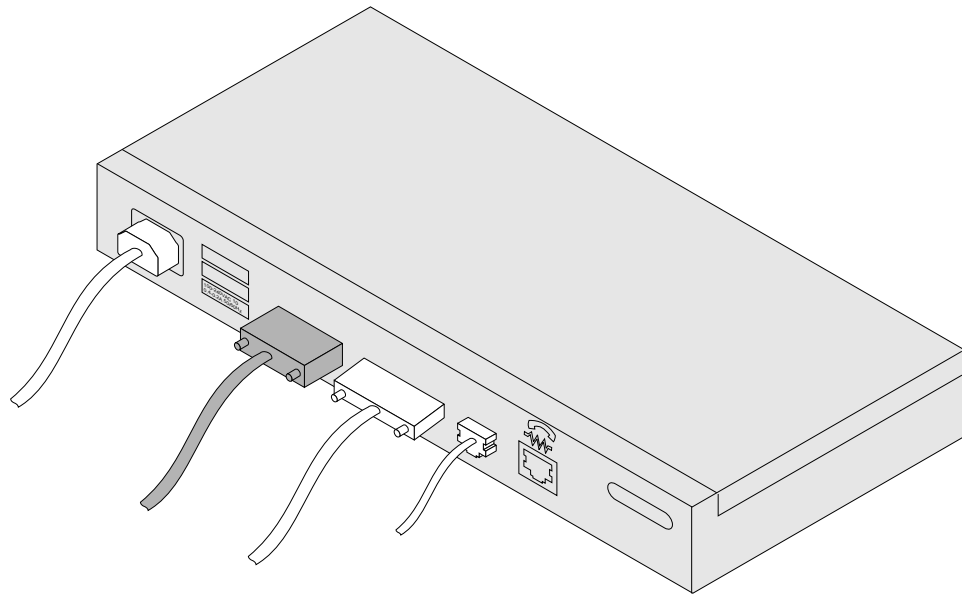
Figure 21. Attaching an ASCII Terminal to the Service Port

the service port has a factory default setting of 9600 bps.

Note: The IBM 2210 service port can be damaged by static electricity discharge. It is shipped with a plastic port cover to prevent such damage. Remove the plastic cover when you are attaching a terminal and store it in a safe place. When you disconnect the terminal, reinstall the plastic cover.

ASCII Terminals and Setup Attributes

The DEC VT100 ASCII terminal is supported, as well as devices, such as personal computer systems, that are configured to emulate it. Configure a VT100 with:

- No parity
- 8-bit word length
- 1 stop bit
- 300 bps–38.4 Kbps bit rate

The following terminals are also supported:

- IBM 3101 Display Terminal
- IBM 3151 ASCII Display Station
- IBM 3161 ASCII Display Station

Configure these terminals as shown in "Setup Attributes."

Setup Attributes

IBM 3101 Setup Attributes
Use Figure 22 to determine the settings for the setup attributes for the IBM 3101 ASCII terminal.
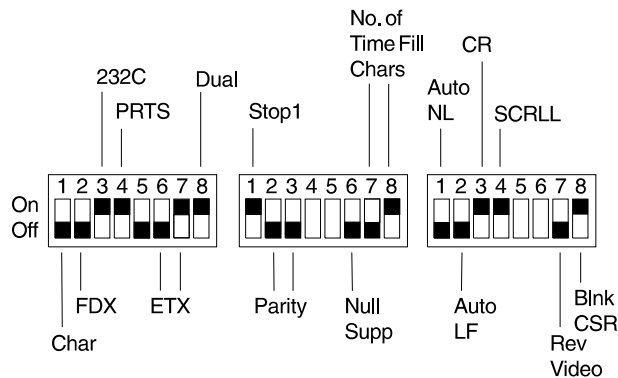
Figure 22. Setup Attributes for the IBM 3101 Display Terminal

The 2210 can use this terminal at all bit rates (in bps) up to 19 200.

IBM 3151 Setup Attributes
Activate setup mode in the IBM 3151 terminal by pressing the **Ctrl** and **Setup** keys. The Ctrl key is located on the lower left of the keyboard. The Setup key is located on the upper right of the keyboard.

Use Table 4 to help you determine the settings for the setup attributes.

Save the setup information by highlighting the **Save** function using the cursor keys.

Exit by pressing the **Ctrl** and **Setup** keys.

Table 4. Setup Attributes for the IBM 3151

Attribute	Setting
Machine Mode	3151
Scroll	JUMP
Auto LF	OFF
Line Wrap	OFF
Operating Mode	ECHO
Word Length (bits)	8
Stop Bit	1
Turnaround Character	CR
Line Control	IPRTS
Break Signal (ms)	500
Send Null Suppress	ON

Supported bit rates (in bps) are:

- 1200
- 2400
- 4800
- 9600
- 19 200
- 38 400

IBM 3161 Setup Attributes

Activate setup mode in the IBM 3161 terminal by pressing the **Ctrl** and **Setup** keys. The Ctrl key is located on the lower left of the keyboard. The Setup key is located on the upper right of the keyboard. The terminal displays a setup attribute panel.

Change the attributes by moving the cursor to the various fields and typing over the information in the field. Use Table 5 to help you determine the settings for the setup attributes.

Press **Send** to save the attributes on this panel.

Table 5. Setup Attributes for the IBM 3161

Attribute	Setting
Machine Mode	3161
Operating Mode	ECHO
Interface	RS-232C
Line Control	IPRTS
Turnaround Character	CR
Stop Bit	1
Word Length (bits)	8
Response Delay (ms)	100
Break Signal (ms)	500

Supported bit rates (in bps) are:

- 1200
- 2400
- 4800
- 9600
- 19 200

You now need to set up additional attributes for the 3161. To set up the additional attributes:

1. Press **Select** to display the attribute selection bar.

2. Change the values on the selection bar to match the values in Table 6 on page 18.

   To move between selections while on a selection bar, press **Tab**. To change a value for an attribute, press the spacebar.

3. Press **Send** to accept the current values for the attributes on the selection bar.

4. Continue with step 2 until you have set all the attributes in Table 6 on page 18.

5. Press **Select** after the last selection bar to exit the 3161 setup function.

Table 6. Additional Setup Attributes for the IBM 3161

Attribute	Setting
Enter	Send
Return	Field
New Line	CR
Tab	Field
Line Wrap	On
Auto LF	Page
Send Null	On
Insert	Space
Trace	All
CRT Saver	No
Scroll	On
Print	Viewport
Print Null	On
Print EOL	On
Line End	CR-LF

Chapter 4. Performing the Initial Configuration

If you have a new router with no configuration, or if you have cleared the router's configuration or encountered a problem that cleared the configuration, you must perform the steps in this section before you can send an existing configuration to the router.

