COMSPHERE
3600 SERIES
DATA SERVICE UNITS
MODELS 3610 AND 3611

TIME DIVISION MULTIPLEXER, MULTICHANNEL MULTIPOINT, AND DIGITAL BRIDGE OPTIONS SUPPLEMENT

March 1999

PARADYNE™

COMSPHERE
3600 Series Data Service Units
Models 3610 and 3611
Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options
Supplement
3610-A2-GB48-70

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Preface

About This Supplement

This supplement provides basic information to get you started using your COMSPHERE 3600 Series Data Service Unit (DSU) with a Time Division Multiplexer (TDM) or Multichannel Multipoint (MCMP) option installed. The supplement also provides a summary of TDM and MCMP capabilities, along with the unit's capabilities when it operates as a digital bridge.

It is assumed that you are familiar with the functional operation of data communications equipment.

How to Use This Supplement

Chapter 1 provides a general overview of the TDM, MCMP, and digital bridge capabilities for the 3600 Series DSU.

Chapter 2 explains the set up of your Model 3610 DSU with TDM or MCMP circuit card. To install a Model 3611 DSU with TDM or MCMP, refer to the *COMSPHERE 3000 Series Carrier, Installation Manual*.

Chapter 3 provides an overview of the front panel with TDM or MCMP and the DSU's status indicators.

Chapter 4 provides the basics of setting or changing configuration options for TDM, MCMP, and digital bridging. The configuration option tables supplement the DSU tables in the User's Guide and the DBM tables in the DBM Options Supplement.

Appendix A provides MUX factory default configuration options and the DSU's menu structure. Refer to the menu tree as you proceed through the menu from the front panel or SDCP if you have a Model 3611 DSU.

Appendix B provides MUX configuration worksheets to use during planning.

Appendix C contains TDM, MCMP, and digital bridge sample configurations.

Appendix D provides troubleshooting and a list of MUX configuration error messages that may appear on the front panel.

Appendix E contains technical specifications.

Refer to the User's Guide for an extensive Glossary and list of acronyms.

Product-Related Documents

For additional 3600 Series features, refer to the:

- *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, User's Guide,* for basic Data Service Unit (DSU) information and a product-related documentation table: Document No. 3610-A2-GB46.

- *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module Options Supplement* for the DBM features: Document No. 3610-A2-GB49.

- *COMSPHERE 3000 Series Carrier, Installation Manual*: Document No. 3000-A2-GA31.

Contact your sales or service representative to order additional product documentation.

Paradyne documents are also available on the World Wide Web at **www.paradyne.com**. Select *Library → Technical Manuals.*

Product Introduction 1

TDM/MCMP Common Capabilities

The TDM/MCMP option is an additional circuit card. TDM capability allows up to six independent ports to share one standard digital point-to-point facility. MCMP capability allows up to six ports to share one standard 56 kbps multipoint facility.

The TDM option can be software-defined to provide one of the following:

- TDM

- Digital bridge capability

The MCMP option can be software-defined to provide one of the following:

- MCMP

- TDM

- Digital bridge capability

Common features are:

- **Async/Sync conversion:** Provides point-to-point and multipoint asynchronous-to-synchronous data conversion for DTE ports for both EIA-232 and V.35. The DSU can send asynchronous data over a synchronous network.

- **FEP port sharing:** Provides a method of connecting a front-end processor (FEP) to two consecutive ports to broadcast the same message over the network and the shared ports. Up to three separate FEP port-sharing groups can be selected. Each group consists of two adjacent ports (1 and 2, 3 and 4, 5 and 6).

- **Elastic store per port:** Provides a transmit elastic store buffer for each port to support extended circuits. Supports both digital and analog extensions.

- **Switched-carrier emulation:** Provides optional switched-carrier emulation for each port for both inbound (toward the control DSU) and outbound (toward the tributary DSU) directions.

TDM Capability

TDM capability allows up to six independent ports to share one standard digital point-to-point facility. Additional TDM capability includes the following features:

- **Flex option:** There are two versions of the TDM/Flex standalone model:

    — 2-port TDM/Flex

    — 6-port TDM/Flex

    With either flex option installed, each port can be set independently as either an EIA-232 or V.35 interface.

- **Port capacity:** Model 3610 provides:

    — Up to six EIA-232 or V.35 ports with DSD or Flex models

    — An EIA-232 or V.35 Port 1 option and five EIA-232 ports for the Standard model

    Model 3611 uses the Standard model and a six-port DTE connector module. The connector module includes six 25-pin DTE connectors and a 26-pin high-density connector for the V.35 alternate Port 1 option. Model 3611 does not have V.35 for Ports 2–6.

- **Port speeds:** Individual TDM ports (1 through 6) can be set to a variety of speeds. The sum of the port speeds cannot exceed the DSU data rate.

- **Digital sharing:** Allows two groups of consecutive ports to share the same TDM channel. All ports in a digital-sharing group operate at the same speed and receive the same data.

- **Data rates:** Operates up to 64 kbps full-duplex.

- **Primary network interface:** The alternate Port 1 on the DSU provides an internal aggregate data stream. When the Network Interface configuration option is set to forced on, the unused V.35 or EIA-232 interface functions as an external TDM. A connection can be made to any multiplexer or DSU/CSU.

    When the DSU powers up, data automatically switches to the alternate Port 1. No DDS connection is required. Any cluster controller requiring subrate can be supported at a remote site. Using the alternate Port 1 for the network interface supports:

    — DBM, TDM, and MCMP options

    — Disruptive and Nondisruptive diagnostics

    — Rate Adaption and In-Band Framing

    — Aggregate data rates of 64, 56, 19.2, 9.6, 4.8, and 2.4 kbps

- **Digital bridge:** Performs digital bridge functions and supports many applications, including dedicated multipoint dial backup and multipoint LADS operation.

- **Flexible device control:** Provides the same diagnostic capabilities as a point-to-point 3600 Series DSU without the TDM option. Allows control of the TDM option from the front panel, an async terminal, or a 6700 or 6800 Series NMS.

- **Point-to-point backup:** Allows a DSU with TDM to have a DBM installed for point-to-point dial backup. If backup is at a different port speed than the DSU's port speed, TDM operation automatically changes to a second predefined port speed to support dial backup operation at a lower port speed.

MCMP Capability

MCMP capability allows up to six independent application programs to share one standard 56 kbps multipoint facility. MCMP capability provides the following features:

- **Channel capacity:** Provides up to eight channels, which can be matched to all enabled ports.

- **Flex option:** There are two versions of the MCMP/Flex standalone model:

  — 2-port MCMP/Flex

  — 6-port MCMP/Flex

  With either flex option installed, each port can be set independently as either an EIA-232 or V.35 interface.

- **Port capacity:** Model 3610 provides:

  — Up to six EIA-232 or V.35 ports with DSD or Flex models

  — An EIA-232 or V.35 Port 1 option and five EIA-232 ports for the Standard model

  Model 3611 uses the Standard model and a six-port DTE connector module. The connector module includes six 25-pin DTE connectors and a 26-pin high-density connector for the V.35 alternate Port 1 option and up to five EIA-232 ports. Model 3611 does not have V.35 for Ports 2–6.

- **Digital sharing:** Allows up to three digital-sharing devices at each tributary by assigning channels to more than one port. All ports operate at the same speed and receive the same data.

  MCMP capability allows digital sharing and multiplexing simultaneously at any tributary site.

- **Number of addressable devices:** Supports up to 40 tributary DSUs or 20 tributary DSUs with DBMs, each equipped with an MCMP circuit card.

- **Channel speeds:** Speeds of the individual channels can be set to a variety of speeds. The sum of the channel speeds cannot exceed 48 kbps.

- **Multipoint dial backup:** Provides multipoint service restoration. When Network Interface configuration option is set to AggSw, the DSU provides an internal aggregate data stream for diagnostics and framing on alternate Port 1. The alternate Port 1 can be connected to an extended bridge.

DSU with Digital Bridge Capability

Digital bridging is used primarily for dedicated multipoint dial backup. A digital data service (DDS) multipoint network can be backed up with:

- V.32 analog DBM

- Switched 56 kbps calls between the central-site and remote-site DBMs that are connected by the digital bridge

- ISDN (Integrated Services Digital Network)

The digital bridge capability is dedicated to a single DSU. The DTE connected to the DSU is usually the controlling DTE of a multipoint network. Configure either the TDM or MCMP option to provide the digital bridge capability.

The digital bridge capability, when used to support dedicated multipoint dial backup, includes the following features:

- **Number of tributaries:** Provides dedicated multipoint dial backup for up to 20 tributary DSUs. Four additional DSUs with TDMs are required for each configured extended bridge (EBrdg).

- **Partial and full backup:** Provides multipoint dial backup for both partial and full backup on DDS multipoint circuits, depending on configuration.

- **Security:** DBMs provide multiple levels of call setup security.

- **Restoration:** When the DSU rate equals the DBM rate, preconfigured tributary DSUs can automatically drop the backup connection and switch back to the DDS facility when the DDS network is restored.

LPDA-2 with TDM or MCMP

The SNA Diagnostic Interface uses the Release 2 Link Problem Determination Aid (LPDA-2) protocol. The LPDA-2 protocol is installed on the DSU circuit card. When enabled:

- With TDM or MCMP, LPDA-2 is only supported on Port 1.

- For digital sharing, all ports are supported.

TDM/MCMP Installation and Setup 2

Before You Begin

The Model 3610 DSU with the TDM or MCMP option is delivered with default hardware settings, factory default configuration option settings, and factory-installed software.

Please note the following:

- Port 1 of the DSU is preconfigured to operate with the TDM or MCMP capability enabled. The DSU includes the factory default configuration option settings for FacT with some defaults based on hardware. Refer to Table A-1 for MUX configuration option default settings.

- For the Model 3610, all additional ports are disabled and preconfigured for EIA-232 port interface operation. Each port configured for V.35 needs an adapter (feature number 3000-F1-510).

- Once a DSD model is powered up, you can verify the port interface switch setting through the right side of the back panel.

  — If set for EIA-232, you will see a green light.

  — If set for V.35, you will see a yellow light.

Installing the DSU

The Model 3610 DSU is designed for desktop operation.

- Place the DSU in the planned location.

- Allow 1 to 2 feet of clearance for cable connections, space for the ventilation slots on the sides, and clearance at the rear for the cable connections.

Hardware Settings

┌─────────────────────────────────────┐
│   **HANDLING PRECAUTIONS**   │
│   **FOR**   │
│   **STATIC-SENSITIVE DEVICES**   │
│   │
│ **This product is designed to   │
│ protect sensitive components   │
│ from damage due to electrostatic   │
│ discharge (ESD) during normal   │
│ operation. When performing   │
│ installation procedures, however,   │
│ take proper static control   │
│ precautions to prevent damage to   │
│ equipment. If you are not sure of   │
│ the proper static control   │
│ precautions, contact your nearest   │
│ sales or service representative.**   │
└─────────────────────────────────────┘

TDM/Flex and MCMP/Flex models are available with two or six ports. When your firmware version is 6.33 or greater, each port can be set individually for either EIA-232 or V.35 using the front panel, an async terminal, or an NMS.

Based on your model, you may need to perform one of following procedures. Use ID from the Status branch to obtain the firmware version.

If your model is a 6-port . . .	And the EIA232 setting . . .	Then . . .
TDM/Flex or MCMP/Flex with firmware 6.33 or greater	Is correct	Go to the *Powering Up the DSU* section, page 2-4.
	Needs to be changed	Go to the *Powering Up the DSU* section, page 2-4 and the *Reconfiguring Ports* section, page 2-5.
TDM/Flex or MCMP/Flex with firmware less than 6.33	Is correct	Go to the *Powering Up the DSU* section, page 2-4.
	Needs to be changed	Change the S1 switch setting on the TDM/Flex or MCMP/Flex circuit card to ON for V.35 or Off for EIA-232.
TDM/DSD or MCMP/DSD	Is correct	Go to the *Powering Up the DSU* section, page 2-4.
	Needs to be changed	Change the option card to set all six ports; start with next section, *Opening the DSU*.

Opening the DSU

```
NOTE

If the unit is already installed,
disconnect all cables, including
the power source, before
opening the DSU.
```

Follow this section to change a TDM/DSD or MCMP/DSD model from:

- EIA-232 interface to V.35 interface, or

- V.35 interface to EIA-232 interface

Use a small flat-head screwdriver to release the four snap tabs holding the base in place. Remove the cover. Do not allow any cables to pull free from the inside front panel connectors.
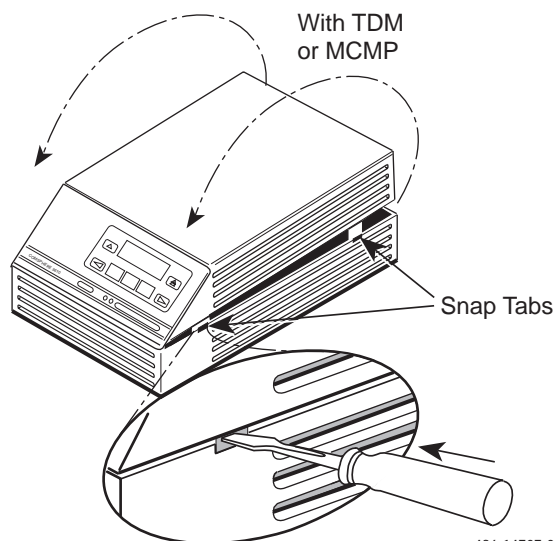
496-14707-01

Separating the DSU from the TDM or MCMP

Follow this procedure to separate the DSU circuit card from the TDM or MCMP (refer to Figure 2-1).

▶ **Procedure**

1. Disconnect the keypad flat cable from the DSU circuit card by squeezing the latches on each side of the cable connection and pulling up on the keypad flat cable.

2. Disconnect the LCD flat cable by working the cable free of the connector.

3. Disconnect the TDM or MCMP flat cable.

4. Unscrew the three screws holding the DSU circuit card in place.

5. Lift the DSU circuit card from the base and set aside.

Keypad Flat Cable

LCD Flat Cable

Screw

DSU Circuit Card

Snap Tabs

Expanded Base

Screw

TDM or MCMP Flat Cable

Screw

Snap Tabs

495-13846c
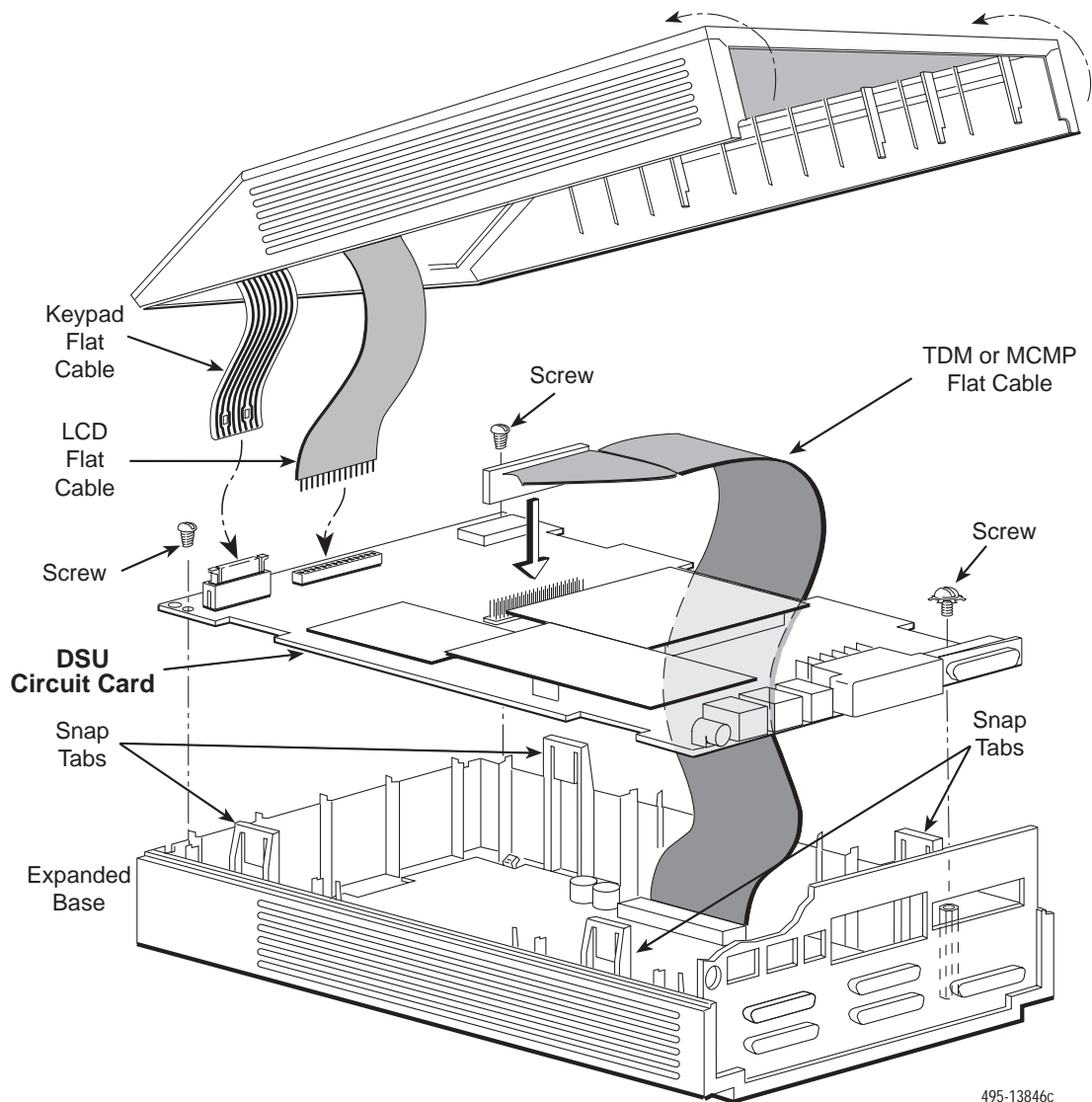
Figure 2-1. Disassembling a TDM or MCMP DSU

Changing the DSD Option Card Setting

For the TDM/DSD or MCMP/DSD model, use the following procedure to change the setting from EIA-232 to V.35 or from V.35 to EIA-232.

▶ **Procedure**

1. Work the option card free of its connector.

496-13845-03
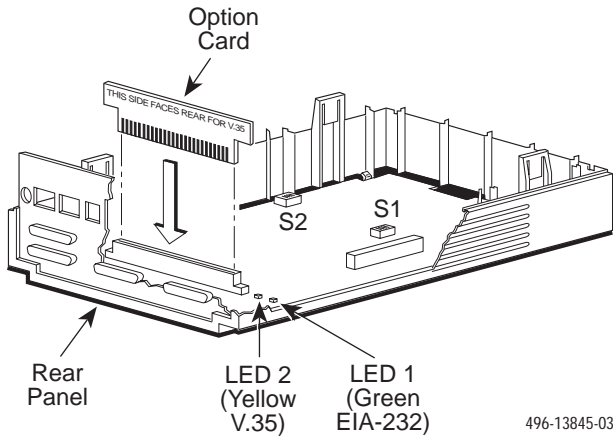
2. Turn the card around and re-insert. In the example above, the card reads **THIS SIDE FACES REAR FOR V.35**.

3. Continue with next section, *Reassembling the DSU*.

Reassembling the DSU

▶ **Procedure**

1. Reinstall the DSU circuit card, using the three screws.

2. Reconnect the three flat cables:

   — TDM/MCMP

   — Keypad

   — LCD

3. Align the rear panel and four snap tabs. Replace the cover over the expanded base, allowing the four tabs to snap into place.

Powering Up the DSU

> **CAUTION**
>
> **The power cord contains a 3-wire grounding-type plug which has a grounding pin. This is a safety feature. Grounding of the unit is vital to ensure safe operation. Do not defeat the purpose of the grounding plug by modifying it or by using an adapter.**
>
> **Prior to installation, use an outlet tester or voltmeter to check the ac receptacle for earth ground. If the power source does not provide a ground connection, consult an electrician to determine another method of grounding the unit before proceeding with the installation.**

▶ **Procedure**

1. At the rear of the DSU, insert the small end of the power cable into the receptacle labeled POWER.

495-14710
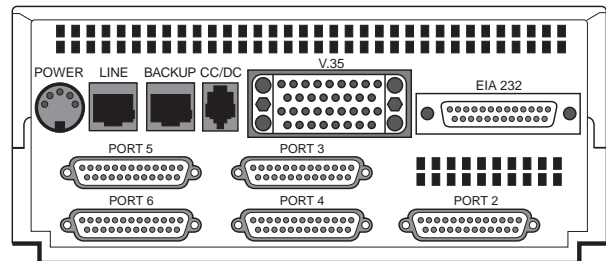
> **CAUTION**
>
> **Only use the power transformer designed for the Model 3610 DSU. Using other transformers may result in personal injury or damage to the equipment.**

2. Connect the 3-prong plug at the other end of the cable to an ac outlet.

Power-Up Routine

When you apply power the first time, the DSU performs a power-up routine and:

- Determines what hardware options are installed. This may include MUX to represent TDM or MCMP.

- Automatically runs a Device Test on the DSU and each installed hardware option. All front panel lights flash on and off.

- If a TDM or MCMP is installed, MUX appears as Pass or Fail on the LCD.

Refer to your User's Guide for power-up messages and steps for saving and changing configuration options. Refer to Table D-1 for Configuration Error messages.

If a **Fail** message appears or an installed hardware option does not appear, see Appendix D, *Troubleshooting and Front Panel Messages*. Refer to Document No. 3610-A2-GB46 for DSU troubleshooting and Document No. 3610-A2-GB49 for DBM troubleshooting.

DTE Connections

Make the DTE connections as described in the User's Guide, Document No. 3610-A2-GB46.

In a TDM or MCMP application, all ports default to EIA-232 port interface operation. For MCMP/TDM Flex, Ports 1 through 6 can be set individually to EIA-232 or V.35 by using the MUX port configuration options.

For an EIA-232 connection with distances greater than 50 feet or data rates higher than 19.2 kbps, use short, high quality cable with low capacitance and a DTE capable of supporting the distance and data rate.

When Port 1 requires a speed higher than 19.2 kbps, it is recommended that the port interface be set to V.35. An adapter is required for every port (2 through 6) that is set to V.35 interface.

Reconfiguring Ports

If you have a MCMP/TDM Flex with a firmware version 6.33 or greater, you can configure each port for either EIA-232 or V.35 interface compatibility from the front panel, an async terminal, or an NMS.

