ACCULINK
316x DATA SERVICE UNIT/ CHANNEL SERVICE UNIT (INCLUDES TERMINAL USER INTERFACE)

OPERATOR'S GUIDE

Document No. 3160-A2-GB22-10

December 1996

PARADYNE™

ACCULINK
316x Data Service Unit/Channel Service Unit
(includes Terminal User Interface)
Operator's Guide
3160-A2-GB22-10

2nd Edition (December 1996)

Changes and enhancements to the product and to the information herein will be documented and issued as a new release to this manual.

Standalone

FCC Registration number:	See label on unit
Ringer Equivalence number (REN):	See label on unit
Canadian Certification number:	See label on unit
Canadian DOC Load number:	See label on unit

Carrier Card

FCC Registration number:	See label on unit
Ringer Equivalence number (REN):	See label on unit
Canadian Certification number:	See label on unit
Canadian DOC Load number:	See label on unit

Warranty, Sales, and Service Information

Contact your sales or service representative directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, or training, use one of the following methods:

- **Via the Internet:** Visit the Paradyne World Wide Web site at http://www.paradyne.com

- **Via Telephone:** Call our automated call system to receive current information via fax or to speak with a company representative.

    — Within the U.S.A., call 1-800-870-2221
    — International, call 813-530-2340

Trademarks

All products and services mentioned herein are the trademarks, service marks, registered trademarks or registered service marks of their respective owners.

Printed on recycled paper

Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.

2. This product is intended to be used with a three-wire grounding type plug - a plug which has a grounding pin. This is a safety feature. Equipment grounding is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adaptor.

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

   If a three-wire grounding type power source is not available, consult a qualified electrician to determine another method of grounding the equipment.

3. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.

4. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.

5. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.

6. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.

7. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

8. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.

9. Models 3160/3164/3165 Input Power to the AC voltage configuration of this product must be provided by a UL Listed or CSA Certified, Class 2 transformer. Input power to the DC voltage configurations of this product must be provided by a National Electric Code (NEC) or a Canadian Electric Code (CEC), Part 1, Class 2 circuit.

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

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

Notices

WARNING

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

THE AUTHORITY TO OPERATE THIS EQUIPMENT IS CONDITIONED BY THE REQUIREMENTS THAT NO MODIFICATIONS WILL BE MADE TO THE EQUIPMENT UNLESS THE CHANGES OR MODIFICATIONS ARE EXPRESSLY APPROVED BY PARADYNE.

WARNING

TO USERS OF DIGITAL APPARATUS IN CANADA:

THE 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.

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

Government Requirements and Equipment Return

Certain governments require that instructions pertaining to DSU/CSU and modem connection to the telephone network be included in the installation and operation manual. Specific instructions are listed in the following sections.

United States

NOTICE TO USERS OF THE UNITED STATES TELEPHONE NETWORK

1. This equipment complies with Part 68 of the FCC rules. On the equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. The label is located on the bottom of the 3160/3164 DSU/CSU, and on the 3161 DSU/CSU circuit card. If requested, this information must be provided to the telephone company.

2. There are two types of telephone lines associated with the standalone equipment. The T1 network connection should be made using a Universal Service Order Code (USOC) type RJ48C jack. The Service Order Code 6.0F should be specified to the telephone company when ordering the T1 line. In addition, the proper Facility Interface Code must be specified to the Telephone Company. The DSU/CSU can be configured to support any of the following framing format and line signaling techniques. The DSU/CSU configuration must correspond to the T1 line's parameters. The 3160/3164 DSU/CSU internal modem connects to the Public Switched Telephone Network using a USOC Type RJ11C jack. The Facility Interface Code 02LS2 along with the RJ11C jack should be specified to the telephone company when ordering a dial line for the modem. The 3161 DSU/CSU connects to the T1 network using the multi-line USOC-type RJ48H jack and does not have a PSTN interface.

316x DSU/CSU Facility Interface Codes

Code	Description
04DU9-BN	1.544 Mbps superframe format (SF) without line power
04DU9-DN	1.544 Mbps SF and B8ZS without line power
04DU9-1KN	1.544 Mbps ANSI ESF without line power
04DU-1SN	1.544 Mbps ANSI ESF and B8ZS without line power

3. The ringer equivalence number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum RENs for the calling area.

4. If the 316x DSU/CSU causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

6. If you experience trouble with this equipment, please contact your sales or service representative (as appropriate) for repair or warranty information. If the product needs to be returned to the company service center for repair, contact them directly for return instructions using one of the following methods:

   - **Via the Internet:** Visit the Paradyne World Wide Web site at http://www.paradyne.com

   - **Via Telephone:** Call our automated call system to receive current information via fax or to speak with a company representative.

     — Within the U.S.A., call 1-800-870-2221

     — International, call 813-530-2340

   If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved.

7. The equipment's modem cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information).

8. FCC compliant telephone line cords with modular plugs are provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant.

Canada

NOTICE TO USERS OF THE CANADIAN TELEPHONE NETWORK

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

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

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

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

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

The load number is labeled on the equipment. The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all devices does not exceed 100.

If your equipment is in need of repair, refer to the procedure in the *Government Requirements and Equipment Return* section.

Table of Contents

3. Operation

4. Maintenance

Appendices

Glossary

Index

List of Figures

Figure   **Page**

List of Tables

Table		**Page**
1-1	Models 3160/3614 DSU/CSUs Rear Panel Connectors	1-7
1-2	Auxiliary Backplane Connectors	1-8
3-1	System LEDs	3-7
3-2	NETWORK Interface LEDs	3-8
3-3	DSX-1 Drop/Insert Port LEDs	3-9
3-4	Data Port LEDs	3-10
3-5	Front Panel Emulation Screen Icons	3-14
3-6	Test Jack Functions	3-16
3-7	Enterprise-Specific Trap Definitions	3-31
3-8	Display Channel Symbols	3-40
3-9	Health and Status Messages	3-54
3-10	Self-Test Health Messages	3-56
3-11	Performance Registers	3-57
3-12	Valid Phone Number Characters	3-68
3-13	Async Terminal Interface Configuration Options	3-70
3-14	Hard-Key Representations for Edit Screens	3-73
3-15	Function Representations for Edit Screens	3-73
3-16	Function Representations for Display Screens	3-74
4-1	SNMP Trap per Interface	4-2
4-2	Valid Loopback Combinations	4-6
4-3	Valid Send Test Pattern Combinations	4-13
4-4	Test Status Messages	4-16
B-1	ACCULINK Models 3160/3164 DSU/CSUs Technical Specifications	B-1
B-2	ACCULINK Model 3161 DSU/CSU Technical Specifications	B-3
C-1	DTE Interface Configuration Options	C-2
C-2	Port Configuration Options	C-4
C-3	Network Interface Configuration Options	C-7
C-4	Channel Configuration Options	C-9
C-5	Data Port Channel Configuration Options	C-10
C-6	General Configuration Options	C-12
C-7	User Interface Configuration Options	C-13
C-8	Alarm Configuration Options	C-17
C-9	General SNMP Configuration Options	C-20
C-10	SNMP Trap Configuration Options	C-22

Table **Page**

Preface

Objectives and Reader Assumptions

This operator's guide contains installation and operation information for the ACCULINK® 316x Data Service Unit (DSU)/Channel Service Unit (CSU).

Related Documents

Contact your sales representative for additional product documentation.

3000-A2-GA31	*COMSPHERE 3000 Series Carrier Installation Manual*
3000-A2-GB41	*COMSPHERE – 48 VDC Central Office Power Unit Installation Guide*
3100-A2-GK40	*ACCULINK 3151 CSU and 3161 DSU/CSU General Information Guide*
3160-A2-GL12	*ACCULINK 3160/3164 DSU/CSU Reference Card*
3161-A2-GL11	*ACCULINK 3161 DSU/CSU Reference Card*
7800-A2-GB20	*ACCULINK 3100 Series Open Management Application for HP OpenView User's Guide*

It is assumed that you are familiar with the operation of digital data communications equipment and DSUs and CSUs in particular. You should also be familiar with Simple Network Management Protocol (SNMP) if you want your DSU/CSU to be managed by an SNMP manager.

Reference Documents

- AT&T Technical Reference 54016
- AT&T Technical Reference 62411
- ANSI T1.403-1989
- DOC Certification Standard CS-03
- CSA-22.2 No. 950-M89
- CSA 108-M1983
- FCC Part 15
- FCC Part 68
- UL 1950
- *Management Information Base for Network Management of TCP/IP-Based Internets*: *MIBII*. RFC 1213, March 1991
- *Definitions of Managed Objects for the DS1 and E1 Interface Types*. RFC 1406, January 1993
- *Definitions of Managed Objects for RS-232-like Hardware Devices*. RFC 1317, April 1992
- *Extensions to the Generic-Interface MIB*. RFC 1229, May 1991

Introduction 1

Overview

The ACCULINK® 316x Series ESF T1 Data Service Unit (DSU)/Channel Service Unit (CSU) acts as an interface between the T1 digital network and the Customer Premise Equipment (CPE), converting signals received from the DTE (Data Terminal Equipment) to bipolar signals that can be transmitted over T1 and Fractional T1 lines. Typical applications include Local Area Network (LAN)/Wide Area Network (WAN) interconnection, channel extension, and video teleconferencing.

In addition to the T1 Drop/Insert port, the ACCULINK Model 3160 provides two DTE ports while the ACCULINK Model 3164 provides four DTE ports.

The ACCULINK Model 3161 provides two ports in addition to the T1 Drop/Insert port and is designed to fit into the COMSPHERE® 3000 Series Carrier.

Differences between these models are discussed where applicable throughout this manual.

The 316x DSU/CSU optimizes network performance with a wide range of benefits such as the following:

- Software configuration menu displayed via an LCD to permit quick and easy operation and elimination of complicated hardware strapping.

- Flash memory software download capability to ensure investment protection.

- Trouble-free installation facilitated by two factory installed settings which anticipate the most common applications: either D4 or ESF framing standards, and B8ZS or AMI line coding standards.

- Security features to ensure network integrity.

- Network management for 3160/3164 DSU/CSUs provided through industry-standard SNMP.

- Multipower source acceptance.

- Local or remote configuration and operation flexibility.

- Several loopback capabilities, test pattern generators and external contact closure for DTE loopback support.

- Independently selectable DTE interfaces (V.35, EIA-530A, V.11, and/or RS449/422).

- Flexible timing source, available from the T1 network interface, the DSX-1 T1 interface, at least one of the synchronous DCE data ports, an internal clock, or an external clock.

- Flexible, user-friendly channel allocation.

The 3160/3164 DSU/CSUs are available in a compact standalone case (Figure 1-1) that can be mounted on a desktop, shelf, or wall. The 3161 DSU/CSU is available as a circuit card that is installed into a COMSPHERE 3000 Series Carrier.

Features

The 316x DSU/CSU offers a wide variety of features:

- Integral modem for 3160/3164 DSU/CSUs only which enables remote operation to enhance serviceability and increases uptime.

- User interfaces for access to configuration and alarm information.

- Front Panel Emulation via Windows™-based front panel emulation software.

- Front panel pass-through to access a remote 3160/3164 DSU/CSU.

- Async terminal interface support.

- DSX-1 Drop/Insert port.

- Front Panel Access Control feature.

- SNMP Management Support.

Integral Modem

The 3160/3164 DSU/CSUs contain an integral modem that enables communication with remote devices such as another 316x DSU/CSU, or an ASCII terminal or printer. This is a low-speed (2400 bps), V.22bis dial modem that provides remote dial-up capability to support downloading, pass-through, alarm reporting, and remote configuration and diagnostics. The integral modem can also communicate with a PC running the 3100 Series Front Panel Emulation software accompanying the 316x DSU/CSU.

User Interface

There are three ways of accessing the user interface:

- **Front panel** – provides an LCD and a keypad which enable you to display information about and interact with the DSU/CSU. A menu tree is available which enables control of the DSU/CSU in the network (see Appendix A, *Front Panel Menu*).

- **COM Port** – used for 3100 Series Front Panel Emulation software which displays the DSU/CSU front panel on a PC and provides the same functions as the actual front panel. It is also used for the async terminal connection (3160/3164 only). For Model 3161 DSU/CSUs, only one slot in the carrier can be configured as the COM port; all slots share the PC.

- **MODEM Port** – provides 3160/3164 DSU/CSU functionality from a PC attached either remotely or by using pass-through via another DSU/CSU (3160/3164 only). It is also used for the async terminal connection. This port is located only on 3160/3164 DSU/CSUs.

Alarm Interface

The 3160/3164 DSU/CSU can be attached, either locally or remotely, to an ASCII terminal or printer to display/print alarm messages. The COM and MODEM ports can be used as destinations for Alarm Set and Alarm Clear messages. This enables an ASCII terminal/printer or async terminal to be used to monitor the DSU/CSU for alarm conditions, but provides a potential conflict if the COM or MODEM port is also the current active physical interface. If this occurs, the user interface functions have priority over any alarm messages that are sent to the currently active physical interface.

Alarms can also be displayed on a PC that is using a terminal emulation package.

Model 3160/3164 DSU/CSUs can be configured to generate traps on alarms which can be sent to an SNMP manager via either the MODEM or COM port.

Front Panel Emulation

The 3160/3164 DSU/CSU offers the same functionality through Front Panel Emulation software as that provided by the DSU/CSU front panel. The DSU/CSU can either be locally attached to a 286 or higher PC, or remotely through a local 3160/3164 DSU/CSU's integral modem. A copy of the DSU/CSU front panel appears on the PC; full functionality of the front panel is available by clicking on the Function keys with the mouse rather than by pressing keys from the actual front panel.

For 3161 DSU/CSUs, a single PC is used to access all of the slots in the carrier. The PC is connected locally to a single slot containing either a 3151 CSU or 3161 DSU/CSU that has been configured as the Master Communication Unit. The Master Communication Unit provides the shared COM port on the Auxiliary Backplane, so that an attached PC can access any 3151/3161 device attached to the Auxiliary Backplane.

The 3161 DSU/CSU is capable of activating the shared alarm relay on the 3000 Series Carrier, if so configured. The alarm relay is deactivated when the condition causing the alarm is corrected, or an Alarm Cut-Off (ACO) command is issued from the SDCP or the optional Front Panel Emulation software.

Front Panel Pass-Through

Pass-through (**passthrough**) mode enables the user at the local DSU/CSU to access the front panel of a remote 316x DSU/CSU using the integral modem. In addition, front panel pass-through can be used from a PC connected to the COM port of the local Model 3160/3164 DSU/CSU. By using Pass-through mode, the user can operate the remote 316x DSU/CSU through the front panel of the local DSU/CSU or via the PC using the Front Panel Emulation software.

Async Terminal Interface Support

A Model 3160/3164 DSU/CSU can be configured and managed from an async (asynchronous) terminal. When the Async Terminal feature is enabled, the DSU/CSU is managed from the async terminal's full screen display using a menu hierarchy similar to, and the same option selections available from, the DSU/CSU front panel. The async terminal can be connected locally via the COM port for direct access or connected via the modem port for dial-in access.

Procedures throughout this manual are described specifically for a front panel user. Look for the subhead *Differences Using the Async Terminal* within each procedure section for the user interface information on the Async Terminal feature.

DSX-1 Drop/Insert Port

The DSX-1 Drop/Insert port allows DTEs/PBXs that support the DS1 signal format to share the T1 network with other high-speed equipment.

Front Panel Access Control Feature

Using the Front Panel Access Control feature, you can disable the front panel so that users cannot manipulate device configuration options from the front panel. This feature is especially useful in conjunction with the async terminal interface or front panel emulation on the PC.

SNMP Management Capabilities

The Model 3160/3164 DSU/CSU supports the Simple Network Management Protocol (SNMP), Version 1, and therefore has the capability of being managed by any industry-standard SNMP manager. The company provides an SNMP application tailored for 3100 Series devices that runs on a Hewlett-Packard® HP OpenView™ network management platform. This application enhances your ability to manage the 3100 Series devices by presenting the Management Information Base (MIB) information relevant to these devices in an easy-to-read format. The functionality provided by the SNMP application is a subset of the functionality available through the DSU/CSU's front panel. The 3100 Series SNMP application is used to manage and control general device functions, the Network T1 interface, the DSX-1 (DTE) interface, the Communications (COM) interface, the MODEM interface, and the individual DCE ports. For more information about SNMP management of 3100 Series devices, refer to the *ACCULINK 3100 Series Open Management Application for HP OpenView User's Guide*.

SNMP is an industry-standard network management system that is used to monitor network performance and status, and to report alarms (i.e., traps). To function, SNMP requires a manager consisting of a software program housed within a workstation; an agent consisting of a software program housed within a device (e.g., 3160/3164 DSU/CSU); and a MIB consisting of a database of managed objects, accessible to agents and controlled via SNMP, to provide network management information.

The 3160/3164 DSU/CSU supports a MIB that can be accessed using SNMP protocol by external SNMP managers. The following MIBs are supported:

- MIB II – Defines the general objects for use with a network management protocol in TCP/IP internets and provides general information about the DSU/CSU. MIB II is backward-compatible with MIB I.

- DS1/E1 MIB – Defines objects for managing DS1 interfaces and supports the network and DTE drop/insert T1 interfaces.

- RS-232-like MIB – Defines objects for managing RS-232 type interfaces (e.g., RS-422, RS-423, etc.) and supports synchronous data ports and management communication ports on the DSU/CSU.

- Generic-Interface MIB Extensions – An extension to MIB II that defines additional objects for control of generic interfaces in MIB II. It supports control of tests on the DSU/CSU's T1 and synchronous data interfaces that are not supported by other MIBs.

Two link layer protocols are supported for connection to an external SNMP manager or network device, Point-to-Point Protocol (PPP) and Serial Line Internet Protocol (SLIP). The protocol type is configurable using the configuration options (see Appendix C, *Configuration Options*).

Communication with the external SNMP management system can be through a serial connection on either the COM port or the MODEM port. Only one port can be configured as the management link at one time. However, the 3160/3164 DSU/CSU can be accessed simultaneously by either the front panel or front panel emulation software on one port, and an SNMP management system on the other port. Users on the external SNMP manager can issue "Get" and "Set" SNMP commands to an object in the SNMP database maintained by the DSU/CSU. The DSU/CSU can be configured to issue SNMP traps to the SNMP manager under various alarm conditions.

ACCULINK 316x DSU/CSU Physical Description

The ACCULINK 316x DSU/CSU series of products consists of a standalone 2-port Model 3160 DSU/CSU, a standalone 4-port Model 3164 DSU/CSU and a 2-port carrier-mounted Model 3161 DSU/CSU.

Standalone Model 3160/3164 DSU/CSUs

The 3160/3164 DSU/CSUs are housed in a compact, standalone unit containing a front panel for control and monitoring of the DSU/CSU and a rear panel for connections. This standalone unit can be mounted on a wall, an equipment shelf, or an RS-310-C equipment cabinet with the optional wall-mount kit.

3160/3164 DSU/CSU Front Panel

The 3160/3164 DSU/CSU front panel contains,

- One 2-line, 16-alphanumeric character per line liquid crystal display (LCD)

- One 7-button keypad (three Function and four directional keys)

- Twelve light-emitting diodes (LEDs), five of which are shared between the DSX-1 (DTE) Drop/Insert T1 interface and the data ports.

- Six test jacks

The front panel is shown in Figure 1-1.

3160/3164 DSU/CSU Rear Panel

The 3160/3164 DSU/CSU rear panel contains the connectors required for the operation of the DSU/CSU (Figures 1-3 and 1-4). The connectors and their functions are listed in Table 1-1.
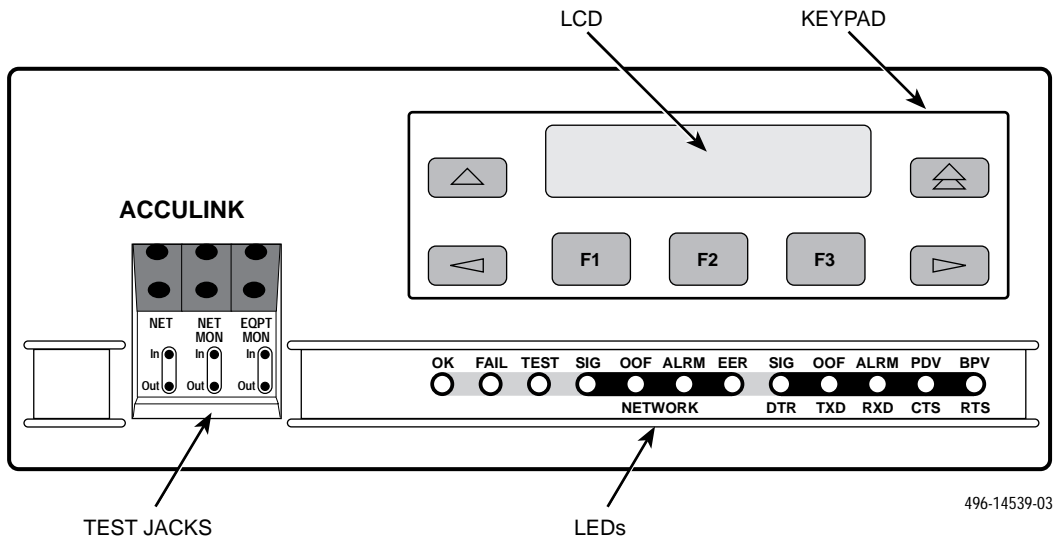
Figure 1-1. 3160 DSU/CSU Front Panel
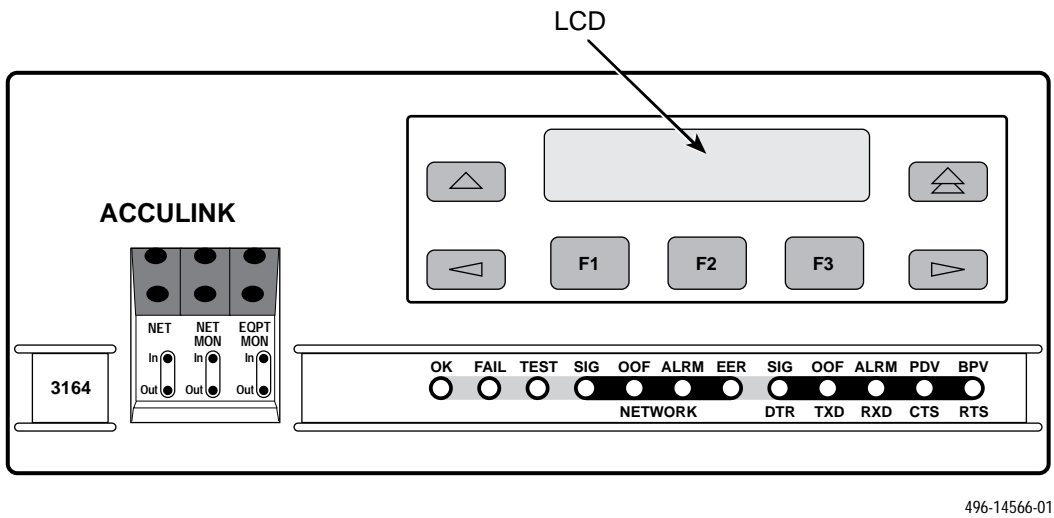
Figure 1-2. 3164 DSU/CSU Front Panel
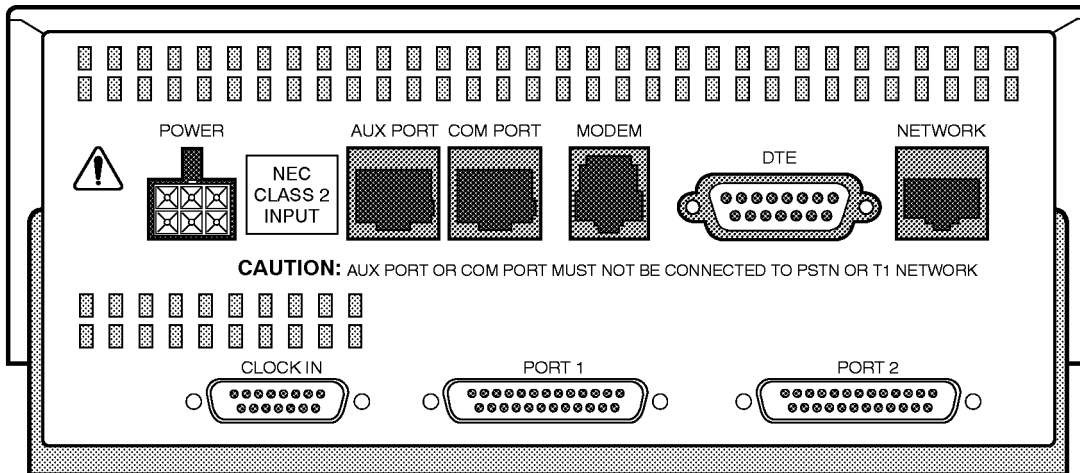
493-14295

Figure 1-3. 3160 DSU/CSU Rear Panel
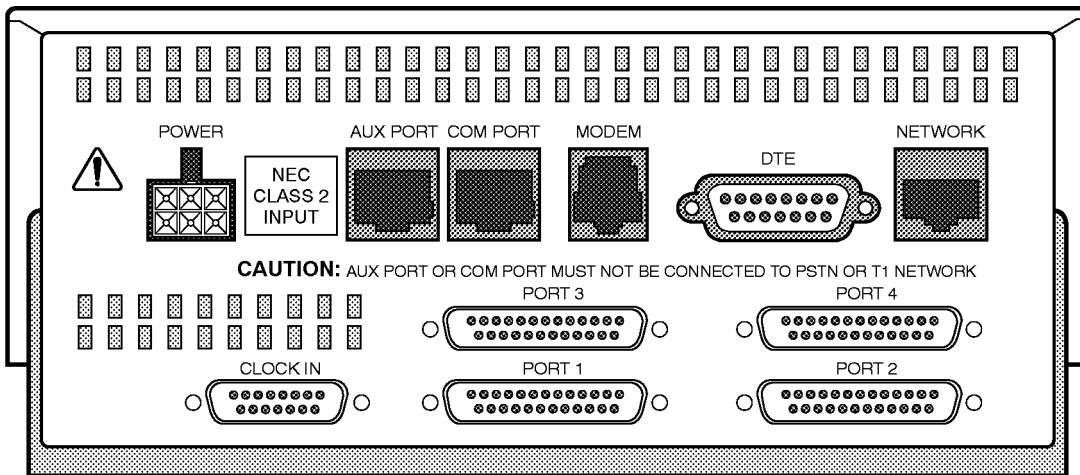
493-14294

Figure 1-4. 3164 DSU/CSU Rear Panel

Table 1-1
Models 3160/3164 DSU/CSUs Rear Panel Connectors

Connector Name	Function
POWER	A modular connector that supplies power to the DSU/CSU.
AUX PORT	An auxiliary communications port for future use.
COM PORT	A communications port that provides access to the front panel from a locally connected PC. The port can also be used to connect a terminal for an async terminal interface, an ASCII terminal or printer for reporting alarm messages, or to support an SNMP management link. The connector is an 8-pin, keyed modular jack.
MODEM	An RJ11 connector for a 2-wire VF line used to connect the integral modem. Provides access to the front panel from a remotely connected PC. The port can also be used to connect a remote terminal for an async terminal interface or an ASCII terminal or printer for reporting alarm messages, or to support an SNMP management link.
DTE (DSX-1)	A DB15 socket, screw-type connector for DTE equipment.
NETWORK	An RJ48C, unkeyed modular jack that provides connection to the T1 network.
CLOCK IN	A connector used to attach an external clock to the DSU/CSU.
PORT 1—4	A DB25 (EIA 530A) connector used to connect the customer's synchronous data DTE.

Carrier-Mounted Model 3161 DSU/CSU

The 3161 DSU/CSU is a circuit card that is installed
into the 3000 Series Carrier. A single carrier can house up
to 16 DSU/CSUs; the DSU/CSUs are controlled by the
carrier's Shared Diagnostic Control Panel (SDCP), which
can control up to eight carriers. Rear panel connections
are provided by the Auxiliary Backplane, which is
installed on the rear of the carrier.

Model 3161 Front Panel Functions

The twelve LEDs and six test jacks provided on the
faceplate of the Model 3161 DSU/CSU are the same in
function as those provided on the front panel of the
3160/3164 DSU/CSU (see Figure 1-5). Other front panel
functions, including a keypad and LCD, are provided by
the SDCP of the 3000 Series Carrier. These SDCP
functions are described in the *COMSPHERE 3000 Series
Carrier Installation Manual*.

Model 3161 DSU/CSU Rear Panel

The Auxiliary Backplane, which is installed on the rear
of the 3000 Series Carrier, contains the connectors needed
for operation of the 3161 DSU/CSU (see Figure 1-6). This
Auxiliary Backplane can be used by both 3151 CSUs and
3161 DSU/CSUs; some of the connectors shown (i.e., data
port and external clock connectors) apply only to 3161
DSU/CSU applications. The 3161 DSU/CSU connectors
and their functions are listed in Table 1-2.

496-14543-01
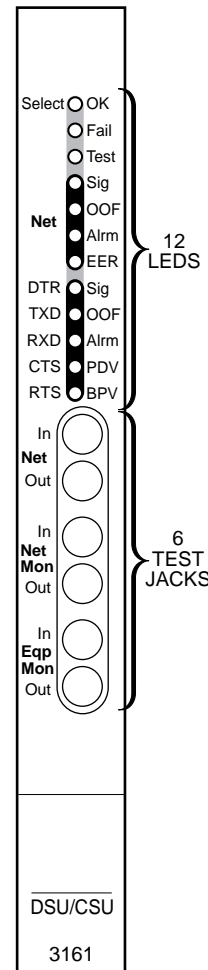
Figure 1-5. 3161 DSU/CSU Faceplate

Table 1-2
Auxiliary Backplane Connectors

Connector Name	Function
DTE	A DB15 socket, screw-type connector for T1 DSX-1 (DTE) equipment.
NETWORK	A 50-pin, RJ48H plug that provides connection to the T1 network for all eight slots supported by the Auxiliary Backplane.
CLOCK IN	A DB9 socket that attaches an external clock to the DSU/CSU. The external clock provides timing for up to eight slots. Each Auxiliary Backplane must have its own external clock input.
PORTS 1 and 2	A DB25 socket (EIA-530A) that connects to the synchronous data DTE. The Port 2 DB25 socket connector allows one slot in the carrier to be configured as the COM port, which replaces the functionality of the second data port. The COM port is a communications port that provides access to Front Panel Emulation software running on a locally connected PC or async terminal connection for DSU/CSU devices on an Async Terminal Interface.
MANAGEMENT	An 8-pin modular jack that provides management connectivity between Auxiliary Backplanes in a carrier.
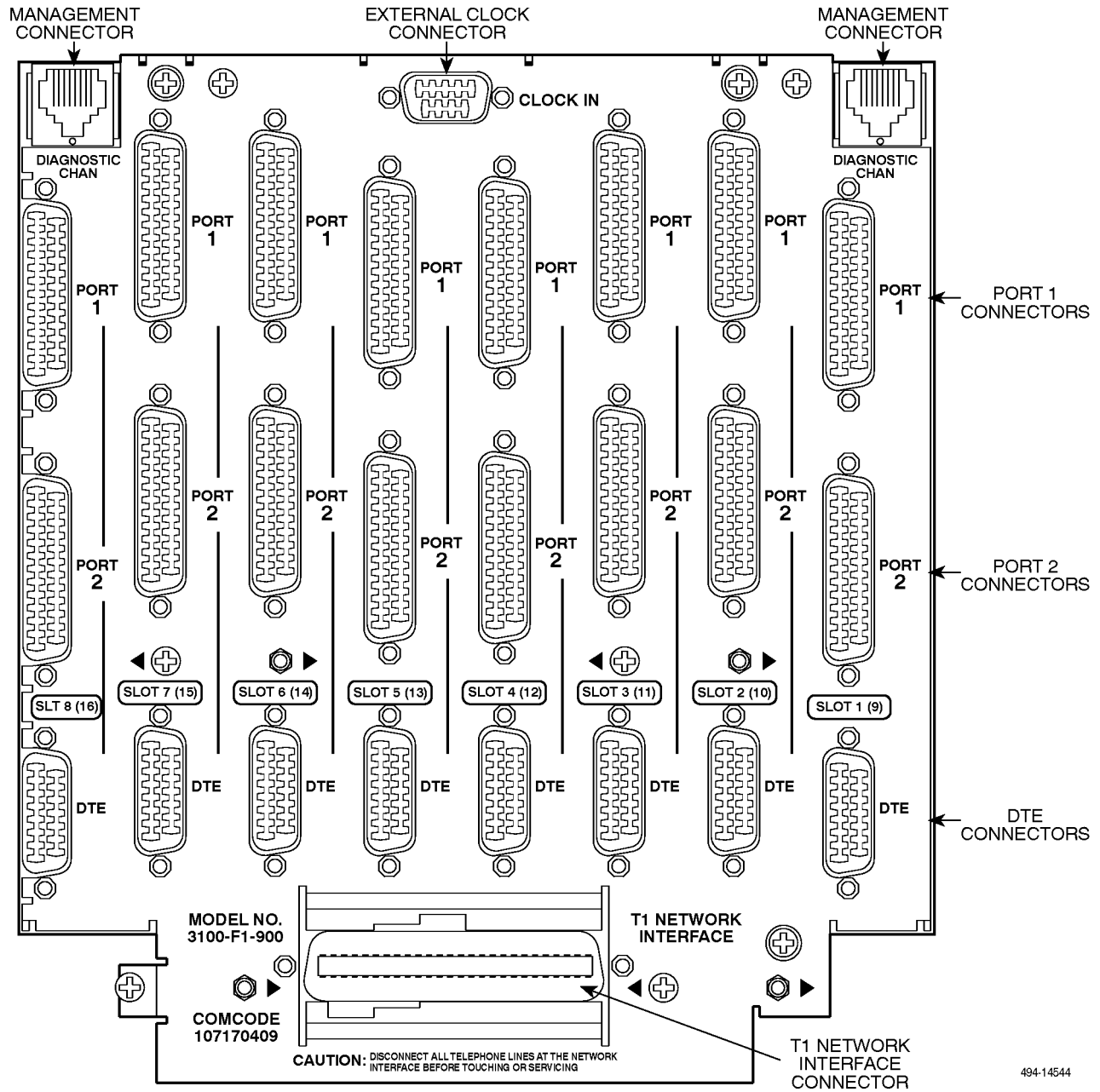
Figure 1-6. Auxiliary Backplane

Installation 2

Overview

This chapter contains information for installing your 3160/3164 DSU/CSU: planning considerations, a list of what you should receive in the DSU/CSU box, and a Quick Start section for experienced DSU/CSU users who have no special installation or operation requirements. More detailed installation instructions are also provided, including cabling and software configuration option information.

Installation instructions for the 3161 DSU/CSU are located in the *ACCULINK 3151 CSU and 3161 DSU/CSU General Information Guide.*

Planning

The ACCULINK 316x DSU/CSU is designed to provide an interface between the T1 digital network and the Customer Premise Equipment (CPE). The DSU/CSU must be connected to the CPE through its DSX-1 (DTE) Drop/Insert port or one of the data ports, and then to the network through the DSU/CSU Network Interface (NET) port. The most common configurations for the 316x DSU/CSU are:

- Point-to-point LAN interconnection (Figure 2-1).

- Shared access to network-based services (Figure 2-2).

- Multiport T1 DSU/CSU in a fractional T1 network (Figure 2-3).

- Central-site T1 termination for Model 3161 DSU/CSUs (Figure 2-4).

Both voice and data applications are supported.

In addition, a 3160 DSU/CSU, acting as an SNMP agent, can be connected to and managed from an SNMP management system in one of two ways:

- Serial connection via the COM or MODEM port to an SNMP management system using either Point-to-Point Protocol (PPP) or Serial Line Internet Protocol (SLIP) (Figure 2-5).

- Serial connection via the COM or MODEM port (using PPP or SLIP) through a network device (e.g., router) that supports IP routing to the network management system (Figure 2-6).

496-14296-03
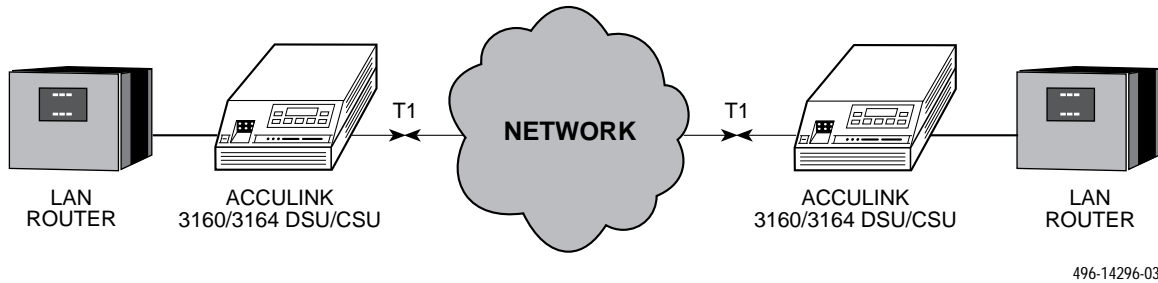
Figure 2-1. Example Point-to-Point Configuration

496-14312-03
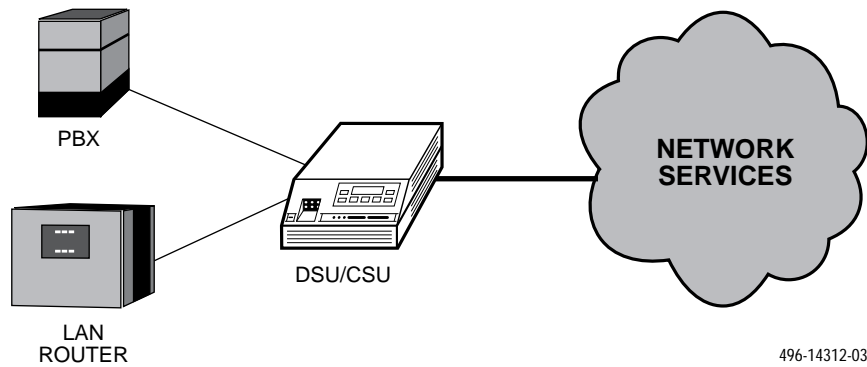
Figure 2-2. Example Shared Access to Network-Based Services Configuration
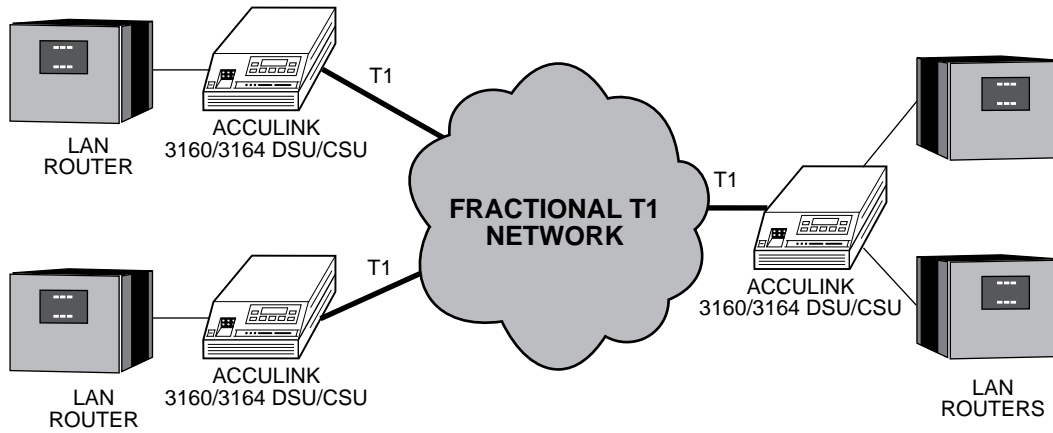
Figure 2-3. Multiport T1 DSU/CSU in a Fractional T1 Network Configuration
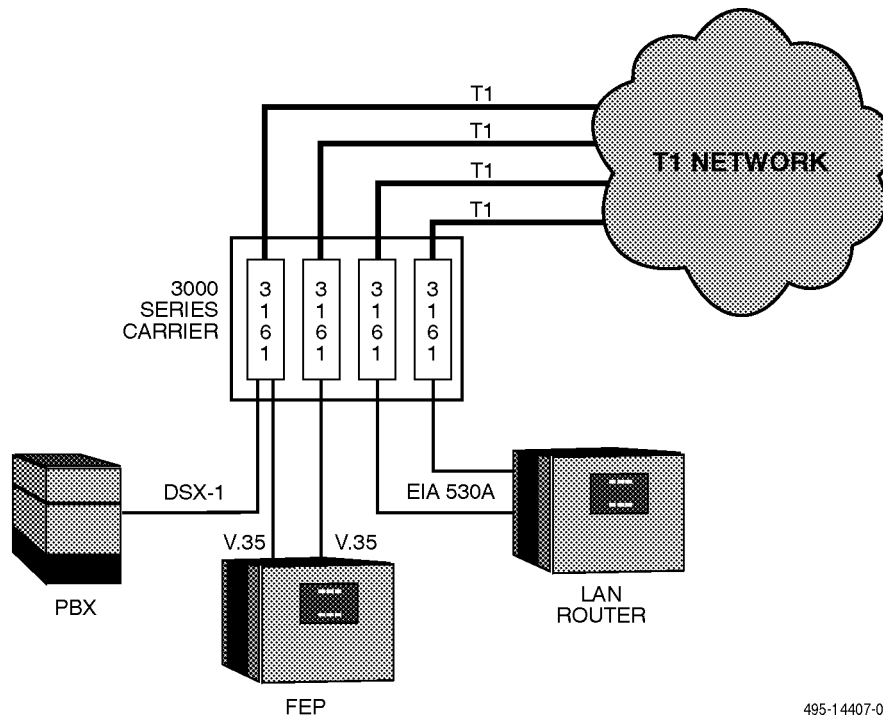
Figure 2-4. Central-Site T1 Termination Configuration
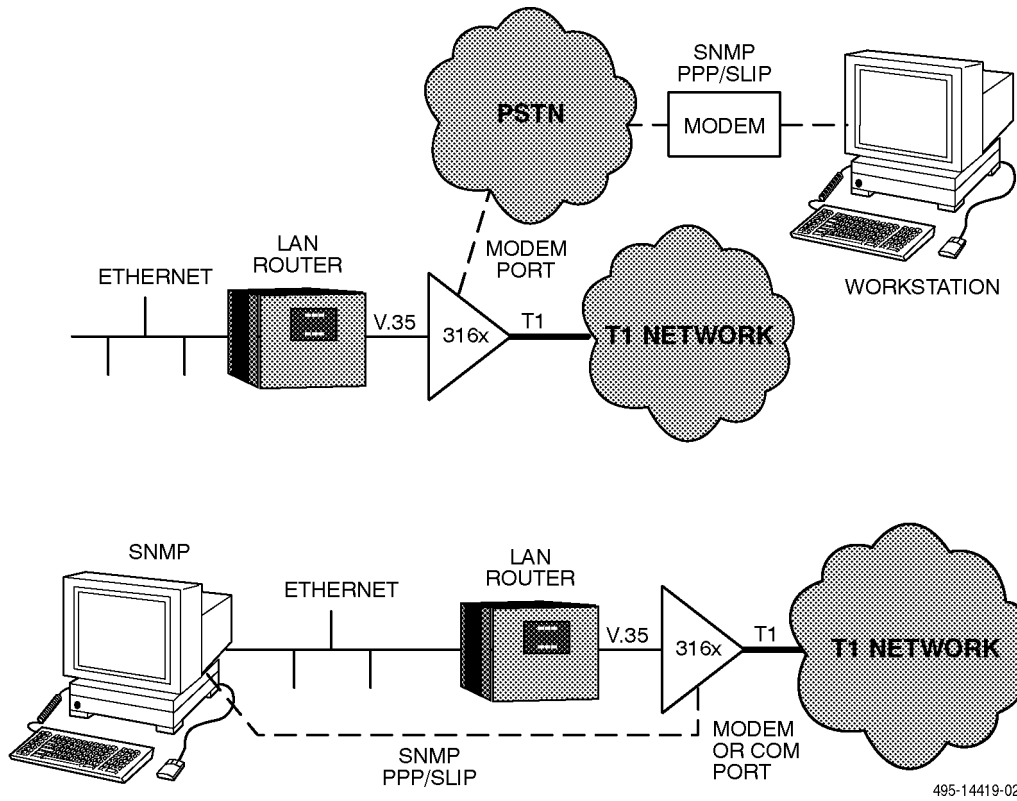
Figure 2-5. Serial Connection to SNMP
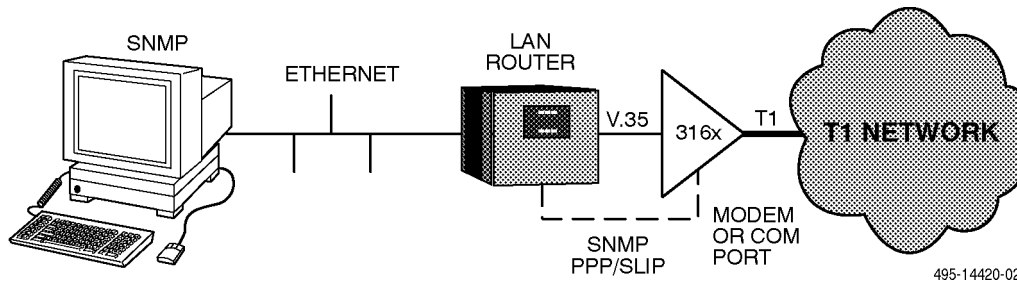
Figure 2-6. Serial Connection through a Router to SNMP

Box Contents

The 3160/3164 DSU/CSU product arrives in a single box and should contain the following:

- One 3160/3164 DSU/CSU standalone unit

- One 14.5 foot VF cable

- One power transformer

- One *ACCULINK 3160/3164 DSU/CSU Reference Card*

- One *ACCULINK 316x Data Service Unit/Channel Service Unit Operator's Guide*

Please refer all servicing to qualified personnel. The Download front panel branch is dedicated to DSU/CSU service and maintenance and is not intended for use by the customer.

The 3100 Series Front Panel Emulation software is available separately and is described in the *Front Panel Emulation Software Installation* section later in this chapter.

Important Safety Instructions

Read and follow all warning notices and instructions marked on the 316x DSU/CSU or included in this guide.

NOTE

The Download command is for use by service personnel only. Loss of primary data could result from improper use.

**HANDLING PRECAUTIONS
FOR
STATIC-SENSITIVE DEVICES**

This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.

For a complete listing of the safety instructions, see the *Important Safety Instructions* section earlier in this guide.

Quick Start Procedure

The following procedure is for experienced DSU/CSU users who are familiar with the 3160/3164 DSU/CSU installation process and have no special requirements for their application.

1. Attach the power cord to the rear of the DSU/CSU and the other end to a grounded 115 Vac power outlet.

2. Attach the 3160/3164 DSU/CSU network connection to the T1 network using the appropriate cable. Attach the 3160/3164 DSU/CSU to the CPE via the DTE (DSX-1) and/or ports connectors. Adapter cables are available which allow RS449 or V.35 devices to be supported from the EIA 530A connector on the rear panel. Refer to Appendix H, *Equipment List*. See the *3160/3164 DSU/CSU Cabling* section later in this chapter for more cabling information.

3. Power on the DSU/CSU to perform the power-up self-test. See the *Power-Up Self-Test* section later in this chapter for more information.

4. To perform front panel emulation, connect the cable from the PC to the COM port on the rear panel of the DSU/CSU. To perform device management from an async terminal, connect the terminal to the COM port (or for dial-in access, the modem port) on the rear panel of the DSU/CSU. See the *3160/3164 DSU/CSU Cabling* section later in this chapter for more cabling information.

---

5. If you intend to manage the 3160/3164 DSU/CSU with SNMP, cable either the COM or MODEM port (as appropriate for your configuration). Then, configure the SNMP management link. See Chapter 3, *Operation,* and Appendix C, *Configuration Options,* for more information.

6. If you do not intend to use the DTE Drop/Insert T1 port, disable it using the configuration procedures in Chapter 3, *Operation*, and Appendix C, *Configuration Options*. (The default setting for this port is **Enabled**.)

7. The Factory 1 configuration for ESF framing format and B8ZS line coding format is the default configuration and is appropriate for most networks. If this configuration does not work for you, try the Factory 2 configuration for D4 framing format and AMI line coding format. To further customize configuration options, refer to the *Configuring the DSU/CSU* section in Chapter 3, *Operation*, and to Appendix C, *Configuration Options*.

8. Verify that the DSU/CSU is functional by observing that the **OK** and **NETWORK SIG** LEDs are lit.

9. Configure the ports and channels you intend to use and assign channels to the network interface. To do so, refer to *Configuring the DSU/CSU* section

in Chapter 3, *Operation*, and to Appendix C, *Configuration Options*.

Optional Power Selection

Using the optional dc power cable, the 3160/3164 DSU/CSU is capable of operating on either a +24 Vdc power source, –48 Vdc single source battery, or –48 Vdc redundant source batteries (for power backup). To select the power, choose one of the following power supply types.

Installing the +24 Vdc Power Supply

To install the 3160/3164 DSU/CSU using a +24 Vdc power supply, refer to Figure 2-7 and use the following procedure.

To install the +24 Vdc power supply,

1. Connect the green wire to a suitable earth ground.

2. Connect the white wire to the +24 Vdc return.

3. Connect the orange wire to the +24 Vdc source.

4. Cut the black, red and blue wires off at the outer insulation.

5. Plug the power connector into the 3160/3164 DSU/CSU.
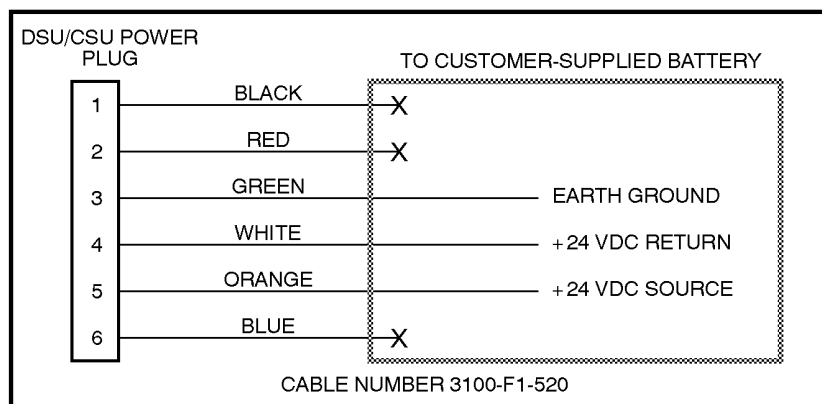
Figure 2-7. +24 Vdc Power Supply Pinouts

Installing the Single –48 Vdc Power Supply

To install the 3160/3164 DSU/CSU using a single source –48 Vdc power supply, refer to Figure 2-8 and use the following procedure.

To install the –48 Vdc single source power supply,

1. Connect the black and red wires to the –48 Vdc return source.

2. Connect the green wire to a suitable earth ground.

3. Connect the orange and blue wires to the –48 Vdc input source.

4. Cut the white wire off at the outer insulation.

5. Plug the power connector into the 3160/3164 DSU/CSU.
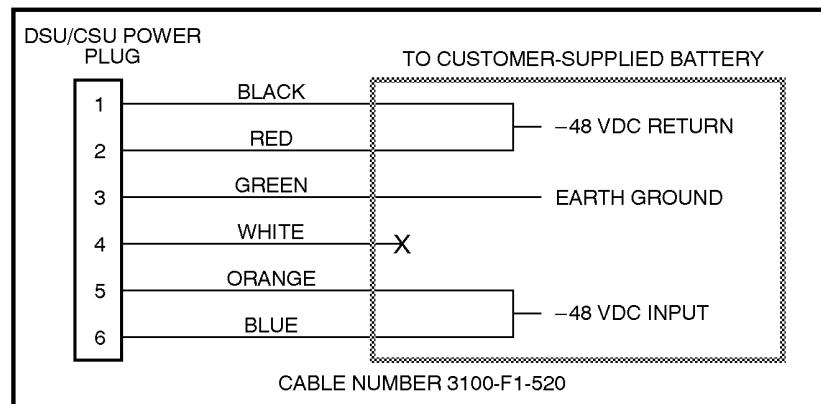
Figure 2-8. –48 Vdc Single Source Power Supply Pinouts

Installing the Redundant −48 Vdc Power Supply

To install the 3160/3164 DSU/CSU using a redundant −48 Vdc power supply, refer to Figure 2-9 and use the following procedure.

To install the redundant −48 Vdc power supply,

1. Connect the black wire to the −48 Vdc return source B.

2. Connect the red wire to the −48 Vdc return source A.

3. Connect the green wire to a suitable earth ground.

4. Connect the orange wire to the −48 Vdc input source B.

5. Connect the blue wire to the −48 Vdc input source A.

6. Cut the white wire off at the outer insulation.

7. Plug the power connector into the 3160/3164 DSU/CSU.
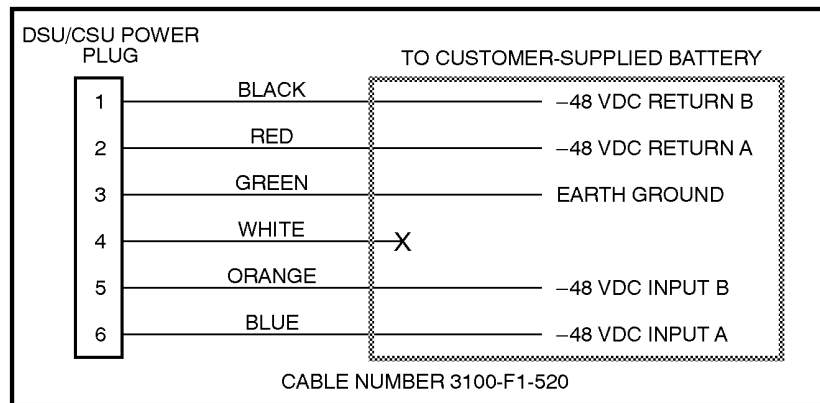

```
DSU/CSU POWER
    PLUG                      TO CUSTOMER-SUPPLIED BATTERY

    1          BLACK                          −48 VDC RETURN B
    2          RED                            −48 VDC RETURN A
    3          GREEN                          EARTH GROUND
    4          WHITE          X
    5          ORANGE                         −48 VDC INPUT B
    6          BLUE                           −48 VDC INPUT A

              CABLE NUMBER 3100-F1-520

                                                493-14300
```

Figure 2-9. −48 Vdc Redundant Source Power Supply Pinouts

Power-Up Self-Test

After you connect the 3160/3164 DSU/CSU to a power outlet, the power-up self-test is performed to ensure that the unit is in good working order. The DSU/CSU performs this test on itself upon power-up or after a device reset unless it has been disabled by the Self-Test configuration option (see Appendix C, *Configuration Options*).

The 3161 DSU/CSU performs the same power-up self-test except that progress is not reported on the SDCP during the test. However, you can use the Self-Test Health command to display the status of the test (see *Self-Test Health* section in Chapter 3, *Operation*).

The self-test includes a basic CPU test, a limited RAM test, a code checksum test, and basic verification tests of its internal components. The front panel LCD displays the progress and pass/fail status of these power-up tests.

The power-up self-test consists of the following steps:

1. Once the DSU/CSU is plugged in, the In Progress screen appears and the Fail LED blinks ON and Off continuously.

493-14302
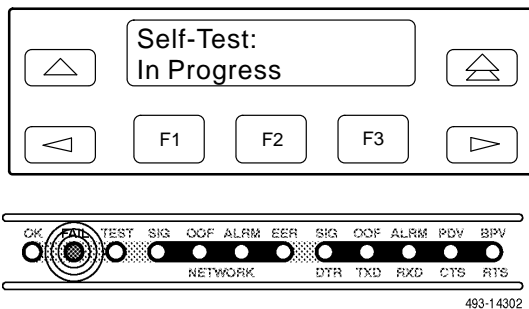
2. All the LEDs then start to flash simultaneously in the pattern twice ON, then Off. Then, the LCD begins to flash characters and numbers in the same pattern, alternating with the flashing LEDs.

3. If the self-test is successful, the Passed screen appears for one second, the Fail LED is turned Off and the OK LED lights.

493-14303
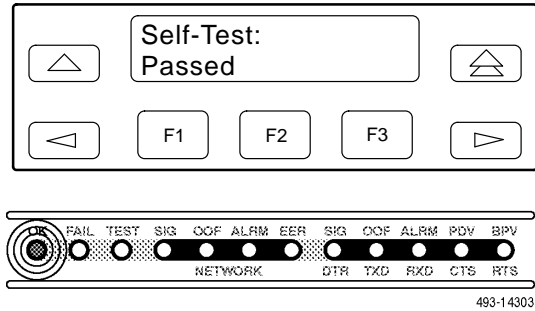
If the self-test fails, the Failed screen appears for five seconds. The Fail LED lights. The DSU/CSU continues to try to operate. If you are in doubt about the results of the self-test, use the Self-Test Health command to display the status of this test (see *Self-Test Health* section in Chapter 3, *Operation*).

493-14302
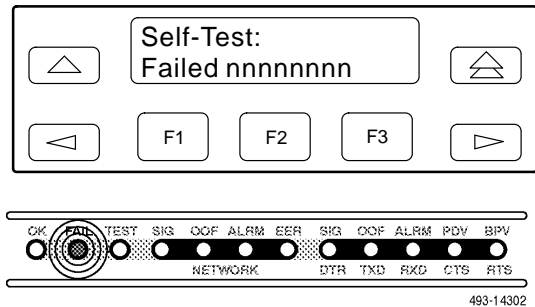
4. The top-level menu screen appears.

493-14305
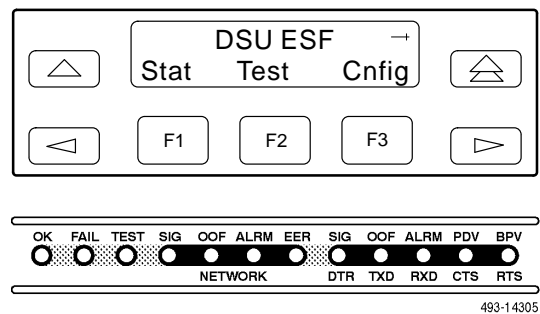
Differences Using the Async Terminal: To monitor the self-test from the async terminal, select **Health, Test Status**, and **Self Test Results** from the main/status menu. The full screen display capacity provides a complete test results screen that includes the self-test results. Figure 2-10 shows an example of this screen.

```
                              main/status/health_and_status
   Customer ID: New Cust       Model: ACCULINK XXXX

   Health and Status     Self Test Results    Test Status
   DSU Operational       CPU fail             No Test Active
   LOS at Net            Device fail          LLB Test Active
   LOS at DTE            B8ZS/LOS fail        PLB Test Active
   OOF at Net            Modem fail           DLB Test Active
   OOF at DTE            DTE T1 fail          RLB Test Active
   AIS at Net            Alarm fail           DCLB on Port n
   AIS at DTE            LCD fail             DTLB on Port n
   EER at Net            NET T1 fail          QRSS Test Active
   Yellow at Net         Memory fail          1–8 Test Active
   Yellow at DTE         DSU fail             QRSS on Port n
   Master Clock Fail     DSU Port 1 fail      511 on Port n
   SNMP Link Down        DSU Port 2 fail      Monitoring QRSS
   Selftest failed       DSU Port 3 fail      Monitoring QRSS, Port n
   DevFail yyyyyyyy      DSU Port 4 fail      Monitoring 511, Port n
   Download failed       Unknown Exp Dev      DLB Test, Extrn
   Alm Retry Disab       Failure xxxxxxxx     Lamp Test Active
   Test in progress      Passed
   Modem Connected
           Refresh  Down  UP  Main  Previous  Cntrl–x to Disconnect
```

Figure 2-10. Health and Status Results Screen

If a test fails, **fail** appears next to the component reporting the failure.

To perform a power or reset of the device, see *Resetting the CSU/DSU* in Chapter 4.

Selecting a Model 3161 DSU/CSU

Use the SDCP when accessing a specific circuit card installed in the 3000 Series Carrier.

To access a 3161 DSU/CSU,

1. Press **Select** on the SDCP.

2. Enter a valid carrier and slot address. The green **OK** indicator on the selected 3161 DSU/CSU should flash. (It should be the only **OK** indicator flashing in the cabinet.)

3. Press **Select** again. The display on the SDCP should show the last menu item displayed, or in the case of a new installation, the top-level menu on the selected circuit card.

DSU/CSU Identity

The identity of the 316x DSU/CSU (serial number, model number, software revision level, hardware revision level, and customer ID) is available through the Status branch of the front panel menu (see Appendix A, *Front Panel Menu*).

The customer ID is the only identity number you can change.

