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# Netpartner<sup>®</sup> Network Management System (NMS) Interface Specification

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**Table of Contents**

1. Introduction	3
1.1. Purpose and Scope	3
1.2. Organization	3
2. General Information	3
2.1. General Product Description	3
2.2. System Architecture	5
2.3. Operating Environment	6
2.3.1. Customer Provided Equipment and Network Requirements	6
2.3.2. User Access to NetPartner NMS	6
3. Overview: Core, User, and Administrative Functions	7
3.1. Core Features of the NetPartner NMS	7
3.2. NetPartner NMS Task Types	8
3.3. End-Customer Interactions	9
4. Detailed Customer Services and Features Provided Via Access to LEC Operations Systems	10
4.1. Technical Background for Interface	10
4.1.1. Conventions Used	10
4.1.2. Physical and Electrical Interfaces	10
4.1.3. High Level Operations	11
4.1.4. Relationship Between Sessions and Connections	14
4.2. Terminal and Facility Change Management – Configuration Management	14
4.2.1. General Description	14
4.2.2. Features	14
4.2.3. Session Operation - csr	15
4.3. Measurement Reporting – Network Planning	17
4.3.1. General Description	17
4.3.2. Features	17
4.3.3. Session Operation - trafflog	17
4.4. Network Surveillance and Alarms – Fault Management	19

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4.4.1.	General Description	19
4.4.2.	Features	19
4.4.3.	Session Operation - dnoos tgnos maintlog	19
4.4.4.	Session Operation - Additional maintlog Features for Status Queries	22
4.4.5.	Session Operation - alarms	23
4.5.	Testing – Fault Management	24
4.5.1.	General Description	24
4.5.2.	Features	25
4.5.3.	Session Operation - maintlog Features for Digital Loopback Tests	25
4.5.4.	Session Operation - mlt	26
4.6.	Trouble Entry and Status – Fault Management	26
4.6.1.	General Description	26
4.6.2.	Features	26
4.6.3.	Session Operation - ras	27
4.7.	General Access Window	27
4.7.1.	General Description	27
4.7.2.	Session Operation - ga	28

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## 1. Introduction

### 1.1. *Purpose and Scope*

The NetPartner Network Management System (NMS) interface specification document defines the interface requirements between the Local Exchange Carrier (LEC) NetPartner host complex communications processor (SUN-3 series processor) (SUN is a trademark of Sun Microsystems, Inc.) and the end-customer premise equipment. NetPartner NMS consists of both premises and LEC software to allow a SUN-3 series workstation(s) or MS-DOS (MS-DOS is a trademark of Microsoft, Inc.) based AT&T Personal Computers (PCs) on customer premises to interact with the NetPartner NMS host complex on LEC premises.

This specification is published as a guide for the designers, manufacturers, and suppliers of the premises equipment and software that are intended to be compatible with the NetPartner NMS host complex. It describes the interface between the NetPartner customer premises equipment (normally a PC or Sun workstation, and hereafter called 'the PC') and the NetPartner host complex. The PC can connect to the host complex, ask for a session with the NetPartner functions, manage communications during a session, terminate a session, and disconnect from the host complex. Only those interactions that require intelligence in the CPE are covered. All other interactions are comparable to the operation of a 'dumb terminal', e.g., VT-100.

This Technical Reference is complete and accurate to the extent of the completeness and accuracy of the information furnished to Ameritech by AT&T. As such, errors of content and omission may be found. Ameritech will attempt to correct any such errors and to resolve any confusion or uncertainty associated with this Technical Reference.

### 1.2. *Organization*

This document contains four sections. Section 1 describes the purpose of the document. Section 2 describes the NetPartner NMS product in general, its network plan, its system architecture, and its environment. Section 3 describes the specific requirements for the NetPartner NMS network management features and its interfaces. Section 4 provides the heart of the technical interface specification, defining the high level interface operations, and the functions and corresponding technical session details for each customer service and provided via access to the LEC-based NetPartner NMS host complex.

## 2. General Information

### 2.1. *General Product Description*

NetPartner NMS provides end-customers with network management capabilities for their network by giving them access to a subset of the LEC's capabilities via a unified and secure user

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interface. It provides Centrex and ISDN (ISDN - Integrated Services Digital Network) end-customers secure access to a subset of the functions available in embedded LEC Operations Systems (OSs), or Element Management Systems (EMSs). These OSs permit the LECs to administer existing networks and network elements such as switches and transmission equipment.

NetPartner NMS features may be classified into network management features and core features. Some of these features are customizable.

What follows is a summary of network management functions, using UNMA (UNMA - AT&T Unified Network Management Architecture) terminology, that are provided through NetPartner NMS.