To set a port for EIA-232 or V.35 operation:

▶ **Procedure**

1. From the Home screen, select **Local** (F1). The following screen appears on the LCD.

```
  ┌────┐  ┌──────────────────────┐  ┌────┐
  │ △  │  │ Local Mode:          │  │ △  │
  └────┘  │  Stat   Bckup   Test │  └────┘
          └──────────────────────┘
  ┌────┐  ┌────┐  ┌────┐  ┌────┐  ┌────┐
  │ ◁  │  │ F1 │  │ F2 │  │ F3 │  │ ▷  │
  └────┘  └────┘  └────┘  └────┘  └────┘
```

   Confg   Ctrl
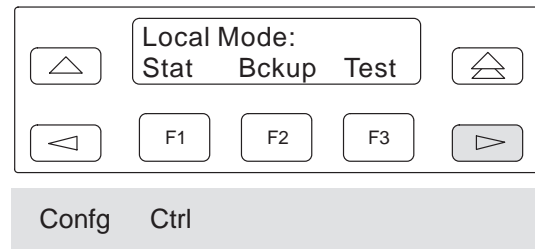
2. Press the ▷ key until Confg appears.

3. Select **Confg** (Configuration branch). The Configure screen appears.

4. Select **Opts**. The **Load from** screen appears.

5. Select **Activ** (F1). The Edit/Save screen appears.

```
  ┌────┐  ┌──────────────────────┐  ┌────┐
  │ △  │  │ Edit/Save:           │  │ △  │
  └────┘  │  SAVE   DSU    Diag  │  └────┘
          └──────────────────────┘
  ┌────┐  ┌────┐  ┌────┐  ┌────┐  ┌────┐
  │ ◁  │  │ F1 │  │ F2 │  │ F3 │  │ ▷  │
  └────┘  └────┘  └────┘  └────┘  └────┘
```

   DBM   Gen   Bkup   MUX   PrtSp

   LPDA
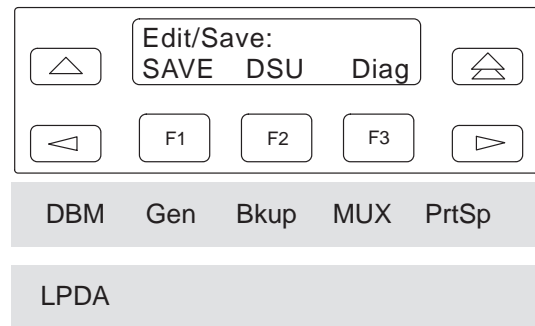
6. Press the ◁ or ▷ key to scroll the MUX option set into view.

7. Press the function key directly below MUX. The Change MUX Opts screen appears.

```
              Change MUX Opts:
  [ △ ]       Copy   Setup   Prt1     [ ⟰ ]

  [ ◁ ]   [ F1 ]    [ F2 ]    [ F3 ]   [ ▷ ]


     Prt2    Prt3    Prt4    Prt5    Prt6
```
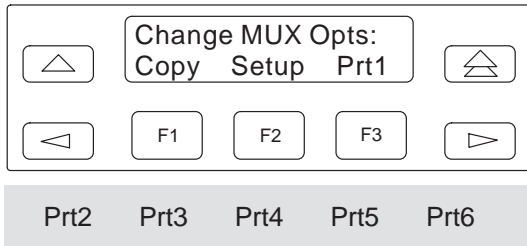
8. Select a port:

   • Any of the installed ports, Prt1 through Prt6, for a 6-port MCMP/TDM Flex

   • Prt1 or Prt2 for a 2-port MCMP/TDM Flex

9. Press **Next** or **Prev** and select **EIA232** or **V.35**.

```
              DTE Port:      EIA232
  [ △ ]       Next    EIA232   V.35    [ ⟰ ]

  [ ◁ ]   [ F1 ]    [ F2 ]    [ F3 ]   [ ▷ ]


     Prev
```
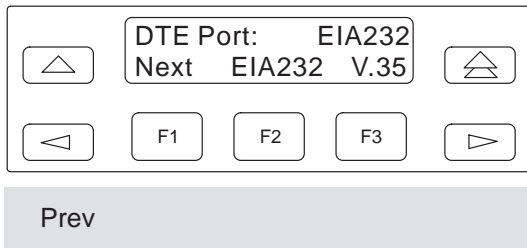
If you are . . .	Then return to . . .
Selecting another port	Change MUX Opts, Step 7.
Finished	The **Edit/Save** screen.

10. Select **SAVE**.

Network Verification Testing

Perform verification testing after any installation.

▶ **Procedure**

1. Request a device Identity report from each tributary to ensure that the DSU is addressed properly (**ID** from the Status branch).

   ```
   ┌─────────────────────────────┐
   │            NOTE             │
   ├─────────────────────────────┤
   │  The Model 3610 is delivered │
   │  with its network address set to │
   │  254.                       │
   └─────────────────────────────┘
   ```

2. Perform a Digital Test on the DDS circuit to ensure that the network is functioning (**DT** from the Test branch).

   Perform a Digital Test on each:

   — Active port when MUX Funct is set to TDM

   — Tributary DSU when MUX Funct is set to MCMP

   ```
   ┌─────────────────────────────┐
   │            NOTE             │
   ├─────────────────────────────┤
   │  A control DSU can originate a │
   │  Digital Test in a point-to-point or │
   │  multipoint network. Use Position │
   │  in the Diagnostic General   │
   │  configuration option table to set │
   │  a unit to Cntrl.           │
   │                             │
   │  A tributary DSU can originate a │
   │  Digital Test in a point-to-point │
   │  network only, provided the │
   │  configuration option Respond to │
   │  Remote Digital Loopback    │
   │  (RespondRDL) is enabled in the │
   │  control.                   │
   └─────────────────────────────┘
   ```

For additional verification steps, refer to Appendix D, *Troubleshooting and Front Panel Messages*.

Front Panel Operation 3

Overview

You can manage a 3600 Series DSU from:

- The front panel

- An async terminal

- A 6700 or 6800 Series NMS

The front panel menus are organized as a branching hierarchy or menu tree. Refer to these reference materials as you proceed through the DSU's menus.

- Appendix A contains this menu tree.

- Chapter 4 presents configuration option tables.

- Appendix B contains Configuration Worksheets.

Front Panels

The front panel is the user interface to the DSU. There are two types of front panels:

- Front panel on the Model 3610 DSU (see Figure 3-1).

- SDCP (shared diagnostic control panel) used with the Model 3611 DSU (see Figure 3-2) in a COMSPHERE 3000 Series Carrier.
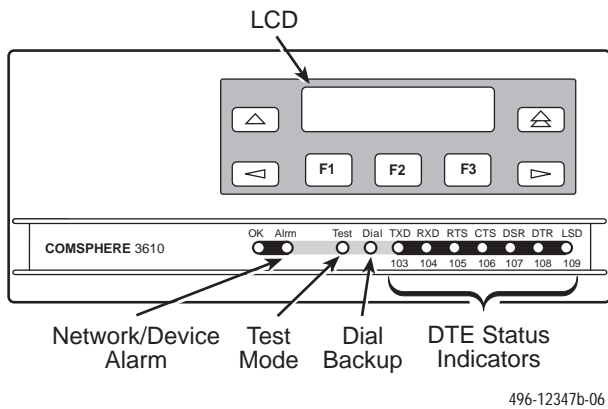
Figure 3-1. Model 3610 Front Panel

Front panel operation does not vary with the addition of DSU options (DBM, TDM, MCMP, or SNA Diagnostic Interface). However, menu or selection displays may vary based on installed options. Refer to the User's Guide for basic front panel, display, keypad, and menu function information.

A Model 3611 DBM with Primary Core set to Yes does not function as a DSU and is labeled with an alpha code: DBM-D, DBM-I, DBM-S, and DBM-V. A DBM-*X* is a Model 3611 DBM-D, DBM-I, DBM-S, or DBM-V. Refer to Document No. 3610-A2-GB49 for DBM details. Any MUX function is operational with a DBM-*X*.
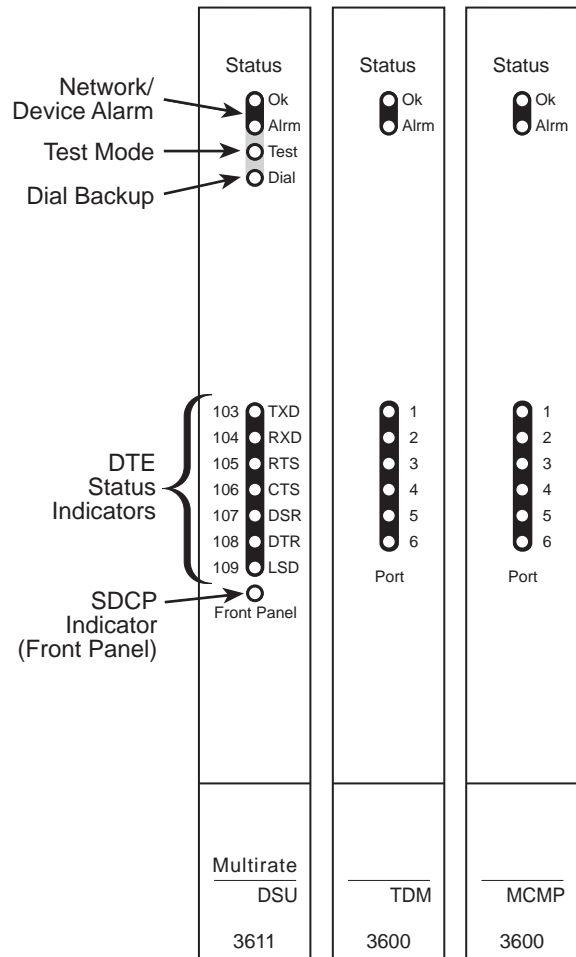
Figure 3-2. Model 3611 DSU, TDM and MCMP Faceplates

Status Indicators

The status indicators on the Model 3610 DSU's front panel and on the Model 3611 DSU's faceplate continuously provide information on the current operating condition of the DSU.

Refer to the *COMSPHERE 3000 Series Carrier Installation Manual* for SDCP status indicator tables; these are unchanged by the presence of a TDM or MCMP circuit card.

The status indicators of the carrier-mounted Model 3611 DSU are spread across the SDCP, DSU, TDM, or MCMP faceplates. Refer to Table 3-1 for TDM and MCMP status indicators and descriptions.

Table 3-1
Model 3611 TDM and MCMP Status Indicators

LED	Color	Description
OK	Green	Health and status indicator: TDM or MCMP operation is normal. Indicator flashes two times per second if a message is present.
Alrm	Red	Health and status indicator: There is an alarm in the TDM or MCMP hardware, firmware, or a corrupted configuration. A voltage spike on the power line or momentary loss of power may cause an alarm. The DSU automatically reloads the active set of TDM or MCMP configuration options. When the reload has completed, the **Alrm** LED goes Off and the TDM or MCMP **OK** LED comes ON.
Port 1, 2, 3, 4, 5, or 6	Green	TDM or MCMP mode: Shows ports currently being monitored. The status of the port's leads is displayed on the faceplate of the associated DSU. One of the six ports can be monitored at any given time; the port to be monitored is selected at the SDCP. When Network Interface is set to aggregate switch (AggSw), all ports are monitored and all LEDs will be ON. Bridge mode: The port LEDs perform differently. The LEDs indicate which ports had RTS ON during the last second. When the port is connected to a DCE device, the port RTS becomes the received LSD signal of the DCE device. The LEDs indicate which ports had upstream activity during the last second.

Menu Structure

A 3600 Series DSU comes factory-loaded with default configuration settings:

- Model 3610 DSU is configured as a tributary (FacT)

- Model 3611 DSU is configured as a control (FacC)

- DSU with MCMP/TDM comes configured as a TDM

Menus and Modes of Operation

A DSU without TDM or MCMP operates in Basic mode. A DSU equipped with TDM or MCMP can operate in one of several modes. The mode of operation affects which menus appear and the selections available within the menus. Use the MUX Function configuration option to set the mode of operation (Table 4-1).

Access to all network management tasks from the front panel begins at the top-level menu, the head of the menu hierarchy. Press the △ key from anywhere in the menu to return to the top-level menu.

495-12970b
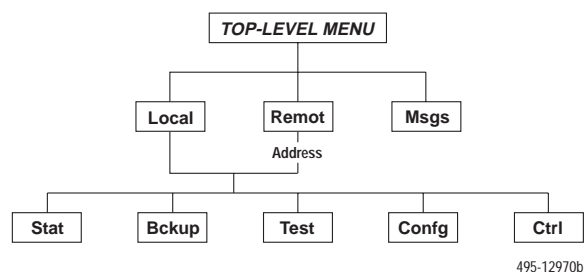
Local/Remote Branch Menus

The Local branch menu has five branches; the Remote branch has four (Bckup is not available):

- Status **(Stat)** branch

- Backup **(Bckup)** branch

- **Test** branch

- Configuration **(Confg)** branch

- Control **(Ctrl)** branch

Each selection leads to submenus. Factors determining which selections or options are available are:

- DSU is in Display mode and operating in DSU mode

- DSU has Full mode disabled

- DSU is a control or tributary

- Selecting the Local or Remote branch

- DBM is installed

- TDM/MCMP is installed

Status Branch

The Status (**Stat**) branch includes reports on the health and status of the DSU, TDM, MCMP, and DBM.

496-12970-02

Health and Status

Health and Status (**H/S**) displays the health and status of the DSU, and DBM, TDM or MCMP, if installed. DSU and line conditions are automatically scanned for normal limits. Refer to the User's Guide for Health and Status messages.

Device Health and Status

Device Health and Status (**Devic**) reports health and status information for a selected DSU.
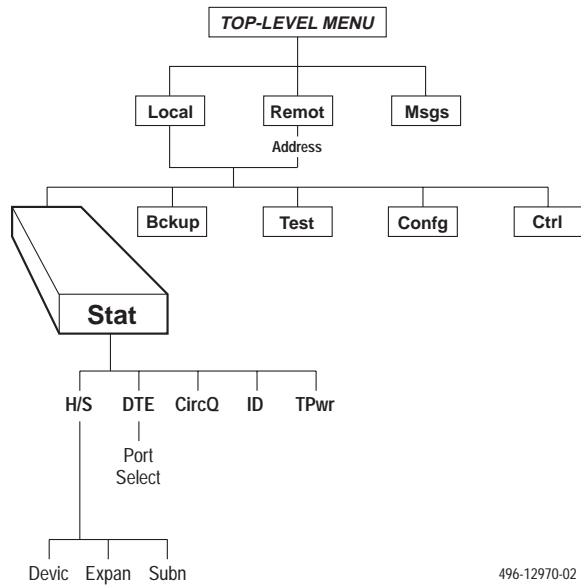
For a DSU with TDM or MCMP, the Device Health and Status report displays:

- The health and status of both the DSU and TDM or MCMP circuit cards.

- Any test or alarm involving the TDM or MCMP that also affects the DSU.

- Any test or alarm that appears on the DSU's Device Health and Status report.

DTE Status

DTE status is a snapshot display of the local or remote DSU/DBM's external DTE interface status. For TDM, MCMP, or Bridge mode, an additional port number screen appears.
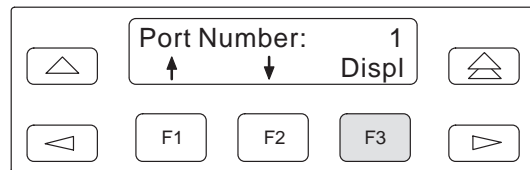
Use F1 and F2 to change the port number and F3 to display the status.

The following external DTE interface data appears for the selected DSU with TDM or MCMP. The display may differ from the DSU's LED indicators which reflect the internal states of the interface circuits.
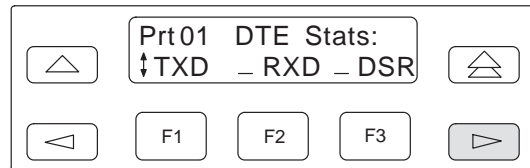
The DTE interface leads appear in sets. Use the ◁ or ▷ key to scroll and view the next set of DTE leads. Table 3-2 translates the status codes.

Table 3-2
DTE Lead Status Codes

Code	Lead Status
‾	ON/SPACE (line above text line)
_	Off/MARK (line below text line)
↑↓	In transition between Off and ON

Circuit Quality

Circuit Quality (**CircQ**) is a display of the DDS Receive Signal Loss and analog DBM measurements. Circuit Quality does not display when MUX Function is set for EBrdg. Refer to Document No. 3610-A2-GB46 for more information.

Identity

Identity (**ID**) displays a report showing a DSU's model number, serial number, software/firmware version, network address, DDS rate, DBM rate, and the DBM type installed. For a DSU with TDM or MCMP, the TDM or MCMP circuit card's model, application, and firmware version also appear. Refer to Table 3-3 in your User's Guide for Identity Descriptions.

Terminal Power

Terminal Power (**TPwr**) is a display showing the status of the connected DTE's EIA-232 and V.35 interface. For a DSU with TDM or MCMP, Terminal Power displays the RTS lead status for the DTE connected to the DSU for Port 1. The front panel displays On when the voltage is less than –3V or greater than +3V.

Backup Branch

The Backup (**Bckup**) branch controls operation of digital bridging when a DSU with TDM or MCMP has MUX Funct set to CBrdg or EBrdg.

496-12971-06
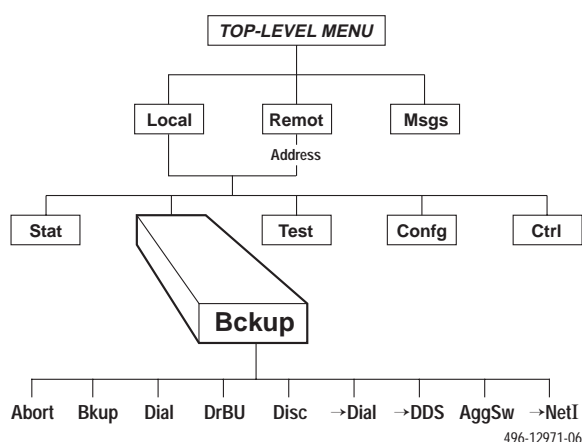
For additional use of the Backup branch, refer to Document No. 3610-A2-GB46 for network interface aggregate switching and Document No. 3610-A2-GB49 for DBM information.

Digital Bridging

Use the Backup branch to configure a digital bridge. Refer to Appendix C for configuration examples.

Central-Site Bridge

For a DSU configured as a central-site bridge (**CBrdg**), the backup options available are **Bkup** and **DrBU**. Refer to Table 4-2 for Digital Bridge Setup Configuration Options.

- **Bkup** (backup) is used to:

  — Activate the bridge

  — Disconnect DDS line from bridge

  — Switch to the timing source specified by the **Bridge Timing** configuration option

  Do not initiate the Bkup option for a partial multipoint backup.

- **DrBU** (drop backup) is used to:

  — Deactivate the bridge

  — Connect the DDS line to bridge

  — Switch to the DDS line using timing specified by the DSU **TxClkSource** configuration option

For a DSU configured as a central-site bridge with the Bridge Rate configuration option set to =**DSU**, the following is an example of the display for partial backup of a CBrdg.
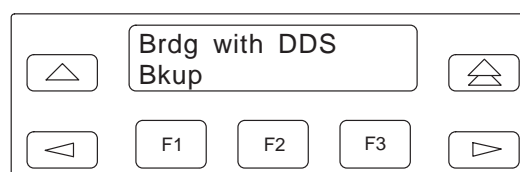
For a DSU configured as a central-site bridge with the Bridge Rate configuration option set to a data rate, the following screen appears. The DDS and backup data rates can be different.

Extended Bridge

For a DSU configured as an extended bridge (**EBrdg**):

- DSU/DBM is always in Dial Backup mode and no Backup menu options appear

- DBM circuit card should not be installed. If installed, the DBM must be disabled

When in full backup, the following screen appears.

```
┌──────────────────────────────────────┐
│  ┌────┐   ┌─────────────────────┐     │
│  │ △  │   │ Brdg  w/o  DDS      │ ┌──┐│
│  └────┘   │ DrBU                │ │△△││
│           └─────────────────────┘ └──┘│
│  ┌────┐  ┌────┐ ┌────┐ ┌────┐  ┌────┐ │
│  │ ◁  │  │ F1 │ │ F2 │ │ F3 │  │ ▷  │ │
│  └────┘  └────┘ └────┘ └────┘  └────┘ │
└──────────────────────────────────────┘
```
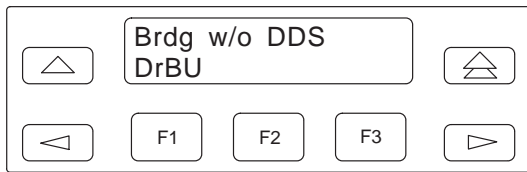
Test Branch

The **Test** branch provides extensive testing capabilities for the DSU, DDS circuit, DBM, and backup circuit.

While performing a multiplexing function for a DSU, tests can be requested on individual ports or on the aggregate data path. Multiplexing functions include:

- TDM or MCMP

- Nondisruptive diagnostics

- Rate adaption

On the aggregate data path, Local Loopback (LL) and End-to-End (EE) tests can be run.

Performing tests on the aggregate data stream tests the entire bandwidth, and in-band transport communication is lost. For tests such as aggregate Digital Loopback (DL), the control DSU reports a **No Response** or a **TribTimOut** alarm for downstream devices.

