PRISM 3000

TXPORT® TRANSPORT

Reference Manual
34-00184
3rd Edition

Table of Contents

Copyright/liability

Reorder # 34-00209

3rd Edition, August 1994

ascom Timeplex

Transport 3000 CSU/DSU

User's Guide

MC15___

January 1994

General

1.0 Introduction

The PRISM 3000 supports all data networking needs, from connection of a single front end processor to shared access for video, frame relay, and voice. This approach gives the speed and flexibility of T1 transport through a single point of control. It may be configured for up to 4 high or low speed data ports.

Operating the PRISM 3000 is easy, with a choice of three menu driven interfaces. The front panel LCD display is described in the 'Operations' chapter of this manual. The RS232 connection to a local or remote terminal is explained in the 'Terminal Operation' chapter. The TxPORT EM8000 network manager may be used for large network control (refer to the EM8000 reference manual).

The unit provides the T1 network connection through an advanced integral ESF CSU. Full performance T1 span monitoring enables early detection and correction of problems before they affect critical applications. The unit provides a wide range of test functions to aid in rapid fault isolation and repair. All the standard loopback functions may be implemented. The unit also responds to inband fractional loop codes to accommodate fractional T1 service testing by the carrier. An internal BERT is provided for testing both the network and equipment connections.

The PRISM 3000 is compatible with industry standards to ensure access to any T1 provided service and to allow connection of all equipment quickly and correctly. Innovative design eliminates clocking problems on the high speed data ports. The unit utilizes 'FLASH' memory to allow firmware upgrades in the field. This eliminates the need for taking units out of service for an extended time or returning units to the factory for updates.

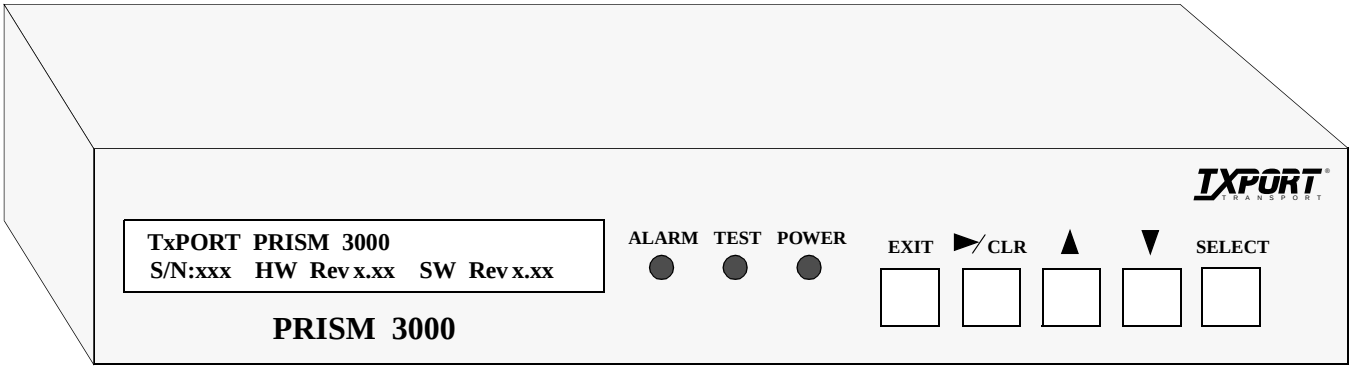
The unit allows complete control of the DS1 bandwidth with flexible assignment of DS0 channels, allowing the user to program bandwidth as needed for each application. For example, voice bandwidth not required after hours can be allocated to meet data processing requirements.

The integral Ethernet or Token Ring management option provides for wide area LAN connectivity. When connecting local area bridging or routing devices to a T1 network, other CSU/DSUs are out of the LAN management loop. With the PRISM 3000, the critical T1 connection point is under control of the existing SNMP management system, providing seamless integration of LAN and WAN, and eliminating the need for a separate CSU/DSU management system.

1.1 Design Highlights

- Three slots for customer application cards:
  - Ethernet or Token Ring card with embedded SNMP/ Telnet support
  - Dual high speed port cards (V.35 or EIA530, synchronous N x 56 kb/s or N x 64 kb/s)
  - High and low speed combination cards (RS232/ V.35, RS232 / EIA530, RS232 synchronous)
- Integral ESF/CSU provides full performance monitoring (meets TR62411, TR54016, and T1.403 standards)

TxPORT PRISM 3000



- D4 or ESF line framing
- AMI or B8ZS line coding
- Supports fractional T1 services with flexible bandwidth allocation
- Built-in BERT function with multiple stress patterns and selectable looping tests; responds to inband fractional loop code
- Full T1 software management through
  - the front panel LCD interface
  - a VT100 compatible terminal interface
  - the TxPORT EM8000 network manager
  - an integral SNMP management interface card
  - a Telnet session
- Programmable alarm thresholds
- FLASH memory allows field software upgrades

1.2 Specifications

Network Interface

Line Rate:	1.544 Mb/s (± 50 ppm)
Line Framing:	D4 or ESF
Line Code:	AMI or B8ZS
Input Signal:	0 to -27 dB ALBO
Connection:	RJ48C jack, 100 ¾ (± 5%)
Output Signal:	3.0 V (±10%) base-peak into 100 ¾ with protection
Line Build Out:	0, -7.5, -15, -22.5 dB attenuation
Transient Voltage:	1000 V protection, fused input/output
Jitter Control:	per TR62411 and T1.403
Timing Source:	Internal, recovered line clock, external DTE, station clock
Ones Density:	B8ZS, Nx56 bit stuffing, alternate fill; complies with TR62411

Equipment Interface

T1 DTE Port	(optional)
Line Rate:	1.544 Mb/s (± 50 ppm)
Line Framing:	D4 or ESF
Line Code:	AMI or B8ZS
Input Signal:	DSX1 to -6 dB
Connection:	RJ48C jack, 100 ¾ (± 5%)
Output Signal:	Selectable DSX1 level from 0 to 655 feet in six incremental levels
DTE Ports 1 & 2	(Ports 3 & 4 optional)
Compatibility:	EIA530 (RS422), female DB25 CCITT V.35, female 34-pin
Data Rate:	Synchronous, Nx56 kb/s or Nx64 kb/s (where N = 1 to 24); independent selection on each port
Clocking:	Internal or External
Data Invert:	Independent selection on each port

RS232 Interface

Compatibility:	EIA RS232D, Female DB25
Rate:	Synchronous, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 48000, 56000, and 64000 b/s
Tx Clock:	Internal or External
Data Invert	Soft selectable (inverts TD and RD)
Control Leads	Supports DTR, RTS, CTS, DSR, and DCD and provides switched carrier function

Ethernet Interface

Network Protocol:	TCP/IP based networks
Data Rate:	10 Mb/s
Connection:	Attachment unit interface (AUI) DB15 female network connector with slide latch (compliant with IEEE 802.3 Ethernet standards)
Compatibility:	AUI connects to media attachment units (MAU) for 10BASE-2, 10BASE-5, and 10BASE-T
Standards:	ISO/IEC 8802-3 (Ethernet)
MIB-II:	Device identification and interface performance data. All applicable objects & reporting traps maintained.
DS1 MIB:	DS1 network interface configuration, performance objects, and alarm reporting traps are maintained.

Interface Standards:	Internet RFC1157 (SNMP) RFC1213 (MIB-II) RFC1406 (DS1 MIB)

Token Ring Interface

Network Protocol:	TCP/IP based networks
Data Rate:	4 or 16 Mb/s
Connection:	Female DB9
Compatibility:	Type 1 shielded twisted pair (STP) networks and Type 3 unshielded twisted pair (UTP) networks (with adapter)
Standards:	ISO/IEC 8802-5 (Token Ring)
MIB-II:	Device identification and interface performance data. All applicable objects & reporting traps maintained.
DS1 MIB:	DS1 network interface configuration, performance objects, and alarm reporting traps are maintained.
Interface Standards:	Internet RFC1157 (SNMP) RFC1213 (MIB-II) RFC1406 (DS1 MIB)

Diagnostics

Performance:	Monitoring per TR54016 and T1.403
Network Loops:	Line loopback or payload loopback
Fractional Loop:	Responds to inband V.54 loop code
DTE Port Loops:	Loop toward DTE or network
BERT:	Multiple test patterns toward network or DTE ports

Alarms

Activation:	Programmable thresholds
Reporting:	Call out on alarm (COA), NO/NC dry contacts, or the EM8000 manager
Contact Ratings:	0.6 A @ 125 VAC 2.0 A @ 30 VDC

Power

110 VAC:	0.254A, 28 W, 95 BTU max
220 VAC:	0.127 A, 28 W, 95 BTU max
48 VDC:	0.583 A, 28 W, 95 BTU max

Mechanical

Mounting:	Desktop or horizontal rack
Dimensions:	17.5" W, " H, 12.5" D
Weight:	pounds

Environmental

Operating Temp:	0° to 50° C (32° to 122°F)
Storage Temp:	-20° to 85° C (-4° to 185°F)
Humidity:	95% maximum (non-condensing)

Compatibility

TR62411:	December 1990
TR54016:	September 1989
T1.403:	1989
TR54019A:	April 1988

Industry Listings

FCC Compliance:	Part 15 Subpart B, Class A
FCC Part 68 Reg #	FXKUSA-74467-DE-N
UL Listed:	E110448
CSA Certified:	LR98859
DOC/CSO3:	1653 5193 A

1.3 FCC Requirements

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of 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 is required to correct the interference at his own expense.

Shielded cables must be used to ensure compliance with the Class A FCC limits.

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for

compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interference.

2) This device must accept any interference received, including interference that may cause undesired operation.

Notice to Users of 1.544 Mb/s Service: The following instructions are provided to ensure compliance with FCC Rules, Part 68:

1) All direct connections to T1 lines must be made using standard plugs and jacks.

2) The following information may be required by the local telephone company when applying for leased line facilities:

Port ID: P/N: FSG 3XX2/4

SOC (Service Order Code): 6.0 N

FIC (digital Facility Interface Code):

04DU9-BN	04DU9-DN
04DU9-IKN	04DU9-ISN

USOC jack: RJ48C

3) If the unit appears to be malfunctioning, it should be disconnected from the telephone lines until you learn whether the source of trouble is your equipment or the telephone line. If your equipment needs repair, it should not be reconnected until it is repaired.

4) The unit has been designed to prevent harm to the T1 network. If the telephone company finds that the equipment is exceeding tolerable parameters, they can temporarily disconnect service. In this case, the telephone company will give you advance notice, if possible.

5) Under FCC rules, no customer is authorized to repair this equipment. This restriction applies regardless of whether the equipment is in or out of warranty.

6) If the telephone company alters their equipment in a manner that will affect the use of this device, they must give you advance warning so that you can have the opportunity for uninterrupted service. You will be advised of your right to file a complaint with the FCC.

7) The attached affidavit must be completed by the installer.

8) In the event of equipment malfunction, all repairs should be performed by our company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our company or to one of our authorized agents.

1.4 Canadian Emissions Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

NOTE: End users should use existing 48 VDC battery sources or a CSA certified power supply.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques (de la class A) prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

1.5 Warranty

TxPORT warrants each unit against defects in material and workmanship for a period of five years from the date the unit was shipped to the customer. If the unit malfunctions at any time during the warranty period, TxPORT will repair, or at TxPORT's option, replace the unit free of charge.

The remedies listed herein are the users sole and exclusive remedies. TxPORT shall not be liable for any indirect, direct, incidental or consequential damages. The owner must return the unit to the factory, shipping prepaid and packaged to the best commercial standard for electronic equipment. TxPORT will pay shipping charges for delivery on return. The customer is responsible for mode and cost of shipment to TxPORT.

This warranty does not apply if the unit has been damaged by accident, misuse or as a result of service or modification by other than TxPORT personnel.

When returning the unit for warranty work, a Return Material Authorization (RMA) number must be obtained from customer service at the address/phone number given at the end of this chapter. When calling TxPORT to obtain a Return Material Authorization number or to arrange service, please have the following information available:

- Model number(s) and serial number(s) for the unit(s).
- Reason for return and symptoms of problem.
- Warranty status (if known).
- Purchase order number to cover charges for out-of-warranty items.
- Name and phone number of person we can contact if we have questions about the unit(s).

- Mode of shipment required (second day air is the normal mode of shipment for all returned material unless otherwise specified).

As soon as TxPORT has the above information, the RMA that must accompany the item(s) returned can be issued.

1.6 Ordering Numbers

Each PRISM 3000 is supplied with the following standard equipment:

- Attached 19" mounting brackets
- AC power supply cord for AC powered units
- PRISM 3000 reference manual

The TxPORT PRISM 3000 unit may be purchased with the following part numbers:

Table 1-1 PRISM Ordering Numbers

Part Number	Description
F-3000-001-1**BC**0**EFG**	PRISM 3000 unit
B	Special option
1	Standard unit
2	RS423 station clock input
C	Voltage option
1	110 VAC
2	220 VAC
3	-48 VDC
E	DTE Ports 1 and 2
1	V.35 / V.35
2	V.35 / EIA530
3	EIA530 / EIA530
4	EIA530 / RS232
5	V.35 / RS232
F	DTE Ports 3 and 4
0	Not installed (blank panel)
1	V.35 / V.35
2	V.35 / EIA530
3	EIA530 / EIA530
4	EIA530 / RS232
5	V.35 / RS232
G	LAN / T1 DTE option
0	Not installed (blank panel)
1	T1 DTE
2	Ethernet and SNMP
3	T1 DTE, Ethernet, and SNMP
4	Ethernet, Telnet, and SNMP
5	T1 DTE, Ethernet, Telnet, and SNMP
6	Ethernet and Telnet
7	T1 DTE, Ethernet, and Telnet

For example, the letter C is a variable for the voltage option. The default part number (F – 3000 – 001 – – 1110200) is therefore a 110 volt PRISM 3000 with V.35 and EIA530 interfaces installed on Ports 1 and 2.

The PRISM products are usually shipped with the purchased items already installed. Additional modules may be purchased at any time and are easily installed to accommodate user requirement changes.

The user may also require the following equipment options for the installation and operation of the PRISM unit.

Table 1-2 Optional Equipment

Part Number	Description
NET / T1 DTE Cables	
9-1001-004	8-pin mod to 8-pin mod (4 twisted pairs)
9-1001-051-1	T1 cross-over kit, 1 ft.
9-1001-006-1 9-1001-006-2	8-pin mod to 15-pin 'D' type adapter, male 8-pin mod to 15-pin 'D' adapter, female
Supervisory Cables	
9-1001-027-1 9-1001-027-2	DB25 male to 6-pin RJ11 (modem to SUPV) DB25 female to 6-pin RJ11 (modem to SUPV)
9-1001-028-1 9-1001-028-2	DB25 male to 6-pin RJ11 (terminal to SUPV) DB25 female to 6-pin RJ11 (terminal to SUPV)
9-1001-029-2	DB9 female to 6-pin RJ11 (terminal to SUPV)
9-1001-048-1 9-1001-048-2	DB25 male to two 6-pin RJ11 (terminal to NMS) DB25 female to two 6-pin (terminal to NMS)
RS232 Cables	
9-1001-044	Null modem male to male (RS232)
9-1001-211	RS232 straight through male to male cable
9-1001-212	RS232 straight through male to female cable
V.35 Cables	
9-1001-001	V.35 male to male null cable
9-1001-311	V.35 male to male cable
9-1001-312	V.35 male to female cable
EIA530 Cables	
9-1001-511N	EIA530 male to male null cable
9-1001-511	EIA530 male to male cable
9-1001-512	EIA530 male to female cable
RS449 Cables	
9-1564A-037-1 9-1564A-037-2	RS449 male to EIA530 male RS449 female to EIA530 male
9-1564A-038-1	RS449 to EIA530 null cable, male to male
Voice Cables	
9-1001-011	50-pin voice cable, male to male
9-1001-012	50-pin voice cable, male to female
9-1001-010	50-pin voice cable, male to stub
Misc.	
9-3000-045-1	Mounting brackets for 23 inch racks
9-8000-001-1 9-8000-001-2	EM8000 with manual on 3-1/2 inch disk (DOS and UNIX version, respectively)

1.7 TxPORT Customer Service

TxPORT
127 Jetplex Circle
Madison, Alabama 35758

Telephone Number: 800-926-0085 or 205-772-3770

Sales/Administration FAX: 205-772-3388
Manufacturing FAX: 205-772-8280

Customer Service Returns: 800-926-0085, ext. 227

Product Support

Normal Hours (8 a.m. to 5 p.m. Central Time, Mon. – Fri.):
Telephone Number: 800-285-2755, ext. 255
205-772-3770, ext. 255

Emergency (Nights / Weekends / Holidays):
800-285-2755
205-603-2194 (Manager)

Installation

2.0 Introduction

This chapter contains information and instructions required to prepare the TxPORT PRISM 3000 for use. Included are initial inspection procedures, mounting instructions, configuration guidelines, connection instructions, and powering information.

The PRISM 3000 is shipped ready for desktop or horizontal rack mount use. Mounting brackets are attached at the front edge of the unit. These may be removed for desktop use.

2.1 Safety Summary

This manual contains information and warnings which must be followed by the user to ensure safe operation and to retain the equipment in a safe condition.

This WARNING sign denotes a potential hazard to the operator. It calls attention to a procedure or practice which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.

2.2 Unpacking and Inspection

This unit is carefully packaged to prevent damage in shipment. Upon receipt, inspect the shipping container for damage. If the shipping container or cushioning material is damaged, notify the carrier immediately and make a notation on the delivery receipt that the container was damaged (if possible, obtain the signature and name of the person making delivery). Retain the packaging material until the contents of the shipment have been checked for completeness and the instrument has been checked both mechanically and electrically.

If the contents of the shipment are incomplete or, if there is mechanical damage or defect, notify TxPORT. If the shipping container is also damaged, or the cushioning material shows signs of stress, notify the carrier of the damage as well as TxPORT. Keep the shipping materials for carrier's inspection. TxPORT will arrange for repair or replacement without waiting for claim settlement.

2.3 Supplied Materials

The PRISM 3000 is shipped from the factory with the following standard equipment:

- Attached 19" mounting brackets
- The PRISM 3000 reference manual
- AC power supply cord for AC powered units

The user may also require the following additional materials for the installation and operation of the unit.