To display the DSU/CSU's identity,

1. Press F1 to select Status from the top-level menu screen.

```
   ┌───┐   ┌─────────────────────┐  ┌───┐
   │ △ │   │  DSU ESF          → │  │ △ │
   └───┘   │  Stat  Test  Cnfig  │  └───┘
           └─────────────────────┘
   ┌───┐     ┌──┐   ┌──┐   ┌──┐      ┌───┐
   │ ◁ │     │F1│   │F2│   │F3│      │ ▷ │
   └───┘     └──┘   └──┘   └──┘      └───┘
```
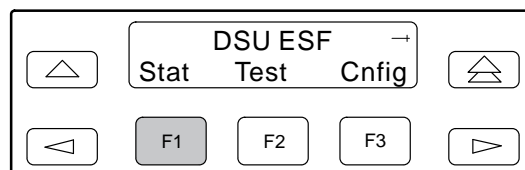
2. Press the ▷ key three times on the Status screen to bring the ID selection onto the front panel LCD.

```
   ┌───┐   ┌─────────────────────┐  ┌───┐
   │ △ │   │  Status:          → │  │ △ │
   └───┘   │  DevHS STest   Perf │  └───┘
           └─────────────────────┘
   ┌───┐     ┌──┐   ┌──┐   ┌──┐      ┌───┐
   │ ◁ │     │F1│   │F2│   │F3│      │ ▷ │
   └───┘     └──┘   └──┘   └──┘      └───┘
```
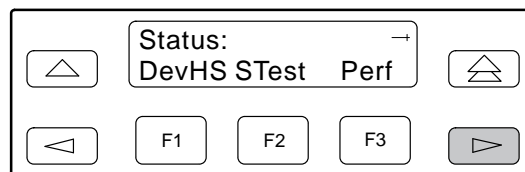
3. Press F3 to select ID from the Status screen.

```
   ┌───┐   ┌─────────────────────┐  ┌───┐
   │ △ │   │  Status:          → │  │ △ │
   └───┘   │  TStat  LED    ID   │  └───┘
           └─────────────────────┘
   ┌───┐     ┌──┐   ┌──┐   ┌──┐      ┌───┐
   │ ◁ │     │F1│   │F2│   │F3│      │ ▷ │
   └───┘     └──┘   └──┘   └──┘      └───┘
```

4. The following screens appear in the order listed each time you press the ▷ key.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Identity:         →   │  │△△│  │
│  └──┘   │ Ser=xxxxxxx          │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Identity:         ⇄   │  │△△│  │
│  └──┘   │ Mod=xxxx-xx-xxx      │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Identity:         ⇄   │  │△△│  │
│  └──┘   │ Cust ID=xxxxxxxx     │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Identity:         ⇄   │  │△△│  │
│  └──┘   │ SRev=xx.xx.xx        │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Identity:         ⇄   │  │△△│  │
│  └──┘   │ CCA1=xxx             │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Identity:         ←   │  │△△│  │
│  └──┘   │ CCA2=xxx             │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```
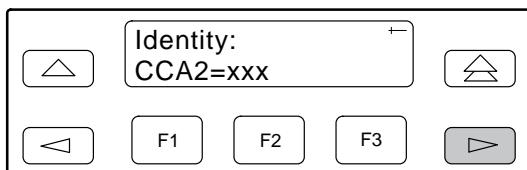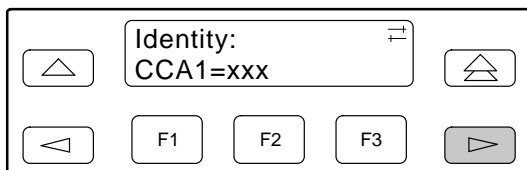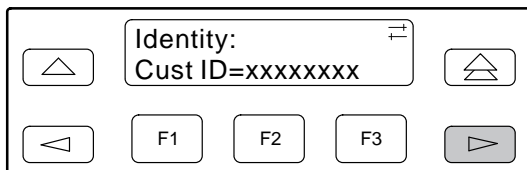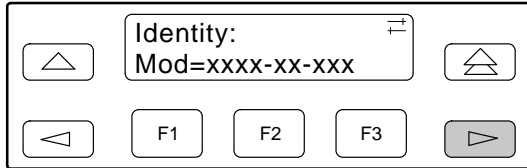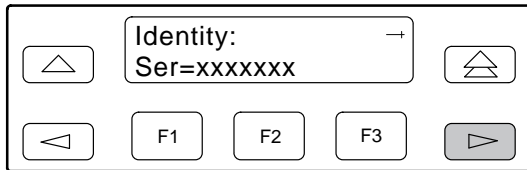
To change the customer ID,

1. Press the ▷ key on the top-level menu to bring the Ctrl branch onto the front panel LCD.
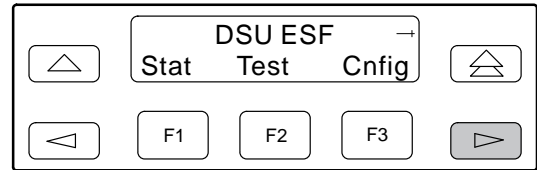
```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │    DSU ESF        →   │  │△△│  │
│  └──┘   │ Stat   Test   Cnfig  │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```

2. Press F3 to select Ctrl from the top-level menu screen.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │    DSU ESF        ←   │  │△△│  │
│  └──┘   │ Test   Cnfig   Ctrl  │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```
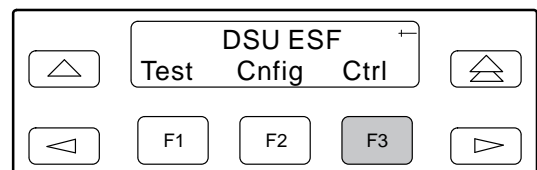
3. Press the ▷ key on the Ctrl screen until the CID selection appears on the front panel LCD.
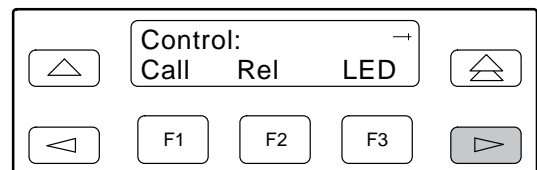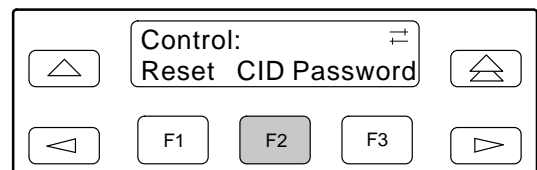
```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Control:          →   │  │△△│  │
│  └──┘   │ Call    Rel    LED   │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```
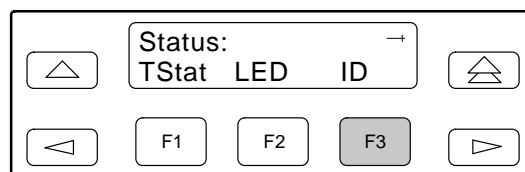
4. Press F2 to select CID.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ Control:          ⇄   │  │△△│  │
│  └──┘   │ Reset  CID Password  │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```
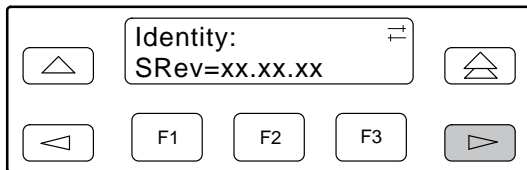
5. Use the ◁ and ▷ keys to position the cursor under the desired character. You must enter a character before the ▷ moves the cursor to the next space to the right. The ◁ key is not destructive.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌──────────────────────┐  ┌──┐  │
│  │△ │   │ CustID=xxxxxxx       │  │△△│  │
│  └──┘   │ Up     Down   Save   │  └──┘  │
│         └──────────────────────┘        │
│  ┌──┐  ┌──┐  ┌──┐  ┌──┐         ┌──┐    │
│  │◁ │  │F1│  │F2│  │F3│         │▷ │    │
│  └──┘  └──┘  └──┘  └──┘         └──┘    │
└─────────────────────────────────────────┘
```
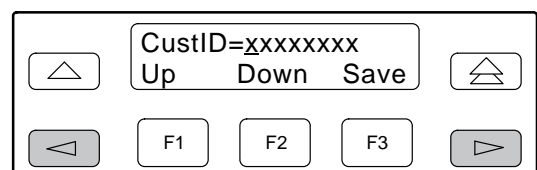
6. Enter the desired ID. Press F1 (Up) and F2 (Down) to scroll up and down through the valid characters/numbers for the customer ID. Valid characters are **0** through **9**, **#**, **-**, **.**, **/**, **A** to **Z**, and blank space. Press F3 (Save) to save the ID.

```
CustID=xxxxxxxx
Up    Down   Save
```

△   ⟨ F1 ⟩ ⟨ F2 ⟩ ⟨ F3 ⟩ ⩘
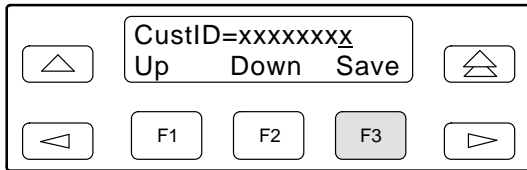
Differences Using the Async Terminal: The customer ID selection is found in the main/control/miscellaneous control options menu. Select **Customer Identification Name/Number** from that menu.

Establishing Access Security on a Port

Although the password feature is available, it is not required as a factory default. If used, it ensures access security before device control is passed to a PC or terminal connected to a port. The password configuration option can be individually set for the COM or MODEM port, or both if security is needed on both port types. The default is **none.** From the front panel, set this configuration option using the Control branch. Select **cnfig→edit→user→password**. The password itself is set separately. Refer to the section *Setting/Changing a Password.*

Differences Using the Async Terminal: The password is set in the main/configuration/edit/user screen. Figure 2-11 shows an example of this screen.

```
                              main/configuration/edit/user
Customer ID: New Cust      Model: ACCULINK XXXX


                          User
                  Self Test: _____
          Front Panel Access: _____
   Front Panel Pass-Through: _____
             Dial-In Access: _____
             Password Mode: _____

   Communications Port                    Modem Port
              Use: _____                      Use: _____
             Type: _____                     Type: _____
             Rate: _____                     Rate: _____
 Character Length: _____         Character Length: _____
           Parity: _____                   Parity: _____
        Stop Bits: _____                Stop Bits: _____
                          Long Space Disconnect: _____


       Save  Edit  Main  Previous  Cntrl–x to Disconnect
```

Figure 2-11. Setting the Password Option

On this screen, set the **Password Mode** field as appropriate.

Setting/Changing a Password

For 3160/3164 DSU/CSUs, you have the option of setting a password for security when receiving a call or the COM port connection is established. Unless you specify otherwise, the password is null.

NOTE

To cancel a password operation, press either the △ or ⩘ key before saving.

To set a password,

1. Press the ▷ key on the top-level menu screen to bring the Ctrl branch onto the front panel LCD.

```
       DSU ESF        →
  Stat    Test    Cnfig
  [△]  [F1]  [F2]  [F3]  [▷]
```

2. Press F3 to select Ctrl from the top-level menu screen.

```
       DSU ESF        ←
  Test    Cnfig    Ctrl
  [△]  [F1]  [F2]  [F3]  [▷]
```

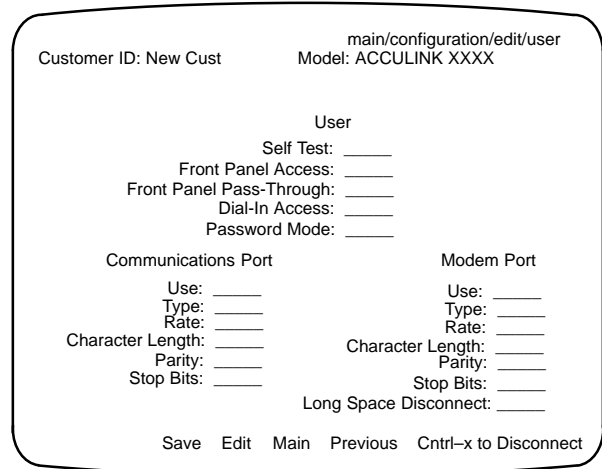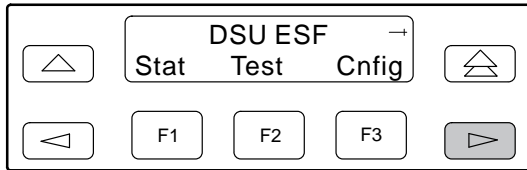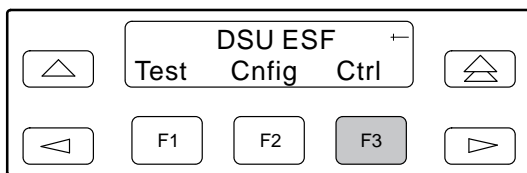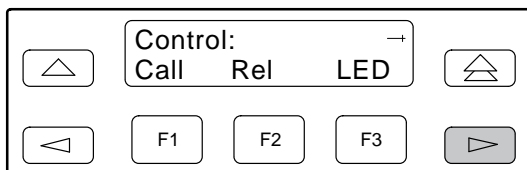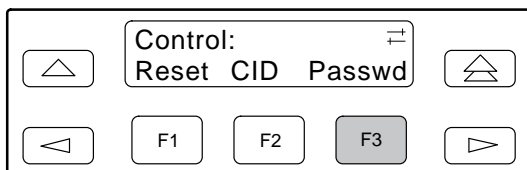3. Press the ▷ key on the Ctrl screen until the Passwd selection appears on the front panel LCD.

```
  Control:            →
  Call    Rel     LED
  [△]  [F1]  [F2]  [F3]  [▷]
```

4. Press F3 to select Passwd.

```
  Control:            ⇄
  Reset  CID   Passwd
  [△]  [F1]  [F2]  [F3]  [▷]
```

5. Use the ◁ and ▷ keys to position the cursor under the desired character. You must enter a character before the ▷ moves the cursor to the next space to the right. The ◁ key is not destructive.

```
  Passwd: _
  Up     Down    Save
  [△]  [F1]  [F2]  [F3]  [▷]
```
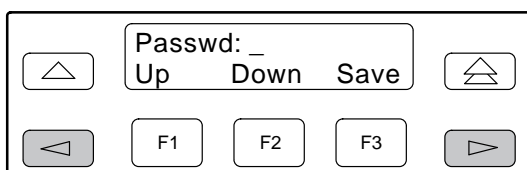
6. Enter the desired password. Press F1 (Up) and F2 (Down) to scroll up and down through the valid characters/numbers for the password. Valid password characters are **0–9**, **a–z**, **A–Z**, **#**, **–**, **.**, and **/**.

```
  Passwd: xxxxxxxx
  Up     Down    Save
  [△]  [F1]  [F2]  [F3]  [▷]
```
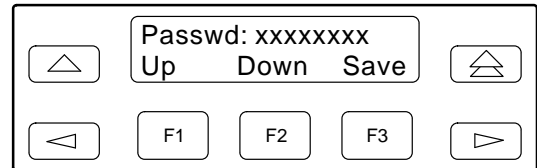
7. Press F3 (Save) to save the password.

```
  Passwd: xxxxxxxx
  Up     Down    Save
  [△]  [F1]  [F2]  [F3]  [▷]
```
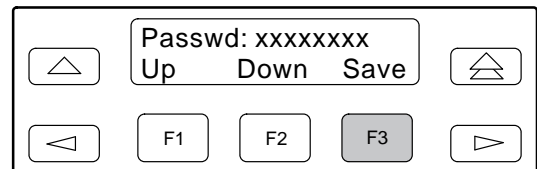
Differences Using the Async Terminal: To set the password, select **miscellaneous/control/options** in the main/control screen. This screen displays the prompt **Change Password?** If you enter **yes**, the screen displays the **Password** and **Re-enter Password** fields as shown in Figure 2-12.

```
                            main/control/miscellaneous
Customer ID: New Cust       Model: ACCULINK XXXX


              Miscellaneous Control Options

              Front Panel LED Display:_____
  Customer Identification Name/Number:_____
                    Change Password?_Yes_
                          Password:_____
                 Re-enter  Password:_____




        Save   Main   Previous   Cntrl–x to Disconnect
```
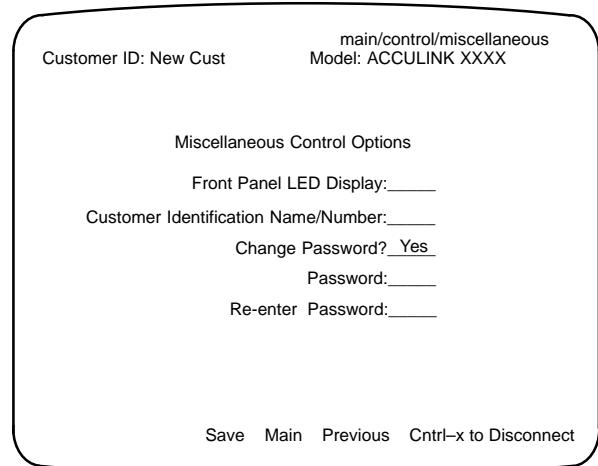
Figure 2-12. Password Configuration Screen

3160/3164 DSU/CSU Cabling

The 3160/3164 DSU/CSU is supplied with an ac power transformer and a VF cable for the integral modem. You must provide the DTE cable to connect the DTE to the DSU/CSU.

Optional cables you can order from the company are the following:

- T1 line interface cable.

- Data port cables (DB25 to V.35 and DB25 to RS449).

- COM port cable to locally connect an ASCII terminal/printer or async terminal.

- COM port cable to locally connect a PC.

- A dc voltage power cable for the –48 Vdc redundant source, –48 Vdc single source, and +24 Vdc power source.

Figure 2-13 illustrates possible cabling configurations. In Canada, an RJ48C-to-CA81A Adapter Cable (Feature Number 3100-F1-510) must be used to connect the T1 network. See Appendix D, *Pin Assignments*, for more cable information. See Appendix H, *Equipment List,* for part number information. See the *COMSPHERE 3000 Series Carrier Installation Manual* for Model 3161 DSU/CSU cabling information.
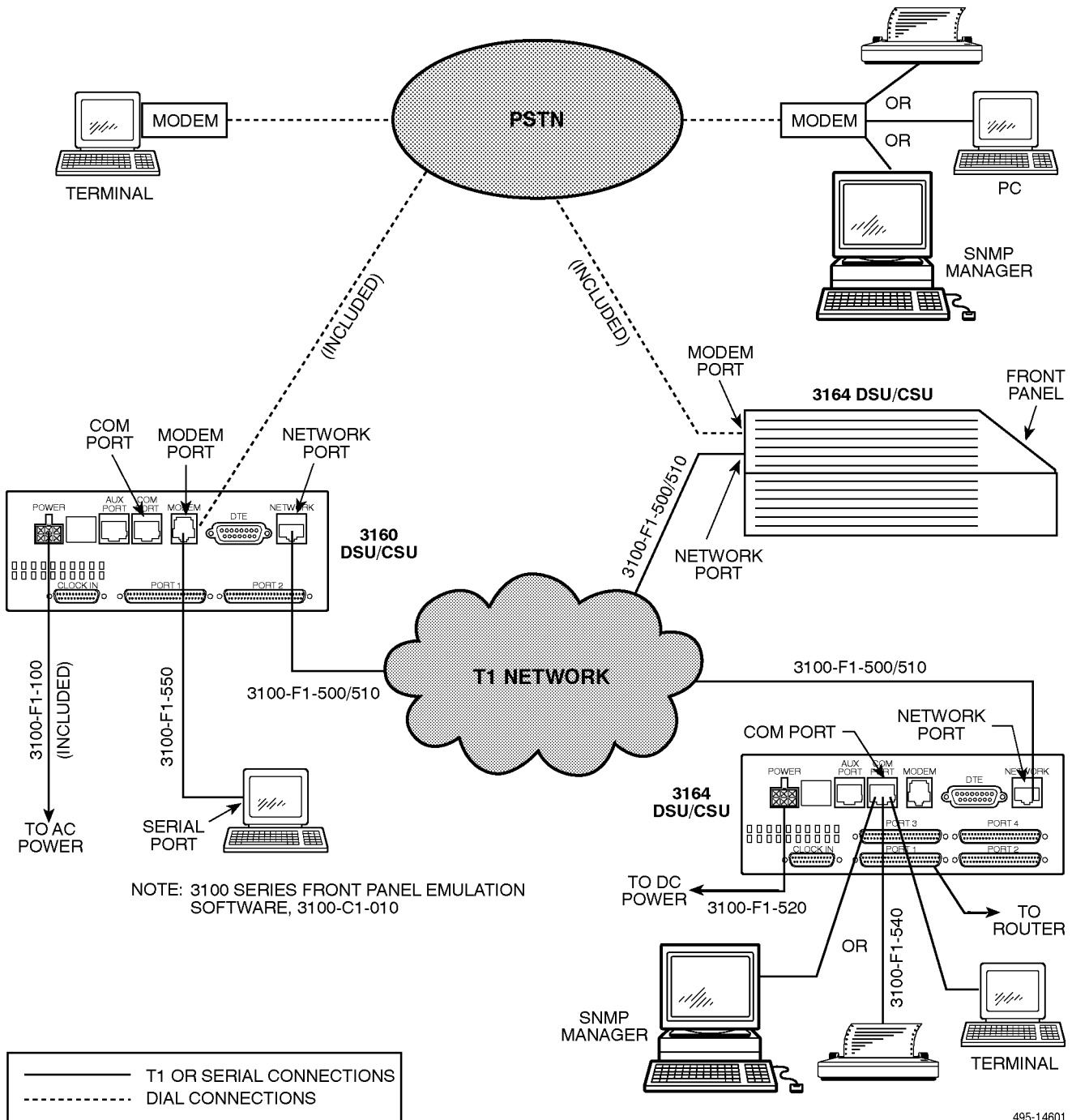
Figure 2-13. 3160/3164 DSU/CSU Cabling Configurations

Factory Default Configuration Options

The 316x DSU/CSU arrives with two preset factory default configuration settings. These settings are based on the following:

- **Factory 1** – ESF framing format with B8ZS line coding format for both the network and the DSX-1 Drop/Insert T1 interfaces. Data ports are unassigned.

- **Factory 2** – D4 framing format with AMI line coding format for both the network and the DSX-1 Drop/Insert T1 interfaces. Data ports are unassigned.

If neither of the factory default settings support your network's configuration, you can customize the configuration options to better suit your application. Refer to the *Configuring the DSU/CSU* section in Chapter 3, *Operation,* and Appendix C, *Configuration Options*, for more information.

Installing Front Panel Emulation Software

The Front Panel Emulation software is supplied on a 3.5-inch diskette formatted as 1.44 Mb, double-sided, high-density, write-protected, with 15 sectors per track, 80 tracks per side, 96 tracks per inch.

This software must be installed on either a 286 or higher PC with Microsoft® Windows™ Release 3.1 or higher already installed, and MS-DOS® 3.3 or higher. A VGA color monitor with VGA adapter (or higher resolution) is required. A mouse is also required. The following procedures must be performed in the Windows environment.

To install Front Panel Emulation software,

1. Insert the diskette into the appropriate drive.

2. Select File from Program Manager.

3. Choose Run...

Run
Command Line: a:install
☐ Run **M**inimized
[OK]   [Cancel]

4. Type the letter of the drive being used by the diskette, followed by a colon.

5. *TYPE:*   INSTALL

6. *PRESS:* ENTER

7. An Information screen appears. Choose Continue to continue the installation.

8. Type the letter of the destination drive, followed by a colon (default is C:), then the appropriate directory name (default is C:\FRONTPAN).

   If the selected directory already exists, the message **The specified directory already exists. Do you want to overwrite the directory?** appears.

   If the selected directory is new, the message **The specified directory does not exist. Do you want to create the directory?** appears.

9. Select Yes. A confirmation screen appears. Select Install to continue the installation.

10. A Setup Completed screen appears. Select Continue. The Program Manager screen appears with the Front Panel icon.

See the *Starting Up a Front Panel Emulation* section in Chapter 3, *Operation*, for information about the Front Panel Emulation operation.

Enabling/Disabling the Front Panel

You can enable or disable the display of data through the front panel. This feature is useful for ensuring that other users do not inadvertently change the device's configuration options while you are using the PC or async terminal interface. The factory default is **enable**.

NOTE

If you disable the front panel, be sure not to alter the options for using the PC or Async terminal interface. If this happens, you lose the ability to communicate with the device. You will need to contact your service representative.

To enable or disable the front panel:

1. Press F3 to select Cnfig from the top-level menu screen.
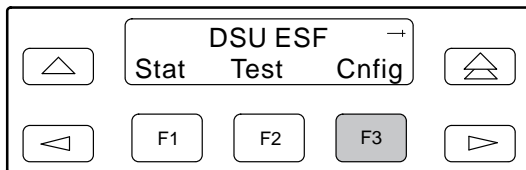
2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.
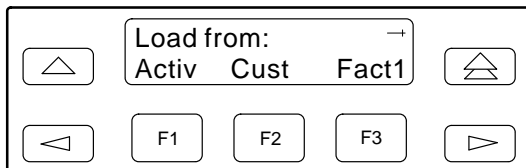
3. Press F1 to select Edit.
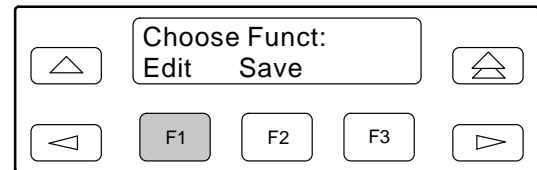
4. Press the ▷ key from the Edit screen to display the User selection.
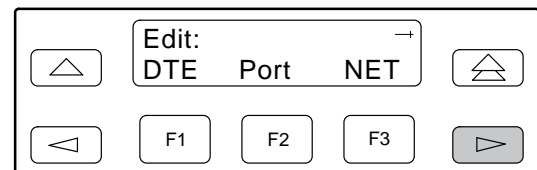
5. Press F3 to select User.
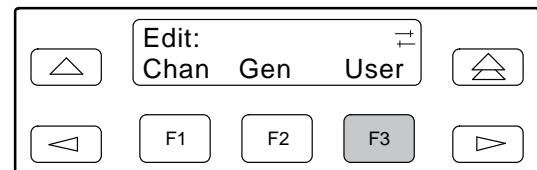
6. Press the F1 (Next) key until the front panel access configuration option appears.
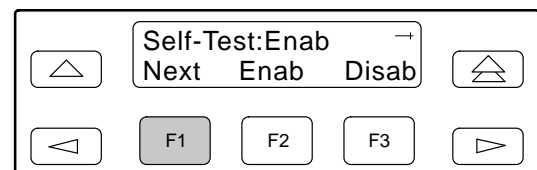
7. Press F2 to enable the front panel or F3 to disable the front panel.
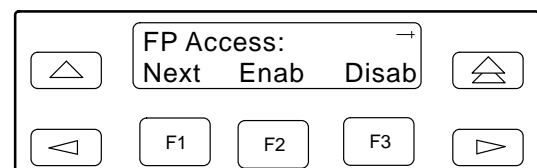
3160/3164 DSU/CSU User Interface Access Security

The user interface access security option allows you to limit access to the 3160/3164 DSU/CSU to display-only and non-intrusive functions. The user access security option is not available for 3161 DSU/CSUs.

Level 1 (Lvl1) access security allows access to all functions available through the menu tree. This is the default setting.

Level 2 (Lvl2) access security restricts access to only those functions that cannot affect the operation of the DSU/CSU in any way. At this level,

- None of the functions in the Test or Ctrl branches are available.

- All functions on the Stat branch are available.

- All functions on the Cnfg branch are available for display, but they cannot be used to save to a configuration (Active, Cust, Fact1, or Fact2).

You can only reach the screen that controls security access using the front panel; you cannot access this option using front panel emulation, async terminal, or the modem interface.

The procedure for changing user interface access security levels appears on the following tear-out page.

NOTE

This page of the manual is self-supporting and can be removed to prevent unwanted knowledge of the security access levels and their selection.

Changing User Interface Access Security

To change user interface access security,

1. Press the ⬘ key two times from the top-level screen.
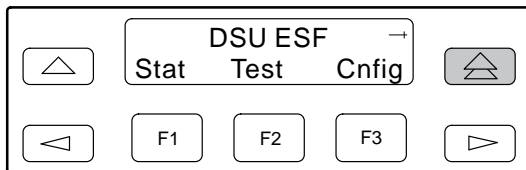
2. Press the △ key three times.
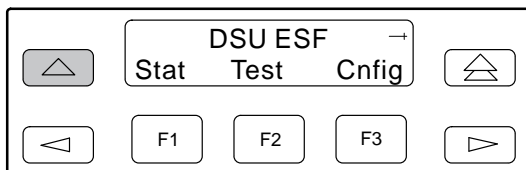
3. Press the ⬘ key once.
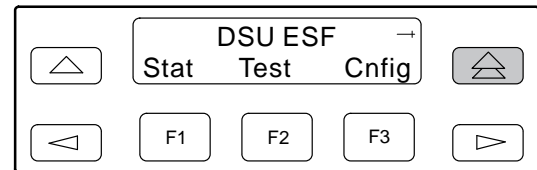
The Security screen appears.
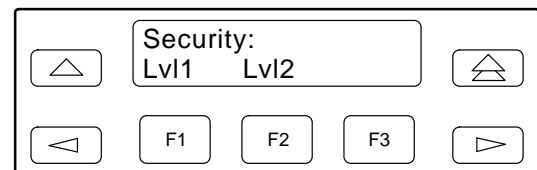
4. Press F1 to select Lvl1, or press F2 to select Lvl2. After you make a selection, the top-level screen appears.

   If you do not make a selection within 5 minutes, the Automatic Device Health/Status screen appears.

Operation 3

Operating the Front Panel

The 3160 DSU/CSU front panel (Figure 3-1) consists of an LCD that displays messages, a keypad, 12 LEDs, and six test jacks. The Model 3161 CSU faceplate contains these same 12 LEDs and six test jacks (see Figure 3-2), however, the LCD and keypad are located on the SDCP of the 3000 Series Carrier (see Figure 3-3). A description of the front panel is contained in Chapter 1, *Introduction*. Instructions for operating the front panel for the 3160/3164 DSU/CSU are listed below. The 3161 DSU/CSU faceplate and the carrier's SDCP operate in the same manner, except where noted.

> **NOTE**
>
> You can display a graphical representation of the 316x DSU/CSU front panel on an attached PC. You can also use the Async Terminal feature which provides full screen displays for managing and configuring 316x DSU/CSUs from an attached async terminal. Differences in operation between the front panel and async terminal are noted where applicable. Front Panel Emulation is further described in the *Front Panel Emulation on a PC* section later in this chapter. The Async Terminal feature is described in the section, *Using the Async Terminal Feature*, also later in this chapter.
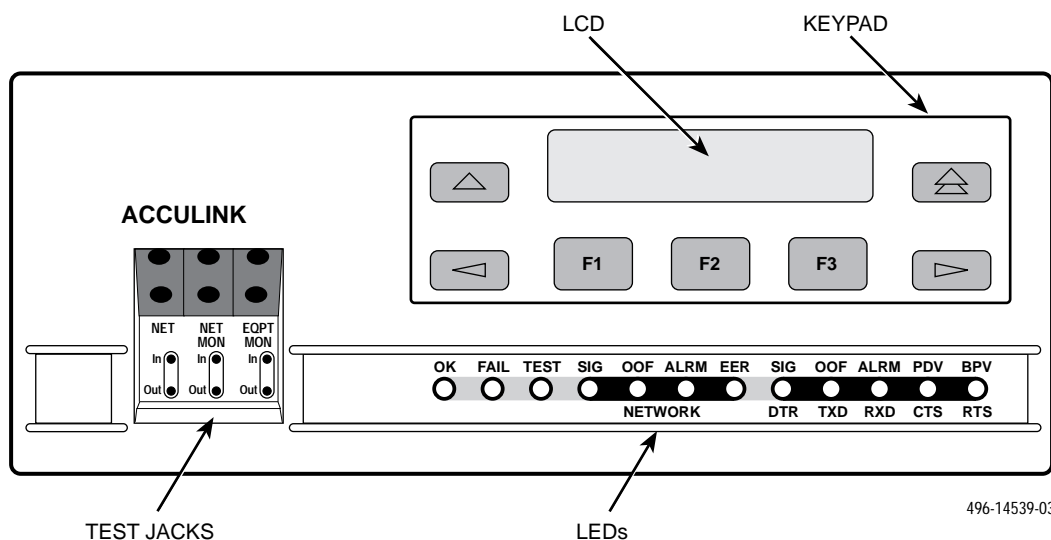
Figure 3-1. 3160 DSU/CSU Front Panel
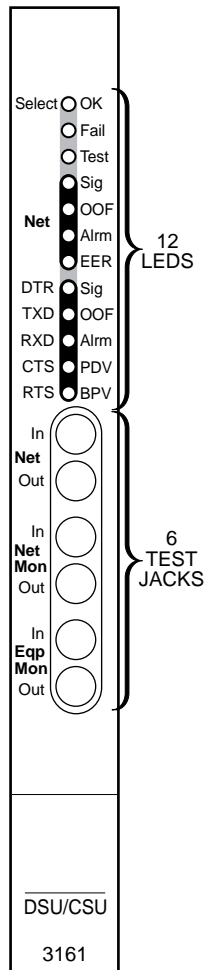
Figure 3-2. Model 3161 DSU/CSU Faceplate
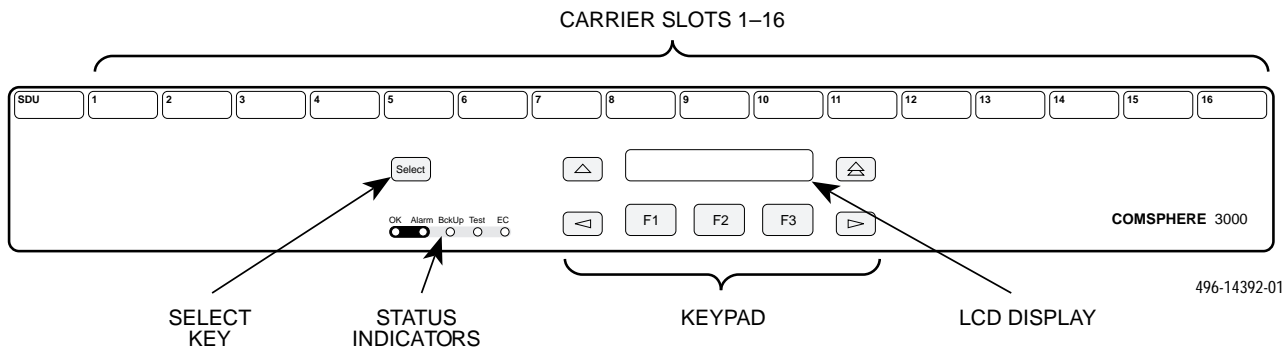
Figure 3-3. Shared Diagnostic Control Panel (SDCP)

LCD

The LCD displays messages and the front panel menu in an easy-to-read English format, including easily recognizable abbreviations and symbols (Figure 3-4).
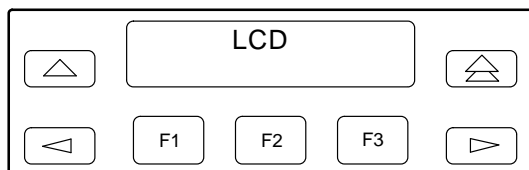
Figure 3-4. LCD

The LCD displays two types of data:

- Messages such as alarms, command/test completion, and action in progress

- Front panel menu tree information (see Appendix A, *Front Panel Menu*)

For 3161 DSU/CSUs, the carrier and slot address is displayed on Line 1 when the CSU is selected via the SDCP.

Device Health and Status Messages

The 316x DSU/CSU features status messages that appear on the front panel LCD. You can request device health and status via the Device Health and Status branch of the front panel menu (see the *Device Health and Status* section later in this chapter). In addition, the highest level status message appears on the front panel automatically if no front panel action has occurred at the DSU/CSU for the past five minutes.

Other Displays

The LCD also lists commands, configuration options, and test results. In most cases, the top line shows the command or option name and default value, while the second line displays options and responses. When a response is required, select from the options displayed directly above the Function keys (F1, F2, F3); make your choice by pressing the corresponding Function key.

Context-Sensitive Menu

This DSU/CSU is an intelligent device that displays only valid options for the current configuration. Therefore, you are only presented with menu choices that are consistent with the current configuration and operational state of the DSU/CSU; invalid combinations of configuration options do not appear. For example, menus displayed for the Model 3160 (2 ports) and the Model 3164 (4 ports) differ due to the number of ports available. Also, if the DSX-1 Drop/Insert T1 interface selection is disabled, many of the menu choices do not appear. Be aware that although all options are shown in this manual, what you see on your DSU/CSU varies with your configuration.

Keypad

The 7-button keypad enables you to navigate through the menu tree and select choices presented on the second line of the LCD (Figure 3-5).
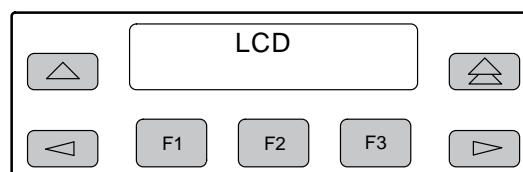
Figure 3-5. Keypad

Use the △ key to move up the menu.
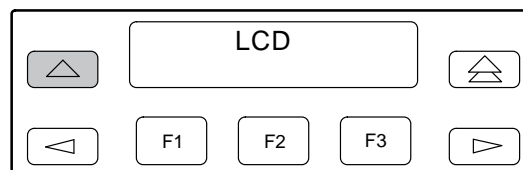
Use the ⇎ key to exit any part of the menu in which you may be operating. You immediately return to the top-level menu screen shown on the front panel menu (see Appendix A, *Front Panel Menu*).
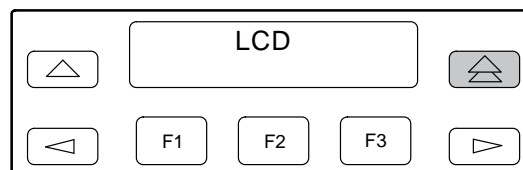
Use the Function (F1, F2, F3) keys to make selections from the choices presented on the second line of the LCD. When this line presents choices, it is generally divided into three sections, each displayed directly above one of the Function keys. When your choice appears above one of the Function keys, press that key to select that choice. The Function keys are repeating.
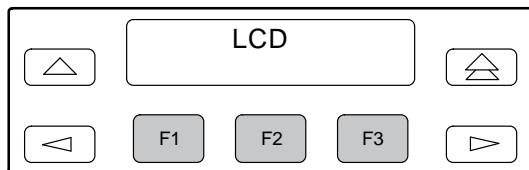
The scroll keys (◁ and ▷) serve one of two functions, depending on whether a menu screen or a data entry screen appears on the front panel.

For data entry screens, the ◁ key scrolls one character to the left while the ▷ key scrolls one character to the right. This operation is repeating.

For menu screens, the ◁ key scrolls to the previous menu choice while the ▷ key scrolls to the next menu choice.

If a choice is available to the left of the screen, the character ← appears on the top line. If a choice is available to the right of the screen, the → character appears on the top line. If choices are available to both the right and the left of the screen, two arrows appear (⇄). The arrows indicate you must use the scroll keys to bring the additional options onto the screen.
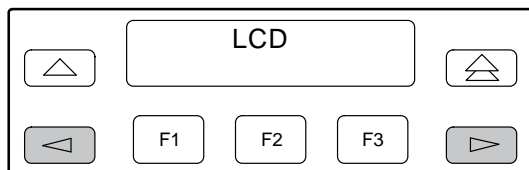
LEDs

There are twelve LEDs on the 3160/3164 DSU/CSU front panel (Figure 3-6) as well as on the 3161 DSU/CSU faceplate. The five LEDs on the right are shared between the DSX-1 Drop/Insert port and the data ports. Refer to the *Selecting the DSX-1 or a Port for LED Display* section later in this chapter to choose which port's status the LEDs display.

A green LED indicates normal operation. A yellow LED indicates a warning (for the DSX-1 Drop/Insert port) or activity (for the data ports). Conditions are sampled every tenth of a second.
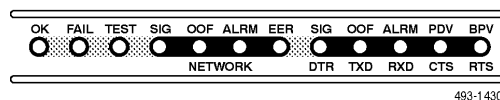
Figure 3-6. LEDs

The twelve front panel LEDs are grouped into four sections to indicate the status of the:

- System (see Table 3-1)

- NETWORK interface (see Table 3-2)

- DSX-1 Drop/Insert Port (see Table 3-3)

- Data Ports (see Table 3-4)

Table 3-1
System LEDs

Name	Color	Meaning
OK	Green	Indicates the current operational state of the DSU/CSU. *ON:*　　　　　The DSU/CSU is operational and has power. *OFF:*　　　　The DSU/CSU is performing a power-up self-test or a system failure has occurred. *BLINKING:*　A software download is in progress. *FAST BLINKING:* The 3161 CSU is currently selected by the SDCP.
FAIL	Yellow	Indicates a system failure or a self-test. *ON:*　　　　　A device error/fault is detected or a reset has just occurred. *OFF:*　　　　No system failures are detected. *BLINKING:*　A self-test is in progress.
TEST	Yellow	A system test is in progress. *ON:*　　　　　A loopback or pattern test has been initiated either locally, by the network, or externally. *OFF:*　　　　No tests are active.

Table 3-2
NETWORK Interface LEDs

Name	Color	Meaning
SIG	Green	Monitors the signal being received from the network. *ON:* A recoverable signal is being received from the network. *OFF:* The signal cannot be recovered from the network (a Loss of Signal condition exists).
OOF	Yellow	Monitors Out Of Frame (OOF) conditions on the received network signal. *ON*: At least one OOF was detected on the signal during the sampling period. *OFF:* No OOFs were detected on the signal during the sampling period.
ALRM	Yellow	Indicates whether an alarm condition exists on the received network signal. *ON:* An alarm condition (LOS, LOF, EER, Yellow, AIS) exists on the received network signal. Use the Device Health and Status command to determine the alarm type. *OFF:* No alarm condition exists on the network interface signal.
EER	Yellow	Indicates when the excessive error rate has been exceeded on the network interface. **NOTE:** This LED is only valid when ESF framing is being used. *ON:* The excessive error rate has been exceeded on the network interface. *OFF:* The excessive error rate has not been exceeded on the network interface.

Table 3-3
DSX-1 Drop/Insert Port LEDs

Name	Color	Meaning
SIG	Green	Monitors the signal being received from the DSX-1. *ON:* A recoverable signal is being received from the DSX-1. *OFF:* The signal cannot be recovered from the DSX-1 (a Loss of Signal condition exists).
OOF	Yellow	Monitors Out Of Frame (OOF) conditions on the received DSX-1 signal. *ON:* At least one OOF was detected on the signal during the sampling period. *OFF:* No OOFs were detected on the signal during the sampling period.
ALRM	Yellow	Indicates whether an alarm condition exists on the received DSX-1 signal. *ON:* An alarm condition (LOS, LOF, EER, Yellow, AIS) exists on the received DSX-1 signal. Use the Device Health and Status command to determine the alarm type. *OFF:* No alarm condition exists on the DSX-1 Interface signal.
PDV	Yellow	Monitors Pulse Density Violations (PDV) on the received DSX-1 signal. *ON*: At least one PDV was detected (and corrected) on the received DSX-1 signal during the sampling period. *OFF:* No PDVs were detected on the received DSX-1 signal during the sampling period.
BPV	Yellow	Monitors DSX-1 Bipolar Violations (BPV) on the received DSX-1 signal. *ON:* At least one BPV was detected (and corrected) on the received DSX-1 signal during the sampling period. *OFF:* No BPVs were detected on the received DSX-1 signal during the sampling period.

Table 3-4
Data Port LEDs

Name	Color	Meaning
DTR	Green	Monitors the state of interchange circuit CD (CCITT 108/1, /2) – DTE Ready received from the DTE. *ON:* DTR is being asserted by the DTE. *OFF:* DTR is not being asserted.
TXD	Yellow	Monitors activity on interchange circuit BA (CCITT 103) – Transmitted Data. This is the data sent from the DTE to the DCE on the DSU/CSU. *ON:* Ones are being received from the DTE. *OFF:* Zeros are being received from the DTE. *CYCLING:* Both ones and zeros are being received from the DTE.
RXD	Yellow	Monitors activity on interchange circuit BB (CCITT 104) – Received Data. This is data sent to the DTE from the DCE on the DSU/CSU. *ON:* Ones are being sent to the DTE. *OFF:* Zeros are being sent to the DTE. *CYCLING:* Both ones and zeros are being received from the DTE.
CTS	Yellow	Monitors the state of interchange circuit CB (CCITT 106) – Clear to Send sent to the DTE. *ON:* CTS is being asserted by the DSU/CSU. *OFF:* CTS is not being asserted.
RTS	Yellow	Monitors the state of interchange circuit CA (CCITT 105) – Request to Send received from the DTE. *ON:* RTS is being asserted by the DTE. *OFF:* RTS is not being asserted.

Displaying LED Conditions on the Front Panel

The same conditions monitored by the front panel LEDs can also be monitored by the LED command. This command is most useful when the DSU/CSU is being accessed remotely.

NOTE

No LEDs are shown on the PC's front panel emulation screen. You must use the Stat command procedure described below to get LED information.

To display LED conditions on the front panel screen,

1. Press F1 to select Stat from the top-level menu screen.

```
        DSU ESF      →
△   Stat   Test   Cnfig   △
◁    F1     F2     F3     ▷
```
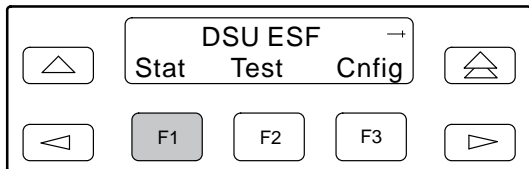
2. From the Status screen, press the ▷ key twice to display the LED selection.

```
        Status:         →
△   DevHS STest   Perf    △
◁    F1     F2     F3     ▷
```
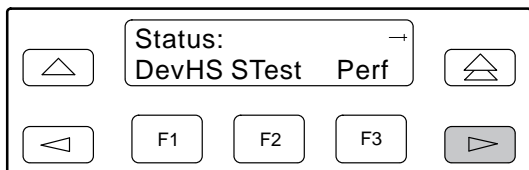
3. Press F3 to select LED from the Status screen.

```
        Status:         ⇄
△   Perf   TStat   LED    △
◁    F1     F2     F3     ▷
```
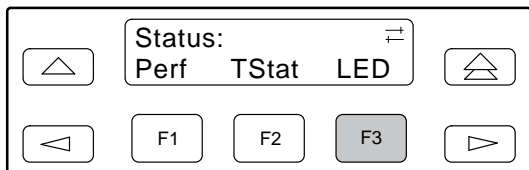
4. From the Select LEDs screen, press the function key that corresponds to the T1 or port for which you want to display LEDs. Use the scroll keys, if necessary.

```
        Select LEDs:     →
△   T1     Prt1    Prt2   △
◁    F1     F2     F3     ▷
```
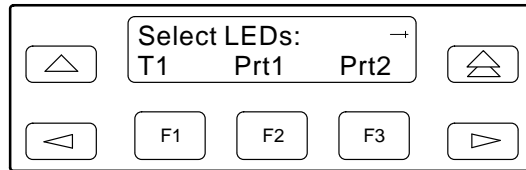
If you chose T1, the LED Display screen lists the LED signals, two at a time, on the second line. A vertical bar at the left of the LED name indicates the condition is ON, while no bar indicates the condition is Off.

```
        LED Display:     →
△   Test    NetSig       △
◁    F1     F2     F3     ▷
```
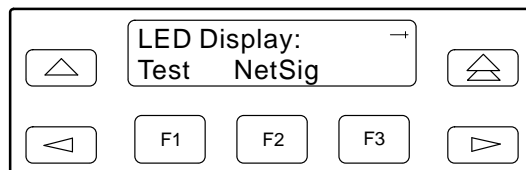
If you chose a port, the Port *n* LEDs screen lists the LED signals, two at a time, on the second line. A vertical bar at the left of the LED name indicates the condition is ON, while no bar indicates the condition is Off.

```
        Port n LEDs:     →
△   DTR    TXD           △
◁    F1     F2     F3     ▷
```
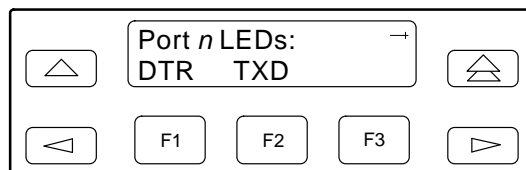
5. Use the ▷ and ◁ keys to scroll LED names onto the screen.

Differences Using Async Terminal: You can monitor LED status using the **Display LEDs** selection under the main/status menu.

Figure 3-7 shows an example of the LED Status screen on the async terminal when all four ports are configured. Unlike the front panel display, you can view all the LED conditions at one time for the ports, the network, and T1 interface. There are no shared LEDs so you do not need to select which port status should appear on this screen.

```
                                       main/status/leds
  Customer ID: New Cust            Model: ACCULINK XXXX


                            LEDs

          NET T1   DTE T1   Port1   Port2   Port3   Port4

  Test    Sig      Sig      DTR     DTR     DTR     DTR
          OOF      OOF      TXD     TXD     TXD     TXD
          Alrm     Alrm     RXD     RXD     RXD     RXD
          EER      PDV      CTS     CTS     CTS     CTS
                   BPV      RTS     RTS     RTS     RTS




                   Refresh  Main  Previous  Cntrl–x to Disconnect
```
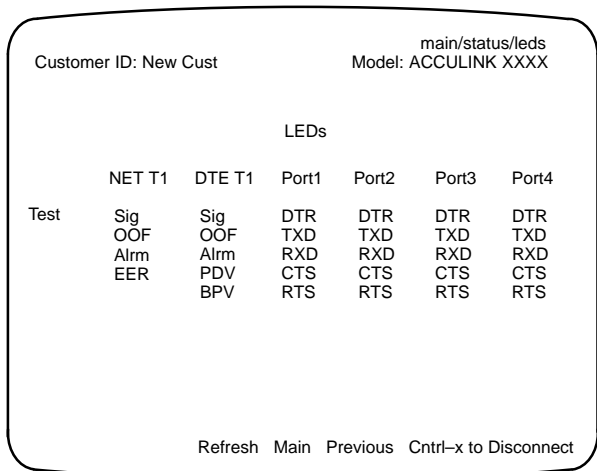
Figure 3-7. LED Status Screen

The LEDs are sampled every 5 seconds from selection time. Use **Refresh** to update the screen.

Selecting the DSX-1 or a Port for LED Display

Use the LED command on the Control branch to select which port's (DSX-1 Drop/Insert or data port) status appears on the five shared LEDs on the front panel.

To select a port for LED display,

1. From the top level menu screen, press ▷ once to scroll the Ctrl name onto the screen.
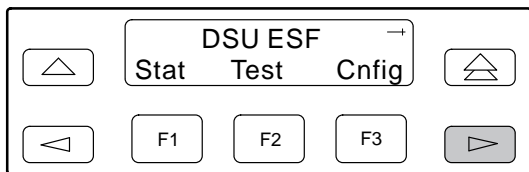
2. Press F3 to select Ctrl.
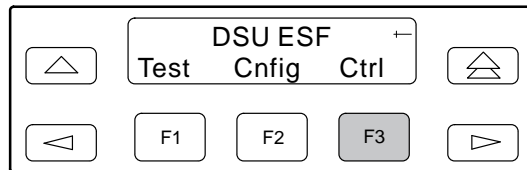
3. From the Ctrl screen, press F3 to select LED.
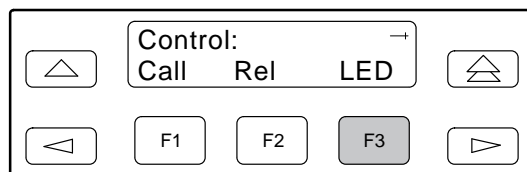
The currently selected port name appears on the top line of the LCD.
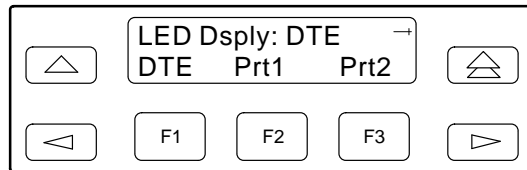
4. From the LED Dsply screen, press the function key that corresponds to the DSX-1 or port for which you want the LEDs to display. Use the scroll keys, if necessary.

   Select DTE to monitor the DSX-1's SIG, OOF, ALRM, PDV, and BPV status signals on the shared LEDs.

   Select a particular port to monitor the port's DTR, TXD, RXD, CTS, and RTS control signals on the shared LEDs.

Differences Using the Async Terminal: Select **Front Panel LED Display** in the main/control/miscellaneous screen to select a port for LED display.

Figure 3-8 shows an example of this selection screen. You can set the front panel LED display to be DTE or a port.

The 3161 front panel emulation screen (Figure 3-10) looks the same as the 3160/3164 DSU/CSU screen, except for the additional function icons defined in Table 3-5.


```
                        main/control/miscellaneous
Customer ID: New Cust    Model: ACCULINK XXXX


             Miscellaneous Control Options

             Front Panel LED Display: _____
Customer Identification Name/Number: _____
             Change Password?: _____




             Save   Main   Previous   Cntrl–x to Disconnect
```

Figure 3-8. LED Display Selection Screen
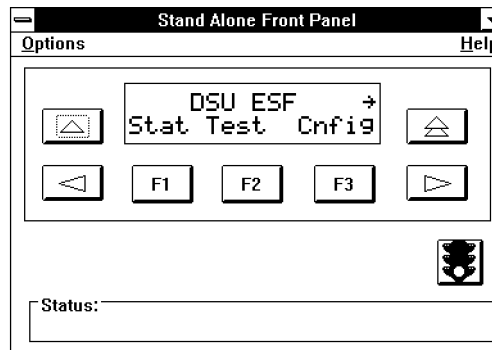
Figure 3-9. Front Panel Emulation Screen Models 3160/3164 DSU/CSUs

Front Panel Emulation on a PC

The 316x DSU/CSU front panel can be mimicked on an attached PC. This front panel emulation capability allows you to access the 3160/3164 DSU/CSU (local or remote) through a PC connected to the COM or MODEM port. For 3161 DSU/CSUs, only one slot in the carrier can be configured as the COM port to provide access for a PC. This slot provides access to all of the circuit cards in the carrier.

Use the front panel display (Figure 3-9) to control the DSU/CSU from a PC just as though you are operating from the DSU/CSU's own front panel. The PC window is updated every five seconds to show the current state of the DSU/CSU.

Figure 3-10. Front Panel Emulation Screen Model 3161 DSU/CSU

Table 3-5
Front Panel Emulation Screen Icons

Icon	Name	Meaning
Help	Help	Click on this pull-down menu to display online HELP.
Options	Options	Click on this pull-down menu to access the following options: 　　　Phone Numbers　　　F1 　　　Open COM Window　　F2 　　　Change MDM Cmds　　F3 　　　Exit　　　　　　　　　F10
	Stop/Go Light	This icon indicates when the front panel display is communicating with the associated DSU/CSU (green = communication, red = no communication). Click on this icon once the PC is connected to the selected DSU/CSU to stop or start communication. The Stop Light indicates there is no device selected, there is a breakdown in communication, or there is a response error.
Front Panel Status Area	Front Panel Status Area	This area displays "In Progress" to indicate the front panel display has sent a command to the DSU/CSU and is waiting for a response.
Slot	Slot	This area enables you to select the slot with which to communicate for 3161 DSU/CSUs. Choose a value from 1 through 16 from the drop down list box.

Test Jacks

There are six Bantam 310 test jacks for signal monitoring on the DSU/CSU front panel (Figures 3-11 and 3-12). These test jacks allow for four break-in tests (Network In, Network Out, Equipment In, and Equipment Out) and two monitor access points (Monitor Net and Monitor Eqpt).

Test jack functions are shown in Figure 3-13 and described in Table 3-6. Note that all tests are located on the DSX-1 side of the DSU. For other types of DSU/CSU tests, refer to Chapter 4, *Maintenance*.
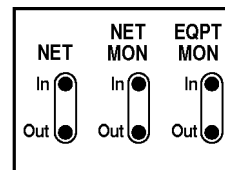
494-14586

Figure 3-11. 3160/3164 DSU/CSU Test Jacks
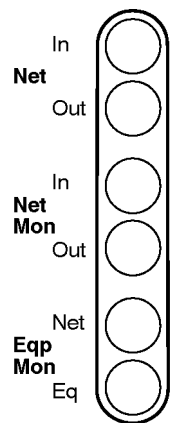
494-14585

Figure 3-12. 3161 DSU/CSU Test Jacks
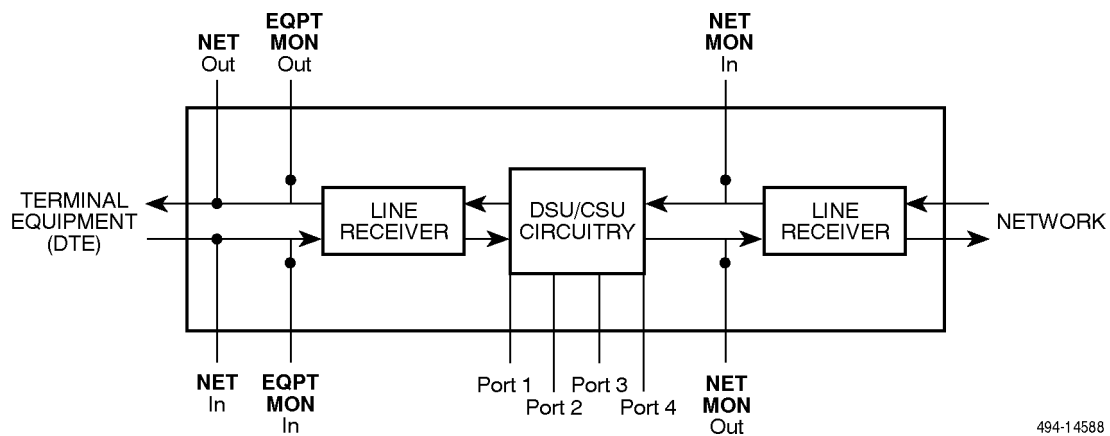
494-14588

Figure 3-13. Test Jack Block Diagram

Table 3-6
Test Jack Functions

Test Jack Name	Function
Net In (Network In)	A break-in and test jack that allows a signal to be inserted toward the network by external test equipment. The signal is inserted on the DSX-1 side of the DSU/CSU.
Net Out (Network Out)	A break-in and test jack that interrupts the signal coming from the network and allows it to be terminated by the external test equipment.
Net Mon In (Monitor Network)	A monitor jack that nonintrusively monitors the incoming signal from the network.
Net Mon Out (Monitor DSX-1)	A monitor jack that nonintrusively monitors the incoming signal from the DSX-1.
Eqp Mon Net (Equipment In)	A break-in and test jack that allows a signal to be inserted toward the DSX-1 by external test equipment.
Eqp Mon Eq (Equipment Out)	A break-in and test jack that interrupts the signal coming from the DSX-1 and allows it to be terminated by the external test equipment.

Configuring the DSU/CSU

You have the option of customizing your 316x DSU/CSU for optimum performance in your network. To do so, use the DSU/CSU configuration options. Appendix G contains a set of blank worksheets to use when configuring your 316x DSU/CSU in the network.

Configuration Option Areas

The 316x DSU/CSU offers four sets of configuration options located in the following areas:

- **Active (Activ)**. The configuration option set active for the DSU/CSU is stored here. Before a set of configuration options become active for the DSU/CSU, you must save the set to the Active area. When the DSU/CSU is shipped from the factory, the Active configuration option set is identical to both the Customer and the Factory 1 sets. This area can be written to and controls the current operation of the device.

- **Customer (Cust)**. This is the set of customer-defined configuration options. Customer set is identical to the Factory 1 set when the DSU/CSU is shipped from the factory. This area can be written to.

- **Factory 1 (Fact1)**. This is a set of configuration options preset at the company. This set is determined by what is considered to be the most common configuration used in the DSU/CSU market. Factory 1 options are read-only.

- **Factory 2 (Fact2)**. This is a set of configuration options preset at the company. This set is determined by what is considered to be the second most common configuration used in the DSU/CSU market. Factory 2 options are read-only.

Configuration Options

The configuration options are divided into seven functional groups. Appendix C contains a list of the configuration options and defaults. These groups are:

- DTE (DSX-1) Interface (see Table C-1)

- Port (see Table C-2)

- Network Interface (see Table C-3)

- Channel (see Tables C-4 and C-5)

- General (see Table C-6)

- User Interface (see Table C-7)

- Alarm (see Table C-8)

- General SNMP (see Table C-9)

- SNMP Trap (see Table C-10)

Configuration Procedures

Use the Configuration (Cnfig) branch of the front panel menu tree to display or change DSU/CSU configuration options (see Figure 3-14).
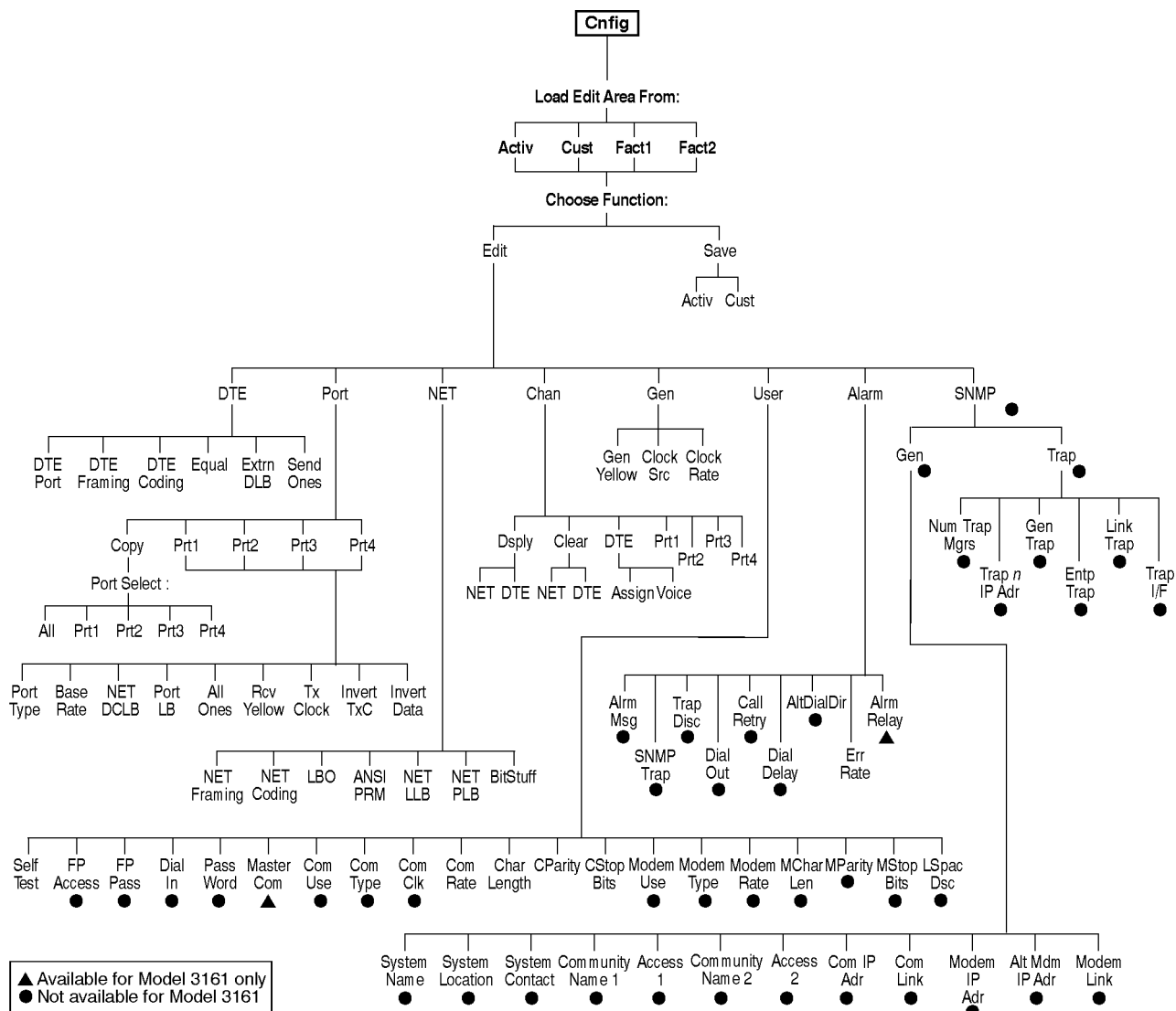
Figure 3-14. Configuration Branch for the Front Panel

Differences using the Async Terminal: Figure 3-15 shows the Configuration branch for the async terminal interface.
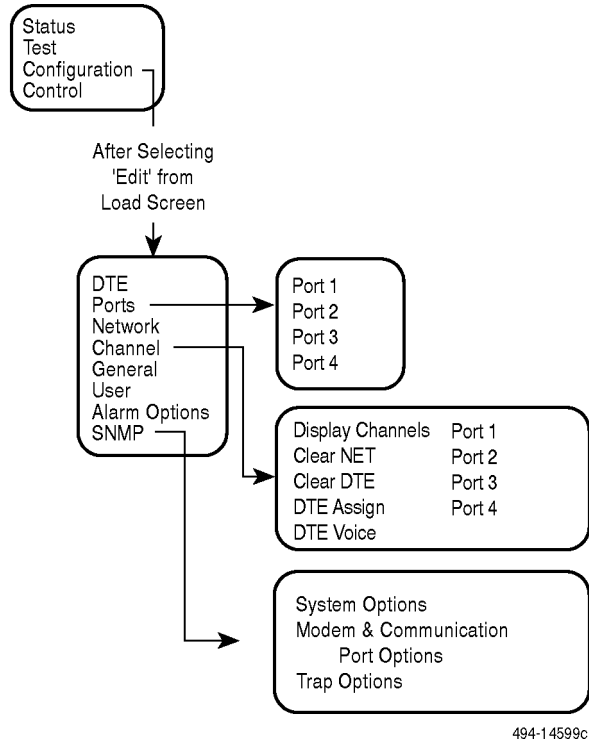
Figure 3-15. Configuration Branch for the Async Terminal

Displaying/Editing Configuration Options

To display/edit configuration options,

1. Press F3 to select Cnfig from the top-level menu screen.
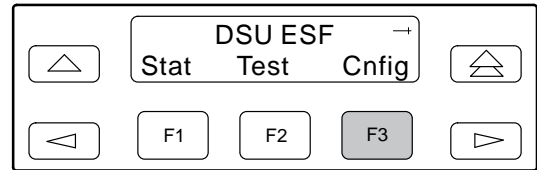
2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.
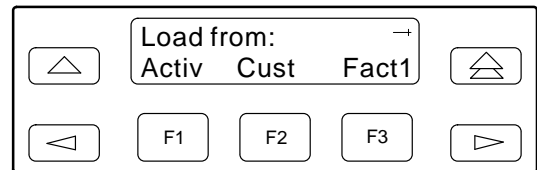
3. Press F1 to select Edit.
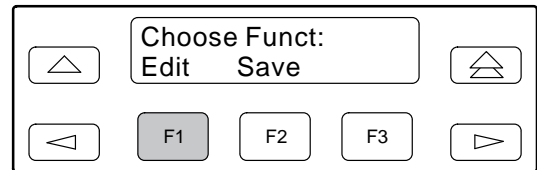
4. From the Edit screen, select the functional group you want to edit by pressing the appropriate function key. Use the scroll keys, if necessary.

The configuration options for the selected functional group appear on the front panel one option at a time. The option name appears on Line 1 with the current value next to it. To reach other options, use the Next and Previous selections to scroll forward and backward through the group of options.
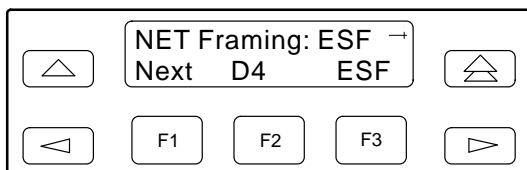
5. Press the appropriate Function key to choose another value. Use the scroll keys, if necessary.

6. Use the Save procedure to save your changes to the Active or Customer area.

Differences Using the Async Terminal: When displaying/editing a configuration option set from the async terminal, select **Configuration** from the main menu. The main/configuration screen appears with the **Load From** field in the display area as shown in Figure 3-16.
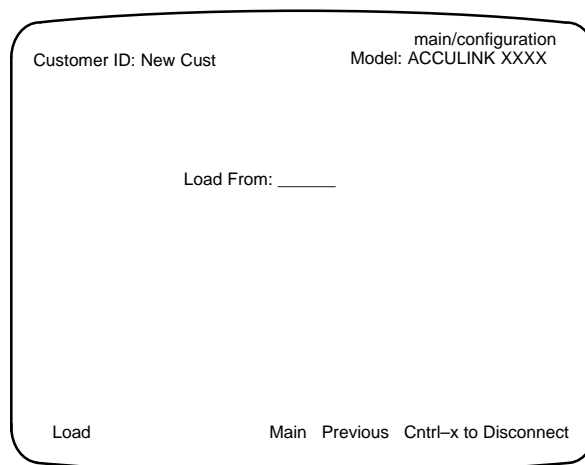
Figure 3-16. Load From Screen

Populate this field with a valid configuration option set value and select **Load** at the bottom of the screen. The configuration option set is loaded and the main/configuration/load screen appears with the **Save To** field as shown in Figure 3-17.
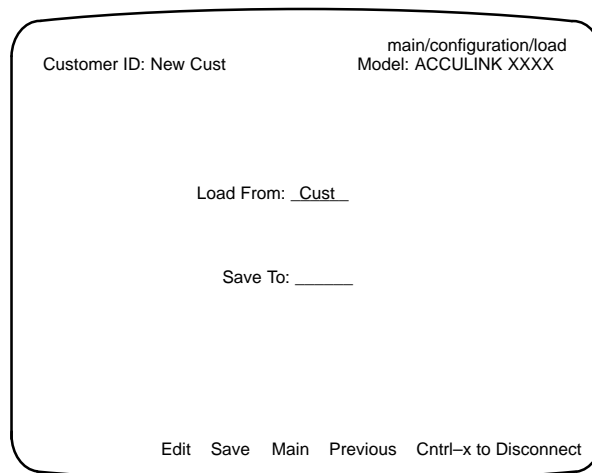
Figure 3-17. Save To Screen

The bottom of the screen shows the addition of the Edit and Save functions.

The **Save To:** field can be populated with **Active** or **Cust** to enable a 1-step copy of one configuration option set into another when the Save function is subsequently selected. The default configuration option set is **Active** except if **Load From:** is set to **Cust**; then **Cust** is the default.

To edit the configuration options, select **Edit**. This displays the configuration menu shown in Figure 3-15.

The async terminal supports character matching for entering valid values in fields when editing configuration options. For example, the valid values for the main/configuration screen is **Activ, Cust**, **Fact1**, and **Fact2**. If you enter the character 'C', the field automatically populates with the value that matches the character criteria. In this case, it would be **Cust.** Appendix C provides all the valid values available for each configuration option. Also refer to the section *Using the Async Terminal Feature* for a discussion of the edit screens.

Saving Edit Changes

Save edit changes to the Active area when you want those changes to take effect immediately. Save edit changes to the Customer area when you want to overwrite the existing Customer configuration options and store these changes for future use.

To save edit changes,

> **NOTE**
>
> If you attempt to exit the Edit function after making changes without performing a Save, the DSU/CSU prompts you with **Save Options?** Choose **Yes** or **No**.

1. From the Choose Function screen (one level above the Edit screen, two levels below the top-level menu screen), press F2 to select Save.
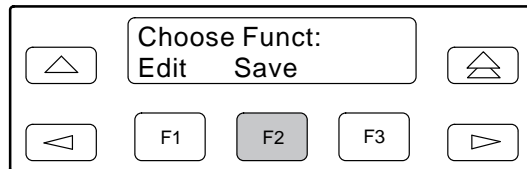
2. Press F1 or F2 to choose whether you want to save to the Active or Customer area.
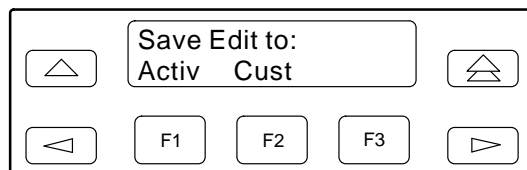
Differences Using the Async Terminal: All subsequent edit screens off the main/configuration menu on the async terminal provide the **Save** and **Edit** functions. When all edit changes are completed, select **Save** from the last screen. It returns you to the main/configuration/load screen as shown in Figure 3-17. Populate the **Save To** field on the main/configuration/load screen and select **Save**.

To protect you from accidentally exiting an edit session before saving your changes, the system prompts **Save Options?** if you select either **Main** or **Cntrl-x** from an edit screen (see Figure 3-18). If you respond **No**, the system exits without saving the changes. If you respond **Yes**, you are prompted to specify where the changes should be saved.


