Installation & Operation

SpectraComm 5553

Fractional T1
Data Set Emulator

General DataComm

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to CISPR 22 which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. The user is cautioned that any changes or modifications not expressly approved by General DataComm void the user's authority to operate the equipment.

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Preface

Scope

This manual describes how to install and configure a General DataComm SC 5553 Data Set Emulator. It is written for installers, service technicians, and users. It assumes a working knowledge of data interfaces, T1 and fractional T1 transmission services, and the Simple Network Management Protocol (SNMP).

Revision History

This is Issue 4 of the manual. It has been revised to include information on the addition of firmware download functionality.

Revisions in Issues 2 and 3 provided information on the addition of terminal interface (Telnet) functionality and the front panel LED test.

Organization

This manual has four chapters and three appendices. The information is arranged as follows:

- *Chapter 1 - Technical Overview* describes the Data Set Emulator, its features, and its options. This chapter contains the Equipment List table.

- *Chapter 2 - Installation* provides directions for installing the DSE in a SpectraComm Shelf and making the cable connections it requires.

- *Chapter 3 - Operation* describes the DSE front panel controls and indicators, and their use; provides directions for controlling and monitoring the DSE by means of the terminal interface and for performing firmware download.

- *Chapter 4 - Tests* describes tests that can be performed on the DSE. Tests can be administered by means of the DSE front panel controls, the terminal interface, or an SNMP controller.

- *Appendix A- Technical Characteristics*

- *Appendix B- DTE Interface Signals* lists pin/signal assignments for the two DTE interfaces that the DSE can support: ITU-T V.35 and EIA-530.

- *Appendix C- SC 5553 MIB Support* consists of tables defining the Management Information Base (MIB) objects that enable SNMP control of the DSE and its remote DSUs.

Document Conventions

Level 1 paragraph headers introduce major topics.

Level 2 paragraph headers introduce subsections of major topics.

Level 3 paragraph headers introduce subsections of secondary topics.

```
This typewriter font shows output that is displayed on the screen.
```

This bold font shows specific input that you type at the keyboard.

This bold italicized font shows variable input that you type at the keyboard.
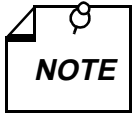
> *Notes present special instructions, helpful hints or general rules.*
>
> **NOTE**

Related Publications

The following document has additional information that may be helpful when using this product:

*   *TEAM 5553 Operation*   GDC 058R725-V110

GDC publication numbers (e.g., *GDC 032R101-000*) are used to track and order technical manuals. Publication numbers use the following format:

GDC NNNRnnn-000 or GDC NNNRnnn-Vnnn

*   NNN   identifies the product family (e.g. SC 5000 system)

*   R   denotes a technical publication

*   nnn   a number assigned by Technical Publications

*   000   identifies a hardware product and does not change

The Issue Number changes when a hardware manual is revised or when a manual is reprinted with additional material.

Service and Support

General DataComm is committed to providing the service and support needed to install, manage, and maintain your equipment. For information about service programs or for assistance with your support requirements, contact your local Sales Representative or call General DataComm Service at the 24-hour, toll-free number listed below.

*   in the U.S. dial 1-800-243-1030

*   outside the U.S. dial 1-203-598-7526

Be ready with the site name and phone number, and a description of the problem. The next available support representative will promptly return your call.

Hands-on training courses are provided by GDC Educational Services. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems and are taught in Connecticut or at a customer location. To discuss educational services or receive a course schedule, call 1-800-243-1030 and follow the menu instructions.

Safety Instructions

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component.

The equipment may contain static-sensitive devices that are easily damaged, so proper handling and grounding are essential. Use ESD precautionary measures when installing parts or cards, and keep the parts and cards in antistatic packaging when not in use. If possible, use antistatic floor pads and workbench pads.

When handling components or setting switch options always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, such as a screwdriver or a paper clip, to set switches.

Safety Guidelines

The following symbols are used in this manual to draw your attention to potential hazards. A Caution indicates a hazard to equipment or data. A Warning indicates a hazard to personnel.

Caution statements identify conditions or practices that can result in damage to the equipment or in loss of data.

Warning statements identify conditions or practices that can result in personal injury or loss of life.

Always use caution and common sense. *To reduce the risk of electrical shock, do not operate any equipment with the cover removed.* Repairs must be performed by qualified service personnel only.

Glossary of Terms

Backplane Data Highway

High speed bus built into the SpectraComm Shelf backplane to support the exchange of data and timing signals between a line terminating unit and up to 24 data set emulators. The backplane contains four data highways. Two shelves, and their data highways, can be connected by daisy-chain cables so that a total of 32 shelf slots are supported.

Data Set Emulator (DSE)

Term for the units in the SpectraComm 5000 system that provide DTE interface functions. Each DSE is designed to be compatible with a GDC device that can be installed as a standalone unit at a remote site. An SC 5553 DSE, for example, is compatible with a remote NMS 553 DSU.

Line Terminating Unit

Term for the unit in the SpectraComm 5000 system that provides network interface functions.

1   Technical Overview

Description

The SC 5553 Data Set Emulator (DSE) is part of the SpectraComm 5000 family of products from General DataComm. An SC 5000 system consists of DSEs to provide interface functions for data terminal equipment (DTEs) and one or more Line Terminating Units (LTU) to provide network interface. The system consolidates data traffic between a user-owned central data communication site and a Telco central switching office, and enables the use of a single, high-capacity line. Unlike a multiplexer, which consolidates data traffic for transmission over a point to point link, the SC 5000 system performs "line grooming" that permits the switching office to separate the signal back into its component parts for transmission to multiple locations.

Data Set Emulator

The SC 5553 DSE is termed a data set emulator rather than a DSU because, instead of including its own network interface circuitry, it interfaces with an SC 5001 LTU. The LTU provides interface to a T1 line and can support up to 24 DSEs installed, with the LTU, in a pair of Spectra-Comm Shelves. The DSEs and LTU exchange channel data by means of a data highway implemented in the SpectraComm Shelf backplane. The backplane provides four data highways, so a pair of SpectraComm Shelves (32 slots, total) can accommodate up to four LTUs, each with its own group of associated DSEs.

The SC 5553 DSE printed circuit (pc) card provides the channel interface functionality of a fractional T1 DSU. It interfaces DTE data to the SC 5000 shelf backplane at any rate from 56 kbps to 1536 kbps. The DSE uses as many time slots on the backplane data highway as the selected rate requires; from one timeslot for a 56 or 64 kbps channel, up through 24 timeslots for a 1536 kbps channel (24 x 64 kbps). Twenty-four timeslots represent a full T1 connection. Each timeslot on an SC 5000 backplane data highway is equivalent to one DS0 on a T1 line.

Local Control and SNMP Network Management

In addition to DSEs and LTUs, each SC 5000 system includes a GDC SpectraComm Manager (SCM) card to provide comprehensive network management capabilities using the Simple Network Management Protocol (SNMP). The SCM card acts as the local control device for the other components of the SC 5000 system under the direction of an SNMP controller.

The DSE is software controllable. You can configure data set options from an SNMP manager at a central site. You can also perform diagnostic testing and alarm management.

The basic SC 5553 DSE is a 7-inch by 9.5-inch (178 mm by 241 mm) pc card. It conforms to the unique GDC SpectraComm packaging concept that enables a variety of data communication products to be mounted in the same high-density shelf. Each 16-slot shelf can hold 16 single card devices.

Table 1-1 defines part numbers for standard and optional equipment available for the SC 5553 DSE. *Appendix A* lists its technical characteristics.

SC 5553 Data Set Emulator Features

The SC 5553 DSE provides the following features:

- Supports T1 and fractional T1 data rates from 1536 kbps (64 kbps x 24 DS0s) down to 56 kbps (56 kbps x 1 DS0).

- Communicates with SNMP controller through the shelf-resident SpectraComm Manager (SCM) card for comprehensive, non intrusive network management.

- Functions fully under Simple Network Management Protocol (SNMP) network management, which provides complete software control for configuration, alarm reporting, and diagnostic testing capabilities.

- Provides terminal interface control functions accessible through the SCM by an ASCII terminal or a computer running the Telnet protocol

- Hardware selectable DTE interface conforms to either ITU-T V.35 or EIA-530.

- Compatible with remote NMS 553 DSUs for transmission and reception of user data.

- Stores operating firmware in flash based memory that supports downloading of new application firmware by means of TFTP for upgrades

- Supports dual application firmware storage, with user control of switchover between active and standby firmware versions

Management

As an SNMP controlled device, the SC 5553 receives configuration and commands in the form of entries in its Management Information Base (MIB) tables. The SCM card stores and administers MIBs for the DSEs and LTUs in its SpectraComm Shelf. The SCM card communicates with an SNMP controller, and passes commands and responses between the controller and the DSE.

Diagnostic testing performed through SNMP does not require intervention by personnel at remote sites. The operator can select Alarm reporting to occur on any of the following conditions:

EEPROM Checksum failure	RXD No Transitions	Front Panel Test
DCD Loss	TXD No Transitions	DSR Loss
Timing (Shelf) loss	DTR Loss	DTR Loss
TxC (Ext. Clock) loss		DTE Test

The DSE facilitates fault isolation in a digital network by providing comprehensive loopback and testing capabilities, that include Local Test, Remote Loop, Data Loop and Self-Test. The operator can use these loopbacks and tests to isolate system faults to a particular DTE, data set, or line.

Application

The SC 5553 DSE works in conjunction with the SC 5001 LTU to provide a groomed T1 environment. The SC 5000 system grooms the local end of multiple DDS circuits into a single T1 aggregate. Refer to *GDC Publication No. 076R100-000* for specific details on the SC 5001 LTU. The SC 5553 DSE is compatible with a remote NMS 553 DSU.

Table 1-1   Equipment List

Description	GDC Part No.
GDC SC 5553 Data Set Emulator	076P019-001
Shelves	
SpectraComm Shelf MS-2 Model 1 (100/120 V ac) Includes two 8-slot, dual RJ48 Zone 1 connector panels	010M054-001
SpectraComm Shelf MS-2 Model 2 (-48 V dc) Includes two 8-slot, dual RJ48 Zone 1 connector panels	010M055-001
SpectraComm Shelf MS-2 Model 10 (-48 V dc, with redundant power supplies) Includes two 8-slot, dual RJ48 Zone 1 connector panels	010M070-001
Unless otherwise stated, systems include one base shelf, one power supply and one power supply blank front panel, Zone 1 connector panels as stated, one 16-slot DB25 Zone 3 connector panel, two standard mounting brackets (19-/23-inch), and assorted mounting hardware.	
Connector Panels	
Kit, Zone 1, 8-slot Blank Rear Panel (Z1-S-B)	010K341-001
Kit, Zone 1, 8-slot dual RJ45 connector panel (Z1-S-16DRJ45)	010K342-001
Kit, Zone 3, 16-slot DB25 connector panel (Z3-S-16DB25)	010K339-001
Cables	
V.35 Male-to-Male, Straight Through Cable	027H516-XXX*
DB25 Male/V.35 Female Adapter Cable	027H572-001
EIA-530/442 (25-pin male) to EIA-422/449 (37-pin female) Adapter Cable Assembly	027H501-001
EIA/TIA-232-E Male-to-Male, Straight Through Cable	028H502-XXX*
EIA/TIA-232-E Male-to-Female, Straight Through Cable (Shielded)	028H506-XXX*
Manuals	
Operating and Installation Instructions for SpectraComm Shelf	010R302-000
Operating and Installation Instructions for SpectraComm Manager Card	048R303-000
* XXX represents three digits which indicate cable length in the actual part number.	

2 Installation

Overview

This chapter describes the installation of the SC 5553 DSE.

The SC 5553 DSE is shipped pre-assembled, tested, and ready to use. Its one hardware option, DTE interface selection, is set in its default position, V.35, when the unit is shipped.

The normal procedure after unpacking the unit is to insert it in its intended shelf slot and perform the Preoperational Check described in this chapter. When the test is successfully completed you may make the DSE cable connections.

The SC 5553 DSE should be installed in a ventilated area where the ambient temperature does not exceed 122°F (50°C). Do not install the DSE above other equipment that generates large amounts of heat (e.g., power supplies).

SpectraComm Shelf

A rack-mountable SpectraComm Shelf can house up to 16 plug-ins. It fits into 19- and 23-inch wide equipment racks. The backplanes of two shelves can be linked by cables so that a total of 32 card slots function as though connected to the same backplane. The SC 5553 DSE can be installed in any card slot.

The shelf backplane is made up of four separate "data highways" and a management bus. Each data highway supports the transfer of data between an LTU and its DSEs, so there can be up to four LTU/DSE functional groupings in a shelf (or pair of shelves). The management bus supports the transfer of management data between an SCM card and the DSEs and LTUs in the shelf. The SCM card functions as an SNMP agent for the control of compatible devices, such as the DSE and LTU, in the shelf. The SpectraComm Shelf can contain a single SCM card, or two SCM cards installed as a primary and a backup.

An LTU/DSE functional group can consist of one or two LTUs (one primary and one backup) and up to 24 DSE cards. The application determines the exact selection of pc cards to be installed in a shelf. An LTU can be combined with 24 DSE channels only when each channel requires just a single DS0. The number of DSE cards the LTU can support is reduced when channels employ N X 56 Kbps or N X 64 Kbps rates. For example, the LTU can support no more than 12 DSE cards when each DSE is providing a 128 Kbps channel.

Two SC 5001 LTUs can be installed in a primary/secondary arrangement. If the primary LTU malfunctions, the SNMP controller can command the secondary LTU to take over.

