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TECHNOLOGY GROUP

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Find the *VIAVI Solutions / JDSU / TTC T-Berd 209A* at our website: ***Click HERE***

T-BERD® 209A/211

T-Carrier Analyzer





TTC™
A Dynatech Company

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Reliable. Rugged. Easy to Use.

For over a decade, telecom technicians have depended on the T-BERD® 209A/211 T-Carrier Analyzer's no-nonsense approach to T1 testing. The T-BERD 209A/211 is one of the most widely used solutions for the spectrum of T1 troubleshooting and analysis needs. The reason is clear. TTC packs this user-friendly instrument with a robust feature set and backs it with a promise of customer care excellence.

Sometimes it makes sense to follow the crowd. When you need to test T1, you need a T-BERD – the tool whose name is synonymous with T1 testing.



T1 technicians worldwide rely on the T-BERD 209A/211 for the full spectrum of monitoring, troubleshooting, and analysis needs.

Highlights

- Identifies jitter; performs both highband and wideband measurements, and pinpoints multiplexer and channel bank clock problems (T-BERD 211 only)
- Auto configuration and results summary provides immediate identification of framing, pattern, and error status
- Supports CSU/NIU emulation for isolation of customer premises and network equipment
- Includes automated and user-configurable stress pattern testing
- Performs G.821, B8ZS, and Fractional T1 (FT1) error analysis
- Measures and analyzes pulse shape
- Brightly lit front panel display is ideally suited for low light testing environments
- Lead acid battery (T-BERD 209A) enables technician to test anywhere for up to five hours without power generators or cords
- Repeater Power Supply, T1 Repeater Extender, and Thermal Graphics Printer economically add versatility to the T-BERD 209A/211

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Information technicians need to ensure optimum T1 performance is readily obtained, quantified, and qualified by the T-BERD 209A/211's comprehensive testing and reporting options.

Jitter Alarm and Trigger (T-BERD 211 only)

- Front panel indicator provides fast identification of jitter problems; jitter measurements across the full 10 Hz to 40 kHz range facilitate isolation of multiplexer and channel bank clock recovery problems

Pulse Shape Measurement and Analysis

- Determine if the output of a network element is acceptable
- Evaluate customer premises and network equipment adherence to pulse mask specifications at the point of sampling
- Use DSX and network interface masks to measure pulse shape and width, rise time, fall time, undershoot, and overshoot

Received Signal Level Measurements

- Analyze signal strength to diagnose transmission problems caused by high/low signal levels

G.821 Measurements

- Perform error analysis per G.821 specification standards to verify circuit quality. Capture data including unavailable seconds, percent availability, degraded minutes, percent degraded minutes, severely errored seconds, percent severely errored seconds

Stress Pattern Testing

Generate a full suite of patterns to rapidly locate and isolate line problems. Patterns include:

- ***Automated Multipattern Tests***
  Detect elusive bridge taps using automated BRIDGTAP sequence and perform qualification tests with the user-configurable MULTIPAT® sequence
- ***Long User Pattern***
  Stress repeater ALBO circuits with 55 OCTET, T1 DALY, and other long user test patterns
- ***All Zero Stress Pattern***
  Identify circuits not configured for or incompatible with B8ZS data

Intelligent Repeater Loopcodes

- Loop up and loop down individual addressable office repeaters and line repeaters, or transmit maintenance switch commands

ESF Testing

- Emulate and loop back network devices that accept either in-band or ESF out-of-band (data link) loopback codes
- Decode ESF PRMs to confirm data link operation and network performance; emulate ANSI T1.403 compatible CSU equipment during circuit installation and qualification

