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FIREBERD 6000
Quick Cards

These Quick Cards have been assembled to help users easily perform basic test functions. The Quick Cards are also effective tools to familiarize new users with the FIREBERD 6000 test set.

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 FIREBERD 6000.*
3. *If additional information is needed, refer to the FIREBERD 6000 User's Guide.*

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These Quick Cards were created with reference to Rev. M or greater software.

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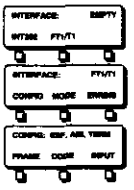
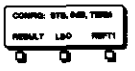
FIREBERD 6000 Setup

Full T1 In-Service Monitoring

*The following procedure outlines how to connect the FIREBERD 6000 with a 41440A interface to the network in order to perform a Full T1 In-Service Monitoring test. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	T1/FT1	Access the T1/FT1 interface.	
2	CONFIG	Access the **CONFIGURATION** menu.	
2a	FRAME	Scroll through the list until you reach the appropriate framing of your circuit (e.g., D4, ESF, SLC®-96, or OFF).	
2b	CODE	Scroll through the list until you reach the appropriate coding of your circuit (e.g., B8ZS or AMI).	
2c	INPUT	Scroll through the list and set to **DSXMON** (assuming DSX access).	
2d	MORE	See additional selections.	
2e	RESULT	Scroll through the list and set to **LIV**.	
2f	REFT1	Scroll through the list and set to **BRDG**.	
2g	▲	Press the ▲ (up-arrow key) on the keypad to return to the T1/FT1 main menu.	
3	MODE	Access the **MODE** menu.	
3a	FULLT1	To monitor the FULL T1 bandwidth.	
4	ENTER	Press **ENTER** on the keypad to return to the main menu.	
5	ANALYSIS MODE	Select **CONTINUOUS**.	

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Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present). B. FIREBERD 6000's **FRM SYNC** LED is illuminated (if **FRM SYNC** is not illuminated, go back to **Step 2a** and select the appropriate frame format).

*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
T-CARRIER	BPVs	Bipolar Violations
	FRA ERR	Frame Errors
	CRC ERR	CRC Errors (ESF framing only)
	FRA LOSS	Frame Loss
	BIT SLIP	Bit Slips (applicable only with a REFT1)
SIGNAL	+LVL dB	Positive Receive Signal Level
	-LVL dB	Negative Receive Signal Level
	PP LVL V	Peak-to-Peak Receive Signal Level (volts)
	RCV FREQ	Receive Frequency

*Table 2 is a list of **INTERFACE STATUS LEDs**. When illuminated each of the status LEDs mean the following:*

Table 2 – Interface Status LEDs

Illuminated Status LED	Description
CODE	Illuminates when B8ZS coding is being received.
ALM 1	Illuminates when a Yellow Alarm is detected.
ALM 2	Illuminates when an Excess Zeros Alarm is detected.

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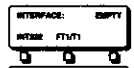
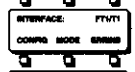
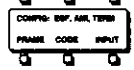
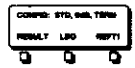
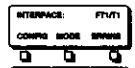
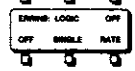
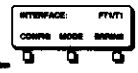
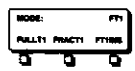
FIREBERD 6000 Setup

T1/FT1 Out-of-Service BERT

The following procedure outlines how to connect the FIREBERD 6000 with a 41440A interface to the network in order to perform a T1/FT1 Out-of-Service BERT. Please read the entire procedure ***BEFORE*** *starting.*

- ***WARNING*** *– Set up the FIREBERD 6000* ***BEFORE*** *connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- ▲ *(up-arrow key) is used to return to the previous menu selection.*
- *Use the* ***MENU*** *softkey to scroll through the options until you reach* ***INTF SETUP*** *(LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	T1/FT1	Access the T1/FT1 interface.	
2	CONFIG	Access the **CONFIGURATION** menu.	
2a	FRAME	Scroll through the list until you reach the appropriate framing of your circuit (e.g., D4, ESF, SLC®-96, or OFF).	
2b	CODE	Scroll through the list until you reach the appropriate coding of your circuit (e.g., B8ZS or AMI).	
2c	INPUT	Scroll through the list and set to **TERM**.	
2d	MORE	See additional selections.	
2e	RESULT	Scroll through the list and set to **STD**.	
2f	LBO	Scroll through the list and set the Line Build Out to **0 dB**.	
2g	REFT1	Scroll through the list and set to **BRDG**.	
2h	▲	Press the ▲ (up-arrow key) on the kepad to return to the previous menu.	
3	ERRINS	Set to **OFF**.	
3a	▲	Press the ▲ (up-arrow key) on the keypad to return to the previous menu.	
4	MODE	Access the **MODE** menu.	
For Full T1 testing, Steps 4a-4b7 should be substituted with the following instruction:			
4a	FULLT1	Allows you to select and BERT the FULL T1 bandwidth.	

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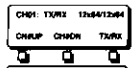
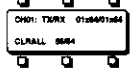
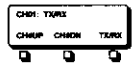
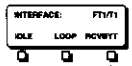
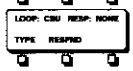
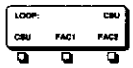
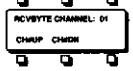
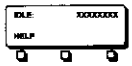
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Part 1 – Interface Setup *(cont.)*

Step	Softkey	Action/Purpose	Setup Display
4a	FRACT1	Select and monitor any selection of time slots. Traffic on unselected channels will be replaced with the idle code entered in **Step 7**. (Repeat **Steps 4b5** and **4b6** for each channel you wish to test.)	
4b1	MORE	See additional selections.	
4b2	CLRALL	Clear all channel setup parameters from a previous test.	
4b3	56/64	Choose between 56K and 64K bandwidth.	
4b4	MORE	See additional selections.	
4b5	CH# UP CH# DN	Select the channels you wish to drop.	
4b6	TX/RX	Set the selected channel to **TX/RX**.	
4b7	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the T1/FT1 main menu.	
4b8	MORE	See additional selections.	
5	LOOP	Access the **LOOP** menu.	
5a	TYPE	Select which piece of equipment you want to loop back. Press **MORE** for additional selections if needed.	
5b	▲	Press the ▲ (up-arrow key) on the keypad to return to the **LOOP** menu.	
5c	RESPND	Set the FIREBERD 6000 to **AUTO** (automatically responds to a received loop code) or **NONE**.	
5d	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the T1/FT1 main menu.	
6	RCVBYT	Select a channel 1-24 to be displayed in the RCV BYTE result.	
6a	CH# UP CH# DN	Select the channel you wish to monitor.	
6b	▲	Press the ▲ (up-arrow key) on the keypad to return to the T1/FT1 main menu.	
7	IDLE	Select an 8-bit binary idle code pattern to be inserted in the inactive channels.	
8	ENTER	Press to set these idle code bits.	
9	ENTER	Press **ENTER** on the keypad to return to the main menu.	

(continued on Card 2)

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FIREBERD 6000 Setup

T1/FT1 Out-of-Service BERT (cont.)

Part 1 – Interface Setup (cont.)

Step	Softkey	Action/Purpose
10	DATA	Scroll through the list and select a data pattern. QRSS is the recommended data pattern for T1 testing. Additional stress patterns (including 3 in 24 and 1:7) are located in **AUX 41**. (Press the **MORE** key as necessary in **AUX 41** to see the additional patterns.) Refer to the FIREBERD 6000 manual for a detailed description of each available test pattern.
11	GEN CLK	Scroll through the list and set to **SYNTH** to generate internal timing or **INTF** to recover timing from the network.
12	ANALYSIS MODE	Select **CONTINUOUS**.

Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present). B. FIREBERD 6000's **FRM SYNC** LED is illuminated (if **FRM SYNC** is not illuminated, go back to **Step 2a** and select the appropriate frame format).

NOTE: *To perform a loopback test, press the **LOOP UP** key on the INTERFACE STATUS and CONTROL section of the FIREBERD 6000.*

*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
ERROR	BIT ERRS	Bit Errors
	BER	Bit Error Rate
	PAT SLIP	Pattern Slips
T-CARRIER	BPVs	Bipolar Violations
	FRA ERR	Frame Errors
	CRC ERR	CRC Errors (ESF framing only)
	FRA LOSS	Frame Loss
	BIT SLIP	Bit Slips (applicable only with a REFT1)

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Table 1 – Analysis Results *(cont.)*

Category	Result Name	Result Description
SIGNAL	+LVL dB	Positive Receive Signal Level
	-LVL dB	Negative Receive Signal Level
	PP LVL V	Peak-to-Peak Receive Signal Level (volts)
	RCV FREQ	Receive Frequency
	RCV BYTE	Receive Byte

*Table 2 is a list of **INTERFACE STATUS** LEDs. When illuminated each of the status LEDs mean the following:*

Table 2 – Interface Status LEDs

Illuminated Status LED	Description
CODE	Illuminates when B8ZS coding is being received.
ALM 1	Illuminates when a Yellow Alarm is detected.
ALM 2	Illuminates when an Excess Zeros Alarm is detected.

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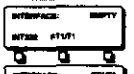
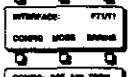
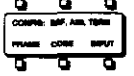
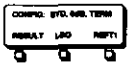
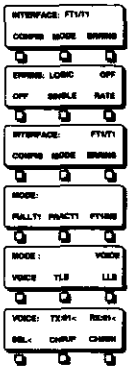
FIREBERD 6000 Setup

T1/FT1 – Voice and Signaling

*The following procedure outlines how to connect the FIREBERD 6000 with a 41440A interface to the network in order to perform an end-to-end T1/FT1 Out-of-Service Voice and Signaling test. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	T1/FT1	Access the T1/FT1 interface.	
2	CONFIG	Access the **CONFIGURATION** menu.	
2a	FRAME	Scroll through the list until you reach the appropriate framing of your circuit (e.g., D4, ESF, SLC®-96, or OFF).	
2b	CODE	Scroll through the list until you reach the appropriate coding of your circuit (e.g., B8ZS or AMI).	
2c	INPUT	Scroll through the list and set to **TERM**.	
2d	MORE	See additional selections.	
2e	RESULT	Scroll through the list and set to **STD**.	
2f	LBO	Scroll through the list and set the Line Build Out to **0 dB**.	
2g	REFT1	Scroll through the list and set to **BRDG**.	
2h	▲	Press the ▲ (up-arrow key) on the keypad to return to the T1/FT1 main menu.	
3	ERRINS	Set to **OFF**.	
3a	▲	Press the ▲ (up-arrow key) on the keypad to return to the T1/FT1 main menu.	
4	MODE	Access the **MODE** menu.	
4a	MORE	See additional selections.	
4b	VOICE	Places the FIREBERD 6000 into **VOICE** mode.	
4b1	SEL<	Press to choose between setting your **TX** channel or your **RX** channel (toggle between **RX:_<TX:_<**, and **TX:_<RX:_<**.)	

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Part 1 – Interface Setup *(cont.)*

Step	Softkey	Action/Purpose	Setup Display
4b2	CH# UP CH# DN	Select your **TX** and **RX** channels.	
4b3	MORE	See additional voice selections.	
4c	SIG	Set to **ON**. (Use the front panel keypad to set the ABCD signaling bits for ESF framing or AB bits for D4 framing in binary format.)	
4c1	ENTER	Press to enter the values selected.	
5	ENTER	Press **ENTER** on the keypad to return to the main menu.	
6	GEN CLK	Scroll through the list and set to **SYNTH** to generate internal timing or **INTF** to recover timing from the network.	
7	ANALYSIS MODE	Select **CONTINUOUS**.	

Part 2 – Performing the Test

Step	Action/Results

Insert the handset into the RJ-8 handset jack, which is located on the T1/FT1 Interface Module (voice transmission/reception can now be verified on an individual channel).

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

A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present).

B. FIREBERD 6000's **FRM SYNC** LED is illuminated (if **FRM SYNC** is not illuminated, go back to **Step 2a** and select the appropriate frame format).

*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
T-CARRIER	RX ABCD	Receive ABCD bits

*Table 2 is a list of **INTERFACE STATUS LEDs**. When illuminated each of the status LEDs mean the following:*

Table 2 – Interface Status LEDs

Illuminated Status LED	Description
CODE	Illuminates when B8ZS coding is being received.
ALM 1	Illuminates when a Yellow Alarm is detected.
ALM 2	Illuminates when an Excess Zeros Alarm is detected.

***NOTE:** Using this mode, you may check the integrity of the circuit by inserting and monitoring voice traffic, and monitoring and transmitting signaling bits on individual channels within the T1/FT1 bit stream. Using this mode gives a quick check of the integrity of the circuit and verifies proper signaling sequences. For example, you may set the signaling bits for on-hook and then verify that proper off-hook bits are being returned.*

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FIREBERD 6000 Setup

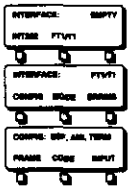
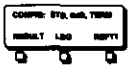
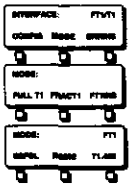
ANSI T1.403 PRMs with the 41440A Interface

*The following procedure outlines how to connect the FIREBERD 6000 with a 41440A interface to the network in order to perform a T1/FT1 In-Service ANSI T1.403 PRM test. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps below:*

***NOTE:** The ANSI T1.403 PRM Option must be installed in the FIREBERD 6000 to perform this test.*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	T1/FT1	Access the T1/FT1 interface.	
2	CONFIG	Access the **CONFIGURATION** menu.	
2a	FRAME	Scroll through the list and set to **ESF** framing.	
2b	CODE	Scroll through the list until you reach the appropriate coding of your circuit (e.g., B8ZS or AMI).	
2c	INPUT	Scroll through the list and set to **DSXMON** (assuming DSX access).	
2d	MORE	See additional selections.	
2e	RESULT	Scroll through the list and set to **LIV**.	
2f	REFT1	Scroll through the list and set to **BRDG**.	
2g	▲	Press the ▲ (up-arrow key) on the keypad to return to the T1/FT1 main menu.	
3	MODE	Access the **MODE** menu.	
3a	MORE	Press ***twice*** to access additional selections.	
3b	T1.403	Receive/generate PRMs.	
4	ENTER	Press **ENTER** on the keypad to return to the main menu.	
5	ANALYSIS MODE	Select **CONTINUOUS**.	

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Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present). B. FIREBERD 6000's **FRM SYNC** LED is illuminated (if **FRM SYNC** is not illuminated, go back to **Step 2a** and select the appropriate frame format).

