

# ISDN PRI (Monitoring)

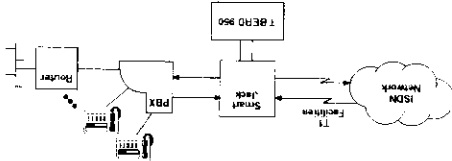
T-BERD 950 Manual Setup

Card 1 of 1

The following procedure outlines how to configure and connect the T-BERD 950 for performing in-service monitoring of ISDN PRI traffic at a smart jack. Please read the entire procedure **BEFORE** starting.

- **WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g. HOME, SETUP, RESSETS, SYSTEM) or to show multiple views within SETUP and RESSETS.
- Use the **FUNCTION** key to access top level softkey selections (e.g. CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
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**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select T1.

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select ISDN PRI.

**Setup Interface View** (The LED under SETUP is illuminated.)

1 MODE Select MONITOR.

2 FRAMING Select ESF.

3 LINE RX IN Select DSX-MON.

4 EQTP RX IN Select DSX-MON.

5 LINE LBO Select 0 dB.

6 EQTP LBO Select 0 dB.

**Setup Test Type View** (Press the SETUP key again. Test Type View appears on top left of screen.)

1 SWITCH Select the appropriate switch type (e.g., NT, TRT, or NI-2 [National ISDN-2]).

2 LINE INTR # Select 0. **NOTE:** If incorrect, the T-BERD 950 will reconfigure to match switch.

3 LINE D CHAN # Use the keypad or SELECT keys to set DSO number containing D Channel information.

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## Part 2 - Connecting to the Circuit

See the T-BFRD 950 TI Monitor Manual Setup card for instructions on how to connect to the circuit for smart jack monitoring access.

## Part 3 - Checking Results

**NOTE:** The **SUMMARY** category should read **ALL RESULTS** OK or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

Results can also be displayed on **RESULTS I** and **RESULTS II**.

Should read "ACTIVE". Only when Layer 2 is active can

Layer 2 Stat

Err Count

Err Frm

Result should equal zero. Number of valid frames with one or more of following errored conditions: undefined control fields, "..." frame with incorrect length, or "..." frame with long information field.

Aborted Frm

Result should equal zero. Number of aborted primary rate ISDN frames detected (including out-of-frame aborts).

Reject Frm

Results should equal zero. Number of primary rate ISDN frames.

Invalid Frm

Result should equal zero. Number of all frames containing one or more of following conditions: not properly bound by two flags, short frames, FCS errored frames, single octet address, or unapproved Service Access Point Identifier (SAPI).

Act Calls

Total number of currently active calls. Includes calls in progress, connected calls, and calls being disconnected.

Comp Calls

Total number of completed calls detected since beginning of test.

Call Fails

Number of call attempts that ended in failure (it does not include busy replies or normal call clears).

Call Progress Report

(RESULT view only - See NOTE)  
Displays status of present active calls. The following results are displayed: "Called #, Calling #, Call Type, Line #, Channel #...". **NOTE:** CALL PROGRESS REPORT status can be found in the Test Type category in the **RESULTS** view.

**NOTE:** Press **D CHANNEL DISPLAY** softkey to view complete Q.931 or Q.921 text-based information for valid receive frames. Decodes are presented on graphical screen or can be printed.



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# T-BERD 950 Manual Setup ISDN PRI Voice/Data Testing

The following procedure outlines how to configure and connect the T-BERD 950 to place and receive calls on a single primary rate ISDN circuit. Please read the entire procedure BEFORE starting.

- **WARNING** – Set up the T-BERD 950 BEFORE connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
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*Home View (The LED under HOME is illuminated)*

- 1 INTERFACE Select T1.
- 2 TASK Select MANUAL SETUP.
- 3 TEST TYPE Select ISDN PRI.

*Setup Interface View (The LED under SETUP is illuminated)*

- 1 MODE Select TERMINATE.
- 2 FRAMING Select the appropriate framing (e.g., ESF, SF, ACTO).
- 3 LINE RX IN Select TERM (terminates line with a 100 ohm resistance).
- 4 EQUIP RX IN Select TERM (terminates line with a 100 ohm resistance).
- 5 LINE LBO Select 0 dB.
- 6 EQUIP LBO Select 0 dB.

*Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)*

- 1 BERT PATTERN Select the appropriate BERT pattern to be sent if a data call is being placed.
- 2 SWITCH Select the appropriate switch type (e.g., National, AT&T, NT).
- 3 NUMBERING PLAN Select the appropriate numbering plan (e.g., Unknown, Int'l, National, Network, Local, or Abbreviated).

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(continued on Card 2)

1 Press **RESTART** to clear alarms and begin the test. Verify that the:  
 A. T-BERD 950 green **SIGNAL (LINE)** LEDs are illuminated (indicating valid T1 signals are being received).  
 B. T-BERD 950 green **FRAME SYNC (LINE)** LEDs are illuminated (indicating Layer 1 is active).  
 See the T-BERD 950 T1 Termination BERT Manual Setup card for instructions on how to connect for circuit access.

## Part 2 – Connecting to the Circuit

Step	Action/Purpose
7	CALL TYPE: Select the type of call to be placed (e.g., voice, 56k, 64k rates, HD, NXS6, and NXS1).
8	BEARER DESTINATION: Select the appropriate destination for connected call (e.g., BERT, SPKR [speaker]).
9	CHANNEL SELECT: Select the appropriate channel over which to place outgoing call (e.g., ANY CHANNEL or SPEECH). <b>NOTE: If you select SPEECH, additional selections (depending on the CALL TYPE selected in Step 7 above) will be available to select the specific channel.</b>
10	CALL MODE: Select the desired programmed number (1-5 for call 1 and 6-10 for Call 2).
11	PROGRAM #: Use the keypad to enter desired digits at the number you are calling.
12	CALLING NUMBER: Use the keypad to enter origination directory number (e.g., your phone number).

### Replicate Steps 7-12 for setting up Call 1 and Call 2.

**NOTE: These are circuit switched calls.**

4	T1 LINES: Select SINGLE.
5	LINE INT#: Use the keypad to enter appropriate primary T1 # for LINE TX & RX jacks (e.g., 0-19).
6	LINE D CHAN #: Use the keypad to enter DSO number containing D Channel information on the T1 selected above (usually #21).

Setup Test Type View (cont.)

## Part 1 – Configuring the T-BERD 950

(cont.)

# ISDN PRI Voice/Data Testing (cont)

T-BERD 950 Manual Setup

## Part 3 - Placing a Voice/Data Call

Step	Softkey	Action/Purpose
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1 ISDN CONTROL Press to new softkeys for Call 1 and Call 2

2 CALL # CONTROL Press to view various options for Call #

3 DIAL CALL # Press to place outgoing call

4 DISC CALL # Press to disconnect call after testing is complete

*NOTE: The connected call can be dynamically switched between speaker/microphone (SPKR) and BERT functionality, so that both voice and data calls can be tested, respectively. Press the appropriate softkey that appears at the bottom of the large graphical screen once call is connected*

*NOTE: Inuit calls can be placed and received (refer to the User's Manual for further information). Repeat Steps 1-4 for the second call*

## Part 4 - Checking Results

Category	Result Name	Result Description
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*NOTE: The SUMMARY category should read ALL RESULTS OK or it displays specific result from the other categories with errors. Press the RESULTS key to view the various result categories (e.g., SUMMARY, INTERFACE, TEST TYPE, etc.)*

*Results can also be displayed on RESULTS I and RESULTS II.*

**TEST TYPE** Layer 2 Stat **Should read "LINK ESTAB"**. Only when Layer 2 is active can calls be established across link.

**Aborted Frm** Result should equal zero. Number of aborted primary rate ISDN frames detected (including out-of-frame aborts).

**Reject Frm** Result should equal zero. Displays a number of frames with a sequence number error

**Frm Rejects** Result should equal zero. Displays a number of frames received with a protocol error

**Invalid Frm** Result should equal zero. Number of all frames containing one or more of the following conditions: not properly bound by two flags, short frames, FCS errored frames, single octet address, or unapproved Service Access Point Identifier (SAPI).

**Call Fails** Number of call attempts that ended in failure (it does not include busy replies or normal call clears).

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**Part 4 – Checking Results (cont.)**

Category	Result Name	Result Description
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TEST TYPE (cont.)	Call Status Report (RESULTS view) only – see <i>NOTE</i>	Displays information about active call(s). Results are displayed as “Call 1 Status” and “Call 2 Status”. The following information is displayed on the <b>RESULTS</b> view: “Call Status, Call Type, CLID, Line #, Channel #, and Cause Code”. <i>NOTE: CALL STATUS REPORT can be found in the Test Type category in the RESULTS view.</i>
	Call Failure Report (RESULTS view) only – see <i>NOTE</i>	Displays status of last five failed calls, and contains following information: Call # (if available), Call Type, Line #, Channel #, and Cause of Failure Code. <i>NOTE: CALL FAILURE REPORT status can be found in the Test Type category in the RESULTS view.</i>
INTERFACE	CRC Err	Result should equal zero. Displays a number of frames in which cyclic Redundancy Check (CRC) of frame does not agree with CRC field received from network.

*NOTE: Press D CHANNEL DISPLAY softkey to view complete Q 951 or Q 921 text-based information for all with receive frames. Decodes are presented on graphical screen or can be printed.*



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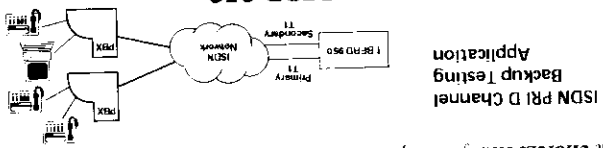
# T-BERD 950 Manual Setup

## ISDN PRI D Channel Backup Testing

The following procedure outlines how to configure and connect the T-BERD 950 to place and receive calls on a NFAS primary rate ISDN service with back-up D channel support. Please read the entire procedure BEFORE starting.

- **WARNING** - Set up the T-BERD 950 BEFORE connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g. HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



ISDN PRI D Channel Backup Testing Application

### Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
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**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select T1.

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select ISDN PRI.

**Setup Interface View** (The LED under SETUP is illuminated.)

1 MODE Select TERMINATE.

2 FRAMING Select the appropriate framing (e.g., ESR, SF, AUTO).

3 LINE RX IN Select TERM (terminates line with a 100 ohm resistance).

4 EQUIP RX IN Select TERM (terminates line with a 100 ohm resistance).

5 LINE LBO Select 0 dB.

6 EQUIP LBO Select 0 dB.

**Setup Test Type View** (Press the SETUP key again. Test Type View appears on top left of screen.)

1 BERT PATTERN Select the appropriate BERT pattern to be sent if data call is being placed.

2 SWITCH Select the appropriate switch type (e.g., National, AT&T, XT).

3 NUMBERING PLAN Select the appropriate numbering plan (e.g., Unknown, Int'l, National, Network, Local, or Abbreviated).



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**Part 1 - Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
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*Setup Test Type View (cont.)*

4	T1 LINES	Select NFAS/DCBU.
5	LINE INTF #	Use the keypad to enter appropriate primary T1 # for LINE TX & RX jacks (e.g., 0-19).
6	LINE D CHAN #	Use the keypad to enter D50 number containing D channel information on the primary T1 selected above (usually #24).
7	EQUIP INTF #	Use the keypad to enter appropriate secondary T1 # for EQUIPMENT TX & RX jacks (e.g., 0-19).
8	EQUIP CHAN #	Use the keypad to enter D50 number containing D channel information on the secondary T1 selected above (usually #24).

**Replicate Steps 9-15 for setting up Call 1 and Call 2.**  
*NOTE: These are circuit switched calls.*

9	CALL TYPE	Select the type of call to be placed (e.g., voice, 56K, 64K rates, HO, H11, Nx56, and Nx64).
10	BEARER DESTINATION	Select the appropriate destination for connected call (e.g., BERT, SPKR [speaker]).
11	CHANNEL SELECT	Select the appropriate channel over which to place outgoing call (e.g., ANY CHANNEL or SPECIFIC). <i>NOTE: If you select SPECIFIC, additional selections (depending on the CALL TYPE selected in Step 9 above) will be available to select the specific channel.</i>
12	INTERFACE	Select whether the Call # configured should be placed on LINE or EQUIP-MENT T1 interface.
13	CALL MODE	Select the desired programmed number (1-5 for Call 1 and 6-10 for Call 2).
14	PROGRAM #	Use the keypad to enter desired digits of the number you are calling.
15	CALLING NUMBER	Use the keypad to enter origination directory number (e.g., your phone number).

**Part 2 - Connecting to the Circuit**

Step	Action/Purpose
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See the T-BERD 950 T1 Termination BERT Manual Setup card for instructions on how to connect to circuit access.

- 1 Press **RESTART** to clear alarms and begin the test. Verify that the:
  - A T-BERD 950 green **SIGNAL (LINE and EQUIPMENT)** LEDs are illuminated (indicating valid T1 signals are being received).
  - B T-BERD 950 green **FRAME SYNC (LINE and EQUIPMENT)** LEDs are illuminated (indicating (indicating Layer 1 is active).

(continued on Card 2)

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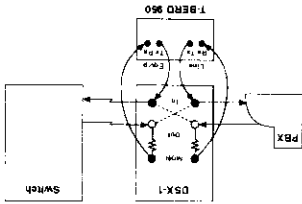
# T1 T1MS (Drop & Insert)

The following procedure outlines how to configure and connect the T-BERD 950 to the DSX-1 to drop & insert a channel to perform T1MS testing. Please read the entire procedure BEFORE starting.

**WARNING** – Set up the T-BERD 950 BEFORE connecting to the network.

- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkeys (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
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**Home View** (the LED under HOME is illuminated)

Select T1 (selects internal T1 test module).

1 INTERFACE

Select MANUAL SETUP.

2 TASK

Select T1MS.

3 TEST TYPE

**Setup Interface View** (the LED under SETUP is illuminated).

1 MODE

Select D&I.

2 FRAMING

Select the appropriate framing (e.g., SF, SSF, or SLC<sup>®</sup>).

3 CHANNEL

Press the INCREASE VALUE or DECREASE VALUE softkeys to select appropriate channel to test.

4 LINE CODING

Select the appropriate line coding (e.g., AMI or B8ZS).

5 LINE RX IN

Select DSX-MON.

6 EQUIP RX IN

Select DSX-MON.

7 INSERT SIDE

Select either LINE TX or EQUIP TX depending upon desired direction of insertion.



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**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
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**Setup Interface View (cont.)**

8      INSERT PAYLOAD      Select OFF. **NOTE:** The payload will be turned ON when entire unit is configured and connected properly.

9      LINE LBO      Select 0 dB.

10      EQUIP LBO      Select 0 dB.

11      IDLE BYTE      Use the keypad to set desired idle byte pattern for unselected channels.

12      YELLOW ALARM      Select OFF.

13      DS1 IDLE TX      Select OFF.

14      DROP TO SPRK      Select TRANSMIT signal, RECEIVE signal, or BOTTLE **NOTE:** You may listen to selected signal through speaker on front panel.

15      ABCD BITS THRE      Select YES.

**Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)**

1      TEST      Select HOLDING TONE.

2      LEVEL      Use the keypad to set desired level (any value from 3 dB to -10 dB).

3      FILTER      Select C-MSG.

4      IMPULSE      Use the keypad to set Impulse Noise Threshold (any value from 30 dBm to 90 dBm).

5      THRESHOLD DIFF      Use the keypad to set Impulse Registers difference (e.g., 2 dB, 4 dB, 6 dB).

**Part 2 – Connecting to the Circuit**

See the T-BERD 950 IT Drop & Insert BERT Manual Setup card for instructions on how to connect to circuit. Then see instructions below: To enable 829 loopback (2713 Hz), press the LOOP UP key on front panel. To disable 829 loopback (2713 Hz), press the LOOP DOWN key.