Figure 2-1 shows the SpectraComm Shelf back panel. An SC 5553 DSE employs only one back panel connector: the DB25 connector in Zone 3 serves as its DTE interface.
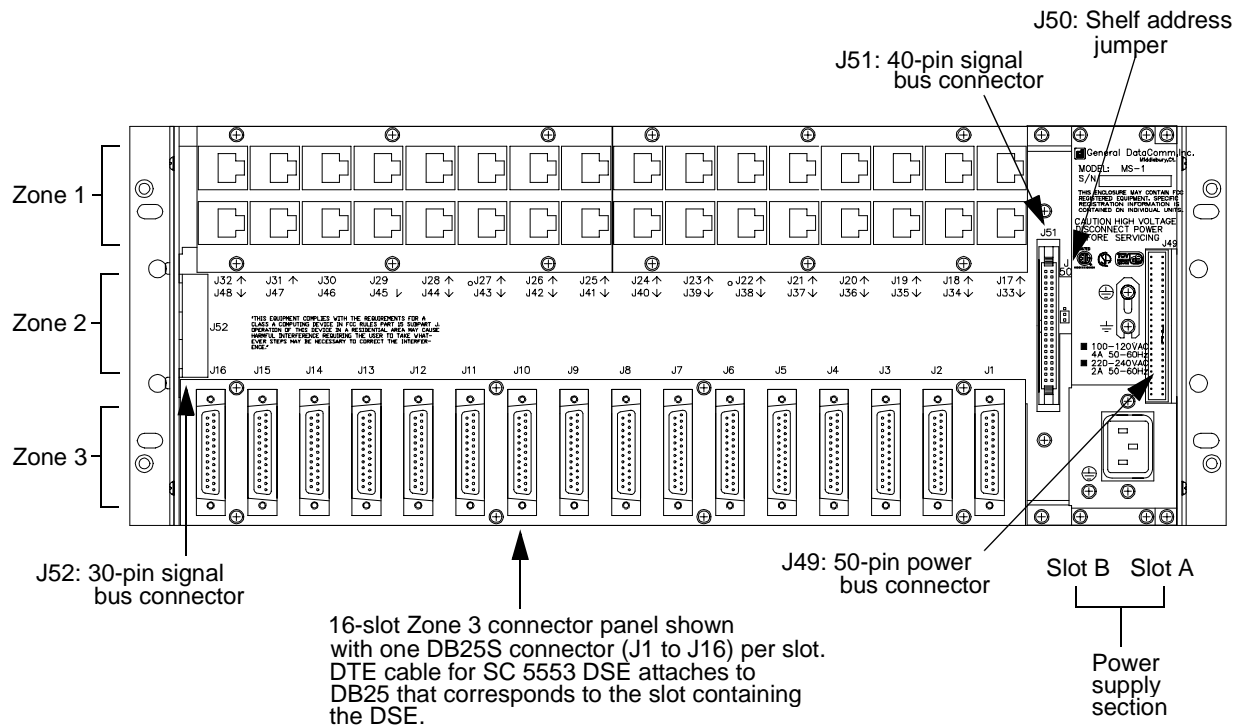
Figure 2-1   SpectraComm Shelf Back Panel

Unpacking and Handling

The SC 5553 DSE is shipped enclosed in a corrugated box and protected by packing material. Inspect the SC 5553 DSE when you receive it. Notify the shipper of any damage immediately.

Keep the box and packing material to use if you ever need to reship the SC 5553 DSE.

Preoperational Check

You should verify that the SC5553 is in good working order by means of two tests: the Power Up Test that the unit performs automatically, and a Local Test with Self Test that you perform using the front panel controls.

Power Up Test Sequence

Inserting the SC 5553 into the shelf automatically initiates a four-part Power Up Test, which you should observe by watching the front panel during power up. The following four events verify that the SC 5553 DSE is in good electrical working order:

1.   All LEDs and all segments of the 4-character, 7-segment LCD display light and are easily visible.

2.   The SC 5553 front panel displays "SELF" and lights the TM LED to indicate the start of an internal diagnostic test of the circuitry.

3.   The front panel displays "PASS" to indicate success of the internal diagnostic test.

4.   The front panel displays "5553" product name following the results of the internal diagnostic test.

If any of those four events does not occur, or if "FAIL" is displayed instead of "PASS" there is a problem with the unit. Install a spare unit if one is available. If you require assistance, contact General DataComm Service at the toll-free telephone number listed in the Preface of this manual. Do not attempt to repair the SC 5553 DSE.

Local Test/Self Test

Once the SC 5553 DSE has passed the Power Up Test and before you connect it to its DTE, you should perform a **Local Test with Self Test** to verify that the internal circuits of the DSE are capable of normal operation. Local Test causes the DSE to loop transmit data back as receive data. Self Test enables both an internal Test Pattern Generator to provide a signal for the test loop and a Test Pattern Checker to verify the signal.

1. Make sure that the front panel LCD display is showing a value other than 0000 to indicate that there is bandwidth selected for the DSE. Make sure, also, that there is a source of Shelf Timing for the shelf in which the DSE is installed. The DSE will not perform the test if these two conditions are not satisfied.

2. Initiate the test by briefly pressing the LT (Local Test) and Self Test (ST) switches on the front panel. The LT, ST, and TM (Test Mode) indicators are On during the test.

3. Run the test for approximately 15 seconds.

4. The TM indicator blinks when an error is detected. The test should run entirely error-free.

5. If the test is successful, the TM indicator remains On until you end the test by depressing the LT and ST buttons a second time.

If errors are detected during this test there is a problem with the unit. Install a spare unit if one is available. If you require assistance, contact General DataComm Service at the toll-free telephone number listed in the Preface of this manual. Do not attempt to repair the SC 5553 DSE.

Installation Procedures

Module Installation Procedures

An SC 5553 DSE card may be installed in any slot in a SpectraComm Shelf. To install the DSE card in the shelf:

1. Insert the module into its slot with the GDC logo on top, then slide it in until it makes contact.

2. Pull down the ejector tab and firmly push the module in until it seats in the rear connectors.

Electrical Power Connection

The DSE obtains power directly from the SpectraComm shelf.

Business Equipment Connections (DTE)

The SC 5553 DSE supports two business equipment interfaces: ITU-T V.35 and EIA-530. The interfaces are selectable by hardware jumpers on the DSE pc card.

Appendix B describes the signals exchanged through each of the business equipment interfaces.

DSE Addressing

The network management system employs a slot-line-drop method of addressing. The DSE slot address is determined by its position in the SpectraComm Shelf, and it is Line 1, Drop 0 for that slot. The remote DSU that the DSE is linked to is Drop 1 for the slot and line.

If the firmware is ever changed on the SC 5553 DSE, the EEPROM containing configuration for the DSE is automatically erased and the unit has to be reconfigured.

Timing Options

Timing options determine the clock source for the data the SC 5553 DSE transmits to the network. The default Transmit Timing option for the DSE is Receive timing.

The precise meaning of Receive timing for the DSE differs from that for a DSU because of the relationship between components in the SC 5000 system. In an SC 5000 system the selection of Receive timing actually means the use of a system shelf timing signal taken from the shelf backplane. A DSU derives Receive timing directly from the signal it receives at its network interface.

The SC5000 MIB, detailed in *Appendix C*, enables or inhibits the DSE as the source of the 8 KHz system shelf timing signal on the backplane. One component in each SC 5000 system, either a DSE or an LTU, may be configured to provide the 8 KHz signal. The MIB also controls the source of a second, 4 MHz, backplane timing signal that only an LTU can provide.

A DSE that is providing the 8 KHz system shelf timing signal must itself employ External transmit timing. All other DSEs in the system must be configured for Receive timing so that they use the system shelf timing signal.

3   Operation

Overview

This chapter describes the functions of the SC 5553 DSE front panel indicator displays and limited test functions.

A Simple Network Management Protocol (SNMP) controller is responsible for all other operations of the SC 5553 DSE. The controller provides capabilities for:

•   Alarm management

•   Configuration

•   Control

•   Diagnostics

Consult the manual for your SNMP controller for detailed instructions on the use of its functions. This manual provides information specific to the SC 5553 DSE, in particular the MIB tables contained in *Appendix C*, as a supplement to those instructions.

Controls and Indicators

Figures 3-1 and 3-2 illustrate the SC 5553 DSE front panel and explain the function of each control and indicator.

SpectraComm Shelf

The manual supplied with the SpectraComm shelf describes front panel controls, indicators, and fuses for the shelf.

In Service -
Lit when the DSE has
been placed into service
by the network controller

Power On -
Lit while power is
applied to the DSE

INS   ON

Send Data -
Lit when the DSE is in data
mode and a space is detected
in the transmit data.

SD   RD

Received Data -
Lit when the DSE is in data
mode and a space is de-
tected in the receive data

RS   CO

Request to Send -
Lit when the RTS is
asserted by the DTE

TMG   RSP

Carrier On -
Lit at all times except when the
DSE is in Self Test or Digital
Loopback with the constant DCD
option disabled.

Timing -
Lit when the DSE is
designated as the
source of timing for
its shelf (8Kclock)

Response -
Lit while the DSE is in
transmitting a re-
sponse to a network
controller command

TM   ALM

Test Mode -
Lit when the DSE is
performing any type
of test.

Blinks to indicate
detected errors dur-
ing a Self Test.

ST

LT

RL

DL

Rate Display -
Displays the current DSE
data rate in kbps.

Alarm -
Flashes while the DSE is
experiencing an alarm
condition

Green

Red

5553

Figure 3-1   Front Panel Indicators
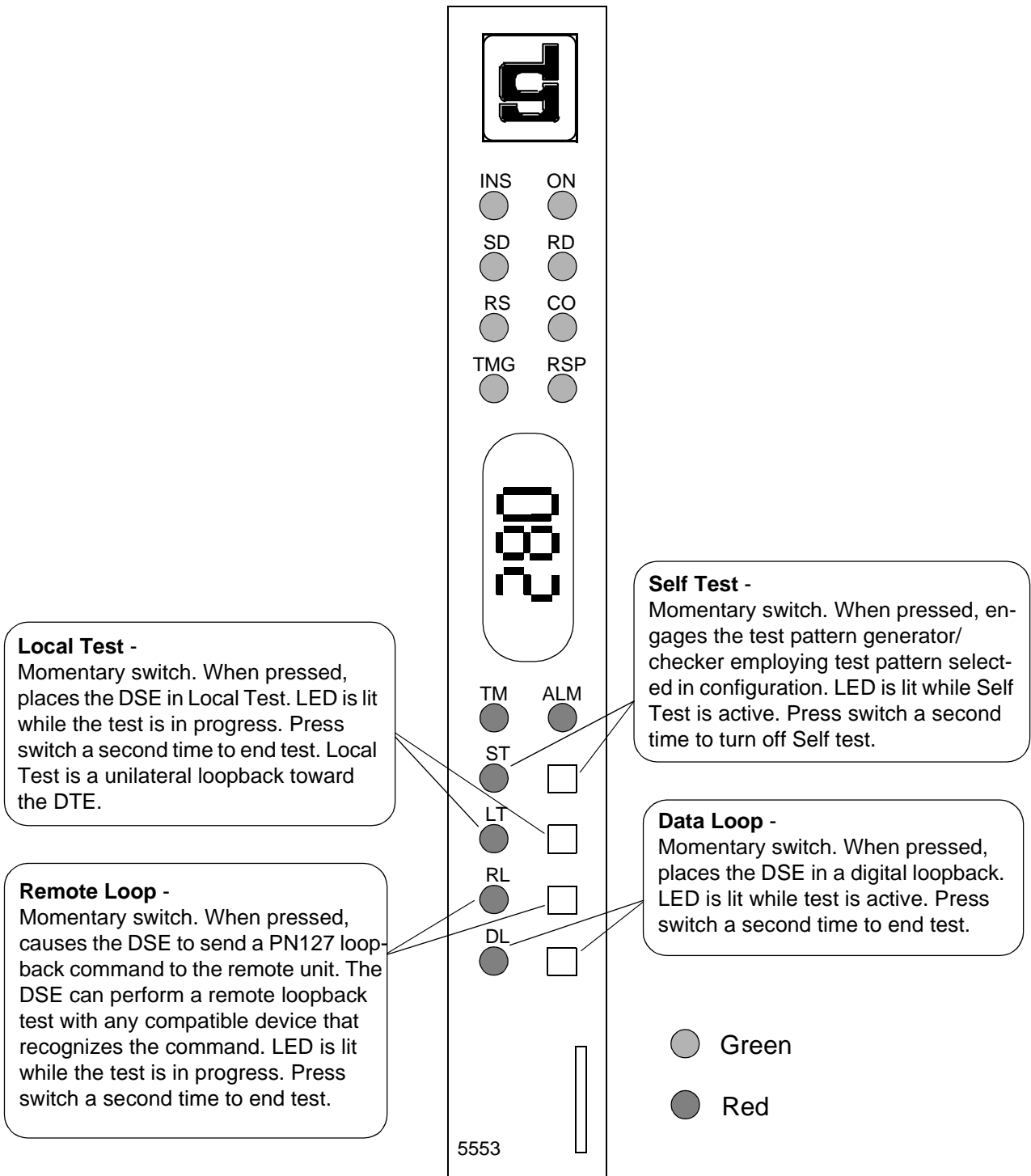
Figure 3-2   Front Panel Controls

Local Test - Momentary switch. When pressed, places the DSE in Local Test. LED is lit while the test is in progress. Press switch a second time to end test. Local Test is a unilateral loopback toward the DTE.

Remote Loop - Momentary switch. When pressed, causes the DSE to send a PN127 loopback command to the remote unit. The DSE can perform a remote loopback test with any compatible device that recognizes the command. LED is lit while the test is in progress. Press switch a second time to end test.

Self Test - Momentary switch. When pressed, engages the test pattern generator/ checker employing test pattern selected in configuration. LED is lit while Self Test is active. Press switch a second time to turn off Self test.

Data Loop - Momentary switch. When pressed, places the DSE in a digital loopback. LED is lit while test is active. Press switch a second time to end test.

Terminal Interface

Access to the SC 5553 DSE terminal interface takes place through the SCM, which provides this functionality for the DSEs installed with it in a SpectraComm shelf or a pair of shelves connected by daisy chain cables. One SCM, then, supports interface functions for up to 15 units in a single shelf or up to 31 units in a pair of shelves.

The SC 5553 DSE requires firmware revision level B- or higher to support the terminal interface functionality.

Initiating a Terminal Interface Session

The first portion of a terminal interface session varies depending on whether you're using a VT100-compatible terminal connected directly to the SCM front panel or a computer with a Telnet connection to the SCM LAN port.

VT100-compatible Terminal

When you connect a terminal to the SCM front panel, the following screen is the first to appear

```
Main Menu
1. IP Address
2. Passwords
3. Element Access
4. Test
Next Selection:
```

Type 3 and press the Enter key. The screen then displays the Shelf Inventory screen that appears below.

The other selections in this menu all relate to SCM functionality. They are discussed in the *SpectraComm Manager Card Installation and Operation Manual*, GDC Publication Number 048R303-000.

Telnet Connection

The *SpectraComm Manager Card Installation and Operation Manual*, GDC Publication Number 048R303-000 explains how to establish a Telnet connection to the SCM LAN port. When you do so, the following screen is the first to appear

```
Copyright (c) 1993-1997 General DataComm Industries Inc.
All rights reserved
SCM Application Version 3.21

login:
```

After you enter the login password the screen displays the Shelf Inventory screen that appears below.