- Configuration Management:
  - Terminal and Facility Change Management
- Network Planning:
  - Measurement Reporting
- Fault Management:
  - Testing
  - Network Surveillance and Alarms
  - Trouble Entry and Status
- Accounting Management:
  - Station Message Detail Recording (SMDR)

Some core features of the NetPartner NMS are:

- Security.
- Browsing Logged Data for Surveillance Messages and Test Results.
- User Activity Logging.
- Translation of Messages and Masks.
- Graphics Displays and Multiple Windows.
- Help.

Some of the customizable features NetPartner NMS are:

- Capacity Ranges
- Configuration Options
- General Access Window
- Alarms, Commands, and Data
- Configuration/Status Displays
- User Interface
- Feature Permission

The first generic of NetPartner NMS was generally available in the first half of 1989. This initial offering addresses network management for Centrex and ISDN services, and it includes terminal and facility change management, measurement reporting, testing, network surveillance and alarms, trouble entry and status, and access to SNA (SNA - IBM's System Network Architecture) network management.

Additional capabilities will be appended to this document as they become available in the future. This document addresses **existing** capabilities only.

## **2.2. System Architecture**

The NetPartner NMS features are modular and permit the end-customer to add or delete them at any time via interaction with the LEC.

NetPartner NMS is a UNIX-based system with three architectural components: host equipment at the LEC premises, workstation equipment on the end-customer premises, and OSs at various LEC sites.

The **host equipment** at the LEC premises consists of three 382/600 computers, a network of communications processors, and an administration workstation.

The **end-customer's equipment** explicitly supported by the software provided with the purchase of a NetPartner NMS from AT&T Network Systems is either the SUN-3 series workstation(s) or the AT&T (or equivalent) PC(s). **All functions are available from either device; only the presentation is different.** The SUN-3 series workstation provides multi-windowing, multi-tasking, and high-resolution graphics. The AT&T-PC provides a single-window display. A printer is optional.

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The OSs are located at LEC sites, and are connected to the host complex via private lines or dial-up through a Datakit VCS. The types of OS connections are dependent on the OS and include two-way or one-way, and dedicated or dial-up, with speeds of 1200, 2400, 4800, and 9600 bps.

### **2.3. Operating Environment**

The user uses the SUN-3 series workstation(s) or the AT&T (or equivalent) PC(s) to interface the NetPartner NMS host communications processor. The user interface supports a menu-driven, graphics enhanced, multi-windowing and multi-tasking environment on the SUN-3 series workstation.

#### *2.3.1. Customer Provided Equipment and Network Requirements*

The end-customer accesses the NetPartner NMS with and end-customer provided workstation interfacing with the NetPartner NMS host communications processor.

##### **A. Workstation Requirements**

The end-customer workstation must be a SUN-3/60 workstation or equivalent to provide full functionality, including multi-windowing, multi-tasking, and high-resolution graphics. It must support at least 8 packets per second to maintain a reasonable level of browsing speed. It must also support VT 100 terminal emulation software for access to OSs and IBM's 3274 cluster controller emulation software for access to SNA network. Each end-customer PC must be the AT&T-PC (Model 6312 WGS [WGS - Work Group Station] /6300 Plus) or MS-DOS based compatible PC. It must have an asynchronous port to support the 1200, 2400, 4800, and 9600 bauds.

##### **B. Network Requirements**

The connection between the NetPartner host and the end-customer SUN-3 series workstation is via dial-up, private line or DSL using X.25 and/or point-to-point links. The connection between the NetPartner host and the end-customer AT&T PC is via dial-up or private line.

#### *2.3.2. User Access to NetPartner NMS*

The end-customer uses the SUN-3 series workstation(s) or the AT&T (or equivalent) PC(s) to interface the NetPartner NMS host communications processor. The end-customer equipment is connected to the host equipments via synchronous point-to-point and/or X.25 (packet switched) SUN-3 series workstation links and asynchronous AT&T-PC links. The point-to-point link can

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be a dial-up or a dedicated connection. The packet switched link can be dedicated or packet switched connections. In an ISDN environment, a 64 or 56 Kbps packed-switched B channel or a 9.6 Kbps D channel can be used. In the non-ISDN environment, the connection is either via a dedicated 64, 56, 48, 19.2 or 9.6 Kbps link or a dial-up 9.6 Kbps link.

The initial setup will offer 56 Kbps access.

The communications processor holds the NetPartner NMS end-customer databases and communications software. It handles the communications between the end-customer workstation(s) and the NetPartner NMS host.

### **3. Overview: Core, User, and Administrative Functions**

#### **3.1. Core Features of the NetPartner NMS**

The following features ensure easy and convenient operation throughout the NetPartner NMS as well as maintain system security and integrity.

