

TIMS/Signaling Wideband Test Set

Highlights

- Rugged, Lightweight & Hand-Held TIMS/Signaling Wideband Test Set
- RJ-11 Modular Jack
- Dual Mini-Phone Jacks (Bantam)
- 2-/4-Wire Interface
- 100, 135, 600, 900 and 1200 Ohm & Bridged
- Measure Line Voltages & Polarity
- Monitor RINGING Voltage
- ADSL/xDSL Facility Testing - Nyquist Tones
- 1.5MHz Range - Load Coil Testing - ERL
- Signaling-DID/PBX CO Emulation
- Digit Capture/Analysis-Wink Timing
- Class Services Test Package
- Complete VF & Wideband TIMS
- E, F, and G Noise Filters

Unique Features

- Wideband Noise
- Impulse Noise
- E, F and G Noise Filters
- Load Coil Testing
- Pre-Programmed DSL Nyquist Frequency Tones
- Single-screen readout of both TX & RX Frequencies & Levels
- 704A-430 and 704A-460 include CO & PBX Switch Emulation

Additional Features

- Send/Receive Tones manual or Pre-Programmed
- 3-Tone or Broadband Sweeps
- Message Noise
- Notched Noise
- Signal-to-Noise
- Impulse Noise
- Analyze MF/DTMF Signals
- Filters - C-MSG; 3KHz; 15KHz; Program, E, F & G
- Measure Loop Voltage/Current
- Measure Sealing Current
- Dial & Hold
- Return Loss, 105/110 Responder Automated Trunk Tone Auto-Test for Signal Level; Gain Slope; Envelope Delay; Intermodulation Distortion; Signal-to-Total Distortion; Signal-to-Noise Ratio



The Halcyon 704A-400 Series™ TIMS/Signaling Wideband Test Set (704A-410, 704A-430 and 704A-460 Models) is a hand-held test set optimized for installation and maintenance of analog voice band, program and wideband data services including Class Services and circuits utilizing DID signaling (E911).

Test Set types are the **704A-410** is a basic 1.5 MHz test set with digital loop qualification features; the **704A-430** includes emulation for CO and PBX switches and the **704A-460** includes testing emulation for CO and PBX switching plus Class testing.

When equipped with 1.5 MHz option, the TIMS/Signaling Wideband Test Set is ideally suited for ADSL, HDSL, ISDN and DDS Facility Testing. Designed with state-of-the-art technology and engineered for ease of operation, the **704A-400** provides users with single-button test execution allowing quick circuit diagnosis and repair without extensive training. The internal NiMH battery pack provides 4-hours of continuous operation. Alternate **704A-NTS1/NTS2** and **704A-PKG2/PKG3** Universal Data Test Packages are available which include digital testing functions such as 4-Wire DEMARC/DS0 DDS test functions, T1/FT1 and BRI-ISDN test capabilities. The rugged hand-held **704A-400** is the complete test solution for installation and maintenance of analog voice and data circuits. Users for all models of the **704A-400** Series consists of DS0/DS1, Central Office (CO), Digital Operations Group (DOG), Special Services, and CO/OSP Construction Technicians.

Applications

Services Tested

All Models perform the following tests: HDSL (E, F and G Noise Filter, Impulse Noise) POTS, Analog Special Services, PBX Trunks (No CO/PBX Emulation for the **704A-410**). The **704A-430** and the **704A-460** both include CO/PBX Emulation and can be substituted for a CO switch or PBX, while the **704A-460** includes CLASS CPE Emulation which can be substituted for CPE at MDF or NID.

Facilities Tested/Qualified

All models perform Facilities Testing/Qualified. These categories include the following: Cable Pairs, DS0 Crossconnects, HDSL Facilities, ADSL Facilities, ISDN Facilities and POTS Facilities.