Setting Up the Router (Initial Configuration)

To perform initial configuration on the router, you must first establish access to the router. You can establish access either locally or remotely as described in Chapter 3, "Accessing Your IBM 2210" on page 15. Then:

1 Perform an initial configuration to establish the IP address and IP mask for the primary interface for the router as follows:

a *Configure Interfaces*

   1) Enter **Yes** to the Configure Interfaces question

   2) Supply the interface information required for the interface which will communicate with the Configuration Program

   3) Enter **Yes** to the Save this configuration question

b *Configure Bridging*

   1) Enter **No** to the Configure Bridging question

c *Configure Protocols*

   1) Enter **Yes** to the Configure Protocols question

d *Configuring IP*

   1) Enter **Yes** to the Configure IP question

   2) Enter **Yes** to the Configure IP on this interface question for the LAN interface that will communicate with the Configuration Program

   3) Enter the IP address at the `IP Address` prompt

   4) Enter the IP mask at the `Address Mask` prompt

   5) Enter **No** to the Enable Dynamic Routing question

   6) Enter **Yes** to the Define Community question

   7) Enter the community name of your choice at the Community Name prompt

   8) Enter **Yes** to the Save this configuration question

   9) Enter **No** to the Configure IP on this interface question for the other router interfaces

e *Configuring IPX, DECnet, Booting, and Console Modem-Control*

   1) Enter **No** to the Configure IPX question, if asked

   2) Enter **No** to the Configure DNA question, if asked

19

3) Enter **No** to the Configure Booting question

4) Enter **No** to the Configure Console Modem-Control question

f *Restarting the Router*

1) Enter **Yes** to the Restart the router question

2 Press **Ctrl-p** to exit Config

3 Enter **restart** to restart the router

When the router completes the restart sequence, it can communicate with the Configuration Program.

After Initial Configuration

Important: After the router is configured and operational, *always* back up the active configuration file. Keeping this file enables you to re-establish the router on the network if the active configuration becomes corrupted.

You can back up the active configuration file by retrieving it and storing it in the workstation.

Full Configuration

The initial configuration procedure you have just performed will enable you to access the router over the network if you configured an IP address for it.

The configuration provided by QCONFIG depends upon many default values for parameters, some of which may not be appropriate to your installation. You may need to modify the configuration that you have created using QCONFIG to customize the router to work on your network. You can do this using either of these methods:

- Configuration Program

  The Configuration Program is the *recommended* configuration method for these reasons:

  1 It can enable you to keep a number of copies of configuration files on a server for uploading to the appropriate routers.

  2 It does not alter any configuration parameters dynamically. This feature helps you control changes to the router configurations.

  3 It performs more input validation and cross-checking of the configuration parameters than the other methods.

- Command line interface (OPCON)

  The command line interface causes certain parameters to be altered dynamically. The binary files that are created are saved on the hard disk of the router, not in the workstation. This characteristic makes it more difficult to manage the configuration of the router. However, the command line interface can be used to monitor the operations of the router, whereas the Configuration Program cannot.

The command line interface is also useful when you want to change one of the parameters that can be dynamically altered. For more information about the command line interface, refer to the *Software User's Guide*.

Use the *Configuration Program User's Guide* in order to create a complete configuration that is suitable for your network.

Chapter 5. Maintenance

Maintenance for 1Sx or 1Ux models

If you have problems with your IBM 2210 Model 1Sx and 1Ux that require maintenance, call your network administrator or service representative. Models 1Sx and 1Ux have no field-replaceable parts.

Maintenance for all other models

If you have problems with models 12T, 12E, 127, 128, 14T, 24T, 24E, or 24M, refer to the *IBM 2210 Service and Maintence Guide*.

Appendix A. Installing Options

Installing Options in Models 12x

You can install the following options in the 12x models of the IBM 2210:

Table 7. Procedures for IBM 2210 Options

Option	Installation and Removal Procedures
Memory Expansion Feature	"Replacing the DRAM SIMM for the 12x Models" on page 32

Installing Options in Models 14T and 24x

You can install the following options in the 14T and 24x models of the IBM 2210:

Table 8. Procedures for IBM 2210 Options

Option	Installation and Removal Procedures
Memory Expansion Feature	"Removing the Flash and DRAM SIMMs in Model 14T and 24x" on page 33
Adapters • 1-port ISDN BRI • 4-port ISDN BRI • T1/J1 ISDN PRI Adapter • E1 120-ohm ISDN PRI Adapter • 4-Port WAN Concentration Adapter • 8-Port WAN Concentration Adapter • 25-Mbps ATM Interface Adapter	"Installing Optional Adapters" on page 28
EIA 232 Service Port Feature	"Cover" and "Installing the EIA 232 Service Port Feature in Models 14T and 24x" on page 30
14.4 Kbps Modem Port Feature	"Cover" and "Installing the 14.4 Kbps Modem Port Feature in Models 14T and 24x" on page 31

Cover

Removing the Cover

DANGER

> **Hazardous voltages exist inside this machine when it is powered on. Anytime you service this unit with the cover off, be sure to unplug the power cord.**

Note: For translations of this safety notice, see "Safety Notices" on page 43.

1 Unplug the power cord from the outlet.

2 If the IBM 2210 is installed in a rack, remove the screws attaching the IBM 2210 to the rack.

3 Remove the two screws that attach the mounting brackets to either side of the IBM 2210. Then remove the center screw that attaches the cover to the side of the IBM 2210. Note the position of the mounting bracket ears as you remove the mounting brackets.
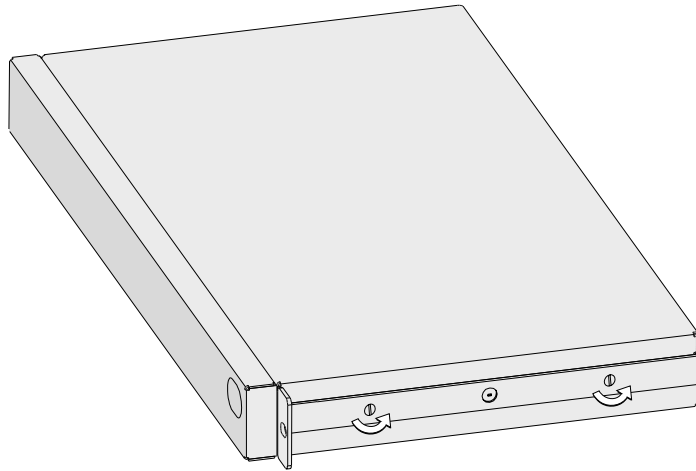
Figure 23. Removing the Side Screws

4 Position the IBM 2210 so that the port side is facing you. From this position, lift the rear portion of the cover and slide it away from you.
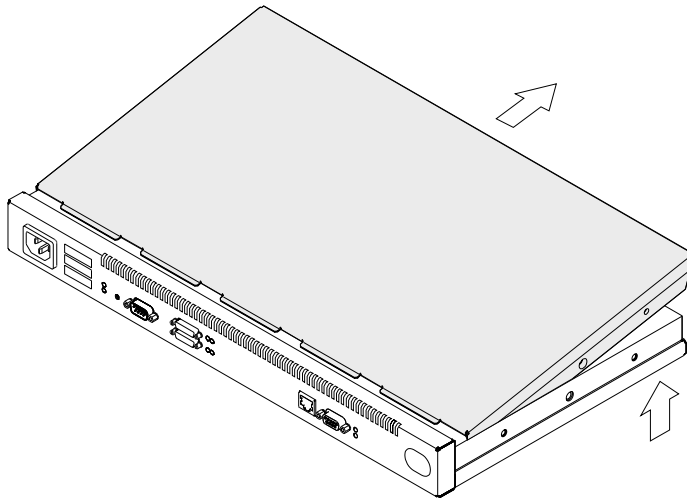
Figure 24. Removing the Cover