When the tributary DSU receives a test request from the control DSU, any locally initiated test in progress is aborted.
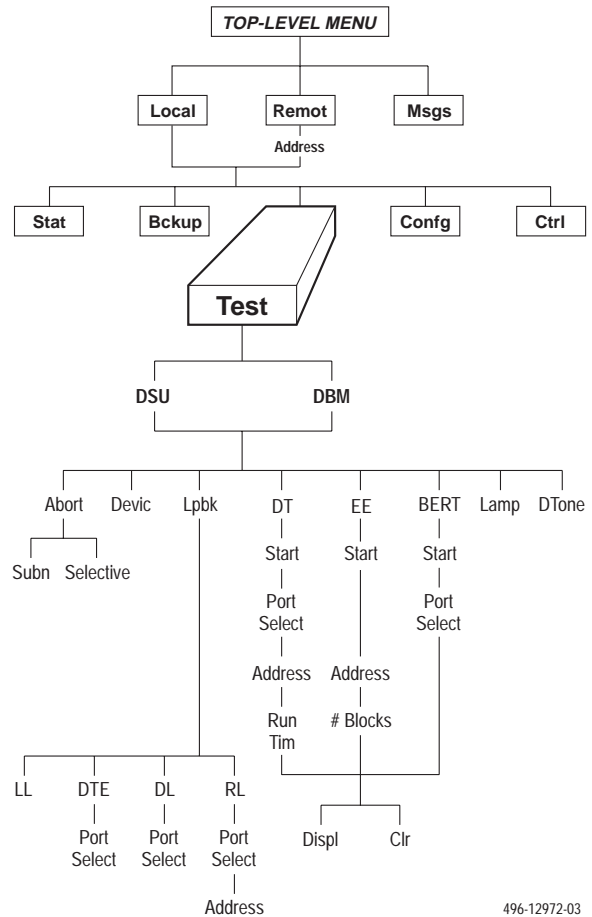
496-12972-03

NOTE

Running a test can affect your application data or may cause your application session to be dropped depending upon the protocol, front-end processor, or time-out parameters. No data or acknowledgment messages will be transmitted while the test is in progress.

Abort

Abort allows you to stop a test currently running. The DSU is not allowed to run any other test until the test in progress completes or is aborted.

Device Test

The Device (**Devic**) Test is an internal self-test. If TDM or MCMP is present, the Device Test will test the MUX circuit card also.

Loopbacks

Loopback (**Lpbk**) provides four loopback tests. Figure 3-3 shows the direction of each loopback on the circuit. Refer to Document No. 3610-A2-GB46 for additional loopback information.

Local Loopback

Local Loopback (**LL**) is session-disruptive; performing the test disrupts data. The DTE may run a test to determine if the DTE to DSU connection and the DSU itself are functioning properly.

- The DSU must be connected to the DTE.

- Network connection to the DSU is not required.

- For TDM, MCMP, or Bridge mode, the entire data stream is looped back and all six ports are in Local Loopback.

DTE Loopback

DTE Loopback (**DTE**) loops back the data path at the DTE/DCE interface on a per-port basis without affecting the operation of the remaining ports. The DSU with TDM or MCMP permits one active test at a time.

Digital Loopback

Digital Loopback (**DL**) allows manual testing with the remote end of the circuit. DL can be initiated from a control or a point-to-point tributary.

Selecting one port or all active ports (**Aggr**) loops back the user-transmitted data and the in-band secondary channel transport data when nondisruptive diagnostics are in effect. This disrupts in-band data transport communications.

In Bridge mode, a Basic mode loopback occurs without port selection. For MCMP mode, using the NetIntf selection to perform a Digital Loopback is not a valid command.

Remote Digital Loopback

Remote Digital Loopback (**RL**) supports testing by an external device, such as a test pattern generator connected to the local DSU's DTE interface. This tests the local DSU and the DDS circuit.

- In TDM or MCMP mode, asserting power to Pin 21 on Port 1 initiates a V.54 aggregate loopback. This loopback is performed on the DDS circuit unless a dial backup session is active.

- In MCMP mode, the port selected is not automatically the port placed in loopback at the remote location. If a channel assigned to Port 2 locally is assigned to Port 3 remotely, Port 3 at the remote location is placed in loopback.

To abort a Remote Digital Loopback, issue an Abort command to the control DSU.
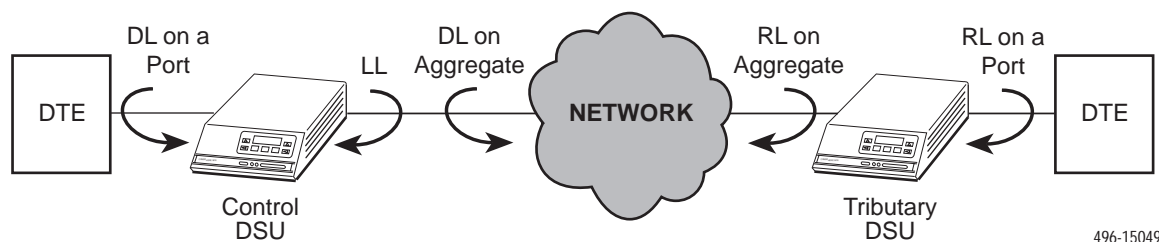
Figure 3-3. Loopbacks Example

Digital Test

The Digital Test (**DT**) verifies operation of a pair of DSUs and the data circuit between them. When a Digital Test is performed on a specific port, data transmission is not affected on the other ports.

For a DSU operating in single-port mode and having either nondisruptive diagnostics or rate adaption in effect, an additional selection for Aggr or Prt1 appears.

Selecting Aggr tests the looped data path; in-band communication transport data is not allowed.

End-to-End Test

The End-to-End (**EE**) test analyzes a control and a tributary DSU or DBM and the network circuit between them in both directions independently. Refer to Document No. 3610-A2-GB46 for additional information.

Bit Error Rate Test

The Bit Error Rate Test (**BERT**) is session-disruptive and transmits a test pattern to analyze the network circuit. Refer to Document No. 3610-A2-GB46 for additional information.

Dial Tone Test

The Dial Tone test (**DTone**) allows a DBM to test for dial tone. This selection does not appear in the DSU's Test branch.

Configuration Branch

The Configuration (**Confg**) branch allows you to configure or customize the DSU and its options.

The Configuration branch menu varies with the options being configured. With TDM or MCMP installed, the MUX and PrtSp (Port Speed) option sets appear.

Refer to the configuration option tables in Chapter 4, the menu tree in Appendix A, and the configuration worksheets in Appendix B for additional configuration details. Additional Configuration branch menu details are in Document No.:

- 3610-A2-GB46 for DSU information
- 3610-A2-GB49 for DBM information

496-12973-07
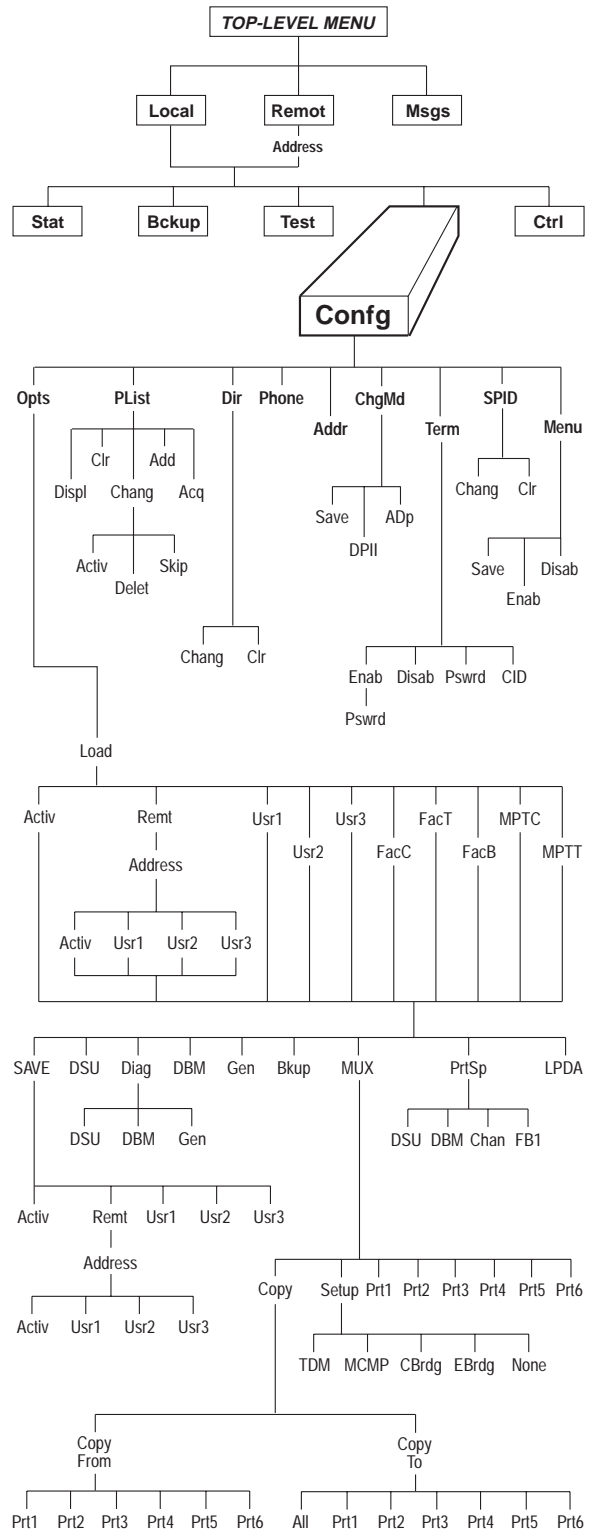
Options

Options (**Opts**) allows you to save, copy, and/or change DSU, Diagnostic, DBM, General, Backup, MUX, port speeds, and LPDA-2 configuration options.

When changing configuration options, always set the mode first (MUX Funct) in the MUX option set (Table 4-1).

- For a DSU with TDM or MCMP, you can set the DSU's MUX operating mode to TDM, MCMP, Bridge, or None. Selecting None disables the MCMP/TDM card and the DSU operates in Basic mode. No MUX configuration options appear.

```
 ┌──────┐   ┌─────────────────────┐   ┌──────┐
 │  △   │   │ MUX Funct: MCMP     │   │  △   │
 │      │   │ Next   TDM   MCMP   │   │      │
 └──────┘   └─────────────────────┘   └──────┘
 ┌──────┐  ┌────┐  ┌────┐  ┌────┐   ┌──────┐
 │  ◁   │  │ F1 │  │ F2 │  │ F3 │   │  ▷   │
 └──────┘  └────┘  └────┘  └────┘   └──────┘

    CBrdg  EBrdg   None    Prev
```
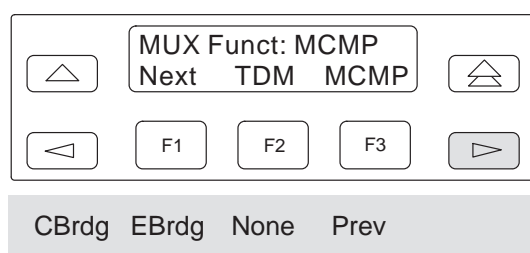
- When a MCMP/TDM is installed, the CBrdg and EBrdg selections are also available to place the DSU in Bridge mode.

    — CBrdg operates as a central-site bridge.

    — EBrdg operates as an extended bridge.

    When a bridge configuration consists of a central-site bridge with one or more extended bridges, digital bridge options must be set for each DSU in the bridge.

- For TDM, MCMP, or Bridge mode, a port number (6-port version or 2-port version) must be specified before issuing some commands. The results sent back from the DSU may vary depending upon the operating mode (MUX Funct) and port selected.

Refer to Table D-1 for configuration error messages that may appear after pressing SAVE.

Poll List

Poll List (**PList**) maintains or changes a DSU's poll list and interfaces with an active internal NMS. A poll list identifies all DSUs or DBMs one level downstream. PList is available for point-to-point tributary DSUs, or tributaries configured for MCMP mode and nondisruptive diagnostics.

- When a DSU is configured for MCMP mode and nondisruptive diagnostics, both tributary DSU and DBM addresses are included in the DSU's poll list.

- When configured for MCMP mode and disruptive diagnostics, only tributary DSU addresses are included in the DSU's poll list (DBM address is omitted).

- Using the Acquire (**Acq**) command is an efficient alternative to the Add command.

When MUX Funct is set to MCMP:

- The **Acq** command must be used to successfully initiate transmissions.

- When adding tributaries to a working network:

    — From a control, use the **Acq** command.

    — From a tributary, use the **Add** command.

Command Complete appears when the poll list is completed. When NMS is polling a control unit or a control unit is polling a tributary, an asterisk (*) appears in the Health and Status display on the right side of the front panel.

Menu

Menu (**Menu**) allows you to disable Full mode. Full mode displays all menu selections based on installed configuration options and those set by the user. When disabled, an abbreviated set of selections appears. The configuration options that do not display when in Full mode are indicated by row with a ◀ symbol in Appendix B, *Configuration Worksheets*.

Control Branch

The Control (**Ctrl**) branch allows you to enable or disable the DSU's transmitter, as well as the DBM's, and to display/change the status of the general purpose external DTE leads.

```
                    ┌──────────────────┐
                    │ TOP-LEVEL MENU   │
                    └──────────────────┘
              ┌───────────┼───────────┐
          ┌───────┐   ┌───────┐   ┌───────┐
          │ Local │   │ Remot │   │ Msgs  │
          └───────┘   └───────┘   └───────┘
                       Address
     ┌──────────┬──────────┬──────────┐
  ┌──────┐  ┌───────┐  ┌──────┐  ┌───────┐
  │ Stat │  │ Bckup │  │ Test │  │ Confg │
  └──────┘  └───────┘  └──────┘  └───────┘
                                    ┌───────┐
                                    │ Ctrl  │
                                    └───────┘
        ┌──────────┬──────────┬──────────┐
     TxCtl        LEDs       ExtL      Reset
  ┌────┬────┬────┬────┐   ┌─────┬──────┐
 DSU  DBM Devic Ports  Displ  Chang
                  │
             Port Select
        ┌──────┬──────┐    ┌──────┬──────┐
      Enab   Disab   Load  Save        496-12974-02
```
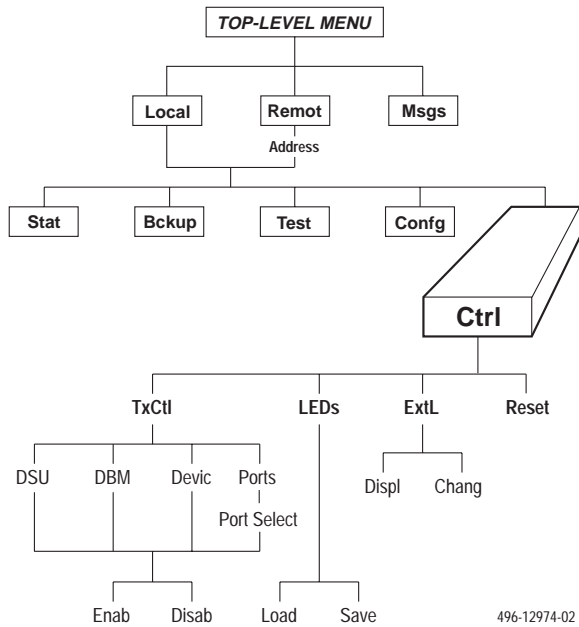
Transmitter Control

Transmitter Control (**TxCtl**) allows you to:

- Enable or disable the DSU's transmitter (DDS core).

- Enable or disable individual ports in TDM or MCMP mode.

- Select the port that will have its circuit leads monitored.

NOTE

If the DSU core is disabled, enabling all ports in TDM or MCMP mode will not enable the DSU core. You must also enable the DSU core separately.

LEDs

The **LEDs** selection is available from the Local branch. This selection allows you to monitor any of the TDM or MCMP ports at any given time. The LEDs on the TDM or MCMP circuit card show which ports are being monitored when the TDM or MCMP mode is in operation. You can also choose to monitor the aggregate data stream.

External Leads

External Leads (**ExtL**) allows display of the state of four general-purpose leads on the EIA-232/V.24 Port 1 interface. Refer to Document No. 3610-A2-GB46 for additional information.

Reset

Selecting **Reset** will reset all connections and start a power-up routine. Refer to Document No. 3610-A2-GB46 for additional information.

Remote Mode

Remote mode is not available for a multipoint tributary. Refer to Document No. 3610-A2-GB46 for additional information.

Configuration Option Tables 4

Overview

After the DSU is installed, set the software configuration options by accessing the Configuration (**Config**) branch of the menu. Refer to the menu tree in Appendix A and worksheets in Appendix B while planning configurations.

TOP-LEVEL MENU

```
                    TOP-LEVEL MENU

          Local         Remot         Msgs
                        Address

    Stat      Bckup     Test     Confg     Ctrl
```
495-12970b
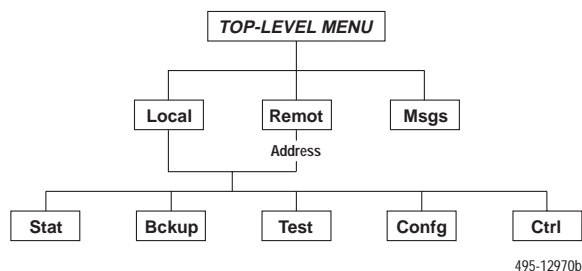
Configuration Option Tables

This section contains a configuration table for each functional group or option set within the Configuration branch of the menu that applies to TDM, MCMP, and digital bridge applications.

Load and save a set of factory defaults before changing any configuration options. For additional details, refer to:

- *Saving and Changing Configuration Options* in Chapter 2 of the User's Guide.

- Table A-1, Factory Default MUX Configuration Options.

- Table D-1, Configuration Error Messages, for messages that may appear after pressing SAVE.

NOTE

With TDM or MCMP, always set the MUX Setup option first. The mode of operation (MUX Funct = TDM, MCMP, CBrdg, EBrdg, or None) results in different configuration options and selections. MUX Funct set to None results in Basic mode and no MUX options appear.

The tables included here are:

MUX Setup Options (from same Confg menu option):

- MCMP/TDM Setup Configuration Options (Table 4-1)

- Digital Bridge Setup Configuration Options (Table 4-2). The setting after each configuration option name is the FacB default setting.

MUX Port*n* Options (from same Confg menu option):

- MCMP/TDM Port Configuration Options (Table 4-3)

- Digital Bridge Port Configuration Options (Table 4-4)

Port Speed DSU Options (from same Confg menu option):

- DSU Port Speed Configuration Options for MCMP/TDM (Table 4-5)

- Port Speed Channel-to-Port Assignment Configuration Options for MCMP (Table 4-6)

Configuration Option Tables Format

The tables are formatted to show the following configuration option information:

- Name of configuration option followed by a colon (:) and the factory default setting.

- All selectable options.

- Description of the configuration option.

- Description of each selectable setting.

Factory default options for the MUX tables in this chapter are located in Table A-1. Configuration options appear or are filtered based on settings in effect and additional installed hardware features.

- For basic DSU operations, refer to Document No. 3610-A2-GB46.

- Options supporting DBMs are in Document No. 3610-A2-GB49.

TDM Mode

Any Model 3610-A4-xxx or Model 3611-B4-xxx with a MUX card has TDM and MCMP combined. The new model is shipped from the factory with MUX Function set to TDM. When factory defaults are loaded and saved, the MCMP mode is in effect. To change the MUX circuit card from MCMP mode to TDM mode, change the following settings for FacC and/or FacT:

Configuration Branch	Configuration Option	FacC or FacT
MUX Setup	MUX Funct	TDM
DSU	Rate(Kbps)	Auto
Diag Gen	Link Config	Pt-Pt
Gen	RTS Cntrl	DTE
DBM (with ISDN DBM installed)	Rate(Kbps)	64
	Fallback	One

Table 4-1
(1 of 4)
MCMP/TDM Setup Configuration Options

MUX Funct: MCMP
Next   TDM   MCMP   CBrdg   EBrdg   None   Prev

MUX Function. Mode of operation for the MCMP/TDM circuit card.

TDM – TDM mode for point-to-point multiplexing, tributary multipoint DSD, or digital-sharing configuration.

MCMP – MCMP mode for multichannel multipoint operation and digital-sharing configuration. Multichannel multipoint circuitry is activated on the MCMP circuit card.

CBrdg – Bridge mode for a central-site bridge configuration (see Table 4-2). An installed DBM must be disabled.

EBrdg – Bridge mode for a extended bridge configuration (see Table 4-2). An installed DBM must be disabled.

None – Basic mode configuration; disables the MUX circuit card. None of the following options appear.

Share DevA: Disab
Next   Enab   Disab   Prev

Sharing Device A. Enabling this configuration option allows you to create one of two digital-sharing groups for TDM backup of MCMP or digital bridging. Used with configuration option MCMP Backup at the end of this table. This configuration option may be used with an LPDA-2 configuration.

The following rules apply:

- All ports in a group must have the same port speed.

- All ports must be adjacent.

- A contention group can have from 2 to 6 ports with a total of 2 ports when a 2-port MCMP/TDM Flex is installed.

- In MCMP mode, a digital-sharing group is set up by assigning multiple ports to the same channel.

Enab – Enables digital-sharing.

Disab – Disables digital-sharing.

Table 4-1
(2 of 4)
MCMP/TDM Setup Configuration Options

Lowest Port#: 1   **Next**   **1**   **2**   **3**   **4**   **5**   **Prev**
Lowest Port Number. Select the lowest port number to be included in the digital-sharing group. This configuration option appears when Sharing Device A is enabled and does not appear when a 2-port MCMP/TDM Flex is installed.   **NOTE:** Enabling Sharing Device A and accepting the defaults for configuration options Lowest Port Number and Number of Ports in Group places Ports 1 and 2 in the digital-sharing group.   **1 to 5** – Selects the lowest port number.
#Ports in Gp: 2   **Next**   **2**   **3**   **4**   **5**   **6**   **Prev**
Number of Ports in Group. Select total number of ports to be included in the first digital-sharing group. This configuration option appears if Sharing Device A is enabled and does not appear when a 2-port MCMP/TDM Flex is installed.   **NOTE:** Individual ports in a digital-sharing group can be configured for streaming terminal. If streaming terminal detection is enabled on a port and RTS (Request to Send) for that port is ON longer than the value selected, the port's leads are clamped until RTS is turned Off. (See RTS Cntrl in Table 4-3.)   **2 to 6** – Selects the number of ports.
Port Cntrl: Host   **Next**   **Host**   **DSD**   **Prev**
Port Control. Specifies how to handle contention between the ports in the first digital-sharing group. This configuration option appears if Sharing Device A is enabled. Only two digital-sharing groups can have DSD contention.   **Host** – No port contention. Causes CTS (Clear to Send) to turn ON for any port that has RTS turned ON, even if another port is active (RTS ON). The host protocol must enforce the order of transmission to avoid collisions.   **DSD** – Digital-Sharing Device (port contention). Controls CTS to ensure that only one port is active at a time. All ports must be configured with RTS Control set to DTE. A subsequent DTE that has RTS turned ON does not have its CTS turned ON until the first DTE has RTS Off. Selection of the next port to transmit when more than one port has raised RTS is based upon the port number; the lowest-numbered port has the highest priority.
Share DevB: Disab   **Next**   **Enab**   **Disab**   **Prev**
Sharing Device B. Enabling this configuration option allows you to create a second digital-sharing group. Use Sharing Device A with LPDA-2 enabled. This configuration option does not appear when a 2-port MCMP/TDM Flex is installed. The following rules apply: • All ports in a group must have the same port speed.   • All ports must be adjacent.   • A digital-sharing group can have from 2 to 6 ports.   • In MCMP mode, a digital-sharing group is set up by assigning multiple ports to the same channel.   **Enab** – Enables digital-sharing.   **Disab** – Disables digital-sharing.
Lowest Port#: 3   **Next**   **1**   **2**   **3**   **4**   **5**   **Prev**
Lowest Port Number. Select the lowest port number to be included in the second digital-sharing group. This configuration option appears when Sharing Device B is enabled and and does not appear when a 2-port MCMP/TDM Flex is installed.   **NOTE:** Enabling Sharing Device B and accepting the defaults for configuration options Lowest Port Number and Number of Ports in Group places Ports 3 and 4 in the digital-sharing group.   **1 to 5** – Selects the lowest port number for the digital-sharing group.

