COMSPHERE 6800 SERIES NETWORK MANAGEMENT SYSTEM

USER'S/SYSTEM ADMINISTRATOR'S GUIDE

Document No. 6800-A2-GE26-20

January 1997

NOTE

This document supports Release 4.2 or greater of 6800 Series NMS.

PARADYNE™

COMSPHERE

6800 Series Network Management System
User's/System Administrator's Guide
6800-A2-GE26-20

2nd Edition (January 1997)

Changes and enhancements to the product and to the information herein will be documented and issued as a new release or a Technical Update Memo (TUM) to this manual.

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IMPORTANT SAFETY INSTRUCTIONS

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. This product is intended to be used with a three-wire grounding type plug - a plug which has a grounding pin. This is a safety feature. Equipment grounding is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adaptor.

   Prior to installation, use an outlet tester or a voltmeter to check the ac receptacle for the presence of earth ground. If the receptacle is not properly grounded, the installation must not continue until a qualified electrician has corrected the problem.

   If a three-wire grounding type power source is not available, consult a qualified electrician to determine another method of grounding the equipment.
3. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
4. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
5. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
6. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
7. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
8. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.

In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:

– Never install telephone wiring during a lightning storm.
– Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
– Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
– Use caution when installing or modifying telephone lines.
– Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
– Do not use the telephone to report a gas leak in the vicinity of the leak.

Notices

WARNING

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

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LE PRESÉNT APPAREIL NUMÉRIQUE N'ÉMET PAS DE BRUITS RADIOÉLECTRIQUES DÉPASSANT LES LIMITES APPLICABLES AUX APPAREILS NUMÉRIQUES DE LA CLASSE A PRESCRITES DANS LE RÈGLEMENT SUR LE BROUILLAGE RADIOÉLECTRIQUE ÉDICTÉ PAR LE MINISTÈRE DES COMMUNICATIONS DU CANADA.

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Preface

Objectives and Reader Assumptions

The *COMSPHERE 6800 Series Network Management System User's/System Administrator's Guide* provides an overview of the 6800 Series NMS and instructions for the use of the system's functions. Users should have operational knowledge of the devices to be supported by the 6800 Series NMS within their unique network configuration. The information in this document assumes total access to all functions in the system. Users with a lesser security access will not see some of the available functions.

Abstract

Chapter 1 provides an overview of the 6800 Series NMS system features, and descriptions of the 6800 Series software applications packages and the 6800 Series NMS hardware. This chapter also provides information on migration support.

Chapter 2 provides information on common procedures, information on the user interfaces for workstations, and descriptions for the following items: tasks, Help feature, routines, commands, and alert color coding.

Chapter 3 provides information on the profile database and provides configuration information for the system at the user level.

Chapter 4 provides System Administrator information for user database set-up and low-level system configuration. This chapter includes the procedures for Database Backup and Restoral.

Chapter 5 provides information on the 6800 Series NMS system filters and alert processing.

Chapter 6 provides information on using the Map, Monitor, and Summary tasks in monitoring the network.

Chapter 7 provides information on trouble tracking and the Automatic Trouble Reporting feature.

Chapter 8 provides information on reporting for the 6800 Series NMS.

Chapter 9 provides information on 6800 Series NMS utilities.

Appendix A contains the Device Model numbers.

Appendix B provides an alphabetical listing of all NMS commands and their command access levels.

Appendix C contains a list of Connectivity Map icons.

Appendix D contains Device Addressing information.

Appendix E contains 6800 Series NMS Naming Conventions.

Appendix F contains International Dial Code information.

Appendix G contains Uniform Alarm Interface information.

Appendix H contains File Export to ACCUMASTER Integrator information.

Appendix I contains configuration information for 6800 Series NMS X-Window cut-through.

Related Documents

The following documents contain information pertinent to the installation process.

6500-A2-GA21	*ANALYSIS 6510 Automated Network Management System Reference Manual*
6800-A2-GA22	*COMSPHERE SNMP Manager Operation Guide*
6800-A2-GB15	*COMSPHERE 6800 Series Network Management System Quick Reference Guide*
6800-A2-GB21	*COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide*
6800-A2-GB30	*COMSPHERE 6800 Series Network Management System Core Command Reference Manual*
6800-A2-GB31	*COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual*
6800-A2-GB32	*COMSPHERE 6800 Series Network Management System Multiplexer Command Reference Manual*
6800-A2-GB33	*COMSPHERE 6800 Series Network Management System 3270 Terminal Emulation Option Manual*
6800-A2-GE25	*COMSPHERE SNMP Manager Administration Guide*
6800-A2-GE27	*COMSPHERE 6800 Series Network Management System Reports and Trouble Tracking Customization Guide*
6800-A2-GN22	*COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide*

Contact your sales representative for additional product documentation.

Introduction 1

Product Overview

The COMSPHERE® 6800 Series Network Management System (NMS) is an integrated network management system. It supports both dial and leased modems, DSUs/CSUs, and T1 access as well as nodal processors on a modular hardware and software platform, providing centralized network management for users with distributed networks. Also, the 6800 Series NMS enables you to view, access, and manage unsupported devices from the NMS via VT100 and 3270 external system cut-throughs to the management systems controlling them.

The 6800 Series NMS offers two versions for network management. One version provides network management for networks of up to 10,000 devices, supporting up to four simultaneous users (or up to 12 simultaneous users if the User Interface Processor (UIP) is installed). The system runs on an Altos®System 5000. There are two 6800 Series configurations – a base configuration and a UIP configuration. Depending on the configuration you have installed, the number of workstations supported varies (see Table 1-1, 6800 Series NMS System Capacities, later in this chapter for specific capacity specifications).

The second version provides network management for networks of up to 15,000 devices, supporting up to 42 simultaneous users. The system runs on the Altos System 15000. This system is configured with two UIPs and requires three hard drives to support automatic database backup. This system also features 16 control channels as standard. See Table 1-1, 6800 Series NMS System Capacities, later in this chapter, for other capacity specifications.

6800 Series NMS Features List

The following list highlights the major 6800 Series NMS features. A description of each feature follows the list.

- Modular System Design
- User-Configurable Ports
- Integrated Device Support, Database Management and Network Control
- INFORMIX® Relational Database System

- Menu- and Command-Oriented Multi-Window User Interface with Online Help Feature
- User Access Security with Customization Capabilities
- Logical Network Partitioning with Customization Capabilities
- Alert Filters with Customization Capabilities
- Dynamic Graphic and Textual Representations of the Network Coupled with an Audible Alarm Feature
- Real-Time Textual Notification of Alerts with Customization Capabilities
- Real-Time Alert Matrix by Category with Customization Capabilities
- Multiplexer Support
- Modem/DSU/SRCU Support
- External Systems Access (via cut-through sessions)
- 3270 Terminal Emulation Providing Access to SNA-Based Hosts and Software for Altos 5000 Systems Only
- VT100 Terminal Emulation
- Asynchronous Terminal Support
- Sun Workstations®/Generic X-Terminal Support
- Configuration Management for Unsupported Devices
- Token Ring Network Interface for Altos 5000 Systems Only
- Interface to the Paradyne ANALYSIS® NMS
- Interface to Bytex U30 and U50 Matrix Switches and to Unity Management System
- Interface to Simple Network Management Protocol (SNMP)/Brouter devices
- Uniform Alarm Interface to StarKeeper NMS and ACCUMASTER Integrator
- File Export of Configuration Information to ACCUMASTER™ Integrator
- SNMP Trap Export
- Interface to IBM's NetView via NetView/PC™ and NetCare®
- Automatic Trouble Reporting
- Standard and Customized Reports
- Audit Trail Tool Providing Usage and Security Violation Information
- Automated Trouble Tracking System with Customization Capabilities
- Personal, System and Alert-Driven Routines
- Command Execution Scheduling
- Command Results Destination Routing
- On-line Database Backup

- Automatic Back Up and Restore
- User Mail
- User Interface Processor (UIP)
- Network Printer Support

Modular System Design

Modularity in system design enables applications support based on individual customer configurations. It also facilitates migration of new product support and management features to the existing customer base.

User-Configurable Ports

The user-assigned 6800 Series serial ports can support the following peripherals:

- System printers
- Basic workstations
- Alert log printer

They also support the following interfaces:

- Automatic Trouble Reporting (ATR) interface
- Uniform Alarm Interface (UAI)
- External system cut-throughs
- Interfaces to ACCULINK®multiplexers
- File export

These ports can be configured during initial NMS installation, or reconfigured later at any time, without disrupting the NMS operation. However, multiplexer ports cannot be reconfigured after installation. The NMS system provides a total of 18 serial ports (two provided by the Altos System 5000 or 15000 and 16 on the IPC-1600 card that is installed in the Altos System). An additional 16 ports are available if the UIP configuration is installed. (For better system performance, it is recommended that the two serial ports on the UIP not be used.)

Integrated Device Support, Database Management and Network Control

An integrated approach for device support, database management, and network control is made possible via the INFORMIX relational database system. This allows effective and efficient management of your integrated network. Using relational database capabilities, the 6800 Series NMS presents four separate views of network configuration data:

- Device view
- Facility view
- Site view
- Vendor view

NMS documentation refers to these views as *profiles*. These profiles make use of the relational database which forms data relationships, eliminating the need to repeat data in multiple files. (Refer to the section *The Concept of Network Profiles*, in Chapter 3, for more information on the content of each profile.)

INFORMIX Relational Database System

An INFORMIX customization option enables you to create additional customized database tables (see the *Standard and Customized Reports* description in this chapter). These new tables can be linked to existing tables to generate customized reports or change the content and/or appearance of standard reports.

You can also have direct access to INFORMIX for database querying purposes and reporting via optional purchase of SQL.

Menu- and Command-Oriented, Multi-Window User Interface with Help Features

The full-feature workstation provides many user-friendly interface features such as mousedriven menus and input forms for quick and easy menu selections and data entry, as well as field and form help to assist in using menus and forms. NMS is a command-oriented system, allowing you to request commands easily via a menu tree structure, or to bypass the menu structure to request commands directly from the command line.

You have multi-windowing capabilities to view and execute separate network activities concurrently. You select these network activities, called *tasks*, from the 6800 Series NMS Tasks menu which is the main menu for the NMS. The tasks are Manager, Map, Monitor, Summary, External Systems, Performance Reports, Trouble/Inventory Reports, Trouble Tracking and Utilities.

Most commands use one or more pages (referred to as input forms) for command parameter input. You can request that command results be sent to your terminal screen (CRT), a local or remote printer, or request that NMS send results to the task's associated results queue. The tasks with associated results queues are Manager, Trouble/Inventory Reports and Trouble Tracking. You can execute commands immediately or schedule commands for delayed, weekly, or monthly execution.

When entering command execution parameters, you can use wildcard characters when specifying a group of devices which have profile relationships. See Appendix E of this manual for a detailed description of wildcards and examples of their use.

The online Help feature includes form, field pop-up menus, and field textual help. Form help provides descriptions of a form's input and output requirements. Field help provides pop-up menus to select field values. The textual help feature describes acceptable field entries which cannot be selected from a pop-up menu, for example, a range of values. There is also a general Help system available, describing usage of function keys. In addition to these Help features, the NMS automatically populates fields with default values on many input forms.

User Access Security with Customization Capabilities

The 6800 Series NMS System Administrator can control the user's access to particular devices or groups of devices, to circuits, networks, or control channels. In addition, users may be restricted to particular commands or sets of commands against those customized groups of devices. The System Administrator assigns a User ID and password to each user in the system. Users can change their own passwords for their personal login security.

For information on user access security and user access customization, see Chapter 3.

Logical Network Partitioning with Customization Capabilities

The 6800 Series NMS System Administrator can customize command access and device, circuit, network and control channel permissions to satisfy user requirements within the customer's network.

The ability to grant or deny permissions to devices, circuits, networks, control channels and commands is accomplished through the definition of device groups and user groups. Device groups identify sets of devices by name, address, circuit, network or control channel. User groups identify sets of 6800 Series NMS commands which are executable by users who are assigned to those groups.

The 6800 Series NMS has built-in access security via four functional access user group levels. Each command is associated with one or more of four user groups: Help Desk, Data Technician, Manager, and Administrator. The NMS System Administrator can edit these groups or define additional groups up to a total of 30 user groups. User group assignments determine which NMS commands can be accessed by a user. Access to network devices is assigned on a per device group basis (30 for Altos 5000 Systems and 50 for Altos 15000 Systems) and, for multiplexer nodes, a subnetwork basis.

For more information on network partitioning, see Chapter 4. For information on user group assignments, see Chapter 3.

Alert Filters with Customization Capabilities

An alert is categorized as an alarm (fault), abnormal status condition changes, or event message. The 6800 Series alert management subsystem filters incoming alarms, status and events that are reported from network devices. Filtering allows NMS to store and take action on only those alerts specified by the user.

The Alert Filter Subsystem determines which alert records are reported to the 6800 Series users, stored in the alert database, cause trouble tickets or automatic trouble reports to be generated, or trigger alert-driven routines (ADRs).

Based on the type of device, you can specify how long an alert must persist before the NMS displays or takes action on it. You can also specify exceptions (on a device-by-device basis) for every filter, enabling special filtering for those devices experiencing abnormal conditions, problems, or usage.

Map: Dynamic Graphic and Textual Representations of the Network

The Map task provides both geographic and topological views of your network. Devices and sites are represented by map icons that are color-coded to reflect alert activity. The Geographic Map provides a site level view of the network. By selecting site icons on the Geographic Map, you can display device-level views of the network. These device-level views are referred to as Connectivity maps.

The map displays only the sites and facilities to which you have access.

Key features of the NMS maps include:

- Automatic generation of maps from device, facility and site profile information.
- Context-sensitive access to profile and network control commands—only those commands applicable to the device, site, or facility selected are presented to the user. Also, command input forms are automatically populated with identification information (for example, device addresses) obtained from the selected object's device, facility, and site profiles.
- Cut-throughs to external systems.

Monitor: Real-Time Textual Notification of Alerts

NMS dynamically updates the network monitor to reflect current alert activity. The Monitor task provides color-coded text indications of these alerts. You can select an alert entry on the monitor and perform a variety of functions, such as acknowledge the alert, clear events, obtain reports on active alerts, and execute device profile commands. Each NMS user can customize his/her network monitor to display selected subsets of alerts based on his/her area of responsibility or interest.

The map displays only the sites and facilities to which you have access.

Summary: Real-Time Alert Matrix by Category

The Summary task provides system-wide, color-coded, numeric tallies of network alerts. The Summary display consists of a 3x10 matrix; each cell in the matrix can be used to tally a different set of alerts. For each category, you specify the set of alerts to be tallied. NMS dynamically updates the network summary to reflect current alert activity.

Audible and Visual Alert Arrival Indicator Feature

An *audible alert* arrival indicator feature provides an audible notification for new alerts. The audible indicator is a beep on the Map and Monitor tasks. The indicator continues until you acknowledge the alert. The *visual alert* arrival indicator feature provides a visual notification for new alerts on the Map and Monitor tasks. The visual indicator remains on screen until the alert is acknowledged. The System Administrator can specify which alerts should activate the audible or visual indicators.

Multiplexer Support

NMS provides the following capabilities for managing the ACCULINK multiplexers in the network:

- Centralized alarm and event reporting.
- Simplified network initialization, including automatic routing table generation.
- Ability to perform multiplexer configuration and diagnostic tasks from a central location.
- Channel group traceability, providing a description of the route traversed and optimal route indication.
- Configuration summary displays for channels, hardware modules, logical links, channel groups, and network connectivity.
- State summary displays for channels, time slots, nodes, and supervisory data links (SDLs).

- Statistics reporting.
- Multiplexer management reports.
- ACCULINK Disaster Recovery Support.
- New polling process and alert handling of multiplexer devices.

Modem/DSU/SRCU Support

NMS provides the following capabilities for managing Paradyne and DATAPHONE® II modems and DSUs:

- Centralized alarm and event reporting.
- Diagnostic test and command support.
- Configuration management.
- Call statistics for COMSPHERE 3800 Series modems.

NMS provides the following capabilities for managing Service Restoration Control Units (SRCUs):

- Configuration and alert management for SRCUs, Analog Bridges (ABs), and Dial Backup Units (DBUs).
- Cut-through access to SRCU's ASCII interface for diagnostic test command support.

External Systems Access

The 6800 Series NMS External Systems task allows cut-through to the ANALYSIS Network Management Systems, DPII System Controllers (SCs), multiplexer terminal interfaces, DATAPHONE II 839A Dial Backup Unit (DBU) Control Units, Bytex U30 and U50 Matrix Switches and Unity Management System (UMS), SNMP/Brouter devices, and DCX 850 Multiplexers. Cut-through support is also available for 3270 sessions. The External Systems task simulates direct workstation connectivity from the 6800 Series NMS to the target system. Cut-through access to external systems can also be achieved via the Map task.

3270 Terminal Emulation Providing Access to SNA-Based Hosts and Software for Altos 5000 Systems Only

NMS supports a 3270 Terminal Emulation option to provide access to SNA-based mainframes and software from both full-feature and basic-feature workstations. The External Systems and Map tasks support the 3270 Terminal Emulation by initiating a cut-through to start the 3270 Terminal Emulation process.

VT100 Terminal Emulation

The 6800 Series NMS supports a DEC VT100 terminal emulation for cut-through to external systems requiring a vt100 interface. VT100 support will be limited to only the full-feature workstation. For more information on VT100 support, see Chapter 3.

Asynchronous Terminal Support

The 6800 Series NMS asynchronous terminal support increases the number of terminals and terminal emulators that can be used as basic-feature workstations. For more information on asynchronous terminal support, see Chapter 2.

Sun Workstations/Generic X-Terminal Support

The 6800 Series NMS supports Sun Workstations and X-Terminals as full-feature work- stations with full software support. Sun Workstations must be running Sun/OS and OpenWindows. Generic X-Terminals must be running MS-DOS Version 5.0 or above and either the GrafPoint X-One software product or another manufacturer's X11 R4 server package.

Management of Unsupported Devices

Using NMS, you can view, access, and manage unsupported devices via external system cut-throughs (such as VT100 and 3270) initiated from the Map task or External Systems task to the management systems controlling the unsupported devices. You create device profiles for these devices to store pertinent device information.

Token Ring Network Interface for Altos 5000 Systems Only

The Token Ring Network Interface enables users to use the NMS with an existing Token Ring Local Area Network (LAN). When using this feature, the Ethernet card must be disabled and an additional Token Ringer Interface Card must be installed for communications between the host, UIP, and full-feature workstations. The Token Ring feature also supports importing SNMP traps and cut-through to X11-based applications.

Interface to the ANALYSIS NMS

The NMS interface to the ANALYSIS 6510 enables NMS to receive and store alert and configuration data from the devices managed by an ANALYSIS NMS. The 6800 Series NMS provides alert management functions such as alert filtering, alert storage, trouble tickets, and management reports for these devices. The ANALYSIS NMS device alerts are displayable on the Monitor, Summary and Map tasks. To send commands to the ANALYSIS devices, you must open a cut-through session from the 6800 Series NMS to the ANALYSIS system. Two different methods of connection for cut-throughs are available.

Interface to the Bytex Unity Management System

The NMS interface to the Bytex Unity Management System (UMS) enables the NMS to process alerts received by the UMS from the Bytex Matrix Switches connected to the UMS. The NMS will provide alert filtering, alert management and storage, automated trouble reporting, trouble tickets, and UAI reporting for the alerts.

Uniform Alarm Interface to StarKeeper NMS and to ACCUMASTER Integrator

The 6800 Series NMS Uniform Alarm Interface (UAI) feature allows transfer of alert information to a StarKeeper (SK) or ACCUMASTER Integrator (AMI). With the UAI feature, you can specify on a per-device basis whether alert information should be sent. The 6800 Series NMS supports both basic and enhanced versions of UAI. Basic UAI is used when transferring alert information to older versions of the AMI or SK. Enhanced UAI is used when transferring alert information to new versions of the AMI or SK. For more information on the UAI feature, refer to Appendix G.

File Export to ACCUMASTER Integrator

The 6800 Series NMS supports a File Export feature to transfer device, site, and facility profile information to the AMI. Once information has been transferred from the 6800 Series NMS, the AMI's File Import-Export Utility is used to load the received information into the AMI database. For more information on the File Export feature, refer to Appendix H.

SNMP Trap Export

The 6800 Series NMS SNMP (Simple Network Management Protocol) Trap Export feature enhances the interoperability between the 6800 Series NMS and most industry-standard, SNMP-based network management systems. This feature exports native 6800 Series NMS alerts as standard SNMP traps. All traps are generated as enterprise specific.

Interface to IBM's NetView via NetView/PC and NetCare®$_{NVI}$

Access to IBM's NetView is achieved via the 6800 Series NMS's ability to support NetCare®$_{NVI}$. NetCare®$_{NVI}$ provides an alarm transport interface between the 6800 Series NMS and NetView/PC. (NetView/PC is an IBM® software product that facilitates the transfer of non-SNA (Systems Network Architecture) alerts from non-IBM systems to NetView. NetView is IBM's host-based network management facility used for diagnostics and control of IBM's communications networks.)

You can append problem determination information to the 6800 Series NMS alarms (alerts) via the user interface program. Then, codes containing the appropriate information and the alert pass to NetView/PC either for local viewing or transfer to NetView for processing along with IBM-initiated failure alerts.

Automatic Trouble Reporting

The 6800 Series automatic trouble reporting feature reports alert information in the form of an Automatic Trouble Report (ATR) to a Paradyne technical support group, or to any customer-selected terminal or printer. NMS generates an ATR based on user-defined filtering and authorization criteria when an alert is reported. A single alert can trigger up to four ATRs, sent to four separate destinations, including remote printer(s) or terminal(s).

If you subscribe to NetCare Support, one of four possible destinations for an ATR is a remotely located NetCare support center. At this center, support personnel can receive the ATR and begin to troubleshoot/diagnose the problem. NetCare support personnel can also dial into the NMS for the purpose of diagnosing the problem.

Standard and Customized Reports

With INFORMIX relational database capabilities, you can generate standard database reports. These reports can help track network alarms, detect potential problems within the network, and obtain inventory reports. NMS provides a standard set of Alert History Reports, Inventory Reports and Trouble Tracking Reports.

An optional INFORMIX SQL Reports Customization software package enables you to create custom reports. You can tailor reports in both content and format to meet your specific needs. Also, you can integrate your customized reports into the NMS menus and scheduling system.

NMS can route reports to a user's CRT, a remote or system printer, or a user's results queue. You can schedule reports for immediate, delayed, and/or repeated execution.

Audit Trail Tool Providing Usage and Security Violation Information

The 6800 Series NMS provides an audit trail tool for monitoring usage and attempted security violations of the NMS. System Administrators can view a historical record of the system command usage via user-level commands. The tool contains a record of all commands, with the exception of the Trouble/Inventory Reports and Trouble Tracking tasks, executed by a user. This record includes security violations, showing attempts to execute a command or attempts to access a device for which permission is denied.

Automated Trouble Tracking System for Network Problems with Customization Capabilities

The Trouble Tracking task uses the INFORMIX relational database system to aid in the tracking of network problems. If a device reports an alert, the NMS can automatically open a trouble ticket for the alert, documenting alert device assignment information in the ticket. You can append comments or additional information in the ticket. Using Trouble Tracking, you can track and escalate outstanding problems, providing a jeopardy state for the problem and a database for problem history.

You can customize trouble ticket forms (inputs and results displays) using the optional INFORMIX 4GL Reports Customization software package.

Personal, System and Alert-Driven Routines

A *routine* is a group of commands, executed sequentially when you request execution of that routine. A personal routine is a routine that can be executed only by the user who created it. A system routine is a routine that is available to many users.

Alert-driven routines (ADRs) are system routines that can be triggered by pre-specified alerts or alert clears. You can direct ADRs to one or more network objects. This ADR feature includes the following capabilities:

- To execute a routine on the object (device, facility, or channel, channel module, channel group, etc.) reporting an alert or clearing of an alert; or execute a routine on other user-specified objects.
- To associate a single routine with multiple objects.
- To associate multiple routines with a single object.

ADR execution logic is based on the alert type, alert duration, and alert reporting object.

Command Execution Scheduling

The command execution scheduling capabilities of the NMS permit users to schedule commands to execute immediately, to execute at delayed times and dates, or to execute weekly or monthly. The 6800 Series NMS supports execution scheduling for commands in the Manager, Performance Reports, Trouble Tracking, and Trouble/Inventory Reports tasks.

Command Results Destination Routing

You can request that command results be sent to your CRT, a remote or system printer, or your results queue. Separate results queues are associated with the commands issued in the Manager, Trouble Tracking, and Trouble/Inventory Reports tasks. Up to 50 command results can be stored into any one results queue.

Online Database Backup

NMS allows you to backup your database without shutting the system down. This feature enables you to continually maintain a current backup of your NMS database without disrupting network operation. Loss of database information is possible due to locked database tables during backup.

Automatic Database Backup and Restore

The Automatic Database Backup/Restore feature provides the user with the ability to backup and/or restore automatically all the INFORMIX database files and other NMS files and directories on a scheduled frequency, date, day of the week, and/or time of day. This feature provides the capability for maintaining up to three ‘‘hot spare” systems ready to run at short notice. Once the user sets up the schedule, all files that are needed to restart a fully functioning NMS will be transferred from a specified NMS host to a separate destination NMS host processor. Restoring all the backed-up files will occur according to the user’s established schedule with a minimum of intervention.

User Mail

The 6800 Series NMS provides a user mail facility for reading, sending, and receiving messages among NMS users. The NMS also uses this facility to broadcast messages to its users.

User Interface Processor (UIP)

The 6800 Series UIP package consists of a single Altos System 5000 processor. This package enables you to add additional full-feature workstations to your NMS configuration. An additional 16 ports are optionally available using the UIP. On the Altos 15000 System, two UIPs must be configured. For an illustration of the UIP configuration, refer to the *Host Cards and Ports* description in this chapter.

Network Printer Support

Support for printers connected to processors over a 10BaseT Network is available to NMS users through the UNIX Remote Line Printing (RLP) feature and modifications to NMS which interface with RLP. The user must define the remote printer to the UNIX operating system and then send print jobs from NMS to the newly-defined printer.

System Capacity

Table 1-1 lists the system capacities for the 6800 Series NMS.

NOTE

Although Table 1-1 lists the maximum capacities for individual system features, these capacities may vary depending on system load and network configuration.

Table 1-1
(1 of 2)
6800 Series NMS System Capacities

Feature	Altos 5000 (Host Only) System Capacity	Altos 5000 (Host W/UIP) System Capacity	Altos 15000 System Capacity
Number of Simultaneous Users	4	12	42
Full-feature Workstations	2	6	24[1]
Basic-feature Workstations	3	11	18
User Profiles	250	250	250
Control Channels	8[2]	8[2]	16
Total Facility Profiles	10,000	10,000	10,000
Total Site Profiles	7,500	7,500	7,500
Total Vendor Profiles	500	500	500
Total Device Profiles (managed and unmanaged)[3]	10,000	10,000	15,000
Total Device Groups	50	50	50
Local 3800 Series Modems Supported	2048	2048	2048
Number of 740,745 Multiplexers Supported Channel Groups Logical Links	249 10,000 19,000	249 10,000 19,000	249 10,000 19,000
Number of 6510 Systems-Managed	6	6	6
Trouble Records	10,000	10,000	10,000
Active Alert Records	10,180	10,180	10,180
Historical Alerts Records	25,000	25,000	75,000
Total Number of Assignable Ports[4]	19	35	35

[1] Requires two UIPs in the System Configuration.
[2] An additional Emulex DCP/MUX-I card is required in the Altos 5000 host.
[3] The device profiles allowed for ACCULINK 740/745 multiplexers, 3800 Series modems, brouter/SNMP devices, and 6510-managed devices are included in the number of device profiles supported.
[4] Printer and cut-through Session capacities are those supported by the 6800 Series software. If you have the base system configuration, you may not have the physical ports to support the printer/external system capacities.

Table 1-1
(2 of 2)
6800 Series NMS System Capacities

Feature	Altos 5000 (Host Only) System Capacity	Altos 5000 (Host W/UIP) System Capacity	Altos 15000 System Capacity
Direct Connect System Printers	2	2	2
Networked System Printers	15	15	15
Scheduled Items Manager Task Trouble/Inventory Reports Task Trouble Tracking Task	 998 150 150	 998 150 150	 998 150 150
Queue Results/User/Subsystem[5]	50	50	50
Simultaneous Cut-through Sessions[4]	6	6	6
Cut-through Sessions/User	2	2	2
Alert Log Printer	1	1	1
Number of Routines User (personal) System	 30 per user 500	 30 per user 500	 30 per user 500
External System Definitions	49	49	49

[4] Printer and cut-through Session capacities are those supported by the 6800 Series software. If you have the base system configuration, you may not have the physical ports to support the printer/external system capacities.
[5] Capacity numbers queue results apply to each of the following NMS tasks: Manager, Trouble/Inventory Reports, and Trouble Tracking.

6800 Series Nms Hardware

The 6800 Series NMS consists of both standard and optional hardware components. The following sections describe these components.

Base 6800 Series NMS Hardware Components

The host computer for the base 6800 Series NMS is the Altos System 5000. The Altos System 5000 serves as both the processor that runs the 6800 Series NMS software as well as a full-feature workstation. Altos System 5000 is based on the Inteli® 80486 central processing unit and operates at a clock speed of 33 MHz. It comes configured with 32 Mb of memory on a memory card, two 520 Mb SCSI hard disk drives, a 1.44 Mb 3.5 inch floppy drive, and an SCSI streaming tape unit. For a detailed description of Altos System 5000, refer to the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide.*

High-Capacity 6800 Series NMS Hardware Components

The host computer for the high-capacity 6800 Series NMS is the Altos System 15000. The Altos System 15000 is based on the EISA bus, featuring two Intel i80486 processors running at a clock speed of 50 Mhz. It comes configured with 32 Mb of memory, three 530 Mb SCSI hard disk drives, a 1.44 Mb 3.5 inch floppy drive, and an SCSI cartridge tape drive. For a detailed description of the Altos System 15000, refer to the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide.*

Optional 6800 Series Hardware Components List

Optional hardware components for the base 6800 Series NMS system are full-feature and basic-feature workstations, printers, monitors, circuit cards and a modem for dial-up connection to printers and external systems. General descriptions of these optional hardware components are provided in the following sections.

6800 Series NMS Hardware Description

The 6800 Series NMS hardware is described in this section.

Full-Feature Workstations

The optional full-feature workstation can be 1) a DOS-based workstation, 2) an X-Terminal workstation, or 3) a Sun Workstation. This workstation has bit-mapped graphics capabilities as well as multi-windowing and multitasking capabilities. The full-feature workstation offers a mouse-based interface and is connected via a LAN.

Basic-Feature Workstations

A basic-feature workstation, running MS-DOS® and Windows software and workstation software, has a keyboard-based interface. These workstations can be directly connected to the NMS or used as remote workstations.

Printers

There are three types of printers. The system printer, alert log printer and ATR/remote printer are associated with the central processor. These printers are briefly described as follows:

System/Network Printer

The system printer is a high-speed, microprocessor-controlled, dot-matrix printer, capable of producing text and color graphics. The system printer is a central, shared utility connected to the host processor. It prints command results and screen displays. You can send reports and command results to a system printer rather than to the workstation CRT, thereby leaving the workstation free for other tasks. Any screen display can also be printed from the full-feature workstation. These printers can also perform as network printers. A network printer is a printer that can be located at any site serviced by the NMS LAN. A print server running UNIX System V or Berkeley UNIX is required. The network printer can receive the same print jobs as the system printer.

Alert Log Printer

The alert log printer is a dedicated 80-column printer used for automatically logging alerts sent to the 6800 Series NMS. The printer prints a message when an alert occurs, when an update to an alert occurs, and when an alert is cleared. The message indicates the alert type or clear, device reporting the alert, and the time of the report.

ATR/Remote Printer

The ATR/remote printer is a dedicated serial printer connected directly to the host processor or connected via a modem. Command results and reports can be sent to this printer if **remote** is requested for the results destination. This is the printer to which ATRs are sent if **port** is specified as the ATR destination.

UIP Cards

When the Altos System 5000 is configured as a UNIX Interface Processor (UIP), it can be configured with the following cards:

- One (optional) Proteon® Token Ring Network Interface Card.
- One (optional) IPC-1600 Ports card with 16 user-defined ports.

Two UNIX Interface Processors must be configured in an Altos 15000 system. One of the UIPs can have an IPC-1600 Ports card installed.

Host Cards and Ports

The Altos System 5000 can be configured with the following ports cards. Many of these ports are optional and are used only if required by the customer's configuration.

- Three system ports (two serial ports and one system printer parallel port).
- One IPC-1600 Ports card with 16 user-defined ports.
- One (optional) dedicated IPC-900 Ports card for ANALYSIS NMS interface.
- One (optional) Emulex® DCP-286i card for 3270 Terminal Emulation.
- One DCP/MUXi/8-512 card for modem control channel interface. (A second DCP/MUXi/8-512 card is optional, however if installed, the system cannot have the optional IPC-900 Ports card or the optional Emulex DCP-286i card installed.)
- One (optional) Proteon Token Ring Network Interface Card.

The Altos System 15000 can be configured with the following ports cards.

- Three system ports (two serial ports and one system printer parallel port).
- One IPC-1600 Ports card with 16 user-defined ports.
- One (optional) dedicated IPC-900 ports card for ANALYSIS NMS interface.
- Two DCP/MUXi/8-512 cards for support of up to 16 modem control channels.

Figure 1-1 illustrates port usage connections for the base 6800 Series network. Figure 1-2 illustrates port usage connections for the 6800 Series network with UIP installed. Figure 1-3 shows the port usage connections for the high-capacity 6800 Series network. The following narratives define port usage in more detail. For full information on 6800 Series hardware, refer to the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide.*

Ports on the Motherboard

The Altos System 5000 has one parallel port dedicated to the system printer, two user-definable serial ports, and keyboard and mouse connections. An add-on video card provides the connector for the monitor. A TCP/IP access port is used for connection to the Ethernet network support.

IPC-1600 Card

User-configurable ports for the 6800 Series NMS are provided by an IPC-1600 card that is shipped with the system. The IPC-1600 card has sixteen user-configurable ports.

You can configure the following interfaces and hardware components on the IPC-1600 card. Each port can be configured as needed to meet unique system requirements. An overview of port configuration procedures for these ports is provided in Chapter 3 of this manual. For full configuration details, refer to the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide*.

NOTE

Many of the following interfaces do not need dedicated ports (that is, one port per interface). This can be achieved by using a dial up connection via a shared dial port.

- Printers (alert log printer, system printer)
- Additional system printer
- Basic-feature workstations (up to eleven workstations)
- Multiplexer event port for Series 700 multiplexers
- Multiplexer cut-through port (external systems port) for Series 700 multiplexers
- Multiplexer network interface port (command port) for Series 700 multiplexers
- Automatic Trouble Report interface
- Dedicated ATR/printer interface
- Uniform Alarm Interface (UAI)
- DCX Multiplexer interface
- 839 Dial Backup cut-through
- System Controller cut-through
- VT100 Emulation for cut throughs to external systems
- Service Restoration Control Unit interface

- ANALYSIS NMS Gateway Option
- Alternate cut-through port to ANALYSIS NMS
- File Export Interface (either dedicated or dial-up)
- Alarm Interface/cut-through port for Bytex Unity Management System

Optional Cards

The optional cards configurable for a 6800 Series NMS system depend on your configuration requirements. These cards are briefly described as follows.

Dedicated IPC-900 Card to Support the ANALYSIS Option

The ANALYSIS option provides cut-through capability to the 6510, 5600, and 5605 ANALYSIS Network Management Systems. With this option, you can open a cut-through session to the ANALYSIS NMS and manage DMC protocol devices.

If the ANALYSIS software option is installed on a 6800 Series NMS system, an ANALYSIS-dedicated IPC-900 card is required for interface support. This dedicated IPC-900 8-port card uses one serial port on the card to communicate with each ANALYSIS NMS for alert and configuration information transport, printer requests and for ANALYSIS NMS cut-through access. An IPC-1600 card cannot be substituted for the ANALYSIS-dedicated IPC-900 card.

DCP/MUXi/8-512 Card to Support ADp and DATAPHONE II Protocol Devices

The DCP/MUXi/8-512 card provides eight ports. The card continuously monitors the network to gather health and status information on the modems, and to transmit command requests from the 6800 Series NMS to the modems. Each port can support up to 256 control modems.

Emulex DCP-286i Card to support 3270 Terminal Emulation Option

If an NMS configuration includes 3270 Terminal Emulation support, the Emulex DCP-286i card is needed to support the 3270 Terminal Emulation option, which allows access to the SNA-based hosts and software from both full-feature and basic-feature workstations. It allows the workstation to appear as if it were functioning as a 3270 terminal with a nonstandard keyboard.

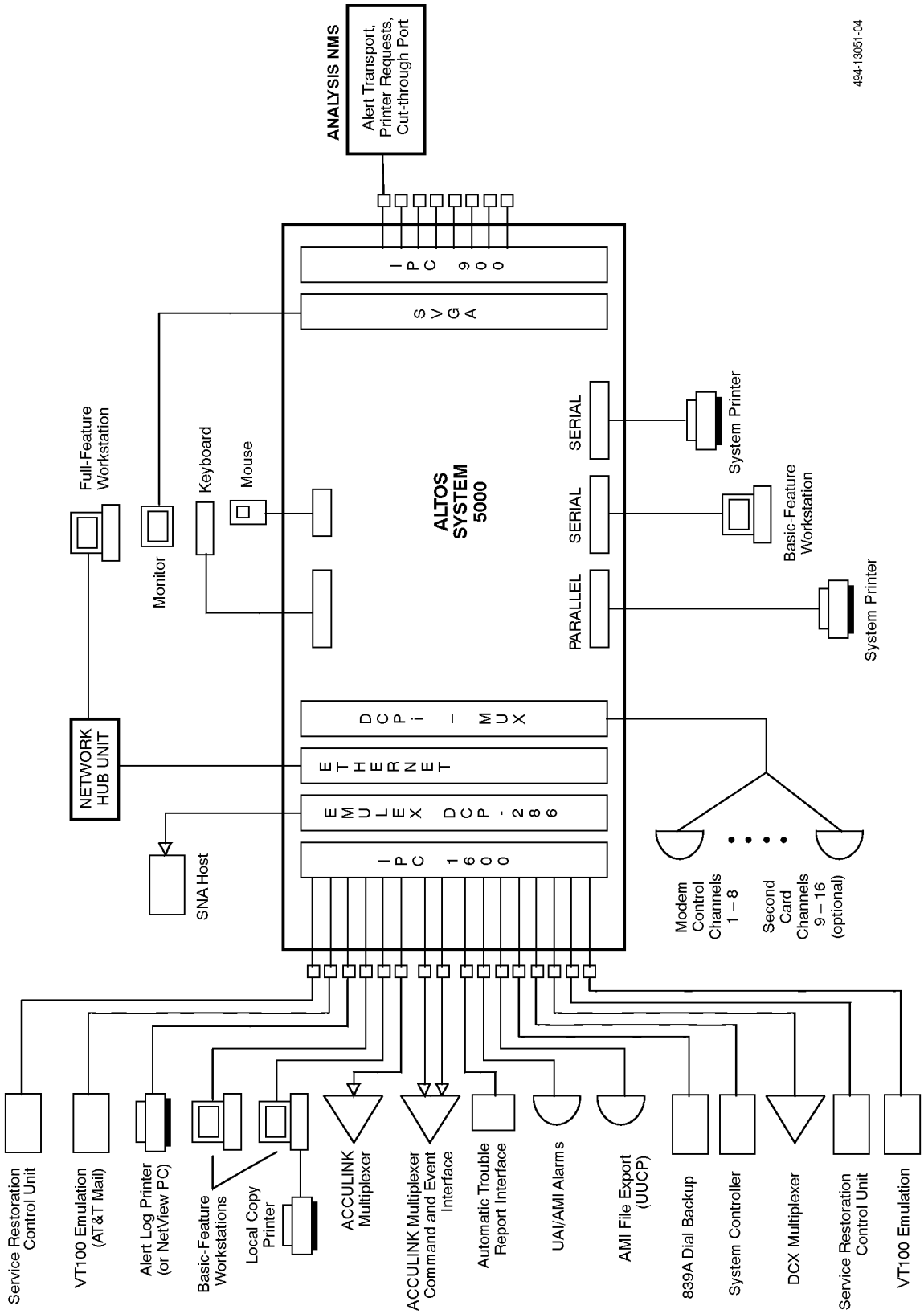


Figure 1-1. 6800 Series NMS Showing Configuration of all Ports without UIP Configured

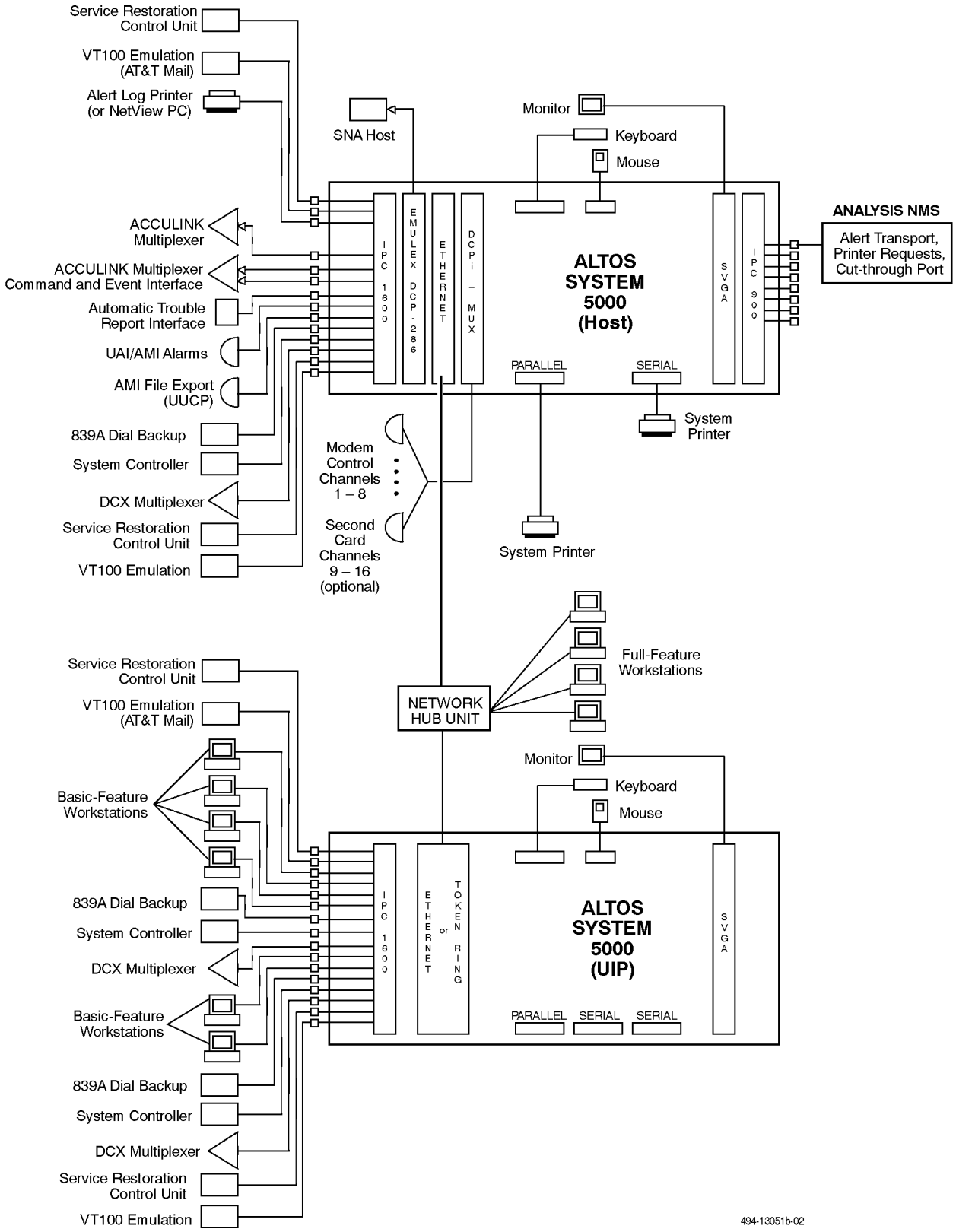


Figure 1-2. 6800 Series NMS Showing Configuration of all Ports without UIP Configured

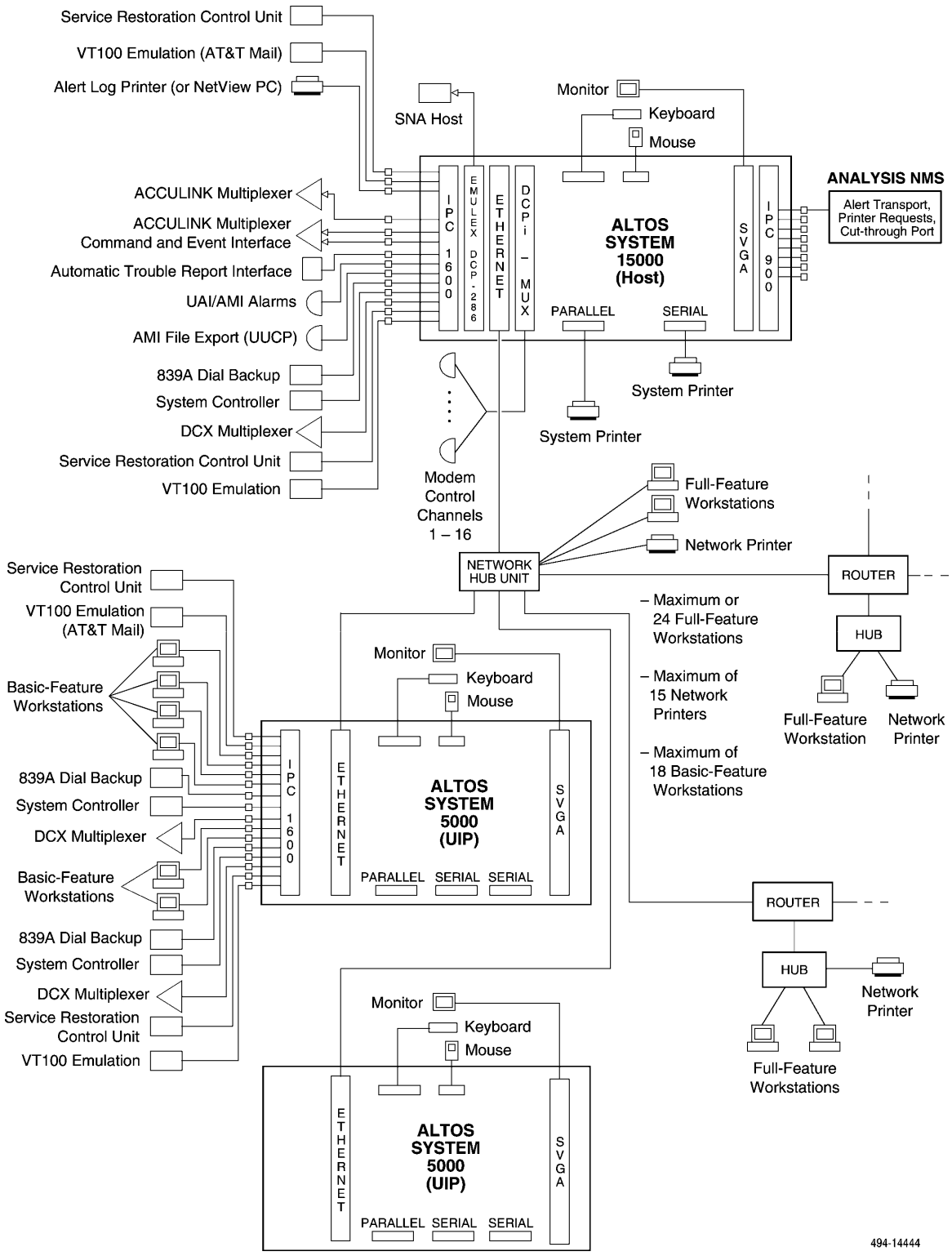


Figure 1-3. High-Capacity 6800 Series NMS Showing Configuration of all Ports with Two UIPs Configured

NMS Software

The 6800 Series NMS software includes the base software supplied with a 6800 Series system, and optional applications packages containing sets of network management features which can be purchased separately, depending on your network support needs.

Base 6800 Series NMS Application Package

Table 1-2 lists the base application package software provided with a 6800 Series NMS.

Table 1-2
6800 Series NMS Base Application Package Software

Software Package	Tasks Supported
Base Package	Manager Task Map Task Monitor Task Summary Task External Systems Task Trouble/Inventory Reports Task Performance Reports Task Trouble Tracking Task Utilities (Unix, Informix, etc.) Software Uniform Alarm Interface (UAI) Software
Modem Management	COMSPHERE 3400/4400 Series APL Modems COMSPHERE 3900 Series APL Modems DATAPHONE II APL Modems DATAPHONE II 2600, 2700 DSUs DATAPHONE II DDD Modems COMSPHERE 3500 Series DSUs COMSPHERE 3600 Series DSUs (with and without LPDA) COMSPHERE 3800 Series DDD Modems COMSPHERE 3600 Dial Backup Modules 4400 Series Service Restoration Unit (SRCU) (Alarms only) Dial Backup Unit (Single and Dual) (Alarms only) Analog Bridge (Alarms only)
Multiplexer Management	ACCULINK 731, 740, 741, 742, 74x-56K, 745 Multiplexers AT&T 719 NETWORKER (Alarms only)

Optional Software/Hardware Packages

Table 1-3 identifies the optional software/hardware packages and the devices supported by each package, based on specific network configuration support requirements.

Table 1-3
Optional Software/Hardware Packages

Software Package	Supported Tasks/Devices
SNA 3270 Emulation Package	3270 Terminal Emulation
INFORMIX SQL Software	INFORMIX® Task (under Utilities) Customized database option software
INFORMIX 4GL Software UNIX SVR 3.2 Development Software	Customized database reports Customized Trouble Tickets
NVI Software	IBM®NetView™ Interface (NVI); also requires IBM software
NMS Upgrade Option Software	Upgrade of NMS configuration
6800 Series SNMP Trap Export Software	Sends SNMP Traps to HP OpenView
6800 Series NMS 16-Control Channel Support	Adds 8 control channel support (System 5000 only)
Token Ring Network Interface Package	Switches LAN from Ethernet to Token Ring for Altos 5000 Systems only

Description of Devices Supported by NMS

The types of devices that can be managed by NMS are briefly described in this section.

NMS-Supported APL Modems

NMS supports the following APL modems:

COMSPHERE 3400/4400 Series Modems

These modems consist of 4.8 kbps point-to-point and multipoint modems, 14.4/9.6 kbps multipoint modems, and 19.2/14.4 kbps point-to-point modems. They are capable of full-duplex, synchronous data transmission over analog private lines (APL). These modems incorporate the VLSI (Very Large Scale Integration) design with new generation architecture referred to as Universal Signal Processor (USP). The USP architecture provides unparalleled processing power for superior online performance, network control, and future product enhancements.

COMSPHERE 3900 Series Modems

The COMSPHERE 3900 Series modem is a standalone or carrier-mounted device, which operates on either 2-wire PSTN or APL facilities in either synchronous or asynchronous mode. These modems are available for both point-to-point and multipoint configurations.

DATAPHONE II Analog Private Line (APL) Modems

These modems are capable of full-duplex, synchronous data transmission over analog private line channels at speeds up to 19.2 kbps. APL modems can be used as control or tributary modems in a point-to-point, multipoint, or secondary diagnostic channel using the low end of the analog private line's bandwidth. Through this secondary channel, the 6800 Series NMS is able to manage and monitor the modems.

NMS-Supported Direct Distance Dialing (DDD) Modems

NMS supports the following DDD modems:

COMSPHERE 3800 Series Direct Distance Dialing (DDD) (or Software-defined) Modems

The COMSPHERE 3800 Series DDD software-defined modem is a standalone or carrier-mounted device. There are three models available. Two models support dial, 2-wire leased, or 4-wire leased communications and also support automatic backup of the leased line. One model supports dial or 2-wire leased communications; automatic backup of the leased line is not supported.

DATAPHONE II Direct Distance Dialing (DDD) Modems

These modems are capable of full-duplex synchronous or asynchronous data transmission over the switched telecommunications network at speeds up to 9.6 kbps. The DDD modems collocated with the 6800 Series NMS have a control channel interface that allows monitoring by the 6800 Series NMS.

These modems interface with the 6800 Series NMS through the Shared Diagnostic Units (SDUs). Each SDU oversees up to eight switched network modems and are fully addressable by NMS.

NMS-Supported Data Service Units (DSUs)

NMS supports the following DSU products:

DATAPHONE II 2600 and 2700 DSUs

These DSUs are designed for multipoint and point-to-point applications. The 2600 Series DSUs provide digital, full-duplex network data transmission over the DATAPHONE Digital Service (DDS) and the ACCUNET Switched 56 Service and do not have diagnostic capabilities. The 2700 Series DSUs, with a secondary channel capability, provide digital, full-duplex synchronous data transmission over DDS facilities plus full, nondisruptive diagnostic capabilities.

COMSPHERE 3500 Series DSUs

These DSUs are capable of speeds up to 64,000 bits per second on the DATAPHONE Digital Service network or equivalent Digital Data Services network. The primary channel characteristics of these DSUs are identical to 2500 Series and 2600 Series DATAPHONE II DSUs; therefore, you can install these devices at either end of a network containing any compatible DSU. These units support both point-to-point and multipoint configurations, and can be used as either a control or a tributary in non-network managed networks. The 3500 Series DSUs have no network management capabilities except when they are used as tributaries in DATAPHONE 2600 Series networks.

COMSPHERE 3600 Series DSUs

These DSUs are capable of multispeed operations on the DATAPHONE Digital Service network or equivalent Digital Data Services network, and can operate as local area datasets (limited-distance modems). An optional integrated V.32 dial backup module (DBM) enables backup through the public switched telephone network in case of failure of the digital connection. The DSU interface to the 6800 Series NMS can be via either control channel connection when directly connected to the 6800 Series NMS, or via diagnostic channel connection when remotely connected to the 6800 Series NMS.

Paradyne APL Modems and DSUs (via ANALYSIS Gateway)

These modems consists of the MPX, LSI24, and the 3400 Series high-speed DMC protocol APL modems. These modems perform at speeds ranging from 1.2 kbps to 19.2 kbps. These speeds are accomplished by using a variety of CCITT, Paradyne proprietary and Forward Error Correcting (FEC) modulation schemes as appropriate for the specific model chosen. The modems can be controlled by NMS using the cut-through feature and ANALYSIS Gateway, by ANALYSIS NMS, or independently through the modem's Diagnostic Control Panel (DCP). The DCP allows the operator of a modem which is optioned as a control to configure, monitor, and test both the control and tributary modems in the network.

Paradyne Basic Service Unit (BSU)

Controlled by NMS via a cut-through or by ANALYSIS, these BSUs are capable of operating at 2.4, 4.8, 9.6, and 56 kbps and integrate both the Data Service Unit (DSU) and Channel Service Unit (CSU) functions in one unit. The BSU operates over the DDS network or as a limited-distance modem (LDM) for local area networks (LANs). The BSU offers both interruptive and noninterruptive testing, as well as optional remote diagnostic channel feature.

NMS-Supported Network Restoration Devices

NMS provides configuration and alert management support for the following restoration devices:

DATAPHONE II 839A Dial Backup Unit (DBU) Control Unit

The DATAPHONE II 839A is used to restore data communications when the APL facility fails. The 4-wire APL channel restoration service transfers data communication from the failed APL channel to two public switched telephone network channels with a minimum of downtime. The DATAPHONE II 839A DBU Control Unit is managed by the 6800 Series NMS on a cut-through basis by using terminal emulation; no alarms are reported to the NMS.

Paradyne Multidrop Auto-Call Unit (MACU via ANALYSIS Gateway)

The MACU restores communication to a remote location when service is interrupted due to a faulty APL. The MACU provides automated dial backup support for both point-to-point and multipoint circuits supported by NMS with cut-through sessions and ANALYSIS Gateway, or by ANALYSIS.

COMSPHERE 4400 Series Service Restoration Control Unit (SRCU)/Analog Bridge/DSUs

The SRCU provides 4-wire dial backup of faulty leased lines for both point-to-point and multipoint circuits, enabling a restoral resource for up to 64 leased lines and simultaneous restoral of up to 16 drops on point-to-point or multipoint circuits.

SRCU multipoint dial backup capabilities are expanded with the use of the Service Restoration Expansion Carrier (SREC), enabling restoral of up to 8 circuits with 16 locations on each circuit. The SREC accommodates up to 16 Analog Bridges or 32 Dial Backup Units. The SREC can also be used without the SRC (Service Restoration Carrier) to provide dedicated dial backup for modems. For these dedicated applications a modem is connected to a single Dial Backup Unit for point-to-point backup, or to an Analog Bridge for multipoint backup. Eight DBUs can be connected to a single Analog Bridge, and if two Analog Bridges are daisy-chained together, up to 16 DBUs can be connected to the Analog Bridges.

The SRCU interfaces with the 6800 Series NMS via cut-through access to the SRCU's ASCII Interface facility. If a control channel interface is also connected, the NMS can poll the SCRC and its devices for alerts.

NMS-Supported Multiplexers

NMS fully supports the following multiplexer products with alert management, diagnostic test capabilities, and configuration and control:

ACCULINK 731/740/741/742 Multiplexer

The 731/740/741/742 multiplexer is a time division multiplexer that can combine up to 4 channels (for the 731 multiplexer), 128 channels (for the 740 multiplexer) 40 channels (for the 741 multiplexer), and 32 channels (for the 742 multiplexer).

The type of channels are as follows:

- Evoice
- Voice
- Synchronous Data
- Asynchronous Data

The 731/740/741/742 is capable of multiplexing any combination of these channel types. These channels are multiplexed into a single digital stream for transmission over a T1 or a fractional T1 digital facility, also referred to as an aggregate link. The 740 can accommodate an optional redundant aggregate link to serve as a backup should the active link fail.

74x-56K ACCULINK Multiplexer

The 740-56K/741-56K multiplexer is a time division multiplexer, supporting up to 40 channels multiplexed into a single 56 kbps or 64 kbps aggregate link. The NMS supports only the 56K aggregate link. The 64K aggregate link option must be configured via the External Systems cut-through. Voice synchronous and asynchronous channels are supported. Optionally, you can use a 56K interface on a 740 chassis and expand it up to 128 channels. The channels on the ACCULINK 740-56K/741-56K multiplexer can be terminated on another 74x-56K in a point-topoint configuration. They also can be terminated on a 740/741 T1 multiplexer when Fractional T1 services are used to provide a bandwidth connection between the 56K and T1 nodes.

ACCULINK 745 Switching Multiplexer

The 745 multiplexer is an intelligent DS0 switching multiplexer that can switch up to 16 T1 links. The 745 also provides DS1 connections to Digital Access Cross Connect System (DACS), Customer Controlled Reconfiguration (CCR) and digital Private Branch Exchanges (PBXs), such as the AT&T System 75/85.

The NMS provides alert and cut-through support for the following multiplexers. Test and commands are not supported.

DATAPHONE II Series 700 Model 719/72x NETWORKER

The 719/72x is a statistical, packet-switching multiplexer that supports up to 32 independent data channels, 18 network links, or a combination of channels and links. The 719/72x NETWORKER's multilink capability can also be used to provide alternative supervisory data links (SDLs).

DATAPHONE II Series 700 Models 724/735 T1 Multiplexers

The 724/735 multiplexers use bit-interleaved time division multiplexing to concentrate up to 128 different channels of data, voice, or compressed video for transmission over 1.544 Mbps T1 facilities. The 735 supports over 500 synchronous channel rates, from 1.2 kbps to 768 kbps.

Migration

You can transfer (or migrate) the NMS databases and file information from each of the following systems to Release 4.0 of the COMSPHERE 6800 Series NMS:

- DATAPHONE II System Controller
- COMSPHERE 6800 Series NMS (6820 or 6830) Release 1
- COMSPHERE 6800 Series NMS (6820) Release 2
- COMSPHERE 6800 Series NMS Release 3.x
- ANALYSIS NMS
- COMSPHERE 6800 Series NMS Release 4.x

File migration is discussed in detail in the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide*. Briefly, the 6800 Series NMS provides migration for the following:

DATAPHONE II System Controller to 6800 Series NMS

When you migrate from the DATAPHONE II System Controller to NMS, all device profile and historical alarm information is transferred to the appropriate databases in NMS. Facility profiles are automatically created for multiplexer links based on link profiles and node connectivity data in the System Controller. Channel group tables and node connectivity data are transferred. Trouble tickets and routines cannot be transferred.

The DPII system controller system printers (AT&T 477, AT&T 583), local copy printers (AT&T 473, AT&T 570), and the optional alert log printer (AT&T 475, AT&T 572) can be re-used as system printers, and the alert log printer. However, screen prints from a full-feature workstation to the SC system printers are not supported. System controller local copy printers can be reused as 6800 local copy printers for basic-feature workstations.

Release 1.X to 6800 Series NMS

When you migrate the database from Release 1.X NMS to the Release 4.0 6800 Series NMS, all device profile and historical alarm information is transferred to the appropriate databases. Facility profiles are automatically generated for multiplexers based on device profile, link profile, and node connectivity information. Site profiles are automatically created based on site name and location information in the earlier device profiles. Channel group tables are also transferred. However, trouble tickets and routines are *not* transferred.

The following hardware components can be migrated:

- System printers and fault/alert log printers can be converted for re-use.
- The host processor can be converted for use as a full-feature workstation.
- Any 6386 full-feature workstation can be updated with Release 4.0 NMS software and then connected to the Ethernet LAN for use in Release 4.0 NMS.
- Any PC-based basic-feature workstation can be re-used as a basic-feature workstation for Release 4.0.

Release 2.0 to 6800 Series NMS

When you migrate the database from Release 2.0 6820 NMS to Release 4.0 6800 Series NMS, all device profiles, site profiles, facility profiles, vendor profiles, historical alerts, trouble tickets, user profiles and user groups, filter values, and channel group tables are transferred.

The following hardware components can be migrated:

- System printers and fault/alert log printers can be re-used.
- The host processor can be converted for use as a full-feature workstation.
- Any 6386 full-feature workstation can be updated with Release 4.0 NMS software and then connected to the Ethernet LAN for use in Release 4.0 NMS.

Release 3.X to 6800 Series NMS

When you migrate the database from Release 3.X NMS to Release 4.0 6800 Series NMS, all device profiles, site profiles, facility profiles, vendor profiles, historical alerts, trouble tickets, user profiles and user groups, filter values, and channel group tables are transferred.

The following hardware components can be migrated:

- System printers and fault/alert log printers can be re-used.
- The host processor can be converted for use as the host processor or UIP for Release 4.0.
- The basic-feature workstation can be re-used.
- The full-feature workstation can be converted for use in Release 4.0.

Release 4.X to Release 4.2

When you migrate the database from Release 4.X NMS to Release 4.2 6800 Series NMS, all device profiles, site profiles, facility profiles, vendor profiles, historical alerts, trouble tickets, user profiles and user groups, filter values, and channel group tables are transferred.

The following hardware components can be migrated:

- System printers and fault/alert log printers can be re-used.
- The host processor can be converted for use as the host processor or UIP for Release 4.2.
- The basic-feature workstation can be re-used.
- The full-feature workstation can be converted for use in Release 4.2.

ANALYSIS to 6800 Series NMS

To provide support for the ANALYSIS NMS via the 6800 Series NMS, the ANALYSIS software must be upgraded when migrating from a previous NMS release. Configuration data and new alert information is uploaded to NMS. The ANALYSIS historical alarm information cannot be uploaded to NMS.

The ANALYSIS processor remains as a gateway to your ANALYSIS-attached devices. Up to 5 terminals and 4 printers currently connected to the ANALYSIS can remain on the ANALYSIS. The number of locally-attached terminals is limited by the number of configured cut-through sessions to that ANALYSIS from the 6800 Series NMS.

Getting Started 2

Overview

This chapter provides the information and procedures for the following operations:

- NMS system start-up.
- NMS system reset.
- NMS system powerdown.
- Using windows within NMS.
- Mouse operations.
- Using the full-feature and basic-feature workstations.
- Using the 6800 Series NMS Tasks menu.
- Navigating through the NMS menu tree hierarchy.
- Selecting (invoking) NMS commands.
- Scheduling commands for execution.
- Creating, editing, displaying, listing routines.
- Editing and displaying alert-driven routines criteria.
- Selective filtering for alert-driven routines criteria.
- Alert color coding within the NMS.

Starting Up the 6800 Series NMS

The 6800 Series NMS runs on an Altos System. The start-up procedure initializes the NMS system as opposed to installation which installs the software onto your Altos system. You use the start-up procedure whenever you need to start the system; for example, after shutting down the system for maintenance or when upgrading to a new release.

The following sections provide the specific steps required to start up the 6800 Series NMS on the host computer, start-up for the full-feature workstation, and start-up for the basic-feature workstation.

6800 Series NMS Start-up from the System Console

To start up the system, perform the following steps:

1. Power on the Altos System.

> **NOTE**
>
> Insert the reset/run key in the RESET/RUN switch and make a one-quarter turn clockwise to the RUN position. Once the key is in the RUN position, the computer begins its BOOT-UP sequence. You may remove the reset/run key while the 6800 Series NMS is running to prevent unauthorized persons from easily resetting the computer.

2. During BOOT-UP, the system console on the host computer executes power-up diagnostics to test its hardware. After a delay of a few seconds, a series of messages is displayed.

   ...Graphics Controller sign-on message...

   ...memory test message...(if cold boot)...

   640K Base Memory, xxxxxxKB Extended

   80486 and external cache enabled

   Press spacebar to interrupt autoboot

> **NOTE**
>
> On the Altos System 15000, the line **"80486 and external cache enabled"** is replaced with **"External cache exists."**

At this point, there is a 30-second pause. This pause enables you to interrupt the autoboot sequence, if necessary. Do one of the following steps:

a. Let the pause time-out. The system automatically proceeds with the normal BOOT-UP sequence.

b. Press CTRL-D to force the system to immediately proceed with the normal BOOT-UP sequence, overriding the 30-second timer.

c. Press the spacebar. The boot menu is displayed. You can select one of four options (boot from hard disk, floppy, tape, or enter the BIOS setup).

Then, the following series of messages are displayed:

Booting from a Hard Disk

Altos UNIX System V/386

Boot

:

3. If you are performing normal start-up from the floppy, hard disk or tape drives, the system continues with the boot sequence. The system initializes in Single User Mode and pauses after displaying the following information lines:

   INIT: Single User Mode

   Type control-d to proceed with normal startup (or hit return for System Maintenance)

   PRESS: Enter

   before the 30-second pause expires to initialize in Single User Mode (puts the system in a state for system maintenance). To continue with normal start-up,

   PRESS: CTRL-D

   or allow the 30-second pause to time-out.

4. At the **Console Login:** prompt,

   TYPE: nms

   PRESS: Enter

   The **Password:** prompt appears.

5. At the **Password:** prompt,

   TYPE: [the password defined for the nms login]

   PRESS: Enter

   The 6800 Series NMS Menu appears (Figure 2-1).

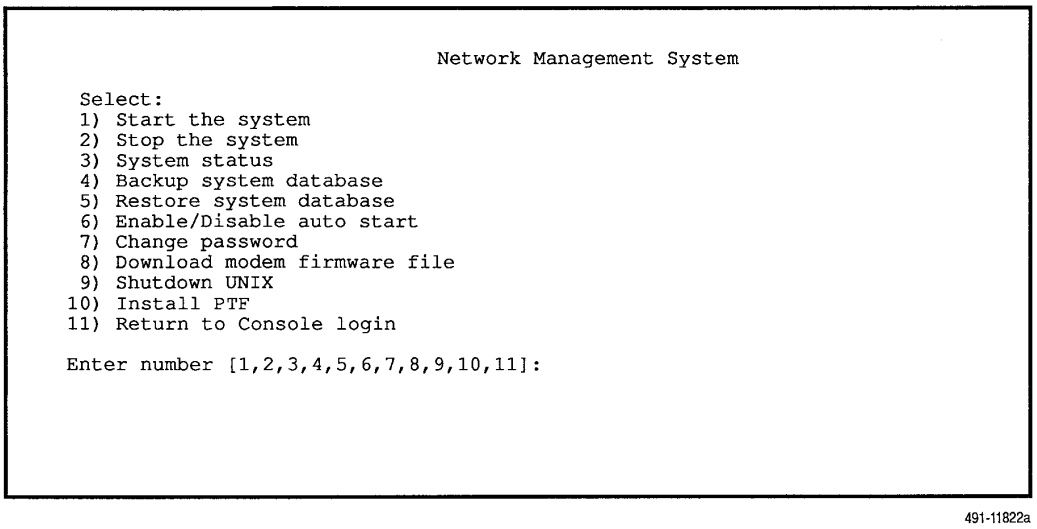


Figure 2-1. 6800 Series NMS Menu

6. To select **Start the system** from the 6800 Series NMS Menu,

   TYPE: 1

   PRESS: Enter

   The following prompts are displayed:

   Starting the AT&T Paradyne NMS system, Please wait...

   Performing database error check

   Database error check is continuing, please wait...

   .

   .

   Database error check has been completed.

   The AT&T Paradyne NMS system has been successfully started.

   Press RETURN to continue

   PRESS: Enter

   to redisplay the 6800 Series NMS Menu.

7. To select Return to Console login from the 6800 Series NMS Menu,

   TYPE: 11

   PRESS: Enter

   The following prompt appears:

   Console Login:

8. At the **Console Login:** prompt

   TYPE: ffw

   PRESS: Enter

   at the **Password:** prompt

   TYPE: [the password defined for the ffw login]

   PRESS: Enter

   The login window for the full-feature workstation appears (Figure 2-2).

Figure 2-2. Login Window

9. ***TYPE:*** admin

   the System Administrator's login, and

   PRESS: Enter

10. ***TYPE:*** [the password defined for the admin login]

    PRESS: Enter

    If you enter an incorrect login or password and want to retry, an Error window appears. Click on the **OK** button using the left mouse button. This clears the window and you are again prompted for the login. A successful login causes two windows to display: the 6800 Series NMS Button window and the 6800 Series NMS Tasks menu (Figure 2-3). For information on how to open task windows from this menu, refer to *Opening Task Windows* later in this chapter.

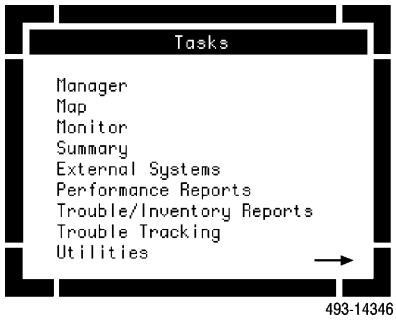


Figure 2-3. 6800 Series NMS Task Menu Window

11. Move the mouse to highlight Manager on this menu and click the left mouse button to open the Manager task window (Figure 2-4).

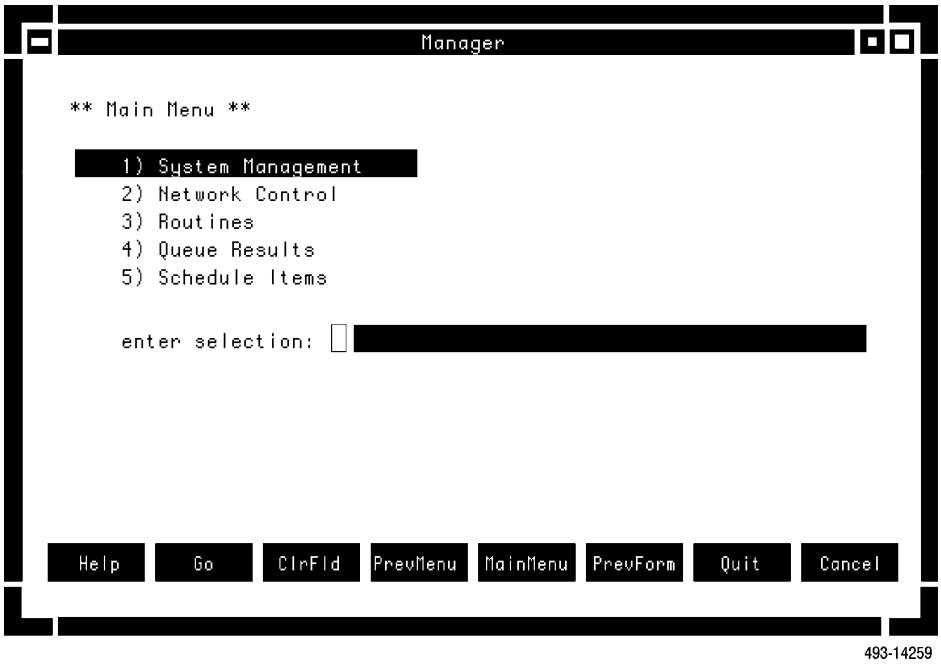


Figure 2-4. Manager Task Window

12. To change the system time, if needed, in the enter selection field,

    TYPE: sdt

    which is the command abbreviation for the Set Date/Time command.

    PRESS: Enter

An input form appears in which you can enter the date and time. Input forms are described later in this chapter.

13. ***TYPE:*** [the date and time]

    Where: the date is in **mm/dd/yy** format and the time in **hh:mm:ss** format

    PRESS: F2(Go)

    The results of the sdt command appear on a results form. For additional information on the Set Time/Date (sdt) command, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*. For information on setting up your databases and port configurations, refer to Chapter 4.

Full-Feature Workstation Start-up

The full-feature workstation should be installed and running MS-DOS and connected via Ethernet. The workstation offers a mouse-based interface and features mutli-windowing and multitasking capabilities.

To start-up the full-feature workstation, perform the following steps:

1. Power on the PC.

2. At the DOS C> prompt,

   TYPE: cd \xone

   PRESS: Enter

   This changes directory to \xone.

3. To start the workstation,

   TYPE: xone

   PRESS: Enter

   The grey workspace appears. You must wait a few minutes until the 6800 NMS login window appears as shown in Figure 2-2.

