Chapter 4
T1 Interface Card

GENERAL

This chapter describes DTE interface options that may be required if application requirements change. It also describes software configuration for the T1 interface card.

DTE INTERFACE OPTIONS

Several standard DTE interfaces are available. Normally, the FT100 M is purchased with the required interface already installed. However, if application requirements change, the unit can be reconfigured.

To select the DTE interface type,

1. install the appropriate adapter card on the main printed circuit board (PCB), and, if required,

2. install an adapter to convert the PORT connector on the rear panel.

Chapter 2, has instructions on removing the main cards from the FT100 M.

Installing an Interface Card

The interface adapter cards are located on the main printed circuit card as shown in Figure 4-1.

Because the available interface adapter cards are used on various Motorola products, they may contain switches and straps that must be set per product requirements. For the T1 interface card, the adapter card settings are described in Table 4-1. Factory installed interface adapter cards are already configured.

Table 4-1. Factory Settings for the Interface Adapter Card

V.35 Card	RS-530/449 Card
#4563956	#4563137
Switches 3, 4, 6 ON 1, 2, 5, 7, 8, OFF	Strapped for TM

Figure 4-1
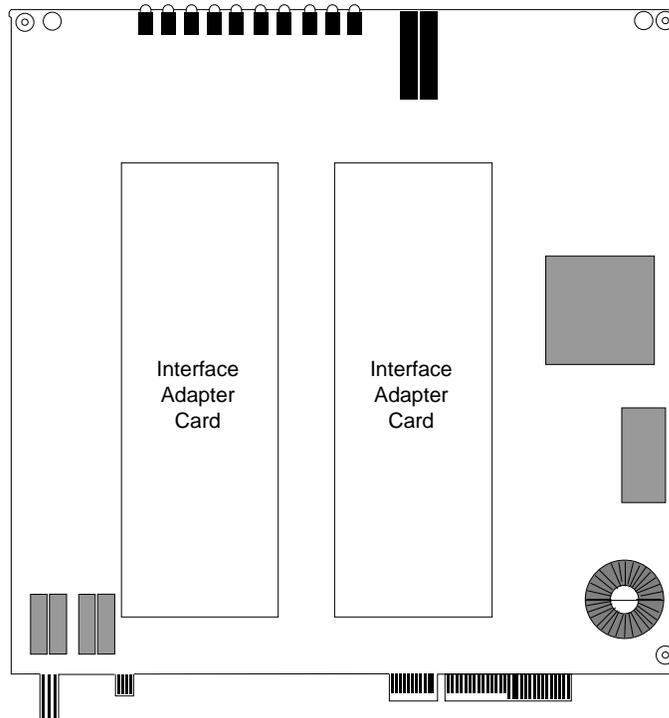***T1 Interface Card***

To install an interface adapter card,

1. Ensure the interface card is configured correctly.

2. Align the connectors.

3. Firmly press the adapter card down at both ends.

4. Place the T1 interface card into the FT100 M housing as described in Chapter 2.

Using a Conversion Adapter

A DSX-1, V.35, or RS-530/RS-449 connector conversion adapter can be attached to the rear panel PORT connectors. The DSX-1 conversion adapter converts the 25-pin D-type DTE connector to an 8-pin modular telephone jack (RJ48C). The V.35 adapter converts the 25-pin D-type DTE connector to a 34-pin V.35 connector. The RS-530/RS-440 adapter converts the 25-pin D-type DTE connector to a 37-pin RS-449 connector.

Adapter part numbers are:

DSX-1 adapter (male db25 to RJ48)	610405490101
DSX-1 adapter (male db25 to female db15)	610406250001
V.35 adapter (male db25 to V.35)	650037690101
RS-449 adapter (3 ft. cable)	92018

SOFTWARE CONFIGURATION

The configuration management card lets you monitor and configure the local T1 interface card or a remote T1 interface card. To choose which card is to be configured, select the <CONFIG> option from the system options. The initial device screen, which is the Device Configuration screen, is shown in Figure 4-2.

```
   Motorola    │ Device: FT100 CSU/DSU (V.35/V.35)
    FT100 M    │ Revision: 1.1.03 PT B.1.1              SN: 01A6ECB90000002A
Copyright 1994 │
               │ Time: 14:51:21  Date: 08-12-96
               ┌─────────Communication Status─────────────┐


          T1 Network Status                      SYNC
          Remote Configuration Mode              ENABLE




       │                                                  │
       │                                                  │
       │          ─────Device Configuration Menus─────────┤
 <System>     <Local>
 Reset        <Remote>
```

Figure 4-2
Device Configuration Screen

REGIONS

The T1 Configuration screen is divided into four distinct regions similar to the configuration management screen:

- BANNER
- MENU
- PARAMETER
- OPTIONS

Banner Region

The BANNER region contains the name, revision, serial number and the time and date. Users cannot access this region.

Menu Region

The MENU region displays items for configuration. Each item is followed by the current value.

Press the RETURN/ENTER key to change the value of the currently selected menu item. The PARAMETER region lists all possible values or prompts for entering text. See Figure 4-3.

Use the SPACE BAR to move between the MENU region and the OPTIONS region.

```
   Motorola     Device: FT100 CSU/DSU (V.35/V.35)
   FT100 M      Revision: 1.1.03 PT B.1.1            SN: 01A6ECB90000002A
Copyright 1994
               Time: 14:55:25  Date: 08-12-96
                        Port 1 Configuration Menu
Port Type               V.35       LL Mode              DISABLE
DS0 Rate                64K        RL Mode              DISABLE
Transmit Clock Source   INTERNAL
Transmit Clock Polarity NORMAL
Receive Clock Polarity  NORMAL
Remote Loopback Operation ENABLE
CTS Mode                NORMAL
RLSD Mode               NORMAL
DSR Mode                NORMAL
TM Mode                 NORMAL
                         Settings
56K
64K

                        Local Main Menus
<System>    Port 1    Network    Alarms     <Device>
Reset       Port 2    Tests      <History>
```

Figure 4-3
Changing Menu Item Values

Parameter Region

Use the arrow keys to move to and highlight the desired value for the menu item in the PARAMETER region. The selected menu field may allow text entry instead of displaying a list of values for selection.