- Security:
  - Security and screening in the host computers to permit 5 to 10 end-customer businesses (e.g., a retail chain, a university, or a state government) and up to 20 simultaneous users on a single NetPartner NMS
  - User permission classes from LEC
  - System access security via logon and password inputs
  - Security restrictions that permit each end-customer to view only information only about their network
- Graphical real-time alarm status display
- Standard and expert selection windows
- Multi-window management
- Logging of user activity to retrace entered commands, and to track patterns of feature use
- Browsing through logged data such as surveillance alarms and test results.
- Translation of alarm messages from the LEC OSs into a user-friendly format

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- A simplified, unified user interface
- Help information
- Menu-driven inquiries and reports

### 3.2. *NetPartner NMS Task Types*

NetPartner NMS allows a user to run multiple tasks simultaneously. For example, an end-customer can browse the surveillance log, run a digital test, run a metallic test, and enter a trouble ticket simultaneously. This means that a customer can have multiple tasks on the same screen active at one time. There are several task types in NetPartner NMS, including terminal emulator, browser, and test/status.

- The **terminal emulator** task accesses network management software packages that enable the users to enter information. In a terminal emulator task, the users enter requests and information about their network with the keyboard.
- The **browser** task displays log files. When in a browser task, the user reviews a specific log file, such as a maintenance log; the users do not directly input any information to the log. The browser task has the same five buttons along the top of the window. In addition, the browser task has nine executable buttons along the bottom of the window:
  - Scroll Up
  - Scroll Down
  - Msg Up
  - Msg Down
  - First Msg
  - Current Msg
  - Print Saved Msg
  - Save Msg
  - Set Time

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- The **test/status** task can access log files the same way the browser task does. However, in a test/status task, the users initiate tests on lines and initiate status requests on lines and trunks. The results of these tests and status requests appear in log files in the window. Along the right side of the test/status window is a numeric keyboard. Users use this keyboard to enter line numbers and trunk group and member numbers for tests and status requests.

### 3.3. *End-Customer Interactions*

The user interface is the end customer's access into NetPartner NMS. It consists of specialized software residing in the workstation or PC that supports interactions between a user and the NetPartner NMS host complex. The user interface provides core functions such as window and menu management, plus additional functions accessed via connections to the LEC operations systems.

NetPartner NMS provides CPE software for a menu-driven, graphics-enhanced multi-window Sun series 3 workstation, or , if an AT&T-PC is used, a single-window display is available. **All functions are available from either device; only the presentation is different.**

Hierarchical menus are provided with five top-level menu items:

- Network management
- Customer services
- Utilities
- Desktop
- Log-off

All **network management** functions that the LEC offers the end customers are integrated in the network management category. For example, the customer has access to line and trunk queries, testing, recent change, and trouble entry and review.

**Customer services** are grouped by system, rather than function. This category includes customer-owned systems.

The **utilities** functions are those that apply to the workstation. For example, printing capabilities and locking the screen are utilities. **Desktop** gives the user access to special core features and the console clock. **Log-off** allows the end customer to exit NetPartner NMS.

All **network management** functions plus the **logoff** function are provided via the NetPartner host complex, and hence are covered in this technical interface specification between the host complex on LEC premises and the CPE. **Customer services, utilities, and desktop** are done entirely on customer premises and hence are not covered in this specification.

#### **4. Detailed Customer Services and Features Provided Via Access to LEC Operations Systems**

In this section, we describe the functions provided to end-customers via access to OSs on LEC premises. The NetPartner host complex acts as a gateway for these services, sending information to customer premises equipment.

After opening with the background on the conventions, physical interface connection, low level format, and details of the high level interface operations, we turn to the specifics of each customer service. Each feature as offered by NetPartner host equipment in conjunction with customer premises equipment is described functionally, followed by the technical details of the interaction between the CPE and the LEC-based host to provide that function.

More information and details on each feature can be found in the NetPartner NMS User's Guide, OPA-3P446-01, available from AT&T, 1-800-432-6600.

##### **4.1. Technical Background for Interface**

###### *4.1.1. Conventions Used*

In this section, most strings are given literally. Strings of the form <XXX> are not literal, but have meaning depending on the XXX. Some common examples are <CR> for carriage return, <NL> for new line, and <SP> for space. All others are the proper names of keys (such as tilde) or are explained in the text following the usage. This quoting mechanism is used since both single and double quotes appear in the specification but the greater and less than sign do not. Unless otherwise specified, the literal strings given are NOT carriage return terminated.