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B8ZS Detection

- Quickly identify B8ZS encoded data via front panel indicator

Performance Monitor NIU

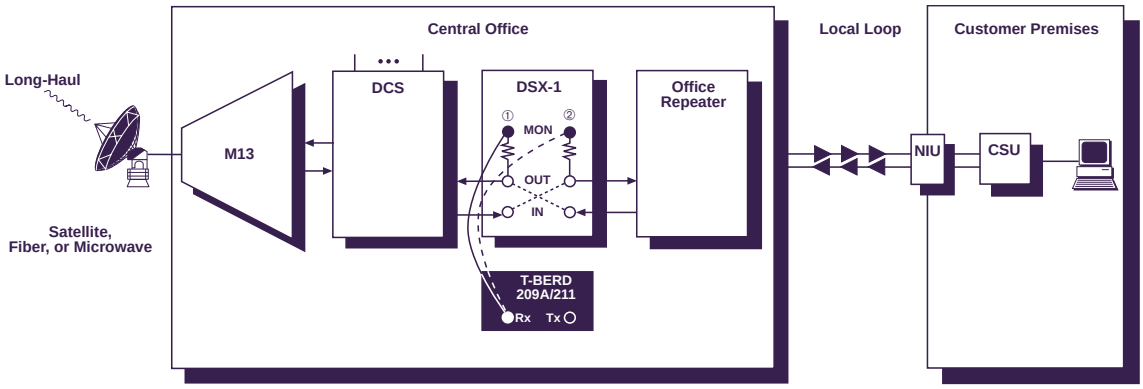
- SMARTNIU mode queries the Performance Monitor portion of combined NIU/Performance Monitor equipment for the recorded T1 span statistics, sets the Performance Monitor NIU clock to match the T-BERD 209A/211's, and clears NIU performance results

CSU/NIU Emulation

- Isolate customer premises and network equipment during installation and maintenance

FT1 Analysis

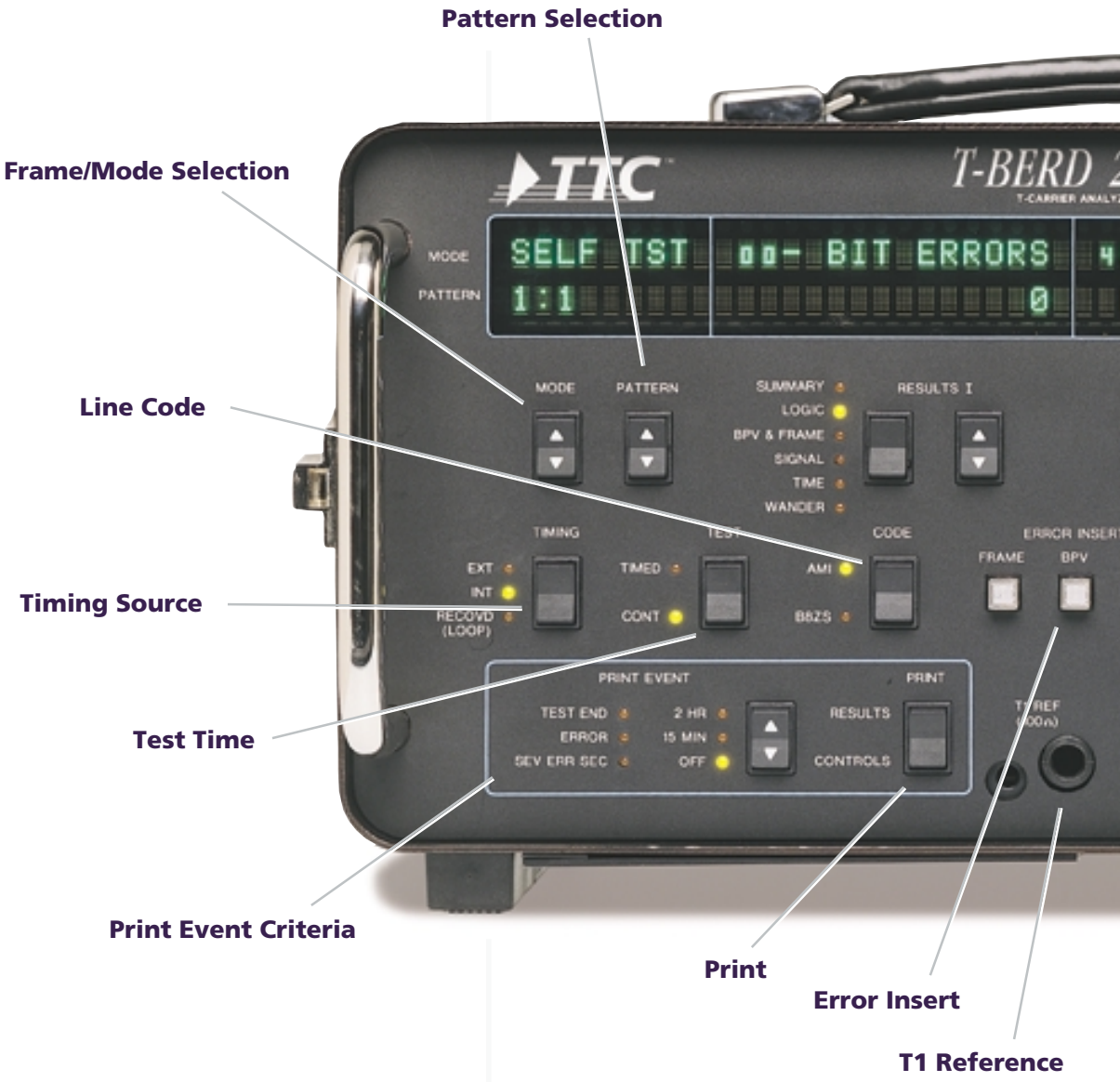
- Perform bit error rate tests on selected channels to verify contiguous and non-contiguous bandwidth and route quality on FT1 circuits



