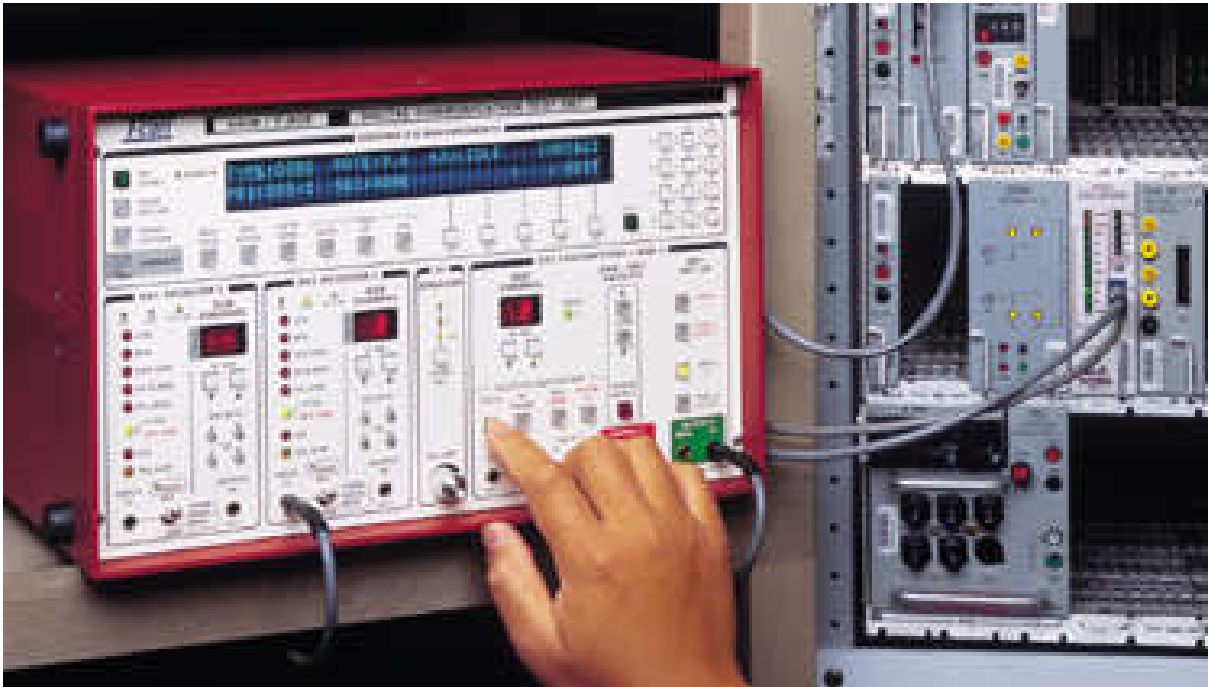


T-COM combines T1, T3, SONET, data voice & switch testing in a single unit!



- ▷ **T1/F-T1**
Dual independent receivers, with auto-frame & auto-sync. Dual transmitters for stress testing and dual drop-&insert. CSU/NI and repeater loopback codes. Display level, frequency, and synchronization slip. Measure T1/F-T1 round trip delay.
- ▷ **DDS/ADN Data**
DS0A/B (2.4kb/s - 64kb/s) and Switched 56. DDS loopback codes and MJU controls with mapping. Full array of DDS stress patterns. Patch into OCU/DSO-DP channel cards and test at T1 DSX jacks. Verify BITS timing.
- ▷ **Voice/Digital Switching**
VF measurements and transmit. Signaling analysis including telephone calls and winks. Emulate a digital switch/PBX.
- ▷ **DS3 & STS-1 SONET**
Dual independent receivers, with auto-frame to DS3 & STS-1 SONET. Automatically demultiplex imbedded T1, VT1.5, and DS0 channels from both receivers. Transmit STS-1, DS3 and VT1.5 stress patterns. Multiplex DS1 and DS3 signals into STS-1/DS3 bitstream. Identify SONET synchronization slip.
- ▷ **SS7**
Dual in-service monitoring from DS1 access, as well as test access from DS3, OCU/DSO-DP, and V.35 test points. Capture errors and packet statistics.
- ▷ **Datacom**
V.35 & RS-232-C interfaces for DTE network testing directly into CSU or Multiplexer. DCE interface to external protocol analyzer for dual monitor and drop-and-insert applications.
- ▷ **Data Link**
ESF (ANSI and AT&T), SLC-96. Automatically display and transmit data link messages.

OCU/DSO-DP Interface for DS0A/B (DDS) Testing

Option 30 adds direct DS0 channel unit access

With Option 30, standard 2.4kb/s thru 64kb/s data facilities can be tested directly at OCU/DSO-DP channel units and T1 access points.

This option makes the 440B/T-ACE ideal for installing and maintaining channel banks and 1/0 digital cross connect systems, whether your office uses AT&T/Western, Northern Telecom, Tellabs, Siemens, AFC or any other DDS/ADN type equipment. Isolate digital data bank problems to individual channel units, CSU/DSUs, or facilities. This option is useful for testing SS7 facilities or to BERT ISDN "BRITE" cards.

Option 30 also provides clock synchronization/slip testing capabilities. Compare a BITS or Office Clock to any other T1 or 64kHz & 8kHz composite clock, before turn-up or while your facility is in-service.



Rear Panel
◀ View

Datacom Testing with V.35 & RS-232-C Interfaces



Option 31 provides DTE & DCE test interfaces for data rates of 2.4kb/s to 1.536Mb/s.

Option 31 is designed for private network/datacom testing, at data rates from 2.4kb/s (low speed data) to 1.536Mb/s (fractional T1). Stress test a data network from a CSU or multiplexer via RS-232-C or V.35 test access for DTE applications. The T-COM 440B/T-ACE can even simultaneously test from T1 or T3 test access jacks.

This option also provides DCE mode interface to external protocol analyzers for testing standard rates from 2.4kb/s to 1.536Mb/s. A variety of connectors provide dual direction monitor or dual drop-and-insert access to a T1 facility. This option does not require specialized cables or converters because it is designed to be used with standard, off-the-shelf, V.35 or RS-232-C straight cables. Option 31 also provides protocol analyzer interface to the 4kb/s ESF data link in a T1 facility.

Unique T1/F-T1 Capabilities

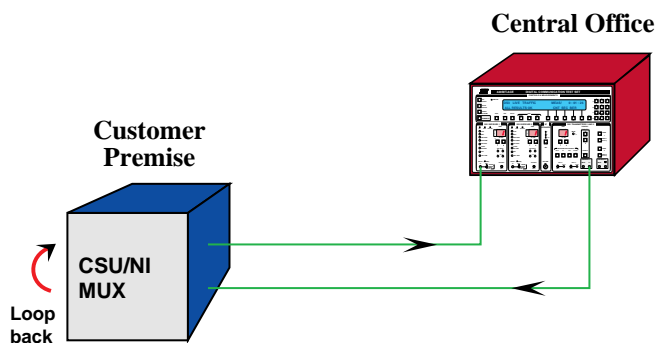
1. Two receivers provide completely independent Auto-Sync, Auto-Frame testing. For example, one receiver can test a circuit with Superframe and 3/24 stress pattern, while the other tests an ESF circuit with 55 Octet test pattern.
2. The SUMMARY Screen provides current test status, elapsed time, and error display at the touch of a single key. See picture on front cover or centerfold front panel.
3. Automatic *flashing* error indication makes error detection immediate and foolproof (an error beeper can also be turned on).
4. Receivers can be reset independently.
5. Split Mode testing. Receivers and transmitters can be easily set-up for independent test Modes (T1, F-T1, channelized Voice/Data). Additionally, transmitters are independent and can be clocked separately.
6. Dual direction DS0/F-T1 Drop-and-Insert. Access and test individual DS0 channels on a live T1 circuit without dropping remaining channels. For specific applications refer to DS0 DATA, Switching/Signaling and VF/Voice.
7. Measure round-trip delay.

Features

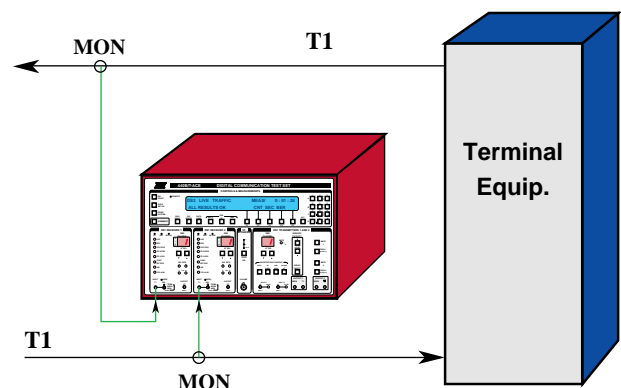
- Full turn-up and in-service testing
- Auto-Frame and Auto-Pattern Sync
- Two independent receivers and transmitters
- Loopback codes (CSU, NI, V.54)
- Contiguous & non-contiguous F-T1 channels (56kb/s or 64kb/s)
- Complete error counting
- LED error and B8ZS history
- Level & Frequency measurement
- Slip timing, synchronization measurement
- DSX Monitor and Terminate/Bridge testing with ALBO
- Extensive library of test patterns including: 3/24, 0/0, 1/1, QRS, 220-1, 55 Octet, MinMax, DDS 1-6, and Four Long User patterns (up to 1000 octets each)

T1/F-T1 Applications

- A** Loopback a T1 or loop selected F-T1 channels for stress testing (BERT).