Press the RETURN/ENTER key to select the highlighted value or to accept the entered text. The MENU region is updated to reflect the new value.

Options Region

The OPTIONS region lists additional configuration screens that are available. Use the SPACE BAR to move between the MENU region and the OPTIONS region.

Press RETURN/ENTER to select a highlighted option.

DEVICE CONFIGURATION SCREEN

The Device Configuration screen (Figure 4-4) lets you monitor network status, to enable the devices ability to be remotely configured, and to select the local or remote device for configuration.

```
  Motorola      Device: FT100 CSU/DSU (V.35/V.35)
   FT100 M      Revision: 1.1.03 PT B.1.1            SN: 01A6ECB90000002A
Copyright 1994
                Time: 14:51:21  Date: 08-12-96
                           Communication Status

           T1 Network Status                 SYNC
           Remote Configuration Mode         ENABLE




                         Device Configuration Menus
<System>      <Local>
Reset         <Remote>
```

Figure 4-4
Device Configuration Screen

COMMUNICATION STATUS

This menu region includes T1 Network Status and the Remote Configuration Mode.

T1 Network Status

This non-selectable setting indicates whether or not the unit is in Sync with the remote end.

Remote Configuration Mode

This setting indicates whether the local unit will accept configuration commands from the remote device. Regardless of this setting, the unit will present its current configuration when queried. The following setting are available:

- ENABLED - allows the local device settings to be changed from the remote device through the Facility Data Link (FDL)

- DISABLE - the local unit will not allow its settings to be changed from the remote device through the FDL

DEVICE CONFIGURATION OPTIONS

This option region lists the following configuration screens and reset options:

<System>   returns to the System screen

Reset   performs a hardware reset

<LOCAL>   displays local software option menus that lets you monitor and configure the local FT100 M

<REMOTE> displays remote software option menus that lets you monitor and configure the remote FT100 M through the FDL over the T1 connection. In order for this feature to be valid, the FDL path must be present

LOCAL SOFTWARE OPTIONS

Each major section that follows represents a screen that is available for configuring/monitoring the local FT100 M device. The Local Main Menu screen is shown in Figure 4-5.

```
   Motorola     Device: FT100 CSU/DSU (U.35/U.35)
    FT100 M      Revision: 1.1.03 PT B.1.1               SN: 01A6ECB90000002A
 Copyright 1994
                 Time: 14:57:32  Date: 08-12-96
                ┌─────Port 1 Configuration Menu─────┐
 Port Type                 U.35      LL Mode              DISABLE
 DS0 Rate                  64K       RL Mode              DISABLE
 Transmit Clock Source     INTERNAL
 Transmit Clock Polarity   NORMAL
 Receive Clock Polarity    NORMAL
 Remote Loopback Operation ENABLE
 CTS Mode                  NORMAL
 RLSD Mode                 NORMAL
 DSR Mode                  NORMAL
 TM Mode                   NORMAL



                      ─────Local Main Menus─────
 <System>       Port 1      Network      Alarms        <Device>
 Reset          Port 2      Tests        <History>
```

Figure 4-5
Local Main Menus

<System>

This selection exits the configuration mode of the T1 interface card and returns to the System screen of the local device.

Reset

This selection performs a hardware reset on the local device as described in Chapter 3.

Port 1 / Port 2

Port configuration screens let you view and change the configuration of the DTE ports.

Port Type

This non-selectable setting indicates the type of DTE interface installed on the selected port.

- V.35
- RS-530
- RS-232
- DSX-1

DS0 Rate

This setting indicates the data rate for all DS0s assigned to a respective port. For 56 kbps channels, the least significant bit of every DS0 is forced to a "1". This ensures minimum ones-density requirements for the T-1 facility. The following settings are available:

- 64k
- 56k

Transmit Clock Source

The following settings are available:

- INTERNAL - The FT100 M uses the transmit clock output to clock DTE transmit data into the transmit buffer. Where the DTE is located near the unit, internal clock is usually selected.

- EXTERNAL - The FT100 M uses the external clock from the DTE to clock DTE data. In applications with a high bit rate and a long DTE cable, it may be necessary to use the external clock option.

In external clock operation, the transmit clock output from the unit is routed to the DTE and sent back to the unit along with the data line. This eliminates any phase misalignment between the clocks and the data signal due to cable or equipment delay, and insures a proper signal/clock relationship at the unit input.

☞ **Note**

Not compatible with most public network timing.

Transmit Clock Polarity

The following settings determine whether the TX clock polarity is normal or inverted with respect to the received data:

- NORMAL - has an auto clocking feature to align data and clock regardless of delays in the system

- INVERTED - lets you invert the polarity of the TX clock. This causes the transmit clock to shift half a bit time with respect to the TX data.

Receive Clock Polarity

The following settings determine whether the RX clock polarity is normal or inverted with respect to the received data:

- NORMAL
- INVERTED - lets you invert the polarity of the RX clock. This causes the receive clock to shift half a bit time with respect to the RX data.

Remote Loopback Operation

This option determines whether the unit acknowledges or ignores a loop-up pattern from the remote CSU/DSU. The following settings are available:

- ENABLE
- DISABLE

CTS Mode

The following settings are available:

- NORMAL
- FORCED ON

When NORMAL is selected, CTS is asserted approximately 10 ms after RTS is received.

RLSD Mode

The following settings are available:

- NORMAL
- FORCED ON

NORMAL turns RSLD ON when the FT100 M receiver has acquired frame synchronization and turns it OFF when frame synchronization is lost or no signal is present.

DSR Mode

The following settings are available:

- NORMAL
- FORCED ON

NORMAL turns DSR ON when the FT100 M receiver has acquired frame synchronization and turns it OFF when frame synchronization is lost or no signal is present.

TM Mode

The TM signal indicates to the DTE if the unit is in a test mode. The following settings are available:

- NORMAL
- FORCED OFF

The FORCED OFF setting disables notification to the DTE of the test modes.

LL Mode

This option determines whether the unit acknowledges or ignores an LL signal (pin 18) from the DTE. If enabled, the LL signal causes the DTE port to enter Local Terminal Loopback. Otherwise, the LL signal is ignored. The following settings are available:

- ENABLE
- DISABLE

☞ **Note**

If the state of this pin on the DTE is unknown, this option should be set to DISABLE. If this pin toggles, it can cause errors in the data stream by causing the port to go in and out of test mode.