5 Be sure to store the mounting brackets and screws with the cover.

Reinstalling the Cover

1 Position the IBM 2210 so that the port side is facing you. From this position, elevate the rear portion of the cover and slide it onto the IBM 2210.
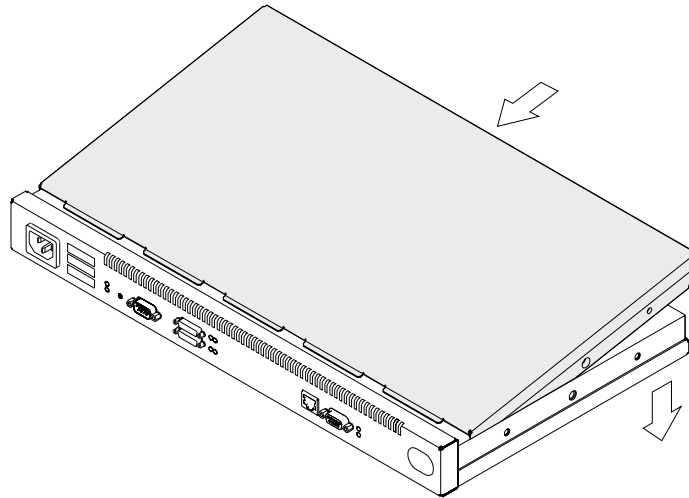
Figure 25. Replacing the Cover

2 Replace the screws that attach the cover and mounting brackets to each side of the machine. Be sure that the screw with the Phillips head is installed in the middle hole.
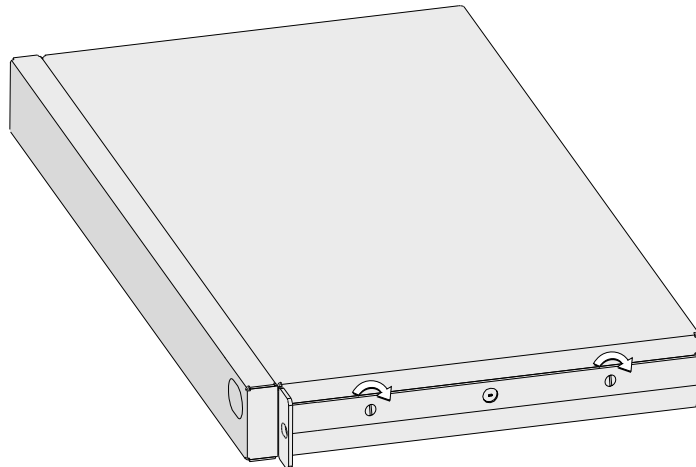
Figure 26. Replacing the Screws and Mounting Bracket

3 If the IBM 2210 was mounted in a rack, return it to the rack.

4 Plug the power cord into the outlet.

Installing Optional Adapters

Refer to "Handling Static-Sensitive Devices" on page 32 before removing or installing any of the optional adapters.
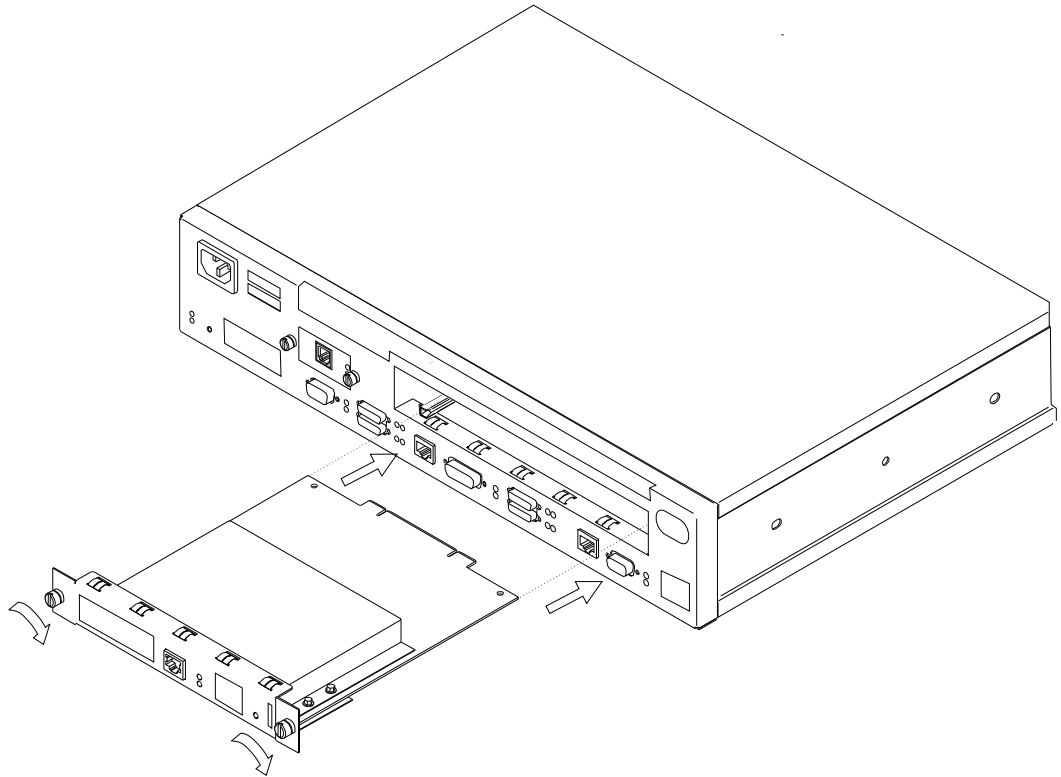
Figure 27. Installing the Optional Adapter (Actual adapter may appear different)

1 Unplug the power cord.

2 Remove the blank faceplate by loosening the two screws and pulling the plate toward you.

3 Check to ensure that the Adapter Enablement Feature is installed. Look inside the module slot and ensure that the guide rails for the card are present.

If the guide rails are not visible, an authorized service representative must install the Adapter Enablement Feature. If you have not ordered the Adapter Enablement Feature, you should do so before proceeding.

If the feature is not installed, refer to the *IBM 2210 Nways Multiprotocol Router Service and Maintenance Manual*.

4 Remove the adapter from the antistatic bag.

5 While holding the adapter carefully by the front plate insert it into the opening. Make sure that the edges of the adapter line up with the guide rails.