**Return to Setup Interface View, Step 8. Turn INSERT PAYLOAD ON.**

(continued on Card 2)



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# T-BERD 950 Manual Setup

## Channel Backup Testing (cont.)

### Part 3 – Verifying D Channel Backup Functionality

Step	Softkey	Action/Purpose
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After configuring circuit and connecting unit, prompt DCBE support can be verified by following the procedure below. Verify the following on the **RESULTS** Test Type view.

- DCBE STAT result is **READY** for both LINE and EQUIPMENT.
- D-CHAN STAT result is **In-Service** for LINE TEST interface and **Standby** for EQUIPMENT TEST interface or **nsi-versa**.

1	ISDN CONTROL	To access Call 1 Control, Call 2 Control, or D-CHAN switch softkeys
2	SWITCH D-CHANS	This will cause a transfer of the In-Service D channel to the Standby D channel. Successful operation will make the D channel State re-suit transition from (In-Service, Standby) to (Standby, In-Service) or <b>nsi-versa</b> . This will take a few seconds.

### Part 4 – Placing a Voice/Data Call

Step	Softkey	Action/Purpose
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1	ISDN CONTROL	To enable placement of call 1, call 2, or Switch D-CHAN test
2	CALL # CONTROL	Press to view various options for call #
3	DIAL CALL #	Press to place outgoing call.
4	DISC CALL #	Press to disconnect call after testing is complete.

**NOTE:** The connected call can be dynamically switched between speaker/microphone (SPKR) and BERT functionality, so that both voice and data calls can be tested, respectively. Press the appropriate softkey that appears at the bottom of the large graphical screen once call is connected.

**NOTE:** Dual calls can be placed and received (refer to the User's Manual for further information). Repeat Steps 1-4 for the second call.

### Part 5 – Checking Results

Category	Result Name	Result Description
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**NOTE:** The **SUMMARY** category should read **ALL RESULTS** OR it displays specific result categories from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g. **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

**Results can also be displayed on RESULTS I and RESULTS II**

TEST TYPE	Layer 2 Stat	DCBE Stat
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**Should read "LINK ESTABL" (only when Layer 2 is active can calls be established across link.**

Should read "READY". Other results include:

- Not Ready: D channel is not ready to place and receive.
- Ready: D channel is ready to place and receive.
- Not In Serv: Indicates D channel is attempting to become In-Service.
- Not Standby: Indicates D channel is not in desired stand-by state.

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**Part 5 – Checking Results (cont.)**

Category	Result Name	Result Description
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TEST TYPE: (cont.) D-Chan Stat

Should read "In-Service" or "Standby", depending on whether D channel is currently activated or in backup mode. Results include:

- In-Service: D channel is the In-Service D channel and is operating normally.
- Standby: D channel is not the In-Service D channel and is operating normally.
- Out-of-Service: D channel is currently out-of-service indicating inactivity of D channel.
- Wait: D channel is waiting for reply from switch to become In-Service D channel.
- Main: Busy: D channel will decline establishment attempts.

**Aborted Frm** Result should equal zero. Number of aborted primary rate ISDN frames detected (including out-of-frame aborts).

**Reject Frm** Result should equal zero. Number of frames with a sequence number error.

**Frm Rejects** Result should equal zero. Number of frames received with a protocol error.

**Invalid Frm** Result should equal zero. Number of all frames containing one or more of the following conditions: not properly bound by two flags, short frames, FCS errored frames, single octet address, or unapproved Service Access Point Identifier (SAPI).

**Call Waits** Number of call attempts that ended in failure (it does not include busy replies or normal call clears).

**(Call) Status Report** (REST LIS view only – see *NOTE*) Displays information about active call(s). Results are displayed as "Call 1 Status" and "Call 2 Status". The following information is displayed on the **RESULTS** view: "Call Status, (Call Type, CLID), Line #, Channel #, and Cause Code".

**(Call) Failure Report** (REST LIS view only – see *NOTE*) Displays status of last five failed calls, and contains following information: Call # (if available), Call Type, Line #, Channel #, and Cause of Failure Code. *NOTE: CALL FAILURE REPORT can be found in the test type category in the RESULTS view.*

**(Call) Failure Report** (REST LIS view only – see *NOTE*) Displays status of last five failed calls, and contains following information: Call # (if available), Call Type, Line #, Channel #, and Cause of Failure Code. *NOTE: CALL FAILURE REPORT can be found in the test type category in the RESULTS view.*

**INTERFACE** (CRC Err) Result should equal zero. Number of frames in which Cyclic Redundancy Check (CRC) of frame does not agree with CRC field received from network.

*NOTE: Press D CHANNEL DISPLAY softkey to view complete Q 931 or Q 921 text-based information for all valid receive frames. Decodes are presented on graphical screen or can be printed.*

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# T1 TIMS (Drop & Insert) (cont.)

T-BERD 950 Manual Setup

## Part 3 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

*NOTE: The SUMMARY category should read ALL RESULTS OK or it displays specific results from the other categories with errors. Press the RESULTS key to view the various result categories (e.g., SUMMARY, INTERFACE, TEST TYPE, etc.).*

*Results can also be displayed on RESULTS I and RESULTS II*

TEST TYPE	Level, dbm	Level of signal measured in dbm
Freq, Hz	Freq, Hz	Frequency of signal measured in Hertz
C-Fil SN	Ratio of power of signal to power of background noise of channel	Ratio of power of signal to power of background noise of channel
C-Nch, dbmC	Measurement (using C-Message weighting and 1010 Hz notch filter) of noise power on channel with holding tone at untransmited end	Measurement (using C-Message weighting and 1010 Hz notch filter) of noise power on channel with holding tone at untransmited end
DC-Off, mv	Measurement of any DC component superimposed on channel. If other than 0 mv, it indicates that bits may be caught in faulty codec or buffer.	Measurement of any DC component superimposed on channel. If other than 0 mv, it indicates that bits may be caught in faulty codec or buffer.
Imp Noise, H	Number of times signal exceeds Impulse Noise Threshold by upper difference	Number of times signal exceeds Impulse Noise Threshold by upper difference
Imp Noise, M	Number of times signal exceeds Impulse Noise Threshold by lower difference	Number of times signal exceeds Impulse Noise Threshold by lower difference
Imp Noise, L	Number of times signal exceeds Impulse Noise Threshold by from level established at start of test	Number of times holding tone decreased by 12 db or more from level established at start of test
Dropouts		



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# T1 T1MS (Monitoring)

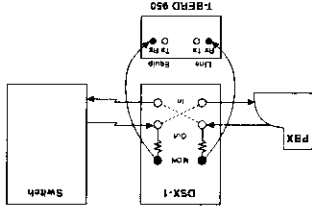
## T-BERD 950 Manual Setup

Card 1 of 1

The following procedure outlines how to configure and connect the T-BERD 950 to the DSX-1 in order to perform DS0 T1MS monitoring. Please read the entire procedure **BEFORE** starting.

- **WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



T1 T1MS Monitoring Application

## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (the LED under HOME is illuminated.)

1 INTERFACE Select T1 (selects internal T1 test module).

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select T1MS.

**Setup Interface View** (the LED under SETUP is illuminated.)

1 MODE Select MONITOR.

2 FRAMING Select the appropriate framing (e.g., UNFRAMED, SF, ESF, or SLC®).

3 CHAN FORMAT Select the appropriate channel format (e.g., DTD, D2, or D3/D4). **NOTE:**

This selection appears only if SF is selected in Step 2 above.

4 CHANNEL Press the INCREASE VALUE or DECREASE VALUE softkeys to select

appropriate channel to monitor.

5 LINE CODING Select the appropriate line coding (e.g., AMI or B8ZS).

6 LINE RX IN Select DSX-MON.

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(continued on back)

**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

Setup Interface View (cont.)

7 EQUIP RX IN Select DSX-MON

8 DROP TO SPRB Select LINE channel, EQUIP channel, or BOTH. **NOTE:** You may listen to selected signal through speaker on front panel.

Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)

1 TEST Select the appropriate condition of channel (e.g., Quiet, Variable Tone, Holding Tone). Make selection based on the following:

- Quiet: If originating end is presenting quiet termination

- Variable Tone: If originating end is sending signal other than holding tone

- Holding Tone: If originating end is sending 1004 Hz holding tone

**Part 2 – Connecting to the Circuit**

See the T-BERD 950 TI Monitor Manual Setup card for instructions on how to connect to circuit at a smart jack or the previous page for DSX-1 access.

**Part 3 – Checking Results**

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The SUMMARY category should read ALL RESULTS OK or it displays specific results from the other categories with errors. Press the RESULTS key to view the various result categories (e.g., SUMMARY, INTERFACE, TEST TYPE, etc.).

Results can also be displayed on RESULTS I and RESULTS II

**TEST TYPE:** Lvl, dbm Level of signal measured in dbm

Freq, Hz Frequency of signal measured in Hertz

C Fil SN Ratio of power of signal to power of background noise of channel

C-Msg, dbmC Measurement (using C-Message weighting) of noise on idle channel (channel with termination at one end and no holding tone at transmitting end), expressed in dbmC

C-Nch, dbmC Measurement (using C-Message weighting and 1010 Hz notch filter) of noise power on channel with holding tone at transmitting end

DC-Off, mV Measurement of any DC component superimposed on channel. If other than 0 mV, it indicates that bits may be caught in faulty codec or buffer.



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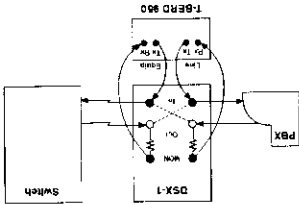
# T1/SIG (PBX/Switch Emulation)

## T-BERD 950 Manual Setup

The following procedure outlines how to configure and connect the T-BERD 950 to the DSX-1 to place or receive a voice call on a VF channel. Please read the entire procedure **BEFORE** starting.

- **WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



T1/SIG PBX/Switch Emulation Application

## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated)

Select T1 (selects internal T1 test module).

INTERFACE

Select **MANUAL SETUP**.

TASK

Select **SIG**.

TEST TYPE

**Setup Interface View** (The LED under SETUP is illuminated)

Select **D&I**.

MODE

Select the appropriate framing (e.g., UNFRAMED, SF, ESF, or SLC<sup>®</sup>).

FRAMING

Select the appropriate channel format (e.g., DID, D2, or D3/D4). **NOTE:** This selection appears only if SF is selected in Step 2 above.

CHANNEL

Press the **INCREASE VALUE** or **DECREASE VALUE** softkeys to select appropriate channel to test.

CHANNEL

LINE CODING

Select the appropriate line coding (e.g., AMI or B8ZS).

5

LINE RX IN

Select **DSX-MON**.



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(continued on back)



(continued on Card 2)

**Return to Setup Interface View, Step 9. Turn INSERT PAYLOAD ON.**

See the T-BERD 950 T1 Drop & Insert BERT Manual Setup card for instructions on how to connect to the circuit.

**Part 2 – Connecting to the Circuit**

Step	Field	Action/Purpose
1	TRUNK	Select the appropriate trunk signaling (e.g., Loop Start, Ground Start, ERM, or User Defined).
2	EMULATE	Select the type of equipment to emulate (e.g., FXS, SLIC office, FXO, or SLIC station). <b>NOTE:</b> This selection is not available if ERM signaling is selected as the TRUNK type in Step 1 above.
3	SFQ TYPE	Select DIAL or RCV.
4	DIAL/RCV SFQ	Select program sequence for dialing or receiving call.
5	DIAL/RCV	Use the keypad to set PROGRAM # desired dial or receive sequence. Once you have entered the desired sequence, press the EXIT EDIT softkey at bottom of screen.
7	EQUIP RX TX	Select DSX-MON.
8	INSERT SIDE	Select either LINE TX or EQUIP TX depending upon desired direction of insertion.
9	INSERT PAYLOAD	Select OFF. <b>NOTE:</b> The payload will be turned ON when entire unit is configured and connected properly.
10	LINE LBO	Select 0 dB.
11	EQUIP LBO	Select 0 dB.
12	IDLE BYTE	Use the keypad to set desired idle byte pattern for unselected channels.
13	YELLOW ALARM	Select OFF.
14	DS1 IDLE TX	Select OFF.
15	DROP TO SPKR	Select either TRANSMIT signal, RECEIVE signal, or BOTH. <b>NOTE:</b> You may listen to selected signal through speaker on front panel.
<b>Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)</b>		
1	TRUNK	Select the appropriate trunk signaling (e.g., Loop Start, Ground Start, ERM, or User Defined).
2	EMULATE	Select the type of equipment to emulate (e.g., FXS, SLIC office, FXO, or SLIC station). <b>NOTE:</b> This selection is not available if ERM signaling is selected as the TRUNK type in Step 1 above.
3	SFQ TYPE	Select DIAL or RCV.
4	DIAL/RCV SFQ	Select program sequence for dialing or receiving call.
5	DIAL/RCV	Use the keypad to set PROGRAM # desired dial or receive sequence. Once you have entered the desired sequence, press the EXIT EDIT softkey at bottom of screen.

**Part 1 – Configuring the T-BERD 950 (cont.)**

# T1S1G (PBX/Switch Emulation) (cont.)

T-BERD 950 Manual Setup

## Part 3 - Placing or Receiving a Call

Step	Softkey	Action/Purpose
------	---------	----------------

The following softkeys are located at bottom of large graphical screen.

1	CALL CONTROL	Press to view selections for placing or receiving call.
2	START PROGRAM #	Press to begin the test. The T-BERD 950 will dial the program sequence of supervision events or wait to receive them.

**NOTE:** After call has been connected, internal speaker and microphone can be used for voice conversations.

## Part 4 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The SUMMARY category should read ALL RESULTS OR it displays specific results from the other categories with errors. Press the RESULTS key to view the various result categories (e.g. SUMMARY, INTERFACE, TEST TYPE, etc.).

Results can also be displayed on RESULTS I and RESULTS II

Displays call sequence supervision events and digits for current call. **NOTE:** If programmed sequence is not satisfied by signaling events that occurred on line, or signaling event delays more than 60 seconds, message "SEQUENCE FAIL" is displayed on screen.

TEST TYPE	Seq	NOTE: The results listed are only available in RESULTS view.
Delay		Measurement of delay from one supervision event/digit to previous supervision event/digit
Duration		Measurement of duration of supervision event or digit
Type		Displays digit type: DP, DTMF, or MF

KEY	Original Supervision	Terminate Supervision
G	Ground on Ring	h off hook
H	Off Hook	o on hook
O	On Hook	w wink
R	Ring	d delay dial
P	Pause	l dial tone

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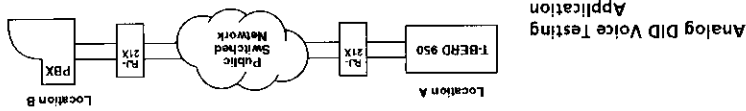
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# ANALOG DID VOICE TESTING

The following procedure outlines how to configure and connect the T-BERD 950 to the 2W circuit emulating a PBX to perform analog Direct-Inward-Dial (DID) voice testing. Please read the entire procedure BEFORE starting.

- **WARNING** – Set up the T-BERD 950 BEFORE connecting to the network.
  - Use the **SCROLL** key to scroll from one field to the next.
  - Use the **VIEW** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
  - Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
  - Use the **HOME** key to view additional selections.
- NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select ANALOG.

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select SIG.