RL Mode

This option determines whether the unit acknowledges or ignores an RL signal (pin 21) from the DTE. If enabled, the RL signal causes the DTE port to enter remote loopback. Otherwise, the RL signal is ignored. The following settings are available:

- ENABLE
- DISABLE

☞ **Note**

If the state of this pin on the DTE is unknown, this option should be set to DISABLE. If this pin toggles, it can cause errors in the data stream by causing the port to go in and out of test mode.

DSX-1 Framing

DSX Interfaces only. This option selects the type of framing used between the DSU and DTE. The following settings are available:

- ESF
- SF or D4

DSX-1 Zero Coding

DSX Interfaces only. This option determines the line coding used between the DSU and DTE. The following settings are available:

- B8ZS
- B7SUB
- NONE

DSX-1 Line Length

DSX Interfaces only. This option allows the setting of line build-out (LBO) for the DSX-1 card interface according to the displayed line length. The following ranges are available:

- 0-133 ft
- 133-266 ft
- 266-399 ft
- 399-533 ft
- 533-655 ft

DSX-1 Signaling

DSX-1 Interfaces only. This display determines whether or not signaling information is passed from the network to the DTE. If this option is disabled, robbed bit signalling between Private Branch Exchanges (PBXs) will not function. The following settings are available:

- ENABLE
- DISABLE

DSX-1 Yellow Alarm

DSX-1 Interfaces only. This option determines whether or not a yellow alarm is sent back to the DTE upon receiving AIS or LOS from the DTE serviced by this particular DSX-1 interface. See Appendix C, *T1 Overview* for detailed information. The following settings are available:

- ENABLE
- DISABLE

DSX-1 Idle Code

DSX Interfaces only. This option selects which code is inserted into unused DS0s. The following settings are available:

- 7F
- FF

NETWORK

The Network Configuration Menu (Figure 4-6) lets you view and change the settings controlling the operation of the T1 network interface circuitry.

```
   Motorola    │ Device: FT100 CSU/DSU (U.35/U.35)
   FT100 M     │ Revision: 1.1.03 PT B.1.1              SN: 01A6ECB90000002A
 Copyright 1994 │
               │ Time: 15:29:36  Date: 08-12-96
               └──────────Network Configuration Menu─────────────────
 Framing              ESF         Yellow Alarm              ENABLE
 Zero Coding          B8ZS        Line Loopback             ENABLE
 Timing Source        LOOP        Payload Loopback          ENABLE
 Line Build-Out       0 dB        Idle Code                 7F
 Error History        ANSI

 Time Slot (Assigned w/ "x")        123456789012345678901234
 Port 1 Map                         ------------------------
 Port 2 Map                         ------------------------



 ───────────────────────────Local Main Menus────────────────────
 <System>      Port 1      Network      Alarms       <Device>
 Reset         Port 2      Tests        <History>
```

Figure 4-6
Local Network Configuration

Framing

The T1 network signal framing mode can be set to either Superframe (SF) or Extended Superframe (ESF) mode. The following settings are available:

- ESF
- SF

☞ **Note**

The framing mode at both the local and remote ends must be the same.

Zero Coding

For a CSU to derive clock synchronization it is necessary for there to be a certain ones density over the T1 network connection. To maintain this ones density, the following settings are available:

- B8ZS - (Bipolar 8-zero substitution) uses a bipolar violation sequence to replace strings of 8 zeros in the transmit data. This option should be selected when you require a 64K clear channel connection.

- B7SUB - on occurrence of string of 8 zeros in a channel, bit 7 is forced to a one. B7SUB is also referred to as *forced bit*.

- NONE - disables zero coding options.

Timing Source

This option selects the timing mode. The following settings are available:

- LOOP - The FT100 M synchronizes all timing and clocks to the T1 network receive signal. In this mode, the unit supplies transmit and receive clock to the DTE port. This is the selection to choose when the unit is connected to a T1 service that provides timing.

- PORT 1 - The FT100 M synchronizes all timing and clocks to the selected DTE's external transmit clock. (Generally used for public networks).

- PORT 2 - The FT100 M synchronizes all timing and clocks to the selected DTE's external transmit clock. (Generally used for public networks).

- INTERNAL - The FT100 M synchronizes all timing and clocks to an internally generated timing source. In this mode, the unit supplies transmit and receive clocks to the DTE port.

Either INTERNAL or DTE port timing can be useful in applications where the unit is directly connected to another FT100 M or T1 multiplexer, such as in LANs and Central Office connections. In these applications, only one unit should be selected for INTERNAL or DTE port timing, while the other is selected for loop timing.

Line Build-Out

LBO is a circuit that provides line attenuation. The amount of LBO depends on the distance to the last T1 line repeater and is selected before installation. The telephone company providing the service determines the amount of LBO required. For DSX-1 cross connect applications, the device has LBO options that can be set according to the line length used for connections. The following settings are available:

- CSU
    - -7.5 dB
    - -15 dB
    - 0 dB

- DSX-1
    - 133-266 ft
    - 266-399 ft
    - 399-533 ft
    - 533-655 ft

Error History

Error History is a record of circuit error and failure event parameters. The following settings are available:

- NONE - disables error reporting so that the device does not respond to a request for performance history.

- ANSI - enables transmission of the performance report message as defined by ANSI T1.403. When enabled, the report message is transmitted toward the network once per second on the FDL. The performance report contains error performance data accumulated during the previous four seconds.

- AT&T - enables error reporting as defined by AT&T publication 54016. When the request is received, the unit transmits the 24-hour performance history to the Central Office using FDL.

Yellow Alarm

The yellow alarm is sent as an indication that the unit has lost its incoming signal. This option determines whether or not Yellow Alarms will be sent out on the T1 network. The following selections are available:

- ENABLE
- DISABLE

Line Loopback

In a line loopback, the T1 network received signal is looped back to the network transmitter. The following settings are available:

- ENABLE
- DISABLE

If line loopback is enabled, the unit enters into a T1 network loopback when a line loopback code is detected on the T1 network. This signal permits easier fault diagnosis by the T1 service provider. When this option is disabled, the unit ignores an incoming line loopback code.