- -48 VDC power source
- Network and DTE interface cables
- 20-gauge stranded wire (or similar) for DC power and alarm connection

For specific applications, the user may require additional cables and adapters for the installation and operation of the unit. The interface requirements of any application may be met by using the appropriate cable. Standard cables and TxPORT ordering numbers are listed in Section 1.6 on page 1-5. Contact TxPORT for any needed assistance in cable selection.

2.4 Unit Configuration

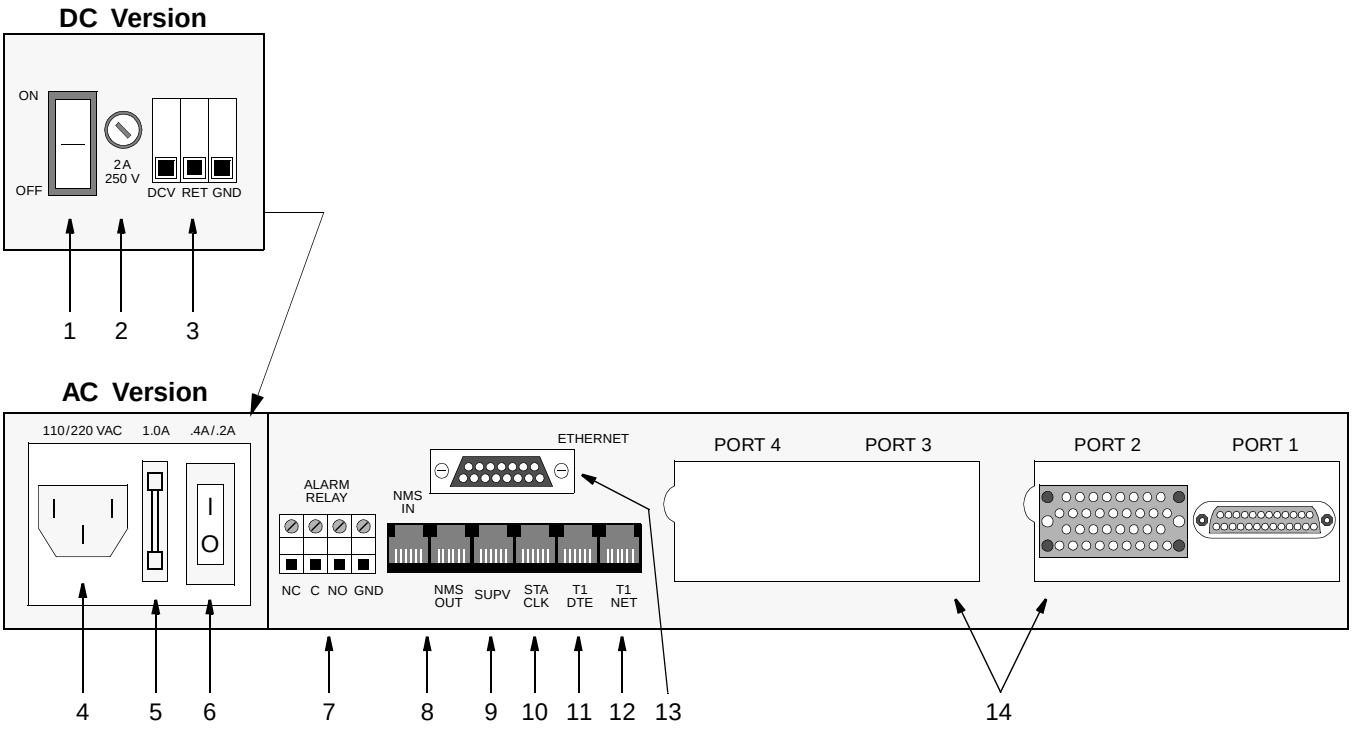
Hardware switch settings are not required on this unit. Configuration is performed using any of the following methods:

- The front panel LCD interface (refer to the 'Operation' chapter of this manual).
- A terminal connected to the 'SUPV' or the 'NMS' port (refer to the 'Terminal Operation' chapter).
- The TxPORT EM8000 element manager (refer to the EM8000 reference manual).

The PRISM 3000 provides non-volatile memory retention of unit configuration in the event of power failure. This feature allows the unit to automatically restore normal service following a power loss. Note, however, that when the unit is stored without power for an extended period, the battery may drain and some parameters may become corrupted.

Therefore, when the unit is first received for installation or if power has not been applied for an extended period of time, a factory default 'maintenance reset' operation should be performed on the unit. Refer to the procedures detailed in Section 3.1.1 on page 3-1.

Figure 2-1 PRISM 3000 Rear Panel



Index	Control/Indicator	Function
1	DC Power Switch	This switch turns the DC power ON or OFF.
2	DC Fuse	This DC fuse is rated at 2.0 Amp.
3	DC Connection	48 VDC power is connected to 'DCV'; the return is connected to 'RET'. See Section 2.11.2 on page 2-6.
4	AC Connection	This 110/220 VAC power receptacle is rated at 50-60 Hz, 0.6 A / 0.3 A. See Section 2.11.1 on page 2-6.
5	AC Fuse	This AC fuse is rated at 1.0 Amp and is shipped with a spare.
6	AC Power Switch	This switch controls the AC power (position I is ON and position O is OFF).
7	Alarm Relay	The 'Normally Closed' alarm connects to NC & C. The 'Normally Open' alarm connects to NO & C.
8	NMS	This is the network management system input/output. Refer to Section 2.10.1 on page 2-4.
9	SUPV	Supervisory port connection. Refer to Section 2.10.2 on page 2-4.
10	Station Clock	The N x 56/64 kHz or 1.544 MHz external station clock connector. Refer to Section 2.9 on page 2-3.
11	T1 DTE	The T1 DTE port for drop and insert applications. Refer to Section 2.6 on page 2-3.
12	T1 NET	The T1 network port. Refer to Section 2.7 on page 2-3.
13	Slot 1 - Ethernet	This is the 15-pin Ethernet or Token Ring connection. Refer to Section 2.10.3 on page 2-5.
14	Ports 1 through 4	Two cards with up to two ports each may be inserted into each of these slots. Ports 1 and 2 show a combination of V.35 and EIA530 cards.

2.5 Data Port Connections

The PRISM 3000 is available with 2 or 4 high speed data ports installed in Ports 1 through 4 on the rear panel (refer to Figure 2-1 on page 2-2). Each slot may contain two ports. The ports are configured as data communications equipment (DCE) for connection to data terminal equipment (DTE) and may be equipped with any combination of V.35 or EIA530 compatible interfaces. Pin assignments for both the V.35 and EIA530 interfaces are given in Appendix A.

Warning: FCC rules require that interconnecting cables carrying high speed data be shielded appropriately in order to minimize radio frequency interference.

2.6 T1 DTE Connection

The PRISM 3000 is supplied with a T1 DTE port, which functions only if the unit is equipped with the T1 DTE interface card. This function provides a DSX1 level interface which allows the user to pass DS0 channels through the unit from the network side to other T1 oriented equipment via the T1 DTE port.

A typical installation divides the channel usage so that DS0 channels carrying high speed data are mapped to the high speed data ports while voice channels are passed to a channel bank or a PABX connected to the T1 DTE port.

The DTE DSX1 line build out level should be set as shown in 'DSX Level' in Section 3.4 on page 3-4. The T1 DTE physical interface is a standard RJ48C 8-pin modular jack with the following pinout assignments.

Pin	T1 DTE Interface
1	Data Out
2	Data Out
3, 6	Not Used
4	Data In
5	Data In
7, 8	Chassis Ground

2.7 Network Connection

The network side of the PRISM 3000 is referred to as the network interface. This interface contains an ALBO (automatic line build out) which allows the unit to be located a substantial distance away from the telco network interface with a receive signal level down to -27 dB.

The network interface LBO level should be set as instructed in 'Line Build Out' in Section 3.3 on page 3-3. Maximum suggested cable lengths for the connection from the unit to the network are listed in the following table. Calculations are based on a cable temperature of 70° F, 0.083 uF/mile capacitance, a 27 dB loss, and a 100 ¾, non-loaded, twisted pair cable. PIC refers to Plastic Insulated Cable.

Cable Type	Loss per 1000'	Max Cable Length
26 gauge PIC	6.8 dB	4,400 ft
24 gauge PIC	5.4 dB	5,500 ft
22 gauge PIC	4.2 dB	7,100 ft
19 gauge PIC	3.0 dB	10,000 ft

The network physical interface is a standard RJ48C 8-pin modular jack with the following pinout assignments.

Pin	T1 NET Interface
1	Data In
2	Data In
3, 6	Not used
4	Data Out
5	Data Out
7, 8	Chassis Ground

Network Disconnection: In accordance with FCC Rules, Part 68.218(b), the user must notify the telephone company prior to disconnecting the PRISM 3000.

2.8 Alarm Connection

Alarm conditions detected by the PRISM 3000 are conveyed at the isolated 'ALARM RELAY' output contacts on the rear panel. NC (Normally Closed) and NO (Normally Open) refer to the alarm contact's relationship to C (Common) under a 'no alarms' condition.

Alarm connections are made to the terminal strip using a 22-gauge stranded, or similar, wire. The 'Normally Closed' alarm connects to NC & C. The 'Normally Open' alarm connects to NO & C. Contacts are rated at 0.6 Amp AC or 2.0 Amp DC. Alarm parameters are discussed in Section 4.6.2 on page 4-11.

2.9 External Clock Connection

If the PRISM 3000 is to receive its timing source from a user supplied clock other than the DTE or T1 lines, the 'Station Clock' input must be connected on the rear panel. This input is designed to accept TTL or bipolar signal levels. The

station clock is commonly available as a 64 kHz, bipolar RTZ signal referred to as a 'composite clock'.

The unit will also accept any unframed all ones bipolar RTZ signal with a level of 1.5 to 4 volts peak and a frequency of 1.544 MHz or any multiple of 56 or 64 kHz. An RS422/423 compatible station clock input, with the same range of input frequencies, is also available as an option.

The station timing is configured through the front panel (refer to Section 3.3 on page 3-3) or through the terminal interface (refer to Section 4.6.1 on page 4-7). Pin utilization of the RJ11 (6x4) connector is shown in the following table.

Pin	TTL Signal	Bipolar Signal
1	Ground	Ground
2	Not Used	Not Used
3	TTL Clock	Balanced Tip
4	Ground	Balanced Ring
5	Not Used	Not Used
6	Ground	Ground

2.10 Network Management

The PRISM unit is fully compatible with TxPORT's element manager, the EM8000. The EM8000 software system can be used to manage small to large networks of TxPORT network access products.

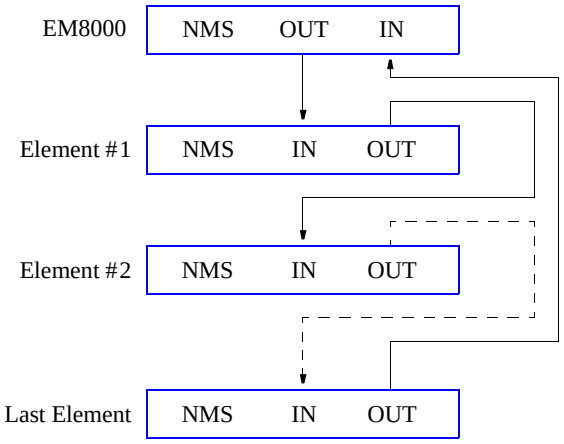
An element is accessed by using an RS232 connection from the serial port of the computer running the EM8000 program to the unit's 'SUPV' or the 'NMS' ports. The Ethernet (or Token Ring) SNMP port in Slot 1 may also be used for network management. The different connection methods are described in the following paragraphs.

2.10.1 NMS Connection

The two 6-pin modular connectors labeled 'NMS IN' and 'NMS OUT' on the rear panel may be used for connection to the EM8000. This port is configured in this manner to allow the connection of multiple collocated units in a daisy chain IN/OUT bus arrangement as shown in Figure 2-2. The OUT port of one element is connected to the IN port of the next element, and so on, to form a complete chain among the group of elements.

NOTE: All units on the same NMS chain must use the same NMS bit rate.

Figure 2-2 NMS Daisy-Chain Arrangement



The 'NMS IN' connector provides both the transmit and receive signal pair. This port may be used for a modem connection or as a VT100 terminal interface (refer to the 'Terminal Operation' chapter).

The EM8000 may be connected directly into the NMS chain between two elements if connection to the 'SUPV' port is not desirable. A 'Y' cable is used from the EM8000 serial port which splits the transmit and receive signals into two 6-pin modular connectors for the 'NMS IN' and 'NMS OUT' ports. See Section 1.6 on page 1-5 for ordering information.

The NMS address, NMS bit rate, and boot configuration mode is set by the front control panel as described in Section 3.8 on page 3-10. The physical connection of the NMS port is a 6-pin modular connector with the pinout shown in the following table. This is a serial RS232 DCE port configured for 8 bits, no parity, and 1 stop bit.

Pin	NMS BUS IN	NMS BUS OUT
1	Not Used	Not Used
2	Signal Ground	Signal Ground
3	Data Out	Data Out
4	Data In	Not Used
5	Signal Ground	Signal Ground
6	Not Used	Not Used

2.10.2 Supervisory Port Connection

The rear panel 'SUPV' port serves several functions. The terminal interface program may be accessed through this port (refer to Figure 2-3 on page 2-5). A modem may be connected to this port for remote access or use of the call on alarm feature (refer to Figure 2-4 on page 2-5).

For cabling convenience, The EM8000 workstation may be directly connected to the supervisory port. When a group of

elements is connected in an NMS chain, the EM8000 may be connected to the supervisory port of any one of the elements. This element can then route messages onto the NMS chain to reach the other elements. The call on alarm (COA) feature works through the supervisory port only.

The supervisory port is an independent serial interface into the PRISM 3000 and plugging into it does not interrupt the NMS port traffic. The supervisory port bit rate must be set by the front control panel (refer to 'System Utilities', Section 3.8 on page 3-10).

The physical connection is a 6-pin modular jack with the following pinout assignments. The port is a serial RS232 DCE port configured for 8 bits, no parity, and 1 stop bit.

Pin	SUPV Port Interface
1	Control Out
2	Signal Ground
3	Data Out
4	Data In
5	Signal Ground
6	Control In

2.10.3 LAN SNMP Connection

The PRISM 3000 may be equipped with an optional Ethernet or Token Ring interface for connection to the user's LAN (local area network). The unit's SNMP (Simple Network Management Protocol) agent can then be programmed to take advantage of the centralized status monitoring and alarm reporting capability of SNMP managed networks. The LAN interface is connected to Slot 1 on the rear panel.

Ethernet: The Ethernet interface consists of a 15-pin female AUI (attachment unit interface) connection compliant with ISO/IEC 8802-3 standards (formerly IEEE 802.3). The pinout assignments are as follows:

Figure 2-3 Supervisory Port to Terminal Connection

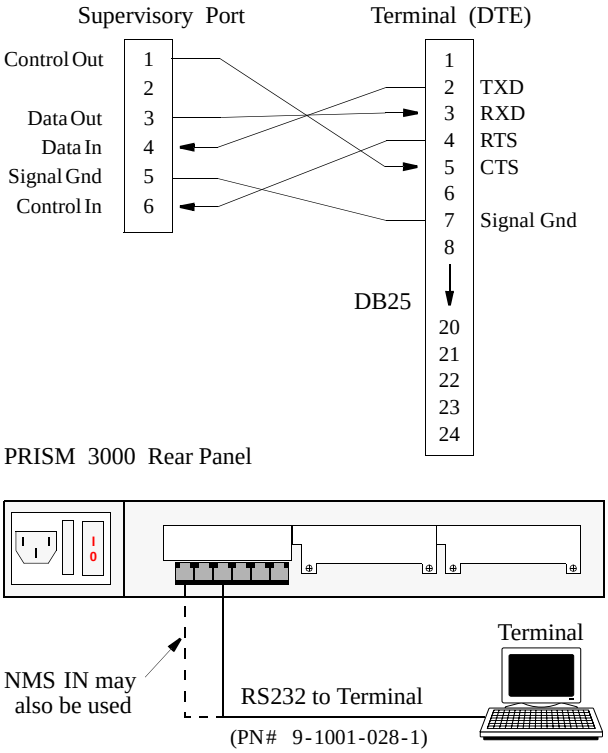
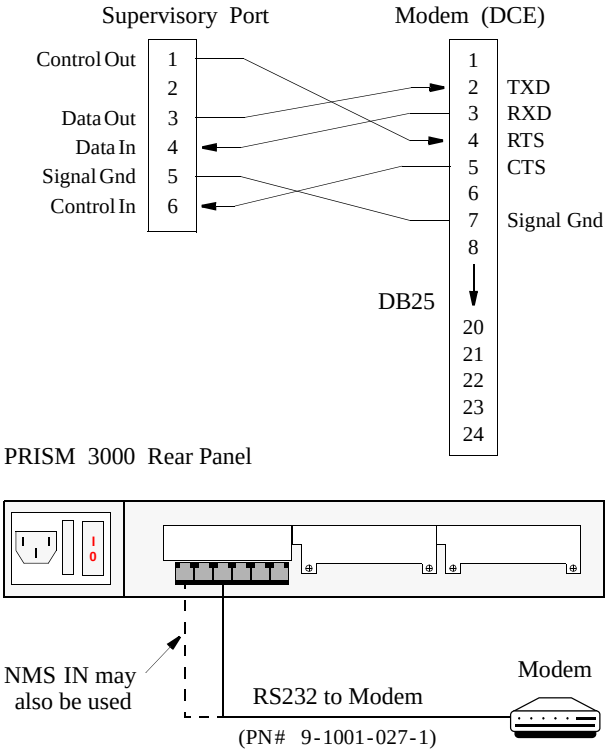


Figure 2-4 Supervisory Port to Modem Connection



Contact	Circuit	Ethernet Interface
3	DO-A	Data Out (Ckt. A)
10	DO-B	Data Out (Ckt. B)
11	DO-S	Data Out (Ckt. Shield)
5	DI-A	Data In (Ckt. A)
12	DI-B	Data In (Ckt. B)
4	DI-S	Data In (Ckt. Shield)
2	CI-A	Control In (Ckt. A)
9	CI-B	Control In (Ckt. B)
1	CI-S	Control In (Ckt. Shield)
6	VC	Voltage Common
13	VP	Voltage Plus
14	VS	Voltage Shield
Shell	PG	Protective Gnd (conductive shell)

The user must attach the appropriate MAU (media attachment unit) for connection to the existing LAN medium. MAUs are available for connection to 10BASE-5 (Thick Net), 10BASE-2 (Thin Net), and 10BASE-T (twisted pair). SNMP configuration should be performed prior to connecting the PRISM 3000 to the LAN interface. This is described in Section 3.6 on page 3-7 and Section 4.6.5 on page 4-13.

