Choreographer!™ Network Manager

Network Control

Installation and Operation

Series: Wireless Messaging System

System Version: WMS 3.0,
WMS One-Way 1.07, 1.08
Software Version: 1.4.0

Issue Date: January 1999

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Ⓜ **MOTOROLA**

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MOTOROLA

Foreword

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Fort Worth, TX 76137-2794

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Fort Worth, TX 76137-2794

telephone: **(800) 520-7243** or
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facsimile: **(817) 245-2141**
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The installation, maintenance, and/or operation of this equipment may present potentially unsafe conditions, including, but not limited to, electrical shock, improper voltage to components, and improper operation that can cause personal injury, death or damage to property.

Read Instructions: Read all the safety instructions before operating the equipment. Retain these safety instructions for future reference. Specialized procedures and instructions are required and must be followed. Also, all applicable safety procedures, such as Occupational, Safety, and Health Administration (OSHA) requirements, National Electric Code Requirements, local code requirements, safe working practices, and good judgement must be used by personnel.

Heed Admonitions: Adhere to all warnings on the equipment and in the operating instructions. Follow all operating and use instructions. Two safety admonitions are used in this instruction manual to indicate:

- Equipment damage–

<table>
<tr>
<td>CAUTION</td>
<td>*This safety admonition applies to an operating or maintenance procedure, practice or condition which, if not strictly observed, could result in damage to the equipment or database.*</td>
</tr>
</table>

- Personal injury or injury that may result in death–

<table>
<tr>
<td>DANGER</td>
<td>*This safety admonition applies to an operating or maintenance procedure, practice or condition which, if not strictly observed, could result in serious personal injury or death.*</td>
</tr>
</table>

Mounting: Mount the equipment only as recommended by the manufacturer. Situate the equipment away from heat sources such as radiators, heat registers, stoves, or other equipment (including amplifiers) that produces heat.

Power Sources and Grounding: Connect the equipment to the type of power source described in the installation instructions or as marked on the equipment. Take precautions to avoid defeating the grounding or polarization provisions of the equipment. Disconnect the power to the equipment by a circuit breaker when left unused for long periods of time.

Cleaning: Clean the outside of the equipment by using only a damp cloth. Do not immerse the equipment in any type of liquid, including water. Do not use liquid cleaners or aerosol cleaners. Dirt or other foreign matter should not be allowed to accumulate in the interior of the enclosure.

Damage Requiring Service: Do not attempt to perform service functions that are not described in the operating instructions. All other servicing should be referred to qualified service personnel.

Telephone Line Installation: All telephone line connections to the equipment should be accomplished with the telephone lines disconnected from the network interface.

Motorola is not responsible for static damage to equipment not sold under the Motorola logo.

PSG Limited Equipment Warranty for U.S. And Canadian Markets

General Terms

1. Motorola Paging Systems Group (PSG) manufactured infrastructure equipment is warranted to be free from defects in material and workmanship to the original purchaser only as set forth herein.

2. This Warranty covers only that equipment identified in paragraph 1 that is used in the manner and for the purpose intended.

3. This Warranty specifically excludes any and all software products from any source. PSG software products are the subject of the PSG Software Maintenance Program, addressed separately.

4. This Warranty shall commence 30 days after the date of shipment of the PSG infrastructure equipment.

5. The term of Warranty for all PSG infrastructure equipment, except for AlphaMate® 250 paging entry terminal products, is one (1) year parts and labor. The term of Warranty for AlphaMate 250 paging entry terminals is one (1) year parts and 120 days labor in Motorola PSG-authorized service centers. In-field labor for warranty claims (excluding AlphaMate 250 products) will be provided by Motorola PSG-authorized service centers during normal business hours.

Limitations and Qualifications of Warranty

6. LIMITATION—THE REMEDY UNDER THIS WARRANTY IS LIMITED TO MOTOROLA'S REPAIR OR REPLACEMENT OF DEFECTIVE EQUIPMENT. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

7. This Warranty does not cover, nor include a remedy for, damages, defects or failure caused by:

   a. The equipment or any part of it NOT having been installed, modified, adapted, repaired, maintained, transported or relocated in accordance with Motorola technical specifications and instructions;

   b. Storage not conforming to the Shipping, Receiving, and Installation section of the applicable Motorola Equipment Manual;

   c. Environmental characteristics not conforming to the applicable Motorola Equipment Manual;

   d. Nonconformance with the Equipment Operating Instructions in the applicable Motorola Equipment Manual;

   e. External causes including, without limitation, use in conjunction with incompatible equipment, unless such use was with or under Motorola's prior written consent;

   f. Cosmetic damages;

   g. Damages caused by external electrical stress;

   h. Lightning;

   i. Accidental damage;

   j. Negligence, neglect, mishandling, abuse or misuse;

   k. Force Majeure; and

   l. Damage caused by Shipper(s).

Return of Equipment

8. If an item of PSG infrastructure equipment malfunctions or fails in normal use within the Warranty Period:

   a. The Customer shall promptly notify the Motorola Paging One-Call-Support™ Center at 1-800-520-PAGE (7243) as to the problem and provide the serial number of the defective item. Motorola shall, at its option, either resolve the problem over the telephone or issue a Return Authorization Number to the Customer. The Customer shall, at its cost, ship the item to the Motorola Paging One-Call-Support Center location designated at the time the Return Authorization Number is issued;

b. The Return Authorization Number must be shown on the label attached to each returned item. A description of the fault must accompany each returned item. The returned item must be properly packed, and the insurance and shipping charges prepaid;

c. Motorola shall either repair or replace the returned item. The replacement item may be new or refurbished. When refurbished, it shall be equivalent to new in operation. When a returned item is replaced by Motorola, the returned item shall become the property of Motorola;

d. Subject to all the terms of this Warranty and to part availability, Motorola shall complete the repair or exchange of Motorola-manufactured equipment returned under Warranty within ten (10) working days of receipt of the equipment;

e. Motorola shall, at its cost, ship the repaired or replaced item to the Customer. If the Customer has requested Express Shipping, the Customer shall pay Motorola an expedite fee; and

f. Equipment which is repaired or replaced by Motorola shall be free of defects in material and workmanship for the remainder of the original Warranty, or for 90 days from the date of repair or replacement, whichever is longer. All other terms of this Warranty shall apply to such repairs or replacements.

Advance Replacements

9. During the Warranty Period:

a. At the Customer's request and for the Customer's convenience, Motorola may supply the Customer with Advance Replacement Parts (parts furnished in advance of Motorola's receipt of defective items). Motorola's provision of such parts will be contingent on part availability and on the Customer's maintaining a satisfactory credit standing with Motorola.

b. Motorola shall ship the Advance Replacement Parts requested by the Customer within 48 hours of Motorola determining that such service is appropriate, if stock is available at the Motorola service location. If stock is not available, Motorola will make reasonable efforts to locate and provide it to the Customer within ten (10) working days.

c. The Customer shall return defective items to Motorola within thirty (30) days from the date of shipment of the Advance Replacement Parts; failing which, Motorola shall bill and the Customer shall pay the full current list price of the Advance Replacement Parts.

10. To secure payment of the list price of Advance Replacement Parts if the defective items are not returned to Motorola, the Customer hereby grants to Motorola a purchase money security interest in any Advance Replacement Parts.

Telephone Technical Assistance

11. During the Warranty Period, Motorola will provide the Customer with over-the-telephone technical fault analysis free of labor charges. The Customer may call the Paging One-Call-Support Center at 1-800-520-PAGE (7243) for assistance. For warranty calls in excess of 15 per location per month or for non-warranty calls, Motorola shall charge the Customer per Motorola's then-current labor rates.

Excluded Equipment

12. The following equipment is excluded from this Warranty and is covered instead by the Original Equipment Manufacturer's Warranty:

    a. Equipment which is not an integral part of a basic system configuration and which is not manufactured by Motorola, such as batteries and satellite dish LNBs;

    b. Peripheral equipment such as printers, modems, data loggers, video display terminals, and lightning and surge protectors; and

    c. Equipment which is not listed in Motorola's Price Book.

Force Majeure

13. Motorola shall not be responsible for failure to discharge its obligations under this Warranty due to delays by suppliers, material shortages; strikes, lockouts or other labor disputes; disturbances, government regulations, floods, lightning, fires, wars, accidents, acts of God, and any other causes beyond Motorola's reasonable control.

Default and Termination

14. Motorola shall have the right to immediately terminate this Warranty, and to suspend its performance under this Warranty, upon notification to the Customer if the Customer:

    a. Assigns or transfers the Customer's rights or obligations under this Warranty without the prior written consent of Motorola; or

    b. Within thirty (30) days of written demand by Motorola, fails to pay (1) any charge for Advance Replacement Parts supplied under this Warranty, if the Customer has not timely returned the defective items, or (2) any other amount that may be due.

15. Notwithstanding any such termination of the Warranty to the Customer, the Customer shall remain responsible for all amounts then due.

Limitation of Liability

16. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THIS WARRANTY, EVEN IF MOTOROLA HAS BEEN ADVISED OF THE POSSIBILITY THEREOF, INCLUDING, WITHOUT LIMITATION, LOST PROFITS AND REVENUES, FAILURE TO REALIZE EXPECTED SAVINGS, LOST DATA OR ANY CLAIMS AGAINST THE CUSTOMER BY A THIRD PARTY.

PSG Limited Equipment Warranty for Non-U.S. and Non-Canadian Markets

General Terms

1. Motorola Paging Systems Group (PSG) manufactured infrastructure equipment is warranted to be free from defects in material and workmanship to the original purchaser only as set forth herein.

2. This Warranty covers only that equipment identified in paragraph 1 that is used in the manner and for the purpose intended.

3. This Warranty specifically excludes any and all software products from any source. PSG software products are the subject of the PSG Software Maintenance Program, addressed separately.

4. This Warranty shall commence 30 days after the date of shipment of the PSG infrastructure equipment.

5. The term of Warranty for all PSG infrastructure equipment is one (1) year parts and labor.

Limitations And Qualifications of Warranty

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   a. The equipment or any part of it NOT having been installed, modified, adapted, repaired, maintained, transported or relocated in accordance with Motorola technical specifications and instructions;

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d. Nonconformance with the Equipment Operating Instructions in the applicable Motorola Equipment Manual;

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i. Accidental damage;

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k. Force Majeure; and

l. Damage caused by Shipper(s).

Return of Equipment

8. If an item of PSG infrastructure equipment malfunctions or fails in normal use within the Warranty Period:

a. The Customer shall promptly notify the nearest Motorola Area Customer Care Center (CCC) of the problem and provide the serial number of the defective item. Motorola shall then, at its option, either resolve the problem over the telephone or issue a Return Authorization Number to the Customer. The Customer shall, at its cost, ship the item to the Motorola Area CCC location designated at the time the Return Authorization Number is issued;

b. The Return Authorization Number must be shown on the label attached to each returned item. A description of the fault must accompany each returned item. The returned item must be properly packed, and the insurance and shipping charges prepaid;

c. Motorola shall either repair or replace the returned item. The replacement item may be new or refurbished. When refurbished, it shall be equivalent to new in operation. When a returned item is replaced by Motorola, the returned item shall become the property of Motorola;

d. Subject to all the terms of this Warranty, part availability and the clearance of Customs, Motorola shall complete the repair or exchange of Motorola-manufactured equipment returned under Warranty within fifteen (15) working days of receipt of the equipment;

e. Motorola shall, at its cost, ship the repaired or replaced item to the Customer. If the Customer has requested Express Shipping, the Customer shall pay Motorola an expedite fee; and

f. Equipment which is repaired or replaced by Motorola shall be free of defects in material and workmanship for the remainder of the original Warranty, or for 90 days from the date of repair or replacement, whichever is longer. All other terms of this Warranty shall apply to such repairs or replacements.

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b. Motorola shall ship the Advance Replacement Parts requested by the Customer within 48 hours of Motorola determining that such service is appropriate, if stock is available at the Motorola service location. If stock is not available, Motorola will make reasonable efforts to locate and provide it to the Customer within ten (10) working days.

c. The Customer shall return defective items to the Motorola Area Customer Care Center within thirty (30) days from the date of shipment of the Advance Replacement Parts; failing which, Motorola shall bill and the Customer shall pay the full current list price of the Advance Replacement Parts.

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Introduction

The *Choreographer! Network Manager Installation and Operation* manual explains how to manage your messaging network with your Choreographer! network manager. The manual addresses the site engineer and network administrators whose tasks include constructing and managing networks.

To perform the tasks detailed in this manual, personnel should be knowledgeable in the following areas:

- Messaging networks
- UNIX® operating system
- Telecommunications

Chapter Overview

The following chapter descriptions summarize the topics explained in each chapter:

- Chapter 1, "Introduction" provides an overview of the Choreographer! network manager and this manual.
- Chapter 2, "Functional Description" describes the organization, function, and protocols of the Choreographer! network manager and the methods for navigating through the system.
- Chapter 3, "Getting Started" describes how to install system software and configure the computer system for the software.
- Chapter 4, "Setting Up the Messaging Network" details how to set up a messaging network in the Choreographer! network manager and describes the functions of the various windows.
- Chapter 5, "Network Configuration" describes how to configure devices. This chapter details how to configure network elements, how to download the configuration and the software to the network devices, and how to optimize paging network performance using configurable parameters.

- Chapter 6, "Viewing Alarms and Events" describes the network alarm and event structure, how to define alarms and events, clear alarms, and use the technician paging feature (TechPage).

- Chapter 7, "Historical Statistics" describes the historical statistics feature, how to set up historical statistics to collect statistics from the RF-Conductor! controller, and how to write queries to collect statistics on specific conditions.

- Appendix A, "Abbreviations and Acronyms" provides a list of abbreviations and acronyms with their definitions.

- Appendix B, "Backup and Restore Procedures" contains the backup and restore procedures and copies of the scripts.

- Appendix C, "Configuring Network Printers" has optional printer configuration procedures.

Related Publications

The following Motorola publications relate to the operation and use of the Choreographer! network manager and the main elements of a messaging network:

- *Choreographer!™ Software Interface Concepts Description*,
  Motorola part number 6880492G08

- *RF-Conductor!™ Controller Installation Description*,
  Motorola part number 6880493G03

- *RF-Audience!™ Receiver Installation and Operation*,
  Motorola part number 6880493G04

- *RF-Baton!™ Transmitter Controller Installation and Operation*,
  Motorola part number 6880497G01

- *RF-Orchestra!™ Transmitter Installation and Operation*,
  Motorola part number 6880493G02

- (Optional) *WMG™-Administrator! Messaging Switch Administration*,
  Motorola part number 6880492G01

- (Optional) *NIU Transmitter Controller Installation and Operation*,
  Motorola part numbers 6880497G10 and 6880497G15

- Current software Release Notes, containing information on the most recent updates and changes to the Choreographer! software

The *HP® OpenView™ Using Network Node Manager* also relates to the operation and use of the Choreographer! network manager

Conventions Used in This Manual

To clarify procedures that are described in this manual, certain text conventions are used (see Table 1-1).

Table 1-1: Conventions Used in this Manual

Convention	Description
Keys	Single keyboard keys used during input appear in a Palatino font enclosed in angle brackets. Example: Press <**Return**> to start the update process.
Command input from keyboard	Commands entered by the reader appear in Helvetica bold type. Example: Type: **ls^-a** <**Return**>
System output	System responses to commands appear in Helvetica type. Example: COMMAND SUCCESSFUL
Menu items	Menu item names appear in bold type. Example: Select **File** from the pull-down menu.
Spaces	A carat symbol (^) means to add a space between letters in a command input. Example: Type: **ls^-a** <**Return**>
<Return>	Depending on your keyboard, the <**Return**> key may be known as <**Enter**>. This manual uses the <**Return**> designation, other than those designations that are output by various system software.
Variables	Variables that you must type into the system are shown inside vertical brackets [ ]. Do not type the brackets. Examples: **[Latitude]**, **[177.12.77.34]**

The Choreographer! Network Manager Overview

The Choreographer! network manager is a network manager for voice and data communications, used in either the two-way or one-way messaging infrastructures. The network manager manages and configures network devices.

As an integral element of the Wireless Messaging System advanced messaging network, the Choreographer! network manager integrates a wide range of utilities and services:

*   Configuration management and software download

*   Statistics monitoring

*   Alarms and event monitor/event manager

The Choreographer! network manager, the pathway to the RF network, administers the following elements of the network while linking the various network equipment:

*   RF-Conductor!™ (RF-C!™) controller: The RF-C! controller is the Motorola controller for an RF network. The RF-Conductor! controller batches, schedules, and queues outbound messages for transmission over the distribution network to the transmitters and schedules inbound messages received from the receivers.

*   Nucleus™ paging station: The Nucleus paging station is the base station that modulates the messages for transmission over the air to the personal messaging units.

*   RF-Baton!™ (RF-B!™) transmitter controller: The RF-B! transmitter controller is the network interface for the Nucleus paging station and the RF-Orchestra! paging station. The RF-B! transmitter controller provides the network interface functions to enable the Nucleus paging station and the RF-Orchestra! paging station to receive messages from the RF-Conductor! controller. The RF-B! transmitter controller also performs digital signal processing on messages before forwarding them to the Nucleus paging station.

*   RF-Audience!™(RF-A!) receiver manages inbound message transmissions from two-way messaging units. Inbound messages are sent to the RF-Conductor! controller for processing.

*   WMG™ Messaging Switch (WMG™ MS): The WMG MS is the messaging platform that maintains the subscriber database, receives message inputs, manages other information services such as voice mail services, and sends messages through the RF-C! controller to the messaging network.

Functional Description

The Choreographer! network manager configures and manages voice and data subsystems in the PSG one-way and two-way messaging infrastructure. As an integral element of the Wireless Messaging System (WMS) advanced messaging network, the Choreographer! network manager provides a wide range of services:

- Configuration management and software download

- Statistics monitoring

- Alarms and event monitor and manager

The Choreographer! network manager uses the Hewlett Packard (HP) OpenView Network Node Manager (OVNNM) for many of the control windows. The Choreographer! network manager runs on a Solaris operating system, providing additional user windows through the X Window System™ Graphical User Interface (GUI).

Choreographer! Network Manager Overview

The Choreographer! network manager provides numerous network services. This section describes the features, specifications, and network architecture that combine to provide these services.

Features

The Choreographer! network manager has the following features:

- Simple operation

- Graphical User Interface

- Two-phase procedure for loading software and configurations

- Protocols:
    - Simple Network Management Protocol (SNMP)
    - File Transfer Protocol (FTP)
    - Trivial File Transfer Protocol (TFTP)

- Primary management for several Motorola RF-control and RF-distribution elements:
    - RF-Conductor! controller (RF-C!)
    - RF-Baton! transmitter controller (RF-B!)
    - Nucleus RF paging station (through the RF-B!)
    - RF-Audience! receiver (RF-A!)
    - RF-Orchestra paging station (RF-O!)
    - Other SNMP-compliant equipment (routers, hubs)

- Ability to run third-party applications

- Hierarchical functionality

- Modules of value-added software for paging management

- Near real-time statistics

- Historical statistics

- Ability to filter and forward events to third-party Network Management Center (NMC) for alarm management purposes

- Ability to page a technician for specific types of alarms

Specifications

Your system must meet the hardware and software requirements described in this section for optimum system performance.

Hardware Specifications

The Choreographer! network manager has the following hardware requirements:

- Sun$^®$ SPARC station 20 with TurboGX frame buffer
    - 256 MB RAM (Upgradable to 512 MB)
    - 2.1-GB internal disk
    - Internal CD-ROM drive
    - 20-in. color monitor
- FastEthernet SBus Adaptor
- External 4 mm DAT tape drive

Note: Sun SPARC station models range from 256MB to 512 MB RAM.

Software Specifications

The Choreographer! network manager requires the following software:

- Solaris$^®$ Operating System 2.5.1
- HP$^®$ OpenView™ (HPOV) 5.0.1
- Java 1.1.5
- The Choreographer! network manager application software 1.4.x
- Software patches for any of the software listed

Network Architecture

The network architecture supports a hierarchical or peer-to-peer approach for organizing these elements. The hierarchical approach consists of a management pyramid:

- Centralized network management center

  This highest level can view the entire messaging system. This level monitors the health and status of the system and provides technical support to the regional level.

- Regional operational centers

  These centers administer the terminals, controls, paging stations, and other network devices throughout the region. The centers also provide technical support for the local level.

- Local operations level

  In this lowest tier, local operations administer the terminal, controller, paging station, and other network devices at the local level.

A typical situation uses systems configured for hierarchical management to provide peer-to-peer communications and control as the system manager requires. The network security controls this communication. Each Choreographer! network manager handles its immediate local market, distribution network equipment, paging stations, and receivers.

The Choreographer! network manager handles a three-level hierarchy of controls, alarms, monitoring, and reports. Normally, control is limited to the local market. However, the local operator may pass control or monitoring of the local market to an authorized remote operator residing on another Choreographer! network manager. This control process may occur during consultation or for reporting statistics or alarm information. A standard feature is the ability to forward a set of critical events or alarms to higher levels within the network management structure.

Customers send data from the local markets to the regional and nationwide network management center for selected alarms and network reporting and analysis.

The following information is available through alarms, reports, and monitoring:

- Numbers, types, configurations, and software versions of the equipment in the network
- Paging traffic through the system
- Equipment status
- Alarms and events that affect system performance

Management Domain

The domain of the Choreographer! network manager includes the following system elements:

- Edge network

- Paging root

- Region

- Zones

- WMG MS

Edge Network

The Edge network side of the FLEX™, ReFLEX™, and InFLEXion™ protocol messaging systems includes the following elements (see Figure 2-1):

- RF-C! controller

- RF-B! transmitter controller

- RF-O! or Nucleus paging station

- RF-A! receivers (ReFLEX and InFLEXion protocols only)

- Routers

SNMP is specifically designed to manage these diverse elements.
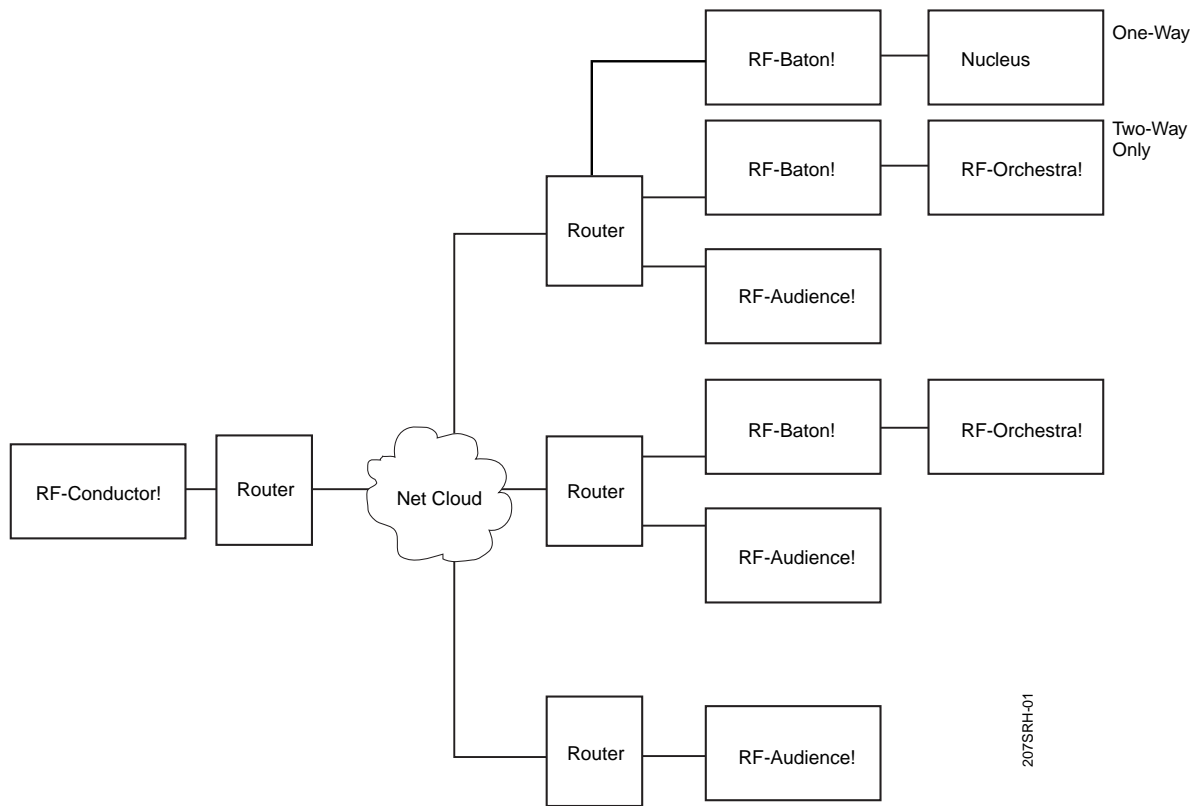
Figure 2-1: Edge Network

RF-Conductor! Controller

An RF-C! controller schedules, queues, and batches outbound messages through the
messaging infrastructure (see Chapter 4, "Setting Up the Messaging Network").

RF-Baton! Transmitter Controller

An RF-B! transmitter controller receives Outbound Paging Protocol (OPP) data messages from
the RF-C! controller, converts the data to paging station-compatible protocols, and sends the
protocols to the paging station at a scheduled time.

Transmitters and Receivers

The paging station accepts the messages from the system and sends them over the air. The receiver accepts return messages from the personal communication devices (PCD). Paging stations and receivers may be in the same or separate site locations. Each coverage area may have several paging stations.

WMG MS

The WMG-Administrator! messaging switch (MS), a clearinghouse for all messages in the Wireless Messaging System, provides a wide range of messaging and administrative services. Callers access the system through the Public Switch Telephone Network (PSTN) or the Internet. Each WMG-Administrator! MS connects to other systems in the Wireless Messaging System through a network of land lines and satellite links.

Paging Root

The paging root graphically represents the paging network and contains logical windows. The paging root shows the relationships of paging devices within the paging hierarchy.

Illustrations and examples shown in this explanation are for a two-way messaging system using the InFLEXion protocol, but the principles remain similar for messaging systems using FLEX or ReFLEX protocols.

Each paging window allows you to arrange network devices. The arrangement can show the relationship and functionality of the devices within the paging system instead of their actual or logical interconnections in the network.