*Table 1 lists 14 ANSI T1.403 **ANALYSIS RESULTS** which are provided by the FIREBERD 6000.*

Table 1 – Analysis Results

Category	Result Name	Result Description
T-CARRIER	F FR ES	Far-End Frame Error Seconds
	F F SES	Far-End Severely Errored Framing Seconds
	F BPV S	Far-End BPV Seconds
	F SLP S	Far-End Controlled Slip Seconds
	F CRC E	Far-End CRC Error Events
	F SI CRC	Far-End CRC 1 Bin
	F LO CRC	Far-End CRC 2 to 5 Bin
	F MD CRC	Far-End CRC 6 to 10 Bin
	F MH CRC	Far-End CRC 11 to 100 Bin
	F HI CRC	Far-End CRC 101 to 319 Bin
	F SV CRC	Far-End CRC 320 to 333 Bin
	F HS CRC	Far-End Severely High CRC Bin
	PRM TIM	Far-End Performance Report Seconds
	PAY SRC	Far-End Payload Source/Loopback

*Table 2 is a list of **INTERFACE STATUS** LEDs. When illuminated each of the status LEDs mean the following:*

Table 2 – Interface Status LEDs

Illuminated Status LED	Description
CODE	Illuminates when B8ZS coding is being received.
ALM 1	Illuminates when a Yellow Alarm is detected.
ALM 2	Illuminates when an Excess Zeros Alarm is detected.

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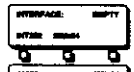
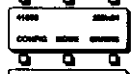
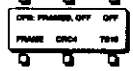
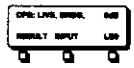
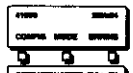
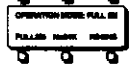
FIREBERD 6000 Setup

2M In-Service Monitoring

*The following procedure outlines how to connect the FIREBERD 6000 with a 41800 interface to the network in order to perform a 2.048M In-Service Monitoring test. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	2M/Nx64	Access the 2M/Nx64 interface.	
2	CONFIG	Access the **CONFIGURATION** menu.	
2a	FRAME	Scroll through the list until you reach the appropriate framing of your circuit (e.g., framed, unframed, CRC4, or TS16).	
2b	MORE	See additional selections.	
2c	RESULT	Scroll through the list and set to **LIVE**.	
2d	INPUT	Scroll through the list and set to **MON**.	
2e	▲	Press the ▲ (up-arrow key) on the keypad to return to the 2M/Nx64 main menu.	
3	MODE	Access the **MODE** menu.	
3a	FULL2M	Monitor the entire 2M bandwidth.	
4	ENTER	Press **ENTER** on the keypad to return to the main menu.	
5	ANALYSIS MODE	Select **CONTINUOUS**.	

Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present). B. FIREBERD 6000's **FRM SYNC** LED is illuminated (if **FRM SYNC** is not illuminated, go back to **Step 2a** and select the appropriate frame format).

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*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
T-CARRIER	FAS ERR	FAS Errors
	MFAS ERR	MFAS Errors (if TS16 is active)
	REBE ERR	REBE Errors
	BIT SLIP	Bit Slips (used with REFT1)
	CODE ERR	Code Errors (per CCITT 0.161)
SIGNAL	+LVL dB	Positive Receive Signal Level
	-LVL dB	Negative Receive Signal Level
	RCV FREQ	Receive Frequency

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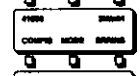
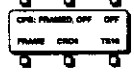
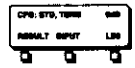
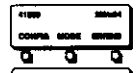
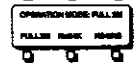
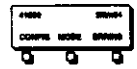
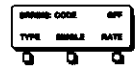
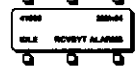
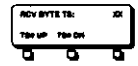
FIREBERD 6000 Setup

2M/Nx64 Out-of-Service BERT

*The following procedure outlines how to connect the FIREBERD 6000 with a 41800 interface to the network in order to perform an end-to-end 2.048M Out-of-Service test. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	2M/Nx64	Access the 2M/Nx64 interface.	
2	CONFIG	Access the **CONFIGURATION** menu.	
2a	FRAME	Scroll through the list until you reach the appropriate framing of your circuit (e.g., framed, unframed, CRC4, or TS16).	
2b	MORE	See additional selections.	
2c	RESULT	Scroll through the list and set to **STD**.	
2d	INPUT	Scroll through the list and set to **TERM**.	
2e	LBO	Scroll through the list and set the Line Build Out to **0 dB**.	
2f	▲	Press the ▲ (up-arrow key) on the keypad to return to the 2M/Nx64 main menu.	
3	MODE	Access the **MODE** menu.	
3a	FULL2M	Test the entire 2M bandwidth.	
3b	▲	Press the ▲ (up-arrow key) on the keypad to return to the 2M/Nx64 main menu.	
4	ERRINS	Access the **ERROR INSERTION** menu. Press **TYPE** and turn each error type **OFF**.	
4a	▲	Press the ▲ (up-arrow key) on the keypad to return to the 2M/Nx64 main menu.	
5	MORE	See additional selections.	
5a	RCVBYT	Select the timeslot 0-31 to be displayed in the RX BYTE result (allows you to see the bytes on a specific timeslot).	
5b	TS# UP TS# DN	Select the timeslot you wish to monitor.	

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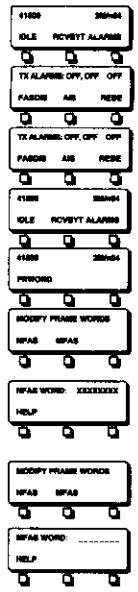
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Part 1 – Interface Setup *(cont.)*

Step	Softkey	Action/Purpose	Setup Display
5c	▲	Press the ▲ (up-arrow key) on the keypad to return to the 2M/Nx64 main menu.	
6	ALARMS	Access the **ALARMS** menu. Turn each type of error **OFF**.	
6a	MORE	See additional selections.	
6b	▲	Press the ▲ (up-arrow key) on the keypad to return to the 2M/Nx64 main menu.	
6c	MORE	See additional selections.	
7	FRWORD	Access the **FRAMING BIT** menu.	
7a	NFAS	Edit the binary digits using the keypad. Press **ENTER** to set the digits (see the note below).	
7b	▲	Press the ▲ (up-arrow key) on the keypad to return to the Frame Word menu.	
7c	NFAS	Edit the binary digits using the keypad. Press **ENTER** to set the digits (see the note below).	
8	ENTER	Press **ENTER** on the keypad to return to the main menu.	
9	DATA	Scroll through the list and select a data pattern. 2^{15}**-1** is the recommended data pattern. Additional stress patterns are located on the front panel or in **AUX 41**. (Press the **MORE** key as necessary in **AUX 41** to see the additional patterns.)	
10	GEN CLK	Scroll through the list and set to **SYNTH** to generate internal timing or **INTF** to recover timing from the network.	
11	ANALYSIS MODE	Select **CONTINUOUS**.	



***NOTE:** Multiframe alignment signals allow receiving equipment to align the appropriate ABCD signaling bits with their corresponding voice channels. Setting the NFAS and MFAS bit will enable you to determine whether the correct signaling bits are being sent throughout the network.*

Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present). B. FIREBERD 6000's **FRM SYNC** LED is illuminated (if **FRM SYNC** is not illuminated, go back to **Step 2a** and select the appropriate frame format).

(continued on Card 2)

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2M/Nx64 Out-of-Service BERT (cont.)