Token Ring: The Token Ring interface is designed to operate on both 4 and 16 Mb/s networks. For 4 Mb/s operation, jumper J3 must be strapped across pins 1 and 2. For operation at 16 Mb/s, jumper J3 must be strapped across pins 2 and 3. The Token Ring interface consists of a 9-pin female connection compatible with shielded twisted pair (STP) cable and complies with ISO/IEC 8802-5 (formerly IEEE 802.5). The pinout assignments are as follows:

Pin	Token Ring Function
1	Data In (A)
6	Data In (B)
9	Data Out (A)
5	Data Out (B)
3	+ 5 Volts
2, 4, 7, 8	Signal Ground
10, 11	Chassis Ground

Connection to unshielded twisted pair (UTP) cable may be accomplished using an appropriate STP to UTP media filter/adapter (TxPORT part # `9-1001-056-1`). After connection to the Token Ring LAN, the unit must be powered down and then back up to allow the interface to perform a self-test on the network.

2.11 Power Connection

The PRISM 3000 is factory equipped for one of three powering options as required by the user. The 110 VAC version is supplied with a standard three-prong AC cord. The 220 VAC version is supplied with an unterminated cord. Both AC versions are fused at 1.0 A.

The DC power version is equipped with terminal blocks for power connection and is fused at 2.0 A. In all cases, a proper ground should be connected to the 'GND' terminal.

Remove power before checking fuses.

NOTE: On power up, the board initialization sequence causes a delay. During this period, the message on the front panel shows '`Calculating Checksum`'. Each voice card adds 6 seconds to the delay.

2.11.1 AC Power Connection

1) Connect the AC power cord to an appropriate AC power receptacle.

2) Set the rear panel power ON/OFF switch to the 'ON' position (labeled '**I**'). The green power LED on the front panel should light after the LED initialization sequence ends. If the indicators do not light, recheck the power connections and the primary AC circuit breaker. Make sure the ON/OFF switch is in the ON position.

2.11.2 DC Power Connection

Connect the ground lead before applying power to the unit.

1) Connect a ground lead (18 to 20-gauge) to the 'GND' terminal. In many cases the 48V return is also ground. In that case, both 'RET' and 'GND' should be connected to ground.

2) Connect the 48 VDC lead (22-gauge) to 'DCV'. Connect the return lead to 'RET'.

3) Set the rear panel power switch to the 'ON' position. The green power LED on the front panel should light after the LED initialization sequence ends. If the indicators do not light, recheck the power connections and make sure the ON/OFF switch is in the 'ON' position.

Operation

3.0 Introduction

This chapter describes the screens and menus associated with the TxPORT PRISM 3000 front panel LCD interface. The 'Terminal Operation' chapter discusses the screens and menus associated with the external terminal interface. In general, the options are the same for both interfaces.

The illustration on this page depicts the front panel which has three LED indicators, an LCD screen, and five control buttons. The table below the illustration is referenced by number to the front panel controls and indicators along with a brief description.

NOTE: Throughout this manual, all the factory default settings are shown underlined.

3.1 Front Panel Operation

After power is applied and the unit performs a self test, the idle display screen appears as shown in the illustration below. The top display line is text that may be user programmed (see 'User Info', Section 3.8 on page 3-10). The bottom line displays the unit serial number and the hardware/software revision numbers. The unit may be accessed by pressing any front panel key.

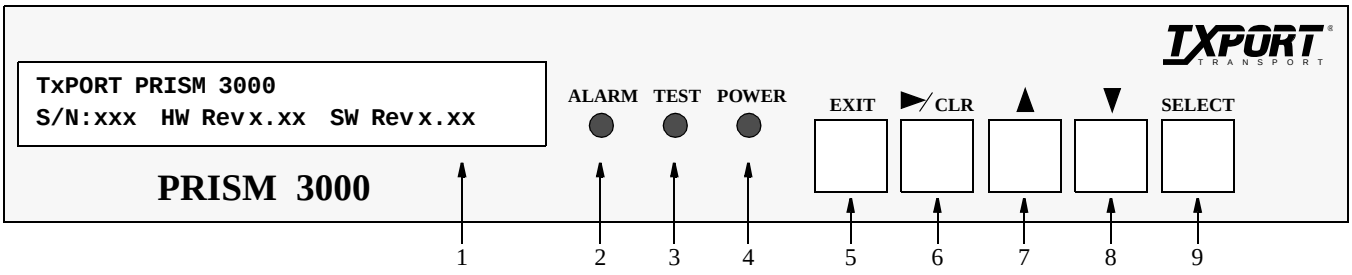
3.1.1 Maintenance Reset

The PRISM 3000 provides non-volatile memory retention of unit configuration in the event of power failure. This feature allows the unit to automatically restore normal service following a power loss. Note, however, that when the unit is stored without power for an extended period, the battery may drain and some parameters may become corrupted.

Therefore, when the unit is first received for installation or if power has not been applied for an extended period, a factory default 'maintenance reset' operation should be performed. This is done by pressing and holding the ' ►/CLR ' button and then applying power to the unit. Hold this key until the 'RAM CLEARED' message appears. This procedure installs the predefined ROM configuration to eliminate the possibility of data corruption. The battery is fully charged after power has been applied for 160 hours.

NOTE: The maintenance reset operation sets all parameters to the factory default ROM settings and zeros all performance registers.

Front Panel Controls and Indicators



Index	Control/Indicator	Function
1	LCD Display	This 2-line, 40-character wide window provides access to unit configuration, diagnostics, and utilities.
2	ALARM (red)	This LED lights continuously when the unit is in an active alarm condition.
3	TEST (yellow)	This LED lights continuously when line or DTE loops are set or if the BERT function is operating.
4	POWER (green)	This LED lights continuously when power is applied to the unit.
5	EXIT	Pressing this button returns the user to the previous menu.
6	►/ CLR	Pressing this button will either move the cursor one character to the right or it will clear the error counts. Pressing this button on power up resets all parameters to the factory defaults.
7	▲	Pressing this button allows the user to scroll up through the elements/parameters.
8	▼	Pressing this button allows the user to scroll down through the elements/parameters.
9	SELECT	Pressing this button accesses a submenu or sets a parameter to the displayed value.

3.1.2 Password

If no password has been programmed, the password prompt will not appear and the PRISM 3000 proceeds directly to the menu system. The unit is factory shipped without a programmed password. The process of setting a password is described in 'Edit Password', Section 3.8 on page 3-10.

If a password has been programmed, the password screen appears when any key is pressed. Each character must be entered using the up and down arrow keys until the desired character is displayed. Using the up arrow, the characters scroll through '0-9', 'A-Z', and 'a-z' for a total of 62 distinct characters. When the correct character is displayed, press the right arrow to move the cursor to the next position. The preceding character is accepted and disappears.

Password Screen

```
Enter Password: A
↑/↓=Letter  Select=Done  →= move
```

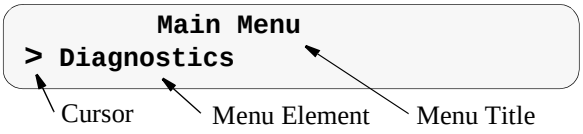
Continue this pattern until the last character is selected. Press the right arrow once more and then press <Select>. If the password is correct, the unit will advance into the menu system. If the password is entered incorrectly, the idle display is returned and the user may try again.

NOTE: The password is case sensitive. Lower case and upper case characters must be entered exactly as they were programmed.

3.1.3 Menu Components

The PRISM 3000 front panel display consists of three components: a menu title, a menu element, and a cursor. These components are shown in the following screen using the Main Menu as an example.

Main Menu Screen



Menu Title: The menu title is the general classification of functions currently accessible to the user.

Menu Element: There are three types of menu elements. In this manual, the distinction is made by the box type shown in the 'menu diagrams'.

1) A large, solid box indicates user selectable menus with lower level menu items.

2) A dashed box lists user selectable parameters. Pressing <Select> executes the displayed configuration.

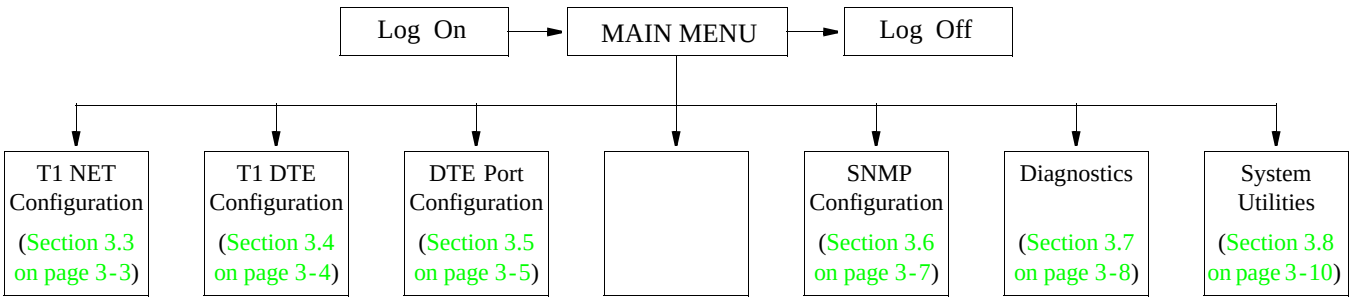
3) A small, solid box (with small type) indicates either a non-selectable status or a field in which a particular value may be entered.

For example, refer to the menu diagram on the bottom of page 3-3. The upper level menus are shown within a large, solid box. This indicates that these items are user selectable menus. The lower level menus are shown within dashed boxes to indicate that these items are user selectable parameters. The small, solid boxes under 'Alarm Thresholds' indicate that values may be entered in these fields.

If the menu element contains a submenu, it is accessed by pressing <Select>. The menu element becomes the menu title and the next lower level in the hierarchy becomes the menu element. For example, if the menu element is 'T1 NET Configuration', pressing <Select> will move 'T1 NET Configuration' up to the menu title level and 'Framing Type' will move up to the menu element level.

Cursor: The cursor first appears on the left side of the display as seen in the top example of the screen shown below.

Main Menu Diagram



When the element is a user selectable function, pressing <Select> moves the cursor to the right with the arrow pointing left (<) as seen in the second screen below.

Example of Cursor Movement

```
      T1 NET Configuration
> Framing Type ..........  ESF
```

```
      T1 NET Configuration
  Framing Type ..........  ESF <
```

This allows the user to scroll through the options available for that function using the arrow keys. Pressing <Select> again sets that parameter. Pressing <Exit> returns the cursor back to the left. The cursor will not appear when status-only elements are displayed.

NOTE: To return to the previous screen without changing a parameter, press <Exit>. Do not press <Select>. Pressing <Exit> again returns the previous screen.

3.2 Main Menu Display

The 'Main Menu' screen is the first level of access for all the functional menus available to the user. To activate any of these menus or submenus, use the methods described in Section 3.1.3.

The 'Main Menu' diagram is shown on page 3-2. The section and page numbers are provided in case the user needs to refer to a specific topic.

3.3 T1 NET Configuration

The 'T1 NET Configuration' screen allows the following network configuration parameters to be set.

T1 NET Configuration Screen

```
      T1 NET Configuration
  Line Code .............  AMI <
```

Framing Type: Selects the framing for the network side of the DSU/CSU. The choices are '`D4`' and '`ESF`'.

Line Code: Sets the network side line coding. The choices are '`AMI`' and '`B8ZS`'.

Line Build Out: Sets the line build out for the network interface. The choices are: '`0 dB`', '`-7.5 dB`', '`-15 dB`', and '`-22.5 dB`'.

Timing: Sets the timing source to synchronize the unit's internal timing generators. In all cases, slips are controlled to occur on frame boundaries at the network and/or DSX1 ports when timing synchronization is lost. The choices are:

INTERNAL: The PRISM unit's internal frequency standard is used for all timing.

NETWORK: Timing is derived from the network recovered clock (the most common selection for most applications).

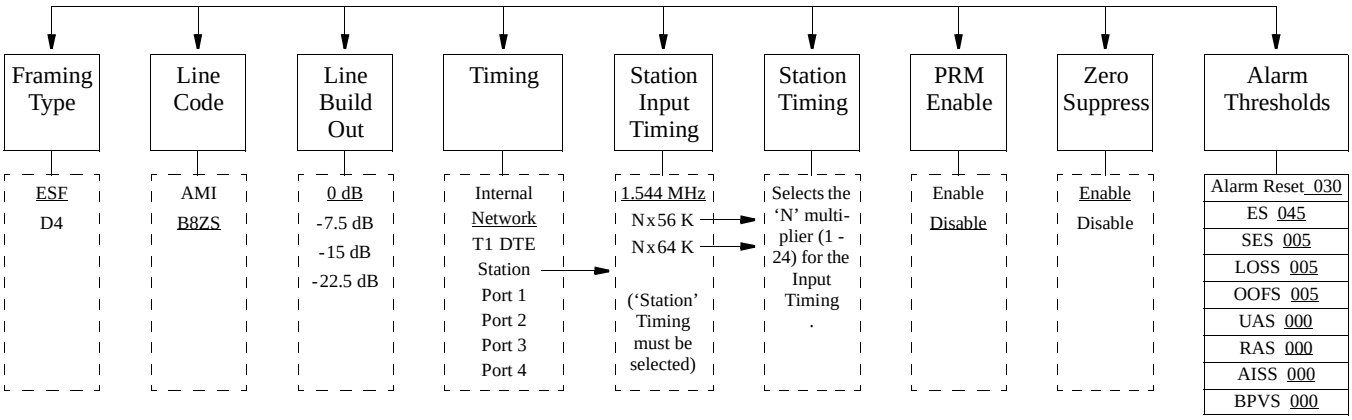
T1 DTE: The unit synchronizes to the clock recovered from the DSX1 T1 DTE port. This selection only appears on units equipped with the T1 DTE option.

STATION: Timing is derived from a bipolar or TTL compatible clock supplied to the unit via the rear panel 'STA CLK' connector. When this mode is selected, the timing rate must also be set from '`Station Input Timing`'.

PORT 1, 2, 3, or 4*:* Timing is synchronized to the external terminal timing clock supplied from the DTE and connected to the selected port. Selections will only appear for ports which are installed on the unit.

Station Input Timing: This field selects the input timing and only appears when '`Station`' has been selected from

T1 NET Configuration Menu Diagram



the ‘Timing’ menu. The choices are ‘Nx56K’, ‘Nx64K’, and ‘1.544 MHz’.

Station Timing: This field selects the ‘N’ multiple when ‘Station Input Timing’ is set to either ‘Nx56K’ or ‘Nx64K’ and only appears when ‘Station’ has been selected from the ‘Timing’ menu. The ‘N’ range is 1 to 24. For example, if N = 2 and ‘Station Input Timing’ is set to ‘Nx64K’, the unit expects a 128 kHz clock on the station input port (2 x 64 = 128).

PRM Enable: This field will ‘ENABLE’ or ‘DISABLE’ the ANSI T1.403 Performance Report Message functions.

Zero Suppression: This field determines whether ones density insertion is activated after 15 zeros. To ensure compliance with TR54016, this field must be enabled. The choices are ‘ENABLE’ and ‘DISABLE’.

Alarm Thresholds: The PRISM can be programmed to generate an alarm condition based on a specific level of performance degradation. Acceptable alarm thresholds are set for periods of 15 minutes (900 seconds). The error types listed below can be preset to a value between ‘0’ and ‘900’ seconds. A field set to ‘0’ causes the unit not to alarm on that statistic. To effectively disable alarm reporting, set all fields to ‘0’.

The 15-minute time frame is not based on the TR54016 or T1.403 interval boundaries, but is a time window based on the accumulated counts over the previous 15 one-minute intervals. In all cases, if the number of actual network errored seconds in the previous 15 minutes reaches the preset threshold for the specified error type, an alarm condition is declared.

Alarm Reset Timer: Sets the length of time after the alarm condition clears before the alarm indication is removed. A value of zero in this field will not allow the alarm to be automatically cleared. The default value is 30 seconds.

ES: Sets the errored seconds threshold. The default value is 45 seconds.

SES: Sets the severely errored seconds threshold. The default value is 5 seconds.

LOSS: Sets the loss of signal seconds threshold. The default value is 5 seconds.

OOFS: Sets the out of frame seconds threshold. The default value is 5 seconds.

UAS: Sets the unavailable seconds threshold. The default is 0 (disabled).

RAS: Sets the remote alarm seconds threshold. The default is 0 (disabled).

AISS: Sets the alarm indication signal seconds threshold. The default is 0 (disabled).

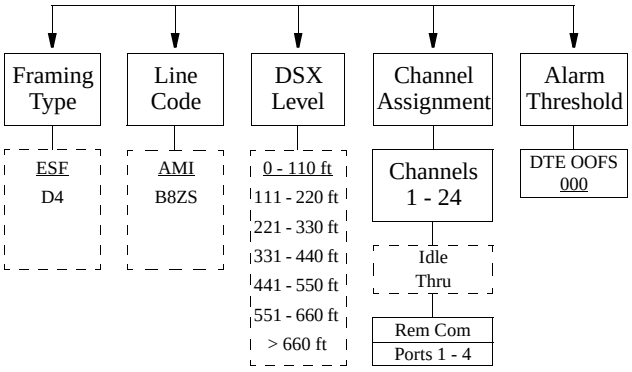
BPVS: Sets the bipolar violation errored seconds threshold. The default is 0 (disabled).

3.4 T1 DTE Configuration

The T1 DTE Configuration display allows configuration parameters to be set the for the T1 DTE port (if equipped).

T1 DTE Configuration Screen & Diagram

```
T1 DTE Configuration
Framing Type ........     ESF <
```



Framing Type: Selects the type of framing for the T1 DTE side of the unit. The PRISM permits framing conversion from the DTE to the Network and from the Network to the DTE (D4 to ESF and ESF to D4). Older D4 equipment can be supported with newer ESF spans. Using ESF framing allows the user and the telco access to the increased serviceability and information available through the FDL protocols. The choices are ‘D4’ and ‘ESF’.

Line Code: Selects the type of line coding for the DTE side of the unit. The choices are ‘AMI’ and ‘B8ZS’.

