Dual Channelized T1 (386)

Network Application Card
Product Reference

Part No. 1.024.1359-01
Version Number 4.3

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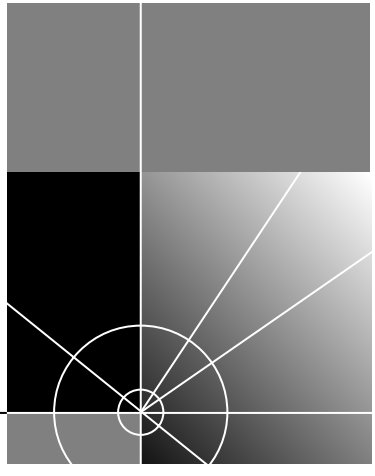

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Part No. 1.024.1359-01

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A TROUBLE CLEARING

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ABOUT THIS REFERENCE

About This Reference provides an overview of this reference, tells where to look for specific information and how to contact 3Com, and lists reference conventions.

This reference describes how to configure the Dual Channelized T1 (386) Network Application Card (NAC) through the user interface (UI) console.

This reference is primarily intended for a network engineer or a network technician. This reference assumes a working knowledge of LAN and WAN technologies.

Release notes are shipped with some products. If the information in the release notes differs from the information in this reference, follow the instructions in the release notes.

Finding Specific Information in This Reference

This table shows the location of specific information in this reference.

If you are looking for	Turn to
A list of supported features	Chapter 1
Configuration information	Chapter 2
Maintenance information	Chapter 3
Status displays	Chapter 4

Document Conventions

These tables list conventions used throughout this reference.

Icon	Notice Type	Description
	Information note	Information that contains important features or instructions.
	Caution	Information to alert you to potential damage to a program, system, or device.
	Warning	Information to alert you to potential personal injury or fatality. May also alert you to potential electrical hazard.
	ESD	Information to alert you to take proper grounding precautions before handling a product.

Convention	Description
Text represented as a `screen display`	`This typeface` represents displays that appear on your terminal screen, for example: `Netlogin:`
Text represented as **`commands`**	**`This typeface`** represents commands that you enter for example: **`setenv TCMHOME directory`** *This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only the uppercase letters and the appropriate value. Commands are not case-sensitive.*
Text represented as **menu** or **sub-menu names**.	**This typeface** represents all menu and sub-menu names within procedures, for example: On the **File** menu, click **New**.

Contacting 3Com

Call the appropriate toll free number listed below for technical support.

For European countries that do not have a toll free number listed, call +31 30 602 9900.

Country	Toll Free Number	Country	Toll Free Number
Austria	06 607468	**Netherlands**	0800 0227788
Belgium	0800 71429	**Norway**	800 11376
Canada	1800 2318770	**Poland**	00800 3111206
Denmark	800 17309	**Portugal**	0800 831416
Finland	0800 113153	**South Africa**	0800 995014
France	0800 917959	**Spain**	900 983125
Germany	0800 1821502	**Sweden**	020 795482
Hungary	00800 12813	**Switzerland**	0800 553072
Ireland	1800 553117	**UK**	0800 966197
Israel	0800 9453794	**United States**	1800 2318770
Italy	1678 79489	***All Other Locations (Outside Europe)***	1847 7976600

Refer to the Total Control Hub Documentation CD-ROM for more information regarding product warranty.

For information about Customer Service, including support, training, code releases and updates, contracts, and documentation, visit our website at ***http://totalservice.3com.com***

1 OVERVIEW

This chapter contains an overview of supported features and instructions for accessing the Dual Channelized T1 (386) Network Application Card (NAC) through the user interface (UI) console.

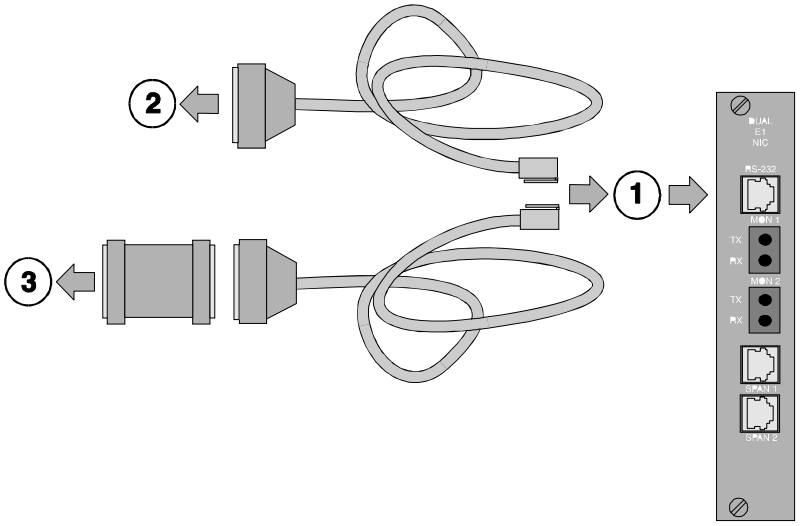
Supported Features

These features are supported in this release:

- Prompt character modification from "~" to "|"
- Configurable wink delay length

Accessing the User Interface

To access the Dual Channelized T1 (386) NAC's UI console, connect the following cables to the corresponding Network Interface Card (NIC) RS-232 port.



Callout #	Description
1	RJ-45 connector to NIC's RS-232 port
2	DB-25 male connector to modem for remote operations
3	DB-25 female-to-female null modem adapter to PC or terminal

2 DUAL CHANNELIZED T1 (386) CONFIGURATION

This chapter provides configuration information for span lines 1 and 2, inbound call routing, software fault event logging, and the card.