*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
ERROR	BIT ERRS	Bit Errors
	BER	Bit Error Rate
	PAT SLIP	Pattern Slips
T-CARRIER	CODE ERR	Code Errors
	FRA ERR	Frame Errors
	CRC ERR	CRC Errors
	FRA LOSS	Frame Loss
	BIT SLIP	Bit Slips (used with REFT1)
	RCV NFAS	Received NFAS Word
	RCV MFAS	Received MFAS Word (if TS16 is active)
	RCV BYTE	Received Timeslot Byte
SIGNAL	+LVL dB	Positive Receive Signal Level
	-LVL dB	Negative Receive Signal Level
	GEN FREQ	Generator Clock Frequency
	RCV FREQ	Receive Frequency
ALARM	AIS SEC	AIS Seconds
	FAS DIS S	FAS Distant Alarm Seconds
	MF DIS S	MFAS Distant Alarm Seconds

*Table 2 is a list of **INTERFACE STATUS LEDs**. When illuminated each of the status LEDs mean the following:*

Table 2 – Interface Status LEDs

Illuminated Status LED	Description
CODE	Not in use on the 41800 interface.
ALM 1	Illuminates when a FAS Distant Alarm is being received (the A-bit is set to 1).
ALM 2	Illuminates when AIS is being received.

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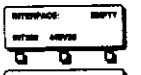
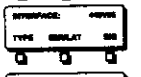
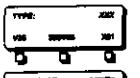
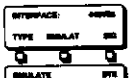
FIREBERD 6000 Setup

Out-of-Service V.35 Testing

*The following procedure outlines how to connect the FIREBERD 6000 with a V.35/449/X.21 interface (42522) to either the DSU/CSU or the (Nx)DSU-DP for out-of-service straight away and loopback BERT analysis. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	449V35	Access the 449V.35 interface.	
2	TYPE	Access the **DATA TYPE** menu. Set to **V35** or **306** (see the note below for an explanation of the difference).	
2a	▲	Press the ▲ (up-arrow key) on the keypad to return to the 449/V35 main menu.	
3	EMULAT	Access the **EMULATION** menu.	
3a	DTE	Select **DTE** emulation.	
3b	▲	Press the ▲ (up-arrow key) on the keypad to return to the 449/V35 main menu.	
4	SIG	Set **LL** (local loop) or **RL** (remote loop) on, depending on the DCE you want to loopback.	
5	ENTER	Press **ENTER** on the keyboard to return to the main menu.	
6	DATA	Scroll through the list and select a data pattern. ***NOTE:** Either a 511 or 2047 pattern is recommended for data rates between 2.4 kb/s and 256 kb/s.*	
7	GEN CLK	Scroll through the list and set to **INTF** to receive clock from the DCE.	
8	TIMING MODE	Scroll through the list and set to **SYNC**.	
9	ANALYSIS MODE	Select **CONTINUOUS**.	
10	RTS/DTR	Press to illuminate both signal leads, setting them to **HIGH**.	

***NOTE:** The selection between **V.35** or **306** is dependent upon the timing to the circuit under test. With a V.35 circuit, the serial clock transmit external (SCTE) timing lead is disabled, whereas with a 306 this lead is enabled. Similar procedures may be followed for **RS-449** and **X.21** datacom testing (your selection of **TYPE** in **Step 2** will change).*

(continued on back)

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Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present).

*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
ERROR	BIT ERRS	Change in Logical Value of Bit
	BER	Ratio of Number of Errored Bits to Receive Bits
	PAT SLIP	An Addition or Deletion of Bits
PERFORMANCE	GERR-SEC	Errored Seconds
TIME	EA SEC	Errored Analysis Seconds
SIGNAL	RCV FREQ	Receive Frequency
	GEN FREQ	Generate Frequency
ALARM	PAT LOSS	Count of Pattern Losses
	C-D CHA	Clock/Data Phase Changes
	DAT LOSS	Count of Data Losses
	CLK LOSS	Count of Clock Losses

***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 C-D CHA changes is also an indication), the FIREBERD 6000 Recovered Clock Option (Option 6004) enables the DTE to extract a clock from the received data. This will enable you to determine whether the transmission line or the clock is the source of errors. See the setup below for using the Recovered Clock Option:*

1. *Set **TIMING MODE** to **RECOVD** (this enables the FIREBERD 6000 to recover timing from transitions in the incoming data).*
2. *Press the **MENU** softkey and scroll through the list and set to **SYNTH FREQ**.*
3. *Using the keypad, enter the expected receive frequency. Press the **ENTER** key to select this frequency.*

***NOTE:** The Recovered Clock Option only operates up to rates of 520 kb/s.*

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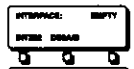
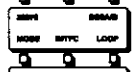
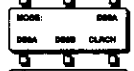
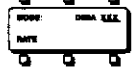
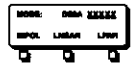
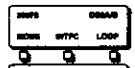
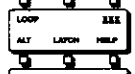
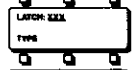
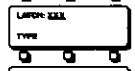
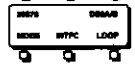
FIREBERD 6000 Setup

DS0A Out-of-Service Testing

*The following procedure outlines how to connect the FIREBERD 6000 with a 30678A interface to the network in order to perform out-of-service BERT analysis on DS0A circuits from OCU-DP access jacks. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	DS0A/B	Access the DS0A/B interface.	
2	MODE	Access the **DATA FORMAT** menu.	
2a	DS0A	Select a **DS0A** format.	
2b	RATE	Scroll through the list until you reach the appropriate data rate of your circuit (e.g., 2, 4, 4.8, 9.6, 19.2, or 56 kb/s).	
2c	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the DS0A/B menu.	
3	INTFC	Select the **INTERFACE CODING** menu: • Select **LNEAR** to test the local DSU/CSU (if access is at the OCU-DP). • Select **LFAR** to test the distant DSU/CSU (if access is at the OCU-DP). • Select **BIPOL** to provide signals on the tip and ring leads (if access is at the DS0-DP).	
3a	▲	Press the ▲ (up-arrow key) on the keypad to return to the previous menu.	
4	LOOP	Access the **LOOP SELECTION** menu.	
4a	LATCH	Select **LATCHING LOOP** codes.	
4a1	TYPE	Scroll through the list and set to **CHAN**.	
4a2	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the DS0A/B menu.	
4a3	MORE	See additional selections.	

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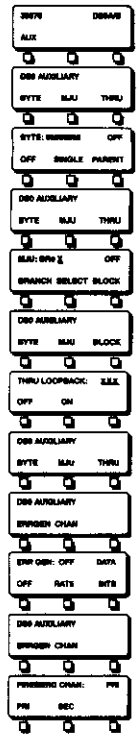
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Part 1 – Interface Setup *(cont.)*

Step	Softkey	Action/Purpose	Setup Display
5	AUX	Access the **AUXILIARY FUNCTIONS** menu.	
5a	BYTE	Set to **OFF**.	
5a1	▲	Press the ▲ (up-arrow key) on the keypad to return to the previous menu.	
5b	MJU	Verify/select branches **OFF**.	
5b1	▲	Press the ▲ (up-arrow key) on the keypad to return to the previous menu.	
5c	THRU	Set to **OFF**.	
5c1	▲	Press the ▲ (up-arrow key) on the keypad to return to the previous menu.	
5c2	MORE	See additional selections.	
5d	ERRGEN	Set to **OFF**.	
5d1	▲	Press the ▲ (up-arrow key) on the keypad to return to the previous menu.	
5e	CHAN	Set to **PRI** (in order to test the primary channel).	
6	ENTER	Press **ENTER** on the keypad to return to the main menu.	
7	DATA	Recommended data patterns are 63, 511, 2047, and DDS 1-6 stress patterns (located in AUX 41).	
8	ANALYSIS MODE	Select **CONTINUOUS**.	