**Table 4-1
(3 of 4)
MCMP/TDM Setup Configuration Options**

#Ports in Gp: 2 **Next   2   3   4   5   6   Prev**
Number of Ports in Group. Select total number of ports to be included in the second digital-sharing group. This configuration option appears when Sharing Device B is enabled and a 6-port MCMP/TDM Flex is installed. **NOTE:**   Individual ports in a digital-sharing group can be configured for streaming terminal. If streaming terminal detection is enabled on a port and RTS for that port is ON longer than the value selected, the port's leads are clamped until RTS is turned Off. (See RTS Cntrl in Table 4-3.) **2 to 6** – Selects the number of ports for digital-sharing.
Port Cntrl: Host **Next   Host   DSD   Prev**
Port Control. Specifies how to handle contention between the ports in the second digital-sharing group. This configuration option appears if Sharing Device B is enabled and does not appear when a 2-port MCMP/TDM Flex is installed. Only two digital-sharing groups can have DSD contention. **Host** – No port contention. Causes CTS to turn ON for any port that has RTS turned ON, even if another port is active (RTS ON). The host protocol must enforce the order of transmission to avoid collisions; the MCMP or TDM does not provide port contention. **DSD** – Digital-Sharing Device (port contention). Controls CTS to ensure that only one port is active at a time. All ports must be configured with RTS Control set to DTE. A subsequent DTE that has RTS turned ON does not have its CTS turned ON until the first DTE has RTS Off. Selection of the next port to transmit when more than one port has raised RTS is based upon the port number; the lowest-numbered port has the highest priority.
P1/2 FEPSh: Disab **Next   Enab   Disab   Prev**
Ports 1 and 2 Front-End Processor Port Sharing. Creates an FEP port-sharing group consisting of Ports 1 and 2. **Enab** [1] – FEP transmissions and controls pass through Port 1 to be broadcast onto the aggregate data stream and to Port 2. Data to be received by the FEP comes from both the aggregate data stream and Port 2. **Disab** – Disables the FEP port-sharing feature for Ports 1 and 2.
P3/4 FEPSh: Disab **Next   Enab   Disab   Prev**
Ports 3 and 4 FEP Port Sharing. Creates an FEP port-sharing group consisting of Ports 3 and 4. This configuration option will not appear if a 2-port MCMP/TDM Flex is installed. **Enab** [1] – FEP transmissions and controls pass through Port 3 to be broadcast onto the aggregate data stream and to Port 4. Data to be received by the FEP comes from both the aggregate data stream and Port 4. **Disab** – Disables the FEP port-sharing feature for Ports 3 and 4.
P5/6 FEPSh: Disab **Next   Enab   Disab   Prev**
Ports 5 and 6 FEP Port Sharing. Creates an FEP port-sharing group consisting of Ports 5 and 6. This configuration option will not appear if a 2-port MCMP/TDM Flex is installed. **Enab** [1] – FEP transmissions and controls pass through Port 5 to be broadcast onto the aggregate data stream and to Port 6. Data to be received by to the FEP comes from both the aggregate data stream and Port 6. **Disab** – Disables FEP port-sharing feature for Ports 5 and 6.
[1] When enabled, the CTS lead is forced ON (high) for the odd-numbered port in the FEP port-sharing group.

Table 4-1
(4 of 4)
MCMP/TDM Setup Configuration Options

MCMP Bckup: MCMP			
Next	**MCMP**	**TDM**	**Prev**

MCMP Backup. Determines the mode for backup with MCMP installed. Valid only when an ISDN or a Switched 56 DBM is installed.

MCMP – Enables backup in MCMP mode.

TDM – Enables backup in TDM mode. Results in FEP port sharing at the control; no aggregate switch with EBrdg. The V.32 analog DBM is forced to TDM.

Table 4-2
(1 of 2)
Digital Bridge Setup Configuration Options

MUX Funct: CBrdg					
Next	**TDM**	**MCMP**	**CBrdg**	**EBrdg**	**None** **Prev**

MUX Function. MCMP/TDM Circuit Card Function with either CBrdg or EBrdg mode selected. Initiates Bridge mode for a central-site bridge or an extended bridge configuration.

TDM – TDM mode for multiplexing or digital-sharing configuration.

MCMP – MCMP mode for multichannel multipoint operation or digital-sharing configuration.

CBrdg – Bridge mode for a central-site bridge configuration; an installed DBM must be disabled.

EBrdg – Bridge mode for an extended bridge configuration; an installed DBM must be disabled.

None – Basic mode configuration; disables MCMP/TDM circuit card. None of the following configuration options appear.

Bridge Rate: =DSU												
Next	**=DSU**	**64**	**56**	**28.8**	**24.0**	**19.2**	**16.8**	**14.4**	**12.0**	**9.6**	**4.8**	**2.4** **Prev**

Bridge Rate. Data rate in kbps on the digital bridge.

=DSU – Choose this configuration value for a CBrdg when the digital bridge operates at the same speed as the DSU. Not valid for EBrdg. This configuration value causes the DSU to connect the controlling DTE to the aggregate data path of the digital bridge, and to connect to the DCE port on the digital bridge to the DDS core. Select this value for:

- Multipoint LADS operation.
- Multipoint dial backup where partial backup is possible.

64 to 2.4 kbps – For multipoint dial backup, if the DSU's speed is higher than the highest possible speed of an analog DBM, configure the digital bridge to operate at a speed that maximizes data throughput. Only full backup is possible, and is set manually from the front panel or initiated by an NMS. When full backup goes into effect, the DSU switches the data path from DTE/DSU to DTE/digital bridge, and enables internal timing at the selected Bridge Rate.

Brdg Timing: Int								
Next	**Int**	**Auto**	**Prt**	**Prt2**	**Prt3**	**Prt4**	**Prt5**	**Prt6** **Prev**

Bridge Timing. In CBrdg mode, this timing is used when in full backup where the backup is initiated from the Backup branch. In EBrdg mode, the Bridge Timing selected is always used.

Int – Timing taken internally from the unit; primarily used for analog backup.

Auto – Timing taken from any of the ports that have DTR high; primarily used for switched 56 kbps backup.

Prt1 to Prt6 – Timing is taken from the specified port. Ports 3 through 6 do not appear with a 2-port MCMP/TDM Flex.

**Table 4-2
(2 of 2)
Digital Bridge Setup Configuration Options**

Share DevA: Enab Next   Enab   Prev
Sharing Device A. This configuration option creates a digital-sharing group to configure for contention. This configuration option can be used with an LPDA-2 configuration. **Enab** – This configuration option is Forced On (enabled) in Bridge mode.
Lowest Port#: DCE Next   DCE   2   3   4   5   Prev
Lowest Port Number. Allows you to specify the number of active ports on the digital bridge. This configuration option displays when Sharing Device A is enabled and does not appear when a 2-port MCMP/TDM Flex is installed. **NOTE:** Accepting the defaults for configuration options Lowest Port Number and Number of Ports in Group places Ports DCE and 2 in this digital-sharing group. **DCE** – Select for multipoint LADS operation or multipoint dial backup where partial backup is possible. Bridge Rate is set to =DSU in this table. **2 to 5** – Selects the number of ports for multipoint dial backup where only full backup is possible [Rate(Kbps) 19.2 kbps or greater].
#Ports in Gp: 6 Next   2   3   4   5   6   Prev
Number of Ports in Group. Allows you to specify the number of active ports on the digital bridge. This configuration option displays when Sharing Device A is enabled and does not appear when a 2-port MCMP/TDM Flex is installed. Ports from the digital bridge can be added or dropped by changing number of ports in the port-sharing group. **2 to 6** – Selects the number of ports to be included in the digital-sharing group.
Port Cntrl: Host Next   Host   DSD   Prev
Port Control. Specifies how to handle contention between the ports in the ports in a port-sharing group. This configuration option is only displayed if Sharing Device A is enabled. In multipoint dial backup, ports are not automatically dropped from the digital bridge if the backup call is lost. A DBM that has dropped a backup call will no longer be raising RTS at the digital bridge port and is effectively isolated from the digital bridge. If the backup call was dropped due to a network problem and a new call is successful, the DBM is able to raise RTS and again work with the digital bridge. **Host** – No port contention. Causes CTS to turn ON for any port that has RTS turned ON, even if another port is active (RTS ON). The host protocol must enforce the order of transmission to avoid collisions. The connected DBM-D, DBM-I, DBM-S, or DBM-V is not required to have V.13 switched-carrier emulation.   **NOTE:** In CBrdg mode, Host is the only available setting if Diag Type is set to NonD. In EBrdg mode, Host should be used if the extended bridge is connected to an MCMP control or a nondisruptive CBrdg. **DSD** – Digital-Sharing Device (port contention). Controls CTS to ensure that only one port is active at a time. All ports must be configured with RTS Control set to DTE. A subsequent DTE that has RTS turned ON does not have its CTS turned ON until the first DTE has lowered its RTS. Selection of the next port to transmit when more than one port has raised RTS is based upon the port; the lowest-numbered port has the highest priority.
Share DevB: Disab Next   Disab   Prev
Sharing Device B. This configuration option creates a digital-sharing group to configure for contention. **Disab** – This configuration option is Forced Off (disabled) in Bridge mode.

Table 4-3
(1 of 4)
MCMP/TDM Port Configuration Options∗

Async→Sync: Disab
Next   Enab   Disab   Prev
Asynchronous-to-Synchronous Conversion. Sets each port for asynchronous or synchronous operation. The DSU verifies that an asynchronous setting is not underspeed if the sum of the port speeds equals the aggregate speed.   **Enab** – Configures the port as asynchronous (asynchronous-to-synchronous conversion takes place).   **Disab** – Configures the port as synchronous.

Async Rate: =Sync
Next   =Sync   1800   1200   600   300   150   Prev
Asynchronous Rate in bps. Specifies the rate of an asynchronous port. The asynchronous rate must be less than or equal to the synchronous port speed. Use the DSU PrtSp(Kbps) configuration option to set the synchronous port speed. This configuration option appears if the Async→Sync configuration option is enabled.   **NOTE:**   When 1800 bps is selected, the DSU verifies that the synchronous port speed is 2400 bps or greater. If only one stop bit is used, the asynchronous rate cannot be equal to half the synchronous rate.   **=Sync** – Asynchronous rate is the same as the synchronous rate.   **1800 to 150** – Select the rate in bps of the asynchronous port.

AsyncBit/Char: 8
Next   6   7   8   9   10   Prev
Asynchronous Bits per Character. Specifies the length of a character, including the parity bit but excluding the start and stop bits. This configuration option appears if the Async→Sync configuration option is enabled.   **6 to 10** – Select the asynchronous bits per character.

Stop Bits: 1
Next   1   2   Prev
Stop Bits. Specifies the number of stop bits in an asynchronous character. This configuration option appears if the Async→Sync configuration option is enabled and the AsyncBit/Char configuration option is not set to 10. If the AsyncBit/Char configuration option is set to 10, stop bits is set to 1.   **1 to 2** – Select the number of stop bits to be used.

Overspeed: 2.50
Next   1.25   2.50   Prev
Overspeed. Selects the overspeed percentage range of the asynchronous-to-synchronous converter. This configuration option displays when MUX Funct is set to TDM and does not display with a MUX SW version less than 5.xx.   **1.25** – Selects the basic overspeed range. Basic range provides 1.25% overspeed in the DTE asynchronous data rate.   **2.50** – Selects the overspeed percentage for extended range. Extended range provides 2.5% overspeed in the DTE asynchronous data rate.

RTS Cntrl: DTE
Next   FrcOn   DTE   Prev
Request-to-Send Control. Controls the internal RTS lead operation.   **NOTE:**   Refer to next configuration option, Transmitter Carrier Select, for a description of constant-carrier and switched-carrier operation.   **FrcOn** – DSU keeps the internal RTS ON continuously. Any data appearing on the transmitted data (TXD) lead from the DTE is transmitted immediately. Choose this configuration value for constant-carrier operation.   **DTE** – DSU turns RTS ON when the external RTS is turned ON. CTS is turned ON or Off by the external control signal RTS. Choose this configuration value for switched-carrier operation.

∗ The menu paths for Port 1 through Port 6 are identical; each port is set separately.

Table 4-3
(2 of 4)
MCMP/TDM Port Configuration Options∗

TxCarrSel: Const			
Next	**Const**	**Cntrl**	**Prev**

Transmitter Carrier Select. Enables the TDM transmitter circuitry to simulate switched-carrier operation using the V.13 codes on an individual channel. The simulated switched-carrier operation is also referred to as pseudo-controlled carrier (PCC) mode. Required for applications where the receiving DTE expects a raised LSD lead prior to receiving data. For MCMP mode, this configuration option is ignored except during dial backup when the MCMP Backup configuration option is set to TDM (Table 4-1) or a V.32 DBM is installed.

NOTE: A port can be configured for switched-carrier operation in one direction and constant-carrier operation in the other direction.

Const – Transmit Constant Carrier (constant-carrier operation). The V.13 codes are not sent. The corresponding remote TDM or MCMP port must be configured for Receiver Constant Carrier or Mark (RxCarrSel set to Const or Mark). Configure each port in a digital-sharing group for Constant Carrier operation (TxCarrSel set to Const).

Cntrl – Transmit Controlled Carrier (switched-carrier operation, PCC mode). The DSU transmits the V.13 codes over the DDS line when the port RTS changes state. When RTS is turned ON, the DSU transmits a code that turns ON LSD at the remote TDM or MCMP port before CTS is turned ON at the local TDM or MCMP port. When RTS is dropped, the DSU sends a code that turns Off LSD at the remote TDM or MCMP port. The corresponding remote TDM or MCMP port must be configured for Receiver Controlled Carrier (RxCarrSel set to Cntrl). This selection is not valid if the DSU is part of a Digital-Sharing Device (DSD) group. See the Mark setting in the next configuration option, RxCarrSel.

RxCarrSel: Const				
Next	**Const**	**Cntrl**	**Mark**	**Prev**

Receiver Carrier Select. Enables the TDM receiver circuitry to simulate switched-carrier operation using the V.13 codes on an individual channel. Configuration values Const and Cntrl for Receiver Carrier Select are both valid choices for a port belonging to a digital-sharing group. Not valid for MCMP mode.

Const – Receiver Constant Carrier (constant-carrier operation). The receiving DSU does not look for V.13 codes used by the V.13 protocol and does not toggle LSD.

Cntrl – Receiver Controlled Carrier for switched-carrier operation in PCC mode (see PCC Buffer, next configuration option). The receiving DSU looks for V.13 codes used by the V.13 protocol that indicate the transition of RTS at the remote TDM port; the receiving DSU toggles LSD as appropriate.

Mark – If 30 consecutive marks are received, received Line Signal Detect (LSD) goes Off at the port. Received LSD goes ON again just before the first space. TxCarrSel must be set to Const at the remote unit. This configuration option is used primarily when the remote DSU has a DSD group.

PCC Buffer: Disab			
Next	**Enab**	**Disab**	**Prev**

Pseudo-Controlled Carrier Buffer. Intercepts the V.13 codes used by the V.13 protocol so they do not pass to the receiving DTE. This configuration option is only valid when RxCarrSel is set to Cntrl. Not valid for MCMP.

For an asynchronous port configured for switched-carrier operation, set PCC Buffer to Enab.

For a synchronous port configured for switched-carrier operation, PCC Buffer can be disabled or enabled, depending on whether the V.13 codes disrupt communication at the receiving DTE.

NOTE: Enabling this configuration option can corrupt the end-of-message for some synchronous protocols.

Enab – Enables PCC Buffer to intercept V.13 codes.
Disab – Disables PCC Buffer.

∗ The menu paths for Port 1 through Port 6 are identical; each port is set separately.

Table 4-3
(3 of 4)
MCMP/TDM Port Configuration Options∗

Elast Stor: Disab			
Next	**Enab**	**Disab**	**Prev**

Elastic Store. Elastic Store hardware consists of a transmit buffer (register). Serial data from the extended circuit is clocked into the DSU elastic store using a clock (on EIA-232 Pin 24 or V.35 Pins U and W) provided by the extended circuit received clock lead (on Pin 17). The DSU uses its own system timing to clock data out of the buffer.

Elastic Store is reset on power-up, overflow, or after the RTS lead makes an Off-to-ON transition. After reset, the elastic store can drift by ±5 bits in TDM mode and ±3 bits in MCMP mode before overflow occurs.

Enab – Use Enable if you have an extended network.

Disab – Use Disable if you do not have an extended network.

RTS/CTS Del: 0		
Next	**Chang**	**Prev**

Request-To-Send to Clear-To-Send Delay. Allows for an additional delay between the time that RTS is turned ON and CTS is turned ON. A delay is sometimes required for multiplexed applications operating in switched-carrier operation with primary channel extended circuits. This configuration option must provide enough delay so that the last DSU in the circuit has time to train and be ready to accept data before CTS is turned ON.

Chang – Set the RTS-to-CTS delay to the desired value, from 0 to 1040 milliseconds in 8 milliseconds increments. Port speeds of 38.4 and higher can only use delays of up to 504 milliseconds.

DTR Alarm: Disab			
Next	**Enab**	**Disab**	**Prev**

Data Terminal Ready Alarm. Causes the DSU to report an alarm for the port if the port's DTR lead is Off for more than 30 seconds. The front panel or async terminal displays DTR Alarm and reports the alarm to NMS.

Enab – If the port's DTR lead turns Off for 30 seconds, the DSU reports an alarm.

Disab – Regardless how long the port's DTR lead is Off, no alarm is reported.

AntiStream: Disab		
Next	**Chang**	**Prev**

AntiStreaming. Specifies if the port is monitored for streaming terminal alarms. The purpose of Antistreaming is to provide network protection against a streaming DTE (a defective DTE that has its RTS lead constantly turned ON) by disabling the DTE.

If the DTE turns ON RTS longer than the time specified for the AntiStreaming configuration option, the tributary DSU turns ON its alarm indicator and clamps the port's leads until RTS is turned Off. Although the DTE port is not allowed to send, it is capable of being tested or disabled. A test resets the streaming terminal timer. When the test is completed, the timer starts again.

Upon detecting that RTS is no longer turned ON, the DSU turns Off its alarm and resets the streaming timer, and allows the DTE port to send data once again.

At tributary locations, this configuration option is generally used for digital-sharing operation and for MCMP operation. This configuration option has an effect only at a port configured with RTS Control set to DTE. It is not allowed when RTS Control is set to FrcOn (set in this table).

Chang – Set timer to any value from 1 to 100 seconds in increments of 1, or Disab. When the timer reaches 100, adding to the timer disables this configuration option. With an async terminal, entering 0 (zero) disables this configuration option.

∗ The menu paths for Port 1 through Port 6 are identical; each port is set separately.

Table 4-3
(4 of 4)
MCMP/TDM Port Configuration Options∗

DSR FrcOn: Enab Next   Enab   Disab   Prev
Data Set Ready Forced On. Overrides any other configuration options controlling the Data Set Ready lead. **Enab** – DSR remains ON as long as the DSU is working, regardless of tests and network alarms. **Disab** – DSR functions as an active lead reflecting various test and alarm conditions and other configuration options.
DSR on Tst: Enab Next   Enab   Disab   Prev
Data Set Ready On in Test. Controls the DSR lead during testing. **Enab** – DSR is ON continuously during testing, allowing a DTE that relies on DSR being ON to send test messages to the DSU. **Disab** – Use to set DSR to Off during testing.
Extend Chan: No Next   Yes   No   Prev
Extend Main Channel. Specifies whether an extended network has main channel connectivity between the DTE port of the tributary DSU and the DTE port of the extended DSU during a test condition. **NOTE:**   This configuration option is not displayed for a single-port multipoint tributary DSU or a tributary with DBM Diag Type set to Disr or None. **Yes** – This configuration option extends main channel connectivity between the DTE ports of the tributary and extended DSU in an extended network. **No** – Use No if you do not have an extended network.
Upstrm Port:Prt1 Next   Prt1   Prt2   Prt3   Prt4   Prt5   Prt6   Prev
Upstream Port. If an extended control DSU has its main (primary) channel connected to a tributary DSU and the tributary's Extend Channel configuration option is set to Yes, set this configuration option to the upstream port number. Select Prt1 if the tributary DSU is operating in single port mode. Ports 3 through 6 do not appear when a 2-port MCMP/TDM Flex is installed. **Prt1 to Prt6** – Selects the upstream port number.
DTE Port: EIA232 Next   EIA232   V.35   Prev
DTE Port. Selects the alternate Port 1 or the Port 2 through port 6 interface for data transmission. For MCMP/TDM Flex models, each port is set separately. See the *Reconfiguring Ports* section in Chapter 2. **EIA232** – Selects EIA-232 interface connector operation for the port. **V.35** – Selects V.35 interface connector operation for the port.
DCE Type: Analg Next   Analg   Digtl   Prev
DCE Type. Appears when FEP Port Sharing is enabled (Table 4-1). Applies to even numbered ports only. When backup initiated, this configuration option specifies what timing source will automatically be in effect. **Analg** – Select for analog connection; includes V.32 DBM. **Digtl** – Select for digital connection; includes Switched 56 and ISDN DBMs.

∗ The menu paths for Port 1 through Port 6 are identical; each port is set separately.

