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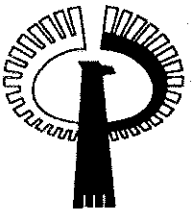
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Phoenix

34–00155–3.00
September 1, 1992

5575B T1 MicroBERT Test Set

MAIN SETUPS

MODE SWITCH

- T1 NORM
- T1 AUTO
- FT1 NORM*
- FT1 D/I*
- CSU
- LINE LB
- INT LOOP
- BTP
- MTP
- TDR*

FRAME SWITCH

- D4
- ESF
- SLC 96®
- NONE

PATTERN SWITCH

- 2^15-1
- 2^20-1
- 2^23-1
- QRSS
- 3:24
- 1:7
- 1:1
- NET55
- OCT55
- ZEROS
- ONES
- USER 1
- USER 2
- USER 3* (Remote)

CODE SWITCH

AMI	B8ZS

LOOP CODES

CSU	NWRK‡
FAC1	LINE‡
FAC2	TXPRT*
PYLD‡	WSTL*

RESULTS 1 AND 2 SWITCHES

SUMMARY
ALL RESULTS OK
B8ZS DETECTED
CRC ALARMS
FRAME BIT ERRORS
BIPOLAR VIOLATIONS
BIT ERRORS
LINE CODING ERRORS
AMI DETECTED
FREQ DEVIATION
BTP PATTERN FAILURES
MPT PATTERN FAILURES

LOGIC
BIT ERRORS
BIT ERROR RATE
ERRORED SEC.
LOGIC EFS
% LOGIC EFS
SEVERELY ERRORED SEC.
CONSECUTIVE SES
CONSECUTIVE SES RATE
PATTERN SYNC LOSSES
PATTERN SYNC LOSS SEC.

BPV
BIPOLAR VIOLATIONS
BPV ERROR RATE
BPV ERRORED SEC.

FRAME
FRAME BIT ERRORS
FRAME BIT ERROR RATE
FRAME SYNC LOSSES
FRAME SYNC LOSS SEC.
FRAME BIT ERRORED SEC.
CRC ERRORS
CRC RATE
CRC ERRORED SEC.

SIGNAL
DENSITY VIOLATIONS
BLUE ALARM SEC.
YELLOW ALARM SEC.
RX FREQUENCY MAX
RX FREQUENCY MIN
RX FREQUENCY
RX LEVEL PK-PK VOLTS
RX LEVEL PK-PK dBDSX
SIMPLEX CURRENT
CLOCK SLIP COUNT
CLOCK SLIP RATE
MAX POSITIVE WANDER
MAX NEGATIVE WANDER
FRAME SLIPS (+)
FRAME SLIPS (-)
A-SIG
B-SIG
C-SIG
D-SIG
IMPAIRMENT*

TIME
ELAPSED TEST TIME
ELAPSED DAYS
ELAPSED TEST SEC.
TEST ENDS IN
TOD
MDY

T1E1*
PRM-EFE
PRM-G1
PRM-G2
PRM-G3
PRM-G4
PRM-G5
PRM-G6
PRM-SE
PRM-FE
PRM-LV
PRM-SL
PRM-LB

TXPORT*
S1 SIG LEVEL
S1 CRC ERR
S1 BPV ERR
S1 TX STAT
S2 SIG LEVEL
S2 CRC ERR
S2 BPV ERR
S2 TX STAT
POWER STAT

G.821*
ERRORED SEC.
ERROR FREE SEC.
SEVERELY ERR SEC.
%SEV ERRORED SEC.
UNAVAILABLE SEC.
AVAILABLE SEC.
%AVAILABLE SEC.
DEGRADED MINUTES
%DEGRADED MINUTES

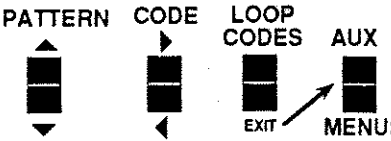
TYPE SWITCHES

SUMMARY	TIME
LOGIC	T1E1*
BPV	TXPORT*
FRAME	G.821*
SIGNAL	

* OPTION
‡ ESF FRAMING

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AUX MENUS



Use these switches to select items in AUX menus. Press LOOP CODES switch to EXIT menus.

0 - TRANSMIT CLOCK SOURCE	INTCLK	RCVCLK	EXTCLK(PCM)
1 - ERROR INJECT RATES	LOGIC: 1E-6	BPV: 1E-6	FRAME 1E-3
2 - LINE BUILD OUT	0 dB	-7.5 dB	-15 dB
3 - TEST LENGTH (0=CONT)	HOURS:000	MIN: 00	SEC: 00
4 - FT1 SETUP -	Select Nx56 or Nx64 and desired channels to BERT		
5 - USER PATTERN 1	Program up to 64 bits from front panel		
6 - USER PATTERN 2	Program up to 64 bits from front panel		
7 - ESF DATA LINK FILL CODE	LSB 01111110 01111110 MSB		
8 - SIGNALING MODE	ROBBED BIT	CCIS	
9 - TXPORT REPEATER SETUP	A-Z Select repeater address from A to Z		
10 - WESTEL REPEATER SETUP	Select type and Address		
11 - TIME OF DAY	HR:MIN:SEC	12:22:12	
12 - DAY and DATE	DAY: FRI	MM/DD/YR	02/08/92
13 - STORE USER PROGRAMS	NO	YES	
14 - PRINTER PORT MODE	ON	OFF	
15 - PRINTER DATA SELECT	Select Desired Parameters to Print out		
16 - PRINT CONDITIONS	RATE: ERROR	RATE: END OF TEST	
17 - PRINTER PORT SETUP	BAUD SIZE	PARITY	STOP BITS
18 - REMOTE PORT SETUP	BAUD SIZE	PARITY	STOP BITS
19 - RELOAD 5575 MEMORY	NO	YES	
50 - TDR Setup	Select Cable lenght, Cable Type, and VP		

Note: Underline indicates factory standard setting.

Why?

- **Use as smart "HELP" key when any error conditions occur**

(RESTART key will hold Why? display)

For additional information on this product, or any Phoenix product, contact:

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991 Discovery Drive
Huntsville, AL 35806
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FAX: 205–922–1256
Factory Direct: 1–800–866–8480

Preface

About This Manual

This manual is arranged so you can quickly and easily find the information you need. The following is an overview of the contents of this manual.

- Chapter 1, General, familiarizes you with 5575B highlights and explains how to unpack your test set properly.
- Chapter 2, Overview, describes the 5575B controls, indicators, and connectors. A test set operation overview is also included.
- Chapter 3, Operation, tells you how to use the 5575B for common communication systems tests.
- Chapter 4, Printer, explains printer use with the 5575B.
- Chapter 5, Remote, tells you how to operate a 5575B from a remote terminal.
- Chapter 6, Options, provides a brief explanation about the options that may be purchased for use with the 5575B.
- Appendices
  A – Specifications
  B – Signaling CCIS and Channel Charts
  C – Network Pinouts
  D – Remote Configuration Worksheet
- Diagrams
  1 – Model 5575B Front Panel
  2 – Model 5575B Menu Tree
  3–8 HEX Tables
  9–10 Network Signaling Charts.
- NOTE – provides additional information.
- CAUTION – alerts you to situations where you could cause possible damage to the 5575B or the circuit under test.
- WARNING – alerts you to situations that could cause personal injury.

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Reorder Number 34-00155

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Warranty

Phoenix Microsystems, Inc. warrants each 5575B against defects in material and workmanship for a period of 2 years from the date shipped to the customer. Options and accessories are likewise warranted for a period of 1 year. If at any time during the warranty period the equipment malfunctions, Phoenix will repair, or at Phoenix's option, replace the unit free of charge. The remedies listed herein are the user's sole and exclusive remedies. Phoenix Microsystems, Inc. will not be liable for any indirect, direct, incidental, or consequential damages. Owner must return the unit to the factory, shipping prepaid and packaged to best commercial standards for electronic equipment. Phoenix will pay shipping charges for delivery on return. Customer is responsible for mode and cost of shipment to Phoenix.

Warranty does not apply if the unit has been damaged by accident, misuse, or as a result of service or modification not performed or not approved by authorized Phoenix personnel.

Safety Summary

The following safety precautions must be observed whenever the 5575B is operated, serviced, or repaired. Failure to comply with these and other specific warnings and cautions within this manual is a violation of Phoenix Microsystems' safety standards of design, manufacture, and intended use of the test set. Phoenix assumes no liability for the customer's or user's failure to comply with these precautions.

Grounding – The 5575B chassis and cabinet must be connected to an electrical ground for proper operation and to minimize shock hazard. The unit is furnished with a three–conductor ac power cable which incorporates a ground lead. The power cable must be connected to an approved three–contact electrical outlet or to a three–conductor to two–conductor adapter with a grounding wire (green) connected to electrical ground at the outlet.

Explosive Atmosphere – The 5575B must never be operated in the presence of any flammable gases or fumes. Power must not be applied to this or any instrument under such conditions due to the potential for explosion.

High Voltage Circuits – Only qualified maintenance personnel should remove the instruments covers. Dangerous voltages may exist within the unit even after the power cable has been disconnected. Do not attempt to replace components with the power cable connected.

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DX SIGNALING

Chapter 1 – General

1.0 INTRODUCTION

This section of the manual contains general information about the Model 5575B Micro BERT test set. The 5575B is a complete full functioned T1 bit error rate test set (BERT) designed for use on 1.544 Mbps T–carrier links. Easy setups and an intelligent "Why?" key allow even untrained users to rapidly locate T1 problems.



Figure 1–1. Model 5575B T1 Micro BERT Test Set.

1.1 DESIGN HIGHLIGHTS

The 5575B is packaged in a rugged, aluminum, 10x5.75x6.5 inch housing with a convenient carrying handle. Optional replacement lids provide additional features allowing the base 5575B unit to be customized for a given application. The removeable lids serve as the storage area for the interface cables. A forty–character by four–line LCD display, 20 status/alarm/history LED indicators, and a 21–key keyboard, provide the operator with a full function, easy to use test set. Design highlights of the 5575B include:

- Intuitive user interface. All main setups are always on display.
- Automatic Evaluation and setup of all main T1 line parameters.
- Why? operator assistance to help with proper unit setups.
- LEDs instantly indicate error conditions.
- Test Summary LED illuminates if any type circuit faults occur.
- Automatic AMI/B8ZS coding detection with history.
- Gate ARRAY that monitors T1 line for true Bell Pub 62411 Ones density compliance.
- Two Test Results displayed simultaneously.
- Tests D4 framed, extended superframe, SLC®96 framing, or unframed links.
- External clock.
- Reference clock for slip measurements.
- Measures signal levels and frequency.
- Displays signaling.
- Direct connection to TelCo interface with full –35dB ALBO.
- Generates and receives nine test patterns plus two user–defined patterns.
- Multi pattern stress testing sequence and industry standard bridge tap detection test sequencing.
- Tests for network timing synchronization.
- Small and rugged portable unit.
- Battery powered option.
- Full remote control RS–232 port.
- Lid options to test SLC®96 and Voice.
- 40–column printer RS–232 port.

1.2 EQUIPMENT SUPPLIED

The 5575B is supplied with the following:

a. Manual
b. Help Card (attached to the bottom of the test set)
c. AC Power Cord
d. Trimmer Tool (used to adjust display view angle)

1.3 FEATURE OPTIONS

Optional hardware and software may be purchased separately for use with the 5575B test set.The 5564 T1 Channel Monitor lid, 5565 Drop and Insert lid, 5565/96 SLC®96 lid, 5565/96A SLC®96 lid (with 96 signaling LEDs), 5587 Span Power lid, 5585 Span Test Adapter, Pulse Mask, Jitter, TDR, and 1PPM Clock are hardware options. Software options include a Long Programmable User Pattern, Smart Repeater Support Codes, T1E1 (PRM), Performance Analysis G.821, Fractional T1, and T1 Impairment. Refer to section 6 of this manual for a description of each option.

1.4 BATTERY OPTION

The 5575B may be equipped with an optional, rechargeable battery to permit operation away from a power source. Refer to paragraph 3.1 for instructions to properly charge the battery.

1.5 ACCESSORIES

Phoenix offers the following cables which may be purchased for use with the 5575B.

a.	Cable, Bantam to 310, Black, 6'	7–5575A–389–1
b.	Cable, Bantam to 310, Red, 6'	7–5575A–394–1
c.	Cable, 9–pin female to 9–pin female (used for option downloading)	33–00171
d.	Cable Adapter, 9–pin male to 25–pin female (used for option downloading)	33–00172

1.6 HANDLING PRECAUTIONS

The 5575B is carefully packaged to prevent damage in shipment. Upon receipt carefully inspect the condition of the shipping

container prior to the carrier's departure. If there is any damage to the container, the damage must be presented to the carrier at this time. Retain the container for future use. After unpacking, examine the exterior of the unit to ensure it is free of scratches, dents, and other visible signs of damage.

If the 5575B was damaged in shipment, file a claim with the carrier IMMEDIATELY. Check to ensure you have received the supplied equipment (listed in paragraph 1.2 of this manual).

1.6.1 Service And Adjustment

The 5575B contains few user serviceable parts. Internal service or adjustment should only be performed by Phoenix repair personnel or authorized maintenance facilities to ensure that the safety features of the instrument are not comprised.

1.6.2 Display

The LCD display of the 5575B consists of two thin polarized glass plates (with UV cut filters) which are susceptible to damage. Extreme care should be used when handling the display panel. Avoid intense shock and high falls.

1.6.2.1 Cleaning

When cleaning the display surface, use a soft cloth (e.g. gauze) with either isopropyl alcohol, ethyl alcohol, or trichloroethylene solvent, and wipe lightly. Do **NOT** wipe the display surface with dry or hard materials that will damage the polarized surface. Do **NOT** use water, ketone, or aromatics.

1.6.2.2 View Angle Adjustment

The **VIEW ANGLE** control, located above the display window, is a recessed control used to vary the angle of view of the display.

CAUTION Use only an insulated, flat bladed, tool to adjust the display view angle to prevent test set damage.

1.6.3 Fuses

The 5575B fuse (located on the power panel on the right side of the test set) may be replaced with one of the recommended fuses listed below.

1. Fuse 1A, 250V, 3AG, Fast Blow, 1/4" x 1–1/4
   Little Fuse #312001.
2. Fuse 2A, 250V, Slow Blow, 1/4" x 1–1/4"
   Little Fuse #313002.

CAUTION Always replace a blown fuse with an identical replacement fuse. Never use a fuse of a larger value or attempt to defeat or bypass the fuse.

1.6.4 Quick Reference Card Replacement

Some software upgrades require replacement of the Quick Reference Card. To replace the card, refer to Figure 1–2 and proceed as follows:

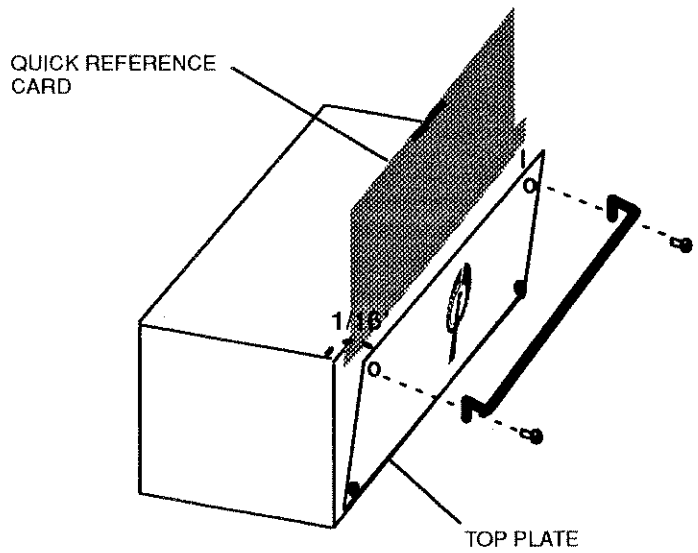


Figure 1–2. Quick Reference Card Replacement.

1. Use a screwdriver to remove the two screws securing the carrying handle to the test set.
2. Lift the top plate no more than 1/16' from the test set and pull the card from the slot.
3. Insert the replacement card behind the top plate.
4. Place the carrying handle over the screw holes.
5. Assemble the two screws to the handle and test set and tighten.

1.6.5 Calibration

Calibration is required when using the 5575B test set with a 5564 lid, revisions prior to 2.00. Hardware revisions 2.00 and higher do not need calibration. Calibration instructions are provided in the 5564 manual, part number 34–00121.

1.6.6 Environmental

Do not exceed the operating temperature limits of 0 to 50°C. To protect the display from degradation, do not operate or store units where they will be exposed to direct sunshine or high temperature/humidity for prolonged periods of time.

1.7 MANUAL

This manual contains the following chapters:

Chapter 1 – General
Chapter 2 – Overview
Chapter 3 – Operation
Chapter 4 – Printer Operation
Chapter 5 – Remote Operation
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Diagrams	1	Model 5575B Front Panel
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All references to front panel keys will be designated in upper case bold letters. All references to menus will be initial cap and bold. Modes will be shown as initial cap letters.

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Chapter 2 – Overview

2.0 INTRODUCTION

This section of the manual contains information to familiarize the user with 5575B controls, indicators, and connectors. An overview of test set operation is also included. Refer to Appendix A for test set specifications. Diagram 1 in the Diagram section of this manual provides a reference to all control, indicator, and connector locations. Diagram 2 provides a menu tree of test parameters and auxiliary menu options.

2.1 CONTROLS

The 5575B is equipped with 10 pushbutton keys and 12 rocker switches which are used to configure the test set. Each depression of a pushbutton will activate a function. Generally, each depression of a rocker switch scrolls menu selections. The exception is the **AUX MENUS** key. The first depression will put you into Auxiliary mode. Once activated, each depression will scroll menu selections. If you press and hold a rocker switch, the 5575B will automatically scroll the list of selections which are viewed on the forty–character by four–line display. The following is a list of the controls which are defined in paragraphs 2.1.1 through 2.1.17.

ON/OFF
RX INPUT
MODE
FRAME
PATTERN
CODE
LOOP CODES/EXIT
TYPE/DATA
HISTORY CLEAR
PRINT
RECALL
ERROR INJECT
SEND/RECEIVE LOOP CODES
Why?
RESTART
AUX MENUS
Display/View Angle

2.1.1 ON/OFF Switch

The **ON/OFF** switch applies and removes power to the 5575B. When power is applied, the display illuminates. The test set's previous configuration which was retained in memory will be displayed.

2.1.2 RX INPUT Switch

The **RX INPUT** switch provides three different T1 terminations; Bridge mode for monitoring in or out–of–service lines, Term mode for out–of–service testing, and DSX–Monitor mode for monitoring in or out–of–service lines through a DSX Monitor jack. The yellow LEDs indicate the currently selected termination. The test set is shipped in the TERM mode, and will default to TERM mode in the event of memory loss. In T1 AUTO mode, the RX line code and pattern will be automatically evaluated when the RX INPUT switch is toggled between any of the three positions. Termination descriptions are presented in the following paragraphs.

a. **Bridge Termination** – The Bridge Mode is typically used to monitor in–service T–spans that do not have a DSX monitor jack. The 5575B assumes a bridged connection to consist of a direct connection to one side of the span, and that the connection is not resistor isolated to the receive connector of the 5575B. When the **RX INPUT** switch is pressed, the Bridge termination is activated. The receiver is set to the high impedance state of greater than 1000 ohms. A full span ALBO is provided to compensate for cable losses. The 5575B will check all parameters applicable to the current configuration of the span.

b. **Monitor Termination** – The Monitor mode is typically used to monitor in–service T1–spans through a DSX monitor jack that is resistor isolated from the span. When the **RX INPUT** switch is pressed to select the Monitor termination, the receiver is terminated into 100 ohms. Due to the loading effect of the 100 ohm termination in series with the isolation resistors, there is approximately a 20dB line drop as seen by the receiver. To compensate for this drop, the 5575B amplifies the received signal by the 20dB to approximate the real signal on the far side

of the isolation resistors. The signal is then directed into the ALBO to provide compensation for cable losses.

c. **Term Termination** – The Terminate mode is used for out–of–service T1 testing. When the **RX INPUT** switch is pressed to select Term termination, the receiver is terminated into 100 ohms and the transmitter is fully functional. A full span ALBO is provided to compensate for cable losses. In this mode, the 5575B can act as a data monitor, data source, or both. The framing, coding, and pattern selections dictate not only what the 5575B should expect to receive, but also what the 5575B is transmitting.

2.1.3 MODE Switch

The **MODE** switch selects the test set mode of operation; T1 NORM, T1 AUTO, FT1 NORM*, FT1 D/I*, CSU, LINE LB, INT LOOP, BTP, MPT, or TDR*. When pressed, this rocker switch scrolls thru the modes, one at a time, in the direction of the key stroke. The current mode is displayed on the bottom line of the display directly above the **MODE** switch. Once final mode selection has been made, approximately three seconds will expire prior to configuration of the selected mode.

a. **T1 NORM** – This mode performs a BERT of a full T1 span. The TX originates the selected pattern and the RX synchronizes to and tests the pattern displayed under the **PATTERN** switch.

b. **T1 AUTO** – The Auto Evaluate Function, in conjunction with the Test Summary feature, permits the operator to have a complete automatic evaluation and setup to the line being monitored within seconds. The front panel display is cleared and the display will appear similar to:

```
BIPOLAR VIOLATIONS                    BPV
BPV ERRORED SEC.                      BPV
 <<EVALUATING>>
T1 AUTO   ESF    QRSS    AMI    CSU
```

*Optional.

The FRAME field will begin to scroll automatically as the test set checks for the frame type being used on the line (ESF, D4, SLC®96, or NONE). Once the frame type has been detected the test set checks for the pattern being transmitted on the line. If a pseudorandom pattern is identified, EVALUATION COMPLETE and the identified pattern will be displayed on line 3 for less than 2 seconds. After pattern identification is complete, line coding is checked. If the RX line coding is different from the selected coding, the 5575B will automatically switch to the RX coding. At the completion of the cycle, the display will appear similar to:

```
BIPOLAR VIOLATIONS                    BPV
BPV ERRORED SEC.                      BPV
EVALUATION COMPLETE:2^23-1
T1 AUTO      D4      2^15-1    AMI    CSU
```

In this example, the 5575B found the pseudorandom pattern (2^23–1) with D4 framing and AMI line coding on the line.The 5575B completes the evaluation cycle by clearing all data registers and restarting the test for the selected time chosen in the Test Length menu. Then the 5575B will automatically configure the transmitters framing and pattern to that detected during the evaluation cycle and perform a full function BERT test on the span.

If pattern sync is not acquired, the 5575B assumes there is either a pattern it cannot recognize or there is live traffic on the span. If live traffic is detected on the line, LIVE will be displayed on line 3, or if a loop up or loop down code is detected, LOOP will be displayed on line 3.

The evaluation cycle will only operate if there is a valid input signal and a Timed Test has not been completed. If the input signal disappears during the cycle, the 5575B will stop evaluating and wait for the signal to reappear.

During the evaluate cycle, for every framing selection made by the 5575B, the transmitter is also sending the current selection. This means that you cannot auto–evaluate an idle span that is looped back to you; the transmitter will send whatever the receiver expects; the results in this mode are not predictable.

The auto–evaluate restart methods are:

1. Select T1 AUTO mode.
2. RX signal is lost and then recovered while in the AUTO mode.
3. The RESTART key is pressed while in the AUTO mode.
4. The RX termination is changed while in the AUTO mode.

NOTE If the 5575B is evaluating a circuit, the operator should not connect the TX side of the unit to the span if there is another instrument on the span generating the signal.

---

c. **FT1 NORM Mode (FRACTIONAL T1 Option)**–The Fractional T1 option provides two additional modes of operation to the 5575B test set; FT1 NORM and FT1 D/I. In FT1 NORM mode, the receiver BERTs only the active channels and ignores the data on all other channels. The transmitter sends the BERT pattern on the active channels and fills the inactive channels with idle code. Refer to Phoenix publication 34–00170.

d. **FT1 D/I Mode (FRACTIONAL T1 Option)**– For FT1 D/I mode, a fraction of the received T1 span is replaced with a BERT pattern. The inactive channels are passed through to the transmitter. Refer to Phoenix publication 34–00170.

e. **CSU Mode** – The CSU mode, selected by pressing the **MODE** switch, emulates a CSU or network interface device (selected by setting of the **LOOP CODES** switch). The 5575B sends all ones out the transmitter (D4, ESF, SLC®96, or NONE, depending on the **FRAME** switch selection). The receiver shift registers load the loop–up code specified using the **LOOP CODES** switch, and the unit waits for the reception and synchronization of the loop–up code. When the loop–up code is seen, the 5575B's receiver is connected to the transmitter. The 5575B now functions as a repeater by transmitting received data at DSX levels (6.0 volts peak–to–peak with LBO set to 0dB). The receiver monitors the received data and performs full T1 monitor testing.

When looped, the unit functions the same as in T1 LINE LOOP BACK mode. The receiver is looking for the loop–down code. When the loop–down code is seen, the 5575B's receiver is disconnected from the transmitter. The transmitter returns to sending all ones.

When the unit is looped using the Payload FDL loop code, the unit enters payload loopback. Only the payload data is looped and the frame, CRC, and data link bits are internally generated. This method of CSU looping is useful for fault isolation.

f. **LINE LB** – The Line Loop Back mode returns the incoming T1 signal. The received data is regenerated and transmitted with user capability to inject BPV errors. Full T1 monitor testing is performed.

g. **INT LOOP** – The INT LOOP mode internally loops the receiver to the transmitter, RX termination is forced to TERM.

f. **BTP** –The BTP mode is a series of patterns used as an aid in the detection of Bridge taps and other impairments on a T1 span and will operate in full duplex or half duplex configurations. In BTP mode, 21 patterns (with various ones and zeros densities) are automatically transmitted as an alternating sequence of a synchronizing pattern and a test pattern (refer to table below). Each synchronizing pattern is transmitted for approximately 2 seconds. Each test pattern is transmitted for approximately 26 seconds. The pattern being sent is displayed above the **PATTERN** switch on the 5575B. Receiver activity is displayed on the 3rd line. After each pattern is displayed, "BTP Sync" is displayed before advancing to the next pattern. The 5575B will then repeat the cycle starting with the first pattern. Total time to transmit all 21 patterns is approximately 10 minutes. The tes will continue to repeat itself until another mode is selected or ur til a timed test is completed. The **RESTART** key can be used t restart the cycle beginning with the first pattern. The BTP mo can also be set up as a timed test using Auxiliary menu #3.

BTP NAME	BIT PATTERN MAKEUP
ALL ONES*	F1111
1:1*	F0101
1:3	F0100
1:5	F0100 00
1:6	F0100 000
1:7*	F0100 0000
2:8	F1100 0000 00
2:9	F1100 0000 000
2:10	F1100 0000 0000
2:11	F1100 0000 0000 0
2:12	F1100 0000 0000 00
2:13	F1100 0000 0000 000
2:14	F1100 0000 0000 0000
3 IN 18	F1101 0000 0000 0000 00
3 IN 19	F1100 1000 0000 0000 000
3 IN 20	F1100 1000 0000 0000 0000
3 IN 21	F0100 0100 0000 0000 0000 1
3 IN 22	F0100 0100 0000 0000 0000 10
3 IN 23	F0100 0100 0000 0000 0000 100
3 IN 24	F0100 0100 0000 0000 0000 0100
QRSS*	2^20–1 Pseudorandom with 15 zeros suppression. *Standard patterns available from Pattern switch.

If SUMMARY is selected in the Results TYPE field, failed patterns will be displayed in the DATA field. Results may also be viewed using a remote terminal or printed test results.

g. **MPT** – The MPT mode is a series of five stress test patterns that operate in full duplex or half duplex configurations. In MPT mode, an alternating sequence of a synchronizing pattern is followed by a test pattern. Each Synchronizing pattern is transmitted for approximately 2 seconds. Each test pattern is transmitted for approximately 175 seconds. The pattern being sent will be displayed above the **PATTERN** switch on the 5575B. Receive activity is displayed on the 3rd line. After each pattern is displayed, "MPT Sync" will be displayed before advancing to the next pattern. The 5575B will then repeat the cycle starting with the first pattern. Total time to transmit all five patterns is approximately 15 minutes, however, the test will repeat itself until another mode is selected or until a timed test is completed. The MPT mode can also be set up as a timed test using Auxiliary menu #3 or will restart the test beginning with the first pattern when the **RESTART** key is pressed.

If SUMMARY is selected in the Results TYPE field, failed patterns will be displayed in the DATA field. Results may also be viewed using a remote terminal or printed test results.

MPT NAME	BIT PATTERN MAKEUP
ALL ONES*	F1111
1:7*	F0100 0000
2:8	F1100 0000 00
3 IN 24	F0100 0100 0000 0000 0000 0100
QRSS*	2^20–1 Pseudorandom Pattern with 15 zero suppression
* Standard patterns available from PATTERN switch.	

g. **TDR*** – TheTDR (Time Domain Reflectometer) mode option is used to test for cable pair faults. Shorts, opens, bridged taps, and other cable faults are detected when a change in impedance is seen using this mode option. Refer to the TDR option manual 34–00165 for additional operation information.

2.1.4 FRAME Switch

The **FRAME** switch selects the framing format for transmitted data; D4, ESF, SLC®96, or NONE. This rocker switch scrolls thru the framing types, one at a time, in the direction of the key stroke. The current framing type is displayed on the bottom line of the display directly above the **FRAME** switch. The test set will be configured approximately three seconds after the frame mode is selected.

a. **D4** – D4 mode allows the 5575B to transmit and receive D4 framed T1 data for testing D4 framed circuits.

b. **ESF (Extended Superframe)** – ESF mode allows the 5575B to transmit and receive ESF framed T1 data for testing ESF framed circuits.

c. **SLC®96** – SLC®96 mode allows the 5575B to transmit and receive SLC framed T1 data when testing SLC®96 framed circuits.

d. **NONE (Unframed)** – NONE framing mode allows the 5575B to transmit and receive unframed T1 data for testing T1 unframed circuits or T1 circuits with proprietary framing formats. NONE is the default setting.

*Optional.

2.1.5 PATTERN Switch

The **PATTERN** switch selects one of eleven "canned" and two 64–bit user definable patterns to be transmitted; 2^15–1, 2^20–1, 2^23–1, QRSS, 3:24, 1:7, 1:1, NET55, OCT55, ZEROS, ONES, USER 1, USER 2, and USER 3*. The test set will default to pattern 2^15–1 in the event of memory loss. This rocker switch scrolls through the patterns in the direction of the key stroke. The current pattern is displayed on the bottom line of the display directly above the **PATTERN** switch. Once final pattern selection has been made, approximately three seconds will expire prior to configuration of the selected pattern. In Auxiliary mode, the blue silkscreened up/down arrow functions are activated. The up arrow scrolls forward and the down arrow scrolls backward. The following paragraphs define the selectable patterns.

a. **2^15–1 (32,757–bit Pseudorandom Pattern)** – is a pseudorandom pattern which generates a maximum of 14 sequential zeros and 15 sequential ones. Although the pattern provides a maximum number of zeros for framed AMI testing, it does violate one's density requirements and should only be used as a valid pattern on B8ZS coded circuits.

2^15–1	UNFRAMED	FRAMED
Number of shift register stages	15	15
Longest sequence of zeros (non–inverted signal)	14	15

b. **2^20–1 (1,048,575–bit PRBS)** – is a pseudorandom pattern which generates a maximum of 19 sequential zeros and 20 sequential ones. The pattern exceeds excess zeros and does not meet the ones density requirement for T1 applications.

* Optional.

2^20–1	UNFRAMED	FRAMED
Number of shift register stages	20	20
Longest sequence of zeros (non–inverted signal)	19	20

c. **2^23–1 (8,388,607–bit PRBS)** – is a pseudorandom pattern which generates a maximum of 22 sequential zeros and 23 sequential ones. The pattern exceeds excess zeros and does not meet the ones density requirement for T1 applications.

2^23–1	UNFRAMED	FRAMED
Number of shift register stages	23	23
Longest sequence of zeros (non–inverted signal)	22	23

d. **QRSS** – simulates live data for T1 applications. QRSS allows 14 sequential zeros and 20 sequential ones.

NOTE Density errors are suppressed when the receiver is synchronized with the QRSS pattern.

e. **3:24** – when transmitted unframed, tests the capability of a circuit to function properly when transporting signal sequences containing both a maximum of 15 consecutive zeros and a minimum overall pulse density. When transmitted framed and aligned with the framing pattern so as not to transmit a false yellow alarm, it tests the consecutive zeros requirement, and, like 2^20–1, does not meet the 8(N + 1) pulse density criteria specified in ANSI T1.403–1989. Both framed and unframed bit sequences are shown below.

BINARY (LtR)	HEXADECIMAL (RtL)
Unframed 10001000 1000000000000000	11 01 00
Framed F 01000100 00000000 00000100	F22 00 20

f. **1:7** – is a fixed pattern of F0100 0000. The pattern is aligned with the framing (F) bits as indicated.

g. **1:1** – is a fixed test pattern of F0101 or alternating AMI ones (Mark) and zeros (Space) pulses.

h. **NET55** –
01 01 03 01 01 01 00 01 01 01 01 01
01 03 01 01 01 01 07 01 01 01 01 55
55 55 55 AA AA AA AA 01 01 01 01 01
01 FF FF FF FF FF FF 80 01 80 01 80
01 80 01 80 01 80 01

i. **OCT55** –
01 01 01 01 01 01 00 01 01 01
01 01 01 03 01 01 01 01 07 01
01 01 01 55 55 55 55 AA AA AA
AA 01 01 01 01 01 01 FF FF FF
FF FF FF 08 01 80 01 80 01 80
01 80 01 80 01

j. **ZEROS** – is All zeros (Space).

k. **ONES** – is the pattern F1111 (Mark).

l. **USER 1 and 2** – are programmable selections using up to 64 bits for each user pattern.

m. **USER 3 (Long User Pattern Option)** – is an extended programmable pattern selection using an additional 2K bytes. Refer to the Long User Pattern Option manual 34–00166 for programming instructions for this pattern selection.