**Setup Interface View** (The LED under SETUP is illuminated.)

1 IMPEDANCE Select 600 ohm (termination impedance).

**Setup Test Type View** (Press the **SETUP** key again. Test Type View appears on top left of screen.)

1 TRUNK TYPE Select DID trunk.

2 DID TYPE Select the type of DID service (i.e., WINK or IMMEDIATE).

3 RECEIVE DIGITS Set the number of expected digits to be received.

4 DIGIT TYPE Select the appropriate type of digits to be received (i.e., DTMF or DP).

5 WINK DURATION (Use the **INCREASE VALUE** or **DECREASE VALUE** softkeys, or the key-

pad to set duration of the wink.

(continued on back)



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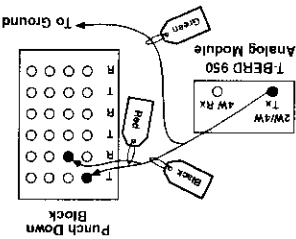
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## Part 2 – Connecting to the Circuit

Step	Action/Results
1	Connect the black clip from the T-BERD 950 Analog Module's 2W/4W TX bantam jack to the TIP terminal on the RJ-21x block.
2	Connect the red clip from the T-BERD 950 Analog Module's 2W/4W TX bantam jack to the RING terminal on the RJ-21x block.
3	Connect the green clip from the T-BERD 950 Analog Module's 2W/4W TX bantam jack to the common circuit ground.



## Part 3 – Receiving a Call

Step	Softkey	Action/Purpose
1	CALL CONTROL	Press to view selection for receiving call.
2	START RCY SEQ	Press to enable the T-BERD 950 to automatically respond with appropriate wink duration upon an OFF HOOK by the network. The T-BERD 950 then automatically answers incoming call.

*NOTE: After call has been received, internal speaker and microphone can be used for voice conversations.*

## Part 4 – Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

*NOTE: The SUMMARY category should read ALL RESULTS OR it displays specific results from the other categories with errors. Press the RESULTS key to view the various result categories (e.g. SUMMARY, INTERFACE, TEST TYPE, etc.).*

Results can also be displayed on RESULTS I and RESULTS II.

Displays call sequence supervision events

**TEST TYPE**      **Seq**

*NOTE: The results listed are only available in RESULTS view.*

**Delay**

Delay measurement of a supervision event/digit from previous event/digit. With exception of first event/digit, result is applicable to any supervision event/digit.

**Duration**

Time interval for supervision event/digit, expressed in milliseconds, ranging 0 to 60 seconds. If result exceeds maximum range, the message "...>60 SECONDS" displays. Result is applicable to all digits and terminate supervision.

**Type**

Type of digit, either Dial Pulse (DP) or Dual Tone Multi Frequency (DTMF), transmitted or received.



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(continued on Card 2)

# Analogy DID Voice Testing (cont.)

T-BERD 950 Manual Setup

Card 2 of 2

## Part 4 – Checking Results (cont.)

Below is a **sample** of supervision events, which may be seen on your DID circuit.

Event	Delay	Duration	Type	Description
o			On hook	T-BERD 950 is on-hook, this simulates the PBX by placing -48V across tip and ring.
o	3 msec.		On hook	Network channel card/switch is on-hook.
H	6531 msec.		Off hook	Network requests to place call by going off-hook—loop closure across tip and ring. The T-BERD 950 recognizes loop current.
w	601 msec.	215 msec.	Wink	T-BERD 950 (e.g., PBX) winks back that it is ready to receive call (-48V to 48V and back to -48V).
X	3057 msec.	513 msec.	DP	DP digit is received from network
X	687 msec.	513 msec.	DP	DP digit is received from network
X	687 msec.	111 msec.	DP	DP digit is received from network
X	690 msec.	210 msec.	DP	DP digit is received from network
h	59 msec.		Off hook	T-BERD 950 is off-hook; this simulates an extension answering call.

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# Analogue Pair Testing

## T-BERD 950 Manual Setup

Card 1 of 2

The following procedure outlines how to configure and connect the T-BERD 950 with a TB950-ANLG interface module to the 4W circuit to perform analogue TMS loss and noise testing. Please read the entire procedure BEFORE starting.

- **WARNING** – Set up the T-BERD 950 BEFORE connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEW'S** control keys to move from one view to the next (e.g. HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g. CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.

### Analogue Pair Testing Application



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select ANALOG.

2 TASK Select MANUAL SETUP.

3 MODE Select TMS.

**Setup Interface View** (The LED under SETUP is illuminated.)

1 PORT Select 4-WIRE.

2 INPUT Select TRM.

3 IMPEDANCE Select the appropriate termination impedance (e.g. 135, 600, 900).

4 TRANSMIT Select SEND (unit will transmit selected tone).

5 TTP REFERENCE Use the INCREASE VALUE or DECREASE VALUE softkeys, or the keypad

to set the desired Transmission Level Point, if necessary. If set, all level measurements will be adjusted by selected amount (valid range is between -19.0 dBm to +10 dBm).

6 LOOPBACK Set to NO (unit will not loop up on receiving a 2713 Hz tone).

7 DROP TO SPEAKER Select whether to hear transmit or receive signal through speaker.



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(continued on back)

**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

1 TEST Select **VARIABLE TONE** to send user-selectable tone for loss measurement.  
 Setup Test Type View (Press the **SETUP** key again. Test Type View appears on top left of screen.)

2 TRANSMIT LEVEL Use the keypad to set the desired level (valid range is between -40 dbm to +10 dbm).

3 TRANSMIT FREQUENCY Use the keypad to set the desired frequency to be transmitted (valid range is between 50 Hz to 15 kHz for 600 and 900 ohm impedances or 1 kHz to 300 kHz for a 135 ohm impedance).

**Skip the following steps until you have made the loss measurement. After making the loss measurement, perform a noise measurement by following Steps 4-6 below. Proceed to Part 2 to connect to circuit.**

4 TEST Select **HOLDING TONE**.

5 TRANSMIT LEVEL Use the keypad to set the desired transmit level (valid range is between -40 dbm to +10 dbm).

6 RECEIVE FILTER Select the appropriate receive filter.

**Part 2 – Connecting to the Circuit**

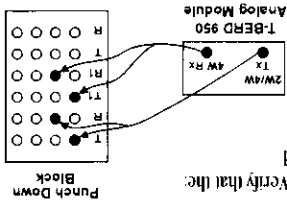
Step	Action/Results
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1 Connect a clip from the T-BERD 950 Analog Module's 2W/4W TX baniam jack to the T and R terminals on the punch down block.

2 Connect a clip from the T-BERD 950 Analog Module's 4W/RX baniam jack to the T1 and R1 terminals on the punch down block.

3 Press **RESTART** to clear alarms and begin the test. Verify that the:

- A. T-BERD 950 green **SIGNAL** LED is illuminated (indicating a level is being received).
- B. T-BERD 950 green **PATTERN SYNC** LED is illuminated. **NOTE: It will only appear if HOLDING TONE is selected as the test, indicating a valid holding tone is being received.**



(continued on Card 2)

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# Analog Pair Testing (cont.)

T-BERD 950 Manual Setup

Card 2 of 2

## Part 3 – Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g. **SUMMARY INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS I and RESULTS II.*

TEST TYPE	Val. dBm0	Measures current received tone level (ranging from +10 dBm to -49.9 dBm).
Freq. Hz	Measures current received frequency (ranging from 50 Hz to 300 kHz)	
Noise dBm0	Measures resulting noise present after 1010 Hz holding tone is "notched" out.	
SN, dB	Measures ratio of signal to noise level.	



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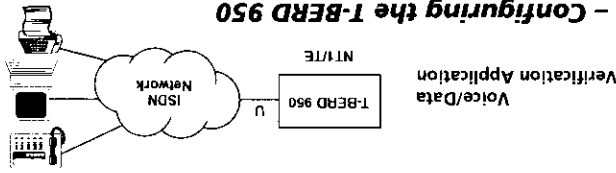
# T-BERD 950 Manual Setup

## ISDN BRI Voice/Data Testing

The following procedure outlines how to configure the T-BERD 950 to place and receive a call using the ISDN Basic Rate Interface (BRI). Please read the entire procedure **BEFORE** starting.

- **WARNING** - Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEW** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



### Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (the LED under HOME is illuminated.)

1 INTERFACE Select BRI.

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select ISDN.

**Setup Interface View** (the LED under SETUP is illuminated.)

1 MODE Select NT/TE.

2 RX LOOP Select RESP TO EOC, so unit will automatically respond to EOC loop-backs that are sent by network.

**Setup Test Type View** (Press the SETUP key again. Test Type View appears on top left of screen.)

1 BERT PATTERNS Select the appropriate BERT pattern to be sent once call is connected.

2 SWITCH Set to the appropriate switch type (e.g., National, AT&T, NT).

3 LINE TYPE Select PT-PT or MULTI-PT. **NOTE:** This appears only if AT&T is chosen as switch type.

4 TYPE Select DMS-F or DMS-S. **NOTE:** This appears only if NT is chosen as switch type.

5 NCMBERING PLAN Select the appropriate numbering plan (e.g., Unknown, International, National, Network, Local, or abbreviated).

6 TEST MODE Set to AUTO, which permits switch to allocate TRs assigned to the T-BERD 950.

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(continued on back)

**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

Setup Test Type View (cont.)

**Replicate Steps 7-12 for setting up Call 1 and Call 2.**

7	CALL TYPE	Select the type of call to be placed (i.e., voice, DATA 56K, DATA 64K, or 3.1K Audio).
8	BEARER DESTINATION	Select the appropriate destination for connected call (i.e., BEFT or SPKR [speaker]).
9	BEARER CHANNEL	Select the appropriate channel over which to place outgoing call (i.e., ANY, B1, or B2).
10	CALL MODE	Select MANUAL DIAL. Until outpulses digits as they are entered on keypad.
11	SPID MODE	Select USER number).
12	SPID	Use the keypad to enter the appropriate SPID.

*NOTE: Dual calls can be placed and received (refer to the User's Manual for further information). Repeat Steps 7-12 for the second call.*

**Part 2 – Connecting to the Circuit**

Step	Action/Purpose
------	----------------

1 (Connect an RJ-45 cable from the termination point to the 'T0' LT connector on the left side of the T-BERD 950.

2 Press **RESTART** to clear alarms and begin the test. Verify that the:

- A. T-BERD 950 green **SIGNAL** LED is illuminated (indicates ZBIQ signal is being received).
- B. T-BERD 950 green **FRAME SYNC** LED is illuminated (indicates Layer 1 is active).

**Part 3 – Placing a Call**

Step	Softkey	Action/Purpose
------	---------	----------------

The following softkeys are located at bottom of the large graphical display. Press the **FUNCTION** key to access top level softkeys.

1	ISDN CONTROL	Selects Call 1, Call 2, or D Packet Call.
2	CALL # CONTROL	Displays various options for Call 1.
3	DIAL CALL #	Dials outgoing call.
4	DISC CALL #	Disconnects call after testing is complete.

*NOTE: The connected call can be dynamically switched between speaker/microphone (SPKR) and BEFT functionality, so that both voice and data calls can be tested, respectively. Press the appropriate softkey that appears at the bottom of the large graphical screen once call is connected.*

*NOTE: Dual calls can be placed and received (refer to the User's Manual for further information). Repeat Steps 1-4 for the second call.*

(continued on Card 2)

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# ISDN BRI Voice/Data Testing (cont.)

## T-BERD 950 Manual Setup

### Part 4 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.)

Results can also be displayed on **RESULTS I** and **RESULTS II**.

TEST TYPE	Result Name	Result Description
Form Count	Form Count	Result should increment, indicating that valid ISDN frames have been detected.
Err Frm	Err Frm	Result should equal zero. Number of valid frames with one or more of following error conditions: undefined control fields, "L" frame with correct length, or "L" frame with long information field.
Reject Frm	Reject Frm	Result should equal zero. Number of ISDN frames with a sequence number error.
Assigned TEL	Assigned TEL	Indicates TEL that was assigned to unit by network.
SPI# Stat	SPI# Stat	Result should read "VALID". If not, the SPI# entered was not accepted by the switch.
Layer2 Stat	Should read "LINK ESTAB"	Only when Layer 2 is active can calls be established across link.
SPI# Value	SPI# Value	Indicates SPI# value assigned to call #.
Aborted Frm	Aborted Frm	Result should equal zero. Number of aborted ISDN frames detected (including out-of-frame aborts).
Call Failure Report	Call Failure Report	Displays status of last five ISDN calls, and contains the following information: Called #, Calling #, Call Rate, Channel #, and Cause Code of Failure. <b>NOTE:</b> This is only seen on <b>RESULTS view</b> .
Call Progress Report	Call Progress Report	Displays present active calls. The following results are displayed: Called #, Calling #, Call Type, Channel #, and Call Status. <b>NOTE:</b> This is only seen on <b>RESULTS view</b> .
Act Calls	Act Calls	Total number of currently active calls. Includes calls in progress, connected calls, and calls detected since beginning of test.
Comp Calls	Comp Calls	Total number of completed calls detected since beginning of test.
Call Fails	Call Fails	Number of call attempts that ended in failure (does not include busy replies or normal call clears).
Layer1 Stat	Should read "ACTIVATED"	Displays last T interface state (e.g., awaiting signal, synchronized, or activated).
CRC Err	CRC Err	Result should equal zero. Number of frames in which cyclic Redundancy Check (CRC) of frame does not agree with CRC field received from network.
Seal Cur	Seal Cur	Displays whether sealing current is present on T interface.

### INTERFACE

**NOTE:** Press **D CHANNEL DISPLAY** softkey to view complete Q.931 or Q.921 text-based information for all with receive frames. Decodes are presented on graphical screen or can be printed.



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# ISDN BRI D Packet Testing

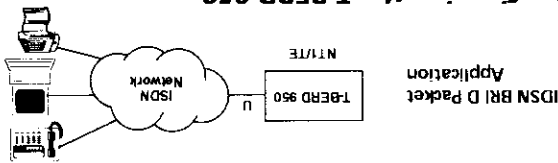
T-BERD 950 Manual Setup

Card 1 of 2

The following procedure outlines how to configure and connect the T-BERD 950 to place and receive a D Packet and circuit switched calls. Please read the entire procedure **BEFORE** starting.

- **WARNING** - Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated)  
 Select BRI INTERFACE

Select MANUAL SETUP  
 Select TASK

**Setup Interface View** (The LED under SETUP is illuminated)  
 Select MODE  
 Select N1/ITE

Select RX LOOP  
 Select RESP TO EOC. (Unit will automatically respond to EOC loop-backs)

**Setup Test Type View** (Press the SETUP key again. Test Type View appears on top left of screen.)  
 Select the appropriate BERT pattern to be sent once call is connected.

Select SWITCH  
 Set to the appropriate switch type (e.g., National, AT&T, NT).

Select LINE TYPE  
 Select PT-PT or MULTI-PT. **NOTE:** This appears only if AT&T is chosen as switch type.

Select TYPE  
 Select DMS-F or DMS-S. **NOTE:** This appears only if NT is chosen as switch type.

Select NUMERING PLAN  
 Select the appropriate numbering plan.

Select TEI MODE  
 Set to AUTO, which will permit switch to allocate TEIs assigned to the T-BERD 950.