Table 4-4
(1 of 3)
Digital Bridge Port Configuration Options*

RTS Cntrl: FrcOn **Next   FrcOn   DTE   Prev**
Request-to-Send Control. Controls the response of the internal RTS lead.
FrcOn – This configuration option is available for CBrdg; not valid for EBrdg.
DTE – DSU turns ON RTS when the external RTS is turned ON. CTS is turned ON or Off by the external control signal RTS. Choose this configuration value for Bridge mode.
TxCarrSel: Const **Next   Const   Cntrl   Prev**
Transmitter Carrier Select. This configuration option is ignored in Bridge mode.
RxCarrSel: Const **Next   Const   Cntrl   Mark   Prev**
Receiver Carrier Select. This configuration option is ignored in Bridge mode.
PCC Buffer: Disab **Next   Enab   Disab   Prev**
Pseudo-Controlled Carrier Buffer. This configuration option is ignored in Bridge mode.
Elast Stor: Disab **Next   Enab   Disab   Prev**
Elastic Store. Elastic Store hardware consists of a transmit buffer (register). Serial data from the extended circuit is clocked into the DSU elastic store using a clock (on EIA-232 Pin 24 or V.35 Pins U and W) provided by the extended circuit received clock lead (on Pin 17). The DSU uses its own system timing to clock data out of the buffer.
Elastic Store is reset on power-up, overflow, or after the RTS lead makes an Off-to-ON transition. After reset, the elastic store can drift by ±8 bits before overflow occurs.
Enab – Use Enable if you have an extended network.
Disab – Use Disable if you do not have an extended network.
RTS/CTS Del: 0 **Next   Chang   Prev**
Request-To-Send to Clear-To-Send Delay. Allows for an additional delay between the time that RTS is turned ON and CTS is turned ON. This is useful for multiplexed applications operating in switched-carrier operation with primary channel extended circuits. This configuration option must provide enough delay so that the last modem in the circuit has time to train and is ready to accept data before CTS is turned ON.
Chang – Set the RTS-to-CTS delay to the desired value (from 0 to 1040 milliseconds in 8 millisecond increments).

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* The menu paths for Port 1 through Port 6 are identical; each port is set separately.

Table 4-4
(2 of 3)
Digital Bridge Port Configuration Options∗

| **DTR Alarm: Disab** |
| Next   Enab   Disab   Prev |

Data Terminal Ready Alarm. Causes the DSU to report an alarm for the port if the port's DTR lead is Off for more than 30 seconds. The front panel or async terminal displays DTR Alarm and reports the alarm to NMS. The ability to report DTR as an alarm is independent of port speed; the alarm is reported even if the speed of the port is set to 0 bps.

Enab – If the port's DTR lead turns Off for 30 seconds, the DSU reports an alarm.

Disab – Regardless how long the port's DTR lead is Off, no alarm is reported.

| **AntiStream: Disab** |
| Next   Chang   Prev6 |

AntiStreaming. Specifies if the port is monitored for streaming terminal alarms. The purpose of Antistreaming is to provide network protection against a streaming DTE (a defective DTE that has its RTS lead constantly turned ON) by disabling the DTE.

If the DTE turns ON RTS longer than the time specified for the AntiStreaming configuration option, the tributary DSU turns ON its alarm indicator and clamps the port's leads until RTS is turned Off. Although the DTE port is not allowed to send, it is capable of being tested or disabled. A test resets the streaming terminal timer. When the test is completed, the timer starts again.

Upon detecting that RTS is no longer turned ON, the DSU turns Off its alarm and resets the streaming timer, and allows the DTE port to send data once again.

This configuration option has an effect only at a port configured with RTS Control set to DTE. It is disabled when RTS Control is set to FrcOn.

Chang – Set timer to any value from 1 to 100 seconds in increments of 1, or Disab. Incrementing the value when it reaches 100 disables this configuration option. With an async terminal, enter 0 (zero) to disable this configuration option.

| **DSR FrcOn: Disab** |
| Next   Enab   Disab   Prev |

Data Set Ready Forced On. Overrides any other configuration options controlling the Data Set Ready lead.

Enab – DSR remains ON as long as the DSU is working, regardless of tests and network alarms.

Disab – DSR functions as an active lead reflecting various test and alarm conditions and other configuration options.

| **DSR on Tst: Disab** |
| Next   Enab   Disab   Prev |

Data Set Ready On in Test. Controls the activity of the DSR lead during testing.

Enab – DSR is ON continuously during testing, allowing a DTE that relies on DSR being ON to send test messages to the DSU.

Disab – DSR is Off during testing.

∗ The menu paths for Port 1 through Port 6 are identical; each port is set separately.

Table 4-4
(3 of 3)
Digital Bridge Port Configuration Options*

Extend Chan: No
Next   Yes   No   Prev
Extend Channel. Specifies whether an extended network has main channel connectivity between the DTE port of the tributary DSU and the DTE port of the extended DSU during a test condition.
NOTE: This configuration option is not displayed for a single-port multipoint tributary DSU or a tributary with DBM Diag Type set to Disr or None.
Yes – Set this configuration option to Yes to extend main channel connectivity between the DTE ports of the tributary and extended DSU in an extended network.
No – Use No if you do not have an extended network.
Upstrm Port:Prt1
Next   Prt1   Prt2   Prt3   Prt4   Prt5   Prt6   Prev
Upstream Port. If an extended control DSU has its main (primary) channel connected to a tributary DSU and the tributary's Extend Channel configuration option is set to Yes, set this configuration option at the control DSU to the upstream DSU's port number. Select Prt1 if the tributary DSU is operating in single-port mode.
NOTE: This configuration option is not displayed for a single-port multipoint tributary DSU or a tributary with DBM Diag Type set to Disr or None.
Prt1 to Prt6 – Selects the upstream port number.
DTE Port: EIA232
Next   EIA232   V.35   Prev
DTE Port. Selects the alternate Port 1 or the Port 2 through Port 6 interface for data transmission. For TDM/Flex or MCMP/Flex models, each port is set separately. See the *Reconfiguring Ports* section in Chapter 2.
EIA232 – Selects EIA-232 interface connector operation for the port.
V.35 – Selects V.35 interface connector operation for the port.

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* The menu paths for Port 1 through Port 6 are identical; each port is set separately.

Table 4-5
DSU Port Speed Configuration Options for MCMP/TDM

Prt1(9.6): 9.6												
Next	**64**	**56**	**48**	**38.4**	**32**	**28.8**		**24.0**	**19.2**	**18.8**	**18.0**	**16.8**	**14.4**
12.0	**9.6**	**9.2**	**8.4**	**7.2**	**4.8**	**4.4**		**4.0**	**2.4**	**2.0**	**1.2**	**Disab**	**Prev**

Port 1 Speed. Primary DSU port speed in kbps on Port 1. Must be set to the same value in the remote DSU.

Choose a port speed for Port 1, then press Next to bring up the speed selection menu for Port 2. Continue selecting port speeds for each enabled port until you enter a port speed for all ports. The default for Ports 2 through 6 is Disab. Ports 3 through 6 do not appear when a 2-port MCMP/TDM Flex is installed.

NOTE: In MCMP mode, the DSU verifies that the sum of the individual port speeds does not exceed 48 kbps. The data rate, set via the DSU's Rate(Kbps) configuration option, must be set to 56 kbps. Port speeds in DSD and FEP port-sharing groups are counted once per group when calculating used bandwidth.

In MCMP mode, the following port speeds do not appear:
64, 56, 32, 28.8, 24.0, 18.8, 18.0, 9.2, 8.4, 4.4, 4.0, and 2.0 kbps.

NOTE: In TDM mode, both ports in an FEP port-sharing group must be configured to operate at the same port speed when using the 18.8, 9.2, and 4.4 kbps. For all ports, the DSU verifies that the sum of the individual port speeds does not exceed the data rate set in the DSU's Rate(Kbps) configuration option. If the sum of the port speeds equals the aggregate data rate, an underspeed port selection is required. Port speeds in DSD and FEP port-sharing groups are only counted once per group when calculating used bandwidth.

In TDM Mode with the Async→Sync configuration option is enabled, the following port speeds will not appear:
32, 24.0, 18.8, 18.0, 9.2, 8.4, 4.4, 4.0, and 2.0 kbps.

64 to 1.2 kbps – Sets the port speed.

Disab – Sets port speed to 0 (zero) bps.

Underspeed: Disab							
Next	**Disab**	**Prt1**	**Prt2**	**Prt3**	**Prt4**	**Prt5**	**Prt6**	**Prev**

Underspeed Port. Selects which port is run underspeed to allow for in-band framing, if used. One port must run underspeed if the sum of the port speeds equals the aggregate data rate [Rate(Kbps)]. A port used for asynchronous operation cannot be set for underspeed. Ports 3 through 6 do not appear when a 2-port TDM/Flex is installed.

NOTE: This configuration option is available in TDM mode. Underspeed cannot be used with 18.8, 9.2, or 4.4 kbps port speeds. The DSU verifies that an underspeed port is selected if the sum of the port speeds equals the primary data rate.

Disab – No port runs underspeed during primary operation.

Prt1 to Prt6 – Selected port runs underspeed during primary operation.

Table 4-6
Port Speed Channel-to-Port Assignment Configuration Options for MCMP

AssgmntPrt1: A									
Next	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**None**	**Prev**

Channel Assignment to Port 1. At the control site, any of the channels (A through H) can be assigned to any of the six ports (e.g., channel F→Port 1). Assign only one channel to one port. With FEP port sharing, the same channel is assigned to both ports in the group. At one or more tributary sites with Port Control set to Host, a channel can be assigned to as many ports as wanted to establish the virtual multiport circuit for that channel. This configuration option is available when MUX Funct is set to MCMP. Ports 3 through 6 do not appear when a 2-port MCMP/Flex is installed.

Choose a channel assignment for Port 1, then press Next to bring up the channel selection menu for Port 2. Continue selecting channel assignments until channels have been assigned to all ports. The default for Ports 2 through 6 is None.

A to H – Assigns one channel to one port.

None – Assigns no channel to Port 1.

Data Service Unit Menu A

DSU Menu Tree

The menu tree and all possible configuration options are presented on the next two pages. Configuration options appear or are filtered based on settings in effect and additional installed hardware features.

Top-Level Menu

The DSU operation is presented as menu selections that branch downward from the top-level of the menu tree.

Factory Default Settings

Table A-1 presents all MUX factory default configuration options in effect when the factory defaults are loaded and saved into active. The unit is shipped with TDM as the default. Refer to Chapter 4 for details regarding MUX configuration options.

For additional factory default configuration options, refer to Document No.:

- 3610-A2-GB46 for DSUs
- 3610-A2-GB49 for DBMs

Table A-1
(1 of 2, continued on page A-4)
Factory Default MUX Configuration Options

MUX	FacC Control	FacT Tributary	FacB Digital Bridge	MPTC Multipoint Control	MPTT Multipoint Tributary
MUX Function	MCMP	MCMP	CBridge	MCMP	MCMP
Bridge Rate	=DSU	=DSU	=DSU	=DSU	=DSU
Bridge Timing	Internal	Internal	Auto	Internal	Internal
Share DevA	Disable	Disable	Enable	Disable	Disable
Lowest Port#	1	1	DCE	1	1
# Ports in Group	2	2	6	2	2
Port Control	Host	Host	Host	Host	Host
Share DevB	Disable	Disable	Disable	Disable	Disable
Lowest Port#	3	3	3	3	3
# Ports in Group	2	2	2	2	2
Port Control	Host	Host	Host	Host	Host
Port1/2 FEPSh	Disable	Disable	Disable	Disable	Disable
Port3/4 FEPSh	Disable	Disable	Disable	Disable	Disable
Port5/6 FEPSh	Disable	Disable	Disable	Disable	Disable
MCMP Backup*	MCMP	MCMP	MCMP	MCMP	MCMP
*MCMP Backup defaults to TDM when a V.32 analog DBM is installed.					

TOP-LEVEL MENU

Local   **Remot**   **Msgs**

Address

Read   Clear

Stat   **Bckup**   **Test**

H/S   DTE   CircQ   ID   TPwr

Port Select

Devic   Expan   Subn

Abort   Bkup   Dial   DrBU   Disc   →Dial   →DDS   AggSw   →NetI

DSU   DBM

Abort   Devic   Lpbk   DT   EE   BERT   Lamp   DTone

Subn   Selective

Start   Start   Start

Port Select   Port Select

Address   Address

Run Tim   # Blocks

LL   DTE   DL   RL

Port Select   Port Select   Port Select

Address

Displ   Clr

NOTE

For additional details refer to Chapter 4, *Configuration Option Tables*, and Appendix B, *Configuration Worksheets*.

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| ABBREVIATIONS							
→ DDS	Switch to DDS Path	DBM	Dial Backup Module	EBrdg	Extended Bridge	MPTC	Multipoint Control
→ Dial	Switch to DDD Path	DDD	Direct Distance Dialing	Enab	Enable	MPTT	Multipoint Tributary
Acq	Acquire	DDS	Digital Data Service	Expan	Expanded Health and Service	MUX	Multiplexer
Addr	Address	Devic	Device	ExtL	External Leads	NetI	Network Interface
ADp	Advanced Diagnostic protocol	Diag	Diagnostic	FacB	Factory Bridge	Opts	Configuration Options
AggSw	Aggregate Switch	Dir	Directory	FacC	Factory Control	PList	Poll List
Bckup	Backup	Disab	Disable	FacT	Factory Tributary	PrtSp	Port Speed
BERT	Bit Error Rate Test	Disc	Disconnect	FB1	Fallback 1	Pswrd	Password
CBrdg	Central-Site Bridge	Displ	Display	Gen	General	Remot	Remote Mode
Chan	Channel to Port	DL	Digital Loopback	H/S	Health and Status	Remt	Remote
ChgMd	Change Mode	DPII	DATAPHONE II	ID	Identity	RL	Remote Digital Loopback
CID	Customer Identifier	DrBU	Drop Backup	LEDs	Light Emitting Diodes	SPID	Service Profile Identifier
CircQ	Circuit Quality	DSU	Data Service Unit	LL	Local Loopback	Subn	Subnetwork Health and Status
Clr	Clear	DT	Digital Test	Lpbk	Loopback	TDM	Time Division Multiplexer
Confg	Configure	DTE	Data Terminal Equipment	LPDA	Link Problem Determination Aid	Term	Async Terminal
Ctrl	Control	DTone	Dial Tone	MCMP	Multichannel Multipoint	TPwr	Terminal Power
		EE	End-to-End Test	Msgs	Messages	TxCtl	Transmitter Control
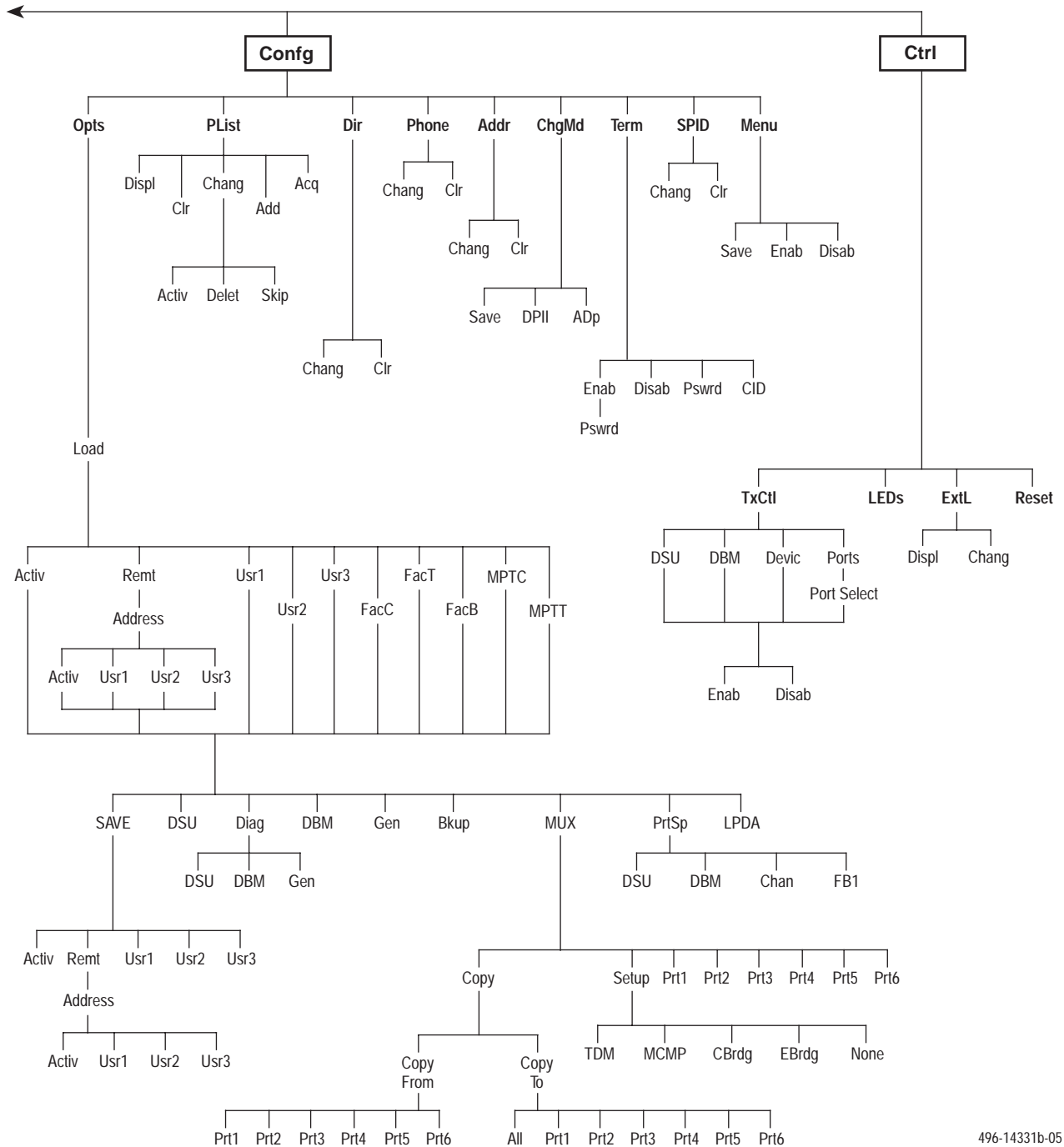
Table A-1
(2 of 2)
Factory Default MUX Configuration Options

MUX Port*n*	FacC Control	FacT Tributary	FacB Digital Bridge	MPTC Multipoint Control	MPTT Multipoint Tributary
Async–>Sync	Disable	Disable	Disable	Disable	Disable
AsyncRate	=Sync	=Sync	=Sync	=Sync	=Sync
AsyncBit/Char	8	8	8	8	8
Stop Bits	1	1	1	1	1
Overspeed	2.50	2.50	2.50	2.50	2.50
RTS Control	DTE	DTE	DTE	DTE	DTE
TxCarrierSelect	Constant	Constant	Constant	Constant	Constant
RxCarrierSelect	Constant	Constant	Constant	Constant	Constant
PCC Buffer	Disable	Disable	Disable	Disable	Disable
Elastic Store	Disable	Disable	Enable	Disable	Disable
RTS/CTS Delay	0	0	0	0	0
DTR Alarm	Disable	Disable	Disable	Disable	Disable
AntiStream	Disable	Disable	Disable	Disable	Disable
DSR FrcOn	Enable	Enable	Disable	Enable	Enable
DSR on Test	Enable	Enable	Disable	Enable	Enable
Extend Channel	No	No	No	No	No
Upstream Port	Port 1	Port 1	Port 1	Port 1	Port 1
DTE Port	EIA232	EIA232	EIA232	EIA232	EIA232
DCE Type	Analog	Analog	Analog	Analog	Analog
DSU Port Speed	**FacC**	**FacT**	**FacB**	**MPTC**	**MPTT**
Port 1	9.6 kbps	9.6 kbps	9.6 kbps	9.6 kbps	9.6 kbps
Port 2 — Port 6	Disable	Disable	9.6 kbps	Disable	Disable
Underspeed	Disable	Disable	Disable	Disable	Disable
MCMP Channel	**FacC**	**FacT**	**FacB**	**MPTC**	**MPTT**
Assignment Port 1	A	A	A	A	A
Assignment Port 2	B	B	B	B	B
Assignment Port 3	C	C	C	C	C
Assignment Port 4	D	D	D	D	D
Assignment Port 5	E	E	E	E	E
Assignment Port 6	F	F	F	F	F

Configuration Worksheets B

Overview

This section contains worksheets for:

- MCMP mode

- TDM mode

- Digital Bridge mode

Each set of worksheets includes the option sets with configuration options and values applicable for the selected MUX mode.

Use the worksheets for:

- Reference

- Recording changes to options

- Planning changes to default settings

Use the worksheets along with Chapter 4, *Configuration Option Tables*, and Appendix A, *Data Service Unit Menu*.