2.1.6 CODE Switch

The **CODE** switch is used to select the code to be transmitted; AMI or B8ZS. In Auxiliary mode, the blue silkscreened left/right arrow functions are activated. The left arrow moves the cursor left and the right arrow moves the cursor right.

a. **AMI** – Alternate Mark Inversion is the default setting.

b. **B8ZS** – (Bipolar 8 Zero Substitution) Substitutes eight consecutive zeros sequence with bipolar violations in the 4th and 7th bit.

2.1.7 LOOP CODES/EXIT Switch

The **LOOP CODES** switch selects CSU loop codes to be transmitted; CSU, FAC1, or FAC2. When in ESF framing, the LOOP CODES key will also select the CSU loop codes PYLD (payload), NWRK (network), and LINE (line) for transmission. TXPORT and Westell loop code options are also provided when the test set is equipped with the applicable option. This switch cycles thru the available loop codes (Table 2–1), one at a time, in the direction of the key stroke. The current loop code is displayed on the bottom line of the display directly above the **LOOP CODES** switch.

Table 2–1. Loop Code Options.

LOOP TYPE	LOOP UP CODE	LOOP DOWN CODE
CSU (in–band)	10000	100
FACILITY1 (in–band)	1100	1110
FACILITY2 (in–band)	11000	11100
PAYLOAD (out–of–band)	1111111100101000	1111111101001100
NETWORK (out–of–band)	1111111101001000	1111111100100100
LINE (out–of–band)	1111111101110000	1111111100011100
TXPORT	Refer to TXPORT Option manual 34–00167.	
WESTELL	Refer to Westell Option manual 34–00184.	

a. **CSU** – loop codes allow the 5575B to activate a loopback with a compatible CSU or respond to a CSU loop code. CSU is the default setting.

b. **FAC 1** – loop codes allow the 5575B to activate a loopback with a compatible facility interface or respond to a facility loop code.

c. **FAC 2** – loop codes allow the 5575B to activate a loopback with a compatible facility interface or respond to a facility loop code.

d. **PYLD** – out of band loop codes allow the 5575B to activate a payload loopback or respond to a facility loop code.

e. **NWRK** – out of band loop codes allow the 5575B to activate a network loopback with a compatible CSU or respond to a facility loop code.

f. **LINE** – out of band loop codes allow the 5575B to activate a line loopback with a compatible CSU or respond to a facility loop code.

g. **TXPRT** (TXPORT Repeater Option) – The TXPORT option permits the 5575B to loop and collect status information from TXPORT addressable repeaters. This allows the technician to test span performance and rapidly locate span failures.

   TXPORT repeaters operate on unframed lines, therefore, the "TXPRT" Loop Code is only selectable when no framing (NONE) framing option is selected. If the TXPORT option is not installed, "TXPRT" will not appear as a choice for the LOOP CODES switch.

   Auxiliary menu #9 (TXPORT REPEATER SETUP) is used to select one of 26 repeater addresses (A thru Z). This menu is always present, even if the option is not installed. If this option is installed, "TXPORT" may be selected using the TYPE switches. Refer to Phoenix option manual 34–00167.

h. **WSTL** (WESTELL Repeater Option) – The Westell option permits the 5575B to arm and loop Westell addressable line or office repeaters for span performance analysis. This capability allows the technician to rapidly locate span failures.

   Westell repeaters operate on framed lines, therefore, the "WSTL" Loop Code is not a choice under the Loop Codes switch if no framing (NONE) is selected. If the Westell option is not installed, "WSTL" will not appear as a choice under this key.

   Auxiliary menu #10 (WESTELL REPEATER SETUP) is used to select the repeater type (OFFICE or LINE) and address (0001 thru 1999). This menu is always present, even if the option is not installed. Refer to Phoenix option manual 34–00184.

In Auxiliary mode, the blue silkscreened **EXIT** function is activated to exit Auxiliary menus. Refer to paragraph 2.1.13 for information to send the selected code.

2.1.8 TYPE Switches and DATA Switches

The TYPE and DATA switches (Figure 2–1) are used to select the tests to be performed and to view test results. Because the standard 5575B test set is equipped with over 60 possible test results, results are divided into logical groups or "TYPEs". Summary, Logic, BPV, Frame, Signal, and Time, are test TYPEs available in standard 5575B test sets. T1 E1 and TXPORT Type options provide additional test parameters listed in Table 2–2 and described in the applicable option manual.

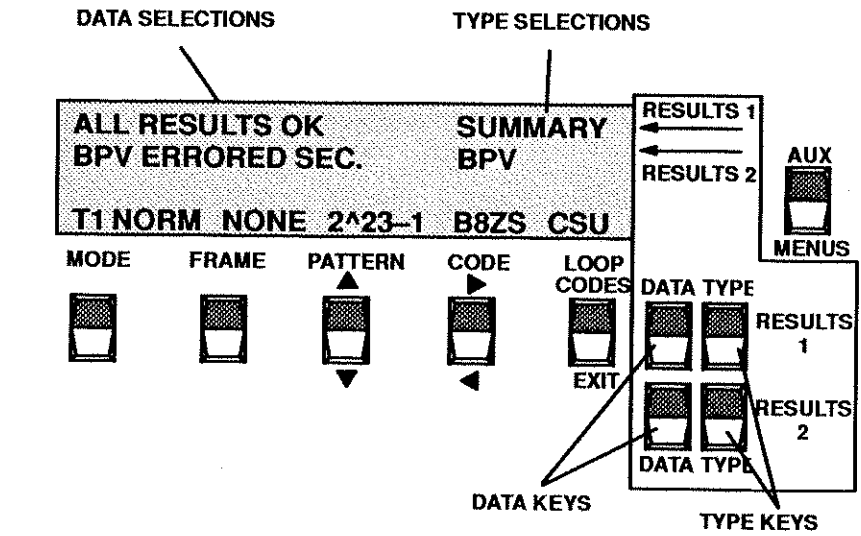


Figure 2–1. Results Menu Operation.

The tests within each group are referred to as "DATA" (Table 2–2). The measurement "TYPEs" are always displayed on the right side of the display. The actual test "DATA" (test results) are always displayed on the left side of the display.

Lines 1 and 2 display the currently selected results for two tests, simultaneously. Line 1 (test 1) selections are scrolled using RESULTS 1 **TYPE** and **DATA** switches. Line 2 (test 2) selections are scrolled using RESULTS 2 **TYPE** and **DATA** switches. Line 3 is normally blank in this mode but may display status messages during a test. Line 4 displays the current test set mode, frame, pattern, code, and loop codes configuration. The **TYPE** and **DATA** switches are rocker keys. Press the upper section of the key to scroll forward. Press the lower section of the key to scroll backward.

a. **TYPE** Switches – **RESULTS 1** and **2 TYPE** switches select SUMMARY, LOGIC, BPV, FRAME, SIGNAL, and TIME results (displayed on the right side of the display). T1E1 and TXPORT results are also displayed when the applicable option is provided.

b. **DATA** Switches – For each TYPE selected (in **a.** above), press the **RESULTS 1** and **2 DATA** switches to select individual results (i.e., select LOGIC with the **TYPE** switch and then Bit Errors with the **DATA** switch).

Table 2-2. Results Type and Data Switch Options.

TYPE	SUMMARY	LOGIC	BPV
DATA	ALL RESULTS OK B8ZS DETECTED CRC COUNT FRAME BIT ERRORS BIPOLAR VIOLATIONS BIT ERRORS LINE CODING ERR AMI DETECTED FREQ DEVIATION BTP* MPT*	BIT ERRORS BIT ERROR RATE ERRORED SEC LOGIC EFS % LOGIC EFS SEVERELY ERR SEC. CONSECUTIVE SES CONSECUTIVE SES RATE PATTERN SYNC LOSSES PATTERN SYNC LOSS SEC	BIPOLAR VIOLATIONS BPV ERROR RATE BPV ERR SEC.
TYPE	**FRAME**	**SIGNAL**	**TIME**
DATA	FRAME BIT ERRORS FRAME BIT ERROR RATE FRAME SYNC LOSSES FRAME SYNC LOSS SEC. FRAME BIT ERR SEC CRC ERRORS CRC RATE CRC ERR SEC.	DENSITY VIOLATIONS BLUE ALARM SEC. YELLOW ALARM SEC. RX FREQUENCY MAX RX FREQUENCY MIN RX FREQUENCY RX LEVEL PK-PK VOLTS RX LEVEL PK-PK dBDSX SIMPLEX CURRENT CLOCK SLIP COUNT CLOCK SLIP RATE MAX POSITIVE WANDER MAX NEGATIVE WANDER FRAME SLIPS (+) FRAME SLIPS (-) A-SIG B-SIG C-SIG D-SIG IMPAIRMENT**	ELAPSED TEST TIME ELAPSED DAYS ELAPSED TEST SEC. TEST ENDS IN TOD MDY
TYPE	**T1E1*** **	**TXPORT**** **	**G.821***** **
DATA	PRM-EFE PRM-G1 PRM-G2 PRM-G3 PRM-G4 PRM-G5 PRM-G6 PRM-SE PRM-FE PRM-LV PRM-SL PRM-LB	S1 SIG LEVEL S1 CRC ERR S1 BPV ERR S1 TX STAT S2 SIG LEVEL S2 CRC ERR S2 BPV ERR S2 TX STAT POWER STAT	ERRORED SEC. ERR FREE SEC. SEV ERR SEC. %SEV ERR SEC. UNAVAILABLE SEC AVAILABLE SEC. %AVAILABLE SEC. DEGRADED MIN %DEGRADED MIN

* These are status indications of MPT/BTP test results having either 5 or 21 members each, respectively.

** Provided with the Impairment option.

*** Provided with the T1E1 option.

**** Provided with the TXPORT Repeater option.

***** Provided with the G.821 option.

2.1.8.1 Summary Type Menus

The SUMMARY TYPE provides a fast and easy way to get a summary of errors detected during testing. To select SUMMARY results, press the **TYPE** switch until SUMMARY is displayed in the TYPE field.

LINE CODING ERROR			**SUMMARY**	
BPV ERRORED SEC.			**BPV**	
T1 NORM	**NONE**	**2^23–1**	**B8ZS**	**CSU**

Should an error occur, the following results may appear. The following fields can be scrolled by pressing the **DATA** switch. After all errors have been displayed, END OF LIST will be displayed. Continue pressing the **DATA** switch to scroll results again.

ALL RESULTS OK	**LINE CODING ERROR**
B8ZS DETECTED	**AMI DETECTED**
CRC ERROR COUNT	**FREQUENCY DEVIATION**
FRAME BIT ERROR COUNT	**BTP RESULTS (In BTP mode)**
BIPOLAR VIOLATION COUNT	**MPT RESULTS (in MPT mode)**
BIT ERROR COUNT	

ALL RESULTS OK – Displayed if no errors are detected.

B8ZS DETECTED – If the transmitter is set for AMI and B8ZS is detected, a B8ZS error will be displayed.

CRC ERROR COUNT – CRC6 (cyclic redundancy check) errors can be detected on either in–service or out–of–service lines employing the extended superframe (ESF) mode of framing. CRC6 uses a mathematical algorithm to check the contents of a superframe and results in a 6–bit code for the superframe. The CRC code of each superframe is encoded as 6 bits in the following superframe. As each superframe is received and decoded, a CRC check is recalculated and compared to the CRC code that was sent over the span. If they do not match, then one or more errors occurred during transmission of the superframe.

FRAME BIT ERROR COUNT – Frame bit errors are violations of the frame bit sequence. The 5575B detects frame bit errors by comparing the input data stream to the known FBit frame bit sequence.

BPV COUNT – Bipolar violations are the result of an improperly coded bipolar signal on the line and can occur in any mode of operation regardless of framing, coding, or data. It is one of the test parameters that can measure the quality of a circuit while in actual customer use with live traffic.

BIT ERROR COUNT – Received data is compared bit–for–bit to the bit pattern selected by the **PATTERN** switch.

LINE CODING ERROR – Senses momentary transitions between line coding techniques (i.e., AMI and B8ZS).

AMI DETECTED – If the transmitter is set for B8ZS and AMI is detected, a AMI error will be displayed.

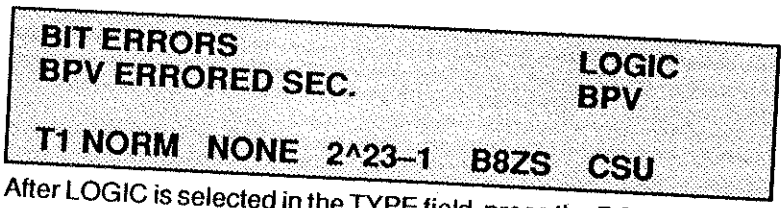
FREQUENCY DEVIATION – Displayed if the input signal has deviated from 1544000 by 50Hz positive or negative.

BTP RESULTS – Failed test patterns will be displayed when an error is detected. Error results may be scrolled by pressing the **DATA** switch.

MPT RESULTS – Failed test patterns will be displayed when an error is detected. Error results may be scrolled by pressing the **DATA** switch.

2.1.8.2 Logic Type Menus

The LOGIC TYPE displays logic errors detected during testing. To select LOGIC results, press the **TYPE** switch until LOGIC is displayed in the TYPE field.



After LOGIC is selected in the TYPE field, press the **DATA** switch to scroll to the following selections:

BIT ERRORS
BIT ERROR RATE
ERRORED SEC.
LOGIC EFS
% LOGIC EFS
SEVERELY ERRORED SEC.
CONSECUTIVE SES
CONSECUTIVE SES RATE
PATTERN SYNC LOSSES
PATTERN SYNC LOSS SEC.

BIT ERRORS – The generated pattern is compared bit–by–bit to the received pattern. After pattern sync has been established, any received bit which does not agree with what was sent is counted as an error.

BIT ERROR RATE – Provides a continuous bit error rate which changes as the number of bits received increases. This provides the user with a running indication of the "health" of the circuit under test at all times. The bit error rate is calculated constantly using the accumulated bit errors and number of bits received in sync. The advantage of the running bit error rate is that it allows the user to track the ups and downs as the test progresses, rather than have to wait for the termination of the test to get an answer.

$$BER = \frac{Bit\ Errors}{Number\ of\ bits\ received\ in\ sync}$$

ERRORED SECONDS – An errored second is defined as a one second window in which at least one logic error occurred. Errored seconds are measured synchronously (a logic error initiates the

errored seconds timer). If one or more logic errors have occurred within one second of the first error, this is calculated as one errored second. Errored seconds are initiated only by logic errors and are only applicable while the 5575B is in pattern sync.

LOGIC ERROR FREE SECONDS – Logic error free seconds are defined in the 5575B as the number of seconds that have elapsed that contained no logic errors. The formula used for calculating error free seconds by the 5575B is EFS=ETS–ES. This is the total number of elapsed test seconds in pattern sync and ES is errored seconds as described above. Since this parameter is based on logic errors, it is only applicable while performing a bit error rate test with a known bit pattern and in pattern sync.

PERCENT LOGIC ERROR FREE SECONDS – Percent logic error free seconds is a measure of the performance level of a circuit. It is defined as the difference of total elapsed test seconds in pattern sync minus the percentage of logic errored seconds that occurred over the total test seconds in pattern sync and is calculated by the 5575B using the formula:

$$\%EFS = 100\% - \frac{ES}{ETS} \times 100$$

Since this parameter is a result of logic errors, it is only applicable while in pattern sync. The result is displayed as a decimal percentage in the form 100.0000.

SEVERELY ERRORED SECONDS – Severely errored seconds is a cumulative measure of the quality of the circuit under test. It is cumulative in the fact that severely errored seconds are declared based upon the rate of detection of bit errors, frame bit errors, out of frame events, and CRC6 errors.

CONSECUTIVE SEVERELY ERRORED SECONDS – This i three or more consecutive SES. Whether there were three or 30 Severely Errored Seconds in a row, this value counts a single ever It takes one Not Severely Errored Second to begin a new count

CONSECUTIVE SEVERELY ERRORED RATE – This parameter defines the rate at which CSES occur. It is calculated as:

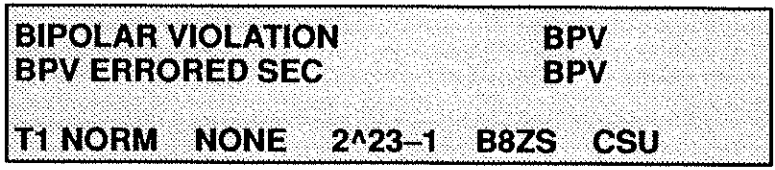
$$CSER = \frac{CSES}{Total\ Test\ Seconds}$$

PATTERN SYNC LOSSES – This parameter is an integer count of the number of losses of sync based upon a bit error rate threshold being crossed, that is, when the bit error rate becomes excessively high. The 5575B will declare that it has lost sync and will not recover sync until the bit error rate drops below the threshold. The sync loss threshold of the 5575B is 100/1000.

PATTERN SYNC LOSS SECONDS – This parameter represents the total accumulated time the 5575B was out of sync. The resolution of the parameter is 20 milliseconds and pattern sync losses in duration of less than 20 milliseconds are counted as a 20 millisecond loss. This parameter is displayed as the integer portion and 2 decimal places up to 99999.99 seconds.

2.1.8.3 BPV Type Menus

The BPV TYPE displays bipolar violation errors detected during testing. To select BPV results, press the **TYPE** switch until BPV is displayed in the TYPE field.



After BPV is selected in the TYPE field, press the **DATA** switch to scroll the following selections:

BIPOLAR VIOLATIONS
BPV ERROR RATE
BPV ERRORED SEC.

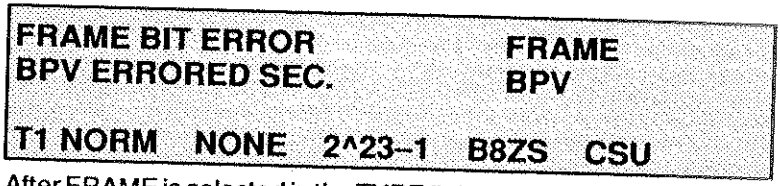
BIPOLAR VIOLATIONS – Bipolar violations are detected as they occur on the receive pair. In the B8ZS mode of operation, intentional bipolar violations are ignored. BPV's are detected in all modes of operation.

BIPOLAR VIOLATION RATE – This parameter is a measure of the rate at which BPV's occur. It is continuously calculated based on the number of BPV's and the number of all bits received.

BPV ERRORED SECONDS – This parameter is defined to be at least one BPV error in any one second interval. If there was one BPV error or 100 errors in any one second interval, it is logged as one BPV errored second. The 5575B measures "synchronous" errored seconds (a BPV error initiates the BPV errored seconds timer).

2.1.8.4 Frame Type Menus

The FRAME TYPE displays framing errors detected during testing. To select FRAME results, press the **TYPE** switch until FRAME is displayed in the Type field.



After FRAME is selected in the TYPE field, press the **DATA** switch to scroll the following selections:

FRAME BIT ERRORS	**FRAME BIT ERRORED SEC.**
FRAME BIT ERROR RATE	**CRC ERRORS**
FRAME SYNC LOSSES	**CRC RATE**
FRAME SYNC LOSS SEC.	**CRC ERRORED SEC.**

FRAME BIT ERRORS – The number of FBit frame bit errors detected on the received pair is active when the 5575B has been selected to be D4, ESF, or SLC®96 framing. Frame bits are present after each 192 information bits. The framing bits follow a predefined pattern the 5575B recognizes while in all framed modes.

FRAME BIT ERROR RATE – The rate that frame bit errors occur. It is continuously calculated based on the number of frame bit errors and the total number of frame bits received. Since frame bits are added in a predefined sequence, the frame bit error rate indicates the "health" of an in–service T1–span. The frame bit error rate is displayed as a decimal exponent.

$$FBER = \frac{Frame\ Bit\ Errors\ (FBit)}{Total\ frame\ bits\ received\ (FBit)}$$

FRAME SYNC LOSSES – Four continuous frames of data have at least two out of five frames containing a frame bit error.

FRAME SYNC LOSS SECONDS – The total accumulated time the 5575B was out of frame sync. The parameter resolution is 20

milliseconds and frame sync losses in duration of less than 20 milliseconds are counted as a 20 millisecond loss. This parameter is displayed as the integer portion and 2 decimal places up to 99999.99 seconds.

FRAME BIT ERRORED SECONDS – This parameter is defined to be at least one FBE error in any one second interval. If there was one FBE error or more errors in any one second interval, it is logged as a single FBES event. The 5575B measures "synchronous" errored seconds (a frame bit error initiates the frame bit errored seconds timer).

CYCLIC REDUNDANCY CHECK (CRC) ERRORS – This parameter is the number of CRC6 errors (cyclic redundancy check errors) that occurred during the test. CRC6 errors are only counted while the 5575B framing is selected as ESF (extended superframe). The CRC6 can be monitored either on in–service or out–of–service lines. Since the expected value of the CRC pattern can be anticipated, the received data can be compared to the expected results. Whenever the expected value does not compare, a CRC error event is counted.

CRC ERROR RATE – This parameter is useful in checking the "health" of in–service or out–of–service span lines. It is only meaningful for ESF framing. This parameter is continuously calculated as the number of CRC errors divided by the number of ESF superframes analyzed.

$$CRC\ Rate = \frac{CRC\ Errors}{Extended\ superframes\ analyzed}$$

CRC ERRORED SECONDS – At least one CRC error in any on second interval. That is, if there was one CRC error or 100 errors i any one second interval, it is logged as one CRC errored secon The 5575B measures "synchronous" errored seconds (a CRC err initiates the CRC errored seconds timer).

2.1.8.5 Signal Type Menus

The SIGNAL TYPE displays electrical errors detected during testing. To select SIGNAL TYPE results, press the **TYPE** switch until SIGNAL is displayed in the Type field.

DENSITY VIOLATIONS				**SIGNAL**
BPV ERRORED SEC.				**BPV**
T1 NORM	**NONE**	**2^23–1**	**B8ZS**	**CSU**

After SIGNAL is selected in the TYPE field, press the **DATA** switch to scroll the following selections:

DENSITY VIOLATIONS	**CLOCK SLIP RATE**
BLUE ALARM SEC.	**MAX POSITIVE WANDER**
YELLOW ALARM SEC.	**MAX NEGATIVE WANDER**
RX FREQUENCY MAX	**FRAME SLIPS (+)**
RX FREQUENCY MIN	**FRAME SLIPS (–)**
RX FREQUENCY	**A–SIG**
RX LEVEL PK–PK VOLTS	**B–SIG**
RX LEVEL PK–PK DBDSX	**C–SIG**
SIMPLEX CURRENT	**D–SIG**
CLOCK SLIP COUNT	**IMPAIRMENT (Optional)**

DENSITY – A density violation is declared anytime either of the following criteria are violated.
(1) More than 15 zeros in a row.
(2) Every 8 (N+1) bits must have at least "N" ones where "N" can be from 1 to 23.

BLUE ALARM SECONDS – This parameter is defined as the total number of one second intervals in which at least one blue alarm occurred. A blue alarm is declared when the 5575B detects unframed ALL ONES. This event also turns the ALL ONES ALARM LED on.

YELLOW ALARM SECONDS – This parameter is defined as the total number of one second intervals in which at least one yellow alarm occurred. A yellow alarm is declared when bit 2 of 255

consecutive channels are received as a zero. This event also turns the YELLOW ALARM LED on.

RX FREQUENCY MAX – This parameter returns the highest frequency received.

RX FREQUENCY MIN – This parameter returns the lowest frequency received.

RX FREQUENCY – This parameter is the received T1 frequency.

RX LEVEL Pk–Pk VOLTS – The Rx level in volts.

RX LEVEL Pk–Pk dBDSX – The Rx level in dB.

SIMPLEX CURRENT – The simplex loop current range is ±150 mA.

CLOCK SLIP – This is a loop timing parameter to show the total number of clock counts that the transmit and the receive clocks have deviated since the test began or from the last restart. A positive number denotes the transmit clock is faster than the receive clock. A negative number denotes the receive clock is faster than the transmit clock. Refer to paragraph 3.4 to set up test for frame slips.

SLIPRATE – This loop timing parameter shows the rate at which the transmit and receive clocks are deviating. A positive number denotes the transmit clock is faster than the receive clock. A negative number denotes the receive clock is faster than the transmit clock. The SLIPRATE shown in the above display represents 1.234 bits per second. Refer to paragraph 3.4 to set up for slip rate.

WANDER+ – This loop timing parameter shows the maximum positive value that the clocks were different. Refer to paragraph 3.4 to test for frame slips.

$$\frac{CLK\ SLP}{Total\ Test\ Seconds}$$

WANDER– – This loop timing parameter shows the maximum negative value that the clocks were different. Refer to paragraph 3.4 to test for frame slips.

FRAME SLIPS – Frame slips occur when there is a sufficiently large change between transmit and receive data rates to cause over/underflow of the elastic store buffers in a network framing device. When the device's elastic storage range is exceeded, it is forced to either replicate or delete a frame (positive or negative frame slip) to restore normal centering and operation. The network provides no flag or positive indication for occurrence of slips, limiting test equipment to the indication of slip potentials. In order to keep slips from causing frame synchronization errors, they must be controlled to whole frames (193–bit times), and a good correlation can be expected between TX and RX clock phase differentials of 193 bits and the occurrence of a frame slip. The 5575B utilizes this differential measurement to provide an indication of potential frame slips. Each additional 193–bit delta between TX and RX is indicated as one frame slip. Refer to paragraph 3.4 to test for frame slips.

SIGNALING – This parameter shows the state of the signaling bits for all 24 channels.

Frequency and Signal Level Measurement Operations

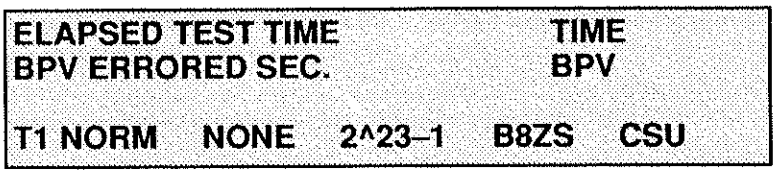
The 5575B constantly measures the frequency and level of the signals present at T1 receive input.

If the signal at the receive connector is lower than the specified input level (see Specifications in Appendix A), the unit will display "NO SIGNAL". In addition, status LEDs for Rx Pulses, Signal Loss, and Signal Loss History are provided on the front panel for immediate indication of faults detected on the receiver.

IMPAIRMENT – This parameter is available when the Impairment option is installed in the 5575B. The T1 Impairment detection option provides the capability to detect and measure the relative severity of T1 twisted pair cable impairments. Refer to Phoenix manual 34–00171.

2.1.8.6 Time Type Menus

The TIME TYPE provides clock/calendar information and current test time status. To select TIME results, press the **TYPE** switch until TIME is displayed in the TYPE field.



After TIME is selected in the TYPE field, press the **DATA** switch to scroll the following selections:

ELAPSED TEST TIME	**TEST ENDS IN**
ELAPSED DAYS	**TOD**
ELAPSED TEST SEC.	**MDY**

ELAPSED TEST TIME – The elapsed test time in hours/minutes/seconds since the **RESTART** switch was pushed. This counter operates in a 24 hour mode.

ELAPSED DAYS – The length of the test in days. This count begins at start of test and rolls over every 24 hours.

ELAPSED TEST SECONDS – The total elapsed test time in seconds regardless of pattern sync.

TEST ENDS IN – The amount of time remaining until the current test is completed is set up in Auxiliary menu #3. Display shows seconds remaining for a timed test or CONTINUE for a continuous test. Use Auxiliary menu 3 to change the test length.

TIME OF DAY – The time of day in hours:minutes:seconds in 24 hour format.

MONTH/DAY/YEAR – The month (1–12)/day (01–31)/year (19xx).

2.1.8.7 T1E1* Type Menus

The T1E1 TYPE option allows the 5575B to transmit and receive the PRM (Performance Report Messages) message–oriented parameters listed below. PRM messages may be transmitted (in one second intervals) for the purpose of emulating an ESF CSU. Received PRM messages are extracted and decoded from the 4K–bit/second data link of an ESF signal. This option allows the user to test the incoming side of the line and extract test results from the other side of the network at a single point in the network. Refer to option manual 34–00170.

PRM–EFE
PRM–G1
PRM–G2
PRM–G3
PRM–G4
PRM–G5
PRM–G6
PRM–SE
PRM–FE
PRM–LV
PRM–SL
PRM–LB

2.1.8.8 TXPORT* Type Menus

The TXPORT TYPE option permits the 5575B to loop and collect status information (listed below) from TXPORT addressable repeaters. This allows the technician to test span performance and rapidly locate span failures. Refer to option manual 34–00167.

S1 SIG LEVEL
S1 CRC ERR
S1 BPV ERR
S1 TX STAT
S2 SIG LEVEL
S2 CRC ERR
S2 BPV ERR
S2 TX STAT
POWER STAT

2.1.8.9 G.821* Type Menus

The G.821 TYPE option is used to monitor the performance of a T1 span. The G.821 option uses the number of errors seen in a given amount of time to determine available or unavailable time. G.821 selections are listed below. Refer to option manual 34–00169.

ERRORED SEC
ERROR FREE SEC
SEVERELY ERR SEC
%SEV ERRORED SEC
UNAVAILABLE SEC
AVAILABLE SEC
%AVAILABLE SEC
DEGRADED MINUTES
%DEGRADED MINUTES

*Optional.

2.1.9 HISTORY CLEAR Key

The **HISTORY CLEAR** key is used to clear all history LEDs. This key does **not** clear data or alarm LEDs.

2.1.10 PRINT Key

The **PRINT** key is used to print test results from an external printer. The printer function must be enabled in Auxiliary menu #14 prior to printing. Test results are selected at Auxiliary menu #15. Printing will occur automatically if print conditions such as ERROR or TIME are set up in Auxiliary menu #16.

The PRINT key will print results selected at menu #15 in all modes except BTP and MPT. When in either BTP or MPT mode, the **PRINT** key will print only the results of the respective test.

NOTE Do not exit BTP or MPT mode prior to printing. Results are purged when another mode is selected.

2.1.11 RECALL Key

The **RECALL** key is used to recall from memory any one of five different pre-installed programs. Any or all programs may be modified to meet specific needs. Refer to paragraph 3.10 through 3.12.

2.1.12 Error Injection Keys

The three ERROR INJECT keys allow insertion of LOGIC, BPV, and FRAME errors into the data stream (Table 2-3). Press any **ERROR INJECT** key one time to inject a single error; press and hold any **ERROR INJECT** key for three seconds to inject an error rate (previously set in Auxiliary menu #1). The key will light to indicate the rate is being injected.

Table 2-3. Error Injection Chart.

MODE	LOGIC	BPV	FBIT
UNFRAMED	X	X	N/A
D4	X	X	X
ESF	X	X	X
SLC®96	X	X	X

2.1.16 AUX MENUS Switch

The 5575B employs 18 Auxiliary Menus which are activated by the **AUX MENUS** switch (Figure 2–2). Each menu is numbered on the left side of the display. Menus scroll forward (1, 2, 3, ...) when the **AUX** end of the switch is pressed and scroll backward (13, 12, 11, ...) when the **MENUS** end of the switch is pressed.

When **AUX MENUS** are activated, the blue silkscreens on the front panel designate the replacement functions of the **PATTERN**, **CODE**, and **LOOP CODES/EXIT** switches. The **PATTERN** switch becomes an up/down arrow to scroll the selections in each Auxiliary menu. The **CODE** switch becomes a left/right arrow to move the cursor to the next or previous field in each Auxiliary menu. (The blinking parameter or the parameter with an underline is the current cursor location). The **LOOP CODES** switch becomes the **EXIT** switch to exit the Auxiliary mode and resume normal testing.

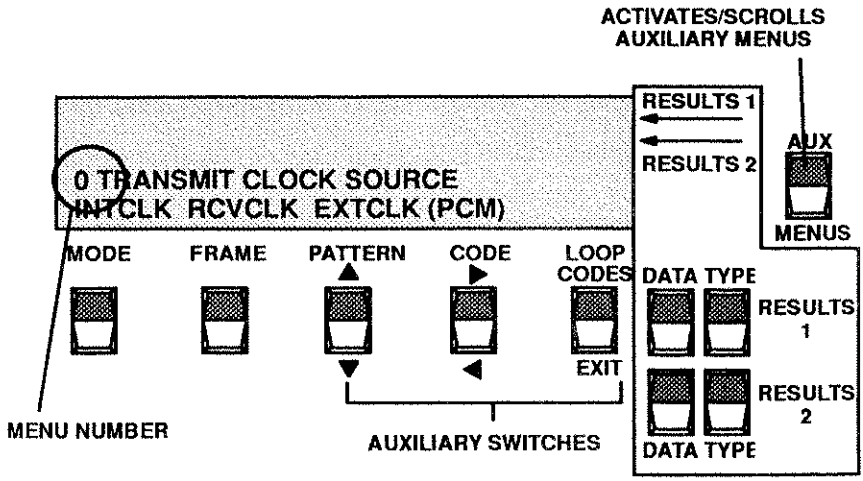


Figure 2–2. Auxiliary Menu Operation.

The following list includes each numbered auxiliary menu. The default parameters for each menu are underlined.