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(continued on back)

## Part 1 - Configuring the T-BERD 950 (cont.)

Step	Field	Action/Purpose
------	-------	----------------

## Setup Test Type View (cont.)

**Replicate Steps 7-12 for setting up Call 1 and Call 2.**

**NOTE:** These are circuit switched calls.

7 CALL TYPE Select the type of call to be placed (i.e., voice, DATA 56K, DATA 64K, or 3.1K AUD [Audio]).

8 BEARER DESTINATION Select the appropriate destination for connected call (i.e., BERT or SPKR [speaker]).

9 BEARER CHANNEL Select the appropriate channel over which to place outgoing call (i.e., ASY, B1, or B2).

10 CALL MODE Select **MANUAL DIAL**. Unit outputs digits as they are entered on keypad. Use the keypad to enter origination directory number (e.g., your phone number).

11 SPD MODE Select **USER**.

12 SPD Use the keypad to enter appropriate SPD.

**Steps 13-19 below are used for configuration of X.25 Packet Call.**

13 TEI MODE Select **AUTO**, which will permit switch to allocate TEIs assigned to the T-BERD 950.

14 ICM Use the **INCREASE VALUE** or **DECREASE VALUE** softkeys, or the keypad to enter logical channel number (e.g., 0-15).

15 PACKET ECHO Select **ON** or **OFF** as appropriate.

16 CALLED NUMBER Use the keypad to enter number you are attempting to call.

17 CALLING NUMBER Use the keypad to enter origination number (e.g., your number).

18 CALL USER DATA Select **ON** if optioned for a Call User Data. Enter the alphanumeric text by pressing the **EDIT** softkey (located at bottom of screen) and the keypad. **NOTE:** See the T-BERD 950 Entering Alphanumeric Text Manual.

**Setup card for additional help.**

19 CUC MODE Select **ON** or **OFF** if a Closed User Group ID is needed.

CUC Use the **INCREASE VALUE** or **DECREASE VALUE** softkeys, or the keypad to enter Closed User Group ID (e.g., 0-9999). **NOTE:** Typically a pass code is entered here.

**NOTE:** Scroll down to the Advanced Configurations section of screen to modify Reverse Charge and RPOA selections. Both default values are **OFF**.

(continued on Card 2)

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# ISDN BRI D Packet Testing (cont.)

T-BERD 950 Manual Setup

## Part 2 - Connecting to the Circuit

Step	Action/Purpose
------	----------------

1 Connect an RJ-45 cable from the termination point to the TO LT connector on the left side of the T-BERD 950.

2 Press **RESTART** to clear alarms and begin the test. Verify that the:

A. T-BERD 950 green **SIGNAL LED** is illuminated (indicates a valid 2B1Q signal is being received).

B. T-BERD 950 green **FRAME SYNC LED** is illuminated (indicates Layer 1 is active).

## Part 3 - Placing a D Packet Call

Step	Softkey	Action/Purpose
------	---------	----------------

Press the **FUNCTION** key to access top level softkeys.

1 To enable placement of Call 1, Call 2, or D Packet Calls test

2 PACKET CALL Press to view various options for D Packet Calls

3 DIAL PACKET Press to place outgoing D Packet call

4 DISC PACKET Press to disconnect call after testing is complete

**NOTE:** Once call is connected, press the **SEND FOX** softkey at bottom of graphical display if you are testing to a loopback at far end. This will enable you to verify data integrity by viewing received fox message on **RESULTS** view.

## Part 4 - Placing a Voice/Data Call

Step	Softkey	Action/Purpose
------	---------	----------------

1 ISDN CONTROL To access Call 1 Control, Call 2 Control, or D Packet Calls test

2 CALL # CONTROL Press to view various options for Call #.

3 DIAL CALL # Press to place outgoing call.

4 DISC CALL # Press to disconnect call after testing is complete.

**NOTE:** The connected call can be dynamically switched between speaker/microphone (SPKR) and BERT functionality, so that both voice and data calls can be tested, respectively. Press the appropriate softkey that appears at the bottom of the large graphical screen once call is connected.

**NOTE:** Dual calls can be placed and received (refer to the User's Manual for further information). Repeat **Steps 1-4** for the second call.

(continued on back)



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## Part 5 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g. **SUMMARY, INTERFACE, TEST TYPE, etc.**).

Results can also be displayed on **RESULTS I** and **RESULTS II**.

TEST TYPE	Layer 2 Stat	Layer 2 Value	Layer 2 Stat	Layer 2 Value	Layer 1 Stat	INTERFACE
	Should read "LINK ESTAB". Only when Layer 2 is active can calls be established across link.	Indicates SPID value assigned to Call #	SPID# Stat	Result should read "VALID". If not, SPID entered was not accepted by switch.	Tot Tx Pkts	
	Should be incrementing. Total number of X.25 packets transmitted		Tot Rx Pkts	Should be incrementing. Total number of X.25 packets received	Tot Data Pkts	
	Should be incrementing. Number of received data packets		Rx RR Pkts	Should be incrementing. Number of receiver ready packets acknowledged by receiver	Rx RNR Pkts	
	Receiver not ready. Displays the receiver not ready to receive packets		Rx REJ Pkts	Result should equal zero. Number of rejected packets received	Packet Stat	
	Should read "DATA TRANSFER", indicating a call is connected. Other results include:		X.25 calls:			
	• Ready: No call is active, however ready to place and receive		• DTE Waiting: Waiting for far end to connect			
	• DCE Waiting: Received in-coming call but not answered		• Data Transfer: Call is connected			
	Indicates TEI that was assigned to unit by network		Assigned TEI	This field on <b>RESULTS</b> view should read "The quick brown fox jumped over the lazy dog" if test call was placed to a loopback and the <b>SEND FOX</b> softkey was pressed on the T-BERD 950. Otherwise displays any incoming data located with received data packet.	X.25 Call Result	
	Call status should read "READY".		X.25 Call Data Result	Call status should read "READY".	Layer 1 Stat	
	Should read "ACTIVATED". Displays last U interface state (e.g., awaiting signal, synchronized, or activated).		CRC Err	Result should equal zero. Number of frames in which Cyclic Redundancy Check (CRC) of frame does not agree with CRC field received from network.	Seal Cur	
	Displays whether sealing current is present on U interface.					

**NOTE:** Press **D CHANNEL DISPLAY** softkey to view complete Q.931 or Q.921 text-based information for all valid receive frames. Decodes are presented on graphical screen or can be printed.

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# Entering Alphanumeric Text

T-BERD 950 Manual Setup

Card 1 of 1

The following procedure outlines how to enter alphanumeric text in a specific field using the keypad on the T-BERD 950. In this specific example, the words "D Packet" are going to be entered in the Call User Data field of a Basic Rate ISDN Channel Packet Call. However, keep in mind that this gives a generic example of the entry process, so it can be used to enter text in other appropriate setup fields. Please read the entire procedure BEFORE starting.

**NOTE:** At this point in the setup, the cursor is located on the Call User Data field. Once the cursor is located on this field, the **EDIT** softkey will appear on the bottom of the graphical user display.

Step	Field	Action/Purpose
------	-------	----------------

1	EDIT	Enables entry of the Call User Data
2	CLEAR STRING	Returns unit to default condition
3	#3	Enables entry of the letters d, e, and f or (^, -, ;, etc.)
4	#4	Enters an uppercase "D"
5	#0	Enters an alphanumeric value
6	#0	Enters a space
7	#7	Enables entry of the letters p, r, and s or (^, -, ;, etc.)
8	#4	Enters an uppercase "P"
9	#2	Enables entry of the letters a, b, and c or (^, -, ;, etc.)
10	#1	Enters a lowercase "a"
11	#2	Enables entry of the letters a, b, and c or (^, -, ;, etc.)
12	#3	Enters a lowercase "c"
13	#5	Enables entry of the letters j, k, and l or (^, -, ;, etc.)
14	#2	Enters a lowercase "k"
15	#3	Enables entry of the letters d, e, and f or (^, -, ;, etc.)
16	#2	Enters a lowercase "e"
17	#8	Enables entry of the letters i, u, and v or (^, -, ;, etc.)
18	#1	Enters a lowercase "i"
19	SAVE & EDIT	Saves string into desired field



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# Looping HDSL Equipment from the Customer Premises

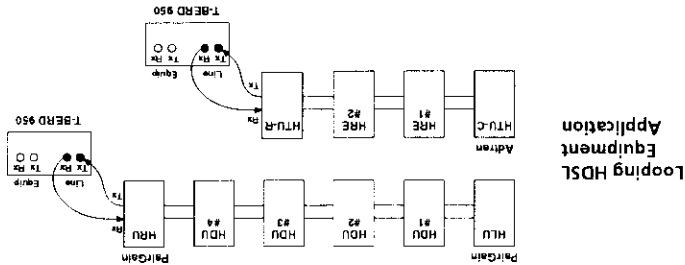
## T-BERD 950 Manual Setup

The following procedure outlines how to configure and connect the T-BERD 950 to perform loopback testing on HDSL equipment from the customer premises. Please read the entire procedure **BEFORE** starting.

**NOTE:** This procedure is for looping Fairgain or Adtran equipment using Generic (Fairgain) or Abtrated (Adtran) loopcodes. Fairgain A2LB loopcodes are also supported but require the span to be unred/assigned.

- WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the **SOFTKEYS** to make a selection within the current field.
- Use the **VIEWS** control keys to move from one field to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



Looping HDSL Equipment Application

### Step Field Action/Purpose

#### Part 1 – Configuring the T-BERD 950

*Home View (The LED under HOME is illuminated)*

1 INTERFACE Select T1

2 TASK Select MANUAL SETUP

3 TEST TYPE Select BERT

*Setup Interface View (The LED under SETUP is illuminated)*

1 MODE Select TERMINATE

2 FRAMING Select the appropriate framing (e.g., ESE, SF, ALTO, etc).

3 PAYLOAD Select FULL

4 LINE CODING Select the appropriate line coding (e.g., AMI or B8ZS).

5 LINE RX IN Select **TERM** (terminates line with a 100 ohm resistance).



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(continued on back)

**Part 1 - Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

**Setup Interface View (cont.)**

6	EQUIP RX IN	Select TRRM (terminates line with a 100 ohm resistance).
7	TX/RX PAIR	Select TFRM.
8	TX TIMING	Select RECOVERD (network is used as timing source).
9	LOOPCODE	Select HDLSL.
10	HDLSL TYPE	Select the appropriate component to be looped up (figure 1). • ADTRAN HRE: HDLSL repeater (doublet). • ADTRAN HTL-C: Adtran central office unit. • ADTRAN HTR-R: Adtran remote unit. • ADTRAN HTR: Adtran remote unit. • ADTRAN HTR-AD: Adtran doublet. • PAIRGAIN HTR: Pairgain remote unit. • PAIRGAIN HTL: Pairgain central office unit. • PAIRGAIN HTR: Pairgain remote unit.
11	ADTRAN CODES	Select ABBREVIATED for Adtran, GENERIC or A2LB for Pairgain. NOTE: If Pairgain is selected under HDLSL TYPE, PAIRGAIN CODES appears in display.
12	ORIGIN OF TEST	Select CUSTOMER PREM.
13	ADDRESS	List the appropriate address. Addresses are designated with central office as reference point (e.g., 1 is the HDLSL repeater (doublet) closest to CO). See figure 1. NOTE: Adtran supports two HDLSL repeaters and Pairgain supports up to four. NOTE: This option is only available if ADTRAN HRE or PAIRGAIN HDU is selected under HDLSL TYPE.
14	LINE LBO	Select 0 dB.
15	YELLOW ALARM	Select OFF.
16	DSL IDLE TX	Select OFF.

**Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)**

1	BERT PATTERN	Select the appropriate test pattern (e.g., QRSS, ALL ONES, etc).
2	ERROR INSERT TYPE	Select LOGIC.
3	ERROR RATE	Select the appropriate error rate (e.g., 1x10-3 or 1x10-6). NOTE: To insert a single error, press the ERROR INSERT key once. To insert errors at the selected rate, hold down the ERROR INSERT key for approximately two seconds. Press the ERROR INSERT key again to turn error insertion OFF.

(continued on Card 2)



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# Looping HDSL Equipment from the Customer Premises (cont.)

## Part 2 – Connecting to the Circuit

**Step**

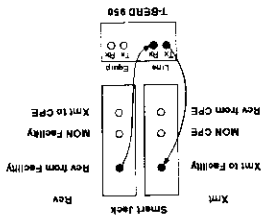
**Action/Purpose**

1 Connect the T-BERD 950 to the circuit at the HTI-R as shown in the figure on the front of this card or at the facility jack as shown in the figure below.

Press **RESTART** to clear alarms and begin the test. Verify that the:

- A. T-BERD 950 green **SIGNAL (LINE)** LED is illuminated (indicating valid T1 signals are being received).
- B. T-BERD 950 green **FRAME SYNC (LINE)** LED is illuminated.

*NOTE: Only LINE LEDs illuminate since circuit is terminated on the LINE TX/RX jacks.*



## Part 3 – Performing Loop Ups and Loop Downs

**Step**

**Action/Purpose**

*NOTE: Retrieve A2LB loopcodes are also supported from the customer premises but the span must be armed/disarmed by using the REPEATER CMD softkey (see Table 2 for loopcodes), which is accessed by pressing the FUNCTION key.*

- 1 Press **LOOP UP** key.  
Verify the T-BERD 950 green **PATTERN SYNC** LED is illuminated (loop up successful).
- 2 Verify the T-BERD 950 green **PATTERN SYNC** LED is not illuminated (loop down successful).
- 3 Verify ALL RESULTS OK appears in the **RESULTS 1** and **RESULTS II** display after 5 minutes.  
Press **LOOP DOWN** key.
- 4 Verify the T-BERD 950 green **PATTERN SYNC** LED is not illuminated (loop down successful).

*NOTE: You may go back to the Setup Interface View (Part 1) and change selections for Step 10 (HDSL TYPE), Step 13 (ADDRESS), and/or the Setup Test Type View (Part 1) (BERT PATTERN) as required by your test needs. For a quick verification of loopbacks, insert three logic (bit) errors. If a loopback exists, you receive them back.*

(continued on back)

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**Part 4 - Checking Results**

Category	Result Name	Result Description
----------	-------------	--------------------

*NOTE: The SUMMARY category should read ALL RESULTS OR it displays specific results from the other categories with errors. Press the RESULTS key to view the various result categories (e.g., SUMMARY, INTERFACE, TEST TYPE, etc.).*

*Results can also be displayed on RESULTS I and RESULTS II.*

INTERFACE	BPS	Result should equal zero. Number of BPS detected in received signal (that are not embedded in valid BRZS sequences) since beginning of test.
TEST TYPE	Rcv Byte	Data byte samples displayed in binary form.
TEST TYPE	Bit Errors	Result should equal zero. Number of received bits that have value opposite that of corresponding transmitted bits (e.g., 1 instead of 0), after pattern synchronization has been achieved.
TEST TYPE	Pat Slips	Result should equal zero. Number of pattern slips detected since beginning of test.
TEST TYPE	Errored Sec	Result should equal zero. Number of test seconds where one or more bit errors occurred.
TEST TYPE	EFS	Result should be total time of test. Number of test seconds during which pattern synchronization was maintained through entire second and no bit error occurred.
TEST TYPE	Pat Los Sec	Result should equal zero. Number of seconds, after pattern synchronization, where pattern synchronization was not present for any length of time.
SIGNAL	Rcv Freq, Hz	Result should be 1.544 MHz $\pm$ 50 Hz. Clock receiver frequency in Hertz.
SIGNAL	Rcv Lvl, Vpp	Level of received signal in peak-to-peak volts.
SIGNAL	Sig Los Cnt	Result should equal zero. Number of times signal has been lost since beginning of test.

(continued on Card 3)

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# Looping HDSL Equipment from the Customer Premises (cont.)