Configuring Span Lines 1 and 2

Configure span lines 1 and 2 by selecting options 5 and 6 from the user interface (UI) console's main menu.

```
Copyright | 3Com Corporation, 1998

        Dual T1 Application Card Revision   4.3.2    (Card Id:27)
        Boot Code Linked Date     : Mon Dec 04 17:41:48 1995
        Operation Code Linked Date: Tue Feb 23 10:29:06 1999

Main Menu

1 Status
2 Command
3 T1 Card Configuration
4 DS0 Configuration
5 T1 Span Line 1 Configuration
6 T1 Span Line 1 Call Parameter Configuration
7 T1 Span Line 2 Configuration
8 T1 Span Line 2 Call Parameter Configuration

Enter menu selection and press Return.

Menu Selection (1-8):
```

The UI console menu options for configuring both spans are identical. Selecting options 5 or 7 from the main menu produces this screen for that span:

```
T1 Span Line 1 Configuration                Current Setting

1 T1 Span Line 1 Framing Mode                SF
2 T1 Span Line 1 Line Coding                 AMI
3 T1 Span Line 1 Remotely Initiated Loopback  Ignore
4 T1 Span Line 1 Jitter Attenuation          Transmitter
5 T1 Span Line 1 Transmit Line Build Out      0.0 dB
6 T1 Span Line 1 Automatic Busy-out          Disabled
7 T1 Span Line 1 Fractional T1 Byte Pattern   FE Hex
8 T1 Span Line 1 Short Haul NIC Line Length   Not Applicable

(NOTE: Changing configuration parameters may affect calls in progress.)

Enter menu selection and press Return or press Esc to exit.
Menu Selection (1-7):
```

Menu Option 1 Configuring the span line's framing mode

The framing mode is a standard channelized T1 frame format.

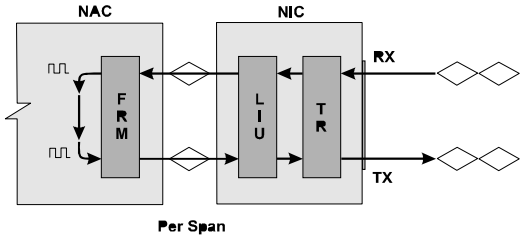
Menu Option 2 Configuring the span line's line coding

Line coding dictates how the data stream is encoded on the span line.

Menu Option 3 Responding to a span line remote (framer) loopback

Performing a framer loopback is one method of performing enhanced trouble clearing. The NAC is put in a "waiting" state for the Telco's loopback (loop-up/loop-down) signal if configured to respond. Various network nodes can be put into loopback in order to isolate "trouble spots" in the network.

This diagram represents this process.



◇ Encoded HDB3 Signal

⎍ Bit Stream

FRM Framer Circuitry

LIU Line Interface Unit

TR Transformer

Configure the NAC framer to respond or ignore the loop-up/loop-down pattern from the Telco.

Menu Option 4 Configuring the span line's jitter attenuation

Jitter attenuation on the span line enhances the network interface card (NIC) tolerance to jitter. The NIC's hardware provides a 193-bit frame buffer to compensate for low frequency jitter on the network.

This option allows you to attenuate jitter on the receiving (from switch to you) and the transmitting (from you to switch) sides. It defaults to the attenuate jitter on the transmitting side.

If you are using the Dual Channelized T1 (386) NAC with a Short Haul (DSX-1) NIC, jitter attenuation is only allowed on the receiving side.

Menu Option 5 Configuring the span line's transmit line build out

The span line's transmit line build out is a configurable output attenuation that can be set to satisfy T1 circuit requirements.

Choose from these four attenuation values:

- 0.0 dB (default)
- 7.5 dB
- 15.0 dB
- 22.5 dB

Menu Option 6 Configuring for automatic busy out

Automatic busy out is a feature that will automatically busy out a DS0 should the modem be removed or become inoperable. A busy out signal will be sent to the Telco on that DS0.

This feature can be enabled or disabled (default) with this option.

Menu Option 7 Configuring the span line's fractional T1 byte pattern

The span line's fractional T1 byte pattern is placed on any unused or ignored DS0 to satisfy density requirement.

This pattern is usually dictated by the Telco and is configured at the NIC by entering a 2-digit hexadecimal number at the prompt. The default is FE Hex.

Menu Option 8 Configuring the Short Haul NIC line length

Use a Short Haul NIC in conjunction with the Dual Channelized T1 (386) NAC to provide a more reliable signal over shorter span line distances.

Configure the Short Haul NIC to handle the following cable lengths:

- 0–133 ft.
- 134–266 ft.
- 267–399 ft.
- 400–533 ft.
- 534–655 ft.

Configuring Span Line Call Parameters

Configure span lines 1 and 2 parameters by selecting options 6 and 8 from the UI console's main menu.

```
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        Dual T1 Application Card Revision   4.3.2    (Card Id:27)
        Boot Code Linked Date     : Mon Dec 04 17:41:48 1995
        Operation Code Linked Date: Tue Feb 23 10:29:06 1999

Main Menu

1 Status
2 Command
3 T1 Card Configuration
4 DS0 Configuration
5 T1 Span Line 1 Configuration
6 T1 Span Line 1 Call Parameter Configuration
7 T1 Span Line 2 Configuration
8 T1 Span Line 2 Call Parameter Configuration

Enter menu selection and press Return.

Menu Selection (1-8):
```

The UI console menu options for configuring call parameters for both span lines are identical. Select options 6 or 8 from the main menu to produce this screen for that span:

```
T1 Span Line 1 Call Parameter Configuration

1  Set to Feature Group B Defaults
2  Set to Feature Group D Defaults
3  Set to Loop-start Defaults
4  Set to Ground-start Defaults
                                  Current Setting
5  Dial-in/Dial-out Trunk Type          E & M type II
6  Dial-in/Dial-out Trunk Start         Wink
7  Dial-in Expected Address             DNIS
8  Dial-in Address Acknowledge Wink     Disable
9  Dial-out Address Delay               70
10 Dial-in No-Add. timeout no answer (0 fast-ans)    0
11 Seizure to Wink Delay                18

(NOTE: Changing configuration parameters may affect calls in progress.)

Enter menu selection and press Return or press Esc to exit.
Menu Selection (1-10):
```

Changing menu option settings may affect calls in progress.