0 TRANSMIT CLOCK SOURCE
INTCLK RCVCLK EXTCLK(PCM)

1 ERROR INJECT RATES
LOGIC: 1E–6 BPV: 1E–6 FRAME: 1E–3

2 LINE BUILD OUT (LBO)
0 dB –7.5 dB –15 dB

3 TEST LENGTH (0 IS CONTINUOUS)
HOURS: 000 MINUTES: 00 SECONDS: 00

4 FT1 SETUP USE RESTART TO SET/CLR CHANS

```
                    1         2
 4 CHAN 12345678901234567890123 4
        -----x---------- Nx56
```

5 USER PATTERN 1 [FO]HEX
LSB 11110000

6 USER PATTERN 2 [FC]HEX
LSB 11111100

7 ESF DATA LINK FILL CODE
LSB 01111110 01111110 MSB

8 SIGNALING MODE
ROBBED BIT CCIS

9 TXPORT REPEATER SETUP
[A–Z]

10 WESTELL REPEATER SETUP
TYPE ADDRESS

11 TIME OF DAY
HR:MIN:SEC 12:00:00

12 DAY AND DATE
DAY: WED MM/DD/YR: 07/03/91

13 STORE USER PROGRAMS ?
NO YES

14 PRINTER PORT MODE
ON OFF

15 PRINTER DATA SELECTION
[BE] [BER] [ES] [EFS]

16 PRINT CONDITIONS
RATE: ERROR RATE: END OF TEST

17 PRINTER PORT SETUP

BAUD	SIZE	PARITY	STOP BITS
9600	7	ODD	1

18 REMOTE PORT SETUP

BAUD	SIZE	PARITY	STOP BITS
9600	7	ODD	1

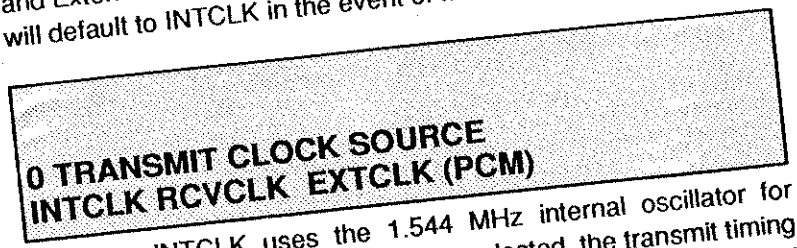
19 RELOAD 5575 MEMORY ?
NO YES

50 TDR SETUP

LENGTH	CABLE TYPE	VP
5000	PIC 22	67

2.1.16.1 Transmit Clock Source – Auxiliary Menu #0

The Transmit Clock Source menu is used to select the transmit timing source. Internal Clock (INTCLK), Receive Clock (RCVCLK), and External Clock (EXTCLK(PCM) may be selected. The test set will default to INTCLK in the event of memory loss.



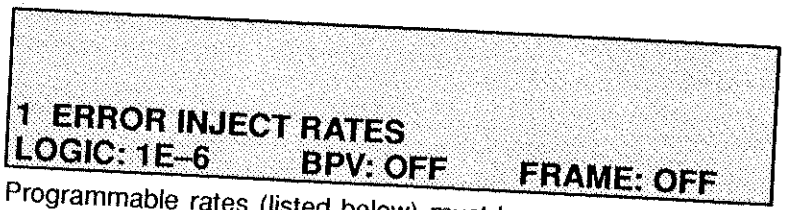
Selecting INTCLK uses the 1.544 MHz internal oscillator for transmitter timing. When RCVCLK is selected, the transmit timing source is taken from the clock signal recovered from the received data. An External Clock (either a T1 reference clock or a TTL clock) may also be used to drive the transmitter clock.

The blinking option is the current menu selection.

NOTE If the 5575B is to be used as the clock source, INTCLK should be selected. If RCVCLK or EXTCLK are selected when using the 5575B as the clock source errors will occur.

2.1.16.2 Error Inject Rates – Auxiliary Menu #1

The 5575B is capable of injecting logic, BPV, and frame errors into the transmitted bit stream in the INT LOOP, BTP, MPT, T1 NORM, T1AUTO, FT1 NORM, and FT1 D/I modes. BPV errors may also be injected in LINELB mode. The Error Inject Rates menu is used to select programmable rates. (Single error injection requires no setup.) Multiple programmable error inject categories allow the user to select all types or only one type of error and dictate the rates at which each type of error will be injected.



Programmable rates (listed below) must be set from this menu. After the rate has been programmed, press and hold the desired **LOGIC**, **BPV**, or **FRAME ERROR INJECT** key for three seconds to inject the specified error rate.

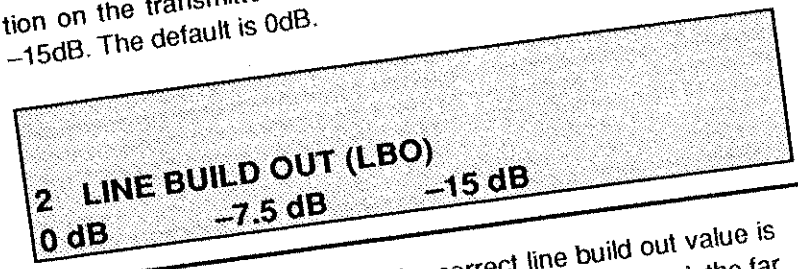
1.0 E–3 = 0.001 = 1 bit error in 1000 bits
1.0 E–4 = 0.0001 = 1 bit error in 10,000 bits
1.0 E–5 = 0.00001 = 1 bit error in 100,000 bits
1.0 E–6 = 0.000001 = 1 bit error in 1 million bits
1.0 E–7 = 0.0000001 = 1 bit error in 10 million bits
1.0 E–8 = 0.00000001 = 1 bit error in 100 million bits
1.0 E–9 = 0.000000001 = 1 bit error in 1 billion bits

NOTE LOGIC and BPV errors can be inserted in all transmitted data.

Selecting OFF for all error types at the Error Injection Rate menu will prevent the 5575B from injecting error rates. Single errors may still be injected when OFF is selected at the Error Injection Rate menu by a single depression of the error inject keys.

2.1.16.3 Line Build Out – Auxiliary Menu #2

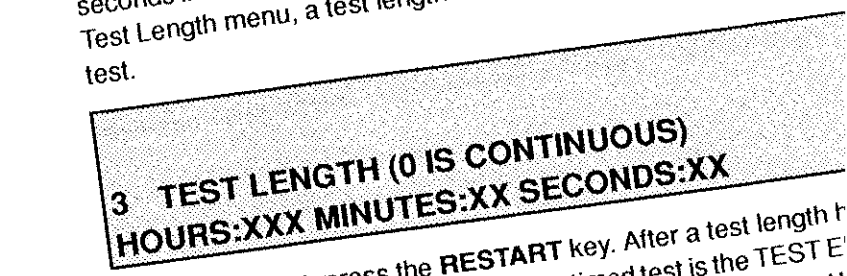
The Line Build Out menu is used to select the line build out emulation on the transmitter signal. Selections are 0dB, –7.5dB, and –15dB. The default is 0dB.



NOTE Make sure that the correct line build out value is selected. If the incorrect value is selected, the far end receiver may cause errors.

2.1.16.4 Test Length – Auxiliary Menu #3

The Test Length menu allows the operator to program a test length that is continuous (all zeros) or up to 999 hours, 59 minutes, and 59 seconds in increments of one second. As noted in the top line of the Test Length menu, a test length of 00:00:00 denotes a continuous test.

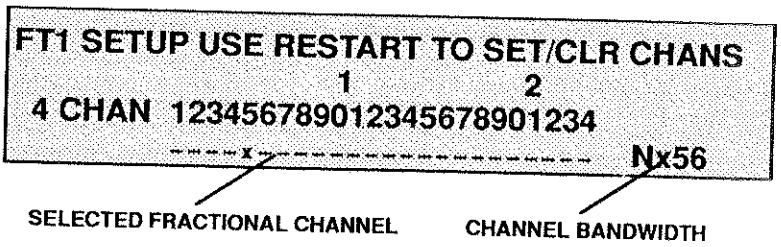


To begin the test, press the **RESTART** key. After a test length h
been selected, the time remaining for a timed test is the TEST E
parameter and is not dependent on any variable such as signal l
or pattern sync loss. The test length does not decrement durin
auto evaluate cycle. Once the cycle is complete, the length
timed test will start counting down. The 5575B will stop testing a
assigned test length if CONTINUOUS mode is not selected an
LED in the RESTART switch illuminates. Press the **RESTAR**
to begin a new timed test.

2.1.16.5 Fractional T1 (optional) – Auxiliary Menu #4

The Fractional Channel Selection is used to select each of the 24 DS0 channels as active or inactive for fractional modes. Only the active channels are used for BERT or Drop/Insert in the fractional modes.

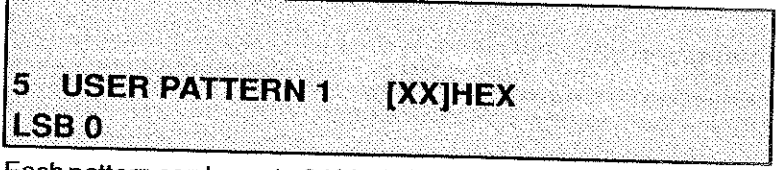
The Channel Bandwidth portion of this menu is used to select the bandwidth of the active channels in fractional modes. If 56kbps is selected, only the first 7 bits of each active channel are used for BERT or Drop and Insert. If 64kbps is selected, all 8 bits of each active channel are used for BERT or Drop and Insert.



NOTE This menu is only applicable when the Fractional T1 option is installed.

2.1.16.6 User Pattern 1 – Auxiliary Menu #5 and #6

Auxiliary Menus 5 and 6 provide for user–defined patterns.



Each pattern can be up to 64 bits in length and may be used to send out a pattern with more than 14 consecutive zeros or any other pattern the user may wish to transmit. The bottom line of the display is used to enter the pattern. The cursor is the underline mark. Arrow keys are used to move the cursor and enter or change the state of a bit. The **RESTART** key clears the pattern. HEX characters are displayed for reference only and cannot be accessed. (Refer to Diagram 3–8 for HEX Conversion tables.)

2.1.16.7 ESF Data Link Fill Code – Auxiliary Menu #7

The ESF Data Link Fill Code menu allows the user to program a data link code to be transmitted. This message can be any of the defined ESF Data Link messages (Protection command, Yellow Alarms, etc.) or any other 16 bit pattern as defined by the user. The test set must be set to ESF framing and should be set to to any mode except CSU mode to transmit the programmed code. The **RESTART** key is used to return the 16 bit fill code pattern to Idle Code (7EH).

```
USE RESTART TO SELECT IDLE CODE (7E'S)

7  ESF DATA LINK FILL CODE
   LSB  01111110 01111110 MSB
```

NOTE This menu is used to transmit programmed codes. The 5575B test set will not respond when these codes are received.

2.1.16.8 Signaling Mode – Auxiliary Menu #8

The Signaling Mode menu is used to select the method the 5575B uses to extract signaling data from the bit stream.

```
8  SIGNALING MODE
ROBBED BIT        CCIS
```

Either robbed bit signaling or common channel interoffice signaling (CCIS) can be selected. In the robbed bit mode, the 5575B extracts the A and B signaling bits from the eighth bit of each channel in frames 6 and 12 for D4 and SLC®96 framing (refer to Appendix B for signaling chart). For ESF mode, the A, B, C, and D signaling bits are extracted from all channels in frames 6, 12, 18, and 24, respectively

The signaling bits are displayed in channel order from left to right on the front panel. The channel order for D4 and ESF is the standard D3/D4 channel sequence 1–24. For SLC®96, the channel order is D1D sequence (1, 13, 2, 14, etc.).

In the CCIS mode the A and B signaling bits are extracted from bits 2 and 3 of channel 24 of all frames excluding frame 24 which is used for synchronization. The 23 CCIS A and B bits are displayed left to right as they are extracted from channel 24 after synchronization. (Refer to Appendix B for CCIS format chart).

2.1.16.9 TXPORT REPEATER SETUP – Auxiliary Menu #9

Auxiliary menu #9 (TXPORT REPEATER SETUP) is used to select one of 26 repeater addresses (A thru Z). This menu is always present, even if the option is not installed. If this option is installed, "TXPORT" may be selected using the TYPE switches. Refer to Phoenix option manual 34–00167.

TXPORT REPEATER SETUP

9 TXPORT REPEATER ADDRESS
– – – > A < – – –

2.1.16.10 WESTELL REPEATER SETUP – Auxiliary Menu #10

Auxiliary menu #10 (WESTELL REPEATER SETUP) is used to select the repeater type (OFFICE or LINE) and address (0001 thru 1999). This menu is always present, even if the option is not installed. Refer to Phoenix option manual 34–00184.

WESTELL REPEATER SETUP

10 TYPE ADDRESS
OFFICE 0001

2.1.16.11 Time of Day – Auxiliary Menu #11

The Time of Day menu allows the user to set the real time clock in the 5575B.

```
11 TIME OF DAY
HR:MIN:SEC      XX:XX:XX
```

The clock is programmed for 24 hour format. Only the hours and minutes are set. The seconds field is zeroed when the clock is set. The real time clock is battery backed–up so the user should not have to set the time of day except for changing time zones or changing from standard to daylight time. The real time clock is used by the printer and remote port drivers to stamp the time and date on printed results.

2.1.16.12 Day and Date – Auxiliary Menu #12

The Day and Date menu selects the current day of the week and date for the battery–backed clock.

```
12 DAY AND DATE
DAY: WED      MM/DD/YR: 07/03/91
```

Once entered, the date is kept current, even with the 5575B switched off. The day and date appear on all 5575B printouts.

2.1.16.13 Store User Programs – Auxiliary Menu #13

The Store User Programs menu is used to gain access to the user program storage function.

```
13 STORE USER PROGRAMS
NO          YES
```

The right cursor key is used to select "YES". Refer to section 3.11 to operate the store and recall feature. Once selected the display will appear as shown below.

```
SELECT USING ASSOCIATED KEY

1      2      3      4      5
```

The unit is now prompting the user to save current setups in one of programs 1 through 5 or to abort storage using the **RESTART** key.

2.1.16.14 Printer Port Mode – Auxiliary Menu #14

The Printer Port menu enables or disables the printer function. If enabled, test results will be printed, as they occur, with a date and time stamp.

```
14 PRINTER PORT MODE
ON    OFF
```

The 5575B printer port is a RS–232 serial port. The configuration is user programmable to match most commonly used serial printers.

The printer format has been set up to print output on a 40 column format line. All printed lines are terminated with a carriage return/line feed. The only handshake required is the DTR line from the printer. Refer to section 4 for additional information.

2.1.16.15 Printer Data Selection – Auxiliary Menu #15

The Printer Data Selection menu allows the user to specify which collected data parameters to print. There are a possible 53 parameters that can be printed. Any number of parameters from 0 to 53 may be selected at any time.

A selected parameter will appear on the display surrounded by square brackets. In the example below, bit errors and bit error rate have been chosen for printing.

```
15 PRINTER DATA SELECTION
[BE      ] [BER      ] ES      EFS
```

The remaining data selection displays are shown as follows:

```
15 PRINTER DATA SELECTION
 %EFS     SES      CSES     CSER
```

```
15 PRINTER DATA SELECTION
 PSL      PSLS     BPV'S    BPV RATE
```

```
15 PRINTER DATA SELECTION
 BPV ES   FBE      FBER     FSL
```

```
15 PRINTER DATA SELECTION
 FSLS     FB ES    CRC ERR  CRC RATE
```

```
15 PRINTER DATA SELECTION
CRC ES   SIGLOS   SIGLSEC   ETtotal
```

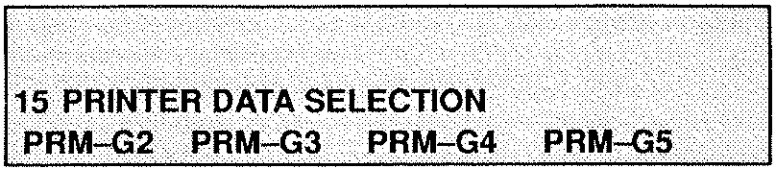
```
15 PRINTER DATA SELECTION
ETStotal   EDtotal   TEST END   DENSITY
```

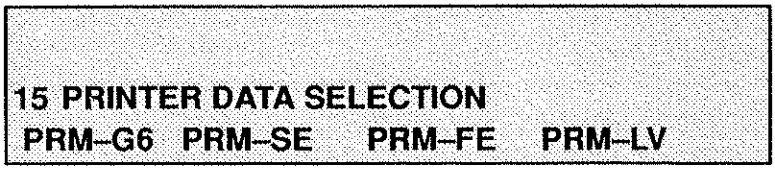
```
15 PRINTER DATA SELECTION
BALM SEC YALM SEC  RFQ MAX RFQ MIN
```

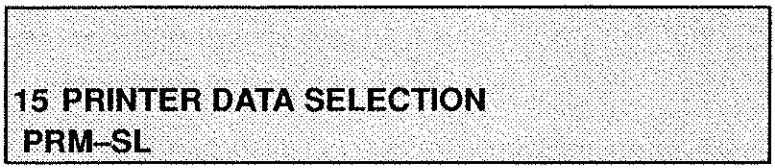
```
15 PRINTER DATA SELECTION
RX FREQ   P–P VLT   P–P dB   CLK SLP
```

```
15 PRINTER DATA SELECTION
SLIPRATE  FSLIPS+  FSLIPS–  WANDER+
```

```
15 PRINTER DATA SELECTION
WANDER–  SMPLX CUR  PRM–EFE  PRM–G1
```

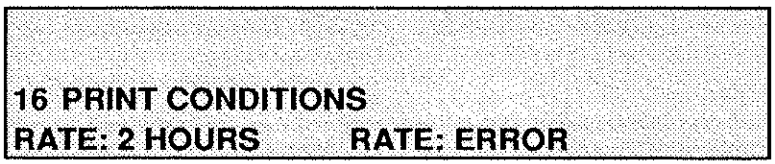






2.1.16.16 Print Conditions – Auxiliary Menu #16

The Print Conditions menu allows the user to select the conditions under which the selected data parameters will be printed.



Two different rates may be selected (in the example shown above, the selected parameters will be printed every 2 hours and every time an error occurs in a print selected parameter). The available conditions for either are:

	————	off
1	MINUTE	prints every minute based on real time
5	MINUTES	prints every 5 minutes
10	MINUTES	prints every 10 minutes
15	MINUTES	prints every 15 minutes
30	MINUTES	prints every 30 minutes
1	HOUR	prints every hour
2	HOURS	prints every 2 hours
6	HOURS	prints every 6 hours
12	HOURS	prints every 12 hours
24	HOURS	prints every 24 hours
END OF TEST		prints all selected parameters at test end
ERROR		prints selected parameters whenever a change has occurred to any selected parameter
CRC ERR SEC		prints internally tested CRC errors occurring in the previous second

The ERROR option will print only as a result of an actual error. Results of errors, for instance, bit error rate (BER), will not cause the printer to print. At least one of the parameters listed below must be selected in order for the ERROR print to force a printout.

Bit Errors
Pattern Sync Losses
Bipolar Violations
Frame Bit Errors
Frame Sync Losses
Frame Severely Errored Seconds
CRC Errors
Signal Losses
Frame Slips
Yellow Alarms
Blue Alarms
Density
Severely Errored Seconds
Consecutive Severely Errored Seconds
RX Frequency Deviations
RX Level Deviations (Monitor Mode Only)

2.1.16.17 Printer Port Setup – Auxiliary Menu #17

The Printer Port Setup menu is used to select the baud rate, character size, port parity, and stop bits to be used when the 5575B is sending data to the printer port.

PRINTER PORT SETUP				
17	BAUD	SIZE	PARITY	STOP BITS
	9600	7	ODD	1

Selectable options:

Baud rate: 300, 1200, 2400, 4800, or 9600
Character size: 7 or 8 bits per character (ASCII format)
Parity: NONE, ODD, or EVEN
Stop bits:1 or 2 bits

2.1.16.18 Remote Port Setup – Auxiliary Menu #18

The Remote Port Setup menu allows the user to select the baud rate, character size, port parity, and stop bits of the 5575B remote port to match those of the terminal.

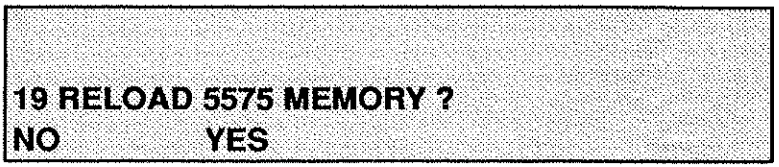
REMOTE PORT SETUP				
18	BAUD	SIZE	PARITY	STOP BITS
	9600	7	ODD	1

Selectable options:

Baud rate: 300, 1200, 2400, 4800, or 9600
Character size: 7 or 8 bits per character (ASCII format)
Parity: NONE, ODD, or EVEN
Stop bits:1 or 2 bits

2.1.16.19 Reload 5575 Memory ? – Auxiliary Menu #19

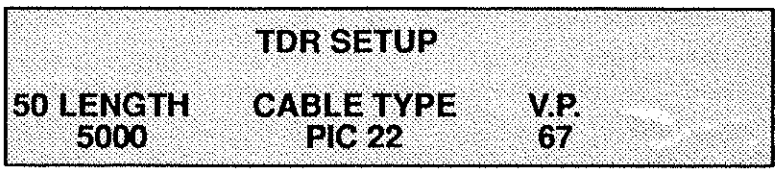
The Reload 5575 Memory menu allows the user to download firmware to the 5575B from a computer or a modem link. Review paragraph 2.5 before selecting the YES option.



NOTE Do not select "YES" unless you are ready to download new firmware into the 5575B.

2.1.16.20 TDR SETUP – Auxiliary Menu #50

The TDR Setup menu allows the user to select the approximate distance the TDR will test the cable pair, cable type and Vp (propagation velocity). If AUTO is selected for the cable length, the TDR will test the cable pair to the first fault. As the cable type is scrolled, the Vp is automatically changed unless USER is selected for the cable type. The USER cable type selection allows the Vp to be set from 40–99 using the up and down arrow keys. Refer to Phoenix manual 34–00165 for additional information.



2.1.17 Display/View Angle

The forty–character by four–line display allows the user to select test configurations. The recessed **VIEW ANGLE** control, located above the display window between the NETWORK and EXPANSION connectors, is used to change the display's view angle.

2.2 INDICATORS

Status, alarm, framing, signal presence, and coding information can be monitored from front panel LEDs (Diagram 1 in the Diagram section of this manual). Status and alarm LED's illuminate when an out of tolerance condition is detected. When the condition clears up, the status and alarm LEDs go off and the HISTORY LED's illuminate to denote a history of the event. The following is a list of the indicators which are defined in paragraphs 2.2.1 through 2.2.3.

STATUS	ALARM	HISTORY
RX PULSES	TEST SUMMARY	B8ZS
FRAME SYNC	SIGNAL LOSS	SIGNAL LOSS
PATTERN SYNC	FRAME LOSS	FRAME LOSS
B8ZS	PATTERN LOSS	PATTERN LOSS
	DENSITY	DENSITY
	ALL ONES	ALL ONES
	YELLOW ALARM	YELLOW ALARM
	POWER LOSS	
	LOW BATTERY	

2.2.1 Status LEDS

Status LEDs (green) provide a visual indication of the current status of a test.

a. **RX PULSES** – ON indicates presence of signal at receive jack.

b. **FRAME SYNC** – ON indicates the 5575B is in frame sync with incoming data.

c. **PATTERN SYNC** – ON indicates the 5575B is in pattern sync with incoming data.

d. **B8ZS** – ON indicates the 5575B is receiving B8ZS.

2.2.2 Alarm LEDS

Alarm LEDs (red) provide a visual indication of the current alarm conditions during a test.

a. **TEST SUMMARY** – In all modes of operation the 5575B informs the user of an error by illuminating the TEST

SUMMARY LED. The TEST SUMMARY LED indicates when B8ZS, No Signal, Density, Blue Alarms, CRC Alarms, Frame Bit Errors, Bipolar Violations, Bit Errors, Line Coding Errors, AMI Detected, and Frequency Deviation errors are detected.

When the TEST SUMMARY LED illuminates (an audible alarm also sounds when an error has been detected), press the **TYPE 1** or **TYPE 2** keys until the "Summary" Type is displayed. The 5575B automatically displays the error detected. If more than one parameter is in error, the remaining error(s) may be viewed by successive depressions of the associated **DATA** key (1 or 2). The only time the Test Summary feature is disabled is during the Auto Evaluate cycle. At the completion of the evaluate cycle, all results are cleared, including test summary results. Then the test summary is re–armed and ready to alert the user of any errors.

NOTE The **RESTART** key will reset the TEST SUMMARY LED to the OFF state and will also clear all collected parameters.

---

b. **SIGNAL LOSS** – ON indicates current loss of signal on Rx jack for more than150ms.

c. **FRAME LOSS** – ON indicates 2 out of 5 Ft bits are in error for D4 and SLC96 framing or 2 out of 5 framing bits are in error for ESF framing.

d. **PATTERN LOSS** – ON indicates 100 bit errors are counted in 1000 or less data bits for the pattern selected.

e. **DENSITY** – ON indicates excess zeros; Insufficient ones. The 5575B complies with AT&T Technical Reference PUB62411 and ANSI T1.403 Network Interface Specifications for density testing.

f. **ALL ONES** – ON indicates unframed all ones (complies with Bellcore TR–TSY–000191. 14 or less zeros out of 13,985 bits). Framed all ones (168 consecutive frames with all ones in the payload data).

g. **YELLOW ALARM** – ON indicates D4 = Bit 2 is 0 for 255 consecutive channel; ESF = alternating eight 1's/eight 0's pattern on 4kbps data link.

h. **POWER LOSS** – ON indicates ac power was present and was removed; indicates during power up that during the previous power cycle the unit was shut down due to low battery power. The POWER LOSS LED is cleared when either the **RESTART** key or the **HISTORY CLEAR** key is pressed.

i. **LOW BATTERY** – ON indicates that there are less than 10 minutes of battery life remaining before the battery protection circuit turns off the 5575B.

2.2.3 History LEDS

History LEDs provide a visual indication of the history of an alarm condition. Press the **HISTORY CLEAR** key to clear History LEDs.

a. **B8ZS** – ON indicates a previously received B8ZS substitution.

b. **SIGNAL LOSS** – ON indicates previously received loss of signal on Rx jack.

c. **FRAME LOSS** – ON indicates previously received loss of selected frame type sync.

d. **PATTERN LOSS** – ON indicates previously received loss of selected pattern sync.

e. **DENSITY** – ON indicates a previous density condition.

f. **ALL ONES** – ON indicates a previous condition of all ones.

g. **YELLOW ALARM** – ON indicates a previous yellow alarm condition.

2.3 CONNECTORS

T1 span connectors are provided on the front panel of the 5575B (Diagram 1 in the Diagram section of this manual). The power receptacles are located on the side panel. The following is a list of the connectors which are defined in paragraphs 2.3.1 through 2.3.2.

FRONT PANEL	SIDE PANEL
RX	POWER
TX	CHASSIS GROUND
T1 Ref/TDR	FUSE
NETWORK	REMOTE
EXPANSION	PRINTER

2.3.1 Front Panel

a. **RX** – Type WECO 310 and Bantam jacks with ALBO for –35dBdsx.

b. **TX** – Type WECO 310 and Bantam jacks.

c. **T1Ref/TDR** – Type WECO 310 and Bantam jacks (used as reference for clock slip measurement or for TDR input/output).

d. **NETWORK** – Standard 15–pin ISO 49081 tip–ring NI connector can be used for connection to Model 5564, 5565, 5565/96A, 5585, or 5587 options. (Appendix C provides network interface pin assignments.)

e. **EXPANSION** – Future use for advanced lid options.

2.3.2 Side Panel

a. **POWER** – The 5575B can be powered by connecting a 110/220 vac power source to the panel located on the right side of the test set and to recharge the optional internal battery.

The 5575B operates from an internal 12 volt, 3 amp–hour, lead–acid battery providing a typical operating life of greater than 2 hours in continuous service. The battery is constantly being recharged as long as the ac power is present.

The 5575B's auto shutdown feature preserves battery life. If the test set is operating from the internal battery alone and a test is complete (**RESTART** key LED is on), the unit will turn itself off if a test is not in process and there is no front panel key activity or remote control activity for 10 minutes. There is also an under–voltage circuit in the unit that monitors the charge of the battery. Should the battery be discharged to the specified level, the unit will automatically turn itself off regardless of the status of the test in progress. For this reason it is highly recommended that for long term testing the unit be plugged into an external power source. The LOW BATTERY LED on the front panel will be illuminated when approximately 10 minutes of battery charge remain. External power may be applied to the 5575B at any time with no detrimental effects on the test in progress.

The 5575B also is constantly checking the condition of the external power source. If the unit is running off external power and the power is interrupted, the 5575B will switch to its internal battery and illuminate the POWER LOSS LED. When the external power is restored, the unit will revert back to using external power. The POWER LOSS LED can be turned off by pressing the **HISTORY CLEAR** key or the **RESTART** key. This feature could be useful in attributing errors during a test to an external environmental failure.

b. **CHASSIS GROUND** – The safety ground connection is wired directly to the chassis.

c. **FUSE** – The 1A, 250V, SLO–BLO line fuse is located directly above the ac receptacle. Always use the correct fuse size.

d. **REMOTE PORT** –The remote port is an RS–232 serial data interface. The connector consists of a 9–pin connector configured for DTE which requires a "null modem" cable for direct connection to a terminal. Prior to connecting the 5575B to the terminal, modem, or computer, the remote port characteristics must be set to match those of the connecting device. The Remote Port Setup menu (Auxiliary menu #16) allows the user to select the serial bit rate, number of bits per character, the number of stop bits, and parity.

Simplicity of operation has been achieved by minimizing the use of the RS–232 signaling leads. The 5575B monitors the Clear To Send (CTS) line of the device to which it is connected. When this line is set true (high) by the device, the 5575B assumes that the device is ready to accept a byte of data. The 5575B then asserts Return To Send (RTS) when it sends a character to the remote device. The 5575B asserts Data Terminal Ready (DTR) true (high) whenever it is ready to accept data from an external controller. The remote port will also respond to XON (CTRL S)/XOFF (CTRL Q) flow control.

Refer to section 5 for additional remote operation information and RS–232 pin configuration.

e. **PRINTER PORT** – The printer port is an RS–232 ASCII serial data interface. Hard copy of selected test results are available by connecting a 40 column ASCII serial interface printer to the printer port. The port consists of a 9–pin connector configured for DCE to allow for direct connection to a printer. Prior to connecting the 5575B to the printer, the port characteristics must be set to match those of the printer. The Printer Port Setup menu (Auxiliary menu #17) allows the user to select the serial bit rate, number of bits per character, number of stop bits, and parity.

The printer port pins required are ground (SG), receive data (RD), and data terminal ready (DTR). The 5575B monitors the DTR line of the printer. When this line is set true (high) by the printer, the 5575B assumes the printer is available to receive a byte of data. No other handshaking is required, although all other control signals are driven or monitored for connection to other DTE type devices.

Refer to section 4 for additional printer operation information or the printer RS–232 pin configuration.

2.4 TEST SET OVERVIEW

Two types of menus are displayed on the 5575B; Results and Auxiliary (Diagram 2 in the Diagram section of this manual). Results menus select the desired test (i.e., line coding errors, bit errors, or bipolar violations), while always displaying the current test set configuration (Figure 2–3). Auxiliary menus are used for infrequently used test setups (i.e., transmit clock source, error injection rates, or test length).

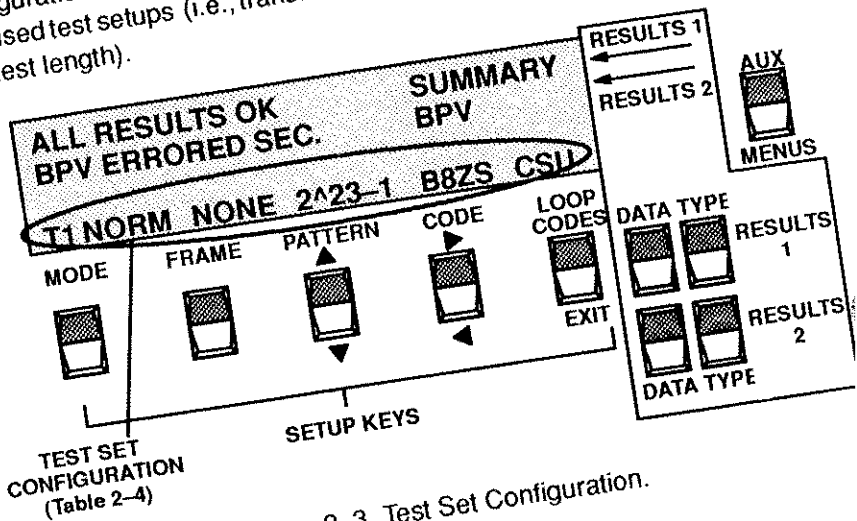


Figure 2–3. Test Set Configuration.

Table 2–4. Setup Key Options.

MODE	FRAME	PATTERN		CODE	LOO CODE
T1 NORM	D4	2^15–1	NET55	AMI	CSU
T1 AUTO	ESF	2^20–1	OCT55	B8ZS	FAC 1
FT1 NORM*	SLC96	2^23–1	ZEROS		FAC 2
FT1 D/I*	NONE	QRSS	ONES		PYLD*
CSU		3:24	USER 1		NWR
LINE LB		1:7	USER 2		LINE*
INT LOOP		1:1	USER 3*		TXP
BTP					WES
MPT					
TDR*					

* Option.

** ESF Framing.

2.5 SOFTWARE DOWNLOAD

The 5575B test set equipped with a download bootrom, permits the download of software for field upgrades. The following procedure may be used to install the Fractional T1, T1E1, Long User Pattern, Repeater Loop Code Options, G.821, and T1 Impairment software options without returning the test set to the factory.

