

T-BERD<sup>®</sup> 107A

T-Carrier Analyzer



**T**oday's demanding network testing environment calls for an instrument that is powerful, compact, and easy to use. TTC's T-BERD™ 107A meets all these requirements and more. Ideal for testing from the central office, in the field, and at the customer premises, this TTC® product provides all the testing capability necessary for troubleshooting the entire T1 span. It quickly and easily performs a full range of T-Carrier testing in the convenience of a lightweight, rugged, handheld package.

## Highlights

- **Reduce Setup Time**

The automatic configuration feature immediately determines the proper framing and pattern so the technician can quickly monitor live circuits.

- **Test Full T1 Span**

Error and signal analysis can be performed at any point along a T1 span, including repeater input. This instrument is ideal for full installation and maintenance testing along T-Carrier spans.

- **Reduce Testing Time**

Qualify T1 spans at the touch of a button with the automated BRIDGTAP and MULTIPAT® tests developed by TTC. These automated test patterns eliminate the need for individual tests.

- **Troubleshoot Equipment Problems**

Emulate the customer premises channel service unit (CSU) and network interface unit (NIU) from the span to isolate the toughest problems.

- **Identify Timing Problems**

Quickly identify network synchronization problems between equipment and a reference signal with the timing slip measurement.

- **Monitor VF Channels**

Listen to individual channels and monitor data and ABCD signaling bits on all 24 channels when troubleshooting DSO problems. Measure VF level, frequency, and quality with the channel monitor feature.

- **Decode SLC® Datalinks**

Decode alarms and datalink messages when installing and troubleshooting SLC systems with the SLC Decode Option.

- **Minimize Downtime**

The Smart Loopback/Command Codes Option enables the technician to isolate problems anywhere along the network with minimal circuit downtime. Use intelligent repeater technology to qualify and maintain circuits in the field and non-intrusively query performance data. Span problems can be sectionalized remotely before dispatching maintenance personnel.



*Powerful and compact, the T-BERD 107A fully tests the T1 Span.*

- **Maximize Stress Testing**

Transmit and receive pre-programmed, long user-patterns including 55 OCTET and T1 DALY. The Advanced Stress Patterns Option stresses circuits as recommended by the ANSI T1.403 standard.

- **Decode ESF Signal**

Verify remote in-service circuit performance from the decoded ESF broadcast and access performance statistics by monitoring NIUs with the Enhanced ESF Option.

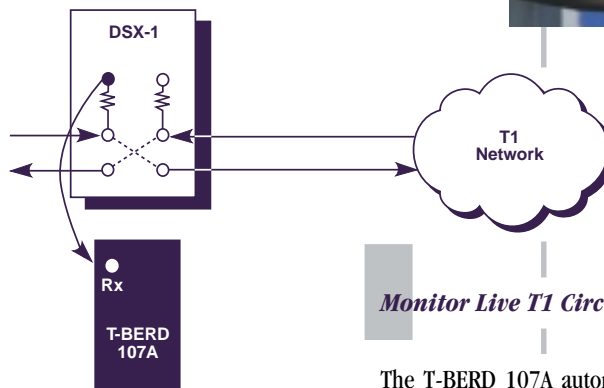
- **Verify Fractional T1 Service**

Use the Fractional T1 Option to perform bit error rate tests on selected channels to verify transmission quality on contiguous and non-contiguous FT1 bandwidths. Insert VF tones on single DSO channels.

- **Combine Convenience with Power**

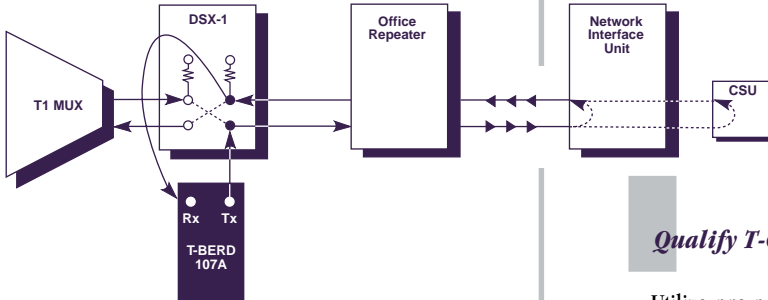
Flash memory technology enables complete field software upgrades in minutes. Battery operated, rugged, and lightweight (4.5 lb.), this test set is ideal for the field service technician.

*The T-BERD 107A is ideal for the field service technician.*



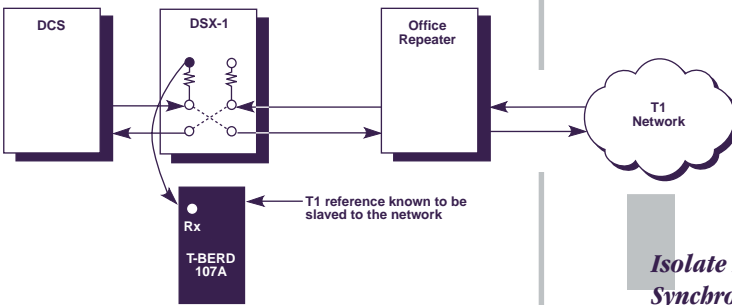
### *Monitor Live T1 Circuits*

The T-BERD 107A automatically determines framing, coding, and pattern. Errors are detected and displayed at a glance on the front panel. Monitor signal quality or view data bits on any DSO channel. Decode the SLC datalink or ESF signal and monitor signaling bits to troubleshoot problems in the field.