Menu Option 1 Setting the call parameters to Feature Group B defaults

This option configures call parameters (menu options 5–9) for the span line to Feature Group B (FGB) defaults.

Setting FGB defaults automatically updates menu options 5–9 as follows:

```
5  Dial-in/Dial-out Trunk Type          E & M type II
6  Dial-in/Dial-out Trunk Start        Wink
7  Dial-in Expected Address             DNIS
8  Dial-in Address Acknowledge Wink          Disable
9  Dial-out Address Delay              70
```

Menu Option 2 Setting the call parameters to Feature Group D defaults

This option configures call parameters (menu options 5–9) for the span line to Feature Group D (FGD) defaults.

Setting FGD defaults automatically updates menu options 5–9 as follows:

```
5  Dial-in/Dial-out Trunk Type          E & M type II
6  Dial-in/Dial-out Trunk Start        Wink
7  Dial-in Expected Address             ANI-DNIS
8  Dial-in Address Acknowledge Wink          Enable
9  Dial-out Address Delay              70
```

Menu Option 3 Setting the call parameters to Loop Start defaults

This option configures call parameters (menu options 5 and 6) for the span line to Loop Start defaults.

Setting to the Loop Start defaults automatically updates menu options 5 and 6 as follows:

```
5  Dial-in/Dial-out Trunk Type          Loop Start
6  Dial-in/Dial-out Trunk Start        Dial Tone
```

Menu Option 4 Setting the call parameters to Ground Start defaults

This option configures call parameters (menu options 5 and 6) for the span line to Ground Start defaults.

Setting to the Ground Start defaults automatically updates menu options 5 and 6 as follows:

```
5  Dial-in/Dial-out Trunk Type          Ground Start
6  Dial-in/Dial-out Trunk Start         Dial Tone
```

Menu Option 5 Setting the dial-in/dial-out trunk type parameter

If none of the default options (1–4) were used, this option allows you to manually select which trunk type to use for dial-in/dial-out applications.

Set the trunk type to one of the following:

- E&M Type II

  Used for FGB, FGD, and direct inward dialing (DID) applications.
- Loop Start
- Ground Start

Menu Option 6 Setting the dial-in/dial-out trunk start parameter

If none of the default options (1–4) were used, this option allows you to manually select which trunk start to use for dial-in/dial-out applications.

Set the trunk start to one of the following (to match Telco provisioning):

- Wink

  Used for E&M II signaling including FGB and FGD applications.

Options 8 and 9 must be configured if wink is selected.

- Immediate

  Used for E&M II signaling where no wink is desired for optimal speed.

The Telco must be configured to support this.

- Dial Tone

  Used for ground and loop start applications.

Menu Option 7 **Setting the dial-in trunk expected address parameter**

If none of the default options (1–4) were used, this option allows you to manually configure the expected address parameter.

Configure the expected address for one of the following:

- No address

  Used for no address applications.

- Dialed Number Identification Service (DNIS)

  DNIS digits collected; used for FGB applications and others.

- Automatic Number Identification (ANI)-DNIS

  ANI and DNIS digits collected; used for FGD applications and others.

- ANI

  ANI digits collected.

Menu Option 8 **Enabling the dial-in address acknowledge wink parameter**

If none of the default options (1–4) were used, this option allows you to manually enable the address acknowledge wink parameter.

This option allows a wink signal to be sent when the trunk start type selected is wink. This is a second wink signal, usually associated with FGD.

Menu Option 9 Setting the dial-out address delay

This option allows you to manually configure the address delay.

Configure the value between 70 and 255 ms (the default is 70 ms). This delays address outpulsing on dial-out calls.

Menu Option 10 Setting the duration before timeout parameter

This is a configurable sanity timer for no address span lines. If the modem does not signal a resource acknowledgment to the Dual Channelized T1 (386) NAC, the dial-in call will be flushed after this time.

This option will only have affect if menu option 6 is set for wink or immediate and option 7 is set to no address.

Set the duration value between 0 and 125. Setting the duration to a value of 0 configures the parameter for unconditional fast answer regardless of modem side resources. Setting the duration to a value between 1 and 125 configures the duration for two second intervals. For example, enter **30** at the prompt to configure a duration of 1 minute (30 x 2 seconds = 60 seconds = 1 minute).

Suggested values are 30 (for 1 minute duration) or 0 (for fast answer).

This option may require the reconfiguration of the following modem S Registers:

- S7

  For longer timeouts.

- S0=0

  For client/server delayed answers.

- S0=1

  For modem auto answer.

If your modems do not support this feature, enter **0** for fast answer.

Menu Option 11 Setting the seizure to wink delay

This option delays the wink by varying amounts for dial-in calls—E&M II timing. Configure the value between 0 and 255 ms (the default is 18 ms).