2.5.1 Equipment Needed

1. Phoenix 5575B test set with download bootrom installed.
2. IBM compatible computer with a serial port.
3. Serial communication software, such as Procomm or Windows Terminal program.
4. One 9–pin to 9–pin straight one–to–one serial cable for an AT compatible computer (Phoenix no. 33–00171*). For an XT or a computer with a 25–pin serial port connector, a 9–pin to 25–pin adapter (Phoenix no. 33–00172*) is required for connection from the PC's serial port to the 5575B remote port.

* These cables may also be purchased from Radio Shack and are identified as catalog no. 26–152 (9–pin female to 9–pin female serial cable) and catalog no. 26–287 (9–pin male to 25–pin female serial adapter).

2.5.2 Before You Start

The bootrom firmware automatically detects and receives data from 1200 to 19200 baud. No baud rate changes are required on the 5575B. Parity, Data Bits, and Stop Bits are fixed and are as follows:

Parity: NONE
Data Bits: 8
Stop Bits: 1

NOTE These settings must be used or the download will not be successful.

2.5.3 Getting Started

Various types of software may be used for downloading purposes. Procomm version 2.01 software is used in the example below.

1. Connect the serial cable from the remote port on the 5575B to the serial port on the PC.
2. Turn both units on.
3. Start the communications software on the PC. Set the parity, data bits, and stop bits. Clear the terminal screen. For Procomm Plus software, start the software by pressing "pcplus<return>" at the prompt.
4. Press any key to enter terminal mode.
5. Press and hold the "Alt" key and press the "S" key simultaneously. This will display the Setup Utility menu.
6. Use the arrow keys to move to the "PROTOCOL OPTIONS" selection and press "Enter" to display the Protocol Option menu.
7. Use the arrow keys to move to the "ASCII PROTOCOL OPTIONS" selection and press "Enter" to display the ASCII Transfer Options menu.
8. Set the character pacing and line pacing to zero.
9. Press "Esc" until you return to the terminal screen.
10. Press "Alt–P" to display the LINE/PORT SETUP menu.
11. Press "Alt–N" to select the required parity, data and stop bits.
12. Select the COM port and baud rate (19200 or 9600 recommended) to be used.
13. Press Exit to exit the screen.
14. Press the **AUX MENUS** key on the 5575B until menu #19 is displayed.

```
19 RELOAD 5575 MEMORY
NO          YES
```

15. Press the 5575B right arrow key to select YES. The following alternating screens will be displayed.

```
RELOAD 5575 MEMORY

IF UNCERTAIN, BE SURE TO CONSULT
TECHNICAL MANUAL BEFORE PROCEEDING.
```

```
SELECT UP ARROW TO CONTINUE

IF UNCERTAIN, BE SURE TO CONSULT
TECHNICAL MANUAL BEFORE PROCEEDING.
```

```
PRESS RESTART TO ABORT

IF UNCERTAIN, BE SURE TO CONSULT
TECHNICAL MANUAL BEFORE PROCEEDING.
```

16. Press the 5575B up arrow key to begin the download procedure. The following screen will be displayed.

```
STARTING DOWNLOAD ROUTINE
```

17. Press the PC carriage return key until the following is displayed on the terminal and the 5575B.

```
PROCOMM PLUS Ready!
Baud rate = 9600 N 8 1

Phoenix Microsystems bootrom downloader

Ready to receive downloader
```

Phoenix Microsystems bootrom downloader

STARTING DOWNLOAD ROUTINE
Ready to receive downloader

18. Press the "PgUp" key on the PC to send the DOWNLD.HEX file to the 5575B.

19. Select the ASCII transfer option. The ASCII UPLOAD screen will be displayed.

20. Type the drive and file name to be sent, e.g., "A:DOWNLD.HEX". Insert the disk and press <return>. The transfer should take less than 30 seconds at 9600 baud. When the transfer is complete, the PC will display the following message.

    JUMPING TO DOWNLOAD
    Turning 12 volts ON.
    Erasing the flash prom. Stand by.

    The 5575B will display the following message.

Phoenix Microsystems bootrom downloader

ERASING THE FLASH PROM

After a few seconds the PC will display the following message.

Verifying.
Send hex file to program into flash prom.

The 5575B will display the following message.

Phoenix Microsystems bootrom downloader

PROGRAMMING THE FLASH PROM

The flash proms have been erased and the 5575B.HEX file may be sent.

21. Press the "PgUp" key on the PC to send the 5575B.HEX file to the 5575B.

22. Select the ASCII transfer option. The ASCII UPLOAD screen will be displayed.

23. Type the drive and file name to be sent, e.g., "A:5575B.HEX". Press <return>.The transfer will vary depending on disk access time. Transfer should take less than ten minutes at 9600 baud. During the download, the firmware will display a number of stars indicating its progress. If the download is successful, the PC terminal and 5575B screen will appear as follows:

```
PROCOMM PLUS Ready!
BAUD RATE = 9600 N 8 1

Phoenix Microsystems bootrom downloader

Ready to receive downloader
JUMPING TO DOWNLOAD
Turn 12 volts ON.
Erasing the flash prom. Stand by.
Verifying.
Send hex file to program into flash prom.
*****
END OF FILE, OK.
Turning 12 volts OFF.
SUCCESSFUL DOWNLOAD. CYCLE POWER TO RESTART SYSTEM.
```

Phoenix Microsystems bootrom downloader

SUCCESSFUL DOWNLOAD
CYCLE POWER TO RESTART SYSTEM

24. Turn the 5575B off and on to start the new firmware. This is the end of the download process.

2.5.4 In Case Of Trouble

If there is an error in the transfer such as a checksum error, you may turn the 5575B off and start over. If the faulty transfer erased all or part of the flash proms, the 5575B will upon power up automatically start the download procedure. It will begin by displaying a bad checksum message on the front panel. This is normal. Refer to the Getting Started paragraph of this document to restart a download. If you have difficulty please call a Phoenix Representative for further technical assistance.

Chapter 3 – Operation

3.0 INTRODUCTION

This section provides operation procedures for the most commonly used tests using the 5575B test set. Procedures include a test set self test and example tests for in–service monitoring, out–of–service BERT testing, in–service clock slip/frame slip detection, BTP and MPT patterns, CSU emulation, and CSU and Facility loop test procedures.

If necessary, refer to section 2 for an overview of the test set. Printer and remote operation are described in section 4 and 5, respectively. All hardware and software options are described in section 6 of this manual. Operation procedures for options are provided in the manual provided with the option.

3.1 BATTERY POWER

The 5575B may be equipped with an optional internal, rechargeable battery to permit operation away from a power source. The 5575B has a built–in limiting circuit to protect the battery from overcharge regardless of how long the 5575B remains connected to the power source.

CAUTION To avoid permanent damage to the test set battery pack, charge the battery for at least 6 hours prior to use. Always maintain some level of charge on the batteries by plugging the test set into a 110/220 volt source during extended periods of storage. The test set should be **OFF** when plugged into an ac source. Charge the battery for 24 hours at least once a month. In ideal situations, the test set should be charged when it is not in use.

To charge the internal battery for the 5575B test set, proceed as follows.

a. Connect the 5575B to either 110/220 vac using the supplied power cord.

b. Leave the 5575B connected to the power source for 6 hours with the 5575B OFF to ensure a full charge.

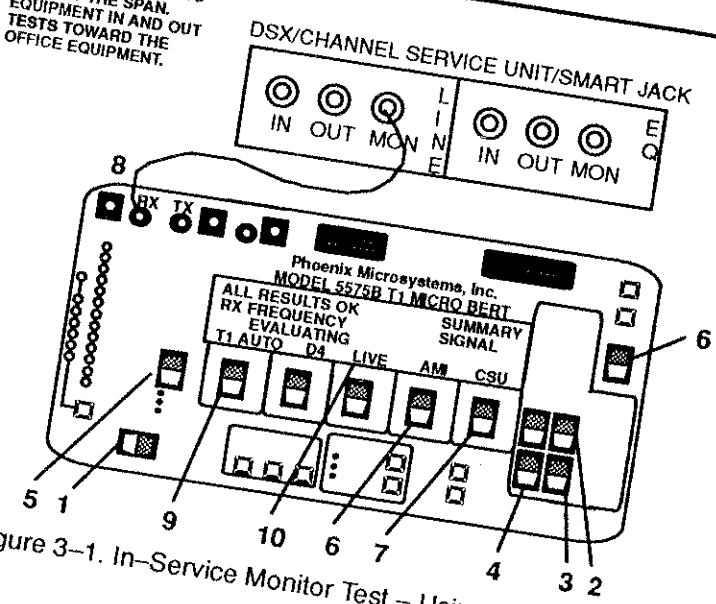
NOTE The **Why?** key aids in proper setup and error–free use by providing responses to improper setup of the equipment and to improper signal conditions. The **Why?** key assists the user by evaluating setup selections, results of completed or attempted tests, and in some cases parameters of the incoming signal and conditions of the test set itself, and directs the technician to the most immediate problem(s) at hand.

3.2 IN–SERVICE MONITOR TEST – USING AUTO–EVALUATE

The In–Service Monitor test is used to automatically setup to and test the T1 signal via the monitor jacks of the DSX, Channel Service Unit, or Smart Jack. After the test set is configured, the display should appear as shown in Figure 3–1. Selectable results that should be monitored during this test are listed below. Proceed with the following steps.

DATA	TYPE
Rx Frequency	Signal
Rx Pk–Pk dBdsx or volts	Signal
Bipolar Violations	BPV
Frame Bit Errors	Frame
CRC Errors	Frame (ESF Framing only)

CAUTION Always use the monitor DSX jack to prevent taking the T1 span out–of–service.



gure 3–1. In–Service Monitor Test – Using Auto–Evaluate.

1. Press the **ON/OFF** switch to ON.
2. Press the Results 1 **TYPE** switch until SUMMARY is displayed in the Results 1 field of the display.
3. Press the Results 2 **TYPE** switch until SIGNAL is displayed in the Results 2 field of the display.
4. Press the Results 2 **DATA** switch until RX FREQUENCY is displayed in the Results 2 field of the display.
5. Press the **RX INPUT** switch to select DSX-MON.
6. Press the **EXIT** switch to escape from Auxiliary menus.
7. Connect a test cord from the 5575B Rx jack (310 or Bantam) to the Line Side MONITOR jack (Figure 3-1) of DSX, CSU, or Smart Jack.
8. Press the **MODE** switch until T1 AUTO is selected. (If T1 AUTO is already selected, press the **RESTART** switch to restart the T1 AUTO mode.
9. The 5575B will display EVALUATING on the third line of the screen. If there is no signal present this line will display NO SIGNAL. Upon completion, the third line will display EVALUATION COMPLETE.

The 5575B will automatically analyze the incoming T1 signal and will configure it's transmitter and receiver to match the type of framing and line coding. If there is no test pattern to detect, the 5575B will recognize if the T-span is idle or if live traffic is present. If the span is idle, "ONES" will be displayed above the **PATTERN** switch. If the span has live traffic, "LIVE" will be displayed.

If no errors have occurred, the TEST SUMMARY LED will not on and the Results SUMMARY will display ALL RESULTS OK the TEST SUMMARY LED does come on, press the Result **DATA** switch to view additional errors.

3.3 OUT–OF–SERVICE BERT TEST

To perform an out–of–service BERT test, proceed with the following instructions. After the test set is configured, the display should appear as shown in Figure 3–2.

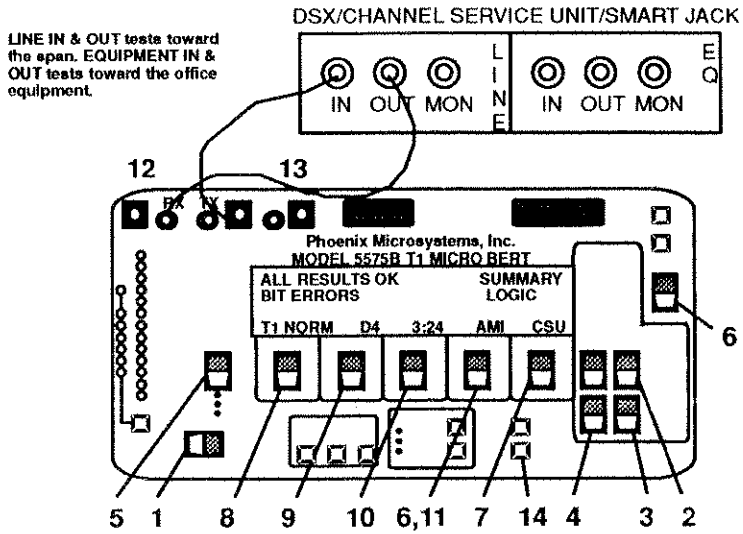


Figure 3–2. Out–of–Service BERT.

1. Press the **ON/OFF** switch to ON.
2. Press the Results 1 **TYPE** switch until SUMMARY is displayed in the Results 1 field of the display.
3. Press the Results 2 **TYPE** switch until LOGIC is displayed in the Results 2 field of the display.
4. Press the Results 2 **DATA** switch until BIT ERRORS is displayed in the Results 2 field of the display.
5. Press the **RX INPUT** switch to select TERM.
6. Press the **AUX MENUS** switch until menu #0 for Transmit Clock Source is displayed. Press the **CODE** right/left arrow switch to select INTCLK.
7. Press the **EXIT** switch to exit the Auxiliary menus.

8. Press the **MODE** switch to select T1 NORM.
9. Press the **FRAME** switch to select either D4, ESF, SLC®96, or NONE.
10. Press the **PATTERN** switch to select QRSS or 3:24 pattern.
11. Press the **CODE** switch to select either AMI or B8ZS line coding to match the equipment being tested.
12. Connect a test cord from the 5575B Rx jack (310 or Bantam) to the LINE OUT jack.
13. Connect a test cord from the 5575B Tx jack (310 or Bantam) to the LINE IN jack.
14. Press the **RESTART** switch.

    This test can be performed in many ways. The distant end can be looped through a CSU, Facility Loop Unit, or patch cord where the test data is looped back to the 5575B test set. (Use the LOOP CODES switch to loop up a CSU or facility loop device.) Another option is to do a END–TO–END type test where another test set is at the distant end, transmitting and receiving the same test data.

    If there is a signal present at the 5575B RX jack, the green RX PULSES LED will be on.

    If the received signal is in frame and pattern sync, the green FRAME SYNC and PATTERN SYNC LEDs will be on.

    If no errors have been detected, the TEST SUMMARY LED will not be on and Results 1 will display ALL RESULTS OK. If the TEST SUMMARY LED does come on, the error type will be displayed in the data field of the Summary Results (left of the Summary field). Press the Results 1 **DATA** switch to view additional errors.

3.4 IN–SERVICE CLOCK/FRAME SLIP DETECTION

To perform an In–Service Clock/Frame Slip Detection test, proceed with the following instructions. After the test set is configured, the display should appear as shown in Figure 3–3. Selectable results that should be monitored during this test are listed below.

DATA	TYPE
Frame Slips (+)	Signal
Frame Slips (–)	Signal
Max Neg Wander	Signal
Max Pos Wander	Signal
Clock Slip Count	Signal
Clock Slip Rate	Signal

CAUTION Always follow this procedure in the correct order to prevent taking the span out of service.

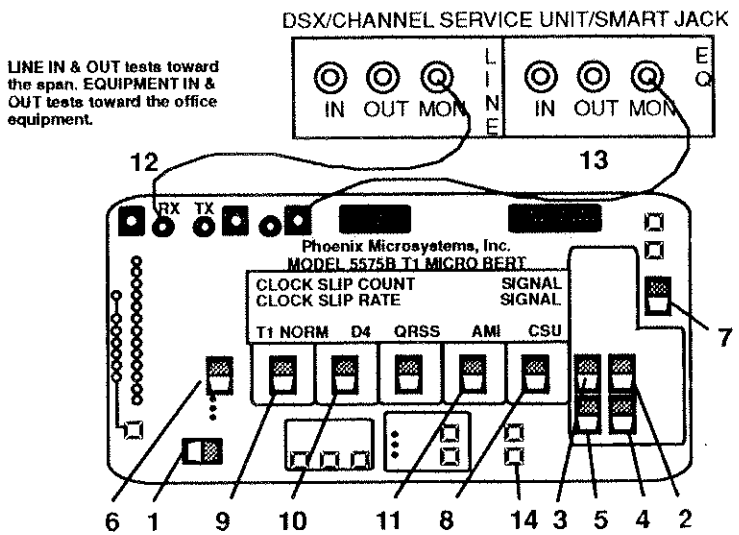


Figure 3–3. In–Service Clock/Frame Slip Detection.

1. Press the **ON/OFF** switch to ON.
2. Press the RESULTS 1 **TYPE** switch to select SIGNAL in the RESULTS 1 field of the display.
3. Press the RESULTS 1 **DATA** switch to select CLOCK SLIP COUNT.
4. Press the RESULTS 2 **TYPE** switch to select SIGNAL in the RESULTS 2 field of the display.
5. Press the RESULTS 2 **DATA** switch to select CLOCK SLIP RATE.
6. Press the **RX INPUT** switch to select DSX-MON.
7. Connect a test cord from the RX jack of the 5575B to the LINE SIDE MONITOR jack (Figure 3-3).
8. Connect another test cord from the T1 REF jack of the 5575B to the EQUIPMENT SIDE MONITOR jack.
9. Press the **MODE** switch to select T1 NORM or T1 AUTO to automatically set up the 5575B.
10. Press the **FRAME** switch to select the appropriate framing mode (D4, ESF, SLC®96, or NONE).
11. Press the **CODE** switch to select either AMI or B8ZS line coding to match how equipment is provisioned.
12. Press the **RESTART** switch.

    This is a loop timing test that compares the RX clock against the T1 REF clock. Under ideal timing conditions no clock slips should occur. If 193 clock slips occur, 1 frame slip will occur.

If there is a signal received at the 5575B jack the green RX PULSES LED will be on.

If there is no signal present at the T1 REF jack of the 5575B, the Frame Slip display will show N/A. If this is the case, check your connections from the T1 REF jack to the reference source.

If there is a signal present at both jacks, observe the frame slip displays to determine if frame slips are occurring. The CLOCK SLIP and CLOCK SLIP RATE displays can be helpful in investigating network timing problems.

3.5 MPT STRESS TEST

The MPT stress test mode sends five patterns (ONES, 1:7. 2 IN 8, 3 IN 24, and QRSS) per cycle. Each cycle runs for approximately 15 minutes at 175 seconds per pattern and will repeat transmitting the five patterns until another mode is selected. After the test set is configured, the display should appear as shown in Figure 3–4. To run the test, proceed with the following steps.

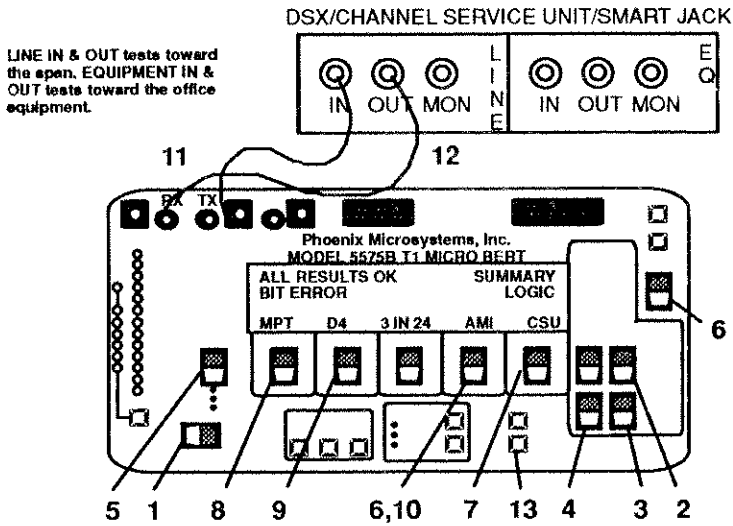


Figure 3–4. MPT Test.

1. Press the **ON/OFF** switch to ON.
2. Press the Results 1 **TYPE** switch until SUMMARY is displayed in the Results 1 field of the display.
3. Press the Results 2 **TYPE** switch until LOGIC is displayed in the Results 2 field of the display.
4. Press the Results 2 **DATA** switch until BIT ERRORS are displayed in the Results 2 field of the display.
5. Press the **RX INPUT** switch to select TERM.

6. Press the **AUX MENUS** switch to select Auxiliary menu #0 Transmit Clock Source menu. Use the **CODE** right/left arrow switch to select INTCLK.
7. Press the **EXIT** switch to return to results menu.
8. Press the **MODE** switch to select MPT.
9. Press the **FRAME** switch to select the appropriate framing mode (D4, ESF, SLC®96, or NONE).
10. Press the **CODE** switch to select either AMI or B8ZS line coding to match how equipment being tested.
11. Connect a test cord from the5575B RX jack to the LINE OUT jack (Figure 3–4).
12. Connect another test cord from the 5575B TX jack to the LINE IN jack.
13. Press the **RESTART** switch.

    ALL RESULTS OK displayed to the left of SUMMARY indicates there have been NO errored conditions. If an error is detected, the Test Summary LED will illuminate. Press the up or down arrow keys to scroll through the failed patterns displayed to the left of SUMMARY. (example: 3:24 FAILED SUMMARY). To verify that other patterns did not fail, press the top **DATA** switch. If the display does not advance to a different pattern, no other patterns failed. At the end of the test, you may go into T1 NORM mode and run the pattern that failed for a longer period of time. If the failed pattern is not one of the standard patterns in the pattern display, program the pattern into the USER 1 or USER 2 programs and run it as a USER PATTERN for further verification. (See paragraph 2.1.3 (g).)
14. Print results. If a hard copy of the MPT results is required, before changing the mode, press the **PRINT** key. All MPT results will be purged when the mode is changed from MPT to another mode.

3.6 BTP DETECTION

The BTP mode automatically transmits 21 patterns (with various ones and zeros densities) sequentially, to detect Bridge taps connected to a span. Each cycle runs for approximately 10 minutes and will repeat transmitting the 21 patterns at 23 seconds each until another mode is selected. After the test set is configured, the display should appear as shown in Figure 3–5. To run BTP, proceed with the following steps.

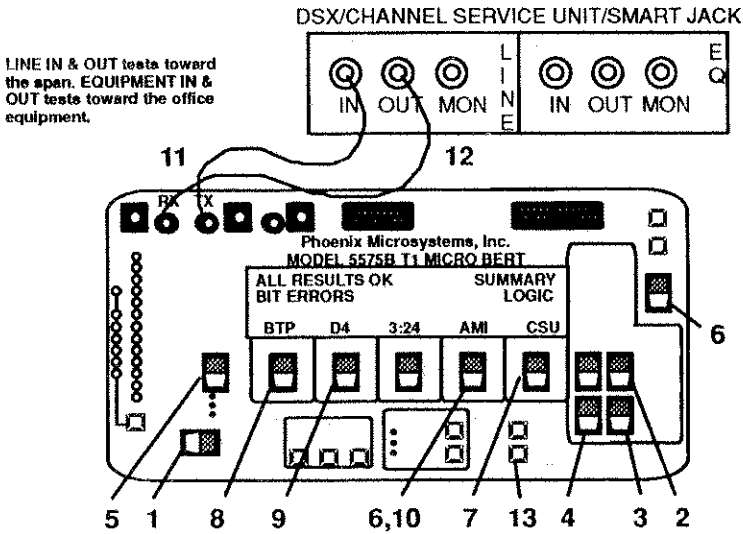


Figure 3–5. BTP Detection.

1. Press the **ON/OFF** switch to ON.
2. Press the Results 1 **TYPE** switch until SUMMARY is displayed in the Results 1 field of the display.
3. Press the Results 2 **TYPE** switch until LOGIC is displayed in the Results 2 field of the display.
4. Press the Results 2 **DATA** switch until BIT ERRORS are displayed in the Results 2 field of the display.
5. Press the **RX INPUT** switch to select TERM.

6. Press the **AUX MENUS** switch to select Auxiliary menu #0 Transmit Clock Source menu. Use the **CODE** right/left arrow switch to select INTCLK.
7. Press the **EXIT** switch to escape the Auxiliary menus.
8. Press the **MODE** switch to select BTP.
9. Press the **FRAME** switch to select the appropriate framing mode (D4, ESF, SLC®96, or NONE).
10. Press the **CODE** switch to select either AMI or B8ZS line coding to match how equipment being tested.
11. Connect a test cord from the5575B RX jack to the LINE OUT jack (Figure 3–5).
12. Connect another test cord from the 5575B TX jack to the LINE IN jack.
13. Press the **RESTART** switch to begin the test.

    ALL RESULTS OK displayed to the left of SUMMARY indicates there have been NO errored conditions. If an error is detected, the Test Summary LED will illuminate. Press the up or down arrow keys to scroll through the failed patterns displayed to the left of SUMMARY (example: 3:24 FAILED SUMMARY). To verify that other patterns did not fail, press the top **DATA** switch. If the display does not advance to a different pattern, no other patterns failed. At the end of the test, you may go into T1 NORM mode and run the pattern that failed for a longer period of time. If the failed pattern is not one of the standard patterns in the pattern display, program the pattern into the USER 1 or USER 2 programs and run it as a USER PATTERN for further verification. (See paragraph 2.1.3 (f).) If signal errors are detected, further testing is required to locate the Bridge tap(s).
14. Print results. If a hard copy of the BTP results is required, before changing the mode, press the **PRINT** key. All BTP results will be purged when the mode is changed from BTP to another mode.

3.7 CSU EMULATION OR NETWORK INTERFACE

CSU Emulation allows testing to be performed without interruption of normal transmission and reception of data. After the test set is configured, the display should appear as shown in Figure 3-6. To emulate a CSU, proceed with the following steps.

WARNING Hazardous voltages exist on the Line Side of the CSU. Give advance notice to the telephone company so that power can be removed prior to disconnection of the CSU.

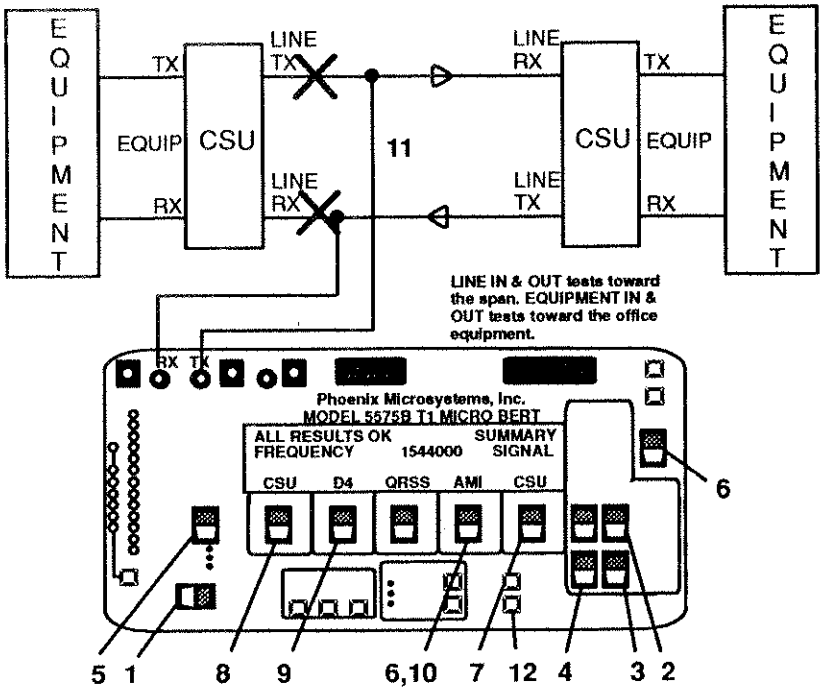


Figure 3-6. CSU Emulation.

1. Press the **ON/OFF** switch to ON.
2. Press the Results 1 **TYPE** switch until SUMMARY is displayed in the Results 1 field of the display.

3. Press the Results 2 **TYPE** switch until SIGNAL is displayed in the Results 2 field of the display.
4. Press the Results 2 **DATA** switch until FREQUENCY is displayed in the Results 2 field of the display.
5. Press the **RX INPUT** switch to select TERM.
6. Press the **AUX MENUS** switch until menu #0 for Transmit Clock Source is displayed. Press the **CODE** right/left arrow switch to select RCVCLK.
7. Press the **EXIT** switch to escape from Auxiliary menus.
8. Press the **LOOP CODES** switch to select CSU.
9. Press the **MODE** switch and select CSU.
10. Press the **FRAME** switch and select the appropriate framing mode (D4, ESF, SLC®96, or NONE).
11. Press the **CODE** switch and select either AMI or B8ZS Line Coding to match how the equipment is provisioned.
12. Disconnect Network interface on the Line side of the CSU, and connect it to the 5575B RX and TX jacks.
13. Press the **RESTART** switch.

In the CSU mode, the 5575B is terminated at 100 ohms, 35dB. A full span ALBO is provided to compensate for cable loss and a LBO is provided to match the requirements of the Telco.

In this mode, the 5575B is now functioning as a CSU. The receiver monitors receive data and performs parameter checks. Also, in the CSU mode the 5575B can be looped–up by another test set sending the CSU 5–bit loop–up code (10000). Bit error rate tests (BERT) can now be performed on the loop. To loop–down the 5575B, a 3–bit code of (100) must be sent.

NOTE For Network Interface Emulation, follow the same procedures listed above except select FAC1 or FAC2 using the LOOP CODES switch.

Appendix A – Specifications

A.0 INTRODUCTION

This section of the manual contains the specifications for the Model 5575B Micro BERT test set. Software and hardware option specifications are provided in the applicable option manual. Option ordering numbers and option manual numbers are listed in section 6 of this manual.

A.1 EQUIPMENT SPECIFICATIONS

Table A–1 provides specifications for the 5575B.

Table A–1. Model 5575B Specifications.

CHARACTERISTIC	SPECIFICATION
Physical	
(Standard unit)	
Dimension	10"W x 5.75"D x 6.5"H
Weight	11 lbs.
peration	
erating Temperature nge	32 to 122°F 0 to 50°C
age Temperature ge	5 to 122° F –15 to 50°C
dity	95% maximum (non–condensing)
al Power	110/220 vac – switch selectable
Power Option	Rechargeable 12 volt 3.2 Ah sealed lead acid battery. Greater than 2 hours continuous operation. Typical recharge time is 6 to 12 hours.

Table A–1. Model 5575B Specifications.(Continued)	
CHARACTERISTIC	**SPECIFICATION**
Input	
Input Connectors	WECO 310 jack, Bantam, 15–pin, D–shell network interface connector. (Refer to Appendix C.)
Input Frequency	1544000Hz ±300Hz
Line Codes	AMI or B8ZS
Input Impedance	**Bridge** = >1000 ohms **Term** = 100 ohms ±5% **DSX–Monitor** = 100 ohms ±5%
Operating Range	**Bridge** = +6dBDSX to –35dBDSX; ALBO compensates for cable loss. **Term** = +6dBDSX to –35 dBDSX; ALBO compensates for cable loss. **Monitor** = +6dBDSX to –6dBDSX ALBO provided with fixed +20dB amplifier to fully compensate to DSX monitor series impedance losses.
Output	
Line Build Out	Selectable with 0, –7.5, and –15dB attenuation
Output Connectors	Provided on WECO 310 jacks, and Bantam, 15–pin D–shell network interface connector. (Refer to appendix for front panel interface connector pin assignments.)
Internal Oscillator	
Frequency	1544000Hz ±5ppm
Line Codes	AMI or B8ZS
Pulse Shape	Complies with AT&T Pub. 62411 and CCITT Recommendation G.703 when terminated in 100 ohms.
Jitter Tolerance	Complies with AT&T Pub. 62411
T1 Ref	1544000 ±300Hz (310 and Bantam connectors)

Table A-1. Model 5575B Specifications.(Continued)

CHARACTERISTIC	SPECIFICATION
Front Panel Indicators	
Alarm Indicators	Test Summary, Signal Loss*, Frame Loss*, Pattern Loss*, Density*, All Ones*, Yellow Alarm*, Power Loss, and Low Battery. (Asterisks indicate a History LED is also provided).
s Indicators	RX Pulses Present
ndicators	Pattern Sync and Frame Sync
dicators	B8ZS (Code and History LED)
iteria	
nc Loss	100 bits in error out of 1000
Loss	2 out of 5 Fbits in error
	QRSS is always suppressed; All canned patterns with known density violations are suppressed in BTP and MPT modes.
	>15 consecutive zeros
	8 x (N+1): N can be 1 to 23
	Bit 2 is 0 for 255 consecutive channels
	Alternating eight 1's/eight 0's pattern on 4Kb/s data link
	mplies with Bellcore TR- -000191. 14 or less zeros out of 95 bits
	nsecutive frames with all ones in load data
	rn violates AT&T Technical ACCUNET T1.5 density re- and should only be used ding.

