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T1/FT1 DATA INTERFACE (MODEL 41440A) OPERATING MANUAL

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This Interface Manual applies to all FIREBERD 4000 Communications Analyzers Incorporating Software Revision 6.0, or higher and to all FIREBERD 6000 Communications Analyzers Incorporating Sofware Revision J or higher.

Rev. G

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SECTION 7
SPECIFICATIONS

7.1 INTRODUCTION

This section contains the specifications for the T1/FT1 Interface.

Operating Modes

- T1 Unframed
- T1 Framed (D4, ESF, SLC-96)
- Fractional T1:
  - Nx64 kb/s or Nx56 kb/s (N=1 to 24)
  - Contiguous or Noncontiguous Channel Selections
  - User-Selectable 8-bit Idle Code
- Fractional T1 Drop and Insert
- Voice & Signaling Bit Transmit/Receive
- T1 Line Loopback
- T1 Test Loopback
- ESF Data Link
- RS-232 Transmit/Receive
- T1.403 PRM (FIREBERD 6000 only)

Receive Input

- Input Frequency: 1544000 b/s $\pm$ 500 b/s minimum tolerance
- Input Impedance:
  - TERM: 100 ohms + 5%
  - DSX-MON: 100 ohms + 5%
  - BRIDGE: 1000 ohms minimum
- Operating Range:
  - TERM: +6 dBdsx to -35 dBdsx cable attenuation
  - DSX-MON: -10 dBdsx to -30 dBdsx resistive attenuation

T1 Reference Input

- Input Frequency: 154000 b/s $\pm$ 500 b/s minimum tolerance
- Input Impedance:
  - TERM: 100 ohms + -5% ohms
  - BRIDGE: 1000 ohms minimum

Output Specifications

- Output Line Build Out:
- Selectable 0 dB, -7.5 dB, -15 dB with + -1 dB attenuation at 772 kHz
- Pulse Shape
- Meets Bell Publication CB113, CB119, CB143, and AT&T PUB 41451, AT&T PUB 62411 and AT&T PUB 62508
- Line codes: AMI and B8ZS

Interface

- Logic Errors: Single or rate
- BPVs: Single or rate
- Logic and BPVs: Single or rate
- Frame: Single or consecutive (consecutive range: 2-4)
- Error insertion on F^t bits (D4 or SLC-96 Framing) or FPS bits (for ESF Framing)
- Error Insertion Rates: 1E-9 to 9E-3 FIREBERD 6000
  1E-6 FIREBERD 4000

Loop Code Generation

- CSU (Loop-up code: 10000; Loop-down code: 100)
- Facility Loop Code 1: (Loop-up code: 1100; Loop-down code: 11100)
- Facility Loop Code 2: (Loop-up code: 11000; Loop-down code: 11100)
- DL-LLB (Data Link-Line Loopback): per ANSI Standard T1.403-1989
- DL-PLB (Data Link-Payload Loopback): per ANSI Standard T1.403-1989
- Programmable Loop Codes: 3 to 8 bit repeating loop-up and loop-down codes

Indicators

- Code: B8ZS Detect
- ALM1: Yellow Alarm
- ALM2: Excess Zeros
- ALM3: Alarm Indication Signal (FIREBERD 4000 only)

Alarm Criteria

- Yellow Alarm
- D4 or SLC Bit 2 is 0 for 255 consecutive bits
- ESF 256 bit + 16 bits of a repetitive "1111111100000000" pattern received in the 4 kb/s data link
- Excess Zeros:

  16 or more consecutive zeros
  AIS (All Ones):
  Unframed All Ones
  Per AT&T PUB 62411 and Bell Publication TR-TSY-000191

Measurements

- Frequency Accuracy: + 5ppm (+1 ppm optional)
- Resolution: 1 Hz

Level

- Peak-to-peak: 60 mV to 12.0 V
- Positive and negative base to peak: 30 mV to 6.0 V
- Positive and negative base to peak: +6 dBdsx to -40 dBdsx
- Resolution: 0.1 dB
- Accuracy ±10%

Simplex Current

- Range: 0 mA to 200 mA
- Resolution: 1 mA
- Accuracy: ±5%
- Voltage Drop: 7.3 V ±5% at 60 mA

Timing Slips

- Resolution: 1 bit slip
- Range: ±65536 bit slips

Wander

- Resolution: 1 UI
- Accuracy: 1 UI

Channel Analysis

- Byte Decoder
- ABCD Signaling Bit Display

Connectors

- T1 Receive Input: Bantam
- T1 Transmit Output: Bantam
- T1 Reference Input: Bantam
- RS-232 Port: RJ-45 (Configuration: DCE, Rates: 4 kb/s, 64 kb/s and 56 kb/s synchronous)
- Handset Port: RJ-8 (Companding: μ-law)