```
                                    main/control/miscellaneous
 Customer ID: New Cust          Model: ACCULINK XXXX


                Miscellaneous Control Options

      Customer Identification Name/Number: _____
                     Change Password: Yes__
                           Password: _____
                 Re-enter Password: _____




             Save   Main   Previous   Cntrl-x to Disconnect
```
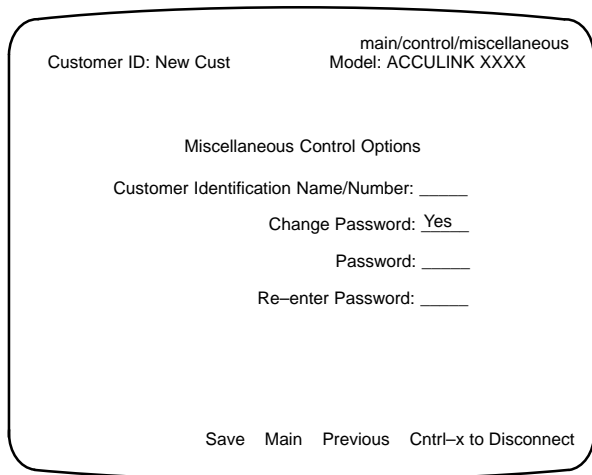
Figure 3-18. Save Edit screen

NOTE

If you terminate async terminal control by changing the configuration interface options, the async terminal must be reconfigured on the port.

Selecting/Copying to a Specific Port

You have the capability of selecting a specific port to configure and to copy the configuration options for one port to another port or to all ports. You can use the configuration worksheets provided to note the configuration options you have chosen (see Figure 3-19).

Selecting a Specific Port

To select a specific port to configure,

1. Press F3 to select Cnfig from the top-level menu screen.
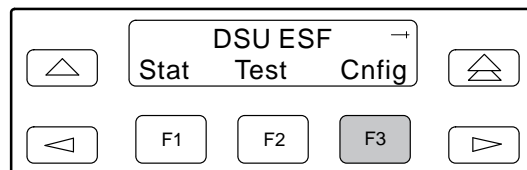

```
         DSU ESF        →
      Stat   Test   Cnfig

        F1     F2    [F3]
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.


```
      Load from:       →
      Activ   Cust   Fact1

        F1     F2    F3
```

3. Press F1 to select Edit.


```
      Choose Funct:
      Edit    Save

       [F1]    F2    F3
```

4. Press F2 to select Port.


```
      Edit:            →
      DTE    Port    NET

        F1   [F2]    F3
```
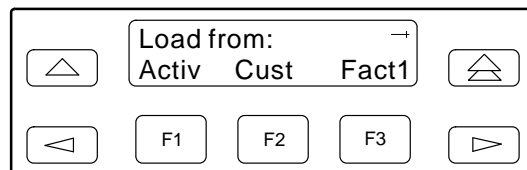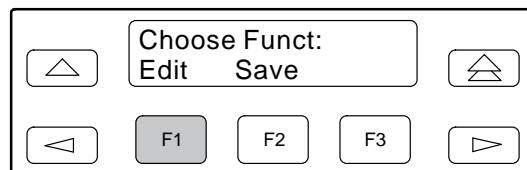
5. From the Port Select screen, press the Function key that corresponds to the desired port. Use the ▷ key to scroll addition ports onto the screen, if necessary.


```
      Port Select:     →
      Copy   Prt1    Prt2

        F1     F2    F3
```
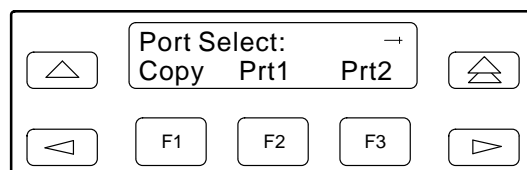
Differences Using the Async Terminal: To select a port, use the **Ports** selection from the main/configuration/edit menu. The subsequent ports menu provides a list of the configured ports (see Figure 3-19).

Prt1 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

Prt3 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

Prt2 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

Prt4 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

Figure 3-19. Port Options Configuration Worksheets

To Copy to One or All Ports

To copy the configuration options to one or all ports,

1. Press F3 to select Cnfig from the top-level menu screen.
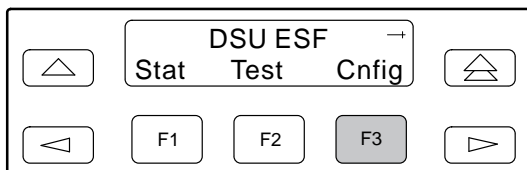
```
            DSU ESF      →
        Stat    Test    Cnfig
       △                      △
       ◁    F1      F2    [F3]   ▷
```

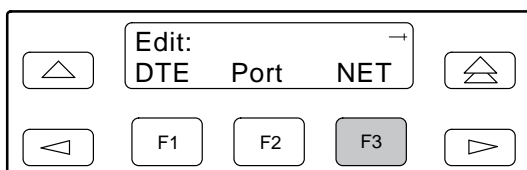2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
        Load from:          →
        Activ    Cust    Fact1
       △                      △
       ◁    F1      F2    F3    ▷
```

3. Press F1 to select Edit.

```
        Choose Funct:
        Edit    Save
       △                      △
       ◁    [F1]     F2    F3    ▷
```

4. Press F2 to select Port.

```
        Edit:                →
        DTE    Port    NET
       △                      △
       ◁    F1     [F2]    F3    ▷
```
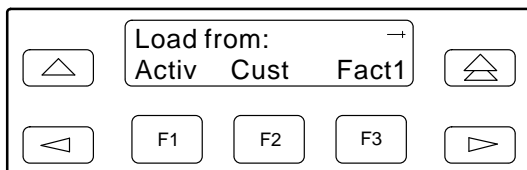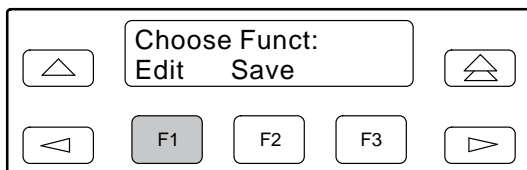
5. From the Port Select screen, press F1 (Copy).

```
        Port Select:         →
        Copy    Prt1    Prt2
       △                      △
       ◁   [F1]     F2    F3    ▷
```
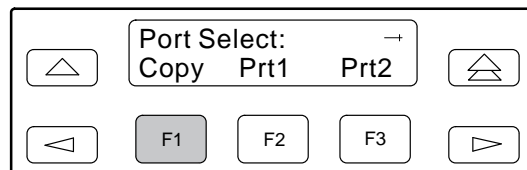
6. Select the port *from* which you want to copy the configuration options using the corresponding Function key.

```
        Copy From:           →
        Prt1    Prt2    Prt3
       △                      △
       ◁    F1      F2    F3    ▷
```
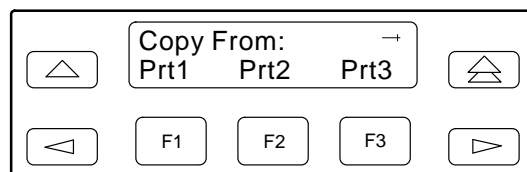
7. Select the port *to* which you want to copy the configuration options using the corresponding Function key. Or, press F1 (All) to choose to copy to all ports.

```
        Copy To:             →
        All     Prt1    Prt2
       △                      △
       ◁    F1      F2    F3    ▷
```
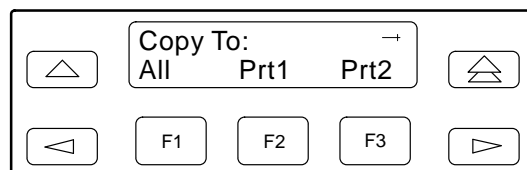
Differences Using the Async Terminal: From the main/configuration/edit/ports menu, select a port. The subsequent screen appears with the **Copy From** field populated with the port selected on the ports menu. The port description fields are populated with the port information. Specify the port to be copied to in the **Copy To** field or **ALL** for all ports. Tab to and select **Copy** on the right of the screen.

Configuring the 3160/3164 DSU/CSU for SNMP Management

To configure a 3160/3164 DSU/CSU for management by an SNMP management system you must,

- Select and configure the port (COM or MODEM) providing the link to the SNMP management system.

- Set the Internet Protocol (IP) address needed to access the device (either for the COM port or the MODEM port).

- Select the link layer protocol (PPP or SLIP) for the port.

- Specify the two community names that are allowed to access the device's Management Information Base (MIB).

- Configure the device to send traps to the SNMP manager, if desired.

Differences Using the Async Terminal: When **SNMP** is selected from the main/configuration/edit menu, the menu selection structure changes slightly from the front panel. Specifically, the **Gen** selection (from the front panel) is split into two logical groups: **System Options** and **Modem and Communication Port Options. Trap** (from the front panel) appears as **Trap Options** on the async terminal interface. (See Figures 3-14 and 3-15)

In the SNMP System Options screen as shown in Figure 3-20, a maximum of 40 characters can be entered per field. If more than 40 characters are required, then scrolling on the line is supported. To scroll, move the cursor to the end of the line. To clear a field, select **Clear.** This action sets the field to a null string, A message appears requiring you to verify that a clear is intended. After executing **Clear**, the cursor is located at the beginning of the cleared field.

Figure 3-20. SNMP System Options Screen

Selecting the Port

The 3160/3164 DSU/CSU supports a communications link between the DSU/CSU and an external SNMP management system or network device (e.g., router) on either the COM port or the MODEM port. Use the MODEM port when configuring devices through a dial-up modem. Use the COM port for direct connections. Either the COM or the MODEM port can be configured as the communications link, but only one port at a time can be configured as the link. The MODEM port can support either synchronous or asynchronous PPP, or asynchronous SLIP at data rates of up to 2400 bps. The COM port can support either synchronous or asynchronous PPP, or asynchronous SLIP at data rates of up to 19,200 bps.

To select the MODEM port as the link to the SNMP manager from the front panel,

1. Press F3 to select Cnfig from the top-level menu screen.

```
              DSU ESF      →
        Stat    Test    Cnfig

         F1      F2      F3
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
        Load from:        →
        Activ   Cust   Fact1

         F1      F2      F3
```

3. Press F1 to select Edit.

```
        Choose Funct:
        Edit    Save

         F1      F2      F3
```

4. Press the ▷ key from the Edit screen to display the User selection.

```
        Edit:             →
        DTE    Port    NET

         F1      F2      F3      ▷
```

5. Press F3 to select User.

```
        Edit:             ⇄
        Chan    Gen    User

         F1      F2      F3
```

6. Press the F1 (Next) key until the Modem Use configuration option appears.

```
        Self-Test:Enab    →
        Next    Enab    Disab

         F1      F2      F3
```
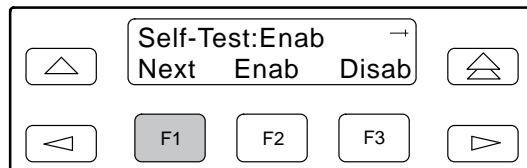
7. Press F2 to configure the MODEM port as the management link to an external SNMP manager.

```
        Modem Use:        →
        Next   SNMP   ASCII

         F1      F2      F3
```

To select the COM port as the link to the SNMP manager,

1. Press F3 to select Cnfig from the top-level menu screen.

```
              DSU ESF      →
        Stat    Test    Cnfig

         F1      F2      F3
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
        Load from:        →
        Activ   Cust   Fact1

         F1      F2      F3
```

3. Press F1 to select Edit.

```
  ┌────────────────────────────────────┐
  │        ┌──────────────────┐         │
  │  ┌───┐ │ Choose Funct:    │  ┌───┐  │
  │  │ △ │ │ Edit    Save     │  │ ▲ │  │
  │  └───┘ └──────────────────┘  └───┘  │
  │  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  │
  │  │ ◁ │  │ F1│  │ F2│  │ F3│  │ ▷ │  │
  │  └───┘  └───┘  └───┘  └───┘  └───┘  │
  └────────────────────────────────────┘
```

4. Press the ▷ key from the Edit screen to display the User selection.
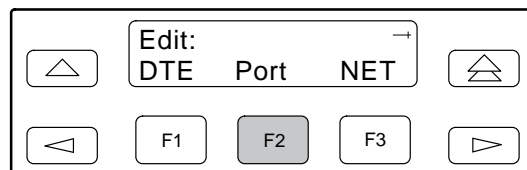
```
  ┌────────────────────────────────────┐
  │        ┌──────────────────┐         │
  │  ┌───┐ │ Edit:         →  │  ┌───┐  │
  │  │ △ │ │ DTE   Port   NET │  │ ▲ │  │
  │  └───┘ └──────────────────┘  └───┘  │
  │  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  │
  │  │ ◁ │  │ F1│  │ F2│  │ F3│  │ ▷ │  │
  │  └───┘  └───┘  └───┘  └───┘  └───┘  │
  └────────────────────────────────────┘
```

5. Press F3 to select User.

```
  ┌────────────────────────────────────┐
  │        ┌──────────────────┐         │
  │  ┌───┐ │ Edit:         ⇄  │  ┌───┐  │
  │  │ △ │ │ Chan  Gen   User │  │ ▲ │  │
  │  └───┘ └──────────────────┘  └───┘  │
  │  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  │
  │  │ ◁ │  │ F1│  │ F2│  │ F3│  │ ▷ │  │
  │  └───┘  └───┘  └───┘  └───┘  └───┘  │
  └────────────────────────────────────┘
```

6. Press the F1 (Next) key until the Com Use configuration option appears.

```
  ┌────────────────────────────────────┐
  │        ┌──────────────────┐         │
  │  ┌───┐ │ Self-Test:Enab →  │  ┌───┐ │
  │  │ △ │ │ Next   Enab  Disab│  │ ▲ │ │
  │  └───┘ └──────────────────┘  └───┘  │
  │  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  │
  │  │ ◁ │  │ F1│  │ F2│  │ F3│  │ ▷ │  │
  │  └───┘  └───┘  └───┘  └───┘  └───┘  │
  └────────────────────────────────────┘
```

7. Press F2 to configure the COM port as the management link to an external SNMP manager.

```
  ┌────────────────────────────────────┐
  │        ┌──────────────────┐         │
  │  ┌───┐ │ Com Use:      →  │  ┌───┐  │
  │  │ △ │ │ Next  SNMP  ASCII│  │ ▲ │  │
  │  └───┘ └──────────────────┘  └───┘  │
  │  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  │
  │  │ ◁ │  │ F1│  │ F2│  │ F3│  │ ▷ │  │
  │  └───┘  └───┘  └───┘  └───┘  └───┘  │
  └────────────────────────────────────┘
```
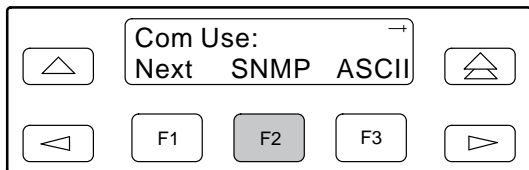
Differences Using the Async Terminal: To select the port to be used for SNMP communications, use the main/configuration/edit/user screen to set the **Use** field to **SNMP** for the appropriate port type**.** Figure 3-21 shows an example of this screen.

```
  ┌──────────────────────────────────────────────┐
  │                          main/configuration/edit/user │
  │  Customer ID: New Cust      Model: ACCULINK XXXX │
  │                                                │
  │                        User                    │
  │                  Self Test: _____              │
  │           Front Panel Access: _____            │
  │      Front Panel Pass-Through: _____           │
  │              Dial-In Access: _____             │
  │              Password Mode: _____              │
  │                                                │
  │   Communications Port              Modem Port  │
  │                                                │
  │          Use: _____                  Use: _____│
  │         Type: _____                 Type: _____│
  │         Rate: _____                 Rate: _____│
  │ Character Length: _____   Character Length: _____│
  │       Parity: _____               Parity: _____│
  │    Stop Bits: _____            Stop Bits: _____│
  │              Long Space Disconnect: _____      │
  │                                                │
  │    Save  Edit  Main  Previous  Cntrl–x to Disconnect │
  └──────────────────────────────────────────────┘
```
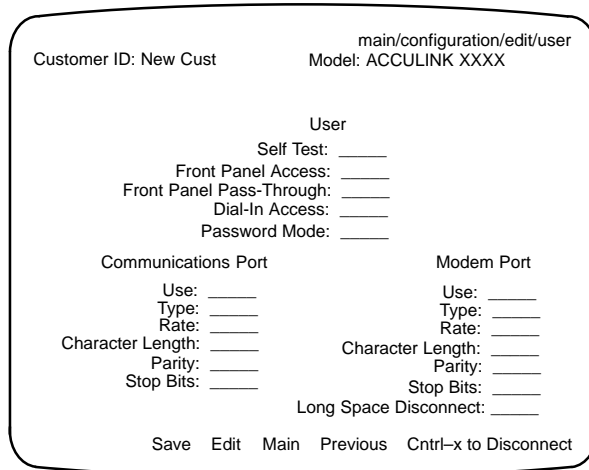
Figure 3-21. Edit User Screen

Setting the IP Address

The IP address is the address used by the SNMP manager to access the device. For devices using PPP, the IP address can be negotiated, if the network device, e.g., router or SNMP manager, supports such negotiation. The IP address is composed of four fields with three digits per field (*xxx.xxx.xxx.xxx*).

The IP address is set for either the COM port or the MODEM port, depending on which one has been chosen as the SNMP communications link. The example below assumes that an IP address of 010.155.111.222 is being set for the MODEM port. You can use the same principles to assign any value (between 000 and 255 for each digit field) to either port.

To assign an IP address to the MODEM port,

1. Press F3 to select Cnfig from the top-level menu screen.
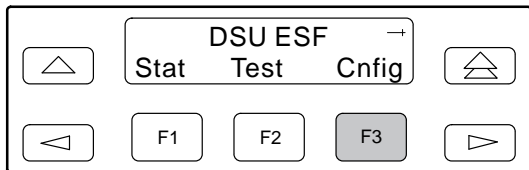
```
          DSU ESF      →
  △    Stat   Test   Cnfig   △
  ◁     F1     F2    [F3]    ▷
```
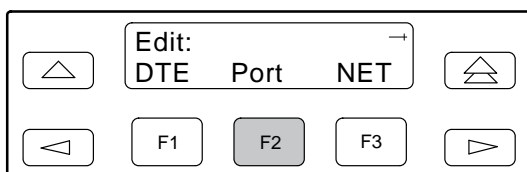
2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
  Load from:        →
  △  Activ   Cust   Fact1   △
  ◁    F1     F2     F3    ▷
```

3. Press F1 to select Edit.

```
  Choose Funct:
  △  Edit    Save          △
  ◁   [F1]    F2     F3    ▷
```

4. Press the ▷ key from the Edit screen to display the SNMP selection.

```
  Edit:             →
  △  DTE    Port    NET    △
  ◁   F1     F2     F3   [▷]
```

5. Press F3 to select SNMP.

```
  Edit:             ←
  △  User   Alarm   SNMP   △
  ◁   F1     F2    [F3]   ▷
```

6. Press F1 to select Gen from the SNMP Config screen.

```
  SNMP Config:
  △  Gen    Trap           △
  ◁  [F1]    F2     F3    ▷
```
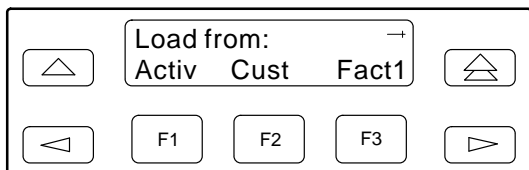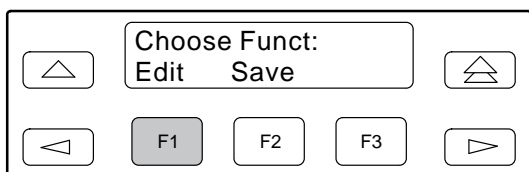
7. Press the F1 (Next) key until the Modem IP Adr configuration option appears.

```
  System Name:      →
  △  Next   Edit   Clear   △
  ◁  [F1]    F2     F3    ▷
```
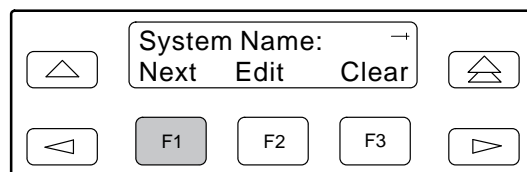
NOTE

Steps 8 and 9 describe the process for entering an IP address. This process applies to any IP address.

8. Press F2 (Edit) to edit the IP address. You have the option of using F3 (Clear) to reset the IP address to the factory default *000.000.000.000*.

```
  Modem IP Adr:     →
  △  Next   Edit   Clear   △
  ◁   F1    [F2]    F3    ▷
```
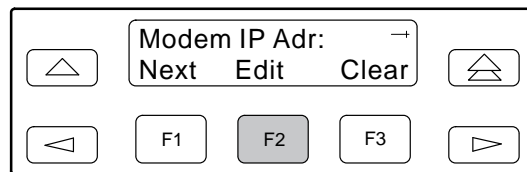
9. Use the ◁ and ▷ keys to position the cursor under the digit you want to change. Press F1 (Up) to increment the digit or F2 (Down) to decrement the digit. In this example, you would press ▷ once to place the cursor under the middle digit in the first digit field, then press F1 (Up) once to change the *0* to a *1*. Continue in this manner to change the other digits.

```
      ┌─────────────────────┐
 ┌──┐ │ 0̲00.000.000.000      · │ ┌──┐
 │△│ │ Up    Down   Save    │ │△│
 └──┘ │                     │ └──┘
 ┌──┐ ┌────┐ ┌────┐ ┌────┐ ┌──┐
 │◁│ │ F1 │ │ F2 │ │ F3 │ │▷│
 └──┘ └────┘ └────┘ └────┘ └──┘
```
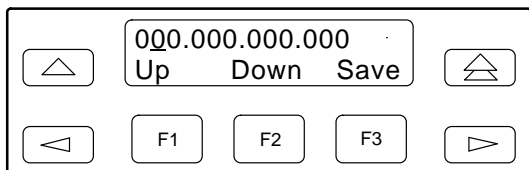
10. When you are through changing the IP address, you *must* press F3 (Save) to save the value. Otherwise, the original value will be retained.

```
      ┌─────────────────────┐
 ┌──┐ │ 010.155.111.22̲2      │ ┌──┐
 │△│ │ Up    Down   Save    │ │△│
 └──┘ │                     │ └──┘
 ┌──┐ ┌────┐ ┌────┐ ┌────┐ ┌──┐
 │◁│ │ F1 │ │ F2 │ │ F3 │ │▷│
 └──┘ └────┘ └────┘ └────┘ └──┘
```
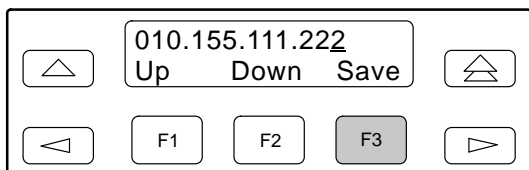
Differences Using the Async Terminal: To set the IP address, select **Modem & Communication Port Options** from the main/configuration/edit/snmp menu. Figure 3-22 shows an example of the screen that appears.

```
 ┌────────────────────────────────────────────────┐
 │                          main/configuration/edit/snmp/traps │
 │  Customer ID: New Cust   Model: ACCULINK XXXX    │
 │                                                  │
 │         Modem & Communication Port Options       │
 │                                                  │
 │   Communication Port IP Address: 000.000.000.000   Clear │
 │                                                  │
 │  Communication Port Link Protocol: PPP           │
 │                                                  │
 │        Modem Port IP Address: 000.000.000.000    Clear │
 │                                                  │
 │  Alternate Modem Port IP Address: 000.000.000.000  Clear │
 │                                                  │
 │         Modem Port Link Protocol: PPP            │
 │                                                  │
 │                                                  │
 │       Save  Edit  Main  Previous  Cntrl–x to Disconnect │
 └────────────────────────────────────────────────┘
```
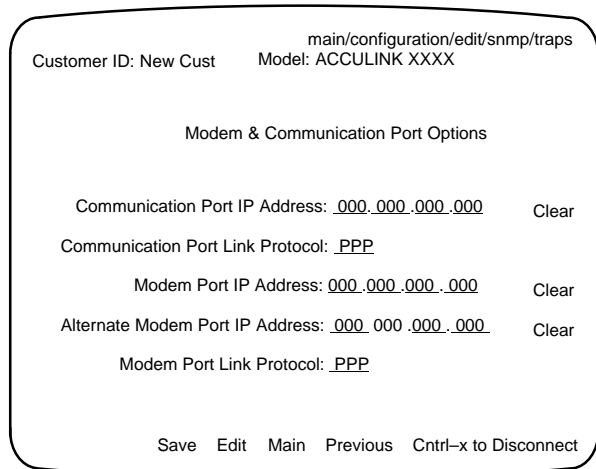
**Figure 3-22. Communication Port
Options Screen**

Selecting the Link Layer Protocol

You have the option of selecting either PPP or SLIP as the link layer protocol. PPP can be used for synchronous or asynchronous operation. SLIP can be used for asynchronous operation only.

The 3160/3164 implementation of PPP supports the following:

• Full negotiation of PPP's Link Control Protocol (LCP).

• Active negotiation of LCP when the connection is established.

• Maximum Request Unit (MRU) sizes up to 1500 bytes, but the 3160/3164 DSU/CSU will attempt to negotiate down to 500 bytes.

• The 3160/3164 DSU/CSU provides a unique LCP magic number derived from the unit serial number and the elapsed time.

• Full negotiation of escape characters.

Model 3160/3164 implementation of PPP does not support Link Quality Reports (LQR), compression, encryption, Password Authentication Protocol (PAP) or Challenge Authentication Protocol (CHAP).

Model 3160/3164 implementation of SLIP supports a fixed MRU size of 1006 bytes.

Before selecting the protocol, you must first select the port to be used as the communications link. Refer to the *Selecting the Port* section earlier in this chapter. This example assumes that the MODEM port is being used as the communications link.

To select the link layer protocol,
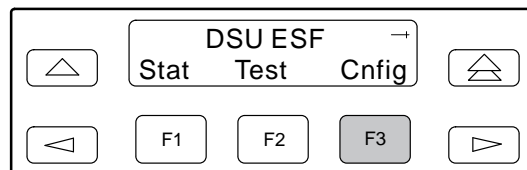
1. Press F3 to select Cnfig from the top-level menu screen.

```
      ┌─────────────────────┐
 ┌──┐ │   DSU ESF        →   │ ┌──┐
 │△│ │ Stat   Test   Cnfig  │ │△│
 └──┘ │                     │ └──┘
 ┌──┐ ┌────┐ ┌────┐ ┌────┐ ┌──┐
 │◁│ │ F1 │ │ F2 │ │ F3 │ │▷│
 └──┘ └────┘ └────┘ └────┘ └──┘
```
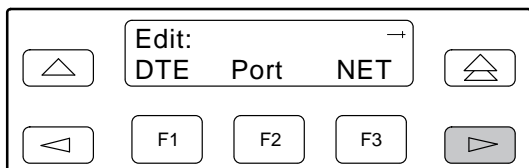
2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
   ┌─────────────────────────────────┐
┌─────┐ │ Load from:              → │ ┌─────┐
│  △  │ │ Activ    Cust     Fact1 │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```
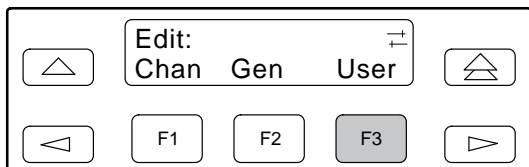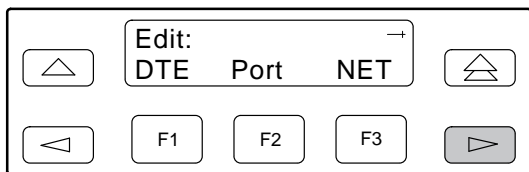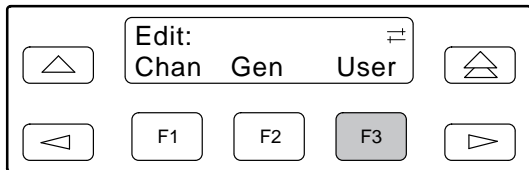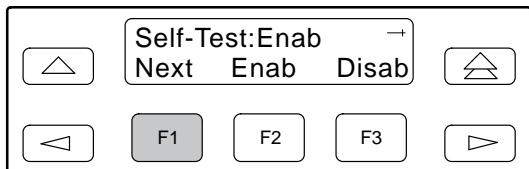
3. Press F1 to select Edit.

```
   ┌─────────────────────────────────┐
┌─────┐ │ Choose Funct:           │ ┌─────┐
│  △  │ │ Edit    Save            │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```

4. Press the ▷ key from the Edit screen to display the SNMP selection.

```
   ┌─────────────────────────────────┐
┌─────┐ │ Edit:                   → │ ┌─────┐
│  △  │ │ DTE     Port      NET   │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```

5. Press F3 to select SNMP.

```
   ┌─────────────────────────────────┐
┌─────┐ │ Edit:                   ← │ ┌─────┐
│  △  │ │ User    Alarm    SNMP   │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```

6. Press F1 to select Gen from the SNMP Config screen.

```
   ┌─────────────────────────────────┐
┌─────┐ │ SNMP Config:            │ ┌─────┐
│  △  │ │ Gen     Trap            │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```
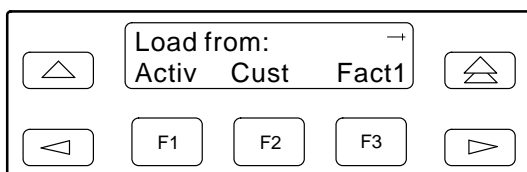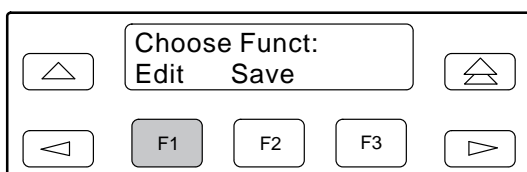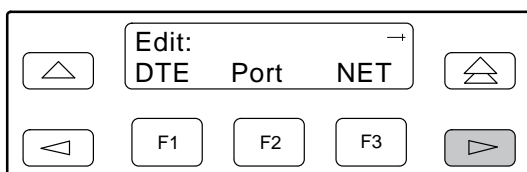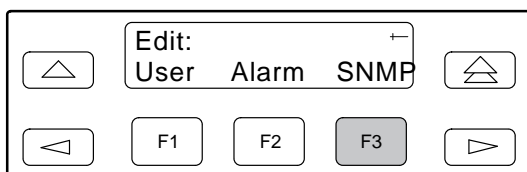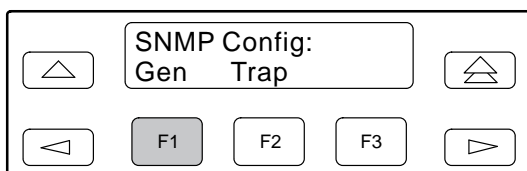
7. Press the F1 (Next) key until the Modem Link configuration option appears.

```
   ┌─────────────────────────────────┐
┌─────┐ │ System Name:            → │ ┌─────┐
│  △  │ │ Next    Edit     Clear  │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```

8. Press F2 (PPP) or F3 (SLIP).

```
   ┌─────────────────────────────────┐
┌─────┐ │ Modem Link:            → │ ┌─────┐
│  △  │ │ Next    PPP      SLIP   │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```
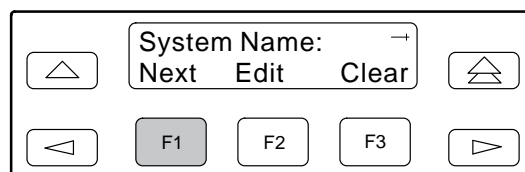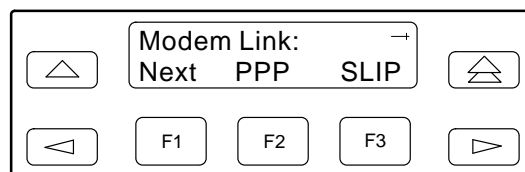
Differences Using the Async Terminal: To set the Link Layer Protocol, select **Modem & Communication Port Options** from the main/configuration/edit/snmp menu. (See Figure 3-22 for an example of the screen that appears.)

Specifying the Community Name(s) and Access Type(s)

You have the capability of specifying up to two community names (community name 1 and community name 2) to be used by external SNMP managers when trying to access objects in the DSU/CSU's MIB. Once you specify the community name(s), you must then specify the type of access to the MIB that SNMP managers in the community are permitted to have.

To specify the community name 1 and its access type,

1. Press F3 to select Cnfig from the top-level menu screen.
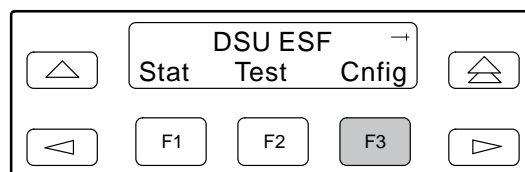
```
   ┌─────────────────────────────────┐
┌─────┐ │      DSU ESF           → │ ┌─────┐
│  △  │ │ Stat    Test     Cnfig  │ │  △  │
└─────┘ │                         │ └─────┘
┌─────┐ ┌────┐  ┌────┐  ┌────┐  ┌─────┐
│  ◁  │ │ F1 │  │ F2 │  │ F3 │  │  ▷  │
└─────┘ └────┘  └────┘  └────┘  └─────┘
```
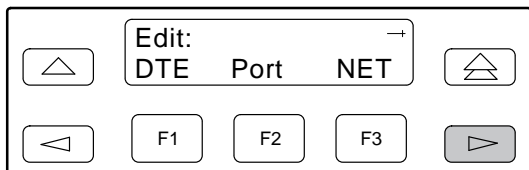
2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.
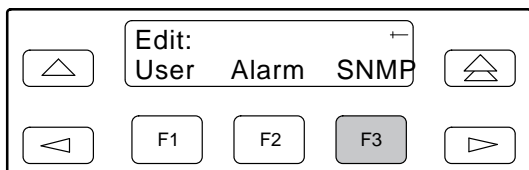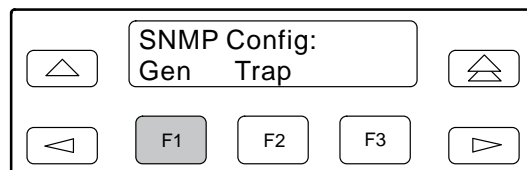
```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ Load from:        → │  │ ⬆│
  └──┘  │ Activ   Cust  Fact1 │  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```

3. Press F1 to select Edit.

```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ Choose Funct:       │  │ ⬆│
  └──┘  │ Edit   Save         │  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```

4. Press the ▷ key from the Edit screen to display the SNMP selection.

```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ Edit:             → │  │ ⬆│
  └──┘  │ DTE    Port    NET  │  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```

5. Press F3 to select SNMP.

```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ Edit:             ← │  │ ⬆│
  └──┘  │ User   Alarm   SNMP │  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```

6. Press F1 to select Gen from the SNMP Config screen.

```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ SNMP Config:        │  │ ⬆│
  └──┘  │ Gen    Trap         │  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```
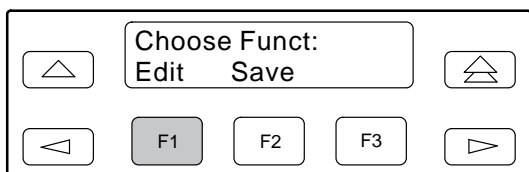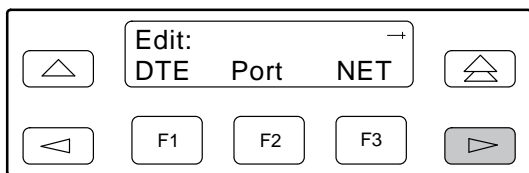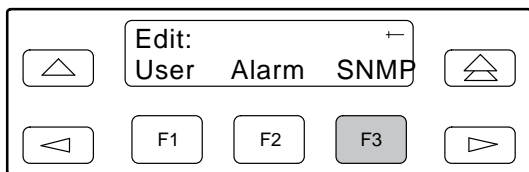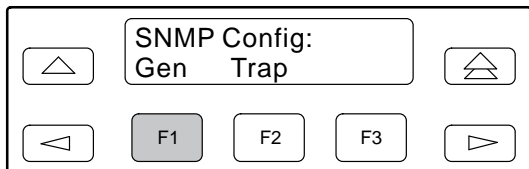
7. Press the F1 (Next) key until the CommunityName1 configuration option appears.

```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ System Name:      → │  │ ⬆│
  └──┘  │ Next    Edit   Clear│  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```
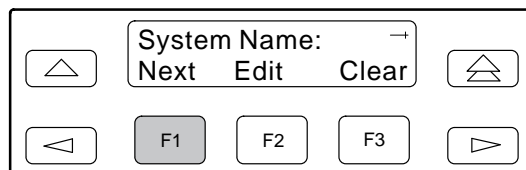
8. Press F2 (Edit) to edit the community name. The factory default community name is *public*.

```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ CommunityName1: →   │  │ ⬆│
  └──┘  │ Next    Edit   Clear│  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```
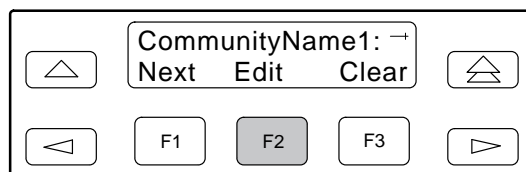
NOTE

Steps 9 and 10 describe the process for entering text strings for SNMP configuration options. This process applies to entering any text strings into SNMP configuration options.

---

9. Use the ◁ and ▷ keys to position the cursor under the character you want to change. Press F1 (Up) or F2 (Down) to scroll through the valid numbers/characters for the text string. The valid characters consist of the set of printable ASCII characters. The F1 (Up) key scrolls through the ASCII character set in the following order: numbers (0–9), lowercase letters (a–z), uppercase letters (A–Z), space character, ASCII symbols (ascending order, based on ASCII code), and the End of Line symbol (←). The ← erases all characters to the right of the cursor.

```
  ┌──┐  ┌─────────────────────┐  ┌──┐
  │ △│  │ public              │  │ ⬆│
  └──┘  │ Up     Down    Save │  └──┘
        └─────────────────────┘
  ┌──┐  ┌────┐  ┌────┐  ┌────┐  ┌──┐
  │ ◁│  │ F1 │  │ F2 │  │ F3 │  │ ▷│
  └──┘  └────┘  └────┘  └────┘  └──┘
```
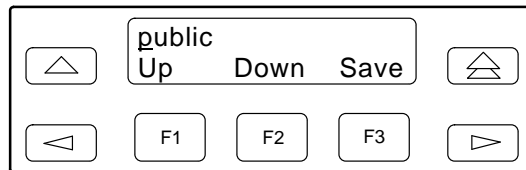
10. When you are through changing the community name, you *must* press F3 (Save) to save the value. Otherwise, the original value will be retained.

```
┌─────────────────────────────────┐
│        ┌──────────────────┐     │
│  △     │ newnam‿e         │  ◇  │
│        │ Up   Down   Save │     │
│        └──────────────────┘     │
│                                 │
│  ◁   [F1]   [F2]   [F3]   ▷    │
└─────────────────────────────────┘
```
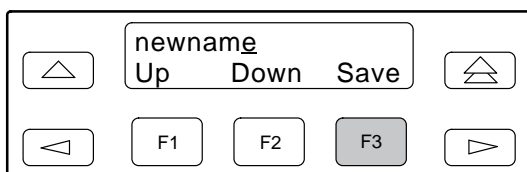
11. Press the F1 (Next) key until the Access 1 configuration option appears.

```
┌─────────────────────────────────┐
│        ┌──────────────────┐     │
│  △     │ CommunityName1: →│  ◇  │
│        │ Next  Edit  Clear│     │
│        └──────────────────┘     │
│                                 │
│  ◁   [F1]   [F2]   [F3]   ▷    │
└─────────────────────────────────┘
```
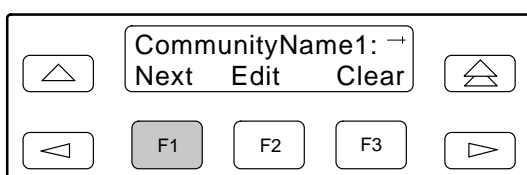
12. Press F2 (Read) or F3 (R/W). The Read selection allows read-only access (SNMP "Get") to the accessible objects in the MIB when community name 1 is used. The R/W selection allows Read/Write access (SNMP "Get" and "Set") to the objects in the MIB. Write access is allowed for all objects specified as read/write in the MIB. Read access is allowed for all objects specified as read-only or read/write.

```
┌─────────────────────────────────┐
│        ┌──────────────────┐     │
│  △     │ Access 1:       →│  ◇  │
│        │ Next  Read   R/W │     │
│        └──────────────────┘     │
│                                 │
│  ◁   [F1]   [F2]   [F3]   ▷    │
└─────────────────────────────────┘
```
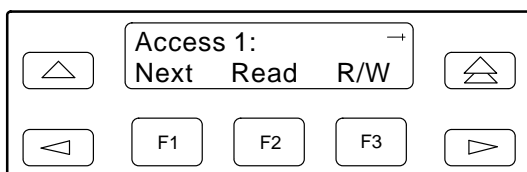
Differences Using the Async Terminal: To set the Community Names and Access types, select **System Options** from the main/configuration/edit/snmp menu. (See Figure 3-20 for an example of the screen that appears.)

SNMP Traps

A trap is an unsolicited message that is sent from the DSU/CSU to an SNMP manager when the device detects certain, prespecified conditions. These traps enable the SNMP manager to gauge the state of the network. The SNMP Trap Enable configuration option must be enabled for trap messages to be sent over the communications link. You must specify the number of SNMP managers that are to receive traps from this device, an IP address for each SNMP manager specified, and the type of traps to be sent from this device. See Appendix C, *Configuration Options* for more information about how to set these traps.

Trap types consist of the following:

- **General traps** – include "warmStart" and "authenticationFailure". The device sends a warmStart trap after it has been reset to indicate that it has just reinitialized itself. The device sends an authenticationFailure trap when it has received an SNMP protocol message that has not been properly authenticated. These traps are set by the Gen Trap configuration option.

- **Enterprise Specific traps** – signify that the device has recognized an enterprise-specific event. See Table 3-7 for enterprise-specific traps. These traps are set by the Entp Trap configuration option.

- **Link Traps** – identify the condition of the communications interface, either linkDown (one of the communications interfaces has failed) or linkUp (one of the communications interfaces has just come up). These traps are set by the Link Trap configuration option. The communications interfaces for which these traps can be generated are specified by the Trap I/F configuration option.

Table 3-7
Enterprise-Specific Trap Definitions

Trap Value	Event
enterpriseClockFail(1)	Currently configured master clock source has failed.
enterpriseSelfTestFail(2)	Device hardware failure detected at self-test. Generated after device initialization.
enterpriseDeviceFail(3)	Internal device failure detected by the operating software.

Selecting the Number of Trap Managers

If you intend to issue traps to an SNMP manager(s) from this device, you must specify the number of SNMP managers that are to receive the traps.

To specify the number of SNMP managers to receive traps from this device,

1. Press F3 to select Cnfig from the top-level menu screen.
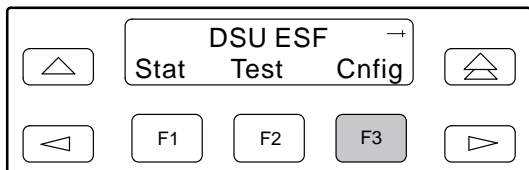
```
         DSU ESF      →
  △    Stat   Test   Cnfig    ⏏

  ◁      F1     F2     F3      ▷
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
         Load from:    →
  △    Activ   Cust   Fact1    ⏏

  ◁      F1     F2     F3      ▷
```

3. Press F1 to select Edit.

```
         Choose Funct:
  △    Edit    Save            ⏏

  ◁      F1     F2     F3      ▷
```

4. Press the ▷ key from the Edit screen to display the SNMP selection.

```
         Edit:          →
  △    DTE   Port   NET       ⏏

  ◁      F1     F2     F3      ▷
```

5. Press F3 to select SNMP.

```
         Edit:          ←
  △    User   Alarm   SNMP     ⏏

  ◁      F1     F2     F3      ▷
```

6. Press F2 to select Trap from the SNMP Config screen.

```
         SNMP Config:
  △    Gen    Trap             ⏏

  ◁      F1     F2     F3      ▷
```
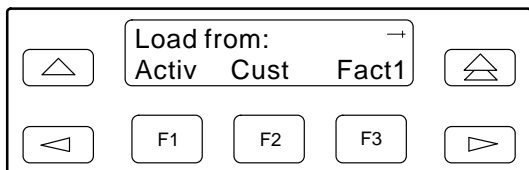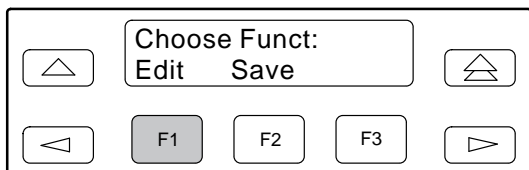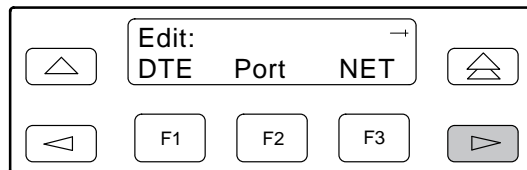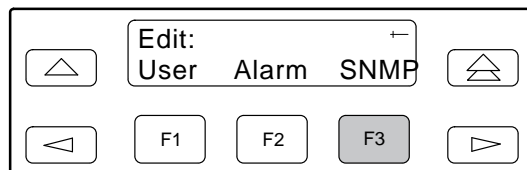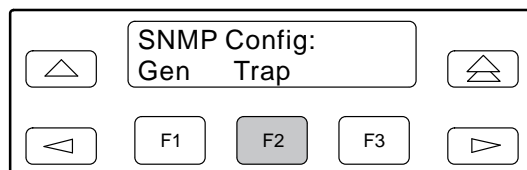
7. Select the number of SNMP managers to receive traps (from 1 through 6) by using the appropriate function key. Use the scroll keys, if necessary.

```
         Num Trap Mgrs:1   →
  △    Next    1       2       ⏏

  ◁      F1     F2     F3      ▷
```
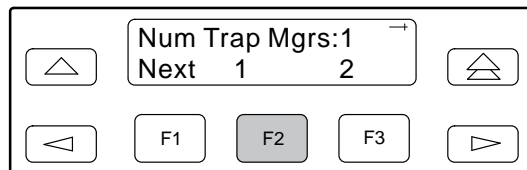
Differences Using the Async Terminal: To set the number of trap managers, select **Trap Options** from the main/configuration/edit/snmp menu. Figure 3-23 shows an example of the screen that appears.

main/configuration/edit/snmp/traps
Customer ID: New Cust   Model: ACCULINK XXXX

Trap Options
Number of Trap Managers: 6

Trap Manager 1 IP Address: <u>000</u>.<u>000</u>.<u>000</u>.<u>000</u>   Clear
Trap Manager 2 IP Address: ___.___.___.___   Clear
Trap Manager 3 IP Address: ___.___.___.___   Clear
Trap Manager 4 IP Address: ___.___.___.___   Clear
Trap Manager 5 IP Address: ___.___.___.___   Clear
Trap Manager 6 IP Address: ___.___.___.___   Clear

General Traps: <u>Both</u>
Enterprise Specific Traps: <u>Enable</u>

Link Traps: <u>Both</u>

Link Trap Interfaces: <u>Both</u>

Save   Edit   Main   Previous   Cntrl–x to Disconnect

Figure 3-23. Trap Options Screen

Configuring an IP Address for SNMP Trap Manager

An IP address must be configured for each SNMP trap manager specified. This configuration option is displayed for the number of trap managers specified by the Number of Trap Managers configuration option.

To configure an IP address for the SNMP trap manager:

1. Press F3 to select Cnfig from the top-level menu screen.
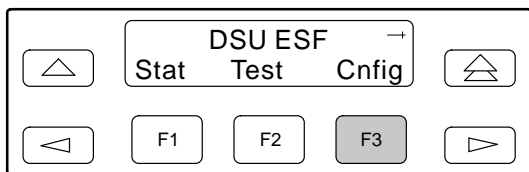
```
          DSU ESF        →
     Stat    Test    Cnfig
       F1      F2      F3
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
     Load from:          →
     Activ   Cust    Fact1
       F1      F2      F3
```

3. Press F1 to select Edit.

```
     Choose Funct:
     Edit    Save
       F1      F2      F3
```

4. Press the ▷ key from the Edit screen to display the SNMP selection.

```
     Edit:              →
     DTE    Port    NET
       F1      F2      F3    ▷
```

5. Press F3 to select SNMP.

```
     Edit:              ←
     User   Alarm   SNMP
       F1      F2      F3
```

6. Press F2 to select Trap from the SNMP Config screen.

```
     SNMP Config:
     Gen    Trap
       F1      F2      F3
```
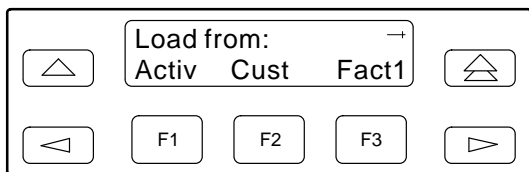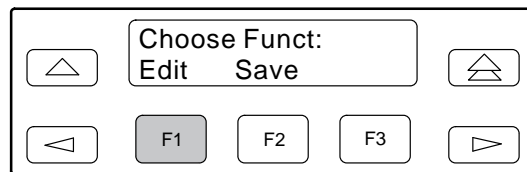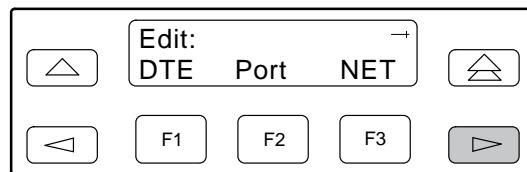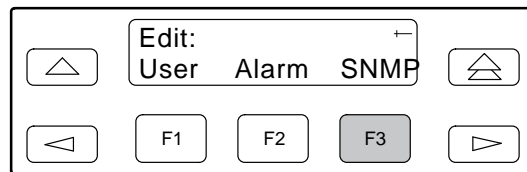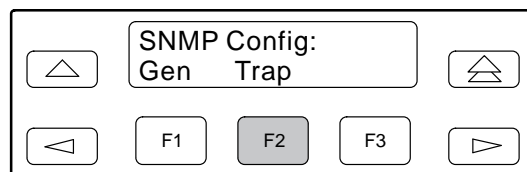
7. Press the F1 (Next) key until the Trap *n* IP Address configuration option appears.
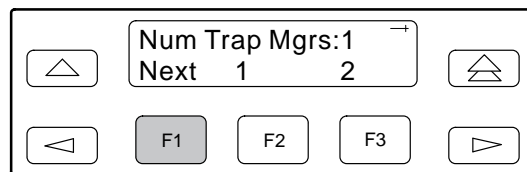
```
     Num Trap Mgrs:1    →
     Next    1       2
       F1      F2      F3
```

8. Press F2 (Edit) to edit the IP address. You have the option of using F3 (Clear) to reset the IP address to the factory default *000.000.000.000*. Refer to the *Setting the IP Address* section earlier in this chapter for more information on setting an IP address.

```
┌─────────────────────────────────┐
│           ┌─────────────────┐    │
│   ┌───┐   │ Trap n IP Adr:  →│  ┌───┐ │
│   │ △ │   │ Next   Edit  Clear│  │ △ │ │
│           └─────────────────┘    │
│                                   │
│   ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐│
│   │ ◁ │  │ F1│  │ F2│  │ F3│  │ ▷ ││
│   └───┘  └───┘  └───┘  └───┘  └───┘│
└─────────────────────────────────┘
```
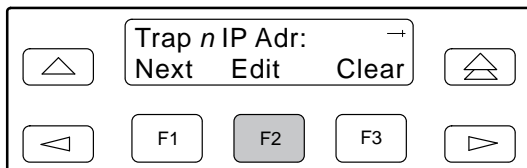
Differences Using the Async Terminal: To set the IP address for the SNMP Trap Manager, select **Trap Options** from the main/configuration/edit/snmp menu. (See Figure 3-23 for an example of the screen that appears.)

Configuring DS0 Channels

The 316x DSU/CSU provides channel configuration options that allow you to do the following:

- Display the DS0 assignments for the Network and DSX-1 Drop/Insert T1 interfaces.

- Allocate DS0 channels on the DSX-1 Drop/Insert T1 interface to the Network interface.

- Allocate DS0 channels on the Network or DSX-1 Drop/Insert T1 interfaces to particular data ports.

- Clear (deallocate) all DS0 channels from the Network or DSX-1 Drop/Insert T1 interfaces.

To allocate DS0 channels, begin by defining logical channel configuration for Network interface, and then the DTE Drop/Insert interface, and then any ports, if desired. See Figure 3-24 for an example of a conceptual diagram of channel configuration.

To complete the configuration worksheets for DS0 channel allocation:

1. Complete the Network T1 Interface and the DSX-1 Drop/Insert Interface tables (unless the DSX-1 Drop/Insert interface is disabled) as shown in Figure 3-25. Figure 3-26 contains a worksheet for specifying which DS0 channels carry Robbed Bit Signaling (RBS) information for voice channels. Figures 3-27 and 3-28 contain a worksheet for allocating data ports.

2. Using the worksheets provided in Appendix G, circle the configuration options needed to implement the logical channel configuration.

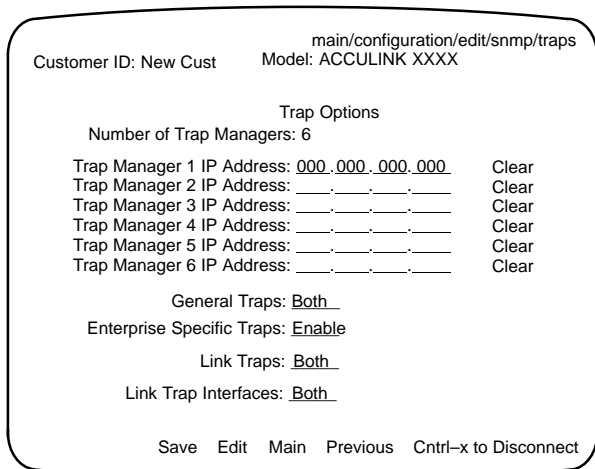Once you have completed the worksheets, enter this information using the front panel of the DSU/CSU or the Async terminal interface. Procedures are listed later in this section; configuration options are listed in Appendix C. For additional worksheets, see Appendix G.

Differences Using the Async Terminal: Menu organization for the async terminal makes the selections for configuring and displaying channels slightly different from the front panel. To edit or display channel configurations, select **Channel** from the main/configuration/edit menu.

The channel menu provides the selection **Display Channels** which combines the **NET** and **DTE** selections found under the **Dsply** selection on the front panel.

Clear NET, **Clear DTE, DTE Assign,** and **DTE Voice** are all individual selections at the channel menu level. The front panel has these selections subleveled with **DTE** and **NET** under **Clear** and **Assign** and **Voice** under **DTE.** The channel menu also provides individual port selections. (See Figures 3-14 and 3-15 for menu hierarchy differences between interfaces.)

DSX-1 INTERFACE

D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
D20
D21
D22
D23
D24

NETWORK INTERFACE

N1
N2
N3
N4
N5
N6
N7
N8
N9
N10
N11
N12
N13
N14
N15
N16
N17
N18
N19
N20
N21
N22
N23
N24

PORTS

PRT 1

PRT 2

PRT 3

PRT 4

493-14340
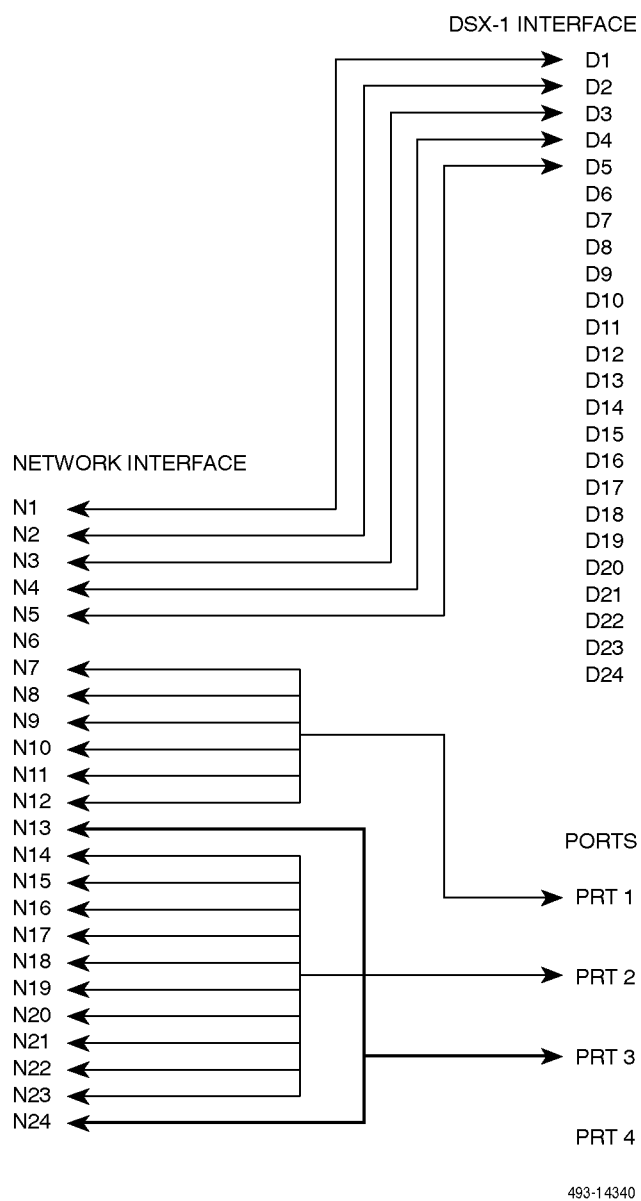
Figure 3-24. Example Channel Allocation

<div align="center">

Network T1 Interface

Network Channel	Allocation
N1	D1
N2	D2
N3	D3
N4	D4
N5	D5
N6	
N7	Prt1
N8	Prt1
N9	Prt1
N10	Prt1
N11	Prt1
N12	Prt1
N13	Prt3
N14	Prt2
N15	Prt2
N16	Prt2
N17	Prt2
N18	Prt2
N19	Prt2
N20	Prt2
N21	Prt2
N22	Prt2
N23	Prt2
N24	Prt3

</div>

<div align="center">

DSX-1 (DTE) Drop/Insert T1 Interface

Drop/Insert Channel	Allocation
D1	N1
D2	N2
D3	N3
D4	N4
D5	N5
D6	
D7	
D8	
D9	
D10	
D11	
D12	
D13	
D14	
D15	
D16	
D17	
D18	
D19	
D20	
D21	
D22	
D23	
D24	

</div>

Allocations

        D1 – D24 indicates allocation to DSX-1
        Drop/Insert T1 channels

        Prt1 – Prt4 indicates allocation to a
        synchronous data port.

Allocations

        N1 – N24 indicates allocation to Network
        T1 Channels

        Prt1 – Prt4 indicates allocation to a
        synchronous data port.

<div align="center">

Figure 3-25. Example Interface Tables

</div>

DTE Chan Config	Assign: (N1 – 24)	Voice (RBS or Data)
D1	N1	RBS
D2	N2	RBS
D3	N3	RBS
D4	N4	RBS
D5	N5	Data
D6		
D7		
D8		
D9		
D10		
D11		
D12		
D13		
D14		
D15		
D16		
D17		
D18		
D19		
D20		
D21		
D22		
D23		
D24		

Figure 3-26. DS0 Channels Containing RBS Information Worksheet

Port Chan Conf	Options		Value
Port 1	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)
Port 2	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)

Figure 3-27. Example Port Channel Configuration Tables (Ports 1 and 2) Worksheet

Port Chan Conf	Options		Value
Port 3	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)
Port 4	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)

Figure 3-28. Example Port Channel Configuration Tables (Ports 3 and 4) Worksheet

Displaying DS0 Channel Assignments

Use the Display command for channel configuration to view how the DS0 channels for either the DSX-1 Drop/Insert T1 interface or the Network interface are currently allocated. The display appears on the front panel LCD.

Line 1 of the display shows the 24 channels of the selected interface. Pressing ◁ or ▷ scrolls the next three channels onto the LCD. Line 2 displays what is allocated to the DS0 channel listed in Line 1. Symbols used in the display are shown in Table 3-8.

Table 3-8
Display Channel Symbols

Symbol	Meaning
–	DS0 channel is not allocated
Prt*n*	DS0 channel is allocated to Port *n*, where *n* is 1, 2, 3, or 4.
N*n*	DS0 channel is allocated to Network T1 interface DS0 channel *n* where *n* can be any number from 1 through 24.
D*n*	DS0 channel is allocated to DSX-1 Drop/Insert T1 interface DS0 channel *n* where *n* can be any number from 1 through 24.

To display the DS0 channel allocation,
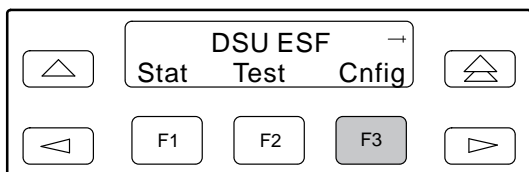
1. Press F3 to select Cnfig from the top-level menu screen.