Table A–1. Model 5575B Specifications.(Continued)	
CHARACTERISTIC	**SPECIFICATION**
(2^20)–1	This pattern violates AT&T Technical Reference ACCUNET T1.5 density requirements and should only be used with B8ZS coding.
(2^23)–1	This pattern violates AT&T Technical Reference ACCUNET T1.5 density requirements and should only be used with B8ZS coding.
QRSS(2^20)–1	Pattern with 15 zeros suppression
3:24	Repetitive "01000100 00000000 00000100"
1:7	Repeating pattern of one Mark and seven Spaces
1:1	Alternating Space and Mark
NET55	Unframed this pattern meets Bell Pub 62411 specs on maximum zeros and 1's density.
OCT55	Unframed this pattern meets Bell Pub 62411 specs on maximum zeros and 1's density.
Zeros	All Zeros (Space)
Ones	All Ones (Mark)
USER1, USER2	User–defined 64–bit maximum pattern
USER3 (Long User Pattern Option required)	Programmable 2 Kbyte maximum pattern
Pattern Synchronization Criteria	
	No bit errors for N + 200 bits where N is the pattern length
Error Inject	
LOGIC	Single, 5E–3 to 2E–7
BPV	Single, 5E–3 to 2E–7

Table A–1. Model 5575B Specifications.(Continued)

HARACTERISTIC	SPECIFICATION
RAME	Single, 5E–3 to 2E–7
equency easurement	
ccuracy	±5ppm
esolution	1Hz
ange	1544000 ±6000Hz
ignal Level leasurement	
ccuracy	±5% of reading
Resolution	.04 volts
Range Referenced o T1 span	0–10 volts peak–to–peak
Simplex Current Measurement	
Range	±150mA
Resolution	1% of input current
Accuracy	0 to +150mA: ±5% of reading 0 to –150mA: ±10% of reading
Simplex Voltage Drop	0.6 volts maximum at 60 mA
Measured Results	
Summary	All Results OK, B8ZS Detected, CRC Alarms, Frame Bit Errors, Bipolar Violations, Bit Errors, Line Coding Errors, AMI Detected, Frequency Deviation, BTP, and MPT
Logic	Bit Errors, Bit Error Rate, Errored Seconds, Logic EFS, % Logic EFS, Severely Errored Seconds, Consecutive Severely Errored Seconds, Consecutive Severely Errored Seconds Rate, Pattern Sync Losses, and Pattern Sync Loss Seconds

Table A–1. Model 5575B Specifications.(Continued)

CHARACTERISTIC	SPECIFICATION
BPV	Bipolar Violations, BPV Error Rate, and BPV Errored Seconds
Frame Errors	Frame Bit Errors, Frame Bit Error Rate, Frame Sync Losses, Frame Sync Loss Seconds, Frame Bit Errored Second, CRC Errors, CRC Rate, and CRC Errored Seconds
Signal	Density Violations, Blue Alarm Seconds, Yellow Alarm Seconds, RX Frequency Maximum, RX Frequency Minimum, RX Frequency, RX Level Pk–Pk Volts, RX Level Pk–Pk dBDSX, Simplex Current, Clock Slip Count, Clock Slip Rate, Maximum Positive Wander, Maximum Negative Wander, Frame Slips (+), Frame Slips (–), A–Signal, B–Signal, C–Signal, D–Signal, Impairment (Optional)
Time	Elapsed Test Time, Elapsed Days, Elapsed Test Seconds, Test Ends In, TOD, and MDY
T1E1 (Optional)	PRM–EFE, PRM–G1, PRM–G2, PRM–G3, PRM–G4, PRM–G5, PRM–G6, PRM–SE, PRM–FE, PRM–LV, PRM–SL, PRM–LB
TXPORT (Optional)	S1 SIG LEVEL, S1 CRC ERR, S1 BPV ERR, S1 TX STAT, S2 SIG LEVEL, S2 CRC ERR, S2 BPV ERR, S2 TX STAT, POWER STAT
G.821 (Optional)	ERRORED SEC, ERROR FREE SEC, SEVERELY ERR SEC, %SEVERELY ERR SEC, UNAVAILABLE SEC, AVAILABLE SEC, %AVAILABLE SEC, DEGRADED MINUTES, %DEGRADED MINUTES
LOOP CODES	**Loop Up/Loop Down**
CSU	10000 /100
AC1	1100 /1110
C2	11000/11100

Table A–1. Model 5575B Specifications.(Continued)

CHARACTERISTIC	SPECIFICATION
PYLD (Payload)	1111111100101000 / 1111111101001100
NWRK (Network)	1111111101001000/ 1111111100100100
LINE	1111111101110000 / 1111111100011100
TXPRT (Optional)	Refer to the Phoenix manual 34–00167.
WSTL (Optional)	Refer to Phoenix manual 34–00184.
RS–232 Remote Port	
Character Size	User selectable for either 7 or 8 bits per character (ASCII format)
Parity	User selectable for NONE, ODD, or EVEN parity
op Bits	User selectable for 1 or 2 stop bits
Rates	User selectable rates: 300, 1200, 2400, 4800, or 9600
es	Interactive (poll and respond) or real time update
erminator	CR or CRLF in interactive mode
ontrol	Hardware (DTR); Software (XON/XOFF)
or	9–pin, female, D–shell
Configuration	Five canned terminal configurations are included, plus a custom configuration program. The five predefined DEC terminals are VT 100, Wyse 50, Hazeltine 1500, Televideo 912/920, and Freedom 100.
	See section 5.
ort	DTE; Suitable for connection to DCE devices (i.e., dial–up modems).

Table A–1. Model 5575B Specifications.(Continued)	
CHARACTERISTIC	**SPECIFICATION**
Character Size	User selectable for 7 or 8 bits per character (ASCII format)
Parity	User selectable for NONE, ODD, or EVEN parity
Stop Bits	User selectable for 1 or 2 stop bits
Bit Rates	User selectable rates: 300, 1200, 2400, 4800, or 9600
Flow Control	DTR (Pin 4)
Print Width	40 columns
Connector Pin Configuration	See section 4.
Connector Configuration	DCE; Suitable for connection to most serial printers
Connector	9–pin, female, D–shell

Appendix B – CCIS/Channel Signaling

B.0 INTRODUCTION

This section of the manual contains the Robbed Bit Numbering and CCIS Numbering charts for the Model 5575B Micro BERT test set.

B.1 CCIS/ROBBED BIT SIGNALING CHARTS

Table B–1 provides a chart for robbed bit signaling channel sequences. Table B–2 provides a chart for CCIS format sequences.

Table B–1. Robbed Bit Numbering Sequence.

TIME SLOT	PREFERRED	D1D/SLC®96 SEQUENCE	D2	D3/D4
	1	1	12	1
	2	13	13	2
	3	2	1	3
	4	14	17	4
	5	3	5	5
	6	15	21	6
	7	4	9	7
	8	16	15	8
	9	5	3	9
	10	17	19	10
	11	6	7	11
	12	18	23	12
	13	7	11	13
	14	19	14	14
	15	8	2	15
	16	20	18	16
	17	9	6	17
	18	21	22	18
	19	10	10	19
	20	22	16	20
	21	11	4	21
	22	23	20	22
	23	12	8	23
	24	24	24	24

Table B-2. CCIS Numbering.

FRAME NUMBER	BIT USE IN CHANNEL 24							
	1	2	3	4	5	6	7	8
1	A13	A1	B1	X	X	X	1	X
2	A14	A2	B2	X	X	X	1	X
3	A15	A3	B3	X	X	X	1	X
4	A16	A4	B4	X	X	X	1	X
5	A17	A5	B5	X	X	X	1	X
6	A18	A6	B6	X	X	X	1	X
7	A19	A7	B7	X	X	X	1	X
8	A20	A8	B8	X	X	X	1	X
9	A21	A9	B9	X	X	X	1	X
10	A22	A10	B10	X	X	X	1	X
11	A23	A11	B11	X	X	X	1	X
12	1	A12	B12	X	X	X	1	X
13	A1	A13	B13	X	X	X	1	X
14	A2	A14	B14	X	X	X	1	X
15	A3	A15	B15	X	X	X	1	X
16	A4	A16	B16	X	X	X	1	X
17	A5	A17	B17	X	X	X	1	X
18	A6	A18	B18	X	X	X	1	X
19	A7	A19	B19	X	X	X	1	X
20	A8	A20	B20	X	X	X	1	X
21	A9	A21	B21	X	X	X	1	X
22	A10	A22	B22	X	X	X	1	X
23	A11	A23	B23	X	X	X	1	X
24	A12	1	1	1	0	Y	0	1

X=RESERVED, SET TO "0".
A=PER CHANNEL SIGNALING BIT.
Y_S=REMOTE MULTIFRAME ALARM (RMA) BIT (Y_S="0" ALARM, Y_S="1" NORMAL)

Appendix C – Network Pin Assignments

C.0 INTRODUCTION

This section of the manual contains the network pin assignments for the Model 5575B Micro BERT test set.

C.1 NETWORK INTERFACE PIN ASSIGNMENTS

Refer to Table C–2 for front panel interface connector pin assignments.

Table C–2. Model 5575B Network Interface Pin Assignments.

PIN	NAME
1	Send Data (Tip)
2	Not Connected
3	Receive Data (Tip)
4	Not Connected
5 through 8	Not Connected
9	Send Data (Ring)
10*	Not Connected
11*	Receive Ring (Ring)
12*	–12 volts (for 5575B lid options only)
13*	+5 volts (for lid option only)
14*	+8 volts (for 5575B lid option only)
15*	Ground

Do not connect external equipment using these pins or damage may result to the 5575B or external equipment.

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Appendix D – Remote Configuration

D.0 INTRODUCTION

This section of the manual contains the remote configuration instructions and worksheet for the Model 5575B Micro BERT test set.

D.1 REMOTE CONFIGURATION

When the 5575B is communicating through the remote port to a terminal in the real time update mode, the 5575B is directly addressing the cursor locations on the terminal screen. Since there are many different types of terminals available, the 5575B has to be told what kind of terminal it is talking to and how to move the cursor to the proper location. The 5575B also needs to know how to clear the screen, home the cursor, and send highlighted modes. There are five preloaded terminal configurations in the 5575B at the present time and an additional custom configuration program. The five preloaded configurations are for the following types of terminals:

Vyse 50
elevideo 912/920
azeltine 1500
eedom 100
100

custom configuration program asks for nine different video utes which must be entered by the operator. The following sheet can be used to enter the terminal attributes. Then am the 5575B to properly communicate with the terminal. he programming is complete, the attributes for that terminal ain in the 5575B's CMOS memory until changed to another ration.

As an example, the following attributes are for a VT100 type terminal.

Clear screen and home the cursor string:	ESC[H ESC[2 J
Start hi-lite mode string:	ESC [7 m
End hi-lite mode string:	ESC[0 m
Cursor addressing lead in string:	ESC[
Cursor addressing row/column separator:	;
Cursor addressing termination character:	H
Row/column data format:	Ascii
Clear screen delay:	0
Cursor addressing row/column bias:	Hex

The spaces in the above strings are not part of the string. They are for clarification only.

If your configuration calls for escape characters (1BH), press your terminal's **ESCAPE** key. Do not type "ESC". All characters are entered directly from your keyboard. For instance, a plus (+) is entered as +. Also verify the "case" of characters (upper and lower case).

M CONFIGURATION WORKSHEET

e: _____

g to clear the screen (8 characters max): _____

he string of characters required
r your screen and home the cursor.

string hi–lite mode (8 characters max): _____

er the string of characters that put your
minal into a hi–lite mode. This can be
verse video, half intensity, etc.

nter string to end hi–lite mode (8 characters max): _____

Enter the string of characters that end your
terminal's hi–lite mode.

Enter lead in string for cursor addressing (8 characters max): _____

Enter the string required by your terminal to
start a cursor addressing sequence.

5. Enter row/column separator character (RETURN for none): _____

   If your terminal requires a special character
   to distinguish row from column data, enter it
   here or press RETURN for none.

6. Enter cursor addressing terminating string (RETURN
   for none): _____

   If your terminal requires hexadecimal data
   as the row and column number enter an
   "H". If your terminal requires the data in
   ASCII format, enter an "A".

7. Enter clear screen delay constant (0–255)...

   If your terminal requires after receiving a clear screen and home cursor command, enter an approximate number of milliseconds. The range is 0 to 255 milliseconds. If none is required, enter "0". This line will not advance until a valid number is entered. _____

8. Enter row/column cursor addressing bias in HEX...

   If your terminal uses absolute cursor addressing, that is, column 0 is really a 0, then enter "0". If your terminal requires some other offset, 20H is typical, enter that offset. _____

5575A T1 Micro BERT Test Set

options – section 7

Phoenix

34-00030-0327TB
2nd Edition, 1 Sep 1989, Change 3

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7-40	Blank

RECORD OF CHANGES

CHANGE NUMBER	CHANGE DATE	CHANGE NUMBER	CHANGE DATE
1st Edition	6/88		
2nd Edition	7/88		
CH 1	11/88		
CH 2	1/89		
CH 3	9/89		

7.0 MODEL 3152 T1C BERT OPTION

The Phoenix 3152 T1C BERT Option (Figure 7–1) adapts the Phoenix 5575A T1 Micro–BERT to permit transmission and reception of framed T1C signals allowing error rate analysis of either of the T1 bit streams embedded in the T1C signal. Monitoring functions are supplied to detect T1C frame format errors and remote alarm condition.



Model 3152 T1C BERT Option
Figure 7–1

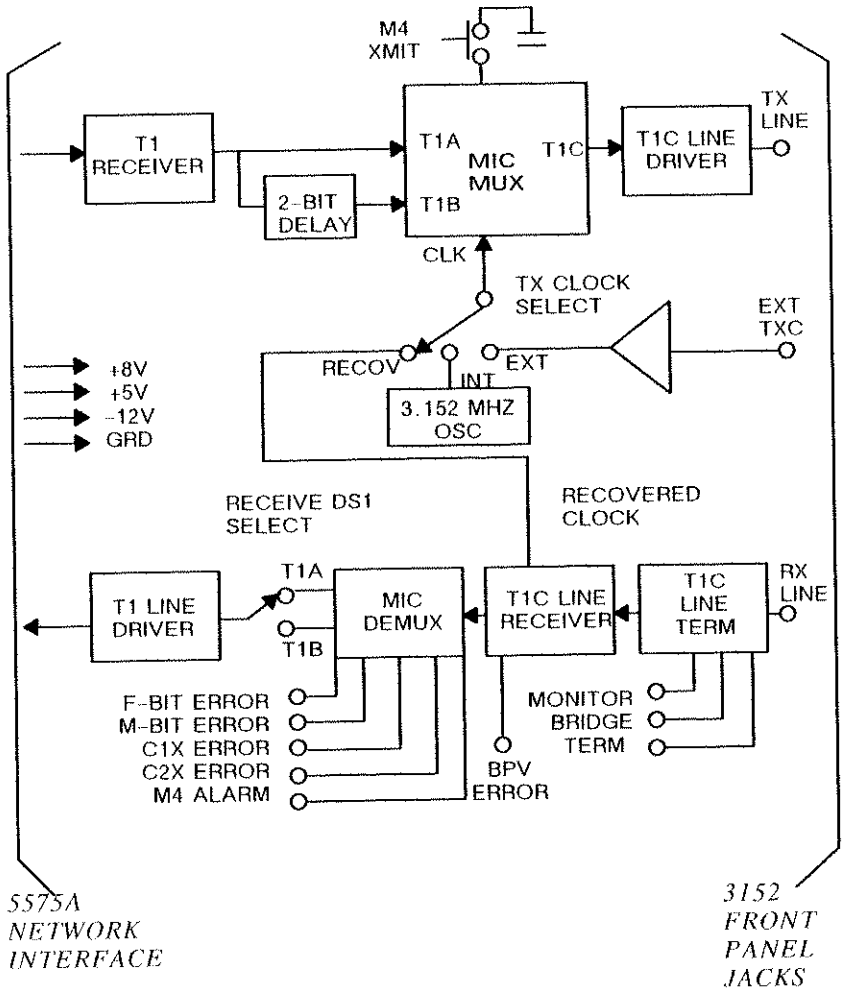
Connections (Figure 7-2):

The 3152 is housed in a replacement lid for the 5575A and should be connected to the 5575A via the 15-pin NETWORK INTERFACE connector. The Tx and Rx jacks on the 5575A should be disconnected from any external T1 equipment when the 3152 is in use (power applied). When the 3152 is not in use, it may be turned off allowing the 5575A to be used for T1 testing without the necessity of disconnecting the 3152 from the NETWORK INTERFACE connector.

The T1C signal to be monitored is connected to the 3152 via the Rx Bantam jack on the 3152 front panel. The Rx Termination provides a 100 ohm termination (TERM), a high impedance bridge (BRIDGE), or a 100 ohm termination with 20dB added gain for connection at a DSX monitor jack (MONITOR).

The transmitted T1C bit stream is available at the Tx jack on the front panel and may be connected to the receive function of any T1C equipment (i.e. span terminator, M1C Mux, etc.).

A jack is provided on the 3152 to allow the user to supply an external T1C clock source for the transmit signal. This source should be a 3.152 MHz TTL compatible signal or a balanced bipolar clock signal of at least 4 volts peak-to-peak (refer to Table 7-1 for 3152 specifications).



Model 3152 T1C BERT Option Block Diagram
Figure 7-2

7.1.1 Specifications

Table 7-1 lists the specifications for the 3152 T1C BERT Option.

Table 7-1. Model 3152 Specifications.

CHARACTERISTICS	SPECIFICATIONS
Line Code	AMI
T1C Frame Format	AT&T Mode 2, M1C Compatible
Transmit Clock	
Internal Clock	3.152 MHz (±5 ppm)
External Clock	TTL or Balanced Bipolar at 3.152 MHz (± 130ppm)
Recovered	Timed from the received T1C signal
Transmit T1C	Amplitude: ±3V (±0.6V) into 100 ohms Pulse Width: 159 nsec (±20 nsec) Rise/Fall: less than 50 nsec Overshoot: less than 10% of amplitude

Table 7-1. Model 3152 Specifications (Cont.).

CHARACTERISTICS	SPECIFICATIONS
Receive T1C	
Bridged	+6dbDsx to -30 dbDsx ALBO Compensated
Terminated	+6dbDsx to -30 dbDsx ALBO Compensated
Monitor	+6dbDsx to -30dbDsx ALBO provided with fixed 20dB amplifier to compensate for DSX monitor series impedance losses.
Receive Termination	
Bridged	>1000 ohms
Terminated	100 ohms (± 5%)
Monitor	100 ohms (± 5%)
Simplex Current	Fused DC current path is provided from receive line to transmit line

7.1.2 Description

Setup:

The 3152 is activated by selecting DS1 #1 or DS1 #2 at the RECV. DS1 switch. The selected DS1 bit stream is extracted from the received T1C signal and sent to the 5575A for BERT analysis.

If the transmit function of the 3152 is to be used, the T1C clock source must be selected. An internal source is provided (INT) but the user may elect to supply an external source (EXT). The clock recovered from the received T1C signal may also be used.

Interpretation of Results:

After connections have been made, the Rx indicator (Table 7-2) should be lit indicating the presence of received T1C pulses. If the received signal integrity is sufficiently intact, the 3152 will acquire frame synchronization as indicated by the SYNC LED in the T1C FRAME section of the front panel. If the 3152 cannot determine the proper sync position, the LOSS indicator will light and the SYNC LED will go off. Note that if no signal is detected at all (Rx indicator is off), all status indicators will be held off and the LOSS indicator will be lit continuously. If the 3152 should lose sync and then reacquire sync, the RECOV LED will light to record this event. The RECOV LED may be reset by depressing the **BREAK/RESET** key. The **BREAK/RESET** key serves an alternate purpose if it is pressed while the RECOV LED is off. In that case, the frame acquisition circuitry in the 3152 is forced to lose sync

and will immediately try to recover when the key is released.

When the 3152 has acquired sync, the **CLEAR** key should be depressed to clear the RECEIVE T1C STATUS LEDs. If the received T1C signal is correctly framed, the status LEDs should remain off. If an error is detected in the receive T1C bit stream, the appropriate status LED will begin to blink. More than two errors per second will cause the affected indicator to remain lit continuously. The status LEDs can be reset at any time by depressing the **CLEAR** key.

If the 3152 is in sync with the received T1C signal, the selected T1 bit stream is presented to the 5575A for further analysis. If the 5575A has been set up to transmit a T1 bit stream, then this signal is available at the 3152 for transmission as part of the T1C bit stream. The 3152 combines the transmit T1 signal from the 5575A with a delayed replica of that signal to form the T1C bit stream. The assembled T1C bit stream meets all the format specifications for a standard M1C Mux compatible signal. The M4 alarm is controllable from the front panel of the 3152. Pushing the M4 XMT key once activates the M4 alarm bit (ACTIVE is indicated) and pushing it again will de-activate it.

Analysis at the T1 Level:

The demultiplexed T1 signal presented to the 5575A is analyzed in the same way as any other T1 signal with a few exceptions. Since the receive T1 signal is extracted from a T1C bit stream, it will not have Bipolar Violations (BPVs). Furthermore, the jitter and amplitude characteristics of the T1 signal will not be representative of the received T1C signal. The 3152 requires that AMI coding be selected on the 5575A.

Aside from the above differences, the T1 bit stream content is not altered by the process of multiplexing or demultiplexing. The 5575A can be used to generate and test the T1 signal content in the framed or unframed modes.

7.1.3 Controls and Indicators

Table 7-2 presents the 3152 controls and indicators.

Table 7-2. Controls and Indicators.

CONTROLS/INDICATORS	FUNCTION
Controls:	
DSI - OFF - DS1 2	Power switch and DS1 signal selector.
MONITOR - BRIDGE - TERM	Selects the T1C receiver termination.
RECOV - INT - EXT	Selects the T1C transmit clock source.
BREAK/RESET -	Clears the RECOV history or interrupts the T1C frame sync.
CLEAR -	Clears the receive T1C status history.
M4 XMT -	Sets or resets the transmitted M4 alarm.
Indicators:	
TX -	Indicates presence of transmit pulses.
RX -	Indicates presence of receive pulses.
DS1 1 and DS1 2	Indicate which T1 signal is selected and that power is turned on.
RECOV,INT,EXT	Indicate selected transmit clock source.
M4 ACTIVE	Indicates that M4 alarm is being transmitted.

Table 7-2. Controls and Indicators (Cont.).

CONTROLS/INDICATORS	FUNCTION
MONITOR, BRIDGE, TERM	Indicate selected receive termination.
T1C FRAME:	
SYNC	Indicates T1C frame is detected.
LOSS	Indicates T1C frame not found.
RECOV	Indicates recovery from loss of frame
Receive T1C Status	
*F BIT ERROR	Indicates T1C F-Bit error has occurred.
*M BIT ERROR	Indicates T1C M-Bit error has occurred.
*BPV	Indicates the occurrence of a bipolar violation.
*C1X ERROR	Indicates a stuffing bit error for DS1 1.
*C2X ERROR	Indicates a Indicates a stuffing bit error for DS1 2.
*M4 ALARM	Indicates the occurrence of a remote alarm.

*These indicators blink after the occurrence of a single error and will light continuously for repetitive errors.

7.1 MODEL 5564 T1 CHANNEL MONITOR OPTION

The Model 5564 Channel Monitor Unit (Figure 7–3) is an option to the 5575A. It is designed to permit monitoring of any VF (voice frequency) channel in the DS1 data stream. A built–in speaker provides audio monitoring of the channel while signaling information for the selected channel is displayed on LEDs.

7.1.1 Specifications

Table 7–3 lists the specifications for the 5564 Channel Monitor Unit.



Model 5564 Channel Monitor Unit
Figure 7–3

Table 7-3. Model 5564 Specifications.

CHARACTERISTIC	SPECIFICATION
Channel Monitor Section	
Channel Selection	Any of 24
Numeric Display	Displays channel number of selected channel (1-24)
LED Indicators	A, B, C, and D signaling bits
LED Indicators	D1D, D2, D3/D4, SLC®96, and ESF framing
VF Decoder	
Output Level	+3 to -55 dBm
Output Impedance	600 ohms balanced (nominal) DC coupled, Bantam jack
Return Loss	$\geq$ 28 dB (300 to 3000 Hz)
Frequency Response	within $\pm$0.2 dB (300 to 3000 Hz)
(1010 Hz reference)	within $\pm$0.3 dB to -1 dB (200 to 3300 Hz)
Signal-to-Noise* Ratio at 1010 Hz	
0 to -30 dBm	$\geq$33 dB
-30 to -40 dBm	$\geq$27 dB
-40 to -45 dBm	$\geq$23 dB
Gain Tracking Error at 1010 Hz	
+3 to -35 dBm	Within $\pm$0.3 dB
-35 to -50 dBm	Within $\pm$0.5 dB
Idle Noise (with steady 11111111 binary word)	$\leq$18 dBrnC0

Table 7-2. Model 5564 Specifications (Cont.).

CHARACTERISTICS	SPECIFICATIONS
Audio Amplifier	
Output	2 1/2 inch internal speaker
Gain	Continuously adjustable to 40dB
Frequency Response (1010 Hz reference)	Within ±2 dB (300 to 3000 Hz)
Output Power	150mW (maximum)

7.2.2 Model 5575A With 5564 Option Calibration

Due to additional loading of the received signal when the 5564 VF Lid Option is installed, the 5575A must be calibrated whenever a 5564 is added to the 5575A or a 5564 is replaced by another 5564.

The steps to calibrate the 5575A are:

1. Turn the 5575A and the 5564 on.

2. Select Monitor mode on the 5575A.

3. Connect the 5575A Rx jack to a DSX monitor jack or an equivalent monitor jack.

4. Unplug the 5564 Lid Option from the 5575A Network Interface connector.

5. Simultaneously press the **REMOTE** Setup key and the **STORE** Program key. The 5575A will respond with:

> Unplug the 5564 from NI connector.
> Press **MONITOR** key to collect a reading

6. Press the **MONITOR** key.

7. After approximately 5 seconds the 5575A will respond with:

> Plug the 5564 into the NI connector
> Press **MONITOR** key to collect a reading

8. Plug the 5564 into the Network Interface connector and press the **MONITOR** key.

9. The 5575A will respond in approximately 5 seconds with:

> Calibration complete

NOTE

The calibration procedure may be aborted at any time by pressing the **CLEAR** key.

7.2.3 Description

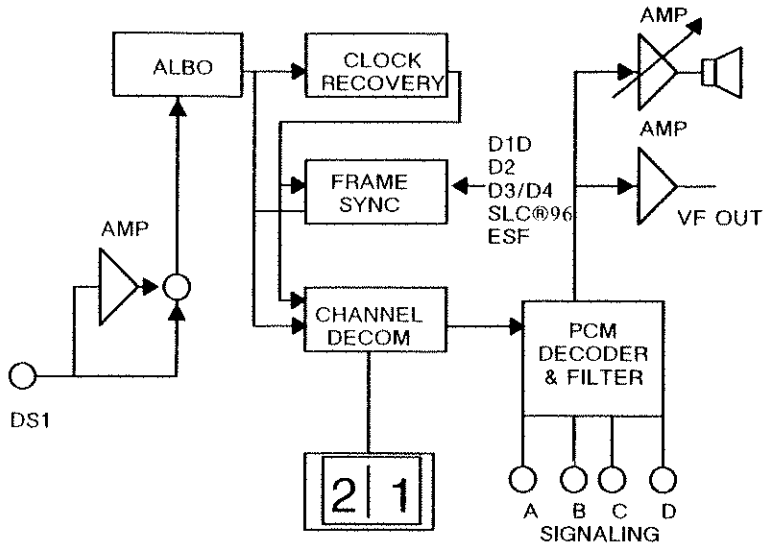
The 5564 is housed in a replacement lid for the 5575A. It connects to the 5575A through use of a cable to the 5575A's 15-pin network interface connector. Power is provided to the 5564 through this cable. When installed, the 5564 is turned on and off by the 5575A's main power switch. An additional power switch is located on the 5564 volume control which permits the 5564 to be turned off independently to reduce power drain on the 5575A's batteries.

Connections (Figure 7-4):

Connection of the 5564 to the network is through use of the 310 jacks on the 5575A's front panel. The 5564 contains a full ALBO front end which permits the user to place it anywhere along the span length. Termination of the line is accomplished by selection of the appropriate termination mode on the 5575A. No additional termination selections are required on the 5564.

Selection of the appropriate framing type is made with the **FRAMING** select key. Successive pushes of the **SELECT** key scrolls the selection through D1D, D2, D3/D4, SLC®96 (mode 1), and ESF. The specific channel to be monitored (refer to Table 7-4) is selected by the CHAN SELECT keys. Separate keys are provided to scroll the channel select up or down. The selected channel number appears in the CHAN SELECT numeric display.

Provisions are made in the lower portion of the lid for storage of the interconnecting cables. Plastic cable retainers keep the cables secure in the storage area.



Model 5564 Functional Block Diagram
Figure 7-4

Table 7–4. Channel Numbering.

TIME SLOT	PREFERRED SEQUENCE	D1D/SLC®96 SEQUENCE	D2 SEQUENCE
1	1	1	12
2	2	13	13
3	3	2	1
4	4	14	17
5	5	3	5
6	6	15	21
7	7	4	9
8	8	16	15
9	9	5	3
10	10	17	19
11	11	6	7
12	12	18	23
13	13	7	11
14	14	19	14
15	15	8	2
16	16	20	18
17	17	9	6
18	18	21	22
19	19	10	10
20	20	22	16
21	21	11	4
22	22	23	20
23	23	12	8
24	24	24	24

7.2.4 Controls and Indicators

Table 7-5 presents the 5564 controls and indicators.

Table 7-5. Model 5564 Controls and Indicators.

KEY	NAME	FUNCTION
1	Speaker	Provides audio output
2	SIG BITS	Displays the instantaneous state of the signaling bits associated with the selected channel. These LEDs are on when the state is "one" and off for a state of "zero"
3	ON OFF VOLUME	Power on/off and volume control to speaker.
4	FRAMING	Selects the framing format of the line being monitored.
5	CHAN SELECT	Selects anyone of the 24 channels in a PCM bit stream.
6	VF OUTPUT	Supplies decoded VF content of selected channel. Output level is normalized such that 0 dBm=0dBm0 with 600 ohm load. This output is DC coupled and mates with a standard Bantam jack.

7.2.5 Channel Monitoring

The 5564 is designed for ease of operation. Basically, the following steps are all that is required to monitor a desired channel.

1. Set the 5575A termination to **MONITOR**. (Refer to sections 3.2 and 5 of this instruction book.

2. Select D1D, D2, D3/D4, SLC®96, or ESF on the 5564 using the **FRAMING** key to match the framing format of the line under test.

3. Connect a patch cord from the 5575 Rx jack (310 jack) on the front panel to the network monitor jack of the network under test.

4. Use the **CHAN SELECT** keys on the 5564 to select the desired channel for monitoring.

5. Observe the SIG BITS indicators. They should be flashing on and off indicating traffic.

6. Adjust the VOLUME control to the desired level.

7. For an accurate reading of the line level, connect a dB meter to the VF OUTPUT jack.

7.3 MODEL 5575A-1544-2 FROGGER OPTION

The Frogger board (part No. 9-5575A-1544-2) is a factory installed option to the 5575A. The option permits the user to arrange the connections between the 5575A and the 4-wire T1 line under test from the 5575A's front panel or from a remote location. There are 14 possible configurations.

To display or set up a configuration locally from the 5575A's front panel, press the **LINE** key one time and use the **NEXT DISPLAY** or **PREVIOUS DISPLAY** key to locate the sub-menu "FROGGER CONNECTIONS." At this level, use the Up and Down arrow keys to locate the desired configuration. The **CLEAR** key can be used at any time to return to the default setting.

To display the 14 possible configurations from a remote terminal, at the REMOTE> prompt, type FROG ? and press **RETURN**. To set up a configuration from the remote terminal, at the REMOTE> prompt, type FROG and the desired character (A through N) assigned to the applicable configuration. Then press **RETURN**. To display the currently assigned configuration, at the REMOTE> prompt, type FROG and press RETURN.

A brief description of the mnemonics for the Frogger option are as follows:

The Frogger board option is located next to the RS232 remote port on the 5575A. There are four bantam jacks on the Frogger option; the two on the left connect to the transmit and receive jacks of the T1 circuit in the

"West" direction. The two jacks on the right connect to the transmit and receive circuitry in the "East" direction.

| | : | | Left and right brackets represent the two directions the T1 circuit is traveling to and coming from. Commonly referred to as the Near End/Far End or East/West directions.

The information contained within the brackets represent 14 possible configurations in which the 5575A can be electronically connected to the T1 line.

The W (West) and E (East) represent the two directions of the T1 line. Tx and Rx represent transmit and receive of the 4-wire circuit.

|W-Rx/E-Tx| : |E-Rx/W-Tx|

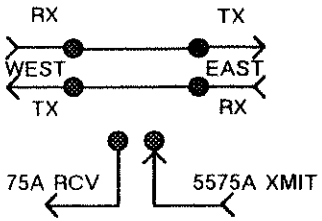
In this example, the first bracket shows the West receive connects to the East transmit; |W-Rx/E-Tx|. The second bracket displays the East receive connects to the West transmit; |E-Rx/W-Tx|. This illustrates a through and normal mode of a T1 circuit with the 5575A **not** connected to the T1 circuit.

|W-Rx/E-Tx|<>Rx : |W-Tx|<>Tx : |E-Rx|

In this example. the <>symbol represents the 5575A transmitter or receiver connected to the circuit. The first bracket, |W-Rx/E-Tx|<>Rx, displays the West receive connected to East transmit with the 5575A receiver **connected** to that side of the T1 circuit. The second bracket, |W-Tx|<>Tx, displays the 5575A transmitter **connected** to the West transmit. The third bracket, |E-Rx|, displays the East receive open.

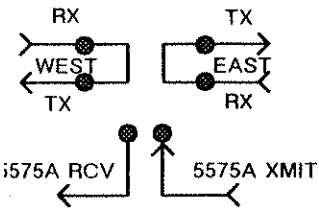
A description of each line setting follows:

A – [W–Rx/E–Tx] : [E–Rx/W–Tx] (DEFAULT SETTING)



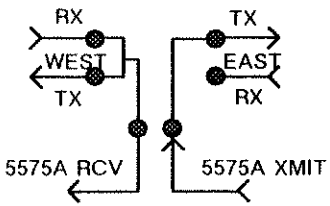
This setting connects the West Receive jack on the Frogger board to the East Transmit jack and the East Receive jack to the West Transmit jack. No connections are made to the 5575A's receiver or transmitter.