> *NOTE*
>
> *There is a 10-minute timeout on the terminal interface. If you allow 10 minutes to pass with no activity, that is without pressing any key on the keyboard, the DSE terminates the session. At that point the display returns to the SCM Main Menu if you are using a terminal connected to the SCM front panel, or to the SCM login screen if you are using a Telnet connection.*

Selecting a DSE (Shelf Inventory Screen)

From this point, procedures are the same for both types of connection. The Shelf Inventory screen below is for a two-shelf installation in which both shelves are filled with SC 5553 DSEs. The two columns for Slots 17 through 32 do not appear when there is only one shelf.

```
     SHELF  INVENTORY
   Slot    Card          Slot    Card
  -------------------------------------------------
   [1]SCM                [17]SC5553
   [2]SC5553             [18]SC5553
   [3]SC5553             [19]SC5553
   [4]SC5553             [20]SC5553
   [5]SC5553             [21]SC5553
   [6]SC5553             [22]SC5553
   [7]SC5553             [23]SC5553
   [8]SC5553             [24]SC5553
   [9]SC5553             [25]SC5553
  [10]SC5553             [26]SC5553
  [11]SC5553             [27]SC5553
  [12]SC5553             [28]SC5553
  [13]SC5553             [29]SC5553
  [14]SC5553             [30]SC5553
  [15]SC5553 (alarm)     [31]SC5553
  [16]SC5553             [32]SC5553


   [0]Close Session

 Enter slot number:  [   ]
```

The Shelf Inventory displays the word "alarm" in parentheses next to the name of any unit that currently has an active alarm condition.

Type the slot number of the unit you intend to work with, and press the Enter key. The DSE responds by displaying the SC 5553 Main Menu as shown below.

```
                          S C  5 5 5 3

                        SHELF SLOT = 5

          [1] Configuration            [2] Diagnostics

          [3] Alarm Configuration      [4] Monitor/Alarms

                        [5] Maintenance




          [0] Return to Shelf Inventory

        Select: [ ]
```

Type the number that corresponds to the function with which you intend to work.

Configuration

The Configuration function presents a screen of configuration options. Each option is identified by a selection number or letter, and displays its current setting.

```
                    SC 5553 Configuration

     Network:
 Shelf Timing:                      Disable

     DS0:
 Data Highway:                      One
 Aggregate Rate:                    0000 Kbps (0 DS0)
 DCC DS0:                           None

 [1]    Format:                     N x 56k
 [2]    Diagnostic Comm. Channel:   None

     DTE:
 [3]    Data:                       TxD Norm RxD Norm
 [4]    Timing (Clock Invert):      TxC Norm RxC Norm
 [5]    External Clock:             Disable
 [6]    Constant DSR:               Enable
 [7]    Constant DCD:               Enable
 [8]    RTS/CTS Control:            RTS Forced ON


 [0] Return to Main Menu    [S] Save & Update Unit
        Select: [ ]
```

Figure 3-3   Configuration Screen, with Default Settings

The procedure for changing configuration option settings involves the following steps:

1. Type the selection number or letter of the option you intend to change, and press the Enter key. Highlighting appears on the current setting field for the corresponding option.

2. Use the arrow keys to toggle the highlighted field through its potential settings.

3. When the field displays the desired setting, press the Enter key again. The highlight returns to the Select field.

4. Repeat steps 1 through 3 for each option you need to change.

5. After you've made all required changes, type selection S, `Save & Update Unit` and press the Enter key. In response the prompt `ARE YOU SURE (Y/N)?` appears.

6. If you are certain that your changes are correct, type `Y` and press the Enter key to put the changed configuration into effect in the DSE.

    If you decide not to put your changes into effect, type `N` and press the Enter key. You can then either make further changes or proceed to dismiss the screen.

7. To dismiss the Configuration screen, type selection 0, `Return to Main Menu`, and press the Enter key. If there are no unsaved changes the display returns to the SC 5553 Main Menu and the configuration procedure is complete.

8. If there are unsaved changes when you attempt to dismiss the Configuration screen, the prompt `Pending Edits, Exit without saving (Y/N)?` appears. You can type `Y` and press the Enter key to dismiss the screen and discard the unsaved changes. If you type `N` and press the Enter key, the Configuration screen remains on display so that you can perform a Save or make further changes before you type `0` again to dismiss the screen.

Table 3-1 lists the configuration options that appear on the terminal interface display and all the settings available for each.

Three items that appear on the Configuration screen are display-only:

Data Highway –   the Backplane Control/Highway Configuration function of the SCM card determines which data highway the SC 5553 DSE uses to exchange data with its LTU.

Aggregate Rate –   the Backplane Control/Highway Configuration function of the SCM card determines how many timeslots/DS0s the SC 5553 DSE uses to exchange data with its LTU on the data highway; the resulting Aggregate Rate depends on the selected Format (N x 56k or N x 64K) and on whether or not DCC DS0 has been selected for Diagnostic Comm. Channel.

DCC DS0 –   displays None unless DCC DS0 has been selected for Diagnostic Comm. Channel. When that selection is made, this displays the number of the DS0 being used as the Diagnostic Communication Channel. That DS0 is the last one in the group assigned to the DSE by the Backplane Control/Highway Configuration function of the SCM card, and the Aggregate Rate is reduced by one DS0. You cannot select DCC DS0 for Diagnostic Comm. Channel unless there are at least two DS0s assigned to the DSE.

Table 3-1   SC 5553 Configuration Option Settings

Option	Potential Settings
[0] Return to Main Menu	
Network:	
Shelf Timing: (Display Only)	Disable
	Enable
DS0:	
Data Highway: (Display Only)	One
	Two
	Three
	Four
Aggregate Rate: (Display Only)	56Kbps (1 DS0) through 1344Kbps (24 DS0s) or
	64Kbps (1 DS0) through 1536Kbps (24 DS0s)
DCC DS0: (Display Only)	None or displays number (2 – 24) of DS0 assigned for DCC when DCC DS0 is selected for Diagnostic Comm. Channel
[1] Format	N x 56k (Default)
	N x 64k
[2] Diagnostic Comm. Channel	None (Default)
	Embedded (only with Format: N x 56k)
	DCC DS0
DTE	
[3] Data	TxD Norm RxD Norm (Default)
	TxD Invert RxD Norm
	TxD Norm RxD Invert
	TxD Invert RxD Invert
[4] Timing (Clock Invert)	TxC Norm RxC Norm (Default)
	TxC Invert RxC Norm
	TxC Norm RxC Invert
	TxC Invert RxC Invert
[5] External Clock	Disable (Default)
	Enable
[6] Constant DSR	Enable (Default)
	Disable (follows DTR)
[7] Constant DCD	Enable (Default)
	Disable (Off during ST and DL tests)
[8] RTS/CTS Control	RTS Forced ON (Default)
	Std. (40 Bit Delay)
	10 msec Delay

Diagnostics

The terminal interface SC 5553 Diagnostics screen combines configuration and command functions. Selections 1 through 5 are configuration options that affect DSE diagnostic functionality. Changes to the options don't go into effect until you save them to the unit. Once saved, they remain in effect until new changes are made and saved.

Selections 6 through B are command fields by which you can begin and end test procedures. The Test Results field below selection B displays the results of tests that employ Self Test. The result is either Passed, if no errors are detected, or the number of RX Errors.

Figure 3-4 illustrates the Diagnostics screen. Detailed instructions for setting its configuration options follow the illustration. Instructions for using the screen to perform tests appear in *Chapter 4, Tests*, together with descriptions of the diagnostic functions.

```
                    SC 5553 Diagnostics


          Diagnostic Options
        DTE:
   [1]     Local Loopback Control:        Disable
   [2]     Remote Loopback Control:       Disable


        Network:
   [3]     Remote Loop (PN127) Response: Enable
   [4]     Remote Loop Auto Timeout:      Disable
   [5]     Self Test Pattern:             511



          T E S T S:
   [6] Local Loopback:                   Idle
   [7] Local Loopback & Self Test:       Idle
   [8] Remote Loopback (PN127):          Idle
   [9] Remote Loopback & Self Test:      Idle
   [A] Digital Loopback:                 Idle
   [B] Self Test:                        Idle
                      Test Results:      Passed

   [0] Return to Main Menu     [S] Save [1] - [5] & Update Unit
         Select: [ ]
```

Figure 3-4 Diagnostics Screen

The procedure for changing Diagnostic configuration option settings involves the following steps:

1. Type the selection number of the option you intend to change, and press the Enter key. Highlighting appears on the current setting field for the corresponding option.

2. Use the arrow keys to toggle the highlighted field through its potential settings.

3. When the field displays the desired setting, press the Enter key again. The highlight returns to the Select field.

4. Repeat steps 1 through 3 for each option you need to change.

5. After you've made all required changes, type selection S, Save 1 - 9 & Update Unit and press the Enter key. In response the prompt ARE YOU SURE (Y/N)? appears.

6. If you are certain that your changes are correct, type Y and press the Enter key to put the

changed configuration into effect in the DSE. You can then perform tests or proceed to dismiss the screen.

If you decide not to put your changes into effect, type N and press the Enter key. You can then make further changes, perform tests, or proceed to dismiss the screen.

7. For instructions on performing tests, consult *Chapter 4*. To dismiss the Diagnostics screen, type selection 0, Return to Main Menu, and press the Enter key. If there are no unsaved diagnostic configuration changes, the display returns to the SC 5553 Main Menu and the procedure is complete.

Table 3-2 lists the Diagnostic configuration options that appear on the terminal interface display and all the settings available for each.

Table 3-2   SC 5553 Diagnostic Configuration Option Settings

Option	Function	Potential Settings
DTE:		
[1] Local Loopback Control:	If enabled, DTE can command Local Loopback with interface signal	Disable (default)
		Enable
[2] Remote Loopback Control:	If enabled, DTE can command Remote Loopback with interface signal	Disable (default)
		Enable
Network:		
[3] Remote Loop (PN 127) Response	If enabled, remote unit can command DSE into digital loopback with PN 127 signal	Enable (default)
		Disable
[4] Remote Loop Auto Timeout	Determines whether or not Remote Loop ends automatically	Disable (default)
		10 minute
[5] Self Test Pattern		511 (default)
		2047

Alarm Configuration

The Alarm Configuration function presents a screen of configuration options that determine which alarms the DSE is to report. Unit and DTE alarms can be individually designated either to be reported when they occur or to masked (not reported). For definitions of the alarm conditions consult the description of the Monitor/Alarms screen, which begins on *page 3-12*.

Each option on the Alarm Configuration screen is identified by a selection number or letter, and displays its current setting.

```
                         SC 5553 Alarm Configuration

       [R]    Report All Alarms,    [N] Report None

            Unit:
       [1]    Front Panel Test:            Masked
       [2]    EEPROM Checksum:             Report

            DTE:
       [3]    DCD Loss:                    Masked
       [4]    DSR Loss:                    Masked
       [5]    DTR Loss:                    Masked
       [6]    RXD Loss:                    Masked
       [7]    TXD Loss:                    Report
       [8]    TxC (Ext. Clk) Loss:         Report
       [9]    Timing (Shelf) Loss:         Masked
       [A]    DTE Test:                    Masked




       [0] Return to Main Menu    [S] Save & Update Unit
             Select: [ ]
```

Figure 3-5   Alarm Configuration Screen (default settings are all Masked)

The procedure for changing Alarm Configuration option settings involves the following steps:

1.   You may want to begin with the Report All Alarms command or the Report None command, depending on how you intend to set the majority of the alarm options. Type R for Report All Alarms or N for Report None, then press the Enter key.

      Go to step 6 if you don't need to change any of the individual alarm options. If you do need to change individual options, follow steps 2 through 5.

2.   Type the selection number or letter of the option you intend to change. Highlighting appears on the current setting field for the corresponding option.

3.   Use the arrow keys to toggle the highlighted field between the Masked and Report settings.

4.   When the field displays the desired setting, press the Enter key. The highlight returns to the Select field.

5.   Repeat steps 2 through 4 for each option you need to change.

6.   After you've made all required changes, type selection S, Save & Update Unit and press the Enter key. In response the prompt ARE YOU SURE (Y/N)? appears.

7.   If you are certain that your changes are correct, type Y and press the Enter key to put the changed configuration into effect in the DSE.

      If you decide not to put your changes into effect, type N and press the Enter key. You can then either make further changes or proceed to dismiss the screen.

8.   To dismiss the Alarm Configuration screen, type selection 0, Return to Main Menu, and press the Enter key. If there are no unsaved changes the display returns to the SC 5553 Main Menu and the configuration procedure is complete.

9.   If there are unsaved changes when you attempt to dismiss the Alarm Configuration screen, the prompt `Pending Edits, Exit without saving (Y/N)?` appears. You can type `Y` and press the Enter key to dismiss the screen and discard the unsaved changes. If you type `N` and press the Enter key, the Alarm Configuration screen remains on display so that you can perform a Save or make further changes before you type `0` again to dismiss the screen.

Monitor/Alarms

The terminal interface SC 5553 Monitor/Alarms function displays a screen of status information concerning DTE interface signals and alarm conditions. *Figure 3-6* illustrates the Monitor/Alarms screen.

The DTE Status portion of the screen displays the current status of nine DTE interface signals. The status of Transmit Data (TXD) and Receive Data (RXD) can be `TRANS`, `MARK`, or `SPACE`. The status of the other seven signals can be `OFF`, `ON`, or `TRANS`. `TRANS` indicates that a signal is transitioning, as opposed to being in a single prolonged state.

The Alarm Status portion of the screen displays `ACTIVE`, `NO`, or `MASKED` for each alarm condition. `ACTIVE` indicates the condition currently exists; `NO` indicates the condition does not currently exist; and `MASKED` indicates reporting of the condition has been masked by means of the Alarm Configuration screen. Definitions of the alarm conditions appear below.