###### *4.1.2. Physical and Electrical Interfaces*

The connectivity between the device described in this specification and the NetPartner host complex will be an asynchronous ASCII interface. This interface will have a speed of 1200 baud minimum and 9600 baud maximum. Unless otherwise noted, all output from the host complex to the PC is in human readable form when displayed on a VT100TM compatible device.

Data transferred between the device and the host complex will be in the following format:

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Start Bit:	1
Data Bits:	8
Stop Bit:	1
Parity:	none

Both devices must be able to provide hardware flow controls by use of TRS and CTS signals. Software flow control may be used - DC3 (Control S) and DC1 (Control Q), also known as XON/XOFF - but is not required. A break length of 200 milliseconds is expected.

The electrical interface will be in an RS-232C standard. The following signals will be supported:

PIN	SIGNAL
1	Frame Ground (FG)
2	Transmit Data (TxD)
3	Receive Data (RxD)
4	Request to Send (RTS)
5	Clear to Send (CTS)
6	Data Set Ready (DSR)
7	Signal Ground (SG)
8	Data Carrier Detect (DCD)
20	Data Terminal Ready (DTR)

The physical interface will use a DB 25 type connector. Both the CPE device and the host complex will provide male type connections and be wired as Data Terminal Equipment (DTE). In the event that distance between the device and the host complex is greater than 100 feet, modems should be installed to provide the interface. The selected modems must support class 4 MNP (MNP is a trademark of Microcom, Inc.) error control protocol. It is recommended that modems, such as an AT&T 2224G, that support MNP class 4 and one or more command protocols, including Hayes Smartmodem 2400 (Smartmodem 2400 is a trademark of and Hayes is a registered trademark of Hayes Microcomputer Products, Inc.), be used.

#### 4.1.3. High Level Operations

##### 4.1.3.1. Connecting to the Host Complex

Once the physical link to the host complex is established, the host complex will reply to the PC. The reply will end in the literal string

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**login:**

At this point, the host will expect a response of a login, terminated by a carriage return. The host complex will then reply with the literal string

**Password:**

At this point, the host will expect a password, terminated by a carriage return. If the password is acceptable to the host complex, the host complex reply to the PC will end with two strings

**<escape>[2J<CR><NL>**

and

**<escape>[24;OfPlease use the mouse to select**

**a connection. <CR><NL>**

**Connection?**

The second string informs the PC that the host complex is ready to accept a request for a session.

If an invalid login or password is provided, the host will respond with

**Login incorrect <CR><NL>**

**login:**

An incorrect login/password sequence can be tried over and over for a sixty second interval, at which point the host will drop the connection.

**4.1.3.2. Disconnecting from the Host Complex**

Before the host will disconnect the PC, the PC must first exit any session the PC has established. Once the host is ready to accept a new session request, the PC can request disconnection by sending the string

**exit<CR>**

The host complex will then disconnect from the PC.

**4.1.3.3. Session Requests**

Session requests are requests sent to the host complex from the PC after the user has chosen a function from a menu or command interface provided by the PC. The host complex will accept the following carriage return terminated strings as session requests:

**csr****trafflog****maintlog****dnoos****tgoos****alarms****mlt****ras****ap****ga**

These sessions are of the three task types defined in Section 3.2: terminal emulation, browser, or test/status. They relate to the functions described in later sections of this document respectively as follows:

The details of each session are outlined separately, under the functional description of each capability.

**4.1.3.4. Forced Session Termination**

The PC can terminate a session by sending the correct session specific string or it can force termination. The sequence of

**<CR><tilde><period><CR>**

will forcibly terminate any session at any time. This method is not graceful and it may have side effects in the session. The PC should avoid using this sequence during most sessions.

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#### 4.1.3.5. Recognizing Session Termination

The host complex informs the PC that it is ready for a session request by sending the string

```
<escape[24;OfPlease use the mouse to select  
a connection.<CR><NL>
```

#### Connection?

This string acknowledges a session termination, forcibly or otherwise. The PC must recognize this indication as signalling the end of any session.

#### 4.1.4. Relationship Between Sessions and Connections

For each active session, there must be on virtual PC connection. On a given PC connection, the interface is expecting the termination of an active session before the activation of a succeeding session.

## 4.2. Terminal and Facility Change Management – Configuration Management

### 4.2.1. General Description

NetPartner NMS provides end-customers **configuration management** control for the following end-customer services via an end-customer workstation: Customer Station Rearrangement (CSR), Automatic Route Selection (ARS), inventory on active lines, and comparison of Customer Premise Equipment (CPE) settings with 5ESS™ line translations for ISDN.

### 4.2.2. Features

CSR is the re-arrangement, or moves, of analog and ISDN telecommunications lines and the change of features on those lines.