B – [W–Rx/W–Tx] : [E–Rx/E–Tx]



This setting connects the West Receive jack to the West Transmit jack and the East Receive jack to the East Transmit jack. No connections are made to the 5575A's receiver or transmitter.

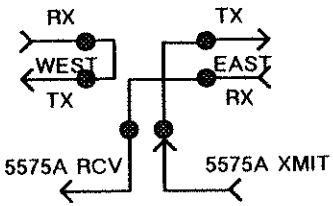
C – [W–Rx/W–Tx]<>Rx : [E–Tx]<>Tx : [E–Rx]



This setting connects the West Receive jack to the West Transmit jack and to the receiver of the 5575A. The East Transmit jack is connected to the transmitter of the 5575A and the East Receive jack is left open.

Recommended termination is Bridge/Enable transmit or Terminate mode.

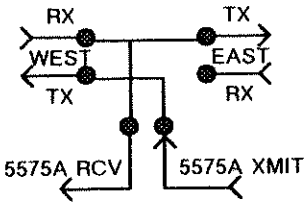
D - [W-Rx/W-Tx] : [E-Rx]<>Rx : [E-Tx]<>Tx



This setting connects the West Receive jack to the West Transmit jack. The East Receive jack is connected to the receiver of the 5575A and the East Transmit jack is connected to the transmitter of the 5575A.

Recommended termination is Terminate mode.

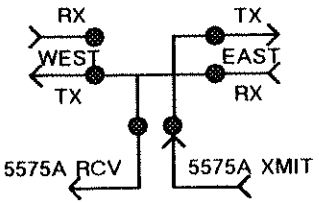
E - [W-Rx/E-Tx]<>Rx : [W-Tx]<>Tx : [E-Rx]



This setting connects the West Receive jack to the East Transmit jack and to the receiver of the 5575A. The West Transmit jack is connected to the transmitter of the 5575A and the East Receive jack is left open.

Recommended termination is Bridge/Enable transmit.

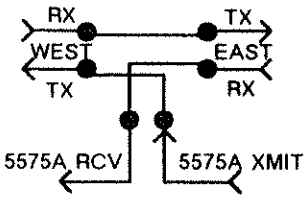
F - [E-Rx/W-Tx]<>Rx : [E-Tx]<>Tx : [W-Rx]



This setting connects the East Receive jack to the West Transmit jack and the receiver of the 5575A. The East Transmit jack is connected to the transmitter of the 5575A and the West Receive jack is left open.

Recommended termination is Bridge/Enable transmit.

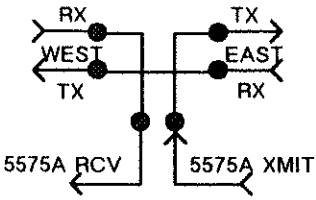
G - [W-Rx/E-Tx] : [E-Rx]<>Rx : [W-Tx]<>Tx



This setting connects the West Receive jack to the East Transmit jack. The East Receive jack to the receiver of the 5575A, and the West Transmit jack is connected to the transmitter of the 5575A.

Recommended termination is Terminate mode.

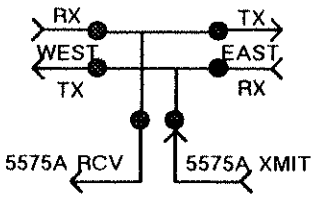
H - [E-Rx/W-Tx] : [W-Rx]<>Rx : [E-Tx]<>Tx



This setting connects the East Receive jack to the West transmit jack. The West Receive jack is connected to the receiver of the 5575A, and the East Transmit jack is connected to the transmitter of the 5575A.

Recommended termination is Terminate mode.

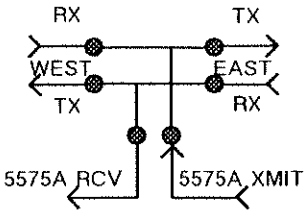
I - [W-Rx/E-Tx]<>Rx : [E-Rx/W-Tx]<>Tx



This setting connects the West Receive jack to the East Transmit jack and to the receiver of the 5575A. The East Receive jack is connected to the West Transmit jack and the transmitter of the 5575A.

Recommended termination is Bridge mode.

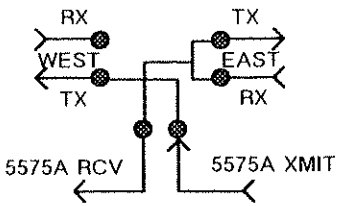
J - [W-Rx/E-Tx]<>Tx : [E-Rx/W-Tx]<>Rx



This setting connects the West Receive jack to the East Transmit jack and to the transmitter of the 5575A. The East Receive jack is connected to the West Transmit jack and to the receiver of the 5575A.

Recommended termination is Bridge mode.

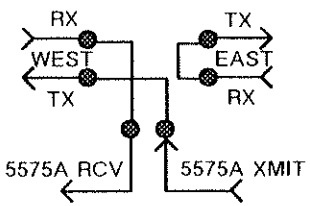
K - [E-Rx/E-Tx]<>Rx : [W-Tx]<>Tx : [W-Rx]



This setting connects the East Receive jack to the East Transmit jack and to the receiver of the 5575A. The West Transmit jack is connected to the transmitter of the 5575A and the West Receive jack is left open.

Recommended termination is Bridge/Enable transmitter in Bridge mode.

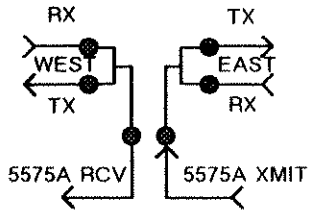
L - [E-Rx/E-Tx] : [W-Rx]<>Rx : [W-Tx]<>Tx



This setting connects the East Receive jack to the East Transmit jack. The West Receive jack is connected to the receiver of the 5575A and the West Transmit jack is connected to the transmitter of the 5575A.

Recommended termination is Terminate.

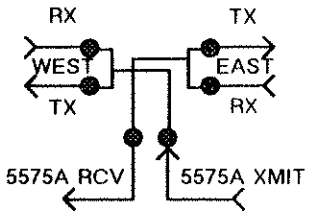
M - [W-Rx/W-Tx]<>Rx : [E-Rx/E-Tx]<>Tx



This setting connects the West Receive jack to the West Transmit jack and to the receiver of the 5575A. The East Receive jack is connected to the East Transmit jack and to the transmitter of the 5575A.

Recommended termination is Bridge mode.

N - [W-Rx/W-Tx]<>Tx : [E-Rx/E-Tx]<>Rx



This setting connects the West Receive jack to the West Transmit jack and to the transmitter of the 5575A. The East Receive jack is connected to the East Transmit jack and to the receiver of the 5575A.

Recommended termination is Bridge mode.

3.8 CSU OR FACILITY LOOP UP/DOWN TEST (OUT-OF-SERVICE TEST)

To perform a CSU and Facility Loop up and Loop down tests, proceed with the following test. After the test set is configured, the display should appear as shown in Figure 3-7. To initiate a CSU test or a Facility Loop test, proceed with the following steps.

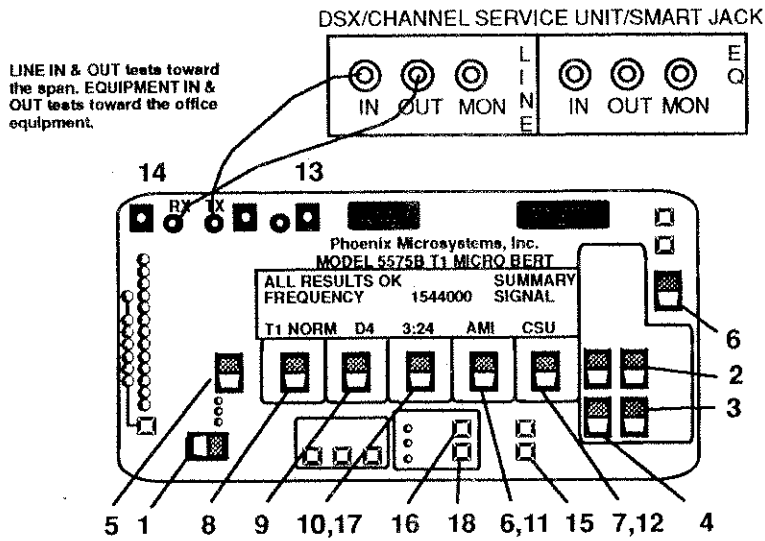


Figure 3-7. CSU or Facility Loop Test Setup.

1. Press the **ON/OFF** switch to ON.
2. Press the Results 1 **TYPE** switch until SUMMARY is displayed in the Results 1 field of the display.
3. Press the Results 2 **TYPE** switch until SIGNAL is displayed in the Results 2 field of the display.
4. Press the Results 2 **DATA** switch until FREQUENCY is displayed in the Results 2 field of the display.
5. Press the **RX INPUT** switch to select TERM.

3.10 PREPROGRAMMED TESTS

The 5575B is equipped with factory programmed configurations to test or monitor circuits. Factory installed Program #1 monitors a span, Program #2 is an out–of–service test to loop up a CSU, Program #3 is an out–of–service test sending 3:24 stress pattern, Program #4 is an out–of–service test sending 1:7 stress pattern, and Program #5 is an out–of–service test to loop down a CSU (Table 3–1). Program numbers are displayed on line four of the display and are aligned with the five setup keys (Figure 3–8). For example, #1 is above the **MODE** switch. These keys become "soft" keys to enter the program into the desired memory location (1–5). A blinking number indicates that a valid program has not been stored in that location (i.e., the memory location may be used without destroying a previously stored program).

Table 3–1. Factory Installed Program Configurations.

TEST	MONITOR CLOCK–SLIPS	LOOP UP CSU	3:24 PATTERN	1:7 PATTERN	LOOP DOWN CSU
PROGRAM #	1	2	3	4	5
LINE	AMI	AMI	AMI	AMI	AMI
FRAME	NONE	D4	NONE	NONE	D4
CLOCK	INTCLK	INTCLK	INTCLK	INTCLK	INTCLK
SIGNALING	ROBBED	ROBBED	ROBBED	ROBBED	ROBBED
LBO	0 dB	0 dB	0 dB	0 dB	0 dB
MODE	T1NORM	T1NORM	T1NORM	T1NORM	T1NORM
PATTERN	QRSS	QRSS	3:24	1:7	QRSS
LOOP CODES	CSU	CSU	CSU	CSU	CSU
TIME	0	0	0	0	0

These programs may be overwritten by storing your own setups in the same locations (refer to paragraph 3.11).

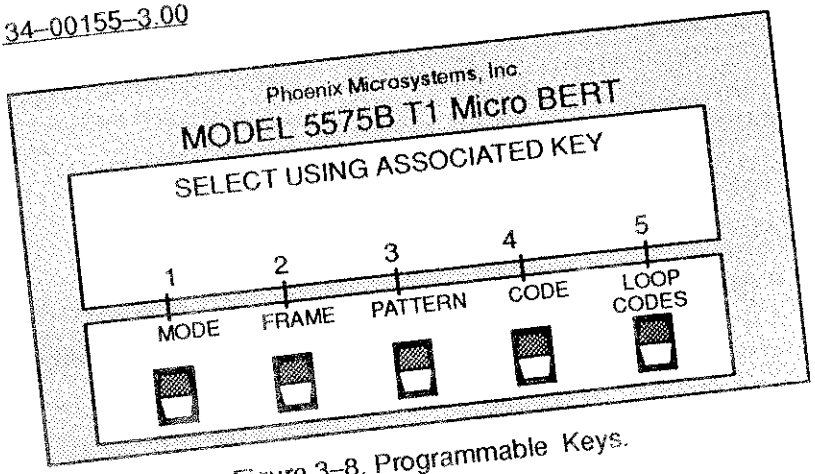


Figure 3-8. Programmable Keys.

3.11 PROGRAM STORAGE

The 5575B allows the user to reconfigure test programs. To allow access to the program storage function, press the **AUX MENUS** switch. The Auxiliary mode will be activated and the following menu will be displayed.

```
9 STORE USER PROGRAMS?
NO          YES
```

1. Press the right arrow (**CODE**) switch to select "YES".
2. Press the **EXIT** switch to exit Auxiliary mode.
3. Press the **RECALL** key. The display will alternate between the following three menus.

```
STORE USER PROGRAM (1-5)
  1     2     3     4     5
```

SELECT USING ASSOCIATED KEY				
1	2	3	4	5

PRESS RESTART TO ABORT				
1	2	3	4	5

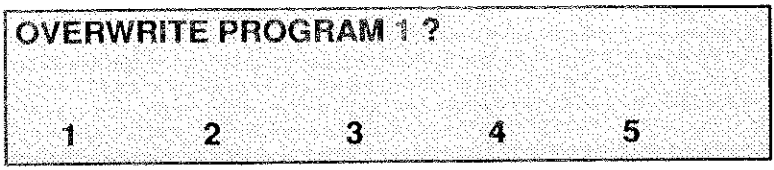
The three menus prompt the user to either save current programs (test set setup configuration and selected RESULTS options) in one of locations 1 through 5 or abort the program storage operation by pressing the **RESTART** key.

To store a program in a location not having a previously stored program, press the "soft" key under the desired blinking number. For example, to store the program into memory location #2, press the **FRAME** switch. The displayed RESULTS DATA or TYPE options will also be stored along with the selected test configuration. When the test configuration and RESULTS selections are stored, PROGRAM STORAGE COMPLETE will be displayed as shown below.

PROGRAM STORAGE COMPLETE				
1	2	3	4	5

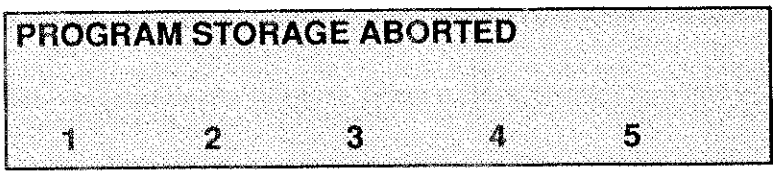
The display will then revert to the Auxiliary menu #9 STORE USER PROGRAMS menu. Press the **EXIT** switch to exit Auxiliary menu mode.

The user may elect to store the program in a memory location that has a previously stored program (locations denoted by a number that is steady on). If a previously used location is selected, the new program will overwrite the previous program. If there is an existing program in the location, the window will appear as:



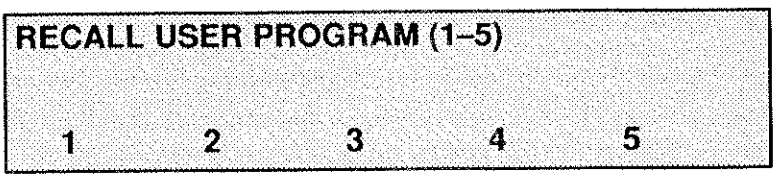
Press the desired location a second time to overwrite the existing program. The program will be stored and Program Storage Complete will be displayed.

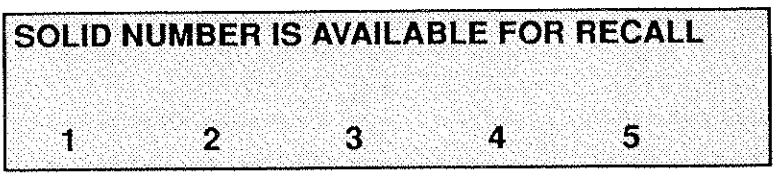
If the user does not want to enter a program, press the **RESTART** key to exit the program storage routine. Any previously stored programs will not be affected and the following will be displayed.

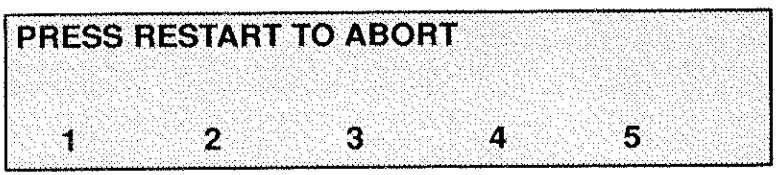


3.12 PROGRAM RECALL

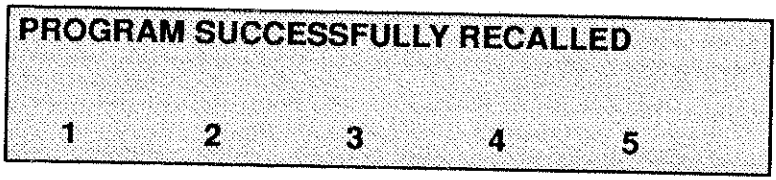
Recalling a program is very similar to storing a program. To recall a previously stored program, press the **RECALL** key. The display will alternate between the following three menus.



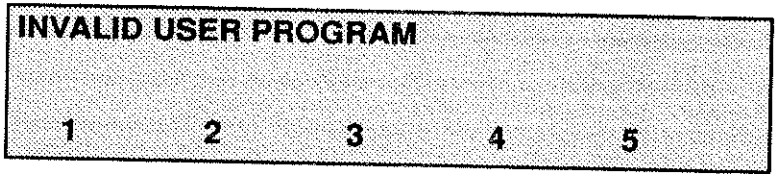




To select the program to be recalled, press the "soft" key which selects the solid ON number of the location in which the desired program is stored (1–5). When the selected program has been recalled, PROGRAM SUCCESSFULLY RECALLED will be displayed as shown below. Then the 5575B will display the recalled test set setup and RESULTS 1 and 2 Data and Type selections.

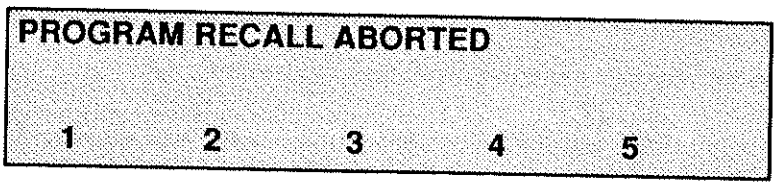


A blinking number indicates that the memory location is empty. Pressing a "soft" key that selects a blinking number will result in the display changing to:



The present menu will not be changed in this case. Only a valid user program can be recalled successfully. The user must press the **RECALL** key to return to the Recall program displays.

As in the store process, press the **RESTART** key to abort the recall operation. The display will appear as:



3.13 SELF TEST

To verify the operational readiness of the 5575B, perform the following self–test. After the test set is configured, the display should appear as shown in Figure 3–9.

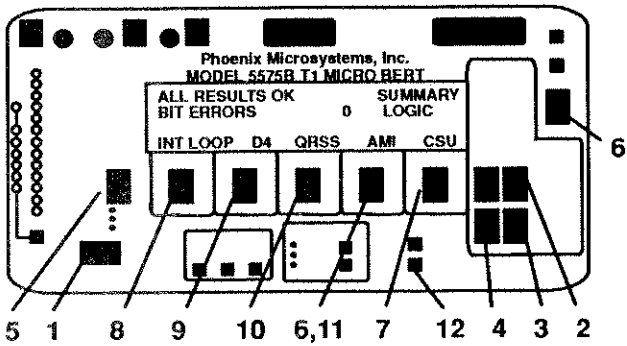


Figure 3–9. Self Test.

1. Press the **ON/OFF** switch to ON.
2. Press the Results 1 **TYPE** switch until SUMMARY is displayed in the Results 1 field of the display.
3. Press the Results 2 **TYPE** switch until LOGIC is displayed in the Results 2 field of the display.
4. Press the Results 2 **DATA** switch until BIT ERRORS is displayed in the Results 2 field of the display.
5. Press the **RX INPUT** switch to select TERM.
6. Press the **AUX MENUS** switch until menu #0 for Transmit Clock Source is displayed. Press the **CODE** right/left arrow switch to select INTCLK.
7. Press the **EXIT** switch to escape from Auxiliary menus.
8. Press the **MODE** switch and select INT LOOP.
9. Press the **FRAME** switch and select D4.
10. Press the **PATTERN** switch until QRSS is displayed.
11. Press the **CODE** switch and select AMI.

12. Press the **RESTART** switch.

Verify that none of the ALARM LEDs are on, and the RX PULSES, FRAME SYNC, and PATTERN SYNC LEDs are illuminated. Also verify that the TEST SUMMARY in the RESULTS 1 display reads ALL RESULTS OK.

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Chapter 4 – Printer

4.0 INTRODUCTION

This section of the manual contains information required for printer operation and printer port setup when printing 5575B test results.

4.1 PRINTER FUNCTION

The 5575B printer port (located on the right end of the test set) gives the user the convenience of hardcopy printouts of all collected test parameters. Standard printouts of results and/or conditions set up in Auxiliary menus #15 and #16 are preceded by the time and date for correlation to system wide problems experienced on the T1 span. In addition to printing the test results, the 5575B will print test data during a test, based on programmed timed intervals and on occurrence of specific errors. The 5575B will also print whenever the **RESTART** key or **CLEAR HISTORY** key have been pressed (Figure 4–1).

```
>>>Clear History<<<
TIME: 13:27:48
DATE: TUE 05/10/88
```

Figure 4–1. Clear History Printout.

This gives the operator a running analysis of the test and prevents front panel key pushes from being mistaken as real system errors.

In all modes except BTP or MPT modes, the operator can also force a printout of selected data at any time by pressing the **PRINT** key. When in either BTP or MPT mode, the **PRINT** key will print out only the results of the respective test (Figure 4–2 or Figure 4–3).

NOTE If a hard copy of the test results are needed, do not exit BTP or MPT mode prior to printing the results. Test results will be purged when another mode is selected.

```
5575B   BTP RESULTS  13:23:20  03/19/92
          **COMPOSITE RESULTS**

BIT ERR     0      BER          0.000E07
BPV ERR     0      BPV RATE     0.000E07
FRM ERR     0      FRM RATE     0.000E04

          **INDIVIDUAL RESULTS**

PATTERN     BIT ERR    ERR SEC   RX LEVEL
ALL ONE     0          0         1.0dB
1:1         0          0         1.0dB
1:3         0          0         1.0dB
1:5         0          0         1.0dB
1:6         0          0         1.0dB
1:7         0          0         1.0dB
2:8         0          0         1.0dB
2:9         0          0         1.0dB
2:10        0          0         1.0dB
2:11        0          0         1.0dB
2:12        0          0         1.0dB
2:13        0          0         1.0dB
2:14        0          0         1.0dB
3:18        0          0         1.0dB
3:19        0          0         1.0dB
3:20        0          0         1.0dB
3:21        0          0         1.0dB
3:22        0          0         1.0dB
3:23        0          0         1.0dB
3:24        0          0         1.0dB
QRSS        0          0         1.0dB
```

Figure 4–2. BTP Printout.

```
5575B   MPT RESULTS  13:23:20  03/19/92
          **COMPOSITE RESULTS**

BIT ERR     0      BER          0.000E07
BPV ERR     0      BPV RATE     0.000E07
FRM ERR     0      FRM RATE     0.000E04

          **INDIVIDUAL RESULTS**

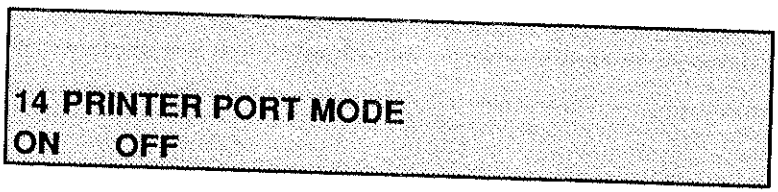
PATTERN     BIT ERR    ERR SEC   RX LEVEL
ALL ONE     0          0         1.0DB
1:7         0          0         1.0DB
2 IN 8      0          0         1.0DB
3:24        0          0         1.0DB
QRSS        0          0         1.0DB
```

Figure 4–3. MPT Printout.

4.2 SETUP FOR PRINTER USE

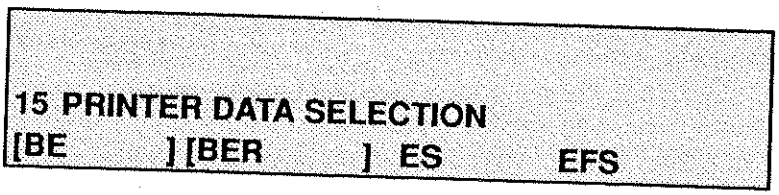
Prior to connecting the 5575B to the printer, the 5575B printer port characteristics must be set to match those of the printer. The PRINTER PORT MODE menu enables/disables the printer. The PRINTER DATA SELECTION menu selects the results to be printed. The PRINTER PORT SETUP menu selects the baud rate, number of bits per character, number of stop bits, and parity.To set up the 5575B for use with a printer, proceed as follows.

1. Press the **AUX MENUS** switch until menu 14 PRINTER PORT MODE is displayed. (In Auxiliary mode, the blue silksceens designate primary key functions.)



2. Press the arrow key to set the Printer Port Mode to ON.

3. Press the **AUX MENUS** switch until menu 15 PRINTER DATA SELECTION is displayed.



4. Select the Printer Data to be printed. Selected parameters enclosed by square brackets (i.e., BE and BER are shown selected).

NOTE It is not possible to print BER without printing BE or BPVR without printing BPV's, etc.

---

5. Press the **AUX MENUS** switch until menu 16 PRINT CONDITIONS is displayed.

16 PRINT CONDITIONS
RATE: 2 HOURS RATE: END OF TEST

6. Select the Print Conditions.

Two different rates may be selected (in the example shown above, the selected parameters will be printed every 2 HOURS and every time an error occurs in a print selected parameter). The available conditions for either are:

	———	off
1	MINUTE	prints every minute based on real time
5	MINUTES	prints every 5 minutes
10	MINUTES	prints every 10 minutes
15	MINUTES	prints every 15 minutes
30	MINUTES	prints every 30 minutes
1	HOUR	prints every hour
2	HOURS	prints every 2 hours
6	HOURS	prints every 6 hours
12	HOURS	prints every 12 hours
24	HOURS	prints every 24 hours
END OF TEST		prints all selected parameters at test end
ERROR		prints selected parameters whenever a change has occurred to any selected parameter
CRC ERR SEC		prints internally tested CRC errors occurring in the previous second

The ERROR option will print only as a result of an actual error. Results of errors, for instance, bit error rate (BER), will not cause the printer to print. At least one of the parameters listed below must be selected in order for the ERROR print to force a printout.

Bit Errors
Pattern Sync Losses
Bipolar Violations

Frame Bit Errors
Frame Sync Losses
Frame Severely Errored Seconds
CRC Errors
Signal Losses
Frame Slips
Yellow Alarms
Blue Alarms
Density
Severely Errored Seconds
Consecutive Severely Errored Seconds
RX Frequency Deviations
RX Level Deviations (Monitor Mode Only)

7. Press the **AUX MENUS** switch until menu 17 PRINTER PORT SETUP is displayed.

PRINTER PORT SETUP			
17 BAUD	SIZE	PARITY	STOP BITS
9600	7	ODD	1

8. Select the Printer Port Baud Rate (300, 1200, 2400, 4800, 9600).

9. Select the Printer Port Character Size (7 or 8 bits)to match the printer.

10. Select the Printer Port Parity (NONE, ODD, or EVEN) to match the printer.

11. Select the Printer Port Stop Bit (1 or 2 stop bits) to match the printer.

2. Connect the printer to the 5575B.

3. Run the applicable test.

. Press the **PRINT** key to print monitor or test results. Printed results will appear in a 40 column format similar to Figure 4–4.

```
>>>Forced Print<<<
TIME: 13:23:20
DATE: TUE 05/10/88

RX INPUT: TERM
Frame: D4
Code: AMI
Pattern: QRSS
Clock: INTCLK

Bit  Errors.......                0
Bit Error Rate...             0.000E08
Bipolar Violations......          0
BPV Error Rate........        0.000E00
Rx Frequency.......           1544000
Rx Signal Level pk-pk....       6.00V
```

Figure 4–4. 40 Column Printout.

4.3 PRINTER PORT RS–232 PIN CONFIGURATION

The printer port is an RS–232 ASCII serial data interface. The connector consists of a 9–pin connector configured for DCE to allow for direct connection to a printer. The printer port has minimal connector pin requirements. The basic pins required are ground (SG), receive data (RD), and data terminal ready (DTR). The 5575B monitors the DTR line of the printer. When this line is set true (high) by the printer, the 5575B assumes the printer is available to receive a byte of data. No other handshaking is required, although all other control signals are driven or monitored for connection to other DTE type devices. Refer to Table 4–1 for printer port RS–232 pin configurations.

Table 4–1. Model 5575B Printer Pin Assignments.

PIN NO	CIRCUIT	CCITT EQUIV	DESCRIPTION	TO 5575	TO DTE	NOTES **
1	CF	109	RECEIVED LINE (SIGNAL DETECTOR		→	+/–6 volts min. @2mA load
2	BB	104	RECEIVED DATA		→	+/–6 volts min @2mA load
3	BA	103	TRANSMITTED DATA	←		Turn "on" 1.75 volts max.; Turn "off" .75 volts min.; 3K ohms min. input resist.
4	CD	108.2	DATA TERM. READY	←		Turn "on" 1.75 volts max.; Turn "off" .75 volts min.; 3K ohms min. input resist.
5	AB	102	SIGNAL GRD COMMON RET			
6	CC	107	DATA SET READY		→	+/–6 volts min. @2mA load
7	CA	105	REQUEST TO SEND	←		Not used
8	CB	106	CLEAR TO SEND		→	+/–6 volts min. @2mA load

* Pin 9 not used.

**Positive voltage is binary zero, space, control "on".
Negative voltage is binary one, mark, control "off".

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Chapter 5 – Remote

5.0 INTRODUCTION

This section of the manual contains information required for remote operation of the 5575B Micro BERT test set.

5.1 REMOTE FUNCTION

The 5575B remote port permits the user to control the 5575B from a computer or terminal. There are two remote modes of operation, interactive and real time update. The interactive mode gives the user complete control of the 5575B. The user can change all menu setups from the remote site with the exception of the remote port setups. All measured parameters are available for inspection by simply typing the parameter name. The 5575B will respond with the parameter value. The second mode, the real time update mode, is more useful when a terminal is used. The 5575B continually updates the terminal's screen with the measured parameters on a real time basis. Real Time Update menus give the user access to all measured parameters as they are changing. In this mode, the user has limited control of the 5575B by use of "soft" keys which allow the user to freeze the screen momentarily, start or stop a test, clear the results, inject errors, and force a pattern sync break or reset pattern sync. The user may change from the update mode to the interactive mode using the escape (ASCII **ESC**) key. Changing from the interactive mode to the real time update mode is achieved by entering the desired menu command at the REMOTE prompt.

In the interactive mode, data is presented strictly in teletype mode with ASCII data, carriage returns, and line feeds; therefore, most terminals may be connected. The real time update mode, however, requires a terminal capable of cursor addressing and some highlighting modes. There are 5 preloaded terminal configurations and a custom configuration program. The 5575B remote port may be configured to match any type of terminal by use of the CONFIG

System Command at the REMOTE prompt. A worksheet is included in Appendix D to aid the operator in configuring the 5575B for a specific terminal. The factory preprogrammed terminal configuration has been set to emulate a DEC VT100 type terminal.

Both the update function and the interactive function are explained in more detail in the following sections.

NOTE Always turn the 5575B on before turning the terminal on, or as an alternative, disconnect the 5575B from the terminal until both the 5575B and the terminal have been turned on.

5.2 REMOTE SETUP FOR 5575B TEST SET

Prior to connecting the 5575B to the terminal, modem, or computer, the remote port characteristics must be set to match those of the connecting device. The remote setup menu allows the user to select the baud rate, character size, parity, and the number of stop bits.

1. Press the **AUX MENUS** switch until menu 18 REMOTE PORT SETUP is displayed. (In Auxiliary mode, the blue silkscreens designate primary key functions.)

REMOTE PORT SETUP			
18 BAUD	SIZE	PARITY	STOP BITS
9600	7	ODD	1

2. Select the Remote Port Baud Rate (300, 1200, 2400, 4800, or 9600) to match the terminal.

3. Select the Remote Port Character Size (7 or 8 bits) to match the terminal.

4. Select the Remote Port Parity (NONE, ODD, or EVEN) to match the terminal.

5. Select the Remote Port Stop Bit (1 or 2) to match the terminal.

5.3 REMOTE PORT INTERFACE DESCRIPTION

The remote port is an RS–232 serial data interface. The connector consists of a 9–pin connector configured for DTE which requires a "null modem" cable for direct connection to a terminal (Figure 5–1). The 5575B monitors the Clear To Send (CTS) line of the device to

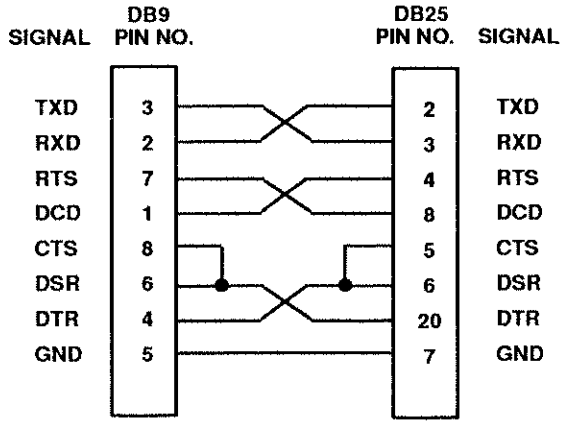


Figure 5–1. Null Modem Cable Connections.

which it is connected. When this line is set true (high) by the device, the 5575B assumes that the device is ready to accept a byte of data. The 5575B then asserts Return To Send (RTS) when it sends a character to the remote device. The 5575B asserts Data Terminal Ready (DTR) true (high) whenever it is ready to accept data from an external controller. The remote port will also respond to XON (CTRL S)/XOFF (CTRL Q) flow control. Table 5–1 presents the RS–232 remote pin configuration.

Table 5–1. Model 5575B Remote Pin Assignments.