- B** Monitor both directions of a live circuit to:
1. Isolate direction of errors
 2. Verify equipment timing (loop timed or internal) by synchronization slip testing.

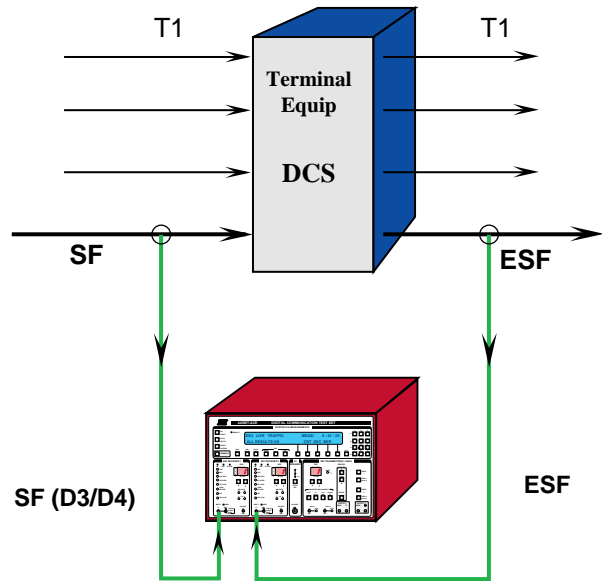


More T1/F-T1 Capabilities

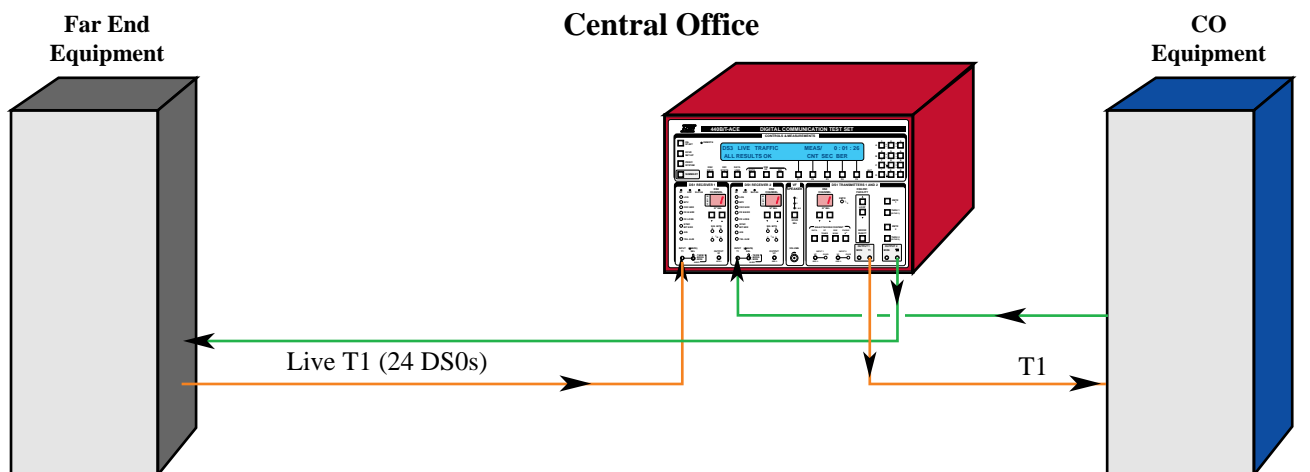
7. Use Multi-pattern programmed Repeater and Bridge-tap tests to identify Span line troubles.
8. Easily create a customized multi-pattern programmed test with any combination from extensive library of test patterns.
9. Automatically identify if T1 loop codes were generated from far-end.
10. Time & Date stamp all errors via RS-232-C printer port.
11. Remote Control for automated manufacturing test applications or remote test head use.

T1/F-T1 Applications

- C** Isolate source of errors by simultaneously monitoring the input and output on equipment. Verify SF to ESF framing conversion by DCS.



- D** Access and test an individual DS0/F-T1 channel on a live T1 circuit without taking the remaining DS0s out-of-service, using DS0/F-T1 Drop-and-Insert



NOTE:
This application shows one direction Drop-and-Insert, though the unit also supports independent and simultaneous dual direction Drop-&-Insert

Drop (Monitor)
selected channel(s)

Insert F-T1, DS0 DATA, VF, Signaling,
etc. into channel(s) while passing
remaining channels "Thru"

Unique DS0 Data Capabilities (Option 12)

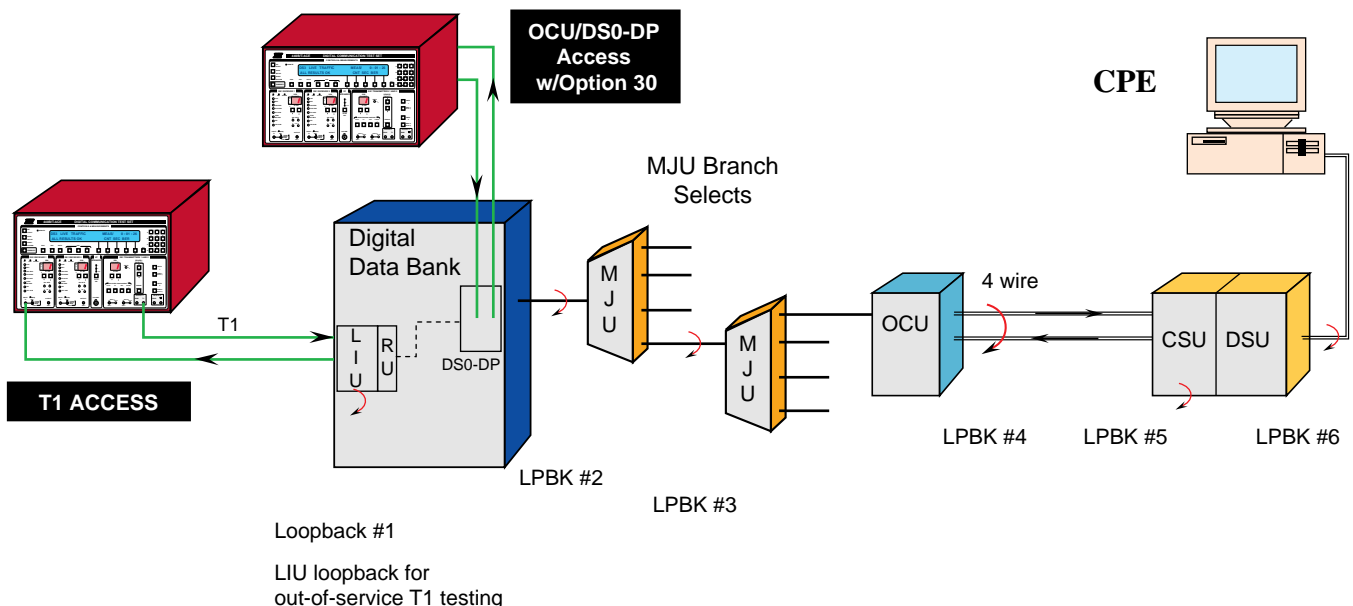
1. Simultaneous DS1 and DS0A/B error capture in order to isolate DDS failures from T1 network troubles. SUMMARY screen and flashing error indication provides automatic test status.
2. Test from DS1 and DS0-DP/OCU-DP access points (also requires Opt 30).
3. Auto-Pattern Sync for DS0A/B on both receivers independently. Simultaneous and independent auto-pattern sync for Primary and Secondary channels.
4. Powerful, in-service testing including DS0A Majority Vote errors, DS0B Frame errors, automatic secondary channel identification.
5. Dual DS0A/B drop-and-insert. Provides test access to DS0A or an individual DS0B subchannel without taking remaining subchannels out-of-service.

Features

- DS0A: 2.4, 4.8, 9.6, 19.2, 38.4, 56 and 64 kb/s
- DS0B: 2.4, 4.8, 9.6, 19.2 kb/s
- Switched 56 (also requires option 06, see Switching/Signaling section)
- Simultaneous and independent Primary/Secondary channel testing
- Complete DDS loopback codes (Latching/Interleaved) for CSU, DSU, DS0-DP (1-20), OCU-DP, Repeater, V.54, NIE
- Complete MJU branch commands including MJU loopback
- MJU MAP displays current MJU path, branch blocks, and loopback
- Easily create customized, automated, multi-pattern tests using complete library of DDS/T1 stress patterns

DS0 Data Applications

- A** Qualify DDS (DS0A/B) network by testing each link and network element, end-to-end, sequentially looping each device (DS0-DP, MJUs, OCU, CSU, DSU, etc).