```
              DSU ESF       →
        Stat     Test    Cnfig
    [△]    [F1]    [F2]    [F3]    [▷]
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
        Load from:          →
        Activ    Cust    Fact1
    [△]    [F1]    [F2]    [F3]    [▷]
```

3. Press F1 to select Edit.

```
        Choose Funct:
        Edit     Save
    [△]    [F1]    [F2]    [F3]    [▷]
```

4. Press the ▷ key from the Edit screen to display the Chan selection.

```
        Edit:               →
        DTE     Port     NET
    [△]    [F1]    [F2]    [F3]    [▷]
```

5. Press F3 to select Chan.

```
        Edit:               ⇄
        Port     NET     Chan
    [△]    [F1]    [F2]    [F3]    [▷]
```
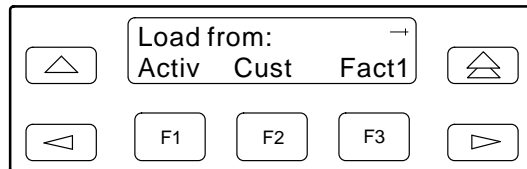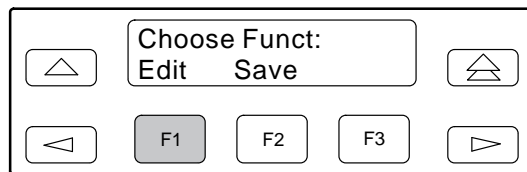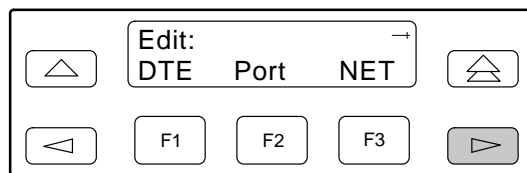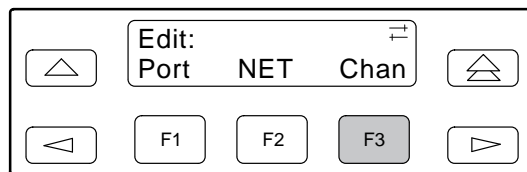
6. From the Channel Config screen, press F1 to select Dsply (display).

```
        Channel Config:     →
        Dsply    Clear    DTE
    [△]    [F1]    [F2]    [F3]    [▷]
```
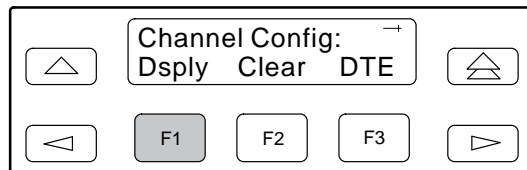
7. From the Display Chan screen, press F1 (NET) to display the channels allocated to the Network T1 interface.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌─────────────────┐   ┌──┐       │
│  │ △│   │ Display Chan:   │   │ ≙│       │
│  └──┘   │ NET    DTE      │   └──┘       │
│         └─────────────────┘              │
│  ┌──┐   ┌────┐  ┌────┐  ┌────┐  ┌──┐     │
│  │ ◁│   │ F1 │  │ F2 │  │ F3 │  │ ▷│     │
│  └──┘   └────┘  └────┘  └────┘  └──┘     │
└─────────────────────────────────────────┘
```
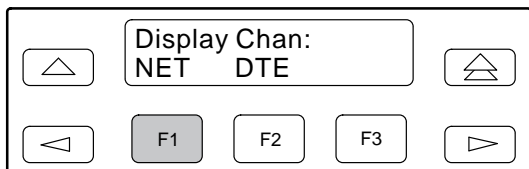
NOTE

If the DSX-1 Drop/Insert T1 Network interface is disabled, the Network T1 interface channels are displayed immediately. The Display Chan screen does not appear.

Or, press F2 (DTE) to display the channels allocated to the DSX-1 Drop/Insert T1 interface.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌─────────────────┐   ┌──┐       │
│  │ △│   │ Display Chan:   │   │ ≙│       │
│  └──┘   │ NET    DTE      │   └──┘       │
│         └─────────────────┘              │
│  ┌──┐   ┌────┐  ┌────┐  ┌────┐  ┌──┐     │
│  │ ◁│   │ F1 │  │ F2 │  │ F3 │  │ ▷│     │
│  └──┘   └────┘  └────┘  └────┘  └──┘     │
└─────────────────────────────────────────┘
```
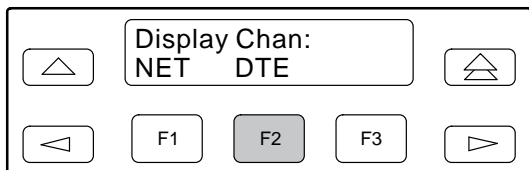
8. If you pressed F1 (NET) the channels allocated to the Network T1 interface are displayed. Line 1 displays the 24 channels for the Network T1 interface, while Line 2 displays what is allocated to the DS0 channel shown in Line 1. Pressing the ◁ or ▷ key scrolls the channels onto the screen in groups of three.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌─────────────────┐   ┌──┐       │
│  │ △│   │ N1    N2    N3 →│   │ ≙│       │
│  └──┘   │ D2    D3    Prt1│   └──┘       │
│         └─────────────────┘              │
│  ┌──┐   ┌────┐  ┌────┐  ┌────┐  ┌──┐     │
│  │ ◁│   │ F1 │  │ F2 │  │ F3 │  │ ▷│     │
│  └──┘   └────┘  └────┘  └────┘  └──┘     │
└─────────────────────────────────────────┘
```
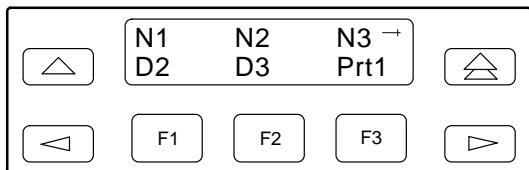
If you pressed F2 (DTE), the channels allocated to the DSX-1 Drop/Insert T1 interface are displayed. Line 1 displays the 24 channels for the DSX-1 Drop/Insert T1 interface, while Line 2 displays what is allocated to the DS0 channel shown in Line 1.

```
┌─────────────────────────────────────────┐
│  ┌──┐   ┌─────────────────┐   ┌──┐       │
│  │ △│   │ D1    D2    D3 →│   │ ≙│       │
│  └──┘   │ −     N1    N2  │   └──┘       │
│         └─────────────────┘              │
│  ┌──┐   ┌────┐  ┌────┐  ┌────┐  ┌──┐     │
│  │ ◁│   │ F1 │  │ F2 │  │ F3 │  │ ▷│     │
│  └──┘   └────┘  └────┘  └────┘  └──┘     │
└─────────────────────────────────────────┘
```
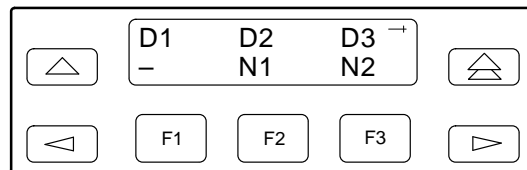
Differences Using the Async Terminal: To display DS0 channel assignments, select **Display Channels** from the main/configuration/edit/channel menu. Figure 3-29 shows an example of the screen that appears. The screen displays both the Network T1 and the DSX-1 Drop/Insert interface channel assignments.

```
                              main/configuration/edit/channel/display
Customer ID: New Cust    Model: ACCULINK XXXX

                         NET

N1: Prt1      N7: D7        N13: D13      N19: D19
N2: Prt1      N8: D8        N14: D14      N20: D20
N3: Prt1      N9: D9        N15: D15      N21: D21
N4: D4        N10: D10      N16: D16      N22: Prt3
N5: D5        N11: D11      N17: −        N23: Prt3
N6: D6        N12: D12      N18: D18      N24: Prt3

                         DTE

D1: N17       D7: N7        D13: N13      D19: N19
D2: Prt2      D8: N8        D14: N14      D20: N20
D3: Prt2      D9: N9        D15: N15      D21: N21
D4: N4        D10: N10      D16: N16      D22: Prt4
D5: N5        D11: N11      D17: −        D23: Prt4
D6: N6        D12: N12      D18: N18      D24: Prt4

              Main    Previous    Cntrl–x to Disconnect
```

Figure 3-29. Display Channels Screen

Allocating Data Ports

You have the capability of assigning a specific port (Prt1...Prt2 for Models 3160/3161, Prt1...Prt4 for Model 3164) to DS0 channels on either the Network interface or the DSX-1 Drop/Insert T1 interface using the configuration options. Three methods are available to assign DS0 channels to the port:

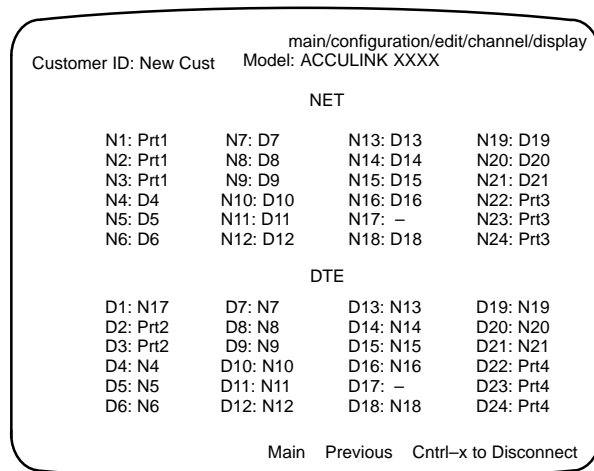**Block** – Allows a block of contiguous channels to be assigned by specifying a data port rate and a starting DS0 channel. The number of channels assigned is determined by the port rate. Only those DS0 channel numbers that provide enough bandwidth (based on the port's data rate) to be used as a starting channel number are displayed on the screen. These channels are automatically assigned to the destination T1 interface when the block method is used and the starting channel is selected.

ACAMI – Allows a block of contiguous channels to be assigned by specifying a data port rate and a starting DS0 channel. However, with ACAMI, the number of channels assigned is twice the number needed for the port rate. This is because with ACAMI, every alternate DS0 channel (starting with the n+1 DS0 channel), does not carry data from the port, but instead always transmits and receives all ones.

Chan – Individually selects the DS0 channels to allocate to the data port. The data port rate is automatically determined based on the number of channels selected.

Once a port is selected, you have access to configuration options to complete the port allocation procedure. These configuration options enable you to,

- Assign the selected port to the desired interface

- Select the desired method for channel allocation

- Select the port rate and starting channel (if the allocation method is block or ACAMI)

NOTE

For the 3164 DSU/CSU, there is a hardware limitation that limits the combined bandwidth used by Port1 and Port3 to a total of 2048 kbps, and the combined bandwidth used by Port2 and Port4 to 2048 kbps. Thus, the rate choices shall be limited appropriately due to this constraint. This limitation should only occur in configurations mapping a port to a port or when mapping ports to the DSX-1 and to the network.

- Select the specific channels if the allocation method is individual channel

These configuration options are explained in detail in Appendix C.

To select the data port,

1. Press F3 to select Cnfig from the top-level menu screen.
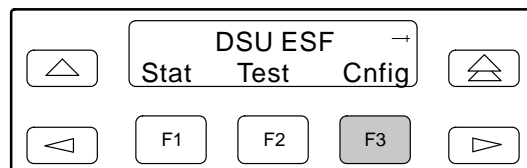
2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

3. Press F1 to select Edit.

```
        Choose Funct:
  △     Edit    Save      △

  ◁      F1      F2      F3      ▷
```

4. Press the ▷ key from the Edit screen to display the Chan selection.

```
        Edit:              →
  △     DTE    Port    NET    △

  ◁      F1      F2      F3      ▷
```

5. Press F3 to select Chan.

```
        Edit:DTE           ⇄
  △     Port   NET    Chan   △

  ◁      F1      F2      F3      ▷
```
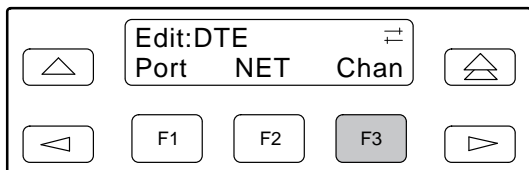
6. From the Channel Config screen, press the ▷ key to scroll the ports onto the screen.

```
        Channel Config:   ⇄
  △     Dsply  Clear   DTE   △

  ◁      F1      F2      F3      ▷
```
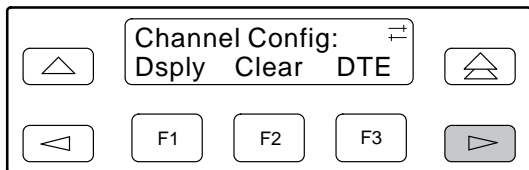
7. Select the desired port by pressing its corresponding Function key.

```
        Channel Config:   ⇄
  △     Prt1    Prt2    Prt3   △

  ◁      F1      F2      F3      ▷
```
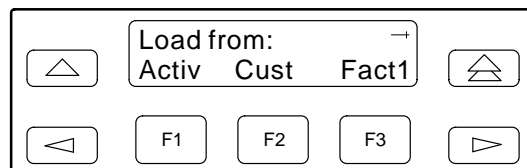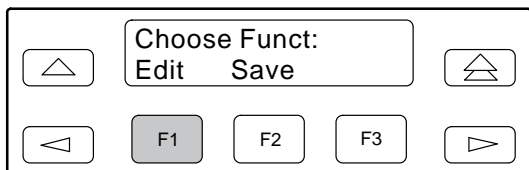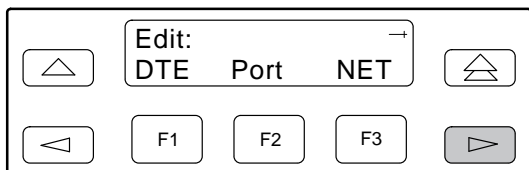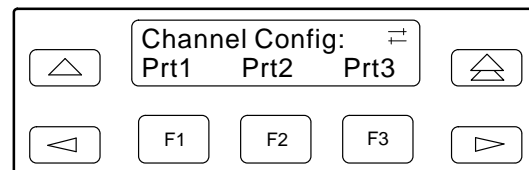
8. The configuration option for the data port channel allocation destination appears on the screen. Press F2 (NET) to assign this port to the Network T1 interface, or F3 (DTE) to assign this port to the DSX-1 Drop/Insert T1 interface.

```
        Assign To:NET      →
  △     Next    NET    DTE   △

  ◁      F1      F2      F3      ▷
```
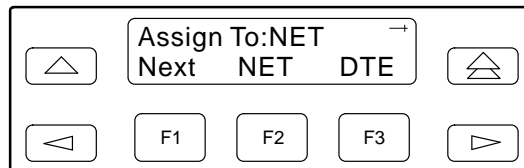
9. Press F1 (Next) to display the appropriate configuration options on the screen. Use one of the following examples, depending on whether you are assigning by block, ACAMI, or i.

Differences Using the Async Terminal: To allocate data ports, choose a port selection from the main/configuration/edit/channel menu. From these screens, you can specify whether the assignment is by block, ACAMI, or individual port.

Block Channel Assignment Method Example

To assign by the block method,

1. The Assign By configuration option screen appears after you select a port. To assign by block, press F2 (Block).

```
        Assign By:Block    →
  △     Next   Block  ACAMI   △

  ◁      F1      F2      F3      ▷
```

2. Press F1 (Next) to display the next configuration option (Port Rate).

```
        Assign By:          →
  △     Next   Block  ACAMI   △

  ◁      F1      F2      F3      ▷
```

3. Use the ◁ or ▷ key to scroll the desired port rate onto the screen. Rates scroll in groups of three. Available selections depend on the current base rate selected for the port. Press the corresponding Function key to select the port rate. Then, select Next to display the Start At configuration option on the screen.

```
       ┌──────────────────────────┐
 ┌───┐ │ Port Rate:384         →  │ ┌───┐
 │ △ │ │ Next    64      128      │ │ ⬆ │
 └───┘ └──────────────────────────┘ └───┘

 ┌───┐  ┌────┐   ┌────┐   ┌────┐   ┌───┐
 │ ◁ │  │ F1 │   │ F2 │   │ F3 │   │ ▷ │
 └───┘  └────┘   └────┘   └────┘   └───┘
```

NOTE

For the 3164 DSU/CSU, there is a hardware limitation that limits the combined bandwidth used by Port1 and Port3 to a total of 2048 kbps, and the combined bandwidth used by Port2 and Port4 to 2048 kbps. Thus, the rate choices shall be limited appropriately due to this constraint. This limitation should only occur in configurations mapping a port to a port or when mapping ports to the DSX-1 and to the network.

---

4. The Start At screen displays the configuration option used to select the starting DS0 channel. If the destination selected is the Network T1 interface, then the Network channels appear on the screen. If the destination selected is the DSX-1 DSX-1 Drop/Insert T1 interface, then the these channels appear on the screen. The following screen shows an example of the Network T1 interface. Use the ◁ or ▷ key to scroll the desired channel onto the screen. Use the Function keys to select the starting channel. Only those DS0 channel numbers that provide enough bandwidth (based on the configured data rate) to be used as a starting channel number are displayed. Channel allocation for this port only can be cleared by selecting Clear.

```
       ┌──────────────────────────┐
 ┌───┐ │ Start At:Clear        →  │ ┌───┐
 │ △ │ │ Next    Clear    N1      │ │ ⬆ │
 └───┘ └──────────────────────────┘ └───┘

 ┌───┐  ┌────┐   ┌────┐   ┌────┐   ┌───┐
 │ ◁ │  │ F1 │   │▓F2▓│   │ F3 │   │ ▷ │
 └───┘  └────┘   └────┘   └────┘   └───┘
```

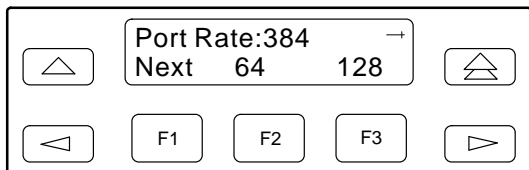## *ACAMI Channel Assignment Method Example*

The Assign By configuration option screen appears after you select a port. To assign by the ACAMI method,

1. Press F3 (ACAMI).

```
       ┌──────────────────────────┐
 ┌───┐ │ Assign By:Block       →  │ ┌───┐
 │ △ │ │ Next   Block  ACAMI      │ │ ⬆ │
 └───┘ └──────────────────────────┘ └───┘

 ┌───┐  ┌────┐   ┌────┐   ┌────┐   ┌───┐
 │ ◁ │  │ F1 │   │ F2 │   │▓F3▓│   │ ▷ │
 └───┘  └────┘   └────┘   └────┘   └───┘
```

2. Press F1 (Next) to display the next configuration option (Port Rate).

```
       ┌──────────────────────────┐
 ┌───┐ │ Assign By:ACAMI       →  │ ┌───┐
 │ △ │ │ Next   Block  ACAMI      │ │ ⬆ │
 └───┘ └──────────────────────────┘ └───┘

 ┌───┐  ┌────┐   ┌────┐   ┌────┐   ┌───┐
 │ ◁ │  │▓F1▓│   │ F2 │   │ F3 │   │ ▷ │
 └───┘  └────┘   └────┘   └────┘   └───┘
```
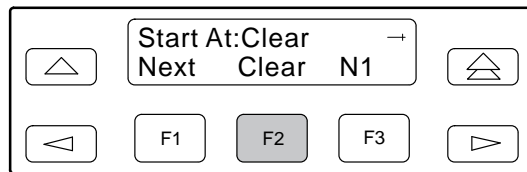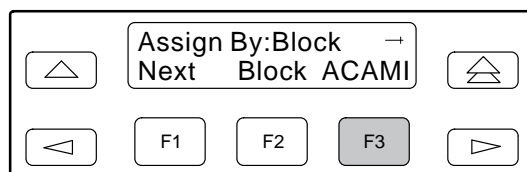
3. Use the ◁ or ▷ key to scroll the desired port rate onto the screen. Rates scroll in groups of three. Available selections depend on the current base rate selected for the port. Press the corresponding Function key to select the port rate. Then, select Next to display the Start At configuration option on the screen.

```
       ┌──────────────────────────┐
 ┌───┐ │ Port Rate:384         →  │ ┌───┐
 │ △ │ │ Next    64      128      │ │ ⬆ │
 └───┘ └──────────────────────────┘ └───┘

 ┌───┐  ┌────┐   ┌────┐   ┌────┐   ┌───┐
 │ ◁ │  │ F1 │   │ F2 │   │ F3 │   │ ▷ │
 └───┘  └────┘   └────┘   └────┘   └───┘
```

4. The Start At screen displays the configuration option used to select the starting DS0 channel. If the destination selected is the Network T1 interface, then the Network channels appear on the screen. If the destination selected is the DSX-1 DS-1 Drop/Insert T1 interface, then these channels appear on the screen. The following screen shows an example of the Network T1 interface. Use the ◁ or ▷ key to scroll the desired channel onto the screen. Use the Function keys to select the starting channel. Only those DS0 channel numbers that provide enough bandwidth (based on the configured data rate) to be used as a starting channel number are displayed.

```
┌──────────────────────────────────────┐
│        ┌───────────────────────┐      │
│  ┌───┐ │ Start At:Clear     →  │ ┌───┐│
│  │ △ │ │ Next    Clear   N1    │ │ ⬗ ││
│  └───┘ └───────────────────────┘ └───┘│
│  ┌───┐  ┌────┐  ┌────┐  ┌────┐  ┌───┐ │
│  │ ◁ │  │ F1 │  │ F2 │  │ F3 │  │ ▷ │ │
│  └───┘  └────┘  └────┘  └────┘  └───┘ │
└──────────────────────────────────────┘
```
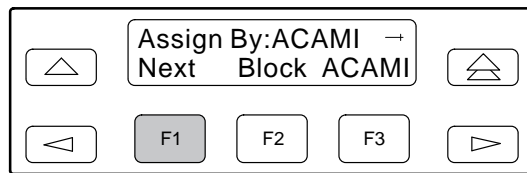
Individual Channel Assignment Method Example

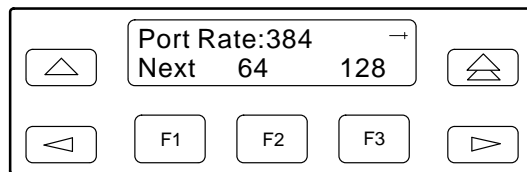The Assign By configuration option screen appears after you select a port. To assign by the individual channel method,
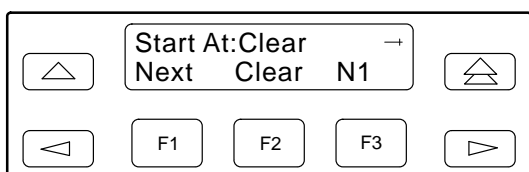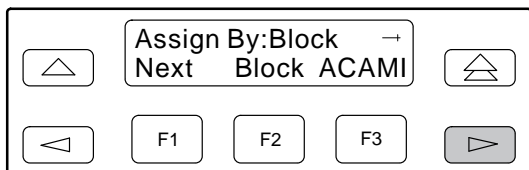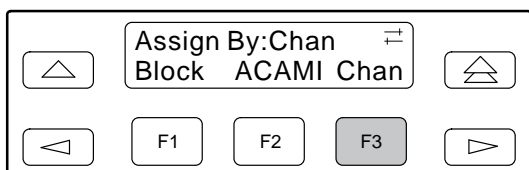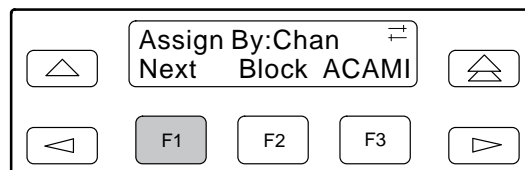
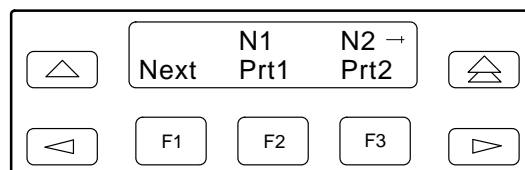1. Press the ▷ key once to bring the Chan selection onto the screen.

```
┌──────────────────────────────────────┐
│        ┌───────────────────────┐      │
│  ┌───┐ │ Assign By:Block    →  │ ┌───┐│
│  │ △ │ │ Next  Block  ACAMI    │ │ ⬗ ││
│  └───┘ └───────────────────────┘ └───┘│
│  ┌───┐  ┌────┐  ┌────┐  ┌────┐  ┌───┐ │
│  │ ◁ │  │ F1 │  │ F2 │  │ F3 │  │ ▷ │ │
│  └───┘  └────┘  └────┘  └────┘  └───┘ │
└──────────────────────────────────────┘
```

2. Press F3 (Chan).

```
┌──────────────────────────────────────┐
│        ┌───────────────────────┐      │
│  ┌───┐ │ Assign By:Chan     ⇄  │ ┌───┐│
│  │ △ │ │ Block  ACAMI  Chan    │ │ ⬗ ││
│  └───┘ └───────────────────────┘ └───┘│
│  ┌───┐  ┌────┐  ┌────┐  ┌────┐  ┌───┐ │
│  │ ◁ │  │ F1 │  │ F2 │  │ F3 │  │ ▷ │ │
│  └───┘  └────┘  └────┘  └────┘  └───┘ │
└──────────────────────────────────────┘
```

3. Press F1 (Next) to display the next configuration option (channel allocation).

```
┌──────────────────────────────────────┐
│        ┌───────────────────────┐      │
│  ┌───┐ │ Assign By:Chan     ⇄  │ ┌───┐│
│  │ △ │ │ Next  Block  ACAMI    │ │ ⬗ ││
│  └───┘ └───────────────────────┘ └───┘│
│  ┌───┐  ┌────┐  ┌────┐  ┌────┐  ┌───┐ │
│  │ ◁ │  │ F1 │  │ F2 │  │ F3 │  │ ▷ │ │
│  └───┘  └────┘  └────┘  └────┘  └───┘ │
└──────────────────────────────────────┘
```

4. Line 1 displays the 24 channels for the Network T1 interface or the DSX-1 Drop/Insert T1 interface, depending on which destination was chosen. This example assumes that the Network T1 interface is the destination. Line 2 displays what is allocated to the DS0 channel shown in Line 1. Pressing the ◁ or ▷ key scrolls the channels onto the screen in groups of three. Possible values for Line 2 are listed in Table 3-7. Select the channel by pressing the Function key under the desired number. Port*n* appears. The port is assigned to that channel. To unallocate a port, press the Function key under that port number. Pressing the Function key under channels assigned to other ports has no effect.

```
┌──────────────────────────────────────┐
│        ┌───────────────────────┐      │
│  ┌───┐ │       N1      N2   →  │ ┌───┐│
│  │ △ │ │ Next  Prt1    Prt2    │ │ ⬗ ││
│  └───┘ └───────────────────────┘ └───┘│
│  ┌───┐  ┌────┐  ┌────┐  ┌────┐  ┌───┐ │
│  │ ◁ │  │ F1 │  │ F2 │  │ F3 │  │ ▷ │ │
│  └───┘  └────┘  └────┘  └────┘  └───┘ │
└──────────────────────────────────────┘
```
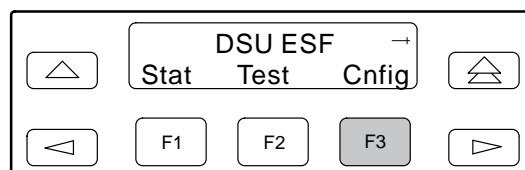
Allocating DS0 Channels from the DSX-1 Drop/Insert T1 Interface to the Network T1 Interface
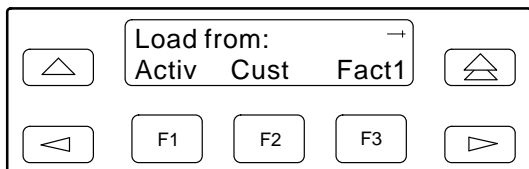
You can allocate DS0 channels from the DSX-1 Drop/Insert T1 interface to the Network interface and specify which DS0 channels carry Robbed Bit Signaling (RBS) information for voice channels.

To allocate DS0 channels from the DSX-1 Drop/Insert T1 interface to the Network interface,

1. Press F3 to select Cnfig from the top-level menu screen.

```
┌──────────────────────────────────────┐
│        ┌───────────────────────┐      │
│  ┌───┐ │     DSU ESF        →  │ ┌───┐│
│  │ △ │ │ Stat   Test   Cnfig   │ │ ⬗ ││
│  └───┘ └───────────────────────┘ └───┘│
│  ┌───┐  ┌────┐  ┌────┐  ┌────┐  ┌───┐ │
│  │ ◁ │  │ F1 │  │ F2 │  │ F3 │  │ ▷ │ │
│  └───┘  └────┘  └────┘  └────┘  └───┘ │
└──────────────────────────────────────┘
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.

```
Load from:        →
Activ   Cust   Fact1
```
F1   F2   F3

3. Press F1 to select Edit.

```
Choose Funct:
Edit    Save
```
F1   F2   F3

4. Press the ▷ key from the Edit screen to display the Chan selection.

```
Edit:             →
DTE     Port    NET
```
F1   F2   F3   **▷**

5. Press F3 to select Chan.

```
Edit:            ⇄
Port    NET    Chan
```
F1   F2   **F3**

6. From the Channel Config screen, press F3 to select DTE.

```
Channel Config:   →
Dsply   Clear   DTE
```
F1   F2   **F3**
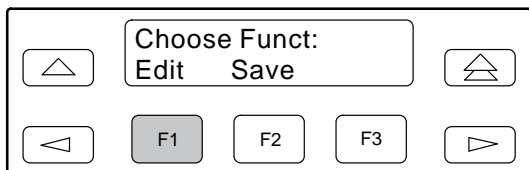
7. From the DTE Channels screen, press F1 to select Assign.

```
DTE Channels:
Assign  Voice
```
F1   F2   F3
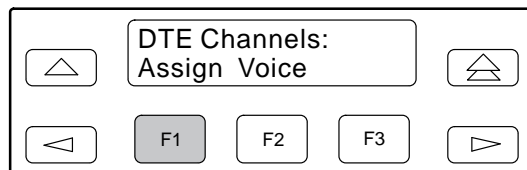
8. Press the Function key below the network channel desired. Each time that you press the Function key, the DTE channel number will scroll up one number. If the network channel is currently unassigned, ("–" is displayed on Line 2), the DTE channel number initially displays the same number as the corresponding network channel number. However, if the network channel is currently assigned, the DTE channel number is shown as D*n*. Pressing the Function key for D24 wraps the display back to D1. Only those channels that are not already assigned will appear on the LCD when scrolling. The network channels assigned to ports (P1...P4) are unavailable for assignment.

```
N1      N2      N3   →
D1      D2      –
```
F1   F2   F3
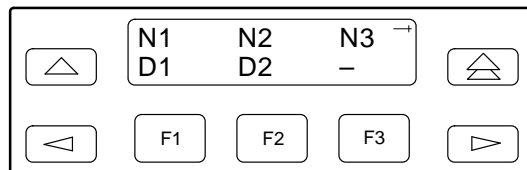
Differences Using the Async Terminal: To allocate DS0 channels from the DSX-1 Drop/Insert T1 interface to the Network interface, select **DTE Assign** from the main/configuration/edit/channel menu. Figure 3-30 shows an example of the DTE Assignment screen.
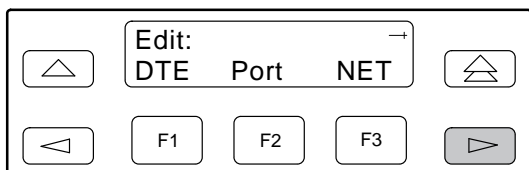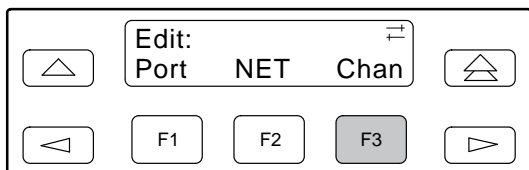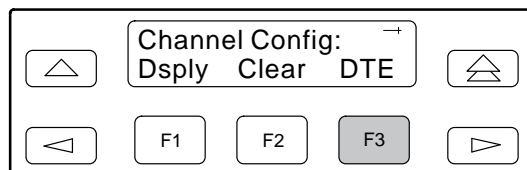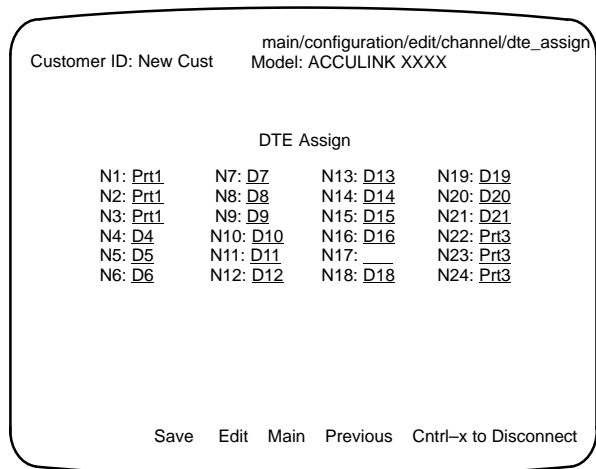
```
                        main/configuration/edit/channel/dte_assign
Customer ID: New Cust   Model: ACCULINK XXXX


                        DTE Assign

   N1: Prt1    N7: D7     N13: D13    N19: D19
   N2: Prt1    N8: D8     N14: D14    N20: D20
   N3: Prt1    N9: D9     N15: D15    N21: D21
   N4: D4      N10: D10   N16: D16    N22: Prt3
   N5: D5      N11: D11   N17: ___    N23: Prt3
   N6: D6      N12: D12   N18: D18    N24: Prt3




        Save   Edit   Main   Previous   Cntrl–x to Disconnect
```

Figure 3-30. DTE Assignment Screen

To specify DSX-1 Drop/Insert channels used to carry voice information,

1. Press △ from the channel allocation screen to return to the DTE Channels screen.

```
   [△]    N1      N2      N3  →    [△]
          D1      D2      –

   [◁]   [ F1 ]  [ F2 ]  [ F3 ]   [▷]
```
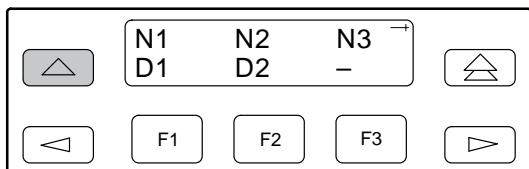
2. From the DTE Channels screen, press F2 to select Voice.

```
   [△]    DTE Channels:           [△]
          Assign  Voice

   [◁]   [ F1 ]  [ F2 ]  [ F3 ]   [▷]
```
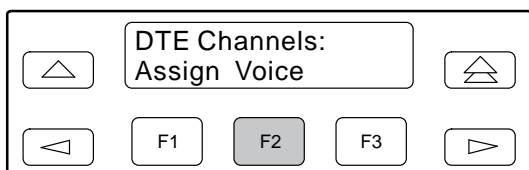
3. Press the Function key below the network channel desired. Line 1 displays the 24 DS0 channels for the DSX-1 Drop/Insert T1 interface. These channels scroll onto the LCD three at a time each time that the ◁ or ▷ key is pressed. Line 2 displays whether the DS0 channel in Line 1 is a data channel "Data" or a voice "RBS" channel. Each time that you press the Function key located below the desired channel, the display in Line 2 toggles between Data and RBS.

```
   [△]    D1      D2      D3  →    [△]
          RBS     RBS     RBS

   [◁]   [ F1 ]  [ F2 ]  [ F3 ]   [▷]
```
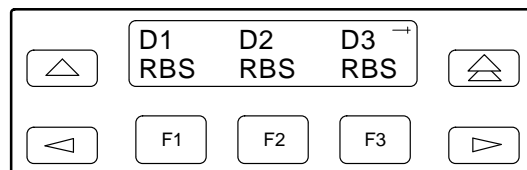
Differences Using the Async Terminal: To specify DSX-1 Drop/Insert channels used to carry voice information, select **DTE Voice** from the main/configuration/edit/channel menu. Figure 3-31 shows an example of the DTE Voice Assignment screen.

```
                        main/configuration/edit/channel/dte_voice
Customer ID: New Cust   Model: ACCULINK XXXX

                        DTE Voice

   D1: Data    D7: Data    D13: Data    D19: RBS
   D2: Data    D8: Data    D14: Data    D20: RBS
   D3: Data    D9: Data    D15: Data    D21: RBS
   D4: RBS     D10: RBS    D16: Data    D22: Data
   D5: RBS     D11: RBS    D17: Data    D23: Data
   D6: RBS     D12: RBS    D18: Data    D24: Data




        Save   Edit   Main   Previous   Cntrl–x to Disconnect
```
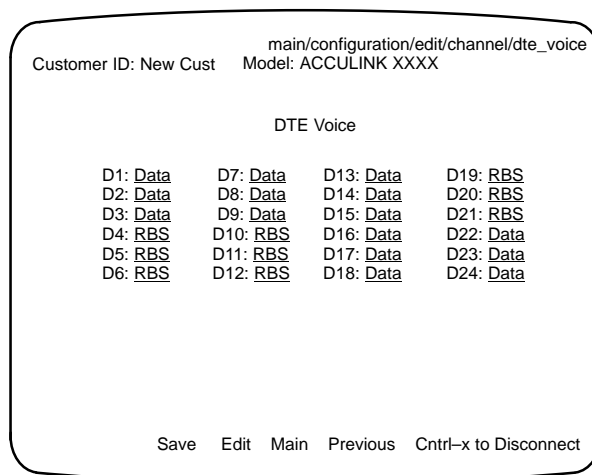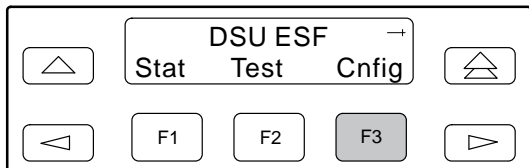
Figure 3-31. DTE Voice Assignment Screen
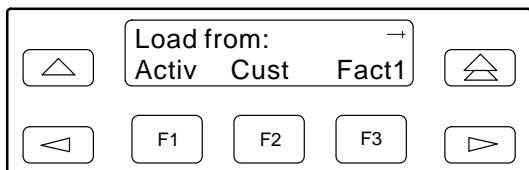
Clearing DS0 Channel Allocation

You can clear (unallocate) all the DS0 channels currently allocated to either the Network T1 interface or the DSX-1 Drop/Insert T1 interface.
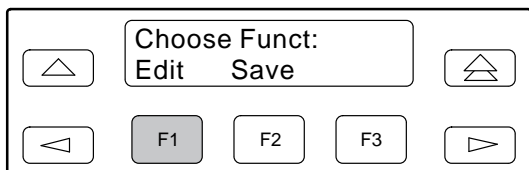
To clear DS0 channel allocation,

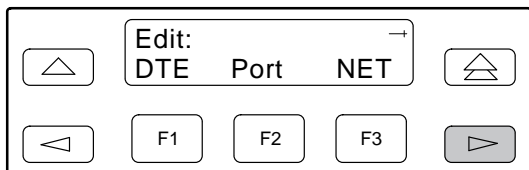1. Press F3 to select Cnfig from the top-level menu screen.

```
          DSU ESF        →
      Stat   Test   Cnfig

      F1      F2      F3
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.
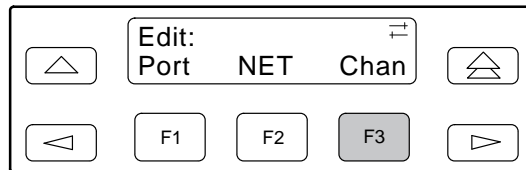
```
      Load from:         →
      Activ   Cust   Fact1

      F1      F2      F3
```

3. Press F1 to select Edit.

```
      Choose Funct:
      Edit   Save

      F1      F2      F3
```

4. Press the ▷ key from the Edit screen to display the Chan selection.

```
      Edit:              →
      DTE   Port   NET

      F1     F2     F3    ▷
```

5. Press F3 to select Chan.

```
      Edit:              ⇄
      Port   NET   Chan

      F1     F2     F3
```

6. From the Channel Config screen, press F2 to select Clear.

```
      Channel Config:    →
      Dsply   Clear   DTE

      F1      F2      F3
```
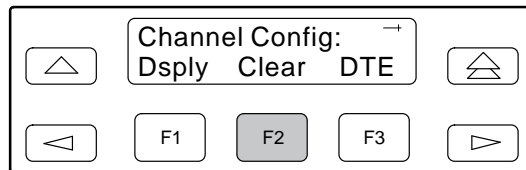
7. From the Clear Channel screen, press F1 (NET) to clear all DS0 channels assigned to the Network T1 interface. Or, press F2 (DTE) to clear all DS0 channels assigned to the DSX-1 Drop/Insert T1 interface.

```
      Clear Channel:
      NET    DTE

      F1     F2     F3    ▷
```
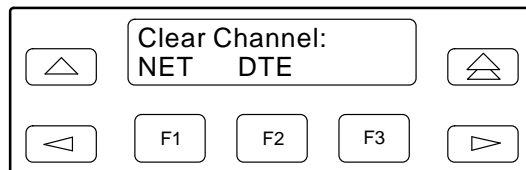
Differences Using the Async Terminal: To clear DS0 channel allocations, use the appropriate clear selections on the main/configuration/edit/channel menu. See the async terminal menu hierarchy (Figure 3-15) for the Clear selections.

Timing

The 316x DSU/CSU provides the ability to select a master clock (timing) source that is used to synchronize all of the T1 and data port interfaces on the DSU/CSU. When a master clock source is selected, the DSU/CSU will synchronize to the master clock and derive clocking for all of the interfaces on the DSU/CSU. The clock for each interface will be at the appropriate rate for that interface (e.g., 1.544 Mbps for the T1 interfaces, the configured port rate for the data ports) and independent of the master clock rate. This means that the master clock rate and the DSU/CSU interface rates may be different. The DSU/CSU will automatically fall back to the internal master clock when a failure of the selected master clock is detected.

> **NOTE**
>
> For Model 3161 DSU/CSUs, the external clock provides timing for up to eight slots in the carrier. Each Auxiliary Backplane must have its own external clock input.

The DSU/CSU clock source configuration option enables you to select one of five sources for the master clock, either the Network T1 interface, the DSX-1 Drop/Insert T1 interface, Port 1, internal clock, or external clock. If external clocking is selected, you must use the clock rate configuration option to specify the clock rate. Two examples for configuring timing are given below. For more information on the configuration options, refer to Appendix C. Figure 3-32 shows some common clocking configurations.

496-14341a-01

Figure 3-32. Common Clocking Configurations

Configuring for Network Timing Example

To configure network timing,

1. Press F3 to select Cnfig from the top-level menu screen.

```
          DSU ESF        →
     Stat    Test    Cnfig
   △                      △
   ◁    F1     F2    [F3]    ▷
```

2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.
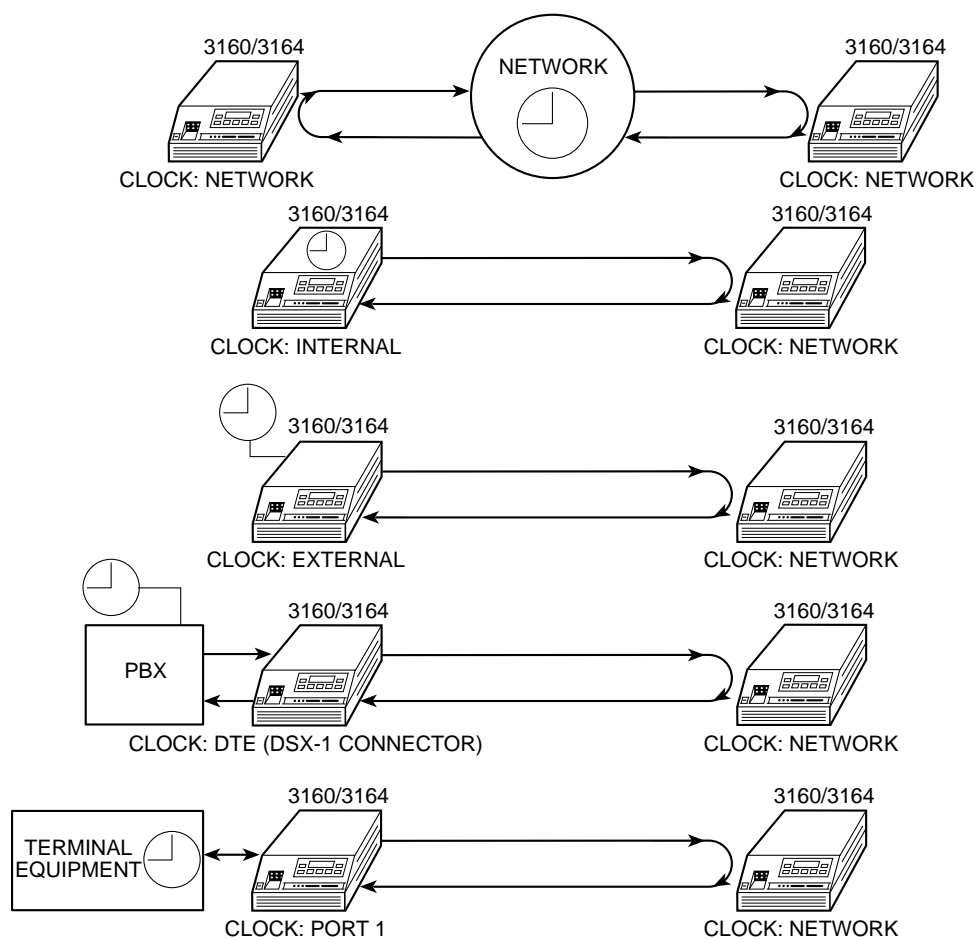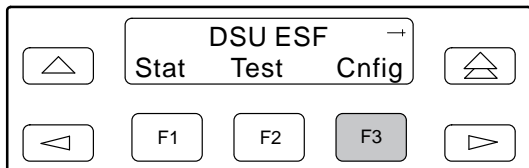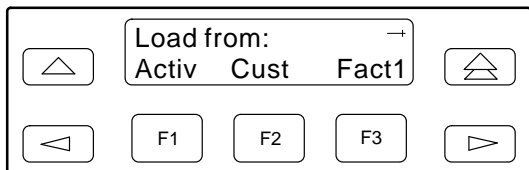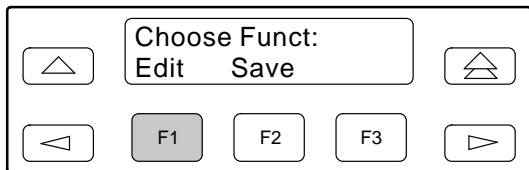
```
     Load from:         →
     Activ   Cust    Fact1
   △                      △
   ◁    F1     F2     F3     ▷
```

3. Press F1 to select Edit.

```
     Choose Funct:
     Edit    Save
   △                      △
   ◁   [F1]    F2     F3     ▷
```

4. From the Edit screen, press the ▷ key twice to bring the Gen selection onto the screen.

```
     Edit:              →
     DTE    Port    NET
   △                      △
   ◁    F1     F2     F3    [▷]
```

5. Press F3 to select Gen for the general configuration options.

```
     Edit:              ⇄
     NET    Chan    Gen
   △                      △
   ◁    F1     F2    [F3]    ▷
```

6. The Generate Yellow Alarm configuration option displays first. Press F1 (Next) once to display the DSU/CSU Clock Source configuration option.

```
     GenYellow:Enab     →
     Next    Enab   Disab
   △                      △
   ◁   [F1]    F2     F3     ▷
```
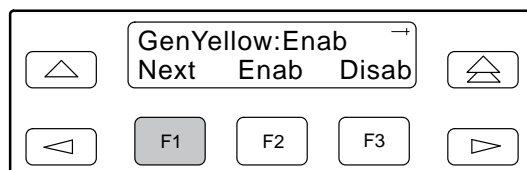
7. Select the master clock source. For network, press F2 (note that network is also the default).
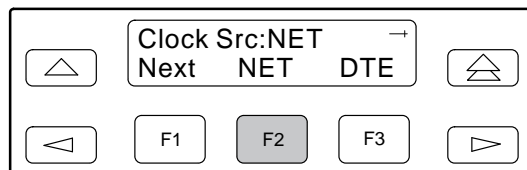
```
     Clock Src:NET      →
     Next    NET    DTE
   △                      △
   ◁    F1    [F2]    F3     ▷
```

Differences Using the Async Terminal: To configure network timing, select **General** from the main/configuration/edit menu.

Configuring for External Timing Example

To configure network timing,

1. Press F3 to select Cnfig from the top-level menu screen.

```
        DSU ESF        →
    Stat    Test    Cnfig
   ◁    F1    F2    [F3]    ▷
```
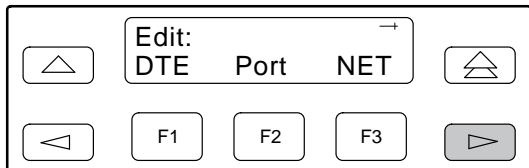
2. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.
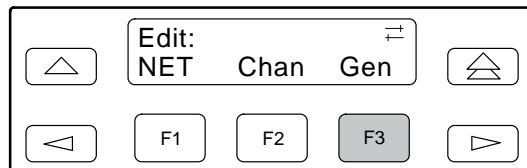
```
    Load from:        →
    Activ   Cust   Fact1
   ◁    F1    F2    F3    ▷
```

3. Press F1 to select Edit.

```
    Choose Funct:
    Edit    Save
   ◁    [F1]    F2    F3    ▷
```

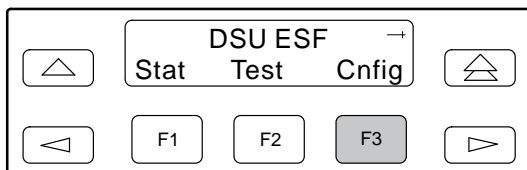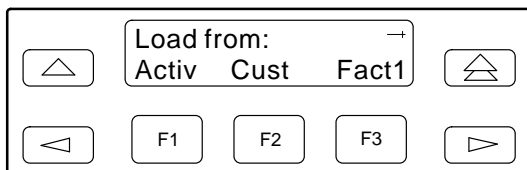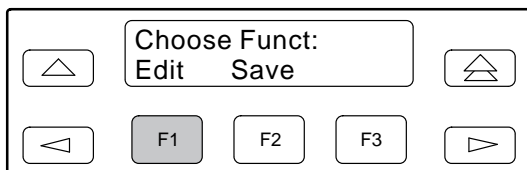4. From the Edit screen, press the ▷ key twice to bring the Gen selection onto the screen.

```
    Edit:            →
    DTE    Port    NET
   ◁    F1    F2    F3    [▷]
```

5. Press F3 to select Gen for the general configuration options.

```
    Edit:            ⇄
    NET    Chan    Gen
   ◁    F1    F2    [F3]    ▷
```

6. The Generate Yellow Alarm configuration option displays first. Press F1 (next) once to display the DSU/CSU Clock Source configuration option.

```
    GenYellow:Enab    →
    Next    Enab    Disab
   ◁    [F1]    F2    F3    ▷
```
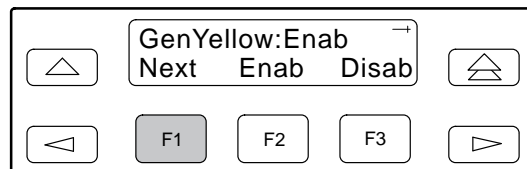
7. Select the master clock source. For external, press the ▷ key three times to scroll the Ext selection onto the screen.

```
    Clock Src:NET     →
    Next    NET    DTE
   ◁    F1    F2    F3    [▷]
```
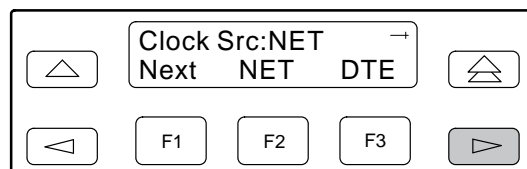
8. Press F3 to select external timing.

```
    Clock Src:NET     ⇄
    Prt1    Int    Ext
   ◁    F1    F2    [F3]    ▷
```
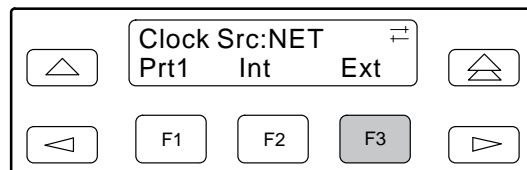
9. Select the appropriate external clock rate by pressing the corresponding Function key. This step is mandatory if you have chosen external clocking.
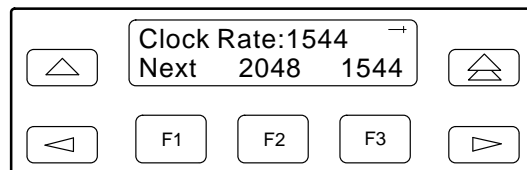
```
    Clock Rate:1544   →
    Next   2048   1544
   ◁    F1    F2    F3    ▷
```

Differences Using the Async Terminal: To configure network timing, select **General** from the main/ configuration/edit menu.

Selecting the Shared Communication Port

Communication between the Model 3161 DSU/CSUs in the 3000 Series Carrier and an external PC (attached either locally or through an external modem) occurs through a shared communication (COM) port (refer to the *COMSPHERE 3000 Series Carrier Installation Manual* for cabling information). Unlike standalone Models 3160/3164 DSU/CSUs, the Model 3161 DSU/CSUs do not have a dedicated COM port for external access. Therefore, one circuit card in the carrier must be selected as the Master Communication Unit, which provides the COM port for all circuit cards in the carrier. Once configured as such, the Master Communication Unit differs from circuit cards in the carrier because it now has COM port configuration options that can be selected. These options are used to configure Port 2 on the Auxiliary Backplane as the COM port for the carrier.

NOTE

If a Model 3161 DSU/CSU is configured as the Master Communication Unit, Port 2 cannot be used as a data port.

To select the Master Communication Unit for the carrier,

1. Use the Select button on the SDCP to choose the desired unit in the carrier (see *Selecting a Model 3161 DSU/CSU* in Chapter 2, *Installation*).

2. Press F3 to select Config from the top-level menu screen.

   ```
   1:01    DSU ESF    →
   Stat    Test    Cnfig
           F1    F2    F3
   ```
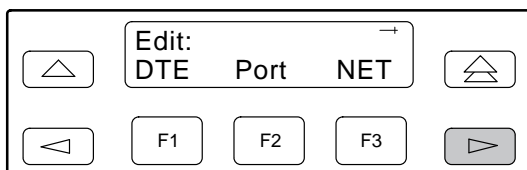
3. Select the configuration option set to be copied into the Edit area by using the appropriate function key. Use the scroll keys, if necessary.
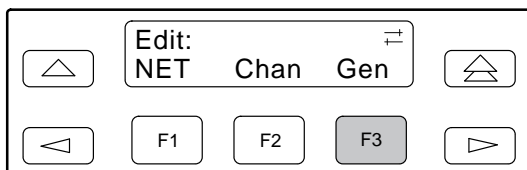
   ```
   Load from:        →
   Activ   Cust   Fact1
           F1    F2    F3
   ```
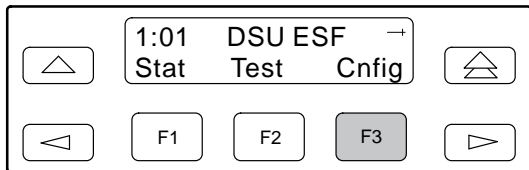
4. Press F1 to select Edit.

   ```
   Choose Funct:
   Edit    Save
           F1    F2    F3
   ```
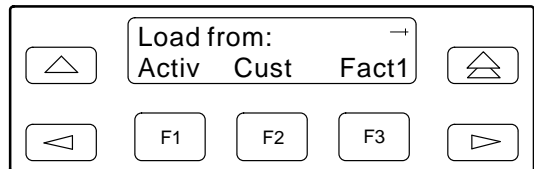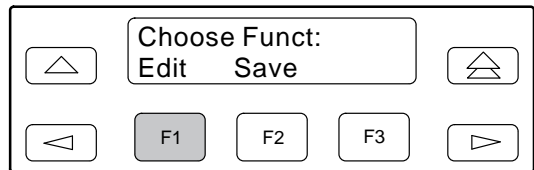
5. From the Edit screen, press the ▷ key until the User selection appears on the screen.

   ```
   Edit:
   DTE    Port    Net
           F1    F2    F3    ▷
   ```

6. Press F3 to select User.

   ```
   Edit:             →
   Chan    Gen    User
           F1    F2    F3
   ```
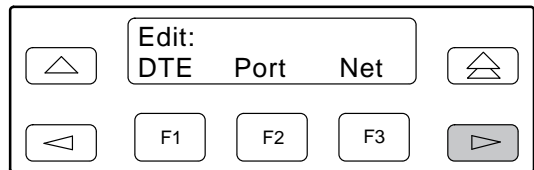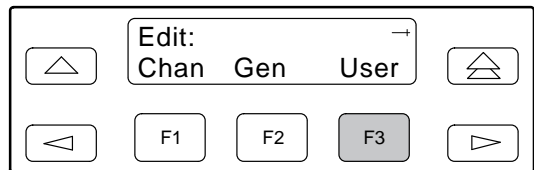
7. Press F1 (Next) until the MasterCom configuration option appears on the screen.

   ```
   Self−Test:Enab    →
   Next    Enab    Disab
           F1    F2    F3
   ```
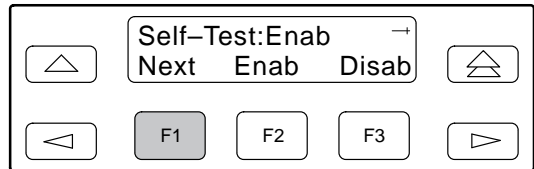
8. Press F2 to select Enab.

Checking the Status of the DSU/CSU

You can request various types of status information from the 316x DSU/CSU's front panel. Access this information from the Status branch of the front panel menu tree (see Figure 3-33).

Figure 3-33. Status Branch
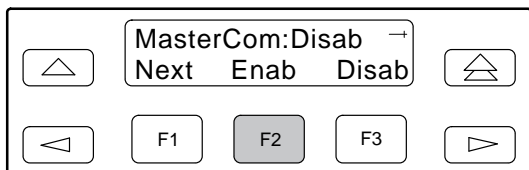
Differences Using the Async Terminal: Figure 3-34 shows the menu hierarchy for the Status branch when using the async terminal.
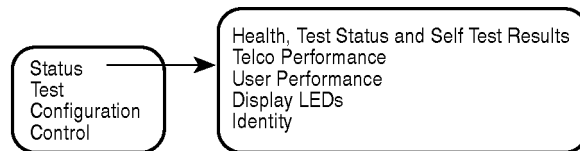
Figure 3-34. Async Terminal Status Branch

Device Health and Status

Use the Device Health and Status branch to view current health and status information of the DSU/CSU. When you access this branch, one or more status messages display in priority order (highest to lowest) on Line 2 of the LCD. On the front panel, use the scroll keys to view any additional messages. Table 3-9 lists these messages in priority order.

The DSU/CSU is polled for current status every ten seconds. If the status has changed from the last poll, the Health and Status screen is updated and the highest priority message is redisplayed. The message **DSU/CSU Operational** appears when there are no other messages.

Differences Using the Async Terminal: The menu structure for the Status branch changes slightly from the front panel to allow you to display health and status information from one screen. To do this, select **Health, Test Status**, and **Self Test Results** from the main/status menu. Figure 2-10 in Chapter 2 shows an example of this results screen.

Table 3-9
Health and Status Messages

Message	Description
LOS at Net	A Loss Of Signal (LOS) condition (declared after 175 consecutive zeros) has been detected on the network interface. The condition is cleared when the density of ones to zeros received is 12.5%.
LOS at DTE	An LOS condition (declared after 175 consecutive zeros) has been detected on the DSX-1 interface. The condition is cleared when the density of ones to zeros received is 12.5%.
OOF at Net	An Out Of Frame (OOF) condition (2 out of 4 frame synchronization bits in error) has been detected on the network interface. The condition is cleared when a reframe occurs.
OOF at DTE	An Out Of Frame has been detected on the DSX-1 interface. The condition is cleared when a reframe occurs.
AIS at Net	An Alarm Indication Signal (unframed all ones signal) is being received by the network interface.
AIS at DTE	An Alarm Indication Signal is being received by the DSX-1 interface.
EER at Net	The error rate of the received network signal exceeds the currently configured threshold (if the network is configured for ESF framing). The condition is cleared when the error rate falls below the threshold value.
Yellow at Net	A yellow alarm signal is being received by the network interface.
Yellow at DTE	A yellow alarm signal is being received by the DSX-1 interface.
Selftest failed	A failure was detected during the power-on self-test. Select STest under the Stat branch to display more information about the failure.
DevFail ########	An internal error has been detected by the operating software. An 8-digit code appears for use by service personnel. The condition is cleared by resetting the device.
Download failed	A download attempt was interrupted and failed to complete. The condition is cleared by resetting the device.
Alrm Retry Disab	Appears only if an alarm message attempts to exceed the maximum number of alarm retries.
Test in progress	A test is currently active. Select Tstat under the Stat branch to display more information about the test.
Modem Connected	The integral modem is currently connected. This message is only displayed for 3160/3164 DSU/CSUs.
Master Clk fail	The master clock has failed. Timing for the DSU/CSU is provided by the internal clock.
SNMP Link Down	The currently configured SNMP management link is down, allowing no communication between the management system and the device. If the management link is configured on the MODEM port, the modem must be currently connected for this message to display.

Displaying Device Health and Status

To display device health and status,

1. Press F1 to select Stat from the top-level menu screen.

```
        DSU ESF          →
  △   Stat    Test   Cnfig   ⬔
  ◁     F1      F2      F3    ▷
```
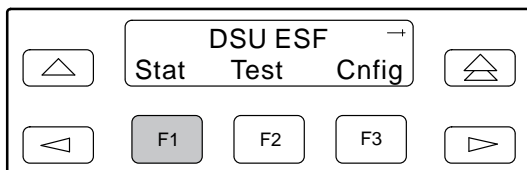
2. From the Status screen, press F1 to select DevHS.

```
   Status:              →
  △ DevHS STest    Perf     ⬔
  ◁     F1      F2      F3    ▷
```
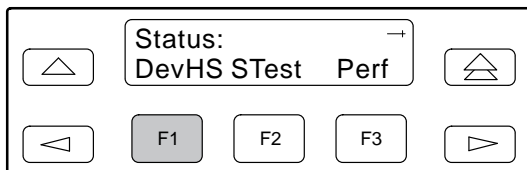
Alarm/status messages appear on Line 2 of the LCD in priority order (highest to lowest).

3. Use the scroll keys, if necessary, to scroll additional device health and status messages onto the LCD.

```
   Device H/S:          →
  △ OOF at DTE              ⬔
  ◁     F1      F2      F3    ▷
```
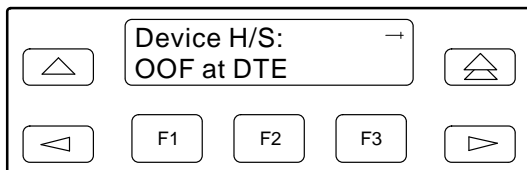
The Auto Device Health and Status screen appears when there is no activity (no keys pressed) on the active physical interface for five minutes. Only the highest priority message appears on Line 2 of the LCD.

```
   Auto Dev H/S
  △ OOF at DTE              ⬔
  ◁     F1      F2      F3    ▷
```
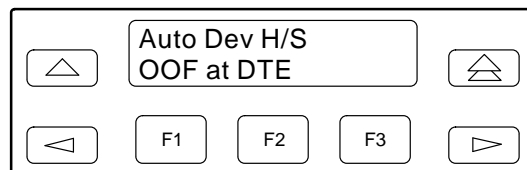
Self-Test Health

Use the Self-Test Health command to display the results of the power-up self-test. Possible messages are listed in Table 3-10. See Chapter 2, *Installation*, for the procedure for performing a power-up self-test.