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Specifications

INTERFACES

All Models: 2- or 4-Wire RJ-11, Dual Bantam

IMPEDANCES

All Models: 100, 135, 600, 900, 1200 Ohm & Bridged

PHYSICAL

- Dimensions: 9.5 in x 6.33 in x 3.5 in (L x W x H)
(Equipped with all options - Less than 2.2 lbs.)
9.5 in x 6.33 in x 2.63 in (L x W x H)
(Basic 704A-400 Series – Weight approx. 3 lbs.)
- Operating Environment: 32^o to 122^o F (0^o to 50^oC), 0 to 95% R.H. (Non-Condensing)
- Power Requirements: 4 Watts at 115 VAC, 60Hz nominal for 9 VDC external DC power supply
- CLEI Codes: TETMAAE7AA, TETMAAF7AA
- Battery: 4 Hours continuous operation from the internal 7.2 VDC NiMH pack.
Charge time: 14 hours
- 2W/4W Interface: RJ-11 C or Dual Bantam (210) connector
- Impedance: 100/135/600/900/1200 ohms in terminated mode; >30K Ohms in bridged mode.
- Longitudinal Balance: Better than 60 dB from 200 Hz to 1.5 MHz
- Audio & Display: Built in speaker with volume control.
Display is LCD, 4 line x 20 character
- Line Hold: Electronic, internally current limited to 24 mA on either the 2W or 4W- XMT port when Off-Hook
- Dial: 16 Character DTMF generation, 12 character MF generation, 10 digit Dial Pulse generation
- Measurements: Level (dBm), Frequency, Weighted Noise, Notch Noise, Signal to noise ratio, Impulse Noise, Return Loss, 23-Tone Sequence (RMS level/frequency, individual level/frequency, IMD, EDD, S/TD, SNR), Advanced Caller ID CND/CNAM (optional), Line voltage, current and ring voltage, Load Coil Detect, MF/DTMF/Dial Pulse analysis

SIGNALING

- Signaling Interfaces: Emulate network and terminal end of Loop Start, Ground Start, Direct Inward Dial, E&M I-IV, Originate or terminate call, Analyze digits, perform transmission tests
- Signaling Modes: MF/DTMF/Dial Pulse analysis
- CO Emulation: Wink start or immediate start
- Measurements: Pre-wink, wink duration and answer delay for up to 999ms with 1ms resolution
- Loop Current Detection: Loop current detector must exceed 20ms to detect a valid off-hook state
- DTMF Generation: Transmit level of -7 ±0.2 dBm, with 1.5 dB twist
- MF Generation: Transmit level of -7 ±0.2 dBm
- Dial Pulse Generation: -10 Pulses per second with 60% break and 250 mS inter-digit time
- PBX Emulation Mode: Wink start or immediate start with pre-wink time of 1 sec and wink duration of 250 mS ± 2 mS

- Measurements: Up to 9999 mS maximum post wink time with 1 mS resolution and ± 1 mS accuracy
- Battery Feed: -48 VDC 400 ohm DC feed limited to 24 mA
- MF Receiver: All 15 valid MF tones received at levels as low as -30 dBm
- DTMF Receiver: 16 digit receiver (1-9, 0, A, B, C, D, *, #)
- Dial Pulse Receiver: 12 digit receiver (1-9, 0, *, 3) Range is from 3 to 29 pulses per second with a 10 to 90% break

DTMF ANALYSIS

- Frequency Meas: A high/low group frequency accuracy of ±3 Hz with 1 Hz resolution
- Level Meas: A high/low tone group range accuracy of +1.5 to -28 dB with 0.1dB resolution and ±0.5 dB accuracy
- Timing Meas: 1 mS to 65.5 seconds with 1mS resolution and ±1mS accuracy
- Tone Acceptance: Maximum twist of ±10 dB with 35 mS minimum tone duration. 18 dB maximum dial tone level tolerance

CLASS SERVICES TESTING (OPTIONAL)

- Enhanced Caller/Name ID: Test Functions
- Timing Measurements: 1mS to 60 seconds with 1mS resolution and ±1mS accuracy

CLASS SERVICES TESTING (OPTIONAL - CONTINUED)

- Receiver Sensitivity: Carrier must be received at -45dB minimum receiver sensitivity
- FSK Data Detection: Continuous phase coherent FSK detection (1200/2200Hz ±1%) @ 1200 BPS
- Ring Voltage Measurements: 40 to 140 VAC with 1 volt resolution and ±2 V accuracy