Date:_____

Location:_____

Local Phone Number: (   )_____

Device:_____

Local Address:_____

☐ DBM Installed

Serial Number:_____

Tributary Network Address:_____

☐ SNA Diagnostic Interface (LPDA-2) Enabled

MUX Setup Configuration Options	Value
MUX Funct	TDM, MCMP, CBrdg, EBrdg, None
Share DevA	Enab, Disab
Lowest Port #	1, 2, 3, 4, 5
#Ports in Gp	2, 3, 4, 5, 6
Port Cntrl	Host, DSD
Share DevB	Enab, Disab
Lowest Port #	1, 2, 3, 4, 5
#Ports in Gp	2, 3, 4, 5, 6
Port Cntrl	Host, DSD
P1/2 FEPSh	Enab, Disab
P3/4 FEPSh	Enab, Disab
P5/6 FEPSh	Enab, Disab
MCMP Bckup ■	MCMP, TDM

- ■   ISDN and Switched 56 kbps Digital DBMs only
- ‡‡   Ports 3–6 are not available for 2-port MCMP/TDM Flex models
- ✳   Available for MCMP/Flex with DSU firmware version 6.33 or greater
- ◄   Configuration options that do not appear when Full mode is disabled using Menu from the Configuration branch

Prt1 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt2 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt3 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt4 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt5 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt6 Configuration Options	Value
Async→Sync	Enab, Disab
Async Rate	=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
RTS Cntrl	FrcOn, DTE
TxCarrSel ◄	Const, Cntrl
RxCarrSel ◄	Const, Cntrl, Mark
PCC Buffer	Enab, Disab
Elast Stor ◄	Enab, Disab
RTS/CTS Del ◄	0–1040 ms (8 ms increments)
DTR Alarm ◄	Enab, Disab
AntiStream ◄	Disab, 1–100 sec (async term = 0–100)
DSR FrcOn ◄	Enab, Disab
DSR on Tst ◄	Enab, Disab
Extend Chan ◄	Yes, No
Upstrm Port ‡‡	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳	EIA232, V.35
DCE Type	Analg, Digtl

DSU Configuration Options	Value
Rate(Kbps)	56
TxClkSource	Int, RXC, DDS
Msg Clamp ◄	Enab, Disab
TxElasStor	Enab, Disab
RxElasStor ◄	Enab, Disab
19.2 PowrLvl ●● ◄	+6, 0, –10
64KScrambling ◄	On, Off
64KLatchLpbk ◄	On, Off
NetIntf ◄	AggSw, Forc, Disab
NetI Timing ◄	Int, NetI
V.54 Lpbk ◄	Enab, Disab

Diagnostic DSU Configuration Options	Value
Diag Type	NonD, Disr, None
2nd Ch(bps) ◄	100, 400, 800, 1200, 1600
Disr Type	3600s, 3600e, Br56

Diagnostic DBM Configuration Options	Value
Diag Type	NonD, Disr, None
2nd Ch(bps) ◄	100, 400, 800, 1200, 1600
RemoteDiag ◄	V.54, Enhan, 2500
FB DiagTyp1 ★	NonD, Disr, Mixed, None
FB 2nd Ch1 ★ ◄	100, 400, 800, 1200, 1600

Diagnostic General Configuration Options	Value
Position	Cntrl, Trib
LinkConfig	Pt-Pt, M-Pt
Resp Period ◄	1, 2, 10
Trib TimOut ◄	min and sec (5 sec. to 10 min.)
Diag Conn	CC, DC
Link Delay ◄	0s, 1s, 2s, 5s, 10s, 20s, 50s
Network Delay ◄	0s, 1s, 2s, 5s, 10s, 20s, 50s
Packet Delay ◄	0s, 1s, 2s, 5s
Fast Sel ◄	Enab, Disab

DSU MCMP PrtSp Configuration Options	Value				
Prt*n* (SS.S) ‡‡	48, 38.4, 19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2, Disab				
Prt1	Prt2	Prt3	Prt4	Prt5	Prt6

DBM PrtSp Configuration Options	Value				
Prt*n* (SS.S) ‡‡ ●	48, 38.4, 32, 28.8, 19.2, 18.0, 16.8, 14.4, 12.0, 9.6, 8.4, 7.2, 4.8, 4.0, 2.4, 2.0, 1.2, Disab				
Underspeed ‡‡	Disab, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6				
Prt1	Prt2	Prt3	Prt4	Prt5	Prt6

DBM Fallback1 PrtSp Configuration Options	Value				
Prt*n* (SS.S) ★ ● ‡‡	48, 38.4, 32, 28.8, 19.2, 18.0, 16.8, 14.4, 12.0, 9.6, 8.4, 7.2, 4.8, 4.0, 2.4, 2.0, 1.2, Disab				
Underspeed ‡‡	Disab, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6				
Prt1	Prt2	Prt3	Prt4	Prt5	Prt6

✳   Appears with MCMP/TDM Flex with DSU firmware version 6.33 or greater

★   ISDN DBM only

‡‡ Ports 3–6 are not available for 2-port MCMP/TDM Flex models.

●   When the Async→Sync configuration option is enabled using the MUX Port*n* branch, the following DBM PrtSp settings will not appear: 32, 18.0, 8.4, 4.0, and 2.0 kbps

●● 19.2 Power Level defaults to +6 dB when App Module ID displays XLOOP

n = Port number

SS.S = Aggregate rate

◄   Configuration options that do not appear when Full mode is disabled using Menu from the Configuration branch.

Configuration Worksheet for MCMP Mode (3 of 3)

DBM Configuration Options	Value
Rate(Kbps) ‡	56, 28.8, 24.0, 19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4
TxClkSource ★★‡‡	Int, RXC, DSU, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
CarrLossDisc ★★ ◄	Yes, No
Auto Retrain ★★ ◄	Yes, No
Single Rate ★★	Yes, No
Fallback ★	None, All, One
AutoAnswer ◄	Enab, Disab
TxElasStor	Enab, Disab
RxElasStor ◄	Enab, Disab
Call Setup	None, Pswrd, Clbk, Alarm
RxPwd	(10 characters)
TxPwd	(10 characters)
V.13 Signl	Enab, Disab
Dial Test ◄	Enab, Disab
Primary Core ◄	Yes, No
DtrCallCon	Orig ◆, Ansr, Disab
EchoCancel ■ ◄	Enab, Disab
Remote DBM ●●● ◄	2-wire, 4-wire
Wait Answer ◆◆ ◄	90 ms, 300 ms, 500 ms, 1s, 2s, 3s, 4s, 5s
Bkup Timer	Disab, 15s, 30s, 1m, 2m, 3m
SwitchTyp ★	NI-1, NI-2, AT&T, DMS100
FBR1(Kbps) ★	56

Channel to Port Configuration Options	Value
AssgmntPrt1	A, B, C, D, E, F, G, H, None
AssgmntPrt2	A, B, C, D, E, F, G, H, None
AssgmntPrt3 ‡‡	A, B, C, D, E, F, G, H, None
AssgmntPrt4 ‡‡	A, B, C, D, E, F, G, H, None
AssgmntPrt5 ‡‡	A, B, C, D, E, F, G, H, None
AssgmntPrt6 ‡‡	A, B, C, D, E, F, G, H, None

Backup Configuration Options	Value		
Auto Bckup ◆	Enab, Disab		
Backup Dir	1–10		
FAOnCMI ◆ ◄	Enab, Disab		
AutoRestor	Enab, Disab		
NtwkTimOut ◆	min and	sec	(1 sec to 30 min)
RestorTimOut ◆	min		(1 min to 60 min)
TriesTimeOut ◆ ◄	min		(1 min to 60 min)
MultiCall ◆ ◄	Enab, Disab		

General Configuration Options	Value
DTE Port ✷✷	EIA232, V.35
RTS Cntrl	FrcOn, DTE
CTS Cntrl	Std, =RTS
LSD Lead ◄	STD, Delay, FrcOn
CTS Lead ◄	STD, Delay, FrcOn
SystemStat ◄	Enab, Disab
Circ Assur ◄	Enab, Disab
Tst Pattern ◄	AT&T, Std
RespondRDL ◄	Enab, Disab
LL by DTE ◄	Enab, Disab
RL by DTE ◄	Enab, Disab
Bilat Lpbk ◄	Enab, Disab
Ext Leads ◄	ExtLd, Rate, RPowr
CCN by EL ◄	Enab, Disab
SW Vers ◄	3.24, 4.43, 6.66, Normal
AnswExtBU ◄	Enab, Disab
RLSD in MCMP ■ ◄	Yes, No
PowerOnTst	Enab, Disab

LPDA-2 Configuration Options	Value
LPDA-2	Enab, Disab
LPDA Address	1–256
SNA Backup	Enab, Disab
Code 1	(6 digits)
Code 2	(7 digits)

Backup Directory	Dial String
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

S1 Hardware Settings	Value
DBM Interface ★★	Permissive (ON), Programmable (OFF)
Frame Ground/ Signal Ground	Connected (ON), Disconnected (OFF)
EIA-232 Test Mode	Enable (ON), Disable (OFF)
V.35 Test Mode	Enable (ON), Disable (OFF)

ChgMd Configuration Options	Value
Protocol Mode	DPII, ADp

★   ISDN DBM only

★★   V.32 Analog DBM only

●●●   ISDN and 2-wire Switched 56 DBMs only

‡   Not available for Switched 56 DBMs; defaults to 56 kbps.

‡‡   Ports 3–6 are not available for 2-port Flex MUX models.

◆   Not available for a DBM-*X* or a DSU with Primary core set to Yes; the DSU is Disabled

◆◆   4-wire Switched 56 DBM only

■   ISDN and Switched 56 Digital DBMs

✷✷   Appears when non-Flex MCMP/TDM is installed or 6-port MCMP/TDM Flex is installed with firmware version less than 6.33

◄   Configuration options that do <u>not</u> appear when Full mode is disabled using Menu from the Configuration branch.

Configuration Worksheet for TDM Mode (1 of 3)

Date:_____   Location:_____   Local Phone Number: (_____)_____

Device:_____   Local Address:_____   ☐ DBM Installed

Serial Number:_____   Tributary Network Address:_____   ☐ SNA Diagnostic Interface (LPDA-2) Installed

MUX Setup Configuration Options	Value Options
MUX Funct	TDM, MCMP ♦, CBrdg, EBrdg, None
Share DevA	Enab, Disab
Lowest Port#	1, 2, 3, 4, 5
#Ports in Gp	2, 3, 4, 5, 6
Port Cntrl	Host, DSD
Share DevB	Enab, Disab
Lowest Port#	1, 2, 3, 4, 5
#Ports in Gp	2, 3, 4, 5, 6
Port Cntrl	Host, DSD
P1/2 FEPSh	Enab, Disab
P3/4 FEPSh	Enab, Disab
P5/6 FEPSh	Enab, Disab

Prt1 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
Overspeed		1.25, 2.50
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt2 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
Overspeed		1.25, 2.50
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

♦   MCMP option only

‡‡   Ports 3–6 not available for 2-port MCMP/TDM Flex models

✳   Appears with MCMP/TDM Flex with DSU firmware version 6.33 or greater

◄   Configuration options that do <u>not</u> appear when Full mode is disabled using Menu from the Configuration branch.

Prt3 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
Overspeed		1.25, 2.50
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt4 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
Overspeed		1.25, 2.50
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt5 Configuration Options		Value
Async→Sync		Enab, Disab
Async Rate		=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char		6, 7, 8, 9, 10
Stop Bits		1, 2
Overspeed		1.25, 2.50
RTS Cntrl		FrcOn, DTE
TxCarrSel	◄	Const, Cntrl
RxCarrSel	◄	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◄	Enab, Disab
RTS/CTS Del	◄	0–1040 ms (8 ms increments)
DTR Alarm	◄	Enab, Disab
AntiStream	◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn	◄	Enab, Disab
DSR on Tst	◄	Enab, Disab
Extend Chan	◄	Yes, No
Upstrm Port ‡‡	◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35
DCE Type		Analg, Digtl

Prt6 Configuration Options	Value
Async→Sync	Enab, Disab
Async Rate	=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
Overspeed	1.25, 2.50
RTS Cntrl	FrcOn, DTE
TxCarrSel ◄	Const, Cntrl
RxCarrSel ◄	Const, Cntrl, Mark
PCC Buffer	Enab, Disab
Elast Stor ◄	Enab, Disab
RTS/CTS Del ◄	0–1040 ms (8 ms increments)
DTR Alarm	Enab, Disab
AntiStream ◄	Disab, 1–100 sec (async terminal = 0–100)
DSR FrcOn ◄	Enab, Disab
DSR on Tst ◄	Enab, Disab
Extend Chan ◄	Yes, No
Upstrm Port ‡‡ ◄	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳	EIA232, V.35
DCE Type	Analg, Digtl

DSU Configuration Options	Value
Rate(Kbps)	Auto, 64CC, 64L, 56, 38.4, 19.2, 9.6, 4.8, 2.4
TxClkSource ‡‡	Int, RXC, DDS, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
Msg Clamp ◄	Enab, Disab
TxElasStor	Enab, Disab
RxElasStor ◄	Enab, Disab
19.2 PowrLvl ●●	+6, 0, –10
64KScrambling ◄	On, Off
64KLatchLpbk ◄	On, Off
NetIntf ◄	AggSw, Forc, Disab
NetI Timing ‡‡ ◄	Int, NetI, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
V.54 Lpbk ◄	Enab, Disab

Diagnostic DSU Configuration Options	Value
Diag Type	NonD, Disr, Mixed, None
2nd Ch(bps) ◄	100, 400, 800, 1200, 1600
Disr Type	2500, 2600, 3600s, 3600e, Br56

Diagnostic DBM Configuration Options	Value
Diag Type	NonD, Disr, Mixed, None
2nd Ch(bps) ◄	100, 400, 800, 1200, 1600
RemoteDiag ◄	V.54, Enhan, 2500
FBDiagTyp1 ★	NonD, Disr, Mixed, None
FB 2nd Ch1 ★ ◄	100, 400, 800, 1200, 1600

Diagnostic General Configuration Options	Value
Position	Cntrl, Trib, G2Trb
LinkConfig	Pt-Pt, M-Pt
Resp Period ◄	1, 2, 10
Trib TimOut ◄	min and sec (5 sec. to 10 min.)
Diag Conn	CC, DC
Link Delay ◄	0s, 1s, 2s, 5s, 10s, 20s, 50s
Network Delay ◄	0s, 1s, 2s, 5s, 10s, 20s, 50s
Packet Delay ◄	0s, 1s, 2s, 5s
M-PtSymPrt ◄	Enab, Disab
Fast Sel ◄	Enab, Disab

DSU TDM PrtSp Configuration Options	Value				
Prt*n* (SS.S) ● ‡‡	64, 56, 48, 38.4, 32, 28.8, 24.0, 19.2, 18.8, 18.0, 16.8, 14.4, 12.0, 9.6, 9.2, 8.4, 7.2, 4.8, 4.4, 4.0, 2.4, 2.0, 1.2, Disab				
Underspeed ‡‡	Disab, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6				
Prt1	Prt2	Prt3	Prt4	Prt5	Prt6

DBM PrtSp Configuration Options	Value				
Prt*n* (SS.S) ● ‡‡	64, 56, 48, 38.4, 32, 28.8, 24.0, 19.2, 18.8, 18.0, 16.8, 14.4, 12.0, 9.6, 9.2, 8.4, 7.2, 4.8, 4.4, 4.0, 2.4, 2.0, 1.2, Disab				
Underspeed ‡‡	Disab, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6				
Prt1	Prt2	Prt3	Prt4	Prt5	Prt6

DBM Fallback1 PrtSp Configuration Options	Value				
Prt*n* (SS.S) ★● ‡‡	56, 48, 38.4, 32, 28.8, 24.0, 19.2, 18.8, 18.0, 16.8, 14.4, 12.0, 9.6, 9.2, 8.4, 7.2, 4.8, 4.4, 4.0, 2.4, 2.0, 1.2, Disab				
Underspeed ‡‡	Disab, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6				
Prt1	Prt2	Prt3	Prt4	Prt5	Prt6

★ ISDN DBM only

‡‡ Ports 3–6 not available for 2-port MCMP/TDM Flex models

✳ Appears with MCMP/TDM Flex with DSU firmware version 6.33 or greater

● When the Async→Sync configuration option is enabled using MUX Port*n*, the following PrtSp settings will not appear:
32, 24.0, 18.8, 18.0, 9.2, 8.4, 4.4, 4.0, and 2.0 kbps.

●● 19.2 Power Level defaults to +6 dB when ID App Module displays XLOOP

n = Port number

SS.S = Aggregate rate

◄ Configuration options that do not appear when Full mode is disabled using Menu from the Configuration branch.8

Configuration Worksheet for TDM Mode (3 of 3)

DBM Configuration Options	Value
Rate(Kbps) ‡	64, 56, 28.8, 24.0, 19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4
TxClkSource ★★‡‡	Int, RXC, DSU, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
CarrLossDisc ★★ ◄	Yes, No
Auto Retrain ★★ ◄	Yes, No
Single Rate ★★	Yes, No
Fallback ★	None, All, One
AutoAnswer ◄	Enab, Disab
TxElasStor	Enab, Disab
RxElasStor ◄	Enab, Disab
Call Setup	None, Pswrd, Clbk, Alarm
RxPwd	(10 characters)
TxPwd	(10 characters)
V.13 Signl	Enab, Disab
Dial Test ◄	Enab, Disab
Primary Core ◄	Yes, No
DtrCallCon	Orig ◆, Ansr, Disab
EchoCancel ■ ◄	Enab, Disab
Remote DBM ●●●◄	2-wire, 4-wire
Wait Answer ◆◆ ◄	90 ms, 300 ms, 500 ms, 1s, 2s, 3s, 4s, 5s
Bkup Timer	Disab, 15s, 30s, 1m, 2m, 3m
SwitchTyp ★	NI-1, NI-2, AT&T, DMS100
FBR1(Kbps) ★	56

LPDA-2 Configuration Options	Value
LPDA-2	Enab, Disab
LPDA Address	1–256
SNA Backup	Enab, Disab
Code 1	(6 digits)
Code 2	(7 digits)

Backup Configuration Options	Value	
Auto Bckup ◆	Enab, Disab	
Backup Dir	1–10	
FAOnCMI ◆ ◄	Enab, Disab	
AutoRestor	Enab, Disab	
NtwkTimOut ◆	min and sec	(1 sec to 30 min)
RestorTimOut ◆	min	(1 min to 60 min)
TriesTimeOut ◆ ◄	min	(1 min to 60 min)
MultiCall ◆ ◄	Enab, Disab	

General Configuration Options	Value
DTE Port ✳✳	EIA232, V.35
RTS Cntrl	FrcOn, DTE
CTS Cntrl	Std, =RTS
LSD Lead ◄	STD, Delay, FrcOn
CTS Lead ◄	STD, Delay, FrcOn
SystemStat ◄	Enab, Disab
Circ Assur ◄	Enab, Disab
Tst Pattern ◄	AT&T, Std
RespondRDL ◄	Enab, Disab
LL by DTE ◄	Enab, Disab
RL by DTE ◄	Enab, Disab
Bilat Lpbk ◄	Enab, Disab
Ext Leads ◄	ExtLd, Rate, RPowr
CCN by EL ◄	Enab, Disab
SW Vers ◄	3.24, 4.43, 6.66, Normal
AnswExtBU ◄	Enab, Disab
RLSD in MCMP ■ ◄	Yes, No
PowerOnTst	Enab, Disab

ChgMd Configuration Options	Value
Protocol Mode	DPII, ADp

Backup Directory	Dial String
1	
3	
4	
5	
6	
7	
8	
9	
10	

S1 Hardware Settings	Value
DBM Interface ★★	Permissive (ON), Programmable (OFF)
Frame Ground/ Signal Ground	Connected (ON), Disconnected (OFF)
EIA-232 Test Mode	Enable (ON), Disable (OFF)
V.35 Test Mode	Enable (ON), Disable (OFF)

‡ Not available for Switched 56 DBM; Defaults to 56 kbps
‡‡ Ports 3–6 not available for 2-port Flex MUX models
■ ISDN and Switched 56 Digital DBMs only
★ ISDN DBM only
★★ V.32 Analog DBM only
●●● ISDN and 2-wire Switched 56 DBMs only
✳✳ Appears with Non-Flex MCMP/TDM or 6-port TDM/Flex with firmware version less than 6.33
◆ Not available for a DBM-*X* or a DSU with Primary Core set to Yes; the DSU is disabled
◆◆ 4-wire Switched 56 DBM only
◄ Configuration options that do not appear when Full mode is disabled using Menu from the Configuration branch.

Configuration Worksheet for Bridge Mode (1 of 2)

Date:_____ Location:_____ Local Phone Number: (_____)_____

Device:_____ Local Address:_____ ☐ DBM Installed

Serial Number:_____ Tributary Network Address:_____ ☐ SNA Diagnostic Interface (LPDA-2) Enabled

MUX Setup Configuration Options	Value
MUX Funct: *(CBrdg or EBrdg)*	TDM, MCMP, CBrdg, EBrdg, None
Bridge Rate	=DSU ◆, 64, 56, 28.8, 24.0, 19.2, 16.8, 14.4, 12.0, 9.6, 4.8, 2.4
Brdg Timing ‡‡	Int, Auto, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
Share DevA:	Enab
Lowest Port #	DCE, 2, 3, 4, 5
#Ports in Gp:	2, 3, 4, 5, 6
Port Cntrl:	Host, DSD
Share DevB:	Disab

◆ Does not appear for EBrdg

‡‡ Ports 3–6 not available for 2-port MCMP/TDM Flex models

✳ Appears with MCMP/TDM Flex with DSU firmware version 6.33 or greater

◀ Configuration options that do <u>not</u> appear when Full mode is disabled using Menu from the configuration branch.