Differences Using the Async Terminal: To display device health and status, select **Health**, **Test Status**, and **Self Test Results** from the main/status menu. This screen (Figure 2-10 in Chapter 2) displays all the test results on a device. Note that Auto Device Health and Status is not supported on the async terminal.

Table 3-10
Self-Test Health Messages

Message	Description
Passed	No problems found during power-up.
CPU fail	Central Processing Unit failed internal testing.
DTE T1 fail	Unit failed to internally loop data on the DTE circuit.
Failure xxxxxxxx	An 8-digit hexadecimal failure code provided for service personnel.
LCD fail	The front panel Liquid Crystal Display (LCD) failed.
Memory fail	Unit failed program checksum verification.
Modem fail	Unit failed to internally loop data through the modem circuit.
NET T1 fail	Unit failed to internally loop data on the network circuit.
Device fail	One or more of the unit's integrated circuit chips failed to pass internal device level testing.
B8ZS/LOS fail	Unit failed to encode data properly or to detect Loss Of Signal.
Alarm fail	Unit failed to transmit AIS or to detect Yellow alarm.
DSU fail	Unit failed to internally loop data on the DSU.
DSU Port*n* fail	Port's integrated circuit failed to pass device internal testing.
Unknown Exp Dev	Unit unable to recognize the expansion device connected to the main circuit board.

Displaying Self-Test Results

To display power-up self-test results,

1. Press F1 to select Stat from the top-level menu screen.

```
            DSU ESF      →
  △    Stat    Test   Cnfig   ⬆

  ◁    [F1]    F2     F3       ▷
```

2. From the Status screen, press F2 to select STest.

```
        Status:          →
  △    DevHS STest   Perf     ⬆

  ◁     F1    [F2]    F3       ▷
```
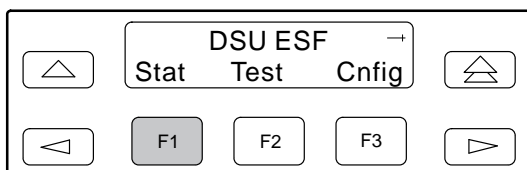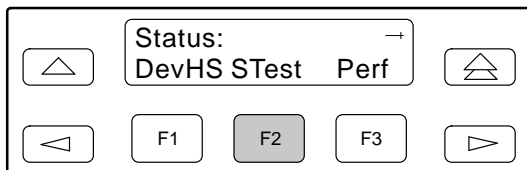
3. View the results of the last power-up self-test. If no problems were found during power-up, the following message appears.

```
        STest Health:
  △     Passed              ⬆

  ◁     F1    F2    F3       ▷
```
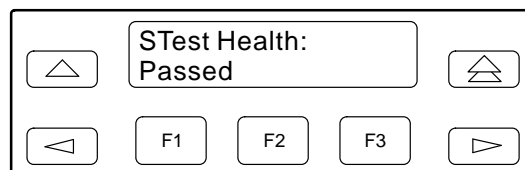
Performance Report

Network performance is continuously monitored and maintained in internal memory registers when the network interface is configured for ESF operation. The DSU/CSU maintains two sets of registers: Carrier Network Interface Registers (Telco) and User Network Interface Registers (User). The User registers contain an extra status register (Status Event).

These registers are accumulators or status registers that collect performance data for the previous 24-hour period.

Registers shown on the front panel LCD are listed in Table 3-11. This data is updated in 15-minute intervals. After 15 minutes, the current interval is rolled over into a set of registers that represent the previous 96 15-minute intervals for the register.

An interval total of how many of the 96 registers contain valid data is also kept, as well as a 24-hour total for each accumulator register. The relationship of the registers is shown in Figure 3-35.

Table 3-11
(1 of 2)
Performance Registers

Register	Interval Description	Totals Description
Event=xx,xxx	ESF error events counter. An error event is an ESF frame with either a CRC error or an OOF event. Maximum count is 65,535. This register must be reset via a reset command from the network. This register is valid for the current interval only.	N/A
CurTimer	Current interval timer. Records the number of seconds in the current 15-minute interval (maximum 900 seconds). This register is valid only for the current interval.	N/A
VldIntvl=xx	N/A	Valid interval total. Records the number of valid 15-minute intervals in the previous 24 hours (maximum 96 intervals). This register is valid for the 24-hour total and the 15-minute interval only.
ES	The number of errored seconds for the current interval (any second with one or more ESF error events \M maximum 900 seconds).	The total number of errored seconds for the previous 24 hours (maximum 65,535 seconds).
UAS	The number of unavailable seconds for the current interval (any one second interval when service is unavailable, maximum 900 seconds).	The total number of unavailable seconds for the previous 24 hours (maximum 65,535 seconds).
SES	The number of severely errored seconds for the current interval (any second with 320 or more CRC errors or one or more OOF event, maximum 900 seconds).	The total number of severely errored seconds for the previous 24 hours (maximum 65,535 seconds).
BES	The number of bursty errored seconds for the current interval (any second with more than one, but less than 320 CRC error, maximum 900 seconds).	The total number of bursty errored seconds for the previous 24 hours (maximum 65,535).
LOFC	The loss of frame (LOF) count for the current interval (a count of the number of times that an LOF is declared, maximum 255 times).	The total loss of frame count for the previous 24 hours (maximum 255).

Table 3-11
(2 of 2)
Performance Registers

Register	Interval Description	Totals Description
CSS	The number of Controlled Slip Seconds for the current interval.	The total number of Controlled Slip Seconds for the previous 24 hours (maximum value is 255).
StEvnt	Status events register records whether one or more of the following events have occurred at least once during the interval. The event is identified by a letter as follows: Y – A yellow alarm has been received on the network interface. L – Loss Of Signal has occurred on the network interface. E – The Excessive Error Rate threshold has been exceeded. F – A Frame Synchronization Bit Error has been detected. V – A Line Code Violation has been detected. none – None of the above events have occurred.	N/A

493-14155

Figure 3-35. Carrier (Telco) and User Register Organization

Displaying User Performance Registers

To display a Performance Report on the front panel LCD,

1. Press F1 to select Stat from the top-level menu screen.

```
        DSU ESF      →
   △    Stat  Test  Cnfig   ▲
   ◁    [F1]   F2    F3    ▷
```

2. From the Status screen, press F3 to select Perf.

```
        Status:          →
   △    DevHS STest  Perf    ▲
   ◁     F1    F2   [F3]   ▷
```
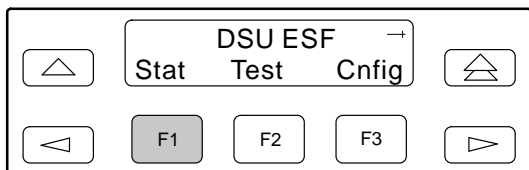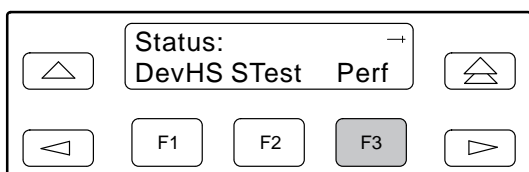
3. Press F1 to select Telco registers or press F2 to select User registers. In the following example, User registers is selected. However, the process to view Telco registers is exactly the same.

```
        Performance:
   △    Telco   User        ▲
   ◁     F1   [F2]   F3    ▷
```
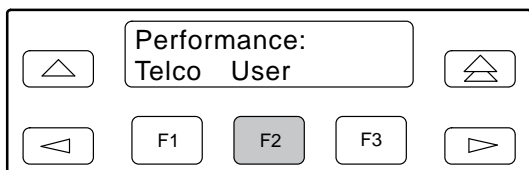
4. From the User Registers screen, press F1 to view current registers (go to Step 5), press F2 to view 24-Hour Totals (go to Step 7), or press F3 to view 15-Minute Interval Registers (go to Step 6).

```
        User Registers:
   △    Cur    24Tot   Intvl   ▲
   ◁     F1    F2    F3    ▷
```
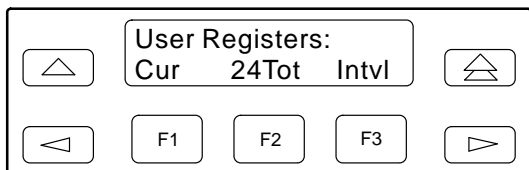
When you press F1 from the User Registers screen, the User registers for the current 15-minute interval appear.

```
        User Current:      →
   △    Event = xx,xxx      ▲
   ◁     F1    F2    F3    ▷
```
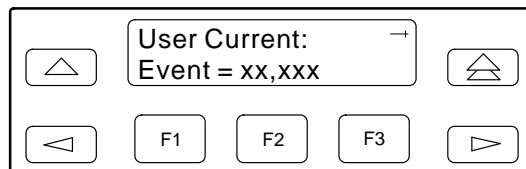
When you press F2 from the User Registers screen, the User registers for the 24-hour total interval appear.

```
        User 24 Hour:      →
   △    VldIntvl = xx       ▲
   ◁     F1    F2    F3    ▷
```
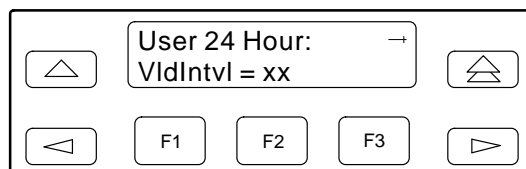
When you press F3 from the User Registers screen, the interval screen appears. Use this screen to choose the specific 15-minute interval.

```
        User Intvl: 01
   △    Up     Down   Dsply   ▲
   ◁     F1    F2    F3    ▷
```
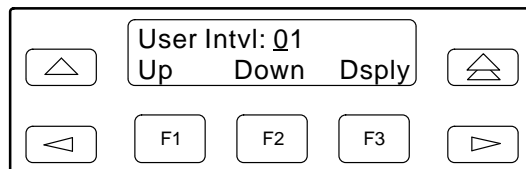
5. Use the ◁ and ▷ keys to position the cursor under the first or second digit in the interval number displayed, then use the F1 (Up) and F2 (Down) keys to increment/ decrement the number.

6. When you have selected the number of the interval you want to display, press F3 (Dsply) to display the registers for the interval selected.

```
        User Intvl: nn      →
   △    ES=xxx              ▲
   ◁     F1    F2    F3    ▷
```
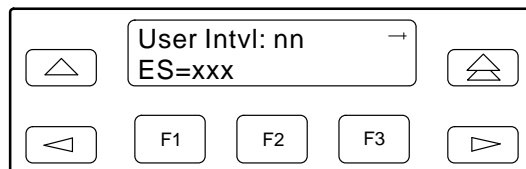
7. Use the scroll keys to view additional register information.

Differences Using the Async Terminal: To display a performance report, select **Telco Performance** or **User Performance** from the main/status menu. Select **Refresh** to force an update to these screens. Figure 3-36 shows an example of the Telco Performance Report, and Figure 3-37 shows an example of the User Performance Report.

NOTE

The 'd' characters in these screens are place holders to show field length of actual results.

```
                                      main/status/user_performance
     Customer ID: New Cust        Model: ACCULINK XXXX


                           User Performance
     Event: dd,ddd          Current Timer: ddd      Valid Intervals: dd
                ES    UAS    SES    BES    CSS    LOFC    StEvnt
     Current:   ddd   ddd    ddd    ddd    ddd    ddd     y,l,
     24 Total: dd,ddd dd,ddd dd,ddd dd,ddd dd,ddd dd,ddd  y,l,e
     Interval:
       01       ddd   ddd    ddd    ddd    ddd    ddd     d,d,d,d,d
       02       ddd   ddd    ddd    ddd    ddd    ddd




            Refresh  Down  Up  Main  Previous  Cntrl–x to Disconnect
```

Figure 3-37. User Performance Report Screen

Clearing User Performance Registers

You can reset the User registers from the DSU/CSU via the ClrUsr command in the Control branch of the front panel menu. You can only reset the Telco registers via a command from the network (refer to AT&T TR 54016).

To clear the user performance registers,

1. Press the ▷ key on the top-level menu screen to bring the Ctrl branch onto the screen.

```
   ┌───┐      DSU ESF       →    ┌───┐
   │ △ │   Stat   Test   Cnfig   │ △ │
   └───┘                         └───┘
   ┌────┐  ┌────┐ ┌────┐ ┌────┐  ┌────┐
   │ ◁  │  │ F1 │ │ F2 │ │ F3 │  │ ▷  │
   └────┘  └────┘ └────┘ └────┘  └────┘
```

2. Press F3 to select Ctrl from the top-level display screen.

```
   ┌───┐      DSU ESF       ←    ┌───┐
   │ △ │   Test   Cnfig   Ctrl   │ △ │
   └───┘                         └───┘
   ┌────┐  ┌────┐ ┌────┐ ┌────┐  ┌────┐
   │ ◁  │  │ F1 │ │ F2 │ │ F3 │  │ ▷  │
   └────┘  └────┘ └────┘ └────┘  └────┘
```

```
                                      main/status/telco_performance
     Customer ID: New Cust        Model: ACCULINK XXXX
                           Telco Performance
     Event: dd,ddd          Current Timer: ddd      Valid Intervals: dd
                ES    UAS    SES    BES    CSS    LOFC
     Current:   ddd   ddd    ddd    ddd    ddd    ddd
     Total:    dd,ddd dd,ddd dd,ddd dd,ddd ddd    ddd
     Interval:
       01       ddd   ddd    ddd    ddd    ddd    ddd
       02       ───   ───    ───    ───    ───    ───
       ───      ───   ───    ───    ───    ───    ───
       ───      ───   ───    ───    ───    ───    ───
       ───      ───   ───    ───    ───    ───    ───
       ───      ───   ───    ───    ───    ───    ───
       ───      ───   ───    ───    ───    ───    ───
       ───      ───   ───    ───    ───    ───    ───


            Refresh  Down  Up  Main  Previous  Cntrl–x to Disconnect
```

Figure 3-36. Telco Performance Report Screen
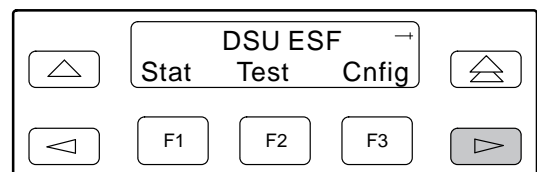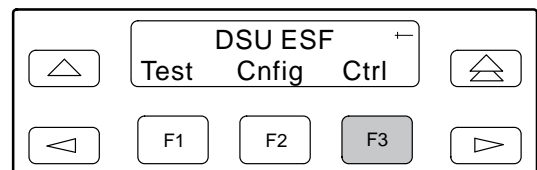
3. From the Control screen, press ▷ to scroll ClrUsr on the screen.

```
┌─────────────────────────────────────────┐
│         ┌──────────────────────┐         │
│  ┌───┐  │ Control:          →  │  ┌───┐  │
│  │ △ │  │ Call    Rel    LED   │  │ △ │  │
│  └───┘  └──────────────────────┘  └───┘  │
│                                          │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐   ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │   │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘   └───┘  │
└─────────────────────────────────────────┘
```

4. Press F3 to select ClrUsr.

```
┌─────────────────────────────────────────┐
│         ┌──────────────────────┐         │
│  ┌───┐  │ Control:          ⇄  │  ┌───┐  │
│  │ △ │  │ Rel    LED    ClrUsr │  │ △ │  │
│  └───┘  └──────────────────────┘  └───┘  │
│                                          │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐   ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │   │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘   └───┘  │
└─────────────────────────────────────────┘
```
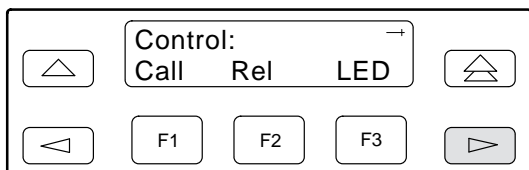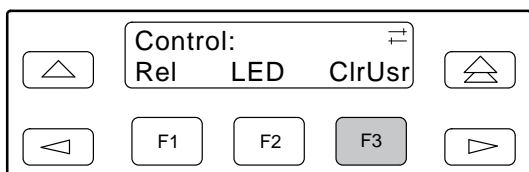
5. From the Clear Registers screen, press F1 to clear the User registers or press F2 if you have decided not to clear the User registers.

```
┌─────────────────────────────────────────┐
│         ┌──────────────────────┐         │
│  ┌───┐  │ Clear Regs?          │  ┌───┐  │
│  │ △ │  │ Yes    No            │  │ △ │  │
│  └───┘  └──────────────────────┘  └───┘  │
│                                          │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐   ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │   │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘   └───┘  │
└─────────────────────────────────────────┘
```
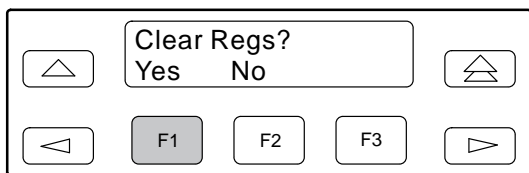
If you selected Yes, the User performance registers are cleared. All accumulators are reset to zero and all status registers are cleared, and the current interval timer, the number of valid intervals count and the total 24-hour counts are reset to zero. The Command Complete screen then appears.

```
┌─────────────────────────────────────────┐
│         ┌──────────────────────┐         │
│  ┌───┐  │ Clear Registers:     │  ┌───┐  │
│  │ △ │  │ Command Complete     │  │ △ │  │
│  └───┘  └──────────────────────┘  └───┘  │
│                                          │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐   ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │   │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘   └───┘  │
└─────────────────────────────────────────┘
```

If you selected No, the Ctrl screen reappears and no registers are reset.

Differences Using the Async Terminal: To reset the User registers, select **Clear User Performance Registers** from the main/control menu (see Figure 3-39). The system prompts **Are You Sure?** so you can verify your intention to reset the registers. Respond with **Yes** to proceed with the Clear command.

Controlling the DSU/CSU

The Control branch of the front panel menu tree allows you to control various aspects of the user interface and integral modem. Figure 3-38 shows the Control branch.
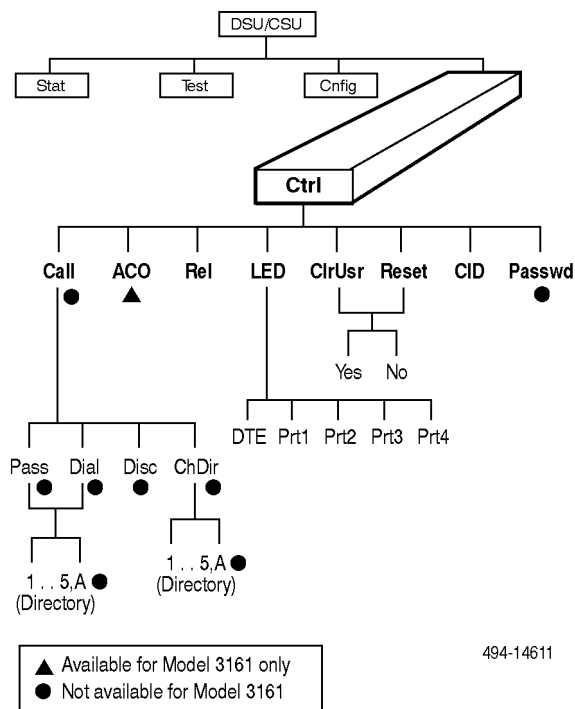

Figure 3-38. Control Branch

Differences Using the Async Terminal: Figure 3-39 shows the Control branch using the async terminal.
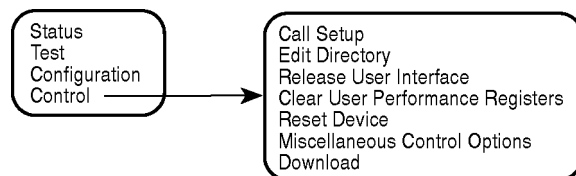

Figure 3-39. Control Branch for the Async Terminal

Acquiring/Releasing the Active Physical Interface

You can access a user interface from either the front panel, the SDCP (for 3161 DSU/CSUs only), the MODEM port (for 3160/3164 DSU/CSUs only), or the COM port. The 316x DSU/CSU allows only one physical interface to be active at a time. The front panel is the default user interface at power-up, after a reset, during a software download, and after a failure at either the local or remote PC, or async terminal.

If the front panel is disabled, after the self-test the active physical interface defaults to the COM port (if configured for a user interface) or the modem port. During download, the front panel always displays Status.

Possible active interfaces are Ft. Panel (front panel), Com (local PC or async terminal, connected to COM port), and Modem (remote PC, DSU/CSU connected through the MODEM port or async terminal connected to the MODEM port).
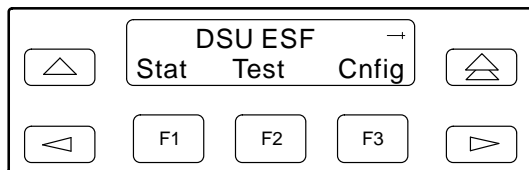
You can switch an inactive physical interface to active if one of the following conditions is true:

- The current active physical interface has had no activity (no key was pressed) for at least five minutes.

- The active physical interface has been released with the Release command.

- The active interface connection is broken. This includes the call disconnect for a modem interface or the termination of the front panel emulation program on a locally attached PC (if PC supports DTR) or the termination of the async terminal interface on a remote or locally attached terminal.

Acquiring the Active Physical Interface

To acquire the active physical interface, press any key. If you are using the PC interface, use the mouse to click on the desired Function key.

The top-level menu screen appears on the active physical interface, regardless of what screen was displayed at the previous active physical interface.

The inactive interface displays the following message when a function key is pressed or a connection is made on the inactive physical interface and control cannot be switched because the currently active interface is in use.
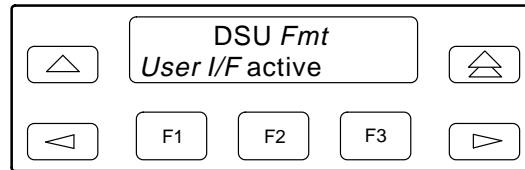
The inactive interface displays the following message after control has been released from the previously active interface and another interface has not become active.
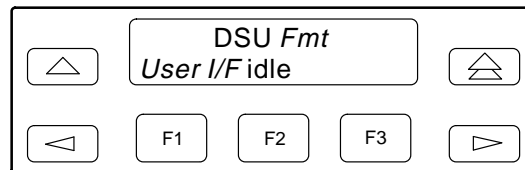
Releasing the Active Physical Interface

To release the current active physical interface, either allow five minutes to elapse without pressing any key or use the Release command. To use the Release command,

1. Press the ▷ key on the top-level menu screen to bring the Ctrl branch onto the front panel LCD.

2. Press F3 to select Ctrl from the top-level menu screen.

3. From the Control screen, press F2 to select Rel.

```
┌─────────────────────────────────────────┐
│  ┌───┐   ┌─────────────────────┐  ┌───┐  │
│  │ △ │   │ Control:         →   │  │ ◬ │  │
│  └───┘   │ Call   Rel    LED   │  └───┘  │
│          └─────────────────────┘         │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐  ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │  │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘  └───┘  │
└─────────────────────────────────────────┘
```
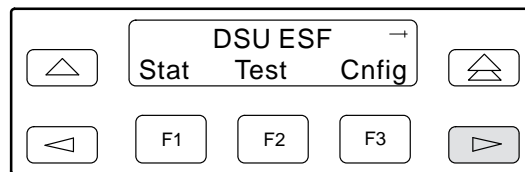
The active physical interface is released. A screen with this message appears. No physical interface is active until input is received from a physical interface.

```
┌─────────────────────────────────────────┐
│  ┌───┐   ┌─────────────────────┐  ┌───┐  │
│  │ △ │   │ Ft. Panel:          │  │ ◬ │  │
│  └───┘   │ Released            │  └───┘  │
│          └─────────────────────┘         │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐  ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │  │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘  └───┘  │
└─────────────────────────────────────────┘
```

Differences Using the Async Terminal: To release the current active interface, select **Release User Interface** from the main/control menu (see Figure 3-39). The system prompts **Are You Sure?*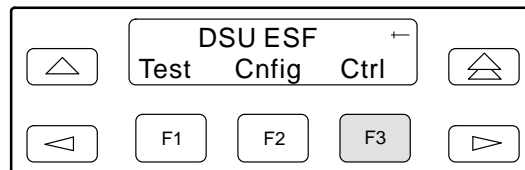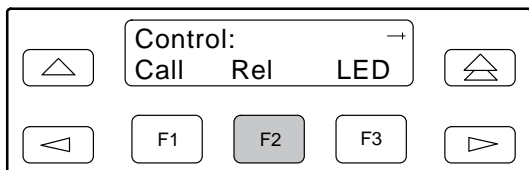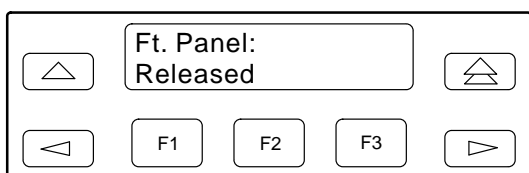* so you can verify your intention to release the user interface. Respond with **Yes** to proceed with the Release command.

Using the Integral Modem

The 3160/3164 DSU/CSUs feature an integral modem which enables your DSU/CSU to communicate with remote devices to display alarm messages or to function as the user interface. The 3161 DSU/CSU does not have an integral modem.

The integral modem also enables you to initiate a pass-through connection to a far-end DSU/CSU. For more information on these configurations, refer to Chapter 2, *Installation*.

The Call command, available from the Control branch of the menu tree, provides the following functions to initiate and terminate modem connections:

- **Pass** – Sets up a call through the integral modem and initiates a front panel pass-through session.

- **Dial** – Sets up a call through the integral modem for ASCII terminal/printer or PC connection.

- **Disconnect** – Disconnects an active modem connection.

- **Change Directory** – Allows entry of phone numbers into the internal phone directories.

The communications parameters for remote connectivity are listed in the *User Interface Options* section of Appendix C, *Configuration Options*.

Initiating a Call for Front Panel Pass-Through Operation

The Pass command initiates a call for front panel pass-through operation. The Front Panel Pass-Through feature is not supported on the async terminal interface.
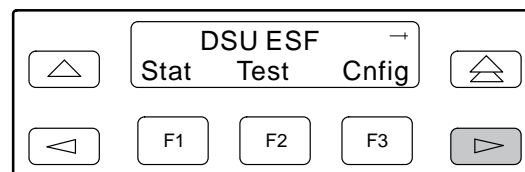
Front panel pass-through allows the user at the DSU/CSU front panel (or PC attached to the COM port) to use the integral modem to dial another remote ACCULINK 3160/3164 DSU/CSU and to access the far-end DSU/CSU front panel from the local DSU/CSU front panel (or PC).

```
┌─────────────────────────────────────────┐
│                   NOTE                    │
│                                           │
│  Pass is only available when the          │
│  Front Panel Pass-Through User            │
│  Interface configuration option has       │
│  been enabled (see Appendix C,            │
│  Configuration Options). The active       │
│  physical interface is either the         │
│  front panel or the PC, and the           │
│  integral modem is not active.            │
└─────────────────────────────────────────┘
```

To initiate front panel pass-through at the near-end DSU/CSU,

1. Press the ▷ key on the top-level menu screen to bring the Ctrl branch onto the front panel LCD.

```
┌─────────────────────────────────────────┐
│  ┌───┐   ┌─────────────────────┐  ┌───┐  │
│  │ △ │   │ DSU ESF          →   │  │ ◬ │  │
│  └───┘   │ Stat   Test   Cnfig │  └───┘  │
│          └─────────────────────┘         │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐  ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │  │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘  └───┘  │
└─────────────────────────────────────────┘
```

2. Press F3 to select Ctrl from the top-level menu screen.

```
┌─────────────────────────────────────────┐
│  ┌───┐   ┌─────────────────────┐  ┌───┐  │
│  │ △ │   │ DSU ESF          ←   │  │ ◬ │  │
│  └───┘   │ Test   Cnfig   Ctrl │  └───┘  │
│          └─────────────────────┘         │
│  ┌───┐   ┌────┐  ┌────┐  ┌────┐  ┌───┐  │
│  │ ◁ │   │ F1 │  │ F2 │  │ F3 │  │ ▷ │  │
│  └───┘   └────┘  └────┘  └────┘  └───┘  │
└─────────────────────────────────────────┘
```

3. From the Control screen, press F1 to select Call.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │ Control:        →  │  ┌───┐ │
│  │ △ │  │ Call   Rel    LED │  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```

4. From the Call Setup screen, press F1 to select Pass.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │ Call Setup:       │  ┌───┐ │
│  │ △ │  │ Pass  Dial   ChDir│  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```
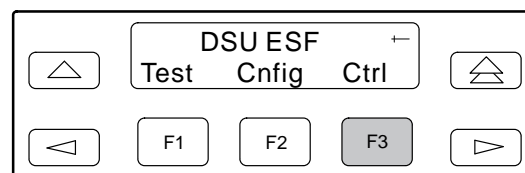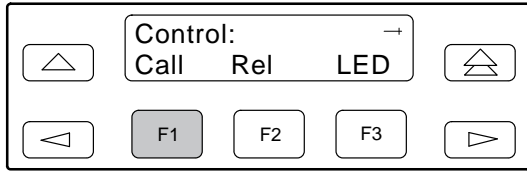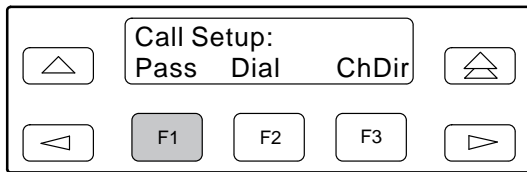
5. From the Pass Directory screen, press F1 (Up) to display the next higher numbered directory or press F2 (Down) to select the next lower numbered directory.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │ Pass n: xxxxxxxxx │  ┌───┐ │
│  │ △ │  │ Up    Down   Dial │  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```
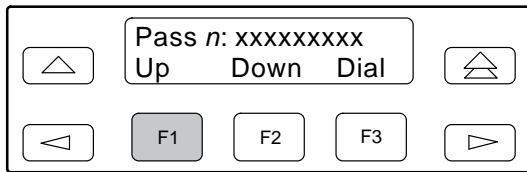
6. When the number of the desired directory appears on the screen, press F3 (Dial) to place the call.

Initiating a Call for PC, ASCII Terminal/Printer, Async Terminal, or SNMP Operation

Use the Dial command to set up a semipermanent connection to route alarm messages to the specified destination. The Dial command initiates a call through the integral modem to a PC, ASCII terminal/printer, or async terminal.

To initiate a call at the local DSU/CSU,

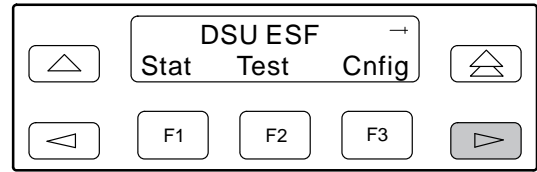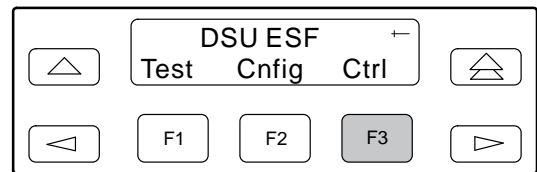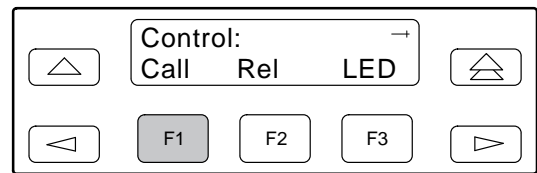1. Press the ▷ key on the top-level menu screen to bring the Ctrl branch onto the front panel LCD.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │   DSU ESF      →  │  ┌───┐ │
│  │ △ │  │ Stat   Test  Cnfig│  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```
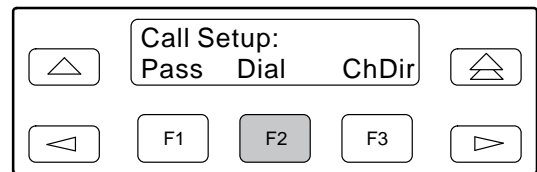
2. Press F3 to select Ctrl from the top-level menu screen.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │   DSU ESF      ←  │  ┌───┐ │
│  │ △ │  │ Test  Cnfig   Ctrl│  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```

3. From the Control screen, press F1 to select Call.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │ Control:        →  │  ┌───┐ │
│  │ △ │  │ Call   Rel    LED │  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```

4. From the Call Setup screen, press F2 to select Dial. This selection is not available if the DSU/CSU's integral modem is currently active.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │ Call Setup:       │  ┌───┐ │
│  │ △ │  │ Pass  Dial   ChDir│  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```

5. From the Dial Directory screen, press F1 (Up) to display the next higher numbered directory or press F2 (Down) to select the next lower numbered directory.

```
┌─────────────────────────────────────┐
│         ┌───────────────────┐        │
│  ┌───┐  │ Dial n: xxxxxxxxx │  ┌───┐ │
│  │ △ │  │ Up    Down   Dial │  │ ⬨ │ │
│  └───┘  └───────────────────┘  └───┘ │
│  ┌───┐  ┌────┐ ┌────┐ ┌────┐  ┌───┐  │
│  │ ◁ │  │ F1 │ │ F2 │ │ F3 │  │ ▷ │  │
│  └───┘  └────┘ └────┘ └────┘  └───┘  │
└─────────────────────────────────────┘
```
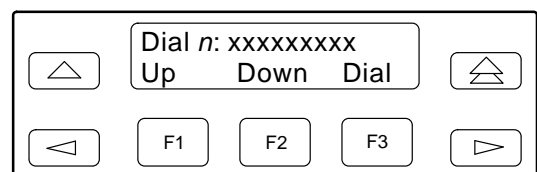
6. When the number of the desired directory appears on the screen, press F3 (Dial) to place the call.

Differences Using the Async Terminal: To initiate a call at the local DSU/CSU, select **Call Setup** from the main/control menu. Figure 3-40 shows an example of the screen that appears.
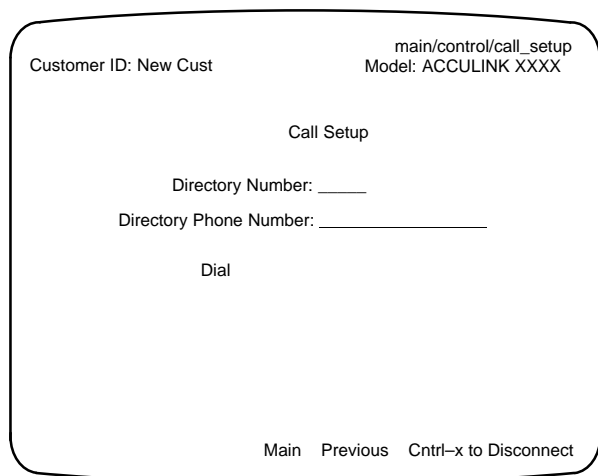
```
                                    main/control/call_setup
Customer ID: New Cust               Model: ACCULINK XXXX


                       Call Setup

              Directory Number: _____
        Directory Phone Number: _____

                         Dial




              Main   Previous   Cntrl–x to Disconnect
```

Figure 3-40. Call Setup Screen

Enter the number for the phone directory and select **Dial**.

Entering a Password to Gain Access

You are prompted to enter a password (up to 8 characters) when you are dialing in to a device whose Set Password User Interface configuration option is set (see Appendix C, *Configuration Options*). The Password function is not available for Model 3161 DSU/CSUs since passwords are only used for modem connections and an integral modem is not available for 3161 DSU/CSUs.

Valid password characters are **0–9**, **a–z**, **A–Z**, **#**, **-**, **.**, and **/**. The existing password is not shown on the screen. An underscore in the first position shows where to enter the first character. If the password is set to all null characters (default value), press F3 (Done) when the password screen first appears.

Create and modify passwords with the Password command in the Control branch of the front panel menu tree (see Chapter 2, *Installation*, for information about creating/modifying a password).

The following screen appears when you call a DSU/CSU that has a password enabled.
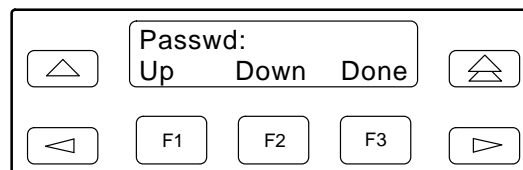
To complete a call when the remote DSU/CSU Set Password configuration option is enabled,

1. Use the ◁ and ▷ keys to position the cursor under the desired character. You must enter a character before the ▷ key moves the cursor to the next space to the right. The ◁ key is not destructive.
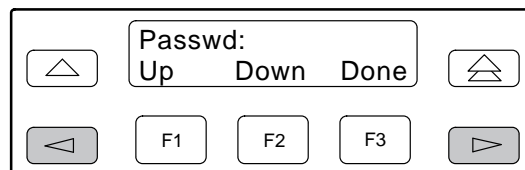
2. Enter the required password. Press F1 (Up) and F2 (Down) to scroll up and down through the valid characters/numbers for the password. You have five minutes to enter the correct password before the DSU/CSU disconnects and ends the session.

3. Press F3 (Done) to indicate you are done entering the password. If you enter an invalid password, the message **Invalid Password** appears and the call disconnects.
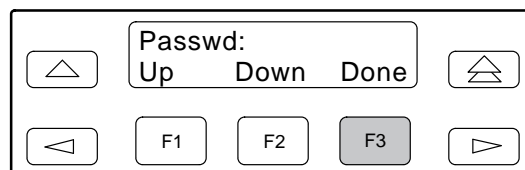

Differences Using the Async Terminal: See *Entering a Password* in the *Using the Async Terminal Feature* section for a description of the password sequence when using the async terminal.

Disconnecting the Modem Connection

The Disconnect command enables you to force a disconnect of an active modem connection from the front panel of the DSU/CSU. This command is only available when the DSU/CSU modem is connected, either through alarm dial out, front panel pass-through, or remote access. The Disconnect function is not used for Model 3161 DSU/CSUs since an integral modem is not available.

There are two methods of disconnection,

- Using the Disconnect command via the front panel menu or async terminal interface.

- Pressing and holding the ⬘ and △ front panel keys simultaneously, or using the **Passthrough Disconnect** button on a PC running Front Panel Emulation software.

Use the Disconnect command for most pass-through connections and all dial connections. You must use the front panel keys when a pass-through connection to a remote device other than a 3160/3164 DSU/CSU is established. You cannot use the front panel keys for dial connections.
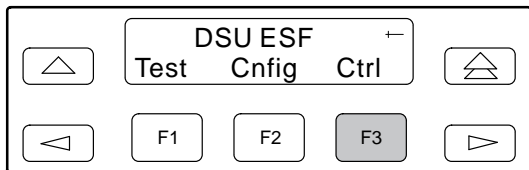
Disconnecting Using the Disconnect Command

To disconnect an established modem connection using the Disconnect command,
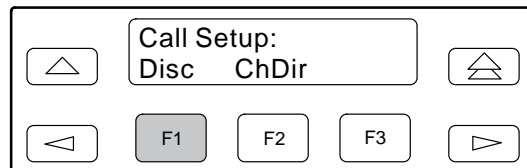
1. Press the ▷ key from the top-level menu screen to bring the Ctrl branch onto the front panel LCD.
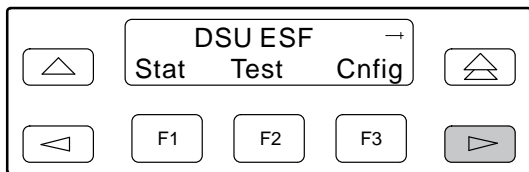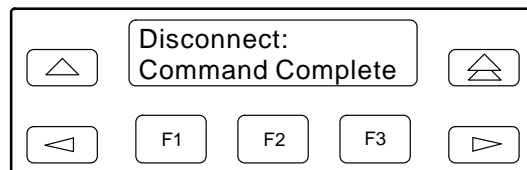

2. Press F3 to select Ctrl from the top-level menu screen.

3. From the Call Setup screen, press F1 to select Disc.

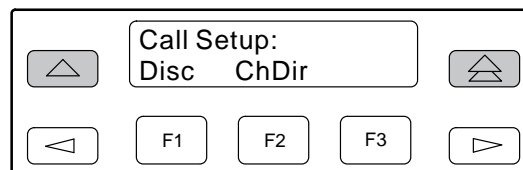The modem call is disconnected and the Command Complete screen appears.
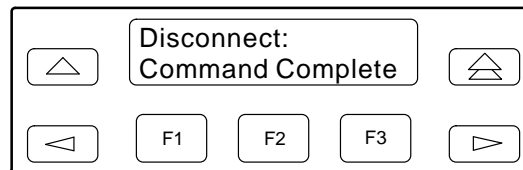

Disconnecting Using Front Panel Keys

To disconnect a modem connection using two keys, from the front panel keypad, press the ⬘ and △ keys simultaneously and hold for two seconds. From a front panel PC Emulation screen, click on the **Disconnect** button.

The modem call is disconnected and the Command Complete screen appears.

Differences Using the Async Terminal: To disconnect an established modem connection, select **Disconnect** from the main/control/call_setup screen. Figure 3-41 shows an example of the screen that appears. The Async Terminal feature does not support the pass-through disconnect feature.
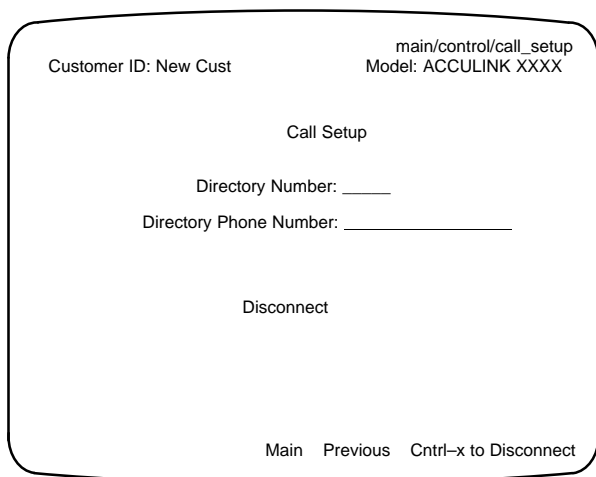
```
                                    main/control/call_setup
  Customer ID: New Cust           Model: ACCULINK XXXX


                         Call Setup

                  Directory Number: _____
         Directory Phone Number: _____



                         Disconnect




                  Main   Previous   Cntrl–x to Disconnect
```

Figure 3-41. Disconnect Screen

## Entering Numbers in the Phone Directories

The 3160/3164 DSU/CSUs have five general directories (1 through 5) and one alarm directory (A) available. Use the general directories to store phone numbers for remote devices such as 3160/3164 DSU/CSUs and ASCII printers. Use the alarm directory to store the phone number of the primary ASCII terminal or printer you use to display or print alarms. This function is not available for 3161 DSU/CSUs.

To enter or change numbers in the phone directories,

1. Press the ▷ key from the top-level menu screen to bring the Ctrl branch onto the front panel LCD.
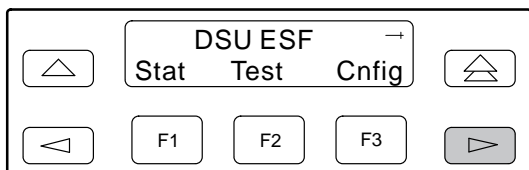
2. Press F3 to select Ctrl from the top-level menu screen.
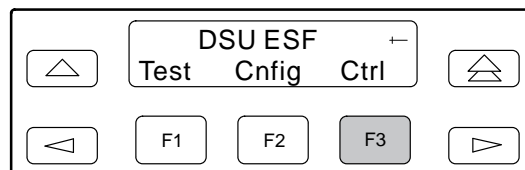
3. From the Control screen, press F1 to select Call.
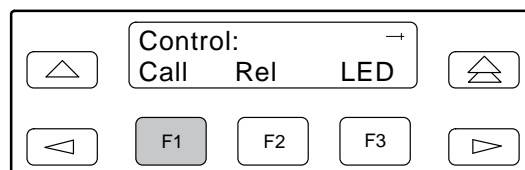
4. From the Call Setup screen, press F3 to select ChDir.
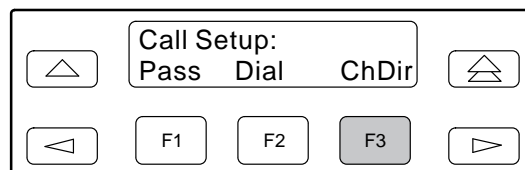
The Directory 1 displays first, along with its phone number if one has been entered.

5. Press F1 (Next) to display the next directory (2, in this case). Press F2 (Previous) to display the previous directory (A, in this case). Directories appear in order, 1–5 and then A.

6. Press F3 (Edit) to change the displayed directory's phone number (phone numbers can be up to 40 characters). If you select Edit, the Edit screen appears.

```
          ┌─────────────────────┐
 ┌────┐   │ 1: xxxxxxxxxxxxxxxx  │   ┌────┐
 │ △  │   │ Next   Prev    Edit  │   │ ⬔  │
 └────┘   └─────────────────────┘   └────┘
 ┌────┐  ┌────┐  ┌────┐  ┌────┐  ┌────┐
 │ ◁  │  │ F1 │  │ F2 │  │ F3 │  │ ▷  │
 └────┘  └────┘  └────┘  └────┘  └────┘
```

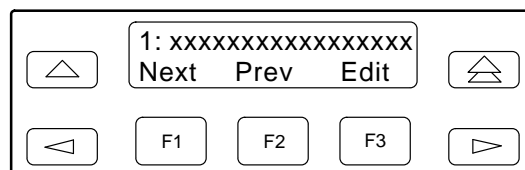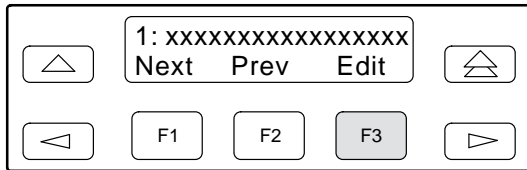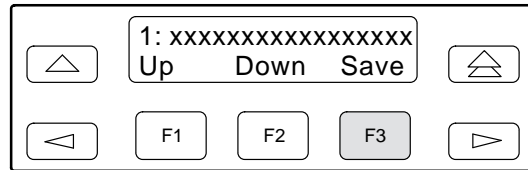7. Use the ◁ and ▷ keys to position the cursor under the digit(s) you want to change. Press F1 to scroll up to a higher digit. Press F2 to scroll down to a lower digit. The (▷) key inserts blanks (default character) while the (◁) key invokes the End Of Number (EON) character which terminates the dial string and erases any characters to the right when you use the Save function.

See Table 3-12 for the set of valid characters and rules that apply to entering phone numbers.

　　　Example: P9W8135551212

8. Press F3 (Save) to store your changes in nonvolatile memory. If you press ⬔ or △ before saving the phone number you just changed, the previous phone number remains in effect.

```
          ┌─────────────────────┐
 ┌────┐   │ 1: xxxxxxxxxxxxxxxx  │   ┌────┐
 │ △  │   │ Up    Down    Save   │   │ ⬔  │
 └────┘   └─────────────────────┘   └────┘
 ┌────┐  ┌────┐  ┌────┐  ┌────┐  ┌────┐
 │ ◁  │  │ F1 │  │ F2 │  │ F3 │  │ ▷  │
 └────┘  └────┘  └────┘  └────┘  └────┘
```

Differences Using the Async Terminal: To edit phone directories, select **Edit Directory** from the main/control menu. This selection is the same as using the **ChDir** selection from the front panel.

Table 3-12
Valid Phone Number Characters

Valid Characters	Meaning	Restrictions
0 to **9**	DTMF or pulse digits	—
* #	DTMF digits	—
P	Sets modem for Pulse Dial Mode	Pulse or Tone must be specified, otherwise Tone is the default. This must be the first character in the string, unless the first character is B. Then, it must immediately follow the B.
T	Selects Tone (DTMF) dialing	Tone or Pulse must be specified, otherwise Tone is the default. This must be the first character in the string, unless the first character is B. Then, it must immediately follow the B.
W	Wait for dial tone	—
B	Blind dialing (you need not wait for a dial tone before entering the dialing sequence)	Must be the first character in the string to be valid
,	Creates a 2-second pause in the dialing sequence	—
<space> ( ) -	Extra characters for readability. The space is the default character.	—
<-	End Of Number (EON) character, terminates the dial string and erases all characters to the right after F3 (Save) is pressed	—

Deactivating the Alarm Relay

The Alarm Cut-off command forces a deactivation of the alarm relay on the 3000 Series Carrier during an alarm condition. Since this function only affects the 3000 Series Carrier, it is only available for Model 3161 DSU/CSUs. The alarm relay function must first be enabled by the Alarm Relay configuration option (see Appendix C, *Configuration Options*).

To deactivate the alarm relay,

1. Press the ▷ key from the top-level menu screen to bring the Ctrl branch onto the front panel LCD.
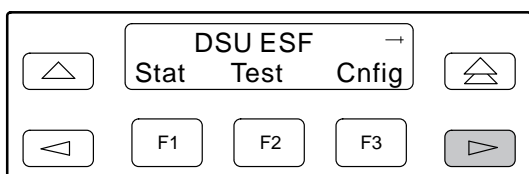
2. Press F3 to select Ctrl from the top-level menu screen.
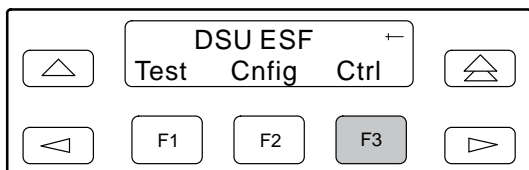
3. From the Control screen, press F1 to select ACO.
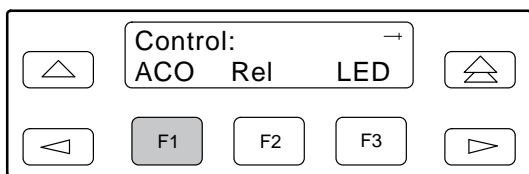
4. The Command Complete screen appears.
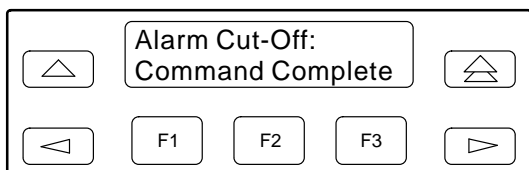
Starting Front Panel Emulation

The front panel emulation function enables you to display the front panel of a specified near-end or far-end 316x DSU/CSU on a PC. If the DSU/CSU selected is not locally attached to the PC, you must first dial to the remote DSU/CSU before starting front panel emulation.

To start front panel emulation,

1. From the PC, open Program Manager from Windows.
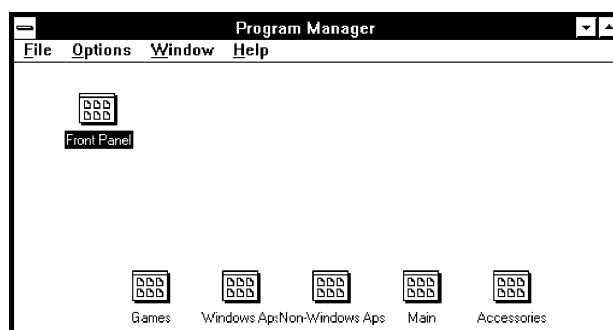
2. The Front Panel window opens.
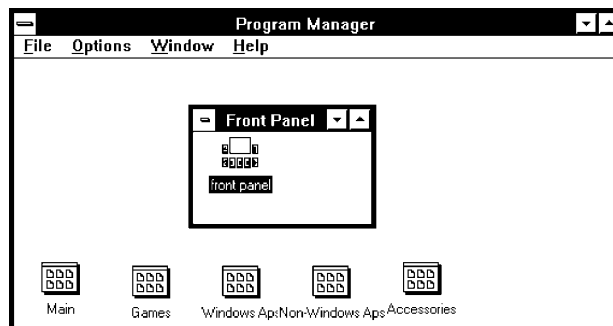
NOTE

The modem attached to the PC must support AT commands for the Front Panel Emulation software to successfully place the call.

---

3. Double click on the Front Panel icon that appears after the Front Panel Emulation program is installed on the PC. The Front Panel Emulation screen appears.
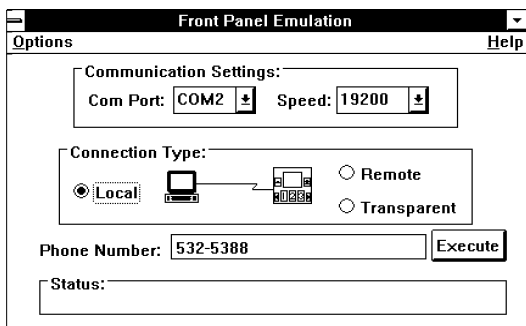
4. Enter the Com Port and Speed from the drop-down selection list boxes.

   The **Com Port** field should contain the actual communications port name as recorded in the Windows information file (INI).

   The **Speed** field should contain one of the following communications speeds: 1200, 2400, 4800, 9600, 14400, or 19200 and should match the DSU/CSU COM port configuration.

5. Choose either a Local (for near-end DSU/CSU) or Remote (for far-end DSU/CSU) destination.

6. If you chose a Local destination, click on the **Execute** button. If you chose a Remote destination, enter the telephone number of the far-end DSU/CSU in the **Phone Number** field, then click on the **Dia**l button.

7. The front panel of the selected 316x DSU/CSU appears on the PC.

Using the Async Terminal Feature

You can use an async terminal to manage the 3160/3164 DSU/CSU devices from either the COM port or MODEM port. You can perform device management and configuration operations as if using the device's front panel without the limitation of the 2-line, 16-character LCD. An entire menu, submenu, test result, or all configuration selections for a configuration option appear on a single screen display.
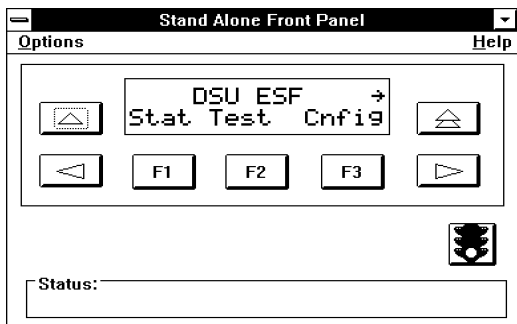
This section is provided as a supplement to all the procedures described throughout this manual for using the front panel. Therefore, all the procedures, tables and descriptions of fields and input values provided in all chapters and appendices apply to the information displayed on the async terminal screens. There are differences in menu selections made from the front panel/PC interface and the async terminal interface when performing a task. Refer to the *Differences Using the Async Terminal Interface* heading within each procedure description to note the differences between interfaces. This section is limited to describing how the async terminal feature is configured, how it is accessed and how to navigate among the menus and screens.

Setting Interface Options

Certain user interface options must be set to enable async terminal operation. Using the front panel, use the Configuration (Cnfig) branch of the front panel menu hierarchy to edit the User Interface (User) options for async terminal operation. Table 3-13 shows the configuration options and appropriate settings for the Async Terminal feature. Basically, the change depends on the port supplying the connection. The other configuration options use their defaults but they should be verified.

Table 3-13
Async Terminal Interface
Configuration Options

COM Port Connection	Modem Port Connection
COM Use:Term	Modem Use:Term
Char Length:8	Char Length:8
	Dial-In:Enab

Activating Interface Option Changes

After the async terminal configuration options are set, the changes must be saved and made active. Depending on your preference, changes are saved to the Customer (Cust) Configuration option set which, in turn, must be written to the active Configuration option set to take affect. Or, they are saved directly to the Active Configuration Option set. Refer to the *Configuration Option Areas* section earlier in this chapter for information on saving changes to the Configuration option sets.

Initiating an Async Terminal Session

Once the async terminal is connected and the configuration option changes are active, modem port users must dial-in through a modem connection to initiate a session using the async terminal. COM port connections automatically display the first level menu provided a password is not required.

If access security is required, the Password Access screen displays the prompt for password input. If access security is not required, the top-level menu (or main menu) appears or a message appears indicating that another user has control of the device. In this case, the screen shows which type of connection is active, **Ft. Panel**, **Modem**, or **COM Port**.

Entering a Password

When access security is required, the Password Access Screen appears and the password must be entered.

- *If the password is valid*, the DSU/CSU's top-level menu is displayed.

- *If the password is invalid*, an invalid password message displays and the Password Access Screen redisplays and waits for password entry.

Figure 3-42 shows an example of the Password Access screen.


```
                                                  password
  Customer ID: New Cust              Model: ACCULINK XXXX




                  Enter Password: _____
```
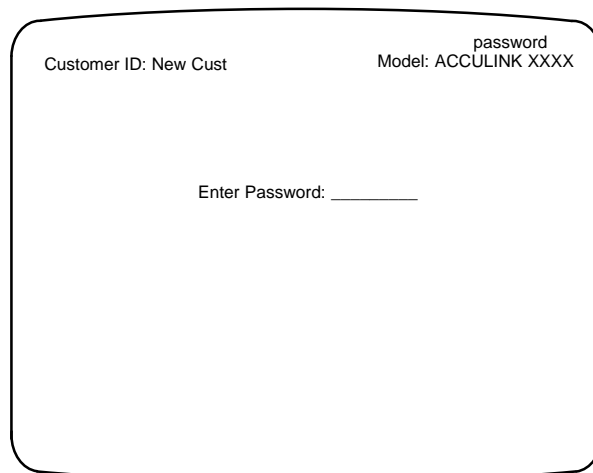
Figure 3-42. Password Access Screen

Async Terminal Menus and Screens

Menus differ from the front panel in that they typically do not use abbreviations and in some cases provide a more direct access to an option or function. However, the menu selections are straightforward and the logical grouping of the menu tree remains the same between interfaces. In general, the interfaces follow the same paths. A few options available from the 3160/3164 DSU/CSU front panel are not available from the async terminal interface, such as the Lamp test. This is noted where appropriate in the procedures. The terminal interface also supports the same context sensitivity as the front panel.

By convention throughout this manual, examples of screens that access the data ports are always shown as they appear with the 4-port 3164 DSU/CSU. Menus for the 2-port DSU/CSU only display the information for Port 1 and Port 2.

The top line of every screen always displays the menu path for the function (or configuration option) being displayed. The second line shows the customer identification (CID) number and the DSU/CSU's model number. The remaining screen area is used for menu or option-specific information.

There are three screen types: menu selection, edit and display screens. Menu screens list selections available through the menu system, edit screens provide the interface for changing configuration options, and display screens provide configuration information and results from performance and device specific tests. Unlike the front panel operation where you constantly key forward to view or choose configuration options and selections, the

Async Terminal feature displays all selections for a menu or configuration option in full screen format with functions available to operate on the screen information appearing at the bottom of the screen.

All functions operate the same throughout the async terminal interface whenever they appear at the bottom of the screen. These functions include the following:

- *To select from the menu or screen,* use the Tab key to move the cursor from one field to the next. Pressing the <CR> carriage return or <Enter> key while the cursor is positioned on a field accepts the selection or initiates the function.

- *To return to the top-level menu from any screen,* from anywhere within the menu hierarchy, select **Main.** This is the same as pressing the △ key when using the front panel.

- *To terminate a session from any screen*, enter **Ctrl-x**.

- *To return to the screen one step up in the menu tree*, select **Previous**. This is the same as pressing the △ key when using the front panel. This selection is not available on the main menu.

Menu Selection Screens

Figure 3-43 shows the top-level menu screen as it appears on the async terminal.

Customer ID: New Cust	main Model: ACCULINK xxx	LED Status Test NET DTE Chan

Status

Test

Configuration

Control
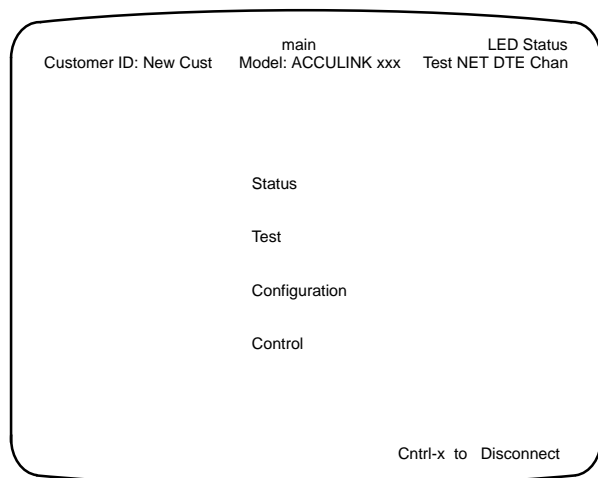
Cntrl-x to Disconnect

Figure 3-43. Async Terminal Top-Level Menu Screen

Appendix A provides a complete Front Panel Menu tree which illustrates a menu structure similar to that supported by the async terminal interface. Refer to this appendix for assistance when navigating through the menu system.

Alarm conditions are indicated on the upper right corner of the menu screen under the header **LED Status.** For example, if an alarm is reported on the DTE interface, **DTE** appears under **LED Status** in inverse video. Likewise, **Test** appears if a test is running on a device. **NET** appears to report alarms on network. **Chan** appears if any of the data ports are configured to generate All Ones (refer to the All Ones configuration option in the *Port Configuration Options* section of Appendix C). When these indicators appear, they reflect the current status upon entering into the menu system or whenever you return to the main menu.

Edit and Display Screens

Edit and display screens use the same navigation keys. The Tab key moves the cursor from field to field in an edit screen and is used to navigate to a Function key on both screen types. Use the carriage return (Enter) to make the selection. When you complete all the changes on an edit screen or finish viewing a display screen, tab to and select **Previous** at the bottom of the current screen. This moves you one step up in the menu tree, thus enabling you to navigate within the menu system.

Editing: Edit screens allow you to edit or change information on a screen. Basically, the procedure for editing or changing options using an async terminal is the same as the front panel. However, you must take into account the full screen capability which makes consolidating menu selections to one screen possible by using the screen's Function keys.

Edit screens support the following hard-key conventions for changing field values (Table 3-14).

Table 3-14
Hard-Key Representations for Edit Screens

Key	Usage
Tab key	Moves between fields.
Backspace	Moves cursor one position to the left.
Spacebar	Steps through valid selections in a field.
Delete key	Deletes character at current cursor position.
Carriage Return (Enter)	Accepts entry or displays valid options on the last row of the screen when pressed before entering data or after entering invalid data.
Ctrl-l	Redraws the screen.
Ctrl-x	Terminates async terminal session.
Ctrl-k	Back tab. Goes to previous field on a screen.
Ctrl-f	Scrolls forward (to the right) one character.
Ctrl-b	Scrolls back (to the left) one character.

Status messages appear in the last row of the screen once an operation is initiated. These include **Please Wait** (when a command takes longer than five seconds), **Command Complete**, and **Command Failed.**

Typically, all screens display the current values set for each field based on the loaded configuration set.

Edit screens support the following Function keys for invoking an operation (Table 3-15).

Table 3-15
Function Representations for Edit Screens

Function Key	Usage
Load	main/configuration screen only: Loads specified configuration option set.
Edit Save	Returns interface to the main/configuration menu where "Save To" information is required before a Save operation.
Save	Saves existing or edited configuration information as well as changes to items in the Control branch.
Edit	From the main/ configuration screen: displays the configurations selection menu.
Main	Returns interface to the main menu.
Previous	Returns interface to the screen one step up the menu tree.

Displaying Information: Display screens show results from a data collection operation such as performance or device test. They also can simply display configuration information such the Identity screen. These screens cannot be edited. Data or status continues to be collected while the screen is displayed. Status and performance polling occurs at regular intervals. Selecting **Refresh** updates the screen display with the most current information. Typically, display screens are filtered to show only the information or data collected for the active configuration.

Display screens support the following Function keys for invoking an operation (Figure 3-16):

Table 3-16
Function Representations for Display Screens

Function Key	Usage
Refresh	Updates the display to the current period.
Up	main/status/performance screens only. Displays the previous 8 interval registers.
Down	main/status/performance screens only. Displays the next 8 interval registers.

Character Matching: The async terminal also supports character matching for entering valid values in fields when editing options. For example, if the valid values for a field are **DTE**, **NET**, and **PORT** and you enter a 'D' and press the carriage return (Enter), then the field automatically populates with the value that matches the character criteria. In this case, it would be **DTE.**

Terminating a Session

To terminate the async terminal session from any screen, press **Ctrl-x** (control key plus x). If access security is not established, the session ends. If access security is established, the system logs off and returns to the Password Access menu; the password must be reentered to reactivate an async terminal session.

Maintenance 4

Overview

The ACCULINK 316x DSU/CSU can detect and report faults, perform diagnostic tests, and download software. These features ensure that your DSU/CSU is giving you optimum performance in your network.

Troubleshooting

The DSU/CSU offers a number of front panel alarms to alert you to possible problems. Once problems are detected, you can use the troubleshooting table (Appendix F) to decide what action to take. Also refer to the *Test Commands* section later in this chapter to isolate problems via loopback tests and test patterns. A lamp test is also available.