Configuring DS0s

Configure DS0s by selecting option 4 from the UI console's main menu.

```
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        Boot Code Linked Date     : Mon Dec 04 17:41:48 1995
        Operation Code Linked Date: Tue Feb 23 10:29:06 1999

Main Menu

1 Status
2 Command
3 T1 Card Configuration
4 DS0 Configuration
5 T1 Span Line 1 Configuration
6 T1 Span Line 1 Call Parameter Configuration
7 T1 Span Line 2 Configuration
8 T1 Span Line 2 Call Parameter Configuration

Enter menu selection and press Return.
Menu Selection (1-8):
```

Pressing option 4 at the main menu prompt produces this screen:

```
DS0 Configuration Menu

DS0 Configuration

 1 Modem Assignment (Span's DS0s to TDM Bus' Time Slots)
 2 Fractional T1 (Span's DS0s Ignored)
 3 Disconnect (Put DS0(s) in 'UNUSED' State)
 4 Configuration Status of DS0  1 To 24  (T1 Span Line 1)
 5 Configuration Status of DS0 25 To 48  (T1 Span Line 2)

 (NOTE: Changing configuration parameters may affect calls in progress.)

 Enter menu selection and press Return or press Esc to exit.
 Menu Selection (1-5):
```

Menu Option 1 Assigning DS0s to TDM Bus time slots

This option allows you to assign individual DS0s to specific time slots on the time division multiplexed (TDM) bus in the Total Control chassis. This bus carries data between the T1 and the quad modems.

Since each time slot corresponds to a specific chassis modem, this option allows you to assign individual DS0s to specific modems.

Use the following syntax when configuring this option:

S:D to T (to assign single DSOs)

S:D,D,D,...to T,T,T,... (to assign multiple DS0s)

S:D-D to T-T

Where:

S = signaling option

- N (for normal signaling)
- T (for transparent signaling)
- B (for busy out)

D = DS0 number (1–24 for span 1, 25–48 for span 2)

T = TDM bus slot number (1–60 correspond to chassis slots 2–16 (see table below for time slot to chassis slot/modem channel mappings), 61–64 correspond to chassis slot 1)

Time Slots	Chassis Slot Number	Modem Channel Number
1–4	2	1–4
5–8	3	1–4
9–12	4	1–4
13–16	5	1–4
17–20	6	1–4
21–24	7	1–4
25–28	8	1–4
29–32	9	1–4
33–36	10	1–4
37–40	11	1–4
41–44	12	1–4
45–48	13	1–4
49–52	14	1–4
53–56	15	1–4
57–60	16	1–4
61–64	1	1–4

Menu Option 2 Configuring DS0s for fractional T1

This option allows you to configure individual DS0s as unused or ignored for fractional T1 applications.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s)

D,D,D,...

Where:

D = DS0 number (1–24 for span 1, and 25–48 for span 2)

Menu Option 3 Disconnecting DS0s

This option allows you to disconnect individual DS0s from service.

The DS0s are disconnected from the chassis' TDM bus and are assigned as unused. Any calls are disconnected and an idle pattern is sent to the Telco.

The unused state may also result from an unmapped DS0.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s)

D,D,D,...

Where:

D = DS0 number (1–24 for span 1, and 25–48 for span 2)

Menu Options 4 and 5

Checking DS0 configuration status

Use these options to examine the configuration status of each DS0:

- The DS0 column lists the individual DS0s for the span. The Conn. To column displays the interface of the DS0 to the TDM bus.
- The DS0/TS column displays what time slots the individual DS0s are mapped to as assigned in menu option 1. If the DS0 was configured for Fractional T1 via menu option 2 or was disconnected via menu option 3, this column will display NONE for that DS0.
- The Cfg. State column displays the status of the DS0 as it was configured via the signaling parameter in menu option 1. The possible states displayed in this column are:
  - NORMAL
  - TRANSPARENT
  - BUSY-OUT

The restore DS0's command will not refresh DS0 configuration states or undo them. You must return to the NORMAL DS0 configuration state first.

Configuring the Card

Configure Dual Channelized T1 (386) NAC chassis options by selecting option 3 from the UI console's main menu.

```
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      Boot Code Linked Date     : Mon Dec 04 17:41:48 1995
      Operation Code Linked Date: Tue Feb 23 10:29:06 1999

Main Menu

1 Status
2 Command
3 T1 Card Configuration
4 DS0 Configuration
5 T1 Span Line 1 Configuration
6 T1 Span Line 1 Call Parameter Configuration
7 T1 Span Line 2 Configuration
8 T1 Span Line 2 Call Parameter Configuration

Enter menu selection and press Return.
Menu Selection (1-8):
```

Pressing option 3 at the main menu prompt produces this screen:

```
T1 Card Configuration                    Current Setting

 1 Save current Configuration to NVRAM
 2 Restore NVRAM Configuration
 3 Restore Default Configuration
 4 Idle Disconnect Pattern Send to Modem      01 Hex
 5 Timing Source Priority Assignment          T1-1=1 T1-2=2 INT=0
 6 Wireless Support (YES/NO):                 YES, supporting WAS

 (NOTE: Changing configuration parameters may affect calls in progress.)

 Enter menu selection and press Return or press Esc to exit.
 Menu Selection (1-4):
```

Menu Option 1 Saving configuration changes to NVRAM

This option allows you to save your settings to NVRAM. If power to the NAC is lost or the card is rebooted, any changes made to the UI console and saved to NVRAM will be restored.

Menu Option 2 Restoring configuration from NVRAM

This option allows you to return the NAC to configuration settings stored in NVRAM.

Menu Option 3 Restoring the default configuration

After saving configuration changes to NVRAM, you may decide at a later date that changes need to be made. An easy way to implement this new configuration is to return the NAC to the default configuration and start fresh.

Menu Option 4 Configuring the idle disconnect pattern

The idle disconnect pattern is a configurable hexadecimal byte pattern sent across the TDM bus between the CH T1 NAC and the modems.

The default is 01 H in the USA and 54 H internationally, but can be configured to any value between 00 and FF H with the exception of these reserved patterns: 00, 02, 03, 04, 05, 06, 79, 80, 81, 82, 85, 86, and FF H.

This option may require modem configuration. Do not use this option unless needed for special applications.

Menu Option 5 Assigning timing source priority

Each span line provides a timing source for the synchronization of data transfer. In addition, the chassis provides an internal clocking source. This option allows you to set the priority of each span's timing source as well as the priority of the internal clock.