① Monitor the span side
② Monitor the long-haul side

The T-BERD 209A/211 monitors both the span and the long haul sides of the circuit for efficient testing from the central office.

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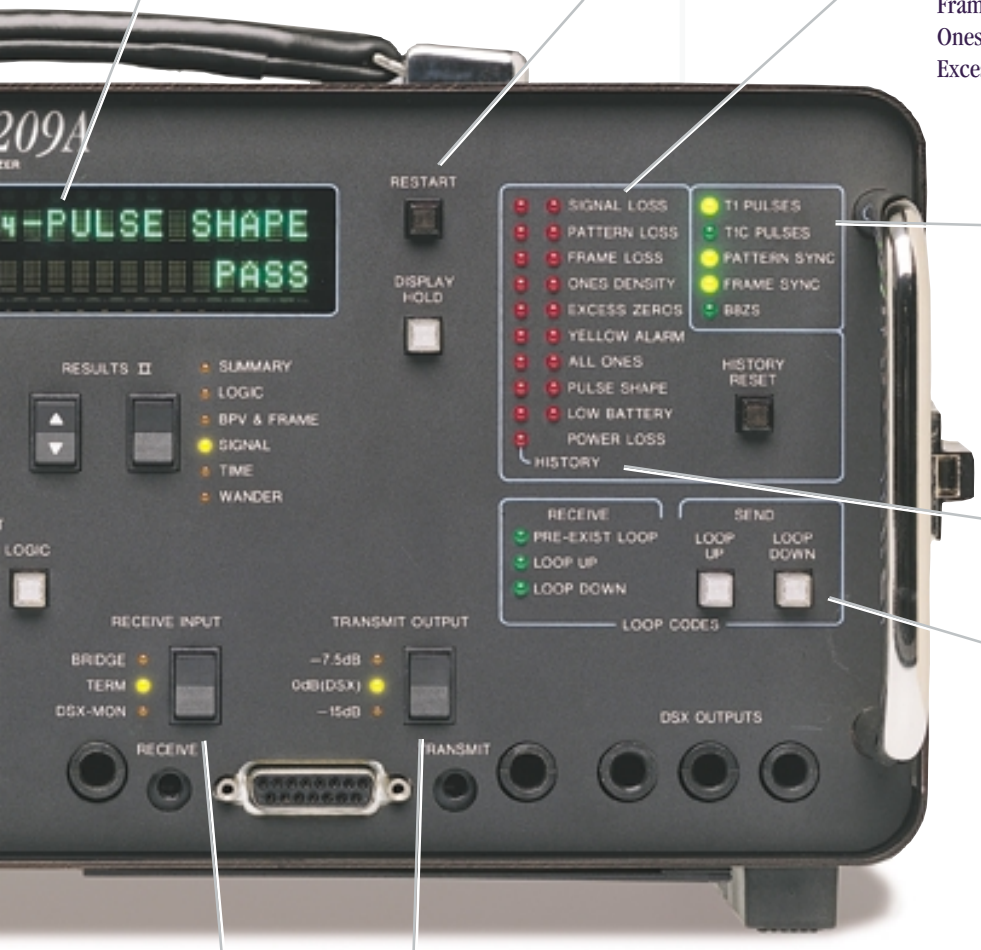