Alarms

The 316x DSU/CSU monitors alarm conditions occurring on either the network interface or the DSX-1 Drop/Insert port (DTE). For Model 3160/3164 DSU/CSUs, you can route these alarms to the MODEM port, the COM port, or both. Each alarm is preceded by the customer identification so you know which DSU/CSU is having the problem. Possible alarm messages are as follows, where *x* is the DTE or Network interface where the condition exists.

For Model 3161 DSU/CSUs, these alarms activate the alarm relay, if so configured.

- **Continuous Loss Of Signal at the *x* Interface.**

- **Alarm Cleared. Loss of Signal condition at the *x* Interface.**

- **Continuous Out Of Frame condition detected at the *x* Interface.**

- **Alarm Clear. Out of Frame condition at the *x* Interface.**

- **Alarm Indication Signal received at the *x* Interface.**

- **Alarm Clear. Alarm Indication Signal at the *x* Interface.**

- **An Excessive Error Rate has been detected at the Network Interface.**

- **Alarm Cleared. An Excessive Error Rate at the Network Interface.**

- **Yellow alarm signal received at the *x* Interface.**

- **Alarm Cleared. Yellow alarm signal at the *x* Interface.**

If two alarm conditions are detected at once, the higher priority alarm is reported. However, if an even higher priority alarm is detected before the first alarm is cleared, the later alarm is not reported.

Alarms remain active until the alarm condition is cleared. Also, an alarm clear message is reported, unless another alarm occurs right away. In this case, the alarm report takes precedence over the alarm clear message.

You can specify the number of minutes to wait between successive dial out alarms and between retry attempts after failed alarm dial outs. For more details, refer to the *Alarm Configuration Options* section of Appendix C, *Configuration Options*.

SNMP Traps

If you are using SNMP to manage your 3160/3164 DSU/CSU, link-up and link-down traps are generated when the state of an interface changes. A link-down trap is generated when an interface transitions from an up state to a down state. A link-up is generated when an interface transitions from a down state to an up state. Table 4-1 defines traps for each interface.

Table 4-1
SNMP Trap per Interface

Interface	SNMP Trap Meaning
Network T1	Interface is up when no alarm conditions exist. Interface is down when an alarm condition is active.
DSX-1 (DTE) Drop/Insert	Interface is up when no alarm conditions exist and the interface is enabled. Interface is down when an alarm condition is active and the interface is disabled.
Data Ports	Interface is up when the port is assigned to a T1 interface and both CTS and DSR are ON. Interface is down when the port is unassigned or either CTS or DSR are off.

Test Commands

The test commands enable you to run loopbacks and test patterns on the DSU/CSU, and to test the front panel LEDs. These tests can help you isolate areas of trouble in case you are having problems with your 316x DSU/CSU. Access all Test commands from the Test branch of the front panel menu tree (see Figure 4-1).

Differences Using the Async Terminal: For the async terminal interface, the Test branch differs from the front panel Test branch in both organization and selection. The async terminal's full-screen display organizes the test selections into tests run on the T1 interface and tests run on ports, as shown in Figure 4-2.
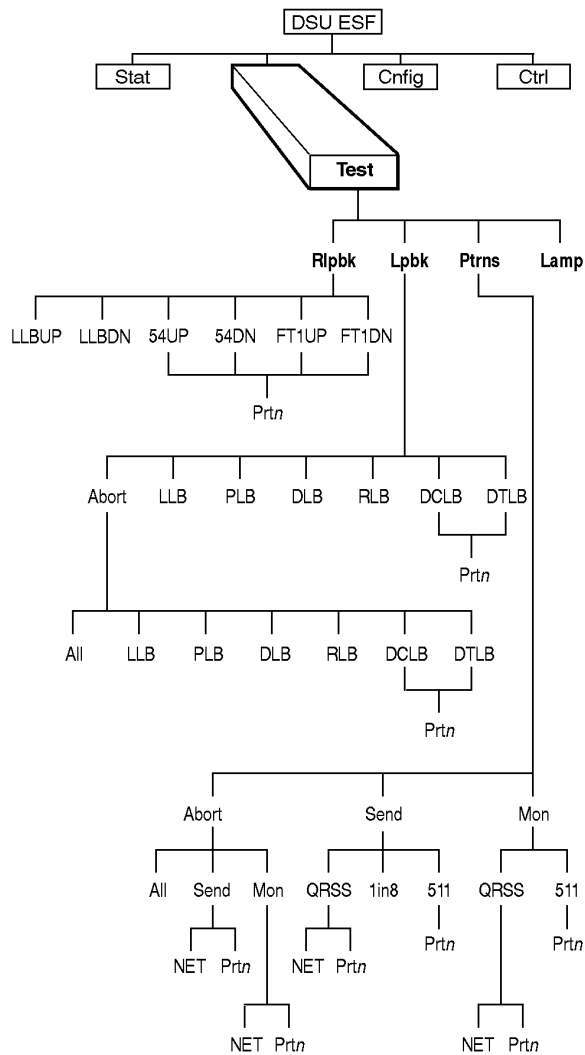
493-14309

Figure 4-1. Test Branch
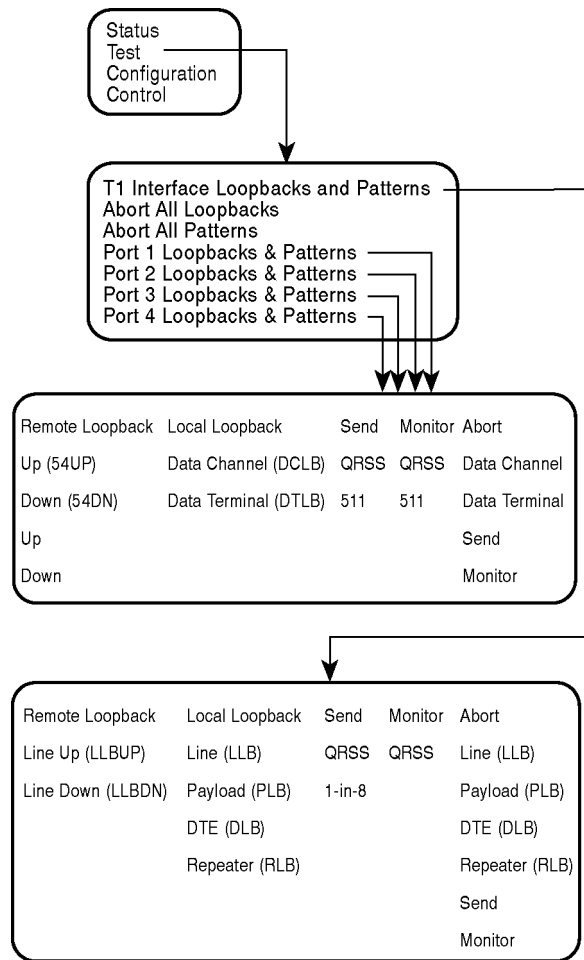
494-14599b

Figure 4-2. Test Branch for Async Terminal

When you select **T1 Interface Loopbacks and Patterns**, the subsequent screen displays the Remote Loopback, Local Loopback, Send, Monitor, and Abort operations that are available to run on the T1 interface, as shown in Figure 4-2. Likewise, from one of the port selections, a similar screen appears with the same operations that can run on the selected port, also shown in Figure 4-2. All the local loopback tests are mutually exclusive with the send pattern and remote loopback tests. If you attempt to run a test that is already active or an invalid local loopback test or test pattern combination (see Tables 4-2 and 4-3), an error message is displayed.

The Lamp test is not available from the async terminal interface.

Remote Loopback Tests

The Remote Loopback tests allow you to troubleshoot your circuit by sending to a far-end DSU/CSU the following:

For Networks,

- Line loopback up code for 10 seconds (LLBUP)

- Line loopback down code for 10 seconds (LLBDN)

For Channels,

- V.54 activation sequence to initiate a V.54 Loop 2 (54UP)

- V.54 deactivation sequence to terminate a V.54 Loop (54DN)

- ANSI T1.403 (Annex B) activation sequence to initiate a DCLB on the remote device (FT1UP)

- ANSI T1.403 (Annex B) deactivation sequence to terminate a DCLB on the remote device (FT1DN)

You cannot perform remote loopbacks if any of the local loopbacks are active. If you attempt to do so, the error message **Invalid Test Combo** appears.

Sending a Line Loopback Up or Down

To send a Line Loopback Up or Down code on the network to a far-end DSU/CSU,

1. Press F2 to select Test from the top-level menu screen.
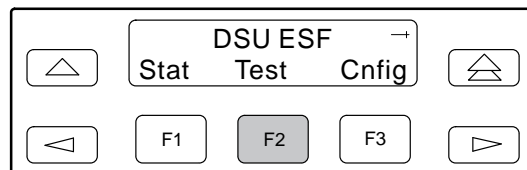
2. From the Test screen, press F1 to select Rlpbk.
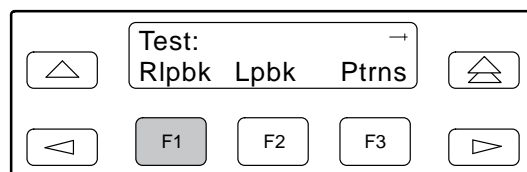
3. From the Rem Loopback screen, press F1 to select LLBUP (Line Loopback Up), or press F2 to select LLBDN (Line Loopback Down).
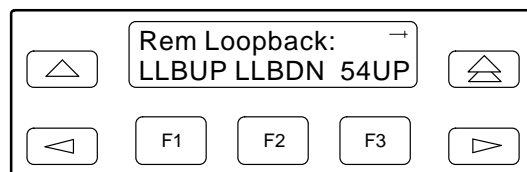
The Local Loopback code is sent up or downstream to the far-end DSU/CSU for 10 seconds. During this time, **Sending** appears on Line 2 of the LCD, followed by **Command Complete** when 10 seconds have elapsed.

You can press any function key to restore the Rem Loopback screen without affecting transmission of the loopback code.

Sending a V.54/ANSI FT1 Activation/Deactivation

To send a V.54 or ANSI FT1 Activation or Deactivation loopback sequence to the far-end DSU/CSU,

1. Press F2 to select Test from the top-level menu screen.

```
          DSU ESF        →
  △     Stat   Test   Cnfig    △

  ◁      F1     F2     F3      ▷
```

2. From the Test screen, press F1 to select Rlpbk.

```
       Test:            →
  △    Rlpbk  Lpbk   Ptrns    △

  ◁     F1     F2     F3      ▷
```

3. From the Rem Loopback screen, press the function key that corresponds to the specific loopback test you want to perform. Use the scroll keys, if necessary

```
       Rem Loopback:    →
  △    LLBUP LLBDN  54UP     △

  ◁     F1     F2     F3      ▷
```
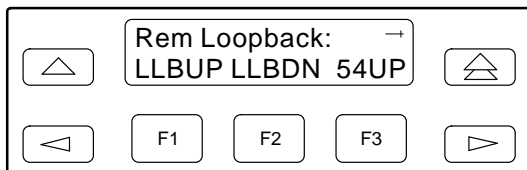
The Rem Loop screen appears.

```
       Rem Loop: Type   →
  △    Prt1    Prt2   Prt3    △

  ◁     F1     F2     F3      ▷
```
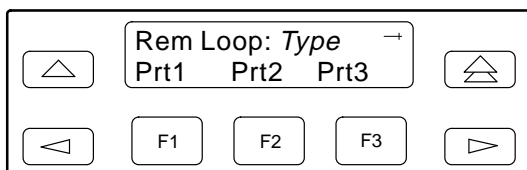
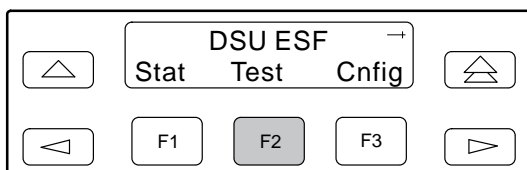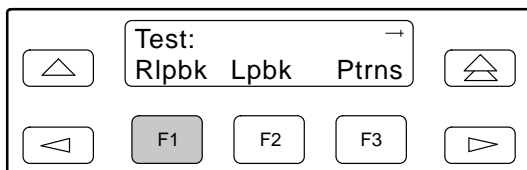The 54UP, 54DN, FT1UP, and FT1DN commands send the requested sequence out the network interface on the DS0 channels allocated to the port you select here.

4. From the Rem Loop screen, press the desired function key to select the specific port. Use the scroll keys, if necessary.

After you select a port, the sequence is sent to the far-end DSU/CSU. During this time, **Sending** appears on Line 2 of the LCD, followed by **Command Complete** when the sequence is complete.

During the **Sending** message, you can press the △ and ◬ keys without affecting transmission of the loopback sequence.

Local Loopback Tests

The Local Loopback tests enable you to conduct circuit testing and single-ended fault isolation for the digital line. The supported local loopback tests are:

- Line Loopback (LLB)

- Payload Loopback (PLB)

- DTE Loopback (DLB)

- Repeater Loopback (RLB)

- Data Channel Loopback (DCLB)

- Data Terminal Loopback (DTLB)

The Line Loopback and Payload Loopback commands can be activated and deactivated in response to commands received over the network interface as specified by ANSI and AT&T standards.

The Network Interface configuration options NET LLB and NET PLB control whether the DSU/CSU responds to the commands transmitted on the network interface to initiate PLBs or LLBs (see Appendix C, *Configuration Options*).

The data port configuration option NET DCLB controls whether the DSU/CSU responds to inband V.54 or fractional T1 commands to initiate DCLB for that port (see Appendix C, *Configuration Options*).

Local loopback tests can be aborted (Abort Command) at any time.

No more than two local loopbacks can be active at any one time. An additional restriction prohibits certain loopbacks from running at the same time. Valid loopback combinations listed in Table 4-2 are identified by **YES**.

Table 4-2
Valid Loopback Combinations

	LLB	**PLB**	**DLB**	**RLB**	**DCLB**	**DTLB**
LLB	N/A	NO	YES	YES	NO	YES
PLB	NO	N/A	YES	NO	NO	YES
DLB	YES	YES	N/A	NO	YES	YES
RLB	YES	NO	NO	N/A	NO	YES
DCLB	NO	NO	YES	NO	YES (on separate ports)	YES (on separate ports)
DTLB	YES	YES	YES	YES	YES (on separate ports)	YES (on separate ports)

Starting a Line Loopback

The Line Loopback command (LLB) loops the received signal on the network interface back to the network without change.
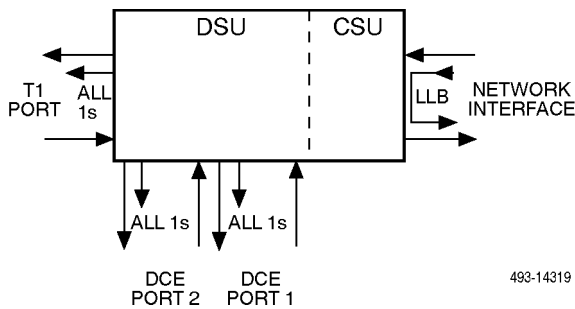

493-14319

To perform a Line loopback,

1. Press F2 to select Test from the top-level display screen.
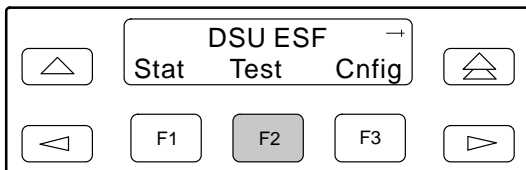
2. From the Test screen, press F2 to select Lpbk.
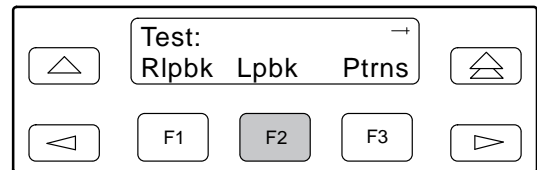
3. From the Loopback screen, press F2 to select LLB.
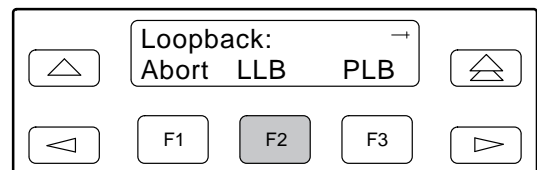
Test Started appears on Line 2. If a line loopback is already in progress, the **Already Active** message appears. If an invalid combination of loopbacks is in progress, the error message **Invalid Test Combo** appears (see Table 4-2 for valid loopback test combinations).

Starting a Payload Loopback

The Payload Loopback command (PLB) loops the received signal on the network interface back to the network. The signal is looped back as close to the DSX-1 Drop/Insert port (DTE) as possible (after it has passed through the framing circuitry of the DSU/CSU). Therefore, framing CRCs and BPVs are corrected. If bit stuffing is enabled, pulse density is enforced.
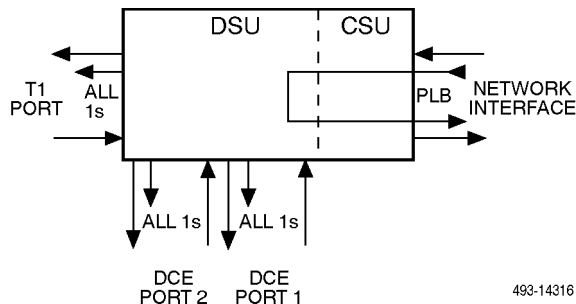
493-14316

To perform a Payload loopback,

1. Press F2 to select Test from the top-level menu screen.
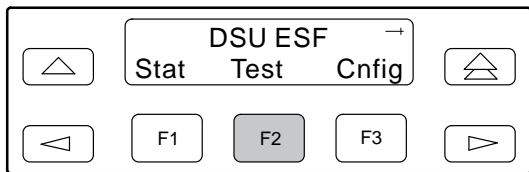
2. From the Test screen, press F2 to select Lpbk.
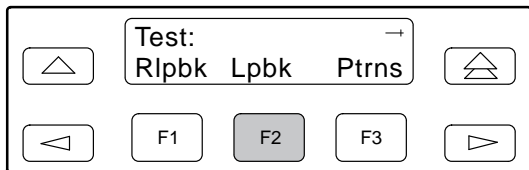
3. From the Loopback screen, press F3 to select PLB.
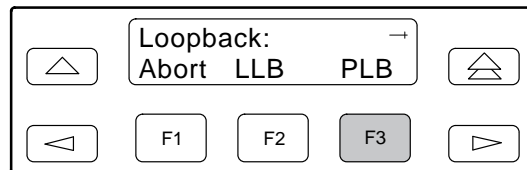
Test Started appears on Line 2. If a Payload loopback is already in progress, the **Already Active** message appears. If an invalid combination of loopbacks is in progress, the error message **Invalid Test Combo** appears (see Table 4-2 for valid loopback test combinations).

Starting a DTE Loopback

The DTE Loopback command (DLB) loops the received signal on the DSX-1 Drop/Insert port (DTE) back to the DTE without change.

A DTE loopback can be activated and deactivated based on the state of an external contact on the DSX-1 Drop/Insert port (DTE). If this option is enabled with the DTE Interface configuration option Extrn DLB, closing the contact (relay contact sense and relay contact return) activates a DLB. The DLB remains active until the contact is opened. Refer to the *DSX-1 Port DTE Interface* section in Appendix D, *Pin Assignments*, for more information.

493-14317

To perform a DTE loopback,

1. Press F2 to select Test from the top-level menu screen.

```
           DSU ESF      →
  △    Stat   Test   Cnfig    △

  ◁     F1     F2     F3     ▷
```

2. From the Test screen, press F2 to select Lpbk.

```
    Test:              →
  △  Rlpbk  Lpbk   Ptrns    △

  ◁     F1     F2     F3     ▷
```
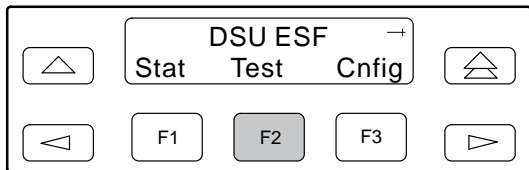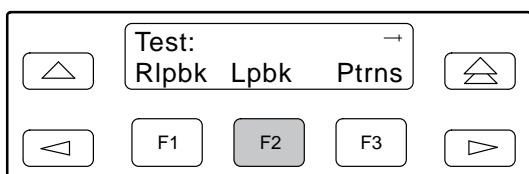
3. From the Loopback screen, press ▷ once to display the DLB selection on the screen.

```
    Loopback:          →
  △  Abort   LLB     PLB    △

  ◁     F1     F2     F3     ▷
```

4. Press F3 to select DLB.

```
    Loopback:          ⇄
  △  LLB     PLB     DLB    △

  ◁     F1     F2     F3     ▷
```
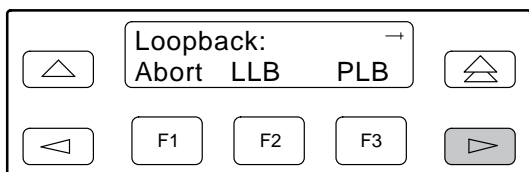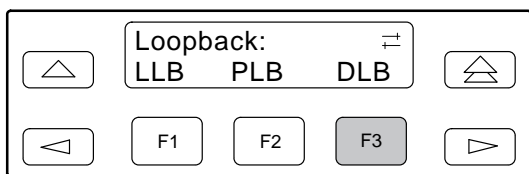
Test Started appears on Line 2. If a DTE loopback is already in progress, the **Already Active** message appears. If an invalid combination of loopbacks is in progress, the error message **Invalid Test Combo** appears (see Table 4-2 for valid loopback test combinations).

Starting a Repeater Loopback

The Repeater Loopback command (RLB) loops the signal being sent to the network and back to the DSX-1 Drop/Insert and data ports. The signal is looped back as close to the network interface as possible (after it has passed through the framing circuitry of the DSU/CSU). Therefore, framing CRCs and BPVs are corrected. If bit stuffing is enabled, pulse density is enforced.

493-14318

To perform a Repeater loopback,

1. Press F2 to select Test from the top-level menu screen.

```
           DSU ESF      →
  △    Stat   Test   Cnfig    △

  ◁     F1     F2     F3     ▷
```

2. From the Test screen, press F2 to select Lpbk.

```
    Test:              →
  △  Rlpbk  Lpbk   Ptrns    △

  ◁     F1     F2     F3     ▷
```
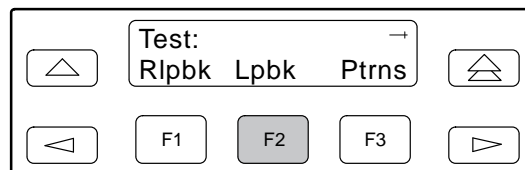
3. From the Loopback screen, press ▷ twice to display the RLB selection on the screen.

```
    Loopback:          →
  △  Abort   LLB     PLB    △

  ◁     F1     F2     F3     ▷
```

4. Press F3 to select RLB.

```
┌──────────────────────────────────────────┐
│  ┌────┐   ┌─────────────────────┐  ┌────┐ │
│  │ △  │   │ Loopback:        ⇄  │  │ △  │ │
│  └────┘   │ PLB    DLB    RLB   │  └────┘ │
│           └─────────────────────┘         │
│  ┌────┐  ┌────┐  ┌────┐  ┌────┐   ┌────┐  │
│  │ ◁  │  │ F1 │  │ F2 │  │ F3 │   │ ▷  │  │
│  └────┘  └────┘  └────┘  └────┘   └────┘  │
└──────────────────────────────────────────┘
```

Test Started appears on Line 2. If a Repeater loopback is already in progress, the **Already Active** message appears. If an invalid combination of loopbacks is in progress, the error message **Invalid Test Combo** appears (see Table 4-2 for valid loopback test combinations).

Starting a Data Channel Loopback

The Data Channel loopback command (DCLB) loops the data received from the network interface, for all DS0 channels allocated to the selected port, back to the network. The loopback occurs after the data passes through the port circuitry but before it is sent out the data port.
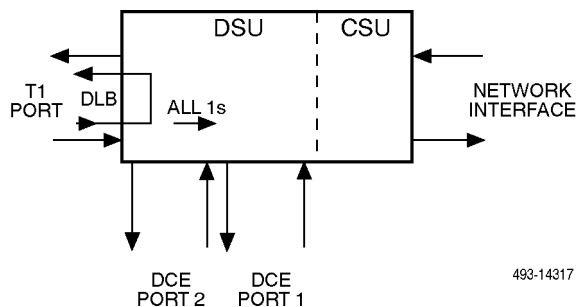

493-14315

To perform a Data Channel loopback,

1. Press F2 to select Test from the top-level menu screen.

```
┌──────────────────────────────────────────┐
│  ┌────┐   ┌─────────────────────┐  ┌────┐ │
│  │ △  │   │    DSU ESF       →  │  │ △  │ │
│  └────┘   │ Stat   Test   Cnfig │  └────┘ │
│           └─────────────────────┘         │
│  ┌────┐  ┌────┐  ┌────┐  ┌────┐   ┌────┐  │
│  │ ◁  │  │ F1 │  │ F2 │  │ F3 │   │ ▷  │  │
│  └────┘  └────┘  └────┘  └────┘   └────┘  │
└──────────────────────────────────────────┘
```

2. From the Test screen, press F2 to select Lpbk.

```
┌──────────────────────────────────────────┐
│  ┌────┐   ┌─────────────────────┐  ┌────┐ │
│  │ △  │   │ Test:            →  │  │ △  │ │
│  └────┘   │ Rlpbk  Lpbk   Ptrns │  └────┘ │
│           └─────────────────────┘         │
│  ┌────┐  ┌────┐  ┌────┐  ┌────┐   ┌────┐  │
│  │ ◁  │  │ F1 │  │ F2 │  │ F3 │   │ ▷  │  │
│  └────┘  └────┘  └────┘  └────┘   └────┘  │
└──────────────────────────────────────────┘
```
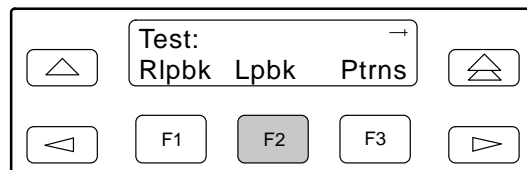
3. From the Loopback screen, press ▷ three times to display the DCLB selection on the screen.

```
┌──────────────────────────────────────────┐
│  ┌────┐   ┌─────────────────────┐  ┌────┐ │
│  │ △  │   │ Loopback:        →  │  │ △  │ │
│  └────┘   │ Abort  LLB    PLB   │  └────┘ │
│           └─────────────────────┘         │
│  ┌────┐  ┌────┐  ┌────┐  ┌────┐   ┌────┐  │
│  │ ◁  │  │ F1 │  │ F2 │  │ F3 │   │ ▷  │  │
│  └────┘  └────┘  └────┘  └────┘   └────┘  │
└──────────────────────────────────────────┘
```

4. Press F3 to select DCLB.

```
┌──────────────────────────────────────────┐
│  ┌────┐   ┌─────────────────────┐  ┌────┐ │
│  │ △  │   │ Loopback:        ⇄  │  │ △  │ │
│  └────┘   │ DLB    RLB    DCLB  │  └────┘ │
│           └─────────────────────┘         │
│  ┌────┐  ┌────┐  ┌────┐  ┌────┐   ┌────┐  │
│  │ ◁  │  │ F1 │  │ F2 │  │ F3 │   │ ▷  │  │
│  └────┘  └────┘  └────┘  └────┘   └────┘  │
└──────────────────────────────────────────┘
```
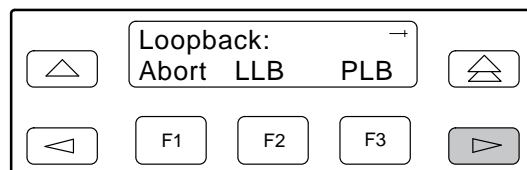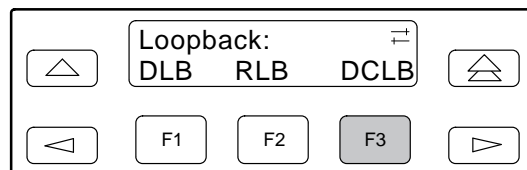
5. From the DCLB screen, press the function key for the port for which you want to perform the data channel loopback. Use the scroll keys, if necessary.

```
┌──────────────────────────────────────────┐
│  ┌────┐   ┌─────────────────────┐  ┌────┐ │
│  │ △  │   │ Loopback: DCLB   →  │  │ △  │ │
│  └────┘   │ Prt1   Prt2   Prt3  │  └────┘ │
│           └─────────────────────┘         │
│  ┌────┐  ┌────┐  ┌────┐  ┌────┐   ┌────┐  │
│  │ ◁  │  │ F1 │  │ F2 │  │ F3 │   │ ▷  │  │
│  └────┘  └────┘  └────┘  └────┘   └────┘  │
└──────────────────────────────────────────┘
```
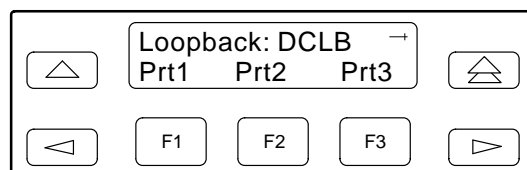
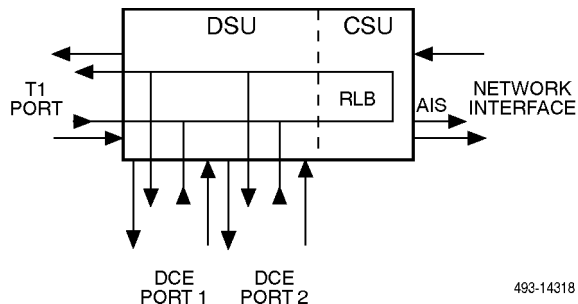**Test Started** appears on Line 2. If a Data Channel loopback is already in progress, the **Already Active** message appears. If an invalid combination of loopbacks is in progress, the error message **Invalid Test Combo** appears (see Table 4-2 for valid loopback test combinations).
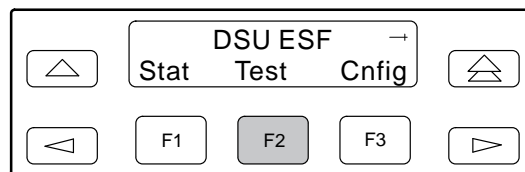
Starting a Data Terminal Loopback

The Data Terminal loopback command (DTLB) loops the data received from the selected port, for all DS0 channels allocated to the port, back out the port. This loopback occurs after the data passes through the port circuitry but before it reaches the T1 framer.

> **HANDLING PRECAUTIONS**
> **FOR**
> **STATIC-SENSITIVE DEVICES**
>
> **This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.**
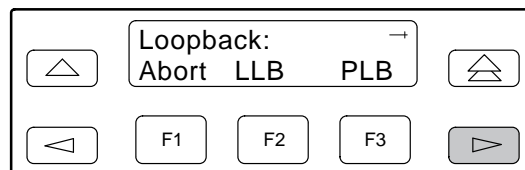

To perform a Data Terminal loopback,

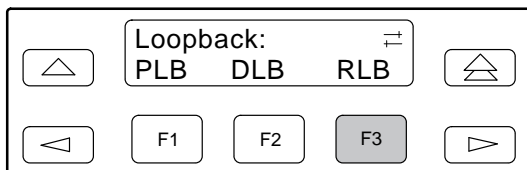1. Press F2 to select Test from the top-level menu screen.
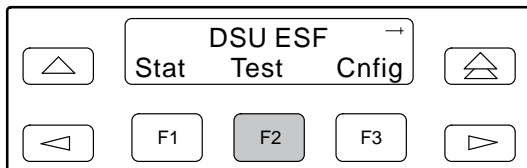
2. From the Test screen, press F2 to select Lpbk.
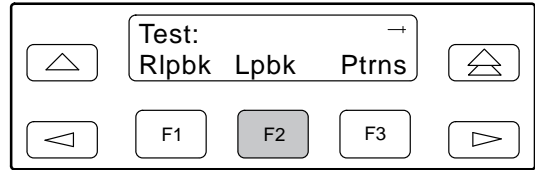
3. From the Loopback screen, press ▷ four times to display the DTLB selection on the screen.
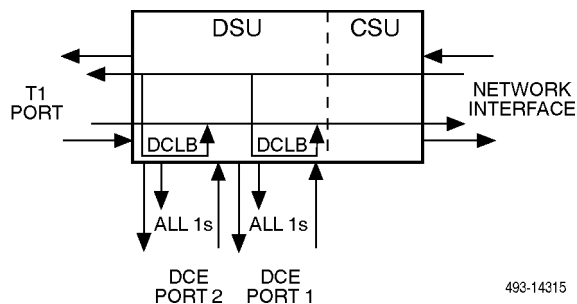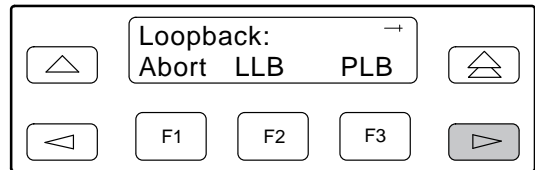

4. Press F3 to select DTLB.
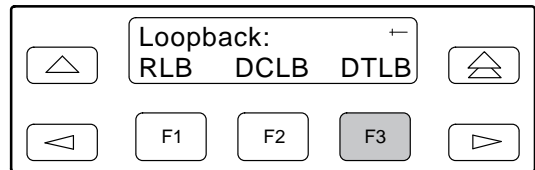
5. From the DTLB screen, press the function key for the port for which you want to perform the data terminal loopback. Use the scroll keys, if necessary.
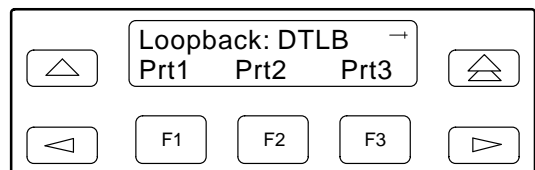
Test Started appears on Line 2. If a Data Terminal loopback is already in progress, the **Already Active** message appears. If an invalid combination of loopbacks is in progress, the error message **Invalid Test Combo** appears (see Table 4-2 for valid loopback test combinations).
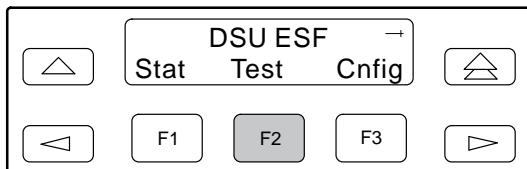
DTE-initiated Loopbacks

The 316x DSU/CSU complies with the V.54 standard for initiating local and remote loopbacks. The local loopback initiates a DTLB, and the remote loopback initiates a DCLB.

DTLBs and DCLBs can be initiated by the DTEs attached to ports 1 through 4 per the V.54 standard.

Aborting Loopbacks

The Abort Loopback command stops all loopback tests or any selected loopback test currently active on the DSU/CSU.

To abort one or more loopback tests,

1. Press F2 to select Test from the top-level menu screen.
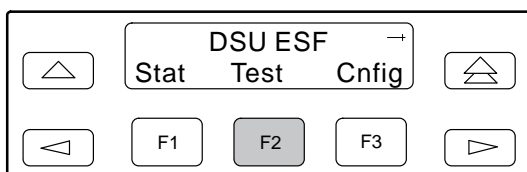
```
          DSU ESF    →
  △   Stat  Test  Cnfig  ⇧
  ◁    F1    [F2]   F3    ▷
```

2. From the Test screen, press F2 to select Lpbk.

```
          Test:       →
  △   Rlpbk  Lpbk  Ptrns  ⇧
  ◁    F1    [F2]   F3    ▷
```

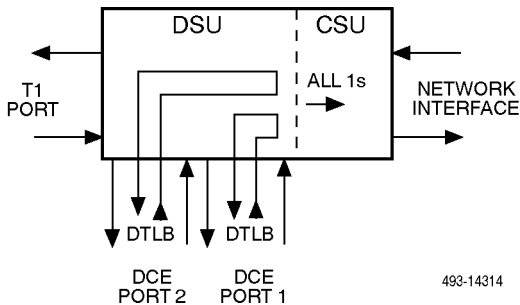3. From the Loopback screen, press F1 to select Abort.

```
          Loopback:    →
  △   Abort  LLB   PLB   ⇧
  ◁   [F1]    F2    F3    ▷
```
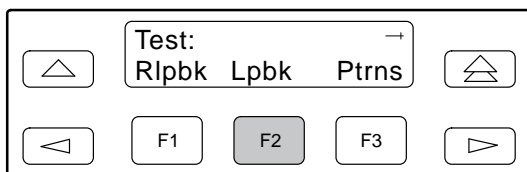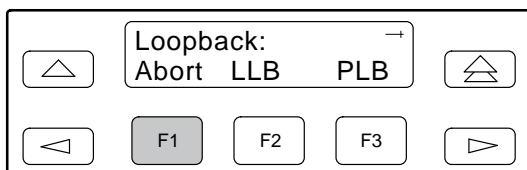
4. From the Loopback Abort screen, press the desired function key to abort All or one specific loopback test. Use the scroll keys, if necessary.

```
          Loopback: Abort  →
  △   All    LLB    PLB    ⇧
  ◁    F1     F2     F3     ▷
```
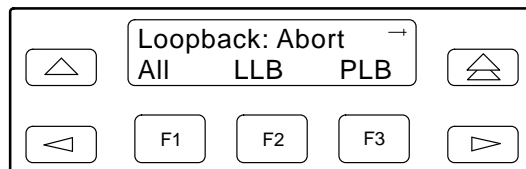
If you select ALL, LLB, PLB, DLB, or RLB, skip Step 5.

5. From the Abort screen, press the function key that corresponds to the port for which you want to about the test. Use the scroll keys, if necessary.

```
          Abort: Test Name  →
  △   Prt1   Prt2   Prt3    ⇧
  ◁    F1     F2     F3     ▷
```
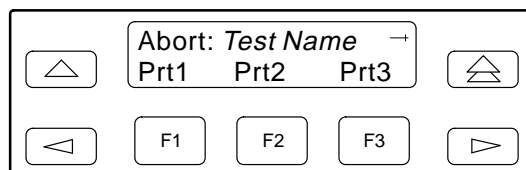
When the abortion is complete, the message **Command Complete** appears on the Abort screen.

NOTE

Be careful when selecting a specific loopback test to abort. If you mistakenly choose to abort a loopback test that is not currently running, a **Command Complete** message will still display and the loopback that is currently active will still be running. You can use the TStat branch of the menu to view the test status to determine if the abort was successful.

Test Patterns

Use the Test Pattern commands to send, monitor, and abort transmission of test patterns on the DSU/CSU network. Available test patterns are:

- **QRSS** – A Quasi-Random Signal Source approximating live data that can be monitored for logic errors (on network and data ports).

- **1-in-8** – A test pattern consisting of a one (1) followed by seven zeros (on network only).

- **511** – A Pseudo-Random Signal 511 bits long (on data ports only).

Sending Test Patterns

Use the Send command to start transmission of a test pattern.

Only one test pattern can be active at a time on one port. Table 4-3 lists the valid send test pattern combinations. Valid combinations are identified by **YES**.

To send a test pattern,

1. Press F2 to select Test from the top-level menu screen.
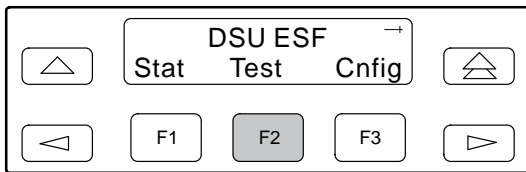
```
            DSU ESF      →
   △    Stat   Test   Cnfig    ≜

   ◁      F1     F2     F3      ▷
```

2. From the Test screen, press F3 to select Ptrns.

```
   Test:             →
   △  Rlpbk  Lpbk   Ptrns   ≜

   ◁    F1     F2     F3     ▷
```

3. From the Patterns screen, press F2 to select Send.

```
         Patterns:
   △    Abort   Send   Mon    ≜

   ◁      F1     F2     F3     ▷
```
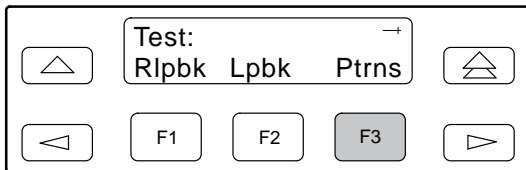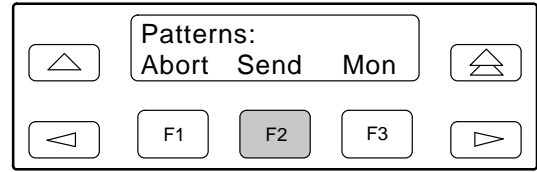
4. From the Patterns Send screen, press F1 to send a QRSS pattern, or F2 to send a 1-in-8 pattern, or F3 to send a 511 pattern.

```
         Patterns: Send
   △    QRSS  1in8     511    ≜

   ◁      F1     F2     F3     ▷
```
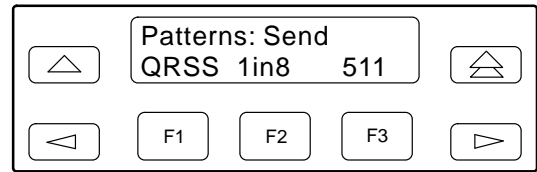
If you press F2 to send a 1-in-8 pattern, skip Step 5.

5. From the Send screen, press the function key that corresponds to the network or port for which you want to send a test pattern. Use the scroll keys, if necessary. (NET does not appear for the 511 pattern.)

```
         Send: Name          →
   △    NET    Prt1     Prt2   ≜

   ◁      F1     F2     F3     ▷
```
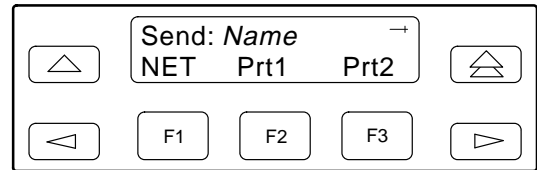
The Test Started screen appears.

```
         Send: Name and Dest
   △    Test Started          ≜

   ◁      F1     F2     F3     ▷
```
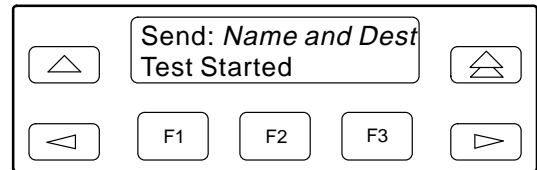
If the DSU/CSU is already sending the test pattern you selected, the message **Already active** appears. If selected an incompatible test pattern combination, the message **Invld Test Combo** appears. See Table 4-3 for valid combinations.

Table 4-3
Valid Send Test Pattern Combinations

	QRSS (Network)	QRSS (Port)	1 in 8 (Network)	511 (Port)
QRSS (Network)	N/A	NO	**NO**	NO
QRSS (Port)	NO	**YES (on separate ports)**	N/A	YES (on separate ports)
1 in 8 (Network)	NO	NO	**N/A**	NO
511 (Port)	NO	N/A	N/A	YES (on separate ports)

Monitoring Test Patterns

Use the Monitor command to monitor a QRSS test pattern over all the channels on the network interface, or to monitor QRSS or 511 test patterns on the channels allocated to an individual port.

This command provides the number of errors detected in the test pattern (5 digits, maximum 99999).

To monitor a QRSS or 511 test pattern,

1. Press F2 to select Test from the top-level menu screen.
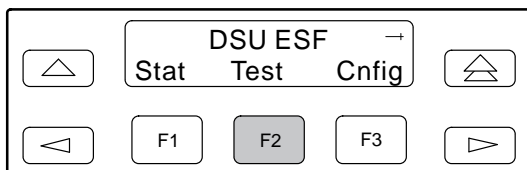
```
          DSU ESF      →
   Stat     Test     Cnfig
   F1       F2       F3
```

2. From the Test screen, press F3 to select Ptrns.

```
   Test:            →
   Rlpbk  Lpbk   Ptrns
   F1     F2     F3
```

3. From the Patterns screen, press F3 to select Mon.

```
   Patterns:
   Abort  Send   Mon
   F1     F2     F3
```
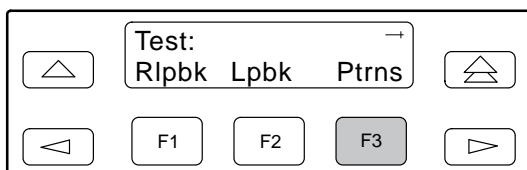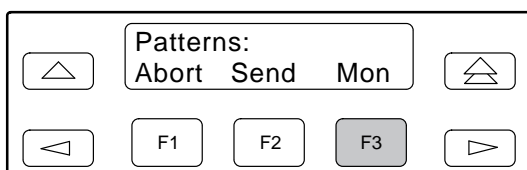
4. From the Patterns Mon screen, press F1 for QRSS or F2 for 511.

```
   Patterns: Mon
   QRSS  511
   F1     F2     F3
```
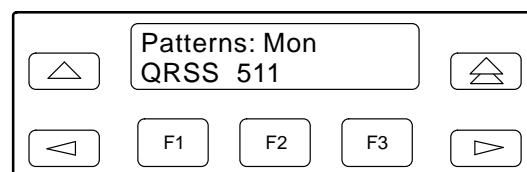
5. From the Monitor screen, press the function key that corresponds to the network or port for which you want to monitor a test pattern. Use the scroll keys, if necessary. (NET does not appear for the 511 pattern.)

```
   Monitor: Name      →
   NET    Prt1    Prt2
   F1     F2     F3
```
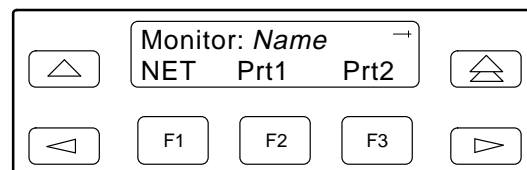
The Monitor screen appears with the error count. If the maximum of 99999 is exceeded, **OvrFlw** appears instead of the count. If the receiver loses synchronization while the monitor is active, **No Sync** appears.

Aborting Test Patterns

Use the Abort command to stop all test patterns or any selected test pattern active on the DSU/CSU.

To abort test patterns,

1. Press F2 to select Test from the top-level menu screen.
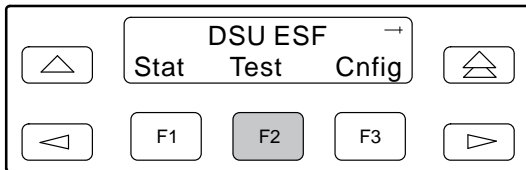
```
              DSU ESF    →
        Stat    Test    Cnfig
         F1      F2      F3
```

2. From the Test screen, press F3 to select Ptrns.

```
        Test:          →
        Rlpbk  Lpbk    Ptrns
         F1      F2      F3
```

3. From the Patterns screen, press F1 to select Abort.

```
        Patterns:
        Abort   Send    Mon
         F1      F2      F3
```
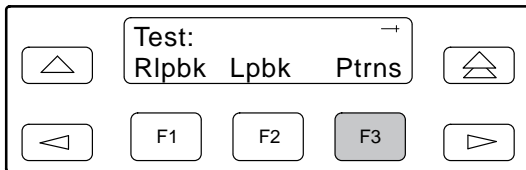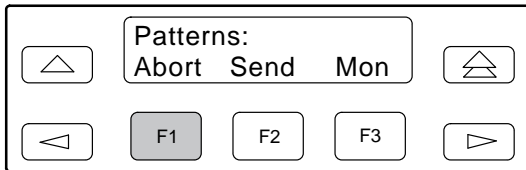
4. From the Patterns Abort screen, press the desired function key to abort either All active test patterns, active Send test patterns, or the active Monitor (Mon) test pattern.

```
        Patterns: Abort
        All     Send    Mon
         F1      F2      F3
```
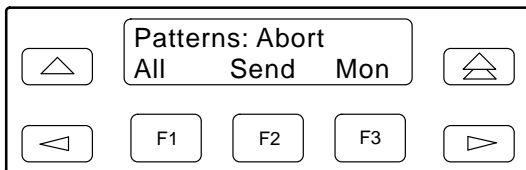
If you select All, the DSU/CSU terminates all active test patterns and displays the message **Command Complete**. Skip Step 5.

NOTE

Be careful when selecting a specific test pattern to abort. If you mistakenly choose to abort a test pattern that is not currently running, a **Command Complete** message still displays and the test pattern currently active still runs. You can use the TStat branch of the menu to view the test status to determine if the abort was successful.

---

5. From the Abort screen, press the function key that corresponds to the network or port for which you want to abort a test pattern. Use the scroll keys, if necessary.

```
        Abort: Send or Mon →
        NET     Prt1    Prt2
         F1      F2      F3
```
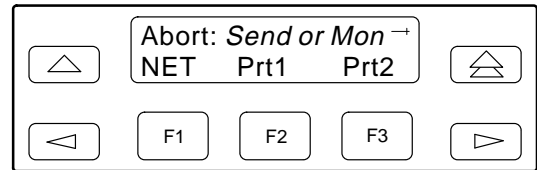
The DSU/CSU terminates the selected test pattern and displays the message **Command Complete**.

Lamp Test

Use the Lamp Test commands to start and stop a test of the DSU/CSU front panel LEDs. This feature is only available from the front panel.

Starting a Lamp Test

To start a Lamp test,

1. Press F2 to select Test from the top-level menu screen.

```
              DSU ESF    →
        Stat    Test    Cnfig
         F1      F2      F3
```
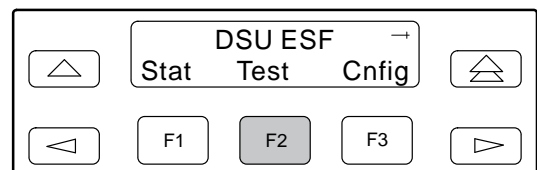
2. From the Test screen, press ▷ once to display the Lamp selection on the screen.
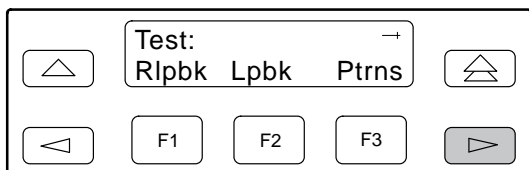
```
Test:                  →
Rlpbk   Lpbk    Ptrns
  △        F1    F2    F3    ▷
```

3. From the Test screen, press F3 to select Lamp.

```
Test:                  ←
Lpbk   Ptrns   Lamp
  △        F1    F2   [F3]   ▷
```

4. From the Lamp Test screen, press F2 to select Start.

```
Lamp Test:
Abort   Start
  △        F1   [F2]   F3    ▷
```
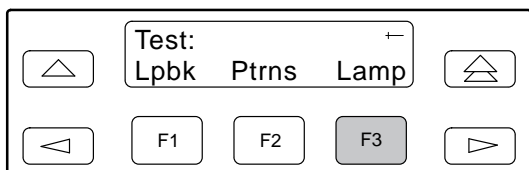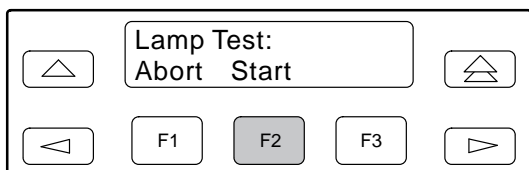
5. The following screens alternately appear on the LCD until you press a Function key to return to the Lamp Test screen. In addition, all LEDs blink.

```
  △   ████████████████████   ▲
       ████████████████████
  ◁        F1    F2    F3    ▷
```

```
0123456789 : ; < = > ?
@ABCDEFGHIJKLMNO
  △        F1    F2    F3    ▷
```
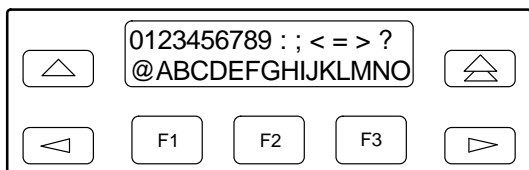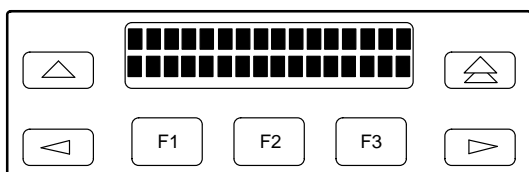
6. When you are satisfied that all LEDs are lighting and the LCD is functioning properly, you can abort the Lamp test from the Lamp Test screen. The Device Health and Status screen appears automatically if there is no activity on the DSU/CSU front panel for five minutes. However, the Lamp test remains active until it is aborted.

Aborting a Lamp Test

To abort the Lamp test,

1. Display the Lamp Test screen. To do this when the LCD is alternating the Lamp test screens, press any function key. Otherwise, follow Steps 1 through 3 for starting a Lamp test.

```
Lamp Test:
Abort   Start
  △        F1    F2    F3    ▷
```

2. From the Lamp Test screen, press F1 to select Abort.

```
Lamp Test:
Abort   Start
  △      [F1]   F2    F3    ▷
```
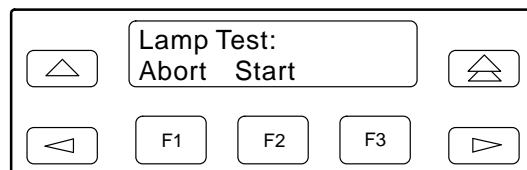
Displaying DSU/CSU Test Status

Use the Test Status command to display the active tests for the DSU/CSU. Status messages that can display on the front panel LCD are listed in Table 4-4.

Table 4-4
Test Status Messages

Message	Description
No Test Active	No tests are currently active.
LLB Test Active	The network interface is in Line loopback.
PLB Test Active	The network interface is in Payload loopback.
DLB Test Active	The DSX-1 Drop/Insert port (DTE) is in DTE loopback.
RLB Test Active	The DSX-1 Drop/Insert port (DTE) is in Repeater loopback.
DCLB on Port n	Port n is in a data channel loopback.
DTLB on Port n	Port n is in a data terminal loopback.
QRSS Test Active	A QRSS test pattern is being sent on the network interface.
1–8 Test Active	A 1-in-8 test pattern is being sent on the network interface.
QRSS on Port n	A QRSS test pattern is being sent to the network on the channels allocated to port n.
511 on Port n	A 511 test pattern is being sent to the network on the channels allocated to port n.
Monitoring QRSS	The QRSS test pattern is being monitored on the received network interface signal.
Mon QRSS, Port n	A QRSS test pattern is being monitored on the channels allocated to port n.
Mon 511, Port n	A 511 test pattern is being monitored on the channels allocated to port n.
DLB Test, Extrn	The DSX-1 Drop/Insert port (DTE) is being held in DTE loopback by the external contact.
Lamp Test Active	The Lamp test is currently active.

To display test status,

1. Press F1 to select Stat from the top-level menu screen.

```
              DSU ESF      →
  △     Stat    Test    Cnfig    ⬆

  ◁      F1       F2       F3     ▷
```
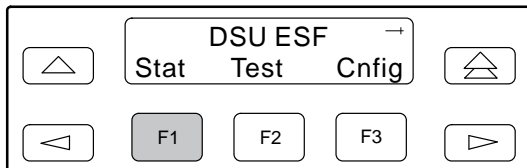
2. From the Status screen, press the ▷ key once to display the TStat selection.

```
         Status:          →
  △     DevHS STest   Perf        ⬆

  ◁      F1       F2       F3     ▷
```

3. Press F3 to select TStat.

```
         Status:          ⇄
  △     STest  Perf    TStat       ⬆

  ◁      F1       F2       F3     ▷
```
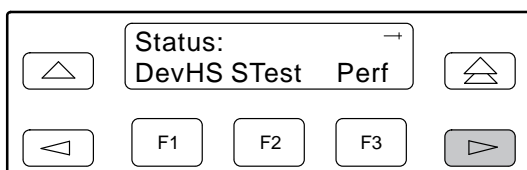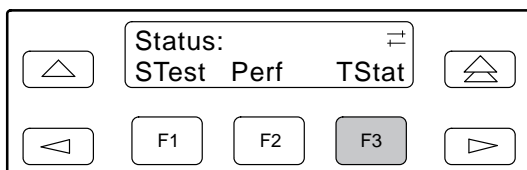
4. The Test Status screen appears showing you what tests are active for the DSU/CSU.

Differences Using the Async Terminal: To display test status, select **Health, Test Status**, and **Self Test Results** from the main/status menu (see Figure 2-10 in Chapter 2).

Downloading Software

The 3160/3164 DSU/CSU is capable of accepting a software download from a PC through either its MODEM port or its COM (Communications) port. The Download procedure is the same for 3161 DSU/CSUs, except that DSU/CSUs in the 3000 Series Carrier have a single COM port (and no MODEM port) that must be shared with other DSU/CSUs in the carrier. The Download feature is used only by Customer Support personnel to update the DSU/CSU.

```
+---------------------------------+
|            CAUTION              |
|                                 |
| The Download command is for     |
| use by service personnel only.  |
| Loss of primary data could      |
| result from improper use.       |
+---------------------------------+
```

Resetting the DSU/CSU

Use the Reset command to perform a power-on reset of the DSU/CSU.

To reset the DSU/CSU,

1. Press the ▷ key once to display the Ctrl selection on the top-level menu screen.

```
              DSU ESF      →
  △     Stat    Test    Cnfig    ⬆

  ◁      F1       F2       F3     ▷
```

2. Press F3 to select Ctrl from the top-level menu screen.

```
              DSU ESF      ←
  △     Test    Cnfig    Ctrl     ⬆

  ◁      F1       F2       F3     ▷
```
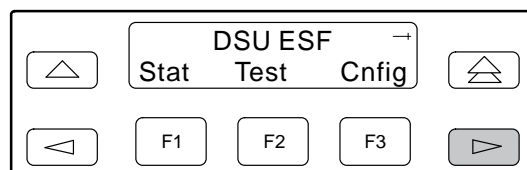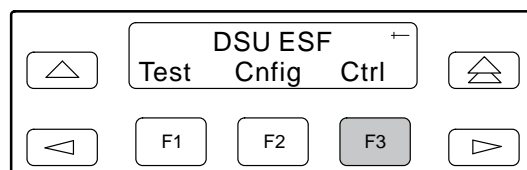
3. From the Control screen, press the ▷ key until the Reset selection appears on the screen.

```
          ┌─────────────────────┐
  ┌────┐  │ Control:         →  │  ┌────┐
  │ △  │  │ Call    Rel    LED  │  │ △  │
  └────┘  └─────────────────────┘  └────┘
  ┌────┐   ┌────┐  ┌────┐  ┌────┐   ┌────┐
  │ ◁  │   │ F1 │  │ F2 │  │ F3 │   │ ▷  │
  └────┘   └────┘  └────┘  └────┘   └────┘
```

4. Press F2 to select Reset.

```
          ┌─────────────────────┐
  ┌────┐  │ Control:         ⇄  │  ┌────┐
  │ △  │  │ ClrUsr  Reset       │  │ △  │
  └────┘  └─────────────────────┘  └────┘
  ┌────┐   ┌────┐  ┌────┐  ┌────┐   ┌────┐
  │ ◁  │   │ F1 │  │ F2 │  │ F3 │   │ ▷  │
  └────┘   └────┘  └────┘  └────┘   └────┘
```
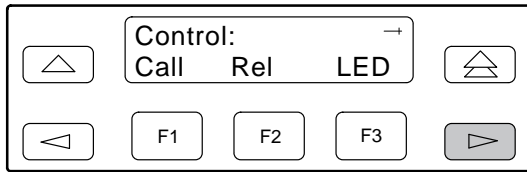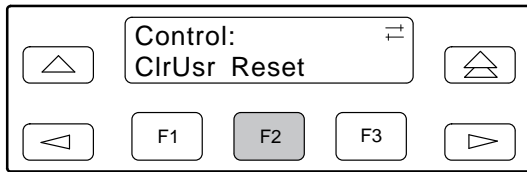
5. From the Device Reset screen, press F1 to initiate a reset of the DSU/CSU (the power-up sequence screen appears). Press F2 instead to return to the Control screen without initiating a reset.

```
          ┌─────────────────────┐
  ┌────┐  │ Device Reset:       │  ┌────┐
  │ △  │  │ Yes    No           │  │ △  │
  └────┘  └─────────────────────┘  └────┘
  ┌────┐   ┌────┐  ┌────┐  ┌────┐   ┌────┐
  │ ◁  │   │ F1 │  │ F2 │  │ F3 │   │ ▷  │
  └────┘   └────┘  └────┘  └────┘   └────┘
```

Differences Using the Async Terminal: To reset the CSU/DSU, select **Reset Device** from the main/control menu (see Figure 3-39 in Chapter 3).

Front Panel Menu A

Menu tree diagram (494-14310-05)

DSU/CSU

Ctrl — Call, ACO, Rel, LED, Clr, Usr Reset, CID, Passwd
- Call: Pass Dial, Dial, Disc, ChDir
- 1...5,A (Directory)
- Usr Reset: Yes, No; DTE, Prt1, Prt2, Prt3, Prt4

Cnfig — Load Edit Area From: Activ, Cust, Fact1, Fact2
- Choose Function: Edit, Save
- Save: Activ, Cust
- Edit: Chan, NET, Gen, User, Alarm, SNMP

Stat — Dev, Hs, STest, Perf, Tstat, LED, ID
- Telco, User T1; Cur, 24Tot, Intvl; Prt*n*

Test — Rlpbk, Lpbk, Ptrns, Lamp
- Abort, LLB, PLB, DLB, RLB, DCLB, DTLB, Prt*n*
- All, LLB, PLB, DLB, DCLB, DTLB, Prt*n*
- LLBUP, LLBDN, 54UP, 54DN, FT1UP, FT1DN
- Send: QRSS, 1in8, 511, Prt*n*, NET Prt*n*
- Mon: QRSS, 511, Prt*n*, NET Prt*n*
- Abort, Send, Mon, All, NET Prt*n*

DTE — DTE Port Type, Base Rate, Equal, DTE Framing Coding, Extrn DLB, Send Ones
Port — Copy, Prt1, Prt2, Prt3, Prt4; Port Select: All, Prt1, Prt2, Prt3, Prt4; Port Rate, NET DCLB, Port LB, All Ones, Rcv Yellow Clock, Tx Clock, Invert Tx C, Invert Data
NET — NET Framing, NET LBO, ANSI PRM, NET LLB, NET PLB, NET BitStuff
Chan — Dsply, Clear, DTE, AssignVoice; NET DTE, NET DTE
Gen — Gen Yellow, Clock Src, Clock Rate
User — Alrm Msg, SNMP Trap, Trap Disc, Dial Out, Call Retry, Dial Delay, AltDialDir, Err Rate, Alrm Relay
Alarm
SNMP — Gen, Trap; Num Trap Mgrs, Trap *n* IP Adr, Gen Trap, Entp Trap, Link Trap, Trap I/F
- System Name, System Location, System Contact, Community Name 1, Access 1, Community Name 2, Access 2, Com IP Adr, Com Link, Modem IP Adr, Alt Mdm IP Adr, Modem Link

Pass Word — Master Com; Com Use, Com Type, Com Clk, Com Rate, Com Char Length, Char Bits, CParity, CStop Bits, Modem Use, Modem Type, Modem Rate, Modem MChar Len, Modem MParity, MStop Bits, LSpac Dsc
Self Test, FP Access, FP Pass, Dial In

▲ Available for Model 3161 only
● Not available for Model 3161

Health, Test Status and Self Test Results
Telco Performance
User Performance
Display LEDs
Identity

Remote Loopback	Local Loopback	Send	Monitor	Abort
Line Up (LLBUP)	Line (LLB)	QRSS	QRSS	Line (LLB)
Line Down (LLBDN)	Payload (PLB)	1-in-8		Payload (PLB)
	DTE (DLB)			DTE (DLB)
	Repeater (RLB)			Repeater (RLB)
				Send
				Monitor

Status
Test
Configuration
Control

After
Selecting
'Edit'
from
Load
Screen

T1 Interface Loopbacks and Patterns
Abort All Loopbacks
Abort All Patterns
Port 1 Loopbacks & Patterns
Port 2 Loopbacks & Patterns
Port 3 Loopbacks & Patterns
Port 4 Loopbacks & Patterns

Remote Loopback	Local Loopback	Send	Monitor	Abort
Up (54UP)	Data Channel (DCLB)	QRSS	QRSS	Data Channel
Down (54DN)	Data Terminal (DTLB)	511	511	Data Terminal
Up				Send
Down				Monitor

DTE
Ports
Network
Channel
General
User
Alarm Options
SNMP

Port 1
Port 2
Port 3
Port 4

Call Setup
Edit Directory
Release User Interface
Clear User Performance Registers
Reset Device
Miscellaneous Control Options
Download

Display Channels	Port 1
Clear NET	Port 2
Clear DTE	Port 3
DTE Assign	Port 4
DTE Voice	

System Options
Modem & Communication Port Options
Trap Options

494-14599

Technical Specifications B

The technical specifications for the Models 3160/3164 DSU/CSUs are listed in Table B-1. The technical specifications for the Model 3161 DSU/CSU are listed in Table B-2.