The Choreographer! network manager provides a way to create hierarchical sequences of windows. Each window may have multiple icons for various devices and logical groupings. Using specific rules (see Chapter 4, "Setting Up the Messaging Network"), you can create a graphical representation of the paging operations.

All messaging devices have associated paging symbols. Only the symbols associated with a window are available for use in that window.

Region

A region is the geographical area that represents the logical groupings of the business operations of the paging network.

Controllers

The controllers are the network devices that control the messaging traffic, receive messaging data, and route it to the appropriate transmitter. The controllers also relay data back to a messaging terminal and batch and schedule messaging protocols

Zones

A zone is the first level of coverage in a messaging system. Zones define a broadcast area for the RF-C! controller.

Paging Stations and Receivers

Within the zones, you have all paging stations and receivers for that zone.

System Navigation

The Choreographer! network manager provides a method for configuring, maintaining, and controlling the information depicted in HP OpenView windows. The Choreographer! network manager functionally consists of a combination of HP OpenView windows, application-specific GUIs, and a variety of other windows.

Hewlett Packard OpenView Windows

The HP OpenView windows software develops pictorial representations of the paging system network. HP OpenView windows have a common appearance. The information varies from window to window, but the location of the following four areas remain consistent: menu bar, tool bar, viewing area, and status area (see Figure 2-2).
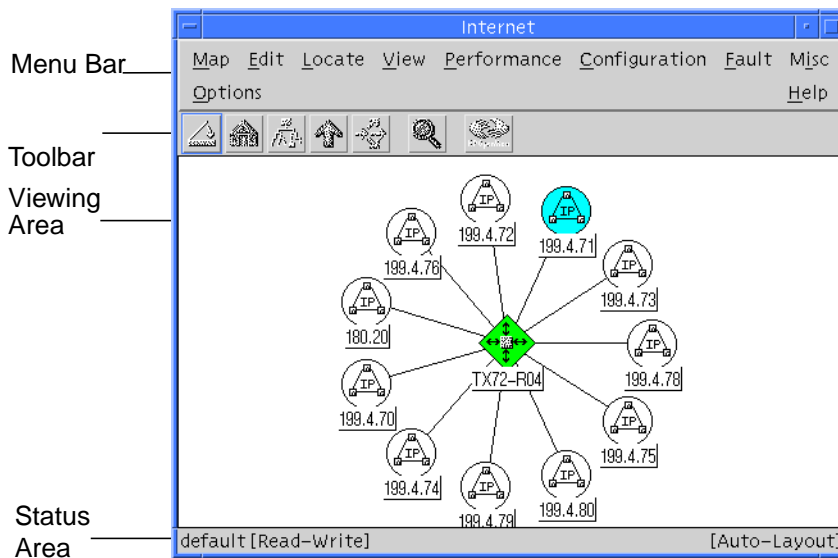
Figure 2-2: HP OpenView Window Example

For more detailed information on the HP OpenView Windows, refer to the following HP documents:

- *HP OpenView Using Network Node Manager*

- *HP OpenView Solutions Catalog*

Menu Bar

The menu bar appears near the top of the window and contains the OpenView Window (OVW) menu items for accessing and controlling the operation of the network management station.

Toolbar

The OVW displays a toolbar directly below the menu bar on each window. The toolbar contains several icons to close the current window or access a different window. The following icons appear from left to right in the toolbar.

The **Close** icon closes the current window.

The **Home** icon accesses the Home window. You can select any window to be the Home window.

The **Root** icon accesses the Root window. In the Choreographer! network manager, the Root window and the Home window are the same.

The **Jump** icon goes back one window from the current window.

The **Shortcut** icon accesses frequently used windows quickly.

The **Zoom** icon enlarges details within a window and pans from area to area. Selecting this icon displays a reduced window identical to the current window.

The **HP OpenView ID** icon provides the copyright date, session ID, server name, and access to information about registered applications. When you select this icon, the About OpenView window appears.

Viewing Area

The actual network information appears in the viewing area. Symbols and graphics convey information about systems, connections, and other parts of the network.

Status Area

Messages on the status area indicate the status of OVW or integrated applications. This information is only available for applications that report status to OVW. The OVW displays the following information on the status bar:

• Name of the root window

• Access available on the open window: read-only or read-write

• Name of the current window

• Status of automatic layout (enabled or not enabled) for the current window

About OpenView Window

The About OpenView window displays the version, copyright, and description (see Figure 2-3). You can access the About OpenView window from any Choreographer! network manager window by clicking the HP OpenView ID icon.
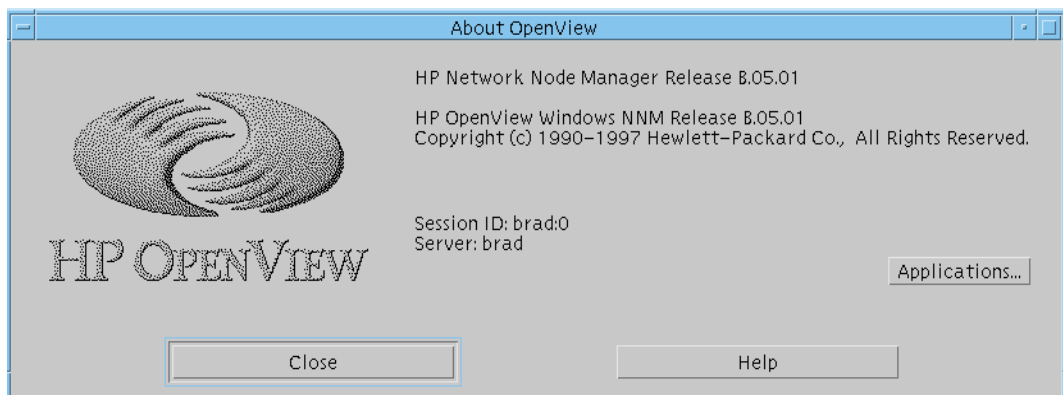
Figure 2-3: About OpenView Window

You can view active applications information by clicking the **Applications** button. The Application Index window appears (see Figure 2-4).
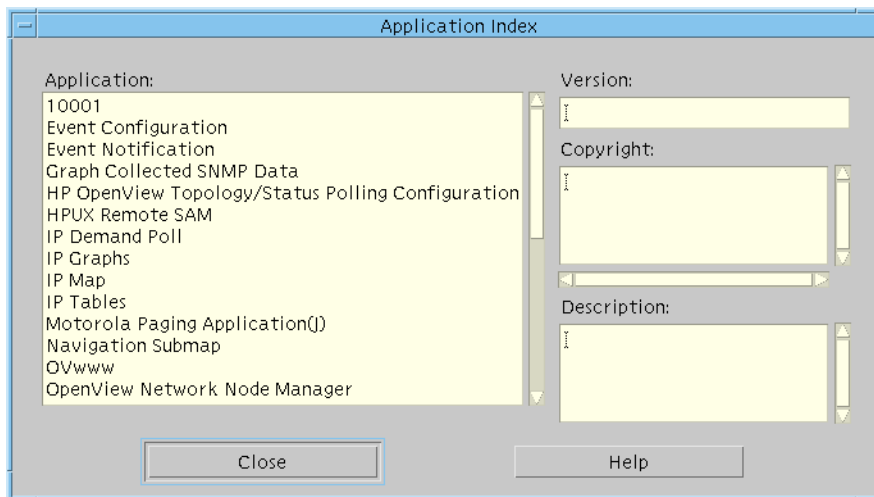
Figure 2-4: Application Index Window

Configuration Windows

The SNMP Management Information Base (MIB) browser provides a means of accessing network information. The Management Information Base contains configuration and status values that the Choreographer! network manager uses to configure the network elements.

SNMP MIB Browser

The MIB browser accesses the network information through a GUI. The MIB browser reads the MIB elements. Use the SNMP MIB browser to monitor your network elements and to troubleshoot problems (see Figure 2-5).

For more information about the MIB browser, refer to the *HP OpenView Network Node Manager's User Guide* (see also Chapter 3, "Getting Started").
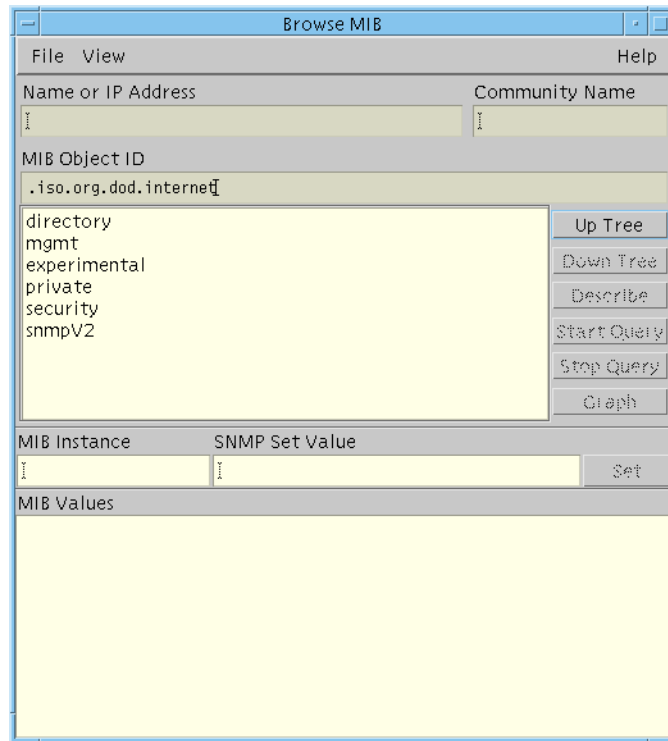
Figure 2-5: SNMP MIB Browser

Use the following steps to use the MIB browser:

1.   Open the MIB browser by selecting **Misc:SNMP MIB browser** from the pull-down menus in the HP OpenView root window.

     The Browse MIB window appears.

2.   Specify the MIB object to view by one of these methods:
     –   Type the MIB Object ID.
     –   Select the MIB Object from the selection list. Move through the MIB tree by using the navigation buttons: **Up Tree** and **Down Tree**.

3.   Click on the **Start Query** or **Set** button to begin.

Paging Application Windows

The paging application windows provide navigation, configuration, and software download windows.

A messaging system design is a hierarchy. Each level in the system breaks down or expands into more detail. The paging configuration windows display the system design in the same top-down configuration as the SNMP MIB browser.

The tree starts in a collapsed configuration. To find any particular element, expand various levels of the system to locate a specific item or device.

Paging Root Windows

The Paging Root windows define the actual operational system. Paging Root windows display the levels of the network and provide access to add and delete components of these levels.

Background maps and icons distinguish Paging Root windows and represent operational divisions of the system, such as regions.

Using IP Internet Windows

The IP Internet windows show the physical network layout. These windows indicate how devices connect to each other in the network.

IP Internet windows are used for viewing only. The software surveys the network and automatically adds or deletes elements without operator input. Do not manually add or delete network elements.

The following HP icons are used on the IP Internet windows:

Gateways: Gateways are connections between different networks, usually routers.

IP maps: IP maps are the representation of the network connected to the gateway.

IP segments: IP segments are the representation of the interfaces of the element.

Segments: Segments are the collection of the devices on the same network.

Devices: Devices are elements such as hard drives, servers, and printers. An empty box may also represent a device or element.

Only example windows appear in this text because the windows are similar. The screens do not necessarily contain the icon for each workstation. All IP addresses shown are for example only. Use the left mouse button unless otherwise noted.

Shaded icons represent objects that have child submaps; therefore, you can tier down the hierarchy. Unshaded icons have no child submaps. You cannot traverse the hierarchy further than the IP Segments.

Use the following steps to display the physical network:

Note: All of the following procedures assume that basic system configuration has already occurred.

1. On the Root window, click the **Internet** icon.

   The IP Internet window displays all available IP addresses and gateways (see Figure 2-6).

2. Double click the **Gateway** icon.

   The selected Gateway window displays available segments.
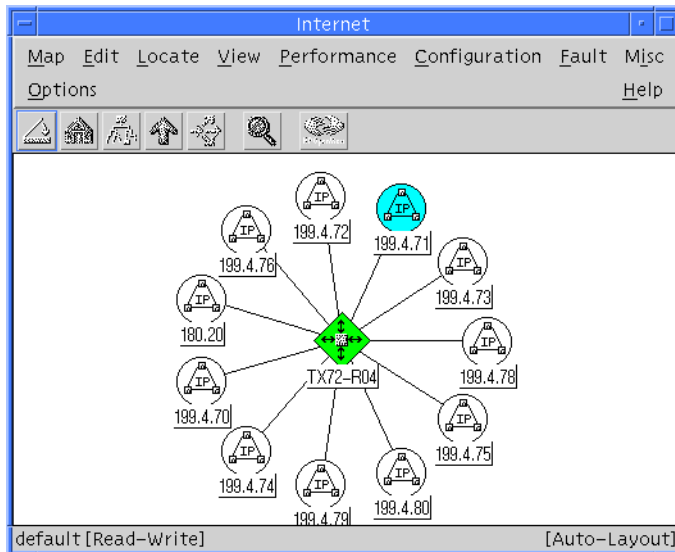
Figure 2-6: Example IP Internet Window

3.   Double click any of the segments in the Gateway window.

     The OpenView Windows QUESTION dialog box displays three options (see Figure 2-7).
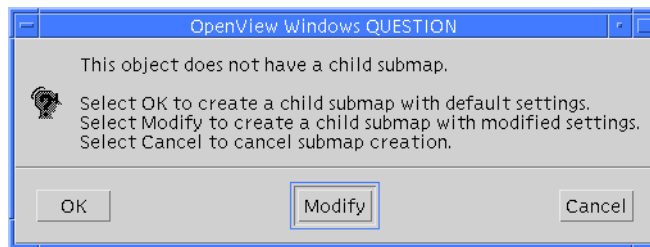
Figure 2-7: OpenView Windows QUESTION Dialog Box

Note: Child submaps are a further definition of the submaps. The IP Segments have no child submaps. Do not traverse further than the IP Segments in the Gateway window.

4.   Click **Cancel**.

     The dialog box closes.

5.   Return to the IP Internet window by clicking the **Jump** icon on the tool bar.

6.   Double click an **IP Segment** icon.

7.   The IP Map Network window shows available segments and gateways.

8.   Double click a **Segment** icon. The IP Map Segment window appears with all available devices and gateways.

9.   Double click any of the device icons. The appropriate device window appears with the IP address for the device.

Note: *The IP Addresses have no child submaps. The operator cannot tier down the hierarchy further than the IP address.*

10. Click the **Jump** icon on the tool bar to return to the IP Map Segment window.

11. Double click the **Gateway** icon.

     The Gateway IP Segment window appears, showing the IP address for the gateway.

Using Paging Root Windows

Detailed information about using the Paging Root windows is in Chapter 4, "Setting Up the Messaging Network". The following table summarizes the navigation available through the Paging Root icon.

Table 2-1: Paging Root Window Functions

Window	Function	Access
Paging Root	Displays all available regions	Double-click the Paging Root icon on the Root window.
Region	Shows all available RF-Conductor! controllers	Double-click the Region icon on the Paging Root window.
RFC	Displays all available zones	Double-click on the RFC icon on the Region window.
Zone	Shows all available paging stations and receivers	Double-click on the RFC icon on the Region window.

Using the Paging World Window

The Network Element Configuration Application (NECA) window, called Paging World, consists of a single screen. Set up and configure your network elements from this screen. Access this window from the OpenView pull-down menu **Misc**>**PagingApps**>**Configure Devices (NECA)**.

The element list is a hierarchy or indented list. Each major group of elements appears as a single entry that expands to show the individual elements or other groups subordinate to the selected element.

Locate any element in the system by expanding the parent group until the device appears. Once the desired element is visible, place the cursor over the name and click the left mouse button to select the element. The example in Figure 2-8 shows a paging network consisting of three groups, entitled Southwest Region, Northeast Region, and Southeast Region. Each group has two network elements; in this example, they are RF-Baton! transmitter controllers.
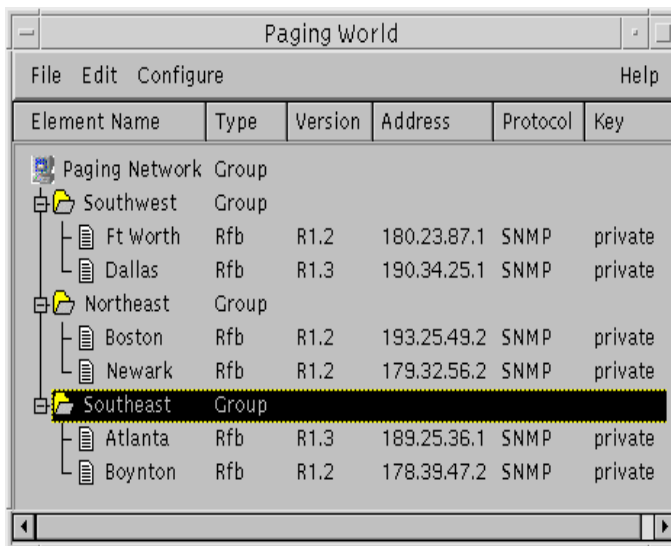
Figure 2-8: Viewing the Paging World Configuration Window

Note: There is no correlation between the Paging World and the topology map.

Expand the Paging Network Group to display the entire network. Use the + and - symbols to the left of the element names to expand or collapse the view of the network.

PNMS Element Configuration Window

Make additions and changes to your configuration by using the PNMS Element Configuration Window (see Figure 2-9). Each group of parameters appears as a folder with the name on the folder tab. The box does not display the entire list of folders. The scroll bar at the top right of the right-hand box scrolls the hidden portion into view.
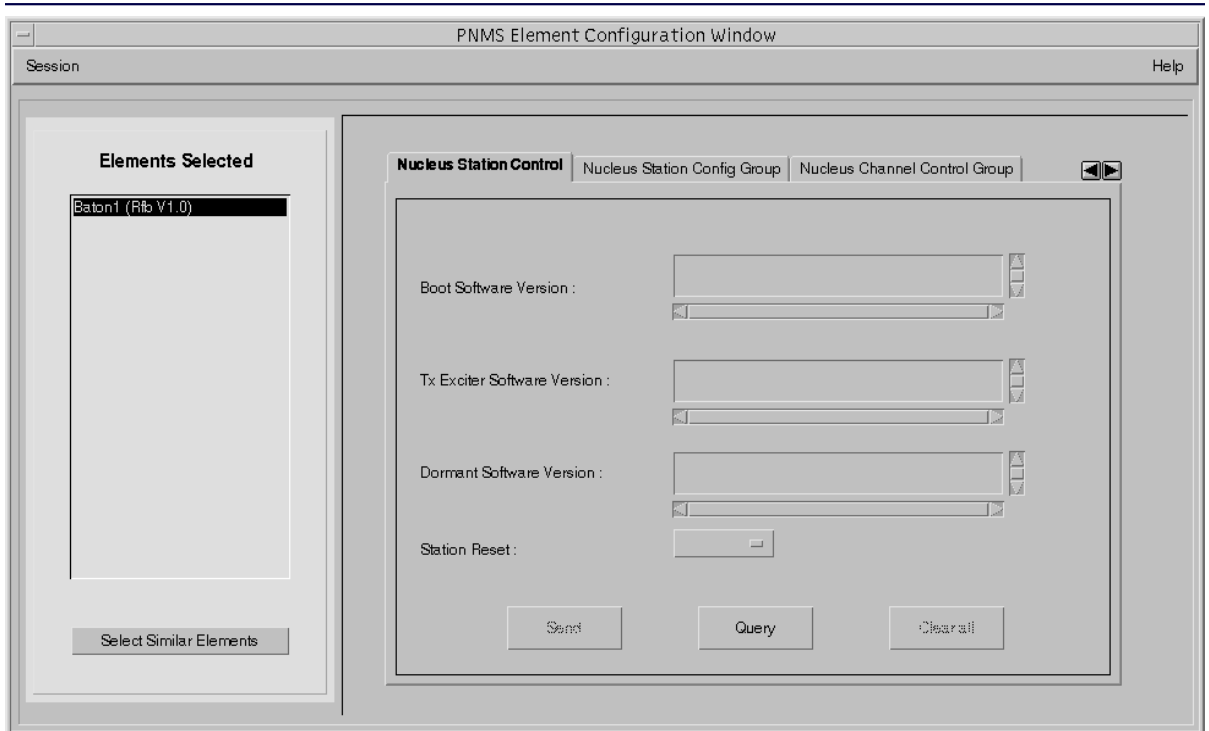
Figure 2-9: Using the PNMS Configuration Window

Tool Set for Alarms, Statistics, and Configuration

The Choreographer! network manager performs the following network management tasks:

- Alarm and fault management

- Event notification

- Device status query

- Fault isolation

- Technician Paging (TechPage)

- Statistics collection and customization

- Direct entry configuration for network elements

- Maintenance and updates for network elements

Alarms

Alarms indicate the health of a messaging network by showing problems that need resolution. However, if the alarm and fault management traffic is not addressed in a timely manner, it can impair messaging traffic over the network. Alarm handling uses HP OpenView methodologies.

Through the Choreographer! network manager you can also configure your system to page a technician when a specific level of alarm occurs.

For more information on alarms, see Chapter 6, "Viewing Alarms and Events".

Statistics

The Choreographer! network manager retrieves statistics for most messaging network activities:

- RF control

- Distribution network traffic

- Near real-time statistics

- Paging station usage

- Receiver activity

The summary reporting functions in the Choreographer! network manager generate additional statistics. For more information on statistics, see Chapter 7, "Historical Statistics".

Configuration

The Choreographer! network manager controls and monitors the following network configuration:

- Network assignments, such as name, location, and numbering

- Software version

- Parameter configuration of controlled network elements

The Choreographer! network manager uses the Motorola NECA to allow you to configure network element information (see Chapter 5, "Network Configuration").

Standards and Protocols

The Choreographer! network manager uses the following protocols:

- Simple Network Management Protocol (SNMP)

- File Transfer Protocol (FTP) and its secondary protocols:
    - Trivial File Transfer Protocol (TFTP)
    - Remote Copy Protocol (RCP)

- X/Motif

Getting Started

To ensure successful installation and operation of the Choreographer! network manager, you must complete the preparation and installation procedures provided in this chapter. Complete the information in Table 3-1 before you begin.

Table 3-1: Information Required for Installation

For this request...	Supply this information for your system...
Host Name (Choreographer!)	
IP Address (Choreographer!)	
Netmask	
Default Router IP Address	
Root Password (Choreographer!)	
Printer IP Address	
Host Name (RF-C!)	
IP Address (RF-C!)	
Root Password (RF-C!)	
RF-C! Version (for each RF-C!)	
Host Name (for each RF-C!)	

Hardware and software specifications are detailed in Chapter 2, "Functional Description", paragraph, "Specifications".

The Choreographer! network manager ships with a partial Solaris operating system factory-installed. All other software must be installed on site. The site-specific information you recorded in Table 3-1 must be typed during the installation.

Installing the Operating System

Note: Before this procedure, you must set up the system hardware. Refer to the SUN hardware
documentation for specific setup information.

CAUTION   ***Do not attempt the installation without the necessary system knowledge and***
training (see Chapter 1, "Introduction" for more information).

The Choreographer! network manager software ships with the Solaris software partially
installed. To finish the installation, complete the following steps to install Solaris:

Note: Names, IP addresses, and netmask entries used in this manual are examples only.
This information is specific to your site. Confirm that you have the correct information from
Table 3-1 before you type the values.

1.   Place the Solaris 2.5.1 CD-ROM in the CD-ROM drive.

2.   On the Sun keyboard, press <**Stop**> **a** to access the **ok**> prompt.

Note: The system prompts are shown.

3.   Type the following command:

      ok> boot cdrom <**Enter**>

      The system comes up.

4.   Select **Continue** twice to proceed with the installation.

5.   Type the information requested by the following system prompts:

      Host Name: **[rfcchor2]**

      Select **Continue**.

      Networked: **Yes**

      Select **Continue**.

Note: The primary network interface prompts only when more than one option is available.

Primary Network Interface: **le0**

Select **Continue**.

IP-Address: [**177.12.77.12**]

Select **Continue**. A Confirm Information dialog box appears. You have the opportunity to change the information. Review the information for accuracy. If changes are required, select **Change**. If the information is correct, select **Continue**.

Name Services: **None**

Select **Continue**. A Confirm Information dialog box appears. You have the opportunity to change the information. Review the information for accuracy. If changes are required, select **Change**. If the information is correct, select **Continue**.

System part of a subnet: **Yes**

Select **Continue**.

Netmask: [**255.255.255.0**]

Select **Continue**.

6.   Select **Geographic Region** to define your region.

Select **Set**.

The Set Geographic Region screen displays.

7.   Select your region in the left box. Select your time zone in the right box. Select **Continue** to type the appropriate time zone parameters.

8.   Set the date and time. You can accept the default format or type the time and date.

Select **Continue.**

A Confirm Information dialog box appears.

9.   You have the opportunity to change the information. Review the information for accuracy. If changes are required, select **Change**. If the information is correct, select **Continue**.

The Install Solaris SW - Initial dialog box appears.

10.   Select **Exit**.

11. From the console, type this command:

format <**Enter**>

a. The system prompts you as follows:

Specify disk (enter its number):

Type the number of the disk as follows:

0 <**Enter**>

The format prompt appears.

b. Type the following:

format> **type** <**Enter**>

The list of format types appears.

c. Type **0** <**Enter**> for Auto Configure.

d. Type format> **format** <**Enter**>

The system prompts:

Ready to format. Formatting cannot be interrupted and takes 34 minutes (estimated) Continue?

Note: This step could take longer and is dependent upon your specific system.

e. Type **yes** <**Enter**> to continue.

f. Issue the following command to proceed with the installation:

format> **quit** <**Enter**>

12. To install the Solaris software, type the following command:

suninstall <**Enter**>

The Install SS - Init dialog box appears.

Select **Continue** to complete your installation.

13. Set the following parameters:

a. Select **System Type: Standalone**

b. Select **Continue**.

c. Select **Entire Distribution plus OEM support.**

     d.   Select **Continue**.

     e.   Select the available disk by highlighting the disk number and selecting **Add.**

     f.   Select **Continue twice.**

     g.   Select **Manual Layout.**

     h.   Select **Customize**, and type the following disk partition sizes (see Table 3-2). use the **<Tab>** key to navigate the table.