- Rearrange station telephone numbers
- Change, add or remove features and service options on a line.
- Verify pending changes and line features.
- Profile Centrex environments with totals and miscellaneous system information
- Bulk changes (same change on a multiple of Telephone Numbers [TNs]).

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- Database operations for query of which TNs have certain features and tally of TNs showing all values for a feature.
- View features active on line.
- On demand feature recent change.
- Selective facility feature verification for a specific line.
- Once end-customer feature set is defined, a process is started and automatically fills the databases through verifies of the switch.

ARS provides the ability to create, administer, and reconfigure routing patterns for private trunks, within restrictions defined by the LEC. It provides the ability to control the sequencing of outgoing route choices and thus be able to achieve least cost routing. The end-customer can change three basic attributes:

- Routing index order
- Facility restriction level
- Expensive route warning tone

Inventory on active lines provides the end-customer with the ability to match phone numbers with LEC-definable attributes such as equipment, name, and location. This same feature also provides the end-customer with the ability to compare the correct CPE settings and the corresponding 5ESS line translations for ISDN CPE.

#### 4.2.3. *Session Operation - csr*

Terminal and facility change management operations are initiated via the "csr" session.

There may be numerous subsessions available under csr. The subsessions relate to the instances of customer station rearrangement vehicles that are defined on the local NetPartner host complex by the system administrator. The specific names of these subsessions are only defined on a per system basis at system installation and are not known to NetPartner in advance. Hence this section deals with **example** subsession names only.

The subsessions all follow the same pattern. Typically, users will request one of these functions from the PC. The PC will then open a session, i.e., csr, with the host as previously defined in Section 4.1. The host complex determines what the available subsessions are, and then sends to the PC a count of how many different subsessions there are to pick from. The count is a car-

riage return-newline terminated ASCII string. If there are none available, or if there is an error, a zero count is sent.

If the count is non-zero, "count" many pairs of strings are sent. Each pair contains a name defined by the DTC (such as may be shown to a customer on a menu) and the corresponding name of the subsession (as known to the NetPartner host). Each string of the pair is terminated by carriage return-newline. An example of the count and the strings is shown below:

**2**

**CSR for 555**

**macstr555**

**CSR fro 575**

**macstr575**

In this example, there are two pairs of subsessions available. The first may be known to the user as "CSR for 555" and is known to the NetPartner host as "macstr555" and the second is known to the user as "CSR for 575" and known to the host as "macstr575".

After the pairs are sent, the PC must reply with one of the subsession names followed by a carriage return, or one of the following carriage return terminated literal strings:

**Cancel**

**Failed**

Cancel implies that the PC no longer wishes to connect to the specified session. The failed reply indicates that the PC encountered an error when trying to load the available subsession names.

Once a subsession request is sent to the host complex, any normal ASCII input from the remote LEC OS (e.g., a customer station rearrangement vehicle) will be passed to the session. In other words, at that point, control is passed to the customer station rearrangement vehicle, which will view the PC as though it were a dumb terminal.

If the session is terminated, forcibly or otherwise, the host will send the string

**<escape>[24;OfPlease use the mouse to select a  
connection.<CR><NL>**

**Connection?**

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to inform the PC that the host is waiting for a subsequent session request.

### **4.3. Measurement Reporting – Network Planning**

#### *4.3.1. General Description*

NetPartner NMS provides the end-customer with **network planning** capabilities. The end-customer can access trunk traffic measurements in the form of User Defined Reports (UDR) that are constructed by the LEC. Trunk traffic measurements, such as peg count, usage and overflow, on an end-customer's private trunks can be used to administer, engineer, and forecast equipment and capacities on customer-subscribed trunks and tie lines. Measurement reports may be viewed on an end-customer terminal or printed at end-customer designated locations.

#### *4.3.2. Features*

Traffic reports on end-customer LEC facilities can include features such as the following:

- Scheduled reports of 30 minute traffic data (peg count, usage, overflow count) for the following traffic:
  - Multi-line hunt group traffic.
  - Private trunk traffic such as tie line traffic.
  - Modem pools.
- Some examples of raw data reports available for the 5ESS switch are:
  - Trunk Overflow Exception Report
  - Trunk Overflow Summary Report
  - MLHG Overflow Exception Report
  - MLHG Overflow Summary Reports
- Reports may be viewed or printed at the end-customer location on end-customer equipment.

#### *4.3.3. Session Operation - trafflog*

Measurement reporting operations are initiated via the "trafflog" session.

The traffic log is available for browsing by the CPE device. The following basic input accepted by the trafflog session is:

**<escape>[A**

**<escape>[B**

**<escape>[C**

**<escape>[D**

**j:sof;**

**j:eof;**

**;**

This input corresponds to the scroll up, scroll down, message up, message down, first message, current message, and session disconnect functions, respectively.