Pattern Selection
Frame/Mode Selection
Line Code
Timing Source
Test Time
Print Event Criteria
Print
Error Insert
T1 Reference
TTC
T-BERD
SELF TST
00- BIT ERRORS
MODE
PATTERN
1:1
0
SUMMARY
LOGIC
BPV & FRAME
SIGNAL
TIME
WANDER
RESULTS I
TIMING
EXT
INT
RECOVD (LOOP)
TIMED
CONT
CODE
AMI
B8ZS
FRAME
BPV
PRINT EVENT
TEST END
ERROR
SEV ERR SEC
2 HR
15 MIN
OFF
PRINT
RESULTS
CONTROLS

Dual Results Display

Restart

Alarm Indicators

Signal Loss	Yellow Alarm
Pattern Loss	All Ones
Frame Loss	Pulse Shape
Ones Density	Jitter/Low Battery
Excess Zeros	Power Loss



Status Indicators

T1 Pulses
T1C Pulses
Pattern Synchronization
Frame Synchronization
B8ZS

History Indicators

Loop Codes

Receive
Send

Transmit Output

Receive Input Termination

The T-BERD 209A/211 is a complete test and measurement solution for technicians who install, test, monitor, and maintain T1 links and equipment. The T-BERD 209A/211 can be optioned to perform the following tasks:

Equipment Installation

- Verify proper circuit operation from point to point
- Ensure that loopback equipment responds to designated loopcodes
- Test equipment under different traffic conditions using built-in fixed and pseudorandom test patterns

Circuit Maintenance and Problem Isolation

- Monitor the circuit for intermittent problems that may become more serious over time
- Avoid the expense of taking the circuit out of service
- Analyze live traffic without introducing any disturbances on the line
- Identify and locate cable pair faults including shorts, bridge taps, load coils, and other line impairments

Out-of-Service Troubleshooting

- Stress and analyze the network with point-to-point and loopback testing



The T-BERD 209A/211 options provide added testing flexibility.

Added Testing Flexibility

Power up and troubleshoot spans with the Repeater Power Supply and T1 Repeater Extender during span installation and maintenance. Monitor channels and signaling bits with the T1 Channel Monitor. Document your test results with the Thermal Graphics Printer.

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When you buy a TTC product, you get more than a world-class test instrument – you get world-class services, too.

Warranty and Instrument Service

TTC service excellence starts with a three-year warranty on all mainframes. You can extend your warranty with our product maintenance agreements, which include plans for service and calibration. Normal service turnaround is five business days, or expedited service is available for even faster turnaround.

Customer Care

Call Customer Care to obtain return authorizations, arrange for product calibrations and upgrades, or get information on products, training, and maintenance agreements.

Technical Assistance

Call TTC's Technical Assistance Center for free, expert consultation on any technical problem. Our engineers can help you with product configuration, test applications, circuit qualification, and more.

Advanced Applications Engineering (AAE)

The AAE team offers expertise in software development, test procedure development, and applications consulting, as well as years of expert test knowledge. AAE services include software customization, test procedure development, and network consulting.