When you are done viewing the Monitor/Alarms screen, type 0 and press the Enter key to return to the Main Menu.
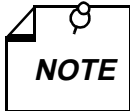
> **NOTE**
>
> *The screen updates every five seconds so that current information is always displayed. The cursor highlight flickers from field to field on the screen during the brief time required to complete the update. Do not attempt to Return to Main Menu by typing 0 while an update is taking place. Wait until the cursor highlight returns to the Select field.*

```
                    SC 5553 Monitor/Alarms

                         DTE Status

TXD:   MARK                 RXD:   TRANS              DCD:   ON
TXC:   TRANS                DTR:   OFF               DSR:   ON
RTS:   OFF                  CTS:   ON                RXC:   TRANS

                        Alarm Status

  Major:                   Minor:                    Informational:
EEPROM Chksum:   NO     RXD (No Transit):  MASKED  Fr. Pan. Test: MASKED
DCD Loss:        MASKED TXD (No Transit):  ACTIVE  DSR Loss:      MASKED
Timing (Shelf):  MASKED                            DTR Loss:      MASKED
TxC (Ext. Clk):  NO                                DTE Test:      MASKED




[0] Return to Main Menu
        Select: [ ]
```

Figure 3-6   Monitor/Alarms Screen

The Alarms Status portion of the Monitor/Alarms screen displays alarms grouped into three categories:

• Major
• Minor
• Informational

Major Alarms

EEPROM Checksum – indicates that the non-volatile memory that stores the DSE configuration has become corrupted

DCD Loss – indicates loss of incoming data

Timing (Shelf) – indicates loss of shelf timing from the backplane

TxC (Ext. Clk) – indicates loss of external clock signal from the DTE

Minor Alarms

RXD (No Transitions) – indicates Received Data signal is all marks or all spaces for one minute or longer

TXD (No Transitions) – indicates Transmit Data signal is all marks or all spaces for one minute or longer

Informational Alarms

Front Panel Test – indicates the DSE has been commanded into a test by means of its front panel switches

DSR Loss – indicates the DSE is not outputting Data Set Ready to the DTE

DTR Loss – indicates the DSE is not receiving Data Terminal Ready from the DTE

DTE Test – indicates the DSE has been commanded into a test by means of a DTE interface lead

Maintenance

The terminal interface Maintenance screen displays information about the unit and provides specialized control functions involving the front panel switches and indicators, equipment resets, and firmware downloading. *Figure 3-7* illustrates the Maintenance screen.

```
                        SC 5553 Maintenance

General Datacomm.
SpectraComm 5553.  Fractional T1 Data Set Emulator

Firmware/Boot Revision:    C-
Serial Number:             0066000102030405
DTE Interface Type:        V.35


[1] Front Panel Switches: Enabled
[2] Front Panel LED Test: Off

      Reset Options:
[3] Soft Reset.                 * WARNING *  Disrupts communications.
[4] Reset to Factory Defaults. * WARNING *  Disrupts communications.

[5] Firmware Down Load.

[0] Return to Main Menu

     Select: [ ]
```

Figure 3-7   Maintenance Screen

The information display identifies the unit, its firmware revision level, the type of DTE interface selected, and its serial number. The DTE Interface Type can be "RS 232" or "V.35" depending on the setting of hardware jumpers on the DSE pc card.

The Maintenance screen includes five command selections:

[1] Front Panel Switches – permits you to enable or disable the hardware switches on the front panel of the SC 5553 DSE.

[2] Front Panel LED Test – when set to On causes all LEDs on the DSE front panel to light. The LEDs remain lit until the command selection is set to Off. This is both a test of the LEDs themselves, and a convenience when using the terminal interface and Telnet for diagnostics from a remote location. This feature enables you to identify a unit for easy location by on-site personnel.

[3] Soft Reset – causes the DSE to perform a reset and resume operation using its current configuration when you type 2 and press the Enter key.

[4] Reset to Factory Defaults – causes all options in the DSE to return to their factory default settings when you type 3 and press the Enter key.

[5] Firmware Down Load – invokes the download function, which is described on the following pages.

NOTE

When you send the Reset to Factory Defaults command to the SC 5553 DSE, it also causes the Backplane Control/Highway Configuration function of the SCM card to default the DS0s assigned to the DSE. The status of DS0s formerly assigned to the DSE changes to Available, and the DSE cannot exchange data with its LTU until you configure timeslot/DS0s for it again.

You set Front Panel Switches or Front Panel LED Test in much the same way that you do configuration selections on other screens:

1.   Type the selection number and press the Enter key. Highlighting appears on the setting field.

2.   Use the arrow keys to toggle the highlighted field between its two values, Enabled /Disabled or On/Off.

3.   When the field displays the desired setting, press the Enter key. The highlight returns to the Select field. The new setting goes into effect immediately.

When you are done with the Maintenance screen, type 0 and press the Enter key to return to the Main Menu.

Firmware Download

The terminal interface Firmware Download function enables you to load new operating firmware into the DSE. Loading of firmware is typically required when GDC makes changes to improve performance or to include new features.

The SC 5553 DSE can store two versions of operating firmware, designated as the Active Revision and the Standby Revision. You can have newly downloaded firmware immediately serve as the Active Revision, or you can store it as the Standby Revision. You can switch between Active and Standby Revisions as needed.

```
              SC 5553 Firmware Download


   Active Firmware Revision:      01.00.00
   Standby Firmware Revision:     00.00.00
   Standby Firmware Status:       INVALID - BLANK
   Download Mode:                 DISABLE ALL DOWNLOADS
   Download Status:               Idle


   [1] SWITCH TO STANDBY FIRMWARE NOW
   [2] DISABLE ALL DOWNLOADS
   [3] ENABLE DOWNLOADS AND STORE ZIPPED
   [4] ENABLE DOWNLOADS, UNZIP AND EXECUTE




   [0] Return to SC 5553 Maintenance


    Select: [ ]
```

Figure 3-8   Firmware Download Screen

The Firmware Download screen contains five lines of read-only information display, and five command selections. The following information is displayed:

Active Firmware Revision – displays the version and revision number of firmware that is currently operating in the DSE

Standby Firmware Revision – displays the version and revision number of inactive firmware that the DSE has stored in zipped (compressed) format

Standby Firmware Status – displays one of five status indications:

Invalid- Blank – new DSE with no standby firmware loaded

Valid- OK – standby firmware loaded and ready for use

Invalid- Checksum Failed – standby firmware corrupted during download

Invalid- Download Aborted – download aborted in progress by SCM

Invalid- Unzip Failed – problem occurred during unzip of standby firmware

Download Mode – displays the DSE's selected response to a download of new firmware; see the command selections below for the potential modes

Download Status – displays one of five status indications:

Idle – no current activity

Active – transfer currently taking place

Calculating Checksum – approximately 40 seconds following completion of transfer

Checksum GOOD – indicates successful completion of transfer

Checksum BAD – indicates failure of transfer

The command selections are

[1] Switch to Standby Firmware Now – commands the DSE to unzip (decompress) the stored, inactive firmware and place it into service as the current operating firmware; at the same time the DSE zips and stores the firmware that it had been operating with.

[2] Disable All Downloads – commands the DSE not to accept download of firmware; appears in the Download Mode display when selected

[3] Enable Downloads and Store Zipped – commands the DSE to accept download of firmware, storing the newly downloaded code as the zipped and inactive Standby Firmware until it is placed into service by the Switch to Standby Firmware Now command; appears in the Download Mode display when selected

[4] Enable Downloads, Unzip and Execute – commands the DSE to accept download of firmware, immediately unzipping the newly downloaded code and placing it into operation, while storing the former operating code as zipped and inactive Standby Firmware; appears in the Download Mode display when selected

[0] Return to SC 5553 Maintenance – dismisses the Firmware Download screen

Command selections 2, 3, and 4 are configuration options. The one you select is displayed on-screen as the Download Mode for the DSE, and the selection remains in effect until it is changed. Download Mode determines how the DSE responds to having firmware downloaded. You perform the actual firmware download procedure by means of Trivial File Transfer Protocol (TFTP).

Unlike those three command selections, command selection 1 initiates an immediate response by the DSE. A description of that response appears following the directions for downloading.

Firmware download procedure using TFTP:

1. Open a second window in which to perform the TFTP functions. Keep the Firmware Download screen on display in order to monitor the Download Status.

2. Initiate a TFTP session to the SCM.
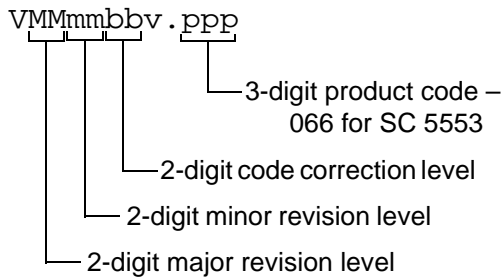
3. At the TFTP prompt type

   bin

   and press the Enter key so that the transfer takes place in binary mode.

4. Type

   put "firmware filename" "address & product code"

   and press the Enter key to initiate the actual transfer. The firmware filename is provided with the firmware that is to be downloaded. The address portion of the address & product code is the slot/line/drop address when you are downloading to a single unit. There is also a broadcast code that enables you to send new firmware to all the SC 5553 DSEs in a shelf (or pair of shelves) at once. The diagram below provides further definitions of the filename and address formats.

Firmware Filename Format:

VMMmmbbv.ppp

├── 3-digit product code –
│   066 for SC 5553
├── 2-digit code correction level
├── 2-digit minor revision level
└── 2-digit major revision level

Address and Product Code Format, Single Unit:

SSLLDD00.66

├── 5-character product code –
│   00.66 for SC 5553
├── 2-digit Drop # (default: 00)
├── 2-digit Line # (default: 01)
└── 2-digit Shelf Slot # in hex - 01 – 20 (32 decimal)
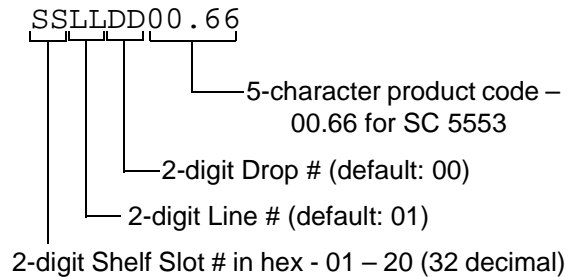
Address and Product Code Format, All SC 5553 Units in Shelf:

applbr00.66

├── 5-character product code –
│   00.66 for SC 5553
└── Application Broadcast
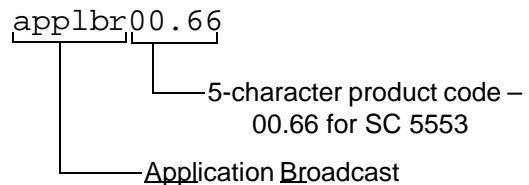
5. The Download Status line of the Firmware Download screen displays Active while the download takes place, then displays Calculating Checksum for approximately 40 seconds. When the calculation is complete, the status line displays either Checksum GOOD or Checksum BAD. When you perform a download to a single unit, the RSP indicator LED of that unit flashes during the download. When you perform a download to all units in a shelf, their RSP indicator LEDs remain Off.

6. If the selected Download Mode is Enable Downloads and Store Zipped, the procedure is complete once the checksum is calculated. The DSE stores the newly loaded firmware as its standby firmware until you put it into service by means of the Switch to Standby Firmware Now command. If the selected Download Mode is Enable Downloads, Unzip and Execute, the DSE continues with the process of placing the new firmware into service as described below.

You can monitor the process as the DSE unzips and begins to execute firmware by observing the indicator LEDs on its front panel. The sequence is the same whether the activity occurs in response to a Switch to Standby Firmware Now command or as the last part of a download with Enable Downloads, Unzip and Execute selected as the Download Mode:

1.   All LEDs light briefly.

2.   Then, while the unzip process takes place, the four test function LEDs (ST, LT, RL, DL) flash in sequence.

3.   When the unzip process is complete, all LEDs light as the DSE performs a reset.

4.   The Test Mode (TM) indicator lights while the DSE performs its power-on self test.

5.   The indicators return to their normal operating states as the DSE resumes operation using the newly activated firmware.

4 Tests

Overview

You should test the SC 5553 DSE when it is first installed to verify correct installation. After the equipment is in service you may need to perform tests to diagnose any problems that occur in the operation of the DSE or the data communications system.

There are five ways to initiate performance testing of the SC 5553 DSE:

- commands from an SNMP controller
- terminal interface commands
- DSE front panel ST, LT, RL, and DL switches
- signals from the DTE on the EIA Remote Loop and EIA Local Loop leads
- PN127 Remote Loop command from the remote DSU

Test commands from an SNMP controller take priority over tests commanded in any other way. You can individually enable/disable front panel, EIA, and PN127 test control in the DSE configuration.

This chapter describes tests you can initiate on the SC 5553 DSE from the terminal interface, the front panel, or the DTE. Consult the appropriate SNMP controller documentation for information on the other forms of testing.

Figure 4-1, Fault Isolation Procedure, illustrates an approach you can follow for using the front panel tests to identify the source of a problem.

NOTE
In order to perform any diagnostic tests the SC 5553 DSE must be configured for its selected bandwidth (data rate) and provided with shelf timing. When the data rate is configured, it appears on the front panel 4-character, 7-segment display. If "0000" appears on the display, there is no bandwidth selected.
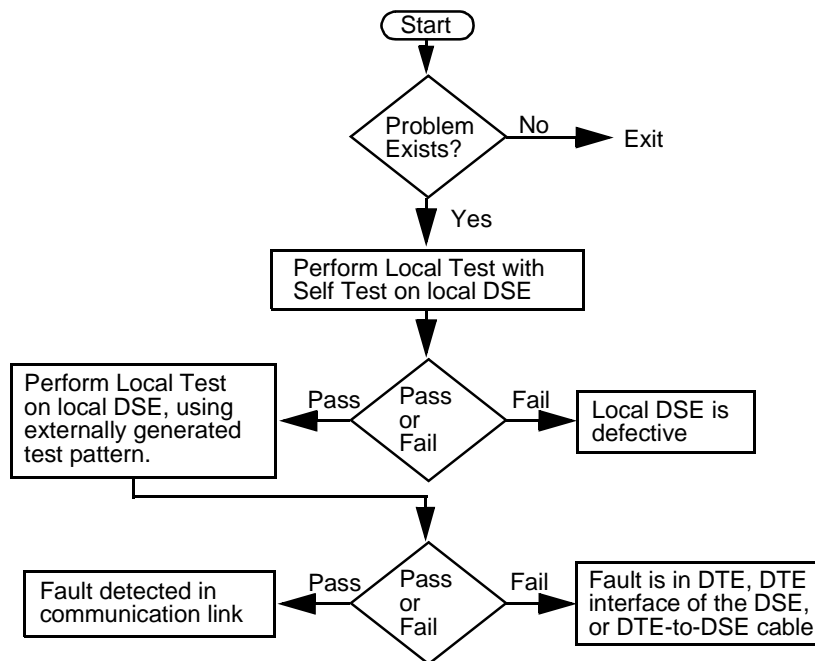
Figure 4-1 Fault Isolation Procedure

Terminal Interface Diagnostics Screen

The terminal interface SC 5553 Diagnostics screen combines configuration and command functions. Selections 6 through B are the command fields by which you can begin and end test procedures. The Test Results field below selection B displays the results of tests that employ Self Test. The result is either Passed, if no errors are detected, or the number of RX Errors.