PIN NO	CIRCUIT	CCITT EQUIV	DESCRIPTION	TO 5575	TO DTE	NOTES **
1	CF	109	RECEIVED LINE (SIGNAL DETECTOR)	<–		Not used
2	BB	104	RECEIVED DATA	<–		Turn "on" 1.75 volts max.; Turn "off" .75 volts min.; 3K ohms min. input resist.
3	BA	103	TRANS-MITTED DATA		–>	+/–6 volts min. @2mA load
4	CD	108.2	DATA TERM. READY		–>	+/–6 volts min. @2mA load
5	AB	102	SIGNAL GRD COMMON RET			
6	CC	107	DATA SET READY	<–		Not used
7	CA	105	REQUEST TO SEND		–>	+/–6 volts min. @2mA load
8	CB	106	CLEAR TO SEND	<–		Turn "on" 1.75 volts max.; Turn "off" .75 volts min.; 3K ohms min. input resist.

* Pin 9 not used.
** Positive voltage is binary zero, space, control "on". Negative voltage is binary one, mark, control "off".

5.4 ESTABLISHING COMMUNICATION

Connect the terminal (or computer) to the 5575B remote port connector (located on the right end of the test set). Turn both units on. Press the **ESC** key on the terminal. The "REMOTE >" prompt should appear on the left side of the terminal screen. This indicates communications have been established between the terminal and the 5575B and that the 5575B is in the interactive mode. From this mode, enter the commands used to control the 5575B or review test results.

NOTE If communications cannot be established, review the 5575B remote port settings. Also check to ensure that all cables and connections are tight.

5.5 COMMANDS

The commands used to control the 5575B are broken down into five groups as follows:

a. System Commands
b. User Programs and Patterns
c. Printer Port Setup
d. BERT Setup
e. BERT Results

Each command consists of a string of ASCII characters which represent a command, a selected parameter, or a menu selection.

If the 5575B does not recognize a string when it is received, it will echo the string back to the screen followed by a question mark (example: if you typed T2AUTO [instead of T1AUTO] and <RETURN>, the 5575B would echo back T2AUTO?). If no errors are detected with the command, the 5575B responds to the command and returns a prompt or screen display to signify it is ready for the next command or action. Pressing the **ESC** key will always return you to the interactive mode from any screen display.

All commands should be entered as they appear under the column "COMMANDS" in Table 5-2 through Table 5-6. When entered as

shown, they will produce the response indicated in the tables in the RESPONSE column or the ENTRIES column. Most commands without a space and question mark "?" or a second string, display the current parameter assignment.

Commands followed by a space and then a question mark "?", display the possible parameters which may be specified (listed in the following tables under ENTRIES).

Commands followed by a space and another character string (parameter) allow immediate selection of a mode or value (example: entering "MODE space T1AUTO" enables the Auto Evaluate mode). The terminal displays the selection as defined under the column titled RESPONSE in Table 5–2.

5.5.1 System Commands

System Commands display Real Time menus, Help menus, Status menus, and Setup menus.

5.5.1.1 Real Time Remote Terminal Menus

The "Real Time" menus, illustrated in Figure 5–2, present a current display of all the test parameters. Figure 5–2, Screen 1 (brought to the screen by typing the **UPDATE** command at the REMOTE prompt), is continually updated. The user may "freeze" the display by pressing the <**1**> key. While this freezes the current display, it does not stop the accumulation of data. The display will update as soon as the freeze command is removed (by pressing the <**1**> key). Additionally, clearing results may be controlled from this display through the use of the designated key <**2**>. To display page two and three of the Real Time screen, press <**P**>. The display will not proceed to page two or three while the screen is in FREEZE mode. To exit the Real Time displays, press the **ESC** key.

RX INPUT: TERM **5575B T1 Micro–Bert Revision x.xx** P – Page
Line Code: B8ZS Frame: D4 Pattern:2^15–1 TOD 07/02/92 20:27:15

BIT ERRORS.....	4	FRAME BIT ERRORS...	0
BIT ERROR RATE...	22.5E–08	FRAME BIT ERROR RATE..	0.000E–05
ERRORED SEC..	3	FRAME SYNC LOSSES...	1
LOGIC EFS...	112	FRAME SYNC LOSS SEC...	8.06E–06
% LOGIC EFS....	97.39130	FRAME BIT ERRORED SEC	0
SEVERELY ERRORED SEC..	0	..	
CONSECUTIVE SES...	0		
CONSECUTIVE SES RATE.	1.00E–02		
PATTERN SYNC LOSSES...	0	CRC ERRORS...	0
PATTERN SYNC LOSS SEC...	0	CRC ERROR RATE..	00E000.0
		CRC ERRORED SEC..	0
BIPOLAR VIOLATIONS.....	4		
BPV ERROR RATE...	2.25E–08		
BPV ERRORED SEC..	3		

1–**Update**/Freeze 2–**Restart**

Figure 5–2 (Screen 1 of 3). Remote Terminal "Real Time".

```
RX INPUT: TERM        5575B T1 Micro–Bert Revision x.xx      P – Page
Line Code: AMI  Frame: ESF  Pattern: 2^15–1  TOD  02/13/92  20:27:15

RX FREQUENCY MAX..     1544015    CLOCK SLIP COUNT...          0
RX FREQUENCY MIN..     1544015    CLOCK SLIP RATE...       0.000E00
RX FREQUENCY...        1544015    MAX POSITIVE WANDER..        0
RX LEVEL PK–PK VOLTS...  6.35V   MAX NEGATIVE WANDER..        0
RX LEVEL PK–PK dBDSX.    6.35V   FRAME SLIPS (+)...    99999999
SIMPLEX CURRENT...       6.31V   FRAME SLIPS (–)...    99999999

A–SIGNAL:11110000  11110000  11110000   ELAPSED TEST TIME     00:00:00
B–SIGNAL:00001111  00001111  11001100   ELAPSED DAYS                 0
C–SIGNAL:10101010  01010101  10100110   ELAPSED TEST SEC             0
D–SIGNAL:11001101  01001001  11001001   TEST ENDS IN          CONTINUE

DENSITY VIOLATIONS...    0
BLUE ALARM SEC...        0
YELLOW ALARM SEC...      0


  1–Update/Freeze  2–Restart
```

Figure 5–2 (Screen 2 of 3). Remote Terminal "Real Time".

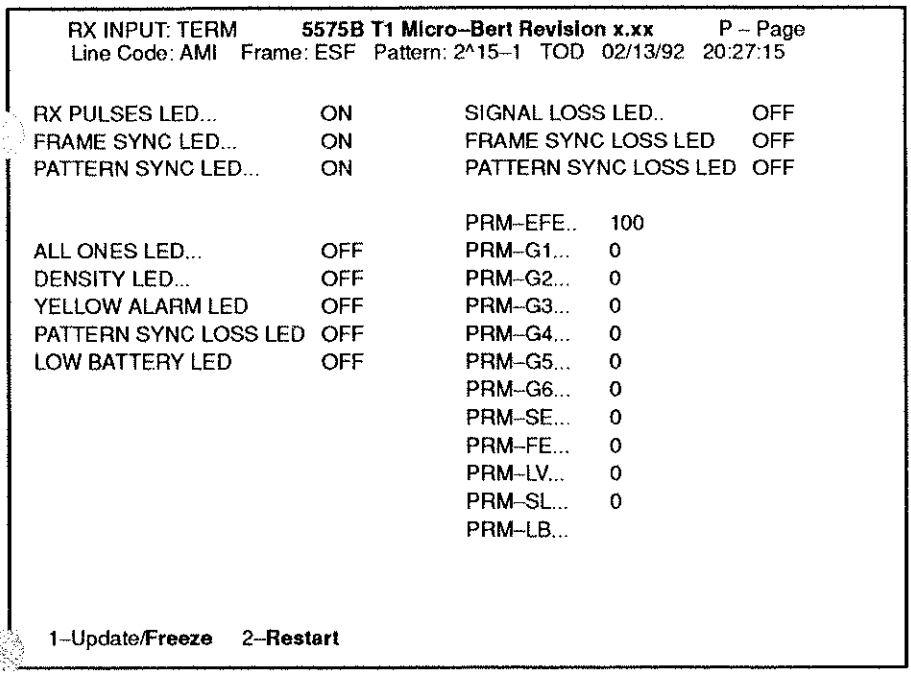


Figure 5–2 (Screen 3 of 3). Remote Terminal "Real Time".

5.5.1.2 HELP? Menus

The word "HELP" and a question mark "?" are System Commands used to control the system functions of the 5575B and view test parameters and test status indicators. When HELP or a question mark is entered as a single entry, a five screen Help menu is presented as shown in Figure 5–3. Screens one through five display the Setup Commands menu, System Commands menu, two Test Results menus, and the PRM Test Results menu. The remaining system commands are listed in Table 5–2. At any System Command Help menu, press any key to continue to the next menu. Press CONTROL–C to exit System Command menus.

REMOTE>?

SETUP COMMANDS

MODE...	Set Mode	TLENGTH..	Set Test Length
FRAME...	Set Framing	TOD	Set Time and Date
PAT	Set Pattern		
CODE	Set Line Code	LINJS	Inject Single Logic Error
LOOPCODE	Set CSU/Facility Codes	LINJR...	Logic Error Rate Enable
		LRATE	Set Logic Inject Rate
CLOCK...	Set Transmit Clock Source	BINJS...	Inject Single BPV Error
SIGMOD...	Set Signaling Mode	BINJR...	BPV Error Rate Enable
		BRATE...	Set BPV Inject Rate
LBO...	Set LBO Setting	FINJS...	Inject Single Frame Error
USER1...	Edit/Display User Pattern 1	FINJR...	Frame Error Rate Enable
USER2...	Edit/Display User Pattern 2	FRATE..	Set Frame Inject Rate
SENDUP..	SEND LOOP UP	PRINT..	Set Print Data Setup
SENDDN..	SEND LOOP DN	BR...	Set Printer Baud Rate
CHAN....	Fractional Channel Select	CS...	Set Printer Character Size
BPC...	x56/x64 Select	PR...	Set Printer Parity
TXPADD..	TXPORT REP ADDRESS	SB...	Set Printer Stop Bits
WSTPADD..	WESTELL REP ADDRESS	WSTTYPE.	WESTELL REP TYPE

Press any key to continue or CONTROL–C to abort

Figure 5–3 (Screen 1 of 6). Help "?" Menus.

REMOTE>?

SYSTEM COMMANDS

CONFIG	Configure Remote Terminal
FTWEAK	Calibrate Frequency
RX INPUT	Select Termination Mode
STATUS	Display Current Configuration
LEDSTAT	Show LED Status
TXPSTAT	Show TXPORT Repeater Status
SYNC	Show Sync Status
UPDATE	Start Real Time Update
RECALL	Recall User Program
STORE	Store User Program
RESTART	Start a Test
BTPSTAT	Show BTP Test Results
MPTSTAT	Show MPT Test Results
LOADU3	Load Long User Pattern
DUMPU3	Display Long User Pattern

Press any key to continue or CONTROL–C to abort

Figure 5–3 (Screen 2 of 6). Help "?" Menus.

TEST RESULTS

BE...	Bit Errors	FBE...	Frame Bit Errors
BER..	Bit Error Rate	FBER...	Frame Error Rate
ES...	Errored Seconds	FSL...	Frame Sync Losses
EFS...	Error Free Seconds	FSLS..	Frame Sync Loss Seconds
PEFS.	% Error Free Seconds	FBES...	Frame Bit Errored Seconds
SES.	Severely Errored Seconds		
CSES.	Consecutive SES...	CRCERR.	CRC Errors
CSER	Consecutive Sev Errored Rate	CRCRATE.	CRC Error Rate
		CRCES..	CRC Errored Seconds
BPV..	Bipolar Violations		
BPVRATE.	BPV Error Rate		
BPVES...	BPV Errored Seconds		
PSL...	Pattern Sync Losses		
PSLS...	Pattern Sync Loss Seconds		

Press any key to continue or CONTROL–C to abort

Figure 5–3 (Screen 3 of 6). Help "?" Menus.

TEST RESULTS

RXFREQ...	Rx Frequency	TET...	Total Elapsed Time
LEVELV...	Rx Signal Level Volts	TED...	Total Elapsed Days
LEVELD...	Rx Signal Level dBdsx	TETS...	Total Elapsed Test Seconds
SPLX...	Simplex Current	TEND...	Test Ends In
CLKSLP...	Clock Slips	DENSITY...	Density Violations
SLPRATE.	Slip Rate..	BLUE...	Blue Alarm Seconds
+WANDER.	Maximum Positive Wander	YELLOW..	Yellow Alarm Seconds
–WANDER.	Maximum Negative Wander		
FSLIP+...	Positive Frame Slips		
FSLIP–...	Negative Frame Slips		
ASIG...	A Signaling Bits		
BSIG...	B Signaling Bits		
CSIG...	C Signaling Bits		
DSIG...	D Signaling Bits		

Press any key to continue or CONTROL–C to abort

Figure 5–3 (Screen 4 of 6). Model 5575B Help "?" Menus.

PRM Test Results

PRM–EFE	PRM Error Free Event
PRM–G1	CRC Error Event = 1
PRM–G2	1 < CRC Error Event <= 5
PRM–G3	5 < CRC Error Event <= 10
PRM–G4	10 < CRC Error Event <= 100
PRM–G5	100 < CRC Error Event <= 319
PRM–G6	CRC Error Event >= 320
PRM–SE	Sev. Errored Framing Event
PRM–FE	Frame Bit Error Event
PRM–LV	BPV Event
PRM–SL	Slip Event
PRM–LB	Payload Loopback

Press any key to continue or CONTROL–C to abort

Figure 5–3 (Screen 5 of 6). Help "?" Menus.

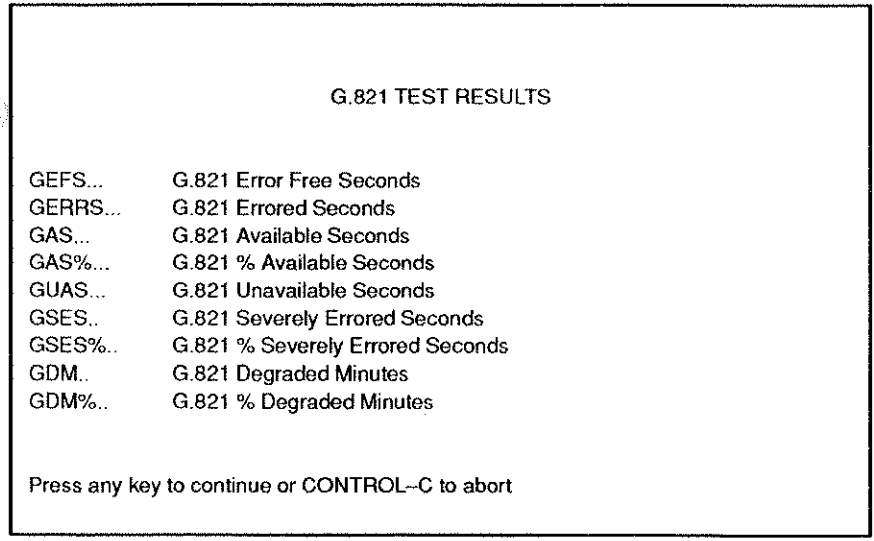


Figure 5–3 (Screen 6 of 6). Help "?" Menus.

Table 5–2. Remote System Commands.

COMMAND	RESPONSE	ENTRIES
BPC	Displays the current BPC.	
BPC ?		N x 56, N x 64
BPC xx	Sets the BPC	
CHAN	Displays the current selected channel(s).	
CHAN ?	To setup BERT channels type: CHAN # followed by + to select; CHAN # followed by – to de–select. To select/de–select all channels type: CHAN * followed by + or –; Use a comma to separate multiple changes; Example: CHAN 02–, 03–, 17+, 18+	01–, 02+, 03+, 04+, 05–, 06–, 07+, 08–, 09–, 10+, 11+, 12–, 13–, 14+, 15–, 16+, 17–, 18+, 19+, 20–, 21–, 22–, 23+, 24+

Table 5–2. Remote System Commands. (Continued)		
COMMAND	**RESPONSE**	**ENTRIES**
CHAN xx	Sets the CHAN.	
CONFIG	Type of terminal being used and video attributes. Factory setting is VT100.	
CONFIG ?		WYSE 50, TELEVIDEO 912/920 HAZELTINE 1500, FREEDOM 100, VT100, CUSTOM
CONFIG xx	Selects terminal type. If CUSTOM is entered the screen will present questions the user must answer to configure the 5575B output to the terminal.	
DUMPU3	Displays contents of USER3.	
LEVELD	Current peak–to–peak signal level in dBs.	
LEVELV	Current peak–to–peak signal level in volts.	
LOADU3		Enter the desired pattern. Each character must be 0 through 9 or A through F (capital letters).
LOOPCODE	Displays the current loopcodes.	

Table 5-2. Remote System Commands. (Continued)		
COMMAND	**RESPONSE**	**ENTRIES**
LOOPCODE ?		CSU, FAC1, FAC2, PYLD, NWRK, LINE. TXPORT and WESTELL if option is included)
LOOPCODE xx	Sets the loopcode.	
MODE	Current mode.	
MODE ?		T1NORM, T1AUTO, CSU, LINELB, INT-LOOP, BTP, MPT, and TDR (if option is included)
MODE xx	Selects the mode status.	
RXINPUT	The current termination mode	
RXINPUT ?		BRIDGE, TERM, MONITOR
RXINPUT xx	Sets the termination mode.	
STATUS	Displays current configuration status.	
SYNC	The current sync status.	
SYNC ?	Describes Stat of Patt Sync. Sync, Sync Loss or Recover.	
TLENGTH	Time remaining to complete current test.	
TLENGTH ?	Format for setting length of test.	(HHH:MM:SS)
TLENGTH xx	Sets length of test. 000:00:00 is continuous.	HHH=0-999 MM=0-59 SS=0-59

Table 5–2. Remote System Commands. (Continued)		
COMMAND	**RESPONSE**	**ENTRIES**
TOD	Time of day and date.	
TOD ?	Format for setting time of day clock.	(HH:MM:SS xx MM/DD/YY)
TOD xx	Sets time of day, day, and date.	HH=hour (24 hr clk) MM=minutes SS=seconds xx=day (SU,MO,TU,WE, TH,FR,SA) MM=Month DD=Date YY=Year
UPDATE	Displays Figure 5–2.	

5.5.1.3 BTP RESULTS Menu

The BTP RESULTS menu (Figure 5–4) displays the current status of bridge tap test. To display the BTP RESULTS menu, type BTPSTAT at the REMOTE prompt. Press the **ESC** key to exit this menu.

```
REMOTE>BTPSTAT

                    **** BTP MODE RESULTS ****
ALL ONES...             PASSED
1:1...                  PASSED
1:3...                  PASSED
1:5...                  FAILED
1:6...                  PASSED
1:7...                  PASSED
2:8...                  PASSED
2:9...                  PASSED
2:10...                 PASSED
2:11...                 PASSED
2:12...                 PASSED
2:13...                 PASSED
2:14...                 PASSED
3 IN 18...              PASSED
3 IN 19...              PASSED
3 IN 20...              PASSED
3 IN 21...              PASSED
3 IN 22...              PASSED
3 IN 23...              PASSED
3 IN 24...              PASSED
QRSS...                 PASSED
```

Figure 5–4. BTP Mode Results Menu.

5.5.1.4 MPT RESULTS Menu

The MPT RESULTS menu (Figure 5–5) displays the current status of bridge tap test. To display the MPT RESULTS menu, type MPTSTAT at the REMOTE prompt. Press the **ESC** key to exit this menu.

```
REMOTE>MPTSTAT

                    **** MPT MODE RESULTS ****
ALL ONES...             PASSED
1:7...                  PASSED
2:8...                  FAILED
3 IN 24...              PASSED
QRSS...                 PASSED
```

Figure 5–5. MPT Mode Results Menu.

5.5.1.5 LED STATUS Menu

The LED STATUS menu (Figure 5–6) displays the 5575B test configuration and the current status of test parameters. The LED ON/OFF status is also displayed providing updated test status while the test is running as well as when the test is completed. To display the Status menu, type LEDSTAT at the REMOTE prompt. Press the **ESC** key to exit this menu.

```
REMOTE>LEDSTAT


                    **** LED STATUS ****

RX  PULSES LED...        ON
FRAME SYNC LED...        ON
PATTERN SYNC LED...      OFF
DENSITY LED...           OFF
B8ZS LED...              OFF
ONES LED...              OFF
YELLOW ALARM LED...      OFF
```

Figure 5–6. LED Status Menu.

5.5.1.6 Configuration STATUS Menu

The Configuration Status menu (Figure 5–7) displays the 5575B test configuration for verification of parameters. To display this status menu, type **STATUS** at the REMOTE prompt. Press the **ESC** key to exit this menu.

```
REMOTE>STATUS

                    CONFIGURATION STATUS

  RX INPUT..   TERM                    TEST LENGTH..   000:00:00
  MODE..       INTLOOP
  FRAME..      D4                      CLOCK..         INTCLK
  PATTERN..    QRSS
  CODE..       AMI                     LOGIC INJ..     OFF
  LOOP CODE.   CSU                     BPV INJ..       OFF
                                       FRAME INJ..     OFF
  UPAT1..      [8040201008040201]HEX
  UPAT2..      [7FBFDFEFF7FBFDFE]HEX   PRINT..         ON
                                       BR..            9600
                                       CS..            8
  SIGMOD..     RBIT                    PR..            NONE
  LBO..        0                       SB..            2
  FRAME SYNC:  Sync                    PATTERN SYNC:   Sync
```

Figure 5–7. Configuration Status Menu.

5.5.2 User Programs and Patterns

The commands used to store, recall, and edit user patterns and programs are presented in Table 5–3.

Table 5–3. User Programs and Patterns Commands.

COMMAND	RESPONSE	ENTRIES
RECALL	Listing of stored programs and whether they are valid or invalid.	
RECALL ?		"FORM:RECALL # where # = 1–5".
RECALL xx	Recalls selected program.	1, 2, 3, 4, or 5
STORE	Listing of stored programs and whether they are valid or invalid.	
STORE ?		"FORM:STORE # where # = 1–5".
STORE xx	Stores selected program in indicated memory location.	1, 2, 3, 4, or 5
USER1	The current user pattern in the form: USER PATTERN 1 [LSB] 0 [MSB] [00] HEX	
USER2	The current user pattern in the form: USER PATTERN 2 [LSB] 0 [MSB] [00] H	

5.5.3 Printer Port Setup Commands

Table 5–4 presents the commands used to setup the optional printer port from the remote terminal. Figure 5–8 illustrates the PRINT command responses the user will see on the terminal.

Table 5–4. Printer Port Setup Commands.

COMMAND	RESPONSE	ENTRIES
BR	Current printer port baud rate.	
BR ?		300, 1200, 2400, 4800,9600
BR xx	Sets printer port baud rate.	
CS	Current printer port character size.	
CS ?		7, 8
CS xx	Sets printer port character size.	
PR	Current printer port parity.	
PR ?		NONE, ODD, EVEN
PR xx	Sets printer port parity.	
CTRL P	Reroutes print data to remote port. Press again to return to local.	
SB	Current printer port stop bits.	
SB ?		1, 2
SB xx	Selects number of stop bits for remote printer port.	
PRINT	Figure 5–8 provides PRINT example.	

```
REMOTE>PRINT

1: Data print enable/disable
2: Select DATA print conditions
3: Select data types.

Enter 1, 2, 3 or <RETURN> to exit : 2

The available print conditions are:
(A) ----------(B)  1 MINUTE
(C)  5 MINUTES (D) 10 MINUTES
(E) 15 MINUTES (F) 30 MINUTES
(G)  1 HOUR    (H)  2 HOURS
(I)  6 HOURS   (J) 12 HOURS
(K) 24 HOURS   (L) END OF TEST
(M) ERROR      (N) CRC ERR SEC


The currently selected conditions are:
(1)----------(2)----------
Enter number (1–2) and letter to select or <RETURN> to exit:
```

Figure 5–8 (Screen 1 of 2). PRINT Commands.

```
0  BE.....  P 13  FBE       P 25  TEST END..  P 37  FSLIPS–...  P 49  PRM–FE..  P
1  BER.....  P 14  FBER...   P 26  DENSITY...  P 38  WANDER+..  P 50  PRM–LV..  P
2  ES.....  P 15  FSL...     P 27  BALM SEC...  P 39  WANDER–...  P 51  PRM–SL..  P
3  EFS..  P 16  FSLS...      P 28  YALM SEC....  P 40  SMPLX CUR  P 52  GERRS..  P
4  %EFS...  P 17  FB ES..    P 29  RFQ MAX....  P 41  PRM–EFE.  P 53  GAS..  P
5  SES.....  P 18  CRC ERR...  P 30  RFQ MIN....  P 42  PRM–G1..  P 54  GUAS..  P
6  CSES....  P 19  CRC RATE.  P 31  RX FREQ...  P 43  PRM–G2..  P 55  GAS%..  P
7  CSER....  P 20  CRC ES..   P 32  P–P VLT...  P 44  PRM–G3..  P 56  GSES%..  P
8  PSL....  P 21  SIGLOS.     P 33  P–P dB..  P 45  PRM–G4....  P 57  GEFS..  P
9  PSLS.  P 22  ETtotal.....  P 34  CLK SLP....  P 46  PRM–G5..  P 58  GSES..  P
10 BPV'S...  P 23  ETStotal..  P 35  SLIPRATE...  P 47  PRM–G6..  P 59  GDM..  P
11 BPVRATE P 24  EDtotal....  P 36  FSLIPS+.....  P 48  PRM–SE..  P 60  GDM%..  P
12 BPV ES..  P

Enter 'A' to enable all parameters, 'C' to disable all parameters,
numbers of parameters to change, or RETURN to exit.
\
```

Figure 5–8 (Screen 2 of 2). PRINT Commands.

5.5.4 BERT Setup Commands

Table 5–5 presents the BERT setup commands. These commands are used to check/set the test conditions.

Table 5–5. BERT Setup Commands.

COMMAND	RESPONSE	ENTRIES
CLOCK	Source of transmitter clock, internal, recovered, EXT–T1, or EXT–TTL	
CLOCK ?		INTCLK, RCVCLK, EXT (PCM)
CLOCK xx	Selects clock source.	INTERNAL, RECOVERED
CLR	Clears all the current data accumulators.	
CODE	Current line code.	
CODE ?		AMI, B8ZS
CODE xx	Selects the line code.	
FRAME	Current framing.	
FRAME ?		NONE, D4, ESF, SLC®96
FRAME xx	Sets framing.	
LINJS	Current pattern.	linjs (single logic error)
LINJR	Current pattern.	linjr (logic error inject rate)
LRATE	Current pattern.	lrate (logic rate is defined)
BINJS	Current pattern.	binjs (single BPV error)
BINJR	Current pattern.	binjr (BPV error inject rate)
BRATE	Current pattern.	brate (BPV rate is defined)

Table 5–5. BERT Setup Commands.(Continued)

COMMAND	RESPONSE	ENTRIES
FINJS	Current pattern.	finjs (single frame error)
FINJR	Current pattern.	finjr (frame error inject rate)
FRATE	Current pattern.	frate (frame rate is defined)
PAT	Current pattern.	
PAT ?		"2^15–1, 2^20–1, 2^23–1, QRSS, ZERO, ONE, 1:1. 1:7, 3:24, OCT55, NET55, USER 1, USER 2, USER 3*".
PAT XX	Selects pattern.	
RESTART	Starts test and clears all previous data.	

*Optional.

5.5.5 BERT Results Commands

Table 5–6 presents the commands used to view the count or results of individual test parameters. In contrast to the previous commands, these commands are all direct entry commands; that is, they have no modifying parameters nor will the question mark produce a Help menu.

Table 5–6. BERT Results Commands.

COMMAND	RETURNS
BE	Bit Errors
BER	Bit Error Rate
BITS	Bits in Pattern Sync
BLUE	Number of Blue Alarm Seconds
BPV	Received Bipolar Violations
BPVES	Bipolar Violation Errored Seconds
BPVRATE	Bipolar Violation Error Rate
CRCERR	Number of CRC Errors
CRCES	CRC Errored Seconds
CRCRATE	CRC Error Rate
GEFS	G.821 Error Free Seconds
GERRS	G.821 Errored Seconds
GAS	G.821 Available Seconds
GAS%	G.821 % Available Seconds
GUAS	G.821 Unavailable Seconds
GSES	G.821 Severely Errored Seconds
GSES%	G.821 % Severely Errored Seconds
GDM	G.821 Degraded Minutes
GDM%	G.821 % Degraded Minutes
TED	Total Elapsed Days since beginning of test
TEND	Time Remaining

Table 5–6. BERT Results Commands.(Continued)	
COMMAND	**RETURNS**
TET	Total Elapsed Time since beginning of test (in seconds)
TETS	Total Elapsed Test Seconds
FBE	Frame Bit Errors
FBER	Frame Bit Error Rate
FSL	Frame Sync Loss
FSLIP+	Positive Frame Slips
FSLIP–	Negative Frame Slips
FSLS	Frame Sync Loss Seconds
LEVELD	RX peak–peak dBdsx
LEVELV	RX peak–peak Volts
PEFS	Percent of Error Free Seconds
PSL	Number of Sync Losses
PSLS	Sync Loss Seconds
RXFREQ	Current Receive Frequency, maximum Receive Frequency, and minimum Receive Frequency
RXLEVEL	Current Receive Signal Level, the maximum Received Signal Level, and the minimum Received Signal Level
SES	Severely Errored Seconds
SPLX	Simplex Current
TEND	Test Ends in
YELLOW	Number of Yellow Alarm Seconds

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Chapter 6 – Options

6.0 INTRODUCTION

This section provides a brief description of the hardware and software options that may be purchased separately to enhance the capabilities of the 5575B test set. Upon receipt of optional equipment, place the manual provided with the option in this section of the 5575B manual.

6.1 HARDWARE OPTIONS

The following paragraphs describe the hardware options designed for use with the 5575B. These paragraphs contain brief descriptions of the 5564 T1 Channel Monitor lid, 5565 Drop and Insert lid, 5565/96 SLC®96 lid, 5565/96A SLC®96 lid (with 96 signaling LEDs), 5587 Span Power lid, 5585 Span Test Adapter, the Pulse Mask, Jitter, and TDR boards, and the 1PPM Clock options. Ordering numbers are provided in Table 6–1. For additional information, contact your Phoenix Representative or Phoenix's Sales Department at 1–800–866–8480, ext. 255.

Table 6–1. Model 5575B Hardware Options.

OPTION	PART NUMBER	MANUAL NUMBER
5564	F–5575–641A–11	34–00121
5565	F–5575–651A–110	34–00096
5565/96	F–5575–651B–110	34–00134
5565/96A	F–5575–651C–110	34–00161
5587	F–5575–871A–111	34–00126
5585	F–5585–001—11	34–00095
Pulse Mask	9–5575B–007–1	34–00163
Jitter	9–5575B–008–1	34–00164
TDR	9–5575B–114–1	34–00165
1PPM Clock	9–5575B–010–1	N/A

6.1.1 Model 5564 T1 Channel Monitor Option

The 5564 Channel Monitor Unit lid option is designed to permit monitoring of any VF (voice frequency) channel in the DS1 data stream. A built-in speaker provides audio monitoring of the channel while signaling information for the selected channel is displayed on LEDs.

6.1.2 Model 5565 Drop/Insert Option

The 5565 Drop/Insert lid option is available as a standard DS0 lid or as a DS0 lid with MF receiver having an 80-digit buffer. The drop feature allows the user to drop the DS0 to the speaker, VF output jack, data bit LEDs, signaling bit LEDs, and the RS-232 port. The insert feature allows the user to insert the DS0 from the VF input jack, internal frequency synthesizer, internal; signaling bit generator, 8-bit data insertion and the RS-232 port.The ESF and SLC96 data link can be dropped to and inserted from the RS-232 port.

6.1.3 Model 5565/96 SLC®96 Drop/Insert Option

The 5565/96 SLC®96 Drop/Insert lid option is available as a standard DS0 lid or as a DS0 lid with MF receiver. The 5565/96 provides all features available in the 5565 Drop/Insert lid (with the exception of remote operation), as well as additional SLC®96 facility testing capabilities.

The 5565/96 tests and monitors SLC®96 spans by simulating all alarm conditions in either direction, switching any integrated span line to protect, looping the RT of any span line up or down from a CO DSX, and mapping physical to electrical channel connections in Mode 2 operation. In addition, Data Bit LEDs allow monitoring of the switch to protect status of the A, B, C, and D spans (S1, S2, S3, and S4).

6.1.4 Model 5565/96A SLC®96 Drop/Insert Option

The 5565/96A SLC®96 Drop/Insert lid option is available as a standard DS0 lid or as a DS0 lid with MF receiver. The 5565/96

provides all features available in the 5565/96 Drop/Insert lid, as well as having 96 Signaling LEDs to allow real time monitoring of signaling bits for all 24 channels.

6.1.5 Model 5587 Span Line Power Option

In conjunction with the 5575B, the 5587 Span Line Power Lid provides the ability to power and test a T1 line before office equipment is installed. The 5587 can power up to 12 miles of a T1 network.

6.1.6 Model 5585 Span Test Adapter Option

The 5585 is designed to provide test access to the signals and power of a T1 repeater at the repeater housing. The 5585's capabilities are enhanced by the 5575B's simplex current measurement, eliminating the need for an additional volt–ohm meter. The 5585, used in conjunction with the 5575B for T1 span repeater testing, also provides bridge and insertion interrupting jacks on the input and output sides of both regenerators and allows signal loopbacks and simplex current loopbacks. With the 5585, a simplex current patch is fuse protected against unregulated span power supplies, sense points are provided for simplex current measurement, the dc power path is maintained irrespective of other test configuration options, and regenerator output can be isolated from the span and 100 ohm terminated by switch actuation.