**Table 1 – Customer Premises Loopbacks  
Pairgain Generic and Adtran Abbreviated**

Loopback Function	HTL-R (HRL)	HTL-C (HLC)	HRE #1	HRE #2	HDC #3	HDC #4	Arm	Disarm
Loopcode	1111100	1111110	111100	111110	1010001	1010010	11000	11100
from CPE	(5 in 7)	(6 in 7)	(4 in 6)	(5 in 6)	(2 in 5)	(3 in 5)		

**Table 2 – Pairgain A2LB Customer Premises Loopbacks**

Loopback Function	Loopcode
HTL	1101 0011 1101 0011
HRL	1100 0111 0100 0010
HDC #1	1100 0111 0100 0001
HDC #2	1100 0111 0101 0100
HDC #3	1100 0111 0100 0011
HDC #4	1100 0111 0100 0100
Timeout Disable	1101 0101 1101 0110
ESF Arming*	1111 1111 0100 1000
ESF Disarm*	1111 1111 0010 0100
Arm	111000
Disarm	111100

\*User-programmable loopcodes

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# Looping Telrend Intelligent T1 Repeaters from the Customer Premises

T-BERD 950 Manual Setup

Card 1 of 3

The following procedure outlines how to configure and connect the T-BERD 950 to perform loopback testing on Telrend Intelligent T1 office and line repeaters from the customer premises. Please read the entire procedure BEFORE starting.

- **WARNING** – Set up the T-BERD 950 BEFORE connecting to the network.
  - Use the **SCROLL** key to scroll from one field to the next.
  - Use the softkeys to make a selection within the current field.
  - Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
  - Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
  - Use the **MORE** key to view additional selections.
- NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.

## Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

*Home View (The LED under HOME is illuminated)*

1	INTERFACE	Select T1
2	TASK	Select MANUAL SETUP
3	TEST TYPE	Select BERT

*Setup Interface View (The LED under SETUP is illuminated)*

1	MODE	Select TERMINATE
2	FRAMING	Select the appropriate framing (e.g., ESF, SF, AUTO).
3	PAYLOAD	Select FULL
4	LINE CODING	Select the appropriate line coding (e.g., AMI or B8ZS).
5	LINE RX IN	Select TERM (terminates line with a 100 ohm resistance).
6	EQUIP RX IN	Select TERM (terminates line with a 100 ohm resistance).
7	TX/RX PAIR	Select LINE
8	TX TIMING	Select RECOVERED
9	LOOPCODE	Select REPEATER
10	REPEATER TYPE	Select the appropriate intelligent office or line repeater.
11	ORIGIN OF TEST	Select CUSTOMER PREM

(continued on back)

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**Part 1 - Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

12 CMD Select the appropriate command. Refer to Tables 1 and 2 to reference repeaters to command sets and available addresses. **NOTE:** To activate the selected command, press the softkey on the bottom of the display which corresponds to your selection. **NOTE:** This option is used to designate special loopbacks such as lineout disable or sequential loopback. This is not needed to loopback individual repeaters.

13 ADDRESS Select the appropriate address of the repeater to be looped.

14 LINE LBO Select 0 dB.

15 YELLOW ALARM Select OFF.

16 DSI IDLE TX Select OFF.

**Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)**

1 BERT PATTERN Select the appropriate test pattern (e.g., QRSS, ALL ONES, etc).

2 ERROR INSERT Select LOGIC.

3 ERROR RATE Select the appropriate error rate (e.g., 1x10-3 or 1x10-6). **NOTE:** To insert a single error, press the **ERROR INSERT** key once. To insert continuous errors at the selected rate, hold down the **ERROR INSERT** key for approximately two seconds. Press the **ERROR INSERT** key again to turn error insertion OFF.

**Part 2 - Connecting to the Circuit**

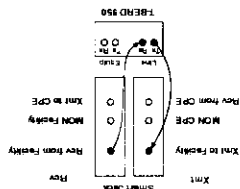
Step	Action/Purpose
------	----------------

1 Connect the T-BERD 950 to the circuit at the facility jack as shown in the figure below.

Press **RESTART** to clear alarms and begin the test. Verify that:

A. T-BERD 950 green **SIGNAL (LINE)** LED is illuminated (indicating valid T1 signals are being received).

B. T-BERD 950 green **FRAME SYNC (LINE)** LED is illuminated.



**NOTE:** Only **LINE** LEDs illuminate since circuit is terminated on the **LINE TX/RX** jacks.

(continued on Card 2)



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# Looping Telrend Intelligent T1 Repeaters from the Customer Premises (cont.)

## Part 3 - Performing Loop Ups and Loop Downs

Step	Action/Purpose
------	----------------

- 1 Press the REPEATER CMDS softkey at bottom of display.
- 2 Press the NEAR END ARM softkey at bottom of display.

**NOTE:** To perform special loopbacks (e.g. timeout disable, loopback query, etc.), you must also select the corresponding softkey to selection made in CMD field.

- 3 Press the LOOP UP key.

- 4 Verify the T-BERD 950 green PATTERN SYNC (LINE) LED is illuminated (loop up successful).

**NOTE:** For a quick verification of loopbacks, insert three logic (bit) errors. If a loopback exists you will receive it back.

- 5 Press RESTART to clear alarms.

- 6 Verify ALL RESULTS OK appears in the RESULTS I and RESULTS II display after 5 minutes.

- 7 Press LOOP DOWN key.

**NOTE:** You may go back to the Setup Interface View (Part 1) and change selections for Step 10 (REPEATER TYPE), Step 12 (CMD), Step 13 (ADDRESS), and/or Setup Test Type View Step 1 (BERT PATTERN) to configure the T-BERD 950 to perform other loopbacks as required by your test needs.

- 8 Verify the T-BERD 950 green PATTERN SYNC LED is not illuminated (loop down successful).

**NOTE:** As a good testing practice, first loop the office repeater. If the bit-error-rate test meets specification, the span is good. If bit errors are detected outside specification, sectionalize the span. Loop the mid-span repeater and check bit errors again. No bit errors would indicate the problem is closer to the central office. Conversely, if bit errors are found, the problem is closer to the customer premises. Continue to loop repeaters to "cut the span in half" until the problem is isolated.

(continued on back)



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## Part 4 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS I and RESULTS II.*

**INTERFACE** BPPs

Result should equal zero. Number of BPPs detected in received signal (that are not embedded in valid B8ZS sequences) since beginning of test.

Frm Errors

Result should equal zero. Number of frame errors received since beginning of test.

CRC Errors

Result should equal zero. Number of CRC-6 errors detected since beginning of test. (ESF Framing).

Frm Los Cnt

Result should equal zero. Number of times frame synchronization has been lost during test.

Frm Los Sec

Number of test seconds in which frame synchronization was not present for any part of second.

Rcv Byte

Data byte samples displayed in binary form.

### TEST TYPE

Bit Errors

Result should equal zero. Number of received bits that have value opposite that of corresponding transmitted bits (e.g., 1 instead of 0), after pattern synchronization has been achieved.

Par Slips

Result should equal zero. Number of pattern slips detected since beginning of test.

BER

Result should equal zero. Ratio of bit errors to received pattern data bits.

Errored Sec

Result should equal zero. Number of test seconds where one or more bit errors occurred.

EFS

Result should be total time of test. Number of test seconds during which pattern synchronization was maintained through entire second and no bit error occurred.

Par Los Sec

Result should equal zero. Number of seconds after pattern synchronization, where pattern synchronization was not present for any length of time.

### SIGNAL

Rcv Freq, Hz

Result should be 1.544 MHz  $\pm$  50 Hz. Clock receiver frequency in Hertz.

Rcv Lvl, Vpp

Level of received signal in peak-to-peak volts.

Sig Los Sec

Result should equal zero. Number of test seconds in which signal was not present for any part of second.

Sig Los Cnt

Result should equal zero. Number of times signal has been lost since beginning of test.

G.821 EFS

Number of available seconds in which no bit errors occurred.

Avail Sec

Number of available seconds per CCITT G.821.

Unavailable Sec

Number of unavailable seconds per CCITT G.821.

(continued on Card 3)

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### PERFORMANCE



# Looping Teltrend Intelligent T1 Repeaters from the Customer Premises (cont.)

**Table 1 - Command Sets**

Command Set 1	Command Set 2
Time Out Disable	Time Out Disable
Loopback Query	Loopback Query
Power Query	Power Query
Issue Query	Issue Query
Power Down	Sequential Loopback
Sequential Loopback	

**Table 2 - Commands and Addresses for Repeaters**

Command Set	Address	Repeater Type
1	N/A	Telrend 7231LP IOR
1	N/A	Telrend 9132LP IHR
1	N/A	Telrend 7231LW IOR
1	N/A	Telrend 9132LW IHR
2	up to 20	Telrend 7239LP ILR
2	up to 20	Telrend 7239LW ILR



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# 10baseT/1P (Traffic Generation)

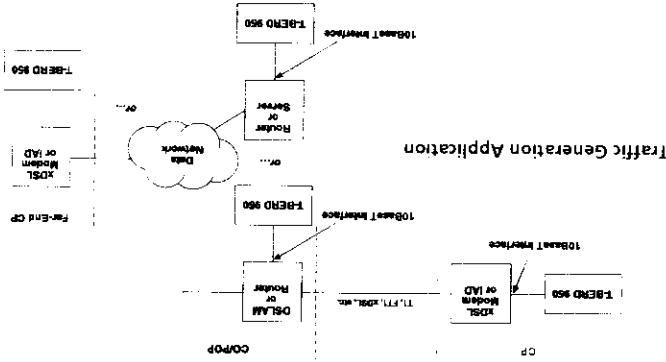
T-BERD 950 Manual Setup

Card 1 of 2

The following procedure outlines how to configure and connect the T-BERD 950 for IP traffic testing from a 10baseT interface. This procedure should be used on **BOTH** T-BERD 950s. Please read the entire procedure **BEFORE** starting.

- **WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the **VIEW** control keys to make a selection within the current field.
- Use the **VIEW**s control keys to move from one item to the next (e.g. HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g. CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select 10BASET.

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select IP.

**Setup Interface View** (The LED under SETUP is illuminated.)

1 MODE Select TERMINATE.

(continued on back)



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**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

*Setup Test Type View (Press the SETP key again. Test Type View appears on top left of screen.)*

1	IP ADDRESS MODE	Select <b>STATIC</b> or <b>DYNAMIC</b> as required.
2	SOURCE IP ADDRESS	Enables entry of IP address to be used as source (by the T-BERD 950).
3	GATEWAY ADDRESS	Enables entry of IP address for the gateway to be used.
4	SUBNET MASK ADDRESS	Enables entry of IP address for the subnet mask to be used.
5	TX LOAD	Select <b>TRAFFIC</b> .
6	DEST IP ADDRESS	Enables entry of destination IP address to which traffic will be sent. Use the keypad to set address.
7	LOAD RATE	Enables entry of desired rate of traffic transmission (valid range: 1 to 10,000 kbps).
8	PACKET LENGTH	Enables entry of desired packet length (valid range: 70 to 999).

**NOTE: Steps 2-4 (SOURCE GATEWAY, and SUBNET MASK IP address selections) are only available for selection if IP ADDRESS MODE is set to **STATIC**. These choices are NOT available when the IP ADDRESS MODE is set to **DYNAMIC (DHCP)**.**

**Part 2 – Connecting to the Circuit**

Step	Action/Purpose
------	----------------

- 1 Connect an RJ-45 cable from the termination point to 10baseT connector on left side of the T-BERD 950.
- 2 Press **RESTART** to clear alarms and begin the test. Verify that the A T-BERD 950 green **SIGNAL LED** is illuminated.  
B T-BERD 950 green **FRAME SYNC LED** is illuminated (only if Ethernet data is being received).

(continued on card 2)



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# 10baseT/1P (Traffic Generation) (cont.)

T-BERD 950 Manual Setup

Card 2 of 2

## Part 3 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g. **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS I and RESULTS II.*

TEST TYPE	Rx Frame Count	Rx IP Packets	Tx IP Packets	Avg% Util	Avg Throughput
	Result should increment. If not, frames are not being transmitted through network from far-end.	Result should increment. If not, either far-end is not generating traffic or traffic generated at far-end is not being properly passed through network.	Result should increment. If not, IP traffic is not being transmitted through network.	Result should be greater than zero and approximately equal to percentage of total circuit bandwidth used for traffic transmission by both ends (sum of near- and far-end load rate[s] divided by circuit data rate).	Result should correspond to rate being transmitted by far-end (assuming fixed rate is below maximum near-end circuit data rate).

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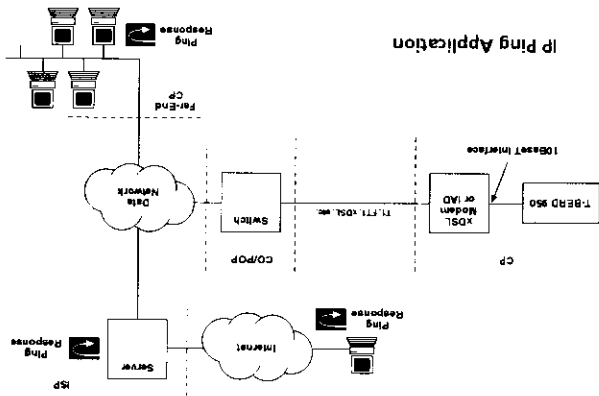


# T-BERD 950 Manual Setup 10baseT/1P (Ping)

The following procedure outlines how to configure and connect the T-BERD 950 for 1P Ping testing from a 10baseT interface. This procedure should be used on BOTH T-BERD 950s. Please read the entire procedure BEFORE starting.

- **WARNING** – Set up the T-BERD 950 BEFORE connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the **softkeys** to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

- |   |           |                      |
|---|-----------|----------------------|
| 1 | INTERFACE | Select 10baseT.      |
| 2 | TASK      | Select MANUAL SETUP. |
| 3 | TEST TYPE | Select 1P.           |
| 1 | MODE      | Select TERMINATE.    |

*Setup Interface View (The LED under SETUP is illuminated.)*

(continued on back)

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## Part 1 – Configuring the T-BERD 950 (cont.)

Step	Field	Action/Purpose
------	-------	----------------

*Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)*

1	IP ADDRESS MODE	Select <b>STATIC</b> or <b>DYNAMIC</b> as required.
---	-----------------	---

2	SOURCE IP ADDRESS	Enables entry of IP address to be used as source (by the T-BERD 950).
---	-------------------	---

3	GATEWAY ADDRESS	Enables entry of IP address for the gateway to be used.
---	-----------------	---

4	SUBNET MASK ADDRESS	Enables entry of IP address for the subnet mask to be used.
---	---------------------	---

5	TX LOAD	Select <b>PING</b> .
---	---------	----------------------

6	DEST IP ADDRESS	Enables entry of destination IP address to which Ping will be sent. Use the keypad to set address.
---	-----------------	--

**NOTE: Steps 2-4 (SOURCE, GATEWAY, and SUBNET MASK IP address selections) are only available for selection if IP ADDRESS MODE is set to **STATIC**. These choices are NOT available when the IP ADDRESS MODE is set to **DYNAMIC (DHCP)**.**

## Part 2 – Connecting to the Circuit

Step	Action/Purpose
------	----------------

1	Connect an RJ-45 cable from the termination point to 10BaseT connector on left side of the T-BERD 950.
---	--

2	Press <b>RESTART</b> to clear alarms and begin the test. Verify that the A T-BERD 950 green <b>SIGNAL LED</b> is illuminated.
---	---

	B T-BERD 950 green <b>FRAME SYNC LED</b> is illuminated (only if Ethernet data is being received).
--	--

(continued on Card 2)

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# T-BERD 950 Manual Setup 10BaseT/1P (Ping) (cont.)