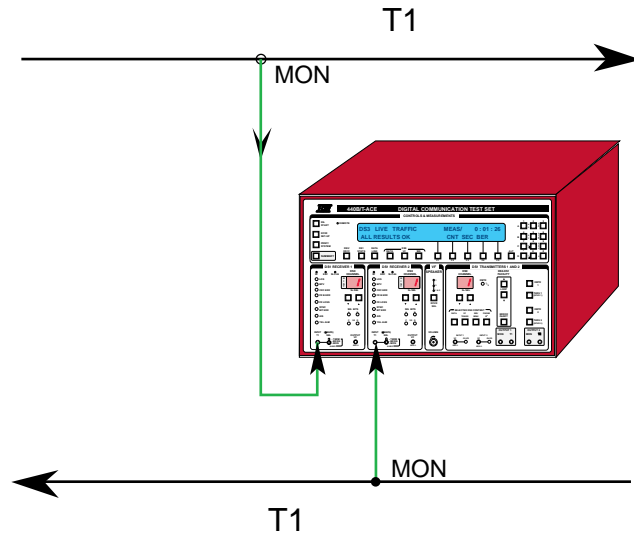


More DS0 Data Capabilities

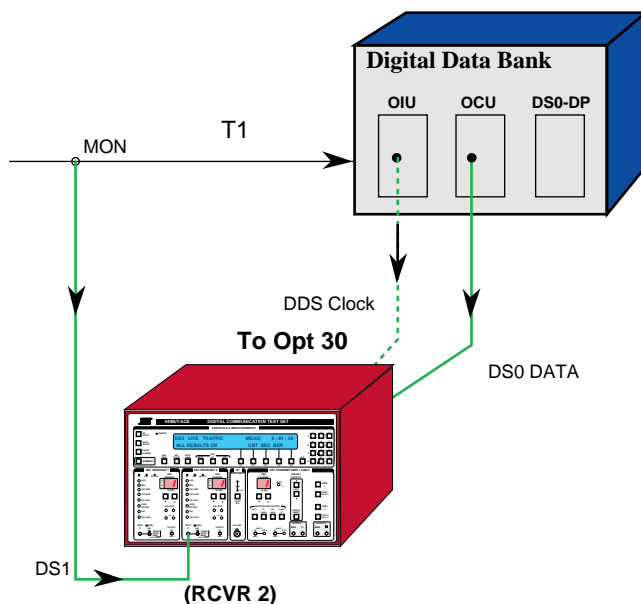
6. Perform split mode DDS testing - i.e. test DS0A and DS0B simultaneously to prove SRDM problems.
7. Simultaneously test two different DS0A/B channels.
8. Automatically identify DS0 test codes/messages.
9. Perform BERT on "live" test messages (i.e. use Unassigned MUX, Idle, Test, etc...as "in-service" test patterns.)

DS0 Data Applications

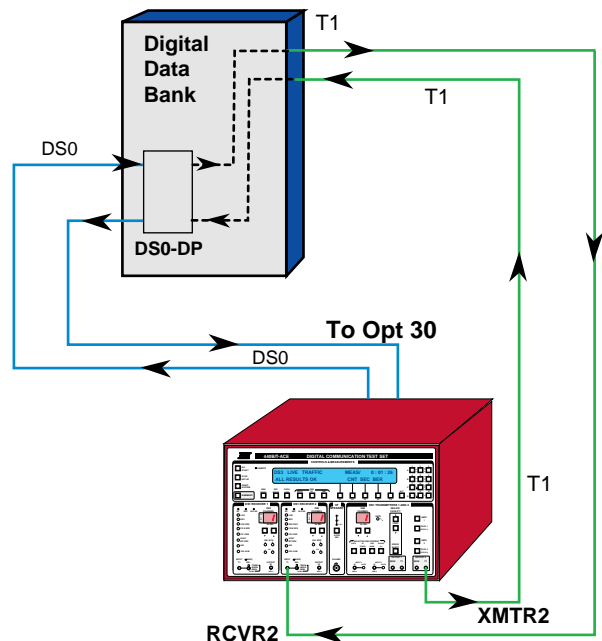
- B** Test (and BERT) both directions of DS0A/B circuits simultaneously, in-service using network DDS test messages (such as Unassigned Mux, Abnormal Station Code, Idle, etc) or out-of-service using stress patterns.



- C** Isolate DDS timing problems by also comparing T1 derived clock (office clock) with OIU clock. (Also requires Opt 30)



- D** Verify Digital Data Bank operation by simultaneously testing from DS0-DP/OCU-DP and T1 access points. (Also requires Opt 30)



Unique SONET STS-1 and DS3 Capabilities

(Option 52C)

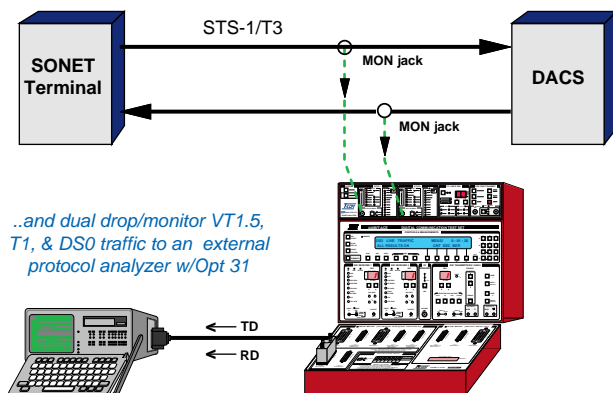
1. Dual, independent STS-1/DS3 receivers support complete monitoring and BERT testing.
2. Automatically demultiplex DS3, VT1.5, DS1, DS0 data and voice payloads from STS-1 & DS3 bitstreams.
3. Transmitter generates STS-1 BERT, DS3 BERT, VT1.5, DS3 and T1 signals into STS-1.
4. Isolate STS-1 synchronization timing slips, in-service.
5. Dual drop/monitor VT1.5, T1, and DS0 traffic and perform drop-&-insert. Interface to external protocol analyzer.
6. Access datacom channels and orderwires.
7. Inject errors into payload and overhead.

Features

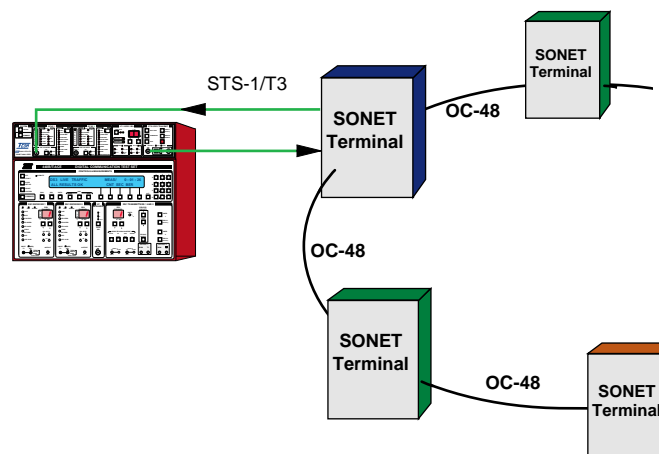
- Two receivers for STS-1 or DS3 monitor with error capture
- One STS-1/DS3 transmitter with standard stress patterns
- Real-time LED status for STS-1, DS3, DS2 & VT1.5
- Flashing History LED to automatically identify errors
- SUMMARY screen provides immediate test status and elapsed test time
- Multiplex internal or external DS1 signal into STS-1/DS3 bitstream
- Auto-rate, Auto-frame & Auto-pattern sync
- Select DS1 (1-28) for automatic demultiplexing and testing to DS0

STS-1/DS3 Applications

- A** Simultaneously monitor both directions on an in-service STS-1/DS3 facility



- B** Turn-up new STS-1/DS3 systems by sending stress patterns and other payloads.