Prt4 Configuration Options		Value
RTS Cntrl		FrcOn, DTE
TxCarrSel	◀	Const, Cntrl
RxCarrSel	◀	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◀	Enab, Disab
RTS/CTS Del	◀	0–1040 ms (8 ms increments)
DTR Alarm	◀	Enab, Disab
AntiStream	◀	Disab, 1–100 sec (async term = 0–100)
DSR FrcOn	◀	Enab, Disab
DSR on Tst	◀	Enab, Disab
Extend Chan	◀	Yes, No
Upstrm Port ‡‡	◀	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35

Prt2 Configuration Options		Value
RTS Cntrl		FrcOn, DTE
TxCarrSel	◀	Const, Cntrl
RxCarrSel	◀	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◀	Enab, Disab
RTS/CTS Del	◀	0–1040 ms (8 ms increments)
DTR Alarm	◀	Enab, Disab
AntiStream	◀	Disab, 1–100 sec (async term = 0–100)
DSR FrcOn	◀	Enab, Disab
DSR on Tst	◀	Enab, Disab
Extend Chan	◀	Yes, No
Upstrm Port ‡‡	◀	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35

Prt5 Configuration Options		Value
RTS Cntrl		FrcOn, DTE
TxCarrSel	◀	Const, Cntrl
RxCarrSel	◀	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◀	Enab, Disab
RTS/CTS Del	◀	0–1040 ms (8 ms increments)
DTR Alarm	◀	Enab, Disab
AntiStream	◀	Disab, 1–100 sec (async term = 0–100)
DSR FrcOn	◀	Enab, Disab
DSR on Tst	◀	Enab, Disab
Extend Chan	◀	Yes, No
Upstrm Port ‡‡	◀	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35

Prt3 Configuration Options		Value
RTS Cntrl		FrcOn, DTE
TxCarrSel	◀	Const, Cntrl
RxCarrSel	◀	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◀	Enab, Disab
RTS/CTS Del	◀	0–1040 ms (8 ms increments)
DTR Alarm	◀	Enab, Disab
AntiStream	◀	Disab, 1–100 sec (async term = 0–100)
DSR FrcOn	◀	Enab, Disab
DSR on Tst	◀	Enab, Disab
Extend Chan	◀	Yes, No
Upstrm Port ‡‡	◀	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35

Prt6 Configuration Options		Value
RTS Cntrl		FrcOn, DTE
TxCarrSel	◀	Const, Cntrl
RxCarrSel	◀	Const, Cntrl, Mark
PCC Buffer		Enab, Disab
Elast Stor	◀	Enab, Disab
RTS/CTS Del	◀	0–1040 ms (8 ms increments)
DTR Alarm	◀	Enab, Disab
AntiStream	◀	Disab, 1–100 sec (async term = 0–100)
DSR FrcOn	◀	Enab, Disab
DSR on Tst	◀	Enab, Disab
Extend Chan	◀	Yes, No
Upstrm Port ‡‡	◀	Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
DTE Port ✳		EIA232, V.35

Configuration Worksheet for Bridge Mode (2 of 2)

DSU Configuration Options	Value
Rate(Kbps) ◆	Auto, 64CC, 64L, 56, 38.4, 19.2, 9.6, 4.8, 2.4
TxClkSource ◆	Int, RXC, DDS, Prt1
Msg Clamp ◆ ◄	Enab, Disab
TxElasStor	Enab, Disab
RxElasStor ◆ ◄	Enab, Disab
19.2 PowrLvl ●● ◄	+6, 0, −10
64KScrambling ◄	On, Off
64KLatchLpbk ◄	On, Off
NetI Timing ◆‡‡ ◄	Int, NetI, Prt1, Prt2, Prt3, Prt4, Prt5, Prt6
V.54 Lpbk ◄	Enab, Disab

Diagnostic DSU Configuration Options	Value
Diag Type	NonD ◆, Disr, Mixed ◆, None
2nd Ch(bps) ◆ ◄	100, 400, 800, 1200, 1600
Disr Type	3600s ◆, 3600e, Br56

Diagnostic General Configuration Options	Value
Position	Cntrl
LinkConfig	Pt-Pt, M-Pt
Resp Period ◄	1, 2, 10
Trib TimOut ◄	min and sec (5 sec to 10 min)
Diag Conn	CC, DC
Link Delay ◄	0s, 1s, 2s, 5s, 10s, 20s, 50s
Network Delay ◄	0s, 1s, 2s, 5s, 10s, 20s, 50s
Packet Delay ◄	0s, 1s, 2s, 5s
M-PtSymPrt ■ ◄	Enab, Disab
Fast Sel ◄	Enab, Disab

General Configuration Options	Value
DTE Port ✳✳	EIA232, V.35
RTS Cntrl	FrcOn
CTS Cntrl	Std, =RTS
LSD Lead ◄	STD, Delay, FrcOn
CTS Lead ◄	STD, Delay, FrcOn
SystemStat ◄	Enab, Disab
Circ Assur ◄	Enab, Disab
Tst Pattern ◄	AT&T, Std
RespondRDL ◄	Enab, Disab
LL by DTE ◄	Enab, Disab
RL by DTE ◄	Enab, Disab
Bilat Lpbk ◄	Enab, Disab
Ext Leads ◄	ExtLd, Rate, RPowr
CCN by EL ◄	Enab, Disab
DTR Alarm ◄	Enab, Disab
SW Vers ◄	3.24, 4.43, 6.66, Normal
AnswExtBU ◄	Enab, Disab
Async→Sync ◆	Enab, Disab
AsyncBit/Char ◆	6, 7, 8, 9, 10
Stop Bits ◆	1, 2
Overspeed ◆	1.0, 2.3
PowerOnTst	Enab, Disab

ChgMd Configuration Options	Value
Protocol Mode	DPII, ADp

LPDA-2 Configuration Options	Value
LPDA-2	Enab, Disab
LPDA Address	1–256
SNA Backup	Enab, Disab
Code 1	(6 digits)
Code 2	(7 digits)

S1 Hardware Settings	Value
DBM Interface ★★	Permissive (ON), Programmable (OFF)
Frame Ground/ Signal Ground	Connected (ON), Disconnected (OFF)
EIA-232 Test Mode	Enable (ON), Disable (OFF)
V.35 Test Mode	Enable (ON), Disable (OFF)

◆ Does not appear for EBrdg

●● 19.2 Power Level defaults to +6 dB when ID App Module displays XLOOP

‡‡ Ports 3–6 not available for 2-port Flex MUX models

■ TDM option only

✳✳ Appears with non-Flex MCMP/TDM or 6-port MCMP/TDM Flex with DSU firmware version less than 6.33

★★ V.32 Analog DBM only

◄ Configuration options that do not appear when Full mode is disabled using Menu from the Configuration branch.

Configuration Examples C

Overview

The MUX Setup configuration options are set using the Configuration branch. When an MCMP/TDM circuit card is installed, the following functions are available:

- MCMP mode

- TDM mode

- Digital Bridge mode

- CBrdg

- EBrdg

- Basic mode (MUX = None)

MCMP Mode

When the MUX function is set to MCMP, multichannel multipoint circuitry is activated. All six ports are available for multiplexing, digital-sharing, or a combination of both.

Using a management channel, the control DSU is in constant communication with each tributary DSU. The management channel is included in the MCMP circuitry and transmits data without disrupting user-transmitted data. In Figure C-1, the DDS multipoint circuit is transmitting to three tributaries.

The management channel is also used for framing and an underspeed channel is not required. MCMP can support up to forty addressable tributary devices (40 DSUs or 20 DSUs with DBMs). With multichannel multipoint and digital sharing, up to three digital-sharing groups can be formed at each tributary site.

> **NOTE**
>
> The figures in this appendix use Customer Provided Equipment (CPE) to represent any DTE, LAN, FEP, DDS backup, MUX, or mainframe.

CPE = Customer Provided Equipment

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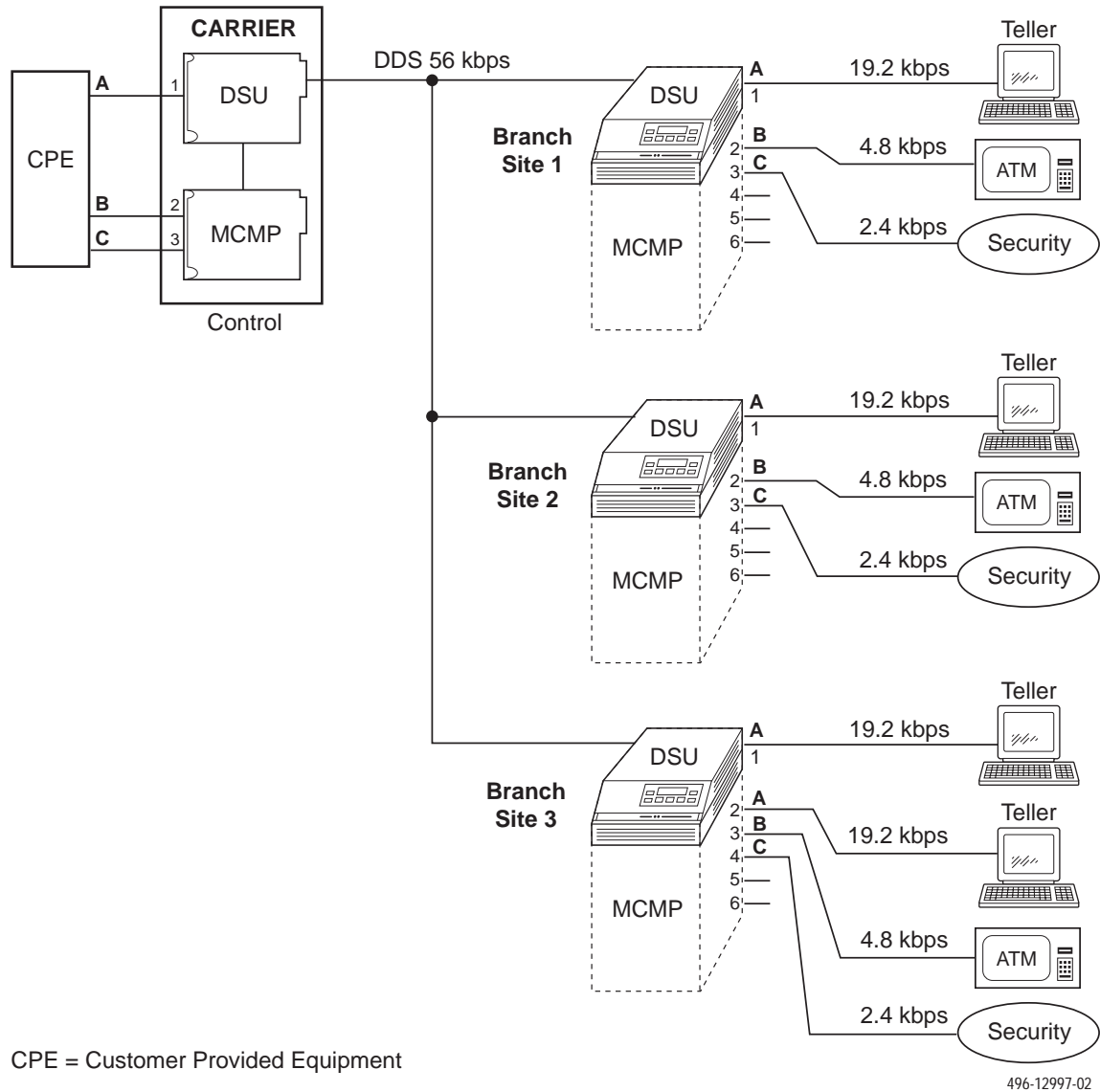
Figure C-1. Applications Combined on One DDS Multipoint Circuit with MCMP

TDM Mode

When MUX Funct is set to TDM, the equivalent of up to six point-to-point circuits are available between the DSU and TDM to increase the port capacity of the DSU to six ports. All six ports can be configured for multiplexing, digital-sharing, or a combination of both.

A variety of configurations are available and include point-to-point multiplexing, FEP port-sharing, digital sharing, and multiplexing with digital sharing. Refer to Figures C-2 and C-3 for two TDM configuration examples.

A = Digital-Sharing Group A
B = Digital-Sharing Group B
CPE = Customer Provided Equipment

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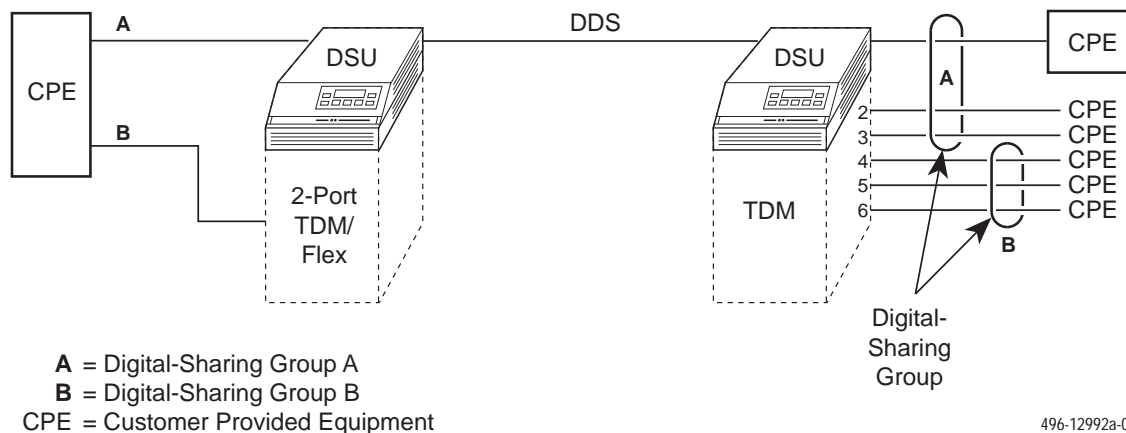
Figure C-2. Point-to-Point Multiplexing with TDM and Tributary Digital Sharing

CPE = Customer Provided Equipment

496-12993a-03
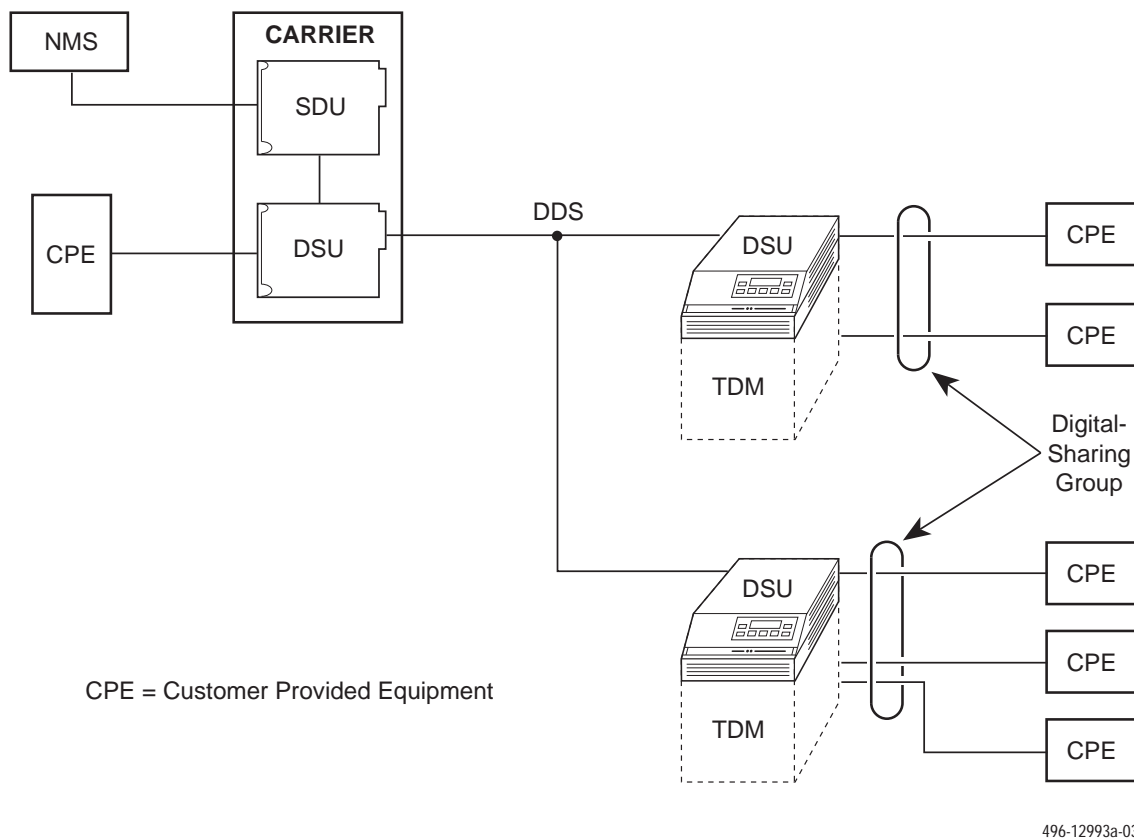
Figure C-3. Digital Sharing in a Multipoint Circuit

Bridge Mode

In Bridge mode, all ports are assigned to one digital-sharing group. When the MCMP/TDM circuit card is configured as a digital bridge, the control DSU can support dedicated multipoint dial backup, expanded digital-sharing, or multipoint LADS operation.

When the digital bridge is set for automatic backup, partial or full backup occurs as needed. In Figures C-4 and C-5, a DDS multipoint network is operating with three central-site V.32 DBMs dedicated to the control DSU and connected to the CBrdg.

If a failure occurs on the DDS line, each of the affected DSUs switches data through the digital bridge to the dedicated DBM. If automatic restoral is enabled, the active DBMs switch back to the DSUs automatically when the DDS network is restored.
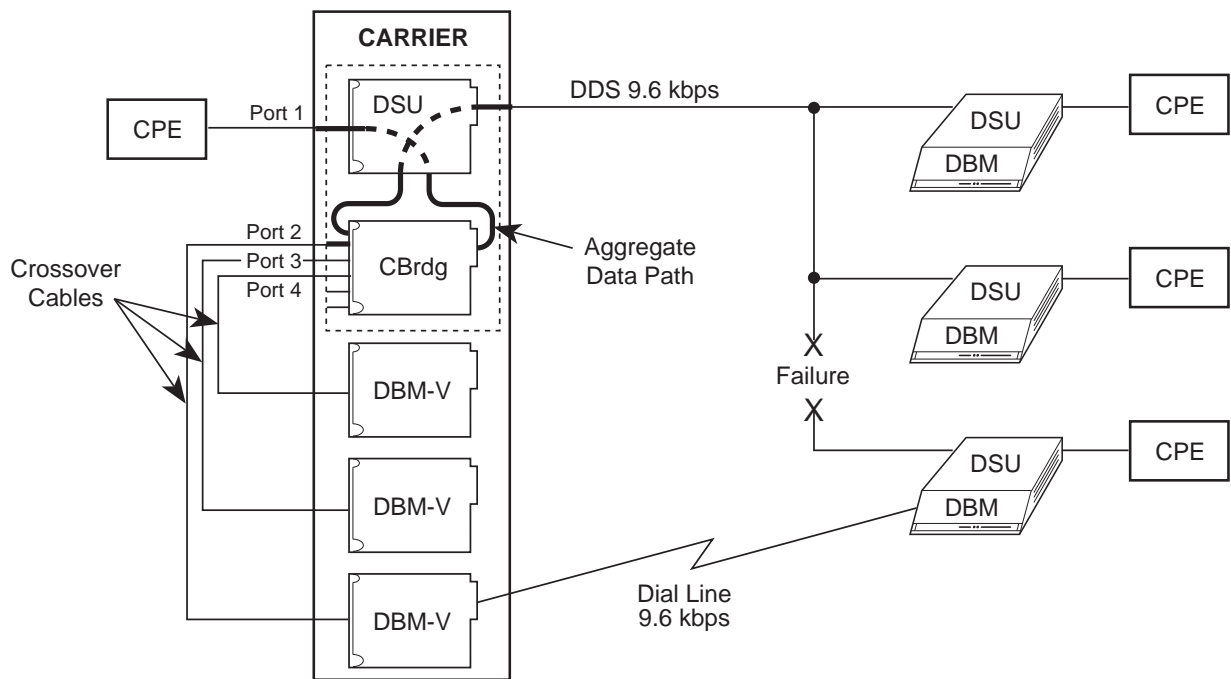
CPE = Customer Provided Equipment
CBrdg = Central-Site Bridge; Bridge Rate: =DSU

496-15120

Figure C-4. Digital Bridging (CBrdg) in Partial Backup
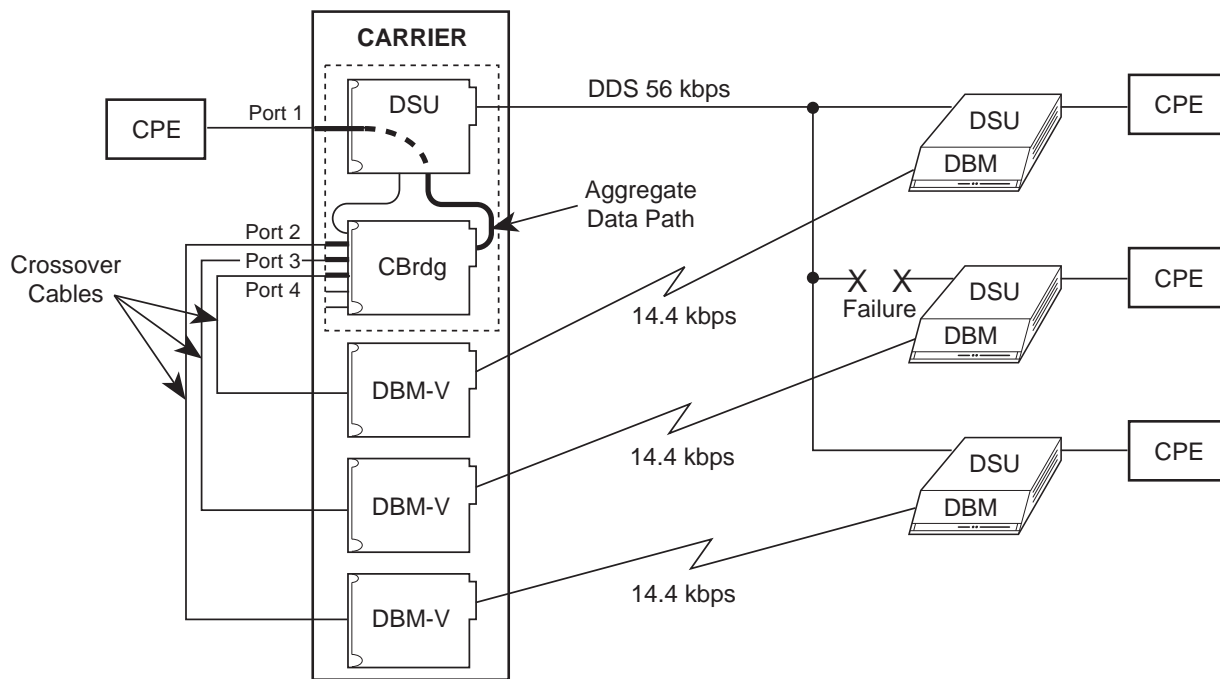
CPE = Customer Provided Equipment
CBrdg = Central-Site Bridge; Bridge Rate: 14.4 kbps

496-15121

Figure C-5. Digital Bridging (CBrdg) in Full Backup

LADS Environment

In the LADS environment, a point-to-point link is established between two devices with a direct 4-wire connection.