Payload Loopback

This option is similar to line loopback except that the contents of the DS0s are reframed before being transmitted back out on the T1 network. The following settings are available:

- ENABLE
- DISABLE

Idle Code

This option selects the 7F pattern to be inserted into unused DS0s or the FF pattern for "all ones". The following settings are available:

- 7F
- FF

Port 1 Map / Port 2 Map

These options map the appropriate DS0s, or time slots, to the respective port. An *x* indicates that the time slot associated with that column is assigned to the port. The 24 columns represent time slots 1 through 24. A hyphen (-) in the port map indicates that the time slot is not assigned to that particular port.

TEST

The Test menu (Figure 4-7) lets you initiate loopbacks and test patterns to identify and isolate problems in the T1 network or shelf. Test paths are shown in figures 4-8 through 4-14. A list of options and settings follows.

⚠️ **Caution**

Only qualified personnel who understand the T1 network and test interaction should initiate these tests.

```
    Motorola      Device: FT100 CSU/DSU (V.35/V.35)
    FT100 M       Revision: 1.1.03 PT B.1.1          SN: 01A6ECB90000002A
 Copyright 1994
                  Time: 15:30:42  Date: 08-12-96
                             ┌─Test Menu─┐
 Network Loopback            │NONE       │
 Network Receive Level       -1.9 dBdsx


 Port 1 Loopback             NONE       Port 2 Loopback             NONE
 Port 1 Test Pattern         NONE       Port 2 Test Pattern         NONE
 Port 1 Error Count             0       Port 2 Error Count             0
 Port 1 Test Time               0       Port 2 Test Time               0
 Port 1 Error Ratio        <7.50e-06    Port 2 Error Ratio        <7.50e-06
 Port 1 Count Reset             ×       Port 2 Count Reset             ×




                       ┌─Local Main Menus─┐
 <System>      Port 1      Network     Alarms       <Device>
 Reset         Port 2      Tests       <History>
```

Figure 4-7
Local Test Menu

Network Loopback

The following settings are available:

- NONE
- LOOP 2
- LOOP 3
- LOOP 4
- LOOP 5

Figure 4-8 shows the unit in Network Loop 3 (Local). This test loops the T1 network transmitter output to the receiver input at the T1 network interface. Since the entire T1 data payload is looped back, the DTE port is also looped back. This allows the local DTE to test the local unit. The looped back T1 signal is also transmitted to the T1 network to keep the network active.

Figure 4-9 shows the unit in Network Loop 4 (Line). The T1 network received signal is looped back to the network transmitter and also passed to the DTE port. The DTE port transmit signal is blocked. This allows testing on the T1 network from a remote FT100, a remote CSU, or from the telephone company's Central Office.

Network Loop 2 (payload) is similar to Loop 4 except that the transmit data is re-framed.

Figure 4-10 shows the unit in Network Loop 5 (Remote Line). When initiated, the local T1 interface card transmits a loop-up code causing the remote unit to enter Remotely Activated Network Loopback. The loop-up code is transmitted until the remote unit enters loopback. The local unit then resumes normal operation. The remote unit enters loop-back after the loop-up code has been received for at least 4 seconds.

The T1 interface card responds to the standard CSU inband loop codes and out-of-band ESF loop codes received on the FDL. When the loop-up code is detected, the unit initiates a T1 network loopback. The loop-back is terminated when the loop-down code is received. When Loop 5 is terminated, a loop-down code is transmitted to return the remote unit to normal operation.

The loop-up and loop-down codes are compatible with AT&T and ANSI inband loop codes. Therefore, the remote unit can be another FT100 M or a standard CSU device.

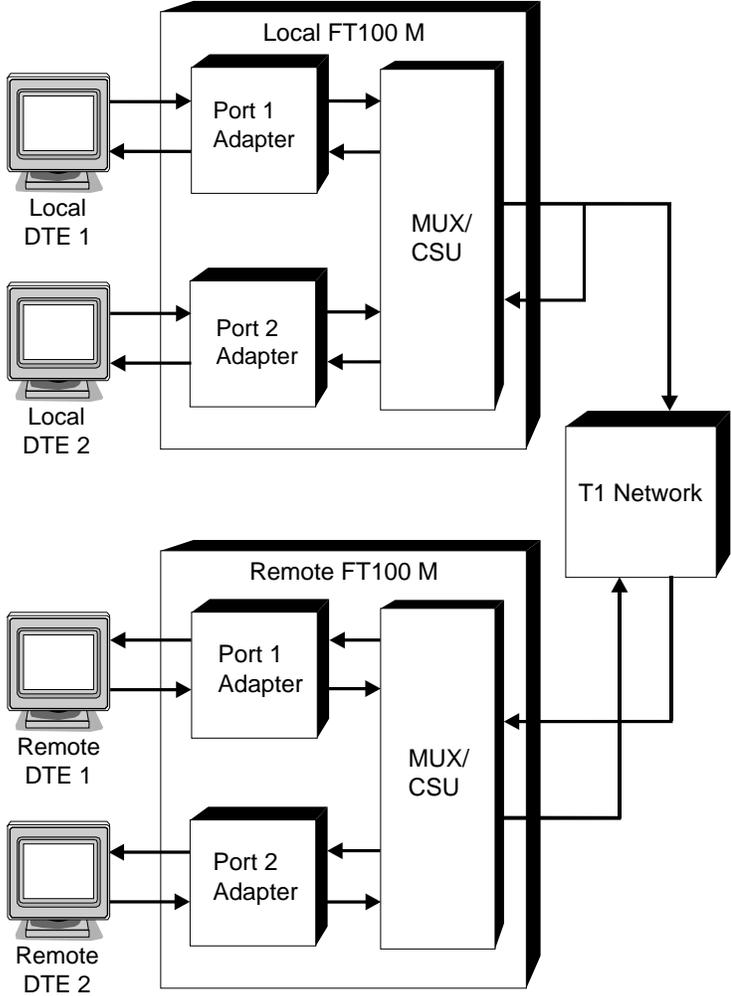Loop-up set code -- repeating bit pattern 10000. Loop-down reset code -- repeating bit pattern 100.
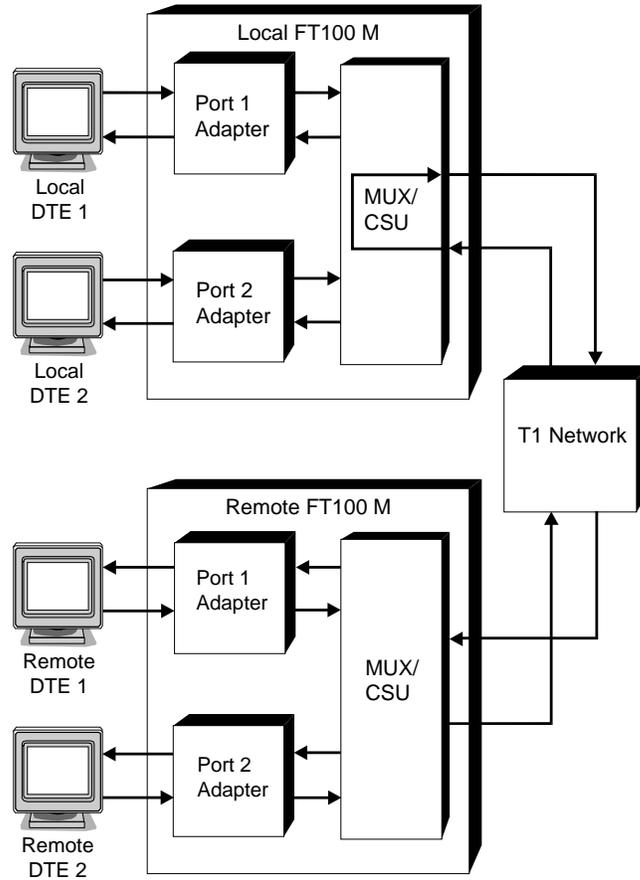
Figure 4-8
Network Loop 3 (Local)