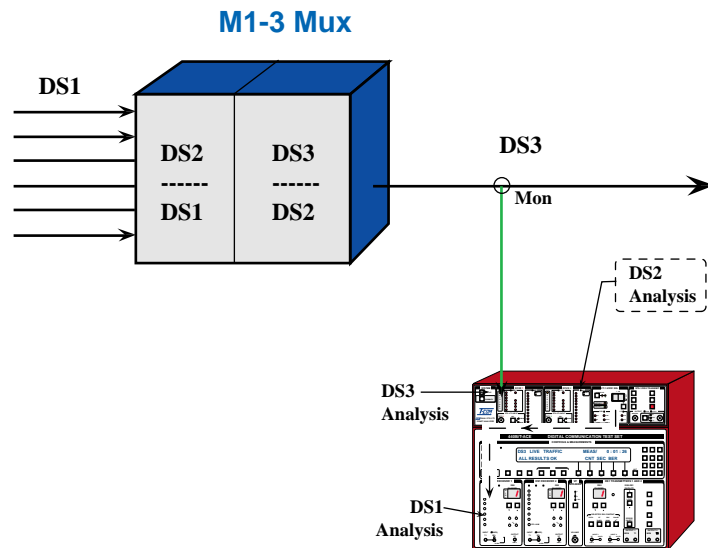


More STS-1/DS3 Capabilities

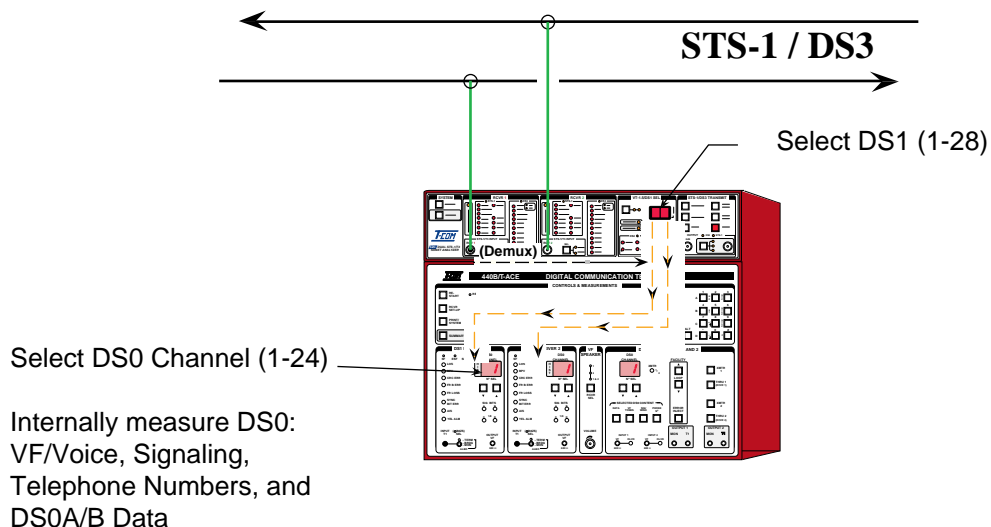
7. Insert (MUX) DS1/DS0 signals into DS3 or STS-1 bitstream.
8. Perform end-to-end tests using Auto-sync and Auto-frame (far-end can use other brands of standard DS3 test equipment).
9. Use STS-1/DS3 Receive & Transmit independently of dual DS1 testing in base unit.
10. Decode transport and path overhead bytes as well as read J1 trace messages.

DS3/DS2 Applications

- C** Identify DS3/DS2 and DS1 errors caused by Remote M1-3



- D** Demux and test DS0 voice & data from dual STS-1/DS3 monitor points. Identify SONET STS-1 synchronization timing slips, in-service.



V.35/RS-232-C Capabilities (Option 31)

1. **DTE mode** provides stress testing (BERT) for datacom circuits and equipment at DDS/F-T1 rates (2.4kb/s thru 1.536Mb/s).
2. **DCE mode** gives external protocol analyzers full duplex monitoring, or drop-&-insert access to DS1/DS3 bitstream.
3. **DCE mode** provides access to 4kb/s ESF data link for external protocol analyzer.
4. Monitor both directions of a DS1, DS3, STS-1 facility to simultaneously drop Transmit and Receive data (DCE & DTE directions) to a protocol analyzer.
5. Simultaneously compare data at V.35/RS-232-C interface with data at DS1 or DS3 interface.
6. Use an external protocol analyzer to test Frame Relay, ATM, SS7, LAN/WAN, and other protocols from T1 or T3 access points. Extend the use of common, low cost protocol analyzers.

Features

- Supports all synchronous DDS/ADN and F-T1 rates and ESF data link

RS-232C

DDS/ADN: 2.4, 4.8, 9.6, 19.2, 38.4*, 56*, 64* kb/s.

ESF data link: 4 kb/s.

V.35

DDS/ADN: 2.4, 4.8, 9.6, 19.2, 38.4, 56, 64kb/s.

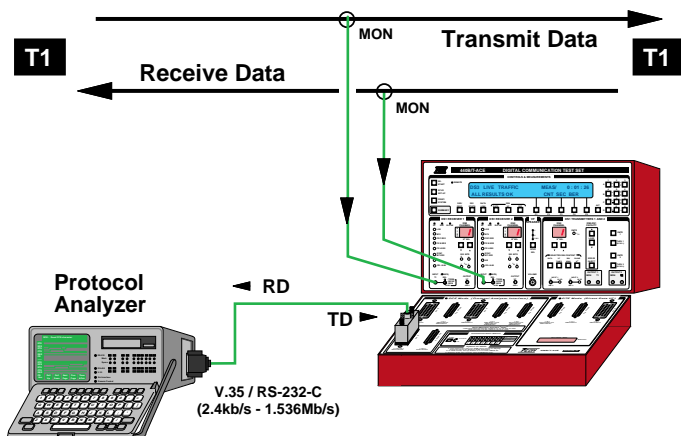
F-T1: n x 56 or 64kb/s (56kb/s - 1.536Mb/s)

- BERT using standard stress patterns
- Display Frequency automatically for RCV and XMT clocks
- Uses standard, straight cables -- requires no break-out boxes or specialized "Y" cables.
- Provides true "smooth" clocks for all DDS and F-T1 rates.

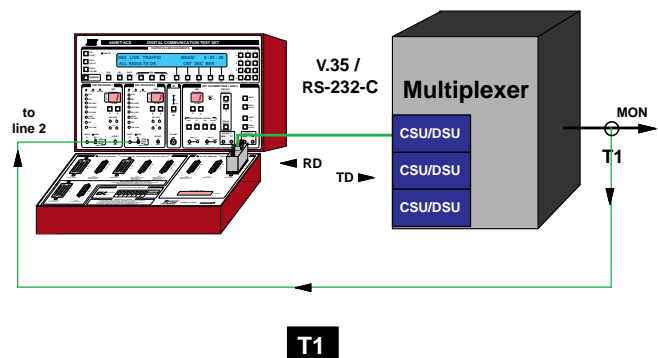
*(these rates not recommended for RS-232-C)

Datacom Applications

- A** Simultaneously monitor two directions of traffic on an in-service T1 facility. Download protocols to an external analyzer.

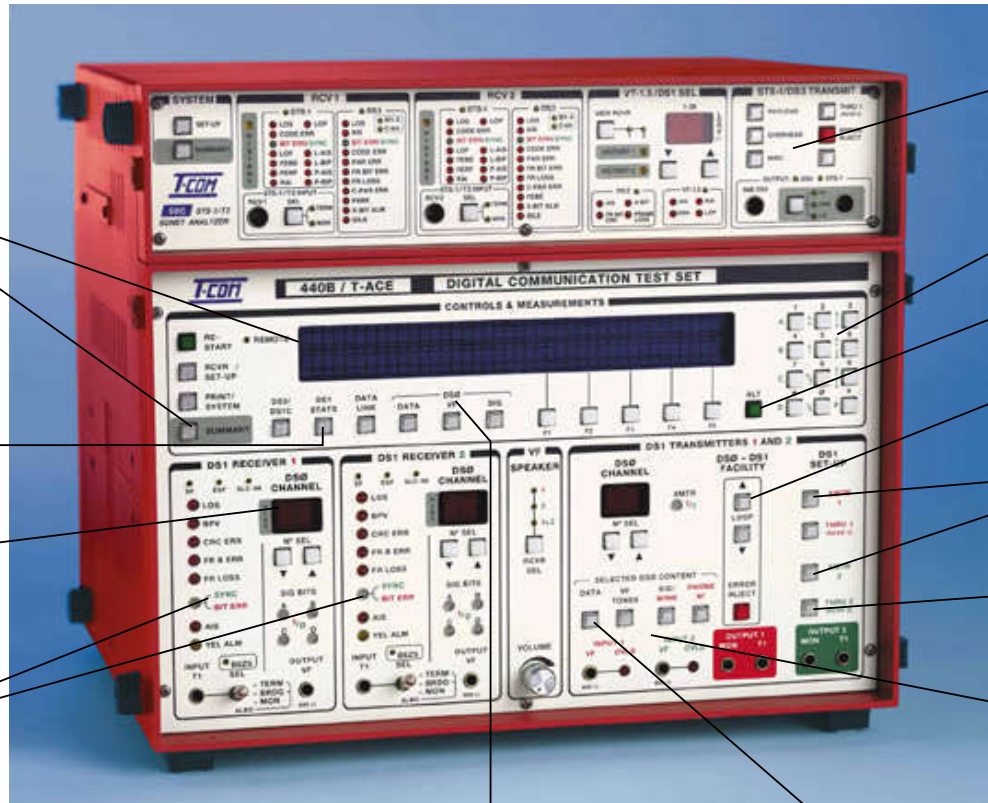


- B** Qualify data circuit & equipment by testing simultaneously at T1 and V.35/RS-232-C access points





The Power to Test



The **SUMMARY** screen provides immediate test status, error results and elapsed test time. Display DS1, F-T1, DS0A/B, Switched 56 and SS7 test status at the touch of a key.

DS1 Measurements
Provides DS1 Level, Frequency, Timing Slip counts, Synchronization display, and Round Trip Delay.

Channel number automatically flashes to indicate T1/F-T1/DS0/SS7 errors for that receiver. Turn beeper on to also provide audible error indication.

Two independent receivers with completely independent Auto-Frame and Auto-Pattern Sync. Receivers can be independently set-up for different test modes, i.e. T1, Fractional T1, DS0A/B, Switched 56 and SS7.

Transmitter Set-Up screens are intuitive and show complete set-up at a glance. Use < > to underline and EDIT to change any parameter.

MODE: T1	PAT: 55-OCT	FRAME: SF - D3/D4
CODE: AMI	CLK: INT	DL: N/A < > EDIT

For example, the screen above shows that Transmitter #1 test Mode is T1, Pattern selected is 55 Octet with SF Framing, AMI line code, and is Clocked Internally. (Data Link is not applicable for SF Frame.)