6 Press the adapter into the slot.

7 Secure the adapter in place by tightening the screws.

8 Plug the power cord into the outlet.

9 Verify that the IBM 2210 is functioning correctly by using "Verifying Operation" on page 12.

Removing the Optional Adapter
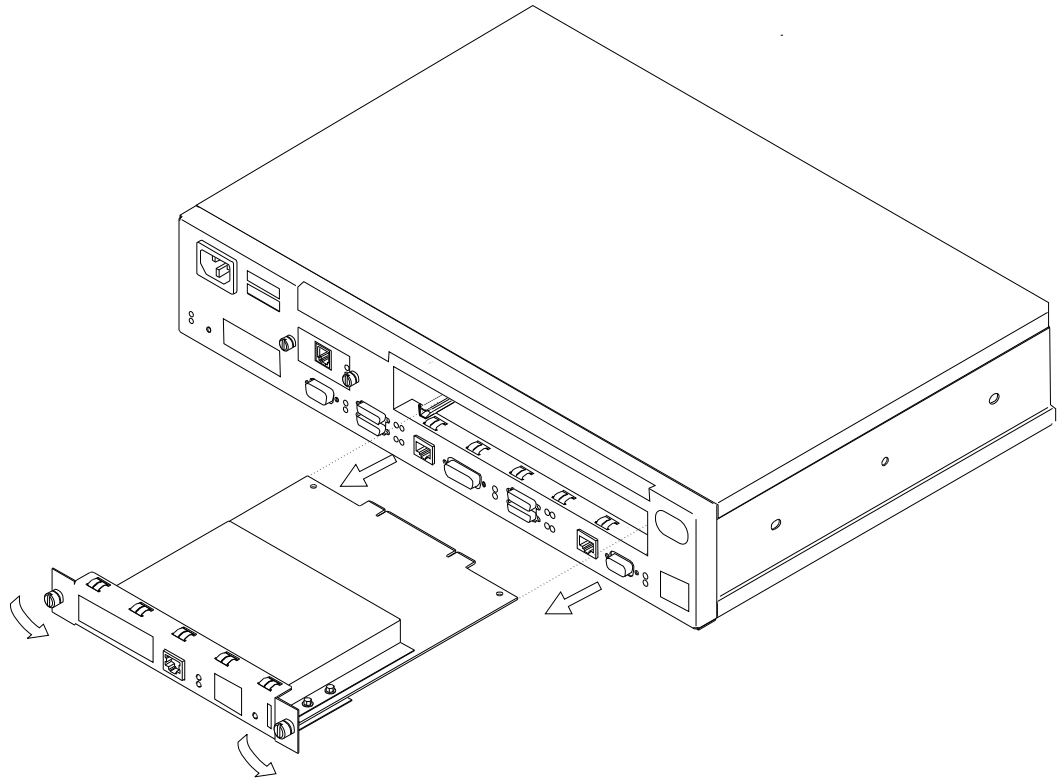
Figure 28. Removing the Adapter (Actual adapter may appear different)

1 Unplug the power cord.

2 Remove the screws holding the adapter in place.

3 Remove the adapter by gently pulling it toward you.

4 Replace the blank faceplate or install new adapter and tighten the two screws.

5 Plug the power cord into the outlet.

6 Verify that the IBM 2210 is functioning correctly by using "Verifying Operation" on page 12.

Installing a Second Service Port in Models 14T and 24x

Refer to "Handling Static-Sensitive Devices" on page 32 before removing or installing a second service port card.

Installing the EIA 232 Service Port Feature in Models 14T and 24x
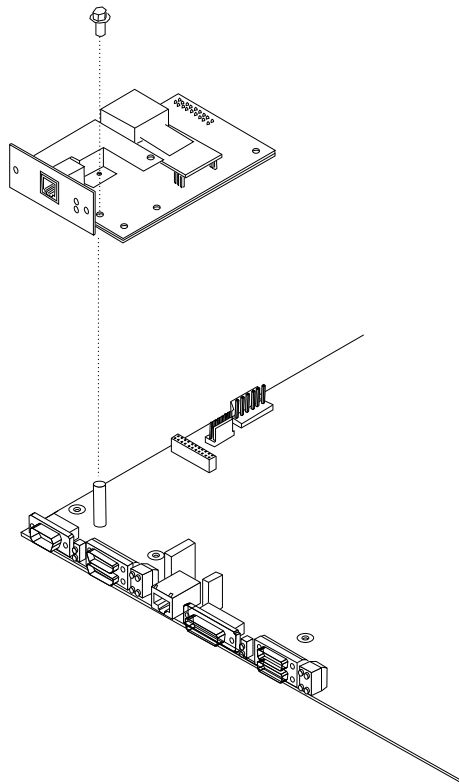
Figure 29. Installing the EIA 232 Service Port Feature

1 Remove the cover from the IBM 2210 as described in "Cover" on page 25.

2 Remove the blank Service Port faceplate by unscrewing the two screws.

3 Save the faceplate and screws.

4 Insert the EIA 232 Service Port Feature connection into the connector on the system board.

5 Using the two screws from the blank faceplate secure the front of the Service Port Card faceplate to the frame of the IBM 2210.

6 Fasten the middle of the EIA 232 Service Port Feature to the standoff on the system board using the supplied Philips-head screw.

7 Replace the cover as described in "Reinstalling the Cover" on page 27.

8 Verify that the IBM 2210 is functioning correctly by using "Verifying Operation" on page 12.

Removing the EIA 232 Service Port Feature in Models 14T and 24x

1 Remove the cover from the IBM 2210 as described in "Cover" on page 25.

2 Remove the two screws that secure the EIA 232 Service Port Feature to the IBM 2210 frame.

3 Remove the Philips-head screw that attaches the middle of the EIA 232 Service Port Feature to the standoff on the system board.

4 Remove the EIA 232 Service Port Feature connection from the system board.

5 Lift the EIA 232 Service Port Feature out of the IBM 2210 chassis.

Installing the 14.4 Kbps Modem Port Feature in Models 14T and 24x
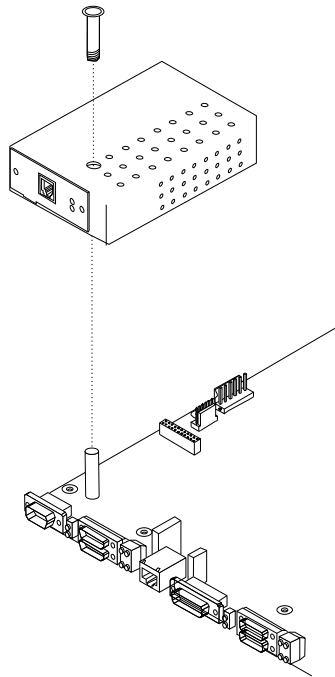
Figure 30. Installing the 14.4 Kbps Modem Port Feature

1 Remove the cover from the IBM 2210 as described in "Cover" on page 25.

2 Remove the blank Service Port faceplate by unscrewing the two screws.

3 Save the faceplate and screws.

4 Insert the 14.4 Kbps Modem Port Feature connection into the connector on the system board.

5 Attach the 14.4 Kbps Modem Port Feature to the system board by inserting the alignment post through the top of the modem and screwing in the post.