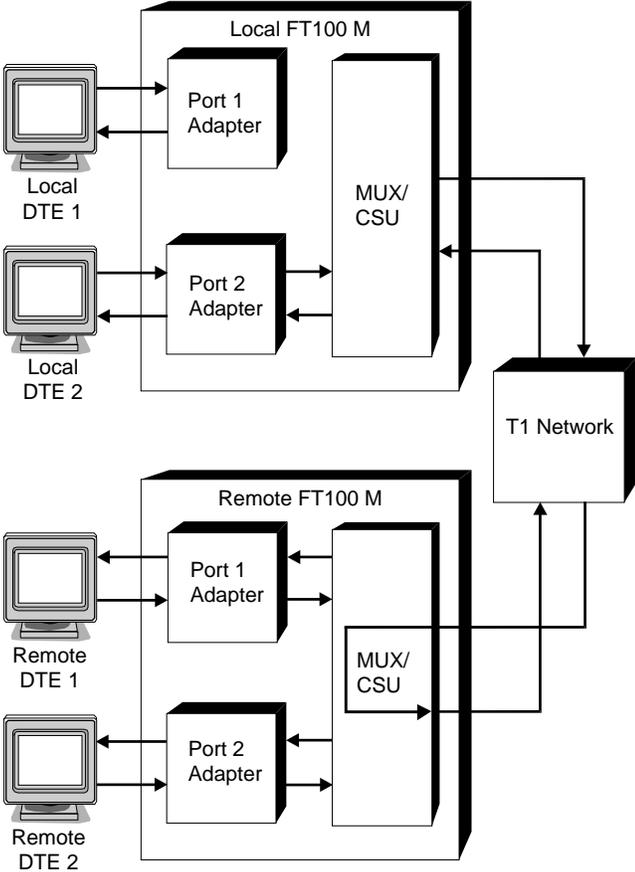***Figure 4-9***
Network Loop 4 (Line)

Figure 4-10
Network Loop 5 (Remote Line)

Network Receive Level
This non-selectable field displays the current receive level in dBDSX at the on-board CSU network interface.

Port Loopback
The following settings are available:

- NONE
- LOOP 1
- LOOP 2
- LOOP 6

Figure 4-11 shows DTE port 1 in Port Loop 1 (Local Terminal Loopback). Transmit data from the DTE is looped back to the DTE received data line. This allows testing on the FT100 M interface adapter card and the cabling to the DTE port from the DTE.

Figure 4-12 shows the DTE port in Port Loop 2 (Remote Terminal Loopback). Received data from the remote DTE is looped back to the remote DTE. The received data is also passed to the local DTE. Loop 2 may also be displayed if the remote unit initiated a remote loopback. None ends the display.

Figure 4-13 shows DTE port 1 in Port Loop 6 (Remote Loopback). The local FT100 M puts the DTE port on the remote FT100 M in remote terminal loopback by sending a (5 bit) repeating pattern (11110) transmitted inband for at least 5 seconds.

The Loop 6 pattern continues until the local FT100 M recognizes that the remote FT100 M is looped. As an option, the local DTE signal may be replaced by an internally generated test pattern.

The Loop 6 test pattern is transmitted to the remote FT100 M and monitored by the local FT100 M for errors indicated by a message.
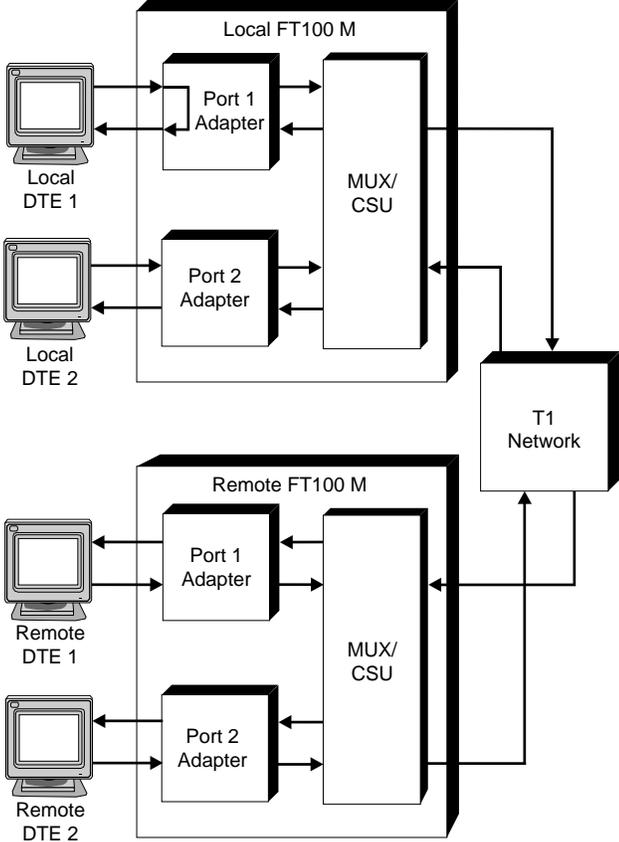
Figure 4-11
Port Loop 1 (Local Terminal)