DS0 Measurements
DATA: - Display DDS test messages, error statistics and 8 bit density
SS7: - Monitor in-service SS7 links for errors and packet statistics
VF: - Measure Level, Frequency, Noise, and DC Offset
SIG: - Display signaling on 24 channels simultaneously for both receivers
- Capture telephone numbers - Measure Wink timing

Optional DS3/STS-1 SONET module provides two independent receivers for monitoring and a transmitter for stress testing. (See photo on back pg)

Keypad is used to dial/program telephone numbers and enter data.

Access OCU/DS0-DP and V.35/RS-232-C interfaces for alternate test access.

Both transmitters support Loopback and error injection for T1, F-T1 & DS0A/B rates.

Two completely independent transmitters, for testing T1, F-T1, DDS Data, Switched 56, VF/Voice and Signaling. (See screen below)

THRU provides dual DS0 Drop-and-Insert for standard DS0 testing and Fractional T1.

Transmitters also support complete DS0 channel testing including sending:
- DS0A/B Data (all rates)
- VF Tones - Automatic Winks - Telephone numbers
- Switched 56
- SS7 packets

The DS0 DATA transmit screen provides the test set-up for the selected channel.

TYPE: DS0B	RATE: 19.2	MJU: IDLE	[XMT#1]
PRI: DDS-6	SEC: 511	SUBCH: 1 < > EDIT	

For example, in the screen above the set-up is for DS0B, 19.2 kb/s, Primary channel sending DDS-6 test pattern, while Secondary channel is sending 511. Subchannel #1 is selected. MJU:Idle indicates no MJU testing is in progress. Use < > to underline and EDIT to change any parameter.

Options

01 Remote Control

Provides remote control for 440B/T-ACE. Ideal for using the unit as a test head at remote offices and digital cross-connects; also ideal for automated testing.

06 MF/DTMF/DP Telephone Number/Wink Capability

Provides the ability to display and send telephone numbers as well as transmit wink, for Digital Switch/PBX emulation.

10 ESF Data Link Analyzer

Provides ESF Data Link analysis and message/alarm transmit capabilities. Automatically displays status and messages in plain English. Supports both ANSI T1.403 and AT&T Pub 54016 formats.

11 SLC-96 Data Link Analyzer

Provides SLC-96 Data Link analysis and message/alarm transmit capabilities. Automatically displays and decodes messages in modes I, II, and III. In mode II provides subscriber On/Off Hook activity and Digital Switch time-slot assignments.

12 DS0A/B DDS Data Testing

Provides full DS0A/B Data Port testing from DS1 access point, for standard transmission types (2.4, 4.8, 9.6, 19.2, 38.4, 56 and 64kb/s rates), including Generic DDS, DS0A/B, Advanced Digital Network and Switched 56. Includes full BERT capabilities with complete array of DDS stress patterns, Latching, Non-Latching Loop codes, and complete MJU control functions. (Switched 56 testing also requires Option 06.)

13 Expanded Loop Codes

Supports Smart Repeater codes for Teltrend, XEL and Westell versions 3150-56/-70. This option is NOT required for standard CSU/N1 loopcodes.

14 SS7 Error Analysis

Provides automatic in-service error capture & analysis for two 56/64 Kbps links. Errors include CRCs, Length Indicator Errors, NAKs, Retransmits, SS7 Sync Loss. (This option requires Option 12.)

15 Round Trip Delay

Provides round trip delay measurements across a T-1/FT-1 circuit in loopback mode. Measures delays in the range of one microsecond to two seconds.

16 GUI Interface

Allows the remote operation via Virtual Private Network or modem. this provides a Windows Browser view of the test set with point and click control, giving you the feel of being right in front of the test set. Works with additional workstation resident software.

30 DS0 Direct Interface

Provides test access to DS0-DP, OCU-DP channel cards for DDS testing. Also provides DS0 clock timing measurements. (This option requires Option 12.)

31 V.35 & RS-232-C Datacom Interface

Provides *DTE* interfaces for direct data test access, and *DCE* interfaces for attaching external protocol analyzers. Supports synchronous testing for fifty rates (from 2.4kb/s to 1.536Mb/s). Requires no specialized cables (uses standard/straight cables). (This option requires Option 12.)

52B+ DS3/DS2/DS1 Multiplexer/Demultiplexer

Provides BERT capabilities for DS3 turn-up testing, as well as full, in-service DS3/DS2 error analysis. This add-on module allows the 440B to simultaneously monitor status and capture errors at DS3/DS2/DS1/DS0A/B rates. Also allows insert of T1 and DS0 signals into a DS3 bitstream i.e. DS1 Drop-&Insert.

52C Dual STS-1 SONET/DS3 Analyzer

Adds dual, independent, STS-1/DS3 receivers and an STS-1/DS3 transmitter. Receivers automatically frame to carrier type (STS-1 or DS3) and determine the imbedded payload structure. Both receivers support complete STS-1/DS3 monitoring and BERT testing, including real time error capture and automatic DS3/VT1.5/DS2/DS1/DS0 payload demultiplexing from STS-1 and DS3 bitstreams. STS-1 transmitter generates STS-1 & DS3 BERT, VT1.5 signals into STS-1, DS3 signals into STS-1, DS0 & T1 into DS3.

52B+, 52C and 53A cannot be installed simultaneously, they are mutually exclusive.

Unique Switching/Signaling Capabilities

(Option 06)

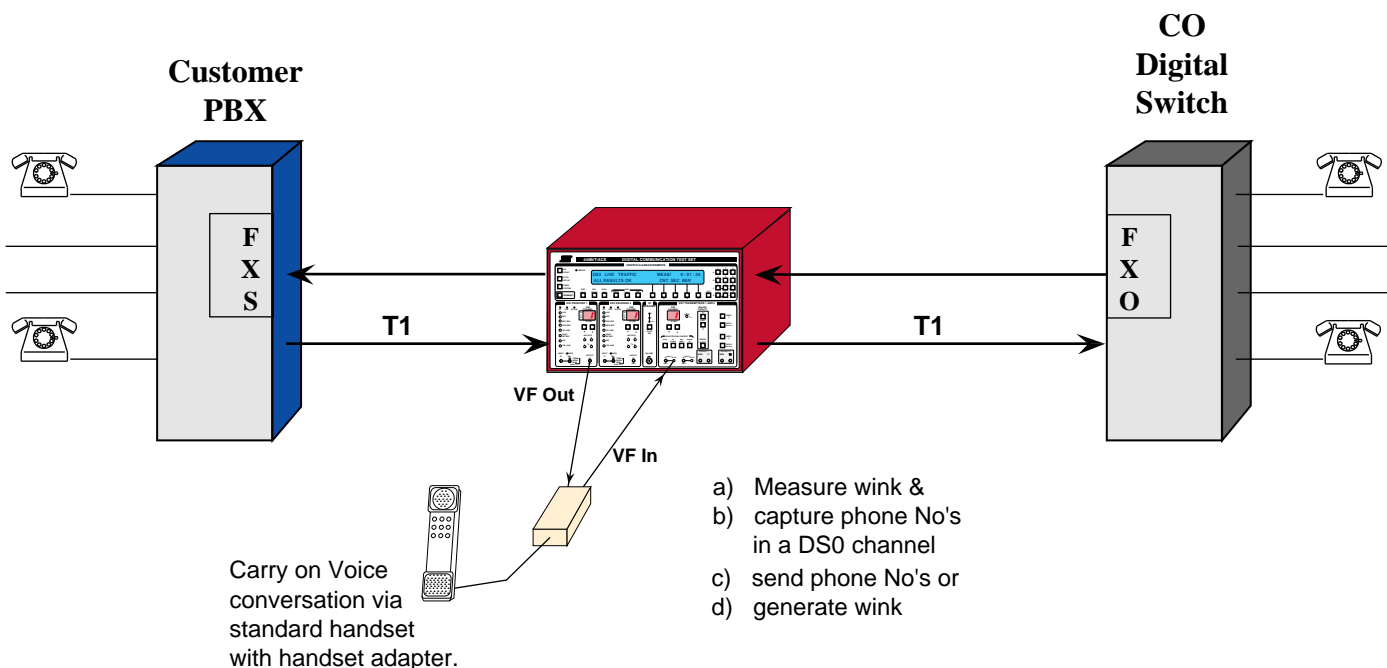
1. Emulate a digital switch/PBX by automatically generating Wink responses, capturing telephone digits, and out-pulsing telephone digit strings (either direct dial or using pre-programmed routines).
2. Capture and measure up to three Wink responses to verify that digital switches, PBXs and other network elements meet Bellcore and ANSI specs.
3. Test FXO/FXS circuits from a live T1 facility (via DS0 drop-and-insert) by dialing and capturing digits.
4. Test Switched 56 circuits on a live T1 network, including wink timing, signaling states, and Data stress testing (also requires option 12).