## Part 3 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS 1 and RESULTS 2.*

TEST TYPE	TEST TYPE	TEST TYPE
Lost Pings	Tx Pings	Echo Pings
Result should not increment. If it does, the T-BERD 950 is not receiving proper echo replies in response to transmitted Ping echo packets.	Result should increment. If not, the T-BERD 950 is not transmitting Ping packets.	Result should increment. If not, far-end device may not be sending Ping packets successfully to the T-BERD 950.
Average time taken for Ping echo packet to be transmitted and echo reply received.	Average time taken for Ping echo packet to be transmitted and echo reply received.	Maximum time taken for Ping echo packet to be transmitted and echo reply received.
Min Ping Dly	Max Ping Dly	Min Ping Dly



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# Quick Cards

These Quick Cards have been assembled to help users easily perform basic test functions. The Quick Cards are also effective tools for familiarizing new users with the T-BERD 950 test set. **NOTE:** These Quick Cards are to be used in Manual Setup Task mode. **INT TASK** modes are not included.

To use the Quick Cards:

1. Select the desired application from the Table of Contents.
2. Refer to the appropriate setup card to configure the T-BERD 950.

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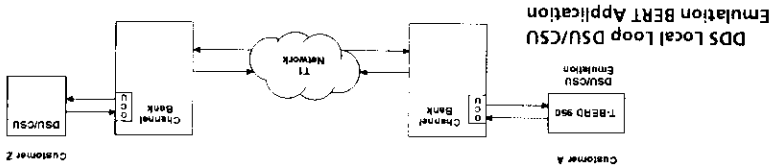


# T-BERD 950 Manual Setup

The following procedure outlines how to configure and connect the T-BERD 950 to the DDS circuit to perform a DSU/CSU emulation BERT. Please read the entire procedure **BEFORE** starting.

- **WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one menu to the next (e.g., HOME, SETUP, RESSETS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated)

1	INTERFACE	Select DDS-1L.
2	TASK	Select MANUAL SETUP.
3	TEST TYPE	Select BERT.

**Setup Interface View** (The LED under SETUP is illuminated)

1	MODE	Select TERMINATE.
2	EMULATE	Select DSU/CSU.
3	PRIMARY RATE	Select the appropriate primary channel rate (e.g., 2.4, 4.8, 9.6, 19.2, 38.4, 56, 64 kbps).
4	SECONDARY CHANNEL	Select ON if a secondary channel is present.
5	ANALYSIS CHANNEL	Select whether to test the PRIMARY or SECONDARY channel. <b>NOTE:</b> This selection appears only if SECONDARY channel is set to ON in Step 4 above.
6	LBO	Select 0 dB.

(continued on back)

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**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

*Setup Interface View (cont.)*

7	TRANSMIT CLOCK	Select RECOVERED. NOTE: The unit derives transmit timing from input signal.
8	LOOPBACK RESPONSE	Select DSTU/CSTU (the unit will now respond to standard DSTU/CSTU loopbacks).

*Setup Test Type View (Press the SETUP key again. Test type View appears on top left of screen.)*

1	BERT PATTERN	Select the appropriate stress pattern for the primary channel.
2	SECONDARY CHANNEL	Select the appropriate stress pattern for the secondary channel (e.g., IDLE, 511, 2017). NOTE: This selection appears only if SECONDARY CHANNEL is set to ON in Step 4 on the front of this card.
3	BERT BLOCK TYPE	Select PATTERN LENGTH
4	ERROR INSERT TYPE	Select the desired error insertion type.

**Part 2 – Connecting to the Circuit**

Step	Action/Purpose
------	----------------

- 1 Connect an RJ-45 cable from the 4-wire local loop into the RJ-45 connector of the T-BERD 950.
- 2 Press **RESTART** to clear alarms and begin the test. Verify that the:
  - A. T-BERD 950 green **SIGNAL LED** is illuminated.
  - B. T-BERD 950 green **FRAME SYNC LED** is illuminated (only if secondary channel is active).
  - C. T-BERD 950 green **PATTERN SYNC LED** is illuminated (only if performing an end-to-end BERT or loopback test).

**Part 3 – Checking Results**

Category	Result Name	Result Description
----------	-------------	--------------------

NOTE: The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

Results can also be displayed on **RESULTS I** and **RESULTS II**.

INTERFACE	BPS	Number of BPs detected in received signal since beginning of test
BPV Rate	Ratio of BPs received over total bits received	Data byte samples displayed in binary form

(continued on Card 2)



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# T-BERD 950 Manual Setup DDS LL BERT (cont.)

## Part 3 - Checking Results (cont.)

Category	Result Name	Result Description
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INTERFACE (cont.)	Rev Code	Displays received bytes, which are interpreted as special network codes, in text form
TEST TYPE	DDS Frm Err	Number of errored framing bits detected since beginning of test. <b>NOTE:</b> Applicable only when rate is set to 64 kbps or secondary channel is active
	DDS FE Rate	Number of frame errors received since beginning of test. <b>NOTE:</b> Applicable only when secondary channel is active
	Data Mode %	Ratio of total control bits received in data mode to total control bits received. <b>NOTE:</b> Applicable only when secondary channel is active
	Bit Errors	Number of bits received that have a value opposite that of the corresponding bits transmitted after pattern synchronization is achieved
	Pat Slips	Total number of pattern slips detected since beginning of test
	BER	Ratio of bit errors to received pattern data bits
	Rec Lvl, Vp	Level of received signal in peak-to-peak volts
	Scal Cur, mA	Measurement of loop up or loop down scaling current, in milliamperes
	Rec Freq, Hz	Current measurement of receiver clock frequency in Hertz
	SIGNAL	

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# DSDL Dual Monitoring

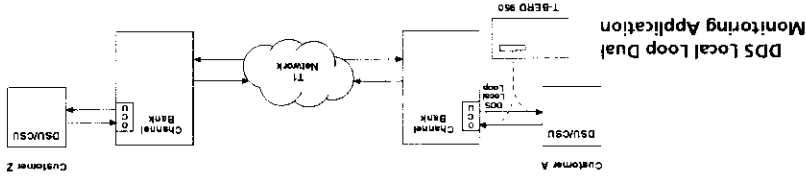
T-BERD 950 Manual Setup

Card 1 of 2

The following procedure outlines how to configure and connect the T-BERD 950 to the DDS circuit to perform dual monitoring. Please read the entire procedure **BEFORE** starting.

- **WARNING** - Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the **SOFTWARE** keys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one item to the next (e.g. HOME, SETUP, RESISTS, SYSTEM) or to show multiple items within SETUP and RESISTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g. CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

*Home View (The LED under HOME is illuminated.)*

1	INTERFACE	Select DDS-TL.
2	TASK	Select MANUAL SETUP.
3	TEST TYPE	Select BERT.

*Setup Interface View (The LED under SETUP is illuminated.)*

1	MODE	Select MONITOR. <b>NOTE:</b> The unit monitors circuit in <b>BOTH</b> directions.
2	PRIMARY RATE	Select the appropriate primary channel rate (e.g., 2.4, 4.8, 9.6, 19.2, 38.4, 56, 64 kbps).
3	SECONDARY CHANNEL	Select ON if a secondary channel is present.
4	ANALYSIS CHANNEL	Select whether to test the PRIMARY or SECONDARY channel. <b>NOTE:</b> This selection appears only if SECONDARY CHANNEL is set to ON in Setup Interface View, Step 3 above.

(continued on back)

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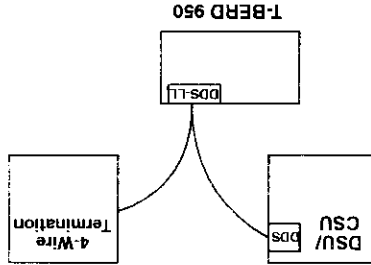


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(continued on Card 2)



**NOTE 3:** Both DSU/CSE and OCL-DP results can be simultaneously displayed using the **RESULTS** view mode under **LINE** and **EQUIPMENT**, respectively.

**NOTE 2:** Press the **EQUIPMENT** key so that at least one of its LEDs is illuminated, allowing OCL-DP results to be seen on either **RESULTS I** or **RESULTS II** and DSU/CSE results to be seen in **RESULTS** view.

**NOTE 1:** DSU/CSE results are located via the **EQUIPMENT** receiver. OCL-DP results are located via the **LINE** receiver.

If secondary channel is active).

- A. T-BERD 950 green **SIGNAL** (LINE and **EQUIPMENT**) LEDs are illuminated (indicating a signal is present from BOTH directions)
- B. T-BERD 950 green **FRAME SYNC** (LINE and **EQUIPMENT**) LEDs are illuminated (only if secondary channel is active).

1. Connect an RJ-15 Y-cable (Model No. CB-31591) from the T-BERD 950 RJ-15 connector to the DSU line under test. Place another end into the DSU/CSE, and the last end into the 4-wire termination towards the OCL-DP.

2. Press **RESTART** to clear alarms and begin the test. Verify that the:

## Part 2 – Connecting to the Circuit

Step	Field	Action/Purpose
1	BEERT PATTERN	Select the appropriate stress pattern for the primary channel. <b>NOTE:</b> Only applies if BEERT is being run over monitored DSS circuit.
2	SECONDARY CHANNEL	Select the appropriate stress pattern for the secondary channel. <b>NOTE:</b> This selection appears only if <b>SECONDARY CHANNEL</b> is set to <b>ON</b> in <b>Setup Interface View</b> . Step 3 on the front of this card.
3	BEERT BLOCK TYPE	Select <b>PATTERN LENGTH</b> . <b>NOTE:</b> Only applies if BEERT is being run over monitored DSS circuit.

## Part 1 – Configuring the T-BERD 950 (cont.)

# DPS LL Dual Monitoring (cont.)

T-BERD 950 Manual Setup

## Part 3 – Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read ALL RESULTS OK or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., SUMMARY, INTERFACE, TEST TAPP, etc.).

*Results can also be displayed on RESULTS I and RESULTS II.*

INTERFACE	BPS	Number of BPS detected in received signal (that are not embedded in valid B8ZS sequences) since beginning of test	Ratio of BPS received over total bits received	Rev Byte	Data byte samples displayed in binary form	Displays received bytes, which are interpreted as special network codes, in text form	DPS Frm Err	Number of errored framing bits detected since beginning of test. <i>NOTE: Applicable only when rate is set to 6 kbps or less. secondary channel is active</i>	DPS FE Rate	Number of frame errors received since beginning of test	Data Mode %	Ratio of total control bits received in data mode to total control bits received. <i>NOTE: Applicable only when secondary channel is active</i>	Rev Lat, Vp	Level of received signal in peak-to-peak volts	Measurement of loop up or loop down settling current, in milliamps	Seal Cur, mA	Rev Freq, Hz	Timing Slip	Measurement of difference between T/R and T1/R1 receiver while in <b>MONITOR</b> mode



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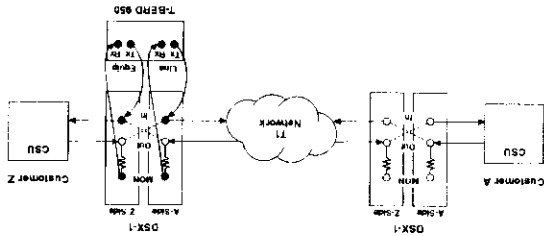
# T1 Drop & Insert BERT

The following procedure outlines how to configure and connect the T-BERD 950 to the DSX-1 to perform drop & insert BERT. Please read the entire procedure **BEFORE** starting.

**WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.

- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



T1 Drop & Insert BERT Application

## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

*Home View (The LED under HOME is illuminated.)*

1 INTERFACE Select T1 (selects internal T1 test module).

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select BERT.

*Setup Interface View (The LED under SETUP is illuminated.)*

1 MODE Select D&I.

2 FRAMING Select the appropriate framing (e.g., SF, B5F, etc).

3 PAYLOAD Select the appropriate channel bandwidth (e.g., X56 or X563).

4 CHANNEL Select the appropriate channel. **NOTE:** This selection appears only if payload is set to **DDS** in **Step 3** above. Use the **INCREASE VALUE** and **DECREASE VALUE** softkeys to select the appropriate channel.

5 CHANNELS To set up fractional bandwidth

5.1 EDIT Press the **EDIT** softkey to choose appropriate channels.

5.2 CLEAR ALL Press the **CLEAR ALL** softkey to clear all activated channels.

(continued on back)

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**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

**Setup Interface View (cont.)**

5.3 SELECT/DESSELECT Press the SELECT/DESSELECT softkey. Use the SCROLL key to move from one channel to next. **NOTE:** All selected dropped channels will have an “\*”

5.4 SAVE & EXIT Press the SAVE & EXIT softkey to save current channel selection.

6 LINE CODING Select the appropriate line coding (e.g., AMI or BRZS).

7 LINE RX IN Select DSX-MON

8 EQUIP RX IN Select DSX-MON

9 INSERT SIDE Select either LINE TX or EQUIPMENT TX depending upon desired direction of insertion.

10 INSERT PAYLOAD Select **OFF**. **NOTE:** You must turn the payload **ON** when entire unit is configured and connected properly.

11 AUTO-RESPOND Select **ON** or **OFF**.

12 LINE LBO Select 0 dB.

13 EQUIP LBO Select 0 dB.

14 IDLE BYTE Use the keypad to set desired idle byte pattern for unselected channels.

15 YELLOW ALARM Select **OFF**. **NOTE:** If **ON** is selected, the T-BERD 950 sends an AIS and Yellow Alarm when the signal is lost.

16 DS1 IDLE TX Select **OFF**.

**Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)**

1 BERT PATTERN Select the appropriate stress pattern.

2 ERROR INSERT Select the desired error insertion type.

3 ERROR RATE Select an error insertion rate (e.g., 1x10<sup>3</sup> or 1x10<sup>4</sup>). **NOTE:** To insert single error, press the **ERROR INSERT** key once. To insert at rate set above, hold down the **ERROR INSERT** key for approximately two seconds. Press the **ERROR INSERT** key again to turn insertion of errors **OFF**.

(continued on Card 2)

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# T-BERD 950 Manual Setup (cont.)

## T1 Drop & Insert BERT (cont.)

### Part 2 – Connecting to the Circuit

#### Step Action/Purpose

**1** Connect a cable from the T-BERD 950 E1/TB RX jack to the DSX-1 A-side MON jack (figure 1).  
 Press **RESTART** to clear alarms and begin the test. Verify that the A. T-BERD 950 green **SIGNAL (LINE)** LED is illuminated.  
 B. T-BERD 950 green **FRAME SYNC (EQUIPMENT)** LED is illuminated.

**2** Connect a cable from the T-BERD 950 **EQUIPMENT RX** jack

to the DSX-1 Z-side MON jack (figure 2).  
 Press **RESTART** to clear alarms and begin the test. Verify that the:

- A. T-BERD 950 green **SIGNAL (EQUIPMENT)** LED is illuminated.
- B. T-BERD 950 green **FRAME SYNC (EQUIPMENT)** LED is illuminated.

3 Connect a cable from the T-BERD 950 **LINE TX** jack to

the DSX-1 A-side TX jack, then immediately insert a 100 ohm terminating plug into the Z-side OLT jack (figure 3).

**WARNING: NEVER insert the terminating plug first.**

4 Connect a cable from the T-BERD 950 **EQUIPMENT TX**

jack to the DSX-1 Z-side TX jack, then immediately insert a 100 ohm terminating plug into the A-side OLT jack (figure 4).