Figure 4-2 illustrates the Diagnostics screen. Instructions for using the screen to perform tests appear following the illustration.

```
                        SC 5553 Diagnostics


            Diagnostic Options
        DTE:
    [1]    Local Loopback Control:        Disable
    [2]    Remote Loopback Control:       Disable


        Network:
    [3]    Remote Loop Receive (PN127):   Enable
    [4]    Remote Loop Auto Timeout:      Disable
    [5]    Self Test Pattern:             511



            T E S T S:
    [6] Local Loopback:                   Idle
    [7] Local Loopback & Self Test:       Idle
    [8] Remote Loopback (PN127):          Idle
    [9] Remote Loopback & Self Test:      Idle
    [A] Digital Loopback:                 Idle
    [B] Self Test:                        Idle
                    Test Results:    Passed


    [0] Return to Main Menu     [S] Save [1] - [5] & Update Unit
            Select: [ ]
```

Figure 4-2   Diagnostics Screen

The procedure for performing tests from the Diagnostic screen involves the following steps:

1. Type the selection letter of the test you intend to perform and press the Enter key. Highlighting appears on the status field for the corresponding test, which displays "Idle" at this point.

2. Use the arrow keys to toggle the highlighted field so that it displays "Active." The DSU begins the selected test.

> **NOTE**
>
> *The terminal interface does not permit a test to run 10 minutes or longer. A timeout disconnect occurs if 10 minutes pass without any keyboard activity. If the DSE disconnects due to a timeout, it performs an orderly shut-down of the test. It does not display results for a test that employs Self Test.*

3. To end the test, use the arrow keys again to toggle the highlighted field so that it again displays "Idle" then press the Enter key. The DSE ends the test and the highlighting returns to the Select field. If the test employed Self Test, the screen displays the number of RX Errors (if any) in the Test Results field.

4. To dismiss the screen, type selection 0, Return to Main Menu, and press the Enter key.

Local Test

The Local Test loopback condition isolates the DSE from the backplane data highway by connecting the transmit logic circuits to the receive logic circuits. The loopback provides a path through the DSE for an externally generated test signal, as shown in *Figure 4-3*.

During Local Test:

• The DTE interface remains active.

• The DSE loops transmit data from the DTE back as receive data.

• Either the DTE or a bit error rate tester (BERT) connected to the DTE interface can supply and check a test signal.

• The device supplying the test signal is responsible for error detection and reporting.

There are four ways to control the Local Test function:

• briefly press the LT switch on the front panel to initiate the loopback; press the switch again to end the loopback.

• assert a signal from the DTE on the LT lead of the DTE interface to initiate the loopback; turn the signal Off to end the loopback.

• command the test by means of the terminal interface.

• transmit commands from an SNMP controller to initiate and end the loopback
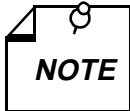
.

NOTE

Tests cannot be performed by means of front panel switches when the front panel has been inhibited by an SNMP controller. Front panel enabled is the default condition.

The DTE interface LT lead can only command Local Test if LT EIA has been enabled by an SNMP controller. The default condition is LT EIA disabled.

In order to perform any diagnostic tests the SC 5553 DSE must be configured for its selected bandwidth (data rate) and provided with shelf timing.

Figure 4-3 Local Test

The following callouts appear in the figure:

3. Enter test data at the DTE. Compare data entered at the DTE with data looped back and displayed by the DTE. (Test equipment can be used in place of the DTE.

SC 5553 DSE

HELLO

DTE Inter-face

TX Logic

RX Logic

Backplane Driver

Backplane Receiver

Interface to Backplane Data Highways

2. TM indicator On while Local Test loopback is active.

1. To start test from front panel, press LT momentary action switch.
LT indicator is lit during the test.
Press switch again to end the test.

Front panel indicators: INS, ON, SD, RD, RS, CO, TMG, RSP, TM, ALM, ST, LT, RL, DL

5553

Local Test with Self-Test

Local Test with Self-Test checks the internal circuits of the local DSE, isolated from both the DTE and the backplane data channels. The test procedure involves two functions:

- Local Test — the DSE loops transmit data back as receive data.

- Self-Test — the DSE enables its internal Test Pattern Generator to provide the signal for the Local Test loop and enables its Test Pattern Checker to verify the signal. The DSE can employ either a 511-bit or a 2047-bit test pattern. The DSE is isolated from its DTE while the Test Pattern Generator and Checker are enabled.

The LT, ST, and TM indicators are On during the test. The Test Mode (TM) indicator remains On as long as the test pattern is received without errors and blinks when an error is detected.

There are three ways to control the Local Test with Self-Test function:

- Briefly press the LT and ST switches on the front panel to initiate the test; press the switches again to end the test.

- command the test by means of the terminal interface.

- Transmit commands from an SNMP controller to initiate and end the test.

.

NOTE
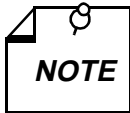
Tests cannot be performed by means of front panel switches when the front panel has been inhibited by an SNMP controller. Front panel enabled is the default condition.

In order to perform any diagnostic tests the SC 5553 DSE must be configured for its selected bandwidth (data rate) and provided with shelf timing.
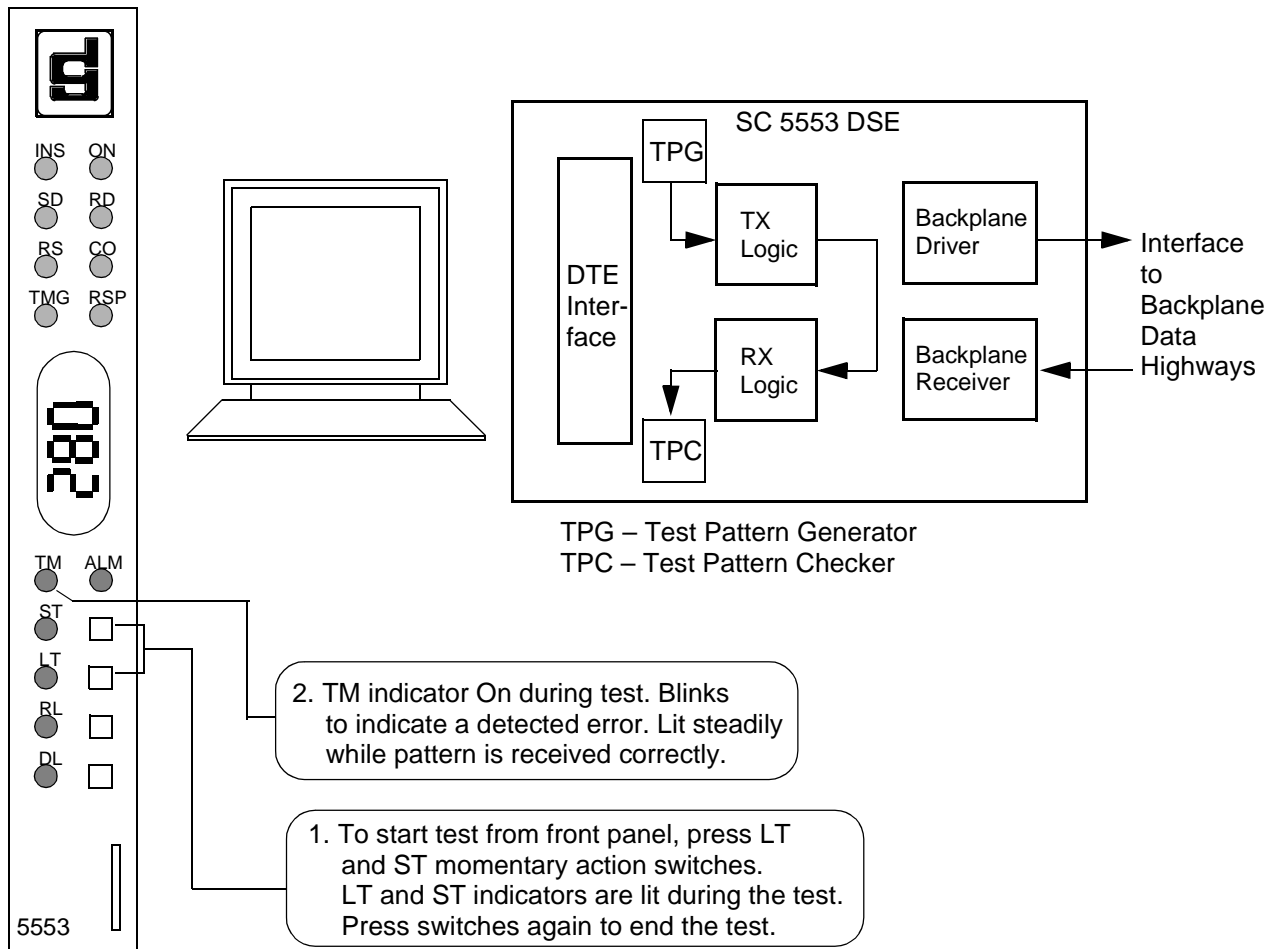
Figure 4-4 Local Test with Self-Test

End-to-End Self Test

The Self Test function enables you to perform an end-to-end self test, which is the most compete test of the DSE, the remote DSU, and the connection between them. In this test, the DSE and the remote DSU each generate and transmit a pattern that is then checked for errors by the unit that receives it.

When controlled from the front panel, this test requires the cooperation of an operator at the remote DSU site to activate the self test function in the remote DSU. Contact the remote operator to arrange for the test, then briefly press the ST switch on the front panel to initiate the test.
.
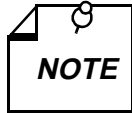
> **NOTE**
>
> *Tests cannot be performed by means of front panel switches when the front panel has been inhibited by an SNMP controller. Front panel enabled is the default condition.*
>
> *In order to perform any diagnostic tests the SC 5553 DSE must be configured for its selected bandwidth (data rate) and provided with shelf timing.*
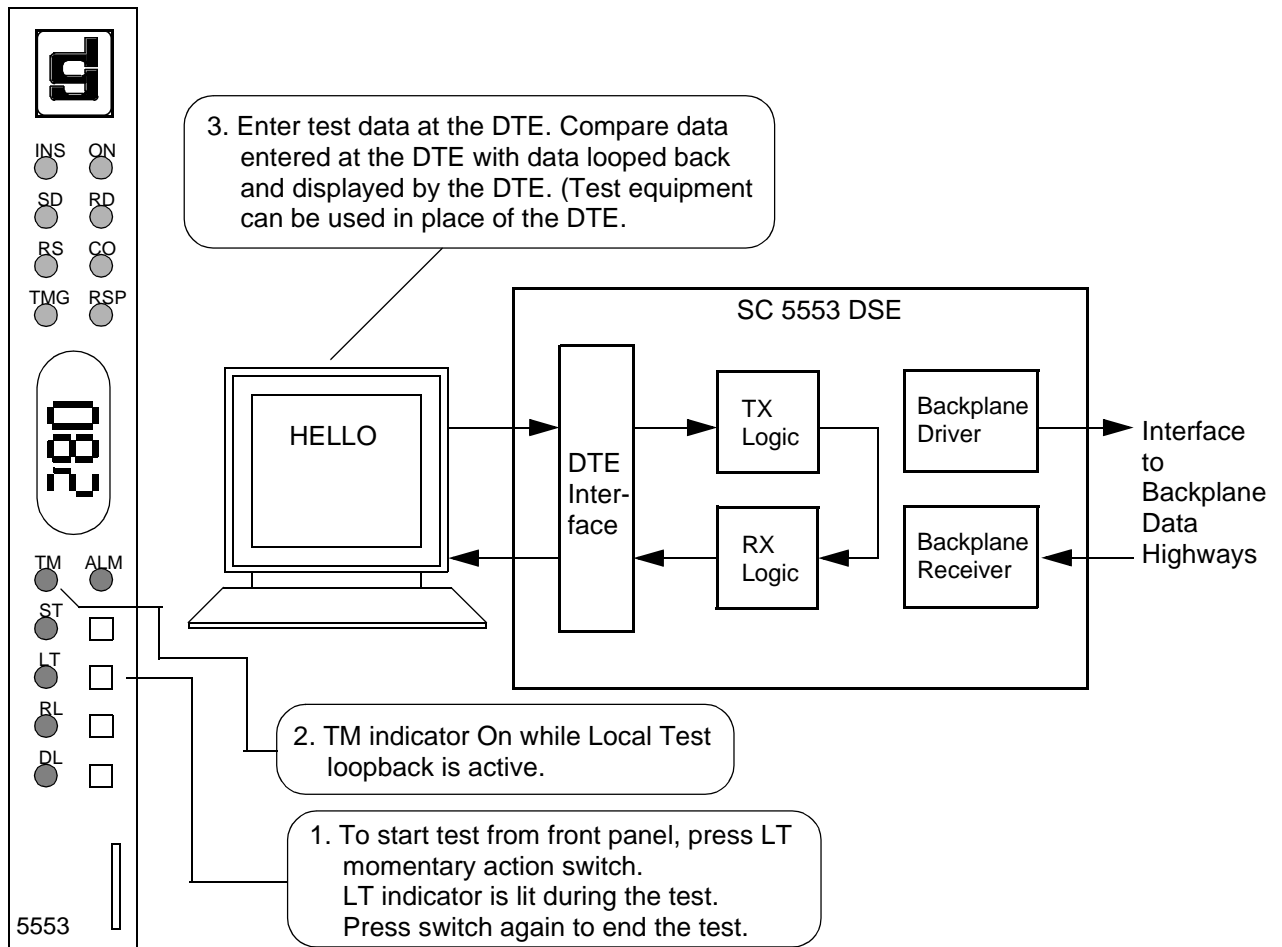
The DSE enables its internal Test Pattern Generator to provide the signal that is transmitted to the remote DSU via the shelf backplane and the LTU. The signal sent from the DSE is checked for errors by the receiving DSU, and the remote operator is responsible for observing error indications at that site.

At the same time the remote DSU transmits its test pattern to the DSE for checking. The ST and TM indicators are On during the test. The TM indicator remains On as long as the test pattern is received without errors and blinks when an error is detected.

The DSE can employ either a 511-bit or a 2047-bit test pattern, selectable by means of an SNMP controller. The DSE returns to its default of 511-bit any time its power is cycled or a reset is performed. The same test pattern must be selected for both the DSE and the remote DSU in order for the end-to-end test to function correctly.

The DSE is isolated from its DTE while the Test Pattern Generator and Checker are enabled.

2. TM indicator On during test. Blinks to indicate a detected error. Lit steadily while pattern is received correctly

1. To start test from front panel, press ST switch. ST indicator is lit during the test. Press switch again to end the test

TPG – Test Pattern Generator
TPC – Test Pattern Checker

Figure 4-5   End-to-End Self Test

Remote Loop

In the Remote Loop test function the local DSE transmits an in-band PN127 command to its remote DSU, directing the remote to loop received signals back onto the network. In order for this test to function, the remote DSU must support use of the PN127 command.
.