Features

- Send, capture, and display telephone numbers (DP, MF, DTMF)
- Display signaling states for 24 channels simultaneously in both T1 directions
- Set-up calls to switches and PBXs
- Store and display up to 5,000 received digits/characters
- Verify that received digits meet Bellcore/ANSI specs
- Measure Wink timing
- Program and store up to 16 preset telephone sequences

Applications

A FXO/FXS, Digital Switch/PBX testing on a live T1 circuit using DS0 Drop-and-Insert

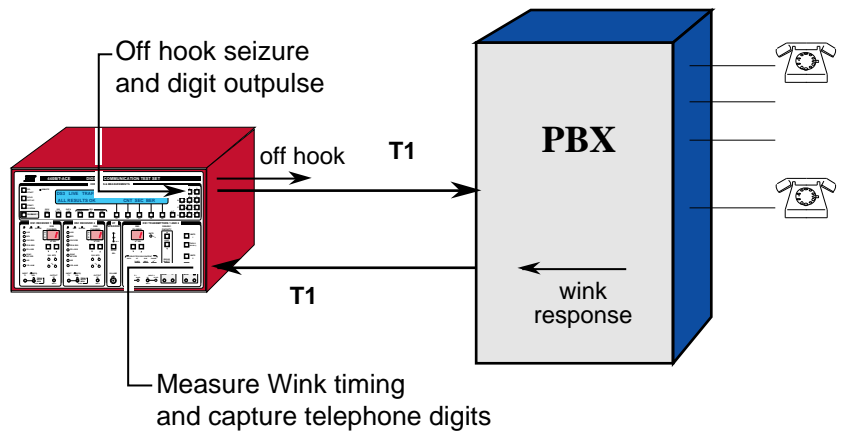


More Switching/ Signaling

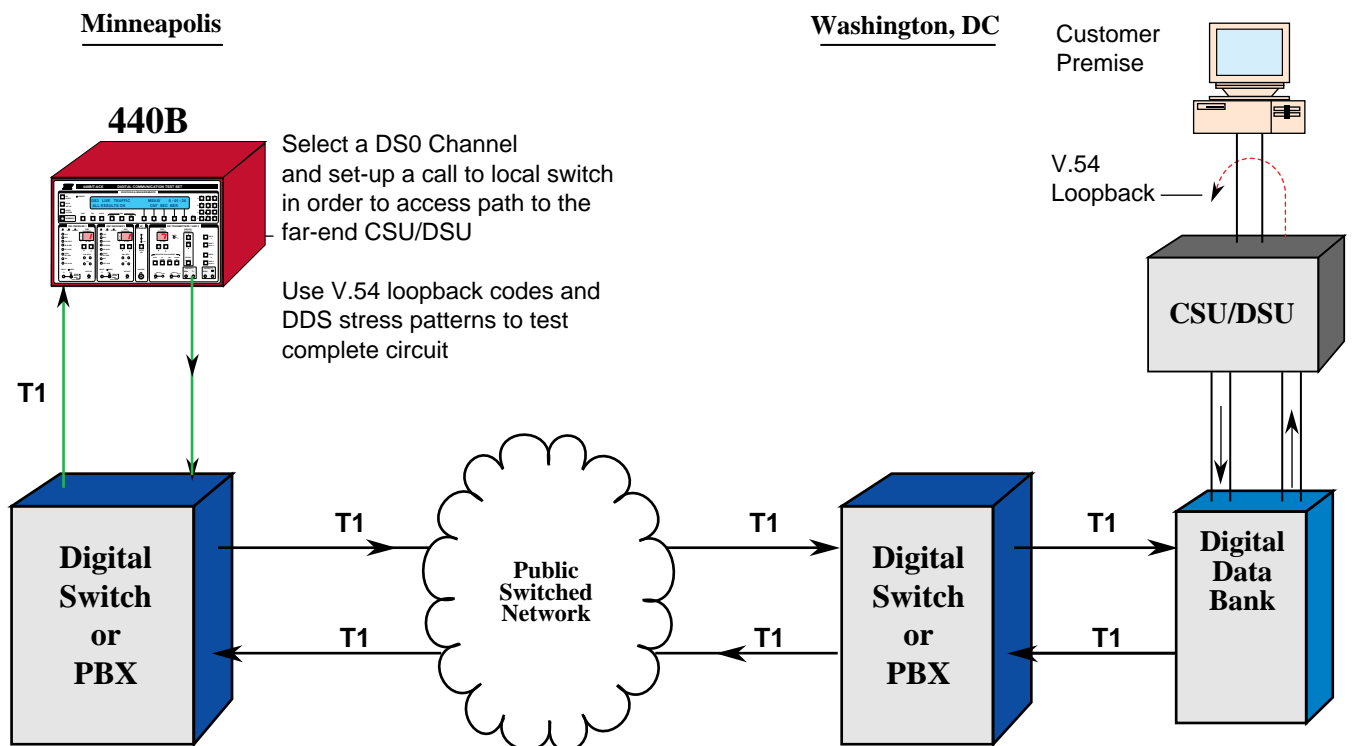
5. Carry on a voice conversation by accessing a DS0 channel on a live T1 (use adapter 2889-001 and a standard handset).
6. Program and edit automatic wink responses (10 ms to 990 ms).
7. Vary outputted digit/interdigit timing and levels for digital switch/PBX acceptance testing.
8. Auto-Scan through 24 channels to capture telephone calls. Time-date stamp each call and supervision information. Download to printer output.

Applications

B Verify PBX operation



C Verify a dial-up Switched 56 circuit, end-to-end, by setting up call to far-end customer and performing a V.54 loopback stress test through customer's CSU/DSU. (Also requires Option 12.)



Unique VF/Voice Capabilities

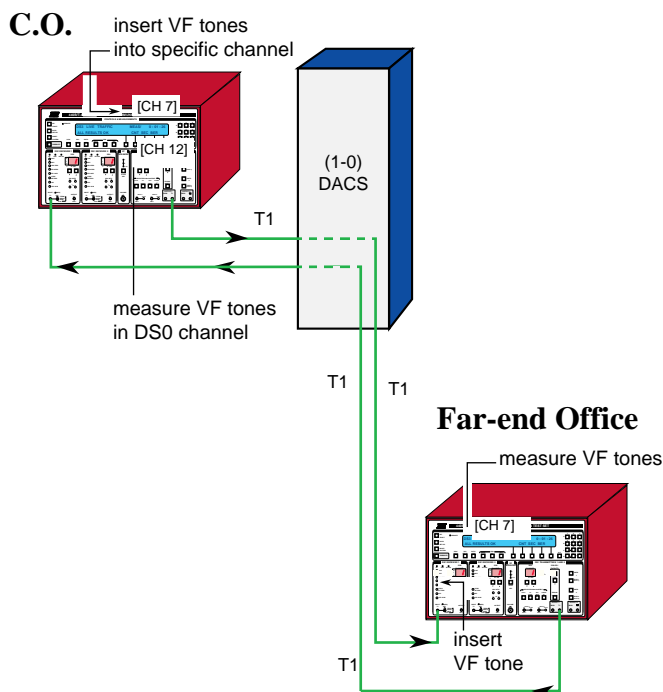
1. By using the 440B's channelized VF, the 440B provides VF tone transmit and measurement capabilities for testing channel banks and multiplexers from the T1 point.
2. In addition to VF noise measurements, the unit automatically identifies presence of DC offset and stuck bits - usually caused by improper codec operation.
3. Insert tones into an individual DS0 channel without interrupting the remaining 23 circuits on a live T1 (via DS0 drop-and-insert).
4. Use 9-state signaling (toggle) when testing SLC-96 systems.
5. Qualify Channel banks and multiplexers.
6. Verify gain linearity and frequency response.
7. Test echo cancellers by inserting and measuring loss with external artificial line (via external VF in/out jacks).
8. Support SF, ESF, SLC-96 systems (including D1D, D2, D3/D4, D5).

Features

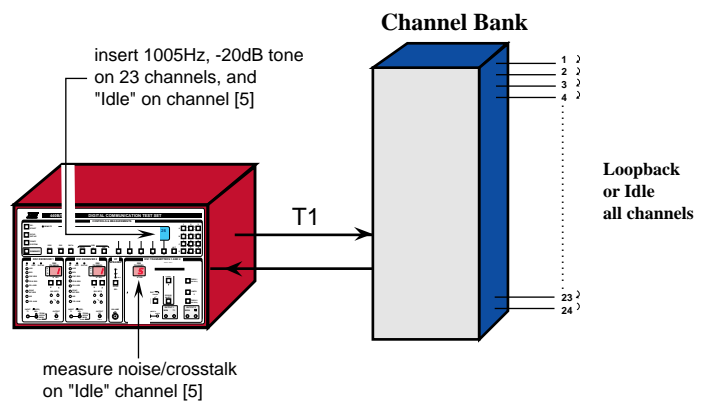
- Send and Measure VF tones into DS0 channels
- Monitor voice quality via speaker for one direction or both
- Measure VF Noise
- Program & store up to sixteen tones
- Display signaling bit state associated with both selected DS0 channels

VF/Voice Applications

- A** Insert and Measure VF tones in individual DS0 channels on live T1 (via DS0 Drop-and-Insert).