DSX Level: Specifies the DTE DSX1 interface output level. The choices are: ‘0-110ft’
‘111-220ft’ ‘221-330ft’ ‘331-440ft’
‘441-550ft’ ‘551-660ft’ ‘>660ft’

Channel Assignment: This field selects which of the 24 network channels are to be passed through to the T1 DTE port. Channels which have been assigned to a high speed port are indicated and can only be changed through the ‘DTE Port Configuration’ menu. The default is all channels idle. Choices for the unassigned channels are:

IDLE: Sets the specified channel to transmit idle code on the T1 DTE port and ignore received data.

THRU: Sets the specified channel to pass data from the T1 DTE port to the network and vice versa.

This menu also displays 'Rem Comm' (channels assigned as remote communication channels) and 'Port X' (channels assigned to ports are indicated as Port 1 to Port 4.

Alarm Thresholds: The PRISM can generate alarm conditions based on alarm thresholds set for periods of 15 minutes (900 seconds). A field set to '0' causes the unit not to alarm on that statistic. To effectively disable alarm reporting, set all fields to '0'.

DTE OOFS: Sets the DTE out of frame seconds threshold. The default value is 0 (disabled).

3.5 DTE Port Configuration

The 'DTE Port Configuration' display sets the operating parameters for each of the high speed ports and the RS232 port. The unit does not allow conflicting configurations for the DTE ports. Therefore, the selections for each menu item are restricted to those that do not conflict with the configuration of other high speed ports or the T1 DTE Port. The default is all ports disabled.

DTE Port Configuration Screen

```
DTE Port Configuration
Port Rate ... 64Kx24=1536 kHz <
```

When channel assignment changes are made to the high speed ports, the remote communication link, or the T1 DTE, the PRISM reestablishes the mapping of all channels. This interruption to traffic will normally result in a brief burst of data errors on other ports.

Port Rate Multiplier: The PRISM can operate at any data rate that is a multiple of 56 or 64 kb/s. If 'NX64K' is selected, the ones density requirements of the T1 network line must be ensured. If 'NX56K' is selected, ones density for the selected DS0 channel is maintained. When set to 'DISABLE', the port is not used and no other configuration choices for that port are available.

Port Rate: The 'N' parameter selects the required port bit rate in increments of 56 or 64 kb/s, depending on the selection in 'Port Rate Multiplier'. The 'N' multiplier ranges in value from 0 to 23. For example, if N is 23 and the base rate is 64 kb/s, the data rate is 1472 kHz (64k x 23).

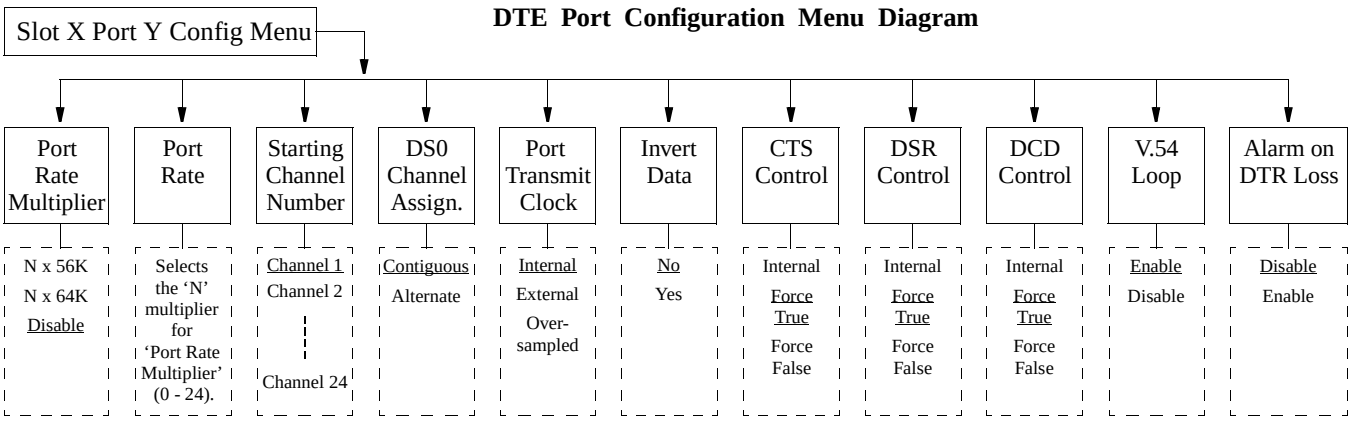
Starting Channel Number: This field selects the starting channel in the 24-channel DS1 bit stream. The unit automatically assigns the channels which follow according to the bit rate and the mode selected in 'DS0 Channel Assignment'. If some channels are already allocated, the starting channel is adjusted to the first block of idle channels that matches the bandwidth to be mapped. The starting channel should be checked before bandwidth is allocated.

DS0 Channel Assignment: Selects whether the DTE channel assignment will be made as a 'CONTIGUOUS' group or as 'ALTERNATE' channels. Selecting 'ALTERNATE' will assure ones density.

Port Transmit Clock: This field is used to select the clock that the unit will use to sample the data transmitted from the DTE. When set to 'INTERNAL', the data is sampled directly with the transmit data clock that is also supplied to the DTE as Transmit Clock. The 'EXTERNAL' option uses the external clock from the DTE. The 'OVERSAMPLED' option is used to operate the port as a low speed asynchronous port. In this mode, the port rate should be set to at least 3 times the asynchronous data rate (depending on the degree of allowable distortion for the particular DTE equipment used).

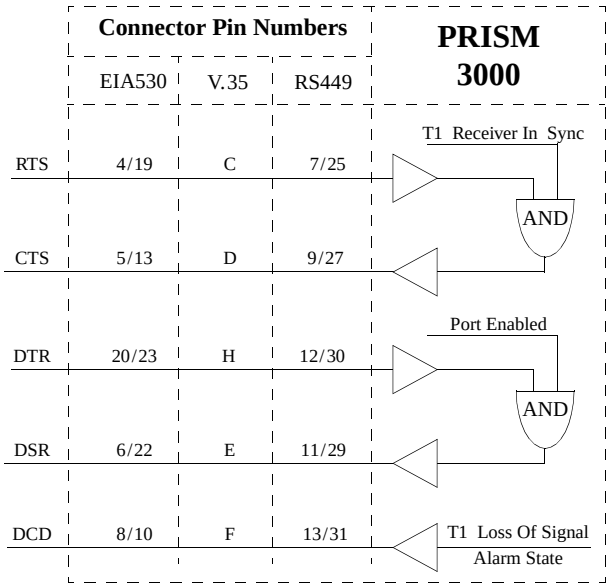
Invert Data: In the invert mode (YES), transmit and receive data are inverted at the port interface. This function may be used as a means of guaranteeing ones density when the data is composed of SDLC type protocols. The choices are 'YES' and 'NO'.

DTE Port Configuration Menu Diagram



CTS/DSR/DCD Control: Setting any of these three fields to '`FORCE TRUE`' or '`FORCE FALSE`' allows the forcing of the port control lead output state. '`INTERNAL`' allows for normal operation as shown in the diagram of the 'High Speed Data Port' below.

High Speed Data Port



V.54 Loop: Selecting '`Enable`' allows the unit to respond to inband V.54 loop commands. If '`Disable`' is selected, the unit ignores these commands.

Alarm on DTR Loss: Selecting '`Enable`' allows the PRISM to alarm on loss of DTR. The default setting is '`Disable`'.

EIA530 or RS232 Option

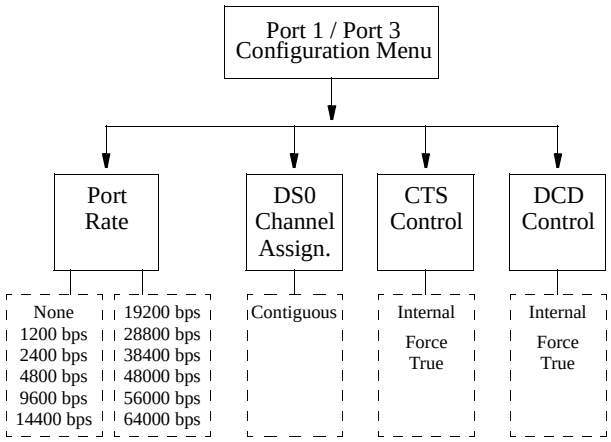
The RS232 low speed port option is available as a combination board with an EIA530 or V.35 port. The RS232 port provides a synchronous DCE interface at subrate speeds for connection to customer DTE. The data from the port is placed in a single selected DS0 channel of the T1 network data stream. For switched carrier applications, the RS232 port provides local RTS to remote DCD control lead operation at all speeds below 64 kb/s.

The RS232 port provides a bidirectional loop for isolating problems associated with the interface. Looping the port does not affect data traffic assigned to any of the other DTE ports. The port loop may be activated from the front panel, the terminal interface, the EM8000, Telnet across the Ethernet or Token Ring interface, or by the reception of inband V.54 loop code. The unit can also be instructed to transmit the inband V.54 loop code to loop the corresponding remote end port.

The PRISM has an internal BERT tester with ten available stress patterns. The user may utilize this capability by looping one end of the DS0 channel assigned to the RS232 port and BERT toward it from the other end. RS232 BERT is valid only at 56kb/s and 64kb/s toward the DTE.

The following RS232 menu diagram is an addition to the 'DTE Port Configuration' menu diagram. It shows the modified menu options available for the RS232 port. The differences are explained in the following paragraphs.Note that only Port 1 and Port 3 are available for the RS232 option.

RS232 Modifications to DTE Port Menu



Port Rate: This parameter selects the required port bit rate for RS232 operation. The '`None`' option disables all operations for this port.

DS0 Channel Assignment: '`CONTIGUOUS`' is the only option available for RS232 operation.

CTS/DSR/DCD Control: The control leads on the RS232 port function as explained in the following paragraphs.

DSR Control: May be set to '`Force True`', '`Force False`', or '`Internal`'. The '`Internal`' option has DSR ON if the port is enabled and OFF if it is disabled.

DCD Control: May be set to '`Force True`' or '`Internal`'. If set to '`Internal`', DCD is ON when data is being received from the remote end and is OFF when idle code is being received from the far end. Setting to '`Force True`' keeps DCD ON regardless of whether data or idle code is being received.

CTS Control: May be set to '`Force True`' or '`Internal`'. The setting of CTS Control has an effect on both the CTS control lead presented to the DTE and on the transmit data from the DTE toward the remote end.

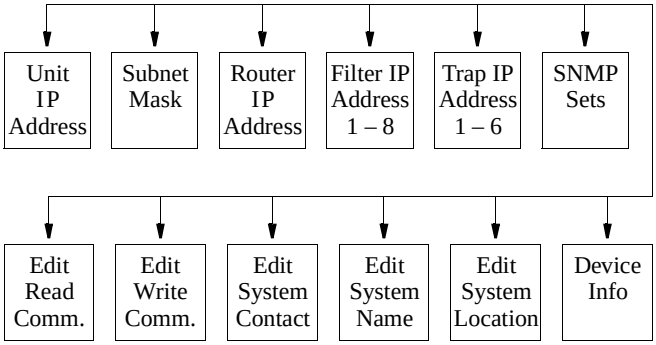
If set to '`Internal`' the CTS control lead will follow the RTS control lead from the DTE after a delay of 21 UI (± 1 UI). The data transmitted to the remote end will also be determined by the state of the RTS control lead. When RTS

is ON, the transmit data from the DTE is sent to the remote end, and when RTS is OFF, idle code is sent to the remote end. If set to '`Force True`' the CTS control lead will always be ON and the RTS control lead from the DTE will be ignored. Thus the transmit data from the DTE will always be sent through to the remote end.

3.6 SNMP Configuration

The SNMP (Simple Network Management Protocol) interface card is an option for the PRISM unit. It provides seamless integration and control of CSU/DSU functions within an existing SNMP managed LAN/WAN environment.

SNMP Menu Diagram



SNMP management stations are able to collect and analyze data from all network devices which comply with the SNMP protocol and to manage those devices. SNMP provides a standard means to monitor the status of all compatible network elements.

The 'SNMP Configuration' screens are accessible if the unit is equipped with the Ethernet or Token Ring SNMP interface option. It allows for the entry of those parameters required for proper operation of the unit with an Ethernet or Token Ring based LAN manager.

The SNMP menu consists of alpha-numeric entry only (no selectable parameters). The following 3 menu items use the format shown in the 'IP Address' screen. Each number has a range from 0 to 255 and is separated by a period.

IP Address Screen

```
        SNMP Configuration
Unit IP Addrs.....132.016.232.000<
```

Unit PRISM IP Address: This field accepts IP addresses. Each device connected to the LAN is required to have a unique IP address identifier.

Subnet Mask: This field is provided to manually override the subnet mask setting which is otherwise discovered by the SNMP agent.

Router IP Address: This field accepts the IP address of a default router, if one is present.

Filter IP Address: These eight fields accept the IP address of the source packet filter. If any of these fields are set, access is allowed only by the specified IP addresses.

Trap IP Address: This field accepts the IP address of a network device where alarm reporting traps are to be sent. The PRISM detects and reports T1 network alarms and provides several options for reporting them, one of which is SNMP traps. When a network alarm occurs, the unit sends a trap message to up to 6 destinations on the user's network.

SNMP Set: This field enables or disables the set command responses. Refer to Appendix ___ for detailed information on these responses.

The following 5 menu items use the format shown in the 'System Edit' screen. The top line in each screen accepts a string of up to 255 characters which identifies the appropriate group, person, device function, or unit location. Each character is entered using the up or down arrow keys until the desired character is displayed. The right arrow moves the cursor to the next position. Continue this pattern until the last character has been selected and press <Select>.

System Edit Screen

```
public
↑/↓=Letter  Select=Done  →=move
```

Read Community: This display accepts a character string identifying the group authorized to perform read operations. The default setting is '`public`'.

Write Community: This display accepts a character string identifying the group authorized to perform write operations. The default setting is '`private`'.

System Contact: This display accepts a character string identifying the person responsible for a network device. The default setting is '`no system contact`'.

System Name: This display accepts a character string identifying the functionality of the network device. The default setting is '`no system name`'.

System Location: This display accepts a character string identifying the physical location of network device. The default setting is '`no system location`'.

Device Info: This field displays the Ethernet or Token Ring hardware/software revision level.

3.7 Diagnostics

The 'Diagnostics' screen allows test and maintenance functions to be performed on the T1 network, the T1 DTE port, and the high speed ports. The PRISM recognizes inband and FDL out-of-band loopback requests. The unit also recognizes local testing and remote network management loopback test configurations. The PRISM supports many ways to test the service to and from the unit.

Diagnostics Screen

```
Diagnostics
T1 Network Loop ---- Loop Far <
```

The PRISM monitors network loopback commands and activates loops based upon their reception as described in TR54016 and T1.403 (loops may also be activated through the EM8000 element manager). Refer to the 'Diagnostics Loop Functions' diagram page 3-10 for a depiction of the loop modes. Also, refer to the 'Loopback Diagrams' shown on page 4-6. The Diagnostics menu allows for loopback and BERT functions as explained in the following paragraphs.

T1 Network Loop: The looping choices are as follows (note that far loops are not allowed during BERT).

NONE: Clears network loops.

LOOP FAR: Sends loop codes over the network to the far end unit to force it into a NET LLB.

UNLOOP FAR: Sends unloop codes to the far end unit to remove the loop condition.

NET PLB: The payload loopback selection loops the data back toward the network. Framing, CRC, and FDL are regenerated and all ones are passed to the DTE ports.

NET LLB: The local loopback selection loops data received from the network back toward the network. Received data is also passed through to the DTE ports as normal.

NET MLB: Network maintenance loopback loops data at the T1 DTE port back toward the network (passes network data to DTE and return data to network). This affects only network channels assigned to the T1 DTE.

DTE MLB: The T1 DTE maintenance loopback loops network data back toward the DTE at the network interface. Data is also passed through to the network.

T1 DTE Loop: The looping choices are as follows:

NONE: Clears DTE loops.

LLB: The local loopback selection loops data received at the T1 DTE interface back toward the T1 DTE. Data is also passed through to the network.

Port Loop: Ports are indicated as Port 1 through Port 4. The looping choices for each port are as follows:

NONE: Clears port loops.

NEAR: A bidirectional fractional loop is set at the port interface.

SEND LOOP: A V.54 in-band loop code is transmitted to the far end unit to force it into a NEAR loop mode on the selected port.

SEND UNLOOP: Unloops the far end unit.

BERT Functions: The following menus offer selections for the BERT port, direction, and pattern along with test results.

BERT Port: This menu item selects the port to be looped. The 'NONE' setting disables the BERT generator. The 'NETWORK' option tests all channels mapped to the network. The 'T1 DTE' option tests all channels associated with the T1 DTE port. Selecting a single port tests all the channels associated with that port.

BERT Channel: This menu item is available only when 'BERT Port' is set to 'Network'. This allows selection of a specific DS0 channel (1 to 24) to be tested. Only unassigned (idle) channels will appear as selections. If 'ALL' is selected, the entire T1 bandwidth will be tested. If 'IDLE' is selected, all unassigned channels are tested.

BERT Pattern: This item specifies which pattern will be transmitted toward the port being tested. The choices are '1 IN 8', '3 IN 24', 'ALT', 'CLEAR', 'QRSS', '63', '511', '2047', '2^{15}-1', '2^{20}-1', and '2^{23}-1'.

BERT Direction: Selects which direction to send the test pattern. The choices are 'Toward Network' and 'Toward DTE'. If the 'BERT Port' menu is set to 'Network', the BERT direction is automatically forced toward the network and this option does not appear.

BERT Results: The following BERT status and error counts are available through this selection:

Sync Status: This field displays the current state of pattern sync during a test. If no test is in progress, 'NO SYNC' is displayed.

Elapsed Time: This field displays the elapsed time since a timed test began. A value is displayed only when a test is running (in the HH:MM:SS format).

Bit Errors: This field displays the total number of bit errors detected since the test began or since error statistics were last cleared.

Errored Seconds: This field displays the number of errored seconds that have been detected since the test began or since error statistics were last cleared.

Pattern Sync Losses: This field displays the number of times during the test period that the BERT pattern detector lost sync.

Reset Bert Test: When set to 'YES', the BERT error counts and elapsed time values are cleared to zero. This parameter then returns to 'NO' automatically.

Network Performance Stats: The PRISM records performance statistics as described in TR54016. The unit is equipped with a dual set of data registers with individual resets that maintain these statistics. One set is accessed by the network service provider (telco). The other set is accessed by the user through the front panel, terminal interface, or the EM8000 element manager.