There is also an input which allows the user to switch quickly between the trafflog and the maintlog, tgoos, or dnoos sessions, which share a common interface and mode of operation. It has three parts: a header, middle section, and trailer.

The header is:

**b:**

The middle section is one of the following:

**<USERID>.misc**

**<USERID>.mtc**

**dn.oos.rpt**

**tgk.oos.rpt**

where the <USERID> field is the user id that was used when the PC logged into the host complex. The .misc is the traffic log, the .mtc is the maintenance (also known as surveillance) log, and the two out of service reports.

The trailer is:

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„off;

#### **4.4. Network Surveillance and Alarms – Fault Management**

##### *4.4.1. General Description*

Surveillance of network equipment and subscribed services informs the end-customer about the health of the telecommunications network in real time. Knowledge of network status can lead the end-customer to invoke service-recovery plans, to begin repair activities, and to report troubles to their LEC.

The NetPartner NMS allows the end-customers to monitor and receive real-time surveillance messages from their network only. Any subset of these messages can be alarmed through the NetPartner to provide near real-time alarm indication.

##### *4.4.2. Features*

The following surveillance commands can be accessed by the user:

- Line/Trunk Status Query - Lets the end-customer request real time status on a given line or trunk.
- Surveillance Log - Lets the end-customers browse the log file that contains line and trunk information for that end-customer's network.
- Line Out-Of-Service Report - Lets the end-customer browse line out-of-service reports that list lines that are out-of-service for that end-customer's network.
- Trunk Out-Of-Service Report - Lets the end-customer browse trunk out-of-service reports that list trunks that are out-of-service for that end-customer's network.

NetPartner NMS provides surveillance messages and alarms translated into near-English form. The following end-customer service-affecting messages are provided and may be modified by the LEC:

- 1ESS/1AESS, 5ESS, DMS-100 switch line messages.
- 1ESS/1AESS, 5ESS, DMS-100 switch trunk messages.

##### *4.4.3. Session Operation - dnoos tgoos maintlog*

The network surveillance and alarms feature involve several sessions - the dnoos, tgoos, maintlog, and alarms sessions. In addition, the actions for line and trunk status queries and

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commands under the maintlog session. Hence, session operations in this section are described in three separate groupings - dnoos/tgoos/(general) maintlog, additional maintlog features for status queries, and alarms. This first section begins with the dnoos/tgoos/(general) maintlog.

The maintenance (also known as surveillance) log and out of service reports are available for browsing by the CPE portion of NetPartner.

#### 4.4.3.1. Basic Input

These sessions share a common interface. The maintlog session has extended capabilities for testing and status queries, which are listed separately. The following basic input accepted by these sessions is:

**<escape>[A**

**<escape>[B**

**<escape>[C**

**<escape>[D**

**j:sof;**

**j:eof;**

**;**

This input corresponds to the scroll up, scroll down, message up, message down, first message, current message, and session disconnect functions, respectively.

#### 4.4.3.2. Complex Input

In addition to the basic functions, there are three complex inputs accepted by these sessions. The first complex input is used to request filtering of by these sessions. The second complex input clears any filter patterns that might be present. The third complex input allows the user to quickly switch between the maintlog, tgoos, dnoos, and trafflog sessions.

##### 4.4.3.2.1. Pattern Requests

The first complex input is used to request filtering of the output using a given set of patterns. The form of the input has three parts: a header, one or more patterns, and a trailer. The header is:

**set-pat="(toff<SP>**

The predefined available patterns are:

**tst.dn**

**tst.mlt**

**stat.dn**

**stat.tg**

**rmvrst.dn**

**rmvrst.tg**

**spec.dn('<EXCH>' , '<EXT>')**

**spec.tg('<TGALIAS>')**

EXCH and EXT are the exchange (a 3 digit string, e.g., 555) and the extension (a 4 digit string, e.g., 1212) which make up the directory number (555-1212 in the example). The <TGALIAS> string can be any trunk group alias, a variable length string consisting of between one and 15 characters, including embedded blanks. If more than one pattern is used in a request, they must be separated by the following string:

**<SP>+<SP>**

The trailer after the pattern(s) is:

**)";j-eof;**

If the PC sends an EXCH, EXT or IGALIAS which corresponds to a facility that does not belong to the end-customer, the result of the eventual pattern match will be null.

#### **4.4.3.2.2. Clearing patterns**

The second complex input clears any patterns that might be present. It is:

**clear;j-eof;**

#### **4.4.3.2.3. Quick Session Switch**

The third complex input allows the user to switch quickly between the maintlog, tgoos, dnoos, and trafflog sessions. It has three parts also. The header is:

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**b:**

The middle section is one of the following:

**<USERID>.mtc**

**<USERID>.misc**

**dn.oos.rpt**

**tgk.oos.rpt**

where the <USERID> field is the user id that was used when the PC logged into the host complex. The .mtc is the maintenance log, the .misc is the traffic log, and the remaining two are the out of service reports.