Local FT100 M

Local DTE 1

Local DTE 2

Port 1 Adapter

Port 2 Adapter

MUX/ CSU

T1 Network

Remote FT100 M

Remote DTE 1

Remote DTE 2

Port 1 Adapter

Port 2 Adapter

MUX/ CSU

- - - - Virtual Data Path
——— Data Path
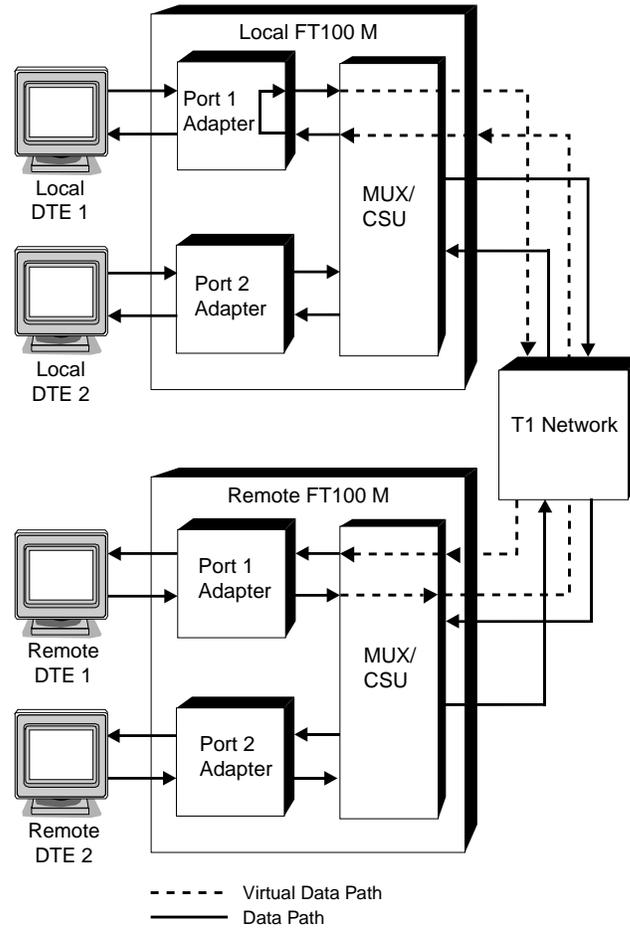
Figure 4-12
Port Loop 2 (Remote Terminal)
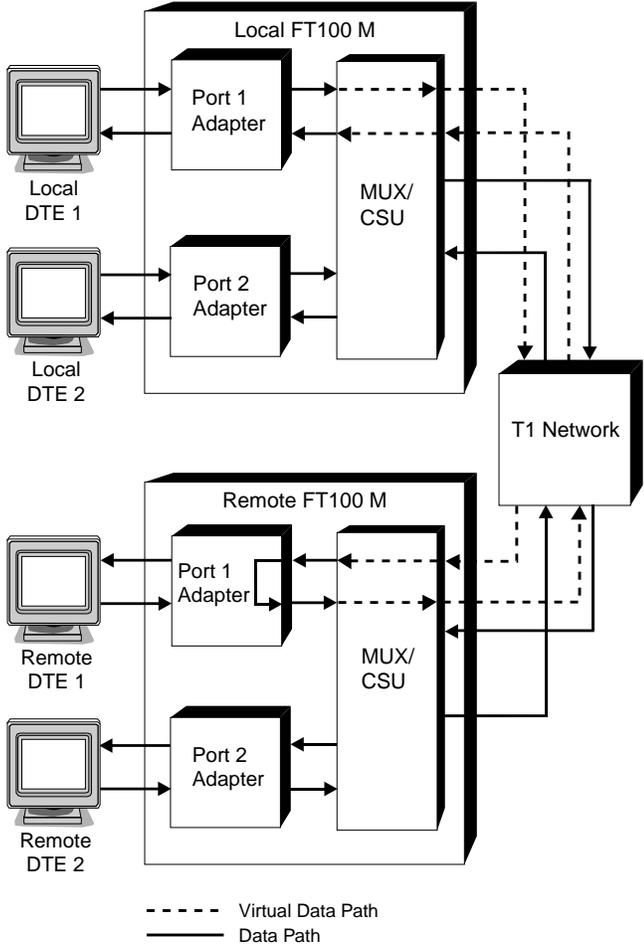
Figure 4-13
Port Loop 6 (Remote)

Port Test Pattern

Figure 4-14 shows the DTE port in the Test Pattern Test. DTE transmitted data is replaced by an internally generated 511 or all ones test pattern and sent to the remote FT100 M. Local receive data is monitored for the same test pattern.
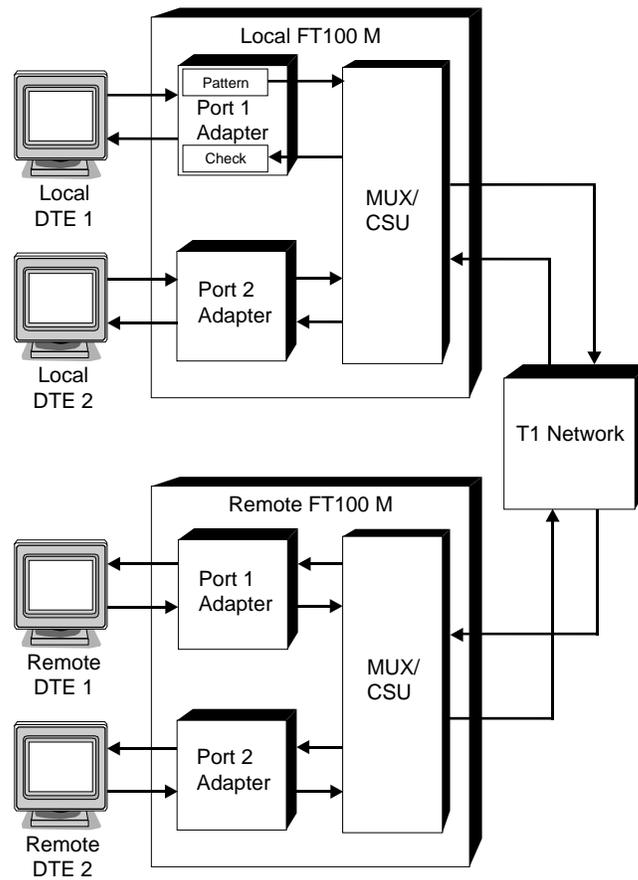
Figure 4-14
Port Test Pattern Test