The source with the highest priority is the primary timing source for the span lines. The source with the next highest priority acts as a secondary timing source should the primary be lost.

Use the following syntax when configuring this option:

P1 P2 P3

Where:

P1 = the desired priority for T1 span line 1 (T1-1)

P2 = the desired priority for T1 span line 2 (T1-2)

P3 = the desired priority for the internal clocking source

Priority options are:

- 1—Highest Priority
- 2—Medium Priority
- 3—Lowest priority
- 0—Disable the source

Menu Option 6 Configuring for wireless support

If you plan to use the CH T1 NAC for wireless applications, this option must be configured to support WAS. This option allows the early full duplex connections between the T1 and the modems needed for WAS applications. The default setting supports WAS.

3 DUAL CHANNELIZED T1 (386) COMMANDS

This chapter contains information about performing Dual Channelized T1 (386) commands.

Dual Channelized T1 (386) Commands

Issue commands to the Dual Channelized T1 (386) Network Application Card (NAC) by selecting option 2 from the UI console's main menu.

```
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        Boot Code Linked Date     : Mon Dec 04 17:41:48 1995
        Operation Code Linked Date: Tue Feb 23 10:29:06 1999

Main Menu

1 Status
2 Command
3 T1 Card Configuration
4 DS0 Configuration
5 T1 Span Line 1 Configuration
6 T1 Span Line 1 Call Parameter Configuration
7 T1 Span Line 2 Configuration
8 T1 Span Line 2 Call Parameter Configuration

Enter menu selection and press Return.
Menu Selection (1-8):
```

Selecting option 1 from the main menu produces this screen:

```
Command

 1 Reset to Highest Priority Timing Source
 2 Reset T1 NAC
 3 Enter/Exit Span to Span Loopback.
 4 Soft Busy Out DS0(s) on T1 Span Line 1
 5 Hard Busy Out DS0(s) on T1 Span Line 1
 6 Restore DS0(s) on T1 Span Line 1
 7 Disconnect Call on T1 Span Line 1 DS0(s)
 8 Ignore Call on T1 Span Line 1 DS0(s)
 9 Force Receiver Reframe on T1 Span Line 1
 10 Set DS0(s) for Transparent Test on T1 Span Line 1
 11 Enter/Exit LoopBack Command on T1 Span Line 1
12 Soft Busy Out DS0(s) on T1 Span Line 2
13 Hard Busy Out DS0(s) on T1 Span Line 2
14 Restore DS0(s) on T1 Span Line 2
15 Disconnect Call on T1 Span Line 2 DS0(s)
16 Ignore Call on T1 Span Line 2 DS0(s)
17 Force Receiver Reframe on T1 Span Line 2
18 Set DS0(s) for Transparent Test on T1 Span Line 2
19 Enter/Exit LoopBack Command on T1 Span Line 2
20 Turn off Red Alarm LED on Span Lines
Enter menu selection and press Return or press Esc to exit.

Menu Selection (1-18):
```

Many of the command menu options have corresponding configurable parameters in other menus of the UI console. Issuing commands will not affect the configured parameters except at the time of initial execution.

Menu Option 1 Resetting the highest priority timing source

This command is only valid until the NAC is rebooted.

If the internal clock (no span timing) is the highest priority timing source, the clock is put out onto the TDM bus. This condition is only necessary for back-to-back testing connections using the internal clock.

CAUTION: *Do not issue this command if there are other WAN interface cards present in the chassis. Use of the internal clock is not standard for this product.*

Menu Option 2 Resetting the Dual Channelized T1 (386) NAC

Issuing this command reboots the NAC.

Any configuration changes that are not saved to NVRAM will be lost when the NAC reboots.

Menu Option 3 **Enter/Exit span-to-span pass-thru loopback mode**

This option allows for a span-to-span loopback, where all of the DS0s on span 1 are connected to all of the DS0s on span 2 through the time slot interchanger (TSI). This command will drop calls.

This option is useful for testing purposes.

Exiting span-to-span loopback reboots the Dual Channelized T1 (386) NAC.

Menu Options 4 and 12 **Configuring specific DS0s for soft busy-out**

Issuing a soft busy-out to specific DS0s allows DS0s with calls in progress to be taken out of service upon completion of the call. DS0s not handling calls at the time the command is issued will be busied-out immediately.

The DS0s will remain busied-out until they are manually restored through options 6 and 14. While busied-out, answer supervision (A and B bits) will remain high.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s)

D,D,D,...

Where:

D = DS0 number (1–24 for span 1, and 25–48 for span 2)

Menu Options 5 and 13 **Configuring specific DS0s for hard busy-out**

Issuing a hard busy-out to specific DS0s will take all of the specified DS0s out of service immediately, even if they are handling a call.

Issuing this command is a useful span line trouble clearing technique because it seizes the M-lead.

The DS0s will remain busied-out until they are manually restored through options 6 and 14.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s)

D,D,D,...

Where:

D = DS0 number (1 – 24 for span 1, and 25 – 48 for span 2)

Menu Options 6 and 14

Restoring specific DS0s from busy-out state

Issue the following commands to restore specific DS0s on span lines 1 and 2 from a busy-out, fractional T1, or call ignore state.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s

or

D,D,D,...

Where:

D = DS0 number (1–24 for span 1, and 25–48 for span 2)

Menu Options 7 and 15

Disconnecting calls on specific DS0s

Options 7 and 15 allow you to disconnect calls on specific DS0s on span lines 1 and 2. Enter the number of the channel or channels you wish to disconnect calls on at the command prompt.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s)

D,D,D,...

Where:

D = DS0 number (1–24 for span 1, and 25–48 for span 2)

Menu Options 8 and 16

Ignoring incoming calls on specific DS0s

Configure command options 8 and 9 to ignore incoming calls on specific DS0s on span lines 1 and 2.