A bridged LADS configuration can be used to provide a multipoint function. Digital bridge crossover interface cables are required as shown in Figure C-6. Both the CBrdg and EBrdg include a DSU circuit card attached to a MUX circuit card.
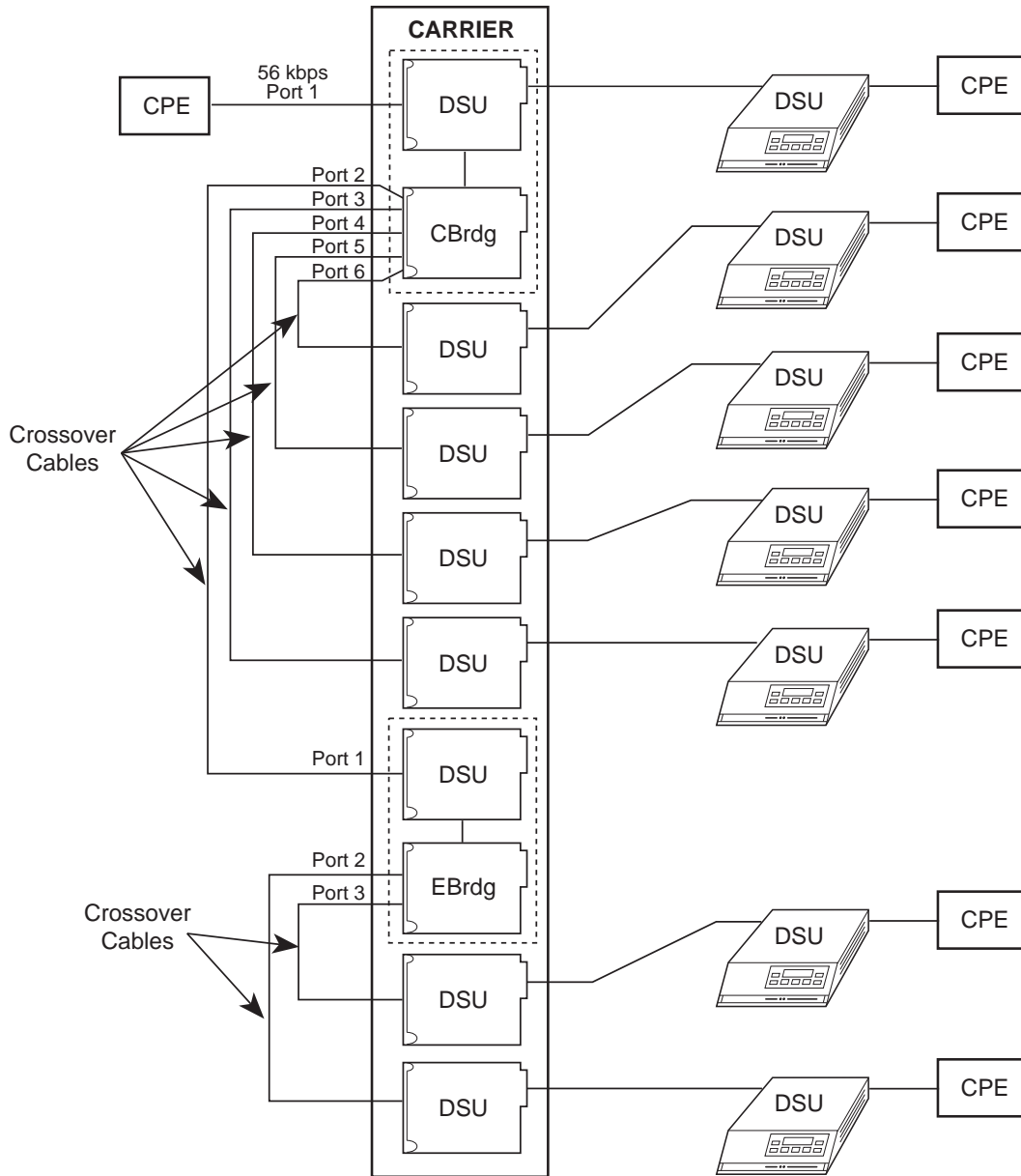
CPE = Customer Provided Equipment
CBrdg = Central-Site Bridge
EBrdg = Extended Bridge

496-12847-06

Figure C-6. Central-Site and Extended Digital Bridges in LADS Environment

Troubleshooting and Front Panel Messages

D

Troubleshooting

Confirm the configuration option settings for the items listed below that apply to your configuration.

- Verify the network, NMS, and DDS connections. Refer to your User's Guide, Chapter 2.

- For an Out of Frame Thresh message and facility alarm, verify that the control and tributary:

  — DSU rates [Rate(Kbps)] are set to match the DDS circuit rate.

  — Diag Type, Port Speed, and 2nd Ch(bps) are set the same.

- Diagnostic type affects the control and tributary interaction. Verify that all DSUs are set to the same Diag Type. Mixed mode is not valid for MCMP.

- For multipoint rate adaption, enabling the M-PtSymPrt configuration option is not required. With Diag Type of NonD, the default is enable. The control and all tributaries must be set the same.

- For MCMP mode, verify poll list acquire (Acq) is completed. To add a tributary, use Add or Acq from the tributary.

- To verify the network, request a remote ID and ensure that you receive all addresses.

- Initiate a Digital Test (DT) and an End-to-End Test (EE) to verify error free communications.

- Confirm the CTS Lead, RTS Cntrl, TxCarrSel, and DSR FrcOn configuration option settings.

Messages

This section describes the progress or error messages that may appear on the front panel of the 3600 Series DSU with a TDM or MCMP installed when:

- Executing a command

- An error condition prevents execution

The messages listed here do not include menus, data entry displays, or specific test results; they do give the condition and any action to perform.

Table D-1 lists the configuration error messages that may appear after pressing SAVE and the verification routine runs.

For command, progress, health and status, and additional configuration error messages, refer to Document No. 3610-A2-GB46.

For configuration error, progress, and health and status messages supporting DBMs, refer to Document No. 3610-A2-GB49.

**Table D-1
(1 of 4)
Configuration Error Messages**

Message	Condition	Action
AgSw&BRDG Incmpt	Bridge Mode is incompatible with Network Interface set to AggSw or forced on.	Refer to configuration option NetIntf.
Asy Not= forChan	MCMP mode: all ports in a sharing group must all be the same, either asynchronous or synchronous. When asynchronous, all ports must be the set the same for asynchronous rate, bits/char, and number of stop bits.	Use configuration option Async→Sync to set all ports. If set to Async, also set the configuration options Async Rate, AsyncBit/Char, and Stop Bits for each port.
BRDG&SymP Incmpt	Multipoint symmetric enabled is incompatible with Bridge mode and NonDisruptive diagnostics.	Disable configuration option M-PtSymPrt.
BRG&Bilat Incmpt	Bilateral Loopback enabled is incompatible with Bridge mode.	Disable configuration option Bilat Lpbk.
Chan >1 in FEPGrp	MCMP mode: both ports in a FEP port-sharing group must be assigned to the same channel.	Assign the same channel to both ports in a FEP port-sharing group using the PrtSp configuration submenu to access Chan.
Chan >1 in ShrGrp	MCMP mode: all ports in a digital-sharing group are not assigned to the same channel.	Use the PrtSp configuration submenu to access Chan. For the ports, use configuration options Share DevA or Share DevB with Lowest Port # and #Ports in Gp.
Ctrl Type Requir	Bridge mode: a DSU configured as a tributary cannot be in Bridge mode.	Set the configuration option Position to Cntrl for digital bridging.
CTS delay > 1024	TDM mode: • If the port speed is equal to or greater than 38.4 kbps, the RTS to CTS delay should be 504 ms or less. • DBM port speed is set to 32 kbps and RTS delay is more than 1280 ms. • Port speed is set to 32 kbps and RTS delay is greater 1280 ms.	• Set the delay with configuration option RTS/CTS Del. • Change the configuration option RTS/CTS Del to 1280 ms or less or change DBM PrtSp(Kbps). • Change the configuration option RTS/CTS Del to 1280 ms or less.
DDS must be 56k	MCMP mode: the DDS data rate is not set to 56 kbps for MCMP.	Set the DSU configuration option Rate(Kbps) to 56 kbps.
DSD Async Diff	• TDM mode: all ports in a port-sharing group must be the same, either asynchronous or synchronous. If asynchronous, all async options must be the same. • Bridge mode: only Port 1 can be asynchronous. All other ports must be synchronous.	Use configuration option Async→Sync to set all ports. If set to Async, also set the configuration options Async Rate, AsyncBit/Char, and Stop Bits for each port.
DSD Wrong RTS	TDM or MCMP multipoint mode: one or more ports in a digital-sharing group with DSD port control do not have RTS Control set to DTE.	Set the configuration option RTS Cntrl to DTE for all ports in the digital-sharing group.
DSU Agg Exceeded	• TDM mode: the sum of the port speeds exceeds the DDS speed. • MCMP mode: the sum of the port speeds exceeds 48 kbps.	Set configuration option Rate(Kbps) to a higher speed or lower one or more port speeds with configuration option PrtSp(Kbps).

**Table D-1
(2 of 4)
Configuration Error Messages**

Message	Condition	Action
DSU ShareGp Spds	DSU port speeds in a sharing group do not match.	Use configuration option PrtSp(Kbps) to set both ports to the same port speed.
DSU Undersp Reqd	TDM mode: the sum of the ports is equal to the DDS speed and either: • There is more than one port active that is not in the same sharing group, or • Diagnostics set to NonDisruptive with no underspeed port.	• Select an underspeed port. • Change configuration option Diag Type to Disr, Mixed or None or use the PrtSp configuration submenu to select an underspeed port and configuration option 2nd Ch(bps) for the diagnostic speed.
Elast Not Valid	Bridge mode: an attempt was made to configure a DSU as an extended bridge with: • Receive elastic store turned ON at one or more of the active bridge ports, or • The Bridge Rate is not set to =DSU.	• Disable configuration option RxElasStor for each of the active bridge ports. • Configuration option Bridge Rate must be set to =DSU when TxElasStor is enabled.
FEP Async diff	Two ports with FEP port-sharing must have both ports set either to asynchronous or synchronous.	Use configuration option Async→Sync to set the ports.
FEP Prt Underspd	One of two ports in an FEP port-sharing group was chosen for the underspeed port.	Select an underspeed port that is not in an FEP port-sharing group.
FEP&ShrDv Incmpt	TDM or MCMP mode: an attempt was made to place a port into both a digital-sharing group and an FEP port-sharing group.	Select which of the groups is to have the port included. Use MCMP Setup configuration options to set Share DevA or P*n*/*n* FEP Sh.
FEP Speeds diff	TDM or MCMP mode: two ports in the FEP port-sharing group are assigned different speeds.	Set all ports in the port-sharing group to the same speed by using the configuration option PrtSp(Kbps) for the DSU or DBM.
G2Trib Inv MCMP	Diagnostic general configuration option Position is set to G2Trib which is invalid with MCMP.	Set configuration option Position to Cntrl or Trib.
Incmpt Diag Mode	Mixed diagnostics is incompatible with EBrdg or MCMP mode.	Use configuration option Diag Type to change diagnostic setting.
Inval BridgeRate	Bridge mode: MUX function set to EBrdg with Bridge rate set to =DSU.	Change configuration option Bridge Rate to a valid data rate or set MUX Funct to CBrdg.
Inval DSU Timing	• Port timing from a TDM port without TDM. • Bridge timing from a port that is not installed • DDS timing from a port that is not installed. • TDM mode and timing is external. • MCMP mode with timing from a port. • Network interface timing from a non-installed port.	Use configuration option: • MUX Funct to enable TDM. • Brdg Timing to select a valid port. • TxClkSource to select a valid port. • TxClkSource to select Port 1. • TxClkSource to select a valid timing source. • NetI Timing to select a valid timing source.

**Table D-1
(3 of 4)
Configuration Error Messages**

Message	Condition	Action
Inval lowest Prt	TDM or MCMP mode: • Sharing group is enabled with DCE as the lowest port number and port control from DSD but not in Bridge mode. • A two-port Flex MUX has sharing group B enabled. • The first port in one sharing group is already in another sharing group.	• When configuration option Share DevA is enabled, the Lowest Port# is 1 for TDM or MCMP. DCE is only valid in Bridge mode. • A two-port TDM/Flex or MCMP/Flex can only have Share DevA enabled. • Use configuration options Lowest Port # and #Ports in Gp to assign ports.
Inval M-Pt Confg	TDM mode: • Multipoint configuration with NonDisruptive diagnostics and Secondary Channel speed of 100 bps. • Multipoint configuration with rate adaption must have NonDisruptive diagnostics with symmetric mode enabled and all ports in a digital-sharing group.	• Change configuration option Diag Type, or use 2nd Ch(bps) to increase speed. • Set configuration option Diag Type to NonD, enable M-PtSymPrt, and enable Share DevA.
Inval Port Cntrl	Bridge mode: NonDisruptive diagnostics not valid with port control set to DSD.	Change configuration option Diag Type, or set configuration option Port Cntrl to Host.
Invalid Async	TDM mode in asynchronous mode cannot run: • 1.2 kbps port speed with async rate of 600 bps and only 1 stop bit, or • 2.4 kbps port speed with async rate of 1.2 kbps and only 1 stop bit.	When configuration option Async→Sync is enabled for asynchronous mode and Stop Bits is set to 1, the Async Rate cannot be equal to half the synchronous rate. Change the configuration option Async Rate, or change the number of Stop Bits.
Invalid Port Spd	1. MCMP mode: invalid port speed. 2. MCMP mode: a DBM port is configured for 56 or 64 kbps with MCMP. 3. TDM mode: a port is set to a port speed of 4.4, 9.2, or 18.8 kbps and set for underspeed. Underspeed is not valid with a port speed of 4.4, 9.2, or 18.8 kbps. 4. TDM mode: one of two ports in a sharing group is set for underspeed.	1. Use configuration option DSU/MCMP Port Speed to select a valid MCMP port speed. 2. Use configuration option DBM Port Speed to select a valid MCMP port speed. 3. Use configuration option DSU/TDM Port Speed to select a valid TDM port speed, or change the Underspeed selection to another port. 4. Set both ports in a sharing group to underspeed.
Invalid Underspeed Port	TDM mode: A port with port speed of 4.4, 9.2 or 18.8 kbps is set for underspeed.	• Use configuration option DSU/TDM Port Speed to select a valid TDM port speed, or • Change Underspeed port selection to another port.
No Ext Timing	CBrdg mode: an attempt was made to configure a DSU as a central-site bridge using external timing on Prt1, and Bridge Rate is not set to =DSU.	For a central-site bridge configuration, set the configuration option: • Bridge Rate to =DSU, or • TxClkSource to Int, RXC, or DDS.
PCC/Async Conflc	TDM mode: an async port's Receiver Carrier Select and PCC Buffer are not both enabled.	When configuration option RxCarrSel is set to Cntrl for an asynchronous port, PCC Buffer must be Enab for the same port.

Table D-1
(4 of 4)
Configuration Error Messages

Message	Condition	Action
Port Off Undersp	TDM mode: a port that is disabled (0 bps) is set for underspeed port.	Use the DSU or DBM PrtSp configuration option to assign a speed to the port or set another port to Underspeed.
Prts>2: FEP Chan	MCMP mode: a channel assigned to both ports of a FEP port-sharing group is also assigned to one or more other ports.	Use the MCMP AssgmntPrt1 to assign the channel only to the two ports of the FEP port-sharing group.
RTS/AnStr Conflc	AntiStreaming disabled and RTS Control forced on are incompatible for the same port.	Disable configuration option AntiStream or set RTS Control to DTE.
RTS FrcOn Requir	Bridge Mode: DDS RTS control must be forced on.	Set configuration option RTS Cntrl to FrcOn.
RTS/TxCrr Conflc	TDM mode: a port's Transmitter Carrier Select and RTS Control settings are incompatible.	Set configuration option TxCarrSel to Cntrl and RTS Cntrl to DTE, or set TxCarrSel to Const and RTS Cntrl to FrcOn for each port.
Share DevA Reqd	Bridge Mode: sharing group A disabled.	Enable configuration option Share DevA.
Share DevB Inval	Bridge Mode: sharing group B enabled.	Disable configuration option Share DevB.
Spd Not=forChan	MCMP mode: a channel is assigned to two or more ports that are not operating at the same port speed.	Use the DSU/MCMP Port Speed configuration option to assign the same port speed to each port in the channel.
Sync >Async Req	TDM mode: the async rate setting for the port must be less than or equal to the synchronous data rate of the port.	Change configuration option Async Rate or use the DSU/TDM Port Speed to change the port speed.
Too Many Ports	TDM or MCMP mode: either a sharing group has more ports assigned than exist on the card or one port is assigned to more than one digital-sharing group.	Use the configuration options Lowest Port# and #Ports in Gp to specify the ports in a digital-sharing group.
V.13&MCMP Bckup	DBM V.13 Signaling enabled with MUX function set to MCMP and MCMP backup set to MCMP.	The configuration option MUX Funct set to MCMP is not valid with V.13 Signaling enabled. Disable V.13 Signaling.

Technical Specifications **E**

Technical Specifications

- Table E-1 lists MCMP technical specifications.

- Table E-2 lists TDM technical specifications.

- Table E-3 lists digital bridge technical specifications.

Refer to the *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, User's Guide* for the general technical specifications for the 3600 Series DSU and the *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module Options Supplement* for DBMs.

Table E-1
MCMP Technical Specifications

Specifications	Criteria
APPLICATION	
Multichannel multipoint	Allows up to two or six independent application programs to share one standard multipoint digital facility, depending upon the version, 2-port or 6-port.
Digital sharing	Allows up to three digital-sharing groups (two ports each) at each tributary site, or a maximum of six ports per group.
FEP port sharing	Provides up to three separate FEP port-sharing groups.
NUMBER OF TRIBUTARIES	Supports up to 40 addressable tributary devices (40 DSUs or 20 DSUs and DBMs).
LINE SPEEDS	56 kbps (maximum usable data rate is 48 kbps)
CHANNEL SYNCHRONOUS RATES Primary (DSU)	1.2, 2.4, 4.8, 7.2, 9.6, 12.0, 14.4, 16.8, 19.2, 38.4, and 48 kbps
CHANNEL ASYNCHRONOUS RATES	150, 300, 600, 1200, and 1800 bps plus all primary (DSU) rates
PORT DTE INTERFACE	
3610 DSU (2-port MCMP/Flex)	Provides an additional 25-pin D-subminiature connector, for a total of two EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.33 or greater.
3610 DSU (6-port MCMP/Flex)	Provides five additional 25-pin D-subminiature connectors, for a total of six EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.33 or greater.
3611 DSU (modular)	Provides a 6-port connector module that provides a total of six 25-pin D-subminiature EIA-232 connections (including the DSU); in addition, a 26-pin high-density D-type connector that provides a V.35 interface through an adapter cable for Port 1.
3610 DSU (MCMP/DSD)	Provides five additional 25-pin D-subminiature connectors that can be optioned for EIA-232 or V.35, for a total of six EIA-232 or six V.35 interfaces.
3611 DSU (non-modular)	Provides one 60-pin high-density D-type connector that provides five additional EIA-232 interfaces through an adapter cable.
NMS SUPPORT	MCMP capability is fully supported by the COMSPHERE 6700 or 6800 Series NMS, Release 4.0 or greater for the 6700 Series NMS and Release 4.1.5 or greater for the 6800 Series NMS software in ADp and DATAPHONE II modes.

**Table E-2
TDM Technical Specifications**

Specifications [1]	Criteria
APPLICATION	
Multiplexing	Provides time division multiplexing of up to two or six independent ports, depending upon the version, 2-port or 6-port.
Digital sharing	Allows two groups of consecutive ports to share the same TDM channel.
FEP port sharing	Provides up to three separate FEP port-sharing groups.
Digital bridge	Configured to perform a 5-port digital bridge capability.
PORT SYNCHRONOUS RATES	1.2, 2.0, 2.4, 4.0, 4.4, 4.8, 7.2, 8.4, 9.2, 9.6, 12.0, 14.4, 16.8, 18.0, 18.8, 19.2, 28.8, 32, 38.4, 48, 56, and 64 kbps
PORT ASYNCHRONOUS RATES	150, 300, 600, 1200, and 1800 bps plus all primary (DSU) rates. Asynchronous rates support +2.3, −2.5 percent overspeed/underspeed compensation.
PORT DTE INTERFACE	
3610 DSU (2-port TDM/Flex)	Provides an additional 25-pin D-subminiature connector, for a total of two EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3610 DSU (6-port TDM/Flex)	Provides five additional 25-pin D-subminiature connectors, for a total of six EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3611 DSU (modular)	Provides a 6-port connector module that provides a total of six 25-pin D-subminiature EIA-232 connections (including the DSU). In addition, a 26-pin high-density D-type connector provides a V.35 interface through an adapter cable.
3610 DSU (TDM/DSD)	Provides five additional 25-pin D-subminiature connectors that can be optioned for EIA-232 or V.35, for a total of six EIA-232 or six V.35 interfaces.
3611 DSU (non-modular)	Provides one 60-pin high-density D-type connector that provides five additional EIA-232 interfaces through an adapter cable.
NMS SUPPORT	TDM capability is fully supported by the COMSPHERE 6700 or 6800 Series NMS, Release 4.0 or greater for the 6700 Series NMS and Release 4.1.5 or greater for the 6800 Series NMS software in ADp and DATAPHONE II modes.
[1] TDM and MCMP circuit cards can be configured to provide TDM capability.	

Table E-3
Digital Bridge Technical Specifications

Specifications [2]	Criteria
APPLICATION Digital Bridge	Provides 5-port digital bridging for various applications. Used primarily for multipoint dial backup, which can be configured as a central-site bridge or an extended bridge.
PORT SYNCHRONOUS RATES Primary (DSU) and Backup (DBM)	2.4, 4.4, 4.8, 9.2, 9.6, 12.0, 14.4, 18.8, 19.2, 38.4, 56 and 64 kbps
DIAGNOSTIC SUPPORT	Supports nondisruptive diagnostics (NonD), mixed, and disruptive (Disr) diagnostic types. The Disruptive Type configuration option must be set to either 3600e or Br56.
PORT DTE INTERFACE 3610 DSU (2-port TDM/Flex or MCMP/Flex)	Provides an additional 25-pin D-subminiature connector, for a total of two EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.33 or greater.
3610 DSU (6-port TDM/Flex or MCMP/Flex)	Provides five additional 25-pin D-subminiature connectors, for a total of six EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.33 or greater.
3611 DSU (modular)	Provides a 6-port connector module that provides a total of six 25-pin D-subminiature EIA-232 connections (including the DSU). In addition, a 26-pin high-density D-type connector provides a V.35 interface through an adapter cable.
3610 DSU (TDM/DSD or MCMP/DSD)	Provides five additional 25-pin D-subminiature connectors that can be optioned for EIA-232 or V.35, for a total of six EIA-232 or six V.35 interfaces.
3611 DSU (non-modular)	Provides one 60-pin high-density D-type connector that provides five additional EIA-232 interfaces through an adapter cable.
NMS SUPPORT	Digital bridging capability is fully supported by the COMSPHERE 6700 or 6800 Series NMS, Release 4.0 or greater for the 6700 Series NMS and Release 4.1.5 or greater for the 6800 Series NMS software in ADp and DATAPHONE II modes.
[2] TDM and MCMP circuit cards can both be configured to provide digital bridge capability.	

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