

# T-BERD 224 Technology

## Test Patterns

The following outlines and explains the various test patterns supported by the T-BERD 224.

### Test Pattern Descriptions

Pattern	Description	Application
<b>AUTO</b> (Automatic Pattern Search)	Allows the T-BERD 224 to automatically search for and recognize known test pattern on dropped line.	Used to identify unknown pattern or live data.
<b>MULTIPAT</b> <sup>®</sup>	Automated test that transmits five test patterns consecutively: All Ones, 1:7, 2 in 8, 3 in 24, and QRSS.	Used during acceptance testing of new T1 span or while troubleshooting existing T1 span.
<b>BRIDGTAP</b>	Automated test that transmits 21 test patterns consecutively: All Ones, 1:1, 1:3, 1:5, 1:6, 1:7, 2:8, 2:9, 2:10, 2:11, 2:12, 2:13, 2:14, 3 in 18, 3 in 19, 3 in 20, 3 in 21, 3 in 22, 3 in 23, 3 in 24, and QRSS.	Used during initial installation to identify bridge taps or to stress T1 span during routine maintenance.
<b>All Ones</b>	Fixed test pattern of AMI pulses.	Used to stress repeater current regulator circuits. Can be used as “keep alive” signal, idle code, or as AIS in unframed circuits.
<b>All Zeros</b>	Pattern can be transmitted framed or unframed.	Used to test T1 circuits for B8ZS clear channel capability and to find equipment misoptioned for AMI.
<b>USER</b>	User-programmable bit pattern. Allows the T-BERD 224 to transmit specific bit pattern configured by user (in <b>AUX 15</b> ) varying in length from 3- to 24-bits.	Used to test circuit’s sensitivity to particular pattern.
<b>MIN/MAX</b>	Rapid transitions from low ones density octets to high ones density octets.	Used to test ability of repeaters to adjust to rapid changes in ones density.
<b>2<sup>^</sup>23-1</b>	Pseudorandom pattern with maximum of 22 sequential zeros and 23 sequential ones.	Most useful in simulating live data.
<b>2<sup>^</sup>20-1</b>	Pseudorandom pattern with maximum of 19 sequential zeros and 20 sequential ones.	Most useful in simulating live data.
<b>2<sup>^</sup>15-1</b>	Pseudorandom pattern with maximum of 14 sequential zeros and 15 sequential ones.	
<b>2<sup>^</sup>15-1/NV</b>	Pseudorandom pattern with maximum of 14 sequential zeros and 15 sequential ones in inverted form.	Provides maximum number of zeros allowed for framed, non-B8ZS testing.

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## Test Pattern Descriptions (cont.)

Pattern	Description	Application
QRSS	T1 Quasi-Random Signal Source (QRSS) pattern. Modified version of $2^{20-1}$ pseudorandom pattern.	Used to simulate live data.
2 in 8	Fixed pattern of F0100 0010... Pattern is aligned with framing bit (F) as indicated.	Used to stress B8ZS encoded equipment.
3 in 24	Fixed pattern of F0100 0010 0000 0000 0000 0100... Pattern is aligned with framing bit (F) as indicated.	Used to stress maximum zeros and minimum ones density criteria simultaneously.
1:7	Fixed pattern of F0100 0000... Pattern is aligned with framing bit (F) as indicated.	Used to test minimal ones density requirement of T1 circuit using AMI coding.
63	63-bit ( $2^{6-1}$ ) pseudorandom pattern that generates maximum of 5 sequential zeros and 6 sequential ones.	Useful when testing 56 kb/s with secondary channel to avoid introduction of all zeros network byte.
511	511-bit ( $2^{9-1}$ ) pseudorandom pattern that generates maximum of 8 sequential zeros and 9 sequential ones.	Useful when testing DDS and other circuits operating below 9.6 kb/s.
2047	2047-bit ( $2^{11-1}$ ) pseudorandom pattern that generates maximum of 10 sequential zeros and 11 sequential ones.	Useful when testing DDS and other circuits operating between 9.6 and 56 kb/s.
DDS1	Repeating pattern of 100 octets of 1111 1111 and 100 octets of 0000 0000.	Used to stress DDS circuit signal recovery capability.
DDS2	Repeating pattern of 100 octets of 0111 1110 and 100 octets of 0000 0000. Provides minimum ones density and simulates bit-oriented protocol flags (e.g., HDLC-SS7/ISDN).	Used to ensure DDS circuit can pass signal properly.
DDS3	Continuous series of octets of 0100 1100... which provides medium ones density.	Used to simulate typical signal transmitted over DDS circuit. Medium stress test of DDS circuit.
DDS4	Continuous series of octets of 0100 0000... which provides low ones density.	Used as moderate stress on DDS clock recovery circuit.
*DDS5	Compilation of DDS 1, 2, 3, and 4 stress patterns.	Used as quick method to test circuits with first four DDS stress patterns. This pattern is not detected in <b>AUTO</b> mode.
*DDS6	Seven octet fixed pattern of 1111 1110 followed by one octet of 1111 1111.	Useful in simulating DDS signal transition from <b>IDLE</b> mode to <b>DATA</b> mode. Also aids in detecting marginal equipment in multipoint applications.

\*Requires the Advanced Stress Pattern Option.

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## Test Patterns (cont.)

### Test Pattern Descriptions

Pattern	Description	Application
*T1-2/TRIP	Fixed 96 octet HEX pattern.	Used to stress T1 circuits and equipment.
*T1-3	Fixed 54 octet HEX pattern.	Used to stress T1 circuits and equipment.
*T1-4	Fixed 120 octet HEX pattern.	Used to stress T1 circuits and equipment.
*T1-5	Fixed 53 octet HEX pattern.	Used to stress T1 circuits and equipment.
*T1-6/55 OCT	Fixed unframed 55 octet HEX pattern.	Used to test repeater's ability to lock onto incoming clock when data changes from high ones density to low ones density.
*T1-DALY	Fixed unframed 55 octet HEX pattern. Variant of T1-6.	Used with framed T1 circuits without causing excess zeros (less than 15 consecutive zeros).

*\*Requires the Advanced Stress Pattern Option.*



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