This feature lowers the answer supervision signal to the Telco and stops response to inbound seizure, but does not busy-out the channel. All incoming signaling is ignored.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s)

D,D,D,...

Where:

D = DS0 number (1–24 for span 1, and 25–48 for span 2)

Menu Options 9 and 17

Forcing receiver reframe on the span lines

Issuing command options 9 or 17 forces the T1 framer to reframe or re-synchronize incoming data on span line 1 or 2.

Use these options if error conditions occur. Observe error conditions through span line 1 and 2 alarm/event status screens.

Menu Options 10 and 18

Running transparent tests

The transparent configuration provides clear channel DS0s to pass between the Dual Channelized T1 (386) NAC and the modems over the TDM bus. Any signaling is passed straight through.

Use the following syntax when configuring this option:

D (to configure individual DS0s)

D-D (to configure multiple DS0s)

D,D,D,...

Where:

D = DS0 number (1–24 for span 1, and 25–48 for span 2)

Menu Options 11 and 19

Entering and exiting locally initiated loopback on the span lines

Issue loopback tests to verify that the span's framer circuitry is functioning properly and to test Telco links. Menu options 9 and 10 control loopback tests for span lines 1 and 2. Initiate or terminate loopback tests from these prompts.

This command turns the local interface into a "mirror" facing back toward the network.

Menu Option 20

Disabling red ALARM LEDs

The span line ALARM LEDs on the NAC's front panel remain lit for the duration of an alarm condition. In cases where the alarm condition is recognized and it is determined that the cause for this alarm is accounted for, disable the LED with this option.

4 DUAL CHANNELIZED T1 (386) STATUS DISPLAYS

This chapter contains information about Dual Channelized T1 (386) status displays.

Dual Channelized T1 Status Displays

Access the Dual Channelized T1 status display by selecting option 2 from the UI console's main menu.

```
Copyright | 3Com Corporation, 1998

      Dual T1 Application Card Revision   4.3.2    (Card Id:27)
      Boot Code Linked Date     : Mon Dec 04 17:41:48 1995
      Operation Code Linked Date: Tue Feb 23 10:29:06 1999

Main Menu

1 Status
2 Command
3 T1 Card Configuration
4 DS0 Configuration
5 T1 Span Line 1 Configuration
6 T1 Span Line 1 Call Parameter Configuration
7 T1 Span Line 2 Configuration
8 T1 Span Line 2 Call Parameter Configuration

Enter menu selection and press Return.
Menu Selection (1-8):
```

Selecting option 1 from the main menu produces this screen:

```
Status

 1 Power-up Self-test Status
 2 T1 Card Status
 3 T1 Span Line 1 DS0/Modem Status
 4 T1 Span Line 1 Alarm/Event Status
 5 T1 Span Line 2 DS0/Modem Status
 6 T1 Span Line 2 Alarm/Event Status
 7 T1 Span Line 1 ABCD Bit Status
 8 T1 Span Line 2 ABCD Bit Status

 Enter menu selection and press Return or press Esc to exit.

 Menu Selection (1-8):
```

Menu Option 1 Checking power-up self test status

Upon power-up, Dual Channelized T1 (386) software performs various tests to ensure proper operation of the network application card (NAC) and network interface card (NIC) hardware. Selecting option 1 from the status menu displays the results for these tests:

- RAM

  This test fills the SRAM of the NAC with a pattern sequence, and then performs a comparison check. The failure level for this test is Critical.

- Flash ROM

  This test performs a CRC check on the Flash ROM. The failure level for this test is Critical.

- Non-maskable Interrupt

  This is a write-to-ROM test that results in a non-maskable interrupt (NMI). Any attempt to write to ROM causes the NMI test code to run. The failure level for this test is Non-critical.

- Watch Dog

  This test verifies that the watch dog circuitry on the NAC functions properly. The failure level for this test is Non-critical.

- Management Bus UART

  This is a simple loopback test to verify that the UART that communicates with the management bus functions properly. The failure level for this test is Non-critical.

- User Interface UART

  This is a simple loopback test to verify that the UART that communicates with the UI port functions properly. The failure level for this test is Non-critical.

- Time/Space Switch

  The NAC's software runs two built-in self-tests of the time space interchange (TSI), as well as a write/read test of the TSI registers. The failure level for this test is Non-critical.

- Framer 1/2

  The Dual Channelized T1 (386) software performs various diagnostic exercises to test the framer chips. The failure level for this test is Non-critical.

- Line Interface Unit 1/2

  The power-up code verifies whether or not the NIC is present and then configures the CSU on the NIC to local loopback mode. The failure level for this test is Non-critical.

- Flash ROM 12v Test

  This self-test checks and verifies the 12v circuitry to the Flash ROM functions properly. The failure level for this test is Non-critical.

Menu Option 2 **Checking the Dual Channelized T1 (386) overall status**

This status screen provides status information for:

- Current timing source
- What type of NIC is installed behind the NAC
- What chassis slot the NAC is installed in
- How much time elapsed since the NAC was last reset

Menu Options 3 and 5 **Checking DS0/modem status**

Status menu options 3 and 5 allow you to observe the status of span line 1 and 2 DS0s and the modems they are mapped to.

The DS0 column indicates the DS0 number, 1–24.

The DS0 Status column indicates the status of the DS0. It displays one of these:

- ALARM

  An alarm is detected on the DS1. Layer 1 is down. An out of frame (OOF) or loss of signal (LOS) condition places associated DS0s into Alarm.

- BUSY-OUT

  The DS0 is not available for use. If a call goes to the DS0, a busy signal is returned. Clear by using the restore DS0 command.

- CALL-IGNORE

  A command is issued from the modem or the T1 operator to ignore all calls on the specified DS0(s). Clear by using the restore DS0 command.