Part 2 – Performing the Test

Step	Action/Results

*Once the FIREBERD 6000 is properly configured and cabled, initiate a loop code sequence by pressing the **LOOP UP** softkey. At the conclusion of the test, press the **LOOP DOWN** softkey to restore the circuit to normal operation.*

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

A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present).

B. FIREBERD 6000's **FRM SYNC** LED is illuminated (only if a 19.2 kb/s DS0A signal is present).

(continued on Card 2)

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DS0A Out-of-Service Testing (cont.)

*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
ERROR	BIT ERRS	Change in Logical Value of Bit
	BER	Ratio of Number of Errored Bits to Received Bits
	PAT SLIP	An Addition or Deletion of Bits
ALARM	PAT LOSS	Count of Pattern Losses
	DAT LOSS	Count of Data Losses
	CLK LOSS	Count of Clock Losses
	PWR LOSS	Count of Power Losses
SIGNAL	REC FREQ	Receive Frequency
	GEN FREQ	Generate Frequency
	RCV CODE	Reportable DDS Code
	RCV BYTE	Current Byte

*Table 2 is a list of **INTERFACE STATUS LEDs**. When illuminated each of the status LEDs mean the following:*

Table 2 – Interface Status LEDs

Illuminated Status LED	Description
FRM SYNC	Illuminates when the interface is configured to receive a DS0B signal at any rate or a DS0A at 19.2 kb/s and the interface has synchronized to the appropriate framing.
CODE	Illuminates when the interface has initiated an alternating loopback and is receiving the correct loop code bytes interleaved with the test data.
ALM 1	Illuminates when the **RX INPUT** jack is terminated and operating with bipolar signals.

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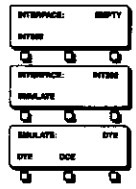
FIREBERD 6000 Setup

Out-of-Service RS-232 Testing

The following procedure outlines how to connect the FIREBERD 6000 with its internal RS-232 interface to either the modem, DSU/CSU, or (Nx)DSU-DP for out-of-service straight away and loopback BERT analysis. Please read the entire procedure ***BEFORE*** *starting.*

- ***WARNING*** *– Set up the FIREBERD 6000* ***BEFORE*** *connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *Use the* ***MENU*** *softkey to scroll through the options until you reach* ***INTF SETUP*** *(LED beside it is illuminated). Then follow the steps below:*

Part 1 – Interface Setup

Step	Softkey	Action/Purpose	Setup Display
1	INT232	Access the RS-232 data interface.	
2	EMULAT	Access the **EMULATION** menu.	
2a	DTE	Select **DTE** emulation.	
3	ENTER	Press **ENTER** on the keypad to return to the main menu.	
4	DATA	Scroll through the list and select a data pattern. ***NOTE:*** *Either 511 or 2047 pattern is recommended for data rates between 2.4 kb/s and 64 kb/s.*	
5	GEN CLK	Scroll though the list and set to **INTF** to receive clock from the DCE.	
6	TIMING MODE	Scroll through the list and set to **SYNC**.	
7	ANALYSIS MODE	Select **CONTINUOUS**.	
8	RTS/DTR	Press to illuminate both signal leads, setting them to **HIGH**.	

Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating a signal is present).

(continued on back)

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*Table 1 lists important **ANAYLSIS RESULTS** that should be checked.*

Table 1 – Analysis Results

Category	Result Name	Result Description
ERROR	BIT ERRS	Change in Logical Value of Bit
	BER	Ratio of Number of Errored Bits to Receive Bits
	PAT SLIP	An Addition or Deletion of Bits
PERFORMANCE	GERR-SEC	Errored Seconds
TIME	EA SEC	Error Analysis Seconds
SIGNAL	RCV FREQ	Receive Frequency
	GEN FREQ	Generate Frequency
ALARM	PAT LOSS	Count of Pattern Losses
	C-D CHA	Clock/Data Phase Changes
	DAT LOSS	Count of Data Losses
	CLK LOSS	Count of Clock Losses

***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 C-D CHA changes is also an indication), the FIREBERD 6000 Recovered Clock Option (Option 6004) enables the DTE to extract a clock from the received data. This will enable you to determine whether the transmission line or the clock is the source of errors. See the setup below for using the Recovered Clock Option:*

1. *Set **TIMING MODE** to **RECOVD** (this enables the FIREBERD 6000 to recover timing from transitions in the incoming data).*
2. *Press the **MENU** softkey and scroll through the list and set to **SYNTH FREQ**.*
3. *Using the keypad, enter the expected receive frequency. Press the **ENTER** key to select this frequency.*

***NOTE:** The Recovered Clock Option only operates up to rates of 520 kb/s.*

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FIREBERD 6000 Setup

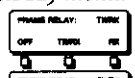
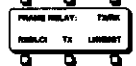
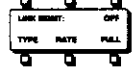
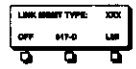
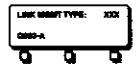
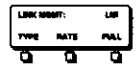
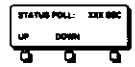
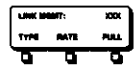
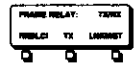
Frame Relay Out-of-Service

*The following procedure outlines how to connect the FIREBERD 6000, with the appropriate physical interface, to the network in order to perform a Frame Relay Out-of-Service test. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps according to the appropriate quick card or application note before beginning the procedures below:*

***NOTE:** The Rev. L software must be installed in the FIREBERD 6000 to perform this test.*

Part 1 – Auxiliary 12: Frame Relay

Step	Softkey	Action/Purpose	Setup Display
		*Press the **MENU** softkey until **AUXILIARY** is selected. Press **1, 2, and ENTER** (BER analysis as well as selections with the DATA, ERROR INSERT, and TIMING MODE keys are disabled). Follow the instructions below in the frame relay (AUX 12) menu:*	
1	TX/RX	Put the FIREBERD 6000 into a transmit and receive mode.	
2	LNKMGT	Access the **LINK MANAGEMENT** menu.	
3	TYPE	Select the appropriate link management specification (e.g., 617-D, LMI, or Q933-A).	
3a	MORE	See additional selections.	
3b	▲	Press the ▲ (up-arrow key) on the keypad to return to the LINK MANAGEMENT menu.	
4	RATE	Access the **STATUS POLL** interval menu. Using the **UP/DOWN** softkeys, set the value to the corresponding network value (e.g., 10 seconds).	
4a	▲	Press the ▲ (up-arrow key) on the keypad to return to the LINK MANAGEMENT menu.	
5	FULL	Access the **FULL STATUS** menu. Use the keypad to enter how many status polls should pass before a full status request is transmitted (e.g., 6).	
5a	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the FRAME RELAY main menu.	
6	RXDLCI	Access the **DLCI** results monitoring menu. Use the keypad to select the DLCI to receive results on. Press **ENTER** to set this value.	
6a	▲	Press the ▲ (up-arrow key) on the keypad to return to the FRAME RELAY main menu.	