Table 3-2: Disk Partition Sizes

Number	Name	Size
0	/	1200
1	swap	445
2	overlap	2028
3		
4		
5		
6	/home	254
7	/usr/local	128

14.   Select **OK**.

15.   Select **Continue twice.**

16.   Select **Begin Installation.**

17.   Select **Reboot.**

Note: Solaris takes several minutes to install. On a SPARC 20, the installation may require more than an hour.

18.   Set the root password. The system prompts you to confirm the password. The factory default password is Motorola.

19. Log in as root using the password from the previous step:

  a. Login: **root**

  b. Password: **[root_password]**

20. Edit the file **/etc/defaultrouter** and insert the default router IP address specified in the previous step. Use the following steps to edit this file:

  a. Start a session by typing the following command:

    # /usr/openwin/bin/openwin <Enter>

  b. Open a UNIX shell. (Select the Shell option from the UNIX desktop menu by using the right mouse button.)

  c. Change your directory with this command:

    # cd^/etc <Enter>

  d. Create a **defaultrouter** file to define the location of your default router. Launch a text editor and enter the following information as istructed. Type the IP address of the default router on the first line of the file.

21. Eject the CD-ROM with the following command:

  # eject <Enter>

22. Insert the Choreographer! network manager CD-ROM.

23. Change directories to the first Solaris patch by issuing the following command:

  cd /cdrom/cdrom0/Solaris2.5.1/Pat.10Jul98/2.5.1_Recommended <Enter>

  To access additional information, type the following:

  more CLUSTER_README <Enter>

24. Install the patch cluster by issuing the following command:

  # ./install_cluster <Enter>

Note: *This step may require an extended time period.*

25. The system issues the following prompt:

  Are you ready to continue with the installation? [y/n]

26. Type **y** for yes.

27. Change your directory to the second Solaris patch by issuing the following command:

    cd /cdrom/cdrom0/Solaris2.5.1/Pat.10Jul98/2.5.1_y2000 <Enter>

    To access additional information, type the following:

    more CLUSTER_README <Enter>

28. Install the patch cluster by issuing the following command:

    # ./install_cluster <Enter>

Note: This step requires approximately 30 minutes.

29. The system issues the following prompt:

    Are you ready to continue with the installation? [y/n]

30. Type **y** for yes. **<Enter>**

31. Eject the CD-ROM with the following command:

    # eject <Enter>

32. The operating system installation is now complete. Reboot your system before you continue by typing the following commands at the command line prompt:

    # **sync <Enter>**

    # **reboot^--^-r <Enter>**

Installing System Software

The installation script automates the installation procedure and reduces operator input. Use these steps to install the Choreographer! network manager installation script:

Note: This installation should only be performed after Solaris is loaded.

1.   Log in as root:

    a.   Login: **root**

    b.   Password: **[root_password]**

2.   Start Open Windows by typing the following command at the command line prompt:

    # **/usr/openwin/bin/openwin** <**Enter**>

Start the Installation Script

3.   Insert the Choreographer! network manager CD-ROM into the CD-ROM drive and type the following commands at the command line prompt:

    # cd^/cdrom/cdrom0 <**Enter**>

    # /usr/sbin/pkgadd^-d^.^CHOcinst <**Enter**>

CAUTION

> *There is a space on both sides of the decimal (.) in the /usr/sbin/pkgadd argument list.*

4.   If you have any conflicting files, they appear as shown in the following example:

    /etc/system

    usr/share/lib/zoneinfo/PRC

    If conflicting files appear, type **y** to the following prompts:

    Do you want to install those conflicting files [y,n,?,q] **y** <**Enter**>

    Do you want to continue with the installation of <CHOcinst> [y,n,?] **y** <**Enter**>

    You are prompted to reboot the system.

5. Reboot the system by typing the following command at the command line prompt:

   # **shutdown^-i6^-g0^-y** <**Enter**>

6. Log in as root:
   a. Login: **root**

   b. Password: **[root_password]**

7. After the system reboots, type the following command to start OpenWindows:

   # **/usr/openwin/bin/openwin** <**Enter**>

8. Use the shell tool to run the Choreographer! network manager installation script. Type the following commands:

   # **cd^/opt/C_Install** <**Enter**>

   # **./start.sh** <**Enter**>

Begin Installation

9. If the CD-ROM remains in the drive, the Welcome screen appears (see Figure 3-1). If you removed the CD-ROM from the drive, you receive a prompt to replace it.
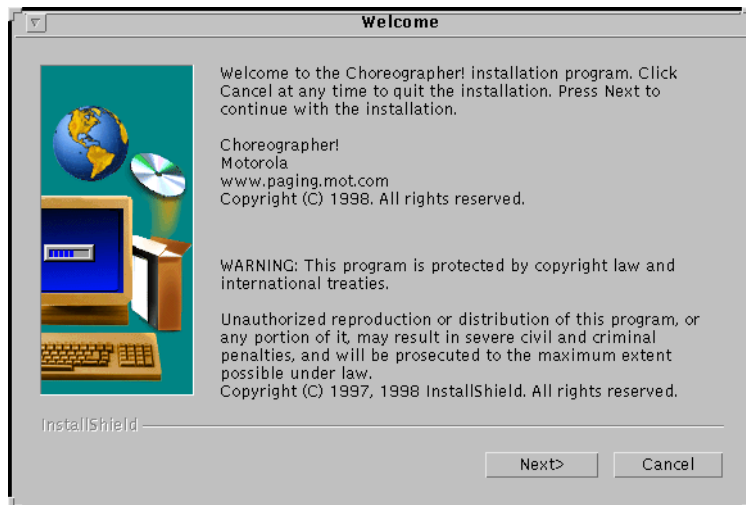
Figure 3-1: Welcome Screen

10. From the Welcome screen, select the **Next** button to install the system software.

   The Select Component to Install screen appears.
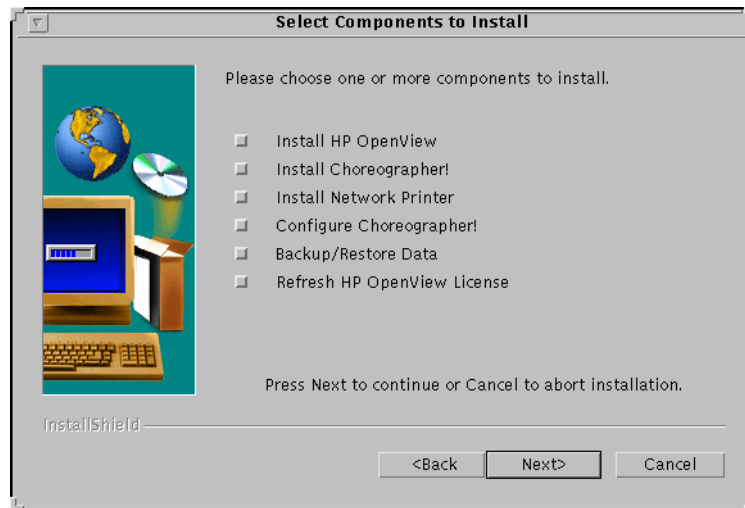
Figure 3-2: Select Component to Install Screen

11. The Select Component to Install screen allows you to specify the installation options you will run. You can run each selection individually, or you can select the first four items together. The following options are available:

   – Install HP OpenView

   – Install Choreographer!

   – Install Network Printers

   – Configure Choreographer!

   – Backup/Restore Data

   – Refresh HP OpenView License

CAUTION

If you do not have a printer to install, do not select the Install Network Printers option. Doing this will produce unpredictable results.

Two restrictions apply:

a.   You must install HP OpenView before you can install the Choreographer! network manager.

b.   If you select the Refresh HP OpenView License option, you must have a password validation file from HP OpenView.

Select the first four items for a new installation, then select the **Next** button to continue with the installation. If you select fewer than the first four, the order of screens will differ from the following text and graphics.

Install HP OpenView

CAUTION

HP OpenView will be installed with a temporary, 60-day license. To obtain a permanent license, please complete the form enclosed with the Choreographer! network manager software and return it to Hewlett Packard.

12.   Select the **Next** button to continue with the installation.
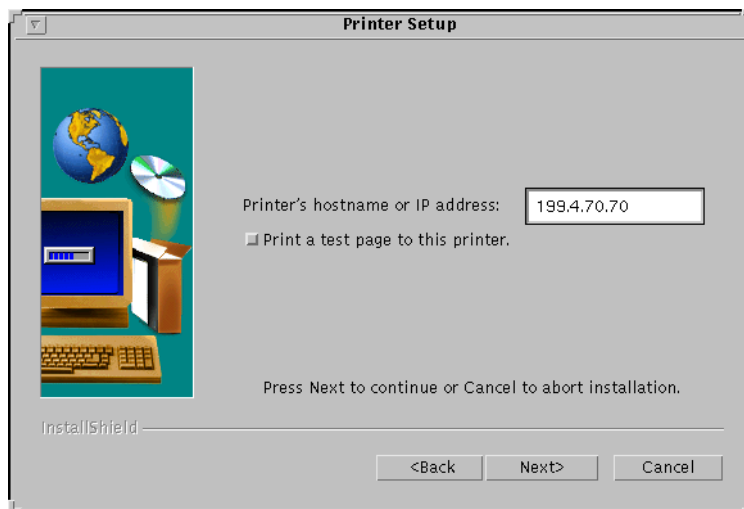
The Printer Setup Screen appears (see Figure 3-3).

Figure 3-3: Printer Setup Screen

13. Type the hostname or IP address of the printer and select test page.

Note: For a new installation, you must use the IP address.

After you complete the requested information, select the **Next** button to continue.

Configure the RF-C!

14. The configuration for the RF-C! controller begins, and the RF-C! Configuration screen appears (see Figure 3-4). Type the Host name and the IP address for the controller from which you are collecting data. The system prompts for this information as follows:

RF-C! Hostname: **[Hostname]**

RF-C! IP Address: **[IP_address]**

RF-C! Root Password: **[root_password]**

Retype Password: **[root_password]**

When you configure the redundant RF-C! controller, the IP address should be the takeover IP address.

Note: This password is the root password for the RF-C! controller.

15. Select the **Next** button.

The system then configures the RF-Conductor! controller host IP information in the .rhosts files, .netrc files, and etc/hosts files.

16. After you complete the configuration information, select the **Next** button to continue.
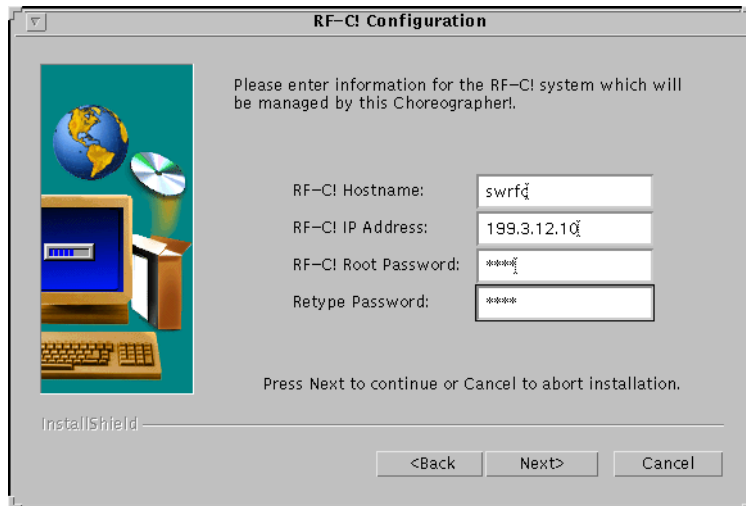
Figure 3-4: RF-C! Configuration Screen

17. The Insert Disk screen prompts you to insert the HP OpenView CD-ROM. After you insert the CD-ROM into the drive, select the **Continue** button.

    The installation of HP OpenView software begins, and the HP OpenView Installation screen appears. This screen provides a progress bar in HP OpenView to measure the progress toward completion. The progress bar proceeds to a certain point and holds there until completion.

18. The HP OpenView installation is complete when the progress bar reaches 100 percent. When this installation step completes, the installation proceeds to the Choreographer! network manager installation.

    Select the **Next** button to continue with the installation.

Install the Choreographer! Network Manager

19. The Insert Disk screen prompts you to insert the Choreographer! CD-ROM. Insert the CD-ROM and select the **Continue** button.

    The installation of the Choreographer! network manager software begins, and the Install Choreographer! Application screen appears. This screen provides a progress bar so that you can monitor the progress of the installation.

Note: *If you have any problems with your installation, two troubleshooting files are available. Open a UNIX shell to view the following files:*

    /tmp/C_Install.StdErr
    /tmp/C_Install.StdOut

20. The Choreographer! network manager installation is complete when the progress bar reaches 100 percent.

    When the installation of the Choreographer! network manager completes, the procedure continues to install the network printers.

Install Network Printers

As part of the printer installation, your printer drivers are automatically installed. The HPNP JetAdmin for UNIX (SPARC) D.02.10 package is available. For information about configuring network printers see Appendix C, "Configuring Network Printers".

21. The system prompts you to reboot your system. Select the **OK** button. Before rebooting, the Choreographer! network manager displays a list of the software that was installed.

Accessing the Installation Menu

At any time after the installation step, use the **./setup <Enter>** command to access this menu. This command displays the Select Component to Install screen. From the screen you can make changes or use backup and restore utility.

1.   Log in as root:

    a.   Login: **root**

    b.   Password: **[root_password]**

2.   Use the shell tool to run the Choreographer! network manager installation script. Type the following commands:

    # cd^/opt/C_Install <Enter>

    # ./setup <Enter>

Loading Management Information Base (MIB) Files

Network data is available in the MIB files, accessible through the **MIB Browser** window. The Management Information Base (MIB) contains configuration and status values that the Choreographer! network manager uses to configure your network elements. You must install these files and load them into the Choreographer! network manager database before the data are available to the Choreographer! network manager. For additional information about MIB files, refer to the HP OpenView *Using Network Node Manager* manual.

Use the following steps to install the files and load them into the Choreographer! network manager database:

1. To load the MIB tape that shipped with your network element, insert the tape into the Choreographer! DAT drive and copy the required MIBs through a UNIX shell. Copy the files to your Choreographer! network manager database. You can use the following directory, **/var/opt/OV/share/snmp_mibs**, to store your MIBs.

Note: Refer to the specific device manual for instructions on how to load the MIBs.

2. Open HP OpenView by typing the following command:

   # **ovw <Enter>**

3. From any Choreographer! network manager window, select **Options**>**Load/Unload MIBs:SNMP** from the pull-down menu on the menu bar.

   The Load/Unload MIBs:SNMP window appears (see Figure 3-5).
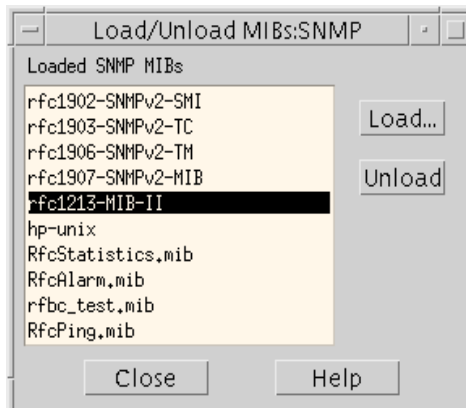
Figure 3-5: Load/Unload MIBs:SNMP Window

4. Select the **Load** button.

   The SNMP/Load MIB from File window appears (see Figure 3-6).
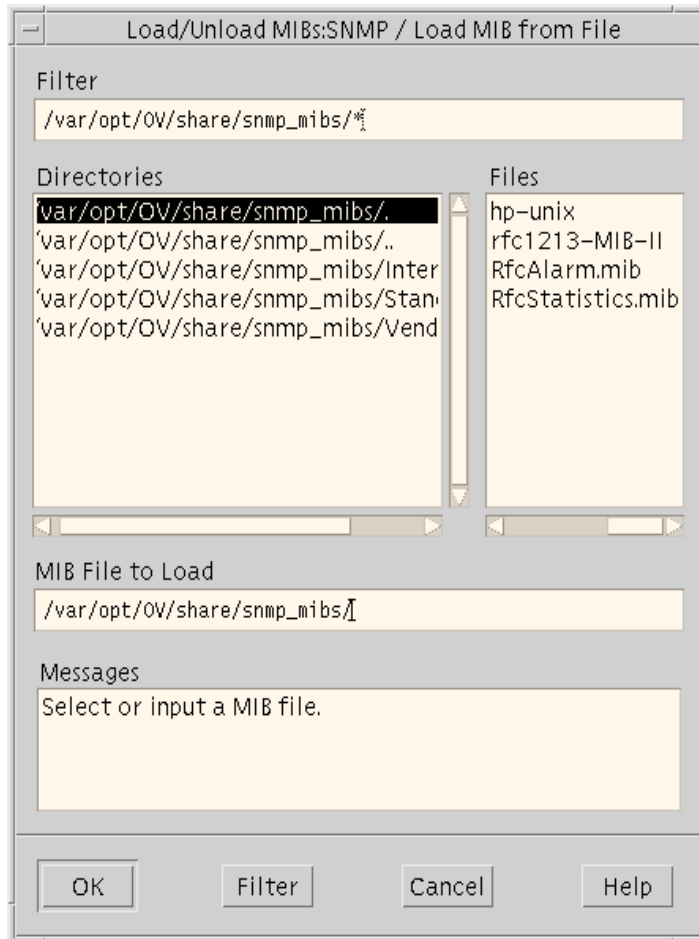
Figure 3-6: Load/Unload MIBs:SNMP/Load MIB from File Window

5. Set the filter in the **Filter** field by typing **[MIB_path] <Enter>**

6. Select the name of the directory that contains the file to load.

   This action highlights the directory of the file to load. Then select the **OK** button to load the file.

7.   The system may issue a warning about duplicate Date and Time. Select the **Close button**. The system returns to the Load/Unload MIBs:SNMP window (see Figure 3-5).

8.   Select the **Close** button to close the Load/Unload MIBs:SNMP dialog box.

Event Configuration

The event configuration option allows you to add event categories that you can view. For additional information, refer to "Managing Events" in the HP OpenView *Using Network Node Manager* manual. Use the following instructions to set up events and alarms for view through the event browser:

1.   From the Paging Root screen, select **Options**>**Event Configuration**.

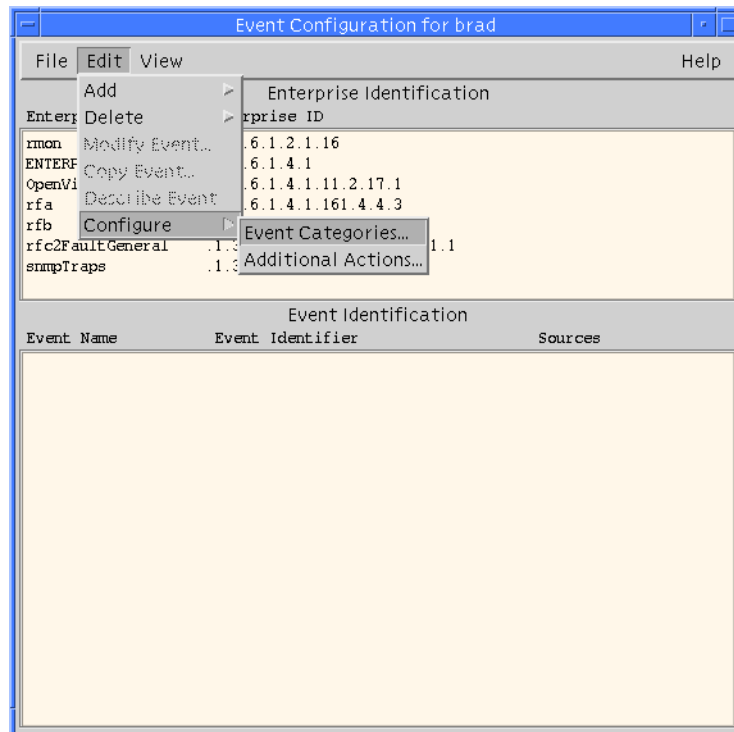   The Event Configuration for **[hostname]** window appears.

Figure 3-7: Event Configuration Window

2.   Select **Edit**>**Configure**>**Event Categories** from the pull-down menu.

     The Event Configuration/Event Categories dialog box appears.
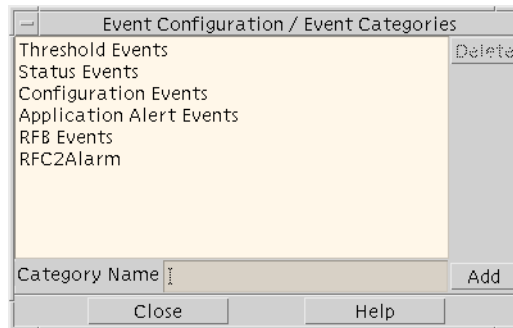
Figure 3-8: Event Configuration/Event Categories Window

3.   Type **[network_element] Events** in the **Category Name** field.

4.   Select the **Add** button.

5.   Select the **Close** button to exit the dialog box.

6.   Select **File**>**Save** to save the event configuration changes you made.

7.   Select the alarm MIB.

8.   The traps appear as a list in the Event Identification box.

9.   Double click on the traps individually.

10.   Determine the number of MIB variables present in the Event Description box that you wish to view.

11.   For Event Log Message, type **$[number]^$[number]**.

Note: You should have a $ symbol and a number for each variable in the trap binding. Multiple variables are separated by a space.

12.   Highlight Select Category from the pull-down list. Find the category just added and select it. In this example, the category is [**network_element**] **Events**.

13. Put in the severity level for the trap. Severity levels are listed on a pop-up list. Match the trap name with its severity level.

14. After you assign all severity levels, select the **OK** button to continue.

15. Select **File**>**Save** to save the changes.

16. Select **File**>**Close** to close the Select Category dialog box.

Setting Up the Messaging Network

After you install the Choreographer! network manager, you must set up your messaging network in the Choreographer! network manager. This procedure defines the Choreographer connections to the messaging network and assigns symbols for quick access. This chapter presents the following information:

- "Messaging Network Components" provides a description of the devices you can set up in a messaging network.

- "Network Windows" describes the windows you use to access your network and how to use them.

- "Defining the Messaging Network" explains how to set up your messaging network in the Choreographer! network manager and define the connections.

This chapter provides information about setting up the messaging network in the Choreographer! network manager. This information assumes that you have previously installed all components of the messaging network. For information about installing a specific component, refer to the documentation for that component.

Messaging Network Components

Messaging network building blocks include messaging switches, paging stations, controllers, and receivers for two-way messaging. The Choreographer! network manager integrates these various components into a unified whole.

You can set up the following Motorola products into a directly integrated messaging system:

- RF-Conductor! (RF-C!) controller

- RF-Audience! (RF-A!) receiver

- RF-Orchestra! (RF-O!) paging station

- RF-Baton! (RF-B!) transmitter controller

- Wireless Messaging System—WMG Messaging Switch (WMG MS)

- Nucleus® paging station

- Routers - Vanguard 300 and 6560

Installation and setup instructions for each component are available in the documentation for the specific component. This section provides a brief explanation of what each component contributes to the messaging network.

RF-Conductor! Controller

The RF-Conductor! controller, center of the Motorola messaging infrastructure system, is a paging system controller with the following responsibilities:

- Controlling message traffic

- Receiving messaging data from a messaging input device, such as a WMG MS

- Routing messaging data to the appropriate paging station

- Relaying incoming data from receivers and receiver concentrators back to a messaging terminal, such as a WMG MS, if appropriate

Network Windows

The operator uses three types of windows to access the network structure in the Choreographer! network manager system:

- The IP Internet windows represent the physical network.

- The Paging Root windows represent the active operational components of the Choreographer! network manager system.

- Browser windows access device messaging configuration, statistics, and alarm elements.

This section explains the type of windows, how to display the windows, and example screens.

IP Internet Windows

The IP Internet windows show the physical network layout. The windows indicate how components connect in the network. For a description of the functions of these windows refer to Chapter 2, "Functional Description". The following table (see Table 4-1) summarizes the functions of the IP internet windows.

Table 4-1: Internet Windows Information

Window	Function	Access
Internet	Shows the physical network layout	Double-click on the Internet icon on the Root window
Name of gateway	Displays all available segments	Double-click on the gateway icon on the Root window
IP segment address	Shows available segments and gateways	Double-click on the IP segment icon on the Internet window
Segment name and address	Displays all available devices and gateways	Double-click on the segment icon from the IP segment window
Segment name and address	Displays all available devices and gateways	Double-click on the segment icon from the IP segment window
Device address	Shows all IP addresses for all available devices	Double-click on the device icon from the IP segment window

<table>
<tr></tr>
</table>

CAUTION	*IP Internet windows are used for viewing only. The software surveys the network and automatically adds or deletes elements without operator input. Do not manually add or delete network elements.*

Paging Root Windows

The Paging Root windows define the actual operational system. Paging Root windows display the operational levels of the network, and provide the ability to add and delete components of these levels.

Background maps and icons distinguish Paging Root windows and represent operational divisions of the system (see Figure 4-1).
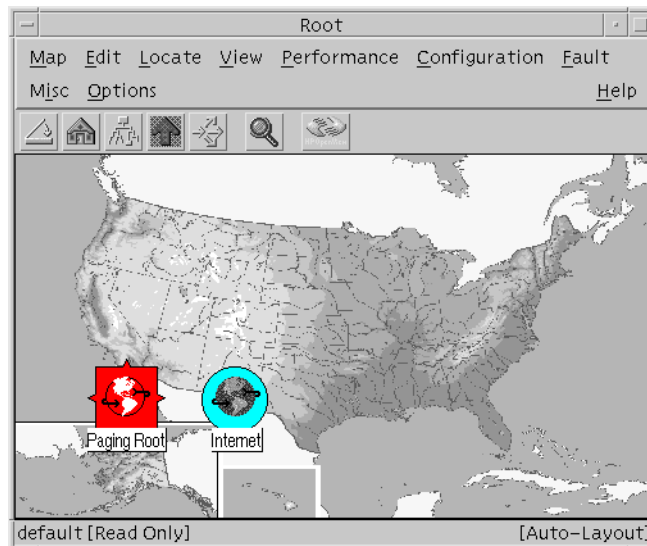

Figure 4-1: Root Window

The following icons represent the operations hierarchy:

The **Region** icon can only be used on Root window.