- CBUSY-OUT

  The DS0 is assigned a configuration state of busy-out. Save and restore this setting from NVRAM.

- CONNECT-IN

  The DS0 line is in use with a call originating from a remote device through the Telco.

- CONNECT-OUT

  The DS0 line is in use with a call originating from a modem in the chassis.

- DIALING-IN

  A call is originating from the Telco and is being answered by the T1/modem. Call setup is in progress.

- DIALING-OUT

  A call is originating from a chassis modem.

- FRAC-UNUSED

  The DS0 is assigned a time slot of 0 (disconnected from the TDM bus), with a configuration state of frac-unused, for a fractional T1 application.

- IDLE

  The DS0 line is available and waiting for a call.

- TEST

  A test is taking place on the DS0. Clear by using the restore DS0 command.

- TRANSPARENT

  This is usually a non call-taking test state. Also used in special applications. The modem is mapped to a DS0 without signaling. When in this state, all DS0 commands are ignored. An alarm state overrides the transparent state, but returns the DS0 to transparent when the alarm clears.

- TRANSPTEST

  The DS0 is placed in a transparent test mode in order for the modem to carry out a tone test on the channel. When in this state, all DS0 commands are ignored except for the restore DS0 command, which returns the DS0 to the idle state.

- UNAVAILABLE

  No T1 span line connected to the NIC. All DS0s display unavailable if a T1 span line is not attached.

- UNUSED

  The DS0 is assigned a time slot of 0 (disconnected from the TDM bus) and a configuration state of normal, busy-out or transparent.

The modem status column indicates the status of the modem corresponding to the DS0. It displays one of these:

- BUSY-OUT

  The modem is not available for use. If a call goes to the modem, a busy signal is returned.

- CONNECT-IN

  A modem is in use with a call originating from a remote device through the Telco.

- CONNECT-OUT

  A modem is originating a call.

- DIALING-IN

  A call is originating from the Telco and is being answered by the modem. Call setup is in progress.

- DIALING-OUT

  A call is originating from a chassis modem.

- IDLE

  The modem is available and waiting for an incoming or outgoing call request.

- TRANSPARENT

  The modem is mapped to a DS0 without signaling.

- TRANSPTEST

  The modem is performing a transparent tone test on the DS0 channel.

- UNAVAILABLE

  The modem failed or is not installed.

- UNUSED

  The modem is not currently connected to a DS0, or mapped for usage.

Menu Options 4 and 6

Checking span line 1 and 2's alarm/event status

Status menu options 4 and 6 allow you to monitor alarm and event status on span lines 1 and 2.

The status of the following items is displayed on these screens:

- Receiver Gain

  This is a function of line interface unit that indicates the T1 span line signal strength in 7.5 dB increments: 0 dB, 7.5 dB, 15 dB and 22.5 dB (0 dB is a strong signal).

- Errored Seconds

  This indicates out of frame (OOF) conditions, frame slip conditions, or error events for super frame (SF) and extended super frame (ESF) framing formats. For SF, it reports the number of seconds the frame was in either OOF or slip condition. For ESF, it reports error events in seconds.

- Severely Errored Seconds (SES)

  This reports how many seconds were timed during which bit, frame, and CRC error events existed.

- Unavailable Secs

  The DS1 is determined to be unavailable. All other counters will stop. Any layer 1 condition or 10 consecutive SES events will lead to DS1 unavailability. Ten consecutive non-SESs (no alarm condition) will clear the unavailability.

- Bipolar Violations

  This indicates bipolar violations (BPV) in the line format being used. A BPV occurs when two consecutive non-zero elements of the same polarity occur in an alternate mark inversion (AMI) signal.

- Framing Bit Errors

  This indicates an error in the framing bit used to determine frame alignment. The framing bit error count is reported.

- Change in Frame Alignment (CFA)

  This indicates that a receiver has reframed on a new framing pattern, and synchronized at a new frame alignment due to an OOF condition. The status report indicates whether or not a CFA occurred. A counter records the number of times a CFA occurred since the latest counter reset.

- Controlled Slip Secs (Frame Slips)

  These are caused either by frames deleted due to buffer overflow (BOF) or frames repeated due to buffer underflow (BUF). The status report indicates whether or not a BOF or BUF condition occurred. A counter records the number of times a condition occurred since the latest counter reset.

- Severely Err Framing Secs (SEFS)

  Any second with an OOF or AIS condition is counted as an SEFS.

- Bursty Errored Seconds

  This occurs in ESF format only. It reports CRC error conditions in seconds.

- CRC Errors

  This occurs only in ESF format when a CRC bit is in error. The CRC error count is reported.

- Excessive CRC Error Indication (ECRCEI)

  This is reported in ESF format when 32 of any 33 consecutive CRCs are in error. The status report indicates whether or not this event occurred. A counter records the number of times an event occurred since the latest counter reset.

- Out of Frame (OOF)

  This is a local alarm that indicates a framing pattern for a span is lost and data cannot be extracted properly. This is also referred to as a red alarm. In both SF and ESF formats, OOF occurs when any two of four consecutive frame synchronization bits are in error. The status indicates whether or not OOF conditions are present.

- Loss of Signal (LOS)

  The received signal is missing. This occurs when 175 consecutive 0's are detected on the span line or when the signal is lost for 150 msec or longer. The signal is recovered when the 1's density reaches 12.5% or when four 1's are received within a 32-bit period. The status report indicates the presence of a LOS condition.

- Remote Frame Alarm (RFA)

  This indicates that an OOF condition is occurring at the remote end. The remote end sends a bit pattern indicating a remote problem. This is also referred to as a yellow alarm. The status report indicates whether or not an RFA is present.