Port Error Count

When a test includes a test pattern (RLTP or TP), this display shows the number of errored bits received since the test was entered or restarted.

Port Test Time

This display shows the length of time (in seconds) that a selected test has been running.

Port Error Ratio

This display shows the average number of errored bits received since the test was entered or restarted. The value appears in exponential notation.

Avg Ber = # of bit errors total bits received

Port Count Reset

This selection lets you reset the error count, test time, and error ratio for the respective port.

ALARMS

The alarm menu (Figure 4-15) lets you modify the priority of alarms reported by the T1 interface card to the configuration management card. The options and settings follow.

```
┌──────────────┬─────────────────────────────────────────────────────────┐
│   Motorola   │ Device: FT100 CSU/DSU (V.35/V.35)                        │
│   FT100 M    │ Revision: 1.1.03 PT B.1.1              SN: 01A6ECB90000002A
│Copyright 1994│                                                         │
│              │ Time: 15:32:10  Date: 08-12-96                          │
│              └──────────────────────────Alarm Menu──────────────────────┤
│           Reset Priority                          █9      █            │
│           LOS Priority                            8                    │
│           OOF Priority                            7                    │
│           AIS Priority                            6                    │
│           YEL Priority                            5                    │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
├───────────────────────────────────────────────────────────────────────┤
│                                                                       │
│                                                                       │
│                          ─Local Main Menus─                           │
│  <System>      Port 1      Network      Alarms       <Device>         │
│  Reset         Port 2      Tests        <History>                     │
└───────────────────────────────────────────────────────────────────────┘
```

Figure 4-15
Local Alarms Menu

Reset Priority

This alarm indicates that the unit has undergone a microprocessor reset.
Settings range from 0 to 9.

LOS Priority

This alarm indicates a loss of signal at the T1 network interface. Settings
range from 0 to 9.

OOF Priority

This alarm indicates an out of frame condition at the T1 network inter-
face. Settings range from 0 to 9.

AIS Priority

This alarm indicates the presence of an unframed ones sequence at the
T1 network interface.

YEL Priority

This alarm indicates a yellow alarms sequence at the T1 network inter-
face. Settings range from 0 to 9.

HISTORY

This selection initiates the display of a separate set of menus related to ESF performance history information. The <MAIN> menu selection returns to the previous configuration and test choices.

Summary

The Summary screen (Figure 4-16) displays the current status of the framing performance statistics in the form of the current interval counters and the past 24 hour totals for the following performances:

- Errored Seconds
- Bursty Errored Seconds
- Severely Errored Seconds
- Unavailable Seconds
- Controlled Slip Seconds
- Loss of Frame Count

```
  Motorola    Device: FT100 CSU/DSU (V.35/V.35)
   FT100 M    Revision: 1.1.03 PT B.1.1              SN: 01A6ECB90000002A
Copyright 1994
              Time: 15:41:28  Date: 08-12-96
                              ┌─Summary─┐
                        113 Current Secs.      24 Hour
Errored Seconds               0                    0
Bursty Errored Seconds        0                    0
Severely Errored Seconds      0                    0
Unavailable Seconds           0                    0
Controlled Slip Seconds       0                    0
Loss of Frame Count           0                    0




                        ───History Menus───
<System>      Summary      UAS        SES          LOFC
Reset         ES           BES        CSS          <Main>
```

Figure 4-16
Local Summary Menu

The history is divided into ninety-six 15 minute (15x60 = 900 seconds) intervals numbered 1 through 96, with interval 1 being the most recent interval. Each current 15 minute block is being updated and replaced. This is a sliding set of statistics.

Errored Seconds   **ES**

The ES screen displays the *errored seconds* performance. An ES is defined as a second in a framing error occurred.

Bursty Errored Seconds   **BES**

The BES screen displays *bursty errored seconds*. A BES is defined as a second in which more than one but less than 320 ESF framing errors occurred without an out of frame (OOF) condition detected.

Severely Errored Seconds   **SES**

The SES screen displays the *severely errored seconds*. An SES is defined as a second in which either an OOF occurred or 320 or more framing errors occurred.

Unavailable Seconds   **UAS**

The UAS screen displays the *unavailable seconds* performance. A UAS is defined as a second in which T1 service is unavailable. An unavailable state is declared at the onset of 10 consecutive *severely errored seconds* (SES) and is cleared at the onset of 10 consecutive seconds with no SES.

Controlled Slip Seconds   **CSS**

The CSS screen displays the *controlled slip seconds*. A CSS is defined as a second in which a frame is either repeated or deleted to account for frequency drift between the remote and local units.

Loss of Frame Count   **LOFC**

The LOFC displays the *loss of frame count performance*. LOFC is declared after 2.5 seconds of continuous loss of signal or OOF. LOFC is cleared after 2.5 seconds of no loss of signal or OOF.

Main

This selection exits the history menus and returns to the main configuration and test menu.

<Device>

This selection returns to the Device Configuration screen.

REMOTE SOFTWARE OPTIONS

Each major section that follows represents a screen that is available for configuring the remote FT100 M device.