The **RFC** (RF-C! controller) installation icon can only be used on Region windows for Models 3100 and 3110.

The **RedRfcII** (RF-C! redundant controller) installation icon can only be used on RF-C! windows as a container for the prime and backup RF-C! controllers.

The **RFCIII** (RF-C! controller) installation icon can only be used on Region windows for Model 3300.

The **RfcIIBackup** installation icon can only be used on RedRfcII windows for Models 3200 and 3210.

The **RfcIIPrime** installation icon can only be used on RedRfcII windows for Models 3200 and 3210.

The **Wmg** installation icon can only be used on Region windows.

The **Zone** icon can only be used on RFC windows.

The **Transmitter** icon (representing paging stations) can only be used on Zone windows.

The **Receiver** icon can only be used on Zone windows.

The paging system example in the next figure illustrates a potential configuration using the RFCIII (Model 3300).
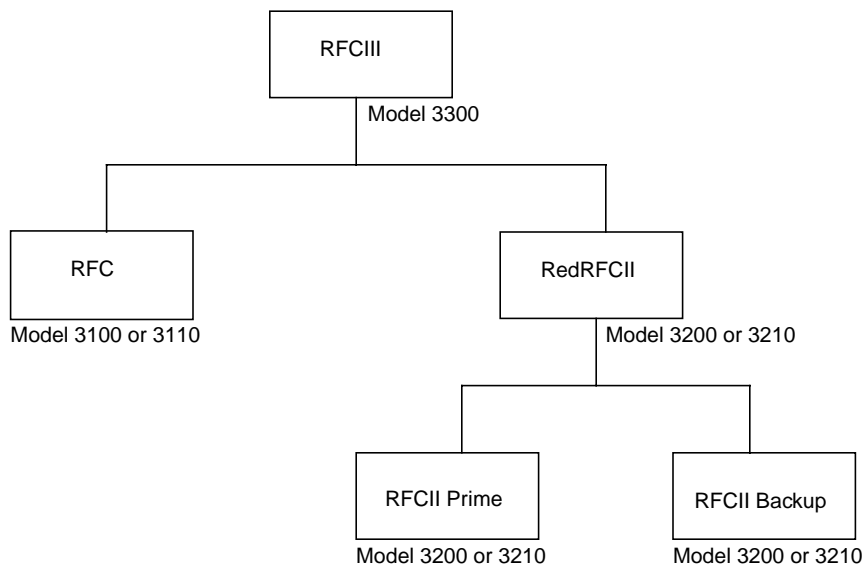

Figure 4-2: Example of a Paging System Hierarchy

Displaying the Root Window

When you open HP OpenView, the system information window appears, then the Root window appears. The Root window includes the **IP Internet** icon and the **Paging Root** icon (see Figure 4-1). In Table 4-2, the Paging Root windows are defined by function and the method of access is described.

Table 4-2: Paging Root Windows Information

Window	Function	Access
Root	Shows the Paging Root icon and provides access to the other windows	Open HP OpenView
Paging Root	Displays all available regions	Double-click on the Paging Root icon on the Root window
Region	Shows available network elements in that region	Double-click on a region icon on the Paging Root window
Network Element	Displays all available zones in that region	Double-click on the network element icon from the region window
Zone	Displays all available zones	Double-click on the zone icon from the network element window
Transmitters and Receivers	Shows all available transmitters and receivers	Double-click on the device icon from the zone window

Note: *Transmitters and receivers have no child submaps. You cannot traverse the hierarchy further than the transmitters and receivers in the Zone window.*

Browser Windows

Four areas of system access use browser windows:

*   Device configuration

*   Software download

*   Statistics

*   Events

All browser windows contain menu bars, activity boxes, and status bars (see Figure 4-3). Additional information on using the browser windows is in paragraph, "Event Browser" in Chapter 6, "Viewing Alarms and Events"
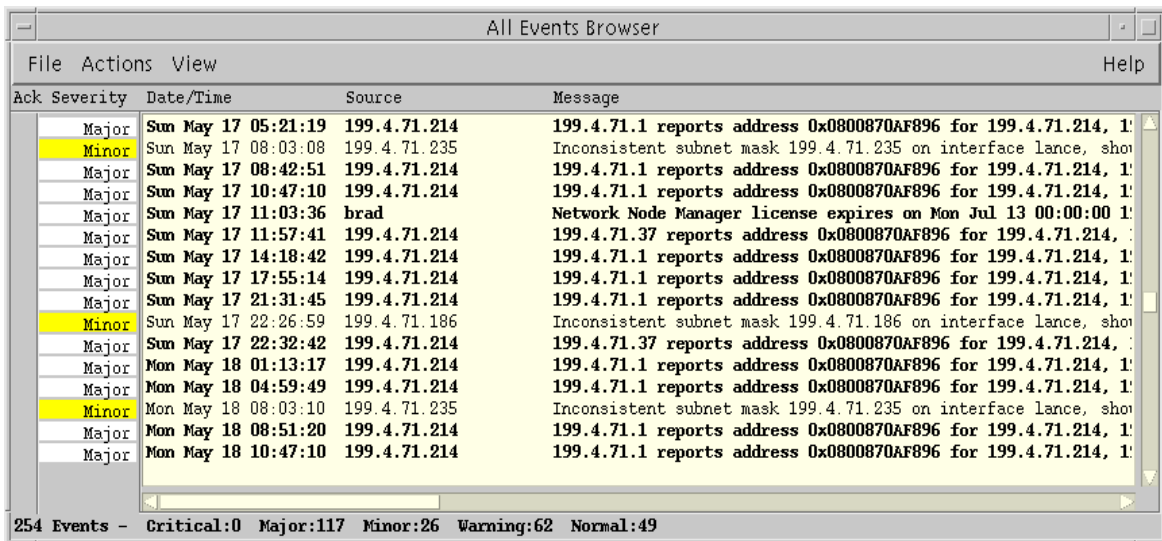

Figure 4-3: Example of an All Events Browser Window

Defining the Messaging Network

After your system components are set up and installed, define the network in the Choreographer! network manager. Use the instructions in the following sections to define your system.

Prepare to Define the Network

You must be logged in as root and you must have HP OpenView open.

1.   Log in as root:

     # Login: **root** <**Enter**>

     # Password: **[root_password]** <**Enter**>

2.   Start HP OpenView with the following command:

     # ovw <**Enter**>

     The HP OpenView Root window appears (see Figure 4-1).

Note: Background maps are not automatically installed. For instructions on setting up maps, refer to the HP OpenView Using Network Node Manager *manual.*

Set Up Paging Root

You must set up your paging root exactly as described in these steps:

1.   Select **Edit**>**Add Object** from the Root screen.

     The Add Object Palette appropriate for the current hierarchy level opens (see Figure 4-4)

2.   From the Symbol Classes, select the Paging symbol.

     The Symbol Subclasses for Class Paging appear below the Symbol Classes.

3. Drag the Paging Root symbol to the Root screen while holding down the middle mouse button.

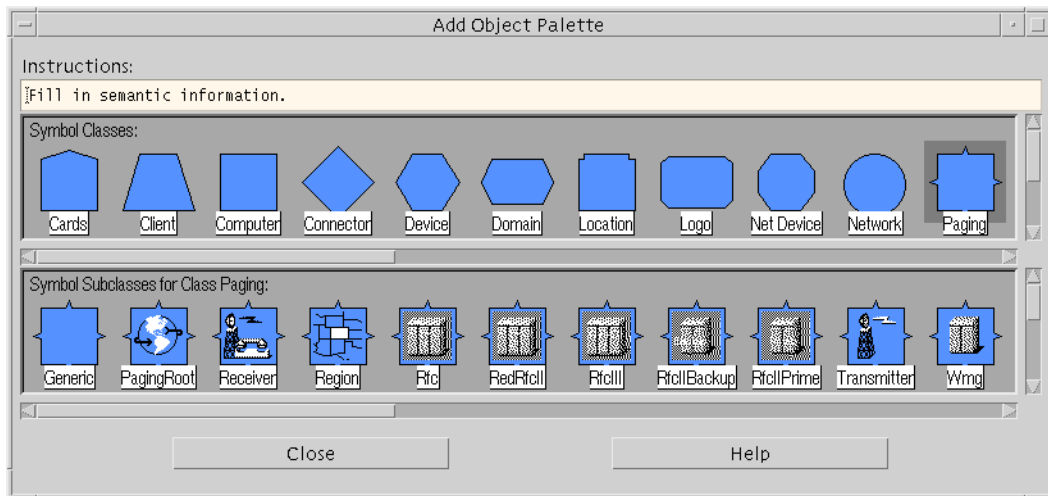   The Add Object dialog box opens (see Figure 4-5).

Figure 4-4: Add Object Palette

> *Note: You cannot add an element that does not belong to the current level of the hierarchy. For example, only a region may be added to a Paging Root window.*
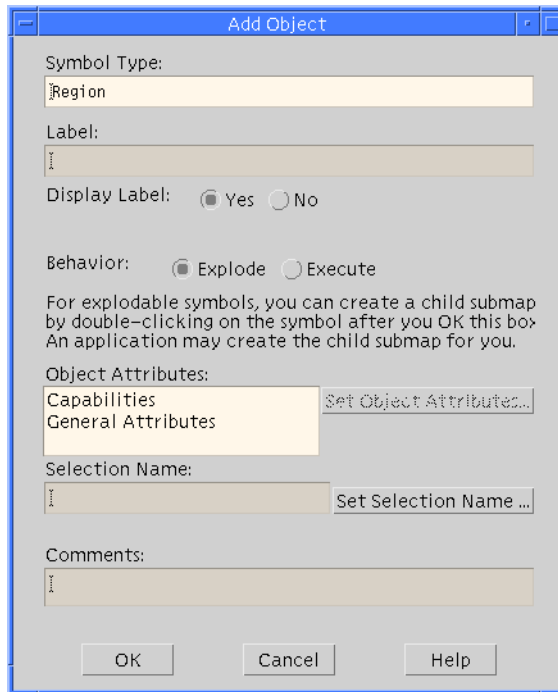
Figure 4-5: Add Object Dialog Box

4.   Label the paging root by typing **[paging_root_label]** in the dialog box. You can specify a paging root label that is specific to your system.

Note: Your network elements must have unique names.

In the dialog box, select the following buttons:

a.   Select **Yes** for **Display Label**.

b.   Select **Explode** for **Behavior**.

c.   Select the **OK** button.

The Paging Root symbol appears on the Root screen as shown in Figure 4-6.

Figure 4-6: Root Window Displays the Paging Root
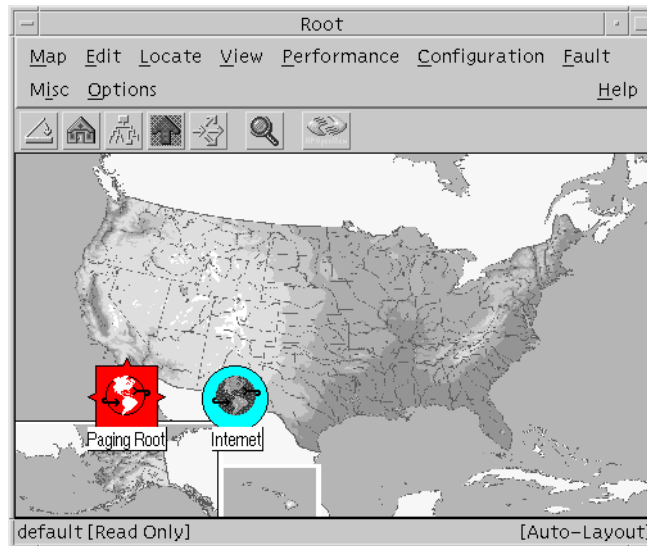
Set Up Region

The following procedures set up the region:

1.   Open the Paging Root window as follows:

   a.   Highlight the paging root symbol with a double click. This warning appears:
         The object does not have a child submap.

   b.   Select the **OK** button to proceed.

2.   Select the region symbol from the Add Object Palette (see Figure 4-4) by highlighting the symbol.

3.   Drag the region symbol to the Paging Root screen while holding the middle mouse button down.

      The Add Object dialog box opens (see Figure 4-5).

4.   Label the region symbol with its selection name and select the **OK** button (see Figure 4-7).

.
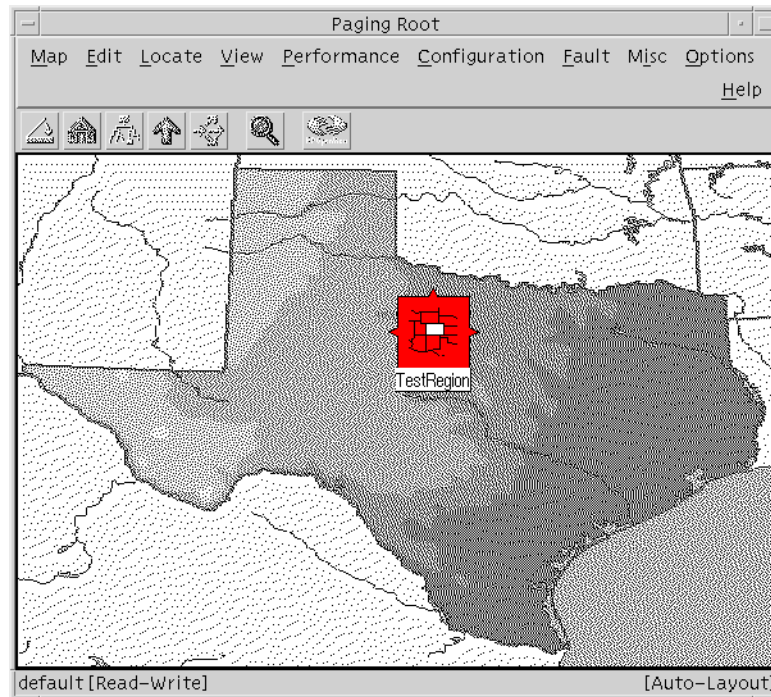
Figure 4-7: Example of a Paging Root Window

Set Up Network Element

Use the following instructions to set up your network element. These instructions use the
RF-C! controller as an example.

1. Double click the region symbol to open the region window.

2. From the Add Object Palette (see Figure 4-4), highlight the RFC symbol (Models 3100 and
    3110).

3. Holding the middle mouse button down, drag the RFC symbol to the Region window.

    The Add Object dialog box opens (see Figure 4-5).

4. Label the RFC symbol with its selection name in the Add Object dialog box.

5.   Select the Paging Map Manager from **Object Attributes** list.

6.   Select the **Set Object Attributes** button.

7.   Type the IP Address of the RF-C! controller (Models 3100 and 3110).

8.   Select the **OK** button to exit the Add Object dialog box.

Set Up Multiple RF-C! Controllers

You can define multiple RF-C! controllers. The procedures for setting up multiple controllers are described in this section:

- For a stand-alone system, use the procedure in paragraph, "Set Up Network Element" to set up each stand-alone controller (for Models 3100 and 3110).

- For a backup or redundant system, use the RedRF-C! II symbol (for Models 3200 and 3210) to represent the redundant system. This system allows login for viewing only. The system polls every ten minutes to determine which system is prime. When the prime changes, the system issues an alarm and the text on the icon changes from prime to backup.

- When you define multiple network elements, use the RFCIII symbol (for Model 3300) to hold the symbols for the multiple elements.

Use the following instructions to set up a system that has a stand-alone RF-C! controller (Model 3100 or 3110) and a redundant RF-C! controller (Model 3200 or 3210) in one system (Model 3300):

1. Open the Region window by double-clicking on the region icon from the Paging Root Window.

2. From the Add Object Palette (see Figure 4-4), highlight the RF-C! III symbol.

3. Hold the middle mouse button down and drag the RF-C! III symbol to the Region window.

   The Add Object dialog box opens (see Figure 4-5).

4. Label the RFC symbol with its selection name in the Add Object dialog box. The example uses **rfc3** for the selection name (see Figure 4-8).
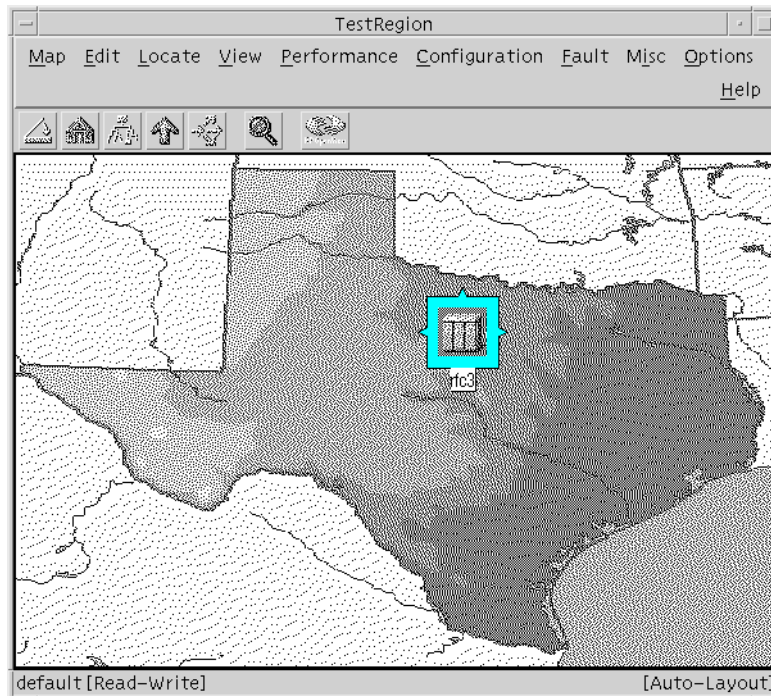
Figure 4-8: Region Window

5.   Open the RF-CIII symbol with a double click.

      The rfc3 screen appears (see Figure 4-9).

6.   Set up the RF-C! (see paragraph, "Set Up Network Element").

7.   Set up the redundant RF-C! controller (RedRFCII) as follows:

*Note: You must type an IP address for the RF-C! controller Models 3100 and 3110. For the RF-C!
          controller Model 3300 and the **RedRFCII** container, you may use the hostname. For the
          RFCIIPrime (Models 3200 and 3210) and the RFCIIBackup (Models 3200 and 3210), you
          must specify the IP address for each.*

      a.   From the Add Object Palette (see Figure 4-4), highlight the RedRFCII symbol.

      b.   Drag the RedRFCII symbol to the Region window while holding the middle mouse
            button down.

The Add Object dialog box opens (see Figure 4-5).

    c.   Label the RedRFCII symbol with its selection name in the Add Object dialog box (see Figure 4-5).
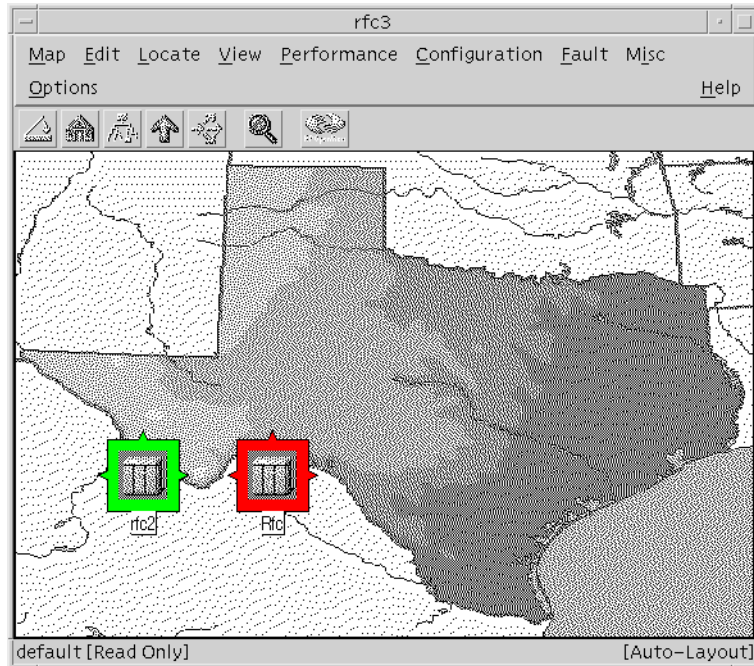

Figure 4-9: Redundant RF-C! System

8.   Set up the RFCIIPrime system as follows:

    a.   Open the RedRFCII symbol (**rfc2**) with a double click.

    b.   From the Add Object Palette (see Figure 4-4), highlight the RFCIIPrime symbol.

    c.   Drag the RFCIIPrime symbol to the RedRFCII window while holding the middle mouse button down.

        The Add Object dialog box opens (see Figure 4-5).

    d.   Label the RFCIIPrime symbol with its selection name in the Add Object dialog box (see Figure 4-10).

    e.   Select the Paging Map Manager from Object Attributes.

    f.   Select the **Set Object Attributes** button.

g.   Type the IP Address of the RFCIIPrime controller.

h.   Select the **OK** button to accept your setup.

Figure 4-10: Prime and Backup RF-C! Controllers

9.   Set up the RFCIIBackup system as follows:

a.   Drag the RFCIIBackup symbol to the RedRFCII window while holding the middle mouse button down.

The Add Object dialog box opens (see Figure 4-5).

b.   Label the RFCIIBackup symbol with its selection name in the Add Object dialog box (see Figure 4-10).

c.   Select the Paging Map Manager from Object Attributes.

d.   Select the **Set Object Attributes** button.

e.   Type the IP Address of the RFCIIBackup controller.

f.   Select the **OK** button to accept your setup.
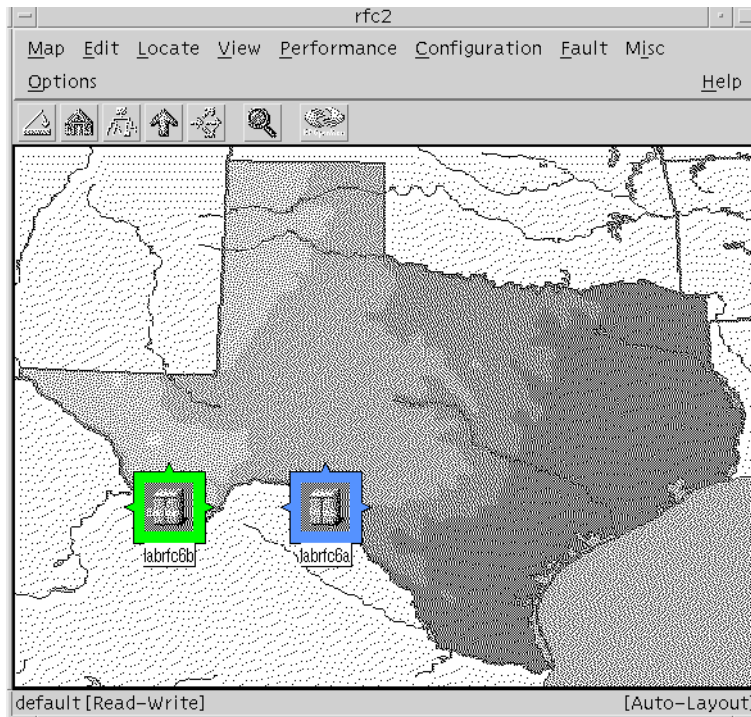
10. Set up the controllers with zones (see Figure 4-11), transmitters (see Figure 4-12), and receivers (see Figure 4-12) for your paging system using the same procedures you used for the network elements.

    a. Highlight and drag the symbol to the appropriate level screen

    b. Label the object in the Add Object dialog box. Select the paging map manager and set the object attributes to define the IP address for each object.
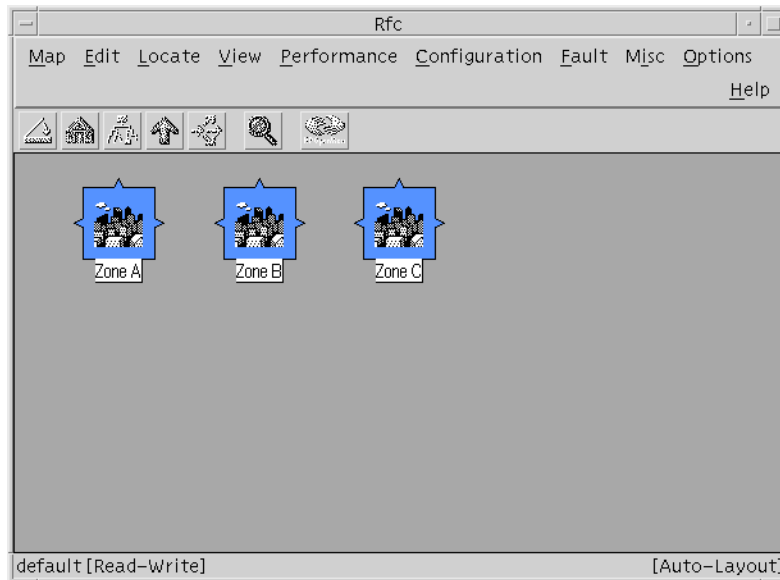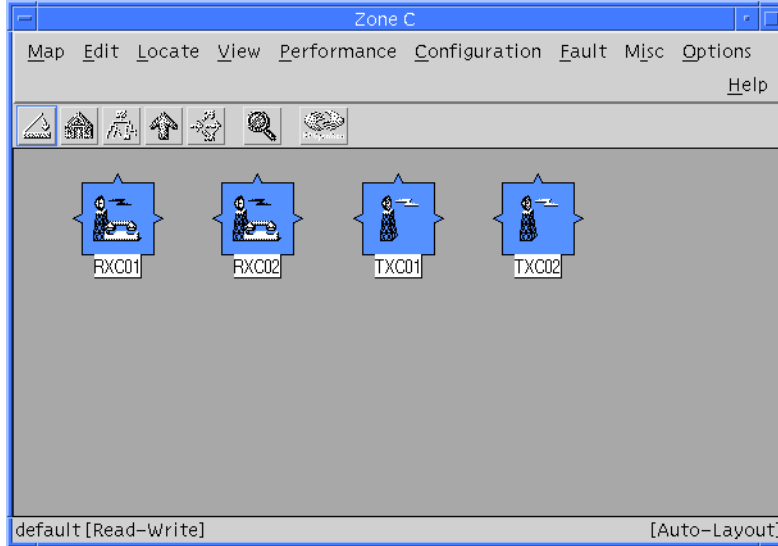

Figure 4-11: RF-C! Window

Figure 4-12: Zone Window

Adding and Removing Objects

You can add objects that represent elements to the windows within the messaging hierarchy. However, the windows only contain certain icons or objects (refer to paragraph, "Paging Root Windows"). To add an object to a window, use the procedure you used to define your messaging network (see paragraph, "Defining the Messaging Network").