Table B-1
(1 of 2)
ACCULINK Models 3160/3164 DSU/CSUs Technical Specifications

Specifications	Criteria

POWER REQUIREMENTS
Typical
 	
Options:
 	
  +24 Vdc
  −48 Vdc
  −48 Vdc Redundant
	
	104–132 Vac; 60 Hz ±3; 0.15A at 115 Vac for 3160, 0.175A at 115 Vac for 3164
	
	+20 Vdc to +32 Vdc, 0.50A
	−38 Vdc to −60 Vdc, 0.25A
	−38 Vdc to −60 Vdc, 0.25A

POWER CONSUMPTION AND DISSIPATION	16.0 watts, 55.0 Btu per hour at 115 volts(ac power); 12.0 watts, 41 Btu per hour at +24 and −48 Vdc (dc power)
DTE (DSX-1) INTERFACE Physical Interface Framing Format Coding Format DTE Line Equalization Send AIS	 DB15 socket D4, ESF AMI, B8ZS 5 selectable ranges from 0 to 655 feet (0 to 196.5 meters) Selectable
NETWORK T1 INTERFACE Physical Interface (USA) Physical Interface (Canada) Framing Format Coding Format Line Build-Out (LBO) ANSI PRM Bit Stuffing Yellow Alarm Generation	 RJ48C CA81A using adapter cable D4, ESF AMI, B8ZS 0.0 dB, −7.5 dB, −15 dB, −22.5 dB Selectable FCC Part 68, AT&T TR 62411 Selectable
LOOPBACKS Standard Additional	 AT&T TR 54016, AT&T TR 62411, ANSI T1.403.1989 RLB (Repeater Loopback), DLB (DTE Loopback), V.54 Loop 2 and Loop 3, ANSI T1.403 Annex B Fractional T1 Loopback
PORT INTERFACE Standards Rates	 EIA 530A, V.35, RS–449, V.11 Nx64 – 64-1.536 Mb Nx56 – 56-1.344 Mb

**Table B-1
(2 of 2)
ACCULINK Models 3160/3164 DSU/CSUs Technical Specifications**

Specifications	Criteria

APPROVALS
FCC Part 15
FCC Part 68
UL
CSA
   Safety
   Emissions
   EMI
DOC
   CS-03
   Load Number (modem)
ANSI
Integral Dial Modem
	Class A digital device
	Registration number AW2USA-75604-DD-E
	Listed UL 1950
	
	Certified CSA 22.2 No. 950-M89,
	Class A digital apparatus
	Class A, CSA 108.8-M1983
	
	230 5354 A
	6
	ANSI T1.403-1989
	V.22bis

CLOCKING SOURCES	T1 network interface, DSX-1 T1 interface, Port 1, internal clock, external clock
MODEM INTERFACE Physical Interface Rate Integral Dial Modem	RJ11C (USA), CA11A (Canada) 2400 bps V.22
PHYSICAL DIMENSIONS Height Width Depth	 3.90 inches (10.0 cm) 7.63 inches (19.4 cm) 12.13 inches (30.8 cm)
WEIGHT	3 lbs. 9 oz. (1.70 kg)
ENVIRONMENT Operating Temperature Storage Temperature Relative Humidity Shock and Vibration	 32°F to 122°F (0°C to 50°C) 4°F to 158°F (20°C to 70°C) 5%—95% (noncondensing) Withstands normal shipping and handling

**Table B-2
(1 of 2)
ACCULINK Model 3161 DSU/CSU Technical Specifications**

Specifications	Criteria

POWER REQUIREMENTS
Sixteen 3161 DSU/CSUs, plus SDU, SDCP and fan module
 	
  115 Vac Power Supply
  −48 Vdc Power Unit
	
	90 to 132 Vac, 60 Hz ±3 (2.4 amp, 215 watts)
	−38 to −60 Vdc (2.5 amps maximum)

POWER CONSUMPTION AND DISSIPATION	9.3 watts per circuit card
DTE (DSX-1) INTERFACE Physical Interface Framing Format Coding Format DTE Line Equalization Send AIS	 DB15S D4, ESF AMI, B8ZS 5 selectable ranges from 0 to 655 feet (0 to 196.5 meters) Selectable
NETWORK T1 INTERFACE Physical Interface (USA) Physical Interface (Canada) Framing Format Coding Format Line Build-Out (LBO) ANSI PRM Bit Stuffing Yellow Alarm Generation	 RJ48H CA81A (T1 using adapter cable) D4, ESF AMI, B8ZS 0.0 dB, −7.5 dB, −15 dB, −22.5 dB Selectable FCC Part 68, AT&T TR 62411 Selectable
LOOPBACKS Standard Additional	 AT&T TR 54016, AT&T TR 62411, ANSI T1.403.1989 RLB (Repeater Loopback), DLB (DTE Loopback), V.54 Loop 2 and Loop 3, ANSI T1.403 Annex B Fractional T1 Loopback
PORT INTERFACE Standards Rates	 EIA 530A, V.35, RS–449, V.11 Nx64 – 64–1.536 Mb Nx56 – 56–1.344 Mb
CLOCKING SOURCES	T1 network interface, DSX-1 T1 interface, Port 1, internal clock, external clock

APPROVALS
FCC Part 15
FCC Part 68
UL
CSA
  Safety
  Emissions
  EMI
DOC
  CS-03
ANSI
	
	Class A digital device
	Registration number AW2USA-20327-DD-N
	Recognized component with 3000 Series Carrier, UL 1950
	
	Certified component with 3000 Series Carrier, CSA 22.2 No. 950-M89,
	Class A digital apparatus
	Class A, CSA 108.8-M1983
	
	Pending
	ANSI T1.403-1989

PHYSICAL DIMENSIONS Height Width Depth	 7.1 inches (18.0 cm) 1.0 inches (2.5 cm) 14.2 inches (36.1 cm)

Table B-2
(2 of 2)
ACCULINK Model 3161 DSU/CSU Technical Specifications

Specifications	Criteria
WEIGHT	1.8 pounds (.82 kg)
ENVIRONMENT Operating Temperature Storage Temperature Relative Humidity Shock and Vibration	32°F to 122°F (0°C to 50°C) −4°F to 158°F (−20°C to 70°C) 5%—95% (noncondensing) Withstands normal shipping and handling

Configuration Options C

Functional Grouping

The 316x DSU/CSU configuration option tables contain a list of all configuration options and their selections for a functional group within the front panel menu. The configuration options are arranged into seven functional groups:

- **DTE Interface Configuration Options**

  The DTE Interface configuration options configure the DSX-1 Drop/Insert port of the 316x DSU/CSU (Table C-1).

- **Port Configuration Options**

  The Port configuration options configure ports on the 316x DSU/CSU (Table C-2).

- **Network Interface Configuration Options**

  Network Interface configuration options configure the Network Interface of the 316x DSU/CSU (Table C-3).

- **Channel Configuration Options**

  The Channel configuration options configure the DTE and data port channels on the 316x DSU/CSU (Tables C-4 and C-5).

- **General Configuration Options**

  The General configuration options configure alarms and clocks on the 316x DSU/CSU (Table C-6).

- **User Interface Configuration Options**

  User Interface configuration options configure and control the 316x DSU/CSU User Interfaces (Table C-7).

- **Alarm Configuration Options**

  Alarm configuration options specify how alarm conditions are handled by the 316x DSU/CSU (Table C-8)

- **SNMP Configuration Options**

  SNMP Configuration Options configure the 3160/3164 DSU/CSU to be managed using SNMP (Tables C-9 and C-10).

The configuration tables include a description of each configuration function and its selectable options. In the tables, the top line of each configuration option entry indicates the factory default setting. When the Factory 1 default differs from the Factory 2 default, the Factory 1 default is listed first and both defaults are clearly marked.

Context-Sensitive Menu

This DSU/CSU is an intelligent device that displays only those options that are valid for the current configuration. Therefore, you will only be presented with menu choices that are consistent with the current configuration and operational state of the DSU/CSU; invalid combinations of configuration options are not displayed. Although all options are shown in this manual, what you see on your DSU/CSU varies with your configuration.

DTE Interface Configuration Options

Table C-1
(1 of 2)
DTE Interface Configuration Options

DTE Port: Enab **Next   Enab   Disab   Prev**
DTE Drop/Insert T1 Port. Enables the use of the DTE Drop/Insert port.
Enab – Allows the use of the DSX-1 Drop/Insert T1 interface.
Disab – Prohibits the use of the DSX-1 Drop/Insert T1 interface.
NOTE: When this configuration option is disabled, you cannot display or configure any other DTE Interface configuration options.
DTE Framing: ESF (Factory 1)   D4 (Factory 2) **Next   D4   ESF   Prev**
DTE Line Framing Format. Designates the framing format for the DTE T1 interface.
D4 – Configures for the D4 framing format.
ESF – Configures for the Extended Superframe framing format.
DTE Coding: B8ZS (Factory 1)   AMI (Factory 2) **Next   AMI   B8ZS   Prev**
DTE Line Coding. Designates the line coding format to be used on the DTE interface.
AMI – Uses the Alternate Mark Inversion coding format.
B8ZS – Uses the Bipolar 8 Zero Suppression coding format.
Equal: 0—133 **Next   0—133   133—266   266—399   399—533   533—655   Prev**
DTE Line Equalization. Specifies the DTE line equalization compensation parameters which permit a standard DSX signal to be delivered over a distance of up to 655 feet.

Table C-1
(2 of 2)
DTE Interface Configuration Options

Extrn DLB: Disab
Next   Enab   Disab   Prev
DTE Loopback on External Contact. Allows initiation and termination of the DTE Loopback (DLB) to be controlled by an external contact (i.e., a PBX). See the *DSX-1 Port DTE Interface* section in Appendix D, *Pin Assignments*, for more information. **Enab** – Causes the DSU/CSU to enter a DTE Loopback (if the current DSU/CSU state allows a DLB to be performed) when the external contact is closed. If the DSU/CSU is already performing a DLB, closing the contact will have no effect. Opening the contact takes the DSU/CSU out of DLB. The DSU/CSU will remain in loopback as long as the contact remains closed. **Disab** – Causes the state of the external contact to affect performance of a DLB.
Send Ones: Enab
Next   Enab   Disab   Prev
Send All Ones on DTE T1 Failure. Specifies the action to take on the signal transmitted to the network when a valid signal cannot be recovered from the DTE Drop/Insert T1 port (due to a LOS, continuous OOF, or AIS). **Enab** – Sends all ones on the DS0 channels allocated to the network interface when a LOS condition, AIS condition, or continuous OOF condition occurs on the DTE Drop/Insert T1 interface. **Disab** – Passes the data received to the network interface channels unchanged.

Port Configuration Options

Table C-2
(1 of 3)
Port Configuration Options

Port Type: E530 (Factory 1)   V.35 (Factory 2)
Next   E530   V.35   RS449   Prev

Data Port Type. Allows selection of the data port type.

E530 – Configures the port as an EIA-530A compatible DCE. EIA 530A DTEs can be directly connected to the DB25 connector for this port on the back of the DSU/CSU.

V.35 – Configures the port as a V.35 compatible DCE. V.35 DTEs can be connected to the DB25 connector using an EIA 530-to-V.35 adapter cable.

RS449 – Configures the port as an RS-449 compatible DCE. RS449 DTEs can be connected to the DB25 connector using an EIA530A-to-RS449/422 adapter cable.

Base Rate: Nx64
Next   Nx64   Nx56   Prev

Data Port Base Rate. Allows selection of the base rate for the data port. The data rate for the port is a multiple (from 1 to 24) of the base rate specified with this configuration option.

Nx64 – Sets the base rate for this port to 64 kbps. The data rate will be Nx64 kbps, where N is a number from 1 to 24.

Nx56 – Sets the base rate for this port to 56 kbps. The data rate will be Nx56 kbps, where N is a number from 1 to 24.

Net DCLB: Disab (Factory 1)   Both (Factory 2)
Next   Disab   V.54   FT1   Both   Prev

Network Initiated DCLB. Allows initiation and termination of the Data Channel Loopback (V.54 loop 2) to be controlled by the receipt of a DCLB-actuate sequence or DCLB-release sequence (either V.54 or FT1 (ANSI) compliant sequences) from the network or far-end DSU/CSU.

NOTE: When this configuration option is enabled (for V.54, FT1, or both), receiving a DCLB-actuate sequence on a particular port causes the DSU/CSU to initiate a DCLB on that port, provided that a DCLB can be performed based on the current state of the port and DSU/CSU. Receiving the DCLB release sequence terminates the DCLB.

Disab – Ignores the DCLB-actuate and DCLB-release sequences for this port.

V.54 – Enables DCLB-actuate and DCLB-release sequences that comply with the V.54 standard for "Inter-DCE signaling for point to point circuits."

FT1 – Enables DCLB-actuate and DCLB-release sequences that comply with the ANSI T1.403, Annex B standard for "In-band signaling for fractional-T1 (FT1) channel loopbacks."

Both – Enables DCLB-actuate and DCLB-release sequences that comply with either the ANSI or V.54 standard. The type of actuate and release sequences do not have to match.

Table C-2
(2 of 3)
Port Configuration Options

Port LB: Disab (Factory 1)   Both (Factory 2)
Next   Disab   DTLB   DCLB   Both   Prev

Port (DTE) Initiated Loopbacks. Allows the initiation and termination of a local Data Terminal Loopback (DTLB, equivalent to a V.54 loop 3) or remote Data Channel Loopback (DCLB, equivalent to a V.54 loop 2) to be controlled by the DTE connected to this port.

NOTE: Control of these loopbacks by the DTE is done through the interchange circuits as specified by the V.54 standard.

Disab – Disables control of local DTLBs and remote DCLBs by the DTE connected to this port.

DTLB – Gives control of the local DTLBs for this port to the DTE attached to this port. This loopback is controlled by the interchange circuit RL (CCITT 140) – Remote Loopback.

DCLB – Gives control of the remote DCLBs for the far-end port connected to this port to the DTE attached to this port. This loopback is controlled by the interchange circuit LL (CCITT 141) – Local Loopback.

NOTE: The far-end equipment must support in-band V.54 loopbacks.

Both – Gives control of local DTLBs and remote DCLBs to the DTE connected to this port.

All Ones: Both
Next   Disab   DTR   RTS   Both   Prev

Send All Ones on Data Port Not Ready. Specifies the conditions on the data port that determine when valid data is not being sent from the DTE. When this condition is detected, all ones are sent to the network on the DS0 channels allocated to the port.

Disab – Disables monitoring of interchange circuits from the DTE connected to this port.

DTR – Monitors interchange circuit CD (CCITT 108/1/2) – DTE Ready (DTR). When DTR is interrupted, all ones are sent to the network.

RTS – Monitors interchange circuit CA (CCITT 105) – Request-to-Send (RTS). When RTS is interrupted, all ones are sent to the network.

Both – Monitors both DTR and RTS. If either is interrupted, all ones are sent to the network.

Rcv Yellow: Halt
Next   None   Halt   Prev

Action on Network Yellow Alarm. Specifies the action taken on this port when a yellow alarm is received on the network interface.

None – Makes the data port unaffected by yellow alarms received on the network interface.

Halt – Stops the transmission of data on the port and disable the data port when yellow alarms are received on the network interface. When yellow alarms are received, all ones are sent on circuit BB(CCITT 104) – Receive Data (RD) and circuit CB (CCITT 106) – Clear-to-Send (CTS) is interrupted.

Table C-2
(3 of 3)
Port Configuration Options

Tx Clock: Int **Next   Int   Ext   Prev**
Data Port Transmit Clock. Specifies whether the transmitted data for the port is clocked using an internal clock provided by the DSU/CSU (synchronized to the clock source specified by the Clock Src General configuration option) or an external clock provided by the DTE connected to the port. When an external clock is used, it must be synchronized to the same clock source as the DSU/CSU. **Int** – Indicates the clock is provided internally by the DCE on the TXC interchange circuit DB (CCITT 114) – Transmit Signal Element Timing. **Ext** – Indicates the clock is provided externally by the DTE on the XTXC interchange circuit DA (CCITT 113) – Transmit Signal Element Timing.
Invert TxC: Disab **Next   Enab   Disab   Prev**
Invert Transmit Clock. Specifies whether the clock supplied by the DCE on interchange circuit DB (CCITT 114) – Transmit Signal Element Timing (DCE source) TXC is phase inverted with respect to interchange circuit BA (CCITT 103) – Transmitted Data (TD). This option is useful when long cable lengths between the DSU/CSU and the DTE are causing data errors. **Enab** – Indicates the clock supplied by the DCE on TXC for this port is phase inverted. **Disab** – Indicates the clock supplied by the DCE on TXC for this port is not inverted.
Invert Data: Disab **Next   Enab   Disab   Prev**
Invert Transmit and Received Data. Specifies whether the transmitted and received data for the port is logically inverted before being transmitted or received from the network. This configuration option is useful for applications where HDLC data is being transported whereby inverting the data ensures density requirements for the Network Interface are met. **Enab** – Indicates the transmitted and received data for this port is logically inverted. **Disab** – Indicates the transmitted and received data for this port is not inverted.

Network Interface Configuration Options

Table C-3
(1 of 2)
Network Interface Configuration Options

NET Framing: ESF (Factory 1)   D4 (Factory 2) **Next   D4   ESF   Prev**
Network Line Framing Format. The framing format to be used on the Network T1 interface. **D4** – Configures for the D4 framing format. **ESF** – Configures for the Extended Superframe format.
NET Coding: B8ZS (Factory 1)   AMI (Factory 2) **Next   AMI   B8ZS   Prev**
Network Line Coding Format. The line coding format to be used on the Network interface. **AMI** – Configures for the Alternate Mark Inversion coding format. **B8ZS** – Configures for the Bipolar 8 Zero Suppression coding format.
LBO: 0.0 **Next   0.0   –7.5   –15   –22.5   Prev**
Line Build Out. The line build out (LBO) for the signal transmitted to the network (0.0 dB is the factory default).
ANSI PRM: Disab **Next   Enab   Disab   Prev**
Generate ANSI Performance Report Messages. Specifies whether ANSI T1.403 compliant performance report messages (PRMs) generate. **Enab** – Generates and sends ANSI PRMs over the FDL every second. **Disab** – Prevents the DSU/CSU from generating ANSI PRMs. **NOTE:** This configuration option is only available when the framing format is set to ESF.
NET LLB: Enab **Next   Enab   Disab   Prev**
Network Initiated Line Loopback (LLB). Allows initiation and termination of the LLB to be controlled by the receipt of LLB-Actuate and LLB-Release commands from the network (or remote DSU/CSU). **Enab** – Causes the DSU/CSU to enter an LLB (if the DSU/CSU can perform an LLB in its current state) and to cause an LLB-Release command to terminate the LLB. **Disab** – Causes the DSU/CSU to ignore LLB-Actuate and LLB-Release commands (the DSU/CSU will not be in compliance with ANSI T1.403 and AT&T TR 62411). **NOTE:** When this configuration option is enabled, the DSU/CSU recognizes the in-band LLB-Actuate and LLB-Release codes specified by AT&T as well as the bit-oriented FDL messages specified by ANSI (for ESF only).

Table C-3
(2 of 2)
Network Interface Configuration Options

NET PLB: Enab **Next   Enab   Disab   Prev**
Network Initiated Payload Loopback (PLB). Allows initiation and termination of the PLB to be controlled by the receipt of PLB-Actuate and PLB-Release commands from the network (or remote DSU/CSU). **Enab** – Causes the DSU/CSU to enter a PLB (if the DSU/CSU can perform a PLB in its current state) and to cause a PLB-Release command to terminate the PLB. **Disab** – Causes the DSU/CSU to ignore PLB-Actuate and PLB-Release commands (the DSU/CSU will not be in compliance with ANSI T1.403 and AT&T TR 54016). **NOTE:**   When this configuration option is enabled, the DSU/CSU recognizes the in-band PLB-Actuate and PLB-Release codes specified by AT&T as well as the bit-oriented FDL messages specified by ANSI. **NOTE:**   This configuration option is only available when the network interface framing is set to ESF.
Bit Stuff: 62411 **Next   62411   Part68   Disab   Prev**
Bit Stuffing. Determines when bit stuffing is performed to meet the ones density requirements for data transmission on the network. You must choose the maximum number of consecutive zeros the DSU/CSU can receive before it inserts a one. **62411** – Specifies that a one be inserted in the data stream after 15 consecutive zeros or when the density of ones falls below 12.5% (factory default and complies with AT&T TR 62411). **WARNING:**   To comply with Canadian DOC CS-03 regulations, equipment installed in Canada must be configured to select 62411. **Part68** – Specifies that a one be inserted in the data stream after 80 consecutive zeros (complies with FCC Part 68). **WARNING:**   To comply with USA Part 68 regulations, equipment installed in the USA must be configured to select Part68. **Disab** – Disables bit stuffing so that ones density is not enforced. **NOTE:**   This configuration option is only available when the network interface line coding format is set to AMI.

Channel Configuration Options

The Channel configuration options are divided into two tables as follows:

- DTE Channel Configuration Options (Table C-4)

- Data Port Channel Configuration Options
  (Table C-5)

Table C-4
DTE Channel Configuration Options

DTE Channels: Assign   Voice
DTE Drop/Insert Channel. Assigns DS0 channels from the DTE Drop/Insert T1 interface to DS0 channels on the Network T1 interface and specifies which DS0 channels carry voice signaling information.
Assign – Assigns DS0 channels from the DTE Drop/Insert T1 interface to the Network T1 interface. This option is explained below.
Voice – Specifies which DS0 channels from the DTE Drop/Insert T1 interface are voice channels and should pass Robbed Bit Signaling (RBS) information to the Network T1 interface. This configuration option is explained below.

N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12	N13	N14	N15	...	N24
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	...	–

DTE Drop/Insert Channel Allocation. Assigns DS0 channels from the DTE Drop/Insert T1 interface to the Network T1 interface.

Line 1 displays the 24 channels for the Network T1 interface. Line 2 displays what is allocated to the DS0 channel indicated in Line 1. Possible values for Line 2 are:

Value	Meaning
–	This DS0 channel is not allocated. You can modify this value on this screen.
Prt*n*	This DS0 channel is allocated to port *n,* where n is a number from 1 to 4. You cannot modify this value on this screen.
D*n*	This DS0 channel is allocated to DTE Drop/Insert T1 Interface DS0 channel *n*, where *n* is a number from 1 to 24. You can modify this value on this screen.

Assign DTE channels to Network channels by pressing the Function key below the Network channel desired. The DTE channel number scrolls up one number each time you press the Function key. Only unassigned DTE channels appear during scrolling.

D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	...	D24
RBS	RBS	RBS	RBS	RBS	RBS	RBS	RBS	RBS	RBS	RBS	RBS	RBS	...	RBS

Specify DTE Drop/Insert Voice Channels. Specifies which DS0 channels from the DTE Drop/Insert T1 interface are voice channels and should pass Robbed Bit Signaling information to the Network T1 interface.

Line 1 displays the 24 channels for the DTE Drop/Insert T1 interface. Line 2 displays whether the DS0 channel indicated in Line 1 is a voice or data channel. Possible values for Line 2 are:

Value	Meaning
RBS	This DS0 channel is a voice channel carrying RBS information. When this DS0 channel is assigned to a network DS0 channel, RBS information will be preserved across the connection.
Data	This DS0 channel is a data channel that does not contain RBS information. Signaling is not preserved across the connection.

Press the Function key below the desired channel to toggle between RBS and Data.

NOTE: If the DSX-1 Drop/Insert T1 interface is disabled, this configuration option will not appear.

Table C-5
(1 of 2)
Data Port Channel Configuration Options

Prt(1, 2, 3, or 4):
Data Port Channel. Assigns the port to DS0 channels on either the Network T1 interface or the DSX-1 Drop/Insert T1 interface. When you select a port, some of the following configuration options appear, depending on your selections.
NOTE: Ports 3 and 4 are not available on Model 3161 DSU/CSUs.
Assign To: NET Next   NET   DTE   Prev
Data Port Channel Allocation Destination. Assigns this port to either the Network or DSX-1 Drop/Insert T1 interface.
NET – Assigns this port to DS0 channels on the Network T1 interface.
DTE – Assigns this port to DS0 channels on the DSX-1 Drop/Insert T1 interface.
NOTE: When you change this configuration option from one T1 interface to the other, the DSU/CSU deallocates all DS0 channels allocated to the previous interface.
NOTE: The DTE selection will not be displayed if the DSX-1 Drop/Insert T1 interface is disabled.
Assign By: Block Next   Block   ACAMI   Chan   Prev
Data Port Channel Allocation Method. Designates the method for assigning DS0 channels to the destination T1 interface.
Block – Allocates DS0 channels to this port by the block method.
ACAMI – Allocates DS0 channels to this port by the Alternate Channel AMI method. The difference between block and ACAMI is that the number of channels allocated with ACAMI is double the number needed for the port rate. With ACAMI, every alternate DS0 channel does not carry data from the port but always transmits and receives all ones.
Chan – Allocates DS0 channels to this port by the individual channel method.
NOTE: When you change this configuration option from one method to another, the DSU/CSU deallocates all DS0 channels allocated with the previous method.
Port Rate: 384 Next   64   128   192   256   320   384   448   512   576   640   704   768   832   896   960 1024   1088 1152   1216   1280   1344   1408   1472   1536   Prev   *OR* Next   56   112   168   224   280   336   392   448   504   560   616   672   728   784   840   896   952 1008   1064   1120   1176   1232   1288   1344   Prev
Data Port Rate (appears for the block and ACAMI methods only). Designates the data rate for the port. Available selections depend on the current base rate configured for the port. The factory default for Nx64 is 384 kbps and Nx56 is 336 kbps.
NOTE: When you change this configuration option from one rate to another, the DSU/CSU deallocates all DS0 channels allocated based on the previous rate.
NOTE: This configuration option does not appear if the individual channel allocation method (Chan) is selected using the Assign By configuration option.

**Table C-5
(2 of 2)
Data Port Channel Configuration Options**

Start At: Clear															
Next	**Clear**	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**	**N9**	**N10**	**N11**	**...**	**N24**	**Prev**
OR															
Start At: Clear															
Next	**Clear**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**D7**	**D8**	**D9**	**D10**	**D11**	**...**	**D24**	**Prev**

Data Port Channel Allocation (appears for the block and ACAMI methods only). Designates the starting DS0 channel (N1–N24 for the Network T1 interface and D1–D24 for the DTE Drop/Insert T1 interface).

Press the left or right arrow key to scroll through the available selections. Available selections are only those DS0 channels that provide enough bandwidth (based on the configured data rate) to be used as a starting channel number.

Select the desired starting channel number by pressing the Function key under that number. When you make the selection, the DSU/CSU allocates the correct amount of DS0 channels to support the data rate currently configured for the port.

Clear – Deallocates all DS0 channels for this port from the T1 interface specified by the channel allocation destination option.

NOTE: This configuration option does not appear if the individual channel allocation method (Chan) is selected using the Assign By configuration option.

	N1	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**	**N9**	**N10**	**N11**	**N12**	**...**	**N24**	
Next	–	–	–	–	–	–	–	–	–	–	–	–	...		**Prev**
OR															
	D1	**D2**	**D3**	**D4**	**D5**	**D6**	**D7**	**D8**	**D9**	**D10**	**D11**	**D12**	**...**	**D24**	
Next	–	–	–	–	–	–	–	–	–	–	–	––	...		**Prev**

Data Port Channel Allocation (appears for the Individual Channel method only). Designates the DS0 channel to allocate to this port (N1–N24 for the Network T1 interface and D1–D24 for the DTE Drop/Insert T1 interface).

Line 1 displays the 24 channels for the Network T1 interface or DTE Drop/Insert T1 interface. Line 2 displays what is allocated to the DS0 channel indicated in Line 1. Possible values for Line 2 are:

Value	**Meaning**
–	This DS0 channel not allocated. This value may be modified from this screen.
Prt*n*	This DS0 channel is allocated to port *n,* where *n* is a number from 1 to 4. You can modify this value from this screen for this port only.
N*n*	This DS0 channel is allocated to Network T1 Interface DS0 channel *n* where *n,* is a number from 1 to 24. You cannot modify this value from this screen.
D*n*	This DS0 channel is allocated to DTE Drop/Insert T1 Interface DS0 channel *n,* where *n* is a number from 1 to 24. You can modify this value from this screen.

Select the channel by pressing the Function key under that number. To unallocate a port, press the Function key under that port number. Pressing the Function key under channels assigned to other ports has no effect.

NOTE: The DSU/CSU automatically derives the data rate for the port from the number of DS0 channels allocated.

General Configuration Options

Table C-6
General Configuration Options

Gen Yellow: Enab
Next   Enab   Disab   Prev
Generate Yellow Alarm Signals. Determines whether the DSU/CSU generates yellow alarm signals on the Network and DTE Drop/Insert T1 Interfaces.
NOTE: This configuration option is only available when the DSX-1 Drop/Insert T1 Interface is enabled. If the DTE Interface is disabled, the DSU/CSU always generates the yellow alarm signal on the Network interface and this configuration option does not appear.
Enab – Generates the yellow alarm signal during a red or blue CFA state for both the Network and Drop/Insert T1 Interfaces.
Disab – Disables the yellow alarm signal. When this configuration option is disabled, red and blue CFAs on the Network T1 interface cause an AIS signal to be transmitted on the DTE Drop/Insert T1 interface.
WARNING: When this configuration option is disabled, the DTE equipment connected to the Drop/Insert T1 interface is responsible for generation of the yellow alarm signal for CFAs on the Network T1 interface. In this case, the interface port marked DTE must only be connected to an FCC Part 68 Registered (for USA) and Canadian DOC Certified (for Canada) Digital Service Unit or System, such as PBX, with a DSX-1 interface. Failure to do so is a violation of FCC Rules and DOC Regulations.
Clock Src: NET
Next   NET   DTE   Prt1   Int   Ext   Prev
DSU/CSU Clock Source. Specifies the source for the master clock for the DSU/CSU. This selection provides synchronization for all timing within the DSU/CSU and the clocks for all external interfaces. The clock rate(s) for the external timing interfaces are independent of the input rate for the master clock.
NOTE: Failure of the clock specified here results in automatic fallback to the DSU/CSU's internal clock.
NET – Configures the Network T1 Interface as the source for the master clock.
DTE – Configures the DTE Drop/Insert T1 Interface as the source for the master clock. This configuration option is not available if the DTE Drop/Insert Interface is disabled.
Prt1 – Configures data port 1 as the source for the master clock. This is the only synchronous data port you can use for the master clock.
Int – Configures the internal clock as the source for the master clock.
Ext – Configures an external clock (provided through the "Clock In" connector) as the source for the master clock.
Clock Rate: 1544
Next   2048   1544   8   Prev
External Clock Rate. Specifies the clock rate when the master clock source is an external clock. This configuration option is only available when the clock source is an external clock (Ext).
2048 – Sets the input rate of the master clock to 2,048 kHz.
1544 – Sets the input rate of the master clock to 1,544 kHz (factory default.)
8 – Sets the input rate of the master clock to 8 kHz.
NOTE: For more information, see the *Timing* section in Chapter 3, *Operation*.
NOTE: External clock rate 2,048 kHz does not imply E1 compatibility.

User Interface Configuration Options

Table C-7
(1 of 4)
User Interface Configuration Options

Self-Test: Enab **Next   Enab   Disab   Prev**
Initial Self-Test. Specifies whether the DSU/CSU performs a device self-test at power-up and after a device reset. **Enab** – Enables a self-test. **Disab** – Disables the self-test.
FP Access: Enab **Next   Enab   Disab   Prev**
Front Panel Access. Determines whether front panel access or display is allowed at the DSU/CSU. **Enab** – Allows the front panel to access and display data. This is the factory default. **Disab** – Prevents the access and display of data.
FP Pass: Disab **Next   Enab   Disab   Prev**
Front Panel Pass-Through. Determines whether front panel pass-through is allowed at the DSU/CSU. Front panel pass-through enables you to use the front panel (or PC attached to the COM port) to access the integral modem to dial to a far-end 3160/3164 DSU/CSU. You can then use the local front panel as a remote dial-in front panel for the far-end DSU/CSU. **Enab** – Allows the front panel to perform a dial-out to the remote DSU/CSU front panel (enables pass-through). The Pass command under the Call Setup branch (under Control) becomes available. **Disab** – Prevents dial-out access to the remote DSU/CSU. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.
Dial-In: Disab **Next   Enab   Disab   Prev**
Dial-in Access. Controls access to the DSU/CSU through the dial-in (MODEM) port. **Enab** – Allows dial-in access to the DSU/CSU. The integral modem will answer incoming calls, allowing a far-end DSU/CSU front panel to access the near-end DSU/CSU menu tree or establish a connection for async terminal interface or SNMP management access. **Disab** – Prevents dial-in access. Incoming calls to the DSU/CSU will not be answered. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.
Password: None **Next   None   Modem   Com   Both   Prev**
Password Mode. Activates a password prompt that asks you to enter an 8-character (maximum) password at the calling DSU/CSU or PC. **None** – Does not specify a password. This is the factory default. **Modem** – Prompts the remote modem port user to enter an alphanumeric, up to 8-character password. **Com** – Prompts the communications port user to enter an alphanumeric, up to 8-character password. **Both** – Prompts both the communications port user and the remote modem port user to enter an alphanumeric, up to 8-character password.

Table C-7
(2 of 4)
User Interface Configuration Options

MasterCom:Disab Next   Enab   Disab   Prev
Master Communication Unit. Specifies which circuit card in the 3000 Series Carrier is configured as the Master Communication Unit. This is the circuit card that provides the shared communication (COM) port connection for the rest of the carrier. The circuit card that is configured as the Master Communication Unit can have an external PC (supporting Front Panel Emulation) connected to Port 2 on the Auxiliary Backplane to provide access for all Models 3151 and 3161 circuit cards in the carrier. The Master Communication Unit usually resides in Slot 1 of the carrier, but this is not mandatory. Only one card per carrier can be configured as the Master Communication Unit. **Enab** – This is the Master Communication Unit for the carrier. **Disab** – This is not the Master Communication Unit for the carrier. **NOTE:**   This configuration option is only displayed for Model 3161 DSU/CSUs.
Com Use: ASCII Next   SNMP   ASCII   Term   Prev
Communication Port Use. Specifies how the communication port is used. **SNMP** – Specifies that the communication port is to be used as the management link to an external SNMP manager. **ASCII** – Specifies that the communication port will be used as a proprietary ASCII port. This configuration option supports Front Panel Emulation software and ASCII alarm messages. **Term** – Specifies that the communication port is to be used as an async terminal interface. This configuration option supports configuration and device management from a terminal. **NOTE:**   Only one port (communication or modem) can be configured as the SNMP management link at a time. If the Modem Use configuration option is set to SNMP, only the ASCII or Term selections are available for this configuration option.
Com Type: Async Next   Async   Sync   Prev
Communication Port Type. Specifies whether the port uses synchronous or asynchronous communication when the port is configured as the SNMP management link. **NOTE:**   This configuration option is not available and is not displayed if the Com Use configuration option is set to ASCII. In this case, the communication port is always asynchronous.
Com Clk: Int Next   Int   Ext   Prev
Communication Port Synchronous Clock. Specifies whether the port uses internal (Int) or external (Ext) clocking when the communication port is configured for synchronous operation. This configuration option reverses the direction of the clock (TXD, RXD) interchange circuits and allows the port to accept clocking from an external device. Connection to another DCE requires the use of a crossover cable. **NOTE:**   This configuration option is not available and not displayed if the Com Type configuration option is set for asynchronous operation.

Table C-7
(3 of 4)
User Interface Configuration Options

Com Rate: 9.6
Next   1.2   2.4   4.8   9.6   14.4   19.2   Prev
Communication Port Rate. Configures the bit rate used for the COM port. Changes take effect when they are saved to the Active configuration.
1.2 – Sets the bit rate to 1200 bps (for asynchronous operation only).
2.4 – Sets the bit rate to 2400 bps.
4.8 – Sets the bit rate to 4800 bps.
9.6 – Sets the bit rate to 9600 bps.
14.4 – Sets the bit rate to 14,400 bps.
19.2 – Sets the bit rate to 19,200 bps.
CAUTION: Saving changes to the configuration while communicating with the PC can result in a loss of communication.
NOTE: This configuration option is not displayed for Model 3161 DSU/CSUs unless the DSU/CSU has been selected as the Master Communication Unit for the carrier by the MasterCom configuration option. This configuration option is not available and is not displayed if the COM port is configured for synchronous operation and the clock source is external.
Char Length: 8
Next   7   8   Prev
Communication Port Character Length. Configures the character length for the COM port. Select 7 or 8 (factory default) bits.
NOTE: This configuration option is not displayed for Model 3161 DSU/CSUs unless the DSU/CSU has been selected as the Master Communication Unit for the carrier by the MasterCom configuration option.
NOTE: This configuration option must be set to 8 to perform PC emulation or pass-through operations, or SNMP management, or for the async terminal interface. This configuration option is not available and is not displayed if the COM port is configured for synchronous operation.
CParity: None
Next   None   Even   Odd   Prev
Communication Port Parity. Configures the parity for the COM port. None is the factory default.
NOTE: This configuration option is not displayed for Model 3161 DSU/CSUs unless the DSU/CSU has been selected as the Master Communication Unit for the carrier by the MasterCom configuration option.
CStop Bits: 1
Next   1   1.5   2   Prev
Communication Port Stop Bits. Configures the number of stop bits for the COM port; 1 is the factory default.
NOTE: This configuration option is not displayed for Model 3161 DSU/CSUs unless the DSU/CSU has been selected as the Master Communication Unit for the carrier by the MasterCom configuration option.
Modem Use: ASCII
Next   SNMP   ASCII   Term   Prev
Modem Port Use. Specifies how the modem is used.
SNMP – Configures the modem as the management link to an external SNMP manager.
ASCII – Configures the modem as a proprietary ASCII port. This selection supports dial-out ASCII alarm messages, dial-out front panel pass-through, and/or dial-in access from a remote PC or DSU/CSU.
Term – Specifies that the modem port will be used as an async terminal interface. This selection supports configuration and device management from a terminal.
NOTE: Only one port (communication or modem) can be configured as the SNMP management link at a time. If the Com Use configuration option is set to SNMP, only ASCII or Term is available for this configuration option.

**Table C-7
(4 of 4)
User Interface Configuration Options**

Modem Type: Async Next   Async   Sync   Prev
Modem Type. Specifies whether the port uses synchronous or asynchronous communication when the modem port is configured as the SNMP management link. **NOTE:**   This configuration option is not available if the Modem Use configuration option is set to ASCII or Term. In this case, the modem port is always asynchronous.
Modem Rate: 2.4 Next   1.2   2.4   Prev
Modem Port Rate. Configures the bit rate for the MODEM port. **1.2** – Sets the bit rate at 1200 bps. **2.4** – Sets the bit rate at 2400 bps. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.
MChar Len: 8 Next   7   8   Prev
Modem Character Length. Configures the character length (number of data bits) for the modem port. This does not include the start bit (always 1) or the stop bits; 8 is the factory default. **NOTE:**   This configuration option must be set to 8 to perform PC emulation or pass-through operations, or SNMP management. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.
MParity: None Next   None   Even   Odd   Prev
Modem Parity. Configures the parity for the MODEM port. None is the factory default. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.
MStop Bits: 1 Next   1   2   Pre
Modem Port Stop Bits. Configures the number of stop bits for the MODEM port; 1 is the factory default. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.
LSpacDsc: Disab Next   Enab   Disab   Pre
Long Space Disconnect. Specifies how the modem disconnects a call. This configuration option makes call disconnecting more robust and prevents invalid data at the remote modem when the call is disconnected. To be effective, the remote modem must be configured to disconnect when it detects continuous space. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.

Alarm Configuration Options

Table C-8
(1 of 3)
Alarm Configuration Options

Alrm Msg: Disab **Next   Disab   Modem   Com   Both   Prev**
Alarm Messages. Controls the generation and routing of alarm messages to an ASCII terminal/printer attached to either the MODEM or COM port. An alarm message generates at the beginning of an alarm state and is followed by an alarm clear message. Only one alarm state can exist at any one time. When two or more alarm conditions exist, the highest priority alarm state is declared. Alarm state priority, from highest to lowest, is LOS, LOF, AIS, OOF, EER, yellow alarm. Alarm messages consist of a customer identification flag, Alarm Set or Alarm Clear, the alarm condition, and the interface at which the alarm has been detected. **Disab** – Prevents an alarm message for any alarm conditions. **Modem** – Enables alarm messages routed to the MODEM port (and sent if the MODEM port is not the active physical interface). **Com** – Enables alarm messages routed to the COM port (and sent if the COM port is not the active physical interface). **Both** – Enables alarm messages routed to both the MODEM and the COM ports. **NOTE:**   Alarm messages are only sent to a particular port if the port is currently configured for proprietary ASCII or Term, if the async terminal is idle. If the SNMP management link is active for the port the alarm message for that port is discarded. Refer to Chapter 4, *Maintenance*, for more information about alarm messages. **NOTE:**   This configuration option is not displayed on Model 3161 DSU/CSUs.
SNMP Trap: Disab **Next   Enab   Disab   Prev**
SNMP Trap Enable. Specifies whether SNMP trap messages are sent over the SNMP management link. **Enab** – Enables sending SNMP trap messages over the SNMP management link. **Disab** – Disables sending SNMP trap messages over the SNMP management link. **NOTE:**   This configuration option is only displayed when the communication or modem port is configured as the SNMP management link.
Trap Disc: Enab **Next   Enab   Disab   Prev**
SNMP Trap Disconnect. Specifies whether the modem connection is disconnected after sending a trap message. This option applies only to modem connections initiated as a result of the trap message being sent. **Enab** – Specifies that the modem call is disconnected after a trap message is sent. **Disab** – Specifies that the modem call is not disconnected after a trap message is sent. The line is held until it is manually disconnected or disconnected by the remote modem. **NOTE:**   This configuration option is only displayed when SNMP traps are enabled and the modem port is configured as the SNMP management link.

**Table C-8
(2 of 3)
Alarm Configuration Options**

DialOut: Disab
Next   Enab   Disab   Prev
Alarm and Trap Dial Out. Controls whether alarm messages sent to the MODEM port initiate a call (to the phone number in Directory A) if the modem connection has not already been established. If the Call Retry configuration option is enabled, the alarm message is held until the call is completed or a maximum of five retries have occurred. If more than one message is received while waiting for a call retry, only the highest priority message is held and all others are discarded. When the modem port is configured as the SNMP management link, up to ten SNMP trap messages are queued at the interface.
Enab – Permits automatic call initiation (dial out) on the MODEM port when an alarm message must be sent.
Disab – Discards messages sent to the MODEM port if a modem connection has not been established.
NOTE: This configuration option is not displayed on Model 3161 DSU/CSUs.
Call Retry: Disab
Next   Enab   Disab   Prev
Call Retry on Alarm. Determines whether an uncompleted call is retried. Calls initiated while attempting to send an alarm or trap message to the MODEM port are retried after a five-minute delay if this configuration option is enabled.
Enab – Retries calls up to five times with a five-minute delay between each. If an alternate dial-out directory is specified, both the alarm directory and the alternate directory are retried up to five times.
Disab – Prevents calls from being retried if they cannot be completed.
NOTE: This configuration option is not displayed on Model 3161 DSU/CSUs.
Dial Delay: 5
Next   1   2   3   4   5   6   7   8   9   10   Prev
Dial Out Delay Time on Alarm or Trap. Specifies the number of minutes to wait between successive dial-out alarms or traps and between retry attempts after failed alarm dial-outs. The factory default is 5 minutes.
NOTE: This configuration option is not displayed on Model 3161 DSU/CSUs.
AltDialDir: None
Next   None   1   2   3   4   5   Prev
Alternate Dial Out Directory for Alarm or Trap. Specifies whether a call that cannot be completed is retried using an alternate phone number. The alternate telephone number resides in one of the five call directories. If call retry is enabled, the initial call is retried at the original number five times before a call attempt to the alternate number is tried. If the call is not completed at the alternate number, it is retried up to the five retry maximum. The alternate dial-out option applies to each alarm or trap event.
None – Specifies that alternate alarm dial-out is not performed when a call cannot be completed to the telephone number contained in the alarm directory.
1–5 – Specifies the call directory that contains the phone number to call when a call cannot be completed to the telephone number contained in the alarm directory.

Table C-8
(3 of 3)
Alarm Configuration Options

Err Rate: 10E-4
Next   10E-4   10E-5   10E-6   10E-7   10E-8   10E-9   Prev

Excessive Error Rate Threshold. Sets the error rate threshold that determines when an Excessive Error Rate (EER) condition is declared. This rate is determined by the ratio of the number of CRC6 errors to the total number of bits received over a set period of time.

Select from the following:

- 10E-4. EER is declared if more than 1,535 CRC6 errors are detected within 10 seconds (factory default).

- 10E-5. EER is declared if more than 921 CRC6 errors are detected within 60 seconds.

- 10E-6. EER is declared if more than 92 CRC6 errors are detected within 60 seconds.

- 10E-7. EER is declared if more than 9 CRC6 errors are detected within 60 seconds.

- 10E-8. EER is declared if more than 41 CRC6 errors are detected in three 15-minute intervals.

- 10E-9. EER is declared if more than 4 CRC6 errors are detected in three 15-minute intervals.

AlrmRelay: Disab
Next   Enab   Disab   Prev

Alarm Relay. Specifies whether an alarm condition for this circuit card will activate the shared alarm relay on the 3000 Series Carrier. The alarm deactivates when the condition(s) causing it is corrected. An Alarm Cut-Off issued from the SDCP (or PC Emulation program) for a particular 3161 DSU/CSU also deactivates the alarm. The 3161 DSU/CSU will not reactivate the alarm relay until all alarm conditions for the unit are cleared.

The following alarm conditions will activate the alarm relay when this configuration option is enabled:

- Continuous Loss of Signal (LOS) or Out of Frame (OOF) at either the NETWORK or DTE T1 interface.

- Alarm Indication Signal (AIS) received at either the NETWORK or DTE T1 interface.

- Yellow alarm signal received at either the NETWORK or DTE T1 interface.

- Excessive Error Rate (EER) detected at the NETWORK T1 interface.

NOTE: This configuration option is only displayed for Model 3161 DSU/CSUs.

SNMP Configuration Options

The SNMP configuration options are divided into two tables as follows:

- General SNMP Configuration Options (Table C-9)

- SNMP Trap Configuration Options (Table C-10)

Table C-9
(1 of 2)
General SNMP Configuration Options

System Name: Clear **Next   Edit   Clear   Prev**
System Name. Specifies the SNMP system name for this unit. This is the node's fully qualified domain name.
Edit – Allows you to edit or display the system name using the generic text string entry screen.
Clear – Allows you to clear the system name.
System Location: Clear **Next   Edit   Clear   Prev**
System Location. Specifies the SNMP system location for this unit. This is the physical location of this SNMP-managed node.
Edit – Allows you to edit or display the system location using the generic text string entry screen.
Clear – Allows you to clear the system location.
System Contact: Clear **Next   Edit   Clear   Prev**
System Contact. Specifies the SNMP system contact person for this unit, and how to contact this person.
Edit – Allows you to edit or display the system contact using the generic text string entry screen.
Clear – Allows you to clear the system contact.
CommunityName1: Edit **Next   Edit   Clear   Prev**
Community Name 1. Specifies the first of two community names allowed access to this unit's Management Information Base (MIB). External SNMP managers must supply this name to access an object in the MIB.
Edit – Allows you to edit or display the first community name using the generic text string entry screen.
Clear – Allows you to clear the first community name.
Access 1: Read **Next   Read   R/W   Prev**
Access 1. Specifies the type of access allowed for community name 1. This is the type of access allowed for external SNMP managers accessing objects in the MIB using community name 1.
Read – Allows read-only access (SNMP Get) to the accessible objects in the MIB for this device when community name 1 is used. This includes all objects specified as either read-only or read/write in the MIB RFCs.
R/W – Allows read and write access (SNMP Get and Set) to the objects in the MIB for this device when community name 1 is used. Write access is allowed for all objects specified as read/write in the MIB RFCs. Read access is allowed for all objects specified as either read-only or read/write.
CommunityName2: Edit **Next   Edit   Clear   Prev**
Community Name 2. Specifies the second of two community names allowed access to this unit's Management Information Base (MIB). External SNMP managers must supply this name to access an object in the MIB.
Edit – Allows you to edit or display the second community name using the generic text string entry screen.
Clear – Allows you to clear the second community name.

Table C-9
(2 of 2)
General SNMP Configuration Options

Access 2: Read **Next   Read   R/W   Prev**
Access 2. Specifies the type of access allowed for community name 2. This is the type of access allowed for external SNMP managers accessing objects in the MIB using community name 2. **Read** – Allows read-only access (SNMP Get) to the accessible objects in the MIB for this device when community name 2 is used. This includes all objects specified as either read-only or read/write in the MIB RFCs. **R/W** – Allows read and write access (SNMP Get and Set) to the objects in the MIB for this device when community name 2 is used. Write access is allowed for all objects specified as read/write in the MIB RFCs. Read access is allowed for all objects specified as either read-only or read/write.
Com IP Adr: Clear **Next   Edit   Clear   Prev**
Com Port IP Address. Specifies the IP address for the COM port of the 316x Series device when it is configured as the SNMP management link. The IP address is only in effect when the Com Use configuration option is set to SNMP. **Edit** – Allows you to edit or display the IP address for the communication port using the generic IP address data entry screen. **Clear** – Allows you to clear the IP address for the communication port.
Com Link: PPP **Next   PPP   SLIP   Prev**
Com Port Link Layer Protocol. Specifies the link layer protocol for the COM port when it is configured as the SNMP management link. This protocol is only in effect when the Com Use configuration option is set to SNMP. **PPP** – Specifies the PPP as the link layer protocol for the SNMP management link on the communication port. **SLIP** – Specifies SLIP as the link layer protocol for the SNMP management link on the communication port. The communication port must be configured for asynchronous operation to support SLIP.
Modem IP Adr: Clear **Next   Edit   Clear   Prev**
Modem Port IP Address. Specifies the IP address for the MODEM port of the 316x Series device when it is configured for SNMP. This IP address is only in effect when the Modem Use configuration option is set to SNMP. **Edit** – Allows you to edit or display the IP address for the modem port using the generic IP address data entry screen. **Clear** – Allows you to clear the IP address for the MODEM port.
Alt Mdm IP Adr: Clear **Next   Edit   Clear   Prev**
Alternate Modem Port IP Address. Specifies the alternate IP address for the MODEM port of the 316x Series device when it is configured for SNMP. This IP address is needed when a call attempt does not complete on the primary alarm/trap phone number (contained in the alarm directory) and the alternate dial out directory is used to try another phone number. **Edit** – Allows you to edit or display the alternate IP address for the MODEM port using the generic IP address data entry screen. **Clear** – Allows you to clear the alternate IP address for the MODEM port.
Modem Link: PPP **Next   PPP   SLIP   Prev**
Modem Port Link Layer Protocol. Specifies the link layer protocol for the MODEM port when it is configured as the SNMP management link. This protocol is only in effect when the Modem Use configuration option is set to SNMP. **PPP** – Specifies PPP as the link layer protocol for the SNMP management link on the MODEM port. **SLIP** – Specifies SLIP protocol as the link layer protocol for the SNMP management link on the MODEM port. The MODEM port must be configured for asynchronous operation to support SLIP.

Table C-10
(1 of 2)
SNMP Trap Configuration Options

Num Trap Mgrs: 1 **Next   1   2   3   4   5   6   Prev**
Number of Trap Managers. Specifies the number of trap managers supported by the unit.
NOTE: You must configure an IP address for each trap manager that is to receive trap messages.
Trap *n* IP Adr: Clear **Next   Edit   Clear   Prev**
Trap *n* IP Address. Specifies the IP address for each trap manager. This configuration option is repeated for all trap managers supported by the unit.
Edit – Allows you to edit or display the IP address for Trap Manager *n* using the generic IP address data entry screen.
Clear – Allows you to clear the IP address for Trap Manager *n*.
Gen Trap: Both **Next   Disab   Warm   Auth   Both   Prev**
General Trap Types. Specifies the general trap types to enable.
Disab – Disables the sending of trap messages for warmStart and authenticationFailure events to the currently configured trap manager(s).
Warm – Sends trap messages for warmStart events to the currently configured trap manager(s). A warmStart trap signifies the unit has reinitialized itself. This trap is sent after the unit resets and stabilizes.
Auth – Sends trap messages for authenticationFailure events to the currently configured trap manager(s). An authenticationFailure trap signifies that the unit is the addressee of an SNMP protocol message that is not properly authenticated.
Both – Sends trap messages for warmStart and authenticationFailure events to the currently configured trap manager(s).
NOTE: This configuration option is not available and is not displayed if the SNMP Trap alarm configuration option is disabled.
Entp Trap: Enab **Next   Enab   Disab   Prev**
Enterprise Specific Traps. Specifies whether the enterpriseSpecific trap is enabled. An enterpriseSpecific trap signifies the unit has recognized an enterprise specific event. The Specific Trap field identifies the particular trap that has occurred. These traps generate because of the following events: • enterpriseSelfTestFail(2) – A hardware failure of the unit was detected as part of the unit's self-test. This is generated after the unit has completed initialization. • enterpriseDeviceFail(3) – An internal device failure was detected by the operating software for the unit.
Disab – Disables the sending of trap messages for enterpriseSpecific events to the currently configured trap manager(s).
Enab – Sends trap messages for enterpriseSpecific events to the currently configured trap manager(s).
NOTE: This configuration option is not available and is not displayed if the SNMP Trap alarm configuration option is disabled.

Table C-10
(2 of 2)
SNMP Trap Configuration Options

Link Trap: Both
Next   Disab   Up   Down   Both   Prev
Link Trap Type. Specifies the link trap type to enable. Interfaces monitored for link-up and link-down traps can be specified with the Trap I/F configuration options.
Disab – Disables the sending of trap messages for linkDown and linkUp events to the currently configured trap manager(s).
Up – Sends trap messages for linkUp events to the currently configured trap manager(s). A linkUp trap signifies the unit recognizes that one of the communication interfaces has come up.
Down – Sends trap messages for linkDown events to the currently configured trap manager(s). A linkDown trap signifies the unit recognizes a failure in one of the communication interfaces.
Both – Sends trap messages for linkDown and linkUp events to the currently configured trap manager(s).
NOTE: This configuration option is not available and is not displayed if the SNMP Trap alarm configuration option is disabled.
Trap I/F: All
Next   NET   DTE   T1s   Ports   All   Prev
Link Trap Interfaces. Specifies which interfaces send linkUp and linkDown trap messages. These traps are supported on the T1 interfaces only.
NET – Sends trap messages for linkDown and linkUp events on the network T1 interface only.
DTE – Sends trap messages for linkDown and linkUp events on the DTE Drop/Insert T1 interface only.
T1s – Sends trap messages for linkDown and linkUp events on both the network and DTE Drop/Insert T1 interfaces.
Ports – Sends trap messages for linkDown and linkUp events on synchronous data ports only.
All – Sends trap messages for linkDown and linkUp events on the network and DTE Drop/Insert T1 interfaces, and the synchronous data ports.
NOTE: This configuration option is not available and is not displayed if the Link Traps configuration option is not configured to generate trap messages for linkUp and linkDown events.

Pin Assignments D

Cables

The ACCULINK Models 3160/3164 DSU/CSUs are shipped with a power transformer and a VF cable. Various other interconnecting cables are available from the company. These cables have a company feature number assigned to them (see Appendix H, *Equipment List*). Cables that are listed, but have no feature number, must be customer-supplied. This appendix describes the cable pin assignments for both company cables and customer-supplied cables. You can use this information should you need to build your own cables.

Model 3161 DSU/CSU interface connections are described in the *COMSPHERE 3000 Series Carrier Installation Manual*, with the rest of the installation instructions for the Model 3161 DSU/CSU.

T1 Network Connector Interface

The T1 line interface cable is 20-foot, 24 AWG solid, 2-twisted pair cable with an RJ48C, plug unkeyed connector (Figures D-1 and D-2). The T1 network interface connector is an RJ48C, 8-position, unkeyed modular jack (Tables D-1 and D-2).

493-14156-01
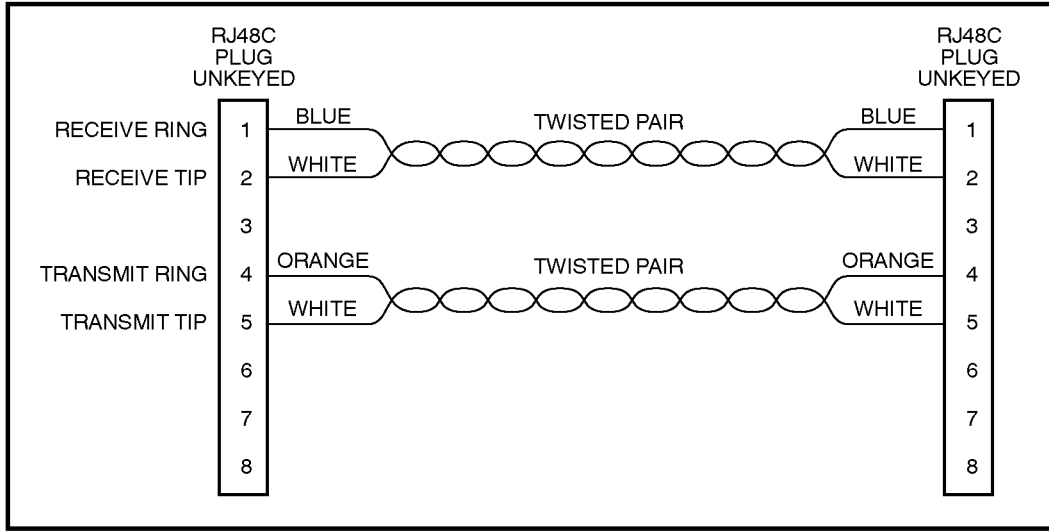
Figure D-1. T1 Line Interface Cable with RJ48C Connector (Feature Number 3100-F1-500)

**Table D-1
T1 Network Interface Connector (J4)**

Signal	Pin Number
Receiver Ring	1
Receiver Tip	2
Transmitter Ring	4
Transmitter Tip	5
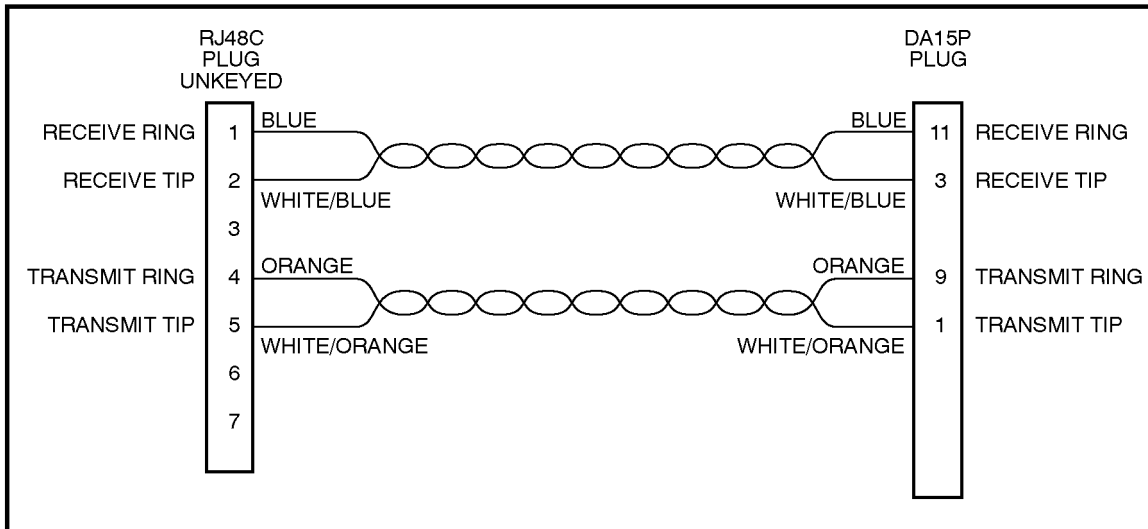
493-14342

Figure D-2. T1 Line Interface Cable with DA15P Connector (Feature Number 3100-F1-510)

**Table D-2
T1 Network Interface Connector (DA15P)**

Signal	Pin Number	
	RJ48C	DA15P
Receiver Ring	1	11
Receiver Tip	2	3
Transmitter Ring	4	9
Transmitter Tip	5	1

DSX-1 Port DTE Interface

This cable is typically supplied by a DTE vendor and is a 22 AWG solid, individually shielded twisted pair cable with drain wire (Figure D-3). The cable connector is a DB15 plug. Be sure to connect the shield ground only at the DSU/CSU end as shown in Figure D-3 to prevent ground loops. The DTE (DSX-1) interface connector is a DB15-type socket connector (Table D-3). Refer to the Extrn DLB configuration option in the *DTE Interface Configuration Options* section of Appendix C for more information.
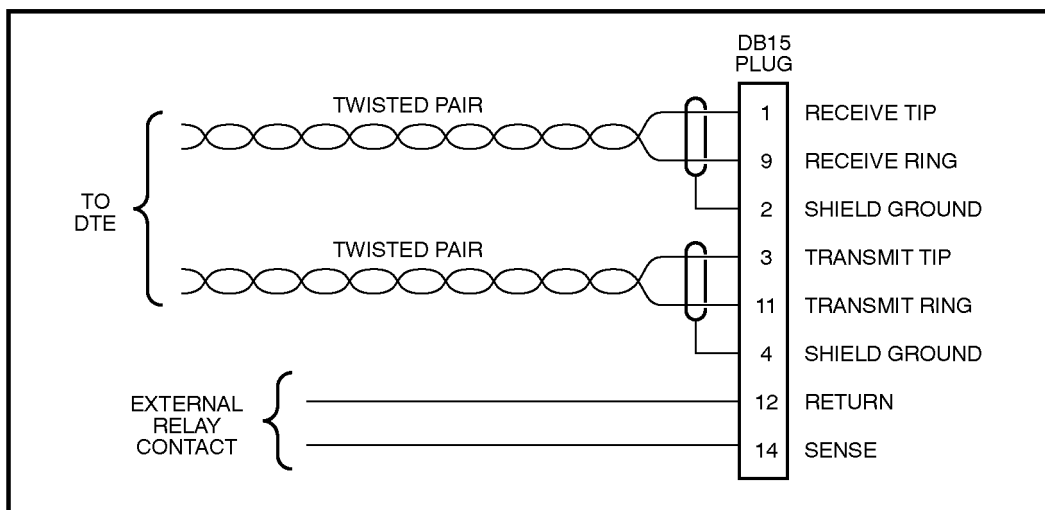
493-14152-01

Figure D-3. DSX-1 Cable

Table D-3
(DSX-1) DTE Interface Connector (J3)

Signal	Pin Number
Receiver Tip from DTE	1
Receiver Ring from DTE	9
Transmitter Tip to DTE	3
Transmitter Ring to DTE	11
Relay Contact Sense Return	12
Relay Contact Sense	14
Shield Ground	2,4

Integral Modem Service Port Interface

The integral modem VF cable is a 14.5-foot, 26 AWG, 4-conductor keyed cable with an RJ11C-like plug connector (Figure D-4). This cable is supplied with your 3160/3164 DSU/CSU. The integral modem service port connector is a 4-position, RJ11C-like modular jack (Table D-4).

493-14157-01
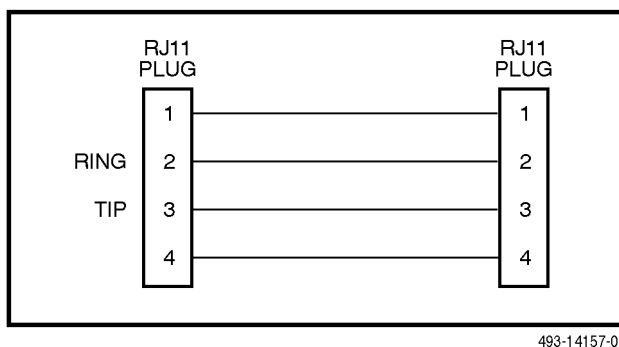
Figure D-4. Integral Modem Cable (Feature Number 3150-A1-210)

**Table D-4
Integral Modem Service
Port Connector (J5)**

Signal	Pin Number
VF Ring	2
VF Tip	3

AUX Port Interface

The Auxiliary (AUX) port is reserved for future use for extended management functions. No connection should be made to this port. The port connector is an 8-position keyed modular jack (Table D-5).