4. At the login window,

   TYPE: [an assigned admin login]

   PRESS: Enter

   TYPE: [an applicable password]

   PRESS: Enter

Basic-Feature Workstation Start-up

The basic-feature workstation (PC) should be installed and connected to the network and Microsoft Windows and the Network Management Workstation (NMW) software must also be installed on the PC. (For installation information, refer to the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide*.)

NOTE

If you are using Microsoft Windows Version 3.0 software you must set the display setting to EGA for the 6800 Series user. This is done via the Change System Settings dialogue box when running the SETUP procedure from Windows. Refer to the *Network Management Workstation Software Release 1.0 User's Guide* for additional information. Also, to determine the version of Microsoft Windows on your workstation, refer to the Microsoft Windows copyright screen.

You can use a mouse to execute Windows commands within the Windows application. To select a command using a mouse, press the left mouse button. This action takes the place of pressing the Enter key on the keyboard. Once the NMS application is successfully loaded, all functions within the NMS must be performed using the keyboard. The mouse is active only for Windows commands.

To start-up the basic-feature workstation, perform the following steps:

1. Power on the PC.

2. At the DOS prompt,

   TYPE: win nmw (if Windows 2.1)

   or

   win /r nmw (if Windows 3.0)

   PRESS: Enter

   This starts the Windows program. The Network Management Workstation copyright window appears (Figure 2-5).

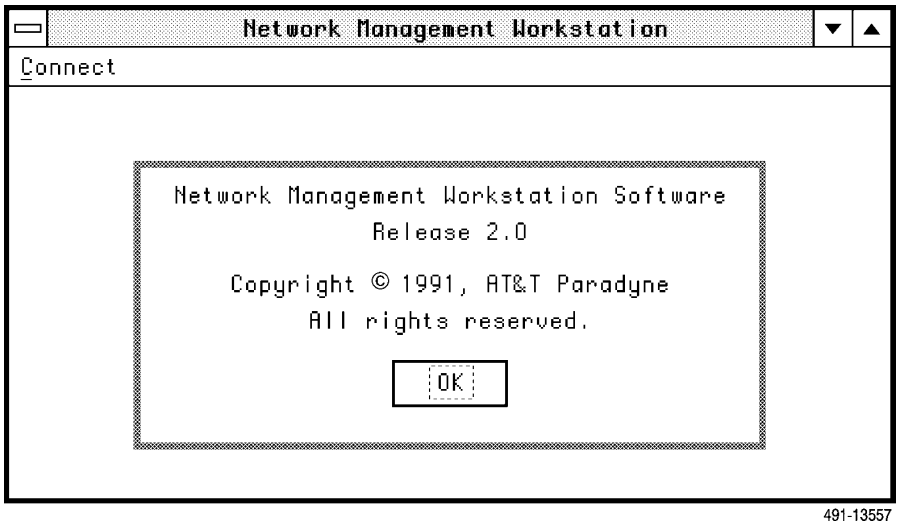


Figure 2-5. Network Management Workstation Copyright Window

3. To start the NMW software, acknowledge that you have read the copyright information by clicking on OK with the left mouse button or:

   PRESS: Enter

   The Network Management Workstation main screen appears (Figure 2-6).

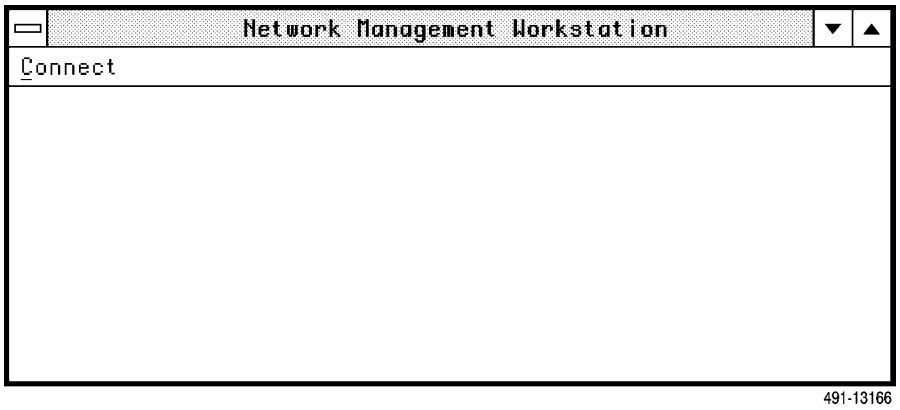


Figure 2-6. Network Management Workstation Main Window (Window Frame)

4. To initiate the connection between the PC and the NMS host computer, click on **Connect** with the left mouse button, or

   PRESS: Alt-C

5. Select the port (Port 1 or Port 2) used on the PC for the physical connection to the NMS host computer. Click on the selected port with the left mouse button, or

   PRESS: Enter

   The System Options menu appears (Figure 2-7).

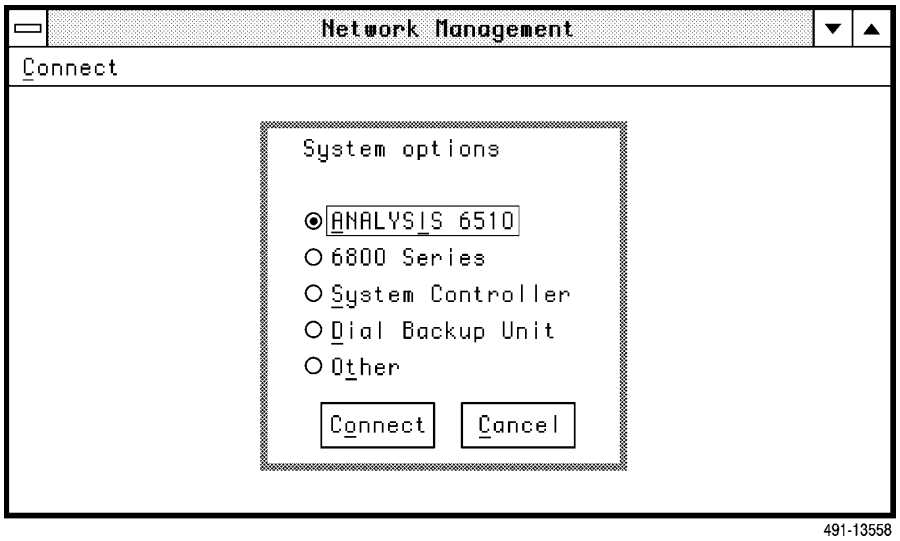


Figure 2-7. System Options Menu

6. To connect the appropriate system, highlight the **6800 Series** option using the mouse or down arrow key. Then, click on the **6800 Series** option with the left mouse button and then click on **Connect**, or

   PRESS: Enter

   The Port n – 6800 Series screen appears (Figure 2-8), where n = 1 or 2.

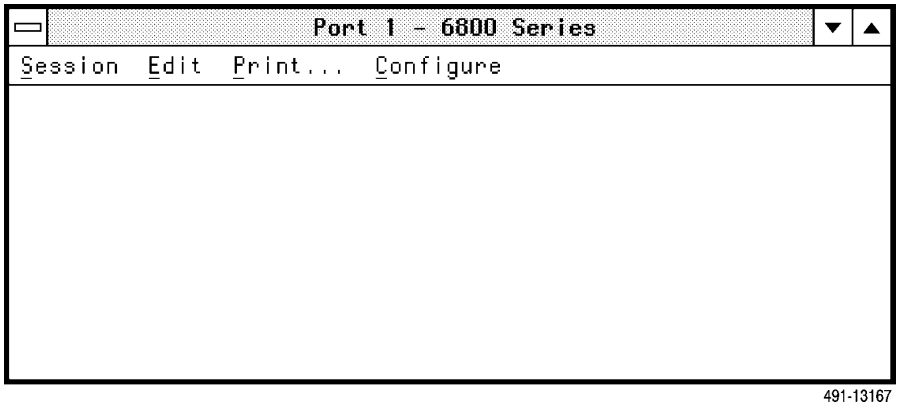


Figure 2-8. Port 1 – 6800 Series Screen (Window Frame)

7. To choose the method of terminal emulation that allows the PC to communicate with the system console on the host computer,

   PRESS: Enter

   The Terminal Type menu appears as follows,

   Terminal type:

> **NOTE**
>
> The Network Management System (NMW) workstation terminal type is a software package that runs on the PC with Microsoft Windows 3.0, and provides terminal emulation in a windowing environment. This is the standard terminal type used by the 6800 Series NMS. The cs10 and scx terminal types are provided to allow customers upgrading from an older system to continue using their existing terminals. Other terminal types may also be used.
>
> The cs10 refers to the Colorscan 10 terminal manufactured by Datamedia. This type of terminal was used with early versions of the AT&T System Controller product, and was referred to as the DATAPHONE II terminal.
>
> The scx terminal types are the System Controller workstations. These are software packages (similar to the NMW) that allow the PCs to emulate a Colorscan 10 terminal. These terminal types were used with Release 1 and Release 4 System Controller NMS, as a replacement for the Colorscan 10, and have both standalone and Microsoft Windows-based versions.
>
> Any terminal type listed in the terminfo database may be used to communicate with the system console on the host computer.

8. To select the terminal type,

   TYPE: [the appropriate terminal type number]

   PRESS: Enter

   The COMSPHERE 6800 Series NMS Login window appears (Figure 2-9).

   If using Windows 3.0, you can enlarge the window by clicking on the mouse button twice.

   If you are using Windows 2.1, you can enlarge the window if you:

   PRESS: Alt-F10

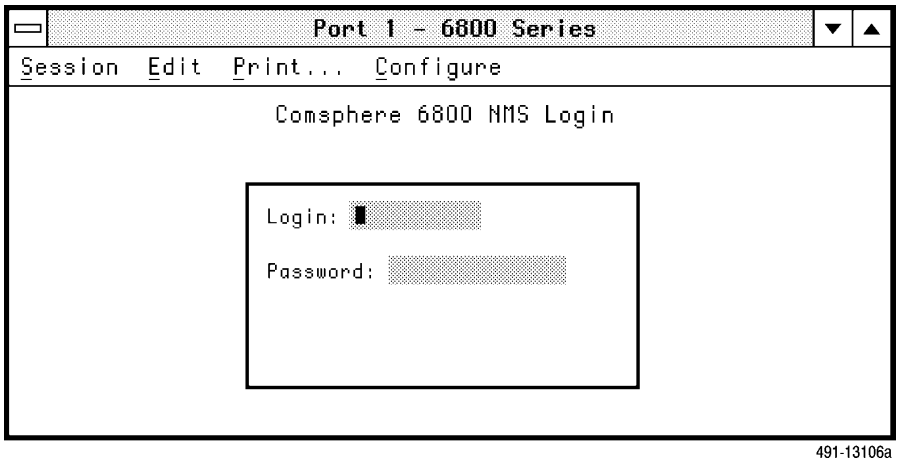


Figure 2-9. COMSPHERE 6800 Series NMS Login Window

9. At the **Login:** prompt,

   TYPE: admin

   PRESS: Enter

10. At the **Password:** prompt,

    TYPE: [the password defined for the System Administrator]

    PRESS: Enter

    The following message appears:

    Verifying Login... Please Wait..

    If the login is successful, the 6800 Series NMS Main Tasks menu appears (Figure 2-10).

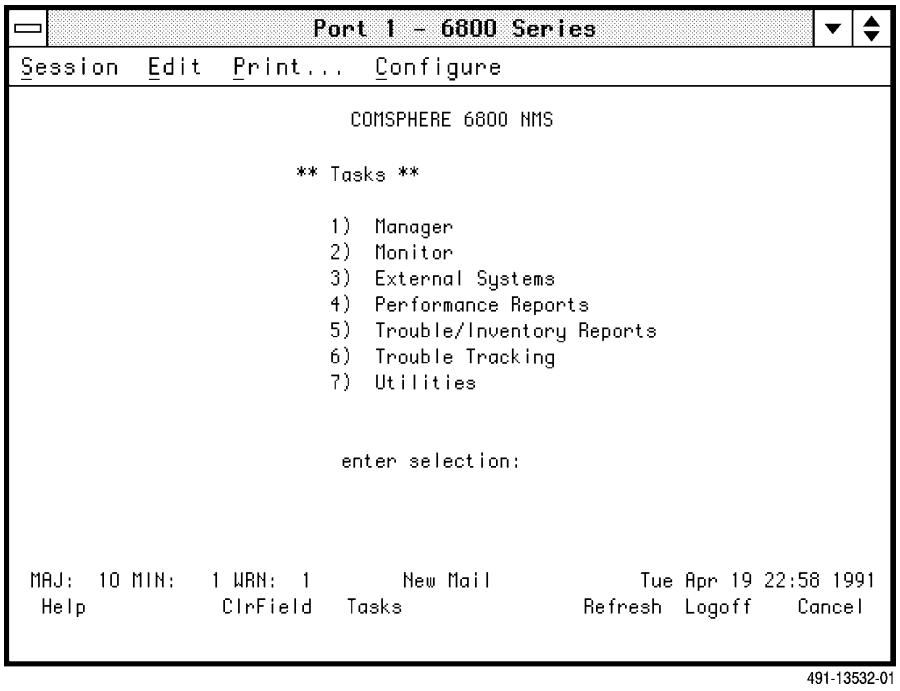


Figure 2-10. 6800 Series NMS Tasks Menu (Shown for Basic-Feature Workstations)

Stopping the 6800 Series NMS Software Application

To reset the 6800 Series NMS software application on the host computer, perform the following steps using the full-feature workstation.

> **NOTE**
>
> If you are currently in an active X-window session, proceed to Step 1. If the **Console Login:** prompt is displayed, skip to Step 2.

1. Select **Quit** from the workspace menu and confirm **OK.**

   If you logged in as ffw, you should now be at the **Console Login:** prompt. At the **Console Login:** prompt,

2. ***TYPE:*** nms

   PRESS: Enter

   This brings up the **Password:** prompt. At the **Password:** prompt,

   TYPE: [the password set up for the nms login]

   PRESS: Enter

3. To select **Stop the System** from the 6800 Series NMS Menu,

   TYPE: 2

   PRESS: Enter

   The following message appears:

   The following processes are running:
   They will be shut down? (y/n) [n]:

   To stop the system,

   TYPE: y

   The following message appears:

   Shutting down the AT&T Paradyne NMS...

   The AT&T Paradyne NMS has been shutdown.
   Press RETURN to continue

4. To continue,

   PRESS: Enter

   The 6800 Series NMS Menu appears.

5. To select **Return to Console login** from the 6800 Series NMS Menu,

   TYPE: 11

   PRESS: Enter

   The **Console Login:** prompt is now displayed.

Powering Down the 6800 Series NMS Host Computer

The system powerdown procedures bring down both the 6800 Series NMS applications software and the UNIX system software. To power down the system, you must power down the system console and all other full-feature or basic-feature workstations as applicable.

To power down the host computer, perform the following steps:

> **NOTE**
>
> If you are currently in an active X-window session, proceed to Step 1. If the **Console Login:** prompt is displayed, proceed to Step 2.

1. Select **Quit** from the workspace menu and confirm **OK**.

   If you logged in as ffw, you should be at the **Console Login:** prompt. At the **Console Login:** prompt,

2. ***TYPE:*** nms

   PRESS: Enter

The **Password:** prompt is displayed. At the **Password:** prompt,

TYPE: [the password set up by the System Administrator]

PRESS: Enter

3. To select **Stop the System** from the 6800 Series NMS Menu,

   TYPE: 2

   PRESS: Enter

   The following message appears, followed by the Start-up Menu.

   The following processes are running:
   They will be shut down? (y/n) [n]:

   To stop the system,

   TYPE: y

   The following message appears:

   Shutting down the AT&T Paradyne NMS...

   Please wait ...

   The AT&T Paradyne NMS has been shutdown.
   Press RETURN to continue

4. To continue,

   PRESS: Enter

5. To select **Shutdown UNIX®** from the 6800 Series NMS Menu,

   TYPE: 9

   PRESS: Enter

6. The following final message appears:

   Unix will now be shutdown? (y/n):

   To continue,

   TYPE: y

   The system displays the following message:

   Safe to Power off.
   Press any key to reboot.

7. To turn the Altos System computer off, set the power switch on the rear of the machine to the Off position. To reboot the computer, set the power switch to the On position. The BOOT-UP sequence automatically begins.

Shutting Down a Full-Feature Workstation

To terminate a session on a full-feature workstation, perform the following steps:

> **NOTE**
>
> **This procedure is the only one recommended for shutting down a full-feature workstation. Using a procedure other than the one described here may result in system errors.**

1. Select **Quit** from the workspace menu and Confirm **OK**.
2. Select **Quit-Xone** from the subsequent notice box.

   The MS-DOS C> prompt appears.
3. To restart the full-feature workstation at the C> prompt,

   TYPE: xone

   PRESS: Enter

Shutting Down a Basic-Feature Workstation

After you have completed the NMS tasks and are ready to leave the system, you should exit the NMS and NMW applications.

To shut down the basic-feature workstation, perform the following steps:

1. From the 6800 Series NMS Tasks menu,

   PRESS: F7

   to logoff the NMS. The NMS Logoff window appears (Figure 2-11).

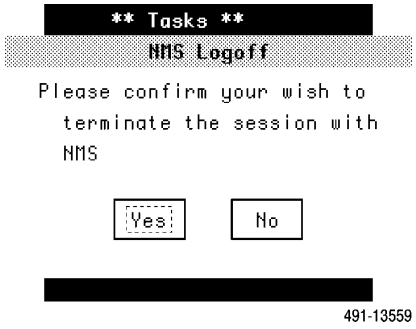


Figure 2-11. NMS Logoff Window

2. The Port n – 6800 Series window showing the confirmer appears (Figure 2-12), where n = 1 or 2. Use the arrow keys to shift between selections. To confirm that this is what you want to do and to logoff,

   PRESS: Enter

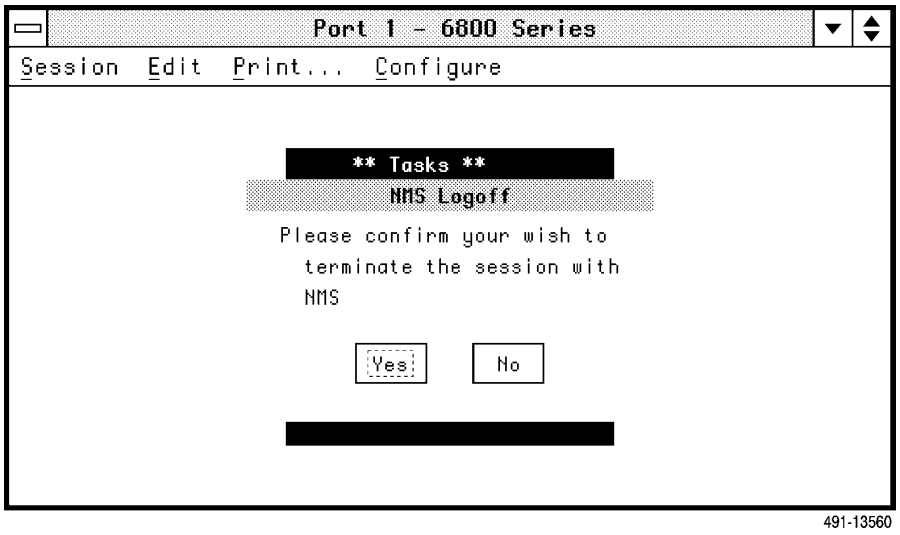


Figure 2-12. Port n – 6800 Series Window

3. To exit the session,

   PRESS: Alt-s

   or click on **Session** with the left mouse button.

   The Session menu appears (Figure 2-13).

Figure 2-13. Session Menu

4. To exit,

   PRESS: x

   or click on the **Exit** option with the left mouse button.

   The Network Management Workstation main window appears (Figure 2-14).

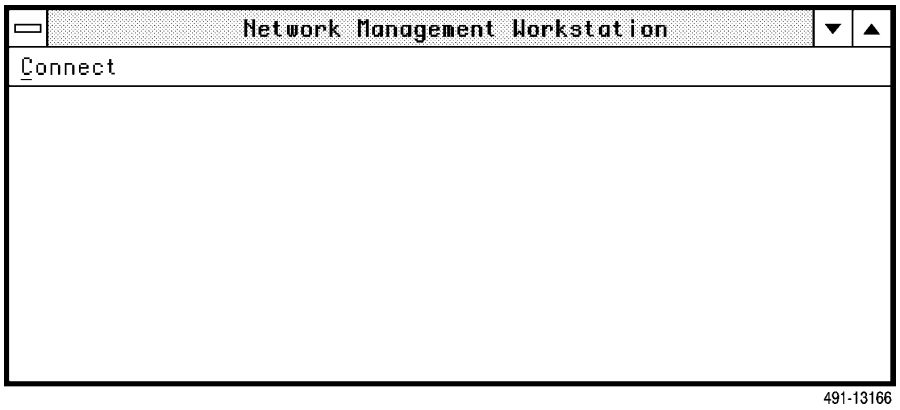


Figure 2-14. Network Management Workstation Main Window

5. To close the NMW application,

   PRESS: Alt-c

   then, to exit:

   PRESS: x

   or click on **Connect** and then on **Exit** with the left mouse button.

   The following message box (Figure 2-15) appears:

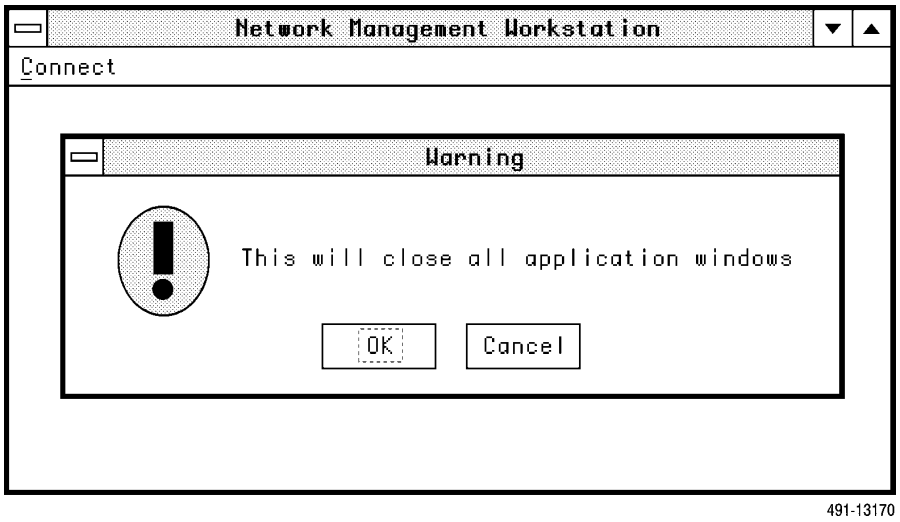


Figure 2-15. Closing Warning Message Box (Shown for Windows 3.0)

6. To close all NMW application windows:

   PRESS: Enter

   or click on **OK** with the left mouse button to confirm that this is what you want to do. The NMW application is closed and the MS-DOS Executive or AT&T Program Manager window appears.

> **NOTE**
>
> If you are using Windows 2.1 continue with Step 7. If you are using Windows 3.0, go to Step 10 at this point in the procedure.

7. For Windows 2.1 users, click on the File option with the left mouse button. Then,

   TYPE: x

   or click on **Exit** with the left mouse button.

   The End Session message box shown in Figure 2-16 appears.

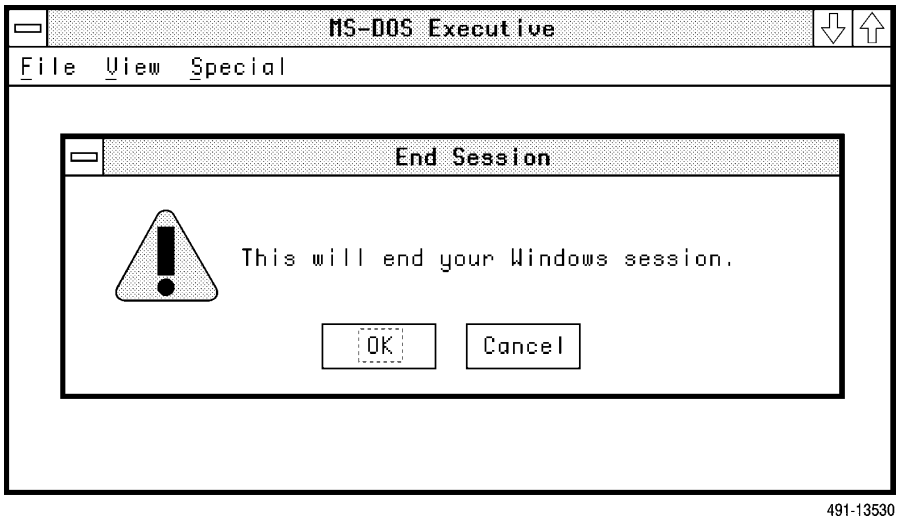


Figure 2-16. The End Session Message Box

8. In this message box,

   PRESS: Enter

   or click on **OK** with the left mouse button.

   The C:\ >prompt appears.

9. Power down your basic-feature workstation.

10. For Windows 3.0 users, click on **Program Manager** with the left mouse button.

11. Move the down arrow key to **Close** and

    PRESS: Enter

    or click on the **Close** option with the left mouse button.

12. The following Exit Windows message box (Figure 2-17) appears.

    PRESS: Enter

    or click on **OK** with the left mouse button.

    The C:\ > prompt appears.

13. Power down your basic-feature workstation.

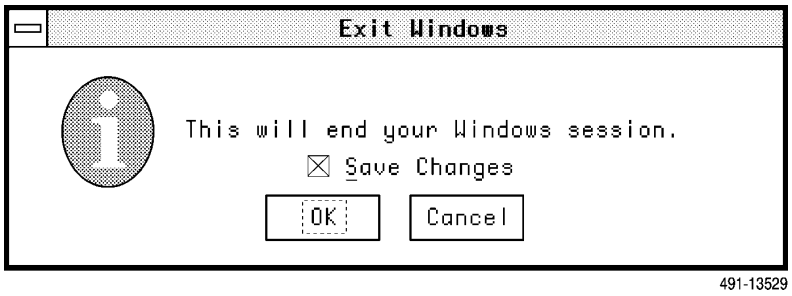


Figure 2-17. Exit Windows Message Box

Windows Within the NMS

The 6800 Series NMS windows are screens used to interact with different tasks. Window operations differ between the basic-feature and full-feature workstations. Window operations in both the basic-feature and full-feature workstations require a mouse. (For the basic-feature workstation, you can only use the mouse for window operations, not NMS task operations.)

The following sections describe mouse operations and window environments for both the basic-feature and full-feature workstations.

Mouse Operations

On the full-feature workstation, use the mouse while in the Manager, Map, Monitor, and Performance Reports tasks, and for all window control operations (e.g., resizing, closing windows, iconifying windows, and selecting options from the Workspace menu). Use the mouse on the basic-feature workstation only when using window control functions supplied by the Microsoft Windows software. The mouse is not supported on the basic-feature workstation within NMS tasks.

Looking at the mouse with the mouse cord away from you, use the buttons as follows:

left button:

Performs 6800 Series NMS functions. For example, use this button to select items from menus, icons in the Map task, window icons, etc. You can also use this button to move windows. Once you release the button, the operation is immediately executed.

middle button:

Used most often in the Map task (available only on a full-feature workstation). Use this button to select and deselect icons and to define a boxed area of a Geographic Map (this action is referred to as creating a candidate subview). Once you release this button, the box you defined remains on the screen without any operation being executed.

NOTE

You must use the left mouse button to select and execute an option to affect the area defined using the middle mouse button.

right button:

Used to restore, lower or close a window. This is done by selecting this button over a window title bar and dragging to the desired function.

NOTE

The full-feature workstation should be operated with the **Num Lock** key in the On position. The **Num Lock** key enables the numeric keypad at the far right of the keyboard. This key is automatically placed in the correct state when the workstation is started. If, after workstation start-up, **Num Lock** is toggled Off, window control functions like iconify, resize, and close will be suspended until **Num Lock** is toggled on again. The Screen input operations are not affected by the **Num Lock** setting.

Terminology for Mouse Use

The following terms are used throughout the descriptions of mouse operations:

dragging

Pressing and holding down the left button and then pulling the mouse over a flat surface without lifting it. (Typically, you use this operation to move or resize a window, or to zoom in on a particular area of the Geographic Map). The phrase ‘‘drag the mouse” implies this activity.

pointing

Moving the mouse to position the cursor at a specific point on the screen. The phrase ‘‘point the mouse” implies this activity.

click

Quickly pressing and then releasing the left mouse button. The phrase ‘‘click on” an option, icon, etc. implies this activity.

double click

Quickly pressing and releasing the left mouse button twice. The phrase ‘‘double click” on an icon, etc. (for example, double clicking on the down arrow key on a basic-feature workstation window frame) implies this activity.

For additional information on using a mouse, refer to your mouse User’s Manual.

Basic-Feature Workstation Windows

Microsoft® Windows controls the windowing environment on the basic-feature workstation. On this workstation, you can only open one window at a time for NMS applications. You can open additional windows concurrently for non-6800 Series applications.

The mouse can be used on the basic-feature workstation when setting up the Microsoft Windows software and when executing functions that are Microsoft Windows related (e.g., using the window icons, explained in this section). When you access the NMS applications via the Microsoft Windows environment, all functions are controlled via your keyboard.

The Microsoft Windows package provides icons for opening up the Microsoft Windows Control menu, and iconifying (maximizing/minimizing) open windows and opening iconified windows. These icons are labeled in Figure 2-18, and briefly described following the illustration.

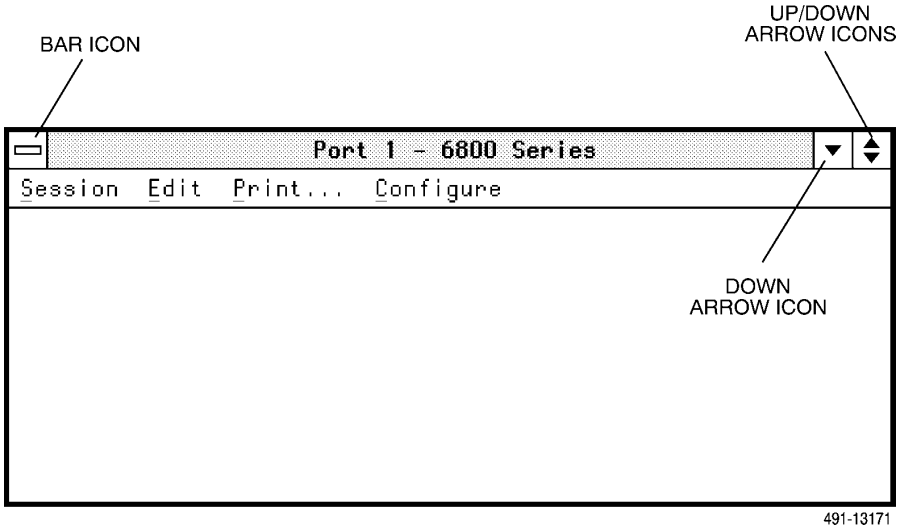


Figure 2-18. Microsoft Windows (2.1) Window Frame with Icons

Bar Icon

Clicking on this bar opens the Microsoft Windows control menu.

Down Arrow Icon

The Down Arrow icon minimizes (or iconifies) the window currently open on your screen. An iconified window is an open window that is visually collapsed into an icon on your display screen to conserve viewing space. Clicking on this icon once when a window has been iconified brings up the Microsoft Windows Control menu. Double clicking (clicking on the left mouse button twice in quick succession) reopens the iconified window.

Up/Down Arrow Icons (Maximize and Minimize Icons)

The Up (maximize) and Down (minimize) Arrow icons enlarge or reduce the size of the open window.

Full-Feature Workstation Windows

The X-Window System is the windowing environment on the full-feature workstation. You can open multiple windows into a single task or into different tasks.

Although multiple windows can be open simultaneously on a workstation, only one window can be active at any given time; that is, accepting keyboard input. When you first open a task window, it automatically becomes the active window. A window can be activated manually by clicking on the title bar.

NMS automatically updates the contents of all open windows, whether they are inactive or iconified.

A Sun Workstation® (when used as a full-feature workstation) uses the OPEN LOOK® Graphical User Interface. This manual describes the OSF/Motif Graphical Interface. For information on OPEN LOOK, see the your OPEN LOOK documentation.

NOTE

The full-feature workstation should be operated with the **Num Lock** key in the On position. The **Num Lock** key enables the numeric keypad at the far right of the keyboard. This key is automatically placed in the correct state when the workstation is started. If, after workstation start-up, **Num Lock** is toggled Off, window control functions like iconify, resize, and close will be suspended until **Num Lock** is toggled on again. The Screen input operations are not affected by the **Num Lock** setting.

Full-Feature Workstation Window Icons and Command Buttons

The full-feature workstation provides task windows, menus, and symbols to help manage windows. The Map and Monitor task windows, pop-up menus, and form helps also utilize scroll bars (described later in Chapter 6). Figure 2-19 shows the labels for the window, menu, and symbols.

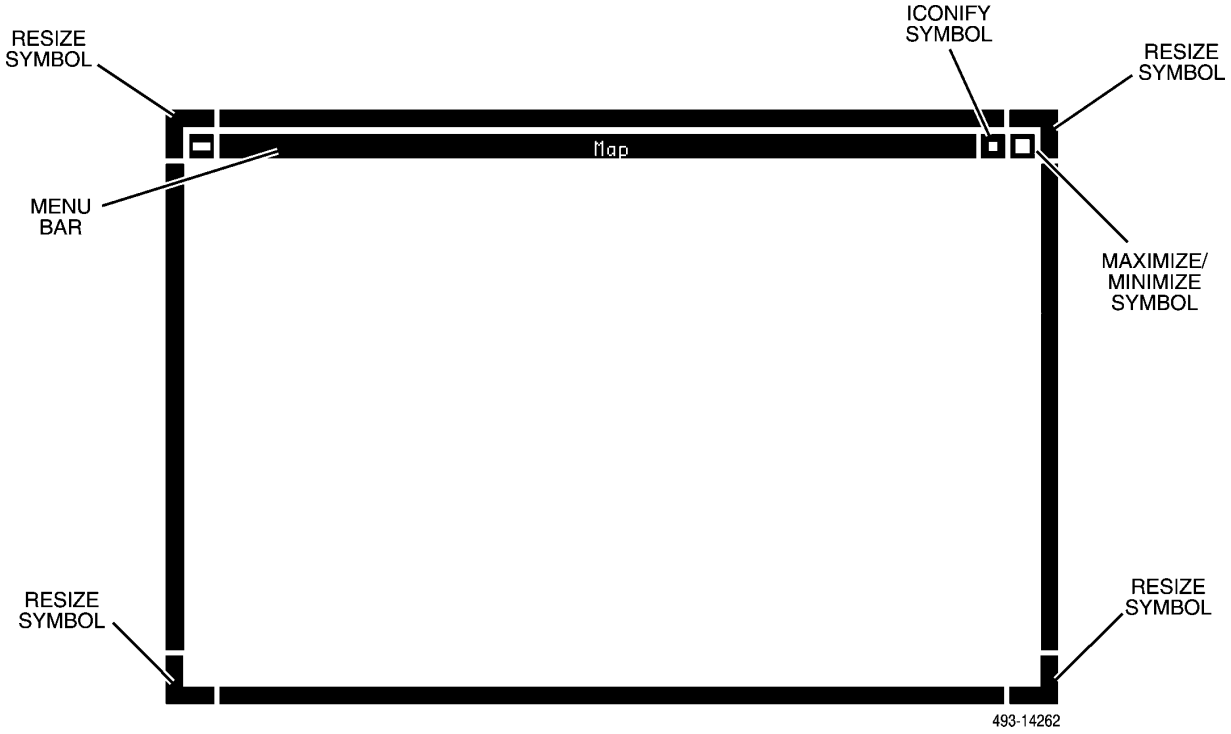


Figure 2-19. Windows, Menus and Symbols on a Full-Feature Workstation

The windows, menu and symbols are described as follows.

Symbols

Resize Symbols

You can resize the Map, Monitor, Summary task windows, and some pop-up menus using the resize symbols. These symbols are located in each of the four corners of the window. To resize a window, position the mouse pointer on one of these symbols. Then press and hold down the left mouse button and drag the mouse. This causes the window to move in the direction of the selected corner. Releasing the mouse button repositions the window on the screen. If you drag the diagonally opposite corner of the window in or out, you change the size of the screen accordingly.

In the Geographic Map, the view of the display is resized to stay proportional to the window size.

Window resizing can also affect the display of icons in the map view. For example, if you downsize the window of the current Geographic Map view, the map resizes to fit the window and closely located single site icons may be changed automatically by the system to a cluster icon (see *Cluster Icons*, in Chapter 6).

NOTE

Some windows have maximum and minimum sizes. For example, the Summary window comes up at its maximum size and the Monitor window has a maximum width but not height. If you try to resize a window beyond its constraints, the attempt is ignored.

Maximize/Minimize Symbol

The Maximize/Minimize symbol toggles the Map and Monitor windows to the largest allowable size and back again. A maximized window can also be returned to its original size by selecting the Restore option from the windows menu.

Iconify Symbol

The Iconify symbol collapses an open window into an icon. The window collapses into a small graphic symbol, and appears in the upper right corner of the screen in the first available slot from right to left. All system processes associated with the window continue. To return the icon to full window size, double click on the icon itself, or select the Restore option from the icon's menu.

New Mail Symbol

This symbol only appears when new mail has arrived. The new mail symbol appears in the upper left-hand corner of the screen.

Button Window

Help

Click on the Help button to display general help information.

Tasks

Click on the Tasks button to display the 6800 Series NMS Tasks menu.

Logoff

Click on the Logoff button to terminate the NMS session. NMS prompts for confirmation before terminating the session.

Workspace Menu

Shuffle Up

Selecting Shuffle Up changes the order of the stacked windows by moving the window to the top. The new window on top becomes the active window.

Shuffle Down

Selecting Shuffle Down changes the order of the stacked windows by moving the active window (i.e., the top window) to the bottom and the second window in the stack to the top. The new window on top becomes active.

Refresh

Selecting Refresh redraws the entire screen, including the active and inactive windows.

Print

Selecting Print initiates a screen capture. The captured screen is printed on the local copy printer. This option is only available if a printer port has already been configured.

Quit

Selecting Quit allows you to quit the NMS. A confirmation prompt will appear before you can quit. Note that XONE remains up and running.

Help Feature

NMS provides online Help to assist you in command input and execution. You can access help from windows, forms, and from fields on a form.

Accessing Help in Windows

Help can be accessed from the following windows:

- From the Button window, the Manager window, and the Performance Reports window.

  By clicking on the Help button on these windows, NMS displays a help screen describing the buttons and function keys displayed on the window. Note that for the Manager and Performance Reports window, the Help button may also be invoked by pressing the **F1** function key.

- From the Map, Summary, Monitor, and External System windows.

  By pressing the **F12** function key or by pressing the key sequence **ESC ?**, task help information is displayed (i.e., a screen is displayed describing the specific task selected).

> **NOTE**
>
> Whenever this document directs you to use the key sequence **ESC ?**, you must press **ESC SHIFT ?**.

- From the Trouble/Inventory Reports and Trouble Tracking windows.

  By pressing the **F1** function key, **F12** function key, or the **ESC ?** sequence, task help information is displayed.

Accessing Help in Forms

Help can be accessed from within the following forms (input and results forms):

- From the forms associated with the Manager and Performance Reports tasks, form help (context-sensitive) is accessed by pressing the **F12** function key or by typing the sequence **ESC ?**.
- From the Trouble/Inventory Reports and Trouble Tracking forms, press the **F1** function key.

Form help includes a general description of the form currently displayed. The form help text for input forms also includes general descriptions of how to enter input, how to access field help, and the types of field help available (selectable menu vs. field help text).

Accessing Help in Fields

Help can be accessed from fields on a form by selecting field labels with the mouse or by typing **?** in the input field for which help is needed.

For tabular fields using a full-feature workstation and the mouse-supported tasks, the column label should be selected. For basic-feature workstations and the Trouble/Inventory Reports and Trouble Tracking tasks, type ? in a field within a column. Refer to Figure 2-20 to clarify selecting fields listed in tabular form.

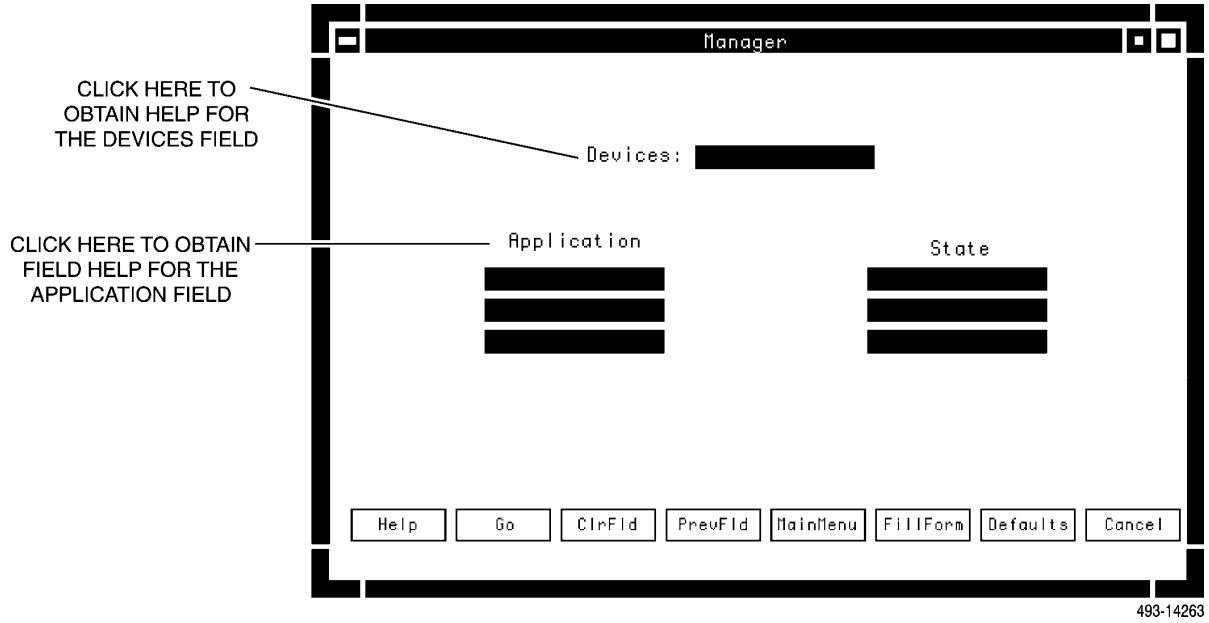


Figure 2-20. Selecting Fields Listed in Tabular Form

Each field that accepts user input has associated field help. Depending on the type of field (either fixed parameter or variable parameter, i.e., a value within a range of values), field help is either a selectable menu of valid field entries, or a text message which describes the valid input format(s) or entries.

Using Pop-up Menus in Mouse-Supported Tasks

The mouse-supported tasks provide pop-up menus which list valid selections for a form field. You can display a pop-up menu by clicking on the field. To choose a selection from the pop-up menu, click on the selection. NMS automatically populates the selected field with the selection from the pop-up menu.

Using Pop-up Menus in the Trouble/Inventory Reports and Trouble Tracking Tasks

The Trouble/Inventory Reports and Trouble Tracking tasks provide pop-up menus for form fields. You display a pop-up menu by placing a question mark (?) in a field and pressing **Enter**. The pop-up menu appears as a checklist, with blank spaces appearing to the left of each item (Figure 2-21).

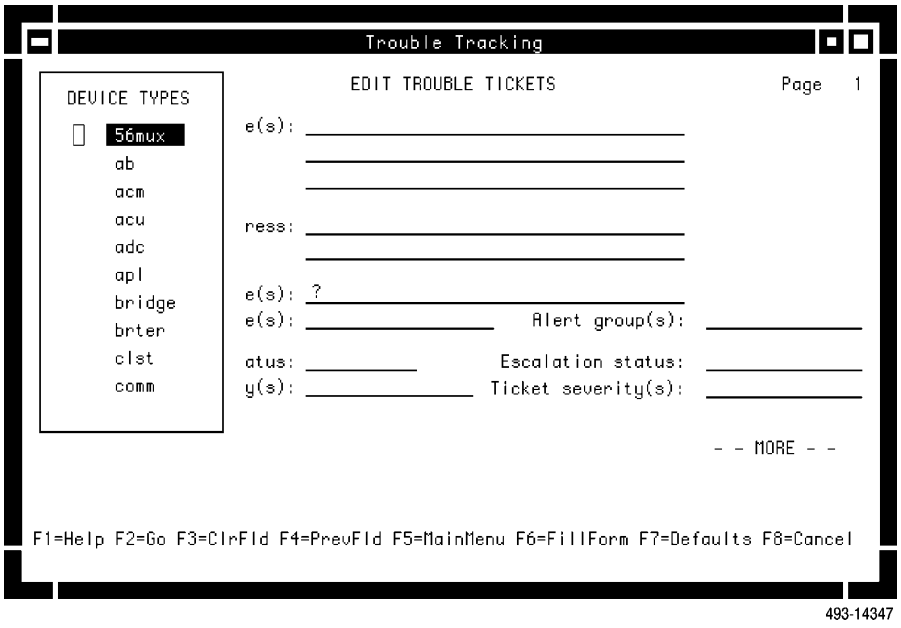


Figure 2-21. Sample Pop-Up Menu for Trouble/Inventory Reports and Trouble Tracking Tasks

To select an item on the pop-up menu, place an **x** in the blank space to the left of each item you want to select. To deselect an item, place the cursor in the blank space next to the item you want to deselect and clear the field using the **F3** key or press the spacebar. If the spacebar is used, the cursor automatically advances to the next field.

Once you have selected an item(s) on the pop-up menu, press the **F2** key. The selected item(s) is displayed on the form field and the cursor is positioned at the beginning of the field. When entering a question mark (?) in fields that do not support a pop-up menu, the system displays help information on the format for these fields.

The 6800 Series NMS Tasks Menu

The 6800 Series NMS Tasks menu (Figure 2-22) is the main menu for the system. This menu appears when you successfully log on to the NMS. You select all major NMS task selections from this menu.

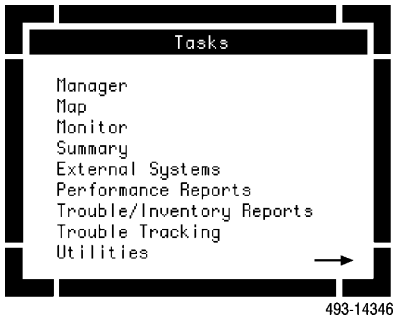


Figure 2-22. 6800 Series NMS Tasks Menu Window on a Full-Feature Workstation

You can have up to five task windows open simultaneously based on the following constraints.

- You can have two instances of any task opened at a time, except for the Map, Monitor, and Summary tasks.
- For the Map task, you can open one map from within the Map task.
- You can only have one Monitor task open at a time.
- You can only have one Summary task open at a time.
- From within the Utilities task, you can open the options as follows: two UNIX, one Read Mail, one Send Mail, one NMS Users, one Printer Status, and one Move Print Jobs.

NOTE

If you open the maximum allowed instances of a task, that task option is no longer displayed in the 6800 Series NMS Tasks menu. The task name is not redisplayed until you close one or more of the task windows.

NMS Task Descriptions

This manual describes the NMS tasks, listed on the 6800 Series NMS Tasks menu, in separate chapters. The user interface considerations when using these tasks, based on the type of workstation, are described later in this chapter. NMS tasks are described as follows.

Manager Task

This task provides **System Management**, **Network Control**, **Routines**, **Queue Results**, and **Scheduled Items** functions for NMS. Information on these functions is provided in this chapter as well as Chapter 3, Chapter 4 and Chapter 5 of this manual. Descriptions of the commands in **System Management**, **Routines**, **Queue Results**, and **Scheduled Items**, are provided in the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*. Commands under Network Control are described in their device-related reference manuals, i.e., *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual* or *COMSPHERE 6800 Series Network Management System Multiplexer Command Reference Manua*l.

Map, Monitor, and Summary Tasks

The Map task provides Geographic Map and Connectivity Map displays and textual equipment (Object) lists and dynamic alert status. The Monitor task provides a dynamic textual list of active alerts. The Summary task is a non-interactive display which provides dynamic counts of active alerts. These tasks are described in Chapter 6 of this manual.

External Systems

The External Systems task provides cut-through access to other systems, such as ANALYSIS NMS. Information on this task is provided in Chapter 3.

Performance Reports

The Performance Reports task provides access to alert and trending reports, call statistics, and multiplexer performance reports. This window provides the same functionality as the Manager window; the only difference is that the initial menu display is the Performance Reports submenu. Chapter 8 of this manual provides information on generating reports as well as examples. Descriptions of the actual reports input and results forms are provided in their device-related reference manuals as follows:

- Descriptions of the commands used to generate the Alert and Trending Reports and the Call Statistics Reports are provided in the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual*.
- Descriptions of the commands used to generate Multiplexer Performance Reports are provided in the *COMSPHERE 6800 Series Network Management System Multiplexer Command Reference Manual*.

Trouble/Inventory Reports

The Trouble/Inventory Reports task is used to generate Alert History, Inventory, and Trouble Tracking Reports. Chapter 8 in this manual provides information for generating these reports as well as examples. Descriptions of the actual reports input and results forms are provided in the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

Trouble Tracking

The Trouble Tracking task is used to report and manage network problems through trouble ticketing. The commands available from this task are used to create, delete, display, and edit trouble tickets. Chapter 7 in this manual provides information on this task. Descriptions of the commands for Trouble Tracking are provided in the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

Utilities

The Utilities task provides access to UNIX, INFORMIX, mail, NMS user, printer functions, and multiplexer utilities. Chapter 9 provides information on using this task.

Opening Task Windows

Open Task windows by selecting a task name from a task menu.

Full-feature workstation users open a task from the 6800 Series NMS Tasks menu by clicking on the task name with the left mouse button. Basic-feature workstation users can enter the number of the selection in the **Enter selection** field and then press the **Enter** key. Optionally, basic-feature workstation users can use the up/down arrow keys to highlight a task selection on the screen. Then, invoke the task by pressing the **Enter** key.

NMS Menu Tree Hierarchy

The NMS menu hierarchy is illustrated in the *COMSPHERE 6800 Series Network Management System Quick Reference Guide*. It shows a menu path to all tasks, their options and commands supported by the NMS.

User Interface on a Full-Feature Workstation

When using the full-feature workstation, the user interface differs based on the task. You can use the mouse in Manager, Map, Monitor, Summary, Performance Reports, External Systems, and Utilities tasks but not in the Trouble/Inventory Reports and Trouble Tracking tasks. The following sections describe the various user interfaces used by different NMS tasks on a full-feature workstation.

NOTE

Pressing the Pause/Break key changes the meaning of the function keys. For example, if you are in a UNIX window and you press the Pause/Break key (rather than the DEL key), and then open a Manager window, pressing the PgDn key causes the system to recognize a "3" rather than a page down instruction. Pressing the Pause/Break key a second time changes the function keys back to their original meanings.

Key Descriptions for Menu Displays

The function keys available for use in the NMS menus are listed at the bottom of the window. These functions keys can be selected via a mouse, or by pressing the corresponding keyboard function key. These functions are defined as follows:

Help (F1)

Displays a pop-up Help screen, explaining the function keys and how to invoke the Help feature. On a full-feature workstation, it defines the Task Menu screen functions: Tasks, Help, and Logoff.

Go (F2)

Instructs the system to execute a command.

ClrFld (F3)

Clear Field. Clears the information from the selected field and positions the cursor at the first character position of the field.

PrevMenu (F4)

Previous Menu. Displays the previously displayed menu.

MainMenu (F5)

Main Menu. Displays the main menu of the task.

PrevForm (F6)

Previous Form. Displays the input form of the command last executed.

Quit (F7)

On a full-feature workstation, Quit (F7) closes the current task. On a basic-feature workstation, Quit (F7) closes the task and displays the 6800 Series NMS Tasks menu. (This key is displayed only at the main menu level.)

Cancel (F8)

Cancels any command in progress and brings up the previously-displayed menu.

Key Descriptions for Input Forms

The function keys available when using input forms are described as follows:

Help (F1)

Displays a pop-up Help screen, explaining the function keys and how to invoke the Help feature.

Go (F2)

Instructs the system to execute a command. If you click on **Go** (or press **F2**) but the input on a command form is incomplete or incorrect, the command is not executed. You receive a validation error message describing the error.

ClrFld (F3)

Clear Field. Clears the information from the selected field and positions the cursor at the first character position of the field.

PrevFld (F4)

Moves the cursor to the previous input field.

MainMenu (F5)

Cancels the current command and returns you to the Manager main menu.

FillForm (F6)

Fills the input fields with the common values from the previous input form. This key is useful if you are performing several executions of the same command and not all fields need to be changed.

Defaults (F7)

Fills the input fields with system-provided default values. Fields that have no default values remain unaffected.

Cancel (F8)

Cancels the current command and returns you to the previous menu.

Key Descriptions for Results Forms

The function keys available when using results forms are described as follows:

Help (F1)

Displays a pop-up Help screen, explaining the function keys and how to invoke the Help feature.

PrevMenu (F4)

Previous Menu. Displays the previously displayed menu.

MainMenu (F5)

Main Menu. Displays the main menu of the task.

PrevForm (F6)

Previous Form. Displays the input form of the command last executed. If the task window is newly-opened (no commands have been executed yet), pressing Cancel (F8) cancels the current command and returns you to the previous menu.

Manager Task User Interface

This task supports the use of the mouse on the full-feature workstation. When you select the Manager task from the 6800 Series NMS Tasks menu, the window appears as shown in Figure 2-23.

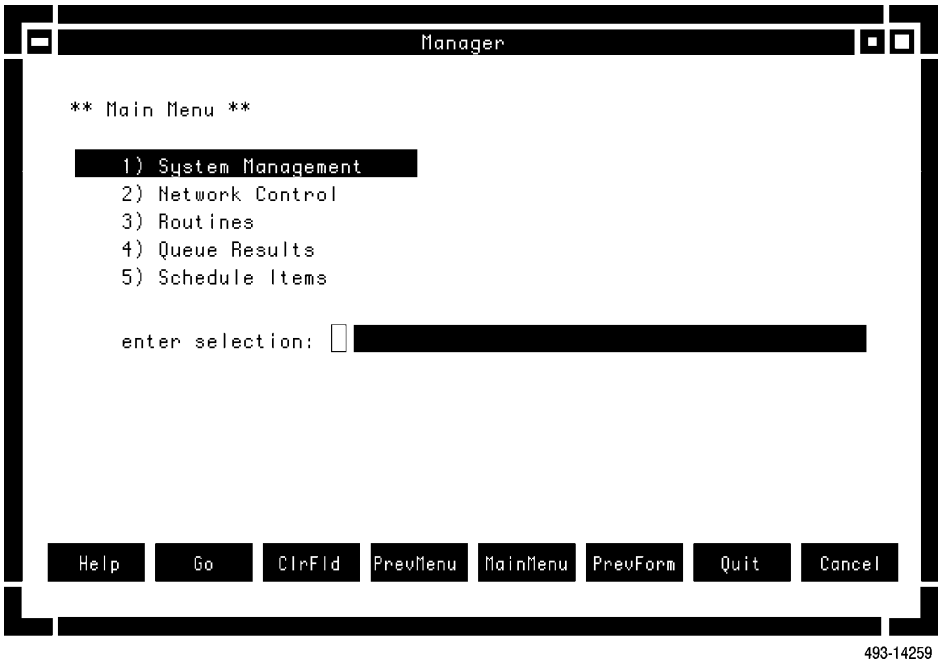


Figure 2-23. Manager Task Window on a Full-Feature Workstation

Map, Monitor, and Summary Task User Interfaces

The Map and Monitor tasks provide user interface support via the mouse. In the Monitor task, the Monitor scrolls as new alerts are reported. Descriptions of these tasks and the user interface considerations when using these tasks are provided in Chapter 6.

The Summary task is a non-interactive display which provides dynamic counts of active alerts. Refer to Chapter 6 for additional information on this task.

External Systems Task User Interface

The External Systems task provides cut-through access to other systems. You can establish cut-through sessions from either the 6800 Series NMS Task menu by selecting the **External Systems** selection or from the Map task by selecting a device managed by a supported external system and then selecting the **Network Control** selection from the device object list. Once you access the selected system, you are under the control of that system's environment.

Refer to Chapter 3 in this manual for notes on external system interfaces to external systems supported by NMS via cut-through sessions.

Performance Reports User Interface

The Performance Reports task provides access to alert and trending reports, call statistics, and multiplexer performance reports. Functionally, this menu is the same as the Performance Reports menu, under **Network Control** in the Manager task. The function keys available for use in this task are the same as those used by the Manager task. Refer to the section *Manager Task User Interface* for more information.

Trouble/Inventory Reports and Trouble Tracking Tasks User Interface

You interface with the Trouble/Inventory Reports task and the Trouble Tracking task via the keyboard. These tasks do not support the use of the mouse.

When you select the Trouble/Inventory Reports task, the window appears as shown in Figure 2-24. When you select the Trouble Tracking task, the Trouble Tracking window appears as shown in Figure 2-25. The function key options, shown at the bottom of the windows, are identical to the function key options used in the Manager task, except **Cancel(F8)** is not available and you must use the keyboard to select the option. Refer to the previous discussion of these function keys under *Manager Task User Interface*.

You access all Help features (form and field help) from within these tasks as you would from a basic-feature workstation. Form help is accessed by entering **ESC ?** (or pressing the **F12** function key), and field help is accessed by entering a **?**.

NOTE

The Trouble/Inventory Reports and Trouble Tracking tasks *do not* support the F8 function key (Cancel) within their main menus, but do support this **F8** key function on their submenus and results forms.

Once a transaction is executed from an input form, F8 (Cancel) does not work. Pressing F8 during execution cancels the results form once the transaction completes.

In addition, to access form help for forms associated with the Trouble/Inventory Reports and Trouble Tracking tasks, you must use the **F1** function key.

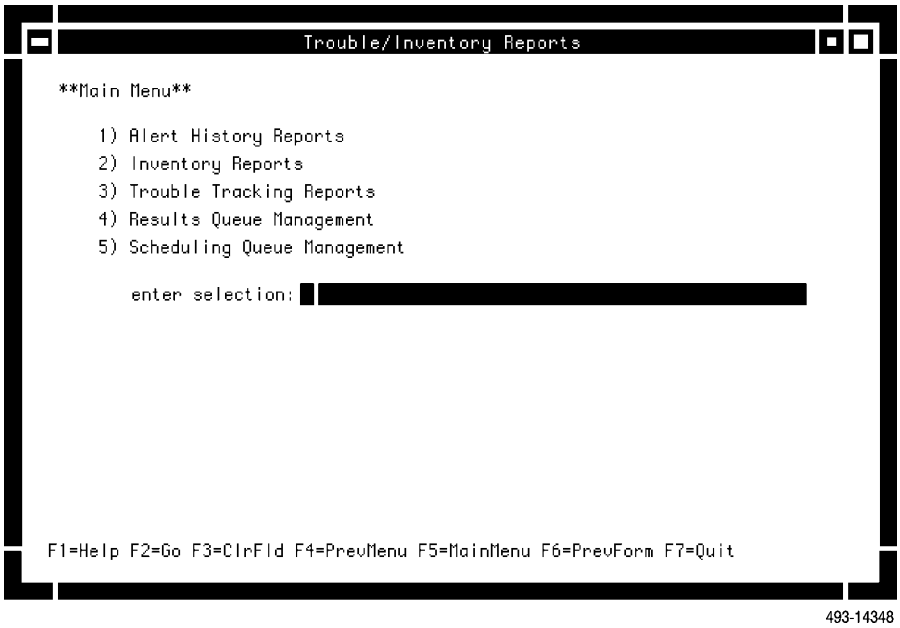


Figure 2-24. Trouble/Inventory Report Task Window on the Full-Feature Workstation

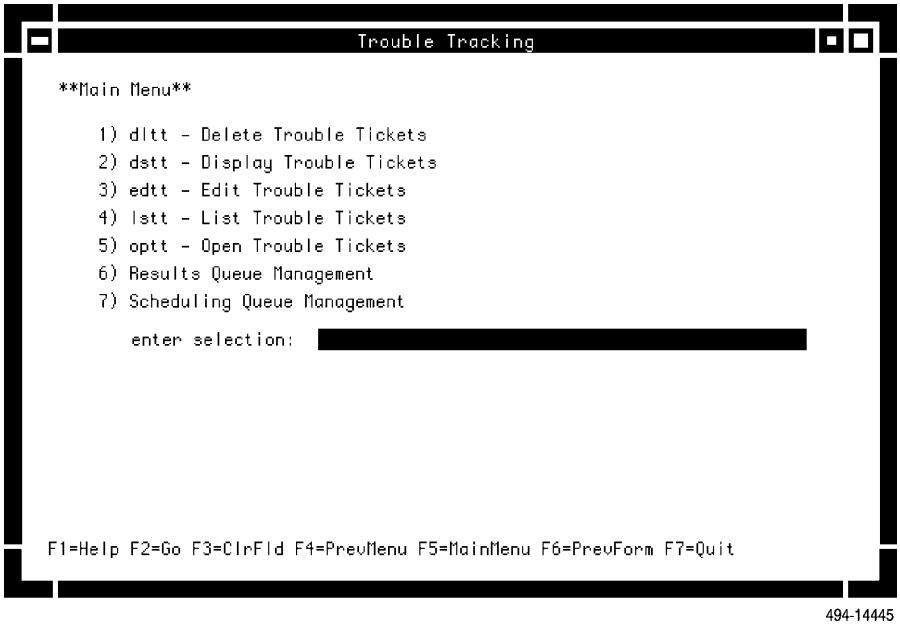


Figure 2-25. Trouble Tracking Task Window on the Full-Feature Workstation

Utilities Task User Interface

The Utilities task window (Figure 2-26) provides access to UNIX, INFORMIX, the Read Mail and Send Mail functions, the NMS Users List, and the Printer Status and Move Print Jobs functions. The User Interface Processor (UIP) selection appears if the UIP is configured on your system. The Multiplexer Utilities selection appears if the multiplexer application is configured. The user interface for all the functions except for the Multiplexer Utilities are keyboard-based with no function keys active.

Figure 2-26. Utilities Task Window

User Interface on a Basic-Feature Workstation

Use the keyboard to interface with the NMS tasks on a basic-feature workstation. The following sections describe the interface provided by each task available on a basic-feature workstation. The 6800 Series NMS Tasks menu is shown in Figure 2-27.

> **NOTE**
>
> Pressing the Pause/Break key changes the meaning of the function keys. For example, if you are in a UNIX window and you press the Pause/Break key (rather than the DEL key), and then open a Manager window, pressing the PgDn key causes the system to recognize a “3” rather than a page down instruction. Pressing the Pause/Break key a second time changes the function keys back to their original meanings.

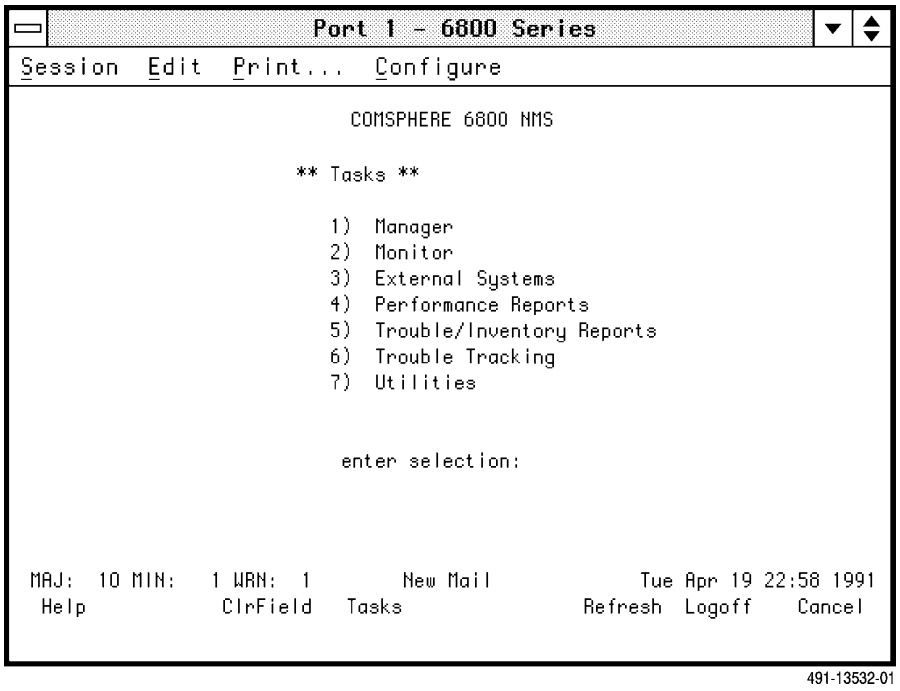


Figure 2-27. 6800 Series NMS Tasks Menu on a Basic-Feature Workstation

Asynchronous Terminal Support

The asynchronous terminal support feature provides an increase in the number of terminals and terminal emulators that can be used as basic-feature workstations. The following sections describe how the user interface features have been adapted to allow for this support.

Color

If you are using a monochrome monitor, basic-feature workstation applications will use reverse video to achieve the same effect as a color monitor.

Function Keys

If function keys and other keyboard keys (such as Pg Up and Pg Dn) are not available on your keyboard, you can still access these keys.

To access the eight numbered function keys, type the following three keys in sequence (one at a time):

ESC f < n >

Where: < n > is a number from 1 through 8 inclusive.

or by pressing the **F8** function key if the function keys are available.

To access the Pg Up (Page Up) key, type the following three keys in sequence (one at a time):

ESC p p

To access the Pg Dn (Page Down) key, type the following three keys in sequence (one at a time):

ESC n p

The following limitations apply to asynchronous terminal support:

- **Trouble Tracking Task and Trouble/Inventory Reports Task**

  The Trouble Tracking task and Trouble/Inventory Reports task do not support the three key sequence for the function and paging keys. They require terminals with eight numbered function keys and with correctly programmed termcap descriptions to operate properly. Paging for these tasks is available by pressing one of the following:

  CTRL-N (for next page)

  CTRL-P (for previous page)

  Hold the **CTRL** key down and then press **n** or **p**.

- **Manager Task**

  If your terminal does not have color, only the text will distinguish between major, minor, and warning counts in the summary display.

  The color chart for the Edit Color Code (*edcc*) command will be all black on non-color terminals.

  Asynchronous terminals do not support the following commands:

  – Trending Reports (*tr*) [graphical portion only]

  – Edit Color Code (*edcc*)

- **External Systems Task**

  Cut-through from a terminal other than an NMW, SCX R1, SCX R4 or CS10 is not supported.

Terminal Type

To find or develop a suitable terminal type, refer to the following UNIX features and documentation:

- terminfo — terminal capability database
- infocmp — compare or print out terminfo descriptions
- tic — terminfo compiler
- UNIX User's or System Administrator's reference manuals

To get the Trouble Tracking task and Trouble/Inventory Reports task working on the terminal, refer to the INFORMIX 4GL Reference manual appendix explaining the procedures for modifying a termcap file.

Prior to modifying the termcap file, save the original termcap file.

Prior to re-installing the NMS, save the modified termcap file, as the modified version will be lost during installation.

After the NMS is installed, restore the modified termcap file.

Example of Remote Terminal Login Set Up

The following example provides information for configuring PROCOMM PLUS or PROCOMM PLUS for Windows when these emulation packages are used for remote terminal login to the NMS. This information can assist you in determining the steps required for performing a remote login using another type of emulation package.

To set up your emulation package to communicate with the NMS, you must configure the terminal emulation options, provided by the emulation package, then perform keyboard mapping. Once these steps are finished, you can establish connection.

Configuring PROCOMM PLUS

PROCOMM PLUS must be properly configured to work with the NMS and the **pc+ansi** terminal type. In the SETUP-TERMINAL OPTIONS menu for PROCOMM PLUS, the following options must be changed to the following:

A - TERMINAL EMULATION . . . . . ANSI
C - Soft flow ctrl (XON/XOFF) . . . . . ON
H - BS translation . . . . . NON_DESTRUCTIVE

For PROCOMM PLUS for Windows using the **pc+wansi** terminal type, the CURRENT SETUP menu must be changed to the following:

Terminal: ANSI BBS

The **Port Settings** dialog must show that **Software Flow Control** is ENABLED. In other words, the box in front of the word **Software** must have an X.

The **Terminal Settings —** ANSI BBS dialog must show the following:

- **Destructive backspace** is DISABLED, i.e., no X in the box.
- **Line wrap** is ENABLED, i.e., has X in the box.
- **8 bit DEC terminal type** is DISABLED, i.e., no X in the box.

Keyboard Mapping

The following table shows how keys must be mapped via the keyboard mapping utilities in PROCOMM PLUS and PROCOMM PLUS for Windows. The mapping in the two PROCOMM products is similar to the keyboard mapping for VT220 emulation.

Key	Mapping	Comments
F1	^[OP	Send ESC OP (letter O not digit 0)
F2	^[OQ	Send ESC OQ (letter O not digit 0)
F3	^[OR	Send ESC OR (letter O not digit 0)
F4	^[OS	Send ESC OS (letter O not digit 0)
F5	^[[15~	Send ESC [1 5 ~
F6	^[[17~	Send ESC [1 7 ~
F7	^[[18~	Send ESC [1 8 ~
F8	^[[19~	Send ESC [1 9 ~
F9	^[[20~	Send ESC [2 0 ~
F10	^[[21~	Send ESC [2 1 ~
F11	^[[23~	Send ESC [2 3 ~
F12	^[[24~	Send ESC [2 4 ~
Cursor Up	^[[A	Send ESC [A
Cursor Down	^[[B	Send ESC [B
Cursor Left	^[[D	Send ESC [D
Cursor Right	^[[C	Send ESC [C
Grey Ins	^[[2~	Send ESC [2 ~
Grey Del	<<D>>	Send DEL (type Ctrl-Backspace)
	PROCOMM PLUS for Windows will display a triangular shape	
Grey Home	^[[1~	Send ESC [1 ~
Grey End	^[[4~	Send ESC [4 ~
Grey PgUp	^[[5~	Send ESC [5 ~ (PC+WIN)
Grey PgDn	^[[6~	Send ESC [6 ~ (PC+WIN)
Ctrl-PgUp	^[[5~	Send ESC [5 ~ (PC+)
Ctrl-PgDn	^[[6~	Send ESC [6 ~ (PC+)

Note that the unshifted PageUp/PageDown keys cannot be mapped with the PROCOMM PLUS product, since they are used to initiate file transfer. To get access to the PageUp/PageDown functionality, you must type Ctrl-PageUp or Ctrl-PageDown.

Specifying Terminal Type

Once you have configured the emulation package and mapped the function keys appropriately, you can perform the remote connection. When remote terminal connects to the NMS, the following prompt is displayed:

Terminal type:

To set the terminal type for PROCOMM PLUS, enter **pc+ansi**. For PROCOMM PLUS for Windows, enter **pc+wansi**.

If you do not know your terminal type, press Enter. The system automatically lists the recommended terminal types.

Manager Task User Interface

On a basic-feature workstation, the Manager task window appears as shown in Figure 2-28.

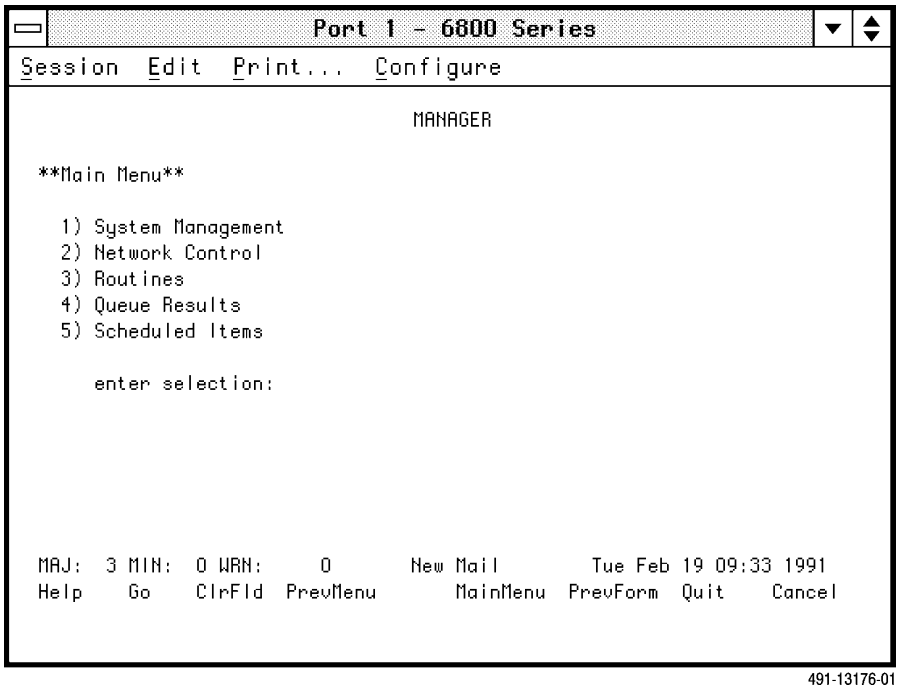


Figure 2-28. Manager Task Window on a Basic-Feature Workstation

The following information is displayed above the function keys.

MAJ:

The total number of currently active major alerts (priority 1 alerts).

MIN:

The total number of currently active minor alerts (priority 2 alerts).

WRN:

The total number of currently active warning alerts (priority 3 alerts).

New Mail Indicator

Displays if new mail arrived in your mail queue. To read mail, you may either click on the New Mail icon or select the Read Mail option from the Utilities task.

[date/time]

Displays the system date and time.

The menu/form functions, labeled across the bottom of the window, are invoked by pressing the associated function key. The function keys on a basic-feature workstation operate the same as the function keys for the Manager task on a full-feature workstation. Refer to the *Manager Task User Interface* section earlier in this chapter for a description of these function keys.

Monitor Task User Interface

On a basic-feature workstation, the Monitor task window appears as shown in Figure 2-29.