6 Using the two screws from the blank faceplate secure the front of the Modem Card faceplate to the frame of the 2210.

7 Replace the cover as described in "Reinstalling the Cover" on page 27.

8 Verify the IBM 2210 is functioning correctly by using "Verifying Operation" on page 12.

Removing the 14.4 Kbps Modem Port Feature in Models 14T and 24x

1 Remove the cover from the IBM 2210 as described in "Cover" on page 25.

2 Remove the two screws that secure the 14.4 Kbps Modem Port Feature to the IBM 2210 frame.

3 Unscrew the alignment post and remove it from the modem.

4 Remove the 14.4 Kbps Modem Port Feature connection from the system board.

5 Lift the 14.4 Kbps Modem Port Feature out of the IBM 2210 chassis.

Handling Static-Sensitive Devices

Certain components, such as planars and memory modules, can be damaged by static electricity discharge. These components are shipped in an antistatic bag to prevent such damage. An electrostatic discharge (ESD) protection device must be used when handling these components.

Take the following precautions:

- Do not remove the component from the antistatic bag until you are ready to replace a component in the IBM 2210.
- With the component still in its antistatic bag, touch the metal frame of the IBM 2210.
- Hold the component by its edges. Avoid touching solder joints or pins.
- Handle the components carefully in order to prevent permanent damage.

Replacing the DRAM SIMM for the 12x Models
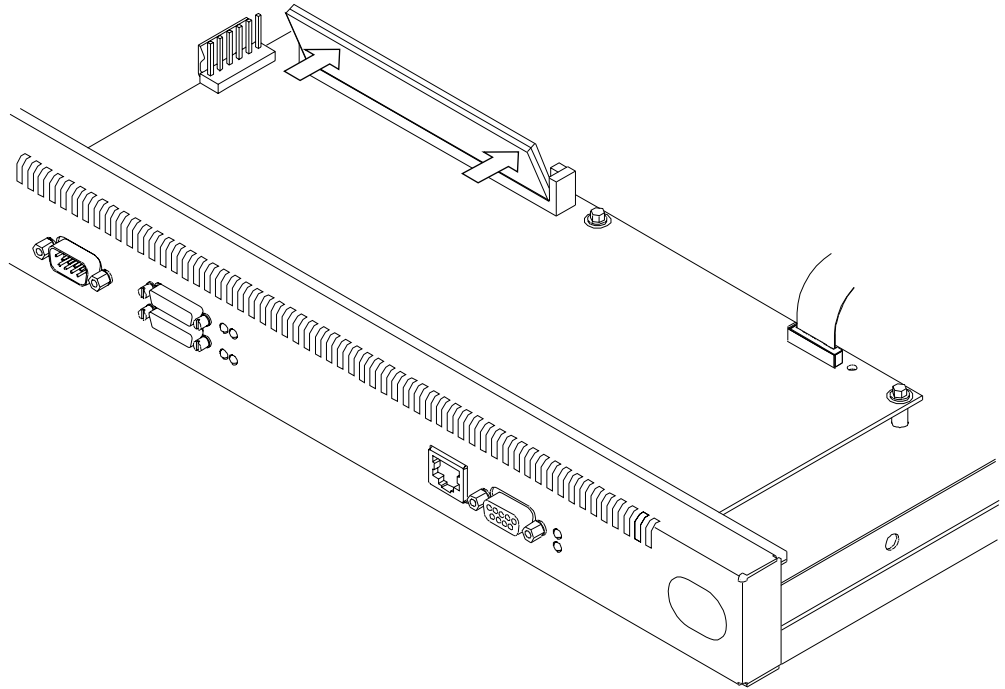
Figure 31. Replacing the DRAM SIMM in 12x Models

1 Tilt the top of the SIMM toward you and slide it into the retainer.

2 Press the SIMM backward until the retaining tabs are holding it securely.

Removing the Flash and DRAM SIMMs in Model 14T and 24x

Figure 32. Removing the Flash SIMM (14T and 24x Models)

1 Remove the cover from the IBM 2210 as described in "Removing the Cover" on page 25.

2 As you face the machine the DRAM SIMM is located in the left slot. To replace the DRAM SIMM you must remove the existing DRAM SIMM and install the replacement. The Flash SIMM location is shown in Figure 32 on page 33

3 Push back the retaining tabs located at each end of the SIMM socket. The SIMM will fall backwards.

4 Remove the SIMM by gently pulling it away from you.

5 Replace the cover on the IBM 2210 as described in "Reinstalling the Cover" on page 27.

6 Verify that the IBM 2210 is functioning correctly by using "Verifying Operation" on page 12.

Installing the Flash and DRAM SIMMs in Models 14T and 24x

Refer to "Handling Static-Sensitive Devices" on page 32 before removing or installing a flash SIMM.
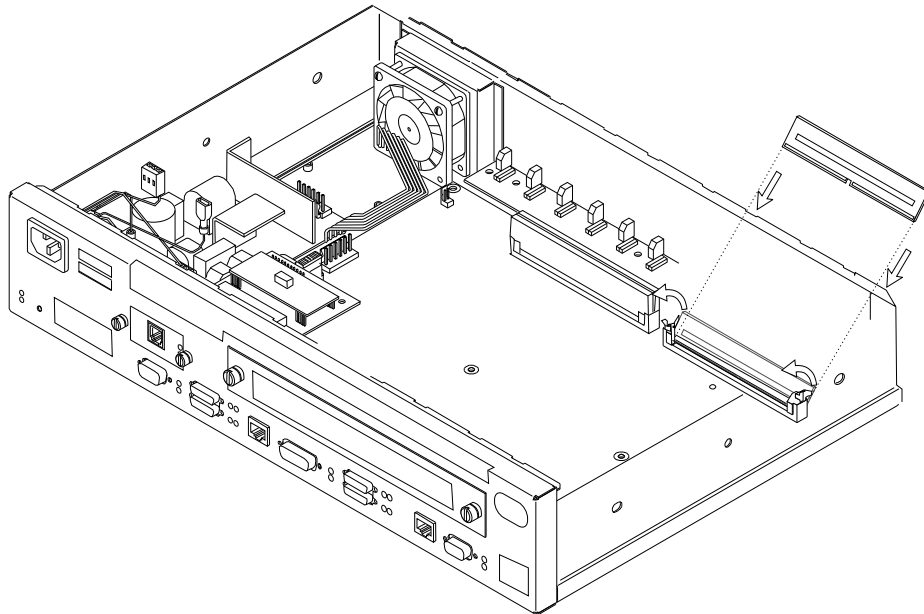
Figure 33. Installing the Flash SIMM (14T and 24x Models)
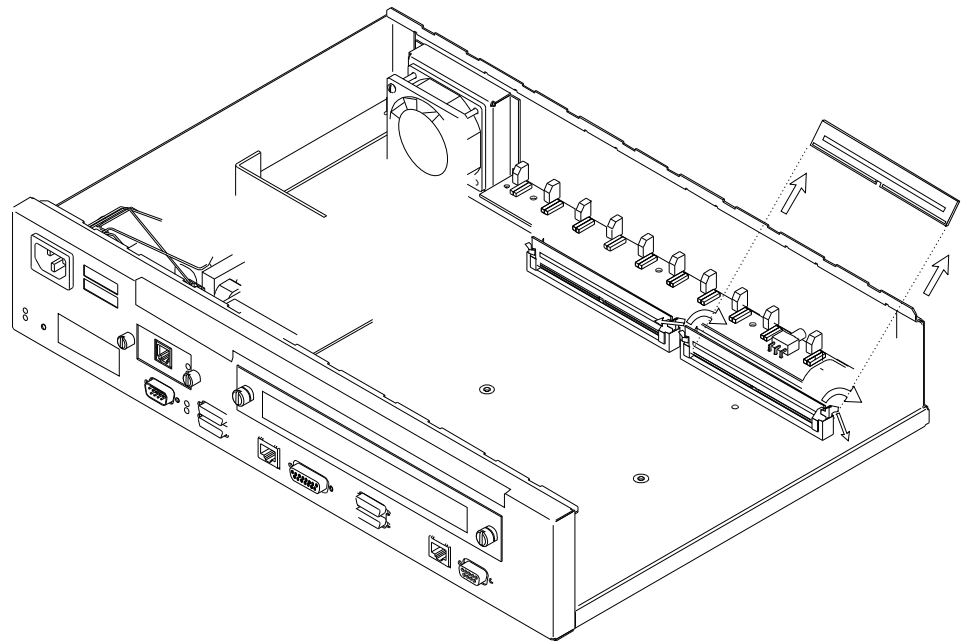
1 Remove the cover from the IBM 2210 as described in "Removing the Cover" on page 25.