> *When configured to do so, the DSE can accept a PN 127 command from the remote DSU and respond to it by looping receive data back onto the network.*
>
> **NOTE**

The Remote Loop Timeout option determines whether or not the DSE automatically ends the remote Loop test it initiates. When the option is enabled the DSE ends the test after ten minutes. When the option is disabled the DSE runs the test until it is terminated manually.

The remote loopback provides a path through the DSE, the network, and the remote DSU for an externally generated test signal, as shown in *Figure 4-6*. Remote Loop checks the local DSE, a portion of the remote unit, and the T1 line.

During Remote Loop:

• The DSE transmits the in-band loop-up command to its remote DSU.

• In response to the command, the remote unit performs a digital loopback and loops the receive signal back to its transmit path.

• The DTE and backplane interfaces of the local DSE remain active.

• A test signal can be supplied and checked either by the DTE or by a bit error rate tester (BERT) connected to the DTE interface.

• The device supplying the test signal is responsible for error detection and reporting.

• The remote loopback remains in effect until the DSE transmits a loop down code for five seconds, commanding the remote unit to release the loopback. The DSE does this automatically after ten minutes when the Remote Loop Timeout option is enabled.

There are four ways to control the Remote Loop function:

• briefly press the RL switch on the front panel to initiate the remote loopback; press the switch again to end the remote loopback.

• assert a signal from the DTE on the RL lead of the DTE interface to initiate the remote loopback; turn the signal Off to end the remote loopback.

• command the test by means of the terminal interface.

• transmit commands from an SNMP controller to initiate and end the remote loopback.
.
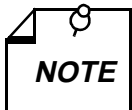
> *Tests cannot be performed by means of front panel switches when the front panel has been inhibited by an SNMP controller. Front panel enabled is the default condition.*
>
> **NOTE**
>
> *The DTE interface RL lead can only command Remote Loop if RL EIA has been enabled by an SNMP controller. The default condition is RL EIA disabled.*
>
> *In order to perform any diagnostic tests the SC 5553 DSE must be configured for its selected bandwidth (data rate) and provided with shelf timing.*
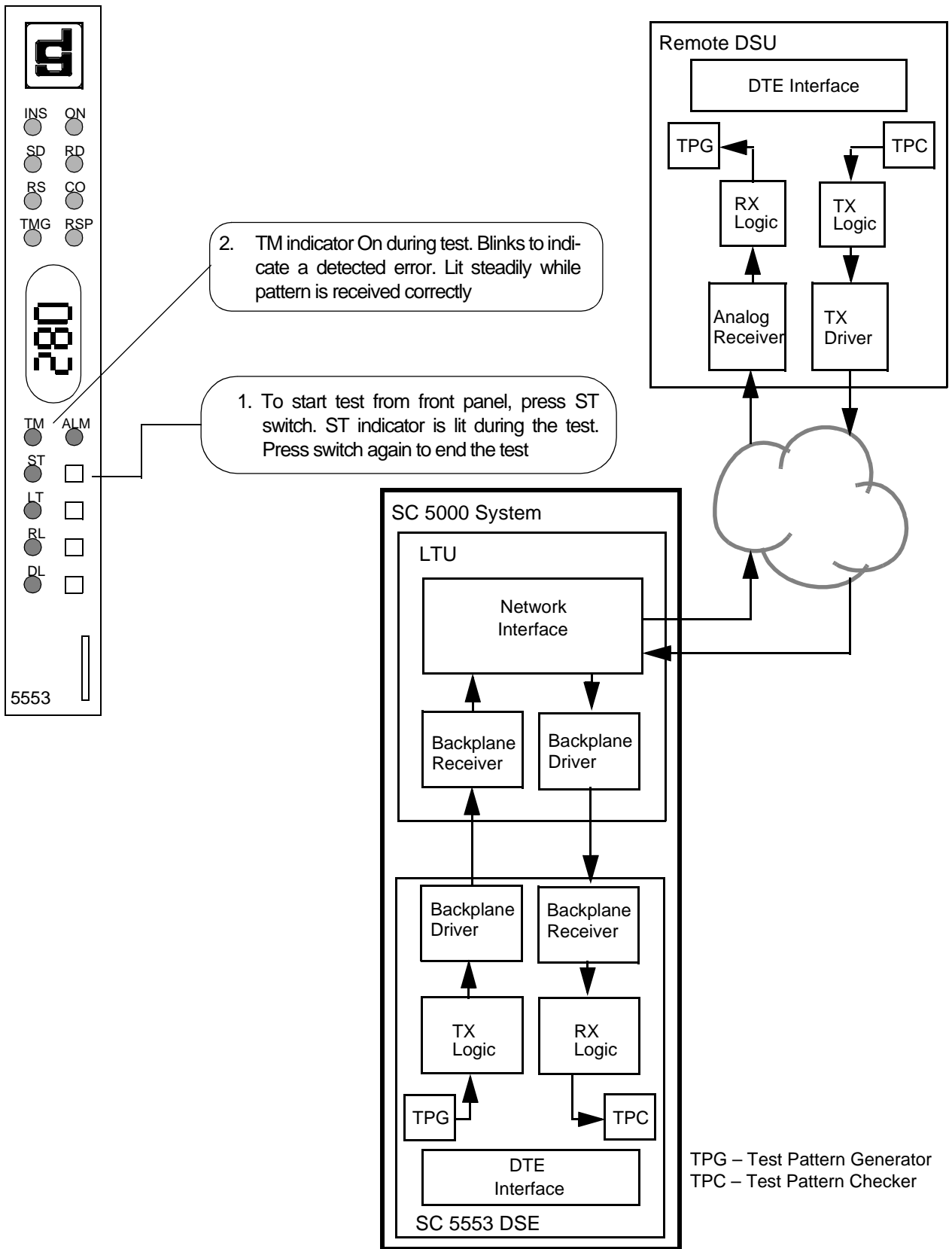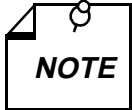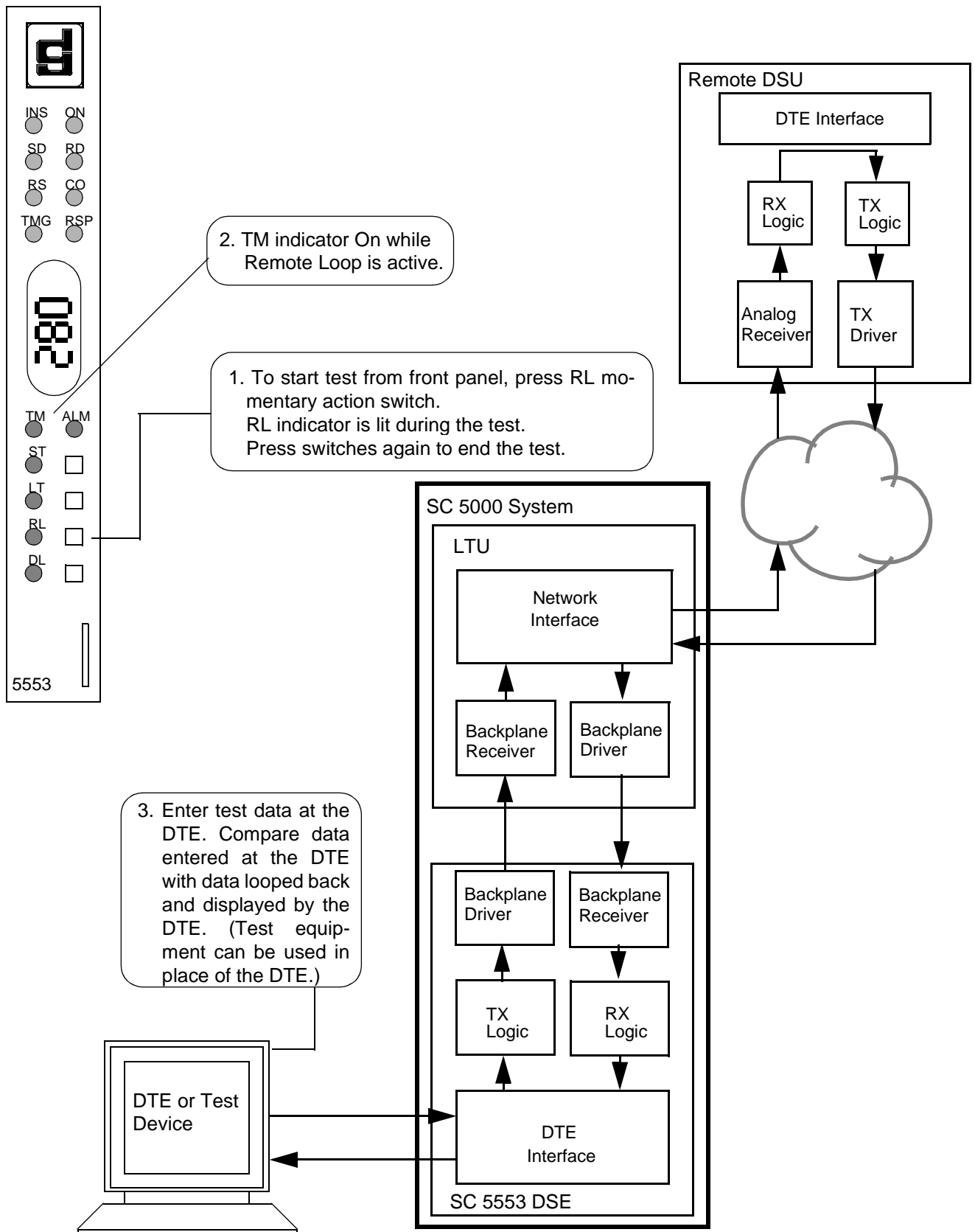
Figure 4-6 Remote Loop

Remote Loop with Self-Test

Remote Loop with Self-Test, shown in *Figure 4-7*, isolates the local DSE from the DTE and checks the DSE internal circuits, the network link, and the remote DSU. The test procedure involves two functions:

- Remote Loop — the local DSE transmits an in-band PN127 command to its remote DSU, directing the remote to loop received signals back onto the network. In order for this test to function, the remote DSU must support use of the PN127 command.

- Self-Test — the DSE enables its internal Test Pattern Generator to provide the signal for the Remote Loop and enables its Test Pattern Checker to verify the signal. The DSE is configurable to use a 511-bit or a 2047-bit test pattern. The DSE is isolated from its DTE while the Test Pattern Generator and Checker are enabled.

The Remote Loop Timeout option determines whether or not the DSE ends this test automatically. When the option is enabled the test DSE ends the test after ten minutes. When the option is disabled the DSE runs the test until it is terminated manually.

The RL, ST, and TM indicators are On during the test. The Test Mode (TM) indicator remains On as long as the test pattern is received without errors and blinks when an error is detected.

There are three ways to control the Local Test with Self-Test function:

- briefly press the RL and ST switches on the front panel to initiate the test; press the switches again to end the test. Test ends automatically after ten minutes if Remote Loop Timeout is enabled.

- command the test by means of the terminal interface.

- transmit commands from an SNMP controller to initiate and end the test. Test ends automatically after ten minutes if Remote Loop Timeout is enabled.
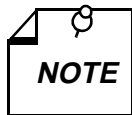
NOTE

Tests cannot be performed by means of front panel switches when the front panel has been inhibited by an SNMP controller. Front panel enabled is the default condition.

In order to perform any diagnostic tests the SC 5553 DSE must be configured for its selected bandwidth (data rate) and provided with shelf timing.

2. TM indicator On during test. Blinks to indicate a detected error. Lit steadily while pattern is received correctly

1. To start test from front panel, press RL and wait approximately 4 seconds for remote end to receive command, then press ST switch. RL and ST indicators are lit during the test. Press switches again to end the test

TPG – Test Pattern Generator
TPC – Test Pattern Checker
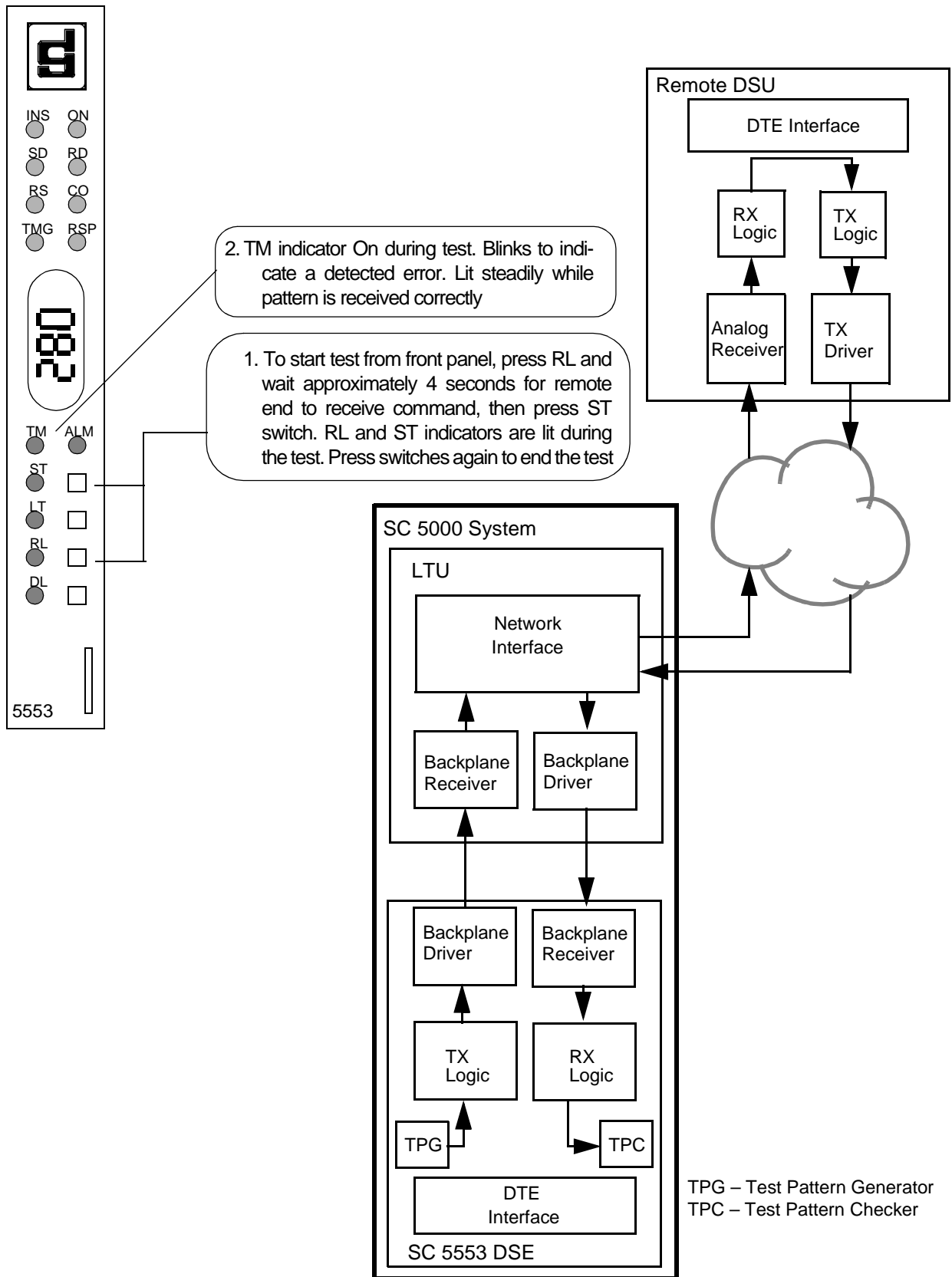
Figure 4-7 Remote Loop with Self-Test

Data Loop

The Data Loop loopback condition, shown in *Figure 4-8*, isolates the DSE from the DTE by connecting the receive logic circuits to the transmit logic circuits. The loopback provides a path through the receive and transmit circuits of the DSE for a test signal from a remote site. Equipment at the remote site is responsible for generating and checking the test signal.