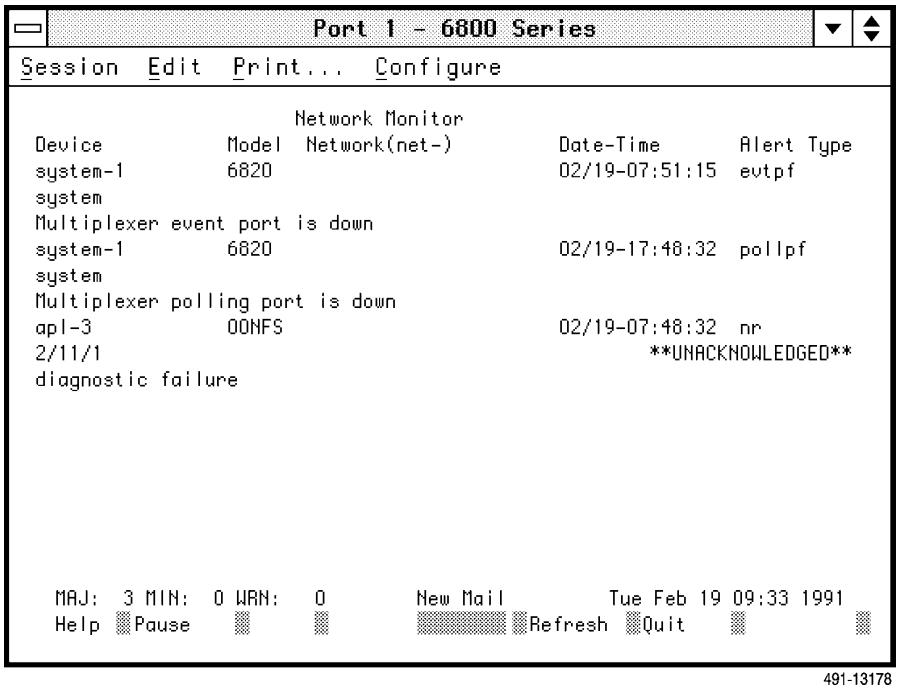


Figure 2-29. Monitor Task Window on a Basic-Feature Workstation

The text information, which appears above the functions keys in this window, is the same as that described in the *Manager Task User Interface* section for the basic-feature workstation. Refer to that section for more information. Also, the monitor scrolls as new alerts are reported.

The functions at the bottom of the window are mapped to functions keys and are described as follows:

Help (F1)

Displays a pop-up Help screen, explaining the function keys, Help feature and Task, LogOff, and Refresh buttons as well as the New Mail indicator.

Pause (F2) or Continue (F2)

Toggles the reporting of alerts (pause/continue). In the pause state, the alerts are not reported to the window for up to one minute. If you do not toggle the reporting back on (continue), the system automatically resumes alert reporting to the window. Because the Monitor scrolls as new alerts are reported, this feature can be used to temporarily freeze the display to facilitate readability.

Refresh (F6)

Redraws the current screen display.

Quit (F7)

Closes the Monitor window and returns to the 6800 NMS Tasks menu.

External Systems Task User Interface

The External Systems task window is shown in Figure 2-30. This figure shows some of the external systems available for NMS. The contents of this menu varies depending on the external systems names configured for your network.

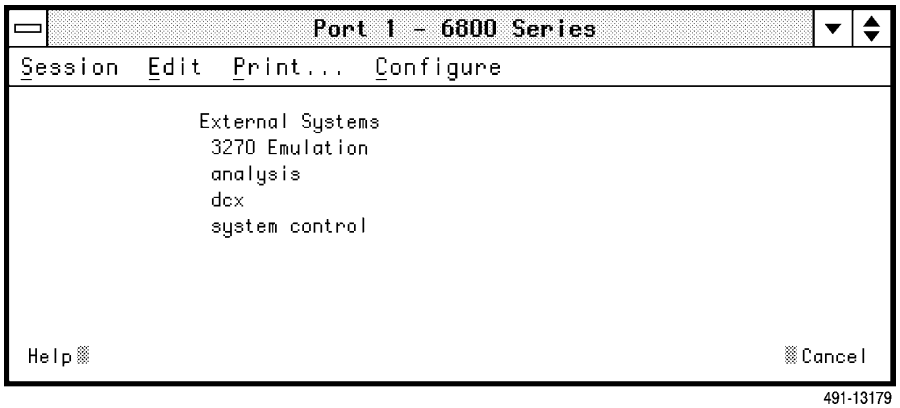


Figure 2-30. External Systems Windows on a Basic-Feature Workstation

To select an external system, use the up/down arrow keys to highlight a selection and press the **Enter** key. Once you access the selected system, you are under the control of that system's environment.

Two functions are available at the bottom of the window. These operations are described as follows:

Help (F1)

Displays a pop-up Help screen, explaining the functions and how to invoke help.

Cancel (F8)

Cancels the External Systems window request and returns you to the 6800 Series NMS Tasks menu.

Performance Reports Task User Interface

The Performance Reports task provides access to alert and trending reports, call statistics, and multiplexer performance reports. Functionally, this menu is the same as the Performance Reports menu, under **Network Control** in the Manager task. The function keys available for use in this task are the same as those used by the Manager task. Refer to the section *Manager Task User Interface* for more information.

Trouble/Inventory Reports Task and Trouble Tracking Task User Interfaces

On the basic-feature workstation, use the keyboard to interface with the Trouble/Inventory Reports and Trouble Tracking tasks.

The Trouble/Inventory Reports task displays the task window as shown in Figure 2-31. When you select the Trouble Tracking task, the Trouble Tracking task window appears as shown in Figure 2-32.

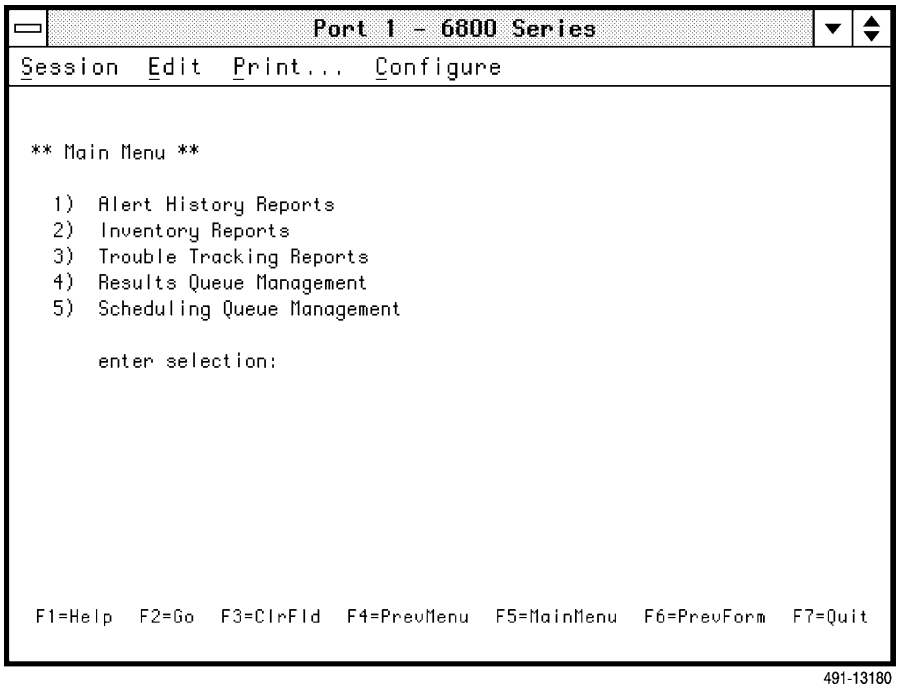


Figure 2-31. Trouble/Inventory Report Task Window on a Basic-Feature Workstation

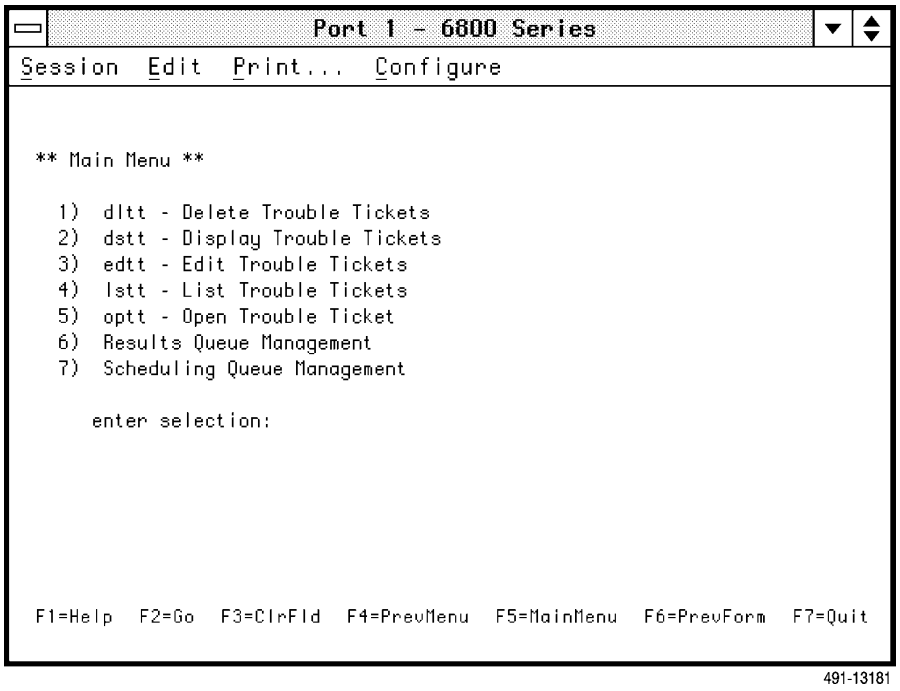


Figure 2-32. Trouble Tracking Task Window on a Basic-Feature Workstation

The function keys, shown at the bottom of the windows, are identical to those in the Manager task on the full-feature workstation, except for the **F8** function key (Cancel), which is not supported for the Trouble/Inventory Reports and Trouble Tracking main menu windows. However, F8 (Cancel) is available in submenus and results forms for these two tasks. Refer to the *Manager Task User Interface* section earlier in this chapter for function key descriptions.

NOTE

The Trouble/Inventory Reports and Trouble Tracking tasks *do not* support the F8 function key (Cancel) within their main menus, but do support this **F8** key function on their submenus and results forms.

Once a transaction is executed from an input form, F8 (Cancel) does not work. Pressing F8 during execution cancels the results form once the transaction completes.

In addition, to access form help for forms associated with the Trouble/Inventory Reports and Trouble Tracking tasks, you must use the **F1** function key.

Utilities Task User Interface

The Utilities task provides access to UNIX, INFORMIX, the Read Mail and Send Mail functions, the NMS Users List, and the Printer Status and Move Print Jobs functions. The user interface is keyboard-based with no function keys active.

NMS Commands

You use commands to execute most functions within the NMS. You can request a command in one of three ways:

1. Selecting the command name from a menu display. You select a command name by clicking on the name, or using the up/down arrow keys to highlight the name and then pressing **Enter**.

2. Entering the number of the command in the **enter selection** field on the menu display.

3. Entering the command abbreviation in the **enter selection** field of the menu display.

The following sections discuss command abbreviations, command input and output forms, and the common fields on these forms.

Command Abbreviation Conventions

As previously mentioned, you can request a command by entering its abbreviation in the **enter selection** field in a menu display. For example, you would type *eddp* to request the Edit Device Profile command. (In this manual, all command abbreviations are shown italics.)

Command abbreviations have a simple syntax. Typically, the first part of the abbreviation is an abbreviated verb; the second part is the abbreviated object of the command. If an object name is more than one word, the first letter of each word is used, for example, Create User Profile is *crup*. The abbreviated verb prefixes are as follows.

ac – acquire
br – break
cp – copy
cr – create
ch – change
dl – delete
ds – display
ed – edit
ls – list
mk – make
op – open
s – set
sn – send

Some commands do not have initial verbs. These commands use the first letter of each word to form their abbreviation; for example, *dar* for Detailed Alert Report and *ccn* for Configuration Change Notification. Some exceptions exist, where if the aforementioned rules were applied, the result would be the same abbreviations for two different commands.

The command abbreviation is listed next to the command name on the menus. You enter command abbreviations from your keyboard in lowercase letters.

Most NMS command results can be sent to specified destinations and scheduled for execution at specified times. These form fields are discussed later in this chapter.

Command Forms

You use input forms to provide parameters needed by a command for execution. Results forms provide you with the command's results after execution. The results can be specific information, or a message indicating execution success or failure. When a command uses multiple pages of an input form, each page is given a sequential page number. Page numbers appear in the upper right-hand corner of the form.

Input Forms

Figure 2-33 shows an example of an input form.

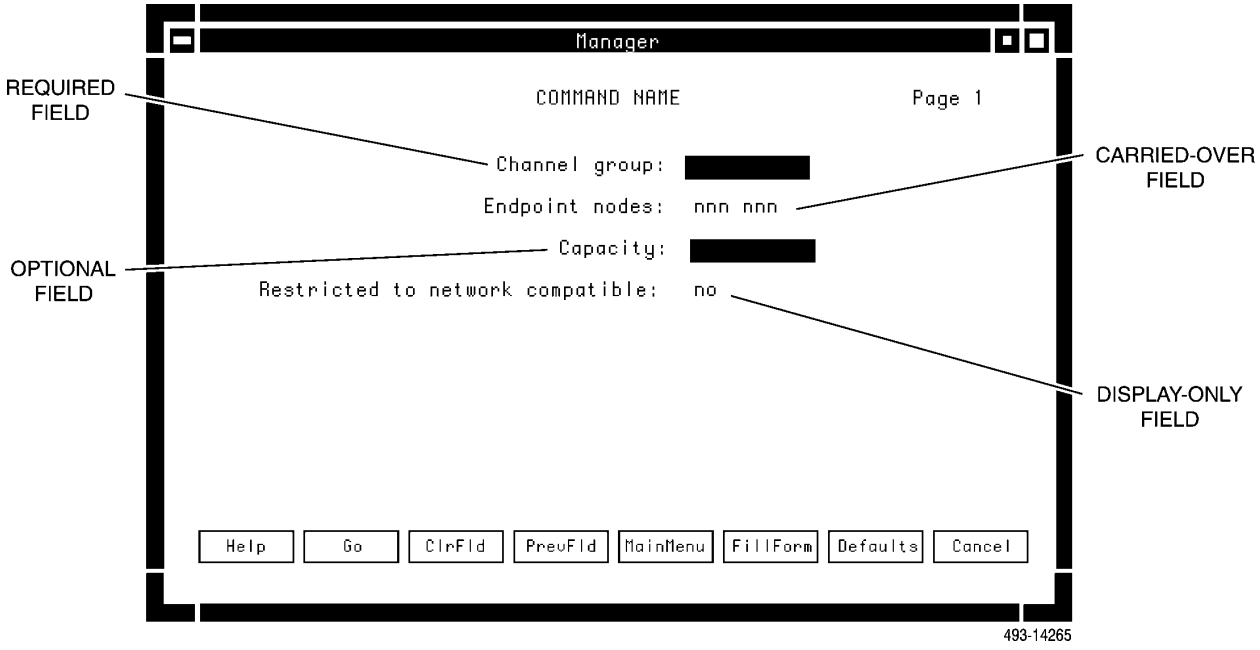


Figure 2-33. Sample Input Form

Input forms have different types of fields. These fields are described as follows.

- *Display-only* fields are protected fields that display pre-determined or previouslyspecified information which cannot be changed on the current form. These fields are not highlighted on the form and you can never place the cursor on this field.
- *Carried-over* fields contain information you entered on a previous page in the form series. These fields may or may not be changed depending on where you are in the form series, which command is selected, or the type of information provided in the field. Typically, you recognize these fields by the carried-over information.

- *Required fields* require user input on that form. These fields are highlighted. Commands cannot be executed if a required field is not filled-in.
- *Optional fields* request information which is not critical for the execution of the command. You may or may not populate these fields, depending on how you want the command to execute. These fields are highlighted.

Some field Helps are pop-up menus which assist in value (parameter) selection. You can select the entry from the selection list and NMS automatically populates the field with your selection. Some field Helps are textual information such as value ranges accepted as input in a field.

The series of input forms for some commands vary depending on the input given on the initial input form. For example, if you invoke the Edit Routine (*edr*) command and you give a routine name on the initial input form, the subsequent command input forms vary depending on the commands used in the routine.

Confirmer Boxes

Some input forms display *confirmer boxes* which provide information messages. For most confirmer boxes, you can either **Continue** or **Cancel** the command after reading the message. You can use the mouse to click on the appropriate response. Note that some confirmer messages have only an **OK** button. For these confirmer boxes, you can click on the **OK** with the mouse to confirm and continue, or you can use the **F8** (Cancel) button to cancel the command. For basic-feature workstations, you can use the left and right arrow keys when a selection is available, then press **Enter** to execute the selection. Figure 2-34 shows an example of a confirmer box.

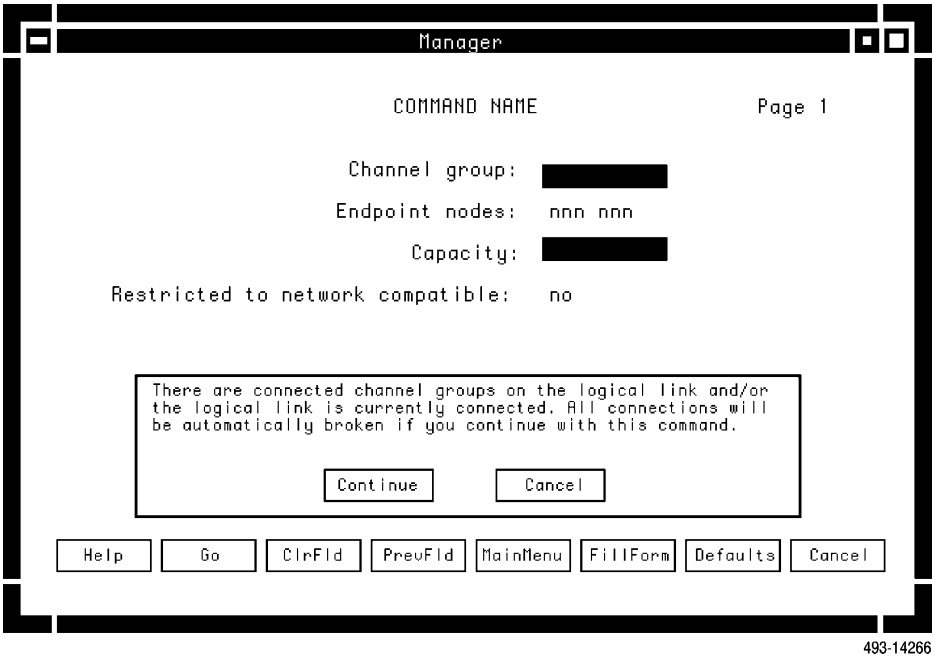


Figure 2-34. Sample Input Form with Confirmer Box

Results Forms

You can have multiple results forms depending on the command selected. The final results form ends with the message **END OF RESULTS**. Figure 2-35 shows an example of a results form.

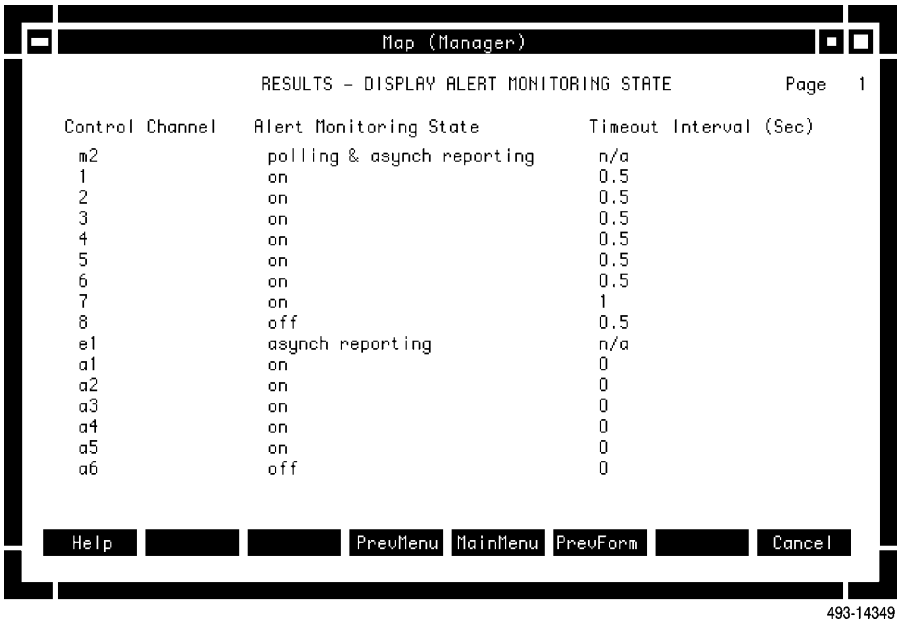


Figure 2-35. Sample Results Form

Routines

A *routine* is a user-defined set of commands which execute sequentially when the name of the routine is called. Up to 25 commands can be placed in a single routine. Routines are very useful tools for executing several of the same commands on individual devices, groups of devices or device types. They also provide an effective means of resolving and acknowledging alerts or monitoring alert status (see *Alert-Driven Routines* for more information on routines and alert-driven routine relationships). Routines can be used to set options or other parameters on similar devices.

NMS classifies routines as either personal routines or system routines.

Personal Routines

You create a personal routine using the Create Routine *(crr)* command. When creating a routine, you are requested to do the following:

- Assign a unique name to the routine.
- Specify the set of commands to be included in the routine.
- Assign the input parameters for each command.
- Add any comments or information concerning the routine.

When creating a routine, an input form requires you to list the commands that compose the routine. Subsequently, NMS displays the input forms for each command listed in the routine so that you may identify the input parameters required for each command to execute.

Each user has a set of personal routines. Likewise, NMS has a set of system routines that are accessible to anyone with the proper permissions. Only the creator and System Administrator have display and access privileges to a personal routine. A personal routine cannot be directly copied to another user's set of personal routines. To transfer personal routines from one user to another, the personal routine must first be copied to a system routine, then the other user must copy the routine to his/her personal set. You can also edit, delete, display and list personal routines using the appropriate command (see the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for execution information on each command). Each User ID can have up to 30 personal routines.

Specification of Routine Input Parameters

When NMS displays the input forms for each command included in the routine, you specify values for the command input parameters. Each input parameter to a routine command is classified as either one of the following parameter types:

1. A parameter that does not pertain to identification of the object(s) (devices) on which the command is executed. For example:
   - *# of test blocks to be transmitted and duration of network test* (input parameters of the Digital Test (*dit*) command).
   - *Tone frequency* (input parameter of the Circuit Loss Inbound (*cli*) and Circuit Loss Outbound (*clo*) commands).
   - *Connection conditions/states* (input parameters of the Channel Group Summary (*cgs*) command).
2. A parameter that does pertain to identification of the object(s) (devices) on which the command is executed. For example, device addresses, channel group names, link numbers, etc.

You must specify the required input parameters of both Types 1 and 2 (defined above) during the creation of the routine. If the routine is executed as an Alert-Driven Routine, however, the user-specified Type 2 parameters may be (functionally) replaced with system-provided parameters. (The term system-provided refers to the ADR and alert subsystems which provide the capability to import parameter values obtained from incoming alert messages into ADR command input forms.) For information on ADRs, refer to *Alert-Driven Routines* later in this chapter.

System Routines

You create a system routine by copying a personal routine to a system routine using the Copy Routine (*cpr*) command. In copying a routine, you do the following.

- Identify the routine to be copied.
- Assign a name to the routine copy.
- All system routines names require sys- prefix. System routines can be displayed by a user, but can only be executed by users with the permission to execute all the commands in the routine. NMS allows up to 500 system routines.

Routinable Commands

Most NMS commands, accessed from the Manager task, can be placed in a routine. Table 2-1 lists those commands that cannot be placed in a routine.

Table 2-1
Non-Routinable Commands in NMS

Core Commands	Multiplexer Commands	Communication Products Commands
Create Routine (*crr*)	Change Node Passwords (*chnp*)	Call Fault Criteria (*cfc*)
Create User Profile (*crup*)		
Edit Routine (*edr*)		Change Address (*cha*)
Edit User Profile (*edup*)*		Change Protocol Mode (*chpm*)
*The Edit User Profile (edup) command is only routinable if the **password** modification option is not used.		

NOTE

Trouble Tracking task commands and Trouble/Inventory Reports task commands cannot be placed in a routine.

Manually Executing a Routine

You execute a routine by entering the routine name on a Manager task's **enter selection** field and pressing **Enter**. The following form is displayed (Figure 2-36).

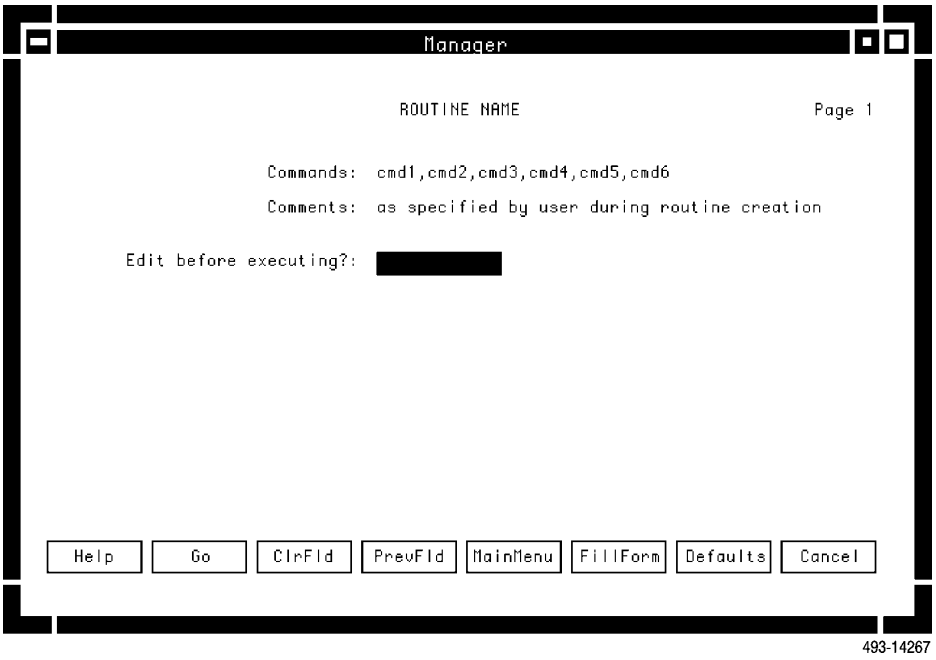


Figure 2-36. Routine Input Form, Page 1

This input form contains the following fields:

Commands

Lists the commands contained in the routine.

Comments

Lists the user-specified comments associated with the routine.

Edit before executing? *(Required field)*

Allows you to specify whether or not you want to edit one or more input forms for the commands contained in the routine. Valid entries are **yes** or **no**. The default is **no**. A pop-up menu provides for mouse selection of either entry.

If you specified **no** in the **Edit before executing?** field, a subsequent input form page displays the common input fields used for specifying results destination and execution scheduling information for the routine (refer to *Destination for Results for Commands and Routines and Scheduling Execution Commands and Routines* later in this chapter for information on these fields). You can populate these fields as needed, then select **Go(F2)**. The routine is executed as requested.

If you entered **yes** in the **Edit before executing?** field, the following input form page is displayed (Figure 2-37):

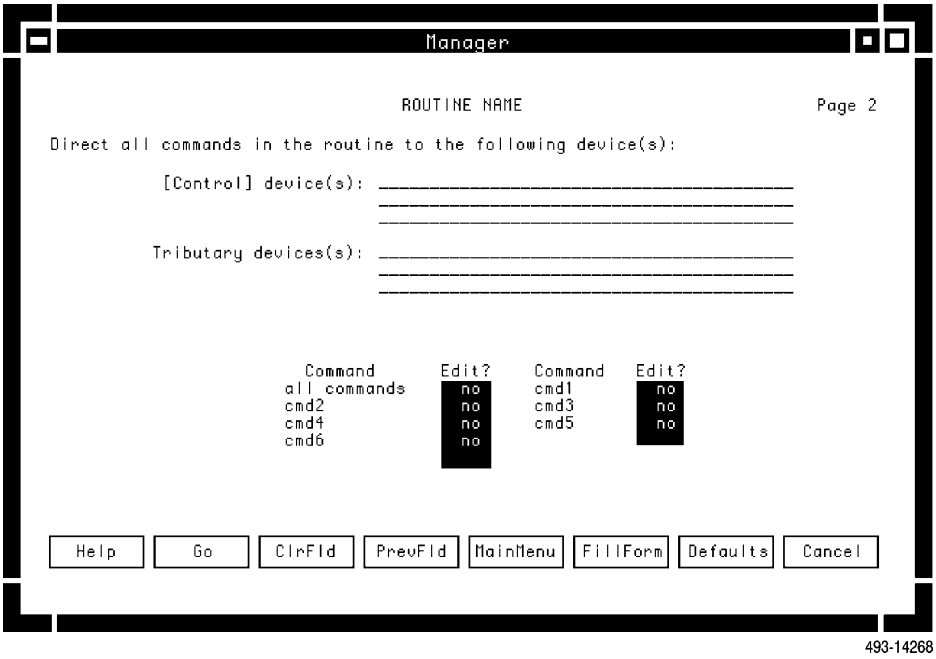


Figure 2-37. Routine Input Form, Page 2

When a routine is requested, input forms allow you to do one or both of the following:

1. Redirect all commands in the routine to the control/tributary devices specified.

2. Select one or more individual commands whose input parameters are to be modified prior to execution of the routine.

The Routine Input Form, Page 2, contains the following fields:

[Control] device(s)

Specifies alternate control device(s). NMS directs (applicable) commands to these devices. You can enter either control device IDs (for communications products commands) or node IDs (for multiplexer commands). This field may not be applicable, depending on the commands included in the routine.

Tributary device(s)

Specifies alternate tributary device(s). NMS directs (applicable) commands to these devices. You can enter either tributary device IDs (for communications products commands) or remote node IDs (for multiplexer commands). This field may not be applicable, depending on the commands included in the routine.

NOTE

By specifying device ID(s) in the Control device(s) and (if applicable) Tributary device(s) input fields, you can redirect all commands in the routine to the device(s) indicated, without having to edit the individual command input forms. Specifying devices in these fields directs commands to those devices for this *execution of the routine only.* **Thus, the new addresses do not replace those previously specified in the stored routine.** This is also true when editing individual commands as part of executing a routine.

Edit? *(Required fields)*

Indicates whether or not you want to edit the command's input forms for the commands listed. Valid entries are **yes** and **no**. To edit all command input forms, enter **yes** in the **all commands** field. To edit selected commands, enter **yes** in the input field following the command abbreviation. (The default in all cases is **no**.)

After you complete all entries on the Routine input form, Page 2, subsequent input pages display forms for each command you requested to edit. When you finish editing the final command input form, the last input page displays the common input fields for specifying results destination and execution scheduling information. Populate these fields as necessary and send the routine for execution by selecting **Go(F2)**.

Routine Notification and Results

If you execute a routine manually and specify that the routine results be sent to your queue, the system sends you a mail notification when results are placed in the queue. If the results are sent to a system or remote printer, the user is also notified by mail.

Editing, Deleting, Listing or Displaying Routines

Other commands associated with routines are as follows:

Delete Routine *(dlr)*

Deletes a personal routine associated with a specific User ID.

Display Routine *(dsr)*

Displays the contents of a specified personal or system routine.

Edit Routine *(edr)*

Enables you to add/delete commands to/from a routine.

List Routine *(lsr)*

Lists system routines and/or a user's personal routines.

Sample Procedure for Creating a Routine

The following example provides a fairly straightforward application of the 6800 Series NMS routines. In this example, a routine is used to create a template for setting the same options on multiple devices of the same type. However, creating routines as templates for setting options/strapping on some devices require certain considerations. Be sure to read the section *Considerations for Creating Routines as Options Templates.*

Creating the Model Template

1. Select a device that is optioned (or can be optioned) with straps/options that represent your *model* template. In this example, this device is referred to as the *model*. The device whose options are to be changed with the template is referred to as the *target device*. Make sure that ALL options of the *model* apply to all target devices on which the template is to be used. For example, you would not use a control DSU as a tributary DSU's template.

2. Execute the Change Options *(chop)* command to the *model*, setting the options as necessary for the template. (It is suggested that you check the current option settings of the *model* even if you assume the device is currently optioned correctly.)

3. Execute the Create Routine *(crr)* command to create the template routine. Name the routine appropriately to define your template, for example, ''trib9600."

4. Include the Change Options *(chop)* command in the routine. (You can also enter other commands as part of your configuration/testing. For example, you might add a Display Options *(dsop)* command to verify the Change Options settings, a Device Health and Status *(dhs)* command to determine the state of the device, or Modem/device Test *(mt)* to check the operation of the *model* after the Change Option settings.)

5. When the command input forms for the *chop* command are displayed, enter the device address of the *model*. The input forms are pre-populated with the options values from the *model*. You do not change any options at this time. Select **Go(F2)**. The *model's* options are now stored in the routine. If other commands are included in the routine, complete those input forms as necessary, using the model's device address whenever a device address is required.

6. To copy the *model's* options to a target device, execute the routine by typing the routine's name in the **enter selection** field. (Remember, if you copied the routine to be a system routine, prefix the name with **sys-**.) On the Routine input form, Page 1, specify that you want to edit the routine before execution. On the Routine input form, Page 2, input the address of the target device in the **Control Device** field. Do not change any other command's input parameter options if you want to download the stored options from *model* to the target device — simply supply the target device's address.

7. Your target device should now be optioned correctly.

Considerations for Creating Routines as Options Templates

Depending on the device, you must be aware of certain considerations, especially when dealing with ‘‘CHANGE” commands. For example, the COMSPHERE 3600 Series DSUs and the 3600 Series DBMs make use of ‘‘options banks.” These are special storage areas within the firmware which hold the option straps. The DSUs have three separate banks of options; the DBMs have a single bank for options and a second bank for their local phone numbers. Different NMS options commands affect different portions of the DSU and DBM option banks. However, internally, some commands may affect more banks than you actually see. Specifically, the Change Port Speed *(chpsp)* command only displays the port speeds options, yet the command first retrieves all three banks of options from the device, displays only the speeds, then sends all the options back to the device. Thus, those options not displayed are erased. Because of this anomaly, you must be careful when using the *chpsp* command within the options template. You can use it to your advantage, if you understand its application. An example of this is described in the following paragraphs.

You can configure options template routines for the 3600 Series DSUs in one of two methods, described as follows.

Method 1

This method uses three options commands: Change Options *(cho)*, Change Port Speeds *(chpsp)*, Change Port Options *(chpo)* commands.

a. Execute all three commands to the *model* and configure the *model* as necessary for your template, in the order shown.

b. Create a routine and place the three commands in the routine using the *model’s* device address.

c. Execute the routine to the target device, supplying the device address at the time of routine execution.

Method 2

This method uses only a single option command within the routine, saving performance and network traffic at the time of the routine’s execution.

a. Execute all three commands (Change Options *(cho)*, Change Port Options *(chpo)*, and Change Port Speed *(chpsp)* to the model and configure the model as necessary for the template.

b. Create a routine and place the Change Port Speed *(chpsp)* command in the routine with the model’s device address.

c. Execute the routine to the target device, supplying the device address at the time of routine execution.

The reason **Method 2** works is as follows. Although the Change Port Speed *(chpsp)* command only displays the port speed options, it is actually retrieving all the device options (i.e., port options, device options and port speeds) and sending them back to the device. Therefore, the routine has actually stored all these options from the *model* and is downloading them to the target device. Thus, you need only use the *chpsp* command to download all configured *model* options to your target devices.

For 3600 Series DBMs, a similar procedure to that used for the 3600 Series DSU is applicable.

For 3400/4400 Series APL modems, the same situation applies. These modems have up to eight different options banks. Depending on the *model*, different commands (Change Options *(cho)*, Change Port Speed *(chpsp)*, Change Port Options *(chpo)*, and Change Telephone Numbers *(chtn)* commands), may overlap with different banks. If you need information on a particular command that may use overlapping options, check with your service representative. The capability to use a routine as an option template depends on the type of APL modem used. However, **Method 1** works without this information regardless of the type of modem used.

Alert-Driven Routines

An Alert-Driven Routine (ADR) is a system routine that executes automatically upon the arrival of an alert or an alert clear. The System Administrator can define generic ADRs, i.e., one ADR associated with multiple devices or several ADRs associated with a single object (device, facility, channel, channel module, channel group, or other user-specified objects). ADRs can be periodically disabled or enabled. Also, you can specify that the ADR be triggered only during user-specified time intervals. ADR execution can be based on alert type, alert duration, and the alert reporting object. Also, the ADR feature provides flexible user notification which includes sending ADR results to selected users.

Only a system routine can be used as an ADR and only the System Administrator can create or modify ADR criteria. The System Administrator establishes an Alert-Driven Routine by specifying execution criteria for a routine using the Edit ADR Criteria *(edadrc)* command. For details on this command, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

Object Identification for ADRs

The ADR subsystem uses incoming alert information to determine the objects (devices) to which ADRs should be directed. Each alert report from network devices contains information identifying the device reporting the alert. Some alert reports contain additional information identification, such as a specific link or module to which the alert applies. This identification information is generally referred to as *object identification information*. Based on the information, the ADR can be directed to a specific device, link, or module.

Depending on the source and type of alert reported, one or more objects may be identified in the incoming alert message. Also, depending on the commands included in the ADR, the object identification information for one or more of the objects may be used as input to the ADR.

You should ensure that the commands included in a routine to be used as an ADR can accept the necessary information from the alert/alert clear message(s) which triggers the ADR. This requires you to know the following information:

1. The object-related information needed by the commands in the routine.

2. The object-identification parameters returned from an alert message.

For communications products (CPS devices), the object identified in the alert message is always either the object which reports the alert, or the object for which the alert (for example, NR) is reported. To determine which device is included in the object information, check the Device ID reported on the network monitor.

Multiplexer alert messages contain the identity of the node reporting the alert. Multiplexer alert messages may also include object identification information for links, channel groups, modules, etc. The set of object identification parameters which can be expected from a multiplexer alert message can be determined by referring to the text message associated with the alert (displayed on the network monitor), i.e., any of the parameter values that are read into the alert text message can be expected from the alert message for use as input to an ADR. For example, the alert type 70.00 has the text **DS1 channel n Red alarm**. If this alert triggered an ADR, the DS1 channel number **n**, as shown in the text message, can be imported to the DS1 channel module test command. See Table 2-2 for object-identification information passed by multiplexer commands.

The 6800 Series NMS system messages contain only the identity (device name) of the 6800 system.

During the creation of a routine, you must supply a device address if it is required. Any command with a **Device(s)** field (in its input form) can accept a device address from alert messages, when the command is used as an ADR. Also, you must indicate that NMS uses these addresses when the routine is executed as an ADR rather than the address obtained from incoming alert messages. To specify that these pre-specified addresses are used, verify that the **Import object info** field in the Edit ADR Criteria input form is set to **No**.

During routine creation, you must enter both a control and tributary address for commands that require this information.

Be aware that when including commands requiring both control and tributary addresses in an ADR, the control device input forms must have the **Import object info** field set to **no** for both devices.

Table 2-2 lists the object-identification information that can be passed to multiplexer commands from multiplexer alert messages.

Table 2-2
Object Identification Information for Multiplexers

Command	Parameter(s)	Command	Parameter(s)	Command	Parameter(s)
accg	none	cs	node/channel group	fer	node/link/DS1 channel
acll	node	cst	node/channel	fpr	node/link/DS1 channel
acpa	node	ccp	node	grt	node
bert	node/channel	cpt	node/CPU	hms	node
brcc	node/channel	crcg	channel group	it	node/channel
brcgc	channel group	crll	none	lls	node
brllc	node/logical link	ddscps	node	mkcc	node/channel
chcc	node/channel	ddsctc	node	mkcgc	channel group
chcg	channel group	dlog	channel group	mkllc	node-logical link
chcmt	node	dlll	node/logical link	nps	node
chdcmc	node/channel	dscc	node/channel	nss	node
chll	node/logical link	dscs	node/channel	nsss	node
chsdle	node/link	dscg	channel group	nwcgs	node
chmcc	node	dsdbc	node	ner	node
chnapc	node	dsdcmc	node/DS.1 channel	pact	node
chncs	node	dsll	node/logical link	rtll	node/link
chncp	node	dssdlc	node/link/times lot	rds	node/channel/link
chnp	node	dsnapc	node	tss	node/link/timeslot
chplc	node/link	dsncs	none	pll	node/link
cgl	node/link/channel group	dsncp	node	lmt	node/link
cgpr	node	dsrt	node	tsimt	node/TSI
cgs	node	dstis	node/link	tspr	node
cgt	channel group	dsplc	node/link	vctt	node/channel
cl	node/channel	dcs	node/channel		
cnl	node/channel	dps	node		
css	node/link	dcl	node/DS1 channel		
cs	node/channel group	dcmt	node/DS1 channel		
cst	node	epr			node

Creating ADR Criteria

Only system routines can be used as ADRs; this means that ADR criteria can be specified for only system routines. Any system routine for which ADR criteria is specified can also be executed manually as a normal routine. When manually executing a routine, ADR criteria does not apply to the routine's execution.

You use the following commands for creation/display/modification of ADR criteria:

- Display ADR Criteria (*dsadrc*) command
- Edit ADR Criteria (*edadrc*) command

Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for detailed descriptions of these commands.

ADR Criteria

ADR execution criteria indicates the following information:

- Whether or not device information imported should be used as input to the ADR alert messages.
- Times/days the ADR is executable.
- The set of [reporting] objects whose alert reports should cause the ADR to be executed.
- The set of alert(s) or alert clear(s) that should cause the ADR to be executed.
- The routine to be executed.
- Destination(s) for ADR results; and users to be notified of ADR execution.

ADR Notification and Results

NMS notifies you of an ADR execution via the network monitor and user mail.

Monitor

When an ADR is triggered by an alert, the network monitor displays the "ADR" indication in the corresponding entry for the alert.

> **NOTE**
>
> The Monitor does not display any indication if the ADR is triggered by an alert clear.

User Mail

When ADR results are sent to the queue or printer, NMS sends mail notifications to users, informing them of the action. The mail message includes the following information:

- The routine name and list of commands contained in the routine.
- Time/date of the routine execution.
- Triggering condition (alert type or clear).
- Object whose alert report caused the ADR to be executed.
- Object(s) on which the ADR was executed.
- ADR results destinations (remote printer, system printer, and/or user queues).

An example of the mail format is as follows:

ADR *[routine name]* executed on *[targeted objects]*

Triggered *[hh;mm;ss,mm/dd/yy]* by *[alert or alert clear]* from *[reporting trigger object]*

trigger object]

Commands: *[list of command included in the routine]*

ADR results have been sent to (lists those that apply:
[system printer name]
remote printer at *[phone number]*
dedicated ATR/remote printer
User queues: *[list of logins]*

ADR Filters

NMS uses separate ADR filters for determining how long the alerts must persist before an ADR triggered by them is executed. These filters allow selective filtering (on a per device type and per alert group basis) of alerts for ADR execution. ADR filter settings determine the amount of time an alert must persist before an ADR is triggered. As with other alert filters, you can modify the filter values associated with each defined alert group for a specified device type. You can also specify exceptional filter values used for individual devices or device groups.

Default ADR filter parameters are defined in the alert filter parameter tables in Chapter 5, *Filter Administration and Alert Processing*, in this manual.

ADR filtering does not apply to alert clear messages. Therefore, you cannot define delays for ADRs which are triggered by alert clear conditions. ADRs are executed immediately on reception of an alert clear, when triggered for such events.

ADR Filter Transactions

Two NMS commands are provided for administration of ADR filter parameters:

- Display ADR Filter *(dsadrf)* command
- Edit ADR Filter *(edadrf)* command

Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for detailed information and use of these commands.

Destination for Results for Commands and Routines

All commands have a **Destination for results** field. In some commands, the entry in this field is protected, meaning the user cannot change the destination. Use of this field is also explained in this section. Refer to Chapter 1, Introduction, in the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for specific information.

Use this field to specify the destination of the output from the command execution. Valid options are **crt**, **remote**, **lp**, **printer**, **queue**. Multiple destinations can be specified. Destinations are described as follows:

crt

Causes the command results to display on your workstation screen. You cannot schedule execution of the command for a later time if you specify crt; the command must execute immediately.

> **NOTE**
>
> When you specify **crt**, NMS does not allow access to any other command from the current window until execution of the command completes. Certain commands can take several minutes to complete. For these commands, it is recommended that you send the command results to a queue or printer so that the command executes in the background. This frees the **crt** for access to executing other commands.

remote

Sends the results of the command to a printer. If you specify **remote**, an additional input field appears, enabling you to specify the telephone number of the remote printer or the ATR/remote printer port. If you provided a remote phone number in your user profile, that phone number is populated in the field. If you specify **port**, results are sent to the printer connected to the ATR/remote printer port. Note that Trouble Tracking and Trouble/Inventory Reports commands cannot be sent to a remote destination.

lp

Sends results to a remote line printer. You are prompted for the name of the remote printer in a field that appears below the destination field.

printer

Sends the results of the command to the system printer to which you are assigned as specified in your user profile.

queue

Sends the results of the command to one of your own results queues. Command results go to one of three results queues, depending on the task from which the command is accessed (Manager, Trouble Tracking, or Trouble/Inventory Reports tasks). From the Performance Reports task or from the Map/Monitor task, all reports results are sent to the Manager task queue. You can list, display, and delete queue results using the queue results commands in each task.

Scheduling Execution of Commands and Routines

Scheduling refers to the capability to specify a command execution at a given time and/or a repeated time.

Scheduling execution directs the system to execute commands automatically at selected times or at regular intervals. Refer to the command reference manuals to verify scheduling ability of specific commands.

> **NOTE**
>
> You will lose scheduled items in the Trouble Tracking and Trouble/ Inventory Reports tasks if those items are scheduled to execute at a time when the system is not running, for example, during database backup or restore.

You specify the type of execution in the **Schedule execution** field. All NMS commands display the **schedule execution** field on the last form of a series of input forms; however, for some commands an entry in this field is protected and cannot be changed by the user. Valid options are **now**, **delayed**, **weekly**, **and monthly**.

now

Causes the command to be executed immediately. If you enter **crt** in the **Destination for results** field, you must enter **now** in the **Schedule execution** field.

delayed

Causes the command to be executed at one or more future time(s). When you enter **delayed** in the **Schedule execution** field, the following additional fields are displayed:

Date(s)

The command executes on the date(s) specified in this field. You can enter as many dates as will fit in the field. Separate all dates with commas or spaces. Valid entries are individual dates in the formats **mm/dd/yy**, **mm/dd**, **dd**, or the keywords **today**, **today+nn**, **last**.

Where:

today	=	Execute today.
today+nn	=	Execute nn number of days from today.
last	=	Execute on the last day of the month.
mm/dd/yy	=	Execute on the specified month, day and year.
mm/dd	=	Execute on the specified month and day; the year defaults to the current year.
dd	=	Execute on the specified day; the month and year default to the current month and year.

Time(s)

The command executes at the time specified in this field.

Valid entries are individual times in the format **hh:mm, hh:mm***am* or *pm*, or a range of hours in the format **hh-hh:mm,** and **all:mm**.

Where:

hh:mm	=	Execute at the 24-hour time specified.
hh:mm*am* or		Execute at the 12-hour time specified or
hh-hh:mm*pm*	=	with an am or pm designation
hh-hh:mm	=	Execute every hour within the time range specified, at the specified minute.
all:mm	=	Execute every hour at the specified minute.

weekly

Causes the command to execute on a weekly basis. When you enter **weekly** in the **Schedule execution** field, the following additional fields are displayed:

Day(s) of the week

Enter the day(s) of the week when the command is to execute. Valid entries are

- The days of the week in abbreviated form, e.g., **sun, mon, tue, wed, thu, fri, sat.** Multiple entries are allowed separated by commas or spaces.
- A range of days, e.g., **sun-thu**.
- The keyword **all** for all days of the week.

Time(s)

Enter the time(s) the command is to execute for each day specified. For time(s) entry parameters, refer to the **Time(s)** field explanation for **delayed** command execution.

Last date

Enter the stop date for command execution. If you leave this field blank the command will execute indefinitely on a weekly basis.

For data format, refer to the **Date(s)** field explanation for **delayed** command execution. (The **today** value is not valid for the Trouble/Inventory Reports and Trouble Tracking tasks.)

monthly

The command executes on a monthly basis. When you enter monthly into the **Schedule execution** field, the following additional fields are displayed:

Day(s) of the month

Enter the day(s) of the month when this command is to execute. Valid entries are

- Multiple days. The numbers must be separated by commas or spaces, e.g., **1,4,7,10**.
- A range of days, e.g., **8-15**.
- The keyword **last** to execute the command on the last day of the current month.
- The keyword **all** for all days of the month (not just current month).

Time(s)

Enter the time(s) the command is to execute for each day specified. For time(s) format, refer to the **Time(s)** field explanation for **delayed** command execution.

Last Date

Enter the stop date for execution of the command. If you leave this field blank, the command executes indefinitely on a monthly basis.

For date entry parameters refer to the **Date(s)** field explanation for **delayed** command execution. (The **today** value is not valid for the Trouble/Inventory Reports and Trouble Tracking tasks.)

Refer to Chapter 1, *Introduction*, of the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional information on the **Schedule execution** field.

Listing, Displaying, and Deleting Scheduled Items

When you schedule an item (a command or routine) for execution, the system automatically assigns an index number to the item. Once an item is scheduled, you can use the following commands.

- Delete Scheduled Items *(dlsi)* command
- Display Scheduled Items *(dssi)* command
- List Scheduled Items *(lssi)* command

These commands are available in the Manager, Map, Trouble/Inventory Reports and Trouble Tracking tasks. These commands only affect your own scheduled items, except for the System Administrator. The System Administrator can also delete/display the scheduled items of all users. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional information on these commands.

Configuration 3

Overview

This chapter provides information for the following areas:

- Concepts of Configuration Management, concerning device identification, addressing, and standardized naming conventions, and the concept of database views represented via profiles.
- Configuring ports for external systems configurations.
- Configuring of the NMS ports.
- Configuring multiplexers, modems and other system devices.
- Establishing the NMS poll list.
- Activating your NMS system.

Beginning Point for NMS Configuration Activities

Configuration activities begin after both NMS hardware and software are installed, the System Administrator has logged into the NMS, and the system time/date are set. Installation is documented in the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide*; the login and set-time activities are also discussed in Chapter 2 of this guide.

Your interface to the NMS during configuration is via NMS system commands. System commands for configuration are accessed from **System Management** under the Manager task. (Refer to Chapter 2 for information on accessing or using the NMS commands. If you need help identifying the correct task or the path for a command, refer to the *COMSPHERE 6800 Series Network Management System Command Quick Reference Guide* for a menu hierarchy of NMS commands.)

The commands to be used during NMS configuration are identified for you in this chapter in the appropriate configuration descriptions. These commands display detailed input forms for configuration data entry. For detailed information on requesting a command for execution, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* in tandem with this chapter. You may also need to reference the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual* and the *COMSPHERE 6800 Series Network Management System Multiplexer Command Reference Manual*.

NOTE

Many commands discussed in this chapter are executable only by the System Administrator. Refer to the command descriptions in the appropriate NMS reference manual for access level information.

Sequential Steps for Configuration

It is recommended that you read through this chapter first to gain an understanding of the concepts, then refer to *Activating the NMS* at the end of this chapter when you are ready to configure your NMS. The following list summarizes the activities for configuring your NMS.

1. Configure all ports.
2. Create Profiles (user, site, facility, vendor, and device profiles).
3. Create the network map.
4. Activate control channels.
5. Establish filter parameters for each device type. Edit color code scheme as desired.

Concepts of Configuration Management

Configuration Management is the storage, management, administration, and synchronization of configuration information. There are some basic concepts that are used within the NMS in regard to the management of configuration data. These concepts are device addressing using standardized naming conventions and the concept of network profiles.

Device Addressing and Standardized Naming Conventions

All managed devices that are in-service in the network must be identified with a unique device address. The term *managed device* refers to a device that can report alerts to the NMS and/or a device to which the NMS can send tests and commands. Device addressing enables the NMS to communicate (diagnostically) with all network devices. Within the 6800 Series NMS network, device addressing is linked to protocol mode.

NMS supports three protocol modes. These protocol modes are as follows:

Advanced Diagnostic Protocol (ADp) Mode

The ADp mode can only be used with COMSPHERE devices. When ADp mode is used, all devices on a diagnostic circuit must be COMSPHERE devices, and the devices must all be configured for ADp mode.

DATAPHONE II (DPII) Protocol Mode

The DPII mode (also referred to in previous releases as Mixed mode) is used for all DATAPHONE II devices. When DPII mode is used, the devices on the diagnostic circuit can be all DATAPHONE II devices, all COMSPHERE devices, or a mix of DATAPHONE II devices and COMSPHERE devices where all devices must be configured for DPII mode.

ACCULINK Datagram/Command Language

If ACCULINK multiplexers are configured within the network, they will use an ACCULINK-specific datagram/command language protocol to communicate with the NMS.

If an ANALYSIS system is configured within your network, the devices managed by ANALYSIS will use Remote Diagnostic (RD) or Diagnostic Microcomputer (DMC) mode. The RD and DMC protocols are not directly supported by the 6800 Series NMS. They are handled by ANALYSIS. In this document, and elsewhere in the NMS system itself, RD and DMC modes are referred to collectively as DMC mode. When information from ANALYSIS is transferred to the NMS, an internal data transfer protocol is used.

Each protocol mode supports a different addressing scheme. These addressing schemes are described in detail in Appendix D of this document.

The naming method offered by NMS enables you to assign a name to a device and to assign a network or circuit name to a group of logically related devices, such as the devices sharing a common customer, location, or application. You can then reference a group of devices, a network, or a circuit by entering a single name. The naming conventions used in NMS contain special characters and numbers for identifying devices and groups of devices, and specific naming conventions are applied to alert groups and types, circuit names, device group names, device names, etc. Appendix E of this document provides you with detailed information on the NMS naming conventions.

The Concept of Network Profiles

Configuration management allows you to manage the details of your network configurations. By consolidating this network configuration data into specific database files based on the type of configuration data being stored, the system is able to present you with four different network views, or profiles of your configuration. These network profiles are device, site, facility and vendor profiles. The idea of a profile is used to group data related to specific network elements in a logical table. Each profile is therefore a separate view of the database. Each database view enables you to manage different aspects of your configuration.

The four network profiles provide three main types of configuration data for the NMS. The configuration data types are as follows:

Device Configuration Data

This data describes the configuration of each device. The **device profiles** are used to store this information.

Network Data

This data describes the physical location of network devices as well as supplying the vendor information related to each device. The **site profiles** are used to store the physical location data. The **vendor profiles** are used to store the vendor information for the equipment.

Connectivity Data

This data describes the connections and facilities that connect the devices in the network. The **facility profiles** are used to store this data in the database.

Device Profiles

Device profiles are detailed, operational descriptions which are created by the user for each of the NMS network devices. Although you do not need a device profile for the NMS to receive an alert from a device, you do need a device profile for complete identification of the device that reported the alert. Information stored in device profiles is accessed and referenced by other profiles and subsystems in NMS:

1. For various map displays, the Map task uses the device address, device name, model number, device type, NMS support, inventory, device position, parent device, restoral, circuit type, # ports, and site name fields.

2. For trouble ticket and report generation, the Trouble Ticket task and ATR system use the device address, device name, model number, device type, serial number, site name, user contact, and trouble ticket and ATR authorization fields.

3. For UAI message information and generation, the UAI system uses the device address, device name, model number, device type, and UAI authorization fields.

4. To properly validate the reported device identification and to code the message transaction to the device, the device tests and commands use the device address, device type, serial number, subnetwork name, circuit name, and protocol mode fields.

5. For display on the network monitor and summary, the Monitor and Summary tasks use the device address, device name, circuit name, and subnetwork name fields. (The summary information displayed depends on the summary categories.)

6. To determine the proper filter values for each incoming alert, the Filter subsystem uses the device address, device type, device name, circuit name and subnetwork name fields.

7. For reports, the Trouble/Inventory and Performance Reports tasks use the device profile fields.

8. The Site Profile uses the site name field.

9. The Vendor Profile uses the vendor name field.

10. To identify the endpoints of a facility, the Facility Profile uses the device address, device name, device type, site name, and model number fields.

11. External Systems uses the External System name field to cut-through to the appropriate external system when a device is selected from the Network Map.

12. To determine the network devices a particular user can access, the User Access subsystem uses the device address and device name fields.

Device profiles maintain information for both supported and unsupported devices in the network. A device is referred to as supported (or managed) if NMS can receive alert information from the device and it can send commands/tests to the device. Examples of supported devices are the ACCULINK 700 Series multiplexers, the COMSPHERE devices, the DATAPHONE II devices, Bytex devices, and ANALYSIS devices if an ANALYSIS connection is configured. *Unsupported devices* are devices that the NMS cannot directly communicate with or directly manage, and which can only be accessed via cut-through sessions to other environments outside the 6800 Series NMS. Examples of unsupported devices are Digital Access Cross-Connect (DACS) systems, Private Branch Exchange (PBX), front-end processors, etc. Although NMS cannot communicate directly with unsupported devices, information for these devices can still be stored in the profile database, and the devices can still be displayed on the network map.

You create device profiles using the Create Device Profile *(crdp)* command. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for a detailed description on the Create Device Profile *(crdp)* command. When you execute the Create Device Profile *(crdp)* command, the required fields differ depending on whether the device is supported, unsupported, modem, multiplexer, or system.

The NMS also creates device profiles automatically as follows:

- NMS creates a device profile for itself during installation. It assigns the reserved device name *system-1* to this profile.

  You can edit or delete that profile as necessary.

- NMS creates device profiles when you execute the Acquire Modem Control Channel Poll List *(acmccpl)* command if the local control devices responding to the poll do not have device profiles.

  In these cases, the NMS creates a profile, populating fields with information it can obtain from the responding device. You can edit this profile as necessary using the Edit Device Profile *(eddp)* command. If a device profile does exist, executing the *acmccpl* command causes the NMS to update the information in the existing profile.

- NMS automatically creates device profiles for devices directly managed by the ANALYSIS NMS with external systems cut-through level support.

  During the 6800 Series NMS start-up process, the device profiles are created via an upload function from the ANALYSIS NMS for all of the ANALYSIS-supported devices. *You cannot create a device profile for an ANALYSIS device.* You must configure the device on the ANALYSIS system via the ANALYSIS device configuration function.

After initial installation, as devices are added to the ANALYSIS configuration, device profiles are automatically created. Once the ANALYSIS profiles are created by NMS, you can edit these profiles using the Edit Device Profile *(eddp)* command. When editing ANALYSIS device profiles, certain fields within the profile record are protected so you cannot edit these fields. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional information on these fields.

When you create COMSPHERE, DATAPHONE II, or ACCULINK profiles, NMS attempts to send an identification query to the device to obtain the information to populate fields in the profile. Once NMS obtains as much information as possible, you can continue to create the profile record for the device.

Other NMS commands related to device profiles are identified as follows:

Delete Device Profile *(dldp)*

Use the Delete Device Profile *(dldp)* command when attempting to delete a device profile. NMS checks for the existence of any facility profiles, trouble tickets, or alert records that may currently reference the device. If there is a reference to any of these items, NMS does not allow you to delete the device profile. Therefore, before deleting the device profile, you must delete all historic alerts (using the Delete Alert History *(dlah)* command), and delete trouble tickets, and facilities (via the Delete Trouble Tickets *(dltt)* and Delete Facility Profile *(dlfp)* commands) associated with the device profile you are deleting. Also, all active alerts for the device must be cleared (refer to Chapter 5 for additional information on clearing alerts). You cannot delete ANALYSIS device profiles within NMS. You must delete the devices from the ANALYSIS configuration. The device profiles are then automatically deleted from the NMS database. You cannot delete a device profile for a multiplexer node used in an existing channel group or logical link without first deleting the associated channel group or logical link.

Display Device Profile *(dsdp)*

Use the Display Device Profile *(dsdp)* command to display one or more device profiles. This command displays profiles based on device classification (e.g., dce, mux, unsupported, system, snmp, bytex).

Edit Device Profile *(eddp)*

Use the Edit Device Profile *(eddp)* command to change the data in the device profiles. You can edit one device profile at a time. If you change the device address, device name, or device serial number, the changes propagate through all facility profiles and trouble tickets related to that device. **However, be careful. Other databases and files which may reference devices by address (for example, routines, ADR criteria records, scheduled items are** *not* updated with this command.

When editing a device profile, you cannot change the **NMS** support field. To change a device from **supported** to **unsupported** (or vice versa), you must delete the original device profile and create a new profile.

List Device Profile *(lsdp)*

Use the List Device Profile *(lsdp)* command to enter specific search criteria to list all device profiles that match the criteria. The resulting output of the command will be a list of summary information about the devices you have selected.

Automatic Generation of Site and Vendor Profiles—Based on Device Profile Input

If you specify a nonexistent site name in the **Site name** or **Vendor name** fields of the device profile, the NMS automatically creates a new site profile or vendor profile for the name specified. You can edit the vendor or site profile using the Edit Vendor Profile *(edvp)* or Edit Site Profile *(edsp)* commands as needed.

Facility Profiles

The *facility profiles* contain information that describe a facility and define the endpoint devices and their interface to that facility. These profiles maintain information for the facilities in the network. The set of all facilities connecting to a specific device provides the necessary data for creating Connectivity Maps. The facility profile data is also used by the multiplexer application to determine multiplexer node connectivity. You access connectivity maps using the Map task. These maps are discussed in Chapter 6.

Use the Create Facility Profile *(crfp)* command to create a facility profile. You identify each facility by its name, connectivity characteristics, and endpoint devices. You identify each endpoint device by its type of facility interface, the slot number (if applicable) for the circuit card that connects the facility, and the interface identity (or port number) for the facility termination.

You are able to create facilities with two endpoints, stub facilities (facilities that have only a single device endpoint), and facilities that connect a device to itself.

Use the following commands to change, delete or list the facility profiles in your NMS.

Delete Facility Profile *(dlfp)*

Deletes an existing facility profile from the profile database.

Display Facility Profile *(dsfp)*

Displays all existing facility profiles.

Edit Facility Profile *(edfp)*

Used to change information in an existing facility profile.

List Facility Profile *(lsfp)*

Lists facility profiles that meet specified search criteria. The output from this command lists summary data for each selected facility.

Site Profiles

Site profiles maintain information on the various sites where your network devices are located. Site profile information includes the geographic location for the site, specified by telephone, city, or country codes, or by latitude and longitude. Use the Create Site Profile *(crsp)* command to manually create a site profile.

The NMS creates site profiles automatically whenever you reference a new site name while creating or editing a device profile. An automatically-created site profile contains only the site name. You must supply the remainder of the information needed for the site profile record using the Edit Site Profile *(edsp)* command.

The **unnamed** site is the default site within the NMS. If you do not assign a site name to a device, the device is automatically placed in the **unnamed** site by the system. You cannot delete the profile for the **unnamed** site (refer to Chapter 6 of this manual for a description of unnamed sites and how they are placed on the map). However, you can edit this site profile to specify a different geographic location for the site.

Use the following commands to delete, display, list or edit site profiles.

Delete Site Profile *(dlsp)*

Deletes an existing site profile from the profile database. If you delete a site profile and it is referenced by device profiles, the references to the site in the device profiles are changed to **unnamed**. The next time the NMS is updated via the execution of the Create Network Map *(crnm)* command (discussed in detail in Chapter 6), the devices with the site name of **unnamed** or devices at the unnamed site for which geographic information has been updated are moved accordingly on the Geographic Map.

Display Site Profile *(dssp)*

Displays site profiles.

Edit Site Profile *(edsp)*

Used to change the information in an existing site profile record. If you change the name of a site in a site profile, the new name propagates to all device profiles that referenced the original site name.

Vendor Profiles

Vendor profiles maintain inventory information regarding the vendors of network devices or facilities. Information stored in these records is used in generating vendor profile reports. Use the Create Vender Profile *(crvp)* command to create vendor profiles. The NMS also creates vendor profiles automatically when a new vendor name is entered in a device profile or a facility profile.

Use the following commands to delete, display, or edit vendor profiles.

Delete Vendor Profile *(dlvp)*

Deletes an existing vendor profile from the profile database. If you delete a profile for a vendor that is referenced in a device profile or a facility profile, that profile is automatically updated accordingly to reflect a null (blank) value in the **Vendor name** field.

Display Vendor Profile *(dsvp)*

Displays vendor profiles.

Edit Vendor Profile *(edvp)*

Used to change the information in an existing vendor profile. If you change the name of a vendor in a vendor profile, the new name will be automatically reflected in the device profiles and facility profiles that referenced the original vendor name.

NMS Port Configuration

When your NMS is installed, the printers, terminals and basic-feature workstations representing your network configuration are connected to the ports in the NMS processor. The actual ports available for these connections are dependent on the hardware ports cards installed in your system. (For a review of these port cards, refer to the *6800 Series NMS Hardware* section in Chapter 1.) Port usage on the IPC-900, IPC-1600 cards, and on the parallel **(lpt)** and serial (COM A and COM B) ports on the NMS is user-defined, while port usage for the connection of the 3270 Terminal Emulation option (DCP 286i card) and for the ANALYSIS NMS option (dedicated IPC-900 card) is fixed within the system. Ports for ACCULINK multiplexers are assigned during NMS installation. Refer to the *COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide* for information on assigning ports for multiplexers.

NMS port configuration is the process of identifying the characteristics of the devices connected to each user-defined port. Use the Edit Port Configurations *(edpc)* command for port configuration.

When you execute the Edit Port Configurations *(edpc)* command, the first page of the input form prompts for the name of the processor. (Default processor names are set during installation. They represent the host and UNIX Interface Processor (UIP) if configured). Once the processor name is entered, the assigned ports are automatically identified by the system (based on the hardware circuit cards installed). Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for a detailed description of the edpc command.

External Systems Configuration

Access from the NMS to external systems is provided through either the External Systems or Map task. From either of these tasks, you can bypass the NMS and enter into real-time control access of the selected external system.

Initiating External Systems Connections

To initiate an external systems connection, select its entry from the External Systems menu. A window opens. If not, it may be necessary to press **Enter** or **Delete** followed by **Enter** to establish the connection.

You access the External Systems task from the 6800 Series NMS Tasks menu. The external systems menu that displays depends on the particular external systems your login ID has given you permission to access, assuming those external systems interfaces are not currently being used. (To add or remove external system permissions use the Edit User Profile *(edup)* command.)

You access external systems from the Map task by selecting a device icon from a Connectivity Map or from an object list. Then, you select the **Network Control** menu selection from its command menu. If you had specified an external system for that device in the device's profile, NMS attempts a cut-through session. For devices managed directly by the 6800 Series NMS, the Network Control option displays a Manager window.

You are then under the control of the selected external system's environment.

Terminating External Systems Connections

When finished with an external systems interface, logout of the far-end (external system) system. If the far-end system does not drop the line, press tilde (~) and dot (.). This closes the connection on the local end, then closes the external systems window. On full-feature workstations, you can also kill the process by closing the window (selecting Close from the Window menu).

Configuring the NMS for External Systems Interface

External systems interfaces are configured by executing the Edit Port Configuration *(edpc)* command to configure the external system port(s) and then creating external system records to assign the port(s) using the Edit External System Configurations *(edesc)* command.

Using the Edit Port Configuration (edpc) Command to Configure External Systems

Configure a port for external systems use by selecting **External Systems** for its application type in the Edit Port Configuration *(edpc)* command. Then, set the appropriate **port type** and **speed** parameters. For dial ports, you must allocate the port to a port group. All dial ports in the same port group can be used by external systems for port sharing.

When choosing the port group, if you are adding a modem that is not to be shared among other external systems connections, choose a unique port group number. Any alphanumeric character can be used. To add a modem to a modem pool for external systems access, use the same port group as the modem pool. To add a modem as a backup or a secondary connection to a dedicated line to an external system, you want to use the same port group as the dedicated line. In this case, make sure the dedicated line is on a lower port number, as the system uses the first available port with the lowest port number when more than one connection is available for any one port group.

Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for detailed information on executing the Edit Port Configuration *(edpc)* command.

Using the Edit External Systems Configuration (edesc) Command to Configure External Systems

Complete the Edit Port Configuration *(edpc)* command input forms before working on the Edit External Systems Configuration *(edesc)* command input forms.

Every entry added to the edesc command input form will indicate an external system to which you can connect. When you add an entry for an external system, you must enter the port group you used during Edit Port Configuration *(edpc)* command input to let the NMS know how to connect to that external system. There is one exception. When the external systems interface is to hosts through telnet, you specify **port group** as 0.

When adding another modem to an existing modem pool, it is not necessary to add another entry to edit the external systems configuration. For only one modem (or one modem pool) to be connected with multiple external systems, each external system must have a separate entry, and must reference the same port group.

Use the Display External Systems Configuration *(dsesc)* command to display the external system configuration.

Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for detailed information on the Edit External System Configurations *(edesc)* and Display External Systems Configuration *(dsesc)* commands.

Assigning User Access to External Systems

You can give users access to each external system by assigning the system in each user's user profile. See the Edit User Profile *(edup)* command in the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for more information.

Configuring Map Access to External Systems

To configure the NMS to automatically open the appropriate cut-through to the management system of an unsupported device, bytex, brouter, or SNMP device, when that device is selected from the Map task, assign the appropriate External System name to the **External System** field in the unsupported device's device profile. See the Create Device Profile *(crdp)* command in the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for more information.

Notes on External Systems Interface to ANALYSIS NMS

The 6800 Series NMS provides interface access to the ANALYSIS 6510, 5600, and 5605 Network Management Systems. The external systems feature provides the capability for a 6800 Series NMS workstation to simulate a workstation connected directly to the ANALYSIS NMS. The ANALYSIS NMS manages modems and other network devices, such as Data Service Units (DSUs) and service restoration devices.

The 6800 Series NMS receives and stores alerts and configuration data from the devices managed by the ANALYSIS NMS and provides alert management functions for those devices, such as alert filtering, alert storage, trouble tickets, and management reports. Remote printing capabilities are also provided. The ANALYSIS NMS network devices are represented on the 6800 Series NMS real-time Map, Monitor, and Summary. However, the 6800 Series NMS cannot actively poll or test any device in the ANALYSIS network. Direct management of these devices is done using the External Systems cut-through.

Two methods of establishing a cut-through to the ANALYSIS NMS are available. Cut-through may be made through the IPC-900 dedicated to the ANALYSIS NMS or through the optional IPC-1600 which is for general use. For systems with connection to one or two ANALYSIS systems the IPC-900 should be sufficient; users connected to more ANALYSIS systems will find the IPC-1600 cut-through to be easier and more efficient. Users should note that the IPC-1600 does not replace the dedicated IPC-900 link which must be used for transmission of all alerts, profiles, and print-jobs to/from the ANALYSIS NMS.

Notes on External Systems Interface to Bytex Switch Unity Management System

The 6800 Series NMS provides interface cut-through access to the Bytex Unity Management System (UMS) or to the Bytex U30 or U50 switches. The external systems features provides the capability for a 6800 Series NMS workstation to simulate a direct connection to the UMS or to the Bytex switches. Management of any parts of or devices connected to the Bytex switch must be accomplished through the external systems cut-through.

Notes on 6800 Series NMS X-Window Cut-Through

The 6800 Series NMS provides a cut-through feature only available via a full-feature workstation. The cut-through access simulates a workstation connected directly to an external system, allowing management of the SNMP/brouter devices. For more information on this cut-through access, refer to Appendix I.

Notes on External Systems Interface to Hosts Through Telnet

The 6800 Series NMS provides telnet cut-through access to any hosts if the hosts support the telnet mechanism and they are on the same TCP/IP network to the 6800 host. Note that the cut-through feature is through an X-window session and is only available via a full-feature workstation.

Perform the following steps to configure the 6800 Series NMS:

> **NOTE**
>
> The following steps must be performed with the NMS application running.

1. Execute the Edit External System Configuration *(edesc)* command.

   The input form appears.

2. Using the following information, fill in the edesc input form:

   TYPE: (cut-through logical name to be assigned as the external system name)

   TYPE: telnet

   in the **Type** field.

   TYPE: **0**

   in the **Port group** field. The default is **0**.

   TYPE: (host name/IP address)

   Leave the **task name** and **parameter name** blank.

Grant permission to NMS users to cut-through to the host by executing the Edit User Profile *(edup)* command or the Create Device Profile *(crdp)* command. Access to an external system can be granted to a user by specifying the name of the external system (or the keyword **all**) in the **External Systems** field on the user profile form.

For related devices, specify the cut-through logical name entered in Step 2 in the **External System** field on the device profile form. This will allow cut-through from the 6800 Series NMS network map.

Notes on External Systems Interface to SRCU

The 6800 Series NMS provides cut-through access to device tests and commands available at the 4400 Series SRCU ASCII terminal. You can open a separate window to a terminal emulation session, connecting the NMS directly to the ASCII terminal interface of the SRCU. All tests and commands available at this terminal are available through the NMS. For each AB, DBU, and SRCU, you should indicate the logical external system name in the device profiles for these devices. Once this data is available to NMS, terminal emulation sessions to the appropriate ASCII terminal can be automatically initiated from the External Systems task or the Map task.

Notes on External Systems Interface to 850 DCX Multiplexer Connection

To establish an external system connection to an 850 DCX multiplexer, the port on the multiplexer side must be configured for connection termination. See your DCX manual for additional details. When connected to an 850 DCX in monitor mode, the connection is dropped if no activity is sensed in 30 seconds; in update mode the time frame is 30 minutes.

Notes on External Systems Interface to 700 Series Multiplexers

Cut-through access from the NMS to the ASCII terminal interfaces of the multiplexer nodes is provided through the External Systems task. The External Systems task allows you to bypass the NMS interface and enter into real-time control access of a 718, 719, 731, 735, 740/741, 742, 745, or 74x-56K ACCULINK multiplexer via the multiplexer's own menudriven command system.

The External Systems task is a useful feature, but it should be used judiciously because improper use could cause problems in the network. Using an external system cut-through session, you can do the following:

- Read a node's message log.
- Change the node's common Level I password.
- Access certain diagnostic features of the multiplexers that are not supported by the NMS. For details, refer to the user's manual that came with your ACCULINK multiplexer.
- Gain control access to any 724, 735, or 719 multiplexer in the network.