GENERATOR

- Variable Tone: Frequency adjustable from 50 Hz to 1.5 MHz in 1 Hz steps: accurate to within ±0.5Hz
- Fixed Tones: Program 50 Hz, 100 Hz, 1 kHz, 5 kHz, 8 kHz, and 15 kHz. (transmit level fixed at 0.0 dBm)
- ADSL Tones: 28 kHz, 40 kHz, 48 kHz, 82 kHz, 196 kHz, 392 kHz (level adj. +13 dBm to 40 dBm)
- Wideband Sweep: 400 Hz to 3200 Hz in 200 Hz steps, 4800 Hz, 8000 Hz, 28 kHz, 32 kHz, 36 kHz, 48 kHz, 80 kHz, 82 kHz. Level adjustable from +13 dBm to 40 dBm
- 3-Tone Slope: 404 Hz, 1004 Hz, 2804 Hz, each at ±0.5Hz. Level adjustable in 4 steps of 0, -10, -13 and -16 dBm ±0.2 dBm
- 2713 Hz Loop Back: Generated at at ±0.5 Hz. Level adjustable as in 3-Tone Slope
- Level Accuracy: 600/900/1200 ohm mode ±1.0 dB from 300 Hz to 400 Hz ± 0.5 dB >400 Hz to 10 KHz ±1.0 dB >10 KHz to 25 KHz
- 100/135 Ohm 4W Mode: ±1.0 dB from 1 KHz to 100 KHz ±2.0 dB > 100 KHz to 400 KHz
- 23-Tone Test: Generate 23-Tone sequence per IEEE-1995 at -6 dBm to -40 dBm. Measures individual frequencies and level, RMS composite tone, IMD, EDD, S/TD and S/NR

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DTMF Generation: XMT level of -7 ± 0.2 dBm, w/1.5dB twist:
freq Accurate to -0.5 Hz, 75mS on, 75mS off

- Line Voltage Measurement 2 to 85 VDC : 0.1 Volt resolution and ± 1 Volt accuracy
- Line Current Measurement 10 to 80mA; 0.1mA resolution and ± 1 mA accuracy
- Return Loss: Continuous generation of band limited noise signal sent at -6 ± 1.0 dBm in each of three bands

RECEIVER

- Level Accuracy: $+13$ to -72 dBm
600 and 900 ohm 4-wire mode
 ± 0.5 dB 400 Hz to 4 KHz
 ± 1.0 dB > 4 KHz to 15 KHz

1200 Ohm 4-wire mode
 ± 2.0 dB 400 Hz to 15 KHz

135 Ohm 4-wire mode
 ± 1.0 dB, 1 KHz to 100 KHz
 ± 2.0 dB > 100 KHz to 400 KHz
- Frequency: For 50 to 1,500,000 Hz, frequency measurement accuracy is ± 1 Hz resolution with 0.005% accuracy with 1Hz resolution
- Noise: 15 to 95 dBm with 1 dBm resolution and ± 1 dBm accuracy from 20 to 90 dBm
- Noise Filters: C-MSG, 3KHz Flat (D), Program, 15 KHz Flat and E, F and G
- Notched Noise: 1010 Hz notch, with a minimum of 50 dB attenuation in the band of 995 to 1025 Hz
- Signal to Noise Ratio: Holding tone (1004 Hz) must be in the range of $+6$ to -45 dB: Measured S/N ratio range from 10 to 55 dB with 1 dB resolution and ± 2 dB accuracy
- 3-Level Impulse Noise: Threshold can be set from 30 to 90 dBm: 3 level difference fixed at 4 dBm with a measurement accuracy of ± 1 dBm. Blanking interval fixed at 125 ms with 3 independent counters
- 23-Tone Test: Generate 23-Tone sequence per IEEE-743 (1995 Edition) at -6 dBm to -40 dBm. Measures individual frequencies and level, RMS Composite Tone, IMD, EDD, S/TD and S/NR
- Return Loss: Three bands: ERL, SRL-HI, SRL-LO; Range of 0 to -30 dB with 1dB resolution and ± 1 dB accuracy. Continuous generation of band limited noise signal sent at -6 ± 1.0 dBm in each of 3 bands



The Halcyon Test Set Suite