There are two ways to control the Data Loop function:

• briefly press the DL switch on the front panel to initiate the test; press the switch again to end the test.

• command the test by means of the terminal interface.

• transmit commands from an SNMP controller to initiate and end the test.

NOTE

Tests cannot be performed by means of front panel switches when the front panel has been inhibited by an SNMP controller. Front panel enabled is the default condition.

In order to perform any diagnostic tests the SC 5553 DSE must be configured for its selected bandwidth (data rate) and provided with shelf timing.

2. TM indicator On while Digital Loop is active.

**1. To start test from front panel, press DL momentary action switch.
DL indicator is lit during the test.
Press switch again to end the test.**

Remote DSU

DTE Interface

RX Logic

TX Logic

Analog Receiver

TX Driver

SC 5000 System

LTU

Network Interface

Backplane Receiver

Backplane Driver

Backplane Driver

Backplane Receiver

TX Logic

RX Logic

DTE Interface

SC 5553 DSE

INS ON
SD RD
RS CO
TMG RSP

TM ALM
ST
LT
RL
DL
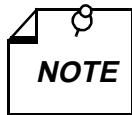
5553
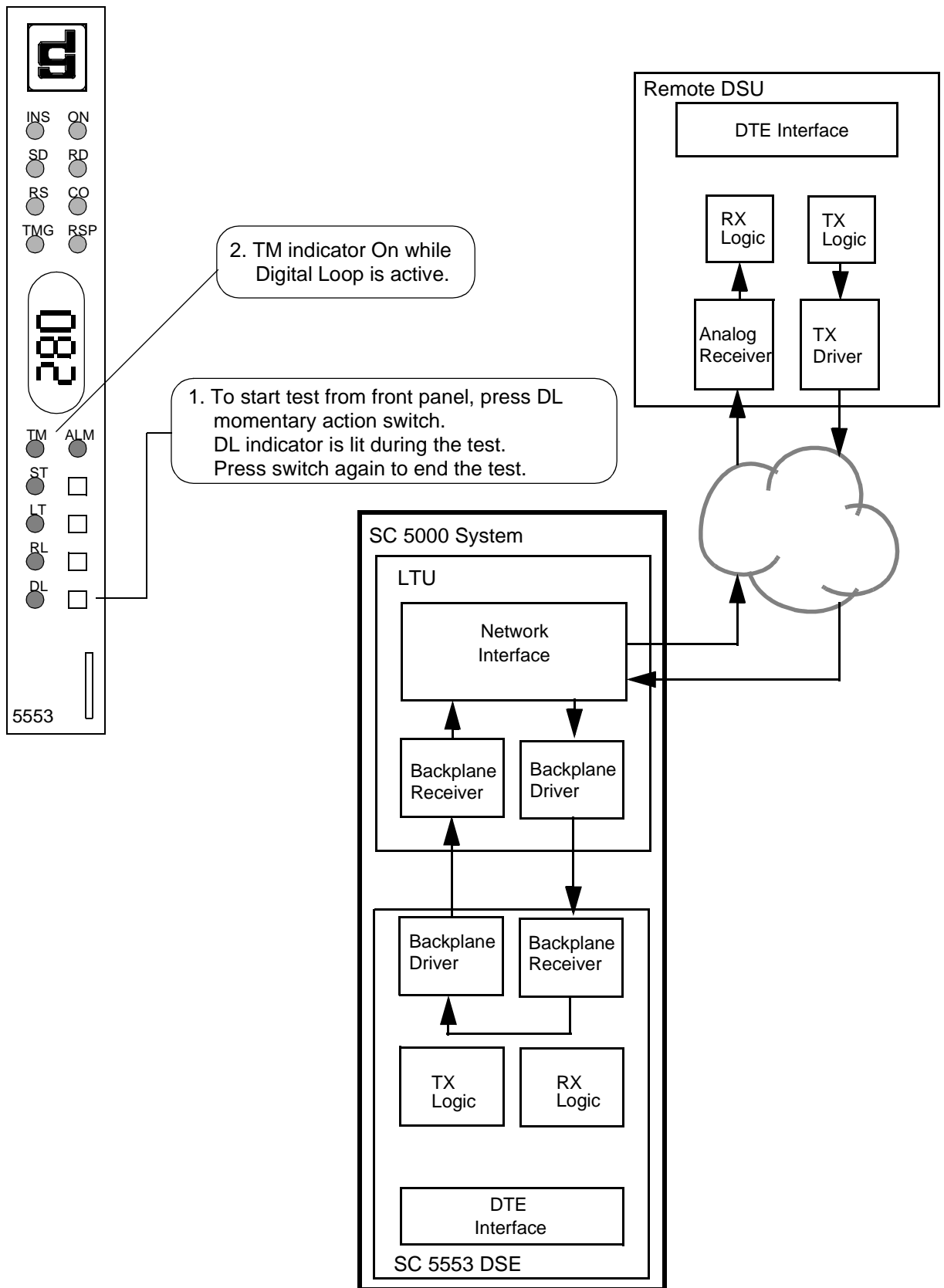
Figure 4-8   Data Loop

A   Technical Characteristics

Item	Specification
Physical	
PC card (rackmount installation)	
Height (SC 5553 card only)	0.81 in. (21 mm)
Width	7 in. (178 mm)
Depth	9.5 in. (241 mm)
Weight (SC 5553 card only)	10 oz (0.28 kg)
Shipping weight (SC 5520 card only)	1 Ib 10 oz (0.74 kg)
Environmental	
Temperature	
Operating	32° to 122°F (0° to 50°C) (Derate by 1°C/1000 ft above sea level)
Non-operating	–40° to 185°F (–40° to 85°C)
Humidity, operating	5% to 95% without condensation
Altitude	
Operating	0 ft to 10,000 ft (0 m to 3,047 m)
Non-operating	0 ft to 40,000 ft (0 m to 12,191 m)
Electrical	
Power dissipation (SC 5553 card only)	4 W maximum
Fusing	Two 2.5 A, 125 V (GDC Part No. 215-201-009) One 5 A, 125 V (GDC Part No. 215-201-021)
Operation	
N x 56 kbps or N x 64 kbps	Point-to-point
Signal format	Serial, synchronous
Data rate, synchronous	56 kbps to 2048 kbps
DTE interface	ITU-T V.35 or EIA-530 – jumper selectable on card
Transmit Timing	Shelf (Receive) or external (DTE) (can accept external clock up to ±0.02%)

B DTE Interface Signals

Table B-1   ITU-T V.35 DTE Interface Signals

V.35	Circuit Designation		
Pin	**ITU-T**	**EIA**	**Description**
A	101	AA	This circuit is connected to the equipment frame. Normally, it is separated from signal ground (pin B) by 100 ohms, but it may be connected to signal ground by means of an option strap (X1).
B	102	AB	Establishes a common ground reference for all interface circuits except protective ground, pin A.
C	105	CA	Indicates to Data Set that DTE is prepared to transmit.
D	106	CB	Indicates to DTE that Data Set is prepared to transmit.
E	107	CC	Indicates to DTE that Data Set is operational.
F	109	CF	Indicates to DTE that Data Set is receiving data (not idle or OOS codes).
K	142	TM	Indicates to DTE that Data Set is in a test mode.
P S	103 103	BA(A) BA(B)	Transfers data signals from DTE for transmission over communication line.
R T	104 104	BB(A) BB(B)	Transfers data signals received over communication line by Data Set to DTE.
U W	113 113	DA(A) DA(B)	Transfers transmitter signal timing information from DTE to Data Set.
V X	115 115	DD(A) DD(B)	Transfers receiver signal timing information from Data Set to DTE.
Y AA/a	114	DB(A) DB(B)	Transfers transmitter signal timing information from Data Set to DTE.
H	108/2	CO	Indicates to Data Set that DTE is prepared for data communication.
L	141	LL	Controls Local Loopback test
N	140	RL	Controls Remote Loop test

Table B-2   EIA-530 DTE Interface Signals

P1 Pin	EIA Circuit Designation	Description
1	—	Allows shield connections via pin number 1.
2 14	BA(A) BA(B)	Transfers data signals from DTE for transmission over communication line.
3 16	BB(A) BB(B)	Transfers data signals received over communications line by Data Set to DTE.
4 19	CA(A) CA(B)	Indicates to Data Set that DTE is prepared to transmit.
5 13	CB(A) CB(B)	Indicates to DTE that Data Set is prepared to transmit.
6 22	CC(A) CC(B)	Indicates to DTE that Data Set is operational.
20 23	CD(A) CD(B)	Indicates to Data Set that DTE is prepared for data communications.
7	AB	Establishes common ground reference for all interface circuits except protective ground.
8 10	CF(A) CF(B)	Indicates to DTE that Data Set is receiving data (not idle or OOS codes).
15 12	DB(A) DB(B)	Transfers transmitter signal timing information from Data Set to DTE.
17 9	DD(A) DD(B)	Transfers receiver signal timing information from Data Set to DTE.
24 11	DA(A) DA(B)	Transfers transmitter signal timing information from DTE to Data Set.
25	TM	Indicates whether the local DCE is in a test condition.

C   SC5553 MIB Support

Overview

This appendix details the Management Information Base (MIB) table objects by which an SNMP controller can command and monitor the SC 5553 DSE.

Table C-1:   GDC Common MIB Tables

MIB Object	Syntax	Access	Enumeration	Description

MIBversion	DisplayString (SIZE (5))	read-only		Identifies the version of the MIB. The format of the version is x.yzT, where 'x' identifies the major revision number, 'y' identifies the minor revision number, 'z' identifies the typographical revision, and T identifies the test revision.
				
				Upon formal release, no designation for the test revision will be present.
				
				Acceptable values for the individual revision components are as follows:
				
				     x: 1 - 9,
				     y: 0 - 9,
				     z: 0 - 9,
				     T: A - Z

Table C-2:   Version Table

MIB Object	Syntax	Access	Enumeration	Description
VersionIndex	SCinstance	read-only		Identifies Version parameters associated with the managed object
FirmwareRev	DisplayString (SIZE(2))	read-only		The version number of the firmware, to allow products to know which revision is installed. The released version number is sequenced from --, A-, ... AA, ... ZZ. Test versions are numerical from 01 to 99

Table C-3:   DS0 Allocation Table (* = default setting**)**

MIB Object	Syntax	Access	Enumeration	Description
Ds0Allocation Index	SCinstance	read-only		The index value: slot, line, drop, and interface
DS0BaseRate	INTEGER	read-write		Indicates the DS0 base rate: either 56K or 64K bits per second. This is used in conjunction with the number of DS0s set to 'enabled' to determine the total bandwidth.
			nx64k(1) = N X 64K rate	The base rate of 64K defines the DS0 data format as clear channel in which all 8 bits of the DS0 are used.
			nx56k(2) = N X 56K rate*	A base rate of 56K defines the DS0 as non-clear in which bits 1-7 are used for channel data and the 8th bit is either unused and forced to marks or used to pass signaling information.
Highway	INTEGER	read-only		The highway used for DS0 traffic by this device
			highway1(1) *	-- All DS0 are routed to Highway 1
			highway2(2)	-- All DS0 are routed to Highway 2
			highway3(3)	-- All DS0 are routed to Highway 3
			highway4(4)	-- All DS0 are routed to Highway 4
DccDs0	INTEGER	read-write	dccDs01(1) through dccDs032(32),	The values 1-32 indicate which DS0 is used for diagnostics communications
			noDccDs0(33) *	The value noDccDs0(33) indicates that diagnostic communications do not utilize a separate Ds0
DS0Allocation	OCTET STRING (SIZE(5))	read-only		A bitwise snapshot of DS0 allocation. bit values are: 0 = disabled*, 1 = enabled
			bit0 - ds0 7 bit1 - ds0 6 bit2 - ds0 5 bit3 - ds0 4 bit4 - ds0 3 bit5 - ds0 2 bit6 - ds0 1 bit7 - n/u	First octet

(Continued on next page)

Table C-3 DS0 Allocation Table (* = default setting) (Continued)

MIB Object	Syntax	Access	Enumeration	Description
DS0Allocation (Continued)	OCTET STRING (SIZE(5))	read-only	bit0 - ds0 14 bit1 - ds0 13 bit2 - ds0 12 bit3 - ds0 11 bit4 - ds0 10 bit5 - ds0 9 bit6 - ds0 8 bit7 - n/u	Second octet
			bit0 - ds0 21 bit1 - ds0 20 bit2 - ds0 19 bit3 - ds0 18 bit4 - ds0 17 bit5 - ds0 16 bit6 - ds0 15 bit7 - n/u	Third octet
			bit0 - ds0 28 bit1 - ds0 27 bit2 - ds0 26 bit3 - ds0 25 bit4 - ds0 24 bit5 - ds0 23 bit6 - ds0 22 bit7 - n/u	fourth octet
			bit0 - n/u bit1 - n/u bit2 - n/u bit3 - ds0 32 bit4 - ds0 31 bit5 - ds0 30 bit6 - ds0 29 bit7 - n/u	fifth octet

Table C-4:   Configuration Table (*= default setting)