Notes on External Systems Interface to DBU

The 6800 Series NMS provides cut-through access to device tests and commands that are available at the DATAPHONE II 839A/B Dial Backup Unit Controller. You can open a separate window to a terminal emulation session that connects the 6800 Series NMS directly to the ASCII terminal interface of the DBU. All tests and commands available at this terminal are then available through the NMS.

Notes on External Systems Interface to SC

The 6800 Series NMS provides cut-through access to device tests and commands that are available from the DATAPHONE II Level 4 System Controller.

Notes on External Systems Interface to 3270

Refer to the *COMSPHERE 6800 Series Network Management System 3270 Terminal Emulation Option Manual*.

Notes on External Systems Interface to VT100

To connect to any system supporting VT100 compatible interface, specify vt100 in the **type** field of the Edit External System Configuration *(edesc)* command input form. VT100 support is limited to the full-feature workstation.

Notes on External Systems Interface to ANSI-compatible Terminals

The 6800 Series NMS will support cut-through to ANSI X3.64 standard compatible terminals. To connect to any ANSI-compatible interface, specify the terminal type (as listed in the terminfo database), in the **Task name** or **Terminal type** field of the Edit External System Configuration *(edesc)* command input form.

Multiplexer Configuration

If you have multiplexers installed in your NMS network, you must configure the multiplexers before NMS can interact with the devices. Multiplexer support is an NMS software application package option. Since some customers may not have multiplexers in their network configuration, all information on configuring and managing multiplexers is provided in the *COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide*.

Modem, Data Service Unit (DSU) and Service Restoration Control Unit (SRCU), with Associated Analog Bridge (AB) and Dial Backup Unit (DBU) Configuration

If you have modems, DSUs and SRCUs installed in your NMS network, you must configure these devices before NMS can interact with them. Modem, DSU, and SRCU (with associated ABs and DBUs) support is an NMS software application package option. Since some customers may not have these devices in their network configuration, all information on configuring and managing these devices in the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual*.

Establishing the NMS Poll List

The network reports alerts to the NMS through the NMS polling process.

Polling Modems/DSUs

The polling of modems or DSUs is an ongoing two-step process, whereby NMS first establishes a poll list of all control channel-connected control modems or DSUs. All DCE control devices with the exception of the ANALYSIS devices, can be acquired for the NMS poll list. The *acmccpl* command enables you to use the **control channel(s)** field to indicate which control devices are to be acquired for the NMS poll list. When you execute this command and a device profile does not already exist for a local control device, the NMS creates a basic device profile automatically for that device. (Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for details on this command). Refer to the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual* for additional information on modems, Data Service Units and Service Restoration Control Units.

Each modem on the NMS poll list has a unique address based on its location in the network. Once the list is established, the NMS polls each modem on each control channel, requesting its health and status.

In turn, each local control device must establish a poll list of its tributary devices. Tributary modems can also poll extended control modems via the diagnostic channel. In the case of DDD devices, each control device must establish a poll list of its DDD devices. After a poll list is established, the control modem polls each device on its poll list. When alerts are detected by control modem or polling, the alert is reported to the NMS when the NMS polls the control device.

You can place an individual device on the NMS poll list by using the **system polling** field in the device's device profile (instead of using the Acquire Modem Control Channel Poll List *(acmccpl)* command). The **System polling** field in each device profile is used to activate/skip polling on the control channel for the device. Use of the **System polling** field is described in greater detail in the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

If you change the device's protocol mode from DATAPHONE II mode to ADp mode, or the other way around, you must use the Change Protocol Mode *(chpm)* command to adjust the value of the **System polling** field. If executing the *chpm* command and the System polling field value is changed from **extended poll** to **no poll** for a device, you may have to add that device to its upstream device's polling list to have that device included in the normal polling process.

You can turn the NMS polling function for each control channel on or off via the Edit Alert Monitoring State *(edams)* command. This command enables you to turn the polling process **on** or **off** for each of the control channels being polled and enables you to set the response time-out interval for each control channel. The time-out value is specified in seconds to indicate the time interval that the NMS will wait to receive a response from a polled device on the specified control channel. If the time interval elapses without a response from the polled control device on the control channel, the NMS then returns a *no response* (NR) alert for the device and moves on to the next sequential control device on the channel to which the NMS has access.

Polling Multiplexers

The polling of multiplexers by the NMS is a similar process, except each multiplexer in the network is polled individually by the NMS. You cannot acquire all multiplexers for the NMS poll list with the Acquire Modem Control Channel Polling List *(acmccpl)* command. The **system polling** field in each multiplexer device profile is used to add/remove a multiplexer from the NMS poll list.

The NMS also uses multiplexer asynchronous alert reporting as a redundant measure against the loss of event information as a result of a hardware failure. This reduces the probability that a problem might not be reported during equipment outage. The multiplexer polling process is discussed in the *COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide*. Multiplexer alert processing is discussed in Chapter 5 of this manual.

Use the following commands to monitor the polling process.

Display Alert Monitoring State *(dsams)*

Displays the current polling and event reporting states, referred to as the alert monitoring state of the control channels. The command displays the control channel name, the current alert monitoring state (polling of the control channel **on** or **off** for modems and polling and asynch reports for multiplexers), and the time-out interval (in seconds) for no response from the control channel being polled (time-out interval is not applicable to multiplexers).

Display System Poll List *(dsspl)*

Displays a list of the devices currently on the poll list of a specified channel. The list displays the control channel whose poll list is being displayed, the device type for each listed device, the name and device address of each listed device, the system polling status of each device **(active, skipped, both)** and lists the number of ports for each device.

Local control devices are added to a control channel poll list via the *acmccpl* command described earlier in this section, and also by setting system polling in their device profile using the Create Device Profile *(crdp)* or Edit Device Profile *(eddp)* commands. In the device profile, the value entered in the **System polling** field determines the type of polling the device receives from the NMS.

Activating the NMS

Complete the following steps to activate the NMS properly.

1. Identify and activate all ports (see *NMS Port Configuration* in this chapter).

2. Verify or create all necessary device, site, vendor, facility and system profiles. Refer to the profile information earlier in this chapter. Also, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for creating profiles.

3. Execute the Create Network Map *(crnm)* command. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional information on executing this command.

4. Establish filter management for each device type. Refer to Chapter 5 in this document for information on establishing filter parameters for each NMS filter.

5. Activate polling. For modem networks, activate polling by executing the Edit Alert Monitoring State *(edams)* command. For activating multiplexer polling, refer to the *COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide*. For activating modem polling, refer to the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual*.

System Administration 4

Overview

This chapter provides information for administering the NMS. Most procedures and commands referenced in this chapter must be performed by a System Administrator with sufficient system knowledge of INFORMIX, UNIX and the NMS.

Managing the NMS User Database

The following sections provide information on establishing system security, assigning each user to a functional access user group, creating user profiles, updating the NMS configuration record, and updating the workstation configuration records.

Establishing System Security

Introduction

NMS security provides the NMS System Administrator with control over user access to network devices, commands, alerts, the Network Map, Monitor, and Summary tasks via the network partitioning feature. The NMS System Administrator is able to restrict the user's access to groups of specifically defined devices, circuits, networks or control channels. In addition, an individual user or groups of users may be restricted to specific commands or sets of commands against those customized groups of devices. Lastly, the NMS System Administrator can restrict users viewing to specific alerts on their Monitor display and to device groups and alerts on their Map display.

This ability to flexibly grant or deny specified users access to devices or NMS commands is accomplished through the definition of device groups, user groups and user profiles. Device groups identify sets of devices, defined either by name, address, circuit, network or control channel. User groups identify sets of NMS commands which are executable by users who are assigned to those groups. User groups will be discussed in a later section. Lastly, the reporting of alerts is customized by defining which devices reporting which alerts will be displayed on the Monitor and Map windows. The network summary customization is handled separately from that for the Monitor and Map displays.

Logical Network Partitioning Procedures

Prior to executing any NMS commands the NMS System Administrator must establish which devices, circuits, or networks will be grouped together. These groups will define those parts of the total network which individual users will access or affect. The System Administrator should examine how naming these devices, circuits or networks will assist in defining the groups through the use of wildcard characters (*?!) when making entries in NMS commands fields. The number of device groups allowed in the NMS is fixed at 30.

The NMS System Administrator should next establish the various levels of NMS command access. The Logical Network Partitioning feature is delivered with four levels of command access predefined: *Administrator, Manager, Data Technician and Help Desk.* These levels are incorporated in the NMS as user groups 1 through 4. Groups 5 through 30 are available for any other level of command access desired by the NMS System Administrator.

Once the device groupings and user command access levels are determined, the System Administrator can enter them in the NMS using the Edit Device Group *(eddg)* and Edit User Group *(edug)* commands respectively. Groups can be displayed using the Display Device Group *(dsdg)* and Display User Group *(dsug)* commands. A List Device Group *(lsdg)* command is also available.

The System Administrator can assign users to the device groups and user groups using the Create User Profile *(crup)* and Edit User Profile *(edup)* commands. Access to the Summary window is also granted or denied using these commands. The Map and Monitor windows are accessible to all users; however, what is displayed is determined by the user profile. Users can use the Edit User Selection Criteria *(edusc)* command to determine which alerts or devices an individual user will see.

Please refer to the *COMSPHERE 6800 Series NMS Core Command Reference Manual* for detailed descriptions of the device group, user group, user profile and user selection criteria commands. Information on user groups and user profiles can be found in subsequent sections.

NMS Configuration Information

The NMS configuration information identifies the NMS customer and the customer's software version. This information is included as part of an Automated Trouble Report (ATR).

The NMS configuration information is stored in a single NMS database record, and identifies the name of the organization or company that is managing the NMS, provides its location address, and provides the name and telephone number of the data communication manager who should be the contact point for service.

An NMS ID serial number is included to uniquely identify the NMS software installed for the customer. The serial number of the software is assigned by the customer. The current NMS software version number is supplied automatically during installation.

To facilitate remote access dial-in maintenance service, the maintenance telephone numbers for dialing into the maintenance port of the NMS can be stored as a part of the NMS configuration information.

When jobs are sent to the system printer, the outputs include a one page printer banner, showing date and time of the command execution and the User ID requesting the command. You can control whether or not the printer banner is printed by setting the appropriate option in the NMS configuration record.

Updating the NMS Configuration Record

The System Administrator updates the NMS configuration record via the Edit NMS Configuration *(ednmsc)* command. When you invoke the command, an input form is displayed for entry of NMS configuration information. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for details on executing this command.

Use the Display NMS Configuration *(dsnmsc)* command to display the NMS configuration record.

NMS Workstation Configuration

The workstation configuration records are administrative records that identify all workstations physically configured on the NMS. This information can be used by the System Administrator to aid in workstation troubleshooting, maintenance and inventory control.

When a new NMS is first installed, 90 null (empty) workstation records are automatically provided by the NMS (see the Edit Workstation Configurations *(edwc)* command in the next section), enabling the System Administrator to complete workstation configuration records for each workstation that is configured on the NMS.

Use the Display Workstation Configurations *(dswc)* command to display the workstation configuration records.

Updating Workstation Configuration Records

Workstation records are updated and maintained via the Edit Workstation Configurations *(edwc)* command. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for details on executing the Edit Workstation Configurations *(edwc)* command.

Backup and Restoring the System Database

NMS provides manual backup and restore procedures for saving the system database. These procedures are described in this chapter. NMS users also have the automatic backup and restore feature. This feature enables a user to schedule backup and restore tasks to maintain up to three ‘‘hot spare” systems that can be ready to run on short notice. This chapter provides a description of the Automatic Backup and Restore feature. Refer to the *COMSPHERE 6800 Series NMS Core Command Reference Manual* for a description of these commands.

Automatic Backup and Restore

The Automatic Backup and Restore feature provides the user with the ability to backup and/or restore automatically all the INFORMIX database files and other NMS files and directories on a scheduled frequency, date, day of the week, and/or time of day. Once the user sets up the schedule, all files that are needed to restart a fully functioning NMS will be transferred from a specified NMS host to a separate destination NMS host processor. Restoring all the backed-up files will occur according to the user’s established schedule with a minimum of intervention.

This feature uses two NMS commands, *mab* (Manage Automatic Backup) and *mar* (Manage Automatic Restore), to specify the frequency, day/date, and time of the backup or restore. The NMS will be backed up while the NMS is active. During the automatic restore, the NMS is stopped, the database, files, and directories are restored, and the NMS is then started again. This process is transparent to the user.

The automatic backup/restore procedures will operate over a network using the TCP/IP protocol where the processors on the network are identified in */etc/hosts*. The *mab* and *mar* commands may be invoked on any processor in the network to schedule backup/restore operations between pairs of processors on the network to a maximum of three pairs. Each destination for a backup must be unique across the network as that processor can only store a single copy of NMS database files and directories. Each origination processor must be unique across the network to eliminate the possibility of scheduling restores to the same origination processor from multiple destinations.

Alerts and events are generated by the Automatic Backup and Restore feature. Ten minutes before a backup or restore is started, an alert is sent to the alert subsystem to indicate that the automatic backup/restore is pending. This alert is cleared when the backup/restore starts. If the user has specified that the backup/restore is to begin **now** or if it is scheduled to begin within ten minutes, this alert is not generated. Other alerts are generated when the backup starts. Events are generated when the backup completes and when it fails to complete.

Messages stating the start of the backup/restore are sent to the system log along with a message indicating the completion of the backup job. During the restore process, messages cannot be sent to the system log nor can alerts or events be generated for the alert subsystem to handle because the NMS is stopped. Messages from the backup or restore procedures themselves are stored in special log files named */user/tmp/backuplog* and */usr/tmp/restorelog*, respectively, and may be viewed by the user.

Disk Storage Requirements

The backup procedure creates the backup files on the origination host processor before transferring them to the destination processor. Sufficient disk space must, therefore, be available on the origination host processor to hold both the operational database files and directories and their backup. The Automatic Backup and Restore feature will require a dedicated third 520 Mb hard disk on both the origination and the destination host processors. Attempting to execute the *mab* or *mar* commands when the third hard disk is not present will result in an error message.

Manual Backup and Restore

The following procedures describe how to backup and restore the system database for the 6800 Series NMS. To perform backup or restore, you must be logged in as **nms** under UNIX (the **nms** login is not within the NMS application.) Database backup can be performed while the NMS application is running, however, database restoral can only be performed when the NMS is stopped. If you attempt to perform the restore procedures while the application software is running, you are prompted to stop the system.

You will lose scheduled items in the Trouble Tracking and Trouble/Inventory Reports tasks if those items have been scheduled to execute while a database backup or restore is being performed.

> **NOTE**
>
> Performing backup while NMS is running can lead to a loss of data. For example, databases are locked sequentially during backup and thus alerts can be lost.

Performing System Database Backup

The backup procedure is recorded in the */usr/tmp/backuplog* file, which stores detailed information concerning the backup activity.

Use the following steps to back up the system database.

1. From the 6800 NMS Menu, select **Backup system database**,

   TYPE: 4

   PRESS: Enter

   The system displays the following prompt,

   The database backup consists of files/directories used with the INFORMIX database and the INFORMIX database itself.

   To perform a database backup, the NMS can be running or stopped. Checking NMS system, please wait...

   Wait until the following message appears,

   Check for database index errors before performing backup? (y/n) [y]:

2. To continue,

   TYPE: y (yes)

   PRESS: Enter

   The following message appears,

   Performing database error check...

   Database error check is continuing, please wait...

   Database error check is continuing, please wait...

   Database error check is continuing, please wait...

Wait until the following message appears,

Database error check has been completed.

Please insert cartridge tape, Type \‘c’ to continue or \‘q’ to quit and then press Enter.

3. Insert a cartridge tape,

   TYPE: c

   To continue,

   PRESS: Enter

   The following message appears,

   Backing up files/directories, please wait...

   Wait until the following message appears,

   Verifying tape readability, please wait...

   Wait until the following message appears,

   Backup of files/directories completed. Please remove tape and label it \‘Database Files/Directories Backup’. DO NOT USE THIS TAPE TO BACKUP THE INFORMIX DATABASE. USE ANOTHER TAPE.

4. Remove tape from the tape drive, label it ‘‘Database Files/Directories Backup” with the current date. Wait for the following message to display,

   Please insert cartridge tape. Type \‘c’ to continue or \‘q’ to quit and then press Enter.

5. Insert a new tape. To continue,

   TYPE: c

   PRESS: Enter

   Wait for the following message to display,

   Please refer to page 3-20 of the “Informix-OnLine Administrator’s Guide” for additional information.

   Backing up INFORMIX database, please wait...

   Performing archive of the entire INFORMIX-OnLine system.

   Please mount tape and press Return to continue...

6. Because the cartridge tape has already been inserted into the tape drive, ignore the instructions to mount the tape.

   PRESS: Enter

7. There are different formats available for archiving the INFORMIX database. Always run a complete archive of all used disk pages. A full archive is selected by responding with 0 to the following prompt.

   Please enter the level of archive to be performed (0, 1 or 2)

   TYPE: 0

   PRESS: Enter

8. At this point the database transfer to tape begins. The message below dynamically updates as the archive continues.

   Archive in progress, X percent done.

   If more than one tape is required to complete the archive, the following message is displayed.

   Please label this type as number 1 in the archive sequence.

   Remove the tape and label as requested. Insert a new tape.

   Please mount next tape and press Return to continue...

   PRESS: Enter

9. When the backup is completed, the following messages are displayed.

   Level 0 archive is 100 percent completed

   date: date/time displayed

   Tapes required to restore the system to the state at the beginning of this archive:

   Archive level: 0 Archive date: date/time displayed

   Logical log unique id at the beginning of the archive: xx

   Program over

   Verify tape readability, please wait...

   Wait until the following message appears.

   Press RETURN to continue

   PRESS: Enter

10. If backup was performed with the NMS stopped, you will need to start the system up again by selecting Start the system from the 6800 NMS Menu,

    TYPE: 1

    PRESS: Enter

11. To return to the 6800 NMS Menu,

    TYPE: 11

    PRESS: Enter

12. Wait until the light on the tape drive goes off, then remove the tape.

This completes the procedure for system database backup.

Restoring the System Database

The Database Restore procedure is recorded in the $TMPFILE (/usr/tmp/restorelog) file. This file stores detailed information concerning database restore activities. The NMS cannot be running when you perform a restoral.

Perform the following steps to restore the system database.

1. From the 6800 NMS Menu select Restore system database,

   TYPE: 5

   PRESS: Enter

   The following message appears,

   The database restore consists of files/directories used with the INFORMIX database and the INFORMIX database itself.

   To perform a database restore, the NMS system must not be running. Checking NMS system, please wait...

   Wait until the following message appears,

   Please insert tape labeled 'Database Files/Directories Backup'.
   Type 'c' to continue or 'q' to quit and then press Enter.

2. Insert the tape labeled ''Database File/Directories Backup",

   TYPE: c

   To continue,

   PRESS: Enter

   The following message appears,

   Restoring files/directories, please wait...

   Wait until the following message appears:

   Restore of files/directories completed. Please remove tape and insert the tape containing the INFORMIX database backup.

   The following message appears,

   Please follow the instructions on pages 3-27 to 3-31 of the "INFORMIX-ONLINE Administrator's Guide".
   Please wait for menu.
   Press [Return] to continue.

   When the INFORMIX-ONLINE menu is displayed, the following message appears,

   Informix-OnLine: Status Parameters Dbspaces Mode Force-Ckpt...
   Status menu to view INFORMIX-OnLine.

3. Select **Archive** from the INFORMIX-ONLINE menu,

   TYPE: a

   The following Archive menu appears,

   ARCHIVE: Create Restore Tape-Parameters Exit

4. Select **Restore** from this menu,

   TYPE: r

   The following message appears,

   Restoring entire INFORMIX-OnLine system.
   Please mount the first system archive tape and press Return to continue...

5. The tape labeled ‘‘Database File/Directories Backup” is currently in the drive. Remove this tape and insert the tape labeled ‘‘INFORMIX database backup”.

   PRESS: Enter

   The following message appears,

   Restoring system control information, please wait...

   The following message then appears,

   Press ESC to return to the Archive menu.
   Use arrow keys to move the cursor.
   Press F3 or CTRL-B to continue.

   CHUNKS THAT WILL BE RESTORED

   Full Pathname Of The Chunk Offset Size

   /dev/rdsk/rootdbspace 16 79990 (These values may vary)

6. To continue,

   PRESS: CTRL-B

   If there are any logical logs presently on disk, you are asked if you want to back them up, as in the following example statement,

   Would you like to backup log 22-23? (y/n)

7. To continue,

   TYPE: n

   PRESS: Enter

   The following message appears,

   Restoring dbspaces/BLOBSpaces, please wait...

   Wait for the following message to display,

   Do you have another level of tapes to restore? [y/n]

8. To continue,

   TYPE: n

   PRESS: Enter

   The following message appears,

   Initializing, please wait...

   [Press Return to continue.]

9. To continue,

   PRESS: Enter

   The following message appears,

   Initializing, please wait...

   Wait for the following message to display,

   Is there a logical log tape to restore?[y/n]

   Roll forward should start with log number 'x'

   Where: x = a log number.

10. To continue:

    TYPE: n

    PRESS: Enter

    The Archive menu appears:

    ARCHIVE: Create Restore Tape-Parameters Exit
    Restore dbspaces from tape to disk.

11. Select **Exit** in order to return to the INFORMIX-ONLINE menu:

    TYPE: e

    The INFORMIX-ONLINE menu appears:

    INFORMIX-OnLine: ... Archive Logical-Logs Exit

12. Select **Exit** from the INFORMIX-ONLINE menu:

    TYPE: e

    The following message appears:

    Restoring any printer, remote terminal or atr ports.
    Now bring INFORMIX-ONLINE system on-line.
    (INFORMIX-ONLINE is currently off-line.)

    INFORMIX-ONLINE daemon restarted.

    . . .

    Press RETURN to continue

13. To return to the 6800 NMS Menu:

    TYPE: 11

    PRESS: Enter

14. Wait until the light on the tape drive goes off, then remove the tape from the tape drive.

This completes the procedure for system database restoral.

NOTE

After restoring the system database, run the Create Network Map *(crnm)* command to update the Map display.

5 Filter Administration and Alert Processing

Overview

This chapter discusses the processing of alerts through the NMS filter system and the processing and management of alerts. The filter commands are provided under **Alert Management** which is under **System Management** in the Manager task.

Filter Administration

A filter is a mechanism that lets the NMS software determine whether or not an alert is accepted by the subsystem or process controlled by the filter parameter. Filters can be defined as duration filters (which check the length of time an alert is present before passing the alert on) or simple on/off or pass/block filters (which check the type of alert and determine whether or not to pass it.

An *alert* is an alarm, status report, or event reported by a device. Each alert received by NMS is mapped to an *alert type*. Alert types are short names or codes which identify the alert. To simplify filter administration, alert types for a specific device type are grouped into *alert groups*. Alert types from the same alert group use the same filters. See *Alert Processing* later in this chapter for more discussion on these terms.

Alerts from all DATAPHONE II devices and COMSPHERE 3400/4400 Series modems are detected through the 6800 Series NMS polling process. Alerts from devices in the ANALYSIS NMS network are not detected by the 6800 Series NMS polling but rather through a transfer of alert information from the ANALYSIS NMS to the 6800 Series NMS. Alerts from multiplexers are detected through polling and asynchronous alert reporting. Alerts from bytex devices, brouters, and SNMP devices are received through asynchronous alert reporting.

When the 6800 Series NMS receives an alert, that alert passes through a series of filters. The filter processing flow is described in the following section.

NMS Filter Processing Flow

There are six types of filters that make up the filtering system within NMS. These filters are the processing filter, the display filter, the Uniform Alarm Interface (UAI) filter, the automated action filter, alert-driven routine filter, and the storage filter. The audible and visual filters are sub-filters of the display filter.

The processing filter processes all alerts coming into the system. Only alerts that pass this filter go on to other filters and processes. A common use of the processing filter is to reduce the number of alerts that are managed by the NMS, eliminating the alerts as specified by the user that are of little interest to the user, or that are transient, lasting only a short time (in terms of seconds).

The duration of each alert is timed and the processing filter passes the alert to subsequent filters if it exceeds the filter value. If the alert does not pass the processing filter, it is removed from the system. If the alert passes this filter, it is concurrently passed through the other filters in the system (Figure 5-1).

The filtering system can be customized and set up for individual network needs.

Filtering Exceptions

Filtering exceptions can be identified for specific devices of the device type associated with each alert group. These specific devices are given individual filter values and are processed as exceptions to the filter parameters set up for their associated alert group.

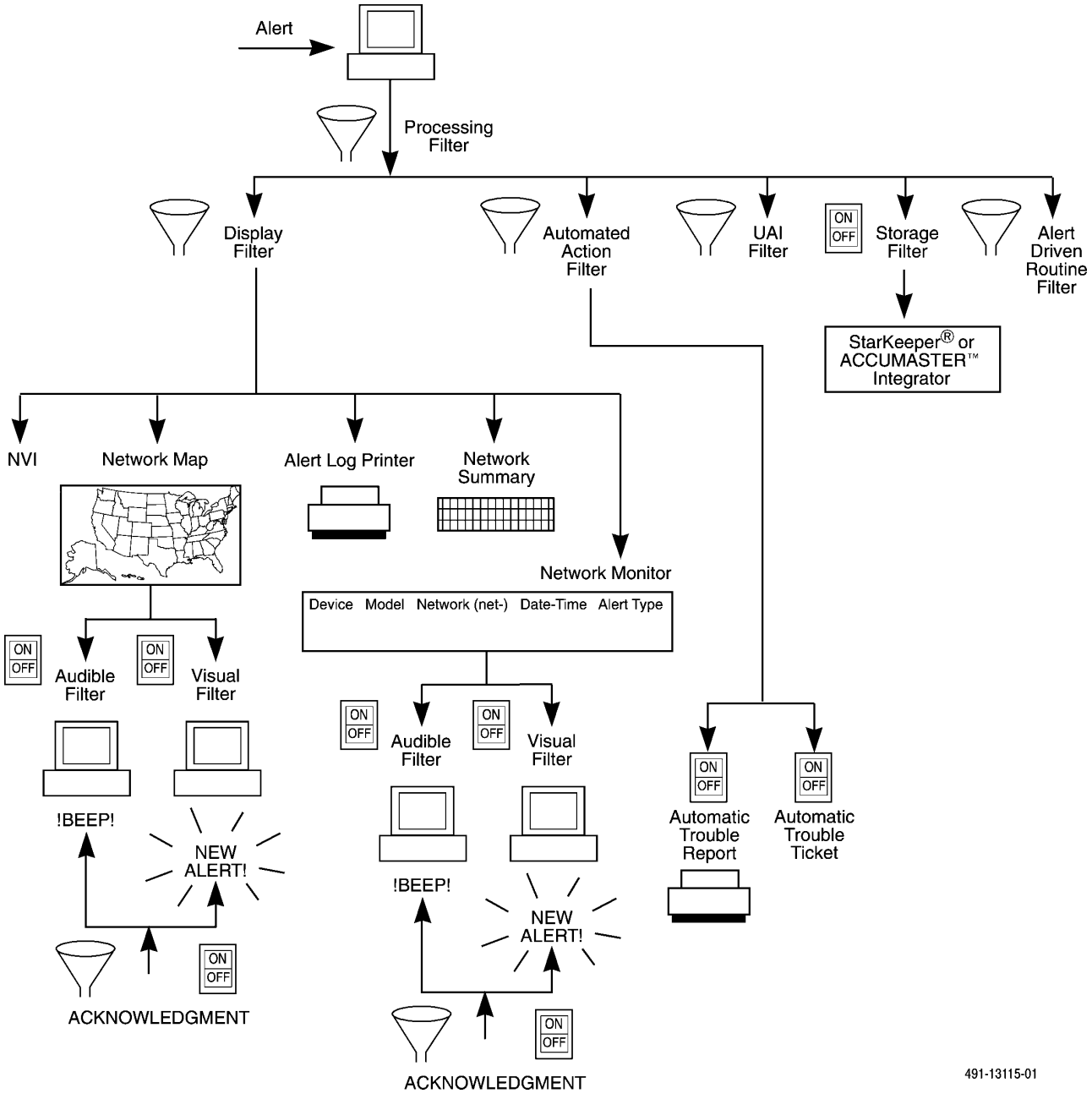


Figure 5-1. Alert Filter Processing Flow

Paradyne NMS presents filter information for a particular device type with two options.

1. With the first option, NMS presents the alert group identification, filter type, and default filter value for each alert group.

2. With the second option, NMS presents exceptions to the default filter value based on the specific devices identified as exceptions for each alert group. Each exception entry consists of a device ID and a filter value for that device. Valid device IDs are as follows.

   - Single Device Address
   - Single Device Name
   - Single Device Serial Number
   - Circuit Name
   - Network Name

Filter Types

The NMS alert filters are further described as follows.

Processing Filter

As described in the previous section, all alerts pass through the processing filter when coming into the NMS. You can change processing filter values using the Edit Processing Filter *(edpf)* command (discussed in the next section).

Display Filter

This filter either totally eliminates alerts or eliminates transient alerts from displaying on the NMS workstations or alert log printer. When an alert passes the display filter, a message is printed on the alert log printer, and each user's alert selection criteria is checked to determine if the alert is to be shown on the user's Monitor and Map displays. User selection criteria can be customized via the Edit User Selection Criteria *(edusc)* command.

If a category in the network summary is defined for the alert, it is tallied in the corresponding cell in the Summary window.

You can change the display filter values via the Edit Display Filter *(eddf)* command. You can display the filter values via the Display Display Filter *(dsdf)* command.

Audible Filter

Audible and visual attributes are administered via the Edit Alert Attribute *(edaa)* command.

When the alert passes the display filter and is enabled for audible acknowledgment, all full-feature workstations that display the alert generates a beep, indicating that the alert is a new, unacknowledged alert. When the alert has been automatically or manually acknowledged, the workstations stop beeping due to that alert. However, if there are other unacknowledged alerts being sent to the full-feature workstation, the beeping continues.

Visual Filter

When the alert passes the display filter and is enabled for visual acknowledgment, the Monitor displays the ****Unacknowledged**** string. The Map displays icons undimmed and the object list names with ****** (double asterisk) preceding and following the names. When the alert has been automatically or manually acknowledged from the Monitor, the *unacknowledged* text automatically disappears from the Monitor. In the Map task, acknowledged alerts are shown in half-tones on the displays. Map icons are displayed with less saturation and the ****** (double asterisk) is removed from the object list names.

Storage Filter

The storage filter determines which alert records are to be stored in the historical alert database once they are cleared. Storage filters are on/off filters.

You can change the storage filter via the Edit Storage Filter *(edsf)* command. You can display the storage filter values via the Display Storage Filter *(dssf)* command.

Automated Action Filter

Each alarm that passes the automated action (AA) filter can trigger to initiate Automatic Trouble Reports (ATR) and/or generate Automatic Trouble Tickets (TT).

For ATRs, authorization must be set up in the device profile of the device reporting the alert, the alert must pass the AA filter, and it must be authorized by the control channel in the Edit ATR States *(edatrs)* command.

For automatic TTs, authorization must be set up in the device profile of the device reporting the alert, the alert must pass the AA filter, and it must be authorized by the control channel in the Edit ATR States *(edatrs)* command.

You can change the automated action filter values via the Edit Automated Action Filter *(edaaf)* command. You can display the automated action filter values via the Display Automated Action Filter *(dsaaf)* command.

Alert Driven Routine Filter (ADR Filter)

Each alert that passes the ADR filter can trigger execution of an alert-driven routine. You can specify (on a per device type, per alert group basis) that ADRs execute only if a triggering alert persists beyond a specified time duration. ADR filters delay ADR execution only if the ADR is triggered by a new alert; an ADR is not delayed by filtering if the ADR is triggered by an alert clear. As with other filters, you can modify the filter values associated with each defined alert group for a specified device type; or you can specify exceptional filter values used for individual devices or device groups.

You can change the alert-driven routine filter values using the Edit Alert-Driven Routine Filter *(edadrf)* command. You can display the ADR filter values via the Display Alert-Driven Routine Filter *(dsadrf)* command.

Uniform Alarm Interface Filter (UAI Filter)

Alerts received by the 6800 Series NMS can be transferred to an ACCUMASTER Integrator or StarKeeper via the Uniform Alarm Interface (UAI). The UAI filters can be set to allow only certain alert types to be sent via the UAI. As with other filters, you can modify the filter values associated with each defined alert group for a specified device type; or you can specify that exceptional filter values be used for individual devices or individual device groups.

You can change the UAI filter values via the Edit Uniform Alarm Filter *(eduaf)* command. You can display the UAI filter values using the Display Uniform Alarm Filter *(dsuaf)* command.

Customizing Alert Attributes and Criteria

The user selection criteria allows per-user customization of Map and Monitor alert displays. A user's Map displays only those alerts as follows:

1. The alerts which pass the display filter.
2. The alerts from device groups for which the user has been given Map/Monitor access.
3. The alerts which are specified as part of the selection criteria ''Map" in the Edit User Selection Criteria *(edusc)*.
4. The alerts which are specified as part of the selection criteria ''Alerts" in the Edit User Selection Criteria *(edusc)*.

A user's Monitor displays only those alerts as follows:

1. The alerts from device groups for which the user has been given Map/Monitor access.
2. The alerts which are specified as part of the selection criteria ''Map" in the Edit User Selection Criteria *(edusc)*.

The System Administrator can customize the alert attributes by editing the visual and audible alert attributes of all alert groups associated with a specified device type via the Edit Alert Attribute *(edaa)* command.

The System Administrator can also specify which alerts are to be tallied in each of the 30 categories of the Summary task. This is done by executing the Edit Category *(edc)* command. The related Edit Row-Column Labels *(edrcl)* command permits the System Administrator to label the Summary display appropriate to the defined categories.

Each individual user can determine what alerts display in their Map and Monitor windows via the Edit User Selection Criteria *(edusc)* command. When executing these commands, be aware that the alert groups are device-dependent. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional information on the following commands.

Edit Alert Attribute *(edaa)*

This command affects the visual and audible indicators for alerts associated with all alert groups for a specified device type. Execute this command to edit the alert attributes for all alert groups for a specified device type. You are able to enable or disable the state of the audible alert feature for alerts associated with each alert group and enable or disable the state of the visual alert feature associated with each alert group.

You are also able to specify the time-out interval for acknowledgment of alerts and for the time-out interval for clearing events associated with each alert group for a specified device type.

Edit Category *(edc)*

This command affects the Summary window displayed for all users of the system. Execute this command to edit a Summary window category. The Summary contains a matrix of 30 cells, each of which can show alert totals based on a specific selection criteria. The specific selection criteria is stored in numbered categories. Each cell is mapped to a category from 1 to 30. You can edit the selection criteria in each category to indicate if this selection category is going to be active or inactive, and to specify the device types, the model numbers of devices, the specific device addresses, names or serial numbers, and the alert type or alert group to be associated with this category. You can also specify alerts by priority for the category. Then, use the Edit Row-Column Labels *(edrcl)* command to change the labels of the matrix appropriately.

Edit User Selection Criteria *(edusc)*

This command affects the display of the Monitor and the Map on an individual user basis. All users of the system can execute this command if the user group to which they belong has the appropriate permissions. Execute this command to customize the information displayed when viewing alerts on the Monitor and on the Map. The changes made to the selection criteria are activated on an individual basis and are linked to the user ID. You are able to specify alert selection criteria based on device type(s), model number(s) of devices, and by specific device address(es), name or by a serial number. You can specify which alert type(s) or alert group(s) are to display and you can specify what alert priority levels should display. Each time you subsequently access the Map or the Monitor tasks, the selection criteria you establish here is used by the system to initialize the displays. You see only those alerts matching your specified criteria on your Map and Monitor appears.

Alert Processing

Alert management enables NMS to process alerts online and to take the appropriate action to restore operations. An alert can be classified as a failure of diagnostic routines, a condition not normal for operation, or as a message from the network to the NMS.

Alerts can be received from the following devices:

- DATAPHONE II APL modems
- DATAPHONE II DDS Data Service Units (DSUs)
- DATAPHONE II DDD Shared Diagnostic Units (SDUs)
- COMSPHERE Devices (APL, DSU, DDD modems)
- ANALYSIS NMS-supported Devices

- 719 NETWORKER
- DATAPHONE II 735 multiplexers
- ACCULINK 731, 740, 741, 742, 745, and 74x-56K multiplexers
- Service Restoration Control Units
- Bytex Unity Management System (UMS); Bytex U30 and U50 switches
- Analog Bridges
- Dial Backup Units
- SNMP/brouter devices

The 6800 Series NMS can monitor device health and status of the modem and multiplexer control channels, display the health and status of devices, report alerts to a technical support group, track the repair of faulty devices, and transfer alert information from the 6800 Series NMS to other network management systems.

There are three types of alerts that can be displayed on the Map, Monitor, and Summary displays: device alerts, facility alerts, and system alerts. Alert management for device types is affected by these alert types as follows.

Device Alerts

A device that has a value of **supported** in the **NMS support** field of its device profile is a device managed by NMS and the display object corresponding to the device can show alert state information. A device that has a value of **unsupported** in its device profile is not managed by NMS and the display object corresponding to that device cannot show alert state information. Device alerts are processed in alert groups, which are device type-specific. Alert group information for modems/DSUs and SRCUs, multiplexers, bytex devices, SNMP/brouter devices, and the NMS is provided later in this chapter.

Alerts on Undefined Devices

If an alert is reported to the NMS for a device that does not have a device profile, the NMS classifies the alert as an *undefined* device. Alerts for undefined devices are handled the same as other devices. However, once processed, they are dropped and not stored in the historical alert database because the alert cannot be associated with a device profile.

Facility Alerts

Facility alerts inform the user regarding problems or activities corresponding to the physical connections between devices in the network. If there is a single facility configured on the appropriate interface (port or line), the display object corresponding to the facility visually indicates the alert. However, if there are multiple facilities configured on a given interface and a determination cannot be made as to the exact facility, the display object corresponding to the device reporting the facility alert visually indicates the alert.

Usually, the exact facility can be determined for line-side facility alerts on multiplexers; the display object representing that facility visually indicates the alert.

System Alerts

The 6800 Series NMS software alerts can be reported and displayed on the Map, the Monitor and Summary and stored in the alert database.

Alert Types

An alert type briefly identifies the alert and is associated with a textual description of the alert. For communications products, it can be one to seven letter abbreviation of the alert's descriptions, such as DF for Device Failure or TM for Test Mode. See Table 5-2 for the alert types associated with communications products. For multiplexers, alert types are major/minor codes, such as 50.00. See Table 5-3 for major/minor codes for ANM-generated events and Table 5-4 for major/minor codes for ANM-generated alarms.

Alert Groups

An alert group is the logical grouping of alert types for filtering and display purposes. The convention for alert group names enables you to identify the device type and a general keyword description of the kind of alert being reported, such as **apl-facility** for modems and **mux-chnll** for multiplexers.

Alert Management Tools

NMS provides the following tools for alert monitoring and management.

- Color Coding and Priorities — To display and set the priority level and colors of the alert.
- Map Task — To display network objects, connectivity and health and status.
- Monitor Task — To display current active alerts.
- Summary Task — To display categorized totals of active alerts.

You also have available an event log printer and alert log printer for use in monitoring the network. A brief description of these tools is provided in this section. References for additional information are noted where appropriate.

Color Coding and Priorities

The Map, Monitor and Summary tasks use color codes when displaying alerts to indicate the priority level of the alert. As alerts are reported to the NMS, the color associated with normal operations changes to a pre-assigned color to indicate the priority of the reported alert. This color coding affects icons on the Geographic Map and the Connectivity Maps, the text displayed in the Map Object Lists and in the Monitor task windows, and affects the cells colors in the Summary display.

Color coding applies to all device types in the network.

NOTE

On a basic-feature workstation, the color grey displays as black.

When your NMS is installed, a system default color-code scheme is in effect. The color to priority level mapping is shown in Table 5-1.

Table 5-1
Default Color Codes

Priority Level	Meaning	Color
1	Major Failure	Red
2	Minor Failure	Yellow
3	Warning	Cyan
(none)	Normal Operation	Green
(none)	Unsupported Device	White

The System Administrator can change the color codes that display on the Map, Monitor, and Summary tasks via the Edit Color Code *(edcc)* command. Also, the system administrator can change the priority level associated with alert groups via the Edit Alert Attribute *(edaa)* command. Both commands are available from the Manager task. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional information on these commands.

Map, Monitor and Summary Task Support for Network Devices

The Map, Monitor, and Summary tasks support alert management. All three of these tasks provide mechanisms for displaying alerts. The following information provides an overview of this support. For detailed descriptions of these tasks, refer to Chapter 6.

Map Task Support

The Map task enables you to display devices and their connectivity in the following ways.

- On the Map as sites and on connections between sites.
- On Object Lists as devices at each site.
- On Connectivity Maps as devices and connections.

To generate Maps, Object Lists, and Connectivity Maps to support network devices, you must populate the following fields in the device, facility and site profile database.

Device Profiles

The **Site name** field must contain the appropriate site name assigned to each device to locate it at the proper site on the Map. The site name should have an associated site profile.

Facility Profile

All fields specified in the *Facility Profiles* section of this chapter should be defined to create the Connectivity Maps appropriately.

Site Profile

You must have a site profile for every unique site name specified in device profiles.

For information required for appropriate device, facilities, and site placement on a map, refer to the description of profiles in Chapter 3 and the description of the Map task in Chapter 6.

Geographic Map

The Geographic Map provides a world map graphic, containing site, cluster, and link icons whose placement reflect the actual equipment locations within your network. You can select these icons to display its related information or perform database maintenance or monitoring functions. Refer to Chapter 6 for more information on the Geographic Map.

Connectivity Map

A Connectivity Map displays a selected device and devices connected to it. You can use the Connectivity Map to display connections between any two points. As an example, a Connectivity Map in shown in Figure 5-2. The Connectivity Map uses standard icons for displaying devices. These icons are discussed in Chapter 2. Icon graphics are shown in Appendix C. Refer to Chapter 6 for a detailed description of Connectivity Maps and their use.

You can also perform external system cut-throughs from the Map for direct access to network devices. You can clear events and acknowledge alerts. External system cut-throughs are described in Chapter 3.

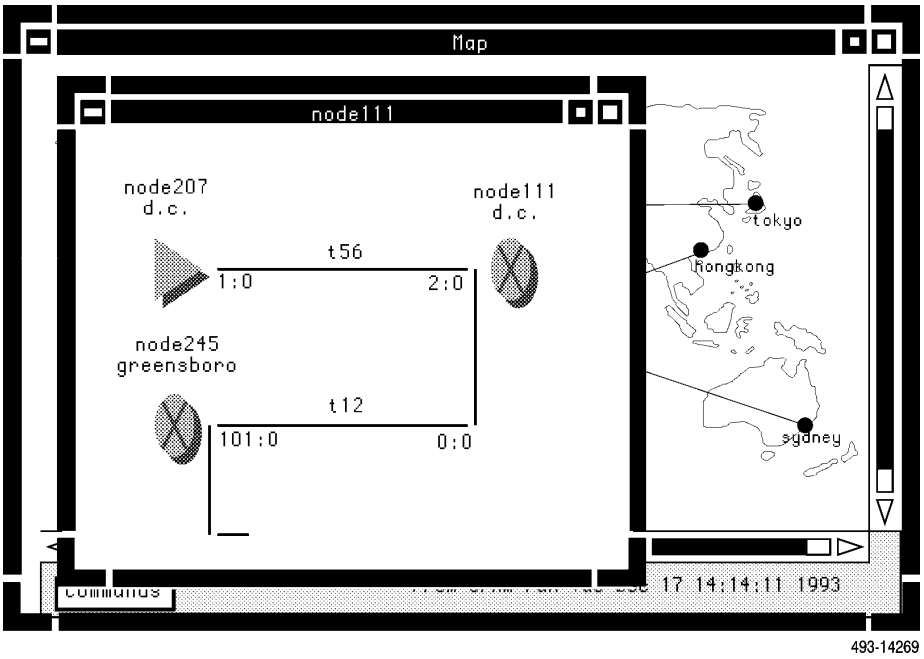


Figure 5-2. Sample Connectivity Map for Multiplexers

Monitor Task Support

The Monitor task provides displays showing new alerts and updated information on existing alerts. It also enables you to acknowledge alerts and clear events. The task display shows a date and time stamp of when the alert occurred, the device name, model number, and network address, the type of alert, the network name where the alert occurred (displays for multiplexers only if there is a device profile for the multiplexer), and a message indicating what problem occurred.

The Monitor task and the functions that can be performed from the Monitor are discussed later in this section and in Chapter 6 of this manual.

Summary Task Support

The Summary task displays the total number of alerts that meet specific user-defined criteria. This task and the default alert categories, displayed on the Summary, are discussed in detail in Chapter 6.

Customizing Alert Displays on Network Devices

The System Administrator can customize the alert handling system using the following commands. Change the **priority, visual, audible,** and **timeout** values by executing the Edit Alert Attribute *(edaa)* command. Execute the Edit User Selection Criteria *(edusc)* command to individualize the information displayed on the Map, Monitor, and Summary. Execute the Edit Color Code *(edcc)* and Edit Category *(edc)* commands to change alert displays system-wide.

Printers

There are two printers available for use in monitoring the network: the alert log printer and the event log printer.

Alert Log Printer (ALP)

This printer prints messages when a fault is reported or cleared, or when an automatic trouble report is generated. The ALP can be dedicated when defining ports. When the printer is disabled, the port is out-of-service. You can change the status between **enabled** and **disabled** to take the port in or out-of-service. To temporarily stop alert log printer jobs, you need to disable the printer port. When a printer is disabled, printer jobs are queued until the printer is enabled.

Event Log Printer

This printer is directly attached to a Network Administration Port (NAP) of a multiplexer node. Refer to the *COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide* for more information on this printer.

Alert Processing within NMS

Alerts consist of alarms, events and status reports. NMS handles these types of alerts alike.

Alarms

An *alarm* is a trouble condition in the network, such as the alert type DL (Dial Line Lost) for modems or alarm 62.00 ([1] Active Yellow Link) for 731/742 or 740/741 multiplexers.

There are actually two types of multiplexer alarms, facility and node alarms. Facility alarms are caused by a problem on any T1 or aggregate link connected to a node or a T1 or aggregate link alarm signal received by an upstream device. Node alarms are caused by a hardware problem within a node. An alert can be caused by a service-affecting hardware problem within a link or by a problem with a device.

An alarm starts when the subsystem receives a state change from normal to an alert condition. The alarm is cleared when the subsystem receives a state change back to normal. The time stamps are provided by the subsystem. The duration of the alarm is the time between when the alarm starts and when it is cleared based on the time stamp.

The function of acquiring network alarms is performed by the internal Monitoring Unit (NMU) for modems and DSUs, or the core subsystem for multiplexers. The NMU monitors the change in state and reports the change to the core subsystem.

Alarm notification is available from the external relays, LEDs, and tone generators built into the nodes; by inquiry via an NMS command, or indirectly as an NMS alarm.

Status

A *status* change is reported by a network device when the device detects a change from its normal operating state to an abnormal state. Status reports are similar to alarms in that a status report is sent to the NMS when the device changes from its normal operating state to an abnormal state.

Events

An *event* is an occurrence in the network reported to the NMS, such as a canned message for the COMSPHERE 3400/4400 Series APL modems, SNMP/brouter traps, bytex alerts, or event 02.00 for 731/742 or 740/741 multiplexers ([L.C] New Log (Old Log). They are reported only once and do not have an associated **clear**. The user can manually **clear** events from the NMS, or specify a duration in the Edit Alert Attribute *(edaa)* command after which the event is automatically cleared by the NMS.

The method of information transfer between a device and NMS for events is product-specific and is described in the NMS configuration guides for managing the specific devices.

Multiplexer Events

Events are the broadest category of multiplexer health and status information. For example, events can report changes in the configuration of the network and in the state of a hardware module, or they can report transient problems in a node. An event is defined by a message generated by the node. A multiplexer can store event messages locally in its message log. In this case, the event **message** is usually referred to as a message.

A multiplexer can also forward event messages to three logical destinations: event log 1, 2, and 3. By configuring an event log, you associate the logical destination with a physical Series 700 multiplexer or 719 channel. You can direct all nodes in the network to send events to a central location where a 6800 Series NMS or event log printer is located. Event log 2 must be configured to be the destination node that is connected to the 6800 Series NMS event port. Event logs 1 and 3 destinations can be any other valid node or event log printer port.

The format of event messages printed on an event log printer are similar to the format used to store messages in a node's message log. Figure 5-3 shows the format of event messages in a node's message log.

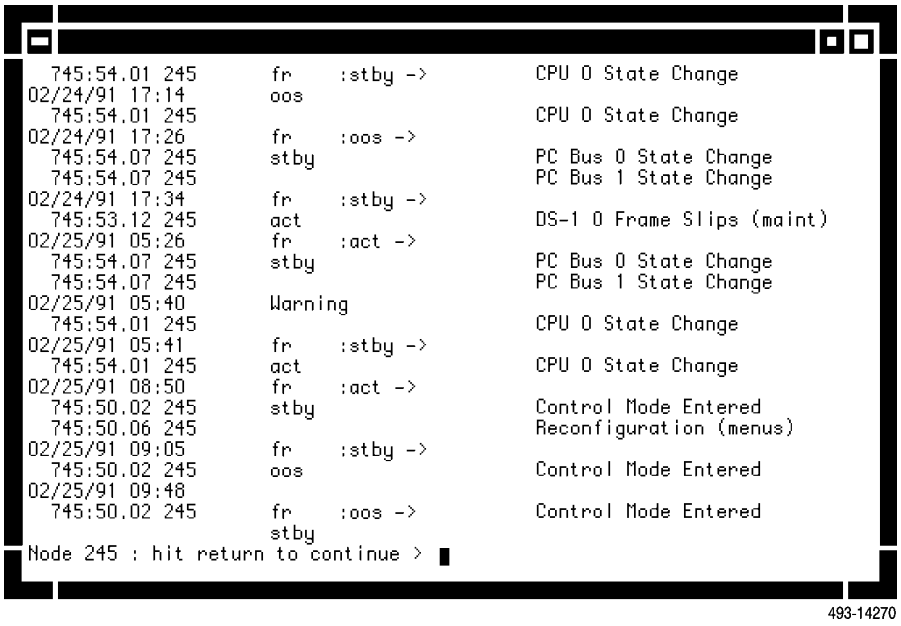
When a 6800 Series NMS is present, event log 2, at all nodes, must be directed to the node whose NAP port is connected to the NMS ''event" port. By executing the Change Node Connected to System *(chncs)* command, you associate this node with the NMS event port. Use the Change Node Configuration Parameters *(chncp)* command to set this node as the Event Log 2 destination for all other nodes.

Types of Events

The ACCULINK multiplexer is capable of forwarding the following types of event messages to NMS.

- Transient problems within a node.
- A change in the state of a hardware module.
- Channel group connects or disconnects.
- Changes in the configuration of the network.
- Status of calls made through a 719 NETWORKER.
- Statistics that are accumulated by a node.

By executing the Change Node Configuration Parameters *(chncp)* command, you can configure the classes of events forwarded from event log 2. By using the Monitor and Map tasks, you can view events accumulated by NMS. The format of events that can be displayed on the Monitor are described in the Monitor task section earlier in this chapter and in detail in Chapter 6.



493-14270

Figure 5-3. Sample of Printed Event Messages

Modem Events

The COMSPHERE 3400/4400 APL modems include a message directory that can accommodate up to five 40-character alphanumeric text messages. Default messages are provided within the device firmware. From the 6800 Series NMS, messages are displayed and changed using the Display Canned Messages *(dscm)* command and the Change Canned Message *(chcm)* command.

When received by the NMS, these modem messages are treated as *events.* They are associated with the alert group **apl-cnnd-msg** and are of the MESSAGE alert type. This alert type is reported when an asynchronous, canned message is sent to the NMS from a 3400/4400 Series modem. The alert text associated with the alert type is the modem message as received from the device. The Monitor and Map provide both visual and audible indications of when the event is received. All alert management and display features apply to these modem events.

Bytex Switch Events

While alerts from the Bytex switch report some trouble conditions, they are handled as NMS events. The user must take some action to clear and acknowledge these events as they will not clear automatically. For more information see *Clearing Events* later on in this chapter.

SNMP Device/Brouter Events

SNMP device/brouter events are SNMP traps (alerts) sent from brouter devices and other SNMP devices to a COMSPHERE 6800 Series NMS residing on the same Ethernet local area network (LAN).

Traps forwarded to the 6800 Series NMS are treated as events by the NMS's alert subsystem; all advertised filtering and display capabilities are applicable to brouter and SNMP events.

Acknowledging Alerts (Alarms and Events)

NMS allows you to acknowledge an alert displayed on the Monitor. Acknowledgment of an alert turns off the audible and changes the visual color indications for that alert. If there are other active Monitor or Map sessions in the system displaying the alert, the audible and visual indications for the acknowledge alert are turned off on those displays also.

You can acknowledge an alert manually or automatically by the NMS:

- To manually acknowledge an alert, you must be in either the Map task or in the Monitor task. You click on the unacknowledged alert and from the subsequent command menu's pop-up menu, click on the **Acknowledge alert** option (On the Monitor, the option is **Acknowledge Alert**; in the Map task, **Acknowledge Alert** is in a submenu under the selection **Alert Management**. (When using the Monitor task on a basic-feature workstation, move the arrow keys and press **Enter** to select the option.)
- To have NMS automatically acknowledge an alert, you can set the time-out period for the alert in the **Acknowledgement timeout** field of the Edit Alert Attribute *(edaa)* command. When the alert remains in the unacknowledged state for a period exceeding the specified time parameter, the system automatically acknowledges the alert.

Clearing Alerts (Alarms and Status Reports)

NMS does not support manual clearing of alarms or status reports. However, these alerts can be cleared directly via other actions. For example, a modem alarm can be cleared by removing the device from the poll list of its control device via the Edit Device Profile *(eddp)* command, or by setting the **Alert Monitoring State** field in the Edit Alert Monitoring State *(edams)* command to **OFF**. An alarm is cleared when the device no longer reports the alarm condition; a status report is cleared only when the device returns to its normal operating state.

Clearing Events

Since events are information-only messages sent from the multiplexers to NMS, there is no clear message associated with the event from the multiplexer. However, NMS allows you to clear events manually through the Map and Monitor tasks.

To clear an event, perform the following steps.

1. In the Monitor or Map task window, select the event you want to clear. This highlights and selects the event and opens a window which displays the action you may take.

2. Select the **Clear Event** entry. The filter system is notified that the event has been cleared. The filter system then sends a message to all display processes that are monitoring the event indicating that the event has been deleted.

Events can also be cleared using the event time-out values in the database. The filter system times all events that have not been cleared from the network and which pass through the processing filter. If the time-out period is exceeded and you have not cleared the event, the filter system clears the event by notifying the display processes that it has deleted the event from the active alerts list. You set up time-outs using the Edit Alert Attributes *(edaa)* command from the Manager task.

If the display filter is blocked for an event, NMS automatically clears the event once it passes the processing filter. (This is done because the event does not display to the user and, consequently, cannot be manually cleared; this also eliminates the possibility of the number of active (non-cleared) events becoming significant to the point where it would affect system performance.) The event then passes immediately to the storage, automated action and Alert Driven Routine filters. Once an event is cleared, the event is stored in the historical alert database, if you have specified it to be stored via the storage filter.

Alert Information Storage and Reports

When an alert passes the NMS processing and storage filters and is cleared, it is automatically stored in a historical alerts database. You can retrieve device and alert information from this database to generate alert history reports. (Refer to Chapter 8 for additional information on report generation.)

Communications Products List of Alerts

Table 5-2 is a list of the possible modem alerts and their attributes. The table contains the following information.

DEVICE TYPE AND DESCRIPTION	—	The type of device reporting the alarm.
ALERT GROUP	—	The alert's assigned alert group.
ALERT TYPE	—	The alert's abbreviation used within NMS.
PRIORITY	—	The alert's assigned priority level.
ALERT'S TEXTUAL DISPLAY	—	The alert's textual description which is displayed on the Monitor.

NOTE

COMSPHERE devices can report more alert types than DATAPHONE II devices. COMSPHERE devices operating in mixed mode report alerts (Health and Status) as if they were coming from DATAPHONE II devices. Some of the COMSPHERE alerts have DATAPHONE II equivalents. For example, tm (test mode) is both a COMSPHERE and DATAPHONE II alert. In this case, a COMSPHERE device in mixed mode would correctly report a test mode alert. However, there are some COMSPHERE alerts which do not have DATAPHONE II equivalents. For these cases, the device has two ways of handling these alerts: 1) The alerts are not reported at all. 2) It makes a misleading mapping and as a result reports the wrong alert. For example, a CCN alert from a COMSPHERE device in mixed mode is reported as being a maintenance mode (mm) alert.

Table 5-2
(1 of 5)
Communication Products Alerts

Device Type And Description	Alert Group	Alert Type	Priority	Alert's Textual Display
AB — COMSPHERE Analog Bridge	ab-backup	aplo	3	APL connection open
	ab-device	df	1	Device failure
		nr		Diagnostic failure
	ab-message	ccn	3	Configuration change
	ab-service	dsab	3	Device disabled
		tm		Test mode
ACU — Paradyne Auto Call Unit (ANALYSIS)	acu-backup	da	2	Device action (auto retry)
		na		Failed all
	acu-device	df	1	Device failure
	acu-facility	fa	1	Facility alarm
		nr		Diagnostic failure
	acu-message	cm	3	Calling switch
	acu-service	dm	3	Device Control mode (ACU manual)
	acu-terminal	pf	1	Port failure (DTE alarm or problem)
ADC — Paradyne ANALYSIS Data Concentrator (ANALYSIS)	adc-device	df	1	ADC hardware fault
		rs		Reset (ADC power up)
	adc-facility	nr	1	ADC timeout
	adc-message	cm	3	ADC call
	adc-service	mm	2	Maintenance mode (ADC disabled, DL abort, DL IP)
		tm		Test mode

Table 5-2
(2 of 5)
Communication Products Alerts

Device Type And Description	Alert Group	Alert Type	Priority	Alert's Textual Display
APL — COMSPHERE, DATAPHONE II and Paradyne Analog Private Line Modems	apl-backup	dc	2	Dial connect (dial mode/dial standby)
		pl-ok		Private line OK for data
	apl-cnnd-msg	message	3	(Text of canned message)
		dial	3	(Alert text varies depending on dial failure)
	apl-device	am	1	Access module alarm
		df		Device failure
		df-dbm		Modem dial backup childboard failure
		ht		Hold time
		md		Modem failure
		na		No answer
		rs		Reset (APL power cycle)
		und		Undefined
	apl-facility	dl	1	Dial line lost
		fa		Facility alarm
		nr		Diagnostic failure
		th		Parameter threshold exceeded
	apl-message	cm	3	Calling switch
		ccn		Configuration change
		sec		Access security alarm
		trnc		Subtree truncation
	apl-service	as	3	Abnormal operating speed
		da		Device action (retrain, auto retry)
		dm		Device control mode (remote mode)
		dsab		Modem disabled
		dttf		Dial tone test failure
		fd		Firmware download in progress
		mb		Make busy
		mm		Maintenance mode
		pci		Primary channel interrupt
		tm		Test mode
		sl		Service line
	apl-terminal	el	1	External lead alarm
		pf		Port failure (DTE alarm or problem)
		sr		Streaming terminal
DBU — COMSPHERE Dial Backup Units	dbu-backup	cm	3	Calling mode
		dbu		Dial backup mode
		ddd		DDD link mode
		aplc		APL continuity
	dbu-device	df	1	Device failure
		nr		Diagnostic failure
	dbu-message	ccn	3	Configuration change
	dbu-service	dsab	3	Device disabled
		tm		Test mode

Table 5-2
(3 of 5)
Communication Products Alerts

Device Type And Description	Alert Group	Alert Type	Priority	Alert's Textual Display
DDD — COMSPHERE DATAPHONE II and Paradyne DDD Modems	ddd-backup	dc	2	Dial connect (dial mode/dial standby)
		dm		Dial mode—Data on dial line
		ds		Dial standby—Data on private line
		dial	1	Alert text varies depending on dial failure
	ddd-call	dd	3	DDD line active
	ddd-device	df	1	Device failure
		ht		Hold time
		md		Modem failure
		na		No answer
		nr		Diagnostic failure
		tdm		TDM failure
	ddd-dttf	dttf	3	Dial tone test failure
	ddd-facility	fa	1	Facility alarm
	ddd-message	cm	3	Call mode
		ccn		Configuration change
		trnc		Subtree truncation
	ddd-power	rps	2	Redundant power supply
	ddd-service	as	3	Abnormal operating speed
		dsab		Modem disabled
		fd		Firmware download in progress
		pci		Primary channel interrupt
		mb		Make busy
		sl		Service line
		tm		Test mode
	ddd-terminal	el	1	External lead alarm
		pf		Port failure (DTE alarm)
		sr		Streaming terminal
	ddd-threshold	th	1	Parameter threshold exceeded
DDS — COMSPHERE DATAPHONE II and Paradyne Digital Data Service Units	dds-backup	dc	2	Dial connect (dial mode/dial standby)
	dds-busy	busy	3	Busy
	dds-call-swch	cm	3	Call switch
	dds-ccn	ccn	3	Configuration change
	dds-device	df	1	Device failure
	dds-disabled	dsab	3	Modem disabled
	dds-dttf	dttf	3	Dial tone test failure
	dds-facility	fa	1	Facility alarm
	dds-frnt-pnl	dm	3	Device control mode (front panel control)
	dds-modem	md	1	Modem failure
	dds-mtnc-mode	mm	3	Maintenance mode
	dds-no-rspnse	nr	1	No response
	dds-port-fail	pf	1	Port failure (DTE alarm or problem)
	dds-power	rps	2	Redundant power supply or fan problem
	dds-s-term	sr	1	Streaming terminal
	dds-speed	as	3	Abnormal operating speed
	dds-tdm	tdm	1	TDM failure
	dds-test-mode	tm	1	Test Mode
	dds-threshold	th	1	Parameter threshold exceeded
	dds-time-out	time	1	Tributary time out
	dds-truncate	trnc	3	Subtree truncation
	dds-x-leads	el	1	External lead alarm

Table 5-2
(4 of 5)
Communication Products Alerts

Device Type And Description	Alert Group	Alert Type	Priority	Alert's Textual Display
MACU — Paradyne Multidrop Auto-Call Unit (ANALYSIS)	macu-device	md	1	MACU failure
	macu-facility	dl	1	Dial line lost
		nr		Diagnostic failure
	macu-service	mm	3	Maintenance mode
		tm		Test mode
NMS Alerts	nms-device	rs		Reset
	nms-facility	nr		Diagnostic failure
	nms-service	tm		Test mode
SRCU — COMSPHERE Service Restoration Control Unit	srcu-bridge	bf1	1	BSU 1 failure
		bf2		BSU 2 failure
		bf3		BSU 3 failure
		bf4		BSU 4 failure
		bf5		BSU 5 failure
		bf6		BSU 6 failure
		bf7		BSU 7 failure
		bf8		BSU 8 failure
	srcu-device	df	1	Device failure
		nr		Diagnostic failure
	srcu-message	ccn	3	Configuration change
	srcu-service	dsab	3	Device Disabled
		tm		Test mode

Table 5-2
(5 of 5)
Communication Products Alerts

Device Type And Description	Alert Group	Alert Type	Priority	Alert's Textual Display
UND — Undefined Devices (Devices reporting alerts but have no device profile and a device type cannot be determined.)	und-alerts	am	1	Access module alarm
		as	1	Abnormal operating speed
		ccn	1	Configuration change
		dc	1	Dial connect (dial mode/dial standby)
		df	1	Device failure
		dm	1	Device control mode
		dsab	1	Device disabled
		el	1	External lead alarm
		fa	1	Facility alarm
		ht	1	Hold time
		mb	1	Make busy
		md	1	Device failure
		mm	1	Maintenance mode
		na	1	No answer
		nr	1	Diagnostic failure
		pf	1	Port failure (DTE alarm or problem)
		sl	1	Service line
		sr	1	Streaming terminal
		th	1	Parameter threshold exceeded
		tm	1	Test mode
		trnc	1	Subtree truncation
UNK — Unknown (not classified) (ANALYSIS)	unk-backup	dc	2	Dial connect (dial mode/dial standby)
	unk-device	md	1	Modem failure
		rs		Reset (UNK power failure)
	unk-facility	fa	1	Facility alarm
		nr		Diagnostic failure
		sl		Dial line lost
	unk-message	cm	3	Calling switch
	unk-service	tm	3	Test mode
		mm		Maintenance mode
		da		Device action (retrain, auto retry)
		dm		Device control mode (remote mode)
		as		Abnormal operating speed
	unk-terminal	el	1	External lead alarm
		sr		Streaming terminal
		pf		Port failure (DTE alarm or problem)

Multiplexer List of Alerts

Alerts for multiplexers comprise **two categories:** alerts generated by the devices and alerts generated by the ACCULINK Network Management (ANM) application. For a list of alerts generated by the devices, see the User Interface Manuals for those devices. Alerts generated by the ANM application are listed in this section.

Multiplexer-Generated Alerts

Alerts generated by the multiplexers are further subdivided into alarms, alarm clears, and events. Each alert has associated with it a unique major.minor code and text description. The major.minor code for alarms and events display on the NMS Monitor in the Alert Type field. Major.minor codes for alarm clears do not display; instead, they clear their respective alarms. The text descriptions for alarms and events display essentially unmodified on the NMS Monitor. Some minor differences from the text descriptions given in the devices' User Interface Manuals are worth noting. These minor differences are:

- For alerts associated with a particular link number and/or channel number, the relevant numbers are displayed in square brackets immediately preceding the text description.
- For alarms, the word ''ALARM" is removed from the text description.
- Unnecessary white space (such as tab characters) are removed from the message.
- Multi-line text descriptions are joined into one line.
- Text descriptions that are too long to fit on the Monitor display are truncated. A tilde (~) character is placed at the end of the displayed text to indicate the truncation. The complete text can be found in the device's User Interface Manual or by cutting-through to the device and viewing the device's Message Log.

ANM-Generated Alerts

ANM-generated alerts are further subdivided into **events** and **alarms**. Events are listed in Table 5-3. Alarms are listed in Table 5-4. In these two tables, alert group names are shown with a bold **"m"** prefix. Substitute one of the actual device types (**mux**, **swtch** or **56mux**) for the prefix.

Table 5-5 describes each ANM-generated alert and suggests possible corrective actions. If the corrective actions do not solve the problem, contact your service representative.

Table 5-3
ANM-Generated Alerts (Events)

Alert Group	Model Number	Major/ Minor Code	Alert's Textual Display
m-nmsevt2	all	00.128	Device/Database mismatch

Table 5-4
ANM-Generated Alerts (Events)

Alert Group	Model Number	Major/ Minor Code	Alert's Textual Display
m-nmsalm2	all	00.02	Internal error sending command to device
		00.04	Device/Agent protocol error
m-alarm1	all	00.00	Node not responding to polls
		00.06	Cannot route commands to device

Table 5-5
ANM-Generated Alerts — Descriptions/Corrective Actions

Major/ Minor Code	Descriptions/Corrective Action
00.00	*Node not responding to polls.* This alarm occurs if the NMS is able to route poll commands to the device, but the device is not returning responses. Verify that the node is in-service. If it is not, turn off polling of the device by editing the device profile. If it is, run diagnostics to isolate the fault.
00.02	*Internal error sending command to device.* This alarm may occur because of a flow control condition caused by too much command traffic to the ACCULINK network. Temporary flow-control conditions will automatically clear. Otherwise, possible solutions include reducing the rate of polling and/or decreasing the number of concurrent NMS commands/routines that send commands to the network.
00.04	*Device/Agent Protocol Error.* This alarm occurs if the device cannot interpret poll commands sent to it by the ANM application or if the ANM application cannot interpret poll responses received from the node. The alarm may occur briefly if a rare ‘‘garbled” command or response is processed by the device or the ANM application. In this case, the alarm should clear automatically on the next poll cycle. If the alarm does not clear, then it is likely that polling of the device is not supported. Turn off polling of the device by editing the device profile.
00.06	*Cannot route commands to device.* This alarm occurs if no SDL path to the node exists. Establish an SDL path to the node and the alarm will clear on the next poll cycle.
00.128	*Device/Database Mismatch.* This event occurs if the device profile indicates that the device is of one type, but the device itself indicates that it is of another type. Edit the device profile and make the device type and firmware version match the actual device. Then, manually clear the event. For information on how to clear the event manually, see Chapter 6.

Alert Group Assignments

With ANM Release 3.2.0 and later, users may choose the alert groups to which multiplexer alerts (device-generated and ANM-generated) are assigned. The ANM software comes with a default mapping. However, users may want to group alerts differently or filter selected alerts differently. For information on how to change the mapping, see the *COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide*.

Bytex Alerts

Table 5-6 shows the alert messages generated by the Unity Management System (UMS) on the Bytex Switch.

Table 5-6
Bytex Alerts

Alert Group	Alert Type	Priority	Text
biem-equip-p1	bytex-switch-p1	1	*variable text sent by Bytex UMS*
biem-nms-p1	sftw-err-p1 mag corruption	1 1	*variable text sent by Bytex UMS* corrupt message received from Bytex UMS
biem-equip-p2	bytex-switch-p2	2	*variable text sent by Bytex UMS*
biem-nms-p2	sftw-err-p2 biem-link-down biem-link-up	2 2 2	*variable text sent by Bytex UMS* link to Bytex UMS is down link to Bytex UMS is up
biem-equip-p3	bytex-switch-p3	3	*variable text sent by Bytex UMS*
biem-nms-p3	sftw-err-p3 biem-unk-event	3 3	*variable text sent by Bytex UMX* unknown event received from Bytex device “xxx”

System Alerts

Table 5-7 shows the alert messages generated to inform of system conditions. These messages display on the Monitor windows.

Table 5-7
System Alerts

Alert Group	Alert Type	Priority	Alert’s Textual Display
System Alert Groups			
sys-database	dbc	1	<database table> cleaned up due to overflow
	dbo	1	<database table> overflow eminent
sys-muxport	pollpf	1	Multiplexer polling port is down
	evtpf	1	Multiplexer event port is down
sys-process	pd	2	<server/machine> is down
	pc	2	Connection lost to <machine>
sys-callstat	dcre	3	Daily call rate exceeded, call detail storage stopped
	cbo	3	Call buffer overflow for <link level address>; no call info stored
sys-profile	dpmissing	2	Device profile for ACCULINK node **n** missing or incorrect.
sys-com	atr		ATR not sent, <device name> atr <atr-phone-number>

Map, Monitor, and Summary Tasks 6

Overview

This chapter describes the Map, Monitor, and Summary tasks. These tasks are the main Network Management System tools for monitoring the health and status of your network.

The Map Task

The Map task is available only on full-feature workstations. You can use the mouse to perform user interface functions and navigate around the map. Mouse key usage is noted as appropriate throughout the following sections.

The Map task provides three major windows (or views) of your network:

- *Geographic Map window*

  The Geographic Map shows a graphic representation of your entire network. It places icons representing network elements at geographically correct locations on an outline of the world map.

- *Connectivity Map*

  Connectivity Maps show detailed graphic representations of the connections between specific devices within your network.

- *Object List window*

  Object Lists are textual lists the specific devices, sites or facilities within your network.

The Geographic Map, Connectivity Map and Object List windows provide both graphic and text tools to monitor and manage your network.

As alerts are reported to the NMS from your network elements, the icons in the Geographic Map, the Connectivity Maps, and the textual items in the Object Lists change from their normal display color to the color associated with alert priorities within your NMS. (Refer to Chapter 2 for information on setting up color codes for alert display.)

Using the Connectivity Map and Object List windows, you can isolate network problems to the device level. Then, using the Map options, you can take action to restore your network to its normal operating state.

The Map task provides selections for the following activities:

- View facility and device alerts, and clear events (Alert Management option).
- Access specific Connectivity Maps and Object Lists associated with network elements
- (Connectivity Map and Object List options).
- Access device, facility and site profiles associated with selected network elements (Network Profile option).
- Access display options that enable you to control the display of the Geographic Map.
- Access NMS network control commands for managed devices.
- Cut-through to external systems.
- Access routines, queue results and scheduled items.

Creating the Map

You use the Create Network Map *(crnm)* command to create the map for the Map task. NMS uses the information it derives from the device, facility, and site profiles as input to the Create Map command. With this information, the NMS determines the following:

- The appropriate icons to use on the Geographic Map and the Connectivity Maps.
- The correct connections, or links, between devices on the Connectivity Maps.
- The geographic placement of icons and their connections on the Geographic Map.
- The contents of the object list for any associated network element.

Every time you make changes to your network by creating new profile records or by deleting existing records, or if you update profile records to change your network configuration, you must execute the *crnm* command so that the changes are reflected in the Map task. If the Map task window is open when the changes are made, the Map must be closed and reopened.

Accessing the Map Task

The Map task is accessed from the main 6800 Series NMS Tasks menu. When you select the Map task, a blank window opens with the window title displayed as **Geographic Map (INITIALIZING)**. This display remains on your screen until the system displays the Geographic Map in the window.

All windows opened from any Map window belong to the Map task. The system does not allow you to invoke a second Map task from the 6800 Series NMS Tasks menu until you terminate the current Map task.

Geographic Map Window

The first window to display when you access the Map task is the Geographic Map window. This window (Figure 6-1) provides an outline of a geographic world map on which site, cluster and link icons are automatically placed in the appropriate geographic locations to reflect the actual equipment locations within your network. (However, sites are not required to have installed devices.)

The icons are selectable, enabling you to perform various operations available for the specific type of icon type selected (refer to Table 6-1 for additional information). Refer to Appendix C for graphic illustrations of the icons.