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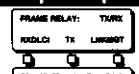
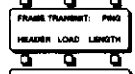
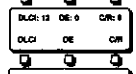
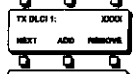
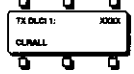
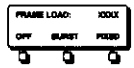
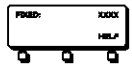
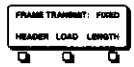
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Part 1 – Auxiliary 12: Frame Relay *(cont.)*

Step	Softkey	Action/Purpose	Setup Display
7	TX	Access the **FRAME TRANSMIT** menu.	
8	HEADER	Access the **HEADER** menu.	
8a	DLCI	Access the **TRANSMIT DLCI** menu.	
8b	MORE	See additional selections.	
8c	CLRALL	Clear all previously set transmit DLCIs. Use the keypad to select the DLCI frames to transmit over. Press **ENTER** to set the value.	
8d	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the FRAME TRANSMIT menu.	
9	LOAD	Access the **FRAME LOAD** menu.	
9a	FIXED	Use the keypad to set the transmit frame rate (in kb/s) to 10% of the line rate. Press **ENTER** to set the value. ***NOTE: This value may change based on your configuration.***	
9b	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the FRAME TRANSMIT menu.	
10	LENGTH	Use the keypad to set the transmit frame minimum and maximum length (in units of octets). Press **ENTER** to set the values.	
11	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the FRAME RELAY main menu.	

Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating that the FIREBERD 6000 is receiving valid frame relay frames).

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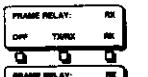
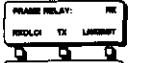
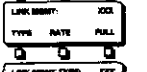
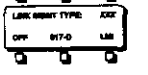
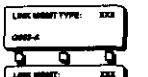
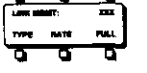
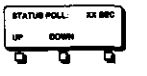
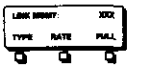
FIREBERD 6000 Setup
Frame Relay In-Service

*The following procedure outlines how to connect the FIREBERD 6000, with the appropriate physical interface, to the network in order to perform a Frame Relay In-Service monitoring test. Please read the entire procedure **BEFORE** starting.*

- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps according to the appropriate quick card or application note before beginning the procedures below:*

***NOTE:** The Rev. L software must be installed in the FIREBERD 6000 to perform this test.*

Part 1 – Auxiliary 12: Frame Relay

Step	Softkey	Action/Purpose	Setup Display
		*Press the **MENU** softkey until **AUXILIARY** is selected. Press **1**, **2**, and **ENTER** (BER analysis as well as selections with the DATA, ERROR INSERT, and TIMING MODE keys are disabled). Follow the instructions below in the frame relay (AUX 12) menu:*	
1	RX	Put the FIREBERD 6000 into **RECEIVE** mode.	
2	LNKMGT	Access the **LINK MANAGEMENT** menu.	
3	TYPE	Select the appropriate link management specification (e.g., 617-D, LMI, or Q933-A).	
3a	MORE	See additional selections.	
3b	▲	Press the ▲ (up-arrow key) on the keypad to return to the LINK MANAGEMENT menu.	
4	RATE	Access the **STATUS POLL** interval menu. Using the **UP/DOWN** softkeys, set the value to the corresponding network value (e.g., 10 seconds).	
4a	▲	Press the ▲ (up-arrow key) on the keypad to return to the LINK MANAGEMENT menu.	
5	FULL	Access the **FULL STATUS** menu. Use the keypad to enter how many status polls should pass before a full status request is transmitted (e.g., 6).	
5a	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the FRAME RELAY main menu.	

(continued on back)

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Part 1 – Auxiliary 12: Frame Relay *(cont.)*

Step	Softkey	Action/Purpose	Setup Display
6	RXDLCI	Access the **DLCI** results monitoring menu. Use the keypad to select the DLCI to receive results on. Press **ENTER** to set this value.	
6a	▲	Press the ▲ (up-arrow key) on the keypad to return to the FRAME RELAY main menu.	

Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating that the FIREBERD 6000 is receiving valid frame relay frames).

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FIREBERD 6000 Setup

Frame Relay IP Ping

*The following procedure outlines how to connect the FIREBERD 6000, with the appropriate physical interface, to the network in order to perform a Frame Relay IP Ping test. Please read the entire procedure **BEFORE** starting.*

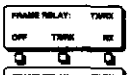
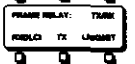
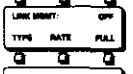
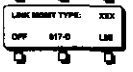
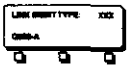
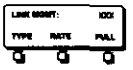
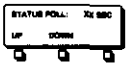
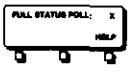
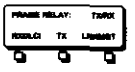
- ***WARNING** – Set up the FIREBERD 6000 **BEFORE** connecting to the network.*
- *By continuously pressing the appropriate softkey, you will scroll through the menu until you reach your desired setting.*
- *▲ (up-arrow key) is used to return to the previous menu selection.*
- *Use the **MENU** softkey to scroll through the options until you reach **INTF SETUP** (LED beside it is illuminated). Then follow the steps according to the appropriate quick card or application note before beginning the procedures below:*

***NOTE:** The Rev. L software must be installed in the FIREBERD 6000 to perform this test.*

Part 1 – Auxiliary 12: Frame Relay

Step	Softkey	Action/Purpose	Setup Display

*Press the **MENU** softkey until **AUXILIARY** is selected. Press **1, 2, and ENTER** (BER analysis as well as selections with the DATA, ERROR INSERT, and TIMING MODE keys are disabled). Follow the instructions below in the frame relay (AUX 12) menu:*

1	TX/RX	Put the FIREBERD 6000 into a transmit and receive mode.	
2	LNKMGT	Access the **LINK MANAGEMENT** menu.	
3	TYPE	Select the appropriate link management specification (e.g., 617-D, LMI, or Q933-A).	
3a	MORE	See additional selections.	
3b	▲	Press the ▲ (up-arrow key) on the keypad to return to the LINK MANAGEMENT menu.	
4	RATE	Access the **STATUS POLL** interval menu. Using the **UP/DOWN** softkeys, set the value to the corresponding network value (e.g., 10 seconds).	
4a	▲	Press the ▲ (up-arrow key) on the keypad to return to the LINK MANAGEMENT menu.	
5	FULL	Access the **FULL STATUS** menu. Use the keypad to enter how many status polls should pass before a full status request is transmitted (e.g., 6).	
5a	▲	Press the ▲ (up-arrow key) on the keypad ***twice*** to return to the FRAME RELAY main menu.	
6	RXDLCI	Access the **DLCI** results monitoring menu. Use the keypad to select the DLCI to receive results on. Press **ENTER** to set this value. The FIREBERD 6000 will automatically transmit InARPs/ Pings on this receive DLCI.	