- B** Testing VF channels for crosstalk and noise



Round Trip Delay Capabilities (Option 15)

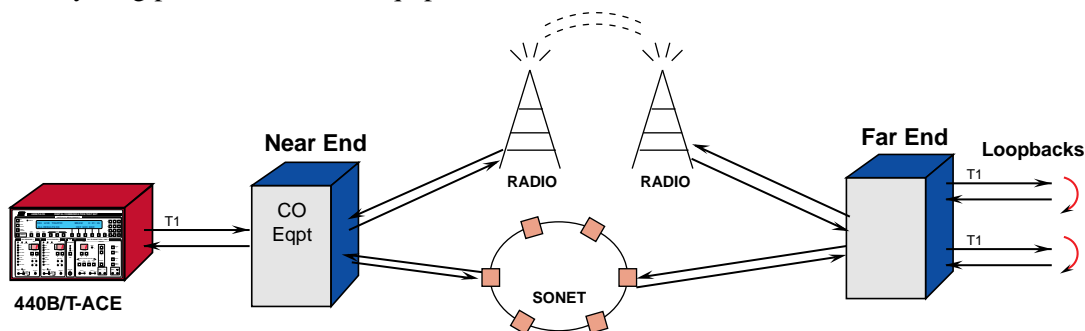
1. Identify excessively long T1 routes by measuring delays on loopback circuits.
2. Isolate delay caused by equipment or multiplex and demultiplex stages.
3. Compare delays caused by various SONET paths or delays caused by different facilities, for example microwave radio vs fiber optic networks.
4. Identify DS0 channel delay variations in a T1/F-T1 system.
5. Prove that an aggregate F-T1 bandwidth is split up by network DCS causing uneven delays among channels and video/data corruption.

Features

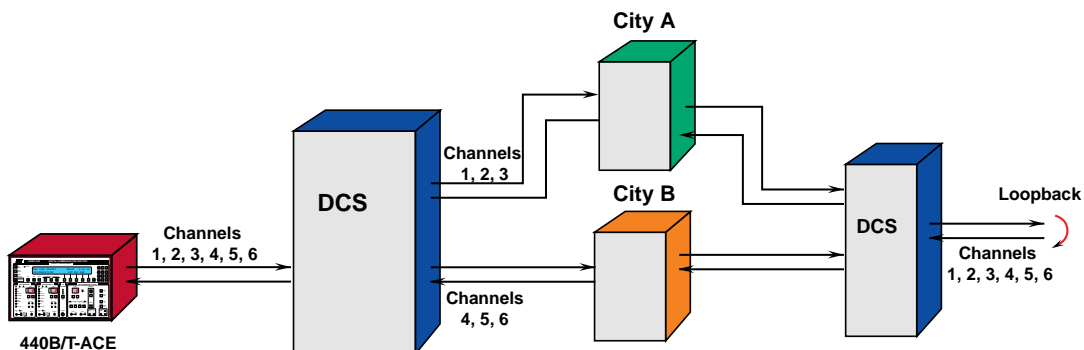
- Measure delays from 1 microsecond to 2 seconds in length
- Easy to set-up and use
- 1 microsecond resolution
- T1 & F-T1 configurations
- 1 - 24 channel measurement
- Results download to printer port

Round Trip Delay Applications

- A** Determine absolute delay in a T1 circuit. Isolate sources of delay at various loopback points whether excessively long path, Mux/deMux equipment, satellite feeds, etc.



- B** Verify that individual DS0 channels within an F-T1 system share exactly the same delays, or the same routes.



Unique SS7 Capabilities (Option 14)

1. Monitor 56kb/s or 64kb/s SS7 links for CRC errors, traffic interruption, NAKs, retransmits, & other errors.
2. Test at STS-1, DS3, DS1, DS0-DP & OCU-DP and V.35 access points.
3. Errors automatically trigger flashing HISTORY indicators & SUMMARY screen display.
4. Test two links independently, or both directions of a link from DS1 monitor access.
5. Calculate packet/traffic statistics including Total Packet counts and % MSUs, LSSUs, FISUs.
6. Install systems using built-in DDS (DS0A) stress tests and simulated SS7 packets. Qualify equipment and DDS facilities prior to cut-over (terminated or drop-&-insert modes).
7. Identify synchronization timing problems. Prove that SS7 errors are caused by T1 or Bit/Byte clock failures. (Requires Opt. 30)

Features

Errors Monitored

- Sync Loss Secs & Events
- CRCs
- Length Indicator Errors
- Negative Acknowledgements
- Retransmits
- Processor Busy Secs & Events
- Processor Outage Secs & Events

SS7 Packet Statistics

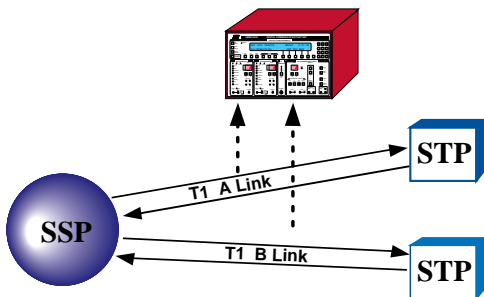
- Total Packets
- Total MSU, LSSU, FISU counts
- % MSU, LSSU, FISU

Test Interfaces

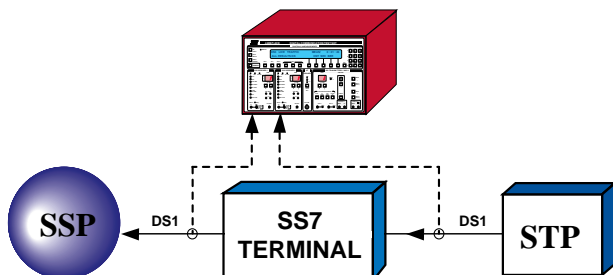
- DS1 (dual, independent)
- OCU/DS0-DP (Option 30)
- STS-1 (Option 52C)
- DS3 (Option 52B⁺ or 52C)
- V.35 (Option 31)

SS7 Applications

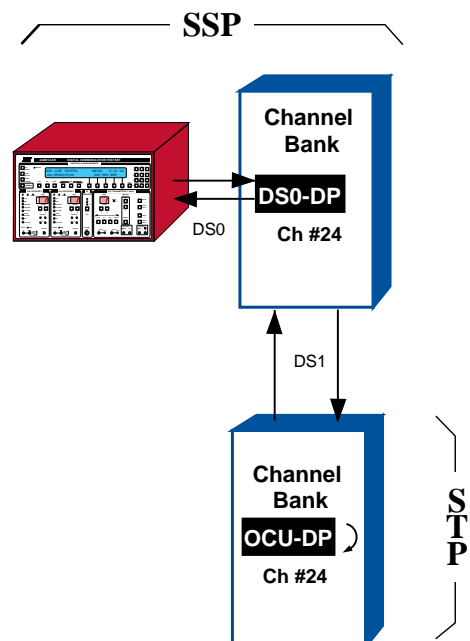
- A** Analyze in-service traffic by monitoring packet flow and errors on both SS7 links



- B** Isolate SS7 problems by simultaneously monitoring circuit input and output.



- C** Turn-up new SS7 facility using DDS BERT and simulated SS7 packets.



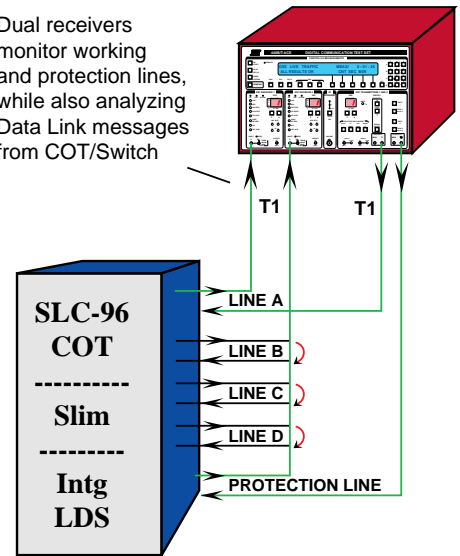
ESF & SLC-96 Data Link Capabilities (Options 10 & 11)

1. ESF or SLC-96 data link alarm status is indicated in SUMMARY screen.
2. Automatically display all known messages into English.
3. Automatic *flashing* error indication makes error detection immediate and foolproof (an error beeper can be turned on).
4. Identify and isolate direction of T1 trouble with both receivers.
5. Generate ANSI PRMs and AT&T messages to emulate a far end CSU.
6. Capture "unknown" or "unidentified" messages and automatically download to printer output (in Hex).
7. Read enhanced ESF counters for ESF LIUs, AT&T NCOE and Network Interfaces.
8. Automatically printer download all SLC-96 messages in Modes I, II, III.
9. Identify digital switch time slot assignments to display On/Off hook status. Also print call blockage report.

SLC-96

- A** Test every SLC-96 shelf by using one transmitter/receiver pair to maintain "A" Shelf (carries Data Link) while using second pair to test other shelves.