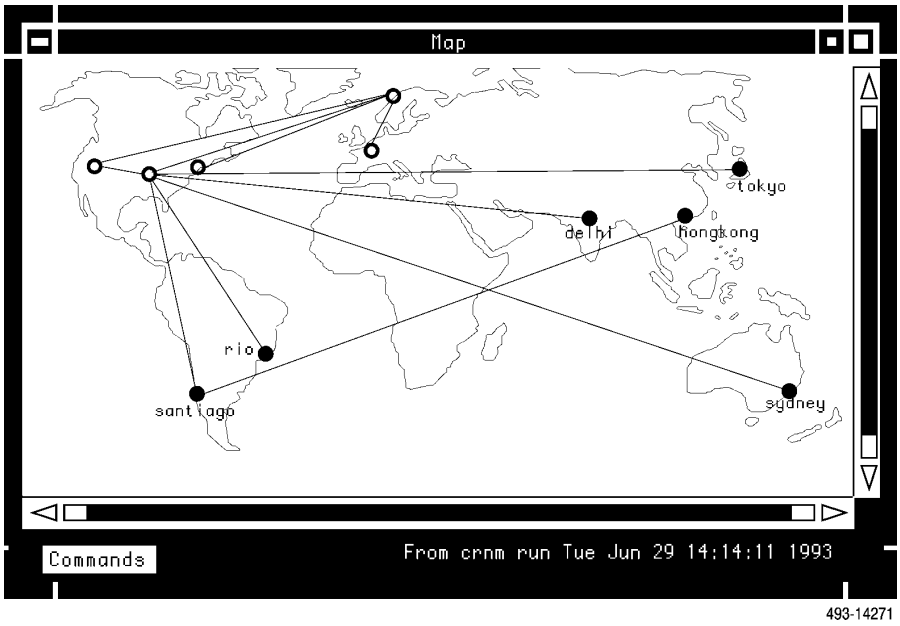


Figure 6-1. Geographic Map

NMS places the icons automatically on the map based on the information in the profile (device, site and facility) database.

The following sections describe the Geographic Map icons, the placement of the icons on the Geographic Map, and the window icons unique to the Geographic Map. Refer to Chapter 2 for information on customization of the system color codes. The Commands Menu is then described and the options available from this menu are identified in detail.

Device Icons

Device Icons are representations of devices on Connectivity Maps. A list of device icons is provided in Appendix C, *Icons*. You can also view the set of icons by selecting Form Help (**F12** or **ESC ?**) while in any Connectivity Map window.

Site Icons

Site icons display as solid circles. These icons represent individual sites. Each site icon on the map also displays its site name.

Alert site information is displayed for simple site icons when the site contains at least one device reporting an alert. Site icons representing non-reporting sites display on the map in the ‘‘unmanaged” color (system default color for ‘‘unmanaged” is white). When alerts are passed to the Geographic Map, the site icon associated with the reporting device(s) changes from its normally displayed color to the color associated with the highest priority alert being reported for the device(s) at that site. (System default color for the highest priority alert is red.) While the alert(s) remain unacknowledged, the site icon is displayed in 100% color saturation. Once the alert is acknowledged the color of the site icon remains the same color as before the alert was acknowledged, but changes to 50% color saturation. An acknowledged icon appears to the user as less bright than an unacknowledged icon.

Cluster Icons

Cluster icons display as open circles. These icons represent a set of individual sites that are so closely located geographically, they would appear overlapped on the map if not consolidated, or clustered into one icon representation. (Refer to the *Placement of Named Sites on the Map* section later in this chapter for additional information.) Cluster icons are labeled, if possible, with the common prefix in the names of the sites of the cluster. For example, sites labeled *nyc1*, *nyc2*, and *nyc3*, when clustered, would be labeled with their common substring nyc. If there are no common prefixes shared by the sites in the cluster, the cluster remains unnamed when displayed on the map.

Alert state information is displayed for a cluster icon that contains both reporting and non-reporting sites. (Non-reporting sites are also known as ‘‘unmanaged” sites.) NMS displays alert state information in the color assigned by the user; the normal state system default color for this cluster icon is green. A cluster icon that contains only non-reporting sites does not display alert state information and displays in the color assigned by the user; the system default color for ‘‘unmanaged” sites is white.

The normal state color assignment for cluster icons is green. When alerts are passed to the Geographic Map, the cluster icon containing the site(s) with the device(s) reporting alerts changes color in the same manner as described for site icons for unacknowledged and acknowledged alerts.

Link Icons

Link icons display on the map as solid lines connecting site or cluster icons. Both simple links and aggregate links exist within the network, although they are not distinguished by different icons on the Geographic Map. Simple links contain only one facility. Aggregate links contain more than one facility. Link icons are not labeled on the Geographic Map.

Links shown on the map that do not represent any managed facilities do not display alert state information and appear in the ‘‘unmanaged” color (system default color for ‘‘unmanaged” is white). When a managed facility, terminating at (at least) one managed device associated with a link icon, reports an alert(s), the link icon changes from its color-coded normal state color to the color associated with the highest alert state of any of its component facilities (system default color is red). While the alert(s) remains unacknowledged the line remains solid. When the alert(s) is acknowledged, the solid line changes to a dashed line.

Site Placement on the Geographic Map

NMS determines site placement by the type of site (named, unnamed, unplaceable) being placed. Those sites that cannot be placed at a determined location on the map by the system are placed in the default site location on the map. These placement scenarios are further explained as follows.

Placement of Named Sites on the Map

NMS places sites on the map based on the information contained in the site profiles. If the **Longitude** and **Latitude** fields contain valid data, NMS places the site at the specified coordinates on the map. Otherwise, NMS places the site based on the **Country code** and **City code** information in the profile. (Refer to Appendix F for a list of all valid international country and city codes recognized by the NMS.)

The system uses the concept of grid boxes to decide when to aggregate site icons into cluster icons (a grid box is four, site/cluster icon diameters on a side). NMS considers all sites, located in the same grid box on the map, close enough to require clustering, thus they all become components of the same cluster.

The name of a site or a cluster appears below its icon on the map. Many clusters may display without names because their component sites have no common prefix based on their naming scheme (refer to Appendix E, *Naming Conventions*). NMS does not adjust the placement of icons to prevent overlapping of icon names. So, it is possible for some icons and/or icon names to be obscured by others. You can adjust these placements by executing the Edit Site Profile *(edsp)* command to manipulate the information in the **Longitude**, **Latitude**, **Country code**, or **City code** fields accordingly.

Placement of Unnamed Site on the Map

If you do not specify a name in the **Site name** field in the device profile, NMS assigns the device to the **unnamed** site. If you do not explicitly update the site profile for the **unnamed** site with location information, and the site contains one or more devices, NMS handles it as an unplaceable site and places the **unnamed** site at the default site location (see *Default Site Location on the Map*, later in this section) on the map. If the **unnamed** site does not contain any devices, NMS ignores the site and it is not displayed on the map.

If you update the unnamed site's site profile with location information, NMS handles the site as a normal, placeable site.

Unplaceable Sites on the Map

Unplaceable sites are those sites which cannot be placed in a geographic location by NMS because the site's city/country codes are missing or not usable by the system for some reason. These sites are always placed in the default site location on the map (see *Default Site Location on the Map* for a description of the default site location).

Default Site Location on the Map

The system assigns a default site location to unnamed and unplaceable sites each time the Create Map *(crnm)* command is executed. NMS automatically calculates the placement so that the default site location is horizontally centered in the network view with respect to the other sites being displayed. The vertical placement of the site on the map is 85 degrees north of the equator. Because of the way NMS internally determines placement, it cannot ensure that the default site location is not clustered in the network view (the view of the entire network on the map, (network view is explained later in this section).

Also, the sites at the default site location may cluster with other placeable sites on the network view as the result of resizing the Map window, even though they were not clustered in the window when it was at its default size.

The addition or deletion of sites may also change the default site location.

Selecting/Deselecting Objects

Objects on the Geographic Map can be defined as any selectable items on an object list. This means that an object can be a site, facility, device, link, or composite link. All objects are represented by icons on the map.

To select an object on the map, position the mouse pointer on the object and click the left mouse button. You see the icon intensify in color. You can also use the middle mouse button to select/deselect icons; however, this button does not invoke a menu.

To deselect an object, click on any area of the map free of icons. When you deselect an icon, you see the icon intensity return to its normal state. You can also use the middle button on the mouse to select/deselect icons; however, a menu does not display.

Window Icons Unique to the Geographic Map

The icons on the Geographic Map window that are unique to the Map task are the two scroll bars, one located horizontally across the bottom of the window, and one located vertically down the right side of the window, and a **Commands** button icon located in the lower left corner of the window.

Using the scroll bars, you can incrementally manipulate the map view in your Geographic Map window as follows.

Clicking on the boxes

There is a box located by each arrow on both the vertical and horizontal scroll bars. Clicking (left mouse button) on the horizontal or vertical scroll bar boxes causes the map view, displayed in the window, to shift to its furthest extent in the direction of the arrow as appropriate.

Clicking on the arrows

Clicking (left mouse button) on an arrow in either the vertical or horizontal scroll bars causes the map view to shift one full screen in the appropriate direction of the arrow used.

Dragging on the bar

The term dragging refers to holding down the left mouse button and moving the mouse without lifting the mouse. If you point the mouse on the bar within a scroll bar and drag the mouse, you see the shaded bar moving with your mouse pointer. The position of the bar within the scroll bar is related to the positioning of the map view in your window. Moving the shaded bar to the right or to the left (up or down for the vertical scroll bar), the map view shifts (when you release the mouse button) accordingly. You can repeat this process until you have shifted the map view as needed.

Using the **Commands** button icon, you can display the Commands Menu for the Map task. This menu is detailed in the following section.

Manager Task Activities from the Map

All Manager task features and functionality are available from the Geographic Map. That is, you have available the user interface features such as on-line help, command line entry, and command/function keys. Also, the Manager task access via the map provides the following capabilities:

- Context-sensitive access to Network Control commands: Based on device type/ classification of a selected device, selection of the Network Control options from the device's command menu displays a submenu of commands applicable to the selected device. ‘‘Context-sensitivity" applies to Network Control submenus of the Manager task. These menus contain commands for modem, DSU, and multiplexer control, diagnostics and performance reports. Selecting **Network Control** opens an external system window if the device profile specifies an external system name.
- Access to Network profiles can be accomplished via the Manager task from the map window. You can traverse the complete Manager task menu structure, request and execute subsequent Manager commands.
- Access to routines, scheduled items, and queue results commands. Selection of one of these options from an object's command menu displays the appropriate submenu of commands. (Used here, the term object refers to facility, site or device.)

As within the Manager task window, you can send command results to the CRT, a remote or local printer, and/or the Manager results queue.

Accessing the Manager Task

From the Map task, you can access the Manager task in two ways:

1. From the Map task command menu (see *Geographic Map Commands Menu*).
2. From the command menu of a selected object icon/object name.

You can invoke up to two separate Map-Manager windows (invoked either from two different objects, or from the Map task command menu). Map-Manager windows are Manager windows opened from the Map command menu or from an objects command menu.

Geographic Map Commands Menus

You display the Commands menu by clicking on the **Commands** button located at the bottom left corner of the Geographic Map window.

Selecting the Command Button

If you click on the **Commands** icon on the Geographic Map window, the menu appears as shown in Figure 6-2.

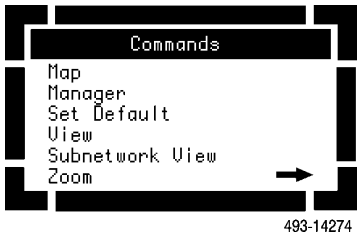


Figure 6-2. Commands Menu

These selections are defined as follows.

Geographic Map Selection

The Geographic Map selection opens a Geographic Map window containing the current default map view.

Manager Selection

The **Manager** selection invokes the Manager task (see the section *Manager Task Activities from the Map*).

Set Default View Option

When you first open a Geographic Map window, the map view that appears in the window is the default view of the Geographic Map. If the default view was not changed using the **Set Default View** selection, the system default map view appears. This default view shows only the portion of the world map containing network devices. This map view is also referred to as the **network view** of the Geographic Map.

Each user can customize the system-default map view using the **Set Default View** selection.

To use the **Set Default View** selection, perform the following steps.

1. Identify the map view to be defined as new default view. You can define this map view in one of three ways:

   a. Using one of the Zoom selections described in the next subsection (or by using the left mouse button as described in the Zoom selections subsection).

   b. Defining a *subview.* To define a subview, place the mouse pointer at some point on the map (this will become a corner of the new submenu), press and hold down the left mouse button and drag the mouse diagonally. As you drag the mouse, a box expands to encompass a map area. When you release the button, the area (subview) outlined by the box becomes the map view currently displayed in your window.

   c. Using the scroll bars.

2. With the map view identified, select the **Set Default View** selection from the Commands menu by clicking on it with the left mouse button. The system prompts you with the following message:

   Setting your default view to the current view.
   Do you wish to continue. Yes or No?

   If you respond **y** or press **Enter**, the NMS executes the selection and the newly-defined view becomes new default map view whenever the Map task is accessed. This map view also remains the default if you open a new Geographic Map window or select the **Zoom To Default View** selection using the **Zoom** selection.

Once you set the default view, it is not affected by closing the map window, terminating the Map task, logging off the system, or system shutdown. This default view can be altered only when you again execute the **Set Default View** selection on a new map view.

Subnetwork View

When **Subnetwork View** is selected, the Geographic Map only displays what is selected using the *edesc* command. After selecting the **Subnetwork View**, you can return the display to its original view by choosing the **Full Network View** selection on the command menu.

Zoom Option

The **Zoom** selection invokes the Zoom Options submenu (Figure 6-3). The options on this submenu provide the following selections:

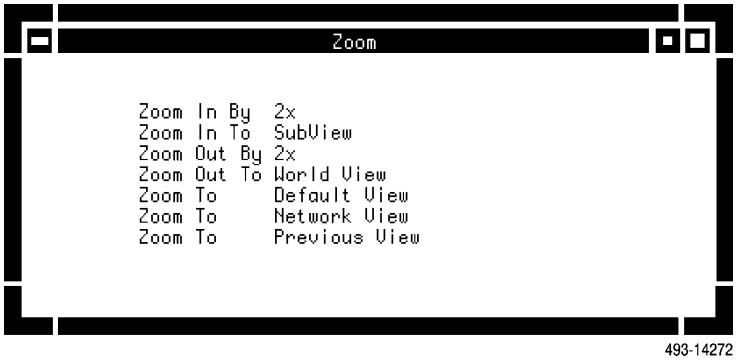


Figure 6-3. Zoom Submenu

- Increase the magnification of the current map view **(Zoom In By 2x)**.
- Decrease the magnification of the current map view **(Zoom Out By 2x)**.
- Change the current map view to a previously established map view **(Zoom Out To World View**, **Zoom To Default**, **Network**, or **Previous View)**.
- Change the current map view to a newly-defined subview using the subview function **(Zoom In To SubView)**.

You can also zoom using the left mouse button to draw a box around any area in the displayed map. When you release the left button, the NMS automatically zooms to the delineated area. The submenu selections are described in the following text.

NOTE

Every zoom operation causes the Map to recalculate site clusters. Occasionally you may notice unexpected clustering behavior when using the zoom options. For example, when you "zoom out," it is possible that two previously-separate sites are now clustered. Zooming causes the map to recalculate internally its gridding system. Sites, previously in separate grid boxes (the size of a grid box is four site/cluster icon diameters on a side), can become grouped into a single grid box when zooming in only a slight amount.

Zoom In By 2x

When you click on the **Zoom In By 2x** selection using the left mouse button, the selection is executed immediately.

This selection doubles the magnification factor of the map view, resulting in more detail but less overall area on the mapview. The new map view midpoint remains the same as the previous map view, with less geographic area displaying in your window. Whenever possible, the NMS changes cluster icons to individual site icons, if appropriate. This zoom operation does not work if your current map view is at maximum magnification (showing only tens of square miles).

Zoom Out By 2

This selection causes the new map view to reduce in size by a factor of two if compared to the previous map view. The new mapview has the same midpoint as the previous map view, with more geographic area displayed. This zoom selection does not work if the current map view is at maximum magnification (world view). If appropriate, the NMS changes site icons to cluster icons.

NOTE

Increasing or decreasing the map magnification can result in changes to the aggregation of sites. For example, when you magnify a portion of the map that contains a composite site (cluster icon), the composite site may change to multiple single sites.

Zoom In To SubView

This selection requires you to define a subview called a **candidate subview**. Functionally, you create a candidate subview the same as a subview (previously explained in the **Set Default View** selection section). However, zooming in on a candidate subview is a two-step process. NMS does not create a new map view until you select the **Zoom in to Subview** selection.

To create a candidate subview, do the following steps.

1. Press and hold the *middle* mouse button with the mouse pointer at a point on the map where the box outline should begin. With the button down, drag the mouse in the direction that encompasses the new subview. Dragging the mouse expands the box in the direction of the mouse. When the new candidate subview is boxed, release the mouse button. The box remains on your screen. Repeat the dragging and clicking of the mouse to change the size and location of the box until your subview is appropriately defined.

2. Select the **Zoom In To SubView** option to make the candidate subview the current map view.

   The map view that appears as a result of using the **Zoom In To SubView** selection, or by using the left mouse button, depends on the existence of site or cluster icons in the newly-defined candidate subview. If the candidate subview contains no site or cluster icons, at a minimum, the new map view displays the geographic area defined by the candidate subview. You may see more area than that defined by the candidate subview because of the difference in the shape of the candidate subview box and the shape of your current window. The map view *origin* (or upper left-hand corner of the new map view) stays the same as previous map view origin.

   If the candidate subview contains site or cluster icons, the system ensures that the resulting map view includes all site icons, including the individual sites that were clustered into the cluster icons in the previous view. If this occurs, you may see a new map view of a larger geographic area than that selected in the subview.

Zoom Out To World View

This selection displays a full world map, regardless of the geographic span of your actual network.

Zoom To Default View

This selection returns your current map view to the default view. The default view can be the map view previously set using the **Set Default View** selection (discussed in the previous section). If you have not set a default view, the system automatically displays the system default view (network view) for this option.

Zoom To Network View

This selection displays a Geographic Map containing only those geographic areas of the world that span your physical network, i.e., where your devices are actually installed.

Zoom To Previous View

This selection redisplays the display of your previous map view.

Selecting an Object

When you select an object (site, facility, or device) on the Geographic Map window, a menu appears based on the object selected. The three command menus are shown in Figure 6-4.

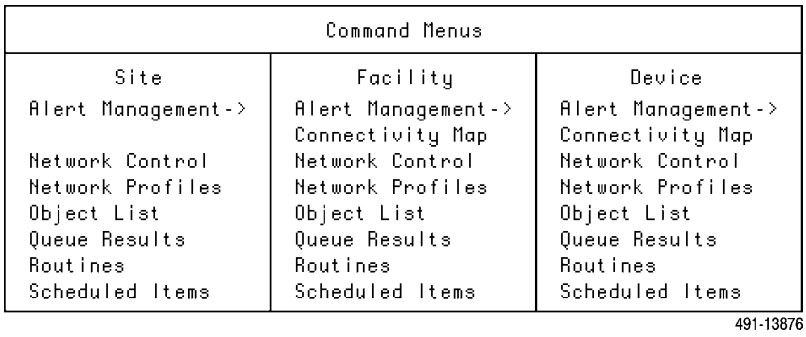


Figure 6-4. Site, Facility, and Device Commands Menus

These selections are defined as follows.

> **NOTE**
>
> If you select the **Network Control**, **Network Profiles**, **Queue Results**, **Routines**, or **Scheduled Items** selections, the submenus displayed allow you to traverse the Map (Manager) menu structure to display and access other Manager submenus and commands. Each counts as one Map (Manager) window towards a limit of two.

Alert Management

The Alert Management selection provides a menu that displays all current alerts associated with the selected object. Selecting an unacknowledged alert or "All Alerts" opens a menu, providing selections for acknowledging the alert(s) or clearing the event(s), based on whether the alert(s) selected represent an alarm(s), status report(s), or event(s). (See Chapter 5, *Filter Administration and Alert Processing*, for more information on acknowledging alerts and clearing events.) This item is not selectable (dimmed on the menu) if there are no current alerts.

Connectivity Map

The Connectivity Map selection displays a graphic representation of device or facility connections. You can access the Connectivity Map by selecting one of the following items:

- A specific device from a device Object List.
- A single facility from a Facility Object List.
- A single link icon from a Geographic Map.
- A device or facility on another Connectivity Map.

The Connectivity Map displays the following information:

- Icon representation for the selected object.
- Directly adjacent devices.
- Facilities connecting the selected device to adjacent devices.

The icons on the Connectivity Maps are also selectable. Refer to the discussions on the Connectivity Maps, later in this chapter, for additional information.

Network Control

The Network Control selection provides a Map-Manager window to the **Network Control** function of the Manager task. Selection of Network Control from a site or facility command menu causes a Map-Manager window to open, which displays the **Network Control** submenu. However, only those commands applicable to the device and for which you have permission are available.

Network Profile

You use the **Network Profile** selection to access the Create, Delete, Display, and Edit Profile commands for a site, facility, or device based on a selected site, facility, link or device icon. For example, if you select a site icon, the site Command menu appears. From this menu, you select **Network Profiles** which causes a Map-Manager window to open and display the **Site Profiles** submenu.

Object List

You use the Object List selection to open an Object List on a selected site, cluster or link icon on the Geographic Map. Depending on the type of icon selected, you can open **Object Lists** to display a list of individual devices contained in a site, list of sites grouped into a cluster, or a list of facilities associated with a link. The text items in any Object List are selectable. Thus, you can select a specific device or facility, then open a Connectivity Map window, open a **Network Profile** submenu, or access **Network Control**. For more information on **Object Lists**, refer to the *Object List Windows* section later in this chapter.

Queue Results

You use the **Queue Results** selection to open a Map-Manager window to display the **Queue Results** submenu. Queue results commands are available to Display, List or Delete queue results items.

Routines

From site, facility, and device command menus, selecting the **Routines** selection causes a Map-Manager window to open. The initial menu displays the **Routines** submenu, enabling you to Create, Display, List, Delete, or Edit a routine.

Scheduled Items

From site, facility, and device command menus, selecting the **Scheduled Items** selection causes a Map-Manager window to open. The initial menu displays the **Scheduled Items** submenu, enabling you to Display, List, or Delete scheduled items.

Geographic Map Selections Based on Icon Selection

Table 6-1 summarizes the selections of each of the **Commands** menus when an icon (object) is selected. The table is based on the selection of a site icon, a simple link icon (a link containing one facility), a cluster icon, and a composite link icon (a link containing more than one facility). For a review on the definition of the icons, refer back to the discussions in the *Site Icons, Cluster Icons* and *Link Icons* sections, earlier in this chapter.)

Table 6-1
Geographic Map Window Operations Based on Icon Selection

Window Selections	Site Icon	Simple Link Icon	Cluster Site Icon	Composite Link Icon
Alert Management Selection	Available only when selected object is reporting an alert. Invokes submenu.	Available only when selected object is reporting an alert. Invokes submenu.	Available only when selected object is reporting an alert. Invokes submenu.	Available only when selected object is reporting an alert. Invokes submenu.
Connectivity Map Selection	Never available.	Always available.	Never available.	Never available.
Network Control Selection	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.	Never available.	Never available.
Network Profile Selection	Invokes Map-Manager submenu.	Never available.	Never available.	Never available.
Object List Selection	Displays device list.	Displays facility list.	Displays site list.	Displays facility list.
Queue Results	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.
Routines	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.
Scheduled Items	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.

Object List Windows

Object List windows display textual lists of network devices, sites or facilities. For both the Geographic or Connectivity Maps, the icon and Object Lists relationships are as follows.

- Object List for a site lists individual devices/facilities located at that site.
- Object List for a cluster icon lists individual sites composing the cluster site.
- Object List for a link cluster icon lists individual facilities composing the link cluster.
- Object list for an individual device lists its child devices (as defined in those device profiles).

Based on how your NMS network is configured, opening an Object List selection can provide another Object List selection from the resulting submenu. Selecting this Object List selection can then lead to device-specific information. For example, if devices are grouped into sites, and multiple sites are clustered, selecting the cluster icon and opening its Object List provides a list of all sites in that cluster. If you select a site and open its Object List, you are provided with a list of all devices or facilities, by device or facility name, grouped into that site. At the device (or facility) level in an Object List, you can select a device and open a Connectivity Map. Refer to Table 6-2 for a list of function selections based on icon selection.

You can establish a parent/child relationship between devices via the **parent device** field in a device's profile. You enter the parent's device address or device name in this field. (A parent device is a network device that may contain or manage another device.) For example, a Service Restoration Control Unit can be a parent device to its application modules. You can select the parent device object from an Object List and all devices with the same parent display on the parent's Object List.

Table 6-2 lists the selections available from an Object List window, and also specifies under what conditions the selections are available.

Alert information for the text items, representing network elements, are color-coded for visual recognition of current alert priority status. The color of the object text is determined by the highest severity alert associated with its corresponding managed device. When an alert is in the unacknowledged state, an asterisk appears at each end of the text. When the alert is acknowledged, no asterisks display. Refer to Chapter 2 for additional information on color-coded alert priorities.

Table 6-2
(1 of 1)
Object List Window Operations Based on Object Selection

Window Option	Device Object	Facility Object	Site Object
Alert Management	Available only if the selected object is reporting one or more alerts; invokes a submenu.	Available if the selected object is reporting one or more alerts; invokes a submenu.	Available if the selected object is reporting one or more alerts; invokes a submenu.
Connectivity Map	Always available.	Always available (if a single facility).	Never available.
Network Control	Available only if the **external system** field of the device profile defines an external system name or if the **device type** field has the value: apl, ddd, dds, mux, ntwk, 56mux, swtch.	Invokes a Map (Manager) submenu.	Available if object list is at the lowest level of sites selectable. Not available if aggregate site is selected.
Network Profile	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.
Object List	Available only if a device whose **parent device** field in their device profile matches the device identification of the selected device.	Always available.	Available only if the selected site contains one or more devices.
Queue Results	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.
Routines	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.
Scheduled Items	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.	Invokes Map (Manager) submenu.

Connectivity Map Windows

Connectivity Maps (Figure 6-5) are topographical representations of device-specific connections. These maps are accessed by selecting one of the following:

- A device name from an Object List (or device icon) and then selecting a Connectivity Map from the results command menu.
- A facility from a facility Object List (or a single facility icon) and then selecting a Connectivity Map from the results command menu.

Icons on the Connectivity Maps are also selectable. These icons open a submenu, enabling you to open additional Connectivity Maps on the selected icon, or to choose other selections available for the selected icon.

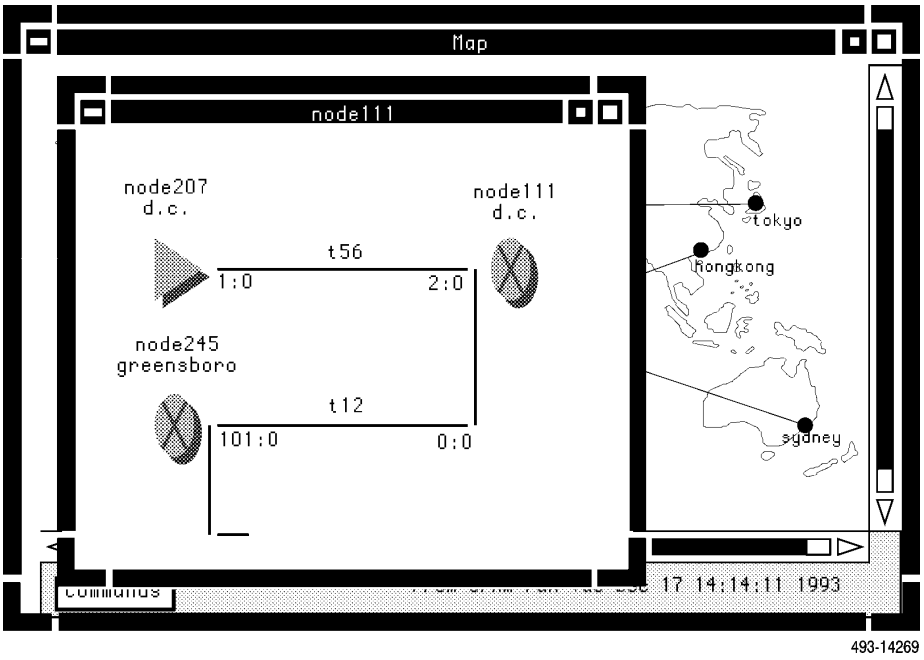


Figure 6-5. Sample Connectivity Map

Connectivity Maps can display connections between different product elements, e.g., multiplexers to modems connections, multiplexers to Digital Access Cross-Connect Switches (DACS), modems to front-end processors, etc. A Connectivity Map displays the following items:

- The selected device's icon.
- That device's directly adjacent devices.
- The connections between these devices based on the information contained in the selected device's facility profile(s).

It is recommended that you configure unsupported devices in your network so that they appear on your Connectivity Maps. With this information on your device database, you significantly improve the ability to assess the impact of a device failure (when diagnosing problems) because you can readily identify what user applications or devices are affected.

The Connectivity Map icons representing network elements are color-coded for visual recognition of current alert priority status. Refer to Chapter 2 for additional information on color-coded alert priorities. Refer to Appendix C for graphic representations of all Connectivity Map icons. You can also view all available icons by selecting **?** while in any Connectivity Map window.

Table 6-3 lists the selections available from the Connectivity Map windows and also specifies under what conditions they are available.

Table 6-3
Connectivity Map Window Operations Based on Icon Selection

Window Option	Device Icon	Link Icon
Alert Management	Available only when icon is in alert state; invokes a submenu.	Available only when icon is in alert state; invokes a submenu.
Connectivity Map	Always available.	Available only for a simple link icon.
Network Control	Available only if the External System field of the device profile defines an external system name, or if the device type field is one of the following: apl, ddd, dds, mux, ntwk, 56mux, swtch.	Available from a simple link icon. Invokes Map-Manager submenu.
Network Profile	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.
Object List	Available only if there exists one device whose parent device field in the device's device profile matches the device identification of the selected device.	Always available.
Queue Results	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.
Routines	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.
Scheduled Items	Invokes Map-Manager submenu.	Invokes Map-Manager submenu.

Adjacent Device Placement on the Connectivity Map

Adjacent devices are those devices known by the system to be immediately connected to a given device, i.e., known to be connected without intervening devices. When you display a Connectivity Map for a selected device, the placement of the adjacent devices forces the placement of all other connected devices. The resulting display ensures that the selected device is shown in the map window. You may need to scroll or enlarge (resize) the window to view any other devices connected to the selected device.

When a facility connects a device to itself, the device is displayed twice to show both ends of the facility.

The adjacent device placement for tributary devices on the Connectivity Maps depend on the definition of the facility which connects the devices to the selected device. In general, if the facility is connected to the line side of the selected device, the adjacent device is placed to the left of the selected device. If the facility is connected to the port side of the selected device, the adjacent device is placed to the right of the selected device.

For control devices, the adjacent device placement is reversed, placing the line side adjacent device to the right of the control device, and the port side adjacent device to the left side of the control device. The terms *line side* and *port side* refer to the sides of the device as defined in the device's facility profile's endpoint interface type.

If there is more than one adjacent device connected to the line side/port side, they are connected to an *icon extender* drawn from the line side/port side of the device icon. The devices on the icon extender are sorted alphabetically by device name. Icon extenders are shown in the foreground color and cannot be selected. Figure 6-6 is an example of the placement of adjacent devices.

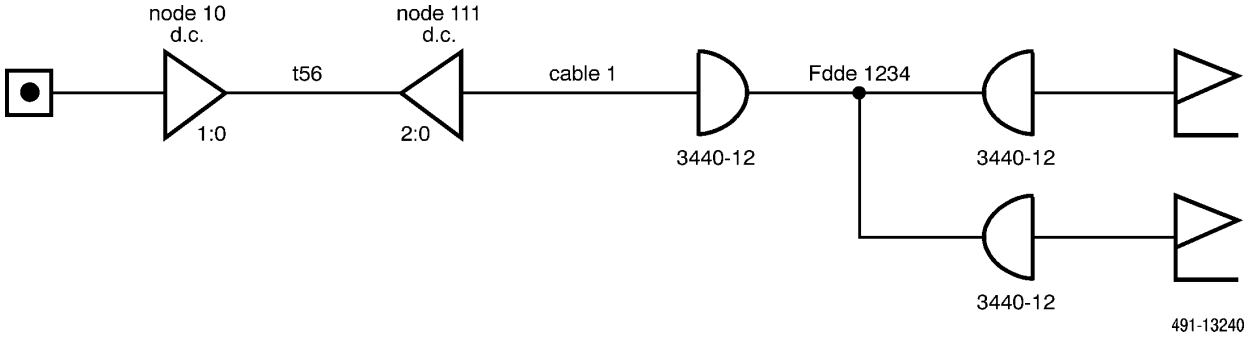


Figure 6-6. Placement of Adjacent Devices on a Connectivity Map

If a device, displayed on a Connectivity Map, has a configured external restoral device, the restoral device is shown connected by a short link. Restoral devices on icon extenders are placed below any other devices. If the restoral device field in the device profile of a device indicates restoral capabilities, an 'R' is placed within the icon.

If a facility is selected, the device in the facility profile specified as device endpoint 1 becomes the selected device. If the device endpoint is null, device endpoint 2 is the selected device.

Stopping Conditions Affecting Connectivity Map Displays

A *stopping condition* is used to limit the number of devices shown on a Connectivity Map. If the fanout from an adjacent device is greater than one, then the connectivity from that device is not shown. Instead, a stub appears, indicating that a stopping condition has occurred (see the next subsection for a description of stub facilities). To view the connectivity represented by the stub, you can select the device with the stub, then select the Connectivity Map from the resulting command menu.

Bridges are an exception to the stopping condition. The devices connected to the bridge are shown, even if the fanout is greater than one.

Stub Facilities

When a device's stopping conditions result in adjacent devices not being shown, a stub (a short solid black line) is drawn next to that device to indicate this (refer back to Figure 6-5). You can select that device and open a new Connectivity Map window, showing its adjacent devices. The stub itself cannot be selected and is shown on the display in the foreground color.

Connectivity Map Icon Alert State Information

Connectivity Map icons are color coded to indicate current alert priority states. Icon extenders and stubs are not color coded and are shown in the foreground color.

Textual Information on Connectivity Maps

Device name and site name are displayed next to each device icon on the Connectivity Map (refer back to Figure 6-5). The device name is shown centered above the associated icon. For non-restoral devices, the site name is placed below the device name.

Facility names are displayed above each simple link representing a non-restoral facility on the map. Interface ID and slot ID are displayed at each end of the facility, if any. If there is a redundant interface defined, its interface ID and slot ID are placed below the primary interface and slot IDs. If the link represents more than one facility between two devices, no textual information is shown. However, the link can be selected and a facility object list can be opened.

Connectivity Help Window

The Connectivity Map Help window can be selected by typing **ESC-?**. The Help window displays all available device icon types.

Network Test and Command Access

The map provides access to NMS-supported network tests and commands for devices directly managed by the 6800 Series NMS. Network tests/commands are accessible from the Geographic Map and from Connectivity Maps.

Network Test Access

Click on the **Commands** button on the lower left corner of the Map task screen. The menu that appears provides the selection item **Manager**. See Figure 6-7.

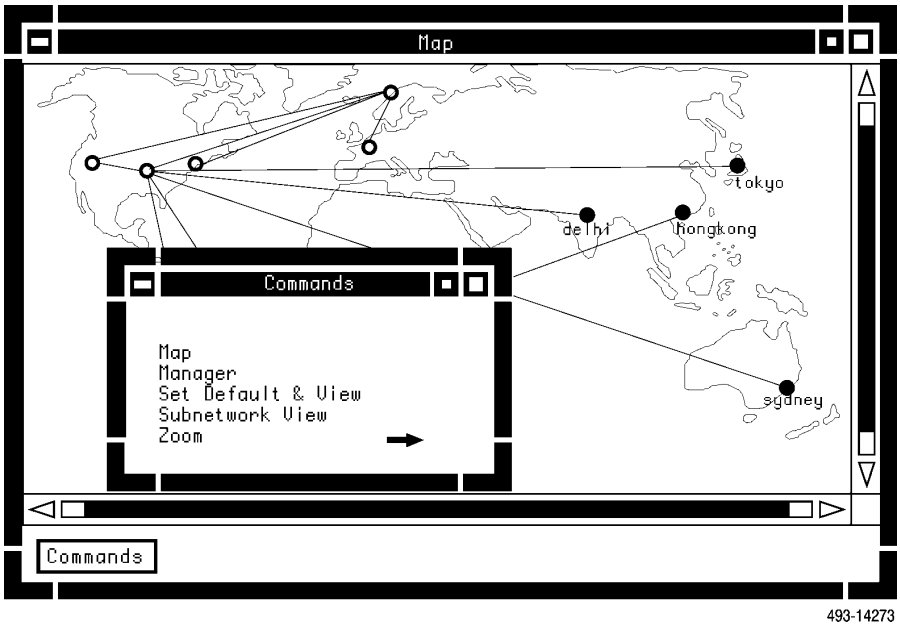


Figure 6-7. Map Command Menu

Select this menu item and a window labeled Map (Manager) opens. This window initially displays the Manager task main menu. See Figure 6-8.

You can access network test/command submenus from the Network Control submenu as you would in the Manager task.

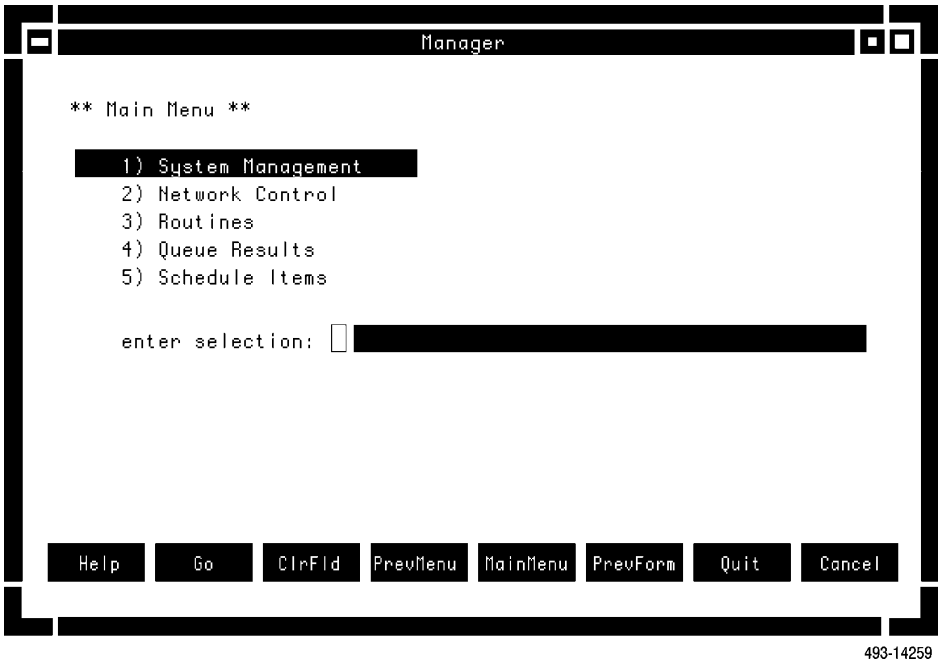


Figure 6-8. Manager Window Invoked from Map Command Menu

Network Test Access from a Selected Object

You can access the set of NMS-supported network tests for a *specific managed network object*. Select either the object icon or the object name from a displayed Object List. When the object icon/name for a managed object is selected, the command menu for the object appears. The menu includes the item **Network Control** as shown in Figure 6-9. For devices managed by external systems, see the *External Systems Configuration* section in Chapter 3.

Figure 6-9. Command Menu for a Selected Object

When you select the Network Control item, a Map (Manager) window opens. This window is labeled **Map (Manager)** : *device name*. This Map (Manager) window initially displays the Network Control submenu. If the selected object is a device, subsequent submenus display only those NMS tests/commands for which you have command access and that apply to the device selected (based on the device type and product type). Figures 6-10 and 6-11 illustrate context-sensitive device command menus.

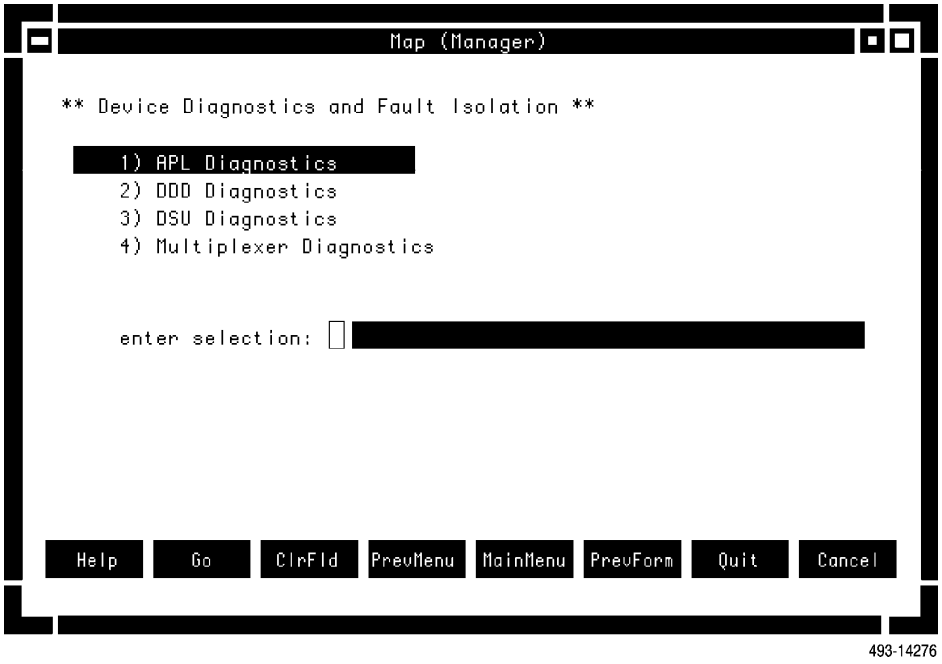


Figure 6-10. Network Control Submenu 1 for a Selected Object

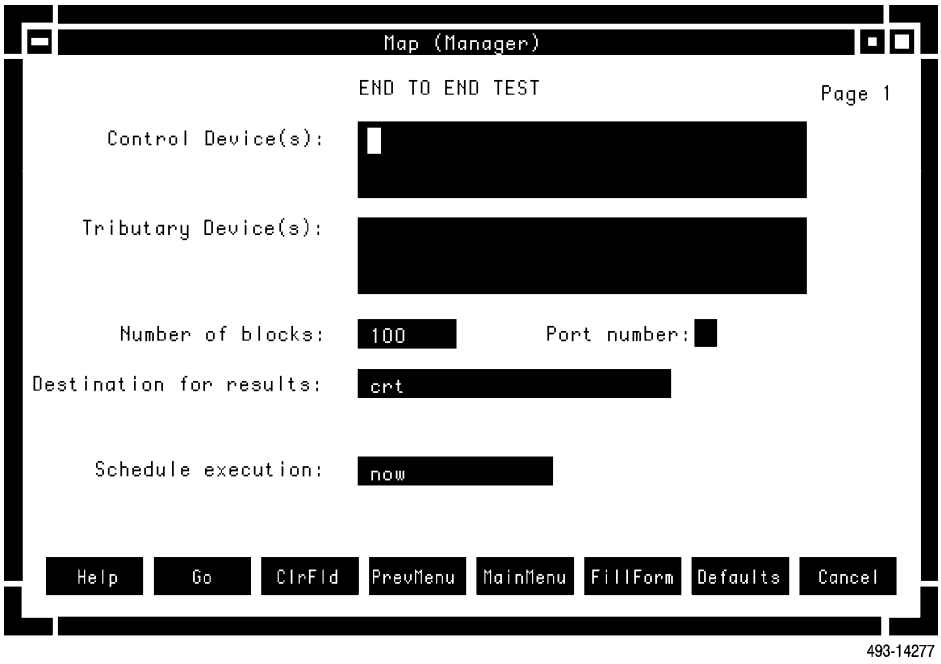


Figure 6-11. Network Control Submenu 2 for a Selected Object

When a specific command is selected from a menu item or command line, the input form for that command is displayed. Where applicable, NMS pre-populates input fields with object specific information obtained from the object or from the NMS databases. See Figure 6-12.

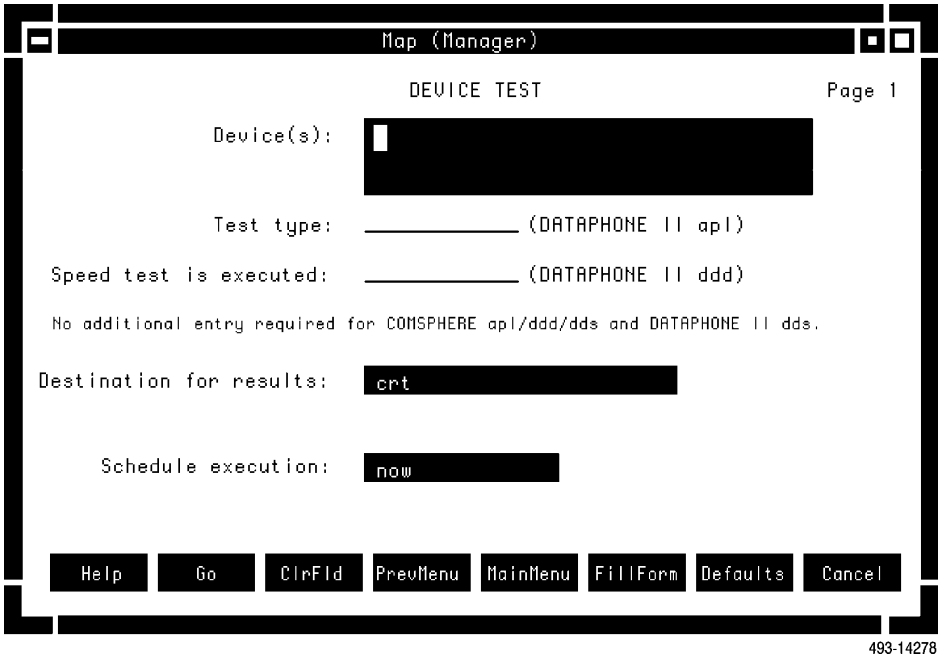


Figure 6-12. Network Command Input Form for a Selected Object

However, you can modify this information as needed. If you change a device's name or address and do not subsequently execute the Create Map *(crnm)* command, the information displayed on the map – used for pre-population of input forms accessed from the map – is not up-to-date from the 6800 Series NMS databases. Therefore, tests/commands executed with the old device information will not be sent to the correct object ("correct" as defined by the 6800 Series NMS database.) The user must execute the *crnm* command, close the open Map task, and reopen the Map task in order for the updated device information to be used in pre-population of command/test input forms.

From the Map (Manager) window, invoked when you select a specific object. You can also request any accessible Manager command by entering its abbreviation on the command line. However, if you request a command not applicable to the object chosen, the command's input form may *not* correctly populate with object-specific information.

Network Profile Access

Device, site, and facility profiles are network profiles. You have access to network profile commands from a Map (Manager) window opened from the Map.

To access the Network Profile submenu, if an object (device icon/name, site icon/name, or facility icon/name) is not selected, select the **Manager** menu item from the Map's Command Menu. (See *Accessing the Manager Task* earlier in this section.) Then, select the **System Management** submenu which displays the **Network Profile** selection. You can also enter any network profile command abbreviation directly on the command line provided.

When a device, site or facility is selected from a geographic or connectivity map, the command menu for that object contains the menu item **Network Profiles**. Selection of this menu item opens a Map (Manager) window. This window displays a menu listing the device, site, or facility profile commands; the commands you have access to and applicable to the object selected. See Figure 6-13. The device/site/facility name is automatically populated in the network profile input form.

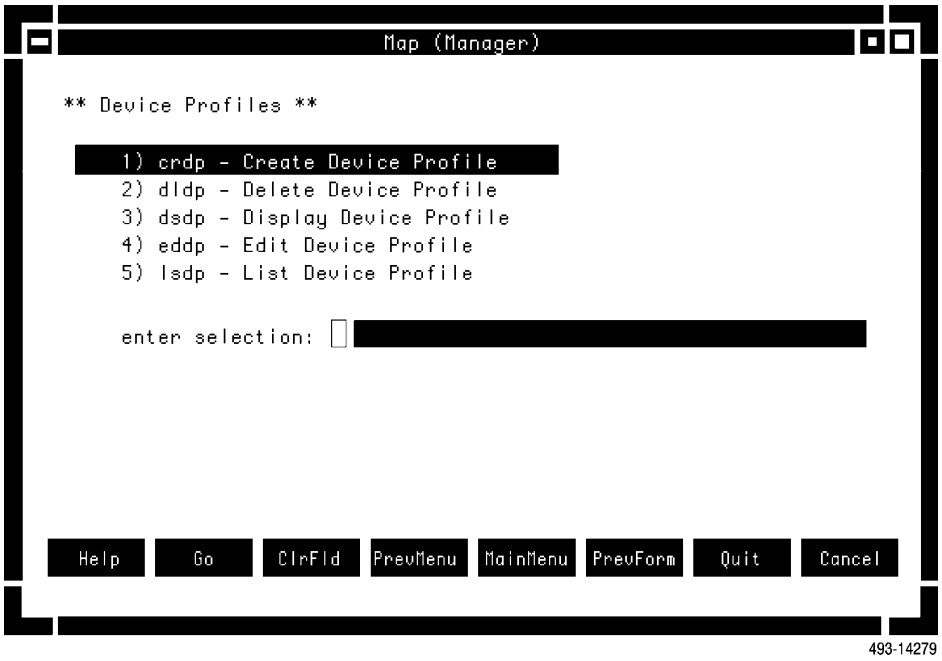


Figure 6-13. Network Profile Submenu for Selected Device

When you select a network profile command, NMS displays the command's input form. Where applicable, NMS pre-populates input fields with object-specific information obtained from the selected object or from NMS databases. See Figure 6-14.

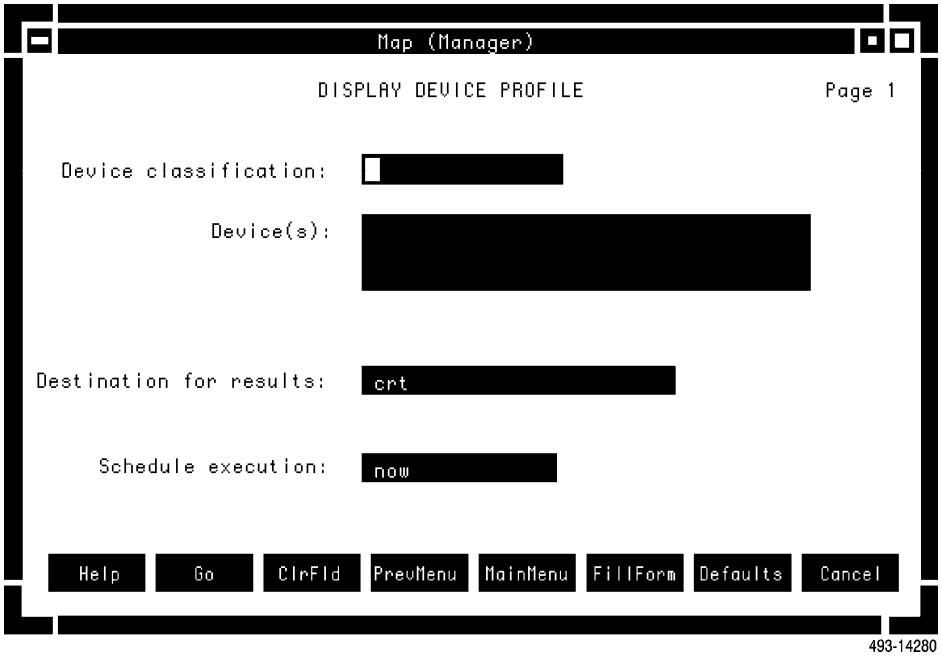


Figure 6-14. Network Profile Input for Selected Object

Routine/Scheduled Item/Queue Results Access

You can access commands for routine, scheduled items, and queue results administration from the Map task. You enter the command abbreviation on the command line of any Manager window invoked from the map, or select the appropriate menu item **Routines**, **Scheduled Items**, or **Queue Results** from a selected object's command menu.

Figure 6-15 illustrates the submenus displayed when you select **Routines**, **Scheduled Items**, or **Queue Results** menu items from the Map-Manager menu. You can also execute routines from the Map by entering the routine name in the command line provided.

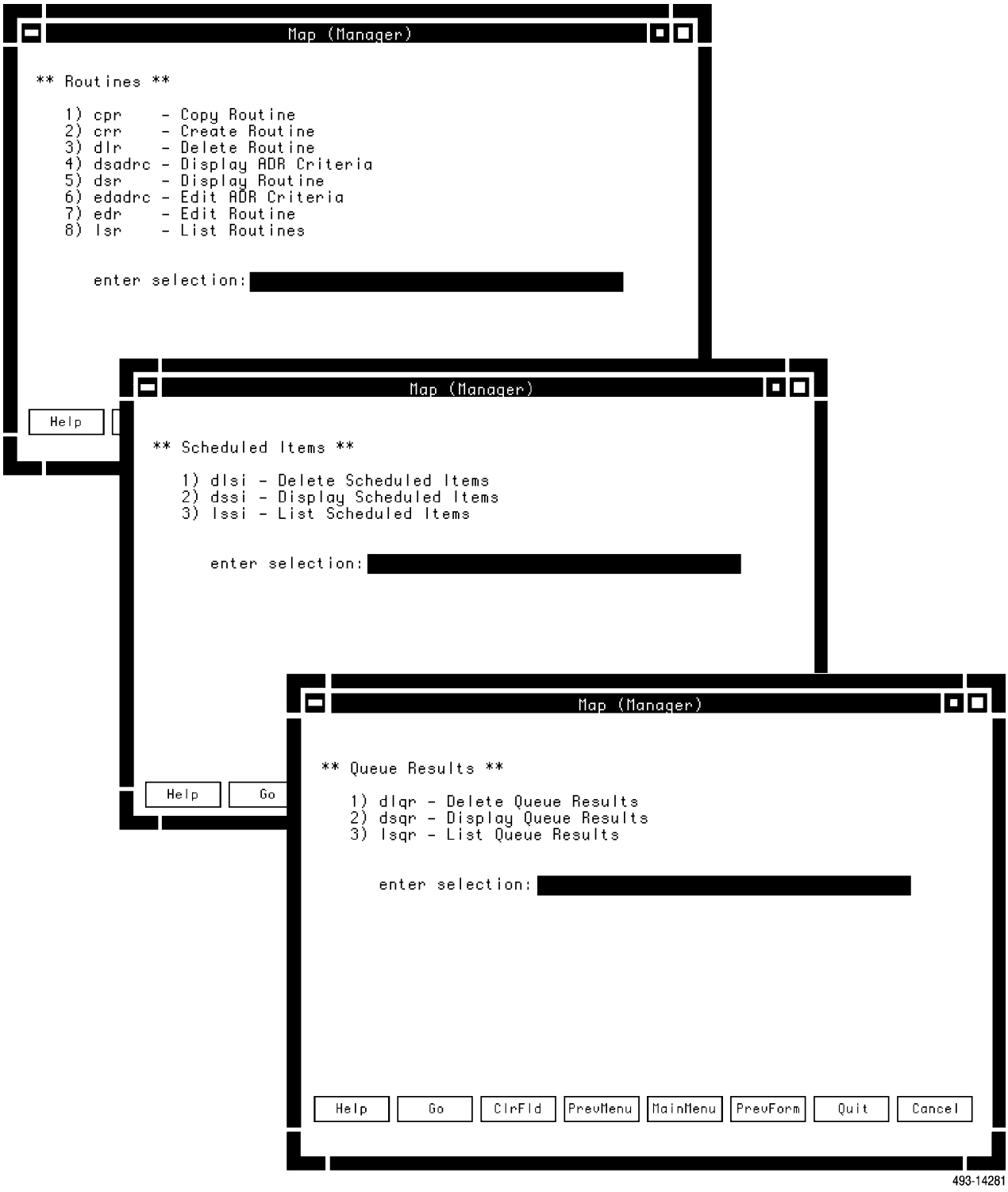


Figure 6-15. Routines, Schedule Items, and Queue Results Submenus

Terminating the Map Task

To terminate the Map task, select Close from the Window Manager menu or press **ESC x** on the keyboard.

Monitoring the Network Using the Monitor Task

The Monitor task shows real-time, color-coded textual representations of network alerts. Using the Monitor task, you can view new alerts, view updated information on existing alerts, acknowledge alerts, clear events and also have access to Network Control device profiles transactions.

The Monitor is updated automatically as alerts in the network are reported and cleared. Alerts display in order of the time of occurrence with the most recent alert placed at the top of the list. Alerts are automatically deleted from the list once they are cleared.

The Monitor task is available on both the full-feature and basic-feature workstations by selecting the Monitor task from the 6800 Series NMS Tasks menu. Selecting the Monitor task opens a window (Figure 6-16) containing column titles and a three line textual description for each of the currently active alerts. Monitor functionality differs between a full-feature workstation and a basic-feature workstation. See Chapter 2 for a description of these differences.

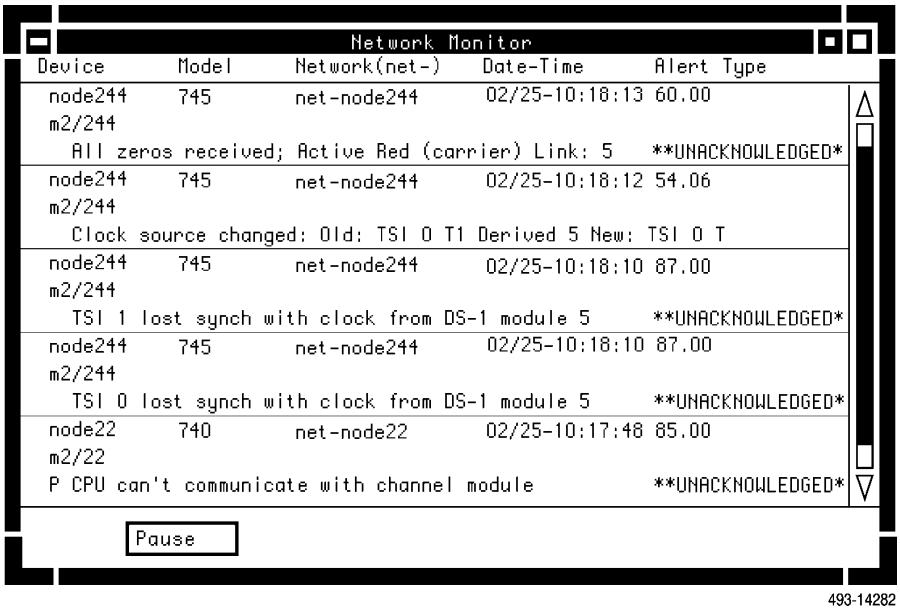


Figure 6-16. Monitor Task Window

Each alert entry contains common fields, labeled from left to right across the top of the window. The network address for the device and the text description correlating to the alert code are shown, respectively, on the subsequent two lines.

The first of the three lines contains information correlating with the common labels displayed across the top of the Monitor window. These fields are described as follows.

Device

A mnemonic device name is assigned to the device by the user in the device profile. If an alert is displayed with no name, there is no device profile for the device associated with that alert. This alert can therefore not be stored in the historical alerts database when the alert is cleared. To store the alert, use the Create Device Profile *(crdp)* command to create a device profile for the device.

Model

The model number of the reporting device is supplied automatically by the NMS from the device profile for that device.

Network(net-)

The network name is assigned by the user in the device profile for that device.

Date-Time

This is the NMS date/time of alert occurrence.

Alert Type

This is the NMS alert type of the alert. For ACCULINK multiplexers, the alert type is the major/minor code reported by the multiplexers. For other devices, the alert type is a mnemonic used to classify the alert.

The second line of information for the alert contains the link-level address of the device. The link-level address appears directly below the device name, and represents the diagnostic location of the device reporting the alert.

The third line of information for the alert provides the text associated with the alert. For ACCULINK multiplexers, the text may contain parameters that identify specific objects reporting the alert, e.g., channel group, link, channel. For other devices, the text is a predetermined text string associated with the alert type. The third line also provides an ****unacknowledged**** indicator. (On the second line, just above ****unacknowledged**** are ATR, ADR, TT, and UAI indicators for Automatic Trouble Report, Alert-Driven Routine, Trouble Ticket, and Uniform Alarm Interface, respectively.)

As new alert indicators are added to the top of the list, the display in the window shifts downward. As alerts are cleared they are deleted from the list and the display shifts upward.

On a full-feature workstation, if the list of existing alerts exceed the screen line limit in the Monitor window, you can scroll through the complete set of alerts by using the scroll bar located to the right on your window. This scroll bar operates the same as the vertical scroll bars used in the Map window. On a basic-feature workstation, paging through the alerts is accomplished using the up and down arrow keys. Note that the up and down arrow keys may not be available on asynchronous terminals. If you are using an asynchronous terminal, see Chapter 2 for information on paging.

Color coding of the text also indicates the priority mapped for the alarm. For color coding information refer back to Chapter 2.

The Monitor Pause/Continue Feature

You can use the Monitor's **Pause/Continue** feature to stop the Monitor from scrolling so you can view the alerts. While the **Pause** feature is in effect, alerts slated for the Monitor are placed in a temporary buffer storage area in the system until alert display is resumed. At this time, the alerts in the buffer display on the Monitor and normal processing continues. You can pause the display of alerts for a duration of one minute, then the system automatically resumes the display of alerts.

To temporarily pause alert display to the Monitor, select the **Pause** command button at the bottom of the Monitor window. The **Pause** button listed at the bottom of the window changes to **Continue**, the background color of the Pause button changes to red, and the following message appears:

**** Please select Continue to resume real-time monitoring. ****

To manually resume reporting on a full-feature workstation, click on **Continue** (or move with the left mouse button. On a basic-feature workstation, press the **F2** key to continue. The Monitor resumes real-time reporting of alerts and the **Continue** button at the bottom of your window changes to read **Pause**. The background color of **Pause** changes to blue and the previously displayed message no longer appears. If you do not manually resume display of alerts within a minute after suspending the display of alerts, the system automatically resumes alert display after one minute has elapsed.

Individual-User Customization of Monitor Displays

You can control what information is displayed in your own Monitor window by specifying selection criteria parameters which then act as viewing filters. This criteria acts on the alerts that have passed the NMS display filter. (Refer to Chapter 5 for additional information on NMS filters.) You specify selection criteria via the Edit User Selection Criteria *(edusc)* command available from the Manager task window. (The *edusc* command was also discussed earlier in the *Customizing Alert Attributes and Criteria* section in Chapter 5.)

You can specify alert selection criteria based on device type(s), model number(s) of devices, and by specific device address(es), site, serial number, network name, or circuit name. You can specify which alert type(s) or alert group(s) display as well as what alert priority levels should be displayed.

This same criteria determines what alerts display on your Map windows.

Once you establish the selection criteria, the selection criteria is associated by the system with your User ID. Each time you open a Monitor window, the system uses the last specified selection criteria to initialize the information display in your window. If you have not specified selection criteria, the system default selection criteria for this task is applied, and you have a view of all alerts as they are reported to the NMS and pass the display filter.

NOTE

Any modifications you make via the *edusc* command will not affect the Monitor window currently open. An active Monitor window must be closed and then reopened for your new selection criteria to take effect.

Other alert display customization commands that affect the Monitor display are Edit Color Code *(edcc)* and Edit Alert Attribute *(edaa)*. These commands affect all users of the system and cannot be used to customize individual user's Monitors. Refer to the *Customizing Alert Attributes and Criteria* section in Chapter 5.

Performing NMS Functions from the Monitor

On the basic-feature workstation, you use the up and down arrow keys to select the alert in the Monitor window and then press **Enter**. This action invokes a menu, allowing you to clear an event or acknowledge an alert. On the full-feature workstation, click the left mouse button to select the alert to display a menu with additional selections (Figure 6-17).

On this menu, you can access an Alert Management command selection menu to request the Delete Alert History *(dlah)* command or the Display Active Alert Snapshot *(dsaas)* command. You can also access device profile commands. (The basic-feature workstation does not support command selection from the Monitor window.) If the alert is for a managed device, you get access to **Network Control**.

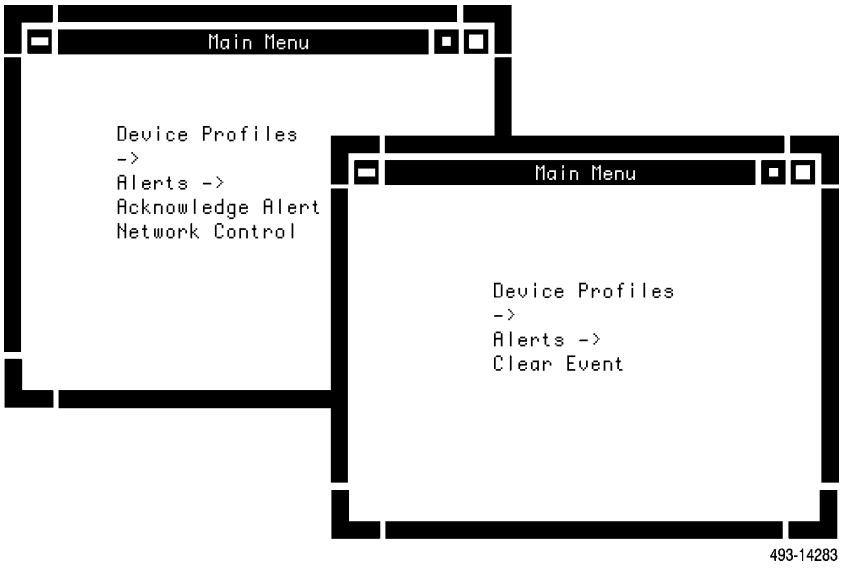


Figure 6-17. Monitor Main Menu Options from a Full-Featured Workstation

The Monitor options are described in more detail as follows.

Using the Alerts Option on the Monitor

When you select the **Alerts** selection from the Monitor task menu, you can access the Delete Alert History *(dlah)* and the Display Active Alert Snapshot *(dsaas)* commands. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for information on these commands.

Using the Device Profiles Option on the Monitor

When you select the **Device Profiles** option from the Monitor's task menu, a Map Manager is invoked at a ''Device Profiles" submenu.

Create Device Profile *(crdp)*

Delete Device Profile *(dldp)*

Display Device Profile *(dsdp)*

Edit Device Profile *(eddp)*

List Device Profile *(lsdp)*

Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional details on requesting these commands.

When you select a device profile command, the input forms are automatically populated with the information about the selected alert, where applicable. The input forms are also automatically populated with information about the device reporting the alert. You can then execute the command or edit the input form parameters as needed.

Network Control Option

You can also access Network Control commands from the Monitor using the same method as when accessing Network Control from the Map task.

Acknowledging Alerts from the Monitor

Use the **Acknowledge Alert** selection to acknowledge a selected alert displayed on the Monitor.

When you select the **Acknowledge Alert** selection from the Monitor's task menu, all audible and visual alert indications are turned off for that alert. If other Monitor sessions are active in the system and are displaying that alert, the audible and visible indications for the acknowledged alert are turned off for those displays. The indicators are also turned off on the Map displays. (If other unacknowledged alerts are still being reported to your workstation, the audible indicator will continue.)

Alerts can be acknowledged automatically by the system based on the audible and visual indication time-out parameters set via the Edit Alert Attribute *(edaa)* command, as discussed in Chapter 5 under *Customizing Alert Attributes and Criteria*.

Clearing Events from the Monitor

Use the **Clear Event** selection to delete events from the active alerts list. Events are informational messages, thus they do not have a *clear* indication or a *stop* time. You can clear events manually from the displays by selecting **Clear Event** for your selected event. You can also choose to set an **Event clear timeout**, directing the NMS to automatically remove the event display after the time-out time expires. This is set via the Edit Alert Attribute *(edaa)* command, discussed earlier in this chapter.

When you select the **Clear Event** selection from the Monitor's task menu, the event is deleted from the Monitor list displayed on your workstation, and is deleted from any other active Monitor list (and from the Geographic Map and Summary windows), if currently being displayed.

Monitoring the Network Using the Summary Task

The Summary task is available only on full-feature workstations. It is accessed from the 6800 Series NMS Tasks menu by selecting the Summary task. Once selected, a single Summary window opens, displaying the most current Summary totals.

The Summary is a real-time, color-coded, numeric representation of network alert totals that match categories, with each category having different alert selection criteria. On a fully-configured NMS with multiplexer, modem, and ANALYSIS 6510 support, the default Network Summary window (Figure 6-18) displays 30 cells or alert categories. The format is three rows with 10 columns each. The rows relate to the priority level of the alerts (major, minor, warning) and the columns relate to the device types *(APL, DDD, etc.)*.

NOTE

If multiplexer or ANALYSIS NMS support is not installed, some columns to the right side of the default Summary window are not labeled and their cells are inactive.

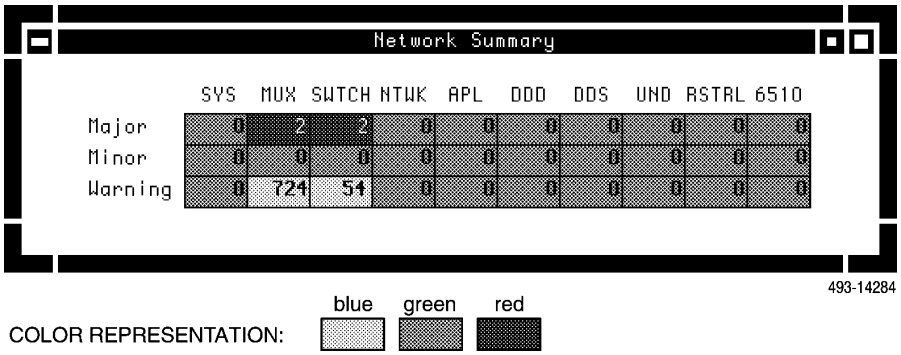


Figure 6-18. Sample Network Summary Window

The default Summary window appears as follows. Each column represents a category, while each row represents a priority level within that category. Thus, for example, the second column, first row cell (a cell is a row/column intersection) in Figure 6-18 represents the number of major alerts on multiplexer devices currently active.

Each cell contains a numeric representation of the number of alerts meeting the category's selection criteria, and the cell background color associated with the highest priority level alert recorded for that cell. Inactive cells assume the background color of the window and do not reflect any numeric information.

If you change the Summary's color code scheme via the Edit Color Code *(edcc)* command, the changes take effect once you close and then reopen the Summary window.

Customizing the Summary

The Summary consists of a 30-cell matrix (3 rows by 10 columns), with each cell representing a category. Each alert category provides a tally of the specific system-wide alerts associated with that category. The category is automatically updated as alerts in the network are received or cleared.

There are 30 categories which map into the 30 cells in the Summary. The mapping of the category numbers into the cells is shown in Table 6-4. When editing the categories, you enter a category number to identify the cell to be edited.

Using Table 6-4 as an example, Alert Category 1 corresponds to major system alerts. If 9 major system alerts occur and none of the alerts are cleared, the Summary display the number 9 in cell 1. If 7 DDD warning alerts occur and three of the alerts are cleared, the Summary window displays a 4 in cell 26.

Initially, each of the 30 categories contain system default values (discussed later in this section, and default row/column labels as shown in Table 6-4) for alert selection criteria. The categories can be edited via the Edit Category *(edc)* command. Use this command to define the alerts to be counted for the category by specifying what device(s) (by name, address, serial numbers, network names or by circuit names), device type(s), alert type(s) and/or alert group(s), alert priority(ies), or model number(s) should be included.

Table 6-4
Alert Category/Cell Mapping

	SYS	MUX	SWTCH	NTWK	APL	DDD	DDS	UND	RSTRL	6510
Major	1	2	3	4	5	6	7	8	9	10
Minor	11	12	13	14	15	16	17	18	19	20
Warning	21	22	23	24	25	26	27	28	29	30

Customizing Row and Column Labels

The default Summary row and column labels relate, respectively, to the priority level of alerts and the device types. The system default values for the row labels are assigned with Row 1 associated with **MAJOR** priority level, Row 2 with **MINOR** priority level, and Row 3 with **WARNING** priority level.

The column labels depend on the order in which the application packages are installed on the system. If both the multiplexer and modem application packages are installed, and your system is configured for ANALYSIS NMS support, the default assignments are the same as those listed in the Summary window shown in Figure 6-18. If you do not have one or more of these application packages, the columns and their associated rows would be deleted and the column labels would shift to the left. There would be blank columns and rows displayed beginning from the left side of the Summary window.

You can customize the row and column labels in the Summary window to correspond with your customization of the categories. Row and Column labels in the Summary window are changed via the Edit Row-Column Labels *(edrcl)* command.

System Default Categories

Your NMS system is installed with system-supplied alert selection parameters so you can immediately use the Summary window. The default values for each category are listed in Table 6-5. In this table, the Device(s) column indicates 1/*,2/* etc. as appropriate. These notations reflect device naming conventions with wildcard usage, indicating all devices on control channels 1 through 8. For example, 1/* indicates all devices with an address beginning with 1/, etc.

Table 6-5
System Default Category Assignments

Category	Device Types	Device(S)	Model	Alert	Priority
1	system	all	all	all	1
2	mux, 56mux	all	all	all	1
3	swtch	all	all	all	1
4	ntwk	all	all	all	1
5	apl	1/*,2/*,...,8/*	all	all	1
6	ddd	1/*,2/*,...,8/*	all	all	1
7	dds	1/*,2/*,...,8/*	all	all	1
8	und	all	all	all	1
9	ab, dbu, srcu	1/*,2/*,...,8/*	all	all	1
10	all	a1/*	all	all	1
11	system	all	all	all	2
12	mux, 56mux	all	all	all	2
13	swtch	all	all	all	2
14	ntwk	all	all	all	2
15	apl	1/*,2/*,...,8/*	all	all	2
16	ddd	1/*,2/*,...,8/*	all	all	2
17	dds	1/*,2/*,...,8/*	all	all	2
18	und	all	all	all	2
19	ab, dbu, srcu	1/*,2/*,...,8/*	all	all	2
20	all	a1/*	all	all	2
21	system	all	all	all	3
22	mux, 56mux	all	all	all	3
23	swtch	all	all	all	3
24	ntwk	all	all	all	3
25	apl	1/*,2/*,...,8/*	all	all	3
26	ddd	1/*,2/*,...,8/*	all	all	3
27	dds	1/*,2/*,...,8/*	all	all	3
28	und	all	all	all	3
29	ab, dbu, srcu	1/*,2/*,...,8/*	all	all	3
30	all	a1/*	all	all	3

Trouble Tracking 7

Overview

Use the commands in the Trouble Tracking task to report and manage network problems. You can manually create trouble tickets, or request Automatic Trouble Reporting (ATR), and automatic trouble ticketing.