Performance data is collected in 15-minute intervals for the preceding 24-hour period. The intervals (numbered Int# 00 to Int# 96) are viewed by pressing <Select> and using the up and down arrow keys. Interval 00 is the most recently stored interval and interval 96 is the interval which is 24 hours old. Pressing the <Exit> or <Select> keys returns the cursor to the left. This allows scrolling to another data type.

When a specific interval is selected for viewing performance data, all other parameters will reflect that interval until another interval is selected.

Errored Seconds: ES displays the number of one second intervals where at least one CRC or out-of-frame error event occurred.

Severely Errored Secs: SES displays the number of one second intervals where at least 320 CRC errors were detected or at least one out-of-frame event occurred.

Loss of Frame Secs: LOFS displays the number of seconds that the network interface is out of frame sync.

Unavailable Seconds: UAS displays the number of one second intervals of unavailable service. Counting begins when 10 consecutive severely errored seconds (CSES) occur and ends when 10 consecutive seconds pass with no SES. The initial 10 seconds are included in this count.

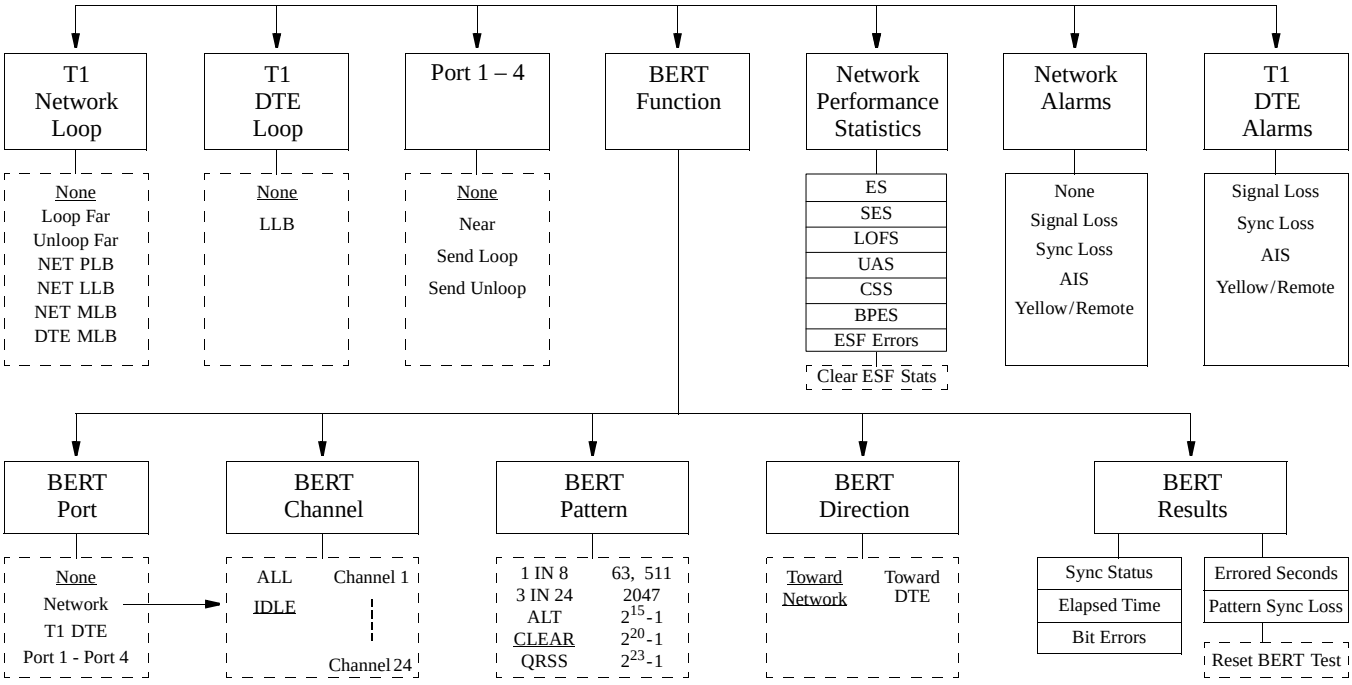
Controlled Slip Seconds: CSS displays the number of one second intervals where at least one controlled slip occurred.

Bipolar Error Secs: BPES displays the number of one second intervals where at least one bipolar code violation occurred.

Daily performance data for the parameters listed above appears following the 15-minute interval listings. It is collected in 24-hour intervals for the preceding 30-day period. The days (from Day#00 to Day#30) are viewed by pressing <Select> and using the up and down arrow keys. Day#00 is the most recently stored day and Day#30 is the oldest day. Pressing the <Exit> or <Select> keys returns the cursor to the left.

ESF Errors: Displays the total number of ESF error events since the counts were last reset. This value is not

Diagnostics Menu Diagram



recorded by interval. Counting will stop when the maximum value of 65535 is reached.

Clear ESF Stats: When 'YES' is selected, all user network performance registers are set to zero and the parameter returns to 'NO'. The telco register set (accessible by the service provider) is not cleared by this action.

Network Alarms: The network interface alarm status is reported as one of the states shown in the following paragraphs. The front panel alarm indicator and the rear panel alarm relay contacts are controlled solely by the user selected 'Alarm Thresholds' set in the 'T1 NET Configuration' menu (see Section 3.3 on page 3-3).

SIGNAL LOSS: Indicates that the T1 receive signal level has dropped below the level that can be detected.

SYNC LOSS: Indicates that the unit is unable to synchronize on the incoming T1 framing pattern.

AIS: Indicates that an unframed 'all ones' pattern is being received.

YELLOW/REMOTE: Indicates that a remote (yellow) alarm indication is being received.

T1 DTE Alarms: T1 DTE alarm status is reported using the same parameters as defined for 'Network Alarms' in the preceding paragraphs. The front panel alarm indicator and the rear panel alarm relay contacts are a function of the network alarm thresholds, not the T1 DTE interface.

3.8 System Utilities

The System Utilities display allows the user to perform the various functions described in the following paragraphs.

System Utilities Screen

```
          System Utilities
> Edit Password
```

Edit Password: The PRISM is factory shipped with the password disabled (factory default). A password is selected by entering up to 10 alphanumeric characters. Each character is entered using the up or down arrow keys until the desired character is displayed. The right arrow moves the cursor to the next position. Continue this pattern until the last character is selected and then press <Select>. The password function is disabled by selecting this field and pressing <Select> without selecting any characters.

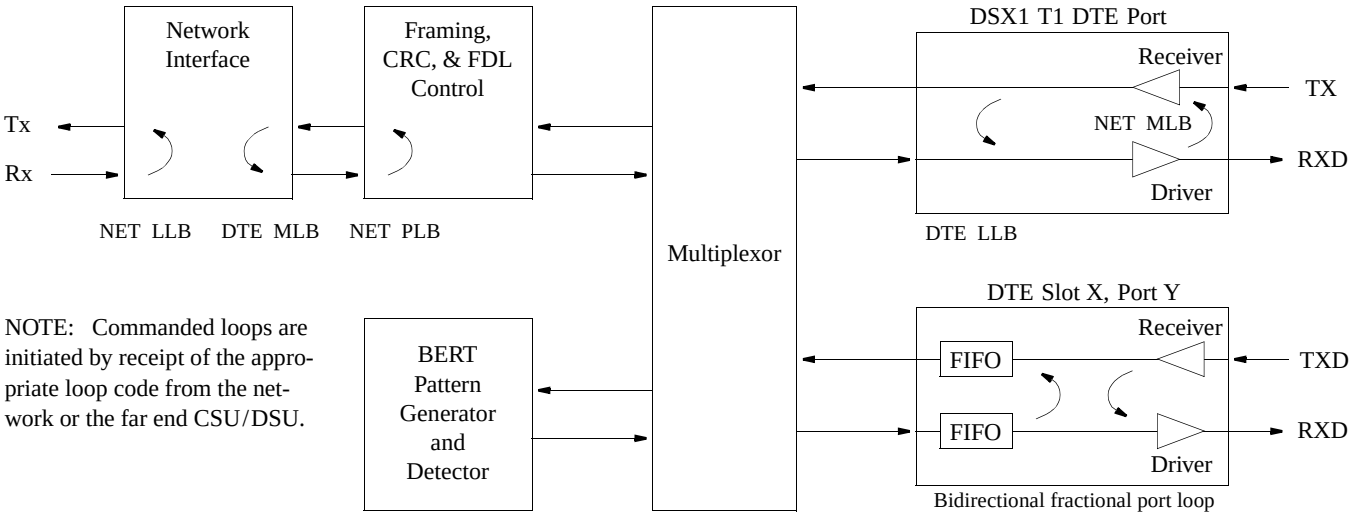
NOTE: The password is case sensitive. During log on, it must be entered exactly as it was programmed.

Display View Angle: The contrast of the front panel LCD display will have a different appearance depending on whether it is being viewed from a high angle or a low angle. Use the arrow keys to adjust for the most suitable contrast. There are 18 selectable values, with a default value of '8'.

Time: The current time is set by entering each digit in the standard 24-hour 'HH:MM:SS' format. Each field is range checked and automatically limited to the appropriate range of values.

Date: The current date is set by entering each digit in the standard 'MM/DD/YY' date format. Each field is range checked and automatically limited to the appropriate range of values.

Diagnostics Loop Functions



User Info/Unit ID: The idle screen top line may be changed in this field. Text is entered using the up and down arrow keys to scroll through each character and the right arrow key to change cursor position. The original text can be restored by pressing <Exit> at any time during the editing process. The screen is shown below.

User Info / Unit ID Display Screen

```
TxPORT PRISM 3000
↑/↓=Letter  Select=Done  →=move
```

NMS Address: When used with the EM8000 element manager, each PRISM unit connected to the local daisy chain must be programmed with a unique address in the range of '1' through '250'. To program a number, scroll through the digits with the up and down arrow key. Press the right arrow key to select a digit. A valid NMS address must be selected before the configuration can be recalled upon start up.

After software has been downloaded into the flash memory, the RAM must be cleared. This process sets the NMS address to '000'. If the unit is then powered down with this address, it will reboot with the NMS address of '251'.

NMS Bit Rate: This field sets the interface speed for the 'NMS IN' and 'NMS OUT' ports. The selections are '1200', '2400', '4800', '9600', and '19200' bps.

Supv Bit Rate: This field sets the interface speed for the supervisory port (SUPV). The selections are '1200', '2400', '4800', '9600', and '19200' bps.

Boot Mode: When the PRISM unit is powered, its configured is based on this selection. If set to 'LOCAL', the unit restores the configuration parameters in effect when power was lost. If set to 'NMS', the unit will use the configuration parameters supplied from the EM8000 element manager database (the unit must have a valid NMS address - from 1 to 250). As shipped from the factory, the unit uses the factory default configurations stored in the 'LOCAL' memory.

Alarm Cutoff: When this menu item is set to 'DISABLE', the PRISM reports a network interface alarm condition by lighting the front panel indicator and activating the alarm relay contacts on the rear panel. When set to 'ENABLE', the front panel 'ALARM' indicator still lights during an alarm condition, but the alarm contacts are forced to an inactive state regardless of the alarm status.

Call on Alarm: This field controls remote alarm reporting. Three submenus are available as follows:

Alarm Notification:

[OFF] - Disables alarm reporting.

[DIRECT] - Sends reports to a printer or terminal connected directly to the supervisory port.

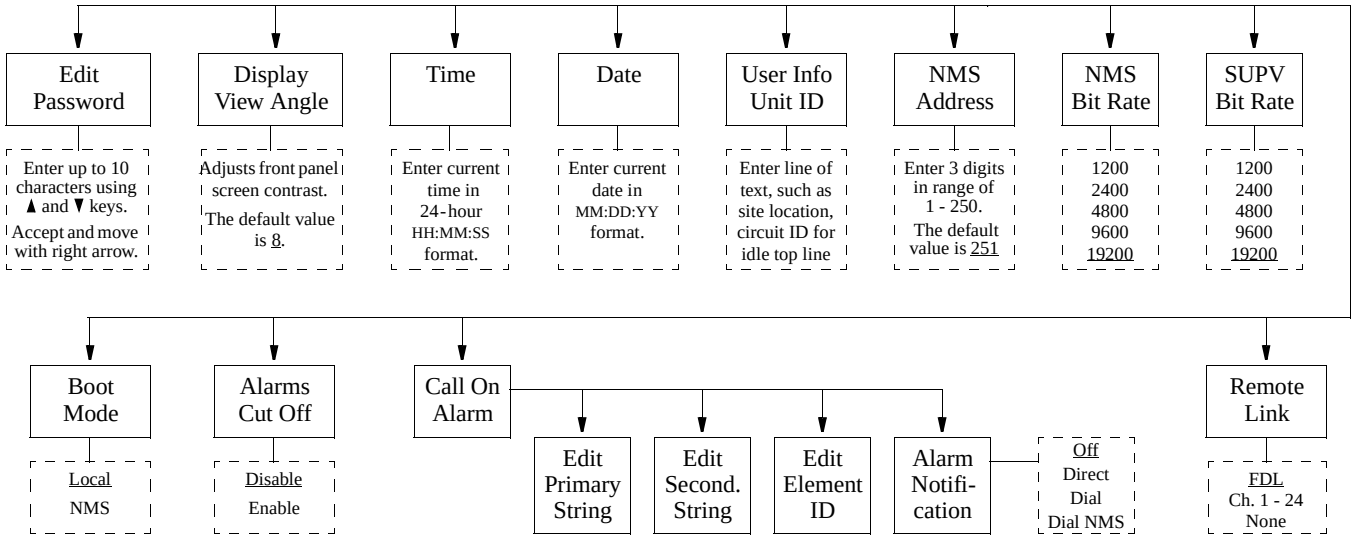
[DIAL] - Sends reports through an attached 'AT' command set compatible modem connected to the 'SUPV' serial port, which must dial out to a remote modem.

[DIAL NMS] - Calls the EM8000 to dump alarms directly.

Edit Primary and Secondary Dial String:

These fields are 18-character ASCII strings for the call on alarm phone numbers used in the [DIAL] and [DIAL NMS] modes. The unit attempts 3 times to connect using the primary number. If all 3 attempts fail, it will attempt 3 times to connect using the secondary number (if it is not

System Utilities Menu Diagram



blank). If the secondary number fails, the unit waits 5 minutes and then attempts to communicate with the primary number again. When a connection is detected, the unit outputs the notification message (as described in 'Element ID' below) and then disconnects.

Edit Element ID: This field allows the user to enter a 29-character ASCII string which identifies the unit to the device receiving the alarm notification messages.

Remote Link: When the PRISM unit is used with the terminal interface or the EM8000 element manager, a communication link to the far end unit can be selected. The facility data link (FDL) may be used in cases where the T1 path is not routed through equipment that corrupts the FDL. If the network framing mode is set to D4 or the FDL is not available, a spare channel may be assigned. Possible channel selections are those that have not been assigned for use with a high speed port or passed through to the T1 DTE. The choices are '`FDL`', '`None`', and '`Channels 1 - 24`'.

3.9 Log Off

If the PRISM 3000 has not been programmed with a password, the user may leave the menu system by pressing <Exit> from the Main Menu. If a password has been programmed, the unit prevents an inadvertent log off by requiring the user to press <Select> in the Log Off menu. Once logged into the front panel, the interface will remain active until the user logs out.

Log Off Screen

```
          Main Menu
> Log Off
```

Terminal Operation

4.0 Introduction

This chapter describes the screens and menus associated with the TxPORT PRISM 3000 terminal interface, which is a firmware application program embedded inside the unit. The 'Operations' chapter discussed the screens and menus associated with the front panel interface. Although the options are essentially the same for both interfaces, the terminal interface is able to show more parameters on each screen. The same is true for the EM8000 element manager.

4.1 System Description

The Terminal Interface requires an ANSI compatible VT100 terminal (ASCII), or a computer running an ANSI terminal emulation program. The Terminal Interface utilizes ASCII 'BREAK' and 'ESCAPE' functions, which are implemented differently with the various terminal emulation programs. The documentation supplied with the terminal emulation program should be consulted for further reference.

In addition to the 54016 and T1.403 protocols, proprietary messages can be sent over the facility data link (FDL) from the near end PRISM unit to the far end PRISM unit. A local RS232 terminal connected to the unit may access a far end PRISM. Thus, the remote unit may be queried for status and statistics, configured, or looped for testing as if the terminal is connected to it directly.

4.1.1 Interface Connection

The terminal may be connected to either of two 6-pin serial RS232 ports on the PRISM 3000. One of the modular ports is a pair of daisy chain type rear panel connectors labeled 'NMS IN' and 'NMS OUT'. The other port is labeled 'SUPV'. Refer to Section 2.10 on page 2-4 for further information. Cables are available for most typical connections. Standard cables and ordering numbers are listed in Section 1.6 on page 1-5. Contact TxPORT for any assistance in cable selection.

A serial bit rate of 1200, 2400, 9600, or 19200 b/s may be selected using the front control panel (refer to 'Supv Bit Rate' in Section 3.8 on page 3-10).

Both serial ports support the same custom protocols which allow the terminal interface or the EM8000 to request and receive performance/configuration data from the PRISM. The unit automatically determines which protocol is needed.

4.1.2 Modem Compatibility

The PRISM 3000 terminal interface supports use of an 'AT' command set compatible modem on either, or both, of the 'NMS IN' and 'SUPV' serial ports. The modem should be optioned to ignore DTR, enable auto answer, inhibit command echo, and return verbal result codes.

NOTE: If the user calls the PRISM unit and sends the 'BREAK' command before receiving the 'CONNECT' message, the modem will hang up.

4.1.3 Screen Components

Terminal interface screens have several components common to all screens and will be discussed individually in the following paragraphs. These common elements are shown in the 'Password Screen' (refer to Screen 4-1 on this page).

Device Type and Revision: The device type (the PRISM 3000) and the revision control numbers are shown in the upper left corner. The first number is the hardware revision and the second number is the software revision. Information is displayed for the near end unit (connected directly to the terminal) on the top line, and for the far end unit (connected

Screen 4-1 Password

```
3000 DSU x.xx/x.xx                PRISM 3000                    Date: MM/DD/YY
No Far End Response              Atlanta: (3)                   Time: HH:MM:SS
--------------------------------  PASSWORD SCREEN--------------------------------

                          Enter Password:    (**********)

                              Start Date:    MM/DD/YY
                              Start Time:    HH:MM:SS


---------------------------------- Messages ----------------------------------
```

to the network T1 interface) on the second line. Refer to this information when contacting the factory with inquiries.