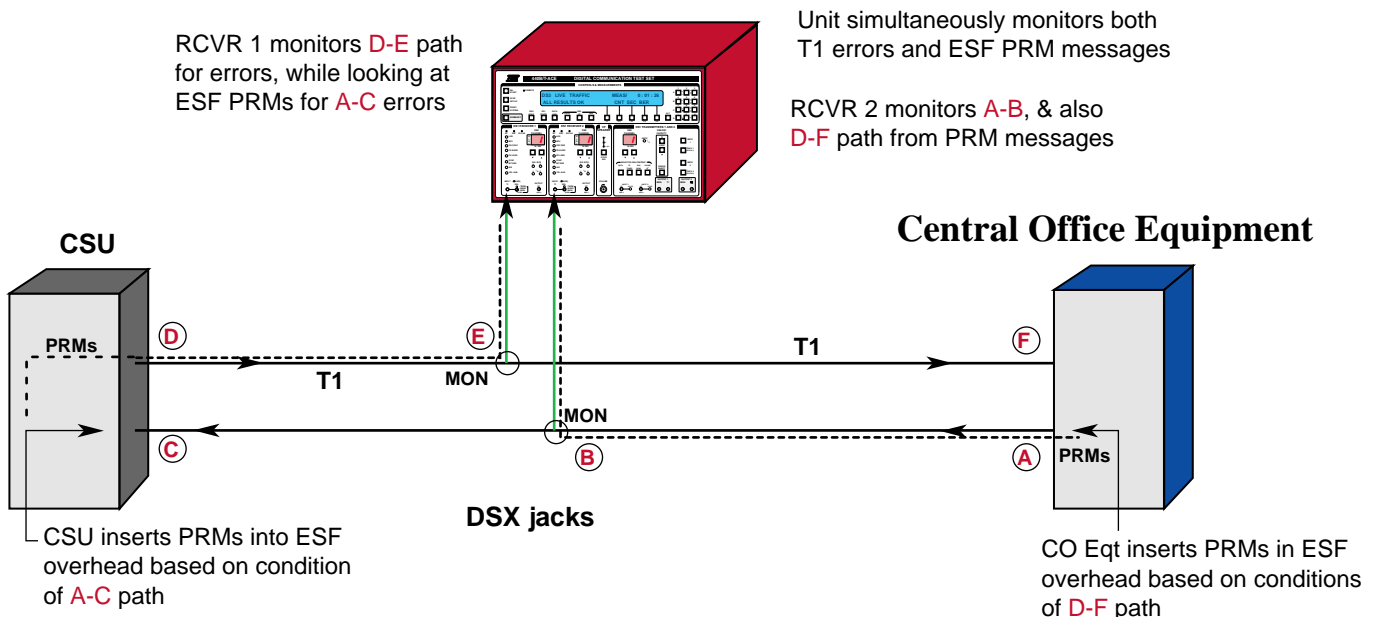
Dual receivers monitor working and protection lines, while also analyzing Data Link messages from COT/Switch



Switch shelves A thru D to Protection
Generate and receive remote alarms
Pre-test VF and Data channel units

ESF Application

- A** Isolate T1 troubles on live circuit by monitoring T1 errors and ESF PRMs (Performance Report Messages) from up to 4 directions simultaneously (A-B, A-C, D-E, D-F).



DS3 Testing with the 52B+ ➤

Add DS3 testing to your 440B with Option 52B+. This option provides a DS3 receiver and transmitter for in-service monitoring, demultiplexing, as well as BERT stress testing.

The 52B+ identifies DS3 and DS2 errors. Imbedded DS1 traffic is automatically demuxed to the base unit for DS1 and DS0 channel testing.



The 235A+ T1 Analyzer

Other T-COM Products

◀ The 235A+

T-COM's popular, low-priced 235A+ T1 analyzer is ideal for T1 monitoring and installation for field or central office applications. The 235A+ provides a full variety of stress patterns for BERT, automatic error capture, auto-frame.



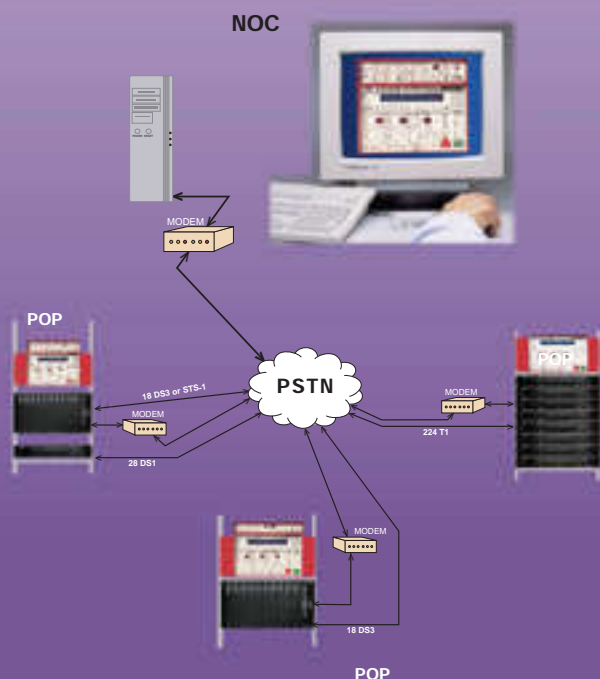
DS3 Testing with the 160A+ ➤

The 160A+ is popular for its low price and size (10 Lbs). This unit offers complete T3 stress testing and complete in-service monitoring for DS3, DS2, DS1 and DS0.

The 160A+ DS3/DS2/DS1 Analyzer



T1 & T3/STS-1 Centralized Test System

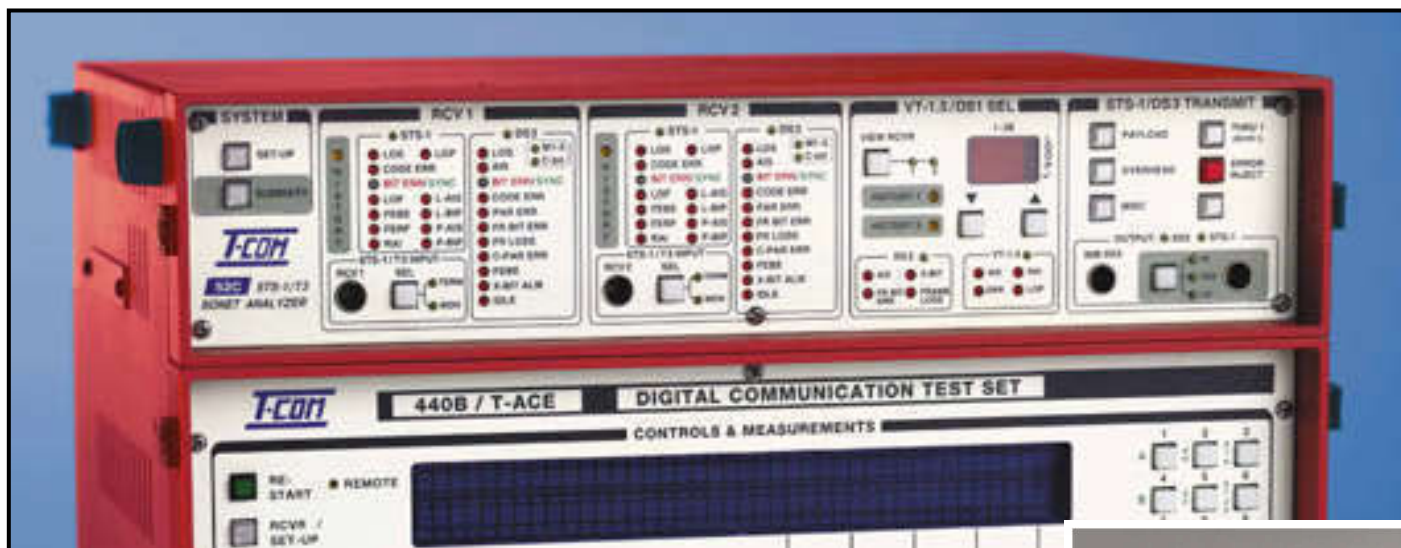


The Remote Testing Solution

Save Money
Save Trained Technician Resources
Save Travel Time
Save Circuit Downtime

T-COM's Sentinel system is designed to economically meet the remote monitor and test needs from the smallest network utilizing a few isolated unmanned POP's to the large general public network providers with multiple POP's and hundreds of T1 and T3 circuits. Almost every network provider utilizing DS1 and/or DS3 circuits could realize significant maintenance cost saving through Sentinel.

Add dual STS-1 SONET and dual DS3 to the 440B with Option 52C!



The 440B/T-ACE supports a wide range of testing including dual T1, F-T1, DS0 voice & data, switching, ESF/SLC-96 data link, SS7 error monitoring and DS3.

Option 52C adds dual STS-1 SONET and dual DS3 error monitoring and demultiplexing, as well as STS-1/DS3 transmit.

Both receivers automatically and independently sync to STS-1 or DS3 carrier type. Demultiplexing from STS-1/DS3 to DS0 voice & data channels is as easy as patching in and pressing Restart!

Option 52C is designed for in-service monitoring, as well as turn-up BERT testing. Transmit stress patterns (BERT) at STS-1, DS3, and VT1.5, as well as inject SONET errors and alarms.



Telecommunications Instrumentation

T-COM LLC 445 Indio Way Sunnyvale, California 94086
Telephone: 408/523-9900 FAX: 408/523-9909

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