The Trouble Tracking task and its features are described in this chapter. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for detailed information on trouble tracking commands.

Trouble Ticketing

Using the NMS Trouble Tracking task, you can manually open (create), display, edit, list, and delete trouble tickets. You can view trouble tracking command results that were sent to the results queue via the Results Queue Management selection. You use the Scheduling Queue Management selection to view/manipulate scheduled trouble ticket commands. Trouble tickets can also be generated automatically if automatic trouble ticket generation is authorized in the device profile database.

Trouble tickets provide a way to keep track of a problem from the time it occurs to the time it is resolved. A trouble ticket can be opened for problems in the network or problems with equipment. You can generate trouble tickets for any types of devices reporting problems (alerts): multiplexers, APL modems, DSU devices, DDS devices, bytex devices, and SNMP/brouter devices.

You can also generate trouble tickets for devices not directly managed by NMS, and for any type problem. For example, you can generate a trouble ticket for a user's terminal that does not work properly.

Once a trouble ticket is opened, you can specify an escalation date so that if the trouble ticket is not closed by a specified date, mail is automatically sent to the person assigned to resolve the trouble ticket.

Trouble ticketing can also log the actions that are taken to resolve each trouble ticket which provides you with a history of the trouble ticket from the time it was opened to the time you close it.

Trouble management uses the INFORMIX database system. You therefore have the ability to completely customize trouble tickets to fit your needs if you have the optional 4GL INFORMIX software package. For more information on customizing trouble tickets, refer to the *COMSPHERE 6800 Series Network Management System Reports and Trouble Tracking Customization Guide.*

The following paragraphs provide information for opening, editing, listing, displaying, and deleting trouble tickets. The queue management information in the following sections only applies to Trouble Tracking.

Accessing the Trouble Tickets Task and Commands

To access the Trouble Tickets task, select Trouble Tracking from the 6800 Series NMS Tasks menu. The Trouble Tracking menu appears as shown in Figure 7-1.

From this menu, you can request commands to delete, display, edit, list, and open trouble tickets. You can also perform results queue and scheduling queue management tasks from this menu. When you select an option from this menu, Trouble Tracking displays input forms, for entering selection criteria and formatting information and results forms. Results forms are displays or printouts of information you requested on the input forms.

The following sections discuss each selection listed on the Trouble Tracking menu. These sections do not provide detailed descriptions of the commands. See the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for command descriptions.

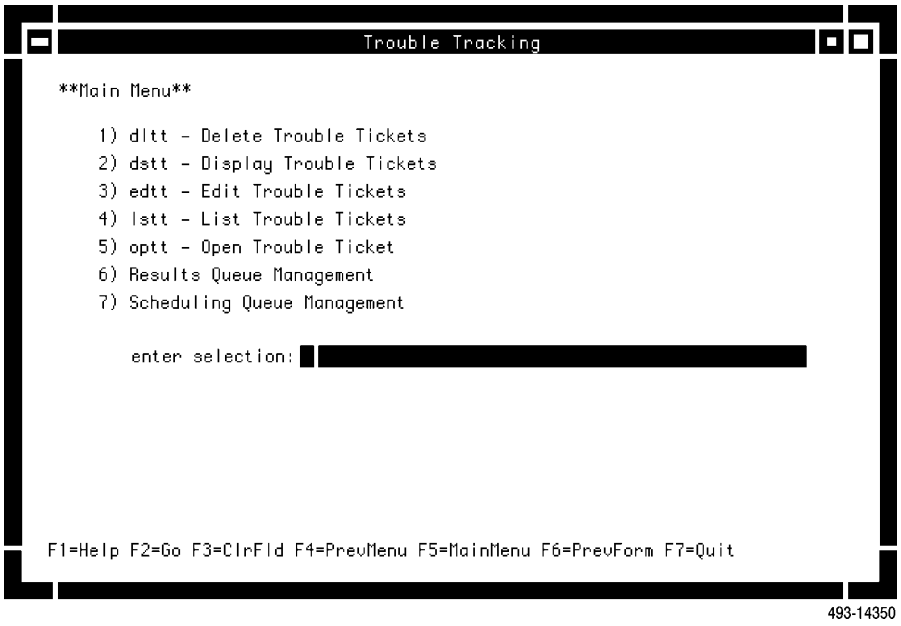


Figure 7-1. Trouble Tracking Menu

Delete Trouble Tickets

The Delete Trouble Tickets function is used to delete old or unnecessary trouble tickets from the database. You can only delete those trouble tickets with a closed status.

You delete trouble tickets using the Delete Trouble Tickets *(dltt)* command. You can also access the Delete Trouble Tickets function from the Trouble Tickets menu.

Display Trouble Tickets

Use the Display Trouble Tickets function to obtain a complete list of the trouble tickets (in their entirety) available in the database that meet the selection criteria you enter on the input form. If any field is left blank on the input form, the field is disregarded during the search.

You can display trouble tickets via the Display Trouble Tickets *(dstt)* command or access the Display Trouble Tickets function from the Trouble Tracking menu.

The Display Trouble Ticket Selection List form is bypassed if you populate the **Ticket #** fields **To** and **From** with the same ticket number. The first Display Trouble Tickets input form is displayed. Once you complete the input forms a Trouble Ticket Selection List displays for you to select which trouble tickets you want to be displayed. You can limit the display of the tickets by going through the list of trouble tickets displayed on the Trouble Ticket Selection List using the arrow keys and placing an x in the box at the left of each ticket you want displayed. Use the **PgUp** and **PgDn** keys to move between pages of the Selection List. Multiple tickets can be selected. The selected tickets are displayed/printed in the sequence in which they appear on the list.

You press **F2** to display the results forms once the selection form is completed. Use **F2** for the next record or **F3** for the previous record. To view each page of the results, use the **PgUp** and **PgDn** keys.

Edit Trouble Tickets

Use the Edit Trouble Tickets function to change the information in trouble tickets. Any fields can be edited by overwriting the existing information on the input forms. The **Ticket #** field cannot be changed.

If the **Reported by** field contains auto and the escalation date is entered during editing, your current User ID is automatically entered in the **Assigned to** field. This is done so that an escalation mail message can be delivered to your terminal by the system.

If you modify any of the fields on the input forms, the previous values of those fields and the latest values entered are automatically logged and displayed in the **Trouble Ticket Audit Trail** portion of the results forms. However, only the time of modification is logged for the **Problem description** and **Comments** fields.

You can edit trouble tickets using the Edit Trouble Tickets *(edtt)* command or access the Edit Trouble Tickets function from the Trouble Tracking menu.

Once you complete the input forms, the Edit Trouble Ticket Selection List form displays all the trouble tickets, matching the selection criteria in the sort sequence specified. You can selectively chose trouble tickets to edit by scanning the list using the arrow keys, and entering an x in the box at the left of a ticket. You can select multiple tickets. NMS provides selected tickets for editing in the order appearing on the list. To bypass the Edit Trouble Tickets Selection List form and edit only one ticket, populate both **Ticket #** fields **To** and **From** with the same ticket number.

Once you complete the selection form, press **F2** to display the first edit form. You can edit all fields on the form except the **Ticket #** field. NMS automatically populates this field which cannot be changed. Continue editing all the forms in the same manner. Once you complete editing all forms for one ticket, press **F2** to display the results of your edit. Pressing **F2** again displays the next ticket selected for editing. To view each page of the results, use the **PgUp** and **PgDn** keys.

List Trouble Tickets

Use the List Trouble Tickets function to display an abbreviated listing of the trouble tickets in the database that meet the criteria entered on the input forms. If a field is left blank on the input forms, the field is disregarded during the search. When a trouble ticket that matches the selection criteria is found, the data is extracted and listed on a two-line display.

You can list trouble tickets using the List Trouble Tickets *(lstt)* command, or you can access the List Trouble Tickets function from the Trouble Tracking menu.

Once you complete the selection criteria, press **F2** to display the results form. For more than one page, press the **PgDn** key to view the next page.

Open Trouble Ticket

Use the Open Trouble Ticket function to manually create a new trouble ticket.

You can open a new trouble ticket using the Open Trouble Ticket *(optt)* command or you can access the Open Trouble Ticket function from the Trouble Tracking menu.

Once you complete all the input forms, press **F2** to display the results forms. The fields displayed on the results forms are system-generated based on the information you entered on the input forms and the information in the database. Use the **PgUp** and **PgDn** keys to view each results form.

Results Queue Management

Use the Results Queue Management function to view results of creating, editing, and deleting trouble tickets. Select the Results Queue Management selection from the Trouble Tracking menu or by directly entering specific Results Queue commands (identified in the following sections). The results of the trouble tracking functions are routed to the queue using the **Destination for results** field.

You access the Results Queue Management submenu from the Trouble Tracking menu. The Results Queue Management submenu is displayed as shown in Figure 7-2.

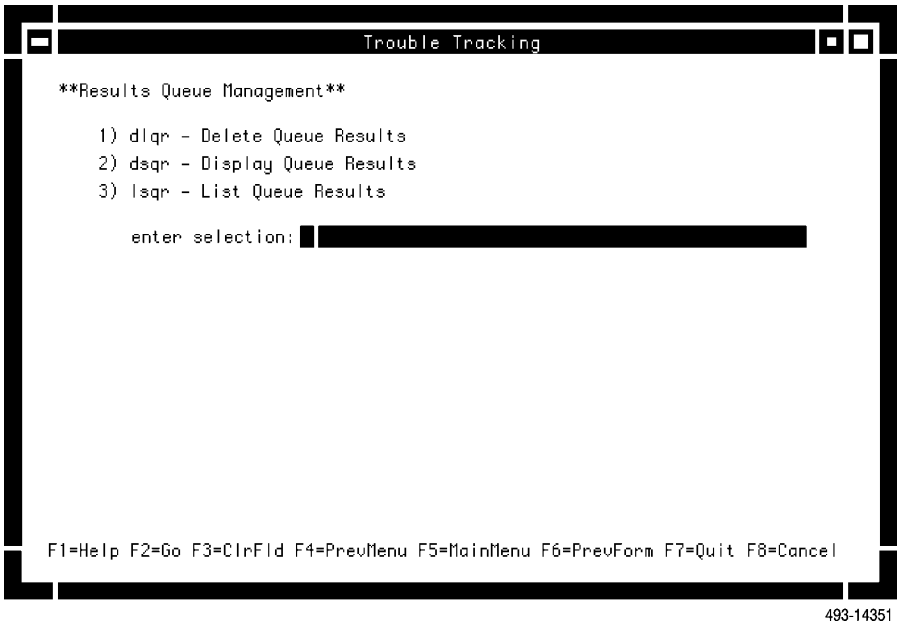


Figure 7-2. Results Queue Management Submenu

Use these commands to Delete, Display, or List queue results.

Scheduling Queue Management

You can examine the queues of trouble tickets scheduled for future execution and manipulate the contents of the queue. You do either function by entering specific schedule Queue Management commands (discussed in the following sections). You can access the Scheduling Queue Management from Trouble Tracking task menu which is displayed as shown in Figure 7-3.

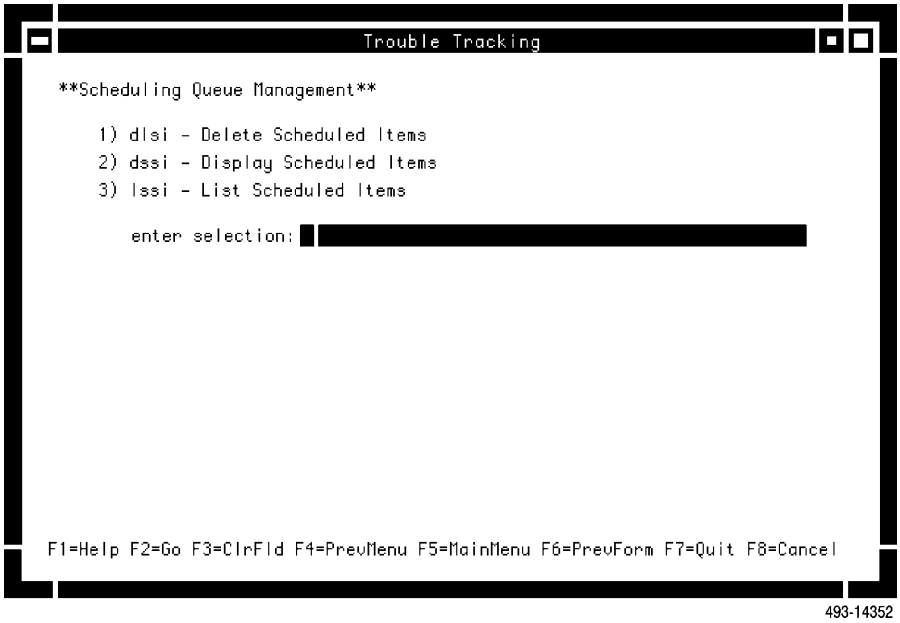


Figure 7-3. Scheduling Queue Management Submenu

Use these commands to Delete, Display, or List scheduled items.

Trouble Ticket Escalation

When a trouble ticket is not resolved by the time the escalation date is reached, a mail message is sent automatically to the user specified in the **Assigned to** field of the trouble ticket. If this field does not contain a valid User ID, the mail is sent to the user specified in the **Opened by** field.

Customizing Trouble Tickets

You can customize trouble tickets to meet your network's needs. If you have the optional INFORMIX 4GL software package, you can customize trouble tickets by adding, modifying, and/or deleting fields in forms or by creating tables in the database. For more information on customizing trouble tickets, refer to the *COMSPHERE 6800 Series Network Management System Reports and Trouble Tracking Customization Guide.*

Trouble Tracking Reports

You can use the following commands to generate reports in the Trouble Tracking task:

- ATR Report *(attr)* command to obtain a summary of the calls made to the service center for Automatic Trouble Reports (ATRs) that automatically generated trouble tickets.
- Detailed Trouble Ticket Report *(dttr)* command to obtain a detailed listing of trouble tickets which match a set of user-defined criteria.

See the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for additional information on these commands.

Automatic Trouble Reporting

The Automatic Trouble Reporting (ATR) system is a feature of the 6800 Series NMS that automatically reports alert information in the form of an ATR when the automated action filter value is exceeded. An ATR report is sent to one or more user-specified destinations.

ATR Process within NMS

When an alert passes the processing filter and is not cleared by the time it passes the automated action filter, NMS checks the ATR states for the control channel to determine whether or not the ATR feature is enabled:

- If the control channel's ATR state is **on**, NMS automatically calls the ATR phone number(s) and sends the ATR(s).
- If the control channel's ATR state is **off**, NMS does not send an ATR regardless of the device profile authorization.

If the ATR is enabled, then NMS checks the device's device profile for ATR authorization.

If the ATR authorization is **off**, NMS does not make a call and the process terminates. If the device profile has a valid entry (1–4) in the **ATR** field, NMS uses the entry to determine which directory to use to place the call. If more than one directory is specified, NMS sends multiple ATRs (one per directory specified). The ATR phone directory numbers are defined per alert group via the Edit ATR Phone Directory *(edatrpd)* command.

NMS attempts to establish communications with the specified ATR phone directory number; NMS attempts to call the number (up to a maximum of 7 attempts) at a specified interval (ranging from 0 to 59:59 minutes). The number of times NMS attempts to call the phone directory number and the interval between these attempts are specified in the ATR phone directory. Both successful and unsuccessful calls are logged in the database if the automatic trouble ticket function was authorized for the device. Also, mail is sent for the number of unsuccessful calls.

If the alert log printer is configured, ATR status is logged at that printer. ATR status and feedback messages are logged as user mail to each user with network access for the associated device. An ATR indication is included in the Monitor entry for an alert if that ATR was authorized for the device reporting the alert.

If the device profile is authorized to automatically generate a trouble ticket, the Trouble Ticket is created for the alert regardless of whether the ATR call is successful or not. The ATR status is logged to this trouble ticket.

If an alert clears while the ATR is pending, NMS still sends the ATR.

If an open trouble ticket exists for a specific modem and alert type, and another alert of the same type for the same device passes the automatic action filter, NMS does not open another trouble ticket. For a multiplexer, the criteria is the unique alert ID. In both cases, NMS initiates another ATR (if authorized) and updates the open trouble ticket with the new ATR information.

NMS can also generate a trouble ticket when an alert exceeds the automated action filter. This trouble ticket is automatically generated only if the device profile authorizes the automatic trouble ticket.

ATR Capacity

If an Automatic Trouble Report (ATR) cannot be sent, mail is no longer generated reporting this problem to the user. An event is now generated with the alert type of **atr**, alert group of **sys-com**, and associated with the system device. The text of the event is:

ATR not sent*, device-name* **atr** ***atr-phone-number***

The **atr-phone-number** field can be **port** if that is what has been defined in the atr phone directory or a telephone number or **NO-ATR-PHONE-NO** if the atr phone directory does not have either a telephone number or **port** defined.

ATR Administration

The NMS System Administrator performs a number of administration and initialization functions for ATRs:

- Initializes the ATR ports.
- Enters the phone numbers (or port numbers) and call retry information in the ATR phone directory.
- Enters the ATR authorization and automatic trouble ticket generation authorization in the profiles.
- Administers the automated action filters.
- Administers ATR states.
- Enters ATR report header information in the system configuration database.

Initialize ATR Ports

Use the Edit Port Configurations *(edpc)* command to define the ports to be associated with ATRs. This command is accessed from the Manager task and is discussed in Chapter 4. You can define the ATR port as either a dial or dedicated port.

Authorize ATRs

To authorize ATRs, you must change the **AUTHORIZATIONS — ATR** field from **off** to the ATR phone directory for the specified device via the Edit Device Profile *(eddp)* command. You can enter more than one ATR phone directory via this field. An ATR will be sent to the destination specified in the named directory for the alert group appropriate to the alert reported.

Automated Action Filters

The automated action filters are used to filter alerts for ATRs and automatic trouble tickets. There is an automatic action filter for each alert group of every device type. Each of these filters is a duration filter.

You can display and edit the automated action filters. See the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for a description of the Display Automated Action Filter *(dsaaf)* and Edit Automated Action Filter *(edaaf)* commands.

ATR States

The ATR state for each operational control channel can be turned **on** or **off**. If the ATR state for a control channel is **off**, no ATRs are sent for alerts on that control channel. You can display and edit the ATR states. See the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for a description of the Display ATR States *(dsatrs)* and Edit ATR States *(edatrs)* commands.

ATR Phone Directory

The NMS ATR phone directories provide ATR dialing information for alert groups. There are four ATR phone directories supported for each alert group. Each directory is a table whose entries consist of the following information:

- Alert Group
- ATR Destination (telephone number or port)
- Number of Retries
- Duration between Retries
- Comments

Tables 7-1 and 7-2 show examples of ATR phone directories for modems and multiplexers.

Table 7-1
ATR Phone Directory 1 for Device Type APL

Alert Group	ATR Destination	Number Of Retries	Retry Interval (MM:SS)	Comments
apl-facility	800-555-4357	3	10:03	Tom in Middletown
apl-device	800-555-4458	3	10:03	Ann in New York
apl-service	800-555-4360	3	10:03	Bob in Middletown

Table 7-2
ATR Phone Directory 2 for Device Type MUX

Alert Group	ATR Destination	Number Of Retries	Retry Interval (MM:SS)	Comments
mux-nodst3	800-555-5222	3	10:03	Jim in Atlanta
mux-callst3	800-555-4456	2	0:55	Joe in Atlanta
mux-noderr1	800-555-1234	3	5:02	Mary in Dallas
mux-facstt3	800-555-8432	3	10:01	Andrew in Dallas
swtch-cmneqp1	800-555-2345	3	10:05	Paradyne Tech Support

For each ATR, NMS checks the telephone number entry that corresponds to the alert group and responds as follows:

- If no telephone number is provided, NMS does not place a call.
- If the entry contains a telephone number, NMS calls that number to report the alert.
- If the entry contains the value **port**, NMS uses the dedicated ATR/remote printer port to send the ATR report. There can be only 1 port configured as a dedicated ATR port (see the Edit Port Configuration *(edpc)* command).

The ATR phone directory allows you to specify whether a call should be made for a particular alert group. You can also configure the directory so that NMS can call a different telephone number for a different alert group.

Each ATR phone directory contains the information on the number of retries and the interval between each retry for each call, and a comment space for each entry.

You can display and edit the ATR Phone Directory. See the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for a description of the Display ATR Phone Directory *(dsatrpd)* and Edit ATR Phone Directory *(edatrpd)* commands.

ATR Reports

There are two types of reports:

- Reports automatically generated and sent to a service center or a user-specified ATR destination.
- Standard reports generated through the Trouble/Inventory Reports task.

An ATR sent to a service center is comprised of the alert description and information extracted from the NMS database records. Figure 7-4 shows typical information in an ATR report.

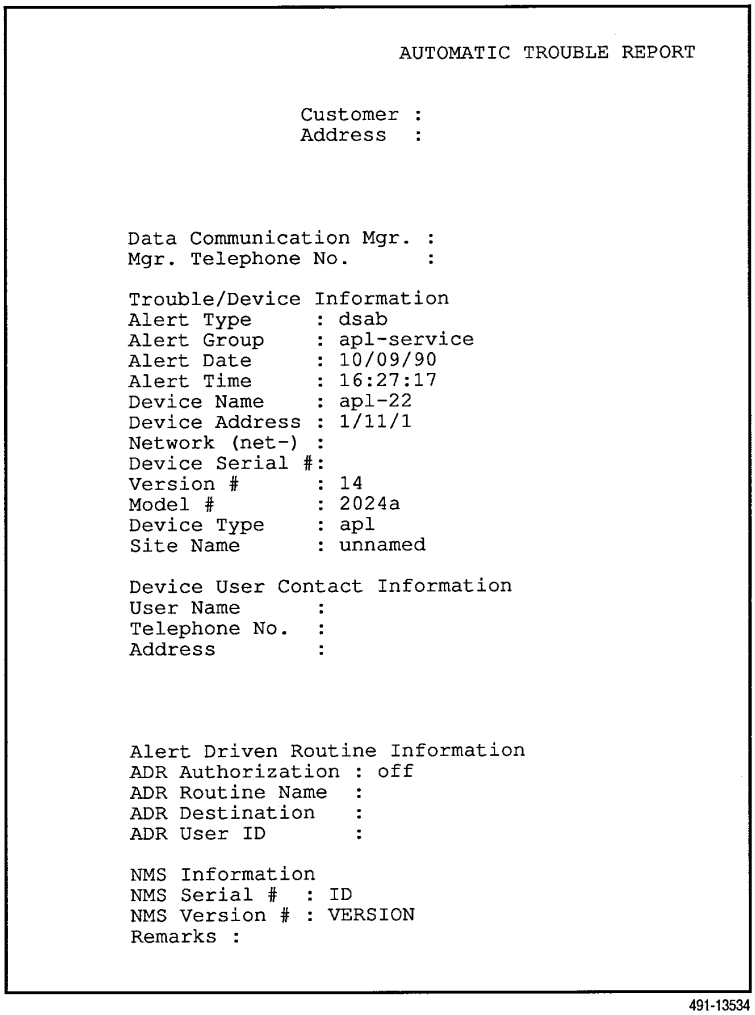


Figure 7-4. Automatic Trouble Report

The information in this report is described as follows.

- Customer Data – data provided by the System Configuration database.
  - Customer Name
  - Customer Address
  - Customer Contact Name
  - Contact Telephone Number
  - NMS Serial Number
  - Software Version Number
  - Remarks
- Device Data – data provided by the device profile.
  - Device Address
  - Device Name
  - Subnetwork Name
  - Serial Number
  - Model Number
  - Device Type
- Site Information – data provided by Site Profile.
  - Site Name
- Device User Contact Information – data provided by the profile that authorized the ATR.
  - User Contact Name
  - User Contact Telephone Number
  - User Contract Address
- Trouble Information – data provided by the Trouble Database.
  - Alert Group
  - Alert Type
  - Alert Date
  - Alert Time
- Alert Driven Routine Information – data provided by the device profile.
  - ADR Authorization
  - ADR Routine Name
  - ADR Destination
  - ADR User ID

You can generate the following standard reports for printing or viewing information on a collection of trouble tickets.

- ATR Report – A summary of the calls made to the service center for ATRs that automatically generated trouble tickets.
- Detailed Trouble Ticket Report – A detailed listing of trouble tickets which match a set of user-defined criteria.

These reports are generated through the Trouble Ticketing Reports portion of the Trouble/Inventory Reports task and are discussed in Chapter 8.

Generating Automatic Trouble Tickets

A trouble ticket is automatically generated when an alert exceeds the automated action filter and the device profile authorizes automatic trouble tickets. Automatically generated trouble tickets do not contain problem description, comments, assigned personnel, or alarm request information, unless this information is manually entered after the ticket is automatically created.

To have the system automatically generate trouble tickets, execute the following commands:

- Edit Alert Monitoring State *(edams)* – Execute this command to turn on or off the alert monitoring function (polling) of the desired control channels, and to specify the control channel's time-out intervals.
- Edit automated action Filters *(edaaf)* – Execute this command to assign an automated action filter value to appropriate alert groups.
- Edit Device Profile *(eddp)* – Execute this command to authorize automatic trouble ticket generation for alerts that exceed the automated action alert filter value and come from devices that have this feature enabled.

Editing Automatically Generated Trouble Tickets

After a trouble ticket is automatically generated, you can use the Edit Trouble Ticket *(edtt)* command to add the following information to the trouble ticket:

- Trouble description
- Comments
- Person to whom the ticket is assigned
- Alert type/group

NMS prevents duplication of automatic trouble tickets by scanning the trouble ticket database for any unclosed trouble ticket that has the same device address, alert type, and a state. If there is an existing trouble ticket in the database with the same information, NMS does not create a new trouble ticket even though the automated action filter has been exceeded.

Reports 8

Overview

NMS provides both standard and customized reporting capabilities through the INFORMIX Relational Database. Reports access data provided in the device, site, vendor, and facility profiles as well as the alerts and trouble ticket databases. This chapter describes the following types of reports:

- Trouble/Inventory Reports, accessed from the Trouble/Inventory Reports task. From this selection, you can generate reports on information stored in the historical database, inventory, trouble tickets, and items in the results and scheduling queue for this task. See to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for descriptions of the commands used to generate these reports and examples of the reports generated.
- Alert, Trending, Exceptions, and Call Statistics Reports, accessed from the Performance Reports or Manager tasks. Trending and Call statistics reports access device-specific data kept in the NMS database and/or at the devices, over repeated and lengthy intervals. See the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual* for descriptions of the commands used to generate these commands and examples of the reports generated.
- Multiplexer Performance Reports, accessed from the Performance Reports or Manager tasks. These reports access multiplexer performance statistics stored at individual multiplexer nodes. See the *COMSPHERE 6800 Series Network Management System Multiplexer Command Reference Manual* for descriptions of the commands used to generate these reports and examples of the reports generated.

With these reports, you can analyze alert information for pinpointing trouble areas and resolving problems. For example, reports specific to multiplexers and modems can assist in resolving problems for these types of devices.

You can sort, compile, and generate reports in tabular format for concise data analysis. Also, both detailed and summary reports are available, providing the appropriate form and amount of data needed at given time on a timely basis.

You can schedule most reports for delayed and repeated execution.

You can customize standard reports using the INFORMIX 4GL software. You can also use NMS database and the INFORMIX SQL software package to create your own reports. For more information on customizing reports, refer to the *COMSPHERE 6800 Series Network Management System Reports and Trouble Tracking Customization Guide*.

Trouble/Inventory Reports

This section describes the Trouble/Inventory Reports task. This task does not support the use of the mouse. Refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual* for a description of the commands used to generate these reports.

Accessing Trouble/Inventory Reports

To access Trouble/Inventory Reports, select the Trouble/Inventory task from the 6800 Series NMS Tasks menu. A menu appears as shown in Figure 8-1, listing the specific reports available.

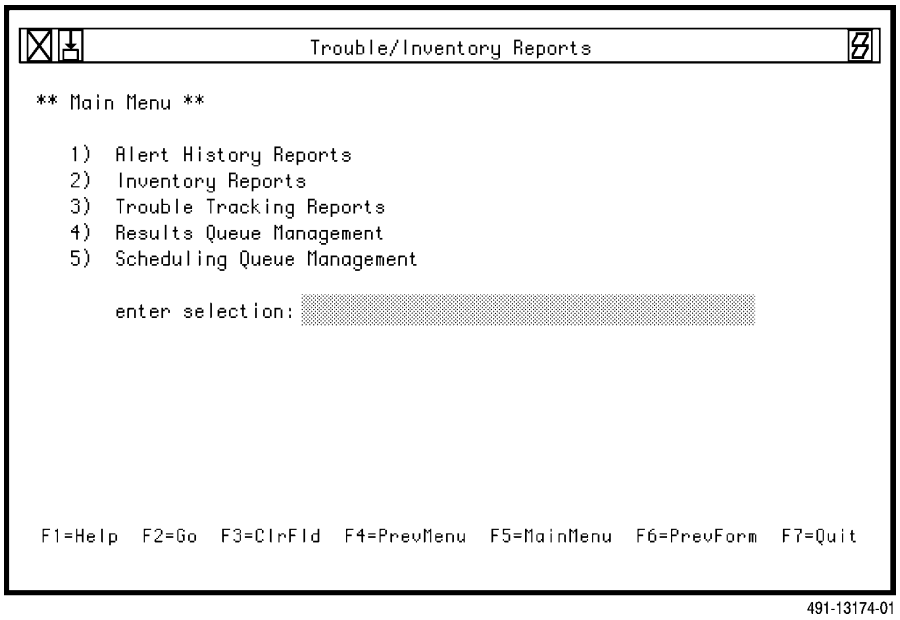


Figure 8-1. Trouble/Inventory Reports Task Menu

All reports commands display input forms for entering selection criteria and formatting information, and for results forms. This information is used to determine what data to display or print. The reports available from the Trouble/Inventory Reports menu are described as follows.

Alert History Reports

The Alert History Reports are used to locate devices that have experienced an unusual amount of alert conditions or to discover alert trends over a period of time. These reports are described as follows.

Alert Report Summary

Use the Alert Report Summary report to obtain a summary of historical alerts based on your entries on the input form.

Detailed Alert Report

Use the Detailed Alert Report to obtain a list of all selected alerts.

Inventory Reports

The Inventory reports are used to provide an inventory of devices, facilities, or the connections between the two types of hardware (as specified by your selection criteria). The usage of these reports depends on your sort criteria. In general, these reports assist you in locating devices or facilities appearing on vendor invoices. These reports are described as follows.

Connectivity Report

Use the Connectivity Report to produce a tabular view of the connectivity information of devices and their connecting facilities based on your selection criteria. This report is used to display information found on the Connectivity Map of a full-feature workstation if you are a basic-feature workstation user.

Device Inventory Report

Use the Device Inventory Report to obtain a detailed listing of device information.

Device Report Summary

Use the Device Report Summary to list the selected sort sequence fields in tabular columns with counts of the number of devices purchased and the number of devices leased as well as the sum of the two. It also has subtotals of the number of devices per the selected sort fields. You specify the records to be included in the report and order of sorting on the data by your selection criteria on the input form.

Facility Inventory Report

Use the Facility Inventory Report to obtain a detailed listing of facility information. You specify the records to be included in the report and order of sorting on the data by your selection criteria on the input form.

Facility Report Summary

Use the Facility Report Summary to obtain the selected sort sequence fields in tabular columns with counts of the number of facilities.

Trouble Tracking Reports

The Trouble Tracking Reports provide information on the collection of trouble tickets. These reports are described as follows.

ATR Report

Use the Automatic Trouble Report (ATR) to obtain a summary of the calls made to the service center for ATRs that automatically generated trouble tickets.

Detailed Trouble Ticket Report

Use the Detailed Trouble Ticket Report to obtain a detailed listing of trouble tickets which match user-defined selection criteria.

Results Queue Management

You can view reports results that were sent to the Trouble/Inventory Reports task's results queue with the Results Queue Management selection from the Trouble/Inventory Reports menu. Report results can be routed to the queue using the **Destination for results** field on the appropriate form.

You have your own results queues. Your queue can have up to 50 items. These items are numbered sequentially from 1 to 50. An index is assigned when a result is sent to the queue. When the next assigned queue item number nears the limit of the queue (45), a mail message is sent indicating the need to delete obsolete items from the queue. These queues are available to you only from the Trouble/Inventory Reports task. The commands available for results queue management are as follows.

- Delete Queue Results *(dlqr)* command
- Display Queue Results *(dsqr)* command
- List Queue Results *(lsqr)* command

Scheduling Queue Management

You can examine scheduling information for reports that are scheduled for future execution. The commands available for scheduling queue management are as follows.

- Delete Scheduled Items *(dlsi)* command
- Display Scheduled Items *(dssi)* command
- List Scheduled Items (lssi) command

Alert, Trending, Exceptions, and Call Statistics Reports

For Alert, Trending, Exceptions and Call Statistics reports, you use the Performance Reports task from the 6800 Series NMS Tasks menu. You can also access these reports from within the Manager task. The same menu, shown in Figure 8-2, appears if you select **Performance Reports** on the **Network Control** menu in the Manager task.

> **NOTE**
>
> Call Statistics reports are applicable only to COMSPHERE 3800 Series DDD modems.

Accessing Alert, Trending, Exceptions, and Call Statistics Reports

To access the Alert, Trending, Exceptions, and Call Statistics Reports, select the Performance Reports task from the 6800 Series NMS Task menu. The Performance Reports task menu appears as shown in Figure 8-2.

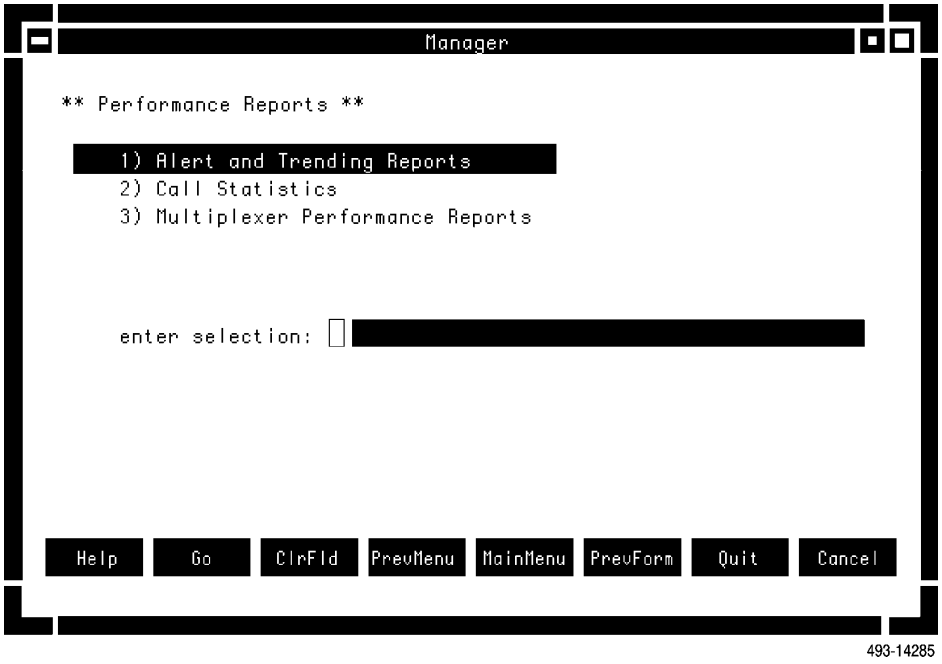


Figure 8-2. Performance Reports Task Menu

All reports commands display input forms for entering selection criteria and formatting information, and for results forms. This information is used to determine what data to display or print. The reports available from this menu are described as follows.

Alert and Trending (and Exceptions) Reports

NMS provides two types of management reports for examining alert records and alert activity in the network.

Trending Reports

Use Trending Reports to analyze the performance of a specific device by formatting the results of repeated network tests into a tabular display. A Trending Report runs a single test a specific number of times, then presents both detailed and summary statistics on the test results. Trending Reports assist in analyzing data for short-term testing to determine the failure rates of problem devices or for long-term testing to determine device degradation over a longer period of time.

Trending Reports can be run on the following tests:

Automatic Network Test *(ant)*

Call Fault Read *(cfr)*

Circuit Loss Inbound *(cli)*

Circuit Loss Outbound *(clo)*

Circuit Quality *(cq)*

Device Test *(det)*

Digital Test *(dit)*

End-to-End Test *(eet)*

Modem Bit Error Rate Test *(mbert)*

Offline Test *(ot)*

Receive Signal Level *(rsl)*

Receive Signal Quality *(rsq)*

Signal Profile *(sp)*

The *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual* describes these commands in detail.

Exception Reports

Use the Exception Reports *(er)* command to list network test results that exceeded preset failure thresholds. The failure thresholds for these tests can be set temporarily within the fields on the input form for the Exception Reports *(er)* command or set permanently with the Change Exception Reporting Thresholds *(chert)* command. These commands are discussed in detail in the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual*.

The Exception Reports allow you to analyze selective results from certain network tests, making it easier to monitor and troubleshoot large networks for specific problems.

Exception Reports can be run for the following tests:

Automatic Network Test *(ant)*

Circuit Loss Inbound *(cli)*

Circuit Loss Outbound *(clo)*

Device Test *(det)*

Digital Test *(dit)*

End-to-End Test *(eet)*

Offline Test *(ot)*

Receive Signal Level *(rsl)*

Receive Signal Quality *(rsq)*

Report Terminal Power *(rtp)*

Signal Profile *(sp)*

Exception reports are applicable only to certain DATAPHONE II/APL/DDD models. The *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual* describes these commands, as well as the *er* command, in detail.

Call Statistics

NMS supports the collection of call information from local COMSPHERE 3800 Series DDD devices. Call information retrieved includes time and duration of each call, the remote modem to which the local was connected for the call, and the reason for call disconnect. NMS stores call information in two forms:

1. Call Summaries. These summaries contain condensed call information. Call summary data stored for each local device includes:
   - The total number of calls received for each hour of the day.
   - The total duration of calls received for each hour of the day.
   - The total number of calls received for each of 10 (6800 Series NMS-defined) call duration periods.

2. Call Details. These detail reports include more explicit (detailed) information about each call. For each call to/from a local device, the following detailed call information is retrieved:

   - The mnemonic name of the remote device involved in the call.
   - The date and time of day the call occurred.
   - The reason for call disconnect or failure.
   - The duration of the call.
   - The line speed of the call.

Four reports are available for retrieving information from call statistics databases. The Manage Call Statistics *(mcs)* command sets to frequency for gathering call statistic information. These reports are briefly described as follows.

Call Detail Display Report

Use the Call Detail Display Report to obtain the following information for each call: device name of the local modem, device name of the remote modem (only available if the call was placed in maintenance mode); connect time for the call, call duration, line speed of the call and the reason the call was disconnected.

Call Duration Distribution Report

Use the Call Duration Distribution Report to obtain a sorted listing of 3800 Series device calls, based on their durations. You specify up to 10 different duration periods. Calls are sorted according to the duration periods you specified. The duration distribution is displayed in both tabular and bar chart form. The tabular display also includes the average call duration, the total number of calls and the standard deviation of the call durations.

Call Occurrence Distribution Report

Use the Call Occurrence Distribution Report to obtain a display of the average number of calls that occurred for a selected group of 3800 Series devices for each hour of the day over a user-specified time period. The report also includes the average number of daily calls and the total number of calls included in the report. Information is retrieved from the call statistics summary database.

Daily Historical Utilization Report

Use the Daily Historical Utilization Report to obtain the percent utilization of a group of 3800 Series devices for each hour of the day, for a user-specified time. The report also lists the average number of calls which occurred for each hour of the day. Information is retrieved from the call statistics summary database.

Managing Call Statistics

Using the Manage Call Statistics *(mcs)* command, you can specify whether call statistics and call detail information should be gathered, and up to two times in a day can be specified for information to be retrieved. You may also selectively specify the set of 3800 Series devices from which call summary and/or call detail information should be retrieved by appropriately populating the call statistics fields in each 3800 Series device profile.

Collecting and Storing Call Statistics

Initially, you must turn on call statistics collection for individual devices via fields in the 3800 Series modem device profiles; also you must set up call status information via the Managing Call Statistics *(mcs)* command. Then, an internal NMS process automatically retrieves this information from specified local 3800 Series devices, at the user specified times.

Call statistics are stored based on the entries in the device profile. You specify **yes/no** to **Collect** call summary information or **store call detail** information. Call statistics are stored as follows.

- If call statistics are to be collected for 1 to 1000 local 3800 Series devices, NMS stores up to 13 months' worth of call summary records, and up to seven days' worth of call detail information.
- If call statistics are to be collected for 1001 to 2000 local 3800 Series devices, NMS stores up to six months' worth of call summary records, and up to 7 days' worth of call detail information.

Call Processing

NMS will process up to 30,000 call records per day. If the call rate exceeds 30,000, the system stops storing call detail for that day. (Call summary information continues to be stored, regardless of the call rate.) When the call rate is exceeded, NMS generates a **DCRE** system alert which can be displayed on the Map, Monitor, or Summary. Also, mail is sent to the System Administrator, explaining what happened and the actions taken. The System Administrator can turn **off** call detail storage, specify the number of devices for which call detail should be stored, or turn **off** call statistics retrieval altogether.

If the call rate reaches 80% of capacity (24,000 call records) during daily call detail processing, a mail message is sent to the System Administrator warning of this condition.

Call Buffer in the Device

Local 3800 Series devices store information about each call in an internal buffer. If a device is experiencing a very high call rate, it is possible that the call buffer in the device can overflow before NMS retrieves the call information. If this happens, information about subsequent calls to and from that device for that day will not be stored.

The NMS call retrieval process can recognize when a device's call buffer has overflowed. When this happens, a **CBO** alert is generated. The alert text indicates the link level address of the local modem whose call buffer has overflowed. However, no summary or detail records can be stored or retrieved for that device for that day.

Multiplexer Performance Reports

The ACCULINK multiplexers have statistics registers that record the performance of a node's hardware, T1 facilities, and channel groups. The statistics registers keep a running count of errors for any specified interval of up to 24 hours. When the specified interval expires, the registers are cleared and the error count starts again from zero. This process applies to all registers, except those for the facility performance report. These registers are overwritten with new data every 24 hours. You can clear the statistical registers on demand by performing a statistical reset.

Because of these registers, you can get an on-demand error count from any node or facility by requesting one of the error or performance reports that display the number and type of error that occurred since the last statistical reset. For nodes and facilities experiencing recurring problems, you can schedule these reports for execution so that they report their results prior to the expiration of the specified performance data reporting interval.

For Multiplexer Performance reports, you use the Performance Reports task from the 6800 Series NMS Tasks menu. You can also access these reports from within the Manager task. The same submenu, as shown in Figure 8-3, appears if you select **Performance Reports** on the Network Control submenu in the Manager task.

Accessing Multiplexer Performance Reports

To access the Multiplexer Reports, select the Performance Reports task from the 6800 Series NMS Task menu. The Performance Reports Task menu appears as shown in Figure 8-3.

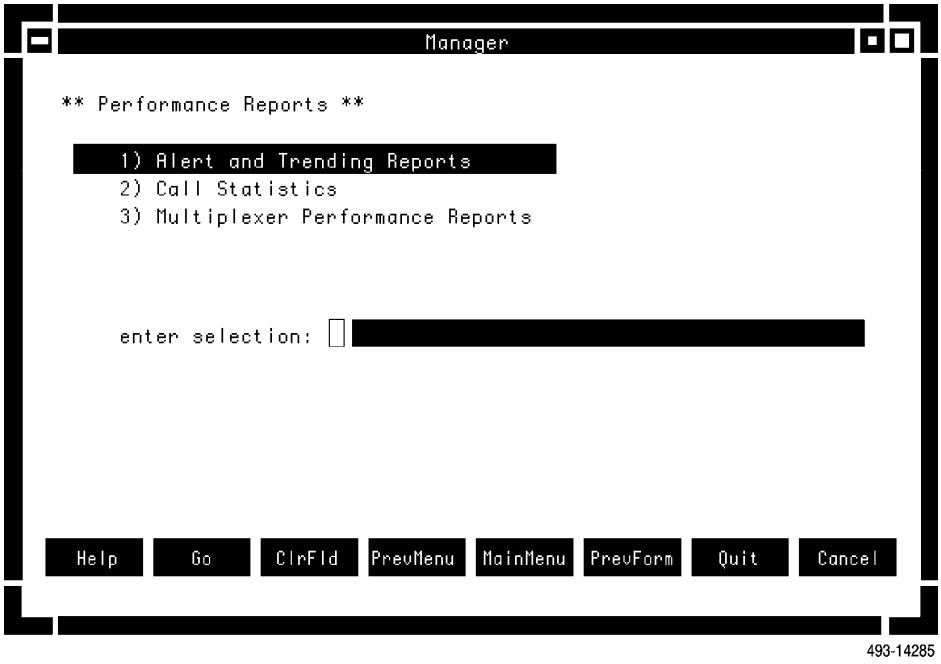


Figure 8-3. Performance Reports Task Menu

All reports commands display input forms for entering selection criteria and formatting information, and for results forms. This information is used to determine what data to display or print. The reports available from this menu are described as follows.

Channel Group Performance Report (cgpr)

Use the Channel Group Performance Report to obtain the number of errored seconds and failed seconds that occurred for each network-compatible channel group which has the specified node as one of its endpoints. The data reported is that accumulated since the last statistical reset.

This report is generated by executing the Channel Group Performance Report *(cgpr)* command. When a channel group registers high error rates, it may be indicative of a degradation in the quality of a T1 facility carrying the channel group. To monitor indirectly the quality of the T1 facilities carrying a channel group, schedule this report to run once every 24 hours.

DDS Channel Performance & Status (ddscps)

Use the DDS Channel Performance and Status Report to obtain network errored seconds, loop errored seconds, loop side signal losses, and loop side signal status for each DDS channel. This report is generated by executing the DDS Channel Performance and Status *(ddscps)* command. When intermittent problems occur on the DDS channels, schedule this report to run every 24 hours.

DDS Channel Trouble Codes (ddsctc)

Use the DDS Channel Trouble Codes Report to obtain the number of multiplexer out-of-sync, abnormal station, test, unassigned multiplexer condition and DS0B out-of-sync codes received for each channel.

This report is generated by executing the DDS Channel Trouble Codes *(ddsctc)* command. When intermittent problems occur on the DDS channels, schedule this report to run every 24 hours.

DS0B Performance & Status (dps)

Use the DS0B Performance and Status Report to obtain the errored seconds, frame losses, and framing status for each DS0B base channel configured on a node.

This report is generated by executing the DS0B Performance and Status *(dps)* command.

When intermittent problems occur on the DS0B channels, schedule this report to run every 24 hours.

Equipment Performance Report (epr)

Use the Equipment Performance Report to obtain the number of each type of node alarm event that occurred at a node since the last statistical reset.

This report is generated by executing the Equipment Performance Report *(epr)* command. To generate a 24-hour summary of the number of node alarms that occurred at a multiplexer, schedule this report to run once every 24 hours.

Facility Errors Report (fer)

Use the Facility Errors Report to obtain the number of each type of facility error that occurred since the last statistical reset.

This report is generated by executing the Facility Errors Report *(fer)* command. When intermittent facility problems occur, schedule this report to run once every 24 hours, and relay the information to the facility vendor if the problem persists.

Facility Performance Report (fpr)

Use the Facility Performance Report to obtain, in tabular or graphical form, the number of errored seconds and failed seconds that occurred on a specified facility during the last 24 hours. This report is generated by executing the Facility Performance Report *(fpr)* command. When intermittent T1 facility problems occur, run this report once a day.

Node Errors Report (ner)

Use the Node Errors Report to obtain the number of each type of node error that occurred since the last statistical reset.

This report is generated by executing the Node Errors Report *(ner)* command. When intermittent node problems occur, schedule this report to run once every 24 hours.

Time Slot Performance Report (tspr)

Use the Time Slot Performance Report to obtain the number of errored seconds and failed seconds on each serial synchronous time slot at a 740/741 node. Serial synchronous time slots are used to connect to 756 terminations. When intermittent problems occur on serial synchronous connections, schedule this report to run once a day.

Utilities 9

Overview

To list the utilities available from the NMS, select Utilities from the 6800 Series NMS Tasks menu. The Utilities task menu appears as shown in Figure 9-1.

Figure 9-1. Utilities Task Menu

NOTE

The UIP selection only appears if the User Interface Processor is configured. Multiplexer Utilities only appear if the multiplexer application is configured.

The options on this menu are described in the following sections.

UNIX Access

Selecting **Unix** from the Utilities task enables you to directly access the UNIX operating system. This access is available provided you have permission under your user profile to do so. You are placed in a restricted shell.

After selecting **Unix**, a window opens and the **$** prompt appears, indicating that you are now communicating with the UNIX operating system. To exit UNIX from a basic-feature workstation,

TYPE: quit at the $ prompt

To exit UNIX from a full-feature workstation, select Close from the Window Manager menu or

TYPE: quit at the $ prompt

INFORMIX Access

Selecting **Informix** from the Utilities task menu enables you to access the optional INFORMIX SQL (Structured Query Language) and/or INFORMIX 4GL (Fourth Generation Language) software packages. This access is available provided that these software packages are installed on your system, and you have permission under your user profile to do so. If both SQL and 4GL are installed, the submenu is displayed asking you to choose which package you want to access.

The INFORMIX relational database software can be used to customize the Reports and Trouble Tracking tasks. For more information, refer to the *COMSPHERE 6800 Series Network Management System Reports and Trouble Tracking Customization Guide.*

Mail Functions

You can send and receive mail based on the UNIX *mailx* command. There are minor differences among task windows on how you are notified of new mail (e.g., between a full-feature workstation and a basic-feature workstation, between the Trouble Tickets function and the System Management function, etc.).

Read Mail

From a full-feature workstation, you can select Read Mail by clicking on the Mail Notification icon in the upper left-hand corner. From a basic-feature workstation, select Read Mail from the Utilities task. Incoming mail files are stored in a standard mailbox for each user. The user can then read, save, delete and respond to messages. As new messages are read, they are moved to a secondary file with the default name of **mbox**. However, other secondary files for mail storage can also be created by the user. Messages remain in the secondary file until explicitly removed by the user.

On selecting the **Read Mail** function from the Utilities menu, the following query appears:

Enter a mailbox name, or press Return key to read new mail:

If you press the Enter (Return) key, a screen listing all new (N) messages received and unread (U) messages (Figure 9-2) appears. Each message is assigned a sequential number, and the current message is marked by a greater than sign (>). A message list [msglist] is an optional set of list messages, the default being the current message.

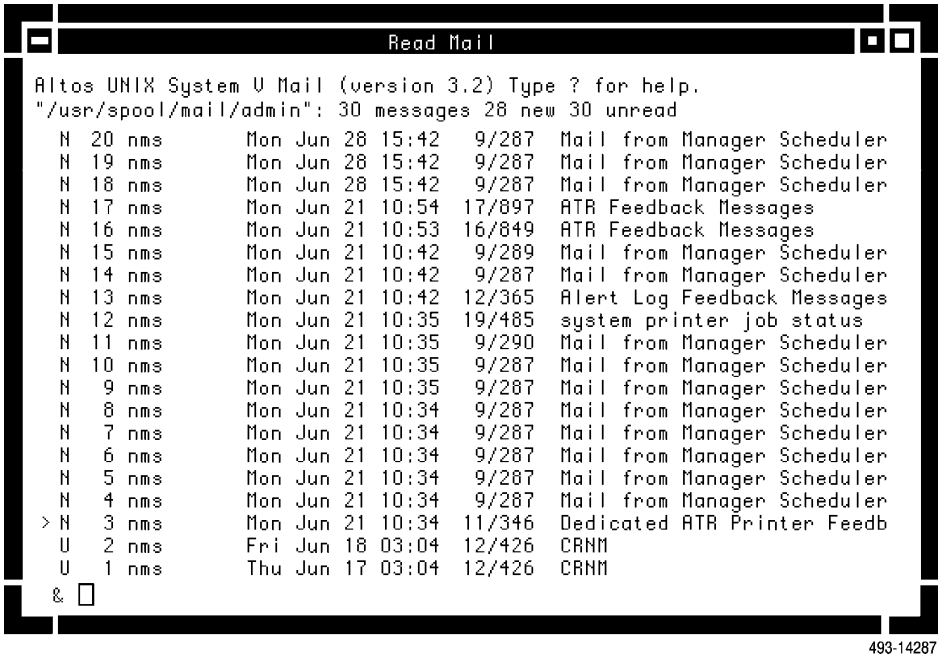


Figure 9-2. Initial Read Mail Screen

Typing the name of a mailbox will produce a similar list to the one shown in Figure 9-2, allowing you to view previously stored messages.

Mail can be received from other users, or can be received from the NMS. Common functions for which NMS sends mail are as follows:

- Notification of results in a queue.
- Notification of results sent to a printer.
- Notification of ADR execution.
- Notification of queue results overflow.
- Notification of network Map creation.

The available mailx commands can be displayed by typing **?** (Figure 9-3).

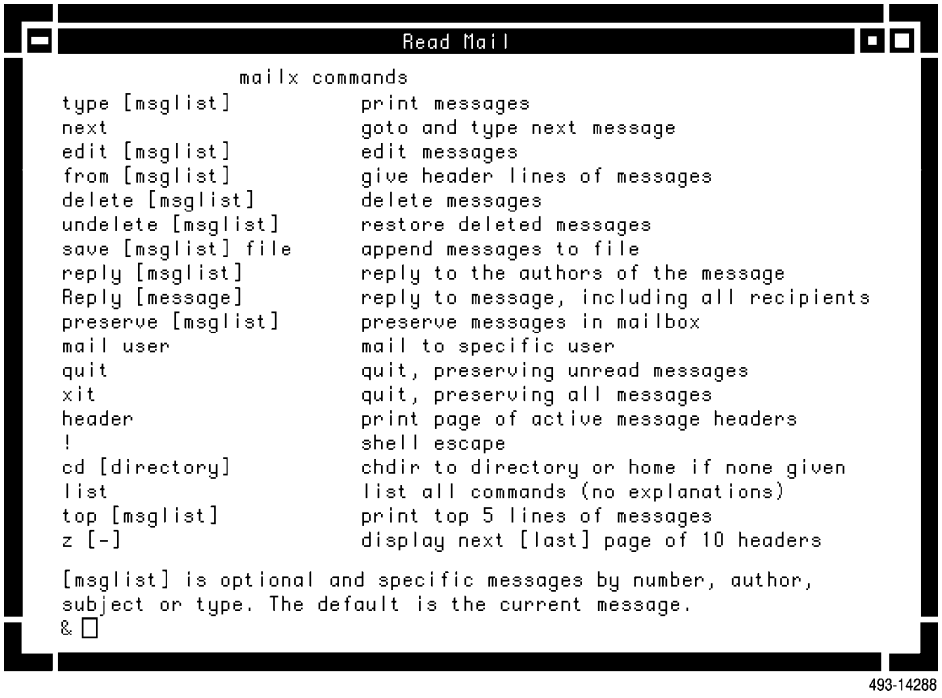


Figure 9-3. Read Mail Commands Screen

These commands are defined as follows.

type [msglist]

Prints the message(s) whose index numbers you specify.

next

Prints the next message.

edit [msglist]

Enables editing of the specified message(s) using the UNIX line editor, ed.

from [msglist]

Prints the header summary from each specified message.

delete [msglist]

Deletes the specified message(s) from the mailbox.

undelete [msglist]

Restores the specified deleted messages.

save [msglist] file.

Saves the specified message(s) in the named file. If the file does not already exist, a file is automatically created. The message is then deleted from the new mailbox.

reply [message]

Replies to the specified message(s), including all other recipients of the message(s).

Reply [msglist]

Sends a response to the author of each specified message.

preserve [msglist]

Preserves the specified message(s) in the mbox.

mail [user]

Sends a message to the specified user and records a copy of it in a file named after that user.

quit

Exits from the mail function, storing messages that were read in the mbox file.

xit

Exits from the mail function without changing any files.

header

Prints the page of headers which includes the specified message.

!

Escapes to the UNIX shell.

cd [directory]

Changes the directory to the one specified.

list

Lists all available commands without explanations.

top [msglist]

Prints the top five lines of the specified message(s).

z [-]

Scrolls the header display forward or backward [-] by 10 lines.

Send Mail

To send mail, select the Send Mail function from the Utilities menu. The screen shown in Figure 9-4 appears.

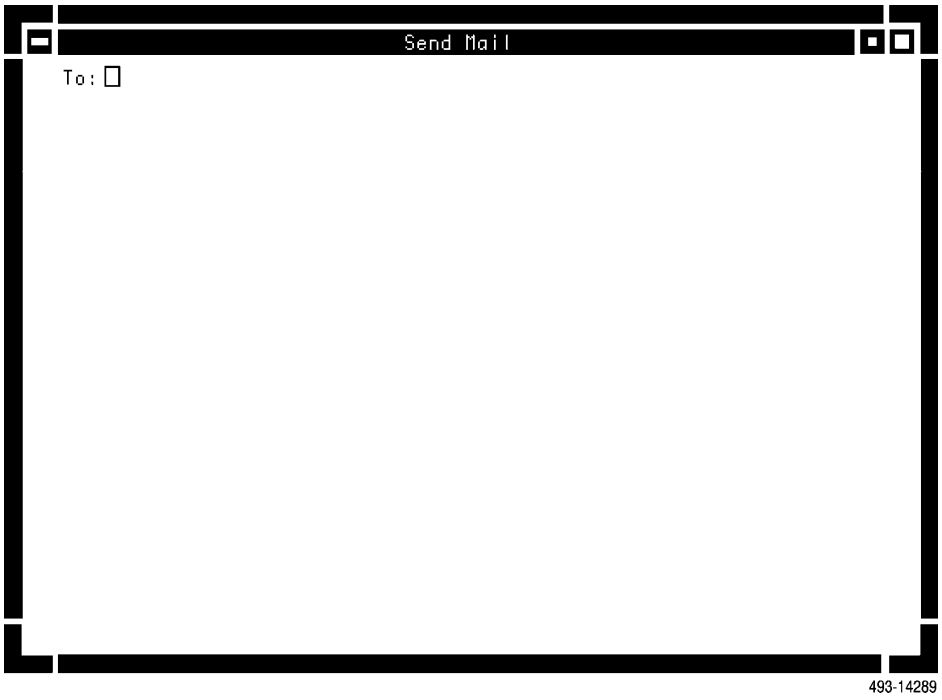


Figure 9-4. Send Mail Screen

The following steps are used to send mail.

1. At the **To:** prompt, type a single user name or type a user name list.

   PRESS: Enter

2. The prompt **Subject:** appears. Type the subject for the text to be sent and

   PRESS: Enter

3. The prompt **Enter body of mail message** appears. Enter the text to be sent and

   PRESS: Enter

4. When finished with the message text make sure you are on a new line, then

   PRESS: CTRL-D

5. The system displays **EOT** and the message is transmitted.

NMS Users List

The NMS Users List function displays a list of currently logged on NMS users. The listing includes the name of the host or UIP name to which they are logged on, their most recent login date and time, and their assigned service ID and user ID (Figure 9-5). The System Administrator can log selected users off. He/she types y in response to the **Do you wish to log a user off?** prompt, then enters the selected user User ID and the associated service ID in response to the **Please enter the user ID** and **Please enter the service ID** prompts.

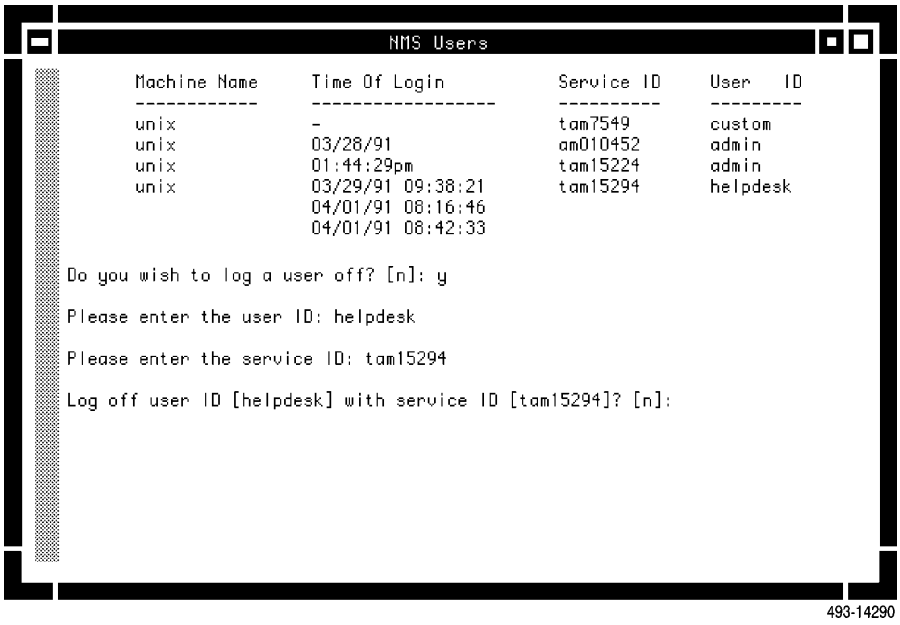


Figure 9-5. NMS Users Screen

Printer Functions

Two printer functions are available from the Utilities menu: **Printer Status** and **Move Print Jobs**.

Printer Status

Use the **Printer Status** function to display the status of one or more system printers. Enter the selected printer(s), or the keyword **all** for all printers (Figure 9-6). The status for the selected printer(s) appears.

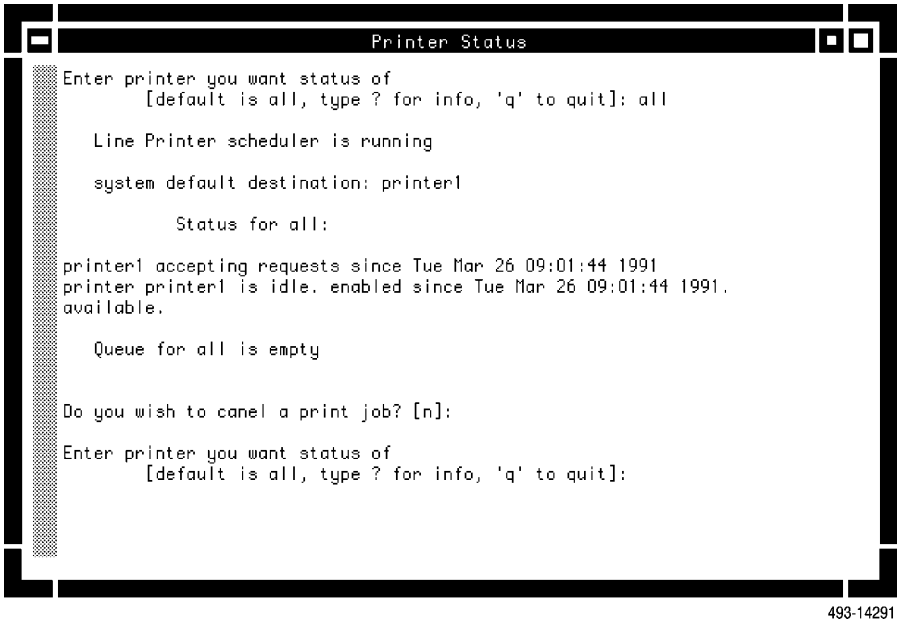


Figure 9-6. Printer Status Screen

The System Administrator can cancel a print job by typing **y** in response to the

Do you wish to cancel a print job?

prompt, then entering the selected print job number in response to the

Enter the job number:

prompt.

Move Print Jobs

The **Move Print Jobs** function enables you to redirect print requests currently stored in the printer's queue from one system printer to another (Figure 9-7). Typically, this function is used if a printer becomes disabled.

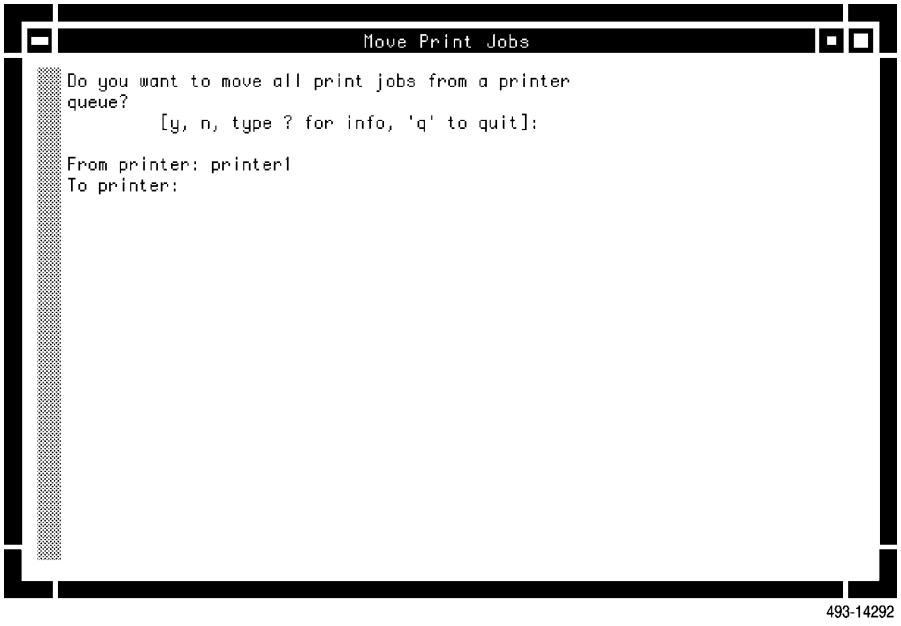


Figure 9-7. Move Print Jobs Screen

User Interface Processor (UIP)

If the User Interface Processor (UIP) is installed, this selection appears on the Utilities main menu. The **UIP** selection is used to bring up UNIX on the UIP processor. (The UNIX selection on the menu brings up UNIX on the host processor.)

On 15000 Systems, the UIP selection on the Utilities menu provides access to only that UIP that your workstation is logically connected to.

Multiplexer Utilities

If the multiplexer application is installed, this selection appears on the Utilities main menu. This selection provides a submenu listing the Manage Routing Utility selection. Refer to your *COMSPHERE 6800 Series Network Management System Multiplexer Management and Configuration Guide* for information on this utility.

Device Model Numbers A

Overview

This appendix provides a list (Table A-1) of device model numbers that can be entered into the Model number fields of certain NMS commands, e.g., Create Device Profile *(crdp)* command.

Table A-1
(1 of 2)
Device Numbers

ANALYSIS Controller			
a6510			
ANALYSIS DMC Device Types			
adc	vhs168mx	3430-00m	3460-10m
mpx2400	vhs168sm	3432-00	3460-20
mpx4800	vhs19200	3440-00	3462-10
mpx48mx	vhs192mx	3440-00m	3462-20
mpx9600	vhs192sm	3440-05	3465-13
mpx96mx	emudmc	3440-05m	3470-00
mpx96rp	macu	3440-20	3478-05
mp144dmc	mmss	3442-00	3478-05m
mp144dmx	2656	3442-20	3480-10
mp144dsm	2656sc	3450-00	3480-10m
vhs14400	2696	3455-00	3480-20
vhs144mx	3420-00	3456-in	3482-10
vhs144sm	3422-00	3456-ni	ddsin
vhs16800	3430-00	3460-10	ddsni
ANALYSIS RD Device Types			
acu	mp9600	mp144mx	mpx9600rd
ldmrd	mp96mx	mp144rsm	mpx96mxrd
lsi2400	mp96rp	mpx2400rd	mpx96rprd
mp4800	mp14400	mpx4800rd	

Table A-1
(2 of 2)
Device Numbers

COMSPHERE 3400/4400 APL Modems			
3430-02	4464-12	4444-19	3480-22
3431-02	3480-12	4464-19	3481-22
3433-02	3481-12	3480-19	3483-22
4434-02	3483-12	4484-19	4484-22
3440-02	4484-12	3440-22	3440-23
3441-02	3440-13	3441-22	4444-23
3443-02	4444-13	3443-22	3460-23
4444-02	3460-13	4444-22	4464-23
3460-12	4464-13	3460-22	3480-23
3460-90	3480-13	3461-22	4484-23
3461-12	4484-13	3463-22	3460-32
3463-12	3440-19	4464-22	3463-32
COMSPHERE 3900 APL Modems			
3910	3911		
DATAPHONE II APL Modems			
2024A	2048C	2096C	2192A
2024T	2048T	2096T	2192B
2048A	2096A	2144A	
COMSPHERE DDD Modems and DSUs			
3510	3511	3810-A1-001	3820-A1-001
3610	3611	3811-B1-001	3830-A1-001 (3830-a1-001)
DATAPHONE II DDD Modems			
2224A	2224E	2224G	2248A
SDU24A	SDU48A	SDU96A	2296A
2656SG	2796SG		
DATAPHONE II DSUs			
2556	2656SC	2756	2796
2596	2696	2756b	2796b
2656	2696A		
DDS — 3500 DSU			
3510	3511		
AB — COMSPHERE			
ab			
DBU — COMSPHERE			
dbu-s	dbu-d		
SRCU — COMSPHERE			
srcu			
Multiplexer Devices			
719	740-56k	741-56k	745
735	740/741/742	742-56k	

Command Access Levels B

Overview

Table B-1 is an alphabetical listing of all commands that you can access from the command menus or from the **enter selection** field in the appropriate task menu. The table also provides the following information for each command:

- **COMMANDS** – represents the NMS command name.

> **NOTE**
>
> A dagger (†) at the beginning of a command name in the **COMMAND** column indicates that this is a new command for this release. A diamond (◆) at the beginning of the command name in the **COMMAND** column indicates that an existing command was modified for this release. No indicator at the beginning of the command name means that the command was not modified.

- **ABBREVIATION** – defines the command abbreviation and the alternate abbreviation (if applicable) for the command. (Alternate command is prefaced by **alt:**.) All command abbreviations within the system are unique.
- **USER ACCESS** – defines the user group assignment for the command at installation. These user group assignments are defined by the system and cannot be changed by the user.

  In the order of increasing command permission, the system-defined (default) user groups are as follows:

  — Help Desk

  — Data Technician (Data Tech)

  — Manager

  — Administrator (This level currently includes the System Administrator.)

> **NOTE**
>
> In addition to the four default user groups, the NMS System Administrator can create up to 26 other user groups for each command in this manual. It is the responsibility of the NMS System Administrator to inform all the users of their system.

When the phrase **All Levels** appears in the column, the command can be accessed by any user group level. The asterisk indicators in this column are defined as follows.

***** Indicates that the component to which the command is directed must be out-of-service only if your user group level is the one indicated. If your user group level is a higher level group, the component does not need to be out-of-service when the command is executed.

****** Indicates that you must have access to the entire multiplexer network to execute the command.

- **ROUTINE** – specifies whether the command can be placed in a routine.
- **SCHEDULE** – specifies whether the command can be scheduled for execution.
- **ACCESSED FROM** – specifies the NMS Task under which the command resides.

Table B-1
(1 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Abort Test	abort	Data Tech, Manager, Administrator	Yes	Yes	Manager
Acknowledge Alert	No abbreviation	No access level assigned	No	No	Monitor, Map
Acquire Channel Groups	accg	Manager, Administrator	Yes	Yes	Manager
Acquire Device Poll List	acpl	Data Tech, Manager, Administrator	Yes	Yes	Manager
Acquire Logical Links	acll	Manager, Administrator*	Yes	Yes	Manager
Acquire Modem Control Channel Poll List	acmccpl alt: acccpl	Data Tech, Manager, Administrator	Yes	Yes	Manager
Acquire Physical Attributes	acpa	Manager, Administrator	Yes	Yes	Manager
Alert Report Summary	ars	All Levels	No	Yes	Trouble/ Inventory Reports
ATR Report	atrr	All Levels	No	Yes	Trouble/ Inventory Reports
Automatic Network Test	ant	Data Tech, Manager, Administrator	Yes	Yes	Manager
Backup Node Database	bkupnd	Manager, Administrator	Yes	Yes	Manager
Bit Error Rate Test	bert	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
* Indicates what is shown on the screen.					

Table B-1
(2 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Break Channel Connection	brcc	Data Tech, Manager, Administrator	Yes	Yes	Manager
Break Channel Group Connection	brcgc	Manager, Administrator	Yes	Yes	Manager
Break Logical Link Connection	brllc	Manager, Administrator	Yes	Yes	Manager
Calibrate Tributary Transmitter	ctt	Data Tech, Manager, Administrator	Yes	Yes	Manager
Call Detail Display	cded	All Levels	Yes	Yes	Manager, Performance Reports
Call Duration Distribution	cdud	All Levels	Yes	Yes	Manager, Performance Reports
Call Fault Criteria (DDD)	cfc	All Levels	No	No	Manager
Call Occurance Distribution	cod	All Levels	Yes	Yes	Manager
Call Fault Read (DDD)	cfr	All Levels	Yes	Yes	Manager
Call Message (DSU)	cm alt: cdr	All Levels	Yes	Yes	Manager
Call Test	ct	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Address	cha	Data Tech, Manager, Administrator	No	No	Manager
Change Call Directory	chcd	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Canned Message	chcm	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Channel Configuation	chcc	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Channel Group	chcg	Manager, Administrator	Yes	Yes	Manager
Change Channel Module Type	chcmt	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Directory (DDD)	chd alt:chdir	All Levels	Yes	Yes	Manager
Change DS-1 Channel Module Configuration	chdcmc	Manager, Administrator	Yes	Yes	Manager
Change Exception Reporting Thresholds	chert	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change External Leads States	chels	Data Tech, Manager, Administrator	Yes	Yes	Manager

Table B-1
(3 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Change Line Designator	chld	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Logical Link	chll	Manager, Administrator	Yes	Yes	Manager
Change Multiplexer	chm alt:chmx	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Multiplexer Component Configuration	chmcc	Manager, Administrator	Yes	Yes	Manager
Change NAP Configuration	chnapc	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Node Connected to System	chncs	Manager, Administrator	Yes	Yes	Manager
Change Node Configuration Parameters	chncp	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Node Passwords	chnp	Manager, Administrator*	Yes	Yes	Manager
Change Options	cho alt: chop	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Physical Link Configuration	chplc	Manager, Administrator	Yes	Yes	Manager
Change Poll List	chpl	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Port Options	chpo alt: chportop	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Port Speed(s)	chpsp alt: chportsp	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Protocol Mode	chpm	Manager, Administrator	No	No	Manager
Change Routing Table	chrt	Manager, Administrator	Yes	Yes	Manager
Change Supervisory Data Link	chsdlc	Manager, Administrator	Yes	Yes	Manager
Change Telephone Number(s)	chtn	Data Tech, Manager, Administrator	Yes	Yes	Manager
Change Thresholds	cht	Data Tech, Manager, Administrator	Yes	Yes	Manager
Channel Group Loopback	cgl	Manager, Administrator	Yes	Yes	Manager
* Indicates what is shown on the screen.					