Note: Be careful using the delete function because there are no confirmation windows.

1.   Select the object to be deleted by selecting the icon on the window.

2.   Choose **Edit**>**Delete**>**From all submaps** from the pull-down menu**,** then release.

The object disappears.

CAUTION

HP OpenView provides a method to delete objects from views. This method is accessible through the **Edit**>**Cut** *pull-down menu. However, this method is incompatible with the Choreographer! network manager for Paging Root and any elements under Paging Root. Therefore, do not use this deletion method. The correct method for deleting messaging elements from a window is through the* **Edit**>**Delete**>**From all submaps** *menu.*

Network Configuration

A network design consists of all the devices associated with the network and how they are connected. Configuration, the assignment of device parameter values, is crucial to optimal performance of the network design.

A network is not static. New technology and devices require that you change device configurations or add new devices.

Use the following tools to configure your network element and to make these changes:

- To make changes for the RF-Conductor! (RF-C!) controller use the vi text editor, the SNMP MIB browser, or the WMS-Data Operator Console (Maintenance Tool).

  For additional information about use of the vi text editor, refer to your UNIX documentation. For additional information about using the WMS-Data Operator Console (Maintenance Tool), refer to the *RF-Conductor! Controller Administration* manual. For additional information about using the SNMP MIB browser, refer to the *RF-C! Controller Software Installation* manual and the HP OpenView *Using Network Node Manager* manual.

- To make changes for the RF-Baton! (RF-B!) transmitter controller, the RF-Audience! (RF-A!) receiver, and the Nucleus paging station use the Network Element Configuration Application (NECA) in the Choreographer! network manager. Refer to paragraph, "Launching the Network Element Configuration Application" for operational information.

- To make changes for other devices, such as the WMG and the Network Interface Units (NIUs) use the stand-alone configuration tools.

  For additional information for the WMG and the NIUs, refer to the NIU Transmitter Controller Installation and Operation manuals (Motorola part numbers 6880497G10 and 6880497G15).

Note: *Contact your Sales Representative for FLEX protocol-related information. See the Release Notes for the current release of the Choreographer! network manager and the hardware in the messaging network.*

Configuring the RF-Conductor! Controller

To configure the RF-Conductor controller, you may use three options:

- Text editor

- SNMP MIB browser

- WMS-Data Operator Console (Maintenance Tool

Use these options to add, modify, and delete devices and parameters for the RF-Conductor! controller. Parameter information is in the *RF-Conductor! Controller Software Installation* manual or the *Choreographer! Software Interface Concepts Description* manual.

Text Editor

The Choreographer! network manager uses a text editor as the configuration tool for the RF-Conductor! controller. Use a text editor to define the system parameters for a large configuration. A large configuration could be an installation or adding or deleting a channel. Refer to the user documentation for the editor that you use for information about the editor.

Note: This option may be quicker than the other options, but it is more conducive to errors. There is no validation available with this option.

MIB Browser

After your initial configuration, you can use the MIB browser to change your parameters. You access the MIB browser through the HP OpenView root window (**Misc**>**SNMP MIB Browser**). For additional information about the MIB browser, refer to the *HP OpenView Using Network Node Manager* manual or the *RF-C! Controller Software Installation* manual.

WMS-Data Operator Console

To access the Maintenance Tool from the Choreographer! network manager, highlight the RF-C! II prime or back-up icon (Model 3200 or 3210) from the Paging Root Window and select the following menu item: **Misc**>**Paging Apps**>**Viewer Maint Tool**. If you have administrative authority, select the **Admin Maint Tool** option from the same menu.

For additional information about using the WMS-Data Operator Console (Maintenance Tool), refer to the *RF-Conductor! Controller Administration* manual.

Configuring the Network Element

The Choreographer! network manager uses the Network Element Configuration Application to configure the RF-Baton! transmitter controller, the RF-Audience! receiver, and the Nucleus paging station.

Launching the Network Element Configuration Application

The Network Element Configuration Application browser launches from any HP OpenView window (see Figure 5-1).

Note: Use the left mouse button unless otherwise specified.

To open the Network Element Configuration Application, select
Misc>**Paging Apps**>**Configure Devices (NECA)**.
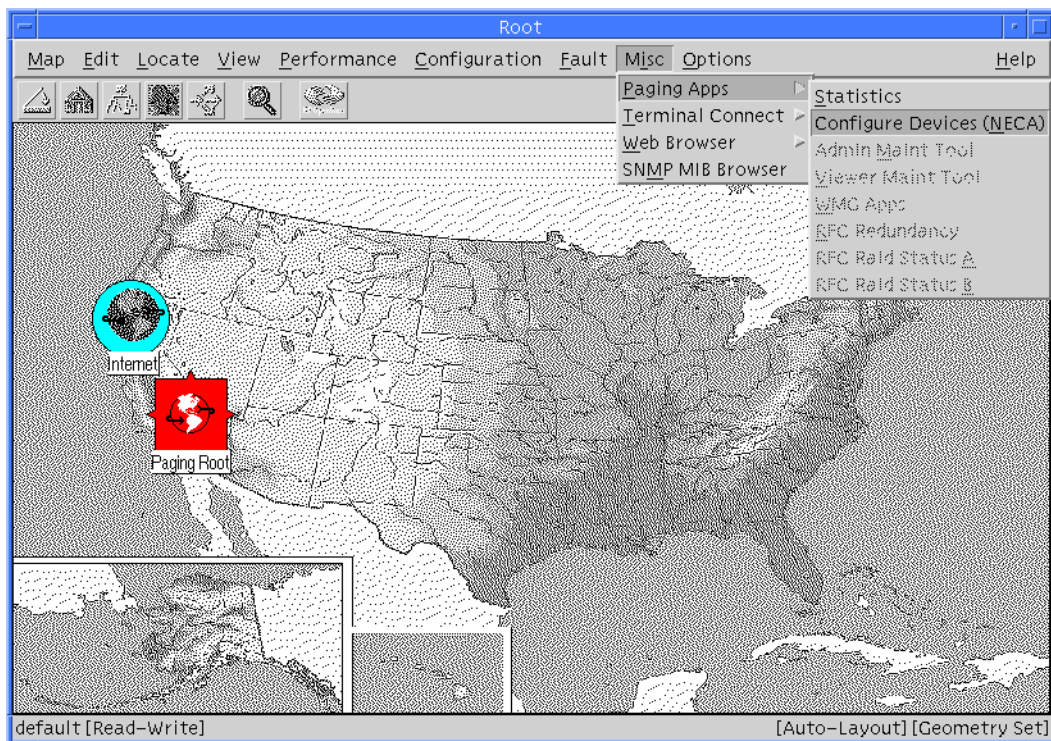

Figure 5-1: HP OpenView Root Window

When the application opens, the Paging World browser appears (see Figure 5-2). From this screen, you can set up and configure your network element.

To display the groups, select the icon to the left of the Paging Network Group. The element groups appear in a hierarchical list. To display the elements in each group, select the + button to the left of the group name.
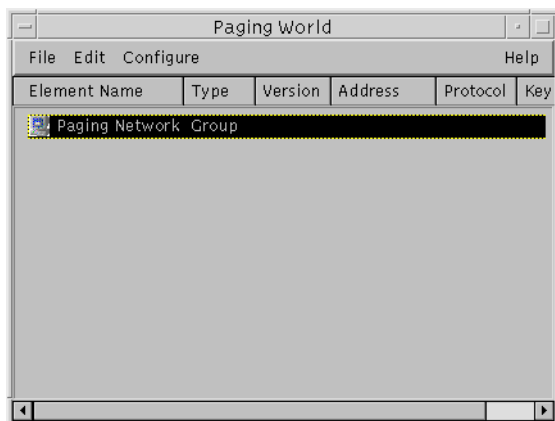

Figure 5-2: Displaying the Paging Hierarchy

Setting Up Network Elements

You must set up your paging network in groups. The groups are subdivided into network elements or additional subgroups. To set up your paging model, you must set up your groups and the network elements in each group.

Setting Up Paging Groups

Paging groups are the first division in the paging model. A folder represents each group. Use these steps to set up your paging group:

1.   Highlight the Paging Network Group by clicking once on the name.

2.   With the paging group highlighted, select **Edit>Add Folder**.

      The Add Folder dialog box appears (see Figure 5-3).

3.   Specify the name of the group. In the configuration sample model (see paragraph, "Using the Paging World Window"), the next group could be named Northwest.
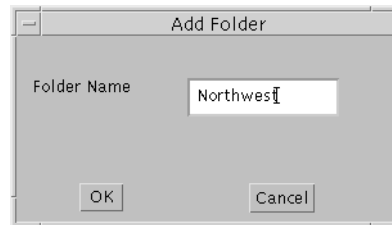
Figure 5-3: Setting Up Network Element Groups

4.   Verify that you typed the name correctly, then select the **OK** button.

5.   Repeat this process until you have set up all of your groups.

Setting Up the Network Elements

To set up your network elements for each group, complete these steps:

1.   Highlight one of the paging groups you created.

2.   With the group name highlighted, select **Edit**>**Add Element**.

3.   The Add Element dialog box appears with the following active fields (see Figure 5-4).

4.   Complete these fields as follows:
   –   **Element Type/Version** is the type of the network element you are configuring (such as the RF-Baton! transmitter controller or the RF-Audience! receiver) and the software version of the network element.
   –   **Address** is the IP address of the network element you are configuring.
   –   **Protocol** identifies the protocol used in the configuration (SNMP).
   –   **Key** acts as a password. If the protocol is set to SNMP, key is equivalent to a community value.

5.   The drop-down list of device types and versions from which the user will choose the network element is in this dialog.

6.   Verify that you completed these fields correctly, and select the **OK** button.

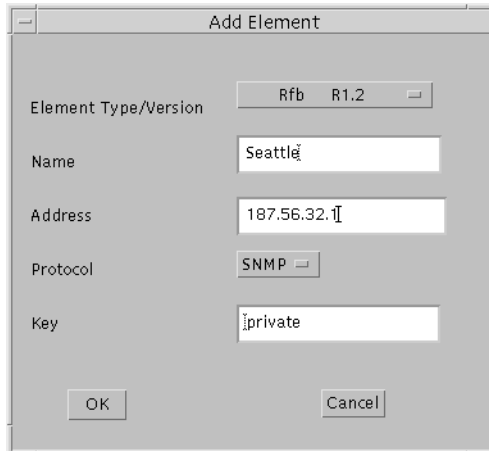7.   Repeat these steps for each network element in each group.

Figure 5-4: Setting up the Network Elements

Using the Paging World Window

The Network Element Configuration Application (NECA) window, called Paging World, consists of a single screen (see Figure 5-5). You set up and configure your network elements from this screen.

The element list is a hierarchy or indented list. Each major group of elements appears as a single folder entry that expands to show the individual elements or other groups subordinate to the selected element.

You can locate any element in the system by expanding the parent group until the device appears. Once the desired element is visible, place the cursor over the name and click the left mouse button to select the element. In this example the paging network consists of three groups, entitled Southwest Region, Northeast Region, and Southeast Region. These regions are for example only; they do not represent an installation. Each group or region consists of two network elements, in this example the elements are RF-Baton! transmitter controllers.
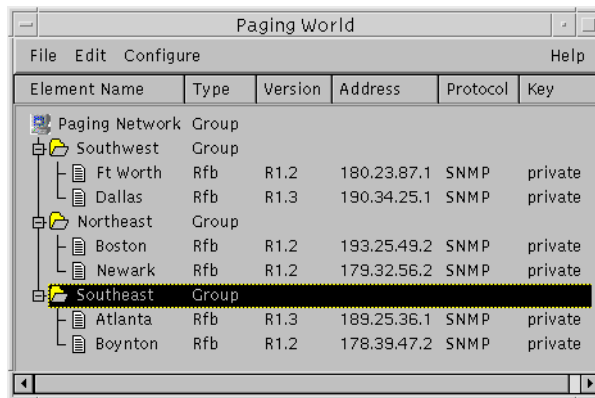
Figure 5-5: Viewing the Paging World Configuration Window

Displaying Elements of the Paging Hierarchy

You can expand the Paging Network Group to display your entire network. Use the + and - symbols to the left of the element names to expand or collapse the view of your network.

1.   To display the groups, select the icon to the left of the Paging Network Group.

     The element groups appear in a hierarchical list.

2.   To display the elements in each group, select the + button to the left of the each group name.

The fully expanded Paging World screen appears in Figure 5-6. You can also have subgroups within the folders.
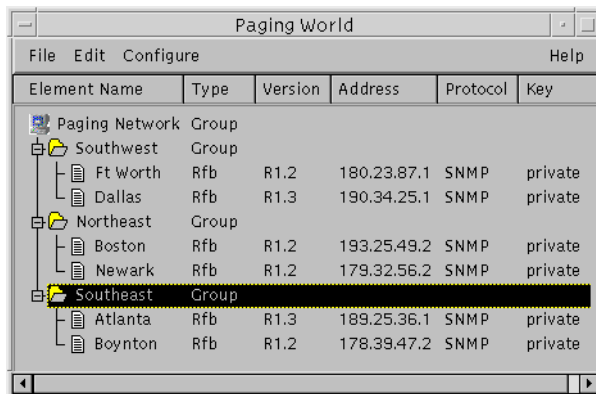
Figure 5-6: Viewing the Paging Hierarchy

Entering and Modifying Parameters

The Choreographer! network manager uses the Network Element Configuration Application (NECA) as the configuration tool for the network elements. NECA sets up and configures your paging network and allows you to specify the parameters for your network elements. You make additions and changes to your configuration by using the Paging Network Management System (PNMS) Element Configuration Window.

Accessing the PNMS Element Configuration Window

To access the configuration window, highlight the elements you will configure and select the **Configure**>**Network Element** pull-down menu from the Paging World browser. You can configure a single network element (see paragraph, "Configuring a Single Network Element"), or you can configure multiple network elements of the same type (see paragraph, "Configuring Multiple Network Elements"). For example, you can select four RF-B! transmitter controllers that are in the group and configure them simultaneously.

Using the PNMS Element Configuration Window

The PNMS Element Configuration Window, or parameter list, lists all groups of configurable parameters for the selected element (see Figure 5-7). Each group of parameters appears as a folder. The box does not display the entire list of folders. To view the additional items, click on the scroll bar at the top right of the right-hand box. The hidden portions scroll into view.
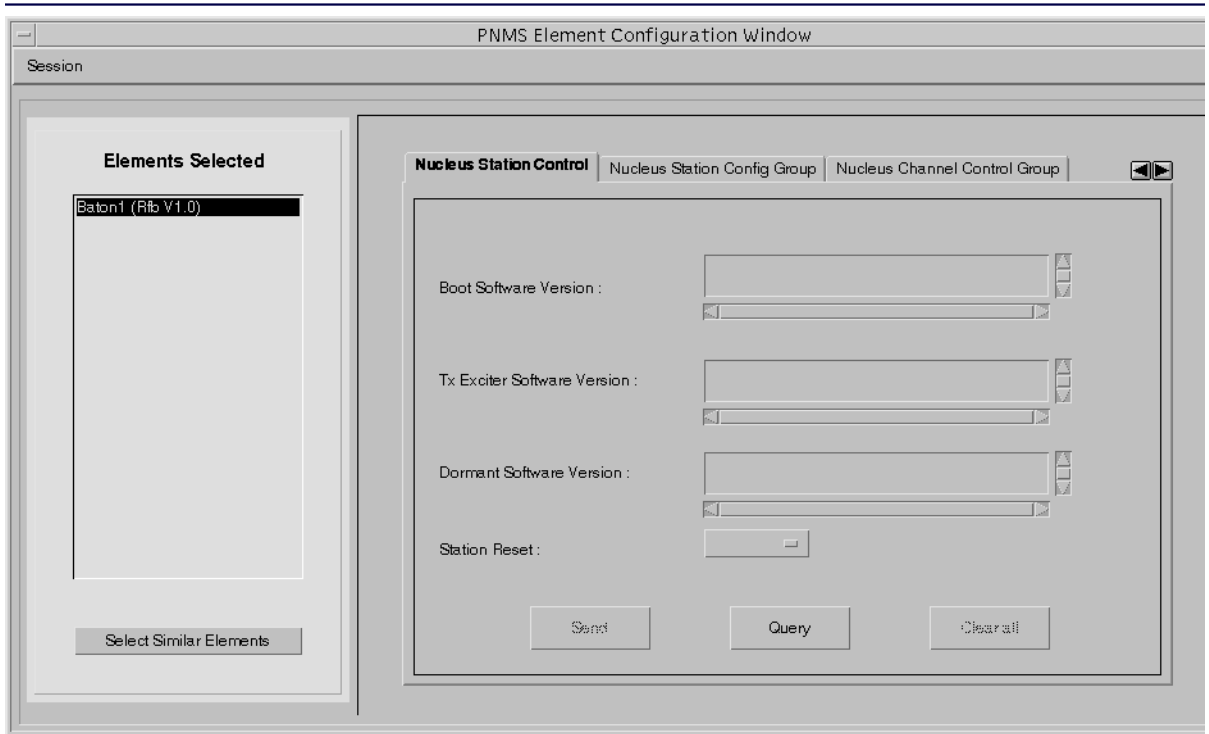
Figure 5-7: Using the PNMS Element Configuration Window

The left-hand column shows the chosen element names, and the right-hand box shows the parameters and the fields for the corresponding values. The grayed parameters are read-only. Use the following buttons as described:

- The **Select Similar Elements** button selects all network elements of the same type with the same version in the group you are configuring. Use this feature when you are configuring devices of the same type.

- The **Send** button accepts new values and initiates the system update. Use this feature to change parameters. The **Send** button is only active when you type a value.

- The **Query** button displays current values. You cannot use Query when you have more than one device selected. If you select the **Query** button while a main parameter group is highlighted, the values for that group appear. If you select the **Query** button while a subparameter group is highlighted, the values for all subgroup parameters within that main group appear.

- The **Clear all** button removes all parameter values for the selected element. Use this feature to prepare to reconfigure all parameters. Using this button clears the values on the PNMS screen; the button does not clear the values on the device. The device values are not changed until you download the configuration.

Configuring a Single Network Element

You can configure each network element individually, or you can configure all similar elements in a paging group simultaneously. To configure by group, see paragraph, "Configuring Multiple Network Elements". Read all procedures before you begin.

Use the following procedures to configure a single network element or to edit existing values:

Note: Use the left mouse button to perform all actions unless otherwise specified.

1. Select the **Element** name on the Paging World window.

2. With the **Element** name highlighted, select **Configure**>**Configure Element**.

   The **PNMS Element Configuration Window** appears (see Figure 5-7). The left-hand box in the window displays the element you selected. The right-hand box displays the parameter groups you can configure.

3. Select the **Tab** at the top of the right-hand box to select the group to configure.

   The parameters for that group appear. You can set any parameters that are not grayed. You can configure any number of fields, only the fields that have been configured will be sent to the device. The fields accept alphanumeric input. A small box in the field accesses a list of choices for the field.

   Some parameter groups are divided into subgroups. These subgroups appear as folder tabs along the bottom of the right-hand box.

4. Use the three buttons for specifying parameters as follows:

    a. Use the **Send** button if you change any values. Only the values that you changed are sent to the devices.

Note: *The* **Send** *button becomes active when you type new parameter values.*

    b. Use the **Query** button to display the current values for the selected element. If you query for values and a field appears blank, use the scroll bar at the right end of the field to bring the values into view. If you begin the query from a subgroup, the query populates all subgroup values for that main group.

    c. Use the **Clear All** button to remove all parameter values for the selected element.

Configuring Multiple Network Elements

You can apply the configuration changes to multiple elements if they are in the same group.

Note: *If a field is grayed, you cannot update it simultaneously with others. You must edit it for each network element after you complete the multiple configuration.*

1. Configure one element as described in paragraph, "Configuring a Single Network Element", and record the values you configure for that first element.

2. Select the multiple elements by either of two ways:

    a. Select the **Select Similar Elements** button to configure all elements of the same type (For example, RF-Baton!) in that group.

    b. Highlight multiple elements in the left-hand box by clicking on each element one time. This method clears the parameter fields in the right-hand box.

3. Type the parameter values.

4. Select the **Send** button to update the parameters.

    All configured zones appear.

Downloading Software

The Network Element Configuration Application uses the TFTP protocol to download software. If you plan to use NECA for software download, you must have the Choreographer! network manager configured to use the TFTP protocol.

Note: *Your network element must be partially configured before the following procedures will work. You must have defined the IP Subnetmask Gateway Host TFTP for your network element. For specific instructions, refer to the installation instructions for your device.*

Sending new software to a device consists of two processes:

- Download, sending the new software to the device
- Cutover, or instructing the device to use the new software

The actual download copies the file to the designated elements. This feature allows you to upgrade your software and distribute new software from a central location. Software Download begins from the Paging World screen.

Use the following procedures to complete your software download:

1. Verify that you set up the TFTP protocol during the installation.

   a. Access the **/etc** directory with the following command:

      # **cd /etc** <**Enter**>

   b. Launch a text editor and view the **inetd.conf** file.

      This file has a line that begins with **tftp**. This line should not be commented out; it should not have a **#** symbol at the beginning of the line.

   c. If the **#** symbol is there, delete it. If it is not there, the TFTP protocol is set up.

2. Place the files you are downloading in the **tftpboot** directory.

3. Select the network element where you are sending the files (For example, RF-Baton!).

4. With the network element highlighted, select **Configure**>**Configure Element** from the pull-down menu.

   The PNMS Element Configuration Window appears.

5.   Select the **Software Download Group** from the folder tabs displayed along the top of the right-hand box.

6.   Select the **Configuration** subgroup from the folder tabs displayed along the bottom of the right-hand box.

7.   Complete the **IP Address** and **File Name** fields as follows:

IP Address: [**IP Address of host where file resides**]
File Name: [**name of file to download**]

8.   Select the **Set SW Download Group** button.

9.   Select the **Control and Status** subgroup from the folders displayed along the bottom of the right-hand box.

10. Select the **Start SW Download** button.

The download process begins. If you want to monitor the progress, you can open multiple configuration GUIs and press the **Query** button to obtain download status.

The download is complete when these two fields display the following status:

a.   Ending State: **downloadAndInstallComplete**

b.   Detailed Status: **downloadSuccess**

11. Check the status periodically by selecting the **Query SW Download Group** button on the **Control and Status** subgroup until the download finishes.

12. Each device validates the downloaded file and sends either an affirmative or negative response. The Choreographer! network manager collects affirmative or negative responses from the devices. You receive notification of all responses.

13. A cutover can be performed through the **Cutover** button on the control and status subgroup. You can verify that the cutover occurred properly by:

a.   Verifying your Dormant Software version on the **Station Control** group folder.

b.   Checking the software version on the **Software Version** folder.

If the version numbers are the identical, cutover is complete. If the version numbers are not identical, check the status through the **Control and Status** subgroup.

Viewing Alarms and Events

The Choreographer! network manager monitors network events through HP OpenView. Events include device status and network information alarms. Events are actions and indications that the operator is not required to clear. Alarms are indications of problems that an operator must take action to clear.

Note: *The behavioral characteristics of a managed element are controlled by the element Simple Network Management Protocol (SNMP) agent and the element, not by the Choreographer! network manager.*

Events and alarms reside in a database where they are available for customer-developed filters to sort and merge information into customized reports.

Alarm and Event Management

SNMP alarms and events appear from a Graphical User Interface (GUI) at the Choreographer! network manager console. With projector hardware, you can project the GUI onto a wall or screen for viewing by the operations staff.

Icons show element status and state in a hierarchical manner. Status information quickly identifies system status from any level of operator view. For example, an alarm condition at a receiver changes the receiver icon color to reflect the alarm severity. The zone that controls the receiver and the RF-Conductor! controller domain that controls the zone also change to reflect the alarm condition. You can then identify a failing element.

Alarm Categories

The network manager or the operator assigns a category level for each of the different types of alarms. The Choreographer! network manager provides color coding of the alarm levels. These colors and categories are fixed, and you cannot change them. (see Table 6-1).

Table 6-1: Alarm Categories

Category	Definition	Color
Critical	Error or failure conditions that require immediate attention (affect service)	Red
Major	Error or failure conditions that require rapid attention but are not as significant as critical alarms (do not affect service)	Orange
Minor	Other error and failure conditions	Yellow
Normal or Informational	All other conditions	Green

Alarm Reporting and Monitoring Scenario

The following scenario illustrates a typical situation where operators monitor multiple windows showing different aspects of the system. At the same time, the operators perform actions that do not affect the same device or zone. The Choreographer! network manager map window alerts an operator of the network current operating conditions. The following reporting and monitoring procedure is typical:

- Upon receipt of an error or alarm message, the Choreographer! network manager changes the color of the device icon affected.

- The operator selects the icon. A window presenting a more detailed regional window appears. Another icon indicates the alarm or event condition.

- The operator clicks through a series of icons and windows until arriving at site-specific information on the reporting device.

- The operator then goes to the event browser, gets more information about the alarm, and takes the necessary action. The operator also decides the events that are actually reported or simply put into a log file. The Choreographer! network manager provides visual indications of when an alarm is acknowledged.

The network manager also configures the events to be filtered and not displayed using the visual indicators. For example, some events are configured for passing to a third-party centralized alarm manager, such as the MAXM network management systems.

Alarm and Fault Management Functions

Alarm and fault management do not interfere with messaging traffic over the network. Alarm management provides the following functions:

- Event notification

- Device status query

- Fault isolation

Alarm States

At a minimum, the alarm includes the following states:

- Active

- Acknowledged

- Cleared

Additional alarm states can be configured into the Choreographer! network manager.

Alarm Generation and Forwarding

An alarm trap is an unscheduled or unpolled message initiated by a device about its status. Traps are defined within each device, and are generated and sent to the Choreographer! network manager when the predefined events occur. All alarms transmit from the device to the Choreographer! network manager in the form of SNMP traps.