6.1.7 Pulse Mask Option

The T1 Pulse Mask option digitizes the incoming receive data pulses for analysis and comparison with user selectable pulse masks. Pass/Fail comparisons with either the AT&T Compatibility Bulletin 119 (ANSI T1.102) or ANSI T1.403 pulse mask specifications are performed along with detailed analysis of critical pulse shape parameter, and displayed on the 5575B front panel. A graphics printout is also provided via the printer port, depicting the actual measured pulse and it's relationship to the specified pulse mask.

6.1.8 Jitter Option

The T1 Jitter option measures the phase jitter of the recovered receive clock and compares the results with user selectable jitter

masks. Pass/fail comparisons with either AT&T PUB41451, PUB43801, or PUB62411 (issue 1983 or 1985) can be performed along with full spectral analysis of the measured peak-to-peak jitter. Additional parameters that are identified include Frequency and amplitude of the maximum wideband jitter component, and the maximum high band jitter component above 5kHz. Spectral analysis extends to frequencies up to 100kHz and is also available for graphics printout via the printer port.

6.1.9 TDR Option

The TDR option performs testing on the T1 line in order to identify and isolate anomalies in the cable such as shorts, opens, and bridge taps. Faults are identified during the test and the distance to the Fault, along with the type of Fault, are presented to the user. Capabilities are included to test a minimum of 10,000 feet of common telecommunication cable types. A graphics printout of the test is also available via the printer port.

6.1.10 1PPM Clock

The 1PPM Clock option increases the accuracy of the 5575B's transmit rate from the standard 1.544 ±7.5 kbps to 1.544 ±1.5 kbps.

6.2 SOFTWARE OPTIONS

The following paragraphs contain brief descriptions of the software options available for the 5575B test set. Long User Pattern, TXPORT and WESTELL Loop Codes, T1E1 (PRM), Performance Analysis G.821, Fractional T1, and T1 Impairment are the currently offered software options. Ordering numbers are provided in Table 6–2. For additional information, contact your Phoenix Representative or Phoenix's Sales Department at 1–800–866–8480.

Table 6–2. Model 5575B Software Options.

OPTION	PART NUMBER	MANUAL NUMBER
Long User Pattern	9–5575B–003–1	34–00166
TXPORT Repeater Codes	9–5575B–004–1	34–00167
Westell Repeater Codes	9–5575B–004–2	34–00184
T1E1 (PRM)	9–5575B–005–1	34–00168
Performance Analysis/ G.821	9–5575B–006–1	34–00169
Fractional T1	9–5575B–009–1	34–00170
T1 Impairment Detection	9–5575B–002–1	34–00171

6.2.1 Long User Pattern Option

The BERT User Pattern option provides a programmable user pattern up to 2Kbytes.

6.2.2 Smart Repeater Support Codes Options

The Smart Loop Code options provide special loop codes for TXPORT or WESTELL repeaters. Consult the factory for your smart loop code requirements.

6.2.3 T1E1 (PRM) Option

The T1E1 option allows the 5575B to provide performance reports and monitoring per ANSI T1.403.

6.2.4 Performance Analysis per CCITT G.821 Option

The Performance Analysis option allows the 5575B to automatically perform analysis on the received T1 signal and provides complete performance information on live traffic or received BERT patterns.

6.2.5 Fractional T1 Option

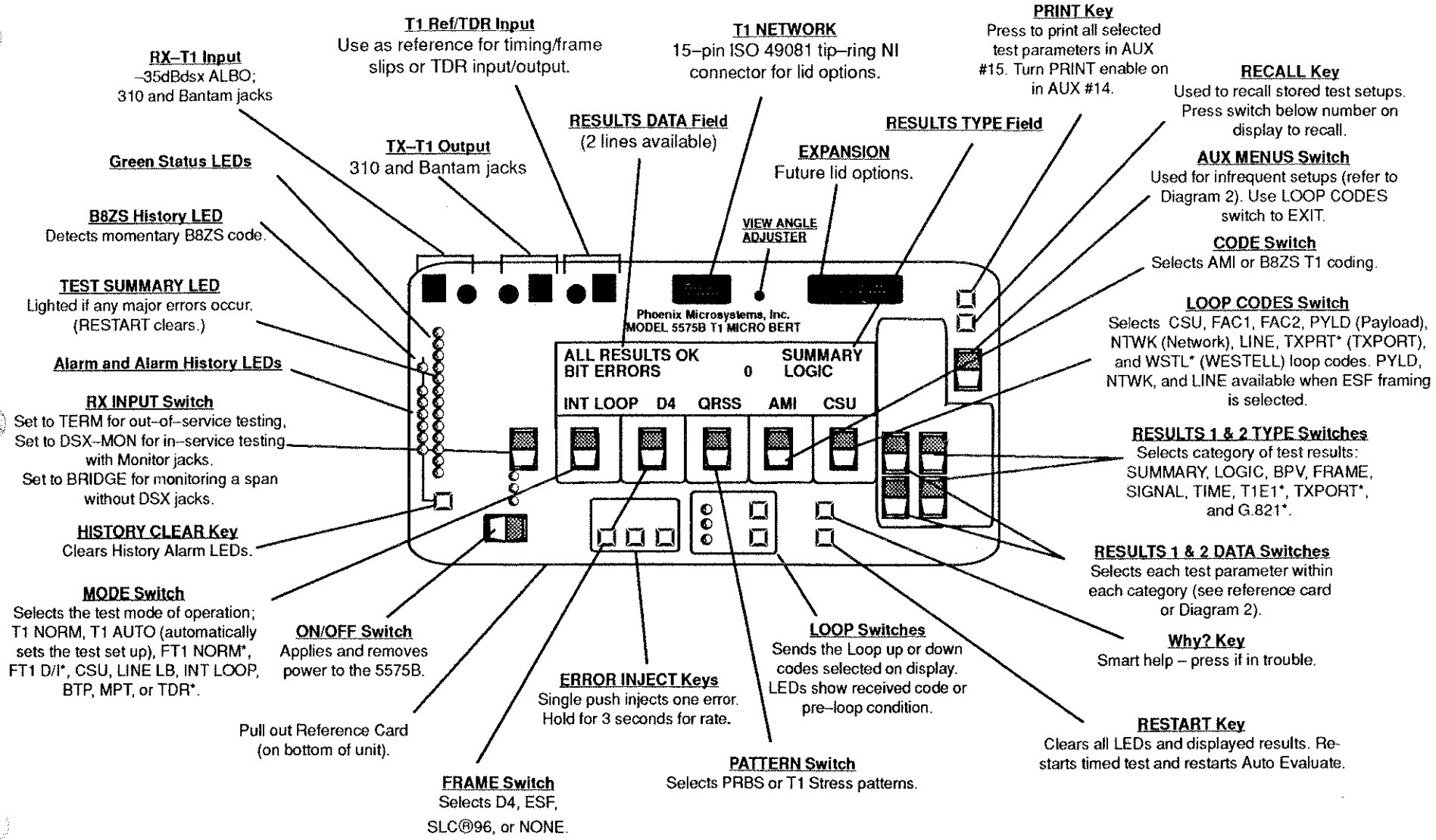
The Fractional T1 option provides two features; FT1 NORM and FT1 D/I. The FT1 NORM mode allows the 5575B to perform BERT on a FT1 span. The FT1 D/I mode allows the 5575B to insert BERT patterns on a FT1 span.

6.2.6 T1 Impairment Detection Option

The Model 5575B will detect and measure the relative severity of T1 twisted pair impairments such as:

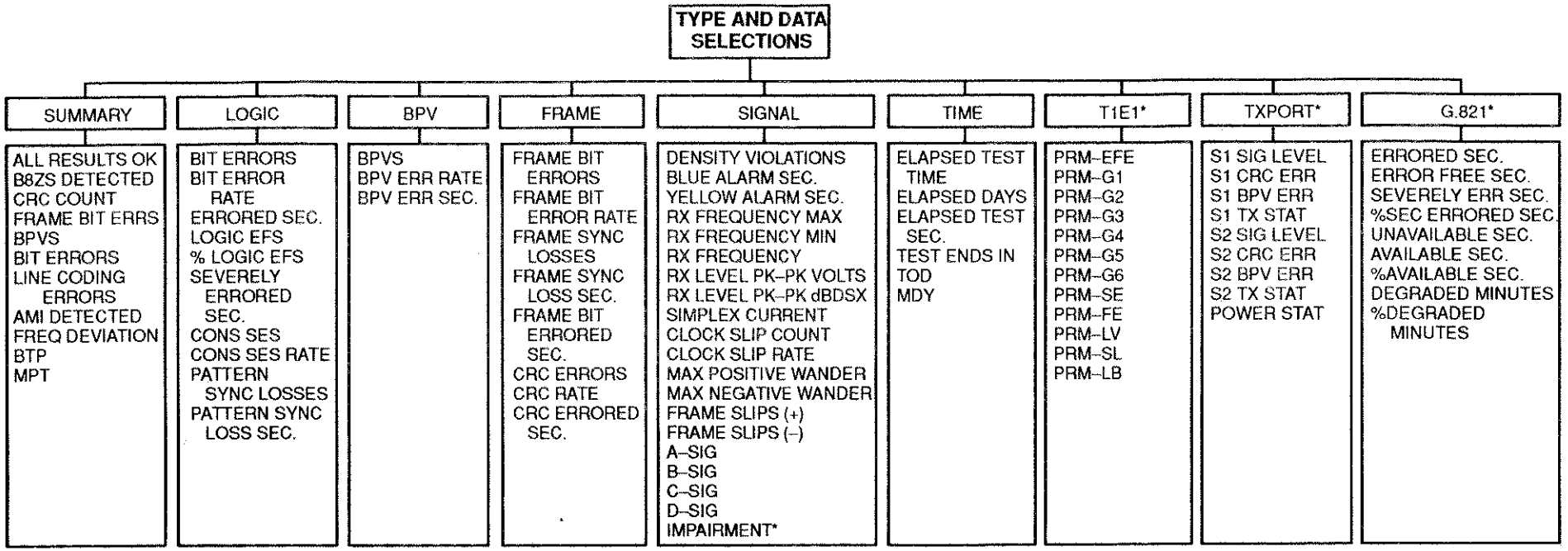
a. Shorted spans.
b. Open or unterminated spans.
c. Mis-match terminated spans.
d. Impedance faults such as Bridge taps.
e. Impedance faults such as water in the cable.

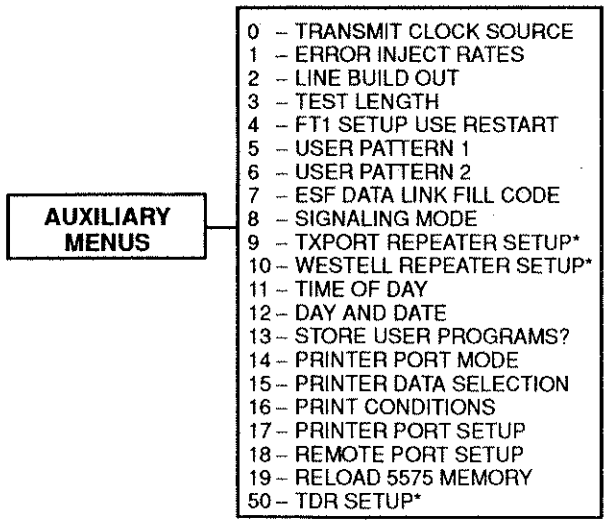
In seconds, the 5575B will detect and measure T1 impairments at any Bridge, Monitor, or Terminate test access point on the impaired span segment in both the transmit and receive direction with LIVE traffic (or any pseudorandom test pattern).



*Optional.

Model 5575B Front Panel.





*Optional.

Model 5575B Menu Chart.

HEX to 7–Bit ASCII No Parity.

HEX	CHAR	TYPE	HEX	CHAR	HEX	CHAR	HEX	CHAR
00	NUL	–	20	space	40	@	60	’
01	SOH	CTRL–A	21	!	41	A	61	a
02	STX	CTRL–B	22	”	42	B	62	b
03	ETX	CTRL–C	23	#	43	C	63	c
04	EOT	CTRL–D	24	$	44	D	64	d
05	ENQ	CTRL–E	25	%	45	E	65	e
06	ACK	CTRL–F	26	&	46	F	66	f
07	BEL	CTRL–G	27	’	47	G	67	g
08	BS	CTRL–H	28	(	48	H	68	h
09	TAB	CTRL–I	29	)	49	I	69	i
0A	LF	CTRL–J	2A	*	4A	J	6A	j
0B	VT	CTRL–K	2B	+	4B	K	6B	k
0C	FF	CTRL–L	2C	,	4C	L	6C	l
0D	CR	CTRL–M	2D	–	4D	M	6D	m
0E	SO	CTRL–N	2E	.	4E	N	6E	n
0F	SI	CTRL–O	2F	/	4F	O	6F	o
10	DLE	CTRL–P	30	0	50	P	70	p
11	DC1	CTRL–Q	31	1	51	Q	71	q
12	DC2	CTRL–R	32	2	52	R	72	r
13	DC3	CTRL–S	33	3	53	S	73	s
14	DC4	CTRL–T	34	4	54	T	74	t
15	NAK	CTRL–U	35	5	55	U	75	u
16	SYN	CTRL–V	36	6	56	V	76	v
17	ETB	CTRL–W	37	7	57	W	77	w
18	CAN	CTRL–X	38	8	58	X	78	x
19	EM	CTRL–Y	39	9	59	Y	79	y
1A	SUB	CTRL–Z	3A	:	5A	Z	7A	z
1B	ESC	ESC	3B	;	5B	[	7B	{
1C	FS	–	3C	<	5C	\	7C	:
1D	GS	–	3D	=	5D	]	7D	}
1E	RS	–	3E	>	5E	^	7E	~
1F	US	–	3F	?	5F	<–	7F	DEL

HEX to 8–Bit ASCII Even Parity.

HEX	CHAR	TYPE	HEX	CHAR	HEX	CHAR	HEX	CHAR
00	NUL	–	A0	space	C0	@	60	'
81	SOH	CTRL–A	21	!	41	A	E1	a
82	STX	CTRL–B	22	"	42	B	E2	b
03	ETX	CTRL–C	A3	#	C3	C	63	c
84	EOT	CTRL–D	24	$	44	D	E4	d
05	ENQ	CTRL–E	A5	%	C5	E	65	e
06	ACK	CTRL–F	A6	&	C6	F	66	f
87	BEL	CTRL–G	27	'	47	G	E7	g
88	BS	CTRL–H	28	(	48	H	E8	h
09	TAB	CTRL–I	A9	)	C9	I	69	i
0A	LF	CTRL–J	AA	*	CA	J	6A	j
8B	VT	CTRL–K	2B	+	4B	K	EB	k
0C	FF	CTRL–L	AC	,	CC	L	6C	l
8D	CR	CTRL–M	2D	–	4D	M	ED	m
8E	SO	CTRL–N	2E	.	4E	N	EE	n
0F	SI	CTRL–O	AF	/	CF	O	6F	o
90	DLE	CTRL–P	30	0	50	P	F0	p
11	DC1	CTRL–Q	B1	1	D1	Q	71	q
12	DC2	CTRL–R	B2	2	D2	R	72	r
93	DC3	CTRL–S	33	3	53	S	F3	s
14	DC4	CTRL–T	B4	4	D4	T	74	t
95	NAK	CTRL–U	35	5	55	U	F5	u
96	SYN	CTRL–V	36	6	56	V	F6	v
17	ETB	CTRL–W	B7	7	D7	W	77	w
18	CAN	CTRL–X	B8	8	D8	X	78	x
99	EM	CTRL–Y	39	9	59	Y	F9	y
9A	SUB	CTRL–Z	3A	:	5A	Z	FA	z
1B	ESC	ESC	BB	;	DB	[	7B	{
9C	FS	–	3C	<	5C	\	FC	:
1D	GS	–	BD	=	DD	]	7D	}
1E	RS	–	BE	>	DE	^	7E	~
9F	US	–	3F	?	5F	<–	FF	DEL

Hex to 8–Bit ASCII Odd Parity.

HEX	CHAR	TYPE	HEX	CHAR	HEX	CHAR	HEX	CHAR
80	NUL	–	20	space	40	@	E0	'
01	SOH	CTRL–A	A1	!	C1	A	61	a
02	STX	CTRL–B	A2	"	C2	B	62	b
83	ETX	CTRL–C	23	#	43	C	E3	c
04	EOT	CTRL–D	A4	$	C4	D	64	d
85	ENQ	CTRL–E	25	%	45	E	E5	e
86	ACK	CTRL–F	26	&	46	F	E6	f
07	BEL	CTRL–G	A7	'	C7	G	67	g
08	BS	CTRL–H	A8	(	C8	H	68	h
89	TAB	CTRL–I	29	)	49	I	E9	i
8A	LF	CTRL–J	2A	*	4A	J	EA	j
0B	VT	CTRL–K	AB	+	CB	K	6B	k
8C	FF	CTRL–L	2C	,	4C	L	EC	l
0D	CR	CTRL–M	AD	–	CD	M	6D	m
0E	SO	CTRL–N	AE	.	CE	N	6E	n
8F	SI	CTRL–O	2F	/	4F	O	EF	o
10	DLE	CTRL–P	B0	0	D0	P	70	p
91	DC1	CTRL–Q	31	1	51	Q	F1	q
92	DC2	CTRL–R	32	2	52	R	F2	r
13	DC3	CTRL–S	B3	3	D3	S	73	s
94	DC4	CTRL–T	34	4	54	T	F4	t
15	NAK	CTRL–U	B5	5	D5	U	75	u
16	SYN	CTRL–V	B6	6	D6	V	76	v
97	ETB	CTRL–W	37	7	57	W	F7	w
98	CAN	CTRL–X	38	8	58	X	F8	x
19	EM	CTRL–Y	B9	9	D9	Y	79	y
1A	SUB	CTRL–Z	BA	:	DA	Z	7A	z
9B	ESC	ESC	3B	;	5B	[	FB	{
1C	FS	–	BC	<	DC	\	7C	B
9D	GS	–	3D	=	5D	]	FD	}
9E	RS	–	3E	>	5E	"	FE	~
1F	US	–	BF	?	DF	z	7F	DEL

Hex to 8–Bit ASCII Mark Parity.

HEX	CHAR	TYPE	HEX	CHAR	HEX	CHAR	HEX	CHAR
80	NUL	–	A0	space	C0	@	E0	'
81	SOH	CTRL–A	A1	!	C1	A	E1	a
82	STX	CTRL–B	A2	"	C2	B	E2	b
83	ETX	CTRL–C	A3	#	C3	C	E3	c
84	EOT	CTRL–D	A4	$	C4	D	E4	d
85	ENQ	CTRL–E	A5	%	C5	E	E5	e
86	ACK	CTRL–F	A6	&	C6	F	E6	f
87	BEL	CTRL–G	A7	'	C7	G	E7	g
88	BS	CTRL–H	A8	(	C8	H	E8	h
89	TAB	CTRL–I	A9	)	C9	I	E9	i
8A	LF	CTRL–J	AA	*	CA	J	EA	j
8B	VT	CTRL–K	AB	+	CB	K	EB	k
8C	FF	CTRL–L	AC	,	CC	L	EC	l
8D	CR	CTRL–M	AD	–	CD	M	ED	m
8E	SO	CTRL–N	AE	.	CE	N	EE	n
8F	SI	CTRL–O	AF	/	CF	O	EF	o
90	DLE	CTRL–P	B0	0	D0	P	F0	p
91	DC1	CTRL–Q	B1	1	D1	Q	F1	q
92	DC2	CTRL–R	B2	2	D2	R	F2	r
93	DC3	CTRL–S	B3	3	D3	S	F3	s
94	DC4	CTRL–T	B4	4	D4	T	F4	t
95	NAK	CTRL–U	B5	5	D5	U	F5	u
96	SYN	CTRL–V	B6	6	D6	V	F6	v
97	ETB	CTRL–W	B7	7	D7	W	F7	w
98	CAN	CTRL–X	B8	8	D8	X	F8	x
99	EM	CTRL–Y	B9	9	D9	Y	F9	y
9A	SUB	CTRL–Z	BA	:	DA	Z	FA	z
9B	ESC	ESC	BB	;	DB	[	FB	{
9C	FS	–	BC	<	DC	\	FC	B
9D	GS	–	BD	=	DD	]	FD	}
9E	RS	–	BE	>	DE	"	FE	~
9F	US	–	BF	?	DF	z	FF	DEL

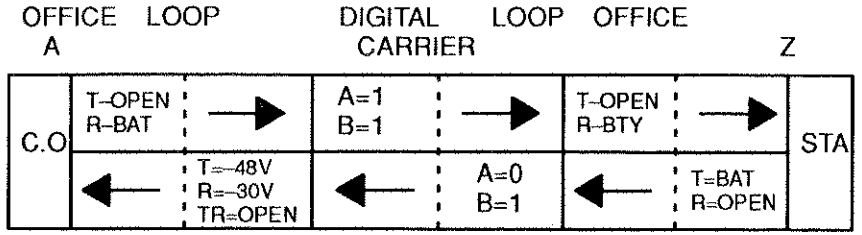
Hex – EBCDIC.

HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR
00	NUL	40	space	7C	@	79	'
01	SOH	5A	!	C1	A	81	a
02	STX	7F	"	C2	B	82	b
03	ETX	7B	#	C3	C	83	c
37	EOT	5B	$	C4	D	84	d
2D	ENQ	6C	%	C5	E	85	e
2E	ACK	50	&	C6	F	86	f
2F	BEL	7D	'	C7	G	87	g
16	BS	4D	(	C8	H	88	h
05	TAB	5D	)	C9	I	89	i
25	LF	5C	*	D1	J	91	j
0B	VT	4E	+	D2	K	92	k
0C	FF	6B	,	D3	L	93	l
0D	CR	60	-	D4	M	94	m
0E	SO	4B	.	D5	N	95	n
0F	SI	61	/	D6	O	96	o
10	DLE	F0	0	D7	P	97	p
11	DC1	F1	1	D8	Q	98	q
12	DC2	F2	2	D9	R	99	r
13	DC3	F3	3	E2	S	A2	s
3C	DC4	F4	4	E3	T	A3	t
3D	NAK	F5	5	E4	U	A4	u
32	SYN	F6	6	E5	V	A5	v
26	ETB	F7	7	E6	W	A6	w
18	CAN	F8	8	E7	X	A7	x
19	EM	F9	9	E8	Y	A8	y
3F	SUB	7A	:	E9	Z	A9	z
27	ESC	5E	;		[	C0	{
22	FS	4C	<	E0	\	6A	|
		7E	=		]	D0	}
35	RS	6E	>		"	A1	~
		6F	?	6D	_	07	DEL

Hex to BAUDOT.

HEX	LETTERS CHAR	FIGURES CHAR	TYPE
18	A	.	
13	B	?	
0E	C	:	
12	D	$	
10	E	3	
16	F	!	
0B	G	&	
05	H	#	
0C	I	8	
1A	J	BELL	
1E	K	(	
09	L	)	
07	M	.	
06	N	,	
03	O	9	
0D	P	0	
1D	Q	1	
0A	R	4	
14	S	'	
01	T	5	
1C	U	7	
0F	V	;	
19	W	2	
17	X	/	
15	Y	6	
11	Z	"	
00			BLANK
1F			LETTERS SHIFT
1B			FIGURES SHIFT
04			SPACE
02			CARRIAGE RET
08			LINE FEED

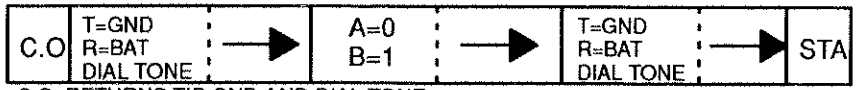
FX GROUND START



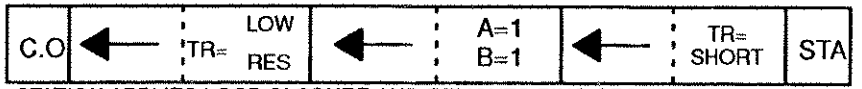
IDLE



STA APPLIES RING GND

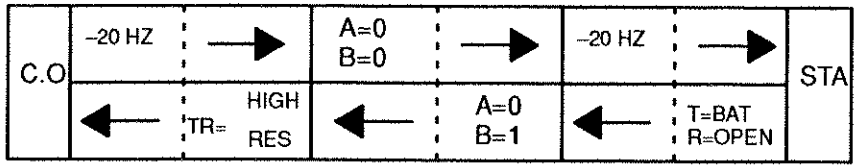


C.O. RETURNS TIP GND AND DIAL TONE

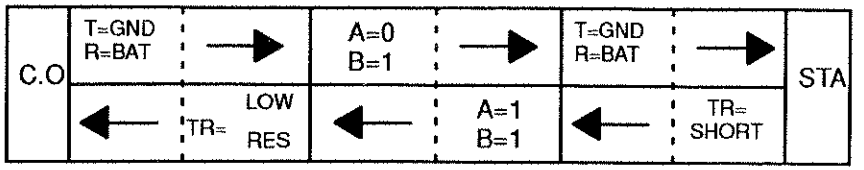


STATION APPLIES LOOP CLOSURE AND REMOVES RING GROUND

STATION OFF HOOK

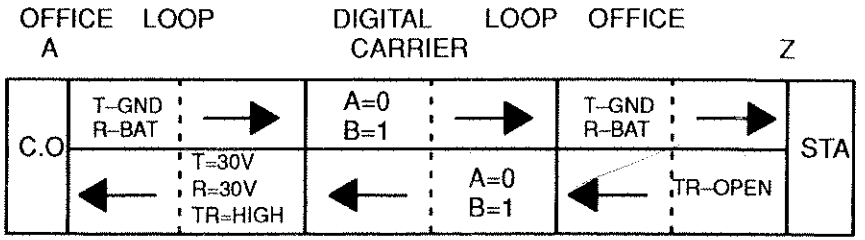


C.O. RINGS STATION

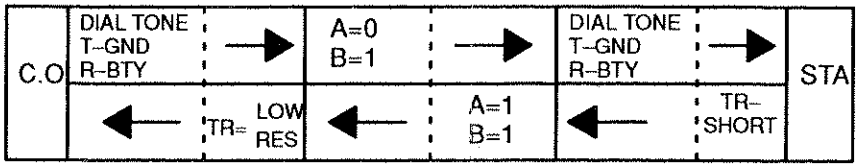


BUSY CONDITION

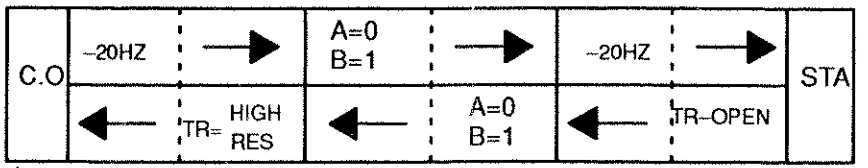
FX LOOP START



IDLE

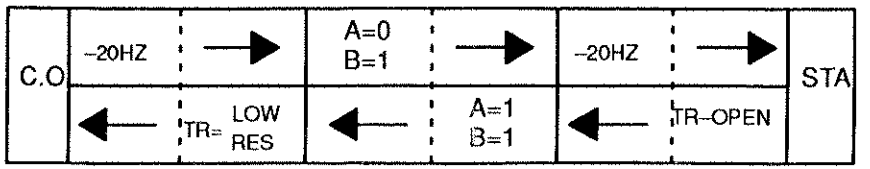


STATION OFF HOOK



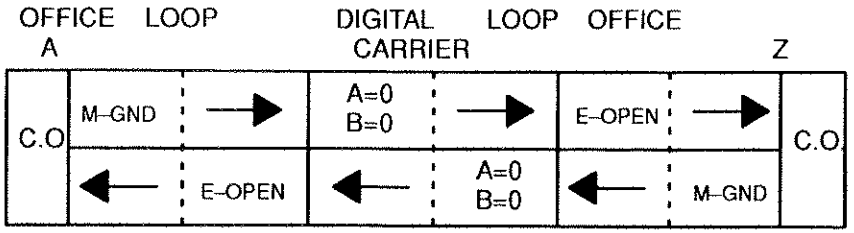
* B BIT FOLLOWS RING CYCLE

CENTRAL OFFICE RINGING

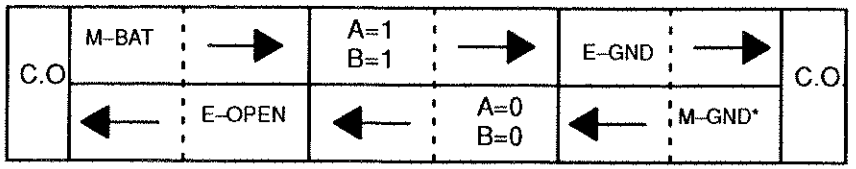


BUSY CONDITION

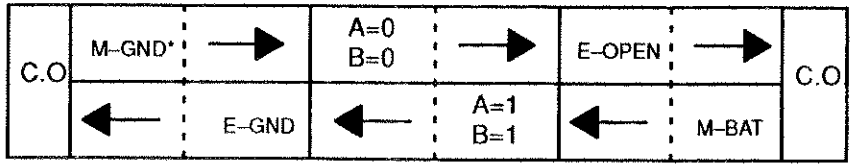
E & M SIGNALING



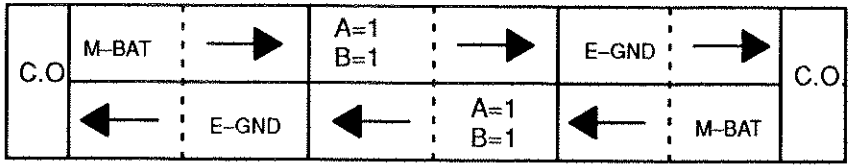
IDLE



OFFICE A OFF HOOK



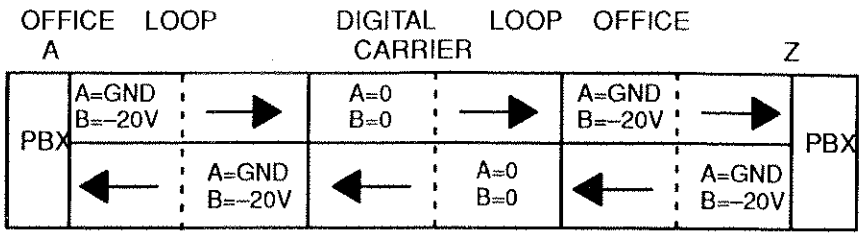
OFFICE Z OFF HOOK



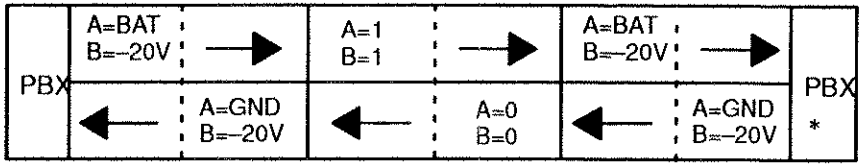
* NOTE: WHEN AN "OFF HOOK" SIGNAL IS RECEIVED AT EITHER END, THAT END WILL NORMALLY RESPOND WITH EITHER A WINK SIGNAL (ON HOOK TO OFF HOOK BACK TO ON HOOK) OR DIAL TONE TO SIGNAL THE ORIGINATING END IT IS READY TO RECEIVE DIALING INFO.

BUSY CONDITION

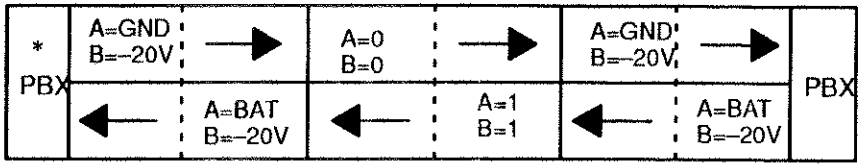
DX SIGNALING



IDLE CONDITION



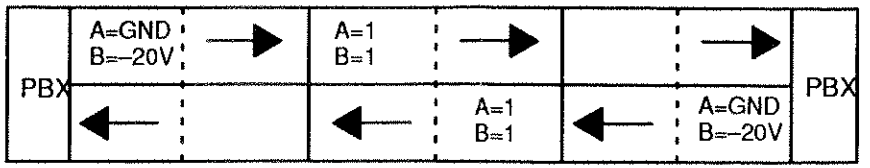
PBX "A" OFF HOOK



PBX "Z" OFF HOOK

* NOTE 1: WHEN AN "OFF HOOK" SIGNAL IS RECEIVED AT EITHER END, THAT END NORMALLY RESPONDS WITH EITHER A WINK SIGNAL (ON HOOK TO OFF HOOK BACK TO ON HOOK) OR DIAL TONE TO SIGNAL THE ORIGINATING END IT IS READY TO RECEIVE DIALING INFO.

**NOTE 2: "A" LEAD CONDITIONS NORMALLY APPEAR ON "T" (2W) OR T.R. SIMPLEX(4W); "B" LEAD CONDITIONS NORMALLY APPEAR ON "R" (2W) OR T.R. SIMPLEX (4W).



* NOTE: WHEN AN "OFF HOOK" SIGNAL IS RECEIVED AT EITHER END, THAT END WILL NORMALLY RESPOND WITH EITHER A WINK SIGNAL (ON HOOK TO OFF HOOK BACK TO ON HOOK) OR DIAL TONE TO SIGNAL THE ORIGINATING END IT IS READY TO RECEIVE DIALING INFO.

BUSY CONDITION

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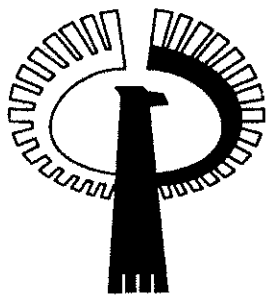
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