Table B-1
(4 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Channel Group Performance Report	cgpr	All Levels	Yes	Yes	Manager, Performance Reports
Channel Group Summary	cgs	All Levels	Yes	Yes	Manager
Channel Group Trace	cgt	All Levels	Yes	Yes	Manager
Channel Loopback	cl	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
Channel Network Loopback	cnl	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
Channel State Summary	css	All Levels	Yes	Yes	Manager
Channel Summary	cs	All Levels	Yes	Yes	Manager
Channel System Test	cst	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
Circuit Loss Inbound	cli	Data Tech, Manager, Administrator	Yes	Yes	Manager
Circuit Loss Outbound	clo	Data Tech, Manager, Administrator	Yes	Yes	Manager
Circuit Quality	cq	All Levels	Yes	Yes	Manager
Clear Call Directory	clcd	Data Tech, Manager, Administrator	Yes	Yes	Manager
Clear Event	No abbreviation	No access level assigned	No No	No No	Monitor, Map
Compare Control Processors	ccp	Manager, Administrator	Yes	Yes	Manager
Configuration Change Notification	ccn	All Levels	Yes	Yes	Manager
CCN Enable/Disable	ccned	Data Tech, Manager, Administrator	Yes	Yes	Manager
Connect Time Utilization	ctu	All Levels	Yes	Yes	Manager
Connectivity Report	cr	All Levels	No	Yes	Trouble/ Inventory Reports
Control Processor Test	cpt	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
Copy Routine	rpc	All Levels	Yes	Yes	Manager
* Indicates what is shown on the screen.					

Table B-1
(5 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Create Channel Group	crcg	Manager, Administrator	Yes	Yes	Manager
Create Device Profile	crdp	Manager, Administrator	Yes	Yes	Manager, Map, Monitor
Create Export File	cref	Data Tech, Manager, Administrator	Yes	Yes	Manager
Create Facility Profile	crfp	Manager, Administrator	Yes	Yes	Manager, Map
Create Logical Link	crll	Manager, Administrator	Yes	Yes	Manager
Create Network Map	crnm	Manager, Administrator	Yes	Yes	Manager
Create Routine	crr	All Levels	No	Yes	Manager
Create Site Profile	crsp	Data Tech, Manager, Administrator	Yes	Yes	Manager, Map
Create User Profile	crup	Administrator	No	Yes	Manager
Create Vendor Profile	crvp	Data Tech, Manager, Administrator	Yes	Yes	Manager
Daily Historical Utilization	dhu	All Levels	Yes	Yes	Trouble/ Inventory Reports
DDS Channel Performance and Status	ddscps	All Levels	Yes	Yes	Manager
DDS Channel Trouble Codes	ddsctc	All Levels	Yes	Yes	Manager
DDS Signaling Test	ddsst	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
† Delete Audit Trail	dlat	Administrator	Yes	Yes	Manager
Delete Audit History	dlah	Data Tech, Manager, Administrator	Yes	Yes	Manager, Map, Monitor
Delete Channel Group	dlcg	Manager, Administrator	Yes	Yes	Manager
Delete Device Profile	dldp	Manager, Administrator	Yes	Yes	Manager, Map, Monitor
Delete Export File	dlef	Data Tech, Manager, Administrator	Yes	Yes	Manager
* Indicates what is shown on the screen.					
† Indicates that this is a new command for this release.					

Table B-1
(6 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Delete Facility Profile	dlfp	Manager, Administrator	Yes	Yes	Manager, Map
Delete Logical Link	dlll	Manager, Administrator	Yes	Yes	Manager
Delete Queue Results	dlqr	All Levels	Yes No No	Yes No No	Manager, Trouble/ Inventory Reports, Trouble Tracking
Delete Routine	dlr	All Levels	Yes	Yes	Manager
Delete Scheduled Items	dlsi	All Levels	Yes No No	Yes Yes Yes	Manager, Trouble/ Inventory Reports, Trouble Tracking
Delete Site Profile	dlsp	Data Tech, Manager, Administrator	Yes	Yes	Manager, Map
Delete Trouble Tickets	dltt	Manager, Administrator	No	No	Trouble Tracking
Delete User Profile	dlup	Administrator	Yes	Yes	Manager
Delete Vendor Profile	dlvp	Data Tech, Manager, Administrator	Yes	Yes	Manager
Detailed Alert Report	dar	All Levels	No	Yes	Trouble/ Inventory Reports
Detailed Trouble Ticket Report	dttr	All Levels	No	Yes	Trouble/ Inventory Reports
Device Health And Status	dhs	All Levels	Yes	Yes	Manager
Device Inventory Report	dir	All Levels	No	Yes	Trouble/ Inventory Reports
Device Report Summary	drs	All Levels	No	Yes	Trouble/ Inventory Reports
Device Test	det alt:mt	Data Tech, Manager, Administrator	Yes	Yes	Manager
Dialing Command	dial	Data Tech, Manager, Administrator	Yes	Yes	Manager
Dial Mode	dm	Data Tech, Manager, Administrator	Yes	Yes	Manager

Table B-1
(7 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Dial Standby	ds	Data Tech, Manager, Administrator	Yes	Yes	Manager
Dial Utilization Snapshot	dus	All Levels	Yes	Yes	Manager
Digital Test	dit	Data Tech, Manager, Administrator	Yes	Yes	Manager
Disable/Enable	de alt: dsab	Data Tech, Manager, Administrator	Yes	Yes	Manager
Display Address	dsa	All Levels	Yes	Yes	Manager
Display Active Alert Snapshot	dsaas	All Levels	Yes	Yes	Manager, Monitor
Display Alert Driven Routine Criteria	dsadrc	All Levels	Yes	Yes	Manager
Display Alert Driven Routine Filter	dsadrf	All Levels	Yes	Yes	Manager
Display Alert Information	dsai alt: dsfi	All Levels	Yes	Yes	Manager
Display Alert Monitoring State	dsams	All Levels	Yes	Yes	Manager
Display ATR Phone Directory	dsatrpd	All Levels	Yes	Yes	Manager
Display ATR States	dsatrs	All Levels	Yes	Yes	Manager
Display Audit Trail	dsat	Administrator	Yes	Yes	Manager
Display Automated Action Filter	dscd	All Levels	Yes	Yes	Manager
Display Call Directory	dscd	All Levels	Yes	Yes	Manager
Display Canned Message	dscm	All Levels	Yes	Yes	Manager
Display Channel Configuration	dscc	All Levels	Yes	Yes	Manager
Display Channel Group	dscg	All Levels	Yes	Yes	Manager
Display Control Signals	dscs	All Levels	Yes	Yes	Manager
◆ Display User Group	dsug	Manager, Administrator	Yes	Yes	Manager
Display Device Group	dsdg	Help Desk, Data Tech, Manager, Administrator	Yes	Yes	Manager
◆ Indicates that an existing command was modified for this release.					

Table B-1
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Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Display Device Profile	dsdp	All Levels	Yes	Yes	Manager, Map, Monitor
Display Display Filter	dsdf	All Levels	Yes	Yes	Manager
Display DSOB Base Channels	dsdbc	All Levels	Yes	Yes	Manager
Display DS-1 Channel Module Configuration	dsdcmc	All Levels	Yes	Yes	Manager
Display Exception Reporting Thresholds	dsert	All Levels	Yes	Yes	Manager
Display External Leads States	dsels	All Levels	Yes	Yes	Manager
Display External System Configuration	dsesc	All Levels	Yes	Yes	Manager
Display Facility Profile	dsfp	All Levels	Yes	Yes	Manager
Display Line Designator	dsld	All Levels	Yes	Yes	Manager
Display Logical Link	dsll	All Levels	Yes	Yes	Manager
Display Multiplexer Component Configuration	dsmcc	All Levels	Yes	Yes	Manager
Display NAP Configuration	dsnapc	All Levels	Yes	Yes	Manager
Display NMS Configuration	dsnmsc	All Levels	Yes	Yes	Manager
Display Node Configuration Parameters	dsncp	All Levels	Yes	Yes	Manager
Display Node Connected to System	dsncs	All Levels	Yes	Yes	Manager
Display Options	dso alt: dsop	All Levels	Yes	Yes	Manager
Display Physical Link Configuration	dsplc	All Levels	Yes	Yes	Manager
Display Poll List	dspl	All Levels	Yes	Yes	Manager
Display Port Configurations	dspc	All Levels	Yes	Yes	Manager
Display Port Options	dspo alt: dsportop	All Levels	Yes	Yes	Manager

Table B-1
(9 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Display Port Speed	dspsp alt: dsportsp	All Levels	Yes	Yes	Manager
Display Processing Filter	dspf	All Levels	No	No	Manager
Display Queue Results	dsqr	All Levels	Yes No No	Yes Yes Yes	Manager, Trouble/ Inventory Reports, Trouble Tracking
Display Routine	dsr	All Levels	Yes	Yes	Manager
Display Routing Table	dsrt	All Levels	Yes	Yes	Manager
Display Scheduled Items	dssi	All Levels	Yes No No	Yes Yes Yes	Manager, Trouble/ Inventory Reports, Trouble Tracking
Display Site Profile	dssp	All Levels	Yes	Yes	Manager, Map
Display Storage Filter	dssf	All Levels	Yes	Yes	Manager
Display Supervisory Data Link Configuration	dssdlc	All Levels	Yes	Yes	Manager
Display System Poll List	dsspl	All Levels	Yes	Yes	Manager
Display T1 Interface Status	dstis	All Levels	Yes	Yes	Manager
Display Telephone Number(s)	dstn	All Levels	Yes	Yes	Manager
Display Thresholds	dst	All Levels	Yes	Yes	Manager
Display Trouble Tickets	dstt	All Levels	Yes	Yes	Trouble Tracking
Display Uniform Alarm Filter	dsuaf	All Levels	Yes	Yes	Manager
Display Uniform Alarm Interface	dsuai	All Levels	Yes	Yes	Manager
Display User Profile	dsup	All Levels	Yes	Yes	Manager
Display Vendor Profile	dsvp	All Levels	Yes	Yes	Manager
Display Workstation Configurations	dswc	All Levels	Yes	Yes	Manager
Download Device Firmware	dndf	Data Tech, Manager, Administrator	Yes	Yes	Manager
DS0B Channel Summary	dcs	All Levels	Yes	Yes	Manager

Table B-1
(10 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
DS0B Performance & Status	dps	All Levels	Yes	Yes	Manager
DS-1 Channel Loopback	dcl	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
DS-1 Channel Module Test	dcmt	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
Edit Alert Attribute	edaa	Administrator	Yes	Yes	Manager
Edit Alert Monitoring State	edams	Data Tech, Manager, Administrator	Yes	Yes	Manager
Edit Alert Driven Routine Criteria	edadrc	Administrator	Yes	Yes	Manager
Edit Alert Driven Routine Filter	edadrf	Administrator	Yes	Yes	Manager
Edit ATR Phone Directory	edatrpd	Data Tech, Manager, Administrator	Yes	Yes	Manager
Edit ATR States	edatrs	Data Tech, Manager, Administrator	Yes	Yes	Manager
Edit Automated Action Filter	edaaf	Data Tech, Manager, Administrator	Yes	Yes	Manager
Edit Category	edc	Administrator	Yes	Yes	Manager
Edit Color Code	edcc	Administrator	Yes	Yes	Manager
Edit Device Group	eddg	Administrator	Yes	Yes	Manager
Edit Device Profile	eddp	Manager, Administrator	Yes	Yes	Manager
Edit Display Filter	eddf	Manager, Administrator	Yes	Yes	Manager
Edit External System Configuration	edesc	Administrator	Yes	Yes	Manager
Edit Facility Profile	edfp	Manager, Administrator	Yes	Yes	Manager
Edit NMS Configuration	ednmsc	Administrator	Yes	Yes	Manager
Edit Port Configurations	edpc	Administrator	Yes	Yes	Manager
Edit Processing Filter	edpf	Administrator	Yes	Yes	Manager
Edit Routine	edr	All Levels	No	Yes	Manager
Edit Row-Column Labels	edrcl	Administrator	Yes	Yes	Manager
Edit Site Profile	edsp	Data Tech, Manager, Administrator	Yes	Yes	Manager, Map
* Indicates what is shown on the screen.					

Table B-1
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Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Edit Storage Filter	edsf	Administrator	Yes	Yes	Manager
Edit Trouble Tickets	edtt	Data Tech, Manager, Administrator	Yes	Yes	Trouble Tracking
Edit Uniform Alarm Filter	eduaf	Data Tech, Manager, Administrator		Yes	Manager
Edit Uniform Alarm Interface	eduai	Manager, Administrator	Yes	Yes	Manager
◆Edit User Group	edug	Administrator	Yes	Yes	Manager
Edit User Profile	edup	All Levels	Yes	Yes	Manager
Edit User Selection Criteria	edusc	All Levels	Yes	Yes	Manager
Edit Vendor Profile	edvp	Data Tech, Manager, Administrator	Yes	Yes	Manager
Edit Workstation Configurations	edwc	Administrator	Yes	Yes	Manager
EIA Status	eias	All Levels	Yes	Yes	Manager
End To End Test	eet alt: ee	Data Tech, Manager, Administrator	Yes	Yes	Manager
Equipment Performance Report	epr	All Levels	Yes	Yes	Manager
Exception Reports	er	All Levels	Yes	Yes	Manager
Export File Configuration	efc	Data Tech, Manager, Administrator	Yes	Yes	Manager
Facility Errors Report	fer	All Levels	Yes	Yes	Manager
Facility Inventory Report	fir	All Levels	Yes	Yes	Trouble/ Inventory Reports
Facility Performance Report	fpr	All Levels	Yes	Yes	Manager
Facility Report Summary	frs	All Levels	Yes	Yes	Trouble/ Inventory Reports
Generate Routing Tables	grt	Manager, Administrator	Yes	Yes	Manager
Hardware Module Summary	hms	All Levels	Yes	Yes	Manager
Identity	id	All Levels	Yes	Yes	Manager
Informix	No abbreviation	No access level assigned	Yes	Yes	Utilities
◆ Indicates that an existing command was modified for this release.					

Table B-1
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Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Internal Test	it	Help Desk*, Data Tech, Manager, Administrator	Yes	Yes	Manager
List Device Group	lsdg	Help Desk, Data Tech, Manager, Administrator	Yes	Yes	Manager
List Device Profile	lsdp	All Levles	Yes	Yes	Manager, Map, Monitor
List Directory	lsd alt: lsdir	All Levels	Yes	Yes	Manager
List Facility Profile	lsfp	All Levels	Yes	Yes	Manager, Map, Monitor
List Queue Results	lsqr	All Levels	Yes No No	Yes Yes Yes	Manager, Trouble/ Inventory Reports, Trouble Tracking
List Routine	lsr	All Levels	Yes	Yes	Manager
List Scheduled Items	lssi	All Levels	Yes No No	Yes	Manager, Trouble/ Inventory Reports, Trouble Tracking
List Trouble Tickets	lstt	All Levels	No	Yes	Trouble Tracking
Logical Link Summary	lls	All Levels	Yes	Yes	Manager
Loopback Test	lo alt: lpbk	Data Tech, Manager, Administrator	Yes	Yes	Manager
Make Busy	mkb alt: mb	Data Tech, Manager, Administrator	Yes	Yes	Manager
Make Channel Connection	mkcc	Data Tech, Manager, Administrator	Yes	Yes	Manager
Make Channel Group Connection	mkcgc	Data Tech, Manager, Administrator	Yes	Yes	Manager
Make Logical Link Connection	mkllc	Manager, Administrator	Yes	Yes	Manager
* Indicates what is shown on the screen.					

Table B-1
(13 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
† Manage Automatic Backup	mab	Administrator	Yes	Yes	Manager
† Manage Automatic Restore	mar	Administrator	Yes	Yes	Manager
Manage Call Statistics	mcs	Manager, Administrator	Yes	Yes	Manager
Modem Bit Error Rate Test	mbert	Data Tech, Manager, Administrator	Yes	Yes	Manager
Move Print Jobs	No abbreviation	No access level assigned	No	No	Utilities
NAP and SDL State Summary	nsss	All Levels	Yes	Yes	Manager
NMS Users	No abbreviation	No access level assigned	No	No	Utilities
Network Paths Summary	nps	All Levels	Yes	Yes	Manager
Network Wide Channel Group Summary	nwcgs	All Levels	Yes	Yes	Manager
Node Errors Report	ner	All Levels	Yes	Yes	Manager
Node State Summary	nss	All Levels	Yes	Yes	Manager
Offline Test	ot alt: offl	Data Tech, Manager, Administrator	Yes	Yes	Manager
Open Trouble Ticket	optt	Data Tech, Manager, Administrator	No	No	Manager
Physical Link Loopback	pll	Manager, Administrator	Yes	Yes	Manager
Physical Link Module Test	plmt	Help Desk*, Data Tech*, Manager, Administrator	Yes	Yes	Manager
Power and Alarm Control Test	pact	All Levels	Yes	Yes	Manager
Printer Status	No abbreviation	No access level assigned	No	No	Manager
Receive Signal Level	rsl	All Levels	Yes	Yes	Manager
Receive Signal Quality	rsq	All Levels	Yes	Yes	Manager
Receive Signal Spectrum	rss	Data Tech, Manager, Administrator	Yes	Yes	Manager
* Indicates what is shown on the screen.					
† Indicates that this is a new command for this release.					

Table B-1
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Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Restore Node Database	rstrnd	Manager, Administrator	Yes	Yes	Manager
Remote Digital Loopback	rdl	Data Tech, Manager, Administrator	Yes	Yes	Manager
Remote Physical Link Loopback	rpll	Manager, Administrator	Yes	Yes	Manager
Report Diagnostic Status	rds	All Levels	Yes	Yes	Manager
Report Terminal Power	rtp	All Levels	Yes	Yes	Manager
Reset Control Processor	rcp	Manager, Administrator	Yes	Yes	Manager
Read Mail	No abbreviation	No access level assigned	No	No	Utilities
Send File Export	snef	Data Tech, Manager, Administrator	Yes	Yes	Manager
Send Mail	No abbreviation	No access level assigned	No	No	Utilities
Send Message	snm alt: smsg	All Levels	Yes	Yes	Manager
Send Tone	snt	Data Tech, Manager, Administrator	Yes	Yes	Manager
Service Line	sl	Data Tech, Manager, Administrator	Yes	Yes	Manager
Set Date/Time	sdt	Administrator	No	No	Manager
Signal Profile	sp	All Levels	Yes	Yes	Manager
Standby Facility	sf	Data Tech, Manager, Administrator	Yes	Yes	Manager
Time Slot Summary	tss	All Levels	Yes	Yes	Manager
Training Time	tt	All Levels	Yes	Yes	Manager
Transmit Test Pattern	ttp	Data Tech, Manager, Administrator	Yes	Yes	Manager
Trending Reports	tr	All Levels	Yes	Yes	Manager
TSI Module Test	tsimt	Help Desk*, Data Tech*, Manager, Administrator	Yes	Yes	Manager
Time Slot Performance Report	tspr	All Levels	Yes	Yes	Manager
Unix	No abbreviation	No access level assigned	No	No	Manager
UIP	No abbreviation	No access level assigned	No	No	Manager
* Indicates what is shown on the screen.					

Table B-1
(15 of 15)
Commands and their Access Levels

Command	Abbrev.	Default User Access	Routine	Schedule	Accessed From
Voice Channel Tone Test	vctt	Help Desk*, Data Tech*, Manager, Administrator	Yes	Yes	Manager
* Indicates what is shown on the screen.					

Icons C

Connectivity Map Icons

The following is a list of the icons used on the Connectivity Map. Certain aspects of these icons may vary slightly from the ones displayed on your workstation.

ab Analog Bridge.

acu Auto Call Unit.

adc ANALYSIS Data Concentrator.

apl Analog Private Line (APL) Modem.

bridge Central Office Bridge for Multipoint Circuits.

brter Brouter.

clst Cluster Controller.

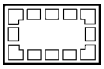
comm Other Communications Equipment.

dacs Cross-Connects (such as a Digital Access Cross-Connect System).

dbu Dial Backup Unit.

ddd Direct Distance Dial Modem.

dds Digital Data Service Unit.

	**erth**	Earth Station.
	**fep**	Front-End Processor.
	**host**	Host.
	**macu**	Multidrop Auto-Call Unit.
	**mux**	Non-switched Multiplexer (such as M24, M44, 73x, 740, 741).
	**56mux**	740/741 Multiplexers with a 56k aggregate link (74x-56K multiplexers).
	**nms**	Network Management System (such as a System Controller, StarKeeper, ANALYSIS, another 6800).
	**ntwk**	Networking Multiplexer (such as 719).
	**pbx**	Private Branch Exchange (such as System 85, DEFINITY).
	**pkt-sw**	Packet Switch.
	**prin**	Printer.
	**proc**	Distributed Processor (such as System 36, System 38, Series 1).
	**psw**	Provider Switch (such as 4ESS, 5ESS).
	**satl**	Satellite.
	**snmp**	Simple Network Management Protocol (SNMP).
	**srcu**	Service Restoration Control Unit.

	**swtch**	Switching Multiplexer (such as 745 or Bytex U30, U50, or UMS). system 6800 Series Network Management System (this particular instance of a 6800 Network Management System).
	**term**	Terminal.
	**unk**	Any device that cannot be classified under one of the other device types.

Map Icons

The following icons are used on the Map. Certain aspects of these icons may vary slightly from the ones displayed on your workstation.

	**site**	Single site.
	**cluster**	Multiple sites in a single icon.
	link	Single or multiple facility.
	acknowledged link	Indicates an acknowledged alert on the facility.

Window Icons

The window manager uses the following symbols with the standard 6800 Series NMS.

	**iconify**	Transforms the window into a small rectangular shape on the screen.
	**resize**	Resizes the window. Present for all windows, although some may not have the resize capability.
	**Menu-bar**	Displays the window manager menu from which either Lower or Close may then be selected.
	**maximize/minimize**	Toggles the window to the largest allowable size and back again. Available only form Map and Monitor windows.

Device Addressing D

Overview

This appendix explains device addressing and identifies the chief distinctions between the communications products addressing schemes recognized by the 6800 Series NMS. In addition, this appendix provides addressing information for the DATAPHONE II devices, ANALYSIS 6510-managed devices, and 3400/4400 Series modems. DATAPHONE II extended addressing and Series 700/7000 Multiplexer addressing are also discussed. Most addressing restrictions are device restrictions and not NMS restrictions.

The 6800 Series NMS manages communications products devices that communicate in one of two protocol modes, depending on the types of devices on the circuit or ‘‘diagnostic tree.” A diagnostic tree consists of the control device and all downstream devices connected to it diagnostically. Each control device on the control channel, along with all its downstream devices, represents one diagnostic tree. If the circuit is composed entirely of 3400/4400 Series modems, 3600 Series DSUs or 3800/3900 Series modems, the Advanced Diagnostic protocol can be used. If the network contains any DATAPHONE II devices, the DATAPHONE II diagnostic protocol must be used.

NOTE

DATAPHONE II protocol mode can be selected from the front panel of the 3400/4400 Series modem.

Regardless of the diagnostic protocol used, the NMS requires device addresses to obtain and process testing, monitoring, and historical database information. However, each protocol supports a different addressing scheme.

Addressing Schemes

The DATAPHONE II diagnostic protocol mode addressing scheme applies to DATAPHONE II devices, 3600 Series DSUs and 3400/4400 Series modems operating in the DATAPHONE II diagnostic protocol mode. It consists of DATAPHONE II local addresses, DATAPHONE II port addresses, and DATAPHONE II network addresses.

The Advanced Diagnostic protocol mode addressing scheme applies only to 3400/4400 Series modems, 3600 Series DSUs, and 3800/3900 Series modems, operating in the Advanced Diagnostic protocol mode. It consists of 3400/4400 Series modems network addresses. The DATAPHONE II and Advanced Diagnostic protocol mode addressing schemes differ significantly in the following aspects:

- Link-level address concatenation
- Address range
- Short-form addressing
- Address management

Link-Level Address

Within a network link, a control modem can communicate with a tributary modem by using the tributary's network address. However, when devices communicate across links, the link-level (or sequential network address) must be used. The *link-level address* for a particular device is a concatenation of addresses. It begins with the control channel and the address of the local control modem and, continuing along the diagnostic tree, adds each device's address, and ends at the particular device. This address, which is stored by the NMS, permits each modem in the network to have a unique path over the diagnostic communications channel.

If the local control modem is a DATAPHONE II device, the local address is derived from the shelf/slot number for the DATAPHONE II device in DATAPHONE II mode. If the local control modem is a 3400/4400 Series modem, the local address is the *network address* in Advanced mode. When the 3400/4400 Series modem is at the head of a DATAPHONE II diagnostic tree, it calculates its own local address directly from the network address.

Short-Form Addressing

Although the Advanced Diagnostic protocol mode does not permit short-form addressing, the DATAPHONE II diagnostic protocol mode requires short-form addressing. This type of addressing is only applicable from the NMS and is a form of link-level addressing.

In short-form addressing, the G2 and G4 tributary modems are omitted from the link-level address of downstream devices. These tributary modems are those point-to-point tributaries that have extended control devices downstream. Short-form addressing is required for extended devices to ensure that all alarm data is associated with the device reporting the alarm.

In the DATAPHONE II diagnostic protocol, the health and status result messages returned during normal polling on an extended circuit do not include the addresses of the G2/G4 tributary modems. In Advanced Diagnostic protocol mode, however, these tributary modems are required. For more information, refer to the discussion on extended polling for DATAPHONE II devices in *DATAPHONE II Extended Polling and Addressing* later in this chapter.

Figure D-1 under *(DATAPHONE II Mode) APL and DDS Addressing* shows the link-level addresses for a sample circuit.

Address Management

The Display Address *(dsa)* and Change Address *(cha)* commands are available for 3400/4400 Series modems, 3600 Series DSUs and 3800 Series modems only. Note that these commands require that serial numbers be contained in the device profiles. Also note that the results returned from these commands differ depending on the diagnostic protocol mode.

The Display Address *(dsa)* command can be sent to multiple devices. In Advance Diagnostic protocol mode, the results header shows the serial number format, and the results show a 1- to 3-digit address with carrier and slot numbers. In DATAPHONE II diagnostic protocol mode, the address header displays the original address. When the address displayed is the local address, the DATAPHONE II and advanced mode formats are shown.

The Change Address *(cha)* can be sent to only one device at a time. You have a choice of selecting either one or all associated device profiles for an update and the link-level and/or alternate address will be updated. You can use this command to restore a device's address to the address in the device profile, and the link-level and/or alternate address will be updated.

In the Advanced Diagnostic protocol mode, the original and new address formats are displayed as the results of the Change Address *(cha)* command. If the link-level address is changed, both of these formats are displayed and the address header is displayed with the serial number format for the device. If you are restoring an address or changing only the alternate mode address, the address display remains the same. In the DATAPHONE II diagnostic protocol mode, when you change the local address, the results displayed show the DATAPHONE II and Advanced mode address formats. The results header displays the original address.

NOTE

While in the DATAPHONE II diagnostic protocol mode, the Change Address *(cha)* command cannot be used to restore an address in the device profile. For more information on these commands, refer to the *COMSPHERE 6800 Series Network Management System Communications Products Support Command Reference Manual*.

DATAPHONE II Mode Addressing

This addressing scheme applies to 3400/4400 Series modems operating in the DATAPHONE II diagnostic mode and DATAPHONE II devices. It consists of the following elements:

- Control channel
- Local address
- Port addresses
- Network addresses

A link-level address takes the form:

CC/la/pa/[na1.../na4]

Where: **CC** is the control channel identification

la is the local address

pa is the port address

na1...na4 is the up to 4 additional network addresses that may be part of the sequential address. Valid entries are from 1 to 80.

Each device on the 6800 Series NMS poll list has a unique address based upon its location within the network. This address is comprised of a string of numbers that represent certain aspects of a device's location. The service classes differ somewhat in addressing conventions.

(DATAPHONE II Mode) APL and DDS Addressing

A typical analog private line or DATAPHONE Digital Service (DDS) device address as shown in Figure D-1.

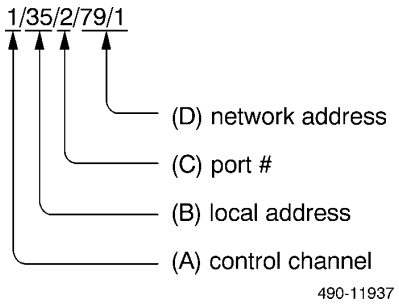


Figure D-1. Typical APL or DDS Address

(A) This segment is the control channel on which the device is located. The control channel identification can be a number from 1 to 8 for the 6800 Series NMS. The highest numbered control channel cannot be used if the 6800 Series NMS is connected to an ANALYSIS NMS.

(B) This segment is the control device's local address. There can be up to 256 addresses on a single control channel.

The local address is based on a modem's location within a specific mounting. The mounting ranges from 1 to 32. The first digit or first two digits refers to the mounting's designated number. The last digit refers to the modem's position in the mounting. There are eight slots numbered one to eight from left to right. A modem located in mounting number 3 and occupying slot number 5 would bear the local address 35.

> **NOTE**
>
> In DATAPHONE II addressing, local addresses range from 11 to 328. The values 0 and 9 are not permissible for the last digit.

(C) This segment is a particular port number of a modem. Most DATAPHONE II modems have one port. The default value is 1. Multiplexing modems can have up to six ports, each supporting a data communications device. The number in the address string represents which port number is being addressed.

(D) This segment is the network addresses of downstream tributary and control modems. Tributary modems are not normally included in the address string, unless they are the last network address, or in the case of extended polling, the third-level tributary network address upstream of the control modem. The omission of the tributary network address is called short-form addressing. The network address can range from 1 to 80.

(DATAPHONE II Mode) DDD Addressing

Addressing conventions in the direct distance dialing (DDD or switched network) service class differs from the APL and DDS classes in the following ways:

- DDD requires a shared diagnostic unit (SDU) for each mounting.
- Each SDU on a control channel must have a unique address from 11 to 328; however, the last digit cannot be 0 or 9. The SDU has an APL control-like diagnostic address.
- Each DDD modem's address is defined by its slot position (1 to 8). The local DDD modems have an APL tributary-like diagnostic address.
- Remote modems cannot be addressed; only local modems can be addressed.

Figure D-2 shows a typical DDD address.

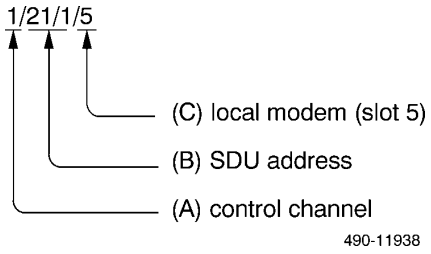


Figure D-2. Typical DDD Address

(A) This segment is the control channel on which the device is located. The control channel identification can be a number from 1 to 8. (The control channel identification can be a number from 1 to 8 for the 6800 Series NMS.) The highest numbered control channel cannot be used when the 6800 Series NMS is connected to an ANALYSIS NMS.

(B) This segment represents the SDU's address. The address is manually set using a dial on the back of the SDU. The /1 following the SDU address is a DATAPHONE II addressing convention.

(C) This segment is the slot number that is occupied by the control modem. This segment can be a number from 1 to 8.

(DATAPHONE II Mode) COMSPHERE 3400/4400 Series Modem Addressing

The 3400/4400 Series modems require unique addresses so that they can be recognized by the network diagnostic system for command and test execution. Device addressing is also used by the 6800 Series NMS to access the device. Operating in DATAPHONE II diagnostic protocol mode with this addressing scheme, the 3400/4400 Series modems are diagnostically compatible with DATAPHONE II devices.

A typical 3400/4400 Series modem address is shown in Figure D-3.

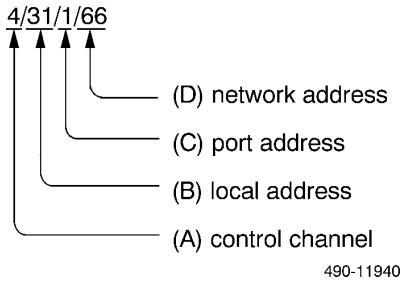


Figure D-3. Typical 3400/4400 Series Modem DATAPHONE II Mode Address

(A) This segment is the control channel on which the device is located. The control channel identification can be a number from 1 to 8 for the 6800 Series NMS.

(B) This segment is the control device's local address. There can be up to 256 addresses on a single control channel.

> **NOTE**
>
> In DATAPHONE II addressing, local addresses range from 11 to 328. The values 0 and 9 are not permissible for the last digit.

(C) This segment is a port address. For COMSPHERE devices in DATAPHONE II diagnostic protocol mode, this is a dummy address that always bears the value of 1. A null port address is permissible and is defined as 1.

> **NOTE**
>
> Because 3400/4400 Series modems do not use a port address in their link-level addresses, a default port address can be assumed by the NMS only when the address is clearly a DATAPHONE II diagnostic protocol mode address. The NMS identifies the address as such only when the local address is in the range of 257 to 328, which is an illegal range in Advanced Diagnostic protocol mode.

(D) This segment represents the network address of any device on the secondary or diagnostic channel. Tributary devices on a multipoint circuit are restricted to network addresses in the range 1 to 256 for 3400/4400 Series modems and 1—80 for 3600 Series DSUs.

(DATAPHONE II Mode) COMSPHERE 3600 Series DSUs Addressing

The COMSPHERE 3600 Series DSUs require unique addresses so that they can be recognized by the network diagnostic system for command and test execution. Device addressing is also used by the 6800 Series NMS to access the device. Operating in DATAPHONE II diagnostic protocol mode with this addressing scheme, the 3600 Series DSUs are diagnostically compatible with DATAPHONE II devices.

The 3600 Series DSUs can have two separately addressable units in the same housing. One unit, the DSU, is restricted to odd network addressing. The other, the V.32 DBM modem, must have even addresses, with the address always 1 greater than the DSU address. Both the DSU and the V.32 DBM modem are at the same diagnostic level. The tributary DSU and V.32 DBM modem are considered tributaries of the control DSU.

A typical COMSPHERE 3600 Series DSU Address is shown in Figure D-4.

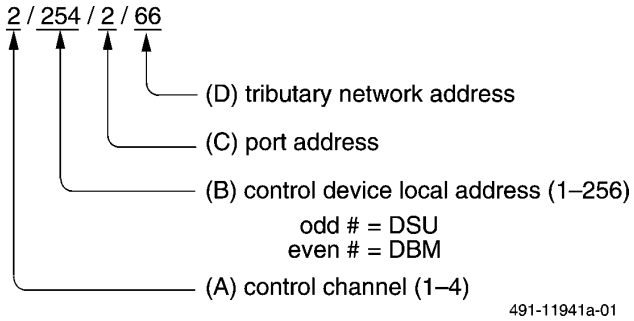


Figure D-4. Typical 3600 Series DSU Address in DATAPHONE II Mode

(A) This segment is the control channel on which the device is located. The control channel identification can be a number from 1 to 8.

(B) This segment is the control device's local address. There can be up to 256 addresses on a single control channel.

The local address of the 3600 Series DSU is derived from its network address. The network address is determined by the physical location of the device and the slot number with the carrier.

> **NOTE**
>
> In DATAPHONE II addressing, local addresses range from 11 to 328. The values 0 and 9 are not permissible for the last digit.

The 3600 Series DSU stores its own network address internally and calculates its own local address directly from the network address when the DSU is at the head of a DATAPHONE II diagnostic tree.

(C) This segment is a port address. For COMSPHERE devices in DATAPHONE II diagnostic protocol mode, this is a dummy address that always bears the value of 1. A null port address is permissible and is defined as 1.

> **NOTE**
>
> Because 3600 Series DSUs do not use a port address in their link-level addresses, a default port address can be assumed by the NMS only when the address is clearly a DATAPHONE II diagnostic protocol mode address. The NMS identifies the address as such only when the local address is in the range of 257 to 328, which is an illegal range in Advanced Diagnostic protocol mode.

(D) This segment represents the network address of any device on the secondary or diagnostic channel. Tributary devices on a multipoint circuit are restricted to network addresses in the range 1 to 256 for 3400/4400 Series modems and 1-80 for 3600 Series DSUs.

(DATAPHONE II Mode) SRCU Addressing

The Service Restoration Control Unit (SRCU) is a peer device to the 4400 Series APL modems. As such, standard link-level addressing applies to the SRCU as described in the *(DATAPHONE II Mode) APL and DDS Addressing* section.

In DATAPHONE II protocol mode, the SRCU is controlled over an upstream device's diagnostic channel and has a network address ranging from 1 to 80.

DATAPHONE II Extended Polling and Addressing

In the DATAPHONE II diagnostic protocol mode, the 6800 Series NMS supports real-time fault monitoring for up to 50 extended DATAPHONE II network devices on each control channel. Extended network devices are control and tributary modems in point-to-point or multipoint circuits that are connected beyond the first tributary device of a point-to-point circuit. Extended polling provides diagnostic monitoring one layer deeper into your network.

For example, without extended polling in a point-to-point configuration, a chain of three modem pairs can normally be monitored over the diagnostic channel by having each tributary device poll its downstream control device and each control device poll its downstream tributaries. By changing options in the last tributary modem of the third pair, and configuring the next control modem into the extended devices, another modem pair can be added to the chain and monitored by the 6800 Series NMS.

When network devices are added beyond the three layers normally supported by the 6800 Series NMS, the modem directly interfacing with the extended level must be re-optioned and a device profile must be created for the extended control modem. The **system polling status** field in the device profile of the extended control modem as well as its local control modem must be set to **active**.

The 6800 Series NMS then accesses extended network devices diagnostically, as part of the 6800 Series NMS poll list, by issuing the device health and status poll command to the extended control devices. Extended control modems poll their tributaries and transmit fault and status information back to the 6800 Series NMS. Tests and commands can be directed to extended control modems in a way exactly analogous to other devices in the network.

Extended Addressing

The limits of extended polling are defined by network addressing. Extended polling allows up to four levels of network addressing; four network addresses can follow the local address in the link-level addressing scheme (refer to Figure D-4).

The last one or two addresses represent the extended network devices. To communicate with these devices, you must add the address of the tributary modem directly preceding the extended control device in the link-level address. The tributary modem marks the limit that the 6800 Series NMS normally supports. For diagnostic communication to proceed across the extension, the network address of that tributary must appear in the addressing scheme. Because only four network addresses can be included in the link-level address, the ability to address extended tributary devices depends on the network configuration.

In the four layer point-to-point example illustrated in Figure D-5, the extended control device fills the fourth address slot. If all four address slots are used, the 6800 Series NMS cannot address the extended tributary modem; therefore, tests and commands cannot be issued to that device. However, the extended control can poll the tributary modem for health and status, and report faults back to the 6800 Series NMS.

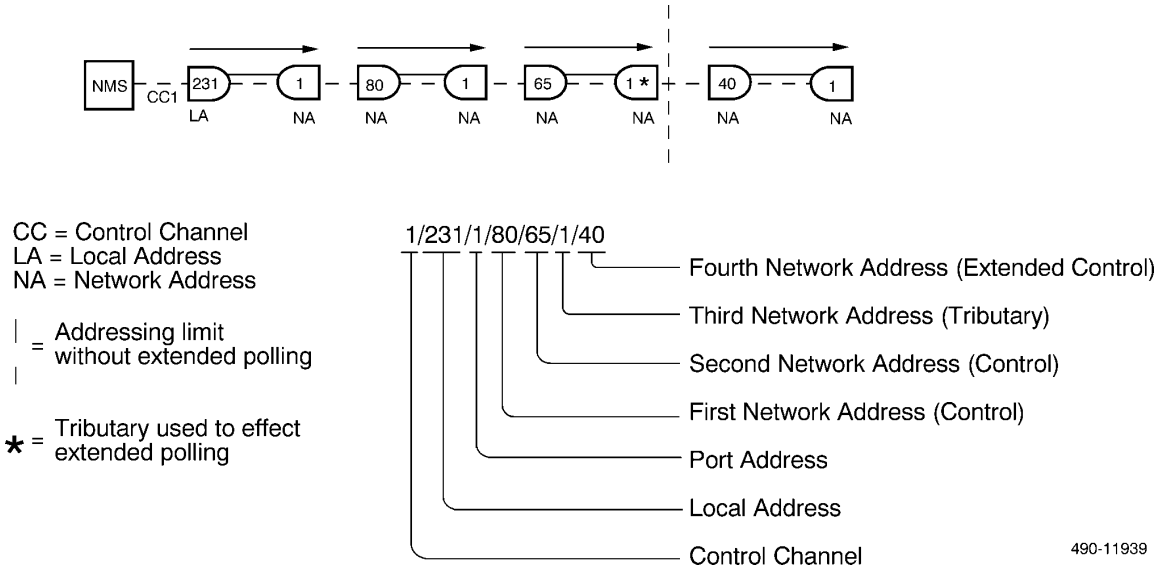


Figure D-5. Extending Addressing

NOTE

The port address shown in Figure D-5 can be Ports 1 through 6.

As previously mentioned, one layer can be added to a DATAPHONE II network extended to its normal diagnostic limit. Once the end point tributary marking the limit of DATAPHONE II service is entered in the link-level address, only one extended layer can be added. This includes networks that have not expanded to four levels of addressing.

The advantage of extended network polling is that it increases the complexity of networks supported by the 6800 Series NMS. Extended polling permits a four layer point-to-point network, a multipoint behind a multipoint network located behind a backbone extension and also a *one modem to many* network followed by another *one modem to many* network.

Advanced Diagnostic Protocol Mode (ADp) Addressing

The Advanced Diagnostic protocol (ADp) mode addressing scheme applies only to COMSPHERE modems operating in Advanced Diagnostic protocol mode. The Advanced mode addressing scheme consists of network addresses.

A link-level address takes the form:

CC/na1/[na2/na3/...na10/]

Where: **CC** is the control channel number from 1—8.

> **NOTE**
>
> 3800/3900 Series modems cannot extend the network beyond two levels.

(ADp Mode) COMSPHERE 3400/4400 Series Modems Addressing

Each COMSPHERE 3400/4400 Series modem on the 6800 Series NMS poll list has a unique address, which is composed of a string of numbers. This address can be up to five levels deep.

Figure D-6 shows a typical 3400/4400 Series modem address.

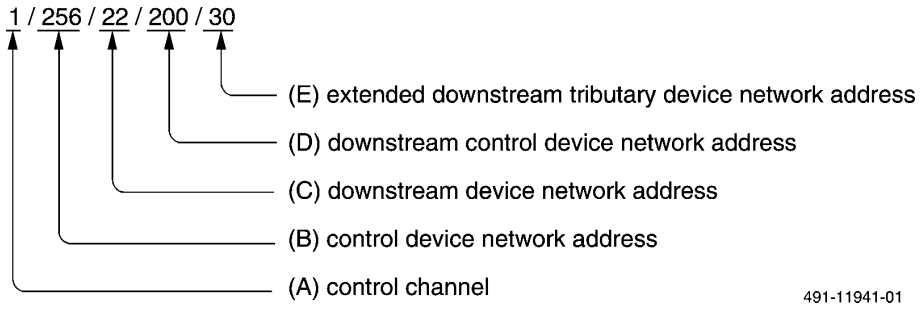


Figure D-6. Typical COMSPHERE 3400/4400 Series Modem Advanced Mode Address

(A) This segment is the control channel on which the device is located. The control channel identification can be a number from 1 to 8 for a 6800 Series NMS.

(B) This segment is the control device's network address, which can range in value from 1 to 256.

> **NOTE**
>
> The 3400/4400 Series modem stores its own network address internally. If you change Advanced to DATAPHONE II diagnostic protocol mode, the modem automatically calculates its own local address from this network address when the modem is at the head of a DATAPHONE II diagnostic tree.

NOTE

Short-form addressing is not allowed in ADp mode.

(C) This segment represents the tributary device network address, ranges from 1 to 256 for point-to-point, 1 to 32 for multipoint.

(D) This segment represents the control device network address, ranges from 1 to 256 for point-to-point, 1 to 32 for multipoint.

(E) This segment represents the tributary device network address, ranges from 1 to 256 for point-to-point, 1 to 32 for multipoint.

Additional circuits can be extended beyond **(E)**, up to five layers deep.

(ADp Mode) COMSPHERE 3600 Series DSUs Addressing

Each 3600 Series DSU on the 6800 Series NMS poll list has a unique address, which is composed of a string of numbers. This address can be up to five levels deep.

The 3600 Series DSU can have two separately addressable units in the same housing. One unit, the DSU, is restricted to odd network addressing. The other, the V.32 DBM modem, must have even addresses, with the address always 1 greater than the DSU address. Both the DSU and the V.32 DBM modem are at the same diagnostic level. The tributary DSU and V.32 DBM modem are considered tributaries of the control DSU.

Figure D-7 shows a typical COMSPHERE 3600 Series DSU address.

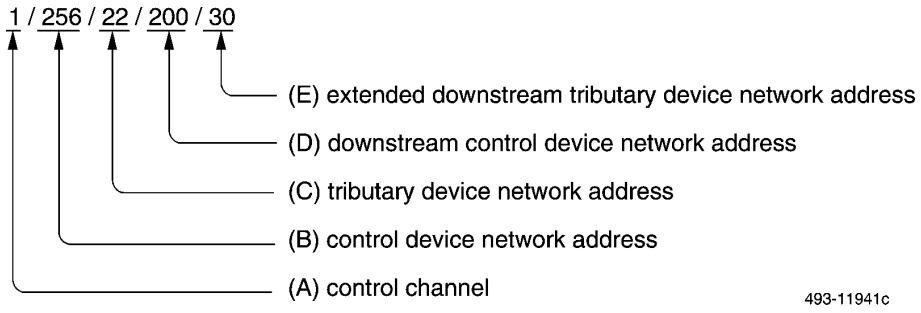


Figure D-7. Typical COMSPHERE 3600 Series DSU Advanced Mode Address

(A) This segment is the control channel on which the device is located. The control channel identification can be a number from 1 to 8 for a 6800 Series NMS.

(B) This segment is the control device's local address. There can be up to 256 addresses on a single control channel.

The network address is determined by the physical location of the device and the slot number within the carrier.

NOTE

The COMSPHERE 3600 Series DSU modem stores its own network address internally. If you change advanced to DATAPHONE II diagnostic protocol mode, the DSU automatically calculates its own local address directly from this network address when the DSU is at the head of a DATAPHONE II diagnostic tree.

NOTE

Short-form addressing is not allowed in ADp mode.

(C) This segment represents the tributary device network address, ranges from 1 to 256 for point-to-point and multipoint. Tributary DSUs on multipoint circuits are restricted to network addresses ranging from 1 to 256.

(D) This segment represents the extended downstream control device network address, ranges from 1 to 256.

(E) This segment represents the extended downstream tributary device network address, ranges from 1 to 256 for point-to-point and multipoint.

Additional circuits can be extended beyond **(E)**, up to five levels deep.

(ADp Mode) COMSPHERE 3800/3900 Series Modem Addressing

Each 3800/3900 Series modem on the 6800 Series NMS poll list has a unique address, which is composed of a string of numbers.

NOTE

The COMSPHERE 3800/3900 Series modems do not allow (or support) connections downstream of the device. Therefore, where the modem is configured constitutes the end of the network. In the following figure, if the 3800/3900 Series modem is B, the network ends at B; if the 3800/3900 Series modem is C, the network ends at C.

Figure D-8 shows a typical COMSPHERE 3800/3900 Series modem address.

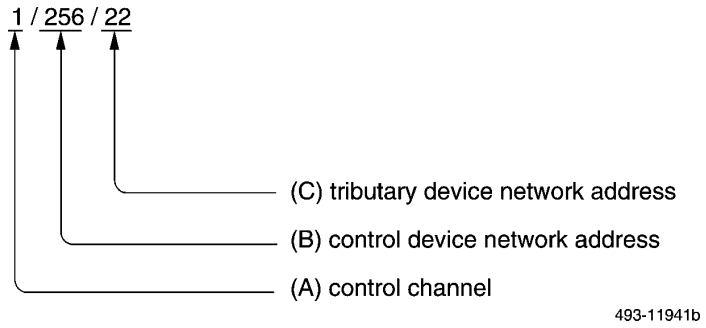


Figure D-8. Typical COMSPHERE 3800/3900 Series Modem Advanced Mode Address

(A) This segment is the control channel on which the device is located. The control channel identification can be a number from 1 to 8 for a 6800 Series NMS.

(B) This segment is the control device's local address. There can be up to 256 addresses on a single control channel.

> **NOTE**
>
> The COMSPHERE 3800/3900 Series modem stores its own network address internally. For a tributary point-to-point configuration, the address is always 1.

> **NOTE**
>
> Short-form addressing is not allowed in ADp mode.

(C) This segment represents the tributary device network address for point-to-point ranges from 1 to 256 for 3800/3900 Series modems. For 3900 Series modems, tributary modems on multipoint circuits are restricted to network addresses ranging from 1 to 256.

(ADp Mode) SRCU Addressing

In ADp mode, the SRCU has a network address ranging from 1 to 256, regardless of whether it is configured a local control device or whether it is on a device's diagnostic channel. The SRCU cannot be polled over a secondary channel or over an application channel.

The Analog Bridges and Dial Backup Units are application modules and follow standard module addressing rules. This type of addressing implies that the Analog Bridge and Dial Backup Unit always operate in ADp mode and are always polled over their associated SRCU's application channel. Their network addresses are in the ranges of 401—464, 501—564, 601—664, 701—764, and are determined by the cabinet, carrier, and slot position of their physical location.

Mode Conversions and Addressing

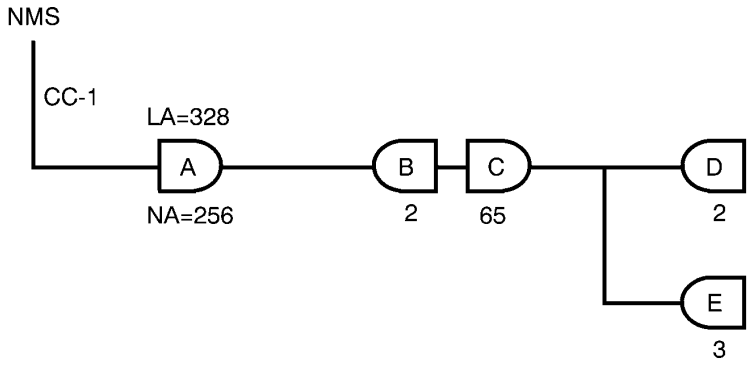
If you have installed a 6800 Series NMS and move from a network that was operating in DATAPHONE II diagnostic protocol mode to one that operates in Advanced Diagnostic protocol mode, you must consider the differences you will encounter as you change addressing schemes.

During conversion, the NMS edits the profiles of all devices on the diagnostic tree to reflect new link-level and alternate mode addresses, protocol mode, and system polling poll list status. Therefore, to achieve a smooth migration to the Advanced Diagnostic protocol addressing scheme, you must maintain the address and protocol mode information in the device profiles.

When changing modes, keep the following in mind:

- In the Advanced Diagnostic protocol mode addressing scheme, the link-level address will not drop the port address. If you migrate from Advanced Diagnostic protocol mode to DATAPHONE II diagnostic protocol mode, the NMS adds a default port address of 1 to the link-level address.
- In the Advanced Diagnostic protocol mode addressing scheme, short-form addressing is not supported. If a device is in DATAPHONE II diagnostic protocol mode and its link-level address is in short form, you must add the missing tributaries' network addresses to the link-level address in the **Alternate mode address** field of the device profile. You must also ensure that device profiles are created for these tributaries and for all devices on the diagnostic tree.
- In the Advanced Diagnostic protocol mode, only local control devices are polled on the control channel. Therefore, change the **System polling** field from **active** to **skipped** for these external devices. These changes are identified as the output results of the Change Protocol Mode *(chpm)* command. You may need to add some of the affected devices to their upstream device's poll list.

Figure D-9 provides a comparison of the two addressing schemes used for a sample circuit. Note that for each type of link-level address, its alternate form, which should be included in the device profile, is shown.



Modem	A	B	C	D	E
Local Address	328	n/a	n/a	n/a	n/a
Port Address	1	n/a	n/a	n/a	n/a
Network Address	256	2	65	2	3
DPII Mode Link-Level Address	1/328/1	1/328/1/2	1/328/1/65	1/328/1/65/2	1/328/1/65/3
DPII Mode Alternate Address	1/328/1	1/328/1/2	1/328/1/2/65	1/328/1/2/65/2	1/328/1/2/65/3
ADp Mode Link-Level Address	1/256	1/256/2	1/256/2/65	1/256/2/65/2	1/256/2/65/3
ADp Mode Alternate Address	1/256	1/256/2	1/256/65	1/256/65/2	1/256/65/3

491-11936b

Figure D-9. Comparison Addressing of Types

Address Validation

When you enter only the address in an input form, NMS validates the address using the following rules:

1. No alphabetic characters are permitted in the link-level address.
2. The maximum character length of the address is 63 characters.
3. The address must begin with a control channel identification followed by a / (slash).
4. Control channels must be from 1 through 8 numeric characters.
5. The first level of the address after the control channel must be in the range of 1 to 256 for ADp, and 11—328 for DPII. For DPII, the last digit cannot be a 0 or 9.
6. The second level (and all succeeding levels) of the address must be in the range of 1 to 256 for COMSPHERE 3400/4400 Series modems in ADp mode and 1 to 256 for 3800/3900 Series modems, from 1—80 for all DATAPHONE II devices, and from 1—256 for 3600 Series DSUs.

The following sections explain addressing in more detail.

Addressing Analysis Devices

Although the NMS does not manage Model 1 devices directly, it can collect information about these devices from the ANALYSIS NMS. These network devices (including ADCs and MACUs) send diagnostic data to ANALYSIS using the DMC protocol. Because the addressing conventions of the DMC protocol differ from those of the protocol modes recognized by the 6800 Series NMS, the NMS automatically translates ANALYSIS addresses into a link-level address format.

For details about the database transfer process from ANALYSIS to the 6800 Series NMS, refer to Chapter 3.

Figure D-10 illustrates an ANALYSIS network.

The addressing conventions for the devices shown in Figure D-10 are discussed in the following sections.

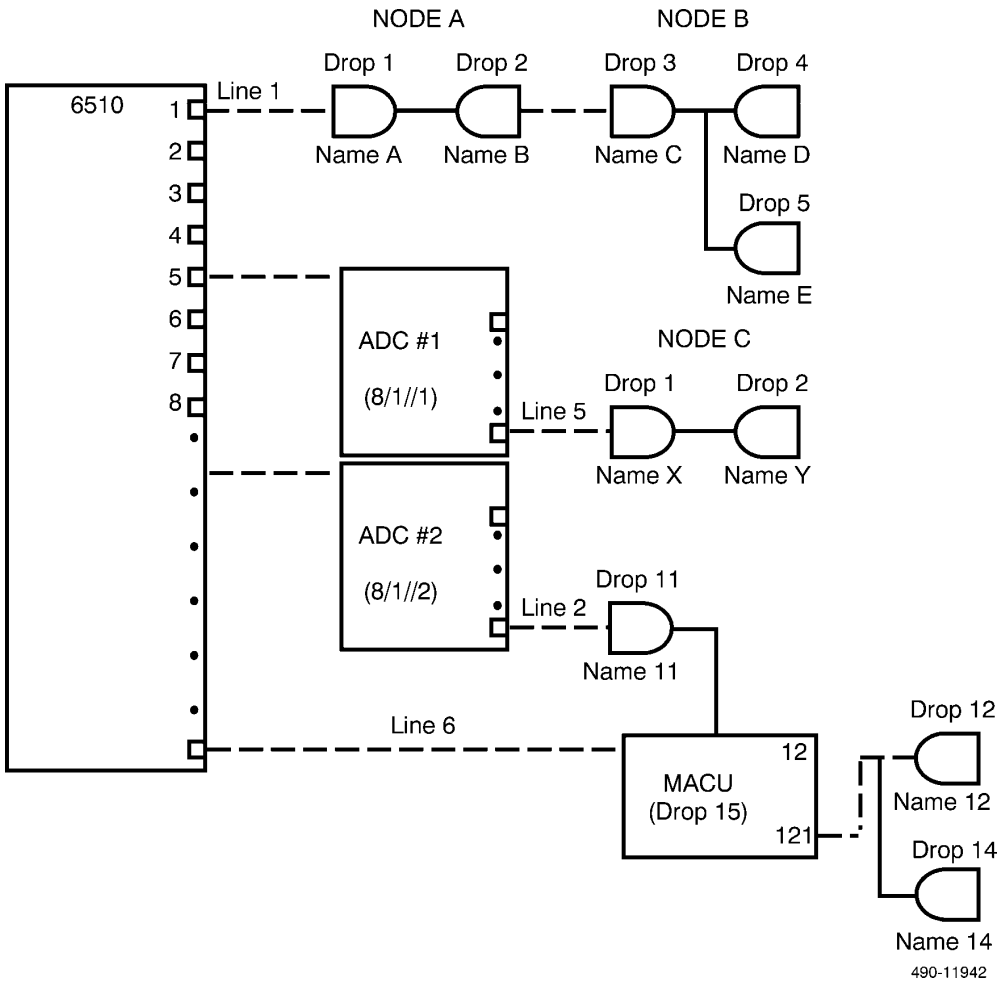


Figure D-10. Sample ANALYSIS Network

Addressing Conventions for Network Modems

In the ANALYSIS network, the addressing scheme consists of the line and drop numbers. When this information is transferred to the 6800 Series NMS, it must be translated (by interface software) into a link-level address. For node C, the address of modem Y would be 5/2. The new link-level address for this device would take the form shown in Figure D-11.

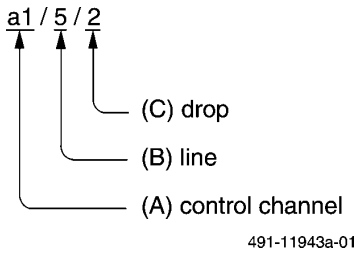


Figure D-11. Typical ANALYSIS Device Link-Level Address

(A) This segment is the control channel identification, which is a1. (It can be in the range from a1—a6.)

(B) This segment is the line. The line value can range from 1 to 150 (except when the address is for an ADC; refer to *Addressing Analysis Data Concentrators*).

(C) This segment is the drop. The drop value can range from 1 to 255.

Each ANALYSIS has its own control channel. Similarly, the link-level address for Drop 14 in Figure D-10 would take the form

a1/6/14

where the control channel identification is a1. The value 6 in the second segment represents the line, and the value 14 in the final segment represents the drop. Note that the MACU is not included. Also note that the facility itself can have a link-level address. Therefore, the link-level address for Line 6 would be a1/6. The segment representing the drop is omitted.

Addressing ANALYSIS Data Concentrators

The link-level address for ADC # 2 shown in Figure D-10 would take the form

a1//2

where the control channel identification is a1, which is followed by two slashes. This convention alerts the NMS to recognize an ADC rather than a line. The value 2 in the final segment identifies the specific ADC. The value range for this segment is 1 to 50.

Addressing Multidrop Auto-Call Units (MACU)

The link-level address for the MACU shown in Figure D-10 would take the form

a1/6/15

where the control channel identification is a1. The second segment contains the line number, 6. The final segment contains the drop number, 15, which is the MACU itself.

Series 700 Multiplexer Addressing

A typical Series 700 Multiplexer configuration is shown in Figure D-12.

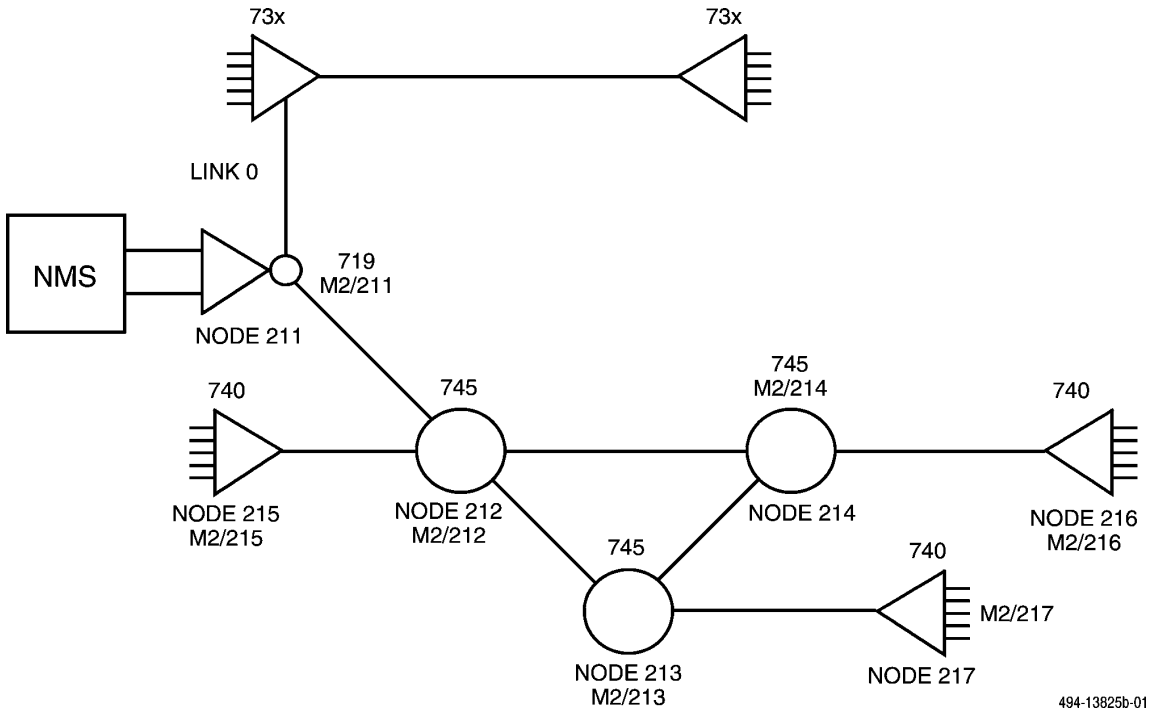


Figure D-12. Typical Series 700 Multiplexer Configuration Showing Connection from a 719 to a 735

719, 72x, 731, 740, 741, 742, 745, and 740-56K Multiplexer Addressing

For the 719, 72x NETWORKER, the 731, 74x ACCULINK multiplexer, 74x-56K ACCULINK multiplexer, and 7050 NSM, the device address uses the following form:

m2/nnn

Where: **m2** is the control channel number.
nnn is the node number of the multiplexer. Valid ranges are from 1 to 249.

Examples of multiplexer addressing are:

m2/28

m2/16

m2/13

Addressing Bytex Devices

All Bytex devices are addressed through a logical control channel, **el**. The Bytex Unity Management System (UMS) is addressed using the following format: **el/ums**. The device address format for the U30 and U50 switches is in the form:

e1/xxxxxxxxxxxxx

Where: **el** is the Bytex logical control channel and

xxxxxxxxxxxxx consists of up to 13 lowercase alphanumeric characters representing the ‘‘Port Name” assigned for each device on the Bytex UMS.

Addressing SNMP/Brouter Devices

All SNMP and brouter devices are addressed on the 6800 Series NMS through a logical control channel, b1. The device address format for the SNMP/brouter devices is in the form:

b1/xxxxxxxxxxxxx

Where: **bl** is the logical control channel

xxxxxxxxxxxxx consists of up to 60 lowercase alphanumeric characters. The characters represent the name assigned to each device on the SNMP Manager system.

In addition, a unique valid IP address is required for SNMP and brouter devices The IP address can be entered in any **Device(s)** field and in any **Device name(s)** field. The IP address format for the SNMP/brouter devices is in this form:

xxx.xxx.xxx.xxx

Where: **xxx** is a numeric between 1 and 255 inclusive.

Naming Conventions E

Overview

In addition to device addressing, the 6800 Series NMS also offers a device naming method. The naming conventions allow you to assign a name to a device and to assign a network or circuit name to a group of logically related devices, such as those devices sharing a common customer, location, or application. You can then reference or test a group of devices, a network, or a circuit by entering a single name.

The device names, circuit names, and network names first must be entered in the device profile, and then may be used interchangeably with the numeric address when requesting information about a particular device. However, the device profile must include a numeric address along with any of these user-defined names.

A device can be specified by using any of the following names:

- Device Addresses
- Device Names
- Serial Numbers
- IP Address (for SNMP/brouter devices only)

Only the Device Address, Device Name, Serial Number, and the IP Address can be used to uniquely specify one device. You can assign a network or circuit name to one or more devices.

When a device ID other than the device address is given as input to the device field on forms, NMS translates the ID to the device address found in the device profile associated with that ID.

Naming conventions allow you to use the previously listed device IDs and some special characters to create device names or device groups. The following sections discuss the naming conventions you may use when identifying devices in the NMS environment.

Characters and Numbers

The naming conventions used in NMS contain special characters and numbers for identifying devices and groups of devices.

Character Case

Uppercase alphabetic characters and lowercase alphabetic characters are equivalent in all device addresses, device names, network names, circuit names, facility names, device types, site names, user IDs, vendor names, date fields, alert types, and alert groups. For these fields, NMS always echoes the lowercase equivalent for characters you enter on the forms. In all other fields, NMS is sensitive to the case of the entered characters.

Leading Zeros

Any zero entered directly after a / (slash) in any device address is ignored by NMS, except on a multiplexer control channel where the multiplexer link number can be just 0 (zero). Refer to Appendix D for more information on multiplexer addressing.

Special and Wildcard Characters

Special characters (non-alphanumerics) can be used within device names (refer to *Device Names* later in this appendix). Wildcard characters are special characters that may be used to expand certain names and fields. The following special characters are available:

.	—	Dot
,	—	Comma
SPACE	—	Blank Space
*****	—	Asterisk
?	—	Question Mark
!	—	Exclamation Point
/	—	Slash
–	—	Dash
all	—	Keyword
none	—	Keyword

Dot (.)

The dot may also be used as a level separator in the device fields, device name, network name, circuit name, serial number, or facility name. For example:

nyc.atm-reg

Comma (,) or Space

Either the , (comma) or a blank space can be used as field delimiters. You can specify multiple device names by separating each one with a space or comma. These device names can be of any allowable form. For example:

1/34/56,3/43/80 1/99/5

This example translates to three addresses sent to the NMS: 1/34/56, 3/43/80, and 1/99/5.

Slash (/)

The / (slash) is a link-level address separator. Use of this character is restricted to link-level addressing only. When two slashes appear together, with no intervening characters or spaces, it is assumed you mean /1/ (for modems only), the default port address for DATAPHONE II devices. The only instance where two slashes may appear consecutively in an address is to identify a default port address of 1 in a DATAPHONE mode address.

Asterisk (*)

The * (asterisk) is a wildcard character which can be used to specify any character string. The * can be used in any of the following fields when the input form allows for multiple devices to be entered:

- Device address
- Network name
- Circuit name
- Facility name
- Device name
- Serial number
- IP Address

The * can also be used in database transactions where permitted in the transaction specification. Some examples of where the * can be used in database transactions are as follows:

- Site name
- Vendor name
- User ID
- Trouble number(s)
- Model number

One use for this wildcard could be

1/12/*/101

This example indicates all the devices that have a network address of 101 that is at least two levels below 1/12. Some more examples:

4/*

would translate to all devices on control channel 4.

m2/*

would translate to all multiplexer nodes.

net-atm*

would translate to all devices with network names beginning with net-atm.

ana*

would translate to all device names beginning with ana.

The asterisk by itself cannot be used. You can use the keyword **all** to indicate all devices.

All device fields (device address, network name, circuit name, device name, serial number) using the asterisk must meet at least one of the following criteria:

- Contain at least one / indicating a device address.
- Begin with **cir-**, **net-**, or **ser-** indicating the corresponding group of devices.

If not, it is assumed that the string containing the asterisk represents a device name, and the expansion should be done accordingly. For example:

***nyc**

translates to all device names that end with nyc.

2/*

translates to all devices on control channel 2.

net-*

translates to all devices with network names in their device profiles.

Multiple asterisks cannot be used in a string.

Question Mark (?)

The **?** (question mark) is analogous to the ***** except that effective usage of **?** is limited to one field and the question mark must be placed between two level separators. Level separators are the / (slash), – (dash), and . (dot).

When you place the question mark between two slashes, NMS finds any address that matches the given string, with the question mark replaced by any string that does not contain a slash.

When you place the question mark between any combination of the two separators – (dash) and . (dot), NMS finds any name that matches the given string, with the question mark replaced by any string that does not contain either a dash or dot.

The question mark is only allowed in the following fields:

- Device address
- Network name
- Circuit name
- Facility name
- Device name
- Serial number
- IP Address

A typical use of the question mark could be:

1/12/?/101

This means all the devices that have a network address of 101 that are exactly two levels below 1/12. If the following are the sequential addresses,

device A 1/12/201/204/101

device B 1/12/201/101

device C 31/12/201/101/201/101

then 1/12/*/101 would address all three devices, whereas 1/12/?/101 would only address device B.

If you entered the following,

net-?-atm

NMS would translate any network of the form **net-anything-atm**, where **anything** is a set of alphanumeric characters (without a dash or a dot).

You can also use the question mark as the first character in a field, before a separator. For example,

?/2

has NMS search for all devices on all control channels with an address of 2.

Only one question mark per device naming group is allowed.

You cannot use the question mark and asterisk in the same device naming group.

Exception Character (!)

An **!** (exclamation mark) is an exception character. Use this character if another wildcard is used to specify multiple devices and you want to eliminate some of the devices specified. The exclamation mark may be placed only at the beginning of a device naming group.

The exception character can only be used within the following fields:

- Device address
- Network name
- Circuit name
- Facility name
- Device name
- Serial number
- IP address

You may want to address a group of devices by using the network name address. If the network link is defined in such a way that there are more devices on that link than you want to address, then the exception character could be used to eliminate the unwanted devices from the particular address command. For example:

1/*/80, !1/2/43/80

implies that the command is to be sent to all devices on control channel 1 with a final network address of 80, except for device 1/2/43/80.

The exception character takes precedence over any other set of addresses given. Therefore, if you were to enter the following set of addresses:

1/12/31/8/52, 1/12/31/*, !1/12/31/8/*

NMS would translate to the following:

1/12/31/*, !1/12/31/8/*

ignoring the first device address entered, as it was negated by the third set of addresses, by use of the exception character.

When the exception character is used, NMS removes the devices identified with the ! from all other non-excepted devices you listed. If there are no non-excepted devices, NMS considers the desired set to be **all** and returns all device records but those marked as excepted. For example:

1/31/*,!2/32

would translate to all devices with addresses beginning with 1/31.

!2/32

would translate to all devices except 2/32.

Order is not important.

Dash (–)

The – (dash) is used as a level separator for device names, circuit names, facility names, network names, IP Address and serial numbers.

Keyword All

The special character keyword **all** can be used in the **Device(s)** field to signify all devices. For database transactions, this is interpreted to mean all records. The keyword **all** is not permitted in the **Device(s)** field for network control commands.

The keyword **all** may be used in non-device(s) fields, where so defined for the field.

Keyword None

The special character keyword **none** can be used in the **Device(s)** field to signify no devices. The keyword **none** may be used in non-device(s) fields where defined for the field.

Alert Groups and Alert Types

Alert groups and alert types are used as input for many commands, and for display on the Monitor task. Alert groups are also used to set up filtering for alerts. The values for group names and alert type names are application specific. Chapter 5 contains valid alert groups and alert types. Alert groups and alert types are defined by the system and cannot be changed in NMS.

Circuit Names

Circuit names can be used in some fields on input forms instead of the device name, indicating to NMS to expand the circuit name into its individual devices.

Circuit names use the form:

cir-a...a

Where: **cir-** is a required prefix and system generated in the circuit name field.

a...a is a 1 to 25 alphanumeric character name which can include alphabetic characters, the digits 0 through 9, and the special characters dash (–) and dot (.). For example:

cir-model2

Device Addresses

Device addresses, which indicate the diagnostic location of the device, can be entered in the **Device(s)** field. When the device type, protocol mode, and model number are known, NMS checks the address entered for proper format. When only an address is entered, NMS validates the address using the address validation process explained earlier in this appendix.

Refer to Appendix D for more information on addressing devices.

Device Names

When a **Device(s)** or **Node(s)** field is used within a task, you can supply any of the following device identifications as the device name:

- Device address
- Device name
- Circuit name
- Serial number
- Network name
- IP address

Multiple entries, separated by commas or spaces, and the special wildcard characters ***** (asterisk), **!** (exception character), and **?** (question mark) are allowed.

NMS expands all values you enter to individual device records, as found in the current device profile database. This expansion is performed independent of application packages; that is, groups of device names can represent devices from different application packages.

Device Types

The **device type** field is provided by the system and cannot be changed by the user. Device types must be unique to an application package. Device types can be both supported device types and unsupported device types.

The managed device types are as follows:

ab	—	Analog Bridge
acu	—	Auto Call Unit
adc	—	ANALYSIS Data Concentrator
apl	—	APL Modem
brter	—	Cisco Brouter Device
dbu	—	Dial Backup Unit
ddd	—	Direct Distance Dial Modem

dds	—	Digital Service Unit
macu	—	Multidrop Auto-Call Unit
mux	—	Non-switched Multiplexer (such as a 740, 741, or 742) 56mux
56mux	—	740/741/742 multiplexer with 56K interface
nms	—	Network Management System (such as System Controller, Star-Keeper, ANALYSIS, another 6800)
ntwk	—	Networking Multiplexer (such as 719)
snmp	—	any SNMP device
srcu	—	Service Restoration Control Unit
swtch	—	Switching Multiplexer (such as a 745 or a Bytex U30/U50 Switch or Bytex Unity Management System)
system	—	6800 Series Network Management System

All device types listed above (with the exception of SNMP and brouter devices) are also valid unmanaged device types. Additional unmanaged device types are as follows:

bridge	—	Central Office Bridge for multiport circuits
clst	—	Cluster Controller
comm	—	Other Communications Equipment
dacs	—	Digital Access Cross-Connect System (such as DACS)
erth	—	Earth Station
fep	—	Front-End Processor
host	—	Host
pbx	—	Private Branch Exchange (such as System 85, DEFINITY)
pkt-sw	—	Packet Switch
prin	—	Printer
proc	—	Distributed Processor (such as System 36, System 38, Series 1)

psw	—	Provider Switch (such as 4ESS, 5ESS)
satl	—	Satellite
term	—	Terminal

Special device types are **unk** and **und**. The device type **unk** is used for devices not classified into managed or unmanaged device types. The device type **und** is used for managed devices that have no device profile in NMS, but do have alert or trouble records.