If an alarm condition occurs, the device sends the alarm to the Choreographer! network manager. The Choreographer! network manager may forward this alarm to a high-level manager. The operator can enable or disable the alarm forwarding by editing the provided configuration file as described in paragraph, "Configuring the AlarmManager for Forwarding".

Scheduled device polling for detecting errors occurs on a periodic basis to ensure the device is working properly. Detection of problems such as link errors, major software errors, or power failures, occurs using either polling or alarm traps. Polling intervals are configurable within HP OpenView.

The alarm manager uses a set of HP OpenView rules to process each alarm or event to determine the action to be taken. Certain actions can be automated through the use of a script, such as taking devices off-line, sending out technician messages, or disabling certain types of traffic.

Each system module (such as the RF-B! transmitter controller or the WMG) accesses operational failures up to and including the Field Replaceable Unit (FRU) module level.

The user interface is built on top of the industry-standard SNMP version 1.0.

Refer to the HP OpenView *Using Network Node Manager* manual for additional information.

Event Browser

The event browser provides access to the various event categories. When you start HP OpenView, the Event Categories window appears (see Figure 6-1). Keep this window open while the Choreographer! network manager is active.

Note: All actions are performed using the left mouse button, unless otherwise stated.
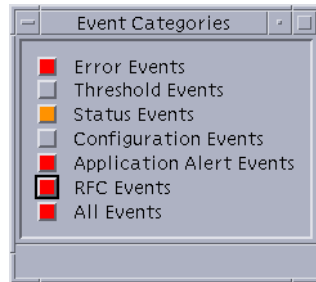

Figure 6-1: Event Categories Window

To close the Event Categories window without closing the application, select **Close** from the window pull-down menu. The Exit Event Browser dialog box appears (see Figure 6-2).
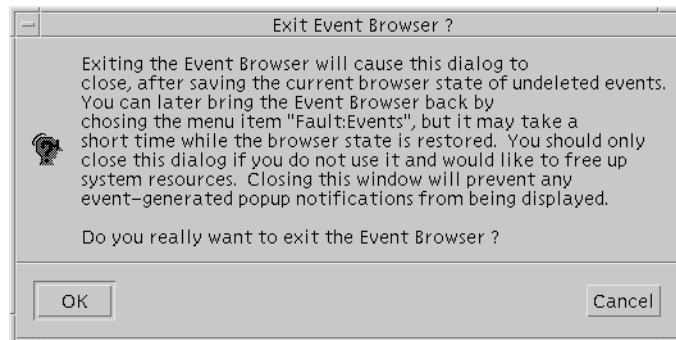

Figure 6-2: Exit Event Browser Dialog Box

Select **OK** to exit.

Event Information

Each category of events provides the following event information (see Figure 6-3):

• Acknowledgment status

• Severity of the error

• Date and time of the error

• Source of the error

• Error message

Use the following steps to access the event information:

1. From the Event Categories window, select the button for the category you will view. For this example, select the **Error Events** button. The RFC Events Browser window displays the following data (see Figure 6-3):

Figure 6-3: Error Events Browser Window

2. Select **File**>**Close** from the pull-down menu to close the window. For additional information about using the event browser, refer to the HP OpenView document, *Using Network Node Manager.*

Alarm and Event Logging

Alarm and event logging contains two types of logs:

*   System event logs

*   Local event logs

System Event Logs

Historical event logs are recorded in an HP OpenView file. You can access the file from the pull-down menu on any event browser window to read, print, and sort. Historical times are recorded to the second.

The historical event logs are maintained in an historical database. You can sort the database based on date, time, device, and alarm severity. The database is definable in size. When the database reaches 4 MB in size, the newer alarms overwrite older alarms. This feature maintains historical data yet prevents the database from using excessive system resources. You can query the data to research recurring problems.

Local Event Logs

Each WMS subsystem maintains its local event logs. Each subsystem forwards the alarms to the respective event manager. The local event log provides event and alarm data on the device directly to the operator. Direct data is important if a network connection is lost or the Choreographer! network manager is out of service.

The Choreographer! network manager combines multiple alarms, generated by the same event, into a single-alarm notification. The single-alarm notification minimizes the total number of alarms displayed for the same event.

The Choreographer! network manager supports a variety of applications that perform alarm correlation analysis on the network devices to assist in corrective actions and as a part of fault isolation. The Choreographer! network manager can resynchronize with the element alarm logs when a lost connection is restored, if this capability is supported by the element.

Communications to Other Network Management Stations

The Choreographer! network manager collects alarms from the messaging devices in the form of SNMP traps. You can configure the Choreographer! network manager to forward these alarms to other network management stations.

You can define which alarms to forward where, and you can forward alarms through the HP OpenView or AlarmManager applications. Information, such as alarm IDs, alarm ID description, and the source of the alarms, is included in the SNMP traps.

Configuring the AlarmManager for Forwarding

Use the following procedures for editing the configuration file:

1. Open a UNIX shell.

2. Edit the **/usr/choreographer/bin/forwarding.cfg** file.

These forwarding rules apply when you edit the configuration (.cfg) files:

- This file has one rule for each line.

- Each line has three columns separated by colons.
  – First column must have the source IP address or a wildcard (RFA, RFB, RFC, WMG)
  – Second column must have the alarm threshold level (CRITICAL, MAJOR, MINOR) or the specific alarm ID
  – Third column must have the destination IP address

- Lines that begin with # as the beginning character are comments.

- If you make changes to **forwarding.cfg**, you must restart HP OpenView.

Alarm Forwarding Examples

The following example entries to this file accomplish the actions described in the comments preceding them. Comment lines begin with the # symbol.

```
#The following line forwards MAJOR and CRITICAL alarms from 10.16.0.1 to 10.16.0.2
10.16.0.1:MAJOR:10.16.0.2

#The following rule forwards MAJOR and CRITICAL ALARMS from all RFBs to
RFB:MAJOR:10.6.0.2

#The following rule forwards only alarms with an alarm ID of 100 from RFAs to 10.6.02
RFA:100:10.6.0.2
```

Figure 6-4: Alarm Forwarding Examples

You can specify either the specific alarm ID or the threshold level to satisfy the rule. Threshold level specifies any alarm of a severity level equal to or higher than the threshold level. If you specify the alarm ID, then alarms whose alarm ID matches the one specified in the file satisfy the rule.

Configuring HP OpenView for Forwarding Alarms

If you want to forward alarms through HP OpenView, refer to the HP OpenView *Using Network Node* manual for instructions.

Configuring for Technician Paging

Some businesses need to have technicians notified immediately for certain alarms. You can configure the Choreographer! network manager to page technicians. You can then specify the category and specific IDs within the category. The TechPage application sends alphanumeric pages in response to alarms.

The AlarmManager application on the Choreographer! network manager uses the information in **/usr/choreographer/bin/techpage.cfg** file to determine which alarms will initiate a page. The format of the **techpage.cfg** file is illustrated in the following section.

1.   Open a UNIX shell

2.   Edit the **/usr/choreographer/bin/techpage.cfg** file by typing the following information:
    –   Source IP or wildcard (RFA, RFB, RFC, WMG)
    –   Threshold (CRITICAL, MAJOR, MINOR) or alarm ID
    –   Pager pin number

- – Telephone number
- – Minimum time between two pages in seconds
- – From information or quotes (If a space is included, enclose in quotation marks.)
- – How many times the process retries
- – Description of the alarm
- – Port to which the modem is connected:
  - **/dev/ttya**
  - **/dev/ttyb**
- – Configuration The following baud rates are available:
  - 24008N1
  - 12008N1
  - 3008N1
  - 24007E1
  - 12007E1
  - 3007E1
- – Password (If no password is required, put # sign.)
- – Verbose output (To disable, put #.)

Technician Paging Example

The following example entry to this file accomplishes the actions described in the comments preceding them. Comment lines begin with the # symbol.

```
#Send a page to pin number 2452403 for all critical alarms from 199.4.71.231
199.4.71.231:CRITICAL:2452403:9,18007596366:1800:NOC:1:"Specific Type":/dev/ttya:24007E1:#:#:
```

Figure 6-5: Technical Paging Example

Historical Statistics

The Choreographer! network manager collects a variety of statistics from the RF-Conductor! controller (Models 3100 and 3110). The historical statistics feature assimilates statistics data from your network element, in this case the RF-Conductor! controller, for viewing and printing through the graphical user interface.

You can specify which parameters to retrieve and what time period to display. Using historical statistics queries, you can perform these activities:

- Specify statistics to display

- Analyze trends

- Examine paging traffic

- Review network usage

You can view the results as a chart, a bar graph, or a table. For archiving and reporting purposes, you can print the results or save the results to disk.

Historical Statistics Components

The historical statistics function consists of three components: file manager, network element manager, and query manager. These components provide the tools to display your statistics.

Historical Statistics File Manager

The file manager provides access to the application files and directories on your disk (see Figure 7-1). The file manager shows a hierarchical view of the file structure. This model allows you to view and maintain application files.

When you make changes with the file manager, the system prompts you to save the changes when you exit the application.

<div>
CAUTION
</div>

You should only delete files using the historical statistics components.
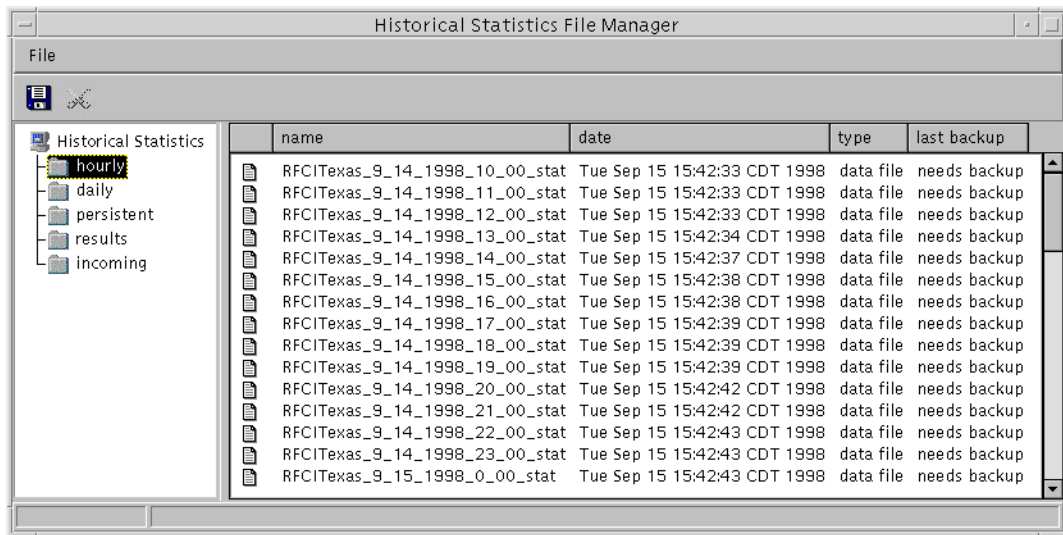

Figure 7-1: Historical Statistics File Manager

Historical Statistics Network Element Manager

All network elements, the systems from which you retrieve statistics information, are maintained in the network element manager (see Figure 7-2). The RF-C! controller is the only network element currently supported for historical statistics retrieval. The network element manager is the component you use to perform the following functions:

– Add network elements

– Configure new and existing network elements

– Remove network elements

The historical statistics application attempts to retrieve statistics on a user-configurable interval from all network elements in the network element manager.

When you make changes with the network element manager, the system prompts you to save the changes when you exit the application.
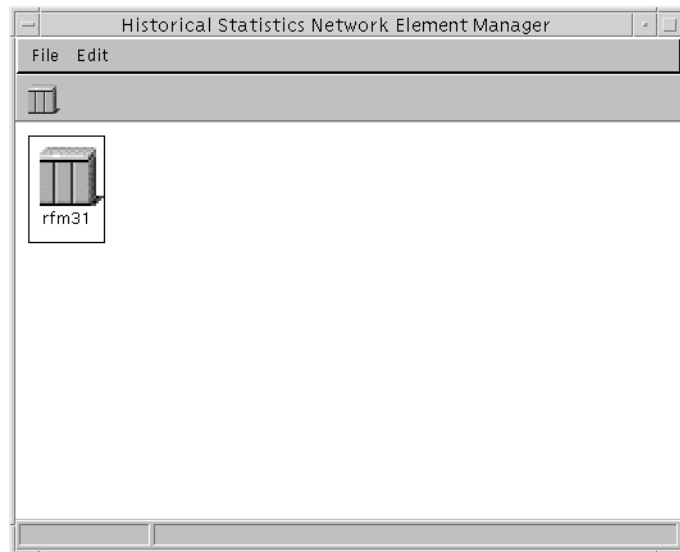

Figure 7-2: Historical Statistics Network Element Manager

Historical Statistics Query Manager

The query manager allows you to select and view specific statistics in chart, bar, or table format (see Figure 7-3). The results can be saved to disk and viewed later. You can also save queries to disk and rerun them at any time if the statistics used to generate the results have not been deleted.

When you make changes with the query manager, the system prompts you to save the changes when you exit the application.
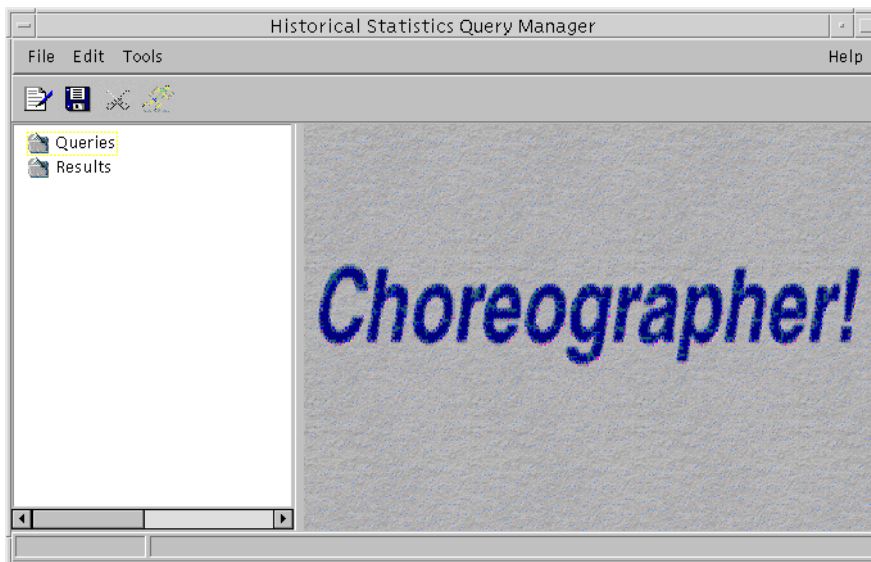

Figure 7-3: Historical Statistics Query Manager

Collecting Statistics from the RF-Conductor! Controller

Before you can begin collecting statistics, you must set up and configure your network element in the network element manager. This setup procedure allows you to complete the following qualifications:

- Designate the network element from which you collect data

- Specify the software version of the network element

- Specify how frequently to retrieve statistics

Set-Up Procedures

The following procedures detail how to set up the network element for retrieving and displaying statistics:

1. Before you set up the network element manager, you must copy the **RFC_<Version>_stat.dat** file from the RF-Conductor! controller to the **/home/HistStats/persistent** directory. Refer to the application installation procedures in the *RF-C! Controller Software Installation* manual for additional information.

    The **<Version>** is the software version of your RF-Conductor! controller. For example, if you were retrieving statistics from an RF-Conductor! Version 3.7.0, this file would be named **RFC_3.7.0_stat.dat.** The software version must be the same software version that you specify in Step 2 of paragraph, "Configure Network Element Type".

2. From the OpenView Paging World screen, open Historical Statistics by selecting **Misc**>**Paging Apps**>**Statistics (see** Figure 7-4**)**.
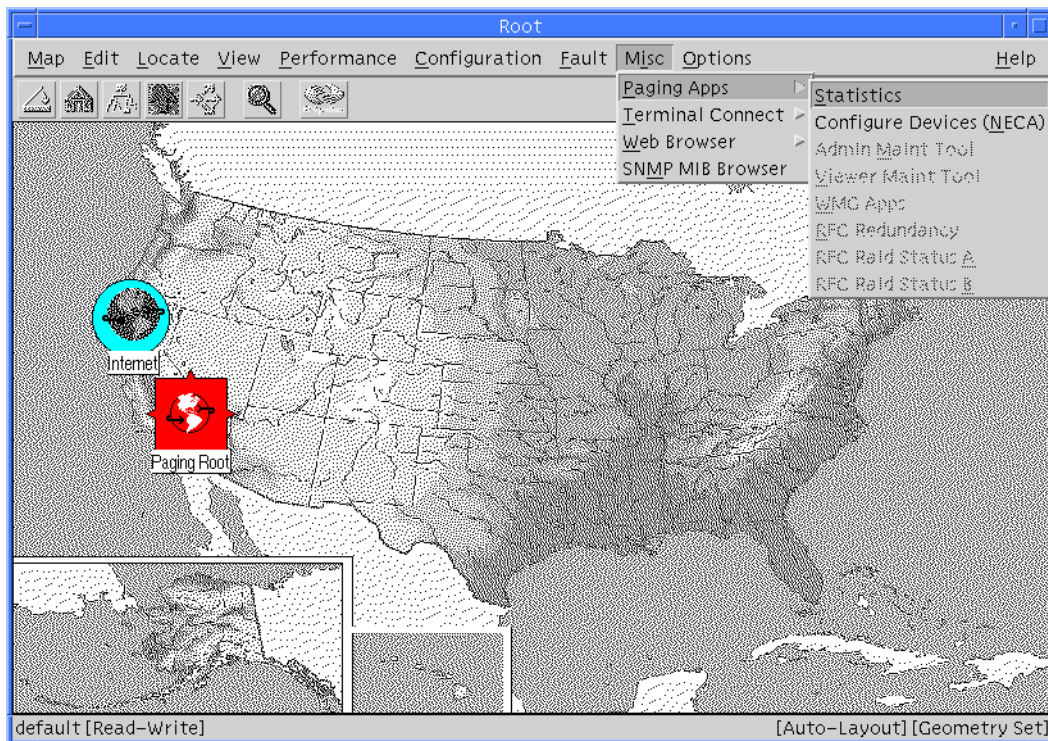
Figure 7-4: Launching Historical Statistics

The Historical Statistics Query Manager appears (see Figure 7-3). This screen contains a list of saved queries and results.

3.   From the Historical Statistics Query Manager (see Figure 7-3), access the network element manager by selecting **Tools**>**Network Element Manager**.

When the Network Element Manager screen (see Figure 7-5) appears, you can setup and configure the network elements from which you retrieve statistics.

Configure the Network Element

From the Network Element Manager, use these steps to configure the network element:

1. Select the network element icon on the Tool Bar.

   The Configure Network Element dialog box appears (see Figure 7-5), and a new icon appears in the Historical Statistics Network Element Manager screen.
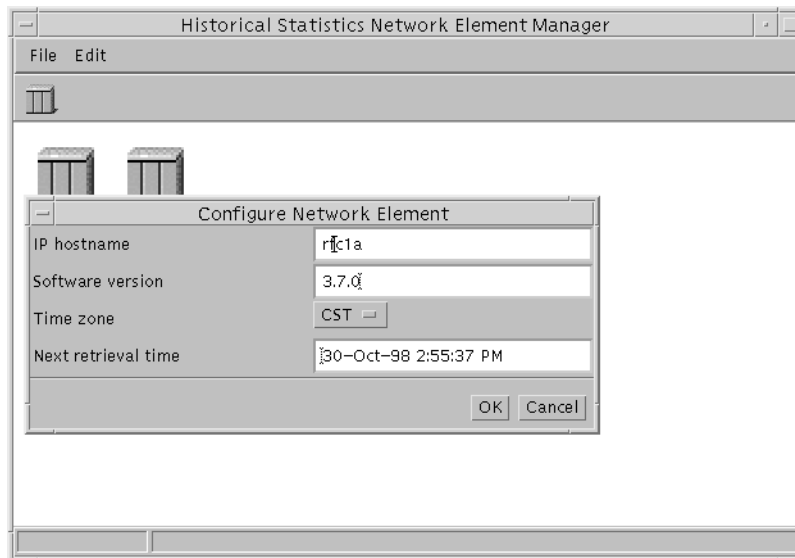

Figure 7-5: Adding a Network Element

2. Complete the following information in the Configure Network Element dialog box (see Figure 7-6):
   – IP hostname of the network element
   – Software version of the software running on the network element
   – Time zone where the network element is located
   – Next time for retrieving statistics

Note: You must specify a hostname; an IP address is not valid. Refer to paragraph, "Configure the Network Element" for information about adding a hostname.

The IP hostname may only contain letters, numbers, and periods. The Choreographer! network manager uses the retrieval interval you configured for the network element type to calculate the next retrieval time.

Note: *When you configure the next retrieval time, select a time when you have minimal paging traffic.*

Figure 7-6: Configuring the Network Element Manager

The software version must be the same software version that you specify in Step 2 of paragraph, "Configure Network Element Type". For example, if you are retrieving statistics from an RF-Conductor! Version 3.7.0, this field would contain **3.7.0.**

Specify the time zone by selecting from the list as shown in Table 7-1

Table 7-1: Time Zone Definitions

Abbreviation	Definition
GMT	Greenwich Mean Time time zone.
ECT	European Central Time time zone.
EET	Eastern European Time time zone.
ART	(Arabic) Egypt Standard Time time zone.
EAT	Eastern African Time time zone.
MET	Middle East Time time zone.
NET	Near East Time time zone.
PLT	Pakistan Lahore Time time zone.
IST	India Standard Time time zone.
BST	Bangladesh Standard Time time zone.

Table 7-1: Time Zone Definitions

Abbreviation	Definition
VST	Vietnam Standard Time time zone.
CTT	China Taiwan Time time zone.
JST	Japan Standard Time time zone.
ACT	Australia Central Time time zone.
AET	Australia Eastern Time time zone.
SST	Solomon Standard Time time zone.
NST	New Zealand Standard Time time zone.
MIT	Midway Islands Time time zone.
HST	Hawaii Standard Time time zone.
AST	Alaska Standard Time time zone.
PST	Pacific Standard Time time zone.
PNT	Phoenix Standard Time time zone.
MST	Mountain Standard Time time zone.
CST	Central Standard Time time zone.
EST	Eastern Standard Time time zone.
IET	Indiana Eastern Standard Time time zone.
PRT	Puerto Rico and US Virgin Islands Time time zone.
CNT	Canada Newfoundland Time time zone.
AGT	Argentina Standard Time time zone.
BET	Brazil Eastern Time time zone.
CAT	Central African Time time zone.

3.　Select the **OK** button after you type your values. The IP hostname of your RF-Conductor! controller appears below the new icon.

This process establishes a one-to-one relationship between the Choreographer! network manager and one RF-Conductor! controller. The Choreographer! network manager now begins retrieving statistics from your network element.

If you should need to change your configuration later, select the icon that represents your RF-Conductor! controller and click the right mouse button to access the Configure Network Element dialog box (see Figure 7-6). Make the changes in this dialog box.

4.　Save your network element changes by selecting **File>Save**. If you fail to save your changes, the Choreographer! network manager prompts you to save when you attempt to exit.

Configure Network Element Type

You may also configure the network element type (see Figure 7-7). This configuration optimizes the retrieval interval and designates where your statistics on the RF-C! are stored.
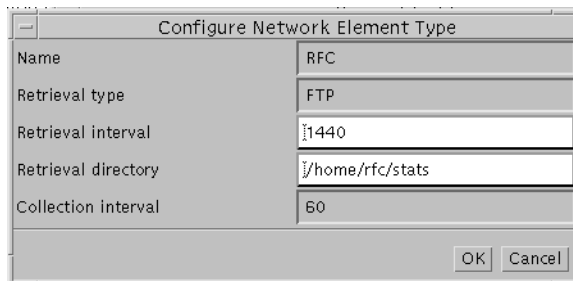

Figure 7-7: Configuring the Network Element Type

1.　Access the Configure Network Element Type dialog box by highlighting the network element icon and selecting **Edit>Element Type**. This step identifies where your statistics information on the network element is stored and how often statistics are retrieved. The grayed fields are not configurable.

2. To configure the network element type, complete these fields:

   a. The **Retrieval interval** field indicates how often statistics are retrieved. This value is stated in minutes. By default, statistics are collected every 24 hours.

   b. The **Retrieval directory** designates where you store statistics on the network elements of this type. Specify this directory by typing the full pathname.

   Note: *If you are unsure of which pathname to use, contact your system administrator. We recommend that you retrieve statistics from the **/home/rfc/stats** directory.*

   c. When you are satisfied with your entries, select the **OK** button. You may cancel your changes at any time by selecting the **Cancel** button.

3. Save your configuration changes by selecting **File**>**Save**. If you fail to save your model, the Choreographer! network manager prompts you to save when you attempt to exit.

Using Historical Statistics

The historical statistics feature provides access to the statistics collected by the network element you select. You can create your own queries to view selected statistics over a specified period of time.

Viewing Specific Statistics

User-defined queries allow you to display statistical information for specific conditions. You can create your own queries to gather information about a particular station, channel, or time interval that you need to review.
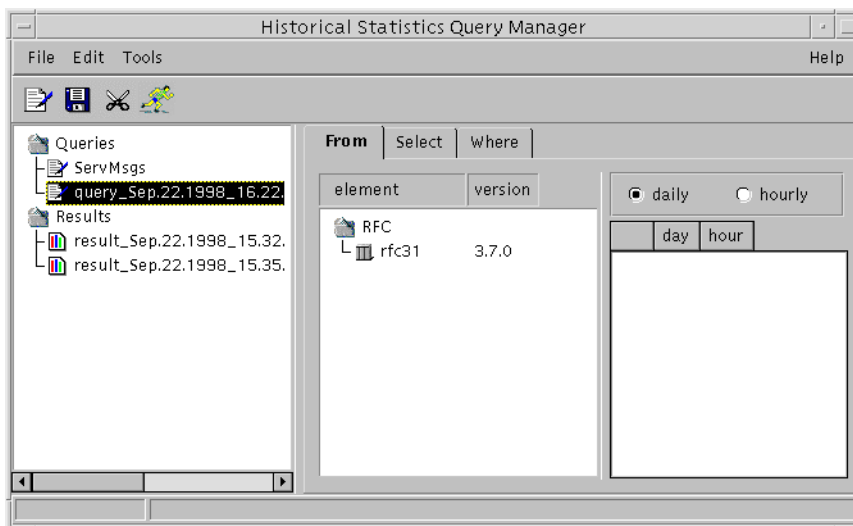

Figure 7-8: Sample Query

You can create queries to do the following activities:

- Specify statistics to display

- Analyze trends

- Examine paging traffic

- Review network usage

Building Queries

You can create queries that collect specific information. Using these queries, the Choreographer! network manager extracts the data you need and presents it in a reporting format. Use the Historical Statistics Query Manager to build your own queries. Before you use the Query Manager, confirm that you completed Step 1 in paragraph, "Collecting Statistics from the RF-Conductor! Controller". In that step you should have copied the **RFC_<Version>_stat.dat** file from the RF-Conductor! controller to the following directory: **/home/HistStats/persistent**.