☞ **Note**

> *In order for the local device to configure the remote, the remote device must have its Remote Configuration Mode set to ENABLE. Regardless of the state of the Remote Configuration Mode, the FT100 M will always supply its configuration when it is requested.*

The Remote Main Menus screen is shown in Figure 4-17.

```
   Motorola     Device: FT100 CSU/DSU (U.35/U.35)
   FT100 M      Revision: 1.1.03 PT B.1.1              SN: 01A6ECB90000002A
 Copyright 1994
                Time: 15:59:07    0   08-12-96   0              0
                         Remote Port 1 Configuration Menu
  Port Type            U.35        LL Mode                  DISABLE
  DS0 Rate             64K         RL Mode                  DISABLE
  Transmit Clock Source    INTERNAL    Retrieve Remote Port 1     ×
  Transmit Clock Polarity  NORMAL
  Receive Clock Polarity   NORMAL
  Remote Loopback Operation ENABLE
  CTS Mode             NORMAL
  RLSD Mode            NORMAL
  DSR Mode             NORMAL
  TM Mode              NORMAL




                         Remote Main Menus
  <System>    Port 1     Network     History
  Reset       Port 2     Tests       <Device>
```

Figure 4-17
Remote Main Menus

☞ **Note**

> *When the remote menu screens are first drawn, the selectable parameter values will all default to ??? and all time related parameters (counters) will default to 0. The Menu item values will not be displayed until that item is selected.*

This selection exits the remote configuration mode of the T1 interface card and returns you to the System screen of the local device.

Reset

Performs a hardware Reset on the local device as described in Chapter 3.

☞ **Note**

The Reset option does not reset the remote device.

The following remote Port Options are discussed earlier in the local software options section of this chapter.

Port 1 / Port 2

- Port Type - **This is a read only parameter**.
- DS0 Rate
- Transmit Clock Source
- Transmit Clock Polarity
- Receive Clock Polarity
- Remote Loopback Option
- CTS Mode
- RLSD Mode
- DSR Mode
- TM Mode
- LL Mode
- RL Mode
- DSX-1 Framing
- DSX-1 Zero Coding
- DSX-1 Line Length
- DSX-1 Signaling
- DSX-1 Yellow Alarm
- DSX-1 Idle Code

Retrieve Remote Port 1 / Port 2

This selection requests all listed parameters from the remote FT100 M's Port Configuration screen.

NETWORK

Figure 4-18 illustrates the Remote Network Configuration
.

```
 Motorola   │ Device: FT100 CSU/DSU (V.35/V.35)
  FT100 M   │ Revision: 1.1.03 PT B.1.1              SN: 01A6ECB90000002A
Copyright 1994│
            │ Time: 16:01:07   0   08-12-96   0                    0
                         ┌Remote Network Configuration┐
Zero Coding              │B8ZS       Line Loopback               ENABLE
Timing Source             INTERNAL   Payload Loopback            ENABLE
Line Build-Out            0 dB       Idle Code                   7F
Error History             ANSI       Retrieve Port 1 Map         ×
Yellow Alarm              ENABLE     Retrieve Port 2 Map         ×

Time Slot (Assigned w/ "x")         123456789012345678901234
Port 1 Map                          ------------------------
Port 2 Map                          ------------------------
Retrieve Remote Network             ×




                        ┌──Remote Main Menus──┐
<System>      Port 1     Network    History
Reset         Port 2     Tests      <Device>
```

Figure 4-18
Remote Network Configuration

The following Network Options are discussed in the local software
options section of this chapter.

- Zero Coding
- Timing Source
- Line Build-Out

☞ **Note**
*Changing Zero Coding, T1 Timing, and Line Build-out
could cause the remote configuration link to be lost.*

- Error History
- Yellow Alarm
- Line Loopback
- Payload Loopback
- Idle Code
- Retrieve Port 1 Map / Port 2 Map - This selection requests the port mapping from the remote FT100 M.

- Time Slot (Assigned w/"x")

    Port 1 Map
    Port 2 Map

- Retrieve Remote Network - This selection requests all listed parameters from the remote FT100 M's Network Configuration screen.

TEST

Figure 4-19 illustrates the Remote Test Menu.

```
  Motorola      Device: FT100 CSU/DSU (V.35/V.35)
   FT100 M      Revision: 1.1.03 PT B.1.1            SN: 01A6ECB90000002A
Copyright 1994
               Time: 16:01:57    0    08-12-96    0              0
                              ─Remote Test Menu─
Port 1 Loopback          NONE        Port 2 Loopback          NONE
Port 1 Test Pattern      NONE        Port 2 Test Pattern      NONE
Port 1 Error Count          0        Port 2 Error Count          0
Port 1 Test Time            0        Port 2 Test Time            0
Port 1 Count Reset          *        Port 2 Count Reset          *

Retrieve Remote Test                 *




                         ─Remote Main Menus─
<System>      Port 1      Network      History
Reset         Port 2      Tests        <Device>
```

Figure 4-19
Remote Test Menu

☞ **Note**
> *All counters/timers retrieved from the remote end are only a snapshot of the true values and are not continually updated.*

The following Test Options are discussed in the local software options section of this chapter.

- Port Loopback
- Port Test Pattern
- Port Error Count - **This is a read only parameter**.
- Port Test Time - **This is a read only parameter**.
- Port Count Reset
- Retrieve Remote Test - This selection requests all listed parameters/values from the remote FT100 M's Test screen.

☞ **Note**
> *Before initiating loopbacks, the test pattern should be set to NONE.*

HISTORY

☞ **Note**
> *All counters/timers retrieved from the remote end are only a snapshot of the true values and are not continually updated.*

This selection requests a snapshot of the current values from the remote devices History Summary screen.

Status

Figure 4-20 illustrates the Remote History Menu.

```
   Motorola    │Device: FT100 CSU/DSU (V.35/V.35)
    FT100 M    │Revision: 1.1.03 PT B.1.1              SN: 01A6ECB90000002A
Copyright 1994 │
               │Time: 16:02:52    0   08-12-96   0                    0
               └───────────Remote History Menu
                              0 Current Secs.      24 Hour
Errored Seconds                      0                0
Bursty Errored Seconds               0                0
Severely Errored Seconds             0                0
Unavailable Seconds                  0                0
Controlled Slip Seconds              0                0
Loss of Frame Count                  0                0

Retrieve Remote History              ×████████████████████████



                        ─Remote Main Menus─
<System>      Port 1      Network     History
Reset         Port 2      Tests       <Device>
```

Figure 4-20
Remote History Menu

☞ **Note**

All parameters on the Remote History Menu are read only.