The trailer is:

**„off;**

#### *4.4.4. Session Operation - Additional maintlog Features for Status Queries*

The maintlog session has two additional features, vdn and vtg. Vdn is used for requests relative to directory numbers, vtg for requests relative to trunk groups.

The form of vdn is

**<CR>vdn <SELECT> <DN><CR>**

**<control-D><CR>**

**j-eof;**

<SELECT> is a value of either 2, 3, or 4. A value of 4 for <SELECT> is used to query the status of a line. (Values of 2 or 3 are described in a different section of this document.) The <DN> field can contain any seven digit phone number that belongs to that customer. (Note that there are no quotes in this field.)

The vtg feature is similar:

**<CR>vtg <SELECT> “<TGALIAS>”**

**<control>-D><CR>**

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**j-eof;**

This command also has two data fields. Currently, 5 is the only valid value for <SELECT>, and indicates the query for the status of a trunk. As before, <TGALIAS> is any valid trunk group alias (i.e., belongs to that customer), 1-15 characters in length. Note that it is surrounded by double quotes.

If the CPE device sends the host complex an incorrect DN or TGALIAS, the error message sent from the host complex is:

**Verify Failed or Insufficient Parameters. Data**

**was:<CR><NL>**

**<code><CR><NL>**

where <code> is:

**4 Line Status Query requested**

**5 Trunk Status Query requested**

Results of these requests are available in the maintenance log, which can be accessed as described in Section 4.4.3.

*4.4.5. Session Operation - alarms*

ASCII-encoded text alarm information is sent across to a VT100 compatible device in real time when the "alarms" session is active. ASCII-encoded VT220 color information can be embedded in some portions of the alarm text information, if so defined by the LEC.

The actions available in the alarms session are retiring alarms, acknowledging alarms, and exiting the session. Acknowledge and retire both require specification to indicate what alarm or alarms are concerned.

All input to the alarms session must be transmitted with at least three seconds delay between each character. While a period of two seconds between each character will usually work properly, performance at that speed can not be guaranteed. This constraint may be relaxed in future releases.

**NOTE:** That alarms will only be sent when the alarm session is open; alarms will not interrupt the machine to machine dialogues of other sessions.

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## 4.4.5.1. Acknowledge

An acknowledge request looks like:

**a<alarm specifier>**

The alarm specifier is covered below.

## 4.4.5.2. Retire

A retire looks like:

**r<alarm specifier>**

## 4.4.5.3. Alarm Specification

There are three alarm specifications: every, minor, and indexed. They are respectively:

**e<CR>**

**m<CR>**

**i<index><CR>**

“e” for “every” indicates that the action should be taken on all alarms currently active in the session. “m” indicates that the action should be taken only for those alarms currently active in the session that are defined by the LEC to be minor alarms. “i” is used to clear a specific alarm, where <index> is the index that appears on the screen next to the alarm. <index> can be any number in the range of 1 to 19.

## 4.4.5.4. Exiting the Session

Instead of forced termination of the session, the PC should exit the session using

**<control-X><CR>**

Forced termination is still available as always.

## **4.5. Testing – Fault Management**

### *4.5.1. General Description*

Testing services include the Digital Loopback Tests (DLTs) and the Mechanized Loop Tests (MLTs), or electrical tests. DLTs allow end-customers to run digital loopback tests on their lines.

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In an ISDN environment, the DLT is run from the central office switch to the NT/1 on the end-customer premises. MLTs provide end-customers with data on the electrical characteristics of a line. DLTs and MLTs allow problem confirmation, identification, and sectionalization. Test results are returned automatically for end-customer viewing or printing.

#### 4.5.2. Features

- Digital Loopback Test (DLT)

The end-customer can execute digital loopback tests that verify the suitability of the loop for digital transmission. They can run tests on the D and B channels, or only on a single channel associated with an ISDN DSL (Digital Subscriber Loop).

- Mechanized Loop Test (MLT)

The end-customer can execute Mechanized Loop Tests (MLTs) on demand that verify the electrical characteristics of the loop.

#### 4.5.3. Session Operation - maintlog Features for Digital Loopback Tests

Two sessions are invoked for test operations: maintlog and mlt. The maintlog feature is described first.

As previously described, the maintlog session has a "vdn" feature, which is used for requests relative to directory numbers.