External System Names

External system names can contain up to 15 alphanumeric lowercase characters including the special characters . (dot) and – (dash). The name must be unique.

Facility Names

Facility names are used in the facility profile to uniquely identify a facility. A facility is always associated with one or two device endpoints. However, the facility name cannot be used as input to the **Device(s)** field in any command or task.

Facility names are entered in the following format:

fac-a...a

Where: **fac-** is a required prefix.

a...a is a 1 to 15 alphanumeric character name which can include the 26 alphabetic characters (a—z), the digits 0 through 9, and the special characters – (dash) and . (dot).

An example of a valid facility name is as follows:

fac-t1-ny-chi or fac-211to212

fac-all and **fac-none** are not valid facility names.

Device Names for Addressing

Mnemonic names provide another way of addressing a device and can be used as input to the **Device(s)** field. They are defined in a device's device profile in its Device name field.

Mnemonic names are unique and are made up of a string of 1 to 15 alphanumeric characters. All 26 alphabetic characters (a—z), the digits 0 through 9, and the special characters – (dash) and . (dot) are allowed. The only restrictions are that the name may not be the keywords **all**, **default** or **none** and may not begin with any of the following series of special prefixes:

- **net-**
- **cir-**
- **ser-**
- **fac-**
- **cg-**
- **grp-**

For example:

nyc-atm1,det-resv2,det.resv2-nyc

Serial Numbers

Serial numbers are another way to address a device and can be used on input forms in the **Device(s)** field to identify a device. Serial numbers must be unique to a device.

Devices can have serial numbers that you assign or which are returned by the device. Serial numbers can contain up to 13 characters. They can consist of alphanumeric characters and the special characters – (dash) and . (dot).

To address a device using serial numbers, prefix the number by ser-.

Site Names

Site names are user-defined. A site name can contain alphanumeric and any special characters, except commas, spaces, and asterisks. A site name cannot be the keywords **all** or **none**.

Network Names

A network name can be used in the **Device(s)** field indicating to NMS to expand the network name into its individual devices.

Network names are entered in the following format:

net-a...a

Where: **net-** is a required prefix.

a...a is a 1 to 15 alphanumeric character name which can include the 26 alphabetic characters (a—z), the digits 0 through 9, and the special characters – (dash) and . (dot). **net-all** and **net-name** are not valid network names.

An example of a valid network name is as follows:

net-nyc,net-atm,net-atm.nyc

Vendor Names

Valid vendor names are alphanumeric and may contain special characters, except the comma, space, and asterisk. Vendor names cannot be the keywords **all** or **none**.

Routine Names

A routine name can be up to 10 lowercase alphanumeric characters. The following rules apply.

1. Personal routine names cannot begin with a number, e.g., 123 is invalid.

2. The following special characters are not allowed:
   comma, space, *, ?, !, (pipe), / (backslash), ‘‘ (double quotation marks)

3. System routine names must be prefixed with **sys-**.

IP Address

All SNMP/brouter devices use an IP address to match an imported SNMP trap to a device profile on the 6800 Series NMS. All SNMP/brouter devices are identified with a unique IP (Internet Protocol) address in the form:

xxx.xxx.xxx.xxx

Where: **xxx** is a numeral between 1 and 255 inclusive.

IP addresses must be obtained from the Network Administrator.

International Dial Codes F

Table F-1 shows the international dial codes.

Table F-1
(1 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
001		**Atlantic/Caribbean Islands**		
	809	Bahamas, Bermuda, Puerto Rico, Virgin Islands	70.00 W	23.50 N
001		**Canada**		
	403	Alberta	113.00 W	52.00 N
	604	British Columba	123.00 W	52.00 N
	204	Manitoba	98.00 W	52.00 N
	506	New Brunswick	66.50 W	46.50 N
	709	Newfoundland	56.00 W	48.50 N
	902	Nova Scotia	63.50 W	45.00 N
	613	Ontario, Ottawa	75.43 W	45.25 N
	705	Ontario, Sault Ste. Marie	84.20 W	46.36 N
	807	Ontario, Thunder Bay	89.12 W	48.27 N
	416	Ontario, Toronto	79.25 W	43.42 N
	519	Ontario, Windsor	72.01 W	45.35 N
	514	Quebec, Montreal	73.38 W	45.30 N
	418	Quebec, Quebec	71.15 W	46.50 N
	819	Quebec, Trois Rivieres	72.34 W	46.21 N
	306	Saskatchewan	106.00 W	52.00 N
001		**United States**		
	907	Alaska	152.00 W	64.00 N
	808	Hawaii	158.00 W	21.50 N
213	N/A	**Algeria**	2.50 E	28.00 N

Table F-1
(2 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
684	N/A	**American Samoa**	170.43 W	14.16 S
33	628	**Andorra**	1.30 E	42.30 N
54		**Argentina**	59.30 W	34.42 S
	1	Buenos Aires	58.30 W	34.40 S
	51	Cordoba	64.11 W	31.25 S
	41	Rosario	66.41 W	
61		**Australia**	133.52 E	23.42 S
	3	Melbourne	144.58 E	37.45 S
	2	Sydney	151.10 E	33.55 S
43		**Austria**	14.39 E	47.44 N
	222	Innsbruck	11.25 E	47.17 N
	22	Vienna	16.22 E	48.13 N
973		**Bahrain**	50.50 E	26.00 N
32		**Belgium**	5.07 E	50.41 N
	3	Antwerp	4.25 E	51.13 N
	2	Brussels	4.21 E	50.50 N
501		**Belize**	88.30 W	170.00 N
	8	Belmopan	88.48 W	17.13 N
	3	Orange Walk	88.31 W	18.06 N
591		**Bolivia**	64.48 W	17.12 S
	2	La Paz	68.10 W	16.30 S
55		**Brazil**	50.25 W	10.26 S
	61	Brasilla	47.57 W	15.45 S
	21	Rio do Janeiro	43.17 W	22.53 S
	11	Sao Paulo	46.39 W	23.33 S
237		**Cameroon**	13.05 E	5.12 N
56		**Chile**	72.10 W	36.37 S
	2	Santiago	70.40 W	33.30 S

Table F-1
(3 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
	32	Valparaiso	71.40 W	33.05 S
57		**Colombia**	72.16 W	3.38 N
	58	Barranquilla	74.50 W	11.10 N
	1	Bogota	74.05 W	4.38 N
	23	Cali	76.30 W	3.24 N
	59	Cartagena	75.33 W	10.24 N
506		**Costa Rica**	83.52 W	9.50 N
357		**Cyprus**	33.10 E	34.59 N
	2	Nicosia	33.21 E	35.09 N
42		**Czechoslovakia**	17.07 E	49.29 N
	5	Brno	16.40 E	49.13 N
	2	Prague	14.26 E	50.06 N
45		**Denmark**	9.34 E	56.10 N
	8	Aalborg	10.00 E	57.00 N
	1	Copenhagen	12.34 E	55.43 N
	2	Copenhagen	12.34 E	55.43 N
593		**Ecuador**	78.26 W	1.30 S
	37	Cuenca	79.00 W	2.54 S
	32	Quito	78.30 W	0.14 S
20		**Egypt**	29.50 E	27.00 N
	3	Alexandria	29.55 E	31.13 N
	2	Cairo	31.15 E	30.03 N
	66	Port Said	32.18 E	31.17 N
503		**El Salador**	88.58 W	13.42 N
251		**Ethiopia**	38.42 E	9.03 N
	1	Addis Ababa	38.42 E	9.03 N
	7	Jimma	36.47 E	7.39 N
679		**Fiji Islands**	178.00 E	17.75 S

Table F-1
(4 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
358		**Finland**	27.15 E	63.32 N
	0	Helsinki	25.00 E	60.08 N
33		**France**	2.23 E	47.05 N
	56	Bordeaux	0.34 W	44.50 N
	91	Marseille	5.22 E	43.18 N
	13	Paris	2.20 E	48.52 N
	14	Paris	2.20 E	48.52 N
	16	Paris	2.20 E	48.52 N
596		**French Antilles**	61.05 W	14.36 N
689		**French Polynesia**	149.34 W	17.32 S
241		**Gabon**	11.48 E	0.38 S
49		**Germany (West)**	8.40 E	50.33 N
	30	Berlin	13.25 E	52.32 N
	228	Bonn	7.06 E	50.44 N
	69	Frankfurt	8.41 E	50.06 N
	89	Munich	11.35 E	48.08 N
37		**Germany (East)**	12.39 E	51.53 N
	2	Berlin	13.25 E	52.32 N
	51	Dresden	13.45 E	51.03 N
	41	Leipzig	12.25 E	51.20 N
30		**Greece**	21.55 E	39.22 N
	1	Athens	23.44 E	38.00 N
	241	Rhodes	28.14 E	36.26 N
671		**Guam**	144.45 E	13.28 N
53		**Guantanamo Bay**	75.14 W	20.09 N
	99	all points	75.14 W	20.09 N
502		**Guatemala**	90.20 W	15.28 N
	22	Guatemala City	90.22 W	14.38 N

Table F-1
(5 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
592		**Guyana**	59.06 W	3.57 N
	22	Georgetown	58.10 W	6.46 N
509		**Haiti**	72.38 W	19.03 N
	93	Cap Haiten	72.17 W	19.47 N
	92	Gonaive	72.42 W	19.29 N
	91	Port au Prince	72.20 W	18.33 N
504		**Honduras**	87.06 W	14.38 N
852		**Hong Kong**	114.13 E	22.16 N
	23	Kowloon	114.10 E	22.19 N
36		**Hungary**	19.31 E	47.02 N
354		**Iceland**	18.00 W	64.52 N
	46	Akureyri	18.04 W	65.41 N
	41	Hafnarfjorour	21.58 W	64.04 N
91		**India**	79.12 E	21.10 N
	22	Bombay	73.00 E	18.56 N
	11	New Delhi	77.13 E	28.37 N
62		**Indonesia**	115.00 E	0.00
	21	Jakarta	106.45 E	6.08 S
98		**Iran**	54.22 E	31.55 N
	31	Esfahan	51.41 E	32.41 N
	51	Mashad	59.34 E	36.16 N
	21	Teheran	51.26 E	35.40 N
964		**Iraq**	44.03 E	32.37 N
	41	Baghdad	44.26 E	33.20 N
353		**Ireland**	7.56 W	53.25 N
	31	Dublin	6.15 W	53.20 N
	391	Galway	9.03 W	53.16 N
972		**Israel**	35.00 E	30.00 N

Table F-1
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Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
	4	Haifa	34.59 E	32.49 N
	2	Jerusalem	35.13 E	31.47 N
	3	Tel Aviv	34.46 E	32.05 N
39		**Italy**	12.39 E	42.34 N
	55	Florence	11.15 E	43.47 N
	81	Naples	14.15 E	40.50 N
	6	Rome	12.30 E	41.53 N
	41	Venice	12.20 E	45.26 N
225		**Ivory Coast**	5.00 W	7.42 N
81		**Japan**	138.00 E	36.03 N
	82	Hiroshima	132.27 E	34.23 N
	6	Osaka	135.30 E	34.40 N
	3	Tokyo	139.45 E	35.40 N
	45	Yokohama	139.38 E	35.28 N
962		**Jordan**	36.40 E	30.46 N
254		**Kenya**	37.40 E	0.39 N
	11	Mombasa	39.40 E	4.04 S
	2	Nairobi	36.50 E	1.17 S
	37	Nakuru	36.04 E	0.16 S
82		**Korea**	128.08 E	36.25 N
	51	Pusan	129.02 E	35.05 N
	2	Seoul	127.00 E	37.30 N
965		**Kuwait**	48.00 E	29.20 N
231		**Liberia**	10.46 W	6.20 N
218		**Libya A.S.J.**	16.21 E	27.51 N
	21	Tripoli	13.12 E	32.58 N
41		**Liechtenstein**	9.32 E	47.08 N
352		**Luxembourg**	6.08 E	49.37 N

Table F-1
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Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
265		**Malawi**	34.29 E	13.45 S
	550	Zomba	35.22 E	15.22 S
60		**Malaysia**	102.00 E	4.11 N
	4	Alor Setar	100.23 E	6.06 N
	5	Ipoh	101.02 E	4.36 N
	3	Kuala Lumpur	101.42 E	3.08 N
52		**Mexico**	101.59 W	23.20 N
	748	Acapulco	99.56 W	16.51 N
	5	Mexico City	99.10 W	19.25 N
33	93	**Monaco**	7.25 E	43.44 N
212		**Morocco**	6.59 W	31.44 N
	7	Rabat	6.51 W	34.02 N
	9	Tangiers (Tanger)	5.50 W	35.48 N
264		**Namibia**	17.06 E	22.34 S
31		**Netherlands**	5.57 E	52.13 N
	20	Amsterdam	4.54 E	52.21 N
	10	Rotterdam	4.29 E	51.55 N
	70	**The Hague (’s Gravenhage)**	4.16 E	52.05 N
599		**Netherlands Antilles**	68.56 W	12.12 N
	8	Aruba	70.00 W	12.30 N
	7	Bonaire	68.27 W	12.15 N
	9	Curacao	68.56 W	12.12 N
	4	Saba	63.26 W	17.42 N
	3	Sint Eustatius	63.05 W	18.05 N
	5	Sint Maarten	63.00 W	17.33 W
687		**New Caledonia**	165.29 E	21.34 S
64		**New Zealand**	172.16 E	42.12 S
	9	Auckland	174.47 E	36.55 S

Table F-1
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Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
	3	Christchurch	172.40 E	43.33 S
	4	Wellington	174.47 E	41.17 S
505		**Nicaragua**	85.58 W	12.52 N
	555	Granada	85.59 W	11.58 N
	531	Leon	86.52 W	12.24 N
	2	Managua	86.18 W	12.06 N
234		**Nigeria**	9.50 E	10.16 N
	1	Lagos	3.28 E	6.27 N
47		**Norway**	10.23 E	63.36 N
	5	Bergen	5.20 E	60.23 N
	2	Oslo	10.45 E	59.56 N
	4	Stavanger	5.45 E	58.58 N
968		**Oman**	57.30 E	22.22 N
92		**Pakistan**	66.38 E	29.01 N
	51	Islamabad	73.08 E	33.40 N
507		**Panama**	79.54 W	9.21 N
675		**Papua New Guinea**	142.32 E	6.40 S
595		**Paraguay**	57.40 W	25.15 S
	21	Asuncion		
51		**Peru**	74.15 W	13.10 S
	54	Arequipa	71.32 W	16.25 S
	14	Lima	77.03 W	12.06 S
63		**Phillipines**	124.35 E	12.29 N
	2	Manilla	120.58 E	14.37 N
48		**Poland**	19.28 E	51.49 N
351		**Portugal**	8.05 W	40.31 N
	1	Lisbon (Lisboa)	9.08 W	38.44 N

Table F-1
(9 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
974		**Quatar**	51.36 E	25.15 N
40		**Romania**	22.55 E	45.33 N
	0	Bucharest (Bucuresti)	26.07 E	44.25 N
670		**Saipan**	145.45 E	15.12 N
39	549	**San Marino**	12.26 E	43.56 N
966		**Saudi Arabia**	46.46 E	24.39 N
	2	Jeddah	39.10 E	21.30 N
	4	Medina	39.35 E	24.30 N
	1	Riyadh	46.46 E	24.39 N
221		**Senegal**	14.80 W	15.20 N
65		**Singapore**	103.47 E	1.23 N
27		**South Africa**	23.47 E	29.04 S
	21	Cape Town	18.28 E	33.56 S
	11	Johannesburg	28.02 E	26.10 S
	12	Pretoria	28.12 E	25.45 S
34		**Spain**	3.36 W	39.36 N
	3	Barcelona	2.10 E	41.25 N
	28	Las Palmas (Canary Is.)	15.27 W	28.08 N
	1	Madrid	3.43 W	40.25 N
	54	Seville	5.59 W	37.24 N
	6	Valencia	0.24 W	39.29 N
94		**Sri Lanka**	80.40 E	7.17 N
	1	Colombo	79.52 E	6.55 N
597		**Suriname**	55.27 W	4.15 N
46		**Sweden**	17.10 E	61.19 N
	31	Goteborg	12.00 E	57.45 N
	8	Stockholm	18.05 E	59.20 N

Table F-1
(10 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
41		**Switzerland**	8.12 E	46.44 N
	31	Berne	7.26 E	46.57 N
	22	Geneva	6.09 E	46.13 N
	41	Lucerne	8.17 E	47.03 N
	1	Zurich	8.33 E	47.23 N
886		**Taiwan**	120.40 E	24.09 N
	6	Tainan	120.14 E	23.01 N
	2	Taipei	121.32 E	22.05 N
66		**Thailand**	101.09 E	17.34 N
	2	Bangkok	100.30 E	13.44 N
216		**Tunisia**	10.25 E	33.24 N
	62	Bizerte	9.52 E	37.18 N
	61	Tunis	10.13 E	36.50 N
90		**Turkey**	30.17 E	38.28 N
	41	Ankara	32.50 E	39.55 N
	1	Istanbul	28.57 E	41.02 N
	51	Izmir	27.10 E	38.25 N
971		**United Arab Emirates**	54.02 E	23.07 N
	2	Abu Dhabi	54.25 E	24.28 N
	6	Ajman	55.26 E	25.23 N
	4	Dubai	55.17 E	24.14 N
	70	Fujairah	56.20 E	25.10 N
	77	Ras-Al-Khaiman	55.56 E	25.48 N
44		**United Kingdom**	1.05 W	52.38 N
	232	Bellfast N. Ireland	5.50 W	54.40 N
	222	Cardiff Wales	3.13 W	51.30 N
	31	Edinburgh Scotland	3.13 W	55.57 N
	41	Glasgow Scotland	4.15 W	55.53 N
	51	Liverpool England	2.55 W	53.25 N
	1	London England	0.10 W	51.30 N

Table F-1
(11 of 11)
Dial Codes Beyond Continental United States

Country Code	City or Area Code	Location	Longitude,	Latitude
598		**Uruguay**	56.31 W	33.22 S
	2	Montevideo	56.10 W	34.55 S
	42	Punta del Este	54.58 W	34.59 S
58		**Venezuela**	66.01 W	8.38 N
	2	Caracas	66.56 W	10.35 N
	61	Maracaibo	71.37 W	10.44 N
967		**Yemen Arab Republic**	44.30 E	14.33 N
38		**Yugoslavia**	19.05 E	43.34 N
	11	Belgrade	20.30 E	44.50 N
	50	Dubrovnik	18.07 E	42.40 N
	41	Zagreb	15.58 E	45.48 N

Uniform Alarm Interface G

Overview

The 6800 Series NMS Uniform Alarm Interface (UAI) feature allows transfer of alert information to a StarKeeper (SK) Network Management System or to an ACCUMASTER Integrator (AMI).

With the UAI feature, you can specify on a per-device basis whether or not alert information should be sent. In addition, the NMS Uniform Alarm filters can be set to allow only certain alert types to be sent.

The 6800 Series NMS supports both basic and enhanced versions of UAI. Basic UAI is used when transferring alert information to AMI versions prior to 2.0 or to SK versions prior to 3.0. Enhanced UAI is used when transferring alert information to AMI versions 2.0 or later, or SK versions 3.0 or later.

Configuring the Uniform Alarm Interface Feature

The following NMS configuration procedures are required to make the NMS Uniform Alarm Interface feature operational. (The receiving system must also be configured to support a uniform alarm interface connection.)

1. Specify the following UAI connection information for NMS by executing the NMS Edit Uniform Alarm Interface *(eduai)* command. Include the following:

   - The login and password that will be used by the remote system to login to the NMS to receive alert information.
   - The connection parameters
   - The alert message to be sent

   (The UAI login, password, and connection information must be coordinated with the System Administrator of the receiving network management system.)

   For more information about this command, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

2. Configure the NMS UAI port by executing the Edit Port Configuration *(edpc)* command as follows:

   - Make an entry for this port in the NMS port configuration table
   - Set the UAI port's state to **enabled**

   For more information about this command, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

3. Turn on UAI authorization for each device for which alert information is to be sent across the UAI connection. UAI is authorized for a device by executing the Edit Device Profile *(eddp)* command as follows:

   - Enter **on** in the **UAI** authorization field of the device's profile

4. For more information about this command, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

5. Set the uniform alarm filter parameters by executing the Edit UAI Filter *(eduaf)* command. For each alert group/device type combination, set the filter to the desired amount of time that the alert must be active before the NMS will send alert information to a receiving system across the UAI connection.

   For more information about this command, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual*.

NOTE

If any parameters specified in the Edit Uniform Alarm Interface *(eduai)* command are changed after the UAI port is installed via the Edit Port Configurations *(edpc)* command, you must do the following to make the change take effect:

1. Remove the UAI port information from the port configuration table. To do this, execute the Edit Port Configurations *(edpc)* command, changing the **Application** field from **uai** to **none**.

2. Re-execute the Edit Port Configurations *(edpc)* command, changing the **Application** field back to **uai** and respecifying the other port parameters related to the **uai** entry.

Transmission of Alert Information

A receiving SK or AMI can log into the NMS UAI port when this port is enabled. When the receiving system is successfully logged into the NMS, the NMS will send alert (and optionally alert clear) information to the receiving system.

During times when there is no alert information to transmit, the NMS will periodically send an **I'm alive** message to the receiving system to indicate that the connection is still active even though no alert information is being transferred. If the message is not received by the receiving system within the time expected, the receiving system will drop the connection and attempt to login to the UAI port again.

The time interval at which the NMS sends an **I'm alive** message is specified in the Edit Uniform Alarm Interface *(eduai)* command. The interval must be coordinated with the receiving network management system to ensure that the NMS sends the message as frequently as the receiving system expects it.

If the UAI connection is dropped and then re-established, the user can specify that the NMS send information about currently-active alerts that occurred before the connection was re-established. Alternatively, the user can specify that the NMS send information only for alerts that occurred after the UAI connection is established. This option is specified in the **Send active alerts on restart** field in the Edit Uniform Alarm Interface *(eduai)* command.

In order for alert information to be sent, UAI authorization must be turned **on** for the device reporting the alert, and the alert must pass both the NMS processing filters and uniform alarm filters.

Depending on how the user has administered the UAI connection in the Edit Uniform Alarm Interface *(eduai)* command, the NMS will send alert information only, or both alert occurrence and alert clear information.

Alarm Text Message and Clear Text Message

The NMS user can specify the content of the UAI alarm text messages to be sent to the receiving system via the Edit Uniform Alarm Interface *(eduai)* command.

The alarm text message can include user text as well as device, network, NMS, and alert information. The alarm text message may include variable parameters which are read in from the actual network alert message or provided by the NMS. Variables within the message are denoted by number, and must be enclosed in braces when specified as part of the message. When the message is received by the other network management system, the alarm text message will be expanded, with the numbers (variables) replaced with the actual alert, device, or network information.

Table G-1 list defines the number mapping that is used when specifying variables in the alarm text message.

Table G-1
Number Mapping

Number	Parameter	Value
0	NMS Type	‘‘PARADYNE” (if using basic version of UAI); ”COM6800” (if using enhanced version of UAI)
1	NMS Id	Serial # of the NMS software
2	Alert Type	Alert type (e.g., NR, FA) reported
3	Device Type	Device Type Device type (eg., apl, ddd) of the reporting device
4	(reserved)	(reserved)
5	(reserved)	(reserved)
6	Priority	‘‘MAJOR” for a priority 1 alert ‘‘MINOR” for a priority 2 alert ‘‘WARNING” for a priority 3 alert
7	Device Address	Link level address of the reporting device
8	Device Name	Mnemonic name of the reporting device
9	Network Name	‘‘net-xxxx”, where xxxx is the assigned network name
10	Circuit Name/ Facility Name	‘‘cir-xxxx”, where xxxx is the assigned circuit name; sent if using the basic version of UAI ‘‘fac-xxxx”, where xxxx is the assigned facility name; sent if using the enhanced version of UAI. If facility name cannot be determined unambiguously, Device Name {8} will be sent instead
11	Start Time	Date and Time (mm/dd/yyyy-hh:mm:ss) that the alert was reported to the NMS
12	Clear Time	Date and Time (mm/dd/yyyy-hh:mm:ss) that the alert was cleared
13	Alert Text	The NMS text description of the alert type

The default alarm text message is:

received alert: {2} time: {11} device: {7} circuit {10}

NOTE

The maximum length of the expanded alarm text message is 160 characters. If the expanded message exceeds this length, the message will be truncated at 160 characters. If the basic version of UAI is used, the parameters {2}, {7},{10} and {11} MUST be included in the alarm text message in order for the alert information to be properly handled by the receiving network management system.

The NMS user can specify whether a UAI message should be sent to the receiving system when an alert clears via the Edit Uniform Alarm Interface *(eduai)* command. The clear text message can include user text as well as device, network, NMS, and alert information. The message may include variable parameters which are determined from the actual network alert message or provided by the NMS. Variables within the message are denoted by number, and must be enclosed in braces when specified as part of the message. When the message is received by the other network management system, the clear text message will be expanded, with the numbers (variables) replaced with the actual alert, device, or network information. The number mapping used when specifying variables in the clear text message is the same mapping as used for the alarm text message; see the previous number/parameter list.

The default clear text message is:

cleared alert: {2} time: {12} device: {7} circuit {10}

NOTE

The maximum length of the expanded clear text message is 160 characters. If the expanded message exceeds this length, the message will be truncated at 160 characters. If the basic version of UAI is used, the parameters {2}, {7},{10} and {12} MUST be included in the clear text message in order for the alert information to be properly handled by the receiving network management system.

Basic UAI and Enhanced UAI

In configuring the NMS Uniform Alarm Interface feature, the NMS user can specify whether the NMS should use *basic* UAI or *enhanced* UAI. This is done by specifying either **basic** or **enhanced** in the **Alert reporting option** field of the Edit Uniform Alarm Interface *(eduai)* command.

With the enhanced version of UAI, the NMS will send any and all of its defined alert types as they are known by the NMS. With the basic version of UAI, the NMS first maps each alert type into one of twenty-five alarm types before transporting the alert information to the receiving system.

NOTE

If the receiving network management system is Release 2 or later of the ACCUMASTER Integrator or Release 3 or later of the StarKeeper NMS, enhanced UAI should be used. For backward compatibility with older versions of StarKeeper or the AMI, basic UAI should be used. A list of the basic/enhanced alert mappings is included in Table G-2 in the *Network Monitor UAI Indicator* section.

Uniform Alarm Filters

Uniform alarm filters are used to determine which alerts should be sent across the UAI connection. An alert must pass both the processing filter and uniform alarm filter before it will be sent. As with other alert filters, the uniform alarm filter parameters can be changed on a per-device type, per-alert group basis. In addition, device exceptions can be created such that alerts from a particular device or group of devices will be filtered differently than those from other devices of the same device type.

Port Configuration

The UAI port information specified in the port configuration table is used to determine the port parameters associated with the UAI connection. The UAI connection must be a dedicated connection; any port speed supported by the NMS can be used.

If you change from basic UAI to enhanced UAI (or vice-versa) after the UAI port has been installed via the Edit Port Configuration *(edpc)* command, you must do the following to make the change take effect:

1. Remove the UAI port information from the port configuration table. To do this, execute the Edit Port Configurations *(edpc)* command, changing the **Application** field from **uai** to **none**.

2. Re-execute the Edit Port Configurations *(edpc)* command, changing the **Application** field back to **uai** and respecifying the other port parameters related to the **uai** entry.

UAI Authorization in Device Profiles

Device profiles for supported devices contain a **UAI** authorization field. The entry in this field must be **on** in order for alerts from the device to be sent across the UAI connection.

Network Monitor UAI Indicator

On the Network Monitor, the indicator UAI will be displayed in the alert entry if

1. UAI authorization for the device reporting the alert is turned on

2. The alert has passed the uniform alarm filter

3. The UAI port is enabled

Table G-2 lists 6800 alert type mappings for both Basic UAI and Enhanced UAI. Items under the columns ALERT TYPE (ENHANCED) are the types as they are referenced on the 6800, and as they are sent to a destination system using Enhanced UAI. Items under the columns FAULT TYPE (BASIC) are the two-letter abbreviated alert types into which 6800 alerts are mapped and sent when basic UAI is used.

Table G-2
(1 of 4)
UAI Alert Type to Fault Type Mapping

Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)
00.00	NR	19.00	RS	48.20	CG
00.01	CG	19.01	HW	48.21	CG
01.00	RS	19.02	CG	48.22	CG
02.00	RS	19.03	PD	48.23	CG
03.00	RS	19.04	CM	50.00	DM
04.02	RS	19.05	CM	50.01	DM
04.03	RS	19.06	CM	50.02	DM
04.04	RS	19.07	CM	50.03	DM
04.05	RS	19.08	CM	50.04	RS
04.06	RS	19.09	CM	50.05	CG
04.07	RS	19.10	CM	50.06	CG
05.00	RS	19.11	CM	50.07	CG
06.00	RS	19.12	PD	50.08	CG
07.00	DS	19.13	CM	50.09	RS
08.00	DS	19.14	RS	51.00	FA
09.00	PD	19.15	RS	51.01	FA
10.00	DS	19.16	RS	51.02	FA
11.00	RS	19.17	NA	51.03	FA
12.00	DS	19.18	CM	51.04	FA
12.01	MM	19.19	CM	51.05	FA
13.00	MM	20.00	PD	51.06	FA
13.01	MM	21.00	PD	51.07	FA
14.01	PD	22.00	PD	51.08	RS
14.02	PD	23.12	PD	51.10	SF
14.03	PD	23.13	PD	51.11	SF
14.04	PD	23.14	PD	51.12	SF
14.05	FA	40.00	DA	51.13	SF
14.06	FA	41.00	CG	51.14	CL
14.07	FA	42.00	PD	51.15	CL
14.08	FA	42.01	PD	51.16	CL
14.09	FA	42.02	PD	51.17	CL
14.10	FA	42.03	PD	51.18	CL
14.11	FA	42.04	PD	51.19	CL
15.00	CM	42.05	PD	51.20	CL
15.01	CM	43.00	PD	51.21	CL
15.10	CM	43.01	PD	52.00	FA
15.11	CM	43.02	PD	52.01	FA
16.00	CM	43.03	PD	52.02	HW
17.00	DS	43.04	PD	52.03	HW

Table G-2
(2 of 4)
UAI Alert Type to Fault Type Mapping

Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)
18.00	RS	44.00	PD	52.04	HW
18.01	HW	47.00	CG	52.05	HW
18.12	HW	48.00	CG	52.06	PD
18.14	RS	48.12	CG	52.07	PD
18.17	RS	48.14	CG	52.08	CG
18.19	HW	48.19	CG	52.09	CG
52.10	PM	54.03	HW	64.01	FA
52.11	PM	54.04	HW	65.00	SF
52.12	PM	54.05	HW	65.01	SF
52.13	PM	54.06	CL	65.02	SF
52.14	PM	54.07	HW	65.03	SF
52.15	PM	54.08	CL	65.04	SF
52.16	PM	54.14	PM	65.05	SF
52.17	PM	55.00	PF	66.00	SF
52.18	FA	55.01	PF	66.01	SF
52.19	FA	55.02	PF	67.00	SF
52.20	FA	55.03	PF	67.01	SF
52.21	FA	55.04	PF	68.00	SF
52.22	PF	55.05	PF	68.01	SF
52.23	PF	55.06	HW	69.00	FA
52.24	PF	55.07	PM	69.01	FA
52.25	PF	55.08	RS	70.00	DS
52.26	PF	55.09	RS	70.01	DS
52.27	PF	55.10	HW	71.00	DS
53.00	RS	55.11	HW	71.01	DS
53.01	HW	55.12	PF	72.00	DS
53.02	HW	55.14	DS	72.01	DS
53.03	HW	55.15	DS	73.00	DS
53.04	HW	55.16	DS	73.01	DS
53.05	HW	55.17	DS	74.00	PD
53.06	HW	55.18	DS	74.01	PD
53.07	HW	55.19	DS	75.00	CG
53.08	HW	55.20	DS	75.01	CG
53.09	PD	55.21	DS	76.00	FA
53.10	PD	55.23	CL	76.02	HW
53.12	PD	55.24	CL	76.04	FA
53.13	DS	55.25	CL	76.06	FA
53.14	MM	55.26	CL	77.00	FA
53.15	DS	60.00	FA	77.02	HW

Table G-2
(3 of 4)
UAI Alert Type to Fault Type Mapping

Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)
53.16	CL	60.01	FA	77.04	FA
53.17	HW	60.02	FA	77.06	FA
53.18	HW	60.03	FA	78.00	FA
53.19	HW	60.04	FA	80.00	HW
53.20	HW	60.05	FA	80.01	HW
53.22	PD	61.00	FA	81.00	HW
53.23	PD	61.01	FA	81.01	HW
53.24	PD	62.00	FA	82.00	PM
53.25	PD	62.01	FA	82.01	PM
54.00	DS	63.00	FA	82.02	PM
54.01	HW	63.01	FA	82.03	PM
54.02	RS	64.00	FA	82.04	PM
82.05	PM	92.18	CL	fd	MM
82.06	PM	92.19	CL	frs	HW
82.07	PM	92.20	CL	ht	HT
83.00	FA	92.21	CL	mb	DF
83.01	FA	92.26	CL	md	MD
84.00	CG	92.27	CL	message	MM
84.01	CG	92.28	CL	mm	MM
85.00	PF	92.29	CL	na	NA
85.01	PF	93.00	HW	nr	FA
85.02	PF	93.01	HW	pci	RS
85.03	PF	94.00	CL	pf	NR
85.04	PF	94.02	CL	pl-ok	FA
85.05	PF	94.30	HW	pollpf	PF
86.00	DS	am	AM	pd	MM
86.01	DS	aplc	HW	rps	PM
86.02	DS	aplo	HW	rs	RS
86.03	DS	as	FA	sl	DF
86.04	DS	bf1	DF	sr	SR
86.05	DS	bf2	DF	tdm	PF
86.06	DS	bf3	DF	th	FA
86.07	DS	bf4	DF	time	DF
87.00	CL	bf5	DF	tm	TM
87.01	CL	bf6	DF	trnc	RS
88.00	CL	bf7	DF	dcre	EL
88.01	CL	bf8	DF	cbo	EL
90.00	HW	busy	FA	87.02	CL
90.01	HW	ccn	RS	87.04	CL

Table G-2
(4 of 4)
UAI Alert Type to Fault Type Mapping

Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)	Alert Type (Enhanced)	Fault Type (Basic)
91.00	HW	cm	CM		
91.01	HW	da	DA		
92.00	CL	dbc	MM		
92.01	CL	dbo	MM		
92.02	CL	dbu	DC		
92.03	CL	dc	DC		
92.04	CL	dd	DC		
92.05	CL	ddd	CM		
92.06	CL	df-dbm	DF		
92.07	CL	df	DF		
92.08	CL	dl	DL		
92.09	CL	dm	DM		
92.10	CL	ds	DA		
92.11	CL	dsab	MM		
92.12	CL	dttf	FA		
92.13	CL	el	EL		
92.16	CL	evtpf	PF		
92.17	CL	fa	FA		

Table G-3 lists 6800 alert type mappings for both Basic UAI and Enhanced UAI as they relate to alerts received from the Bytex Unity Management System (UMS). Items under the columns ALERT TYPE (NMS) are the types as they are referenced on the 6800. Items under the columns ALERT TYPE (ENHANCED) are the types as they are sent to a destination system using Enhanced UAI. Items under the columns FAULT TYPE (BASIC) are the two-letter abbreviated alert types into which 6800 alerts are mapped and sent when basic UAI is used.

Table G-3
NMS Alert Type to UAI Alert Type to Fault Type Mapping

Alert Type (NMS)	Alert Type (Enhanced)	Fault Type (Basic)
bytex-switch-p1	swthp1	HW
bytex-switch-p2	swthp2	HW
bytex-switch-p3	swthp3	HW
sftw-err-p1	swerrp1	MM
sftw-err-p2	swerrp2	MM
sftw-err-p3	swerrp3	MM
msg-corruption	msg-cor	HW
biem-link-up	bmup	MM
biem-link-down	bmdown	MM
biem-unk-event	bmevent	MM

Table G-4 lists the 6800 alert type mappings for both Basic UAI and Enhanced UAI as they relate to alerts received from the SNMP Manager system. Items under the column ALERT TYPE (NMS) are the types as they are referenced on the 6800. Items under the column ALERT TYPE (ENHANCED) are the types as they are sent to a destination system using Enhanced UAI. Items under the column FAULT TYPE (BASIC) are the two-letter abbreviated alert types into which the 6800 alerts are mapped and sent when Basic UAI is used.

Table G-4
NMS Alert to UAI Alert Type to Fault Type Mapping For the SNMP Manager

Alert Type (NMS)	Alert Type (Enhanced)	Fault Type (Basic)
link-down	link_dwn	HW
information	info	HW
msg-corruption	msg-cor	HW
unk-event	unk-evt	HW
unk-device	unk-dev	HW
cold-start	c-start	HW
warm-start	w-start	HW
neighbor-loss	n-loss	HW
auth-fail	au-fail	HW
major	major	HW
minor	minor	HW
link-up	link_up	HW

File Export to ACCUMASTER Integrator H

Overview

The 6800 Series NMS File Export feature utilizes the UNIX® **uucp** (unix-to-unix file copy) utility to transport configuration files from the 6800 to the ACCUMASTER Integrator (AMI). These files contain selected information from the NMS device, site, and facility profile databases.

The **uucp** utility is invoked by the Send Export File *(snef)* command. Two additional NMS commands, Create Export File *(cref)* and Delete Export File *(dlef)*, are used to create and delete export files. Another new NMS command, Export File Configuration *(efc)*, is used to specify NMS port and connection information needed to establish an NMS-to-AMI file export connection.

Configuring the NMS for File Export

Steps required for configuring the 6800 Series NMS for file export are outlined below.

1. Specify an NMS ID in the Edit NMS Configuration *(ednmsc)* command input form. The name specified in the command form must correspond to the EMS name used for provisioning on the AMI.

2. Specify file export connection and port information in the Export File Configuration *(efc)* command input form. The user must specify:

   - The 6800 port number to be used for the file export connection
   - The type of connection (direct or ddd) to be used
   - The modem type (if a dial-up connection is used)
   - The operating speed of the port or modem
   - The name of the receiving AMI (this must be the AMI host name—not an AMI workstation name)
   - The password of the **nuucp** login on the AMI
   - The telephone number of the remote modem (if a dial-up connection is used)

Modem Settings

For a dial-up connection, the AMI-side modem must be optioned for auto answer; the NMS-side modem must be optioned for auto dial. Other option settings (e.g., speed, error control) must be compatible between the two modems. Listed in Table H-1 are att2224ceo modem option settings for a dial-up file export connection:

Table H-1
att2224ceo Modem Option Settings

Modem	S1-1	S1-2	S1-3	S1-4,5,6	S1-7	S1-8	o7	o12	o34	o51
NMS end	D	D	D	DUD	D	D	n	y	1	y
AMI end	D	D	D	DUD	D	D	y	y	1	y

Listed in Table H-2 are the att2224ceo switch and option settings.

Table H-2
att2224ceo Switch and Option Settings

S1-1	D: CTS and CD follow DTR U: CTS and CD follow EIA RS-232-C standard
S1-2	D: Option changes enabled U: Option changes disabled
S-3	D: Enter command mode with carriage return U: Enter command mode with at or atz sequence
S1-4,5,6	Control speed and mode. (DUD is 2400 async operation)
S1-7	D: Modem interprets commands sent by DTE U: Modem ignores commands sent by DTE
o7	Auto answer enabled
o12	Transparent data mode enabled
o34	(o34=1) operate as standard modem without error control
o51	CTS controlled by RTS

Location Object Class

Data from the NMS site profiles will be mapped into the LOCATION object of the AMI File Import (FI) data as shown in Table H-3.

Table H-3
LOCATION Object Class

NMP Message Element	Corresponding NMS Information	Corresponding File Import Information
Location ID	Site Name	Site Name
Location Type	CUSTOMER	0 (Customer)
Location Details	Site Contact Name, when present Site Contact Name, when present	Site Contact Number, when present Site Contact Phone Number, when present Site Contact Address, when present
	NULL, when neither present	NULL, when neither present
Geographic Coordinates Type	NPA NXX, when Country Code is 1	2 (NPA NXX), when Country Code is 1
	Null, when Country Code is not 1	Null, when Country Code is not 1
Geographic Coordinates	First six digits of City Code, when Country Code is 1	First six digits of City Code, when Country Code is 1
	Null, when Country Code is not 1	Null, when Country Code is not 1

Equipment Object Class

Data from the device profiles will be mapped into the EQUIPMENT object of the AMI File Import data in Table H-4.

Table H-4
EQUIPMENT Object Class

NMP Message Element	Corresponding NMS Information	Corresponding File Import Information
Equipment ID	Device Name	See Table H-5
Equipment Type	See Table H-6	See Table H-6
Location Name	Site Name, when present	Site Name, when present
	Unnamed, when not present	Unnamed, when not present
State	0, when Inventory State is o or s	0, when Inventory State is o or s
	50, when Inventory State is a or l	50, when Inventory State is a or l
	150, when Inventory State is r	150, when Inventory State is r
	255, when Inventory State is i	255, when Inventory State is i
Release	Hardware/Software Version, when present	Hardware/Software Version, when present
	{not used}, when not present	NULL, when not present
Equipment Alias	First 20 characters of Device Address, when present	See Table H-5
	{not used}, when not present	See Table H-5
Key to Inventory States: a — active l — limited access r — repair s — stock o — on order i — removed		

The 6800 device information used for **Equipment ID**, **Equipment Alias**, and **Endpoint Names** message elements depends on the device mapping option specified in the NMS command Export File Configuration *(efc)*. Table H-5 specifies, for both device name and device address mappings, the 6800 information used for the NMP message elements listed.

Table H-5
Mapping for Equipment ID, Alias, and Endpoint Names

Device Mapping	Equipment ID	Equipment Alias	Endpoint Names
Address	Device Address	Device Name if Device Address is present	Device Address
	Device Name, when Device Address not present	NULL otherwise	
Name	Device Name	First 20 characters of Device Address, when present	Device Name
		NULL, when not present	

Device types will be mapped into the Equipment Types of the AMI FI data, as shown in Table H-6.

Table H-6
Mapping for Device Type and Equipment Type

Device Type	Equipment Type
56 mux	MUX-56mux
ab	DIAL-ab
acm	COMM-acm
acu	DIAL-acu
adc	MOD-adc
apl	MOD-apl
bridge	COMM-bridge
brter	COMM-brter
clst	CLST-clst
comm	COMM-snmp
dacs	DACS-dacs
dbu	DIAL-dbu
ddd	MOD-ddd
dds	MOD-dds
erth	ERTH-fep
fep	FEP-fep
host	HOST-host
macu	DIAL-macu
mux	MUX-mux
nms	HOST-nms
ntwk	SMUX-ntwk
pbx	PBX-pbx
pkt-sw	COMM-pkt-sw
prin	PRIN-prin
proc	HOST-proc
psw	SW-psw
satl	SATL-satl
snmp	COMM-snmp
srcu	COMM-srcu
swtch	SMUX-swtch
system	HOST-system
term	TERM-term
und	UNK-und
unk	UNK-unk

Circuit Object Class

Data from the facility profiles will be mapped into the CIRCUIT object of the AMI FI data in Table H-7.

Table H-7
CIRCUIT Object Class

NMP Message Element	Corresponding NMS Information	Corresponding File Import Information
Circuit ID	Facility Name	Facility Name
Endpoint Names	Device Name of devices at both endpoints	See Table H-5 of devices at both endpoints
State	255	255
Circuit Type	UNK	UNK

Deleting NMS Sites on the AMI

When an NMS device profile for a new device is loaded into the AMI database via the File Import utility, the AMI automatically creates an NMP association between the device and the site (location) to which the device belongs.

If a device profile is changed to reference a new or different location (as determined by the **Site name** field in the device profile) and then loaded into the AMI database via the File Import utility, the location change is automatically made in the AMI configuration database, but *not in the AMI graphical database*. To change the graphical location of the device, the user must manually relocate the device to the new location, using the AMI's Edit Network utility.

The fact that the graphical location of a device is not automatically changed to remain in sync with the AMI configuration database will cause a file import error if the NMS user tries to delete or change the name of a site which contained (or contains) devices. When the AMI user attempts to load the update export file, an error message will be generated. The message indicates that a child graphical object is present. This message means that even though from the NMS point of view the devices at a [deleted] site have been reassigned to another site, from the AMI graphical point of view the [deleted] site is still associated with those devices. The situation is the same with a name change, since the name change is essentially a deletion of the old site and the addition of a new site (with the new site name).

Though the AMI generates an error message, all records (except the delete site record) should load properly. All that remains is that the graphical database be updated by removing the equipment from the old (to-be-deleted) location, moving that equipment to one or more new (existing) locations, and then deleting the old location. To do this, use the following procedure:

1. Display the old location using the AMI's Edit Network utility.

2. Unassign each equipment at the old location. This is done by clicking on the equipment, then selecting **unassign** from the displayed menu. This causes the equipment to be removed from the location display.

3. Display the new location to which the equipment is to be moved.

4. Select all the equipment from the ‘‘unassigned” equipment list that belongs in the new location and move it to the new location. Each piece of equipment that was formerly assigned to the old location must be assigned to a new (existing) location.

5. Delete the old location after each piece of equipment that was formerly at the old location has been reassigned to another location.

NMS Mail Message for a Successful File Transfer

The NMS admin login will receive a mail message from uucp when an export file is successfully sent. The format of the mail message is:

REQUEST: <machine name>!/usr/nms/RNMS/file_export/<filename>--><AMI name> !”iadm/(admin)
(SYSTEM: <AMI name>) copy succeeded

The admin login may also receive a mail message if a transfer failed due to a problem (e.g., nuucp login failure, no connection) that the **uucp** utility can detect.

Therefore if a mail message is not received you should:

1. Verify that the file was NOT received by the AMI.

2. Try to resend the file. If the file was an update file, *do not re-execute the Create Export File command or make any further changes in device, facility or site profiles until the file is sent and received by the AMI*. Otherwise, the changes that were logged in the ‘‘lost” update file will be overwritten and cannot be recovered unless you create and send a new base file.

Troubleshooting and Miscellaneous Notes

If the file export connection is down when the Send Export File *(snef)* command is executed, export files will be queued at the NMS by the uucp function. When the connection is re-established, all export files which have been queued will be sent sequentially. This behavior does not cause problems when sending base files; however, if multiple update files are queued, the latest file will overwrite any previous files when the files are finally sent to the AMI. Consequently, only the changes contained in the last update file written will be retained; all others will be lost. Therefore, it is important to verify that each file sent by the NMS is received by the AMI.

If you are using device name mapping, you cannot create a device profile for a device with a link-level address longer than 21 characters.

6800 Series NMS X-Window Cut-Through

Overview

The 6800 Series NMS X-window cut-through feature provides an X-window cut-through session to any external management system on the same TCP/IP network as the 6800 Series NMS.

Cut-Through Session Restrictions

Observe the following restrictions when performing the X-window cut-through:

- The X-window cut-through from the 6800 Series NMS to any system on the TCP/IP network can be accessed only on a 6800 Series NMS full-feature workstation.
- The 6800 Series NMS allows a maximum of two cut-throughs on each full-feature workstation, independent of cut-through type.
- Any user given access to cut-through to a TCP/IP external system must have an account on the external system's host which coincides with the 6800 Series NMS login. A *.rhosts* file needs to be set up for each account wanting to perform a cut-through. Initially this file does not exists, so you must create it using a UNIX text editor. The *.rhosts* file must reside in the home directory of the user's account.

Network Configuration – 6800 Series NMS Host and UIP

To configure the 6800 Series NMS host and UIP, the following information is needed:

- Host name or the IP address of the external system.

  Ensure that this host name is also set up in the 6800 Series NMS host and UIP */etc/hosts* files by the 6800 Series NMS System Administrator.

- Task name which provides the full path to the command to be executed.

  The command is assumed to start an X-window session.

- Parameter(s) required by the task.

Perform the following steps on both the 6800 Series NMS host and the UIP, if your system is configured with a UIP:

1. Log in as **root**.

2. Add the external systems host name and the IP address to the */etc/hosts* file using a UNIX text editor (such as vi) in the following format:

   nnn.nnn.nnn.nnn (space or tab) host name

3. Add the external system's host name to the */etc/XO.hosts* file.

Perform the following steps to configure the 6800 Series NMS:

> **NOTE**
>
> The following steps must be performed with the NMS application running.

1. Execute the Edit External System Configuration *(edesc)* command.

   The input form appears.

2. Using the following information, fill in the *edesc* input form:

   - Enter **sm** in the **Type** field.
   - Enter a cut-through name to be assigned to the external system in the **Name** field.
   - Enter the host name/IP address.
   - Enter the task name. This is the task name that will remotely execute on the external system host.
   - Enter the parameter that may be required by the task.
   - Enter **0** in the **Port group** field. The default is **0**.

3. Execute the Edit User Profile *(edup)* command or Create User Profile *(crup)* command to grant permissions to NMS users to cut-through to the external system. Access to an external system can be granted to a user by specifying the name of the external system (or the keyword **all**) in the **External Systems** field on the user profile form.

4. For brouter/SNMP devices, specify the cut-through name in the **External System** field on the device profile form. This will allow cut-through from the 6800 Series NMS network map.

For details on the *edesc, edup, crup, crdp, and eddp* commands, refer to the *COMSPHERE 6800 Series Network Management System Core Command Reference Manual.*

Network Configuration — 6800 Series Full-Feature Workstations (Running X-One Server)

On each 6800 Series NMS full-feature Sun Workstation (Altos 486DX/33, Altos SX/20, or generic 386/486 PC) from which cut-through to a TCP/IP external system will be allowed, add the external system's host name and IP address to the *\XONE\HOSTS* file.

Note that the full-feature workstations must have a 1 Mb video card supporting 256 colors. For more information, see the *COMSPHERE 6800 Series Network Management System Installation and Maintenance Guide*.

Network Configuration — 6800 Series NMS Sun Workstations

On each 6800 Series NMS full-feature Sun Workstation from which cut-through to a TCP/IP external system will be allowed, perform the following steps:

1. Log in as **root** on the Sun Workstation.
2. Add the external system host name and IP address to the */etc/hosts* file.
3. Add the following command to the */usr/bin/Startup* file:

   xhost+<*sm100host*>

This command must be inserted on a line by itself before the line containing the **rsh** (remote shell) command.

Glossary

active alert	An alarm, abnormal status condition, or event occurrence that is currently being reported to the NMS. Once the alert is cleared, it becomes a historical alert and is no longer considered active by NMS.
ACU	Automatic Call Unit.
adaptive rate control	A feature of certain 3400 Series modems that allows a pair of modems in point-to-point applications to adjust their signaling rate automatically based on current line conditions. The highest signaling rate possible is maintained without operator intervention.
ADC	ANALYSIS Data Concentrator.
ADR	Alert-Driven Routine, a routine that is triggered for execution by the arrival of an alert to the NMS.
Advanced diagnostic protocol (ADp) mode	The network management protocol used by the COMSPHERE 6800 Series NMS. It provides diagnostic communication to the network.
aggregate link	The logical termination of a facility at an ACCULINK 740 multiplexer.
aggregate link module	The ACCULINK 740 multiplexer hardware that provides aggregate link interface control. Aggregate link modules are on the front card in the multiplexer carrier.
aggregate link interface module	The ACCULINK 740 hardware module that physically terminates a T1 facility. Aggregate link interface modules are on the back card in the multiplexer carrier.
alarm	An abnormal condition affecting modems, multiplexers, and data services units, usually requiring attention. Major alarms indicate a service disruption; minor alarms are less severe, but are indications of a developing problem.
alert	An occurrence of interest within the network. Alerts include alarms and change of status experienced by modems and Data Service Units, as well as alarms experienced by multiplexers, and event messages reported by multiplexers.

alert-driven routine (ADR)	A routine, consisting of a list of commands, performing a specific process in response to a particular alert.
alert export	A feature permitting the export of alert data to external systems.
alert filtering	A feature that times or judges each alert and passes it only if the alert exceeds the specified duration threshold or other criteria. The network management system features processing display, storage, and automated action filters. A type of error control for data transmission in which the receiving device can detect and correct characters or blocks of code containing a predetermined number of erroneous bits.
alert group	A pre-defined collection of alerts used to manage alerts for filtering purposes. An alert group may consist of one or more alerts.
analog bridge	A multiport broadcast polling bridge that is used to increase the number of dial backup units available for multipoint backup. An analog bridge can be used at either a remote tributary site or at the control modem site.
Analog Private Line (APL)	The private circuit used for data transmission. Also called 4-wire private line, private line, or leased line.
ANALYSIS	The network management system that monitors Paradyne 3400 Series modems, multiplexers, digital links, and terminal connections. The 6800 Series NMS offers cut-through access to ANALYSIS.
answering DBU	The dial backup unit that receives the first call when DDD connections are being established with another DBU.
asynchronous transmission	Data transmission in which time intervals between transmitted characters can be of any length. Transmission is controlled by start and stop elements at the beginning and end of each character.
async-to-sync (ASC)	For Model 2 modems, an option that converts asynchronous data received from data terminal equipment to data synchronized with the transmit clock for a synchronous modem port.
auto-call auto-answer (ACAA)	A circuit restoration features used on point-to-point telephone circuits that allows a station to initiate a call automatically and respond to a call automatically over a switched line.
automatic adaptive equalization	Equalization of a transmission channel that is adjusted while signals are being transmitted to adapt to changing line characteristics.
Automatic Trouble Reporting (ATR)	A feature that allows the automatic reporting of alerts to local or remote printers or terminals.
backup channel	A channel established by the DBU for data traffic during a private line failure. Consists of two 2-wire dial-up lines. Also called DDD lines.

backup session The period during which data traffic is on the backup channel, rather than on the private line. Also includes the time required to establish the dial-up connections.

basic-feature workstation A user terminal capable of supporting all 6800 Series NMS menus and forms, as well as ANALYSIS NMS, System Controller, and 839A DBU Control Unit cut-through access in a single-task environment. (See full-feature workstation.)

brouter A device used as a bridge or router utilizing the SNMP protocol.

carrier A rack mounting that contains 17 slots: 1 slot is a control slot for an SDU (or ICCU, or SRCU) and 16 slots are available for modems, DSUs and other devices. Alternately, a continuous frequency capable of being altered (modulated) to transmit information.

category A single cell within the Network Summary defined by its own set of selection criteria and reflecting the running total and severity information about the alerts which fit that selection criteria.

centralized rate control For certain 3400 Series modems, a feature allowing modems in multipoint applications to control the data rate on the circuit. When the control modem starts to operate at a specified fallback rate, the tributary modem detects this rate change and also starts to operate at that fallback rate.

channel A bidirectional DS0, voice, or data path, such as the one between devices and the network management system permitting I/O operations to occur simultaneously with computer operations. Also, a logical end-to-end connection.

channel endpoint In the multiplexer network, the specific channel terminus on the channel interface module.

channel group An end-to-end allocation of bandwidth in integer multiples of 64k in the range of 64k to 1536k.

channeling device A device in which the data coming in to or going out of a certain port or ports is distributed to or gathered from the devices attached to various other ports, such as multiplexers and control modems on a multipoint circuit.

channel interface module The multiplexer hardware module that physically terminates a channel. Channel interface modules are the back cards on the multiplexer.

channel module The ACCULINK 740 multiplexer hardware module that provides channel control. This module is the front card on the multiplexer.

circuit A logical connection between 2 devices, either point-to-point or multipoint.

circuit card assembly (CCA) A printed circuit card to which separate components have been attached.

cluster	Composite object containing a group of sites which have been aggregated together in order to avoid icon overlap on the screen.
command abbreviation	A short acronym for a command. You use the abbreviation on task menus to execute a command.
command button	An on-screen icon which is selectable with the mouse. Selection of a command button invokes a specific pre-defined function from a full-feature workstation. Command buttons are used to invoke application-specific commands and basic commands (e.g., logoff, refresh, etc.).
command key	One of the keyboard function keys (F1 through F8). Pressing a function key invokes a specific pre-defined function. Command keys are used to invoke application-specific commands (e.g., previous field, main menu) from the keyboard.
composite object	An object on the network map which contains or is composed of other objects. For example, a site may contain network devices.
configuration management	The storage, administration, and synchronization of data concerning a network; e.g., device, facility, connectivity, user, and vendor data.
control channel	A diagnostic transmission path between the NMS and collocated control modems or other control devices.
control device	A modem or DSU that communicates with several remote modems or DSUs (called tributary modems) over one channel. The control modem/DSU polls tributary modems/DSUs for health and status.
cut-through access	A type of access or terminal emulation from a window or NMS to another computer system.
database	A logical collection of information.
datagram	A data packet used to implement message transmissions between multiplexers and NMS; these can include alerts, configuration, commands, etc.
Data Communication Equipment (DCE)	Equipment such as APL modems, DSUs, DBUs, and DDD modems supported by the 6800 Series NMS.
DATAPHONE II diagnostic protocol mode	The diagnostic mode that provides for networks containing only DATAPHONE II devices and DATAPHONE II NMS, or networks containing a mixture of AT&T DATAPHONE II modems (with NMS) and AT&T Paradyne Model 2 modems (with 6800 Series NMS). Also referred to as mixed mode.
data service unit (DSU)	A DCE device that interprets, interfaces, and provides timing and signal control between a DTE device and a digital network.
Data Terminal Equipment (DTE)	Any piece of equipment at which a communications path begins (source) or ends (sink). This equipment provides the protocol for communication (e.g., host computer, terminal).

default	A condition, state, or value in effect unless the user specifically changes it.
deiconification	The transformation of an iconified window back into a full-size window caused by clicking on an icon.
device group	A user- or system-defined group of devices.
device profile	In the 6800 Series NMS, a record containing configuration data for each device on the network.
diagnostic channel (DC)	A diagnostic connection between collocated tributary modems and control modems. It is used to transmit tests and commands downstream and to transport diagnostic information upstream to the 6800 Series NMS. Physically, this channel can be either a dedicated link or multiplexed with another data link.
diagnostic compatibility	The ability of a product to coexist in diagnostic networks composed of products of other types, to send interpretable alarm information upstream, and to receive and execute commands from other devices. For example, DATAPHONE II and Model 2 modems are diagnostically compatible.
Diagnostic Control Device (DCD)	The common term used for any DATAPHONE II network management device – Level II (Diagnostic Console), Level III (Network Controller), and Level IV (System Controller).
Diagnostic Control Processor (DIAG)	A diagnostic microcomputer processor used by 3400 Series modems to perform real-time transmission line measurements, modem performance monitoring, and complete modem/terminal interface monitoring.
diagnostic network	A network used to transmit network control, monitoring, and testing information between devices in the network and the network management system. It shares the same physical transport facilities as the primary data network.
diagnostic tree	A network of devices, distinct from the primary data transmission network, that originates with a local device on the control channel and extends to the remote termination points. (See control channel.)
dial backup	A method of restoring service for data communications during a private line failure by switching the data traffic to the public telephone network.
Dial Backup Unit (DBU)	A device used to establish a data channel on the public telephone network and to switch data traffic there during a failure of the private line data channel. (See Dual-Call AutoAnswer.)
Digital Access Cross-Connect System (DACS)	A cross-connect device for T1 facilities, allowing for the establishment of cross-connects between individual DS0 channels in different T1 circuits.

Direct Distance Dialing (DDD)	The DDD network is also known as the public switched network. (See APL.)
Digital Data Service (DDS)	Within AT&T and the Bell Operating companies this acronym stands for DATAPHONE Digital Service. More commonly, it is used for Digital Data Service.
digital signal level 0 (DS0)	A 64 kbps digital telecommunications signal or channel.
digital signal level 1 (DS1)	A digital signal transmitted at the rate of 1.544 Mbps.
downstream	In extended networks, the direction in which diagnostic messages flow from the diagnostic control site to any intermediate links and then to the final tributary modem.
Dual-Call Auto-Answer (DCAA)	The integral 4-wire APL dial backup module for remote-site housings that automatically answers two incoming calls and switches the modem's voice frequency connection from leased to dial telephone lines.
Dual-Tone Multi-Frequency (DTMF)	A signaling method using two voice frequencies to designate the tones used for touch-tone dialing, as distinguished from pulse dialing.
elastic store	A form of buffering between collocated data communications devices in complex networks; required to maintain timing synchronization for data transmission in the entire network.
event	Within a network, an occurrence of interest that is reported via an event message.
event log printer	A printer connected to the Network Administration Port on the ACCULINK 740 and 745 multiplexers, used to print messages of real-time events from a node's event log.
facility	The physical connection of two devices without any intervening devices (e.g., a T1 facility, which can connect two multiplexers).
facility profile	In the 6800 Series NMS, a record containing data that describes the connections and facilities that connect the devices in the network.
4-wire private line	A dedicated data communications channel with separate transmit and receive pairs, dedicated to one user only.
front-end processor (FEP)	A device that provides the interface between DCEs or other types of major computer equipment with an input/output bus or storage device, and a data processing computer.
full-feature workstation	A user terminal with bit-mapped graphics capability that is connected to a network management system processor via a 10baseT local area network (LAN). It supports all NMS features in a multitasking environment. (See basic-feature workstation.)

full duplex The capability to transmit in two directions simultaneously.

half duplex The capability to transmit in two directions, but not simultaneously.

hold time An alert indicating a DDD modem repeatedly answers and enters the data mode but drops the connection before a useful exchange of information can take place.

iconification The transformation of a window into a small rectangular object on the screen caused by clicking on the iconify icon.

identity Information about a particular data communications device, consisting of serial number, model number and software version number.

INFORMIX The relational database management system used by NMS.

key sequence A combination of keyboard keys which must be selected simultaneously to invoke a specific pre-defined function. Key sequences are used to invoke basic commands (e.g., logoff, tasks, refresh, etc.) from the keyboard.

line signal compatibility The ability of one product to communicate over a line (facility) with another product. For example an AT&T Paradyne 3400 Series Model 1 modem at one end of a facility can communicate with a Model 2 modem at the other end.

link The physical endpoint of a facility connecting two T1 multiplexers. For Map uses, a graphical representation of composite object.

link delay The estimated roundtrip delay in a diagnostic link immediately downstream from the specific modem.

link-level address Address for a particular device that is a concatenation of network addresses. It begins with the device immediately downstream from the starting device (control channel address), includes all intermediate devices, and ends with the destination device. Also known as sequential address.

local address In DATAPHONE II diagnostic mode, the address of a device on the control channel. It is derived from the shelf/slot numbers for DATAPHONE II devices and from the network address for Model 2 modems. The latter is assigned by the user.

local area network (LAN) Local area network, such as TCP/IP. A type of high-speed data communications arrangement in which all segments of the transmission medium are in an office environment under the control of the network user.

long-form addressing Addressing scheme used in networks in which the addresses of all intermediate devices, including the tributary modems, are included in the address of the downstream device.

mnemonic addressing	The identification of system components by a customer-defined, easy-to-remember, alphanumeric name, e.g., nyc1.
modem	A device that converts signals for transmission (modulator) and receives signals for delivery (demodulator).
modem-sharing device (MSD)	The device that allows multiple terminals to share one modem thereby reducing the number of modems and transmission lines required.
Multidrop Auto-Call Unit (MACU)	An ANALYSIS controlled device that permits sharing of dial backup units among 3400 Model 1 APL modems.
multiplex	To combine many low-speed data sources into a single, high speed serial data stream. The data is coded at transmission, and decoded at reception. Some multiplexing techniques include Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), and Statistical Multiplexing (Stat MUX).
multiplexer	The device used to combine a number of individual channels into a common bit stream for transmission.
multipoint circuit	A special type of circuit where one control device communicates in a broadcast mode with one or more tributary devices. Communication from a tributary device is always directly to the control device, and not to any of the other tributary devices.
NetCare/NVI	AT&T Paradyne's open architecture software running under IBM's NetView/PC Program Product. It provides a service point from which all AT&T Paradyne network alarms for IBM NetView users are displayed.
network	In the broad sense, all modems, multiplexers, and facilities interconnected for diagnostics and control by the network management system. In a restricted sense (e.g., addressing), all modems connected to the same control channel. The network for 6800 Series NMS is defined to be all devices downstream from the NMS.
network address	The user-assigned identification number for a particular device. The network address is used by a node to communicate with other nodes connected to it.
Network Administration Port (NAP)	An RS-232 port on a 745 or 740 multiplexer providing control access to the ACCULINK Series 700 multiplexer network. It can be configured to interface with any ASCII terminal, printer, or the 6800 Series NMS.
network data	The site profile data that describes the physical location of network devices and vendor profile data that describes the providers of equipment, facilities, or services for the network.
network delay	The sum of all link delays downstream from a given modem.

Network Hub Unit (NHU) — A device that permits the expansion of the StarLAN network by connecting workstations and processors in a star configuration.

network map — A feature of the 6800 Series NMS that provides views of the network configuration at various levels. It supports Geographic Maps, Connectivity Maps, and an Object List.

Network Monitoring Unit (NMU) — A front-end microprocessor providing the diagnostic interface between the modem network and the NMS processor. It is used to poll control modems for network health and status, and to send user-initiated tests and commands to specific network devices. An NMU can be internal to an NMS processor or external, or a standalone unit.

network view — A view of the network map which displays all the sites in the network.

node — A device on a diagnostic tree. (See diagnostic tree.) A multiplexer such as a 740, 745, or 719, with built-in packet switching and control network software.

operation — Any task, function, or routine which can be performed by the system when instructed to do so.

personal routine — A group of 6800 Series NMS commands or tests, identified by a common name, that can be accessed or executed only by the network management system user who created the group of commands. (See system routine.)

personality module — An AT&T Paradyne modem component that characterizes the modem's speed, features, and applications.

point-to-point circuit — A single data transport channel connecting two modems and their associated peripherals. (See multipoint.)

polling — The continuous process by which NMS solicits information network. Health, status, and test results through this process.

port address — The identification of a port for DATAPHONE II devices on the control channel. For Model 2 modems operating in DATAPHONE II diagnostic mode, the port address is always 1.

primary data network — A network used to transport data from terminal to computer or from computer to computer. It shares the same physical transmission facilities with the diagnostic network.

priority display — A transient display which requires an immediate user response. You will not be able to proceed with normal task interaction until you respond to the priority display.

profile — A view from a database. Data are stored internally within NMS in INFORMIX database tables. Profiles are used to group portions of those tables into a specific class for presentation and management to the user.

protocol mode	The operational state in which a device communicates with other devices and NMS. The protocol mode determines the format and types of messages that are communicated within the network. There are three types of protocol modes for modems and DSUs: DMC, DATAPHONE II, and Advanced (ADp). NMS does not support the DMC mode.
Public Switched Telephone Network (PSTN)	The dial-up network intended for general telephone use. Distinguished from 4-wire private line network. Also called DDD or switched network.
report	The textual presentation of information in a format designed to solve some problem. Graphic reports can be presented using character graphics or bit-mapped graphics.
resident display	A display that remains on the screen until you take specific action (i.e., closing the resident display window or logging off the system) to cause the display to be removed. Selecting selectable items from a resident display does not cause the resident display to be removed. These displays are used to display list items. (See list.)
response time	The elapsed time between a device receiving the first character of a message and the receipt of the first character of the reply. (See network delay.)
restoral device	Any device which is strictly used for data communication restoral. This includes devices with boards which perform restoral functions, etc.
results queue	The queue containing results entries from scheduled routines, commands, tasks, etc.
routine	A group of commands under a single name which can be scheduled, or executed, at your discretion. User-defined (personal) and system routines are available in the 6800 Series NMS.
routing table	A table used by a node to route traffic to another node in the multiplexer network.
scheduling	The ability to mark a transaction or command for execution at a specific time and/or for repeated execution.
secondary channel	A diagnostic channel connecting a control modem to a tributary modem.
select	The choosing of an element in a window using the left button (for map users, the left and middle buttons) on the mouse.
selection criteria	A set of information used to determine a subset of alerts. Selection criteria may consist of such information as device addresses, models, device types, alert types, alert groups, and alert severities.
selection filter	A form containing various fields from the trouble ticket which is used to narrow down the trouble ticket for presentation.

sequential address — The concatenation of the network addresses of all nodes between two nodes, beginning with the control channel address and ending with the node itself. (See link-level address.)

Service Restoration Carrier (SRC) — A 4400 Series Carrier that provides the capability to share analog line-side application modules among any of up to 64 APL modems residing in the same or different cabinets.

Service Restoration Control Unit (SRCU) — A module that provides the interface between the NMS and the devices in the Service Restoration Carrier.

session — In 3270 terminal emulation, a logical connection between your terminal and a mainframe computer.

shared DBU — A DBU that is not dedicated to a particular circuit and may be used for the backup of any circuit link that has a collocated device as needed. It is shared among many devices and circuits.

Shared Diagnostic Unit (SDU) — A circuit card that plugs into a dedicated slot in the COMSPHERE 3000 Series Carrier to provide the shared diagnostic control panel and network management interfaces to the modems and DSUs in the carrier. It translates the network management protocol to the devices in the carrier and routes incoming messages to the appropriate devices.

site profile — In the 6800 Series NMS, a record containing data describing the physical location of network devices.

short-form addressing — Addressing scheme used in DATAPHONE II networks in which the network addresses of the G2 (outboard) and G4 (backbone) tributary modems are left out of the address sequence for devices downstream from those tributaries.

6800 Series Network Management System (NMS) — An AT&T Paradyne automated network management system that allows an operator to monitor network conditions, analyze problems, and take restorative measures.

submenu — A menu which is invoked by selection of a menu item on a previous menu.

subnetwork — A collection of devices which are diagnostically connected starting from a local device (on the control channel) down to the remote termination point(s). (See secondary channel.)

Supervisory Data Link (SDL) — The connection between multiplexer nodes, used to pass network control data.

supported device — A device supported by a user's NMS. It is a device from which alerts can be interpreted by NMS or for which tests and commands can be directly accessed from the NMS.

supported facility — A facility which is connected to at least one supported device. NMS associates alert state information with supported facilities.

synchronous transmission Transmission in which the data characters and bits are transmitted at a fixed rate with transmitter and receiver synchronized. This eliminates the need for start-stop elements, thus providing greater efficiency.

system administrator The person whose profile was created at system initialization, and who is initially responsible for administrator-type activities in the system. The NMS user access structure allows the system administrator to grant other logins privileges to use specified commands and tasks.

system printer A central, shared printer connected to the 6800 Series NMS processor via a dedicated port, used to print test, command results, reports, and full-feature workstation screen dumps.

system routine A group of 6800 Series NMS tests and commands for delayed or repeated execution that has been created by a particular user and copied to the system library. It may be accessed by anyone who has a user profile on the network management system and the required command access for the commands in the routine.

terminal emulation Software that allows a session to work as if it was running a specific type of terminal; e.g., VT100 or 3270 to logically connect your terminal to a mainframe computer.

time division multiplexer (TDM) A device that enables simultaneous transmission of various independent channels into a single high-speed data stream. See multiplexer.

time slot One of the ways in which bandwidth can be specified for multiplexer channel groups. Time slots are specified by any number from one to twenty four, with each time slot equal to 64 kbps. Time slot 1 is the default location for the embedded supervisory data link.

T1 A term for a digital carrier facility used to transmit a DS1 formatted digital signal at 1.544 Mbps.

T1 link The termination of a facility at a 745 multiplexer (node).

training A part of call set up during which modems exchange tones and adjust their receive levels.

transient display A display that remains on the screen until you make one or more selections from it. When selections are made, the display is removed. A transient display can also be removed by closing the display from which it was invoked. These displays are used for cascading menus and word boxes.

trellis-coded modulation Advanced error correction coding technique for primary data typically used on higher speed modems.

trending report — The results of a single network test, repetitively performed, and packaged into one concise graphic or tabular form rather than numerous separate forms. It allows the review of the performance of specified devices through scheduled network testing. The user specifies the test, the number of tests, and the interval between tests, as well as the form the results will take/either graphic or tabular display.

tributary device — A modem or DSU that is, for diagnostic purposes, at a logically subsidiary level in a hierarchical network. Tributary devices in a network receive data from the control device, as well as from any network management system present in the network.

trouble ticket — A 6800 Series NMS feature by which specific device problems are detailed. The ticket includes a tracking log that automatically lists changes made to the ticket, when the changes were made, and who made them, thereby providing a continually updated account of the repair process. Trouble tickets can be user created, or automatically generated when an automated action filter is exceeded.

undefined device — A supported device with no device profile.

Uniform Alarm Interface (UAI) — A 6800 Series NMS alarm protocol that can be configured to transfer alerts and alarms from the NMS to other network management systems that might accept it.

unnamed site — The NMS-defined site that contains those devices for which the user does not assign a site name.

unplaceable site — A site whose city and country code or the city and country codes cannot be mapped to a geographic location and whose longitude and latitude fields are empty.

unsupported device — A device not directly supported by NMS for purposes of alert notification and network access. Specifically, unmanaged devices' alerts cannot be interpreted by the NMS and the NMS cannot directly access the device's tests and commands without using the cut-through software.

user access — The specification of one's ability to access a command or task. Every command and task available on NMS is associated with one of the system-defined user groups (or access levels).

user group — A means by which NMS users can be categorized to provide access to those NMS features applicable to their specific job functions.

User Interface Processor (UIP) — An NMS processor providing control for multiple full-feature and basic-feature workstations.

upstream — In extended networks, the direction in which diagnostic messages flow from the final tributary diagnostic modem to the intermediate links to the diagnostic control site.

vendor profile	In the 6800 Series NMS, a record containing data describing vendor information for the equipment.
window	A workspace in which you interact with a task.
workstation	A user terminal. (See basic-feature workstation and full-feature workstation.)