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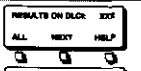
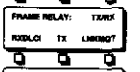
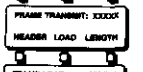
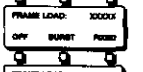
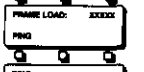
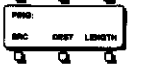
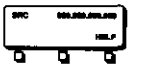
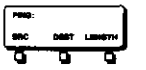
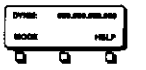
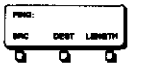
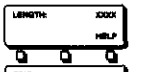
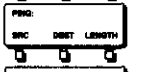
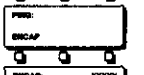
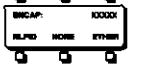
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Part 1 – Auxiliary 12: Frame Relay *(cont.)*

Step	Softkey	Action/Purpose	Setup Display
6a	▲	Press the ▲ (up-arrow key) on the keypad to return to the FRAME RELAY main menu.	
7	TX	Access the **FRAME TRANSMIT** menu.	
8	LOAD	Access the **FRAME LOAD** menu.	
8a	MORE	See additional selections.	
8b	PING	Access the **IP PING** menu.	
8c	SRC	Use the keypad to enter the source IP address. After keying in the digits, press **ENTER** to set these values.	
8d	▲	Press the ▲ (up-arrow key) on the keypad to return to the Ping menu.	
8e	DEST	Access the destination menu.	
8f	MODE	Toggle between **STATIC** and **DYNAMIC**. If set to **STATIC**, use the keypad to enter the destination address. If set to **DYNAMIC**, the unit will send InARP message to determine destination address.	
8g	▲	Press the ▲ (up-arrow key) on the keypad to return to the Ping menu.	
8h	LENGTH	Use the keypad to enter the frame length. Press **ENTER** to set each of these values.	
8i	▲	Press the ▲ (up-arrow key) on the keypad to return to the Ping menu.	
8j	MORE	See additional selections.	
8k	ENCAP	Choose an encapsulation method (e.g., NLPID, NONE, or ETHER).	
9	▲	Press the ▲ (up-arrow key) on the keypad ***five times*** to return to the FRAME RELAY main menu.	

Part 2 – Performing the Test

Step	Action/Results
1	Press **RESTART** to clear alarms and begin the test. Verify that: A. FIREBERD 6000's **PATTERN SYNC** LED is illuminated (indicating that the FIREBERD 6000 is receiving valid frame relay frames).

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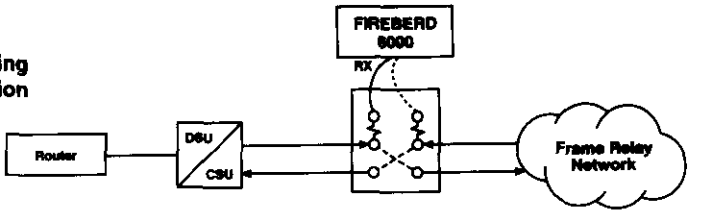
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FIREBERD 6000 Application

Frame Relay In-Service Monitoring

*The following procedure outlines how to use the FIREBERD 6000 to perform in-service monitoring of frame relay traffic. Please read the entire procedure **BEFORE** starting.*

Frame Relay In-Service Monitoring at the UNI Application



Part 1 – Monitoring Results at the UNI

Category	Result Name	Result Description

*Configure the FIREBERD 6000 for frame relay testing according to the FIREBERD 6000 **Frame Relay In-Service Setup** card.*

ERROR	FRM CNT	Result should increment. If not, frames are not being transmitted through the network.
	LMI MSGS	Result should increment. If not, LMI "keep alive" signals are not being sent between the CPE and POP switch.
	LMI ERRS	Result should equal zero. If not, handshaking between the CPE and the POP switch is not occuring properly.
	LMI TMOS	Result should equal zero. If not, possibly the transmit link between the CPE and POP switch is down, or the receive link from the switch to the CPE is down, or the POP switch is incorrectly configured. STATUS POLL settings may also be incorrect.
	PVC STAT	**Should read "ACTIVE".** This indicates that the network has established a PVC and frames can be transmitted through the POP switch. **If not**, then look below for an explanation of other results: • " " – DLCI is undefined • INACTIVE – DLCI is inactive • NEW – DLCI was just added • DELETED – DLCI was just deleted ***NOTE: This result is only valid when monitoring traffic in the direction from the network to the customer on one DLCI (traffic from the customer to the network does not contain PVC status information).***
PERFORMANCE	AVG%UTIL	This result should be greater than zero. It is the average percentage of link utilization on the received channel since the start of the test calculated as the number of FRM OCTS divided by the total number of octets received.
	AVG TPUT	This result should correspond to the rate being transmitted by the far-end. It is the average received throughput since the start of the test, calculated as the total UDF bits divided by the total seconds. This result can be used to estimate the Committed Information Rate (CIR).

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Frame Relay In-Service Monitoring
at the NNI Application



Part 2 – Monitoring Results at the NNI

Category	Result Name	Result Description
Configure the FIREBERD 6000 for frame relay testing according to the FIREBERD 6000 ***Frame Relay In-Service Setup*** *card.*		
ERROR	FRM CNT	Result should increment. If not, frames are not being transmitted between frame relay networks.
	LMI ENQS	Result should increment. If not, LMI status enquires are not being sent between frame relay switches.
	LMI STAT	Result should increment. If not, LMI status responses are not being sent between frame relay switches.
	LMI ERRS	Result should equal zero. If not, handshaking between the two frame relay switches is not occurring properly.
	LMI TMOS	Result should equal zero. If not, possibly the transmit link or the receive link between the two switches is down, or one of the switches is incorrectly configured. STATUS POLL settings may also be incorrect.
	PVC STAT	**Should read** "**ACTIVE**". This indicates that a PVC exists between frame relay networks and that frames can be transmitted between frame relay switches. **If not**, then look below for an explanation of other results: • " " – DLCI is undefined • INACTIVE – DLCI is inactive • NEW – DLCI was just added • DELETED – DLCI was just deleted
PERFORMANCE	AVG%UTIL	This result should be greater than zero. It is the average percentage of link utilization on the received channel since the start of the test calculated as the number of FRM OCTS divided by the total number of octets received.
	AVG TPUT	This result should correspond to the rate being transmitted by the far-end. It is the average received throughput since the start of the test, calculated as the total UDF bits divided by the total seconds. This result can be used to estimate the Committed Information Rate (CIR).

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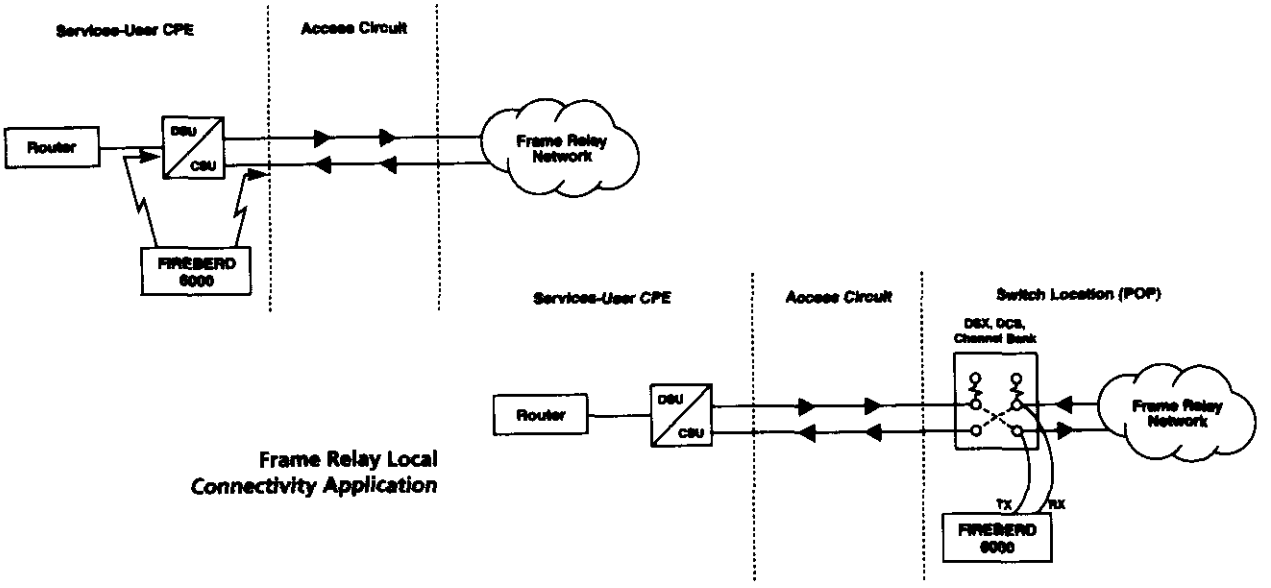
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FIREBERD 6000 Application