The form of vdn is

```
<CR>vdn <SELECT> <DN><CR>
```

```
<control-D><CR>
```

```
j-eof;
```

<SELECT> is a value of either 2, 3, or 4. 2 is a request to begin a digital loopback test, 3 a request to stop a digital loopback test. (A value of 4 for <SELECT> was previously described.)

The <DN> field can have any valid seven digit phone number, i.e., one that belongs to that customer.

**NOTE:** That there are no quotes in this field.

If the CPE device sends the host complex an incorrect DN, the error message sent from the host complex is:

**Verify Failed or Insufficient Parameters. Data**

was:<CR><NL>

<code><CR><NL>

where <code> is:

**2 Test DSL requested****3 Stop DSL Test requested**

Results of these requests are available in the maintenance log, which can be accessed as described in Section 4.4.3.

**4.5.4. Session Operation - mlt**

Electrical tests are initiated via the “mlt” session. No special processing is required for mlt, i.e., this session behaves exactly as the sessions described under the ap, csr, and ga sessions, except that there no subsessions to be selected. The NetPartner host is expecting interactions with a dumb terminal once the session is established.

The PC can forcibly terminate the session, and it must recognize when the host complex is ready for a new session request.

<escape?[24;OfPlease use the mouse to select a

connection.<CR><NL>

Connection?

**4.6. Trouble Entry and Status – Fault Management****4.6.1. General Description**

Trouble-ticket entry enables the end-customer to create a trouble ticket and automatically send it to the LEC. The trouble ticket includes the observed trouble condition and other valuable information that can help the LEC restore and repair service. End-Customers may also obtain status information and can see in which stage, for example “pending dispatch,” a trouble is.

**4.6.2. Features**

- On-line trouble reporting on LEC-provided services.

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- Confirmation of trouble reports received by the LEC.
- On-line additions to trouble reports.
- Status on trouble reports on demand.
- Status includes items such as:
  - pending screening
  - pending dispatch
  - dispatched

#### 4.6.3. *Session Operation - ras*

Trouble ticket operations are initiated via the “ras” session. No special processing is required for ras, i.e., this session behaves exactly as the sessions described under the ap, csr, and ga sessions, except that there are no subsessions to be selected. The NetPartner host is expecting interactions with a dumb terminal once the session is established.

The PC can forcibly terminate the session, and it must recognize when the host complex is ready for a new session request.

**<escape>[24;OfPlease use the mouse to select a**

**connection.<CR><NL>**

**Connection?**

**=**

#### 4.7. *General Access Window*

##### 4.7.1. *General Description*

The generalized access window allows the LEC to provide a connection to one additional Operations System for each end-customer. The connection is a cut-through connection and the Operations System must support VT (Trademark of Digital Equipment Corporation) 100 terminals, or equivalent.

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#### 4.7.2. *Session Operation - ga*

There may be numerous subsessions available under *ga*. The subsessions relate to the instances of general access window applications that are defined on the local NetPartner host complex by the system administrator. The specific names of these subsessions are only defined on a per system basis at system installation and are not known to NetPartner in advance. Hence this section deals with **example** subsession names only.

The subsessions all follow the same pattern. Typically, users will request one of these functions from the PC. The PC will then open a session, i.e., *ga*, with the host as previously defined in Section 4.1. The host complex determines what the available subsessions are, and then sends to the PC a count of how many different subsessions there are to pick from. The count is a carriage return-newline terminated ASCII string. If there are none available, or if there is an error, a zero count is sent.

If the count is non-zero, "count" many pairs of strings are sent. Each pair contains a name defined by the DTC (such as may be shown to a customer on a menu) and the corresponding name of the subsession (as known to the NetPartner host). Each string of the pair is terminated by carriage return-newline. An example of the count and the strings is shown below:

**2**

**General for 555**

**strkpr555**

**General for 575**

**strkpr575**

In this example, there are two pairs of subsessions available. The first may be known to the user as "General for 555" and is known to the NetPartner host as "strkpr555" and the second is known to the user as "General for 575" and known to the host as "strkpr575".

After the pairs are sent, the PC must reply with one of the subsession names followed by a carriage return, or one of the following carriage return terminated literal strings:

**Cancel**

**failed**

Cancel implies that the PC no longer wishes to connect to the specified session. The failed reply indicates that the PC encountered an error when trying to load the available subsession names.

Once a subsession request is sent to the host complex, any normal ASCII input from the remote LEC DS (e.g., a general access window application) will be passed to the session. In other words, at that point, control is passed to the general access window application, which will view the PC as though it were a dumb terminal.

If the session is terminated, forcibly or otherwise, the host will send the string

**<escape>[24;OfPlease use the mouse to select a  
connection.<CR><NL>**

**Connection?**

to inform the PC that the host is waiting for a subsequent session request.