The far end information is available only for TxPORT products that support a proprietary message set. If the far end does not support these messages but does support the standard 54016 protocol, then the far end information is displayed as '`GENERIC 54016 FAR END`'. If the far end does not respond to either proprietary or 54016 messages, then '`NO FAR END RESPONSE`' will be displayed. If the far end echoes the FDL messages transmitted by the near end unit, then '`FAR END LINE LOOP`' is displayed.

Date/Time: The top right corner of the terminal screen displays the current date and time. The setting of these functions is described in Section 4.7.1 on page 4-15.

Element ID: Unit Address: Below the header (PRISM 3000), the 'Element ID' is displayed (refer to Section 4.7.2 on page 4-15). Next to the 'Element ID' is the unit's NMS address (refer to Section 3.8 on page 3-10).

Menu Title: The menu title (third line, center) denotes the general classification of functions currently accessible by the user (such as '`Alarms`' or '`Performance`').

Messages: This line may display diagnostic messages.

4.1.4 Interface Start-Up

Once a compatible terminal is properly connected to the unit, a Terminal Interface session is started by sending a '`BREAK`' to the unit. If the NMS port is used, the unit then responds with the prompt "`Enter Unit Address`". To activate the first (or only) unit, simply press <return>. To select a specific unit, enter the address number of the desired unit and press <return>.

The "`Enter Unit Address`" prompt will time out after 10 seconds. If this happens, send another '`BREAK`'. To select another unit, exit the current Terminal Interface session, send a '`BREAK`', and repeat the process. If an invalid address is entered, that address is echoed back to the terminal. Send another '`BREAK`' to start a new session.

The 'Main Menu' screen (Screen 4-2) is then displayed if no password has been specified. The 'Utilities' menu (Section 4.7.1 on page 4-15 explains the setting of the password). In the 'Password' screen (Screen 4-1), the user must enter the correct password to obtain access to any other menu. *Note that the password is case-sensitive.*

4.1.5 Cursor Controls

The terminal interface utilizes a highlighted cursor to make selections from menus and select fields within screens to be operated on. The cursor is moved in different ways, depending on the terminal emulation program used. Most programs allow use of the <tab> and <shift-tab> keys. Others allow use of the 4 arrow keys. Once a field is highlighted, it is manipulated as described in Section 4.1.6.

For keyboards which do not have these standard keys or have only some of them, an alternate set of cursor control commands is provided. Each command is performed by pressing a letter key while holding down the <Ctrl> key. Alternate commands may be freely mixed with the keyboard commands at the user's discretion.

Keyboard Command	Alternate Command
< left arrow >	< Ctrl - S >
< right arrow >	< Ctrl - D >
< up arrow >	< Ctrl - E >
< down arrow >	< Ctrl - X >
< backspace >	< Ctrl - H >
< delete >	< Ctrl - Z >

4.1.6 Field Types

Each screen is made up of fields. The two basic field types are 'user selectable' and 'display only'. If the highlighted

Screen 4-2 Main Menu

```
3000 DSU x.xx/x.xx                PRISM 3000                  Date: MM/DD/YY
3000 DSU x.xx/x.xx              Huntsville: (2)               Time: HH:MM:SS
------------------------------------ MAIN ------------------------------------

                                 Alarms
                                 Performance
                                 Maintenance
                                 Configuration
                                 Utilities

---------------------------------- Messages ----------------------------------
```

cursor can be moved to a field, it is a user selectable field. All other fields are for display only. User selectable fields allow for changes to be made or commands to be executed.

Fields without brackets or parenthesis are 'display only'. They cannot be changed on the screen. Most user selectable fields are enclosed in brackets or parenthesis and are described in the following paragraphs.

Fields enclosed in brackets [ ] offer the user a list of selections from which to choose. The selections may be toggled by pressing the <spacebar>. Each time it is pressed, a new item appears. When the appropriate choice is displayed, press <return> to select it.

Fields enclosed in parenthesis ( ) are manipulated by one of the following two methods:

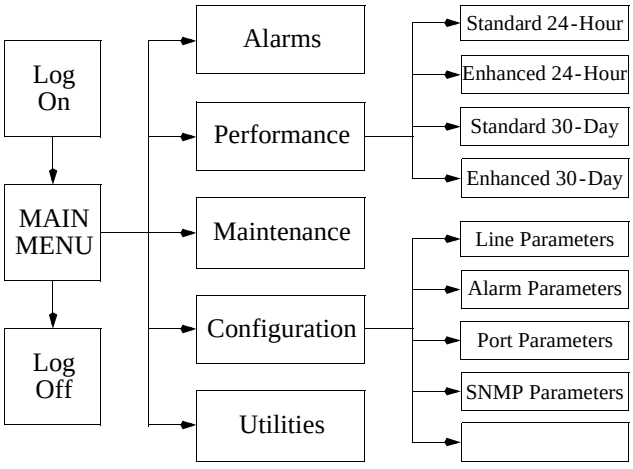
1) Pressing <return> on such fields as (`Reset`) and (`Start Test`) simply execute the function.

2) The most common type of field in parenthesis accepts typed input in the form of letters and/or numbers. Typing characters when the field is highlighted causes the current entry to be replaced with the new characters. To edit an existing entry rather than replace it, press the <right arrow> key to move the cursor to the point that needs editing. Characters may then be inserted or deleted. Typed data is always inserted rather than typed over. If the field is full, though, at least one character must be deleted to add another.

Many fields of this type may also be toggled by pressing the <spacebar>. Other fields are range checked, where the user is not allowed to exit with an illegal value set.

NOTE: Any screen may be redisplayed (or refreshed) by pressing <Ctrl - U>. Any changes to fields on a screen, that have not been activated by pressing <return>, will be discarded.

Figure 4-1 Menu Structure



4.2 Main Menu Screen

The 'Main Menu' screen (Screen 4-2) lists the functional user accessible menus. To activate any menu, highlight the desired selection and press <return>. This menu and any subsequent menu may be exited by pressing <esc>. If the 'Main Menu' is exited, the terminal interface program terminates. This is a valid way to end a user session. If any other menu is exited, the previous screen is returned.

The menu structure (Figure 4-1) shows all the screens accessible from the 'Main Menu'.

NOTE: If no key is pressed for 10 minutes, the terminal interface logs off automatically. To manually log off, press <esc> from the 'Main Menu'.

4.3 Alarms Screen

The 'Alarms' screen (Screen 4-3 on page 4-4) is used to view the current alarm status of the network and the DTE lines. The fields are described as follows:

NET/DTE Alarms: These status lines display the selected element's current network/DTE signal alarm state. Alarms are determined by the following user selectable thresholds.

Table 4-1 Alarm Indications

Alarm	Description
-------	No status is available
OK	No alarm threshold has been exceeded, although errors may exist which do not exceed thresholds.
ERRS	The Errored Seconds, Severely Errored Seconds, or Bipolar Errored Seconds threshold is exceeded.
LOSS	The Loss Of Signal Seconds threshold is exceeded.
OOFS	The Out Of Frame Seconds threshold is exceeded.
RAIS	The Remote Alarm Seconds threshold is exceeded.
AISS	The Alarm Indication Seconds threshold is exceeded.
UAS	The Unavailable Seconds threshold is exceeded.

(alarm status): The main body of the 'Alarms' screen shows the current count for parameters that may be used to trigger an alarm.

The '`Current`' column shows the total of the preceding 15 one-minute intervals. At the end of each one-minute interval, the oldest minute of the 15-minute interval is discarded.

The '`Threshold`' column shows the values set in the 'Alarm Configuration' screen (Screen 4-7 on page 4-10). Any parameter that has a current value equal to or greater than its non-zero threshold will generate an alarm. Any parameter with a threshold value of '`0`' is disabled from generating alarms.

NOTE: The parameters shown on the Alarms Screen are updated at five second intervals.

Power Loss Seconds: This field displays the number of seconds that the element has been without power since this value was last cleared.

Reset Alarm Registers: Pressing <return> on (RESET) zeros the value of all 'Current' alarm parameters, but does not affect 24-hour or 30-day performance registers.

4.4 Performance Screens

The 'Performance' screens display a detailed history of the error parameters that are continuously monitored. The terminal interface provides display of near end or far end performance data using the facility data link.

The unit is equipped with a dual set of performance data registers that hold line statistics for both the telco and user. Each register set provides detailed status and performance history for the network and DTE interfaces.

The system has four 'Performance' screens. The 'STANDARD 24 HOUR' and the 'ENHANCED 24 HOUR' screens allow the user to view the 24-hour detailed performance history of the T1 circuit. The only difference in the two screens is in the type of performance data displayed. The 'STANDARD 24 HOUR' screen is shown in Screen 4-4.

The 'STANDARD 30 DAY' and the 'ENHANCED 30 DAY' screens allow the user to view a 30-day history of a particular element's performance. These screens reference intervals by date rather than by time. To reach each of the four screen types, use the <spacebar> to toggle the 'STANDARD 24 HOUR' field. The other fields are described as follows:

Element: Pressing the <spacebar> toggles this field for selection of either the 'NEAR' or 'FAR' unit as the source of performance data or the target of commands. 'NEAR' refers to the unit to which the terminal is connected. 'FAR' refers to the unit at the other end of the network T1 span.

Target: This two-part field determines which section of the circuit is presently displayed by toggling the <spacebar>. Telco registers are for viewing only and may not be changed. The four options are:

[USER] [NET] – Display the user performance registers for the network.

[USER] [DTE] – Display the user performance registers for the T1 DTE.

[TELCO] [NET] – Display the telco performance registers for the network.

[TELCO] [DTE] – Display the telco performance registers for the T1 DTE.

Error Events: This field displays the running total of ESF error events for the circuit selected in 'Element' and is applicable only when 'Target' is set to [USER]. This count accumulates until it reaches 65535 or is reset by pressing <return> with the (RESET) field highlighted.

Reset Performance Registers: This field allows the element registers to be reset and may only be used when the 'Target' field is set to [USER]. If <return> is pressed, the following warning appears:

DELETE ALL PERFORMANCE DATA?
(NO!) (YES)

To exit this screen without performing the reset function, press <return> with 'NO' selected. To proceed with the reset

Screen 4-3 Alarms

```
3000 DSU x.xx/x.xx                PRISM 3000                  Date: MM/DD/YY
No Far End Response              Houston: (130)               Time: HH:MM:SS
------------------------------------ ALARMS -------------------------------------

                                Element: [NEAR]
                NET Alarms: OK
                DTE Alarms: OK
                                                      Current      Threshold
                Loss of Signal Seconds (LOSS)           0              5
                Errored Seconds (ES)                    2             45
                Severely Errored Seconds (SES)          2              5
                Unavailable Seconds (UAS)               0              0
                Out of Frame Seconds (OOFS)             0              5
                Remote Alarm Seconds (RAS)              0              0
                AIS Seconds (AISS)                      0              0
                BPV Seconds (BPVS)                      0              0
                DTE LOS/OOF Seconds (LOSS)              0              0
                Power Loss Seconds (PLS)                0

                Reset Alarm Registers:                (RESET)
```

function, press <return> on 'YES'. All values for the chosen register set (NET or DTE) are then reset to zero.

[Standard 24 Hour]: Toggling this field with the <spacebar> steps through the four available performance screens.

The remainder of the fields in the 'Performance' screen are for display only. They are defined as follows:

Status: This field displays the selected T1 line status derived from the type (or absence) of errors in the received data. This status represents the immediate state of the received T1 signal and is not related to the alarm thresholds. This field shows one or more of the signal conditions listed in Table 4-2 on page 4-7.

Completed Days: Displays the number of days which are included in the 30-day totals.

Completed Intervals: This field displays the number of 15-minute intervals in the last 24-hour period since the registers were last cleared (a 24-hour period may contain up to 96 intervals).

24 Hr.% Error Free: This field displays the percentage of error free seconds within the last 24 hours or since the event registers were last cleared. It is based only on the ES and UAS parameters.

(performance data): The main body of display data consists of error events for three different periods: The first display line shows the data accumulated for the current interval (from 0 to 900 seconds). The second line shows the totals for the last 24-hour period (or the last 96 fifteen-minute intervals). The third line shows the 30-day totals.

The remaining lines of this screen show the data for any intervals containing errors. Interval 1 is the most recently stored 15-minute interval and interval 96 is the oldest in the current 24-hour period. On the 30-day screens, interval 30 is the oldest 1-day interval in the current 30-day period. The real time (or date on 30-day screens) of the interval beginning is shown in the first column.

If more than 5 errored intervals have elapsed, [PAGE-DN] appears to the left of the performance data. Pressing <return> on this field displays the next five errored intervals. [PAGE-UP] appears once [PAGE-DN] is used. Pressing <return> on [PAGE-UP] displays the previous five errored intervals. Only intervals that contained errors are displayed, which eliminates rows of zeroes. If an interval is not displayed, no errors were detected during that time period.

NOTE: The parameters shown on the 'Performance' screens are updated at 5 second intervals.

Per AT&T Technical Reference TR54016, the 'Standard 24 Hour' and 'Standard 30 Day' performance data consists of Errored Seconds (ES), Unavailable Seconds (UAS), Bursty Errored Seconds (BES), Severely Errored Seconds (SES), Loss of Frame Count (LOFC), and Controlled Slip Seconds (CSS).

The 'Enhanced 24 Hour' and 'Enhanced 30 Day' screens show data for CRC Errored Seconds (CRCES), Out of Frame Seconds (OOFS), Loss of Signal Seconds (LOSS), Alarm Indication Signal Seconds (AISS), Remote Alarm Seconds (RAS), and Bipolar Violation Seconds (BPVS).

NOTE: For generic 54016 far end devices, only the standard telco 24-hour performance data is displayed. 30-day data is not available.

Screen 4-4 Performance

```
3000 DSU x.xx/x.xx                PRISM 3000                    Date: MM/DD/YY
No Far End Response             New York: (236)                 Time: HH:MM:SS

----------------------------- 24 HOUR PERFORMANCE------------------------------

     Element: [NEAR]                            Status: OK
     Target: [USER ][NET]                       Completed Days:         12
     Error Events:   302   (RESET)              Completed Intervals:     6
     (RESET PERFORMANCE REGS)                   24 Hr.% Error Free:   91.7

                              [STANDARD 24 HOUR]

         362                   2     362       0       2       3       3
         24 Hour               6    2700       0       2       3       0
         30 Day               30       0      20      12      23      13
PAGE-UP ------------------------------------------------------------------
          Time    Interval     ES     UAS     BES     SES    LOFC     CSS
PAGE-DN ------------------------------------------------------------------
         13:30       6          1     900       0       0       1       0
         13:15       7          2     900       0       0       3       3
```

4.5 Maintenance Screen

The ‘Maintenance’ screen (Screen 4-5 on page 4-6) allows the user to perform test and maintenance functions on the T1 circuit. BERT is performed by using on-board test facilities. No other test equipment is needed. Actions initiated by each field are detailed in the following paragraphs.

Clear Tests: Pressing <return> on this field clears all tests and any line loops that have been initiated.

Clear Alarms: Pressing <return> on this field causes all near end alarms to be cleared.

4.5.1 Test Loops

Loop status changes can be made only when the BERT function is not in the active mode. The type of loop is chosen by toggling the <spacebar> and is executed by pressing <return>.

T1 Loop: This field is used to select the test loops which will be initiated. The normal operating mode and available loopback options are detailed in Figure 4-2 on page 4-8.

T1 Unloop: Pressing <return> on this field takes down the specified loop.

Port Loop: This field is used to loop a high speed DTE port at the near or far end (see Figure 4-2 on page 4-8). Far end loops use V.54 loop codes to activate. To enable the V.54 function, refer to Section 4.6.3 on page 4-12.

Port Unloop: Pressing <return> takes down the specified loop from the currently selected port.

4.5.2 BERT

BERT: Specifies the direction the BERT signal will be sent. If the direction is changed from the front panel, the new choice is not updated on the terminal interface until this screen is exited and then reentered. The choices are: ‘IDLE’, ‘T1 NET’, ‘T1 DTE’, ‘Channels 1–24’, plus ‘ONE NET’, ‘ONE DTE’, ‘TWO NET’, ‘TWO DTE’, ‘THREE NET’, ‘THREE DTE’, ‘FOUR NET’, and ‘FOUR DTE’.

NOTE: All testing must be stopped before channels may be reallocated to an active port.

Pattern: Specifies the pattern to be transmitted during a test. Modifying this field will not cause the pattern to be transmitted (refer to ‘Start Test’). The choices are [QRSS], [63], [511], [2047], [2^{15}], [2^{20}], [2^{23}],[1:8], [3:24], [ALT], and [CLEAR]. The ‘CLEAR’ pattern passes the received data through the unit (alarm detection and reporting is disabled while the test is active).

Test Length: Defines the run-time of test pattern generation and error accumulation. The choices are [Continuous], [15 min], [30 min], [60 min], [24 Hour].

Start Test: Pressing <return> with the cursor on this field starts the selected test pattern. ‘TEST IN PROGRESS’ appears once the test has started. To end the test, press <return> on ‘STOP TEST’.

Reset Errors: Pressing <return> with the cursor on this field causes the test error results to be cleared to zero.

The following fields are for display only. They reflect the selected test parameters and the results of these tests only:

Screen 4-5 Maintenance

```
3000 DSU x.xx/x.xx                PRISM 3000                    Date: MM/DD/YY
No Far End Response              London: (148)                  Time: HH:MM:SS
 ----------------------------- ELEMENT MAINTENANCE------------------------------

                                                    BERT:             [T1 NET]
    (CLEAR TESTS)                                   Pattern:          [QRSS]
    (CLEAR ALARMS)                                  Test Length:      [15 min]

    T1 Loop:    [FAR PLB]                           Pattern Sync:     IN SYNC
    T1 Unloop:  [FAR PLB]                           Elapsed Time:     01:15:00
                                                    Bit Errors:              5
    Port Loop:   [2A NEAR ]                         Errored Seconds:         3
    Port Unloop: [2A NEAR ]                         % EFS:                97.5

                                                    (START TEST)
NET Status: OK                                      (RESET ERRORS)
DTE Status: OK
Near Loops: -------/-------/-------/-------
Far Loops:  -------/-------
```

Pattern Sync: This field displays the current state of pattern sync during a test. If no test is in progress, 'NO TEST' is displayed. If a test is active, but the receiver is not in pattern sync, 'NO SYNC' is displayed. If the receiver is in pattern sync, 'IN SYNC' is displayed.