From the Historical Statistics Query Manager, you can view and edit previous queries, build new queries, save queries, and execute queries. The following icons help you perform these activities from the Query Manager screen (see Figure 7-9):

     Begin a new query

     Save a query or results

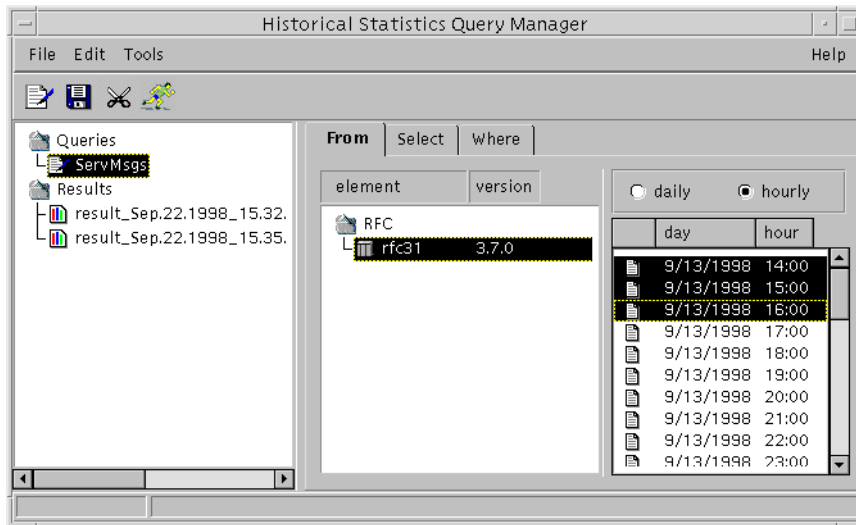   Delete a result or query

     Execute a query

Figure 7-9: Using the Historical Statistics Query Manager

The procedures for building a new query follow:

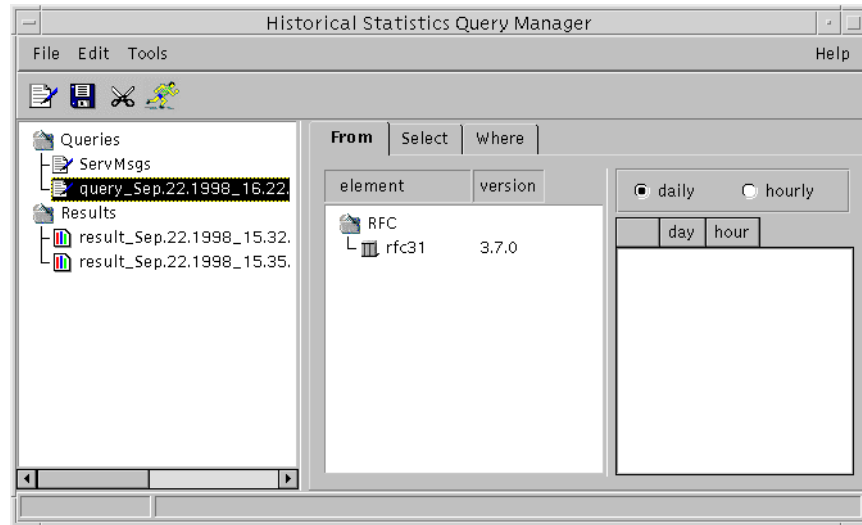1. Select the **New** button from the Query Manager to create a new, empty query.

Figure 7-10: Using the Query Builder

2. The query builder is the tool where you specify the following qualifications for your statistics query:
    –   which RF-Conductor! controller from which to retrieve statistics
    –   which statistics to display
    –   whether your statistics group is by hour or by day
    –   which dates to report

3. Complete each of the three clauses (From, Select, and Where) to build your query.

Specifying the From Clause

The From clause determines the controller and the dates to display and the method of grouping the statistics. Use the following steps to complete the From clause:

1. When you select the **From** tab, the From Clause panel appears (see Figure 7-11).

    In this example, statistics from the rfc31 are reported on a hourly basis on 9/13/1998 from 2:00 p.m. through 4:00 p.m.

2. Complete the following fields when you use the From clause:

   – Select the RF-Conductor! controller to display.

   – Select either day or hour to specify how your statistics are to be grouped.

   – Select from the list of dates or hours for which statistics are available. Highlight the appropriate dates or hours
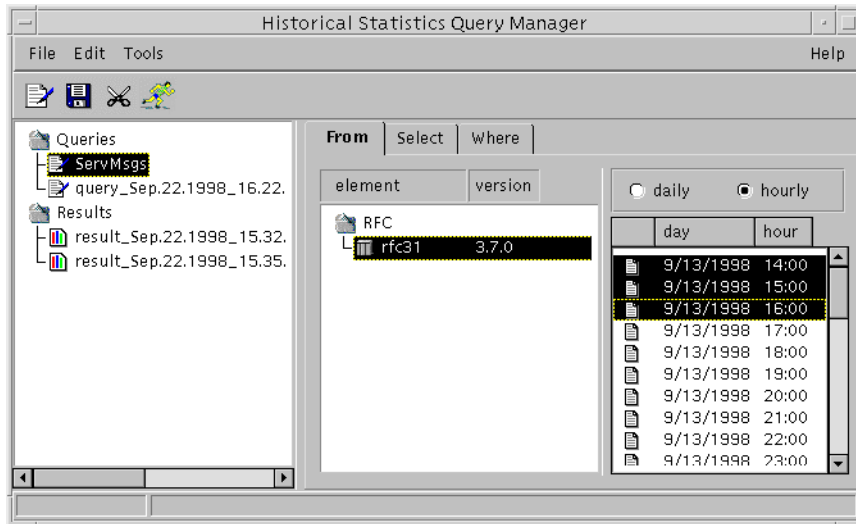
Figure 7-11: Specifying the From Clause

Specifying the Select Clause

The Select clause specifies which statistics to retrieve, such as messages and channel usage.

1. When you press the **Select** tab, the Select panel appears (see Figure 7-12). This panel displays a list of the statistics categories and statistics parameters available for your network element.
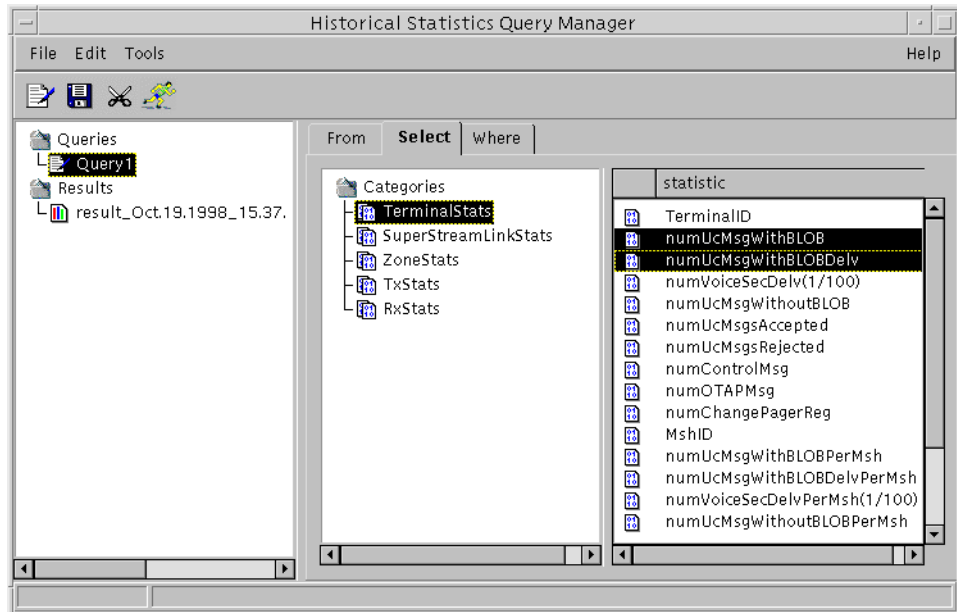

Figure 7-12: Specifying the Select Clause

2. Highlight the statistics category to display.

3. Select the parameters for which you need statistical information.

Specifying the Where Clause

The Where clause allows you to specify conditions to display, for example, certain channels, thresholds, or number of messages.

Select the **Where** tab to display the Where Clause panel (see Figure 7-13).
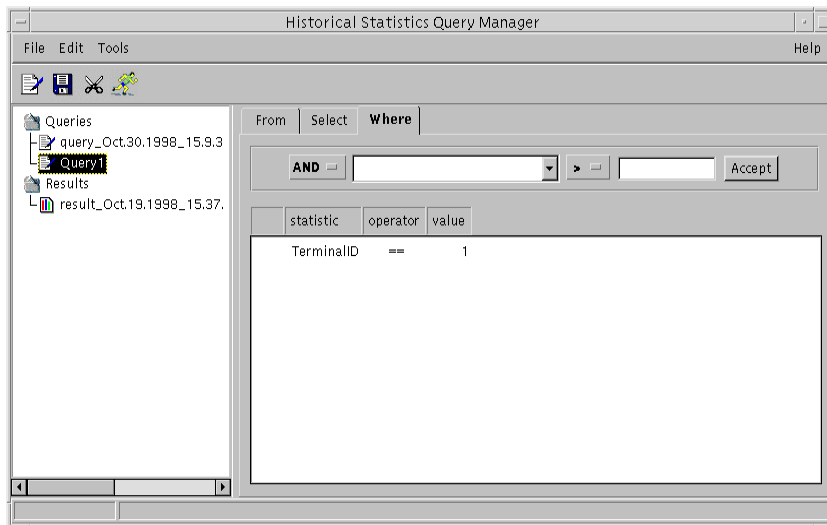
Figure 7-13: Specifying the Where Clause

4. Complete the following fields:

    – Select from the list of parameters that can be displayed. Select the parameter by highlighting it in the list.

    – **Qualifiers** are symbols you can use to limit your query:
        - **>** indicates greater than
        - **>=** indicates greater than or equal to
        - **<** indicates less than
        - **<=** selects less than or equal to
        - **==** selects equal to values
        - **!=** specifies not equal to
        - **AND** joins two qualifiers
        - **OR** provides a selection

      Select the qualifier from the list.

    – Type a value to compare against the selected statistic parameter. Type a numerical value.

5. When you have the proper values highlighted or typed, press the **Accept** button. The new row appears in the bottom box.

6.   Continue adding to the **Where** clause.

7.   To save your query, select the **Save** disk or select **File** > **Save** from the pull-down menu.

8.   To run the query, you highlight the query name in the query builder and select the
      Execute button (picture of a man running) or select the **File** > **Execute** menu.

9.   The query results appear in chart (see Figure 7-14), bar graph (see Figure 7-15), or table
      (see Figure 7-16) format after the **Execute** is completed. For reporting or archiving the
      results, you can also print or save the results. To view the different formats, select the
      view you desire from the available tabs.

      To import the results to a spreadsheet, you must save the results (**File**>**Save** menu or the
      Save button) then locate the results file.

Displaying Query Results

The following examples illustrate three ways of displaying results of your queries -- line
graph (see Figure 7-14), bar graph (see Figure 7-15), and table (see Figure 7-16). You can
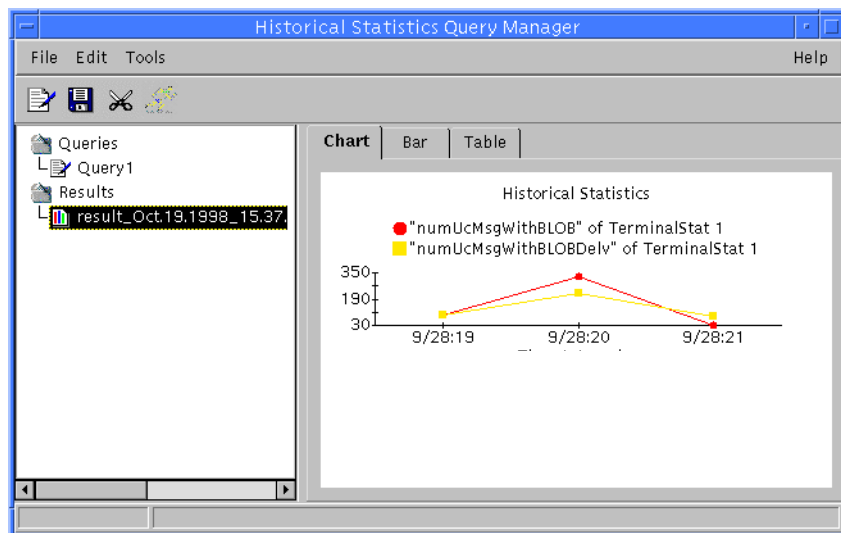change to the different views by selecting the appropriate tab.

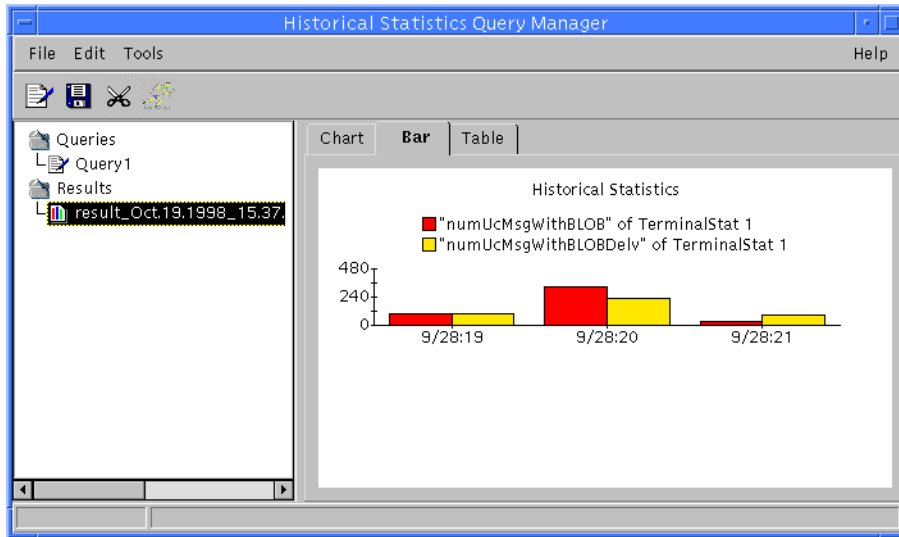*Figure 7-14: Displaying Query Results in a Line Graph*

Figure 7-15: Displaying Query Results in a Bar Graph

Figure 7-16: Displaying Query Results in a Table

Printing Query Results

You can also print the query results. Use the following instructions to print your results:

1. Select the results to be printed. This option prints the results currently on the screen.

2. Select **File**>**Print** from the pull-down menu.

    The Print dialog box appears (see Figure 7-17).
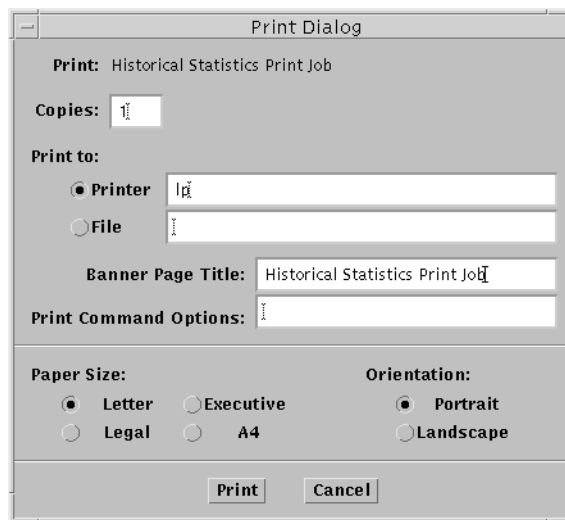

Figure 7-17: Printing Query Results

3. Complete the following information in the Print dialog box:

    Number of Copies:

    Printer (or File)

    Banner Page Title (if desired)

    Print Command Options (if desired)

    Paper Size

    Orientation

4. Select the **Print** button.

Backing Up and Restoring Folders

Using the file manager, you can back up selected folders and delete files from within a folder. The folders are backed up to your 4mm DAT tape drive. You should back up your files each week. After you back up the files, delete them from your active list. This backup process maintains room for new statistical information.

Backing Up Folders

To back up folders from within the file manager, use the following steps (see Figure 7-18):

1. In the left-hand box, select the folder to be backed up.

2. With the folder selected, select the back-up icon (disk) in the toolbar or select **File**>**Save** from the pull-down menu. The system asks you to confirm the action.

Note: Initiating a backup erases the previous contents of the tape.

3. After initiating the backup, the system informs you that the backup completed or failed. If the backup fails, verify that you have a tape in the 4mm DAT tape drive and that the tape is not write-protected.

    If the backup is successful, the last backup column in the file display window will reflect the timestamp of the backup.

4. You can view the contents of the tape to verify the backup by typing the following command in a UNIX shell:
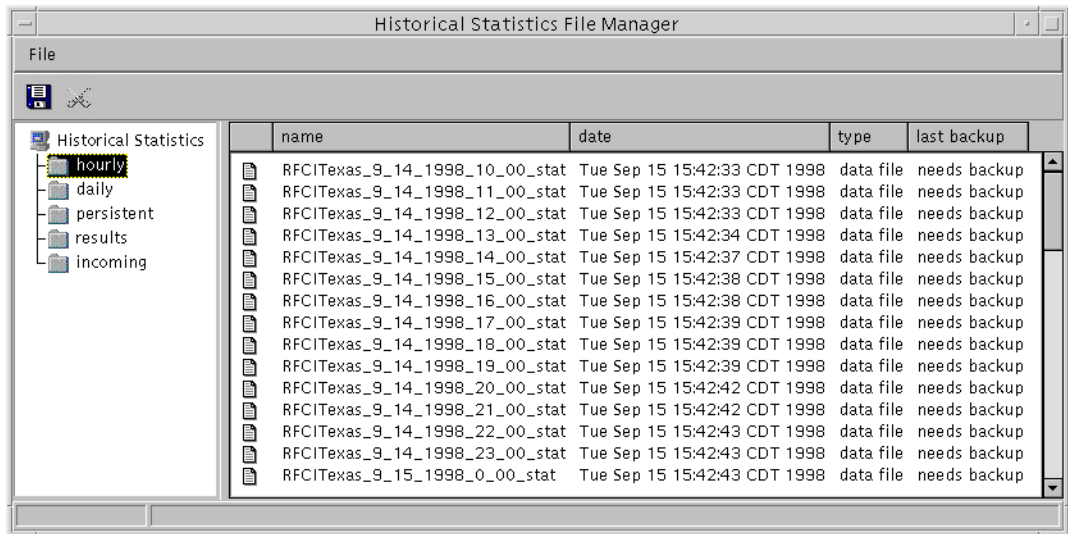
    tar^tvf^/dev/rst4

Figure 7-18: Backing Up Statistics Folders

Deleting Files

You can delete files from within the file manager by using these steps:

1.   Select one or more files to be deleted in the file display window (right-hand box).

2.   Select the delete icon (scissors) in the toolbar.

     If you have not backed up the file, the system prompts you to confirm this deletion (see Figure 7-19).

Note: Delete files only after you have backed them up. Files that need to be backed up will have the words "needs backup" in the last backup column of the file display window.
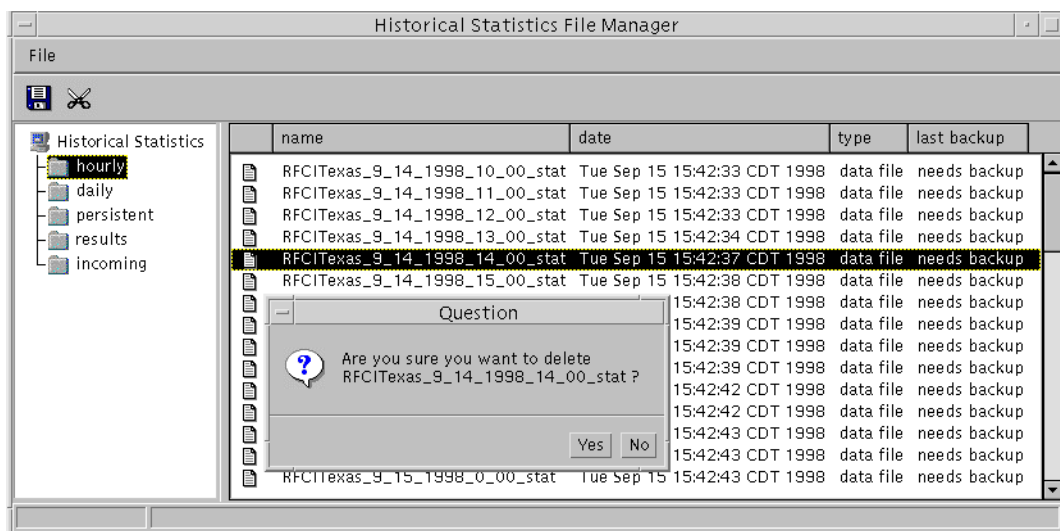
Figure 7-19: Deleting a File That is Not Backed Up

Restoring Folders

To restore folders, you must complete the following steps:

1.   Exit the Historical Statistics application by selecting **File>Exit** from the Query Manager
       pull-down menu.

2.   When you have the application closed, place the tape containing the folder to be restored
       in the tape drive.

3.   Open a UNIX shell.

4.   Type the following command to restore the tape contents:

       # **tar xvf /dev/rst4**

5.   Launch the Historical Statistics application from within HP OpenView (see paragraph,
       "Set-Up Procedures").

6.   Open the file manager component from the query manager by selecting **Tools>File
       Manager** from the pull-down menu.

7.   Select the folder that you restored. You should see the restored files in the file display
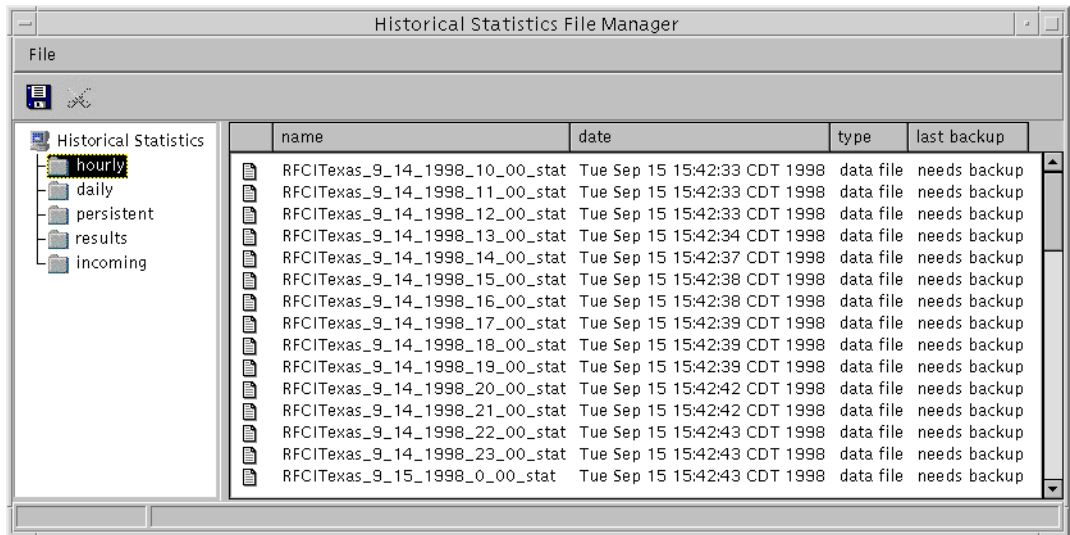   window (see Figure 7-20).

Figure 7-20: Verifying File Restoration

Abbreviations and Acronyms

This appendix provides a list of abbreviations and acronyms used in this document and their definitions (see Table A-1). These definitions are applicable only to the Choreographer! network element and the elements of the edge network. Other applications or systems can use the same acronyms with different meanings.

Table A-1: Acronyms and Abbreviations (Sheet 1 of 2)

Acronym/ Abbreviation	Description
CP	Central Processor
DSP	Digital Signal Processing
EM	Element Manager
FRAD	Frame Relay Access Device
FRU	Field Replaceable Unit
FS	File Server
FTP	File Transfer Protocol
FTPD	File Transfer Protocol Demon
GB	Gigabyte
GPS	Global Positioning System
GUI	Graphical User Interface
HP	Hewlett Packard
HPOV	Hewlett Packard OpenView
MB	Megabyte
MIB	Management Information Base
MS	Messaging Switch
NECA	Network Element Configuration Application

Table A-1: Acronyms and Abbreviations (Sheet 2 of 2)

Acronym/ Abbreviation	Description
NIU	Network Interface Unit
NMC	Network Management Center
OMC	Operations and Management Center
OTA	Over the Air
OVNNM	OpenView Network Node Manager
OVW	OpenView Window
PA	Power Amplifier
PCD	Personal Communication Device
PNMS	Paging Network Management System
POMC	Paging Area Operations and Management Center
RAM	Random Access Memory
RCP	Remote Copy Protocol
RF	Radio Frequency
RF-A!	RF-Audience!
RF-B!	RF-Baton!
RF-C!	RF-Conductor!
RF-O!	RF-Orchestra!
SNMP	Simple Network Management Protocol
TFTP	Trivial File Transfer Protocol
UCC	Universal Communication Controller
UDP	User Datagram Protocol
WMG	Wireless Message Gateway
WMS	Wireless Messaging System

Backup and Restore Procedures

This appendix covers Choreographer! network manager backup and restore procedures. You can back up and restore the Choreographer! network manager database with options from the installation script, **C_Install**. This script may be on the hard drive or may be accessed from the installation disk.