2 Tilt the top of the SIMM away from you and slide it into the retainer.

3 Press the SIMM forward until the retaining tabs are holding it securely.

4 Replace the cover on the IBM 2210 as described in "Reinstalling the Cover" on page 27.

5 Verify that the IBM 2210 is functioning correctly by using "Verifying Operation" on page 12.

If the router was not pre-configured at the factory, it will enter EasyStart automatically at the end of the power-on self-test (POST).

EasyStart automatically downloads the router's configuration file from a "BOOTP server." During the process the router displays the EasyStart> prompt and ELS messages which track the process.

To prepare for automatic configuration using EasyStart, the network administrator must perform the following steps:

1. Set up the BOOTP server with records for downloading configurations.

2. Set up the BOOTP server with a valid configuration file for your router.

   These steps are described in *Software User's Guide for Multiprotocol Routing Services*.

If the BOOTP server is correctly set up, and if the router does not have a configuration record, the router will automatically go into EasyStart at power-on and will load its configuration record from the BOOTP server.

You can cause the router to go into EasyStart by typing the **clear all** and **clear device** commands at the Config> prompt, as shown in the following example:

```
Config>clear all
You are about to clear all non Device configuration information
Are you sure you want to do this (Yes or [No]): yes
non Device configuration cleared

Config>clear device
You are about to clear all Device configuration information
Are you sure you want to do this (Yes or [No]): yes
Device configuration cleared

*restart
Are you sure you want to restart the gateway? (Yes or [No]): yes
```

The following panel appears:

```
Copyright IBM Corp. 1994, 1996

MOS Operator Control
 Entering EasyStart operation. Type 'stop' or ¬C to terminate.
 ELS messages are automatically displayed in this mode.
 ISDN Install
 EasyStart>
 00:00:00   GW.001:
 Copyright 1984 Massachusetts Institute of Technology,
Copyright 1989 The Regents of the University of California
 00:00:00   GW.002: Portable CGW [not configured] Rel 16.0[R1] strtd
00:00:00   GW.005: Bffrs: 400 avail 400 idle   fair 103 low 80
 Top of xtp_init
00:00:00   EZ.001: Starting.
00:00:01   EZ.007: Waiting up to 6 seconds for devices to pass self-test.
00:00:04   EZ.009: *** Restarting Router ***


 No Protocols Configured. Entering Quick Config

Router Quick Configuration for the following:
o    Interfaces
o    Bridging
          Spanning Tree Bridge (STB)
          Source Routing Bridge (SRB)
          Source Routing/Transparent Bridge (SR/TB)
          Source Routing Transparent Bridge (SRT)
o    Protocols
          IP (including OSPF, RIP and SNMP)
o    Booting

Event Logging will be enabled for all configured subsystems
with logging level 'Standard'

Note:  Please be warned that any existing configuration for a particular item
will be removed if that item is configured through Quick Configuration
```

Notes:

1. If you are in EasyStart and you enter **stop** or press **CNTL-C**, the router restarts and puts you into Quick Config automatically. For more information about Quick Config, refer to the *Nways Multiprotocol Routing Services Software User's Guide*.

2. If you are in EasyStart and you enter **pause**, the router suspends the EasyStart process. Enter **restart** to resume the process. Suspend EasyStart only for debugging purposes.

Appendix B. Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's intellectual property rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the user's responsibility.

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Electronic Emission Notices

Notices for Models 12x, 14T, and 24x

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. IBM is not 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.

Industry Canada Class A Emission Compliance Statement

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

Avis de conformité aux normes d'Industrie Canada

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

Notices for Models 1Sx and 1Ux

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not 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.

Industry Canada Class B Emission Compliance Statement

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de conformité aux normes d'Industrie Canada

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

Notices for All Models

Japanese Voluntary Control Council for Interference (VCCI) Statement

This equipment is Class 1 Equipment (information equipment to be used in commercial and industrial districts) which is in conformance with the standard set by the Voluntary Control for Interference Council by Data Processing Equipment and Electronic Office Machines (VCCI) with an aim to prevent radio interference in commercial and industrial districts. This equipment could cause interference to radio and television receivers when used in and around residential districts. Please handle the equipment properly according to the instruction manual.

情報処理装置等電波障害自主規制協議会（VCCI）表示

この装置は、第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

European Community (CE) Mark of Conformity Statement

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorised dealers. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

A Declaration of Conformity with the requirements of the Directive has been signed by IBM Spain, Division of Fabricacion, 46185 La Pobla de Vallbona, Valencia, Spain.

The product bears the Telecom CE mark (CE 168 X) for:

- V.24/V.28,V36 and X.21 electrical interfaces complying with NET 1 and with NET 2 physical level.
- ISDN Basic Rate complying with I-CTR3 (Bridging measures)

as per the European directive 91/263/EEC (TTE directive).

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

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 Spain, Division of Fabricacion, 46185 La Pobla de Vallbona, Valencia, Spain.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Notice about Lithium Battery

The IBM 2210 contains a non-replaceable lithium battery that, if disposed of improperly, can cause a fire, an explosion, or a severe burn. At the end of the life of this machine, return the IBM 2210 to IBM or dispose of it according to local regulations.