Elapsed Time: Displays the amount of time elapsed since a timed test began or, if completed, the total test time.

Bit Errors: Displays the total number of bit errors detected since the test began or since error statistics were cleared (up to a maximum number of 999,999).

Errored Seconds: This field displays the number of asynchronous errored seconds that have been detected since the test began or since error statistics were last cleared. This parameter includes bit error seconds and sync loss seconds.

% EFS: This ratio is derived from the number of error free seconds divided by the number of seconds accumulated in 'Elapsed Time'.

4.5.3 Line Fault and Loop Status

NET/DTE Status: These two fields display the fault status of the network and DTE. They are indicators of current fault conditions and do not indicate that alarm thresholds are exceeded. Status indications are described in Table 4-2.

Near Loops: Displays the loop status of the 'near' element.

Far Loops: Displays the loop status of the 'far' element.

Table 4-2 Status Indications

Status	Description
-------	No status is available
OK	No errors are currently detected.
ERR	Frame bit errors, CRC errors, or BPVs are detected.
LOS	A loss of signal condition exists.
OOF	An out of frame condition exists.
RAI	The far end is receiving a remote alarm indication signal.
AIS	The far end is receiving an alarm indication signal.
UAS	An unavailable signal state exists due to consecutive severely errored seconds.

4.6 Configuration Screens

The various 'Configuration' screens allow the user to view and set configuration parameters for the network elements. Only the installed options are available as menu items.

NOTES: To send a new configuration to the unit, the user must press <return> on one of the fields or exit the screen. The underlined values are the factory default parameters stored in ROM.

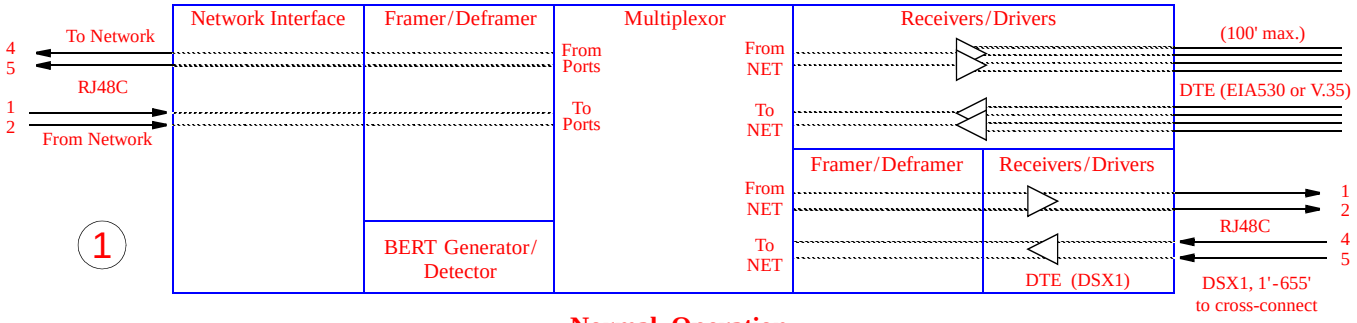
4.6.1 Line Parameters

The 'Line Parameters' screen (Screen 4-6) allows the user to review and set line parameters for the selected element on the T1 circuit. The T1 DTE fields appear only in units with the T1 DTE option installed.

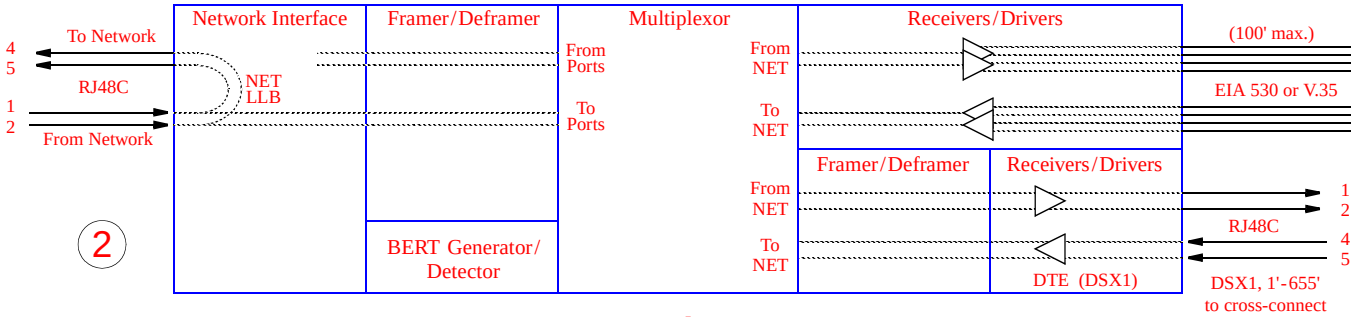
Screen 4-6 Line Parameters

```
3000 DSU x.xx/x.xx                PRISM 3000                    Date: MM/DD/YY
3030 DSU x.xx/x.xx               Ontario: (91)                  Time: HH:MM:SS
-------------------------------- LINE PARAMETERS--------------------------------

                                 Element: [NEAR]
    T1-NET Framing:   [ESF     ]          Rem Comm Channel:  ( 0)
    T1-NET Line Code: [B8ZS]              T1-DTE Framing:    [ESF      ]
    T1-NET LBO:       [0 dB    ]          T1-DTE Line Code:  [B8ZS]
    PRM Enable:       [DISABLED]          T1-DTE DSX Level:  [0-110 FEET  ]
    Zero Suppression: [ENABLED ]          D/I Start Ch:      ( 1)
    T1-NET Timing:    [STATION ]          # of Channels:     (24)
    Station Timing:   [64K x   ] ( 1)

                                                Channel Allocation: 1x1x1x 1x1x1x
------ ------
```

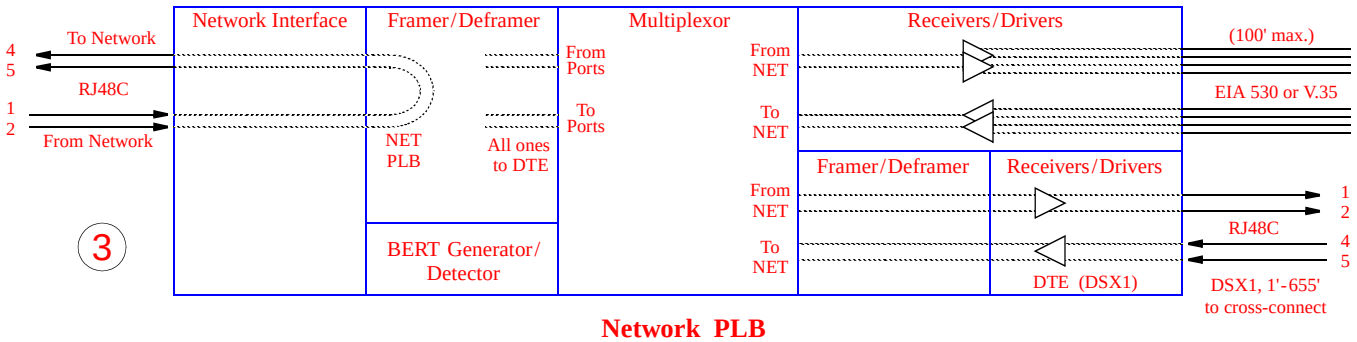
Figure 4-2 Loopback Diagrams



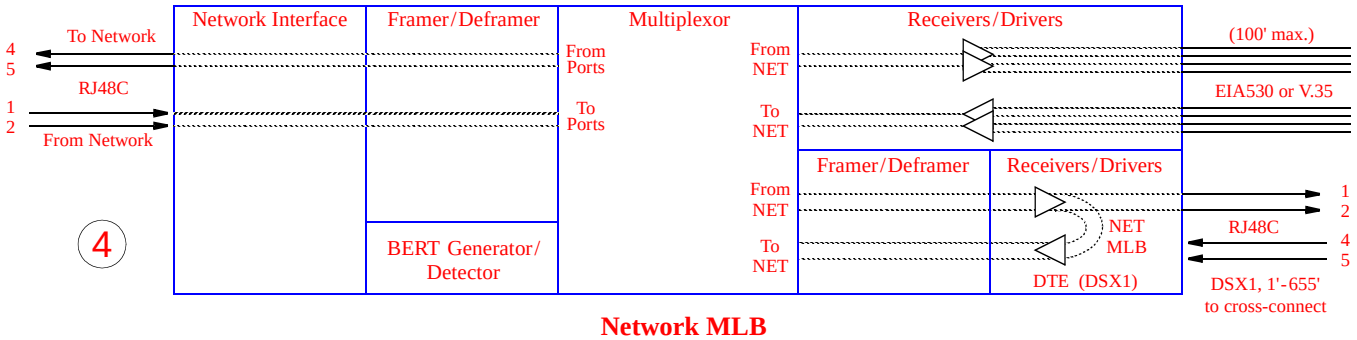
Normal Operation



Network LLB



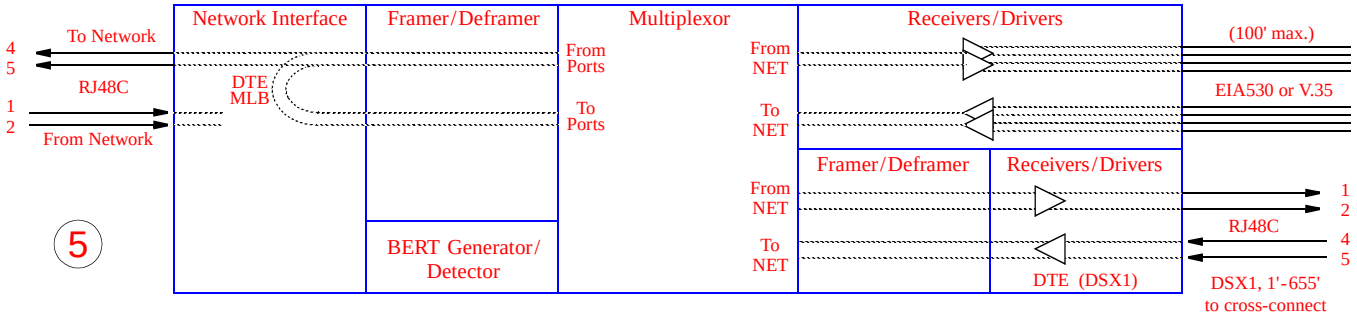
Network PLB



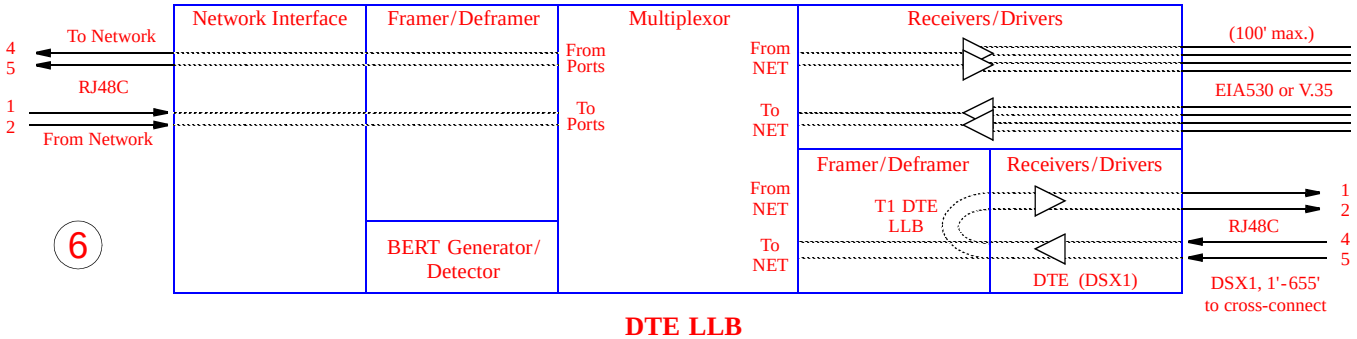
Network MLB

1) *Normal Operation:* This diagram depicts the unit's normal operating mode.

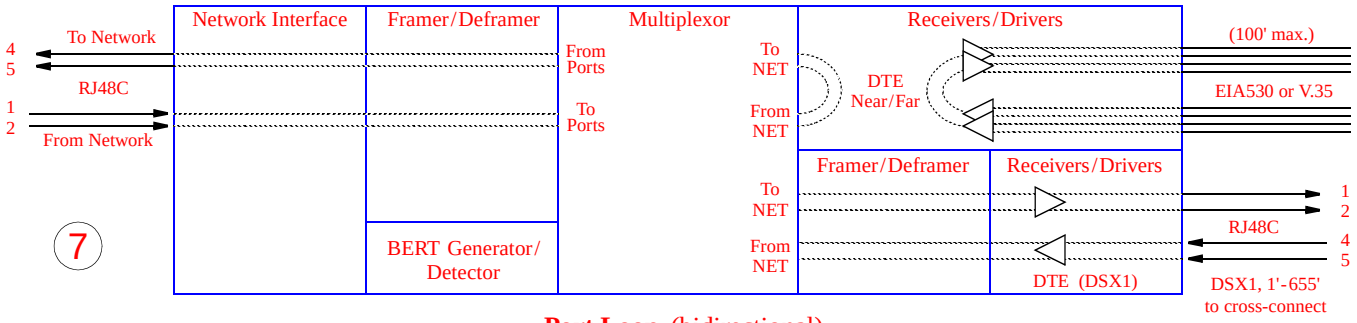
2) *NET LLB:* The network 'line loopback' command loops data received from the network back toward the network. Received data is passed through to the DTE ports.



DTE MLB



DTE LLB



Port Loop (bidirectional)

3) *NET PLB:* The network 'payload loopback' command loops the network data back toward the network. Framing, CRC, and FDL are regenerated. Framed all ones are passed to the DTE ports.

4) *NET MLB:* The network 'maintenance loopback' command loops data at the T1 DTE port back toward the network (passes network data to the DTE and return data to the network). MLB affects only network channels assigned to the T1 DTE.

5) *DTE MLB:* The T1 DTE 'maintenance loopback' command loops all network data back toward the DTE ports at the network interface. Data is passed through to the network. It is advisable to set '`T1-NET Timing`' to '`INTERNAL`' rather than '`NETWORK`' when this loop is enabled.

6) *DTE LLB:* The T1 DTE 'line loopback' command loops data received at the T1 DTE interface back toward the T1 DTE (all DS0s are returned to the T1 DTE port). The T1 DTE data is also passed to the network.

FAR PLB: The far 'payload loopback' command sends loop codes to the far end unit to force it into a network payload loopback mode.

FAR LLB: The far 'line loopback' command sends loop codes to the far end unit to force it into a network line loopback mode.

7) **Port Loop**: This field is used to loop a high speed DTE port at the near or far end. High speed port loops are bidirectional.

This screen has the following fields, most of which have user selectable options. To send the new line configuration to the unit, either press <return> on one of the fields, change the 'Element' selection, or exit the screen.

T1-NET Framing: Selects the type of framing for the network side of the element. The choices are [ESF] and [D4].

T1-NET Line Code: Sets the network side line coding. The choices are [AMI] and [B8ZS].

T1-NET LBO: Sets the line build out for the network interface. The choices are [0 dB], [-7.5 dB], [-15 dB], and [-22.5 dB].

PRM Enable: This field allows the T1.403 Performance Report Message, which is sent once a second, to be turned on or off. The choices are [ENABLE] and [DISABLE].

Zero Suppression: This field determines whether ones density insertion is activated after 15 zeros (rather than 175 zeros). The choices are [ENABLE] and [DISABLE].

T1-NET Timing: Sets the timing source to synchronize the PRISM's internal timing generators. In all cases, slips are controlled to occur on frame boundaries at the network and/or DSX1 ports when timing synchronization is lost.

NETWORK: Timing is derived from the network recovered clock (most applications use this selection).

STATION: Timing is derived from a bipolar or TTL compatible clock supplied to the unit via the rear panel 'STA CLK' connector. When this mode is selected, the timing rate must also be set from 'Station Timing'.

INTERNAL: The unit's internal frequency standard is used for all timing.

T1 DTE: The unit synchronizes to the clock recovered from the DSX1 T1 DTE port. This selection only appears on units equipped with the T1 DTE option.

PORT 1, 2, 3, or 4*:* Timing is synchronized to the external terminal timing clock supplied from the DTE and connected to the selected port.

Station Timing: Selects the input timing and only appears when 'Station' is selected from the 'T1-NET Timing' menu. The choices are 'Nx56K', 'Nx64K', and '1.544 MHz'. A number appears to the right of this field when 'Nx56K' or 'Nx64K' is selected to indicate the rate multiplier. A value from '1' through '24' must be entered.

Remote Comm Channel: This field selects a communication link to the far end unit. If '0' is selected, communication is established over the ESF facility data link (valid only when the network interface is configured for ESF and the FDL has end-to-end integrity). For example, the entire T1 bandwidth must be available to the user with no intervening multiplexors in the signal path blocking the FDL.

As an alternative, the communication link may be assigned to an unused idle channel. This option may be used whether the network is operating in D4 or ESF modes.

When the remote communication is programmed to operate over a spare network channel, the following test conditions will interrupt access to the far end unit:

- A remote network LLB or PLB is initiated.
- A local network LLB is initiated.

When the remote communication is programmed to operate over the facility data link (FDL), the following test conditions will interrupt access to the far end unit:

- A remote network LLB is initiated.
- A local LLB is activated on the near end.

NOTE: If far end communication is interrupted for any reason while accessing the remote unit, the user should

Screen 4-7 Alarm Parameters

```
3000 DSU x.xx/x.xx                  PRISM 3000                    Date: MM/DD/YY
No Far End Response                Topeka: (205)                  Time: HH:MM:SS
 ----------------------------- ALARM CONFIGURATION------------------------------

                                Element: [NEAR]

  Errored Seconds (ES):             ( 45)   Remote Alarm Seconds (RAS):  (  0)
  Severely Errored Seconds (SES):   (  5)   AIS Seconds (AISS):          (  0)
  Loss of Signal Seconds (LOSS):    (  5)   Out of Frame Seconds (OOFS): (  5)
  Unavailable Seconds (UAS):        (  0)   BPV Seconds (BPVS):          (  0)

  DTE LOS/LOF Seconds (LOSS):       (  0)   Alarm Reset Timer (seconds): ( 30)
```

exit and then reenter this screen to ensure that all the parameters have been updated.