Table D-5
Extended Management Port Connector (J7)

Signal	Direction	Pin Number
Reserved for future use	to DCE (Out)	1
DTE Received Data	from DCE (IN)	2
Signal Ground	—	3
DTE Transmit Data	to DCE (Out)	4
Reserved for future use	to DCE (Out)	8

COM Port Interface

The COM port connects to either a PC for front panel emulation or to an ASCII terminal or printer for alarms. The COM port-to-PC cable is a 14-foot, 26 AWG, 8-conductor cable with an 8-position modular plug keyed connector and a DB9 socket connector (Figure D-5). The COM port connector is an 8-position keyed modular jack (Table D-6). The data signals on this port are referenced to a DTE interface.

The COM port-to-terminal/printer cable is a 14-foot, 26 AWG 8-conductor cable with an 8-position modular plug keyed connector and a DB25 plug connector (Figure D-6). The COM port connector is an 8-position keyed modular jack (Table D-6). The data signals on this port are referenced to a DTE interface.
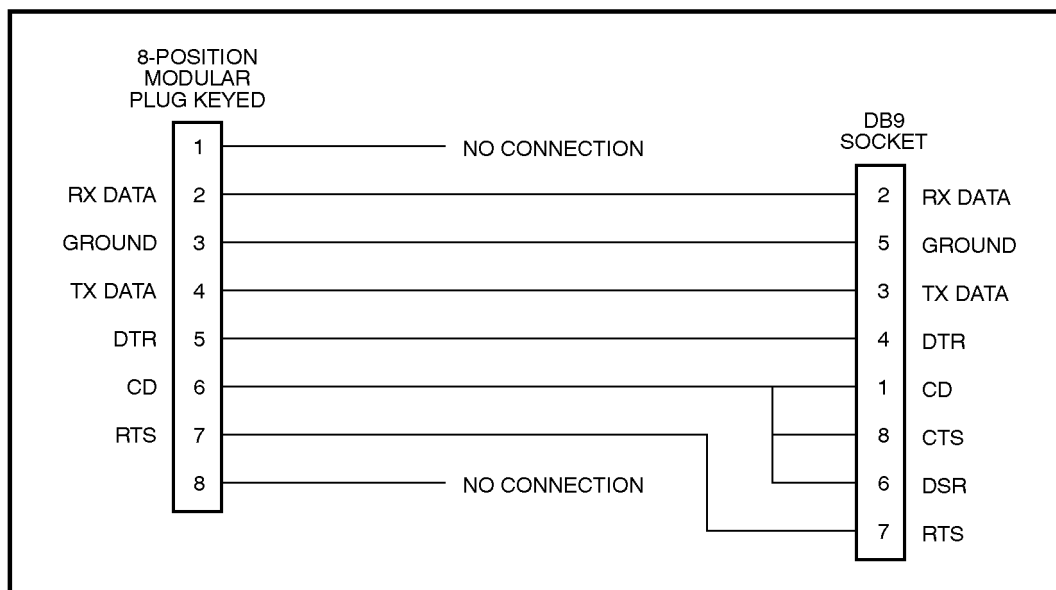
Figure D-5. COM Port-to-PC Cable (Feature Number 3100-F1-550)
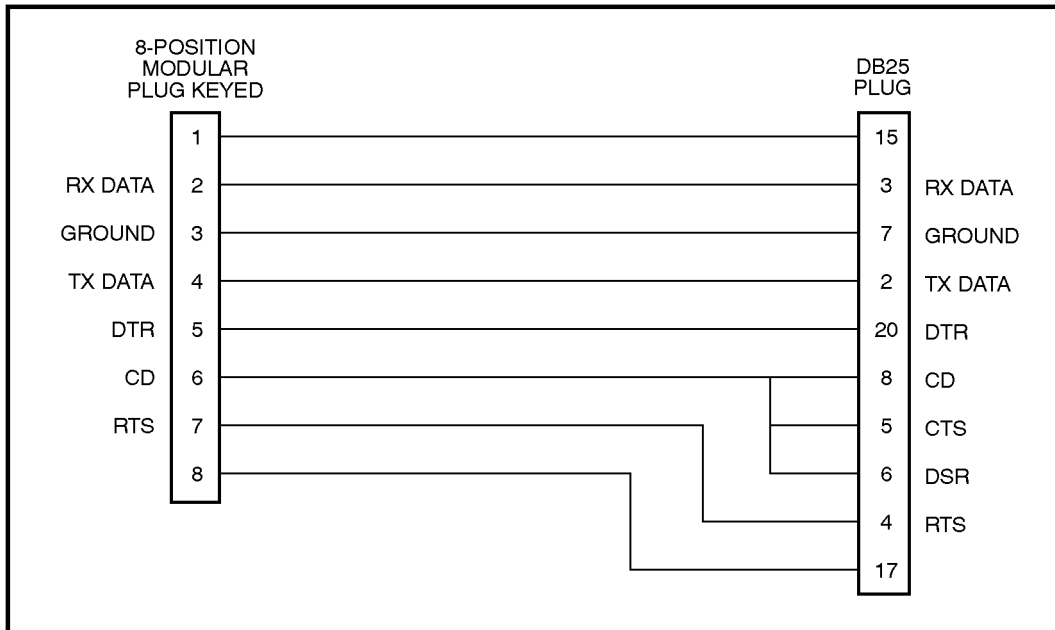
493-14154-01

Figure D-6. COM Port-to-Terminal/Printer Cable (Feature Number 3100-F1-540)

**Table D-6
COM Port Connector (J6)**

Signal	Direction	Pin Number
Reserved for future use	to DTE (Out)	1
DCE Received Data	to DTE (Out)	2
Signal Ground	—	3
DCE Transmit Data	from DTE (IN)	4
DCE Data Terminal Ready	from DTE (IN)	5
DCE Carrier Detect	to DTE Out)	6
DCE Request-to-Send	from DTE (IN)	7
Reserved for future use	to DTE (Out)	8

EIA-530A DB25 Port Interface Connector

The EIA-530A Port Interface connector information is shown in Table D-7 and Figure D-7.

Table D-7
EIA-530A Port Interface Connector

Signal	Circuit Mnemonic	CCITT Number	Direction	Pin
Shield	—	—	—	1
Signal Common	AB	102A	—	7
Signal Common	AC	102B	—	23
Transmitted Data	BA	103	To DCE	2 (A) 14 (B)
Received Data	BB	104	From DCE	3 (A) 16(B)
Request-to-Send	CA	105	To DCE	4 (A) 19 (B)
Clear-to-Send	CB	106	From DCE	5 (A) 13 (B)
Received Line Signal Detector	CF	109	From DCE	8 (A) 10 (B)
DCE Ready	CC	107	From DCE	6
DTE Ready	CD	108/1, /2	To DCE	20
Transmit Signal Element Timing (DTE Source)	DA	113	To DCE	11 (B) 24 (A)
Transmit Signal Element Timing (DCE Source)	DB	114	From DCE	12 (B) 15 (A)
Receiver Signal Element Timing (DCE Source)	DD	115	From DCE	17 (A) 9 (B)
Local Loopback	LL	141	To DCE	18
Remote Loopback	RL	140	To DCE	21
Test Mode	TM	142	From DCE	25

RS449 Port Interface Connector

The RS449 Port Interface connector information is shown in Table D-8 and Figure D-7.

Table D-8
RS449 Port Interface Connector

Signal	Circuit Mnemonic	CCITT Number	Direction	Pin
Shield	—	—	—	1
Signal Ground	SG	102A	—	19
Receive Ground	RC	102B	—	20
Send Common	SC	—	—	37
Send Data	SD	103	To DCE	4 (A) 22 (B)
Receive Data	RD	104	From DCE	6 (A) 24 (B)
Request-to-Send	RS	105	To DCE	7 (A) 25 (B)
Clear-to-Send	CS	106	From DCE	9 (A) 27 (B)
Receiver Ready	RR	109	From DCE	13 (A) 31 (B)
Data Mode	DM	107	From DCE	11 (A) 29 (B)
Terminal Ready	TR	108/1, /2	To DCE	12 (A) 30 (B)
Terminal Timing	TT	113	To DCE	17 (A) 35 (B)
Send Timing	ST	114	From DCE	5 (A) 23 (B)
Receive Timing	RT	115	From DCE	8 (A) 26 (B)
Local Loopback	LL	141	To DCE	10
Remote Loopback	RL	140	To DCE	14
Test Mode	TM	142	From DCE	18

530 SIGNAL	DB-25 PLUG		DB-37 SOCKET	449 SIGNAL
SHIELD	1		1	SHIELD
TD-A	2		4	TD-A
TD-B	14		22	TD-B
RD-A	3		6	RD-A
RD-B	16		24	RD-B
TXC-A	15		5	TXC-A
TXC-B	12		23	TXC-B
RCX-A	17		8	RXC-A
RXC-B	9		26	RXC-B
RTS-A	4		7	RTS-A
RTS-B	19		25	RTS-B
CTS-A	5		9	CTS-A
CTS-B	13		27	CTS-B
DTR	20		12	DTR-A
RLSD-A	8		13	RR-A
RLSD-B	10		31	RR-B
DSR	6		11	DM-A
SIG. COMMON	7		19	SIG. COMMON
RL	21		14	RL
LL	18		10	LL
RCV. COMMON	23		20	RCV. COMMON
TT-A	24		17	TT-A
TT-B	11		35	TT-B
TM	25		18	TM
–	22			
			29	DM-B
			30	DTR-B

493-14323

Figure D-7. EIA-530A to RS449 Adapter Cable (Feature Number 3100-F1-580)

V.35 Port Interface Connector

The V.35 Port Interface connector information is shown in Table D-9 and Figure D-8.

Table D-9
V.35 Port Interface Connectors

Signal	CCITT Number	Direction	Pin
Shield	—	—	A
Signal Common	102	—	B
Transmitted Data	103	To DCE	P (A) S (B)
Received Data	104	From DCE	R (A) T (B)
Request-to-Send	105	To DCE	C
Clear-to-Send	106	From DCE	D
Data Channel Received Line Signal Detector	109	From DCE	F
Data Set Ready	107	From DCE	E
Data Terminal Ready	108/1, /2	To DCE	H
Transmit Signal Element Timing (DTE Source)	113	To DCE	U (A) W (B)
Transmit Signal Element Timing (DCE Source)	114	From DCE	Y (A) AA (B)
Receiver Signal Element Timing (DCE Source)	115	From DCE	V (A) X (B)
Local Loopback	141	To DCE	L
Loopback/Maintenance	140	To DCE	N
Test Indicator	142	From DCE	NN

530 SIGNAL	DB-25 PLUG		MS-34 SOCKET	V.35 SIGNAL
SHIELD	1		A	SHIELD
TD-A	2		P	TD-A
TD-B	14		S	TD-B
RD-A	3		R	RD-A
RD-B	16		T	RD-B
TXC-A	15		Y	TXC-A
TXC-B	12		AA	TXC-B
RCX-A	17		V	RXC-A
RXC-B	9		X	RXC-B
RTS	4		C	RTS
CTS	5		D	CTS
RLSD	8		F	RLSD
DSR	6		E	DSR
SIG. COMMON	7		B	SIG. COMMON
TT-A	24		U	TT-A
TT-B	11		W	TT-B
DTR	20		H	DTR
RL	21		N	RL
LL	18		L	LL
TM	25		NN	TM
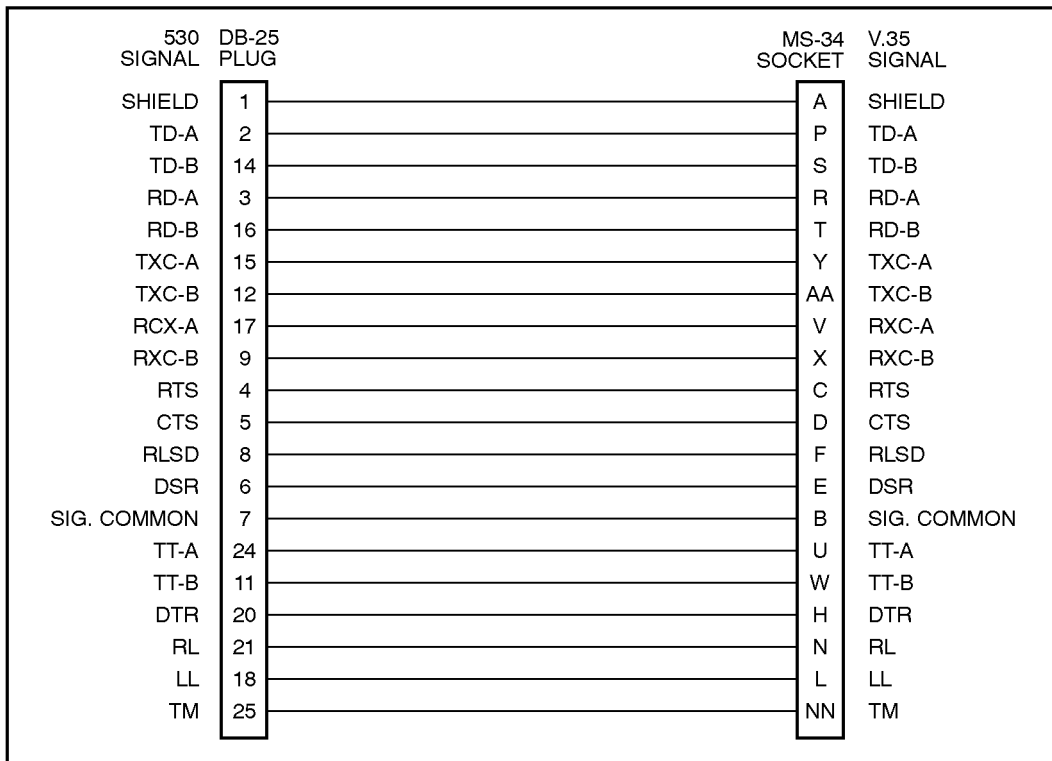
493-14324

Figure D-8. EIA-530A to V.35 Adapter Cable (Feature Number 3100-F1-570)

Power Cable

The power cable is a 14.5-foot, 18 AWG stranded cable. The connector is terminated at one end with a 6-position Molex 39-01-2060 connector. The other end of the cable is terminated with a bare wire that should be connected to a DC power source. Figure D-9 shows the wire colors. The power source can be either a single source of +24 Vdc or up to two sources of −48 Vdc (A and B). You cannot connect +24 Vdc and −48 Vdc to the same unit. See the installation instructions in Chapter 2, *Installation*.
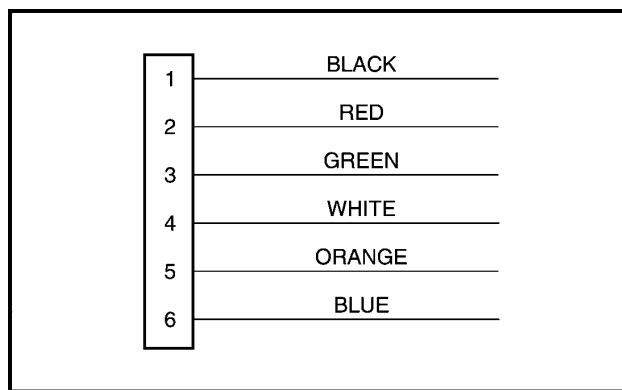
493-14158

**Figure D-9. DC Power Cable
(Feature Number 3100-F1-520)**

Power Input Connector

The required input power connector leads are shown in Table D-10.

**Table D-10
DC Power Connector**

Signal	Pin Number
−48 Vdc Return	1,2
−48 Vdc A	6
−48 Vdc B	5
+24 Vdc	5
+24 Vdc Return	4
Chassis Ground	3

External Clock Connector

The External Clock connector cable diagram is shown in Figure D-10. This is a customer-supplied cable. Connector pinouts are in Table D-11.
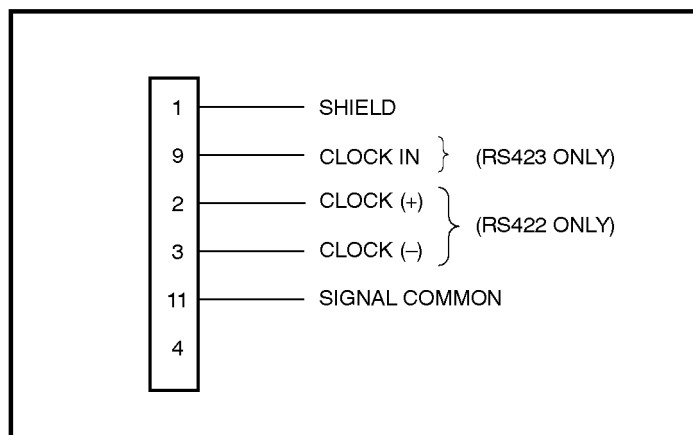
493-14344

Figure D-10. External Clock Connector

Table D-11
External Clock Connector

Signal	Pin Number
Shield	1
Clock (+) (RS422 only)	2
Clock (−) (RS422 only)	3
Clock In (RS423 only)	9
Signal Common	11

Slide Latch Adapter

The Slide Latch Adapter 12-inch cable is shown in
Figure D-11. The connector information is in Table D-12.

493-14343
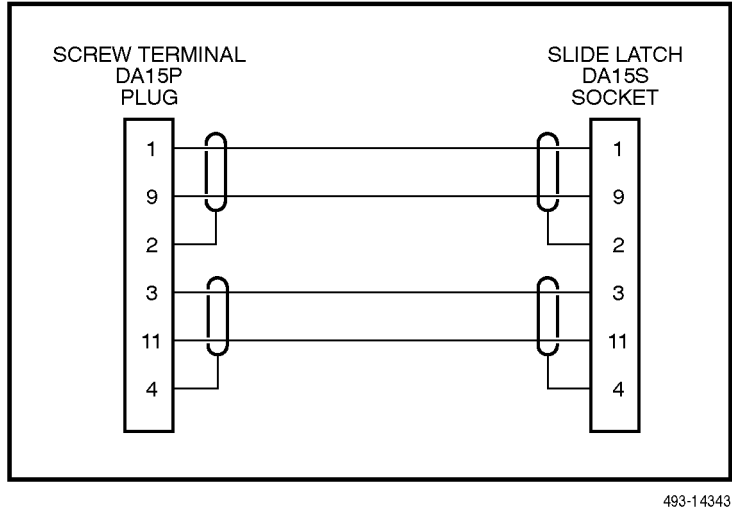
Figure D-11. Slide Latch Adapter Cable (Feature Number 3100-F1-560)

Table D-12
Slide Latch Connector

Signal	DA15P	DA15S
Receiver Tip	1	1
Receiver Ring	9	9
Shield	2	2
Transmitter Tip	3	3
Transmitter Ring	11	11
Shield	4	4

SNMP MIB Objects E

Management Information Base (MIB) II (RFC 1213)

The objects defined by MIB II are organized into 10 different groups. The DSU/CSU implements only those groups where the semantics of the group are applicable to the implementation of a DSU/CSU (e.g., if EGP is not implemented, the EGP group is not supported). The MIB II object groups supported or not supported by the 3100 Series devices are as follows:

System Group	Supported.
Interfaces Group	Supported for the Network T1 interface, the DTE Drop/Insert T1 interface, the synchronous DCE data ports, the COM port, and the MODEM port. Interface statistics (counters) apply only to the COM port and MODEM port, whichever is defined as the SNMP management link.
Address Translation Group	Not supported since this group is not supported in MIB II.
IP Group	Supported on the interface (MODEM or COM) configured as the SNMP management link.
ICMP Group	Supported on the interface (MODEM or COM) configured as the SNMP management link.
TCP Group	Not supported since the TCP protocol is not supported by the DSU/CSU.
UDP Group	Supported on the interface (MODEM or COM) configured as the SNMP management link.
EGP Group	Not supported since the EGP protocol is not supported by the DSU/CSU.

Transmission Group	Supported on the T1 interfaces using the DS1/E1 MIB. Supported on the synchronous DCE data ports using the RS-232-like MIB. Not supported on the COM and MODEM ports.
SNMP Group	Supported.

System Group, MIB II

The System Group Objects are fully supported by the T1 DSU/CSU. The following sections provide clarification for objects contained in the System Group where it is not otherwise clear how the object definition in MIB II is related to the DSU/CSU.

System Group – "sysDescr" Object (system 1)

This object provides the full name and version identification for the systems hardware and software. Set this object to display the following string:

AT&T Paradyne T1 DSU/CSU, model *xxxx-xx-xxx*. S/W Release: *yy.yy.yy*. H/W CCA numbers: CCA1 *zzzz.zzz* CCA2 *zzzz-zzz*. Serial number *ssssssss*

> *Where:* *xxxx-xx-xxx* represents the full model number of the unit.
>
> *yy.yy.yy* represents the software revision number of the unit.
>
> *zzzz-zzz* represents the hardware revision numbers for the unit.
>
> *ssssssss* represents the serial number for the unit.

System Group – "sysObjectID" Object (system 2)

This object provides the authoritative identification of the network management subsystem contained in the unit. Set this object to display the following object identifier:

3160	1.3.6.1.4.1.74.1.14.2.2.1
3164	1.3.6.1.4.1.74.1.14.2.2.2

System Group – "sysUpTime" Object (system 3)

This object provides the time in hundredths of a second since the network management subsystem contained in the unit was last re-initialized.

System Group – "sysContact" Object (system 4)

This object provides information about the contact person for the DSU/CSU.

System Group – "sysName" Object (system 5)

This object provides the administratively-assigned name for the DSU/CSU.

System Group – "sysLocation" Object (system 6)

This object provides the physical location of the DSU/CSU.

System Group – "sysServices" Object (system 7)

This object provides a value which indicates the set of services that are potentially offered by the DSU/CSU. Only the following values are supported by the DSU/CSU.

- physical(1) – Layer 1 functionality for all interfaces.

- datalink/subnetwork(2) – Layer 2 functionality (SLIP, PPP) for the COM and MODEM ports.

- internet(4) – Layer 3 functionality (IP) for the COM and MODEM ports.

- end-to-end(8) – Layer 4 functionality (UDP) for the COM and MODEM ports.

Therefore, set this object to 15 (the sum of $1 + 2 + 4 + 8$).

Interface Group, MIB II

The interfaces group consists of an object indicating the number of interfaces supported by the unit and an interface table containing an entry for each interface. The T1 DSU/CSU provides an entry in the interface table for the Network T1 interface, the DTE Drop/Insert T1 interface, each of the synchronous DCE data ports (1, 2, or 4 depending on the model), the COM port, and the MODEM port. The following sections provide clarification for objects contained in the Interface Group where it is not clear how the object definition in MIB II is related to the DSU/CSU.

Interface Group – "ifDescr" Object (ifEntry 2)

This object provides the textual information about the interface. Set each interface to a text string as specified below:

Network T1:	"Network T1. AT&T Paradyne T1 DSU/CSU, Hardware Version: [CCA number for the CSU board]".
DTE T1:	"DTE T1. AT&T Paradyne T1 DSU/CSU, Hardware Version: [CCA number for the CSU board]".
COM:	"COM port. AT&T Paradyne T1 DSU/CSU, Hardware Version: [CCA number for the CSU board]".
Modem:	"MODEM port. AT&T Paradyne T1 DSU/CSU, Hardware Version: [CCA number for the CSU board]".
Data Ports:	"Data Port n. AT&T Paradyne T1 DSU/CSU, Hardware Version: [CCA number for the DSU board]". (where n is between 1 and 4).

Interface Group – "ifType" Object (ifEntry 3)

This object identifies the type of the interface based on the physical/link protocol(s) immediately below the network layer. Only the following values are supported by the DSU/CSU:

- t1-carrier(18) – Used for the Network and DTE Drop/Insert T1 interfaces.

- propPointToPointSerial(22) – Used for the synchronous DCE data ports. Used for the MODEM or COM port when the port is not configured as the SNMP management interface.

- ppp(23) – Used for the MODEM or COM port when the port is configured for PPP.

- slip(28) – Used for the MODEM or COM port when the port is configured for SLIP.

Interface Group – "ifMtu" Object (ifEntry 4)

This object identifies the largest datagram that can be sent/received on the interface. It is applicable only to the interface configured as the SNMP management link. This object is zero for all other interfaces.

Interface Group – "ifSpeed" Object (ifEntry 5)

This object provides the interface's current bandwidth in bits per second. The value of this object for each interface is specified as follows:

T1 Interfaces:	1,544,000 bps.
COM and Modem:	The currently configured data rate for the port.
Data Ports:	The currently configured data rate for the port when the port is allocated to one of the T1 interfaces. If the port is not allocated the data rate is defined as zero.

Interface Group – "ifAdminStatus" Object (ifEntry 7)

This object specifies the desired state (configuration) of the interface. This object is supported only for the MODEM port. It provides the ability to switch between using the MODEM port as the SNMP management link and ASCII operations (Dial-out, FPE). Refer to the 3100 Series device document for more information. The value of this object will not affect the state of any of the interfaces on the T1 DSU/CSU other than the MODEM port. Only the following values are supported by the DSU/CSU:

- up(1) – The SNMP management link is active on the MODEM port (i.e., the Modem Use configuration option is set to SNMP).

- testing(3) – The SNMP management link is inactive on the MODEM port and can be used for proprietary ASCII functions.

- Interface Group – "ifOperStatus" Object (ifEntry 8)

This object specifies the current operational state of the interface. The value of this object for each interface is defined as follows:

Network T1:	The interface is up(1) when no alarm conditions exist.
	The interface is down(2) when an alarm condition is active.
DTE Drop/Insert T1:	The interface is up(1) when no alarm conditions exist and the I/F is enabled.
	The interface is down(2) when an alarm condition is active and the I/F is disabled.
	The interface is testing(3) when a test is active on the interface.
COM Port:	When configured as the SNMP management link, up and down are based on the current state of the link layer protocol. Otherwise, the interface is always up(1).
	The interface is never in the testing(3) state.

MODEM Port:	When configured as the SNMP management link, up and down are based on the current state of the link layer protocol. Otherwise, the interface is always up(1) when the MODEM is connected and down(2) when the MODEM is not connected.
	The interface is never in the testing(3) state.
Data Ports:	The interface is up(1) when the port is assigned to a T1 interface and both CTS and DSR are ON.
	The interface is down(2) when the port is unassigned or either CTS or DSR is OFF.
	The interface is testing(3) when a test is active on the interface.

Interface Group – Input Counters (objects ifEntry 10 to ifEntry 15)

The objects used to collect statistics on the data received by an interface apply only to the COM port and the MODEM port when the port is configured as the SNMP management link. For interfaces that are not configured as the SNMP management link, these statistics are not provided and an error status is returned if access is attempted. The objects used to collect input statistics are listed below:

- ifInOctets (ifEntry 10)

- ifInUcastPkts (ifEntry 11)

- ifInNUcastPkts (ifEntry 12)

- ifInDiscards (ifEntry 13)

- ifInErrors (ifEntry 14)

- ifInUnknownProtos (ifEntry 15)

Interface Group – Output Counters (objects ifEntry 16 to ifEntry 21)

The objects used to collect statistics on the data transmitted by an interface apply only to the COM port and the MODEM port when the port is configured as the SNMP management link. For interfaces that are not configured as the SNMP management link, these statistics are not provided and an error status is returned if access is attempted. The objects used to collect output statistics are listed below:

- ifOutOctets (ifEntry 16)
- ifOutUcastPkts (ifEntry 17)
- ifOutNUcastPkts (ifEntry 18)
- ifOutDiscards (ifEntry 19)
- ifOutErrors (ifEntry 20)
- ifOutQLen (ifEntry 21)

IP Group, MIB II

The IP Group Objects are supported by the T1 DSU/CSU for the MODEM port and the COM port when the port is configured as the SNMP management link. All of the objects in the IP Group other than the IP Address Translation table are fully supported. The IP Group objects are not supported for the T1 interfaces and synchronous data ports. The following sections provide clarification for objects contained in the IP Group when it is not clear how the object definition in MIB II is related to the DSU/CSU.

IP Group – "ipForwarding" Object (ip 1)

This object specifies whether the unit is acting as an IP gateway in respect to the forwarding of a datagram received by, but not addressed to, this unit. Only the following value is supported by the DSU/CSU.

- not-forwarding(2) – The unit is not acting as a gateway.

IP Group – "ipRoutingTable" Object (ip 21)

The routing table used by the DSU/CSU is supported as a read-only table. Entries in this table may not be added or deleted.

IP Group – "ipNetToMediaTable" Object (ip 22)

This table is not supported.

ICMP Group, MIB II

The ICMP Group objects are fully supported by the T1 DSU/CSU for the MODEM port and the COM port when the port is configured as the SNMP management link. The ICMP Group objects are not supported for the T1 interfaces and synchronous data ports.

UDP Group, MIB II

The UDP Group objects are fully supported by the T1 DSU/CSU for the MODEM port and the COM port when the port is configured as the SNMP management link. The UDP Group objects are not supported for the T1 interfaces and synchronous data ports.

Transmission Group, MIB II

Objects in the Transmission Group are supported on the Network and DTE Drop/Insert T1 interfaces and the synchronous data ports. The Transmission Group objects are not supported on the COM and MODEM ports. The objects in the Transmission Group are not defined within MIB II but rather through other Internet-standard MIB definitions. The following two Transmission Group objects are supported by the T1 DSU/CSU.

- ds1 (transmission 18) – The transmission object supported on the T1 interfaces.
- rs232 (transmission 33) – The transmission object supported on the synchronous data ports.

The "ds1" transmission object is defined by the DS1/E1 MIB. The rs232 transmission object is defined by the RS-232-like MIB.

SNMP Group, MIB II

The SNMP Group objects that apply to a management agent are fully supported by the T1 DSU/CSU. The following objects apply only to a management client and return a zero value if accessed.

- snmpInTooBigs (snmp 8)

- snmpInNoSuchNames (snmp 9)

- snmpInBadValues (snmp 10)

- snmpInReadOnlys (snmp 11)

- snmpInGenErrs (snmp 12)

- snmpInGetResponses (snmp 18)

- snmpInTraps (snmp19)

- snmpOutGetRequests (snmp 25)

- snmpOutGetNexts (snmp 26)

- snmpOutSetRequests (snmp 27)

- snmpOutGetResponses (snmp 28)

DS1/E1 MIB (RFC 1406)

The "ds1" object defined by RFC 1406 is supported for both the Network and DTE Drop/Insert T1 interfaces. The DS1 Near End Group and DS1 Fractional Group will be supported for both interfaces. The DS1 Far End Group is not supported.

Near End Group, DS1/E1 MIB

The DS1 Near End Group consists of the following four tables:

- DS1 Configuration

- DS1 Current

- DS1 Interval

- DS1 Total

All four tables are fully supported for the Network T1 interface. Since statistics are not kept for the DTE Drop/Insert T1 interface, only the DS1 Configuration table is fully supported. The "statistic" objects for the DTE Drop/Insert T1 interface entry in the DS1 Current, DS1 Interval, and DS1 Total tables are always zero (null). The following sections provide clarification for objects contained in the Near End Group when it is not clear how the object definition in the DS1/E1 MIB is related to the DSU/CSU.

Near End Group – "dsx1TimeElapsed" Object (dsx1ConfigEntry 3)

Applies to the Network T1 interface only. An error status is returned if access is attempted for the DTE Drop/Insert T1 interface.

Near End Group – "dsx1ValidIntervals" Object (dsx1ConfigEntry 4)

Applies to the Network T1 interface only. An error status is returned if access is attempted for the DTE Drop/Insert T1 interface.

Near End Group – "dsx1LineType" Object (dsx1ConfigEntry 5)

This object corresponds to the NET Framing/DTE Framing configuration options for the T1 interfaces on the DSU/CSU. Only the following values are supported by the DSU/CSU.

- dsx1ESF(2) – Indicates ESF framing.

- dsx1D4(2) – Indicates D4 framing.

Near End Group – "dsx1LineCoding" Object (dsx1ConfigEntry 6)

This object corresponds to the NET Coding/DTE Coding configuration options for the T1 interfaces on the DSU/CSU. Only the following values are supported by the DSU/CSU.

- dsx1B8ZS(2) – Indicates B8ZS line coding.

- dsx1AMI(5) – Indicates AMI line coding.

Near End Group – "dsx1SendCode" Object (dsx1ConfigEntry 7)

This object specifies the test patterns/codes being sent over the Network T1 interface. These tests are not supported on the DTE Drop/Insert T1 Interface. Only the following values are supported by the DSU/CSU.

- dsx1SendNoCode(1) – Specifies that the interface is sending normal or looped data. Setting the interface to this value stops an active "send pattern" test on the interface. This is the only value supported by the DTE Drop/Insert T1 interface.

- dsx1SendLineCode(2) – Specifies that the Network T1 interface is sending a Remote Loopback (Rlpbk) LLBUP code. The code is sent for 10 seconds.

- dsx1SendResetCode(4) – Specifies that the Network T1 interface is sending Remote Loopback (Rlpbk) LLBDN code. The code is sent for 10 seconds.

- dsx1SendQRS(5) – Specifies that the Network T1 interface is sending a QRSS test pattern. The pattern is sent until the test is halted (i.e., setting to dsx1SendNoCode).

- dsx1SendOtherTestPattern(8) – Specifies that the Network T1 interface is sending a 1-in-8 test pattern. The pattern is sent until the test is halted (i.e., setting to dsx1SendNoCode).

Near End Group – "dsx1CircuitIdentifier" Object (dsx1ConfigEntry 8)

This object is not supported by the DSU/CSU.

Near End Group – "dsx1LoopbackConfig" Object (dsx1ConfigEntry 9)

This object specifies the loopback state of the T1 interfaces. Only the following values are supported by the DSU/CSU.

- dsx1NoLoop(1) – The T1 interface is not in a loopback state.

- dsx1PayloadLoop(2) – Specifies that a Payload Loopback (PLB) is active for the Network T1 interface or a Repeater Loopback (RLB) is active for the DTE Drop/Insert T1 interface.

- dsx1LineLoop(3) – Specifies that a Line Loopback (LLB) is active for the Network T1 interface or a DTE Loopback (DLB) is active for the DTE Drop/Insert T1 interface.

Near End Group – "dsx1LineStatus" Object (dsx1ConfigEntry 10)

This object specifies the line (alarm) status of the T1 interfaces. Only the following values are supported by the DSU/CSU. More than one value may be active at a time.

- dsx1NoAlarm(1) – No alarm present.

- dsx1RcvFarEndLOF(2) – A yellow alarm signal is being received.

- dsx1RcvAIS(8) – An Alarm Indication Signal (AIS) is being received.

- dsx1LossOfFrame(32) – An Out Of Frame condition has persisted for more that 2.5 seconds (i.e., Red Alarm).

- dsx1LossOfSignal(64) – A Loss of Signal condition has persisted for more that 2.5 seconds (i.e., Red Alarm).

- dsx1LoopbackState(128) – The near end of the T1 interfaces is in a loopback state.

- dsx1Other Failure(4096) – An Excessive Error Rate (EER) has been detected on the Network T1 interface.

Near End Group – "dsx1SignalMode" Object (dsx1ConfigEntry 11)

This object specifies whether Robbed Bit Signaling (RBS) is being used. This object differs from the MIB definition in that it is "read-only" (not read/write) for DSU/CSUs. Only the following values are supported by the DSU/CSU.

- none(1) – No signaling is being used on this interface.

- robbedBit(2) – Robbed Bit Signaling is being used on at least one DS0 on this T1 interface.

Near End Group – "dsx1TransmitClockSource" Object (dsx1ConfigEntry 12)

This object specifies the timing source for the transmit clock for this T1 interface. This object differs from the MIB definition in that it is "read-only" (not read/write) for DSU/CSUs. Only the following values are supported by the DSU/CSU.

- loopTiming(1) – The recovered receive clock is being used as the transmit clock.

- localTiming(2) – The DSU/CSU's internal clock is being used as the transmit clock.

- ThroughTiming(3) – The recovered receive clock from another interface (e.g., T1, Port, or External) is being used as the transmit clock.

Near End Group – "dsx1Fdl" Object (dsx1ConfigEntry 13)

This object specifies how the Facility Data Link is being used. Only the following values are supported by the DSU/CSU. More than one value may be active at a time.

- dsx1Ansi-T1-403 (2) – ANSI PRMs are supported on the Network T1 interface as specified by ANSI T1.403.

- dsx1Att-54016(4) – The FDL supports the requirements specified by AT&T publication TR54016.

- dsx1Fdl-none(8) – Indicates that the device does not use the FDL. This value applies to the DTE Drop/Insert T1 interface.

Near End Group – The DS1 Current Table Objects (dsx1CurrentEntry)

The following DS1 current table objects are provided for the Network T1 interface only. Objects in the table that are not listed are not supported and will return an error status if access is attempted.

- dsx1CurrentIndex – The index that identifies the T1 interface.

- dsx1CurrentESs – Errored Seconds for the current interval.

- dsx1Current SESs – Severely Errored Seconds for the current interval.

- dsx1CurrentUASs – Unavailable Seconds for the current interval.

- dsx1CurrentCSSs – Controlled Slip Seconds for the current interval.

- dsx1CurrentBESs – Bursty Errored Seconds for the current interval.

Near End Group – The DS1 Interval Table Objects (dsx1IntervalEntry)

The following DS1 interval table objects are provided for the Network T1 interface only. Objects in the table that are not listed are not supported and will return an error status if access is attempted.

- dsx1IntervalIndex – The index that identifies the T1 interface.

- dsx1IntervalNumber – The interval number (1 to 96).

- dsx1IntervalESs – Errored Seconds for the interval.

- dsx1Interval SESs – Severely Errored Seconds for the interval.

- dsx1IntervalUASs – Unavailable Seconds for the interval.

- dsx1IntervalCSSs – Controlled Slip Seconds for the interval.

- dsx1Interval BESs – Bursty Errored Seconds for the interval.

Near End Group – The DS1 Total Table Objects (dsx1TotalEntry)

The following DS1 total table objects are provided for the Network T1 interface only. Objects in the table that are not listed are not supported and will return an error status if access is attempted.

- dsx1TotalIndex – The index that identifies the T1 interface.

- dsx1TotalESs – The 24-hour total Errored Seconds.

- dsx1Total SESs – The 24-hour total Severely Errored Seconds.

- dsx1TotalUASs – The 24-hour total Unavailable Seconds.

- dsx1TotalCSSs – The 24-hour total Controlled Slip Seconds.

- dsx1TotalBESs – The 24-hour total Bursty Errored Seconds.

Far End Group, DS1/E1 MIB

The DS1 Far End Group consists of the following three tables:

- DS1 Far End Current

- DS1 Far End Interval

- DS1 Far End Total

These tables are not supported for either the network or DTE Drop/Insert T1 interfaces.

The DS1 Fractional Group, DS1/E1 MIB

The DS1 Fractional Group consists of the DS1 fractional table. This table (dsx1FracTable) is fully supported by the T1 DSU/CSU and allows channel (time slots) to be mapped between the T1 interface and data ports. If an invalid channel map (e.g. two interfaces mapped to a single time slot, one interface mapped to two T1s, etc.) is received an error will be returned to the SNMP manager. The T1 DSU/CSU validates all channel configurations before applying them.

Operational Note: The fractional T1 group only allows specification of an entire interface to a particular time slot on another interface (i.e., a time slot on one interface cannot be mapped to a time slot on another interface). This prevents complete mapping of time slots on the DTE Drop/Insert T1 interface to time slots on the network T1 interface. For mapping time slots between the network and DTE T1 interfaces the following convention will be used. Time slots on the T1 interface that are mapped to another T1 interface (i.e., not a data port) will be connected in ascending order. For example, if the fractional table for the network T1 interface maps time slots 1, 3 and 5 to the DTE T1 interface and the DTE T1 interface maps time slots 10, 11 and 15 to the network the following time slots will be connected: N1 – D10, N3 – D11, and N5 to D15.

RS-232-like MIB (RFC 1317)

The "rs232" object defined by RFC 1317 is supported for all of the synchronous DCE data ports, the MODEM port, and the COM port. The RS-232-like MIB consists of one object and five tables, as follows:

- Number of RS-232-like ports

- The General Port Table

- The Asynchronous Port Table

- The Synchronous Port Table

- The Input Signal Table

- The Output Signal Table

The Asynchronous Port Table is not supported by the DSU/CSU for the synchronous DCE data ports. The Input Signal and Output Signal Tables are not supported for the MODEM and COM ports. The following sections provide clarification for objects contained in the RS-232-like MIB when it is not clear how the object definition in MIB is related to the DSU/CSU.

Number of Ports – "rs232Number" Object (rs232 1)

This object contains the number of ports in the RS-232-like general port table. This number is 4 for the 3160 DSU/CSU and 6 for the 3164 DSU/CSU.

General Port Table, RS-232-like MIB

The general port table contains general configuration objects for the RS-232-like interfaces.

General Port Table – "rs232PortIndex" Object (rs232PortEntry 1)

This object contains a unique value for each port and is used as an index into the general port table (rs232PortTable).

General Port Table – "rs232PortType" Object (rs232PortEntry 2)

This object is used to identify the ports hardware type. Only the following values are supported by the DSU/CSU.

- rs232(2) – Used to identify the MODEM and COM ports.

- rs422(3) – Used to identify ports that are configured as EIA-530A or RS-449.

- V35(5) – Used to identify ports that are configured as V.35.

General Port Table – "rs232PortInSigNumber" Object (rs232PortEntry 3)

This object contains the number of input signals contained in the input signal table. This is the number of signals that can be detected. This number is 2 for the synchronous DCE ports and 0 for the MODEM and COM ports.

General Port Table – "rs232PortOutSigNumber" Object (rs232PortEntry 4)

This object contains the number of output signals contained in the output signal table. This is the number of signals that can be asserted. This number is 2 for the synchronous DCE ports and 0 for the MODEM and COM ports.

General Port Table – "rs232PortInSpeed" Object (rs232PortEntry 5)

This object contains the port's input speed in bits per second. For the T1 DSU/CSU, this object is read-only. The input speed of a synchronous data port is determined by the channel configuration and cannot be changed through this object. The input speed of the MODEM or COM port is the currently configured speed.

General Port Table – "rs232PortOutSpeed" Object (rs232PortEntry 6)

This object contains the port's output speed in bits per second. For the T1 DSU/CSU this object will be read-only. The output speed of a synchronous data port is determined by the channel configuration and cannot be changed through this object. The output speed of the MODEM or COM port is the currently configured speed.

Asynchronous Port Table, RS-232-like MIB

The asynchronous port table contains an entry for each of the MODEM or COM port when the port is configured for asynchronous operation. For the T1 DSU/CSU, the entries in the table that are counters (rs232AsyncPortEntry 6–8) are used to collect statistics and are not supported.

Asynchronous Port Table, "rs232AsyncPortBits" (rs232AsyncPortEntry 2)

This object specifies the number of bits in a character. Only the following values are supported by the DSU/CSU.

- 7 – 7-bit characters.

- 8 – 8-bit characters.

Asynchronous Port Table, "rs232AsyncPortStopBits" (rs232AsyncPortEntry 3)

This object specifies the number of stop bits supported. Only the following values are supported by the DSU/CSU.

- one(1) – One stop bit.

- two(2) – Two stop bits.

- one-and-half(3) – One and a half stop bits.

Asynchronous Port Table, "rs232AsyncPortParity" (rs232AsyncPortEntry 4)

This object specifies the parity used by the port. Only the following values are supported by the DSU/CSU.

- none(1) – No parity bit.

- odd(2) – Odd parity.

- even(3) – Even parity.

Asynchronous Port Table, "rs232AsyncPortAutoBaud" (rs232AsyncPortEntry 5)

This object specifies the ability to automatically sense the input speed of the port. Only the following value is supported by the DSU/CSU.

- disabled(2) – Autobaud is not supported.

Synchronous Port Table, RS-232-like MIB

The synchronous port table contains an entry for each of the synchronous DCE data ports and the MODEM or COM port when the port is configured for synchronous operation. For the T1 DSU/CSU, the entries in the table that are counters (rs232SyncPortEntry 3–7) are used to collect statistics and are not supported.

Synchronous Port Table – "rs232SyncPortClockSource" (rs232SyncPortEntry 2)

This object specifies the clock source for the port. Only the following values are supported by the DSU/CSU.

- internal(1) – The port uses an internal clock.

- external(2) – The port uses an external clock.

Input Signal Table, RS-232-like MIB

This table contains entries for the input signals that can be detected by the unit for each of the synchronous DCE data ports.

Input Signal Table – "rs232InSigName" (rs232InSigEntry 2)

This object contains the identification of a hardware input signal. Only the following values are supported by the DSU/CSU.

- rts(1) – Request-To-Send

- dtr(4) – Data Terminal Ready

Input Signal Table – "rs232InSigState" (rs232InSigEntry 3)

This object contains the current signal state. Only the following values are supported by the DSU/CSU.

- on(2) – The signal is asserted.

- off(3) – The signal is not asserted.

Input Signal Table – "rs232InSigChanges" (rs232InSigEntry 4)

This object is not supported by the T1 DSU/CSU.

Output Signal Table, RS-232-like MIB

This object contains entries for the output signals that can be asserted by the unit for each of the synchronous DCE data ports.

Output Signal Table – "rs232OutSigName" (rs232OutSigEntry 2)

This object contains the identification of a hardware output signal. Only the following values are supported by the DSU/CSU.

- cts(2) – Clear-To-Send
- dsr(3) – Data Set Ready

Output Signal Table – "rs232OutSigState" (rs232OutSigEntry 3)

This object contains the current signal state. Only the following values are supported by the DSU/CSU.

- on(2) – The signal is asserted.
- off(3) – The signal is not asserted.

Output Signal Table – "rs232OutSigChanges" (rs232OutSigEntry 4)

This object is not supported by the T1 DSU/CSU.

Generic-Interface MIB Extensions (RFC 1229)

The generic interface MIB is an experimental MIB that provides extensions to the generic interface group defined in MIB II. This MIB describes three tables:

- Generic Interface Extension Table
- Generic Interface Test Table
- Generic Receive Address Table

Only the generic interface test table is supported by the T1 DSU/CSU. This table is supported for Network T1 interface and the synchronous DCE data ports only. It is not supported for the DTE Drop/Insert T1 interface, the COM port, and MODEM port.

Generic Interface Test Table, Generic Interface MIB

The test table is used to provide access to additional tests (loopbacks and pattern tests) that are not provided for in the interfaces group of MIB II. The following sections provide clarification for objects contained in the Near End Group when it is not clear how the object definition in the DS1/E1 MIB is related to the DSU/CSU.

Generic Interface Test Table – "ifExtnsTestType" Object (ifExtnsTestEntry 4)

This object is a control variable used to start and stop operator-initiated tests on the interface. It provides the capability to:

- Start/stop the Monitor QRSS test pattern on the network T1 interface.
- Start/stop the Send QRSS/511 test pattern on a synchronous DCE data port.
- Start sending a V.54/FT1 UP/DOWN code to the remote unit for a synchronous DCE data port.
- Start/stop the Monitor QRSS/511 test pattern on a synchronous DCE data port.
- Start/stop the DCLB/DTLB loopback test on a synchronous DCE data port.

The following object identifiers are used to control the tests on the interface. The "noTest" and "testFullDuplexLoopBack" object identifiers are defined in the generic interface MIB, the other object identifiers are defined here.

- noTest – Stops the test in progress on the interface.
- testFullDuplexLoopBack – Initiates a DCLB on the interface. Only supported for the data ports.
- testLoopDTLB – Initiates a DTLB on the interface. Only supported for the data ports.

- testMonQRSS – Initiates a Monitor QRSS test on the interface. Supported for the data ports and the Network T1 interface.

- testMon511 – Initiates a Monitor 511 test on the interface. Only supported for the data ports.

- testSendQRSS – Initiates a Send QRSS test on the interface. Only supported for the data ports.

- testSend511 – Initiates a send 511 test on the interface. Only supported for the data ports.

- testSendV54Up – Sends a V54 up code to the remote unit. Only supported for the data ports.

- testSendV54Down –Sends a V54 down code to the remote unit. Only supported for the data ports.

- testSendFT1Up – ends a FT1 up code to the remote unit. Only supported for the data ports.

- testSendFT1Down – Sends a FT1 down code to the remote unit. Only supported for the data ports.

Where these object identifiers are defined as follows:

- testLoopDTLB – OBJECT IDENTIFIER ::= [wellKnownTests 2]

- testMonQRSS – OBJECT IDENTIFIER ::= [wellKnownTests 3]

- testMon511 – OBJECT IDENTIFIER ::= [wellKnownTests 4]

- testSendQRSS – OBJECT IDENTIFIER ::= [wellKnownTests 5]

- testSend511 – OBJECT IDENTIFIER ::= [wellKnownTests 6]

- testSendV54Up – OBJECT IDENTIFIER ::= [wellKnownTests 7]

- testSendV54Down – OBJECT IDENTIFIER ::= [wellKnownTests 8]

- testSendFT1Up – OBJECT IDENTIFIER ::= [wellKnownTests 9]

- testSendFT1Down – OBJECT IDENTIFIER ::= [wellKnownTests 10]

Generic Interface Test Table – "ifExtnsTestResult" Object (ifExtnsTestEntry 5)

This object contains the result of the most recently requested test. Only the following values are supported by the DSU/CSU.

- none(1) – No test currently active.

- inProgress(3) – A test is currently in progress.

- notSupported(4) – The requested test is not supported.

- unAbleToRun(5) – The requested test cannot run due to the state of the unit.

Generic Interface Test Table – "ifExtnsTestCode" Object (ifExtnsTestEntry 6)

This object contains a code which contains more specific information on the test result. This object is defined as an INTEGER. Only the following values are supported by the DSU/CSU.

- none – No further information is available. Used for the send pattern/code and loopback tests.

- inSyncNoBitErrors – A monitor pattern (QRSS or 511) test has synchronized on the pattern and has not detected any bit errors.

- inSyncWithBitErrors – A monitor pattern (QRSS or 511) test has synchronized on the pattern and has detected bit errors.

- notInSync – A monitor pattern (QRSS or 511) test has not synchronized on the requested pattern.

Where these object identifiers are defined as follows:

- wellKnownCodes – OBJECT IDENTIFIER ::= [ifExtensions 5]

- none – OBJECT IDENTIFIER ::= [wellKnownCodes 1]

- inSyncNoBitErrors – OBJECT IDENTIFIER ::= [wellKnownCodes 2]

- inSyncWithBitErrors – OBJECT IDENTIFIER ::= [wellKnownCodes 3]

- notInSync – OBJECT IDENTIFIER ::= [wellKnownCodes 4]

Troubleshooting Table F

The ACCULINK 316x DSU/CSU is designed to provide you with many years of trouble-free service. However, Table F-1 gives you some direction if a problem occurs. For problems other than those listed in the table, please contact your service representative immediately (see Chapter 1, *Introduction*, for more information).

Table F-1
(1 of 2)
Troubleshooting

Symptom	Possible Cause	Solutions
No power	1. The power cord is not securely plugged into the wall receptacle or rear panel connector. 2. The wall receptacle has no power.	1. Check that the power cord is securely attached at both ends. 2. Check the wall receptacle power by plugging in some equipment that is known to be working.
Power-Up Self-Test fails	The DSU/CSU has detected an internal hardware failure.	Contact your field service representative.
Message **LOS at Net** appears	1. Network cable problem. 2. No signal is being transmitted at the far-end DSU/CSU. 3. T1 facility problem.	1. Check that the network cable is securely attached at both ends. 2. Check far-end DSU/CSU status. 3. Contact your T1 facility provider.
Message **LOS at DTE** appears	1. DSX-1 cable problem. 2. No signal being transmitted from the DTE.	1. Check that the DSX-1 cable is securely attached at both ends. 2. Check the DTE status.
Message **OOF at Net** appears	1. Incompatible framing format between the network and the DSU/CSU. 2. Network cabling problem. 3. T1 facility problem.	1. Check that the framing format for the network interface is correct. 2. Check that the network cable is securely attached at both ends. 3. Contact your T1 facility provider.
Message **OOF at DTE** appears	1. Incompatible framing format between the DSX-1 port on the CPE and the DSU/CSU. 2. DSX-1 cabling problem.	1. Check that the framing format for the DSX-1 (DTE) interface is correct. 2. Check that the DSX-1 cable is securely attached at both ends.
Message **Yellow at Net** appears	1. Network cable problem. 2. Far-end DSU/CSU/DTE has lost framing sync on the T1 line. 3. T1 facility problem.	1. Check that your network cable is securely attached at both ends. 2. Check the status of the far-end device. 3. Contact your T1 facility provider.

Table F-1
(2 of 2)
Troubleshooting

Symptom	Possible Cause	Solutions
Message **Yellow at DTE** appears	DTE has detected an LOS or OOF condition.	1. Check the status of the DTE. 2. Check that the DSX-1 cable is securely attached at both ends.
Message **AIS at Net** appears	1. Upstream DSU/CSU is transmitting AIS (keep-alive signal). 2. The network is transmitting an AIS.	1. Check status of upstream DSU/CSU(s). 2. Report problem to carrier.
Message **AIS at DTE** appears	DTE is sending an AIS.	Check DTE.
Message **EER at Net** appears	T1 facility problem.	Contact your T1 facility provider.
BPV LED is ON	1. Incompatible line coding format between the DTE and DSU/CSU. 2. DSX-1 cable problem.	1. Check that the line coding format for the DSX-1 Drop/Insert port (DTE) is correct. 2. Check that the DTE cable is securely attached at both ends.
Message Failed **# #######** appears	Internal DSU/CSU problem.	Record the 8-digit code, then contact your field service representative.
SNMP Link Down	1. The SNMP manager configuration is mismatched with the device configuration. 2. The SNMP manager's link layer protocol is not running.	1. Check that the configurations are matched. 2. Start the link layer protocol.
Invalid Number	The modem cannot dial because the phone number is invalid or there is no number in the selected directory.	Check that the selected phone number is correct.
No Dial Tone	The modem cannot dial because there is no dial tone.	Check that the modem is connected properly.
Busy Signal	The modem is receiving a busy signal.	Redial the phone number later.
No Answer Tone	The remote end does not answer within 45 seconds.	Redial the phone number later.
Modem In Use	The modem is in use.	Redial the phone number later.

Configuration Worksheets G

This appendix contains one set of blank worksheets to be used when configuring your 316x DSU/CSU in the network. It is recommended that you copy these blank worksheets before using them.

DTE Options	Value
DTE Port	Enab, Disab
DTE Framing	D4, ESF
DTE Coding	AMI, B8ZS
Equal	0–133, 133–266, 266–399, 399–533, 533–655
Extrn DLB	Enab, Disab
Send Ones	Enab, Disab

Net Options	Value
NET Framing	D4, ESF
NET Coding	AMI, B8ZS
LBO	0.0, –7.5, –15, –22.5
ANSI PRM	Enab, Disab
NET LLB	Enab, Disab
NET PLB	Enab, Disab
BitStuff	62411, Part68, Disab

Prt1 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

Prt3 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

Prt2 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

Prt4 Options	Value
Port Type	E530, V.35, RS449
Base Rate	Nx64, Nx56
NetDCLB	Disab, V.54, FT1, Both
Port LB	Disab, DTLB, DCLB, Both
All Ones	Disab, DTR, RTS, Both
Rcv Yellow	None, Halt
Tx Clock	Int, Ext
Invert TxC	Enab, Disab
Invert Data	Enab, Disab

<div style="display:flex; gap:2rem;">

Network T1 Interface

Network Channel	Allocation
N1	
N2	
N3	
N4	
N5	
N6	
N7	
N8	
N9	
N10	
N11	
N12	
N13	
N14	
N15	
N16	
N17	
N18	
N19	
N20	
N21	
N22	
N23	
N24	

Allocations

> D1 – D24 indicates allocation to DSX-1 Drop/Insert T1 channels
>
> Prt1 – Prt4 indicates allocation to a synchronous data port.

DSX-1 (DTE) Drop/Insert T1 Interface

Drop/Insert Channel	Allocation
D1	
D2	
D3	
D4	
D5	
D6	
D7	
D8	
D9	
D10	
D11	
D12	
D13	
D14	
D15	
D16	
D17	
D18	
D19	
D20	
D21	
D22	
D23	
D24	

Allocations

> N1 – N24 indicates allocation to Network T1 Channels
>
> Prt1 – Prt4 indicates allocation to a synchronous data port.

</div>

DTE Chan Config	Assign: (N1 – 24)	Voice (RBS or Data)
D1		
D2		
D3		
D4		
D5		
D6		
D7		
D8		
D9		
D10		
D11		
D12		
D13		
D14		
D15		
D16		
D17		
D18		
D19		
D20		
D21		
D22		
D23		
D25		

Port Chan Conf	Options		Value
Port 1	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)
Port 2	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)

Port Chan Conf	Options		Value
Port 3	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)
Port 4	Assign To		NET, DTE
	Assign By		Block, ACAMI, Chan
	If Assign By Block	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672, 728, 784, 840, 896, 952, 1008, 1064, 1120, 1176, 1232, 1288, 1344
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select One)
	If Assign By ACAMI	Port Rate	Nx64: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768 Nx56: 56, 112, 168, 224, 280, 336, 392, 448, 504, 560, 616, 672
		Start At	Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 (Select One)
	If Assign By Chan		Time Slot (Nx or Dx): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 (Select Multiple)

General Options	Value
Gen Yellow	Enab, Disab
Clock Src	NET, DTE, Prt1, Int, Ext
Clock Rate	2048, 1544, 8

User Options	Value
Self-Test	Enab, Disab
FP Access	Enab, Disab
FP Pass	Enab, Disab
Dial-In	Enab, Disab
Password	None, Modem, Com, Both
MasterCom	Enab, Disab
Com Use	SNMP, ASCII, Term
Com Type	Async, Sync
Com Clk	Int, Ext
COM Rate	1, 2, 2.4, 4.8, 9.6, 14.4, 19.2
Char Length	7, 8
CParity	None, Even, Odd
CStop Bits	1, 1.5, 2
Modem Use	SNMP, ASCII, Term
Modem Type	Async, Sync
Modem Rate	1.2, 2.4
MChar Len	7, 8
MParity	None, Even, Odd
MStop Bits	1, 2
LSpacDisc	Enab, Disab

Alarm Options	Value
Alrm Msg	Disab, Modem, Com, Both
SNMP Trap	Enab, Disab
Trap Disc	Enab, Disab
DialOut	Enab, Disab
Call Retry	Enab, Disab
Dial Delay	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
AltDialDir	None, 1, 2, 3, 4, 5
Err Rate	10E–4, 10E–5, 10E–6, 10E–7, 10E–8, 10E–9
Alrm Relay	Enab, Disab

SNMP Gen Options	Value
System Name	Edit, Clear
System Location	Edit, Clear
System Contact	Edit, Clear
Community Name 1	Edit, Clear
Access 1	Read, R/W
Community Name 2	Edit, Clear
Access 2	Read, R/W
Com IP Adr	Edit, Clear
Com Link	PPP, SLIP
Modem IP Adr	Edit, Clear
Alt Modem IP Adr	Edit, Clear
Modem Link	PPP, SLIP

SNMP Trap Options	Value
Num Trap Mgrs	1, 2, 3, 4, 5, 6
Trap *n* IP Adr	Edit, Clear
Gen Trap	Disab, Warm, Auth, Both
Entp Trap	Enab, Disab
Link Trap	Disab, Up, Down, Both
Trap I/F	NET, DTE, T1s, Ports, All

Equipment List H

Equipment	Feature Number	COMCODE	PEC Code
Model 3160 DSU/CSU in housing	3160-A2-211	107575367	2156-AS2
Model 3164 DSU/CSU in housing	3164-A2-211	107575391	2156-AS4
T1 Line Interface Cable, RJ48C-to-RJ48C, 20 feet	3100-F1-500	406941559	21587
Modular COM Port-to-PC Cable, 8-pin modular to DB9S, 14 feet	3100-F1-550	406941542	21584
COM Port-to-Terminal/Printer Cable, 8-pin modular to DB25P, 14 feet	3100-F1-540	406941534	21585
DC Power Cable, 15 feet	3100-F1-520	406941492	21586
115 Vac Wall-Mount Transformer	3100-F1-100	406942284	21573
3100 Series Front Panel Emulation Software	3100-C1-010	406942110	21589
Slide Latch Adapter Cable, 6 inches	3100-F1-560	107063711	21583
T1 Line Interface Cable RJ48C-to-CA81A Adapter Cable (Canada), 20 feet	3100-F1-510	107063703	21582
EIA 530A-to-RS449/422 Cable, 12 inches	3100-F1-580	107116543	21578
EIA 530A-to-V.35 Cable, 12 inches	3100-F1-570	107116550	21577
ACCULINK 3100 Series CSU Wall-Mount/ Rack-Mount Adapter	3100-F1-400	406941674	21590
Model 3161 DSU/CSU	3161-B3-010	107170391	2156-NMU
Auxiliary Backplane	3100-F1-900	107170409	25551

NOTE

Cable numbers for the 3161 DSU/CSU are located in the *ACCULINK 3151 CSU and 3161 DSU/CSU General Information Guide* and the *COMSPHERE 3000 Series Carrier Installation Manual*.

Glossary

AIS	Alarm Indication Signal. A signal transmitted instead of the normal signal to continue transmission continuity and to indicate to the receiving terminal that a transmission fault exists at either the transmitting terminal or upstream of the transmitting signal. Sometimes referred to as Blue Alarm.
AMI	Alternate Mark Inversion. A line encoding technique and a bipolar return-to-zero signal.
Async Terminal	This feature allows a DSU/CSU to be controlled from an asynchronous (async) terminal. When this feature is enabled, the async terminal menus and displays emulate the DCP without being limited to the 2-line LCD display.
Auxiliary Backplane	An 8-slot backplane that fits over one half of the open section of the 3000 Series Carrier. This is a passive assembly that provides interconnect capability between 3151 CSUs and 3161 DSU/CSUs and provides all interface connectors.
AWG	American Wire Gauge.
BES	Bursty Error Seconds. A second in which more than one, but less than 320 CRC6 error events, have occurred.
BPV	Bipolar Violation. A modified bipolar signaling method in which a control code is inserted into the original data format.
B8ZS	Bipolar with 8 Zero Substitution.
CRC	Cyclic Redundancy Check. A method of error detection.
CSU	Channel Service Unit. Protects the T1 line from damage and regenerates the T1 signal.
DCE	Data Communications Equipment.
DSU	Data Service Unit. Data communications equipment which transmits digital data over a private line. Also used for limited distance communications over the PSTN when a high-speed modem is not needed.
DS0	Digital Signal level 0. A signal of worldwide standard speed for PCM digital voice channels running at 64 kbps.
DS1	Digital Signal level 1. A signal of 1.544 Mbps in North America.
DSX-1	Digital Signal Cross Connect level 1. An interconnection point for terminals, multiplexers and transmission facilities.
DTE	Data Terminal Equipment.
DTMF	Dual Tone Multifrequency. The basis of operation for a pushbutton telephone.
D4	The transmission standard that specifies 12 frames as a superframe that is used for frame synchronization and to locate signaling bits.

EER	Excessive Error Rate.
EON	End of Number.
ES	Errored second. A second with one or more ESF error events (one or more CRC6 error events or OOFs).
ESD	Electrostatic discharge.
ESF	Extended Superframe. The T1 transmission standard that specifies 24 frames as an extended superframe to be used for frame synchronization and to locate signaling bits.
FCC	Federal Communications Commission.
FDL	Facility Data Link. The selected bits in the ESF format that are used for control, monitoring and testing.
LBO	Line Build-out. The amount of attenuation of the transmitted signal that is used to compensate for the length of wire between the transmitter and the receiver.
LCD	Liquid Crystal Display.
LED	Light-Emitting Diode.
LOF	Loss of Frame. Occurs when a DS1 terminal is unable to synchronize on the DS1 signal for some interval (nominally 2 1/2 seconds).
LOFC	Loss of Frame Count. A count of the number of LOFs declared.
LOS	Loss of Signal. The T1 line condition where there are no pulses.
MIB	Management Information Base. Database of managed objects used by SNMP to provide network management information.
MUX	Multiplexer.
OOF	An error condition in which two out of four synchronization bits are in error.
PDV	Pulse Density Violation.
PPP	Point-to-Point Protocol. A link layer protocol used by SNMP.
PSTN	Public Switched Telephone Network.
QRSS	Quasi-Random Signal. A test pattern simulating a random pattern of digital ones and zeros used to simulate normal transmission.
SDCP	Shared Diagnostic Control Panel.
SES	Severely Errored Seconds. A second with 320 or more CRC6 error events or one or more OOFs occurring.
SLIP	Serial Line Internet Protocol. A link layer protocol used by SNMP.
SNMP	Simple Network Management Protocol. A generic network management system that allows the device to be managed by any industry-standard SNMP manager.
UAS	Unavailable Seconds. A count of 1-second intervals when service is unavailable.
Vac	Volts alternating current.
Vdc	Volts direct current.
VF	Voice Frequency.
Yellow Alarm	An outgoing signal transmitted when a DS1 terminal has determined that it has lost the incoming signal.
3000 Series Carrier	A rack-mounted device containing 17 slots in which to place circuit cards.

Index