U.K. Safety Approval

The IBM 2210 is manufactured to the International Safety Standard EN 60950 and as such is approved in the U.K. under the General Approval number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

Telecommunication Notices

FCC Part 68 Compliance Information

Features and optional adapters for the IBM 2210 comply with Part 68 of the FCC rules. The label included on the bottom of the IBM 2210 and the top of the features and adapters contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. If requested, provide this information to your telephone company.

The features and adapters include:

Part Number Part Name

41H7096 14.4 Kbps Modem Port Feature with REN # .6B and jack type RJ11.

41H7150 T1/J1 ISDN PRI Adapter with interface code 04DU9-1SN, service code 6.0N and jack type RJ48C.

72H5062 ISDN Quad BRI Adapter - U with interface code 021S5 service code 6.0F and jack type RJ49C

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area.

If the IBM 2210 causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, in the United States, call IBM at **1-800-IBM-SERV**. In Canada, call IBM at **1-800-465-6600**.

No repairs can be performed by the customer.

Industry Canada Information

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

The load number assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load numbers of all the devices does not exceed 100. The load number of the 14.4 Kbps Modem Port Feature is 05.

AVIS : L'étiquette d'Industrie Canada permet d'identifier un équipement homologué. Cette homologation signifie que cet équipement satisfait certaines exigences en matière de protection, d'exploitation et de sécurité du réseau de télécommunications. Industrie Canada n'offre aucune garantie que le fonctionnement de cet équipement soit à la satisfaction de l'utilisateur.

Avant d'installer cet équipement, l'utilisateur doit s'assurer qu'il a la permission de le raccorder aux installations de l'entreprise de télécommunications. L'installation de cet équipement doit aussi se faire selon un mode de raccordement acceptable. Dans certains cas, le câblage interne de l'entreprise associé au service individuel offert par une ligne d'abonné peut être prolongé au moyen d'un connecteur homologué (prolongateur de téléphone). Le client devrait être informé que la conformité de son équipement aux conditions susmentionnées n'est pas une prévention contre la dégradation du service dans certaines situations.

Toute réparation d'un équipement homologué devrait être effectuée par un service de maintenance canadien autorisé qui a été désigné par le fournisseur. Toute réparation ou modification d'équipement faite par l'utilisateur, ou tout mauvais fonctionnement, pourrait entraîner la déconnexion de cet équipement par l'utilisateur à la demande de l'entreprise de télécommunications.

Pour sa protection personnelle, l'utilisateur devrait s'assurer que les mises à la terre des services publics électriques, des lignes téléphoniques et du système interne des canalisations d'eau à tuyaux métalliques, advenant leur présence, sont interconnectées. Dans les zones rurales, il s'agit-là d'une précaution particulièrement importante à prendre.

ATTENTION : Toute tentative de connexion par l'utilisateur est à déconseiller. Il est préférable de communiquer avec le responsable de l'inspection en électricité ou un électricien, selon le cas.

Le NUMÉRO DE CHARGE (LN) attribué à chaque dispositif du terminal sert à indiquer le pourcentage de la charge totale qui doit être connecté à une ligne d'abonné utilisée par ce dispositif, afin de prévenir toute surcharge. Par terminaison de ligne, on entend toute combinaison de dispositifs qui satisfait l'exigence selon laquelle le total des NUMÉROS DE CHARGE de tous les dispositifs n'est pas supérieur à 100.

NUMÉRO DE CHARGE DE CETTE UNITÉ (14.4 Kbps Modem Port Feature) : 05

Safety Notices

Danger: Before you begin to install this product, read the safety information in *Caution: Safety Information—Read This First,* SD21-0030. This booklet describes safe procedures for cabling and plugging in electrical equipment.

Danger:

Hazardous voltages exist inside this machine when it is powered on. Anytime you service this unit with the cover off, be sure to unplug the power cord.

Gevaar: Voordat u begint met de installatie van dit produkt, moet u eerst de veiligheidsinstructies lezen in de brochure *PAS OP! Veiligheidsinstructies—Lees dit eerst,* SD21-0030. Hierin wordt beschreven hoe u electrische apparatuur op een veilige manier moet bekabelen en aansluiten.

Gevaar:

Er bevindt zich gevaarlijke spanning binnenin deze machine, wanneer ze is ingeschakeld. Telkens als u onderhoud uitvoert op deze eenheid, met de behuizing verwijderd, moet u het netsnoer loskoppelen.

Pericolo: prima di iniziare l'installazione di questo prodotto, leggere le informazioni relative alla sicurezza riportate nell'opuscolo *Attenzione: Informazioni di sicurezza — Prime informazioni da leggere* in cui sono descritte le procedure per il cablaggio ed il collegamento di apparecchiature elettriche.

Pericolo:

Quando la macchina è alimentata, vi sono tensioni pericolose all'interno. Ogni volta che si effettuano interventi di manutenzione, se il coperchio non è inserito, scollegare il cavo di alimentazione.

Vorsicht: Bevor mit der Installation des Produktes begonnen wird, die Sicherheitshinweise in *Achtung: Sicherheitsinformationen—Bitte zuerst lesen,* IBM Form SD21-0030. Diese Veröffentlichung beschreibt die Sicherheitsvorkehrungen für das Verkabeln und Anschließen elektrischer Geräte.

Vorsicht:

Bei eingeschaltetem Gerät liegen im Innern gefährliche Spannungen an. Sicherstellen, daß bei Arbeiten an der geöffneten Maschine der Netzstecker gezogen ist.

Perigo: Antes de iniciar a instalação deste produto, leia as informações de segurança *Cuidado: Informações de Segurança — Leia Primeiro*, SD21-0030. Este documento descreve como efectuar, de um modo seguro, as ligações eléctricas dos equipamentos.

Perigo:

Este equipamento, quando ligado, apresenta tensões perigosas no seu interior. Sempre que proceda a assistência nesta unidade com a cobertura retirada, certifique-se que o cabo de alimentação da unidade se encontra desligado.

Peligro: Antes de empezar a instalar este producto, lea la información de seguridad en *Atención: Información de Seguridad — Lea Esto Primero,* SD21-0030. Este documento describe los procedimientos de seguridad para cablear y enchufar equipos eléctricos.

Peligro:

Aun cuando está apagada, hay voltajes peligrosos en esta máquina. Siempre que dé servicio a esta máquina sin la cubierta, asegúrese de desenchufar el cable de alimentación.

Fare: Før du begynner å installere dette produktet, må du lese sikkerhetsinformasjonen i *Advarsel: Sikkerhetsinformasjon — Les dette først*, SD21-0030 som beskriver sikkerhetsrutinene for kabling og tilkobling av elektrisk utstyr.

Fare:

Det er farlig spenning inni maskinen når den er slått på. Hver gang du utfører service på maskinen mens dekselet er tatt av, må du huske på å trekke ut nettkabelen.