**WARNING: NEVER insert the terminating plug first.**

5 Verify that the:

- A. T-BERD 950 green **SIGNAL (LINE)** and **EQUIPMENT (EQUIPMENT)** LEDs are illuminated.
- B. T-BERD 950 green **FRAME SYNC (LINE)** and **EQUIPMENT (EQUIPMENT)** LEDs are illuminated.

**NOTE:** Press the **EQUIPMENT** key so that at least one of its LEDs is illuminated, enabling unit to display equipment results on **RESULTS I, RESULTS II, or both.**

### Return to Setup Interface View, Step 10. Turn INSERT PAYLOAD ON.

(continued on back)



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### Part 3 – Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read ALL RESULTS OK or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., SUMMARY, INTERFACE, TEST TYPE, etc.).

*Results can also be displayed on RESULTS I and RESULTS II.*

INTERFACE	BPVS	Number of BPVs detected in received signal (that are not embedded in valid B8ZS sequences) since beginning of test
Frm Errors	Number of frame errors received since beginning of test	
CRC Errors	Number of CRC-6 errors detected since beginning of test (if LST framing)	
Recv Byte	Data byte samples displayed in binary form	
TEST TYPE	Bit Errors	Number of bits received that have a value opposite that of the corresponding bits transmitted after pattern synchronization is achieved
Pat Slips	Total number of pattern slips detected since beginning of test	
BER	Ratio of bit errors to received pattern data bits	
Errorred Sec	Number of test seconds where one or more bit errors occurred	
EPS	Number of seconds during which pattern synchronization was maintained through entire second and no bit error occurred	
Pat Los Sec	Total number of seconds, after pattern synchronization, where pattern synchronization was not present for any length of time.	
Recv Freq, Hz	Current measurement of receiver clock frequency in Hertz	
Recv Lvl, Vpp	Level of received signal in peak-to-peak volts	
Sig Los Sec	Number of test seconds in which signal was not present for any part of second	
Sig Los Cnt	Number of times signal has been lost	
Timing Slip	Measurement of accumulated difference between TT clocks	
PERFORMANCE	G.821 EPS	Number of available seconds in which no bit errors occurred
Avail Sec	Number of available seconds per CITT G.821	
Unavail Sec	Number of unavailable seconds per CITT G.821	

#### EQUIPMENT RX INPUT

**NOTE:** A reference TT signal **MUST** be provided at

Measurement of accumulated difference between TT clocks

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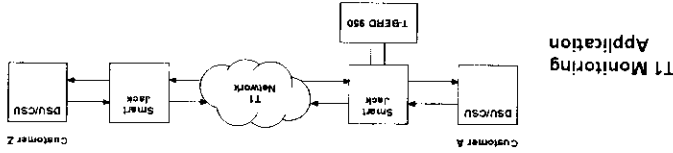
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The following procedure outlines how to configure and connect the T-BERD 950 to the smart jack to perform T1 monitoring. Please read the entire procedure **BEFORE** starting.

- **WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within SETUP and RESULTS.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select T1 (selects internal T1 test module.)

2 TASK Select MANUAL SETUP.

3 TEST TYPE Select BERT.

**Setup Interface View** (The LED under SETUP is illuminated.)

1 MODE Select MONITOR.

2 FRAMING Select the appropriate framing (e.g., UNFRAMED, SF, ESF, or SLC).

3 PAYLOAD Select the appropriate payload type (e.g., FULL, X56, or X64). **NOTE:** If you chose FULL, proceed to Step 6.

4 CHANNEL Select the appropriate channel. **NOTE:** This selection appears only if payload is set to DDS in Step 3 above. Use the INCREASE VALUE and DECREASE VALUE softkeys to select the appropriate channel.

5 CHANNELS To set up fractional bandwidth

5.1 EDIT Press the EDIT softkey to choose appropriate channels.

5.2 CLEAR ALL Press the CLEAR ALL softkey to clear all activated channels.

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## Part 1 - Configuring the T-BERD 950 (cont.)

Step	Field	Action/Purpose
------	-------	----------------

### Setup Interface View (cont.)

5.3 SELECT/DESELECT Press the SELECT/DESELECT softkey. Use the SCROLL key to move from one channel to next. **NOTE:** All selected dropped channels will have an "x".

5.4 SAVE & EXIT Press the SAVE & EXIT softkey to save current channel selection.

6 LINE CODING Select the appropriate line coding (e.g., AMI or BRZS).

7 LINE RX IN Select BRIDGE.

8 EQUIP RX IN Select BRIDGE.

1 Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)  
 BERT PATTERNS Select the appropriate stress pattern. **NOTE:** (Only applies if BERT is being run over monitored DDS circuit.)

## Part 2 - Connecting to the Circuit

Step	Action/Purpose
------	----------------

1 Connect a cable from the T-BERD 950 LINE RX jack to the MON facility jack.

2 Connect a cable from the T-BERD 950 EQUIPMENT RX jack to the MON CPE jack.

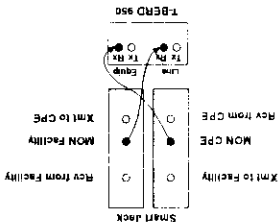
3 Press RESTART to clear alarms and begin the test. Verify that the

A T-BERD 950 green SIGNAL (LINE and EQUIPMENT) LEDs are illuminated.

B T-BERD 950 green FRAME SYNC (LINE and EQUIPMENT) LEDs are illuminated.

**NOTE 1:** Press the EQUIPMENT key so that at least one of its LEDs is illuminated, enabling unit to display equipment results on RESULTS I, RESULTS II, or both.

**NOTE 2:** Both LINE and EQUIPMENT results can be simultaneously viewed using the RESULTS new mode.



(continued on Card 2)

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TB950-T1.MON/5/ard1.2/11.00

# T1 Monitor (cont.)

T-BERD 950 Manual Setup

## Part 3 – Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS I and RESULTS II*

INTERFACE	BPVS	Number of BPVs detected in received signal (that are not embedded in valid BRSZ sequences) since beginning of test
Frame Errors	Frame Errors	Number of frame errors received since beginning of test
Frame Los Sec	Frame Los Sec	Number of test seconds in which frame synchronization was not present for any part of second
Frame Los Cnt	Frame Los Cnt	Number of times frame synchronization has been lost during test
CRC Errors	CRC Errors	Number of CRC-6 errors detected since beginning of test
Rec Lvl Vpp	Rec Lvl Vpp	Level of received signal in peak-to-peak volts
Sig Los Sec	Sig Los Sec	Number of test seconds in which signal was not present for any part of second
Max Zeros	Max Zeros	Number of maximum number of consecutive spaces on T1 receiver since initial signal was present
Timing Slip	Timing Slip	Measurement of accumulated differences between T1 clocks. <b>NOTE:</b> A reference T1 signal <b>MUST</b> be provided at <b>EQUIPMENT RX</b> input.

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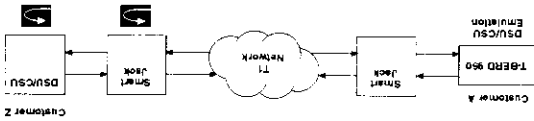


# T1 Termination BERT

The following procedure outlines how to configure and connect the T-BERD 950 to the smart jack to perform T1 BERT. Please read the entire procedure **BEFORE** starting.

- **WARNING** Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
- Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select T1 (selects internal T1 test module).

2 TASK Select MANUAL SETUP

3 TEST TYPE Select BERT

**Setup Interface View** (The LED under SETUP is illuminated.)

1 MODE Select TERMINATE

2 FRAMING Select the appropriate framing (e.g., UNFRAMED, SF, ESF, or SLIC<sup>®</sup>).

3 PAYLOAD Select FITL (Full T1 testing).

4 LINE CODING Select the appropriate line coding (e.g., AMI or B8ZS).

5 LINE RX IN Select TERM (terminates line with a 100 ohm resistance).

6 BERT RX IN Select TERM (terminates line with a 100 ohm resistance).

7 TX/RX PAIR Select LINE

8 TX TIMING Select INTERNAL (selects internal synthesizer as transmit timing source).

9 LOOPCODE Select the appropriate device to loopback.

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TB950-T1 Term BERT/6/Can/1.2/1.00

(continued on back)

## Part 1 – Configuring the T-BERD 950 (cont.)

Step	Field	Action/Purpose
------	-------	----------------

### Setup Interface View (cont.)

10	ALTO-RESPOND	Select OFF
11	LINE LBO	Select 0 dB
12	YELLOW ALARM	Select OFF
13	DSL IDLE TX	Select OFF

Setup Test Type View (Press the **SLT/F** key again. Test Type View appears on top left of screen.)

14 BERT PATTERN Select the appropriate stress pattern.

15 ERROR INSERT Select the desired error insertion type (e.g., logic, BPV, logic+BPV, TYPE)

16 ERROR RATE Select an error insertion rate (e.g., 1x10<sup>2</sup> or 1x10<sup>3</sup>). **NOTE:** To insert

single error, press the **ERROR INSERT** key once. To insert at rate set above, hold down the **ERROR INSERT** key for approximately two seconds. Press the **ERROR INSERT** key again to turn insertion of errors OFF.

## Part 2 – Connecting to the Circuit

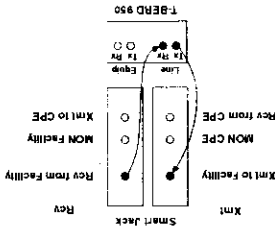
Step	Action/Purpose
------	----------------

1 Connect a cable from the T-BERD 950's LINE TX jack to the Xmt to Facility jack

2 Connect a cable from the T-BERD 950's LINE RX jack to the Rcv from Facility jack.

3 Press **RESTART** to clear alarms and begin the test. Verify that the:

- A. T-BERD 950 green SIGNAL LED is illuminated.
- B. T-BERD 950 green FRAME SYNC LED is illuminated.
- C. T-BERD 950 green PATTERN SYNC LED is illuminated (loopback is activated).



**NOTE 1:** Both **EQUIPMENT** LEDs should not be illuminated since circuit is terminated on the **LINE TX/RX** jacks. **EQUIPMENT** results are non-applicable.

**NOTE 2:** To enable loopback, press the **LOOP UP** key on front panel. To disable loopback, press the **LOOP DOWN** key.

(continued on Card 2)



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# T1 Termination BERT (cont.)

## Part 3 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS** OR it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g. **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS I and RESULTS II*

INTERFACE	BPVS	Number of BPVS detected in received signal (that are not embedded in valid BRZ sequences) since beginning of test
Frame Errors	Frame Errors	Number of frame errors received since beginning of test
Frame Loss Count	Frame Loss Count	Number of times frame synchronization has been lost during test
Frame Loss Seconds	Frame Loss Seconds	Number of test seconds in which frame synchronization was not present for any part of second
CRQ Errors	CRQ Errors	Number of CRQ errors detected since beginning of test (if PSF framing)
Recv Byte	Recv Byte	Data byte samples displayed in binary form
Bit Errors	Bit Errors	Number of bits received that have a value opposite that of the corresponding bits transmitted after pattern synchronization is achieved
Pat Slips	Pat Slips	Total number of pattern slips detected since beginning of test
BER	BER	Ratio of bit errors to received pattern data bits
Errorred Sec	Errorred Sec	Number of test seconds where one or more bit errors occurred
EPS	EPS	Number of seconds during which pattern synchronization was maintained through entire second and no bit error occurred
Pat Los Sec	Pat Los Sec	Total number of seconds after pattern synchronization, where pattern synchronization was not present for any length of time
Rx Freq, Hz	Rx Freq, Hz	Current measurement of receiver clock frequency in Hertz
Rev Lvl, Vpp	Rev Lvl, Vpp	Level of received signal in peak-to-peak volts
Sig Los Sec	Sig Los Sec	Number of test seconds in which signal was not present for any part of second
Sig Los Cnt	Sig Los Cnt	Number of times signal has been lost
PERFORMANCE	G.821 EFS	Number of available seconds in which no bit errors occurred
Avail Sec	Avail Sec	Number of available seconds per CCITT G.821
Unavail Sec	Unavail Sec	Number of unavailable seconds per CCITT G.821



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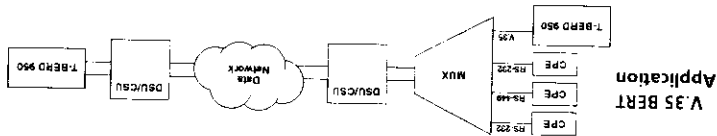
# Out-of-Service V.35 BER Testing

T-BERD 950 Manual Setup

The following procedure outlines how to configure and connect the T-BERD 950 with a TB95-DMTA interface module to a CPE device for out-of-service end-to-end testing. Please read the entire procedure **BEFORE** starting.

- **WARNING** - Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g. HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
- Use the **FUNCTION** key to access top level softkey selections (e.g. CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select **DATA.COM**

2 TASK Select **MANUAL SETUP**

3 TEST TYPE Select **BERT**

**Setup Interface View** (The LED under SETUP is illuminated.)

1 TYPE Select **V.35**

2 MODE Select **EMULATE DTE**

3 TX TIMING Select **INTERFACE** (unit is now using incoming timing from DCE as the transmit timing source.)

4 RX TIMING Select **INTERFACE** (unit is now using DCE source as its receive timing source.)

5 RX CLK POL Select **ATTO** (unit automatically detects an inverted phase relationship and corrects it.)

6 SYNTH Set the desired synchronous data rate using the keypad (valid range is between 50 bps to 10 Mbps).

7 DTR Set to **ON** (sets the signal lead high).

8 RTS Set to **ON** (sets the signal lead high).

(continued on back)

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**Part 1 – Configuring the T-BERD 950 (cont.)**

Step	Field	Action/Purpose
------	-------	----------------

*Setup Interface View (cont.)*

9 RL Set to ON (sets the signal lead high).

10 LL Set to ON (sets the signal lead high).

11 FLOW CONTROL Set to OFF.

*Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)*

1 BERT PATTERN Select the appropriate stress pattern.

2 ERROR RATE Select an error insertion rate (e.g., 1X10<sup>0</sup> or 1X10<sup>6</sup>). **NOTE:** To insert a

single error, press the **ERROR INSERT** key once. To insert at the rate

set above, hold down the **ERROR INSERT** key for approximately two

seconds. Press the **ERROR INSERT** key again to turn the insertion of

**Part 2 – Checking Results**

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the

other categories with errors. Press the **RESULTS** key to view the various result categories

(e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS I and RESULTS II.*

**INTERFACE** Clk Dat Chg Indicates number of times phase between clock and data

leads have changed

Indicates whether unit has received an inverted clock

Inv Rx Clk

Indicates whether the T-BERD 950 has stopped sending a

TX Clk Loss

clock. (This occurs if unit is set up for **INTERFACE TX**

**TIMING** and a clocked is not received from external piece of

equipment).

Indicates whether data is being transmitted (**TXING**) from the

Flw Dat

T-BERD 950 or not (**HALT**).

Indicates whether the unit has received 64 or more consecu-

Dat Act Los

ive ones or zeros

Measures frequency of transmitted clock

Tx Clk Freq

Measures frequency of received clock

Rx Clk Freq

**NOTE:** If you are receiving a large number of errors, your received clock may be faulty. If the received clock is

missing or unusable (a large number of Clk Dat Chg changes is also an indication), place the T-BERD 950 into

recovered clock mode. In this mode the T-BERD 950 can extract the clock from the received data and use this

extracted clock as either the TX or RX timing source. This enables you to determine whether the transmission

line or the clock is the source of errors. See the instructions below to set up the T-BERD 950 for this functionality.