Technical Training

TTC offers hands-on training at our facilities in the USA, Canada, UK, and Germany. We can provide on-site training at any location you choose. And, we offer computer-based training and customized multimedia courseware so you can train anytime, anywhere, at your own pace and on your own PC.

How to Contact Customer Services

Toll Free:	1-800-638-2049 (M-F, 8:00 a.m. - 8:00 p.m., ET)
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Fax:	+1-301-353-9216 (Customer Care)
Internet:	www.ttc.com
E-mail:	custserv@ttc.com (training) isc@ttc.com (instrument repair) tac@ttc.com (technical assistance)

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Specifications

Input and Output Connectors

Bantam, WECO 310, 15-pin D, BNC

Input Impedance

Bridge: ≥1000 ohms with ALBO
Term: 100 ohms with ALBO
DSX-MON: 100 ohms with AGC

Receive Level

Bridge or Term: +6 dBdsx to -35 dBdsx (T1),
+3 dBdsx to -6 dBdsx (T1C)
DSX-MON: +6 dBdsx to -24 dBdsx (T1),
+3 dBdsx to -24 dBdsx (T1C)

Level Measurement

+6 dBdsx to -40 dBdsx; +6 to -6, 0.1 dB resolution;
-6 to -40, 0.5 dB resolution

Frequency Measurement

1 Hz resolution; 5 ppm accuracy

Transmit Timing Sources

Internal Clock, External Clock, Reference Clock, Recovered Clock

Line Codes

AMI, B8ZS

Loopback Codes

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

TDR Measurements

Pulse Amplitude: 10.0 Vp-p, nominal
Pulse Frequency: 11.718 kHz, nominal
Measurement Range: 100 to 10,000 feet

Jitter Measurement (T-BERD 211 only)

Wideband: ≥32 UI, 10 Hz to 40 kHz
Highband: ≥32 UI, 8 kHz to 40 kHz
Spectral Analysis: ≥32 UI, 10 Hz to 40 kHz

Jitter Masks (T-BERD 211 only)

ITU O.171, PUB 41451, PUB 62411-1983, PUB 62411-1985, PUB 43801

Pulse Masks

CB 119 (ANSI T1.102), ANSI T1.403-1989

Wander Measurement

+99999 UI, 1 UI resolution

Power Requirements

115 VAC ±10%, 50 to 60 Hz; Lead Acid Battery

Dimensions and Weight

Overall Dimensions: 6 x 13.5 x 8.5 in, (15.3 x 34.4 x 16.5 cm)
Weight: 10 lbs (4.5 kg), without battery option

Environment

Temperature Range: 32° to 113° F (0° to 45° C), operating
Time: 5 hrs, nominal (operating); 8 hrs, nominal (charging)

Product Information

Model No.	*Description*
TB209A-PKG-01	T-BERD T-Carrier Analyzer Package (includes G.821 and battery)
TB209A-PKG-02	T-BERD T-Carrier Analyzer Package (includes G.821, battery, and LUP)
TB209A-PKG-03	T-BERD T-Carrier Analyzer Package (includes G.821, battery, LUP, Enhanced ESF, and FT1)
TB209A-PKG-04	T-BERD T-Carrier Analyzer Package (includes G.821, battery, LUP, Enhanced ESF, FT1, and TDR)
TB211-PKG-01	T-BERD T-Carrier Analyzer Package (includes G.821 and Spectral Analysis)
TB211-PKG-02	T-BERD T-Carrier Analyzer Package (includes G.821, Spectral Analysis, and LUP)
TB211-PKG-03	T-BERD T-Carrier Analyzer Package (includes G.821, Spectral Analysis, LUP, Enhanced ESF, and FT1)
TB211-PKG-04	T-BERD T-Carrier Analyzer Package (includes G.821, Spectral Analysis, LUP, Enhanced ESF, FT1, and TDR)
40849-01	T-BERD T1 Channel Monitor
41084	T-BERD Repeater Power Supply
41157	T-BERD T1 Repeater Extender
12445	External Power Supply for Model No. 209A/211-96
PR-40A	Thermal Graphics Printer with Carrying Case

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