VAARA: Ennen kuin aloitat tämän tuotteen asennuksen, lue julkaisussa *Varoitus: Turvaohjeet—Lue tämä ensin*, SD21-0030, olevat turvaohjeet. Tässä kirjasessa on ohjeet siitä, miten sähkölaitteet kaapeloidaan ja kytketään turvallisesti.

Vaara:

Virran ollessa kytkettynä koneen sisällä on vaarallisia jännitteitä. Muista aina irrottaa verkkojohto, jos huollat konetta sen suojakannen ollessa irrotettuna.

Fare! Før du installerer dette produkt, skal du læse sikkerhedsforskrifterne i *NB: Sikkerhedsforskrifter—Læs dette først* SD21-0030. Vejledningen beskriver den fremgangsmåde, du skal bruge ved tilslutning af kabler og udstyr.

Fare!

Der er høj spænding i denne maskine, når den er tændt. Træk derfor altid netledningen ud, når enheden skal efterses.

Varning — livsfara: Innan du börjar installera den här produkten bör du läsa säkerhetsinformationen i dokumentet *Varning: Säkerhetsföreskrifter— Läs detta först,* SD21-0030. Där beskrivs hur du på ett säkert sätt ansluter elektrisk utrustning.

Varning — livsfara:

Farliga spänningar i maskinen när den är påslagen. Se till att nätkabeln är urkopplad innan du öppnar enheten.

危険: 導入作業を開始する前に、安全に関する
小冊子SD21-0030 の「最初にお読みください」
(Read This First)の項をお読みください。
この小冊子は、電気機器の安全な配線と接続の
手順について説明しています。

危険：

電源投入中は、内部に危険な電圧がかかっています。カバーを開けて
保守作業をする場合は、必ず電源コードを抜いてから行ってください。

위험: 이 제품을 설치하기 전에 반드시
"주의: 안전 정보-시작하기 전에"
(SD21-0030) 에 있는 안전 정보를
읽으십시오.

위험:

기계를 켤때 위험한 전압이 흐를 수 있으니 조심하십시오.

Perigo: Antes de começar a instalar este produto, leia as informações de
segurança contidas em *Cuidado: Informações Sobre Segurança—Leia Isto
Primeiro,* SD21-0030. Esse folheto descreve procedimentos de segurança para a
instalação de cabos e conexões em equipamentos elétricos.

Perigo:
Existem voltagens perigosas no interior desta máquina quando ela está ligada.
Toda vez que você for fazer a manutenção desta unidade com a tampa aberta,
certifique-se de desconectar o cabo de força.

Danger : Avant d'installer le présent produit, consultez le livret *Attention :
Informations pour la sécurité — Lisez-moi d'abord*, SD21-0030, qui décrit les
procédures à respecter pour effectuer les opérations de câblage et brancher les
équipements électriques en toute sécurité.

Danger:
Tension dangereuse à l'intérieur de la machine lorsque celle-ci est sous tension.
Avant toute intervention à l'intérieur, débranchez le cordon d'alimentation.

Upozornění: než zahájíte instalaci tohoto produktu, přečtěte si
nejprve bezpečnostní informace v pokynech „Bezpečnostní
informace" č. 21-0030. Tato brožurka popisuje bezpečnostní
opatření pro kabeláž a zapojení elektrického zařízení.

NEBEZPEČÍ!

Když je zařízení připojeno k síti, je uvnitř nebezpečné napětí. Před každým
zásahem do odkrytého zařízení je třeba se přesvědčit, že je přívodní kabel od
sítě odpojen.

Vigyázat: Mielôtt megkezdi a berendezés üzembe helyezését, olvassa el a *"Caution: Safety Information— Read This First,* SD21-0030 könyvecskében leírt biztonsági információkat. Ez a könyv leírja, milyen biztonsági intézkedéseket kell megtenni az elektromos berendezés huzalozásakor illetve csatlakoztatásakor.

VESZÉLY!

Bekapcsolt állapotban a gépen belül veszélyes feszültségek lépnek fel. Amikor a készüléket eltávolított fedél mellett javítja, feltétlenül húzza ki a hálózati csatlakozózsinórt.

Uwaga:
Przed rozpoczęciem instalacji produktu należy zapoznać się z instrukcją:
"Caution: Safety Information - Read This First", SD21-0030.
Zawiera ona warunki bezpieczeństwa przy podłączaniu do sieci elektrycznej i eksploatacji.

Uwaga wysokie napięcie!

Przed zdjęciem obudowy, należy wyłączyć przewód zasilający z gniazdka.

危險：安裝本產品之前，請先閱讀
"Caution: Safety Information--Read
This First" SD21-0030　手冊中所提
供的安全注意事項。 這本手冊將會說明
使用電器設備的纜線及電源的安全程序。

危險：

本機器電源開啓時有高壓電。
如需打開機蓋維修機器，請務
必先把電源線的插頭拔掉。

Pozor: Preden zaènete z instalacijo tega produkta
preberite poglavje: ʹOpozorilo: Informacije
o varnem rokovanju-preberi pred uporabo,"
SD21-0030. To poglavje opisuje pravilne
postopke za kabliranje,

Nevarnost:

Visoka napetost pri vključeni napravil
Pri servisiranju odprte naprave, se prepričajte,
da je naprava izključena iz omrežja.

ОСТОРОЖНО: Прежде чем инсталлировать этот
продукт, прочтите Инструкцию по технике безо-
пасности в документе "Внимание: Инструкция по
технике безопасности -- Прочесть в первую очередь",
SD21-0030. В этой брошюре описаны безопас-
ные способы каблирования и подключения элект-
рического оборудования.

Осторожно:

При включенном питании в устройстве имеется напряжение, опасное для жизни. При обслуживании устройства со снятой крышкой отсоедините кабель питания.

UL Notices

Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

Use caution when installing or modifying telephone lines.

Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.

Do not use the telephone to report a gas leak in the vicinity of the leak.

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Tell Us What You Think!

2210 Nways Multiprotocol Router
Installation and
Initial Configuration Guide

Publication No. GC30-3867-01

We hope you find this publication useful, readable, and technically accurate, but only you can tell us!
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minutes to let us know what you think by completing this form. If you are in the U.S.A., you can mail this
form postage free or fax it to us at 1-800-253-3520. Elsewhere, your local IBM branch office or
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Overall, how satisfied are you with the information in this book?	Satisfied	Dissatisfied
	☐	☐

How satisfied are you that the information in this book is:	Satisfied	Dissatisfied
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Complete	☐	☐
Easy to find	☐	☐
Easy to understand	☐	☐
Well organized	☐	☐
Applicable to your task	☐	☐

Specific comments or problems:

_____

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Please tell us how we can improve this book:

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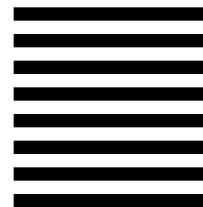Phone No.

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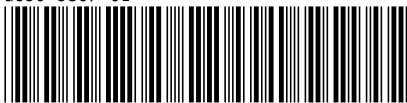Fold and Tape   **Please do not staple**   Fold and Tape

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