Frame Relay Local Connectivity Test

(Link Management Verification)

*The following procedure outlines how to use the FIREBERD 6000 to verify proper link management between the CPE and the POP switch within the frame relay network. Please read the entire procedure **BEFORE** starting.*



Frame Relay Local Connectivity Application

Part 1 – Verify Link Management

Category	Result Name	Result Description

*Configure the FIREBERD 6000 for frame relay testing according to the FIREBERD 6000 **Frame Relay Out-of-Service Setup** card.*

ERROR	LMI ERRS	Result should equal zero. If not, handshaking between the CPE and the POP switch is not occurring properly.
	LMI TMOS	Result should equal zero. If not, possibly the transmit link between the FIREBERD 6000 and the network is down, or the receive link from the switch to you is down, or the POP switch is incorrectly configured. STATUS POLL settings may also be incorrect.
	LMI MSGS	Result should increment. If not, LMI "keep alive" signals are not being sent between the CPE and the POP switch.

NOTE: Link management must be operating properly BEFORE performing Part 2.

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Part 2 – Verify Each PVC

Category	Result Name	Result Description

*Use **Step 6** of the FIREBERD 6000 **Frame Relay Out-of-Service Setup** card to set the next available DLCI to receive PVC information. Continue this step until all available DLCIs are tested.*

ERROR PVC STAT

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

- " " – DLCI is undefined
- INACTIVE – DLCI is inactive
- NEW – DLCI was just added
- DELETED – DLCI was just deleted

***NOTE:** This result is **not** valid when **ALL** has been selected under RXDLCI.*

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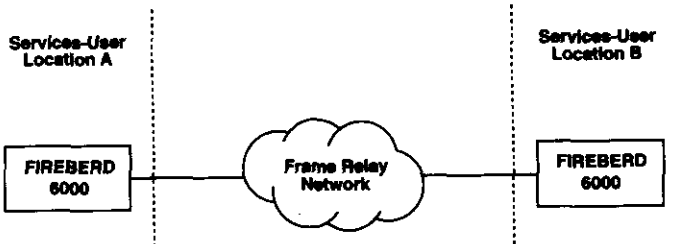
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FIREBERD 6000 Application

Frame Relay End-to-End Connectivity Test

*The following procedure outlines how to use the FIREBERD 6000 to verify the end-to-end transmission of frame relay traffic. Please read the entire procedure **BEFORE** starting.*



Frame Relay End-to-End Connectivity Application

Part 1 – Verify Proper Transmission of Frames

Category	Result Name	Result Description

*Configure **BOTH** FIREBERD 6000s for frame relay testing according to the FIREBERD 6000 **Frame Relay Out-of-Service Setup** card. The procedures below should be followed for **BOTH** FIREBERD 6000s.*

*Use **Steps 9a** and **10** of the FIREBERD 6000 **Frame Relay Out-of-Service Setup** card to set the load to **FIXED** and the frame minimum and maximum length to **250 OCTETS**, respectively.*

ERROR	LOST FRM	Result should equal zero. If result is incrementing, then frames are being discarded by the network. Possible causes of lost frames: (1) there are bit errors at the physical layer, or (2) there is congestion in the switching network – frames are dropped.
	FRM CNT	Result should rapidly increment, indicating that valid test frames are being received. If not, the far-end FIREBERD 6000 is not transmitting test frames or the switching network is not configured properly.
PERFORMANCE	AVG TPUT	Should correspond to the FIXED rate being transmitted by the far-end FIREBERD 6000 (assuming this fixed rate is below the near-end line rate).
	AVG%UTL	Result should equal 10% (assuming both ends have equal line rates and the frame relay transmit rate is equal to 10% of the line rate).

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Part 2 – Verify the Committed Information Rate (CIR)

Category	Result Name	Result Description
*Use **Step 9a** of the FIREBERD 6000 **Frame Relay Out-of-Service Setup** card to increase the fixed rate to the CIR.*		
ERROR	DE FRMS	Result should be incrementing, indicating that the switch has set the DE bit (e.g., 1) due to transmission above the CIR. If not, DE functionality has not been implemented by the network or there is not transmission above the CIR.
	FRM CNT	Result should rapidly increment, indicating that valid test frames are being received. If not, the far-end FIREBERD 6000 is not transmitting valid test frames or the frame relay network is not configured properly.
	LOST FRM	Result should equal zero. If result is incrementing, then frames are being discarded by the network. Possible causes of lost frames: (1) there are bit errors at the physical layer, or (2) there is congestion in the switching network – frames are dropped. If there is congestion, FECN FRMs may increase.

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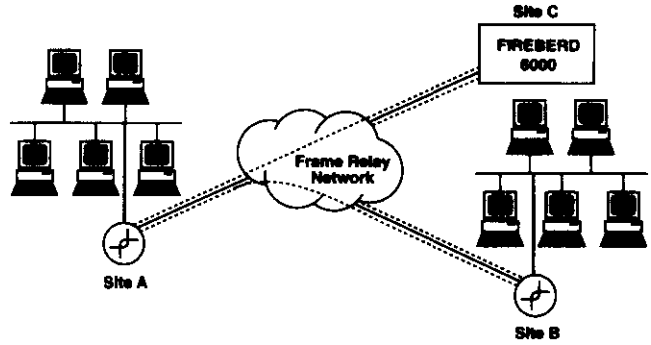
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FIREBERD 6000 Application

Frame Relay IP Ping Test

*The following procedure outlines how to use the FIREBERD 6000 to verify end-to-end connectivity of a new PVC via an in-service IP Ping test. Please read the entire procedure **BEFORE** starting.*

Frame Relay IP Ping Test Application



Part 1 – Verify Ping Echo Transmission/Proper Echo Reply Response

Category	Result Name	Result Description
*Configure the FIREBERD 6000 for frame relay testing according to the FIREBERD 6000 **Frame Relay IP Ping Setup** card.*		
ERROR	TX PNG	Result should increment. If not, your FIREBERD 6000 is not transmitting Ping packets.
	ECHO PNG	Result should increment. If not, the far-end device may not be sending Ping packets successfully to your FIREBERD 6000.
	LOST PNG	Result should not increment. If so, your FIREBERD 6000 is not receiving proper echo replies in response to transmitted Ping echo packets.

Part 2 – Determine Roundtrip Delay Throughout the Network

Category	Result Name	Result Description
Monitor the following results:		
PERFORMANCE	MIN PNG	Minimum time taken for a Ping echo packet to be transmitted and an echo reply received.
	MAX PNG	Maximum time taken for a Ping echo packet to be transmitted and an echo reply received.
	AVG PNG	Average time taken for a Ping echo packet to be transmitted and an echo reply received.

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