1. Return to **Part 1, Setup Interface View, Steps 3 and 4.**

2. Select **RECOVERED** for both **TX TIMING** and **RX TIMING.**

**NOTE:** The **Recovered Clock** Option only operates up to rates of 520 kbps.



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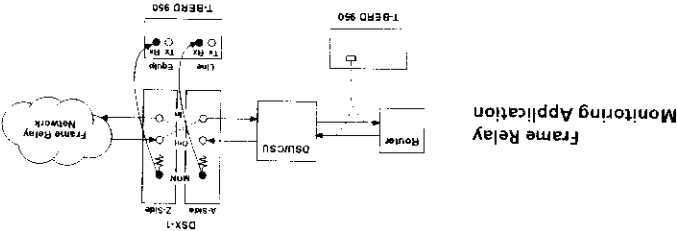
# Frame Relay (Monitoring)

T-BERD 950 Manual Setup

The following procedure outlines how to configure and connect the T-BERD 950 to perform DDS local loop or T1 frame relay monitoring. Please read the entire procedure **BEFORE** starting.

- **WARNING** – Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next
- Use the **SOFTKEYS** to make a selection within the current field
- Use the **VIEWS** control keys to move from one view to the next (e.g. HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
- Use the **FUNCTION** key to access top level softkey selections (e.g. CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

**Home View** (The LED under HOME is illuminated.)

1 INTERFACE Select T1 or DDS-T1, depending on type of circuit to be tested. Follow the appropriate **SETUP** screen below.

2 TASK Select **MANUAL SETUP**.

2 TEST TYPE Select **FRAME RELAY**.

**Setup Interface View** (The LED under SETUP is illuminated.)

1 MODE Select **MONITOR**.

2 FRAMING Select the appropriate T1 framing format.

3 PAYLOAD Select **FULL** for Full T1, **Nx56** or **Nx64** for fractional T1. If you select Nx56 or Nx64, you will be prompted to set desired channels to monitor, using the **EDIT** softkey.

4 CHANNELS To set up fractional bandwidth

4.1 EDIT Press the **EDIT** softkey to chose appropriate channels.

(continued on back)



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(continued on Card 2)

See the appropriate T-BERD 950 T1 Monitor Manual Setup or DDS LL Dual Monitoring Manual Setup card for instructions on how to connect to the circuit.

## Part 2 – Connecting to the Circuit

3	LONG FRAME	Use the keypad to set long frame byte size threshold (any frame longer than this will be counted in LONG FRM result).
2	RECEIVE DIAL	Enables entry of particular DIAL for analysis.
1	SHOW RESULTS FOR	Select LINK NOTE: This will give results for entire frame relay link. as opposed to just one DIAL.
Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)		
3	SECONDARY CHANNEL	Select ON if secondary channel is present. NOTE: This selection is not available if 6fk is selected in Setup Interface View. DDS, Step 2 above.
2	PRIMARY RATE	Select the appropriate primary channel rate (e.g., 56k or 6fk).
1	MODE	Select MONITOR

### DDS

#### Setup Interface View

3	LONG FRAME	Use the keypad to set long frame byte size threshold (any frame longer than this will be counted in LONG FRM result).
2	RECEIVE DIAL FOR	Enables entry of particular DIAL for analysis. as opposed to just one DIAL.
1	SHOW RESULTS FOR	Select LINK NOTE: This gives results for entire frame relay link.
Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)		
7	EQUIP RX IN	Select DSX-MON
6	LINE RX IN	Select DSX-MON
5	LINE CODING	Select the appropriate line coding.
4/4	SAVE & EXIT	Press the SAVE & EXIT softkey to save current channel selection.
4/3	SELECT/DESELECT	Press the SELECT/DESELECT softkey, use the SCROLL keys to move from one channel to next. NOTE: All selected dropped channels will have an "x".
4/2	CLEAR ALL	Press the CLEAR ALL softkey to clear all activated channels.

### T1/T11 (cont.)

#### Setup Interface View (cont.)

## Step Field Action/Purpose

## Part 1 – Configuring the T-BERD 950 (cont.)

# Frame Relay (Monitoring) (cont.)

T-BERD 950 Manual Setup

## Part 3 – Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various specific result categories (e.g., **SUMMARY**, **INTERFAC**, **TEST TYPE**, etc.).

Results can also be displayed on **RESULTS I** and **RESULTS II**.

**NOTE:** **LMI ERRS**, **LMI TMOS**, and **LMI COUNT** are each aggregates of the **LINE** and **EQUIPMENT** receivers, but each is displayed for the **LINE** receiver only.

**TEST TYPE**      **Errm Cm**      Result should increment. If not, frames are not being transmitted through network.

**LMI Count**      Result should increment. If not, LMI "keep alive" signals are not being sent between CPE and POP switch.

**LMI Errs**      Result should equal zero. If not, handshaking between CPE and POP switch is not occurring properly.

**LMI TMOS**      Result should equal zero. If not, possibly transmit link between the T-BERD 950 and network is down, or receive link from switch to you is down, or POP switch is incorrectly configured. **STATUS** **POP** settings may also be incorrect.

**DICLS (RESULTS**      Should read "ACTIVE". This indicates that network has established PVC and frames can be transmitted through POP switch. If not, then look below for explanation of other results.

**NOTE 2)**      view only – see

**NOTE 1:** This result is **only** valid when monitoring traffic in direction from network to customer on one DLCI (traffic from customer to network does not contain PVC status information).

**NOTE 2:** **DICLS** status can be found in the Test Type category in the **RESULTS** view.

**PERFORMANCE**      **Avg% Util**      Result should be greater than zero. The average percentage of link utilization on received channel since start of test calculated as number of FRM OCTS divided by total number of octets received.

**Avg Thruput**      Result should correspond to rate being transmitted by far-end. It is average received throughput since start of test, calculated as total header+DFR bits divided by total seconds. This result can be used to estimate committed information rate (CIR).

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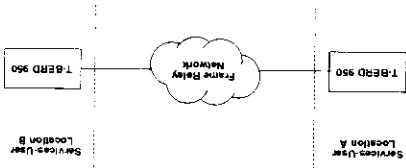
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The following procedure outlines how to configure and connect the T-BERD 950 for frame relay end-to-end testing at the DDS local loop. This procedure should be used on BOTH T-BERD 950s. Please read the entire procedure BEFORE starting.

- **WARNING** – Set up the T-BERD 950 BEFORE connecting to the network.
  - Use the **SCROLL** key to scroll from one field to the next.
  - Use the **SOFTKEY** key to make a selection within the current field.
  - Use the **VIEWS** control keys to move from one view to the next (e.g., HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
  - Use the **FUNCTION** key to access top level softkey selections (e.g., CALL CONTROL, etc).
  - Use the **MORE** key to view additional selections.
- NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



Frame Relay End-to-End Connectivity Application

## Part 1 – Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

Home View (The LED under HOME is illuminated.)

1 INTERFACE Select DDS-TL.

2 TASK Select MANUAL setup.

3 TEST TYPE Select FRAME RELAY.

Setup Interface View (The LED under SETUP is illuminated.)

1 MODE Select TERMINATE.

2 PRIMARY RATE Select the appropriate link speed (e.g., 56K or 64K).

3 SECONDARY Select OFF.

CHANNEL

4 LBO Select 0 DB.

5 TRANSMIT CLOCK Select RECOVERED.

(continued on back)

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## Part 1 – Configuring the T-BERD 950 (cont.)

Step	Field	Action/Purpose
------	-------	----------------

**Setup Test Type View** (Press the **SETUP** key again. Test Type View appears on top left of screen.)

1 SHOW RESULTS Select LINK. **NOTE:** This gives results for entire frame relay link.

FOR as opposed to just one DLCL

2 RECEIVE DLCL Enables entry of particular DLCL for analysis

3 TRANSMIT DLCL Enables entry of particular DLCL to transmit frame relay traffic

4 FECN BIT Select 0.

5 BECN BIT Select 0.

6 DE BIT Select 0.

7 CR BIT Select 0.

8 LOAD Select **FIXED** to transmit frames at fixed rate.

9 LOAD RATE (kbps) Use the keypad to set transmit frame rate (in kbps to 1/2 the line rate).

10 MIN LENGTH Enables user-definable minimum frame size between 4 and 9999 bytes.

11 MAX LENGTH Enables user-selectable maximum frame size between 4 and 9999 bytes.

12 PAYLOAD Select SEQ TEST.

13 LMI TYPE Select the appropriate type of link management for this link.

14 POLL TIME Use the keypad to set interval (in seconds) between link management

STATS POLL messages (default is 10 seconds).

15 FTL INTERVAL Use the keypad to set number of STATS POLLS that will be sent before full

STATS POLL is transmitted (default is 6).

16 LONG FRAME Use the keypad to set long frame byte threshold (any frame longer

than this will be counted in LONG FRM result).

**NOTE:** A similar setup can be used for frame relay testing of T1 circuit (refer to the User's Manual for further information).

## Part 2 – Connecting to the Circuit

See the T-BERD 950 DDS II BERT Manual Setup card for instructions on how to connect to the circuit at the remote local loop.

(continued on Card 2)

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TR950-FR-Relay\_End2End/9/Card1.2/1.00

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# T-BERD 950 Manual Setup Frame Relay (End-to-End Connectivity) (cont.)

## Part 3 – Checking Results

Category	Result Name	Result Description
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**NOTE:** The **SUMMARY** category should read **ALL RESULTS OK** or it displays specific results from the other categories with errors. Press the **RESULTS** key to view the various result categories (e.g., **SUMMARY**, **INTERFACE**, **TEST TYPE**, etc.).

*Results can also be displayed on RESULTS I and RESULTS II*

**TEST TYPE** Frm Cntm

Result should increment. If not, frames are not being transmitted through network.

**LMI Count** LMI Count

Result should increment. If not, LMI "keep alive" signals are not being sent between CPE and POP switch.

**LMI Errs** LMI Errs

Result should equal zero. If not, handshaking between CPE and POP switch is not occurring properly.

**LMI TMOS** LMI TMOS

Result should equal zero. If not, possibly transmit link between the T-BERD 950 and network is down, or receive link configured. STAT1'S POLL settings may also be incorrect.

**DLCIs (RESULTS)** view only – see

**Should read "ACTIVE"**. This indicates that network has established PVC and frames can be transmitted through POP switch. If not, then look below for explanation of other results.

• – DLCI is undefined

• – DLCI is inactive

• – DLCI was just added

• – DLCI was just deleted

**NOTE:** DLCIs status can be found in the Test Type category in the **RESULTS** menu.

**PERFORMANCE** Avg%Clkld

Result should be greater than zero and approximately 50% (assuming both ends have equal line rates and frame relay transmit rate is 1/2 the line rate). The average percentage of link utilization on received link since start of test calculated as number of FRM (OCTS) divided by total number of octets received.

**Avg Throughput**

Result should correspond to rate being transmitted by far-end (assuming this fixed rate is below near-end line rate). It is average received throughput since start of test, calculated as total header+LDF bits divided by total seconds. This result can be used to estimate Committed Information Rate (CIR).

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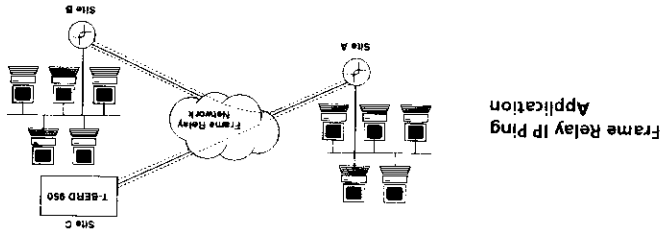


# Frame Relay (IP Ping)

The following procedure outlines how to configure and connect the T-BERD 950 for frame relay IP ping testing at the DNS local loop. Please read the entire procedure **BEFORE** starting.

- **WARNING** - Set up the T-BERD 950 **BEFORE** connecting to the network.
- Use the **SCROLL** key to scroll from one field to the next.
- Use the softkeys to make a selection within the current field.
- Use the **VIEWS** control keys to move from one view to the next (e.g. HOME, SETUP, RESULTS, SYSTEM) or to show multiple views within **SETUP** and **RESULTS**.
- Use the **FUNCTION** key to access top level softkey selections (e.g. CALL CONTROL, etc).
- Use the **MORE** key to view additional selections.

**NOTE:** Pressing the **CHOICES** softkey will expand the field options across the bottom of the screen.



## Part 1 - Configuring the T-BERD 950

Step	Field	Action/Purpose
------	-------	----------------

*Home View (The LED under Home is illuminated.)*

1 INTERFACE Select DDS-TL

2 TASK Select MANUAL SETUP

3 TEST TYPE Select FRAME RELAY

*Setup Interface View (The LED under SETUP is illuminated.)*

1 MODE Select TERMINATE

2 PRIMARY RATE Select the appropriate primary channel format (e.g., 56k or 64k).

3 SECONDARY CHANNEL Select OFF. **NOTE:** This selection is not available if 64k is selected as the **PRIMARY RATE** in Step 2 above.

4 LBO Select 0 dB

5 TRANSMIT CLOCK Select RECOVERED

(continued on back)

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## Part 1 – Configuring the T-BERD 950 (cont.)

Step	Field	Action/Purpose
------	-------	----------------

*Setup Test Type View (Press the SETUP key again. Test Type View appears on top left of screen.)*

1 SHOW RESULTS Select LINK. **NOTE:** This gives results for entire frame relay link as opposed to just one DLCI.

2 RECEIVE DLCI Enables entry of particular DLCI for analysis

3 TRANSMIT DLCI Enables entry of particular DLCI to transmit frame relay traffic

4 EBCN BIT Select 0

5 BECN BIT Select 0

6 DE BIT Select 0

7 CR BIT Select 0

8 LOAD Select PING to transmit frame relay IP Pings.

9 SOURCE IP ADDRESS Use the keypad to set source IP address.

10 DEST IP ADDRESS Use the keypad to set destination IP address.

11 LMI TYPE Select the appropriate type of link management for this link

12 POLL TIME Use the keypad to set interval (in seconds) between link management

13 POLL INTERVAL Use the keypad to set number of STATUS POLLS that will be sent before

14 LONG FRAME Use the keypad to set long frame byte size threshold (any frame longer

than this will be counted in LONG FRM result).

**NOTE:** A similar setup can be used for frame relay testing of T1 circuit (refer to the User's Manual for further information).

## Part 2 – Connecting to the Circuit

See the T-BERD 950 DDS II BERT Manual Setup card for instructions on how to connect to the circuit at the 4-wire local loop.

(continued on Card 2)

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# Frame Relay (IP Ping) (cont.)

T-BERD 950 Manual Setup

(card 2 of 2)

## Part 3 - Checking Results

Category	Result Name	Result Description
----------	-------------	--------------------

*NOTE: The SUMMARY category should read ALL RESULTS OK or it displays specific results from the other categories with errors. Press the RESULTS key to view the various result categories (e.g. SUMMARY, INTERACE, TEST TYPE, etc.)*

*Results can also be displayed on RESULTS I and RESULTS II.*

TEST TYPE	Lost Pings	Tx Pings	Echo Pings	Avg Ping (Dly)	PERFORMANCE	Avg Ping (Dly)	Max Ping (Dly)	Min Ping (Dly)
	Result should not increment. If it does, the T-BERD 950 is not receiving proper echo replies in response to transmitted ping echo packets.	Result should increment. If not, your T-BERD 950 is not transmitting Ping packets.	Result should increment. If not, far-end device may not be sending Ping packets successfully to your T-BERD 950.	Average time taken for Ping echo packet to be transmitted and echo reply received.	Maximum time taken for Ping echo packet to be transmitted and echo reply received.	Minimum time taken for Ping echo packet to be transmitted and echo reply received.		



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