T1-DTE Framing: Selects the type of framing for the DTE side of the element. The choices are [ESF] and [D4].

T1-DTE Line Code: Sets the DTE side line coding. The choices are [AMI] and [B8ZS].

T1-DTE DSX Level: Specifies the DTE line build out signal level. The choices are: '0-110ft'
'111-220ft' '221-330ft' '331-440ft'
'441-550ft' '551-660ft' '>660 ft'

D/I Start Channel: Selects the first channel in the block of channels assigned to the T1 DTE, from '1' through '24'.

# of Channels: Sets the number of channels to be passed through to the T1 DTE, from '1' through '24'.

Channel Allocation: This display indicates the network channel assignments with Channel 1 on the left and Channel 24 on the right.

Channels assigned to a port are identified with a port number (1, 2, 3, or 4). Channels assigned to the T1 DTE are marked as 'D'. Non-assigned idle channels are marked with a dash '-'. Remote communication channels are marked with an 'R'. When channels are assigned to a port in the 'ALTERNATE' assignment mode (see Section 4.6.3), each data channel is followed by an idle channel that is not assignable for other ports and is marked with an 'X'.

4.6.2 Alarm Parameters

The 'Alarm Parameters' screen (Screen 4-7) allows the user to review and set alarm related thresholds for the selected element. These thresholds are the minimum acceptable performance levels. To modify the parameters, highlight the desired statistic, type in the new value (any number from 0 to 900) and press <return>. If this value is later surpassed, an alarm indication will appear. A field set to (0) will cause the element not to alarm on that statistic.

NOTE: If alarm thresholds are edited from the front panel, the corresponding values are not reflected on this screen until it is exited and then reentered.

Errored Seconds: A one second period in which at least one logic error occurred.

Severely Errored Seconds: A one second period in which at least 320 CRC errors or 1 OOF (out-of-frame) occurred.

Loss of Signal Seconds: A one second period in which the T1 received signal is interrupted.

Unavailable Seconds: A one second period in which consecutive severely errored seconds cause an unavailable state.

DTE LOS/LOF Seconds: A one second period in which the T1 received signal (on the optional T1 DTE interface) is interrupted or the amplitude drops below a certain level.

Remote Alarm Seconds: Generated by the terminal equipment when an improper signal is received from the facility (or upon receipt of unframed all ones).

AIS Seconds: A one second period in which all ones are received.

Out of Frame Seconds: A one second period in which a frame sync loss occurred.

BPV Seconds: A one second period in which at least one bipolar violation occurred.

Alarm Reset Timer: Determines the number of seconds after alarm conditions clear before indications are removed.

Screen 4-8 Port Parameters

```
3000 DSU x.xx/x.xx                  PRISM 3000                    Date: MM/DD/YY
No Far End Response              Los Angeles: (248)               Time: HH:MM:SS
------------------------------ PORT CONFIGURATION -------------------------------
                                 Element: [NEAR]
                                    1x1x1x 1x1x1x ------ ------
                Channel Allocation:

     Port #           [One ]
     Rate Mult:       [N x 64k]
     DS0 Ch. Assign:  [Alternate ]                V.54 Loop  : [Enable ]
                                                  Invert Data: [No ]
     Start Ch. #:     ( 1)                        CTS Control: [Force True ]
     Port Rate:       [384 kHz  ]                 DSR Control: [Force True ]
     # of Channels:   6                           DCD Control: [Force True ]
     Tx Clock:        [Internal  ]                Alarm on DTR Loss: [Disable]
```

4.6.3 Port Parameters

The 'Port Configuration' screen (Screen 4-8) sets the operating parameters for each high speed port and the RS232 port, if equipped. The unit does not allow conflicting configurations for the DTE ports. Therefore, the selections for each menu item are restricted to those that do not conflict with the configuration of other high speed ports or the T1 DTE Port. The default is all channels disabled.

When channel assignment changes are made to the high or low speed ports, to the remote communication link, or to the T1 DTE, the PRISM unit reestablishes the mapping of all channels. This interruption to traffic will normally result in a brief burst of data errors on other ports.

Channel Allocation: This field is described in detail on the previous page.

Port #: Selects the port to be configured, from [One] to [Four] (Note: The RS232 port can use only ports 1 and 3).

Rate Multiplier: The unit can operate at any data rate that is a multiple of 56 or 64 kb/s. When 'Nx64K' is selected, the ones density requirements of the T1 network line must be ensured. When 'Nx56K' is selected, the unit maintains ones density for the selected DS0 channel.

DS0 Channel Assignment: Selects whether the DTE channel assignment will be made as a 'CONTIGUOUS' group or as 'ALTERNATE' channels. Selecting 'ALTERNATE' will assure ones density. Note: the RS232 port can use only the 'CONTIGUOUS' mode.

Start Channel #: The starting channel in the 24-channel DS1 bit stream must be selected in this field. The unit then assigns the following channels automatically according to the bit rate and the mode selected in 'DS0 Channel Assignment'. The choices are '1' through '24'.

Port Rate (high speed port): Selects the required port bit rate in increments of 56 or 64 kb/s, depending on the 'Rate Multiplier' setting. The 'N' multiplier ranges in value from '0' to '24'.

Port Rate (RS232 port): The choices are: 'None', 'Synchronous', '1200', '2400', '4800', '9600', '14400', '19200', '28800', '38400', '48000', '56000', and '64000'.

# of Channels (high speed ports only): Displays the number of channels to be passed through to the T1 DTE. This number is determined by the selection in 'Port Rate'.

Transmit Clock: This field is used to select the clock that the unit will use to sample the data transmitted from the DTE. When set to 'INTERNAL', the data is sampled directly with the transmit data clock that is also supplied to the DTE as Transmit Clock. The 'EXTERNAL' option uses the external clock supplied by the DTE. The external clock for the RS232 port is only valid at 56 or 64 kb/s. The 'OVERSAMPLED' option is used to operate the port as a low speed asynchronous port. In this mode, the port rate should be set to at least 3 times the asynchronous data rate (depending on the degree of allowable distortion for the particular DTE equipment used).

V.54 Loop: Selecting 'Enable' allows the unit to respond to inband V.54 loop commands. If 'Disable' is selected, the unit ignores these commands.

Invert Data: In the invert mode (YES), transmit and receive data are inverted at the port interface. This function may be used as a means of guaranteeing ones density when the data

Screen 4-9 TCP/IP Parameters

```
3000 DSU x.xx/x.xx                  PRISM 3000                    Date: MM/DD/YY
No Far End Response              Birmingham: (151)                Time: HH:MM:SS

----------------------------- TCP/IP Configuration -----------------------------
Ethernet 255.255/X.XX
                                    Element: [NEAR]        (RESET LAN INTERFACE)

                    PRISM  I.P. Address  (000.000.000.000)
                    Subnet Mask          (000.000.000.000)
                    Router I.P. Address  (000.000.000.000)

                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
```

is composed of SDLC type protocols. The choices are 'YES' and 'NO'.

CTS/DSR/DCD Control: Setting any of these three fields to 'FORCE TRUE' or 'FORCE FALSE' allows the forcing of the port control lead output state. 'INTERNAL' allows for normal operation as shown in the High Speed Data Port diagram on page 3-6. The control lead operation for the RS232 port is shown in the EIA530 or RS232 Option diagram on page 3-6.

Alarm on DTR Loss: Selecting [Enable] allows the PRISM to go into alarm on loss of DTR. The default setting is [Disable].

4.6.4 TCP/IP Parameters

The 'TCP/IP Configuration' screen (Screen 4-9) is accessible for the Ethernet or Token Ring SNMP interface. It allows for the entry of those parameters required for proper operation with an Ethernet or Token Ring-based LAN manager. The SNMP menu consists of alpha-numeric entry only (no selectable parameters).

Ethernet / Token Ring: This field displays the applicable hardware/software revision level.

Element: Toggling this field with the <spacebar> accesses either the [NEAR] or [FAR] unit.

Reset LAN Interface: For changes to take effect, the unit must be restarted. Selecting this field brings up a confirmation screen which asks if you want to proceed with the reset.

PRISM IP Address: This field accepts IP addresses. Each device connected to the LAN is required to have a unique IP address identifier.

Subnet Mask: This field is provided to manually override the subnet mask setting which is otherwise discovered by the SNMP agent.

Router IP Address: This field accepts the IP address of the default router.

Filter IP Address: These eight fields accept the IP address of the source packet filter. If any of these fields are set, access is allowed only by the specified IP addresses.

4.6.5 SNMP Parameters

The 'SNMP Configuration' screen (Screen 4-9) is accessible if the unit is equipped with the Ethernet or Token Ring SNMP interface. It allows for the entry of those parameters required for proper operation with an Ethernet or Token Ring-based LAN manager. The SNMP menu consists of alpha-numeric entry only (no selectable parameters).

Element: Toggling this field with the <spacebar> accesses either the [NEAR] or [FAR] unit.

Reset LAN Interface: For changes to take effect, the unit must be restarted. Selecting this field brings up a confirmation screen which asks if you want to proceed with the reset.

SNMP Sets: This field enables or disables the set command responses. Refer to Appendix ___ for detailed information on these responses.

Trap IP Address: This field accepts the IP address of a network device where alarm reporting traps are to be sent. Each of the four numbers range from 0 to 255 and is separated by a period.

The PRISM detects and reports T1 network alarms and provides several options for reporting them, one of which is

Screen 4-10 SNMP Parameters

```
3000 DSU x.xx/x.xx                PRISM 3000                    Date: MM/DD/YY
No Far End Response            Birmingham: (151)                Time: HH:MM:SS

------------------------------ SNMP CONFIGURATION ------------------------------

Ethernet x.xx/x.xx          Element: [NEAR]            (RESET LAN INTERFACE)

                  SNMP Sets:  [ENABLE ]

                  Trap I.P. Address 1  (000.000.000.000)
                  Trap I.P. Address 2  (000.000.000.000)
                  Trap I.P. Address 3  (000.000.000.000)
                  Trap I.P. Address 4  (000.000.000.000)
                  Trap I.P. Address 5  (000.000.000.000)
                  Trap I.P. Address 6  (000.000.000.000)

Read Community      (public                                              )
Write Community     (private                                             )
System Contact      (no system contact                                   )
System Name         (no system name                                      )
System Location     (no system location                                  )
```

Trap Definitions

Cleared Near	Cleared Far	Alarmed Near	Alarmed Far	Description
4	54	104	154	DTE CRCES
5	55	105	155	DTE BPVS
6	56	106	156	DTE AISS
7	57	107	157	DTE RAS
8	58	108	158	DTE UAS
9	59	109	159	DTE OOFS
10	60	110	160	DTE LOSS
11	61	111	161	DTE CSS
12	62	112	162	DTE SES
13	63	113	163	DTE ES
14	64	114	164	NET CRCES
15	65	115	165	NET BPVS
16	66	116	166	NET AISS
17	67	117	167	NET RAS
18	68	118	168	NET UAS
19	69	119	169	NET OOFS
20	70	120	170	NET LOSS
21	71	121	171	NET CSS
22	72	122	172	NET SES
23	73	123	173	NET ES
24	74	124	174	Device Reset

SNMP traps. When a network alarm occurs, the unit sends a trap message to up to 6 destinations on the user's network. The trap message is formatted per RFC 1157. The generic trap type is 'enterpriseSpecific' (generic-trap = 6).

When an alarm group is defined to report via SNMP, up to 6 Trap IP addresses can be assigned. The PRISM will report each alarm by transmitting an SNMP 'Trap' to each Trap IP address. T1 network problems often cause more than one alarm type. In these cases, multiple trap messages are generated, each with a different specific trap type. The specific-trap field of each trap message is set to one of the values shown in the 'Trap Definition' table on the previous page.

The following five menu items require the entry of up to 255 characters identifying the appropriate group, person, device function, or unit location.

Read Community: This display accepts a character string identifying the group authorized to perform read operations. The default setting is '`public`'.

Write Community: This display accepts a character string identifying the group authorized to perform write operations. The default setting is '`private`'.

System Contact: This display accepts a character string identifying the person responsible for a network device. The default setting is '`no system contact`'.

System Name: This display accepts a character string identifying the functionality of the network device. The default setting is '`no system name`'.

System Location: This display accepts a character string identifying the physical location of network device. The default setting is '`no system location`'.

Screen 4-11 Voice Parameters

```
3000 DSU x.xx/x.xx                PRISM 3000                    Date: MM/DD/YY
No Far End Response              Boston: (232)                  Time: HH:MM:SS

--------------------------- Voice Port Configuration ---------------------------

                                    Element: (NEAR)
                                       Slot: (3)
                                  Card Type: 4 Wire E&M

Port  DS0   Mode     State          Name/ID              Sig.     Tx Gn.  Rx Gn.
-------------------------------------------------------------------------------
A    (13)  [ACTIVE]  BUSY   (DS0 13                 )  [FXS/LS]  [ 0dB]  [ -6dB]
B    (14)  [ACTIVE]  BUSY   (DS0 14                 )  [FXS/GS]  [ 0dB]  [ -6dB]
C    (15)  [ACTIVE]  BUSY   (                       )  [MEG/LS]  [ 0dB]  [ -6dB]
D    (16)  [ACTIVE]  BUSY   (                       )  [MEG/GS]  [ 0dB]  [ -6dB]
E    (17)  [ACTIVE]  BUSY   (                       )  [PLAR  ]  [ 0dB]  [ -6dB]
F    (18)  [SPARE ]  IDLE   (                       )  [FXS/LS]  [ 0dB]  [ -6dB]

                                          Channel Allocation: 1x1x1x 1x1x1x -

----- ------

                              Firmware Revision: x.xx
```

4.7 Utilities Screen

The 'Utilities' screen (Screen 4-12) handles the functions described in the following paragraphs.

4.7.1 General Functions

Set Time: The current time may be entered in this field using the 24-hour HH:MM:SS format. For example, 3:45 AM is entered as '0345' and 3:45 PM is entered as '1545'.

Set Date: The current date may be entered in this field using the MM:DD:YY format. For example, July 4, 1993 is entered as '070493'.

NOTE: The time and date can be set at the far end, but not displayed.

New Password: This field allows entry of a password of up to 10 characters. An empty string (carriage return only) may be entered to disable the password feature. After <return> is pressed, the new password is activated and is no longer visible. Therefore, type carefully when entering a new password and verify before pressing <return>. When the terminal interface is exited and later reactivated, this password must be entered exactly to gain access. If the wrong password is entered, the following message will appear:

Incorrect Password; Please Enter Again.

NOTE: Do not exit the terminal interface program until the password procedure is fully understood. If a password has been specified, it must be typed exactly to reenter the program.

If the user programs a password and later forgets it, the password may be cleared through the front panel maintenance reset (refer to Section 3.1.1 on page 3-1). The reset operation sets all parameters to the factory default settings and zeros all performance registers. If the reset operation is not a satisfactory option, then call TxPORT Customer Support for a one time use 'back door' password (refer to Section 1.7 on page 1-6 for telephone numbers).

Maintenance Reset: This field will clear all user selectable parameters, performance registers, passwords, and alarms. All alarm threshold parameters will be reset to default values. The unit reloads start-up configuration settings from the default parameters stored in ROM. Pressing <return> on this field brings up a warning prompt asking whether or not to perform the reset function.

4.7.2 COA Parameters

The following fields pertain only to call on alarm functions.

Alarm Notification: This field controls the remote alarm reporting. The choices are:

[OFF] - Disables alarm reporting.

[DIRECT] - Sends reports to a printer or terminal connected directly to the supervisory port.

[DIAL] - Sends reports through an attached 'AT' command set compatible modem connected to the 'SUPV' serial port, which must dial out to a remote modem. The message format is described in the 'Element ID' field.

[DIAL NMS] - Sends reports through a modem to an EM8000 element manager workstation.

Primary Phone#, Secondary Phone#: These fields are ASCII strings for the primary and secondary call on alarm phone numbers used in the [DIAL] and [DIAL NMS] modes. The strings must NOT include the 'ATDT' command prefix.

Screen 4-12 Utilities

```
3000 DSU x.xx/x.xx                PRISM 3000                    Date: MM/DD/YY
No Far End Response               Miami: (97)                   Time: HH:MM:SS
---------------------------------- UTILITIES-----------------------------------

                                Element: [NEAR]

                             Set Time: (12:34:25)
                             Set Date: (04/30/93)

                     Alarm Notification: [DIAL      ]
                         Primary Phone#: (205-555-1212               )
                       Secondary Phone#: (205-532-8853               )
                            Element ID: (DSU 1230                    )

                          New Password: (JohnDoe     )

                                (MAINTENANCE RESET)
```

The unit attempts 3 times to connect using the primary number. If all 3 attempts fail, it will attempt 3 times to connect using the secondary number (if it is not blank). If the secondary number fails, the unit waits 5 minutes and then attempts to communicate with the primary number again. When a connection is detected, the unit outputs the notification message (as described in the 'Element ID' field) and then disconnects.

Element ID: This field allows the entry of an ASCII string (29 characters in length) which identifies the unit to the device receiving the alarm notification messages.

Call on alarm messages are reported in the following format in the [DIAL] or [DIRECT] modes only:

```
Element ID HH:MM:SS MM/DD/YY <CR> <LF>
NET Alarms: alarms <CR> <LF>
DTE Alarms: alarms <CR> <LF>
```

where (alarms) is a string consisting of some or all of the identifiers 'LOS', 'OOF', 'RAS', 'AIS', 'UAS', 'ERRS', or the word 'NONE'. The following is an example:

```
Joesunit 17:24:55 08/04/93
NET Alarms: LOS AIS ERRS
DTE Alarms: LOS 2A 2B 3A 3B
```

The user programmable 'Element ID' string is transmitted first to allow the COA function to send a message with a specific meaning to some host (such as a log on message).

NOTE: The identifier 'ERRS' represents an alarm that is caused by ES, SES, and/or BPV errors.

4.8 Telnet Option

Telnet expands the Ethernet or Token Ring capabilities of the PRISM unit. With the telnet feature installed, any telnet compatible station emulating an ANSI VT100 terminal can communicate with the PRISM unit. Fractional loopback and BERT can be initiated and monitored from any telnet compatible device in the wide area network (WAN). Note that only a single telnet session is supported at any one time.

The user must be familiar with telnet operation to begin communication with the unit (refer to the telnet documentation) The telnet interface provides security through password layers identical to those described in this chapter for the terminal interface. Once communication is established, all telnet screens are identical to those described for the terminal interface.

Index