### Qualify T-Carrier Circuits

Utilize pre-programmed loop codes for intelligent repeaters to sectionalize span problems before dispatching maintenance personnel. Loop NIUs and CSUs from the central office with one test set. Perform automated pattern tests to quickly test the span and identify problems.



### Isolate Network Synchronization Problems

Timing problems are easily identified. Compare T1 circuit against a network reference clock to isolate timing slips.

## Measurements

### Errors

Bit Errors, Bit Errored Seconds, Bit Error Rate, CRC Errors, CRC Errored Seconds, CRC Error Rate, Frame Errors, Frame Errored Seconds, Frame Error Rate, Bipolar Violations, Bipolar Violation Seconds, Bipolar Violation Rate

### Signal

Received Frequency (Hz), Receive Signal Level (dBdsx), Received Signal Level (V p-p), Simplex Current, Timing Slips, ABCD Signaling Bits, Data Bits, VF Level, VF Frequency

### Summary

Bit Errors, Violations Frame Errors, CRC Errors, Receive Frequency (Hz), Timing Slips

### Time

Signal Loss Seconds, Test Length, Elapsed Time, Test End In, Date, Time, Battery Charge

### Datalink

SLC Alarm Seconds\*, SLC Alarm Field Size\*

\*Optional

## Operating Modes

Self Test, Automatic Configuration, T1, T1 D4, T1 ESF, T1 SLC, SLC-M1\*, SLC-M2\*, T1 D1D, FT1 D4 Framed\*, FT1 ESF Framed\*, T1 Test Loopback, T1 Line Loopback, SMARTNIU\*, T1 MBLT

## Patterns

All Ones, 1:1, 1:7, 2 IN 8, 3 IN 24, T1-QRSS, BRIDGTAP, MULTIPAT, User 1, User 2, User 3, All Zeros, 404 Hz\*, 1004 Hz\*, 2804 Hz\*, 2713 Hz\*, T1 DALY\*, T1-2/96\*, T1-3/54\*, T1-4/120\*, T1-5/53\*, 55 OCTET\*, MIN/MAX\*

## Input and Output Connectors

Bantam and RS-232 (printer operation)

## Input Impedance

BRIDGE:  $\geq 1000 \Omega$  or greater with ALBO  
 TERM:  $100 \Omega \pm 5\%$  with ALBO  
 DSX-MON:  $100 \Omega \pm 5\%$  with AGC

## Receive Level

BRIDGE or TERM: +6 to -35 dBdsx  
 DSX-MON: +6 to -24 dBdsx (of resistive loss)

## Line Build Out (LBO)

Range: 0, -7.5, -15.0, -22.5 dB  
 Accuracy:  $\pm 1$  dB at 772 kHz

## VF Level

Range: +3.0 to -40 dBm  
 Resolution: 0.1 dB  
 Accuracy:  $\pm 0.5$  dBm

## VF Frequency

Range: 60 to 3904 Hz (+3.0 to -26.0 dBm)  
 60 to 3400 Hz (-26.0 to -40.0 dBm)  
 Resolution: 1 Hz  
 Accuracy:  $\pm 1$  Hz

## Transmit Timing Sources

Internal Clock, Recovered Clock, External Clock

## Loopback Codes

CSU, CSU Line (ESF), CSU Payload (ESF), NIU (FAC1, FAC2, FAC3), NIU Network (ESF), Programmable (3 to 8 bit), Intelligent Repeaters

## Line Codes

AMI, B8ZS

## Signal Loss

No pulses detected for 150 ms

## Frame Loss

D1D: 2 out of 5 F<sub>i</sub> bits in error  
 D4: 2 out of 5 F<sub>i</sub> bits in error  
 ESF: 2 out of 5 frame bits in error  
 SLC: 2 out of 5 F<sub>i</sub> bits in error

## Pattern Loss

Fixed Pattern: 100 errors in  $\leq 1000$  bits  
 QRSS: 250 errors in  $\leq 1000$  bits

## Electrical/Mechanical Specifications

Size:

8.5" H x 4.25" W x 3.25" D  
 (21.6 cm x 10.8 cm x 8.3 cm)

Weight:

4.5 pounds (2.1 kg)

Operating Temperature:

32° F to 122° F (0° C to 50° C)

Storage Temperature:

-40° F to 167° F (-40° C to 75° C)

Power:

AC Adapter: 120 VAC to 12 VDC  
 Charging Time: 8 hours (nominal)  
 Battery: 12 VDC, lead-acid electrolyte  
 Operation: 4 hours (nominal)

## Mainframe

<i>Model No.</i>	<i>Description</i>
107A	T-BERD T-Carrier Analyzer Includes: Soft Carrying Case, AC Adapter/Charger, and Printer Cable

## Options

<i>Model No.</i>	<i>Description</i>
107A-1	SLC Decode
107A-2	Advanced Stress Patterns
107A-3	Enhanced ESF
107A-4	Smart Loopback/Command Codes
107A-5	Fractional T1

\*Optional

**TTC United States**

California, Georgia, Illinois, Maryland,  
New Jersey, Texas, Washington

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