- Alarm Indication Signal (AIS)

  This indicates to the other end that a loss of the received signal is occurring (Central Office switch sends the AIS patterns). The remote end is alive but there are problems. This is also referred to as a blue alarm. AIS occurs when a stream of 1's is received. The status report indicates the presence of an AIS condition.

- Loop Back

  This indicates whether or not a remotely or locally initiated loopback is in progress from the network.

- Time since clear

  The time in days:hours:minutes:seconds since the counters were reset and the screen was last looked at.

The events in the lower left-hand side of the screen are real time alarms. The events in the lower right-hand side of the screen are debounced alarms and will activate only if the condition persists for more than two seconds.

Press **Ctrl-R** to reset any of the counters on this screen.

Menu Options 7 and 8

Checking span line ABCD bit status

Monitor supervision bits for T1 signaling for trouble clearing. Toggle the AB bits out to the network by initiating a busy-out command and restoring the DS0 command.

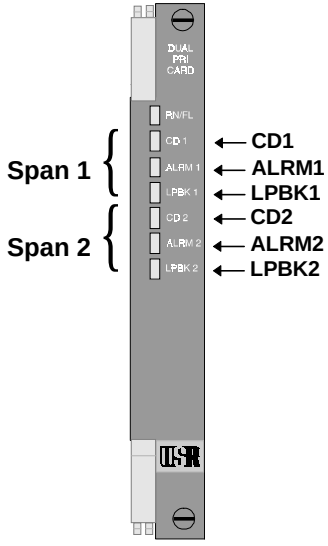
A

TROUBLE CLEARING

This appendix contains Dual Channelized T1 (386) Network Application Card (NAC) trouble clearing information.

Using the LEDs

The Dual Channelized T1 (386) NAC has six LEDs on the front panel, three per span, that indicate line signal conditions.



LED	Purpose
CD1 & CD2	Carrier Detect indicators for span lines
ALRM1 & ALRM2	Alarm condition indicators for span lines
LPBK1 & LPBK2	Loopback indicators for span lines

CD (1 or 2) LED Color	ALRM (1 or 2) LED Color	LPBK (1 or 2) LED Color	T1 Condition
Green	Off	Off	No Alarm
Green	Red	Off	Remote Frame Alarm (RFA)
Off	Red	Off	Loss of Signal Alarm (LOS)
Red	Red	Off	Out of Frame Alarm (OOF)
Red	Red	Off	Unframed All Ones Alarm (AIS)
Green	Off	Green	Loopback in Progress

If LEDs indicate an alarm condition, refer to the alarm event status screen for details.

Alarm LEDs will still register during loopback.

About Dual Channelized T1 (386) Alarm Levels

Layer 1 alarm conditions are categorized into one of three alarm levels:

Alarm	Severity	Result
Red Alarm	High	Loss of connection and/or data locally
Blue Alarm	High	No data received from Telco; all 1's received by NAC
Yellow Alarm	High	Improper data received at remote end

Correcting Alarm/Error Conditions

Alarm/Error	Level	Trouble Clearing
Remote Frame Alarm (RFA)	Yellow	■ Verify that the NAC is configured properly according to the services provisioned by the Telco. Contact the Telco if necessary. ■ Check the cables—do not use a flat cable. ■ Check break-out boxes. ■ Examine boot-up test results. ■ Examine error counters.
Loss of Signal (LOS)	N/A	■ Verify that the span is plugged into the NIC properly. ■ If the cabling is correct, there is most likely a problem at the Telco. Contact the Telco for service. ■ Check the cables—do not use a flat cable. ■ Check break-out boxes. ■ Examine boot-up test results. ■ Examine error counters.
Out-of-Frame (OOF)	Red	■ Verify that the NAC is configured properly according to the services provisioned by the Telco. ■ If your configuration is correct, there may be a problem with the Telco's equipment. Contact the Telco for service. Check the cables—do not use a flat cable. ■ Check break-out boxes. ■ Examine boot-up test results. ■ Examine error counters. ■ Check framing mode configuration.
Unframed All Ones (AIS)	Blue	■ Indicates a red alarm at the Telco. Contact the Telco for service.
RFA and Continuous CRC (CCRC) Errors	N/A	■ Verify that the NAC is configured properly according to the services provisioned by the Telco.

Using SNMP Traps

The Total Control Enterprise Network Hub provides for the management of the Dual Channelized T1 (386) NAC via the Network Management Card (NC) NAC. The NMC manages the Dual Channelized T1 (386) and other cards in the chassis using Simple Network Management Protocol (SNMP).

One function of SNMP is to allow for faults, or traps, to be triggered when one of the cards experiences an alarm condition. View the alarm conditions using a standard MIB browser or 3Com's Total Control Manager/SNMP software.

The Dual Channelized T1 (386) NAC triggers traps at both the card and span levels.

For a detailed listing and explanation of Dual Channelized T1 (386) traps, consult the Total Control Parameter Reference on the Total Control CD-ROM or the Total Control Manager/SNMP online help.

B

TECHNICAL SPECIFICATIONS

Certification

EMI/RFI	■ FCC 15A ■ EN55022 A
Safety	■ UL 1950 ■ C-UL ■ EN 60950 ■ JATE

Regulatory Compliance Statements

United States

FCC Part 15 Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Current Draw

+5.2 vDC @ 2.0 A typical maximum

Typical Maximum refers to the maximum current draw under most typical configurations.

Environment

Shipping and Storage

Temperature:	-25 to 75° C, -13 to 167° F
Relative Humidity:	0 to 100%, Non-condensing

Operating

Temperature:	0 to 40° C, 32 to 104° F
Relative Humidity:	0 to 95%, Non-condensing

Physical Dimensions

Network Application Card

	Inches	Centimeters
Length:	5.30	13.46
Width:	0.79	2.00
Height:	6.90	17.53

INDEX

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