MIB Object	Syntax	Access	Enumeration	Description
ConfigIndex	SCinstance	read-only		The index value: slot, line, drop, and interface
External Timing	INTEGER	read-write	disabled(1)*	Disabled indicates timing is provided by the 5553.
			enabled(2)	Enabled indicates timing is provided by the customer business equipment
ChannelType	INTEGER	read-only		The channel interface type
			v35(1)*	-- V.35 interface
			eia530(2)	-- 530 EIA interface
ClockInvert	INTEGER	read-write		Clock invert option
			(1)*	txClockNormRxClockNorm(1), -- Tx and Rx clock normal
			(2)	txClockNormRxClockInvert(2) -- Tx clock normal, Rx clock inverted
			(3)	txClockInvertRxClockNorm(3) -- Tx clock inverted, Rx clock normal
			(4)	txClockInvertRxClockInvert(4) -- Tx and Rx clock inverted
DataInvert	INTEGER	read-write		Data invert option
			(1)*	txDataNormRxDataNorm(1) -- Tx and Rx data normal
			(2)	txDataNormRxDataInvert(2) -- Tx data normal, Rx data inverted
			(3)	txDataInvertRxDataNorm(3) -- Tx data inverted, Rx data normal
			(4)	txDataInvertRxDataInvert(4) -- Tx and Rx clock inverted
ConstantDCD	INTEGER	read-write		Controls the operation of Data Carrier Detect (DCD)signal.
			disabled(1)	-- local DCD Off during ST and DL tests
			enabled(2)*	-- local DCD forced On
ConstantDSR	INTEGER	read-write		Controls the operation of the Data Set Ready (DSR) signal
			disabled(1)	-- local DSR Off during ST and DL tests
			enabled(2)*	-- local DSR forced On

Table C-4 Configuration Table (*= default setting) (Continued)

MIB Object	Syntax	Access	Enumeration	Description
RTSCTS control	INTEGER	read-write		Controls the function of the channel's Request To Send and and Clear To Send signals used for flow control
			ctsOn(1)*	-- CTS forced on
			ctsDelay10ms(2)	-- CTS delay 10 ms
			ctsDelay Standard(3)	-- CTS standard delay (40 bit delay)
ExtLLCtrl	INTEGER	read-write	disabled(1)* enabled(2)	Enables/disables the ability to initiate a local loop test via the assertion of the EIA LL test lead at the DTE interface
ExtRLCtrl	INTEGER	read-write	disabled(1)* enabled(2)	Enables/disables the ability to initiate a remote loop test via the assertion of the EIA RL test lead at the DTE interface
InbandDcc Mode	INTEGER	read-write		The mode of propagation of inband Diagnostics Communication Channel to the dedicated remote NMS553 unit.
			none(1)*,	Specifies no inband DCC
			embedded(2)	An allowed value when the mib object sc5553DS0BaseRate is set to Nx56K, and specifies that DCC is propagated in the 8th bit of the assigned DS0's.
			dccDs0(3)	Specifies that a DS0 is used for propagation of DCC. This value must be selected when the sc5553DS0BaseRate is Nx64k (clear channel). Permitted as an option when the sc5553DS0BaseRate is Nx56k. A minimum of two DS0s must be assigned to this device in this mode. The last DS0 should be set as the sc5553DccDs0 when using this mode. The DS0 allocation may be read from the mib object sc5553DS0Allocation
InbandLoop	INTEGER	read-write		This object is also referred to as RDL response.
			disable(1)	-- disable detection of inband loop code
			pn127(2)*	-- PN127 random code When enabled (pn127), the channel will enter a remote data loopback when an inband RDL code is detected. The required in-band code must conform to CCITT V.54 PN-127 scrambled codes

(Continued on next page)

Table C-4   Configuration Table (*= default setting) (Continued)

MIB Object	Syntax	Access	Enumeration	Description
Inband Loopdown	INTEGER	read-write		This object is also referred to as RDL Auto Timeout.
			disable(1*),	When disabled, the loopback must be terminated by an in-band loopdown code
			tenMinutes(2)	When enabled (tenMinutes), the loopback will be automatically terminatedby the unit after ten minutes.
WakeUp Remote	DisplayString (SIZE (16))	read-only		This object is requested to initiate the add remote process. The serial number of the associated remote is returned.

Table C-5:   DTE Signal Status Table

MIB Object	Syntax	Access	Enumeration	Description
SignalStatus Index	SCinstance	read-only		The index value: slot, line, drop, and interface
CTSstatus	INTEGER	read-only		The state of the sc5553's Clear To Send (CTS) signal
			off(1)	CTS is off
			on(2)	CTS is on
			transitions(3)	CTS is transitioning -- indicates that the signal is alternating between the states off(1) and on(2).
RTSstatus	INTEGER	read-only		The state of the sc5553's Request To Send (RTS) signal
			off(1)	RTS is off
			on(2)	RTS is on
			transitions(3)	RTS is transitioning -- indicates that the signal is alternating between the states off(1) and on(2).
DTRstatus	INTEGER	read-only		The state of the sc5553's DataTerminal Ready (DTR) signal
			off(1)	DTR is off
			on(2)	DTR is on

(Continued on next page)

Table C-5   DTE Signal Status Table (Continued)

MIB Object	Syntax	Access	Enumeration	Description
DCDstatus	INTEGER	read-only		The state of the sc5553's Data Carrier Detect (DCD) signal
			off(1)	DCD is off
			on(2)	DCD is on
			transitions(3)	DCD is transitioning -- indicates that the signal is alternating between the states off(1) and on(2).
RXCstatus	INTEGER	read-only		The state of the sc5553's Receive Clock (RXC) signal
			off(1)	RXC is off
			transitions(2)	RXC is transitioning -- indicates that the signal is alternating between the states off(1) and on(2).
TXCstatus	INTEGER	read-only		The state of the sc5553's Transmit Clock (TXC) signal
			off(1)	TXC is off
			transitions(2)	TXC is transitioning -- indicates that the signal is alternating between the states off(1) and on(2).
RXDstatus	INTEGER	read-only		The state of the sc5553's Receive Data (RXD) signal
			off(1)	RXD is off
			on(2)	RXD is on
			transitions(3)	RXD is transitioning -- indicates that the signal is alternating between the states off(1) and on(2).
TXDstatus	INTEGER	read-only		The state of the sc5553's Transmit Data (TXD) signal
			off(1)	TXD is off
			on(2)	TXD is on
			transitions(3)	TXD is transitioning -- indicates that the signal is alternating between the states off(1) and on(2).
ALTestLead Status	INTEGER	read-only		The state of the AL Test Lead
			off(1)	AL Test Lead is off
			on(2)	AL Test Lead is on

(Continued on next page)

Table C-5   DTE Signal Status Table (Continued)

MIB Object	Syntax	Access	Enumeration	Description
RLTestLead Status	INTEGER	read-only		The state of the RL Test Lead
			off(1)	RL Test Lead is off
			on(2)	RL Test Lead is on

Table C-6:   Diagnostics Table (*=default setting)

MIB Object	Syntax	Access	Enumeration	Description
DiagIndex	SCinstance	read-only		The index value: slot, line, drop, and interface
DiagPattern	INTEGER	read-write		Selects the test pattern for Remote and Local loopback tests
			send511 Pattern(1)*	-- sending 511 test pattern only
			send2047 Pattern(2)	-- sending 2047 test pattern only
DiagTest Results	INTEGER	read-only		The results of the last diagnostic test. This can be the current test running or the last completed test.
				The units of the value of this object depend on the type of diagnostic test run. For all cases except a network delay measurement, the units of the value of this object is the number of bit errors that occurred. Bit errors can be read at any time during the duration of the test.
				The valid range for bit errors is 0 to 4,095.
				65,535 will be returned if for any reason the test is terminated early.
				32,770 will be returned if the number of bit errors exceeds 4,095.
				For a network delay measurement,the units of the value of this test are milliseconds.
				32,770 will be returned if the delay is greater than 4,095 milliseconds.

Table C-6   Diagnostics Table (*=default setting) (Continued)

MIB Object	Syntax	Access	Enumeration	Description
DiagTest Duration	INTEGER	read-write	testTime30Secs(15)* testTime1Min(1) testTime2Mins(2) testTime3Mins(3) testTime4Mins(4), testTime5Mins(5), testTime6Mins(6), testTime7Mins(7), testTime8Mins(8), testTime9Mins(9), testTime10Mins(10), testTime15Mins(11), testTime20Mins(12), testTime25Mins(13), testTime30Mins(14)	This specifies the test duration (in seconds) for the Remote and Local loopback tests with Self Test
TestSelection	INTEGER	read-write	stopTest or- noTest(1)	To halt the execution of any and all diagnostic tests that may be running, SET this object to stopTestorNoTest(1)
			localloop(2)	LocalLoopback test is running To initiate a LocalLoopBack with no Self-Test, SET this object to localloop(2). Data from the DTE will be looped back to itself
			localloopself test(3)	LocalLoopback with Self Test is running To initiate a LocalLoopBack SelfTest, SET this object to localloopselftest(3). The pattern specified in sc5553DiagPattern will be sent and checked for bit errors. The test will run for the time specified in sc5553DiagTestDuration, unless terminated by sending stopTestorNoTest(1). Test results can be checked by reading the sc5553DiagTestResults object
			digitalLoop(4)	DigitalLoopback test is running To initiate a DigitalLoopback test SET this object to digitalLoop(4). This will allow the data from the DTE attached to the far end unit (nms553) to be looped back to itself. This loopback can be terminated by sending stopTestorNoTest(1).

(Continued on next page)

Table C-6   Diagnostics Table (*=default setting) (Continued)

MIB Object	Syntax	Access	Enumeration	Description
TestSelection (continued)	INTEGER	read-write	remoteloop(5)	RemoteLoopback test is running
				To initiate a RemoteLoopback test with no SelfTest, SET this object to remoteloop(5). The sc5553 DSE transmits an in-band command to its remote DSU, directing the remote to loop received signals back to the network.
				The DSE is configurable to send (and accept) a PN127 remote loop command. The remote DSU must be configured to accept the same command the DSE transmits.
				This loopback can be terminated by sending stopTestorNoTest(1).
			remote-loopselftest(6)	RemoteLoopback with Self Test is running
				To initiate a RemoteLoopback with SelfTest SET this object to remoteloopselftest(6).
				The remote unit will go into remoteloopback and the master (sc5553) unit will go into SelfTest.
				The sc5553 transmits an in-band command to its remote DSU, directing the remote to loop received signals back onto the network.
				The DSE is configurable to send (and accept)a PN127 remote loop command.
				The remote DSU must be configured to accept the same command the DSE transmits. The sc5553 enables its internal Test Pattern Generator to provide the signal for
			networkdelay(7)	Network delay test is running
				To initiate a Network Delay Test SET this object to networkdelay(7).
				The results are valid only after the test is completed which takes about10 seconds.
				Network Delay Time can be checked by reading the sc5553DiagTestResults object after completion of the test.
				For a GET, the value stopTestorNoTest(1) indicates there are no active diagnostic tests currently running. Any other value indicates which test is currently active."

Table C-7: Maintenance Table (*=default setting)

MIB Object	Syntax	Access	Enumeration	Description
MaintIndex	SCinstance	read-only		
LedStatus (Octet 1)	OCTET STRING	read-only		Returns a bitwise snapshot of front panel LED state and front panel switches Octet 1 bit 7 - not used Octet 1 bit 6 - ON Octet 1 bit 5 - INSV Octet 1 bit 4 - RSP Octet 1 bit 3 - TMG Octet 1 bit 2 - future use Octet 1 bit 1 - future use Octet 1 bit 0 - future use
LedStatus (Octet 2)	OCTET STRING	read-only		Octet 2 bit 7 - not used Octet 2 bit 6 - SD transitions Octet 2 bit 5 - SD on/off Octet 2 bit 4 - RD transitions Octet 2 bit 3 - RD on/off Octet 2 bit 2 - RS transitions Octet 2 bit 1 - RS on/off Octet 2 bit 0 - future use
LedStatus (Octet 3)	OCTET STRING	read-only		Octet 3 bit 7 - not used Octet 3 bit 6 - CO transitions Octet 3 bit 5 - CO on/off Octet 3 bit 4 - ALM transitions Octet 3 bit 3 - ALM on/off Octet 3 bit 2 - TM transitions Octet 3 bit 1 - TM on/off Octet 3 bit 0 - future use
LedStatus (Octet 4)	OCTET STRING	read-only		Octet 4 bit 7 - not used Octet 4 bit 6 - ST (switch) Octet 4 bit 5 - LT (switch) Octet 4 bit 4 - RL (switch) Octet 4 bit 3 - DL (switch) Octet 4 bit 2 - future use Octet 4 bit 1 - future use Octet 4 bit 0 - future use

Table C-7   Maintenance Table (*=default setting) (Continued)

MIB Object	Syntax	Access	Enumeration	Description
SoftReset	INTEGER	read-write		Supports the action of soft resetting the unit. When this object is set to reset(1), the unit performs a soft reset.
				The value norm will be returned when the reset is complete. The value of norm can not be set by management
			reset(1)	-- write-only
			norm(2)	-- read-only
FrontPanel	INTEGER	read-write	inhibit(1), enable(2)*	This variable is used to indicate whether the front panel switches are operational or not
DefaultInit	INTEGER	read-write	factoryDefault(1) normal(2)	(1)--write only
				(2)--read-write
				This is used to allow the NonVolatile Configuration to be set to a factory default state. When this value is set to factoryDefault, the unit will reset to the default configuration. The value of normal will be returned when the initialization is complete. The value normal can not be set by management.

Table C-8:   Alarm Object Identifier Definitions Table

MIB Object	AccessEnumerationDescription
sc5553AlarmData	OBJECT IDENTIFIER ::= { sc5553Alarms 1 }
sc5553NoResponseAlm	OBJECT IDENTIFIER ::= { sc5553AlarmData 1 }
sc5553DiagRxErrAlm	OBJECT IDENTIFIER ::= { sc5553AlarmData 2 }
sc5553PowerUpAlm	OBJECT IDENTIFIER ::= { sc5553AlarmData 3 }
sc5553DTRLossAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 4}
sc5553DSRLossAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 5 }
sc5553DCDLossAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 6 }
sc5553TxCLossAlarm (Ext Clk Loss)	OBJECT IDENTIFIER ::= { sc5553AlarmData 7 }
sc5553TimingLoss (Shelf Timing)	OBJECT IDENTIFIER ::= { sc5553AlarmData 8 }
sc5553EEPROMCheckAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 9 }
sc5553EIATestAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 10 }
sc5553FrontPanelTestAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 11 }
sc5553TxDNoTransAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 12 }
sc5553RxDNoTransAlarm	OBJECT IDENTIFIER ::= { sc5553AlarmData 13 }

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