Backup Procedures

Database backup is a part of regular system maintenance. You should also perform a database backup before you make any major configuration changes. This backup prevents the loss of system configuration information. When the major changes are operational, perform another backup to save your changes.

> CAUTION
>
> *Stop all processes that affect the database, such as HP OpenView, before you begin a backup.*

To back up the Choreographer! network manager database, use the following procedure:

1. Log on to the system as root.

2. If you run the backup process from the Installation CD-ROM, insert the CD-ROM into the drive.

3. Whether you run the backup process from the installation script or from the CD-ROM, use the following command to launch the backup process:

   # **cd^/opt/C_Install** <**Enter**>

   # **./setup** <**Enter**>
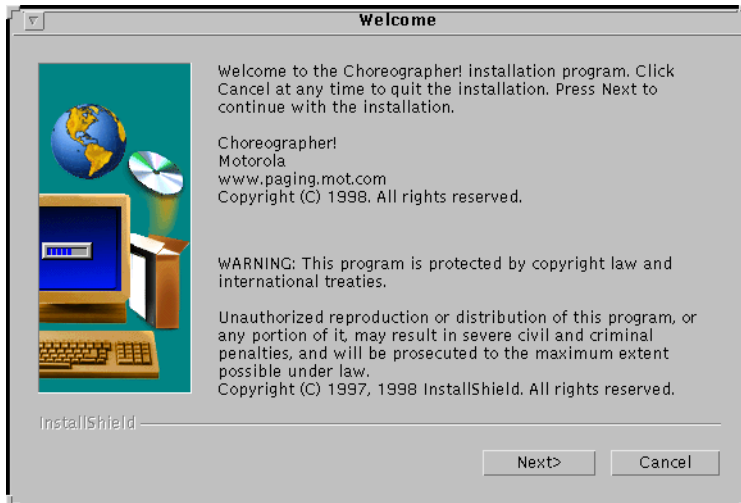
   The Welcome screen appears (see Figure B-1).

Figure B-1: Welcome Screen

4.   Select the **Next** button to continue. The Select Components to Install menu appears (see Figure B-2).
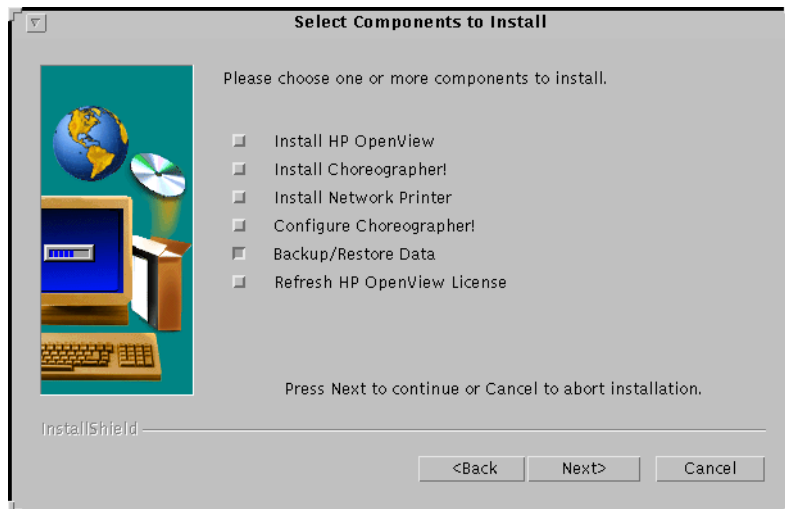

Figure B-2: Select Components to Install

5.   Select the Backup/Restore Data option and press the **Next** button. The Backup and Restore menu appears (see Figure B-3).
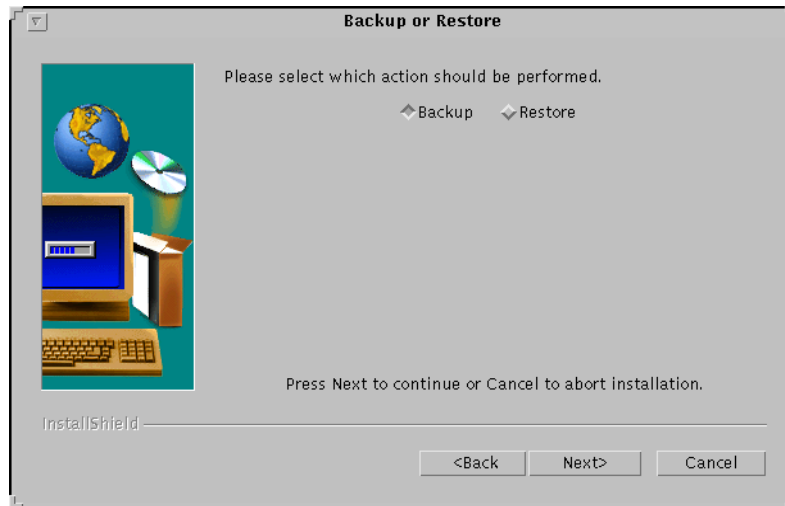

Figure B-3: Backup and Restore Menu

6.   Select the Backup option and press the **Next** button. The status screen (see Figure B-4) appears. The system issues the RFCCTL hostname prompt:

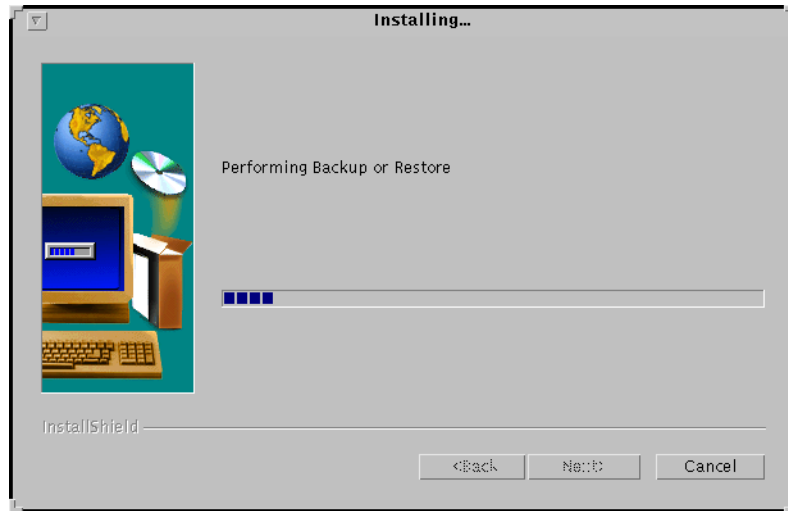Please enter the RFCCTL's IP Address or Alias Hostname:

Figure B-4: Status Screen

7. Type in the control hostname of the RF-C! controller, then press **<Enter>**. The tape driver name prompt appears:

    Please Enter the Tape device name (/dev/rmt/0lb)

8. When the prompt appears, the default tape driver name should already be visible. Press **<Enter>** to accept the default or type **[tape_driver_name]** and press **<Enter>**.

    The system prompts you to insert a tape into the tape driver:

    Please put an empty tape in tape driver.

    INFO: Enter 'C' to Continue or 'X' to Exit: [C]

9. Type **C** **<Enter>** to continue with the backup or **X** **<Enter>** to abort the backup process. The system responds that the database is about to be stopped.

CAUTION

Stop all processes that affect the database, such as HP OpenView, before you begin a backup.

10. When the backup completes, the Installation Complete screen appears (see Figure B-5). This screen displays the results of the backup.
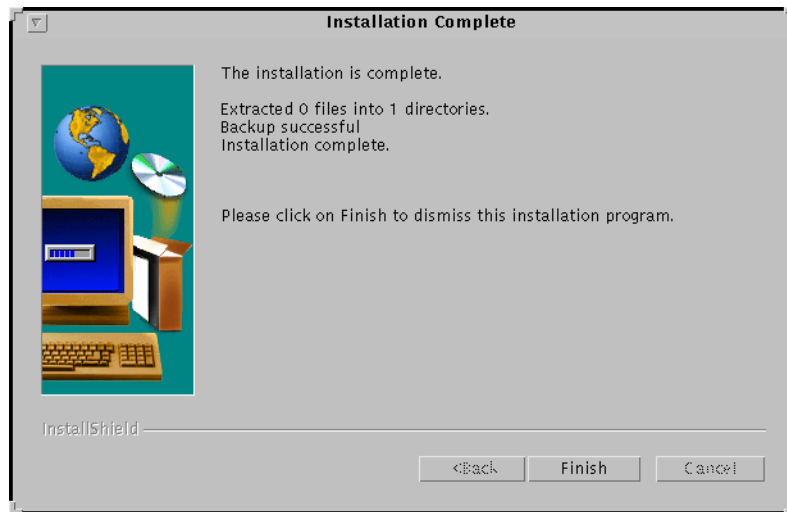

Figure B-5: Installation Complete Screen

11. Select the **Finish** button to exit from the process. Remove the tape from the tape drive and label the tape with the current date and time.

Restore Procedure

If a serious system problem occurs, or you need to regress to an earlier system configuration, use the backup tape to restore the database.

<table>
<tr><td>CAUTION</td><td>You must stop all processes that affect the database, such as HP OpenView, before you begin any backup and restore procedures.</td></tr>
</table>

To restore the database, use the following procedure:

1. Log onto the system as root.

2. If you are running the restore process from the Installation CD-ROM, insert the CD-ROM into the drive.

3. If you are running the restore process from the installation script resident on the hard drive or once the CD-ROM is inserted, use the following command to launch the restore process:

    # **cd^/opt/C_Install <Enter>**

    # **./setup <Enter>**

    The Welcome screen appears (see Figure B-6).
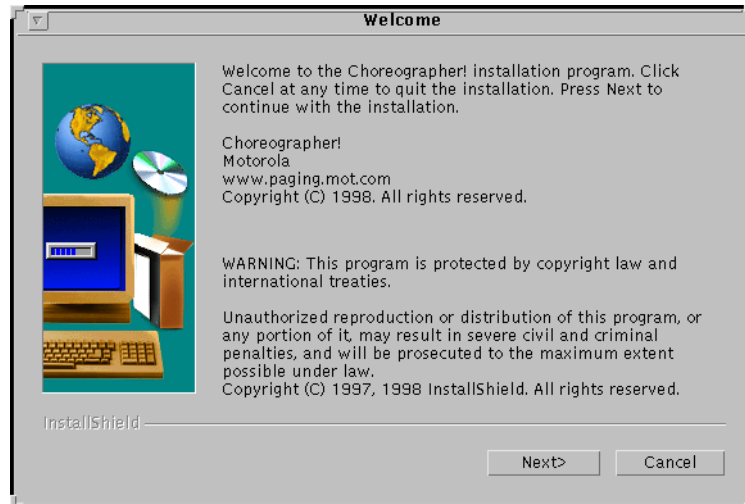
Figure B-6: Welcome Screen

4.   Select the **Next** button to begin.

      The Select Components to Install menu appears (see Figure B-7).
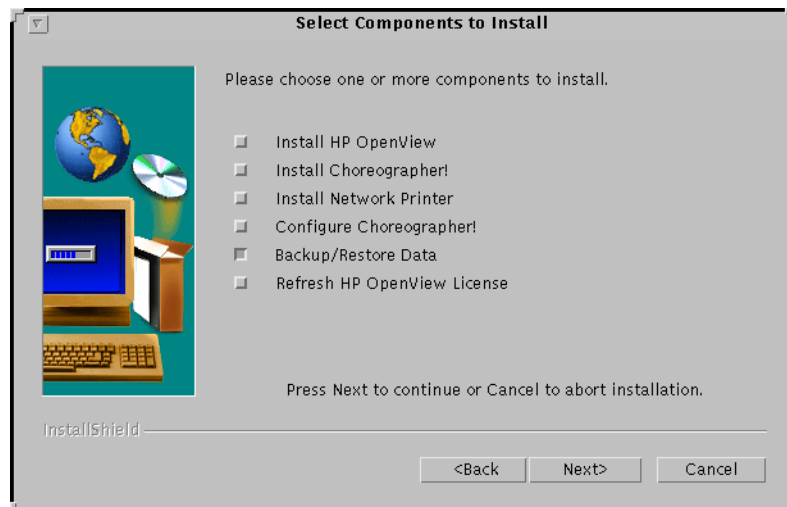
Figure B-7: Select Components to Install Screen

5.   Select the Backup/Restore Data option and select the **Next** button to continue.

The Backup or Restore menu appears (see Figure B-8).
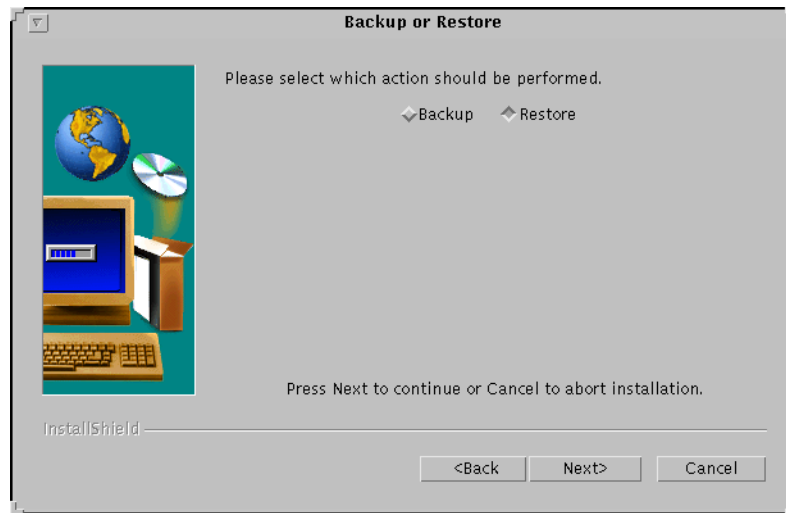
Figure B-8: Backup or Restore Menu

6.   Select the Restore option and the **Next** button.

The Status screen (see Figure B-9) appears. The system prompts for the RFCCTL hostname:

Please enter the RFCCTL's IP Address or Alias Hostname:

7.   Type **[control_hostname]** <**Enter**>.

Figure B-9: Status Screen

8.   The tape driver name prompt appears as follows:

Please Enter the Tape driver name (/dev/rmt/0lb)

9.   At the tape driver name prompt, the default tape driver name should be visible. Press **<Enter>** to accept the default or type **[tape_driver_name]** and press **<Enter>**. The system displays the following prompt:

Please put a tape in tape driver.

INFO: Enter 'C' to Continue or 'X' to Exit [C]:

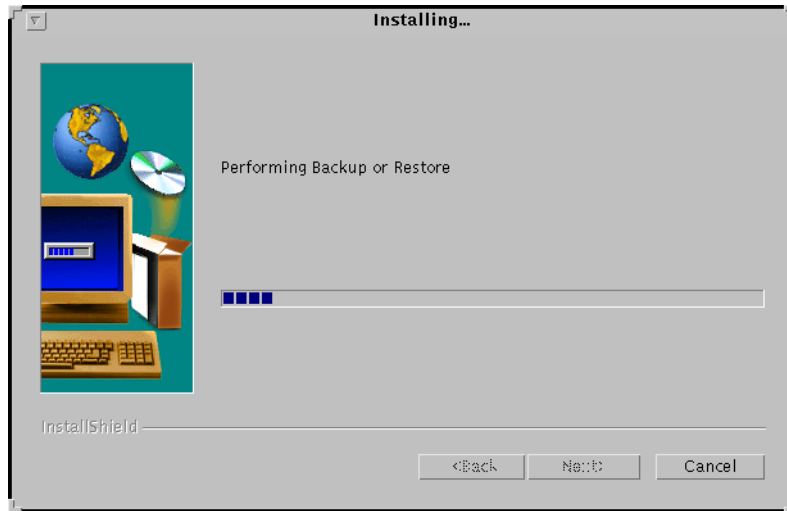10. Type **C <Enter>** to continue with the restore or **X <Enter>** to stop the restore process.

    If you continue with the restore, the system warns:

    Warning: About to stop the database!

CAUTION

Stop all processes that affect the database, such as HP OpenView, before you begin a restore.

11. When the restore is complete, the Installation Complete screen appears. This screen displays the results of the restore. Select the **Finish** button to exit from the process. Remove the tape from the tape driver.
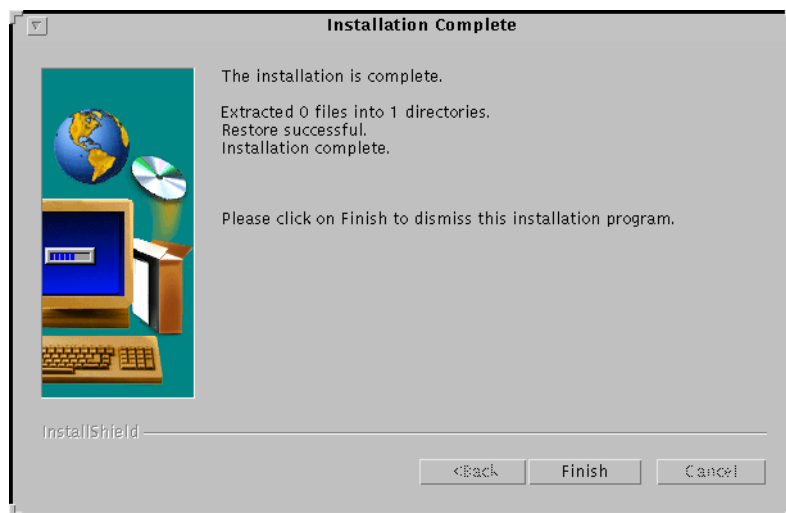

Figure B-10: Installation Complete Screen

12. You must restart the RF-C! controller for the controller to use the new configuration.

Configuring Network Printers

This appendix provides printer configuration procedures for the HP-4MP, the HP-5M, and the HP-4000N. The following topics are included:

The following instructions can be used to configure an HP-4MP or an HP-5M printer as a network printer. These configuration procedures are optional.

HP-4MP and HP-5M Laserjet Configuration

1. Push the printer power switch (front right) to ON position.

2. Verify the printer successfully completes its self test and the display panel reads:

   READY

HP-4MP Configuration

1. Verify that the printer has paper (The front panel menu does not respond unless the printer has paper in the paper tray).

2. Place printer in Off Line mode by pressing the **<On Line>** button on the front control panel of the printer.

3. Press the **<Menu>** button until [MIO MENU] appears on the printer display.

4. Press the **<Item>** button until [CFG NETWORK=NO *] appears on the printer display.

5. Press the <+/-> button until [CFG NETWORK=YES] appears on the printer display.

6. Press the **<Return>** button until [CFG NETWORK=YES *] appears on the printer display.

7. Press the **<Item>** button until [TCP/IP=OFF *] appears on the printer display.

8. Press the <+/-> button until [TCP/IP=ON] appears on the printer display.

9. Press the <**Return**> button until [TCP/IP=ON *] appears on the printer display.

10. Press the <**Item**> button until [CFG TCP/IP=NO *] appears on the printer display.

11. Press the <+/-> button until [CFG TCP/IP=YES] appears on the printer display.

12. Press the <**Return**> button until [CFG TCP/IP=YES *] appears on the printer display.

13. Press the <**Item**> button until [BOOTP=YES *] appears on the printer display.

14. Press the <+/-> button until [BOOTP=NO] appears on the printer display.

15. Press the <**Return**> button until [BOOTP=NO *] appears on the printer display.

16. Press the <**Item**> button until [IP BYTE 1=0] appears on the printer display.

17. Press the <+/-> button until [IP BYTE 1=10] appears on the printer display.

Note: Hold down the <+/-> button for automatic incrementing.

18. Press the <**Return**> button until [IP BYTE 1= 10*] appears on the printer display.

19. Press the <**Item**> button until [IP BYTE 2=0] appears on the printer display.

20. Press the <+/-> button until [IP BYTE 2=5] appears on the printer display.

Note: Hold down the <+/-> button for automatic incrementing.

21. Press the <**Return**> button until [IP BYTE 2=5 *] appears on the printer display.

22. Press the <**Item**> button until [IP BYTE 3=0] appears on the printer display.

23. Press the <+/-> button until [IP BYTE 3=0] appears on the printer display.

Note: Hold down the <+/-> button for automatic incrementing.

24. Press the <**Return**> button until [IP BYTE 3=0 *] appears on the printer display.

25. Press the <**Item**> button until [IP BYTE 4=0] appears on the printer display.

26. Press the <+/-> button until [IP BYTE 4=50] appears on the printer display.

Note: *Hold down the <+/-> button for automatic incrementing.*

27. Press the **<Return>** button until [IP BYTE 4=50 *] appears on the printer display.

28. Press the **<On Line>** button to place the printer in the On Line mode.

Local printer set up is complete for HP-4MP.

HP-5M and HP-4000N Configuration

1. Verify that the printer has paper (The front panel menu does not respond unless the printer has paper in the paper tray).

2. Place printer in Off Line mode by pressing the **<Go>** button on the front control panel of the printer.

3. For the HP-5M, press the **<Menu>** button until [HP MIO MENU] appears on the printer display.

   For the HP-4000N, press the **<Menu>** button until [JETDIRECT MENU] appears on the printer display.

4. Press the **<Item>** button until [CFG NETWORK=NO *] appears on the printer display.

5. Press the **<Value** +/-> button until [CFG NETWORK=YES] appears on the printer display.

6. Press the **<Select>** button until [CFG NETWORK=YES *] appears on the printer display.

7. Press the **<Item** +/-> button until [NOVELL=ON] appears on the printer display.

8. Press the **<Value** +/-> button until [NOVELL=OFF *] appears on the printer display.

9. Press the **<Select>** button.

10. Press the **<Item>** button until [DLC/LLL] appears on the printer display.

11. Press the **<Value** +/-> key to [OFF].

12. Press the <**Select**> button.

13. Press the <**Item**> button until [TCP/IP*] appears on the printer display.

14. Toggle the <**Value** +/-> key to [ON].

15. Press the <**Select**> button.

16. Press the <**Item**> button until [ETALK] appears on the printer display.

17. Toggle the <**Value** +/-> key to [OFF].

18. Press the <**Select**> button.

19. Press the <**Item**> button until [CFG TCP/IP] appears on the printer display.

20. Toggle the <**Value** +/-> key to [YES].

21. Press the <**Select**> button.

22. Press the <**Item**> button until [BOOTP] appears on the printer display.

23. Toggle the <**Value** +/-> key to [BOOTP=NO].

24. Press the <**Item**> button until [BOOTP=NO *] appears on the printer display.

25. Press the<**Item**> button until [IP BYTE 1=0] appears on the printer display.

26. Press the <**Value** +/-> button until [IP BYTE 1=10] appears on the printer display.
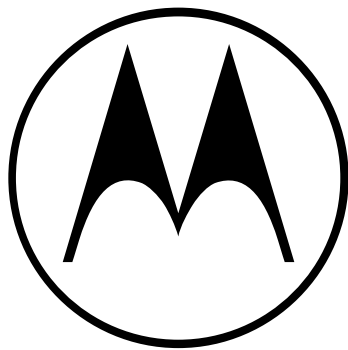
Note: Hold down the <+/-> button for automatic incrementing or decrementing.

27. Press the <**Select**> button until [IP BYTE 1=10 *] appears on the printer display.

28. Press the <**Item**> button until [IP BYTE 2=0] appears on the printer display.

29. Press the <**Value**+/- > button until [IP BYTE 2=5] appears on the printer display.

30. Press the <**Select**> button until [IP BYTE 2=5 *] appears on the printer display.

31. Press the <**Item**> button until [IP BYTE 3=0 *]appears on the printer display.

32. Press the <**Value**+/- > button until [IP BYTE 3=0] appears on the printer display.

33. Press the <**Select**> button until [IP BYTE 3=0 *] appears on the printer display.

34. Press the <**Item**> button until [IP BYTE 4=0] appears on the printer display.

35. Press the <**Value** +/-> button until [IP BYTE 4=50] appears on the printer display.

36. Press the <**Select**> button until [IP BYTE 4=50 *] appears on the printer display.

37. Press the <**Item**> button until [SM BYTE 1] appears on the printer display.

38. Press the <**Value**+/-> button to increment to 255.

39. Press the <**Select**> button.

40. Press the <**Item**> button until [SM BYTE 2] appears on the printer display.

41. Press the <**Value**+/-> button to increment to 255.

42. Press the <**Select**> button.

43. Press the <**Item**> button until [SM BYTE 3] appears on the printer display.

44. Press the <**Value**+/-> button to increment to 0.

45. Press the <**Select**> button.

46. Press the <**Item**> button until [SM BYTE 4] appears on the printer display.

47. Press the <**Value**+/-> button to increment to 0.

48. Press the <**Select**> button.

49. Press the <**Item**> button until [LG BYTE 1] appears on the printer display.

50. Press the <**Value**+/-> button to increment to 10

51. Press the <**Select**> button.

52. Press the <**Item**> button until [LG BYTE 2] appears on the printer display.

53. Press the <**Value**+/-> button to increment to 5

54. Press the <**Select**> button.

55. Press the <**Item**> button until [LG BYTE 3] appears on the printer display.

56. Press the <**Value**+/-> button to increment to 0

57. Press the <**Select**> button.

58. Press the <**Item**> button until [LG BYTE 4] appears on the printer display.

59. Press the <**Value**+/-> button to increment to 2

60. Press the <**Select**> button.

61. Press the <**Item**> button until [GW BYTE 1] appears on the printer display.

62. Press the <**Value**+/-> button to increment to 10

63. Press the <**Select**> button.

64. Press the <**Item**> button until [GW BYTE 2] appears on the printer display.

65. Press the <**Value**+/-> button to increment to 5

66. Press the <**Select**> button.

67. Press the <**Item**> button until [GW BYTE 3] appears on the printer display.

68. Press the <**Value**+/-> button to increment to 0

69. Press the <**Select**> button.

70. Press the <**Item**> button until [GW BYTE 4] appears on the printer display.

71. Press the **<Value**+/-> button to increment to 2

72. Press the **<Select>** button.

73. Press the **<Item>** button until TIMEOUT appears on the printer display.

74. Press the **<Value**+/-> button to increment to 90.

75. Press the **<Select>** button.

76. Press the <Go> button to place the printer On-Line.

Local printer set up is complete for HP-5M or HP-4000N.

MOTOROLA