Complete Emulation and Analysis of International 2 Mbps CAS PCM and Analog Signaling

- Signaling Monitor/Emulator/Analyzer
- Dialed Digit Monitor/Emulator/Analyzer
- Complex Sequence Dialer
- Analog Loop and E&M Trunk Capabilities
- User Programmable Signaling Protocols
- VF Level, Frequency, & Noise Measure
- Dual Multimeter
- 2 Mbps PCM Drop & Insert
- Non-Intrusive PCM Measure
- CO Battery, Ring Generator, and Dial Tone Generator Sources
- Portable and Battery Powered
Introduction
Whether you are a telecommunications service provider or a telecommunications equipment manufacturer, the global marketplace has requirements for a multitude of signaling protocols within countries and between countries.

In-service circuits need troubleshooting. New products need testing and, eventually, manufacturing and field support. Until now, the only solution may have been numerous test instruments or expensive in-house test equipment.

The Ameritec Model AM8e is a Call Analyzer capable of emulating, observing and troubleshooting signaling protocols on a wide variety of analog circuits or 2 Mbps channel associated signaling PCM circuits. The AM8e is user programmable. You can modify existing signaling protocols or develop new signaling protocols based on your requirements.

2 Mbps PCM Testing
The AM8e is compatible with worldwide CCITT recommendations for 2 Mbps, 30-channel, channel associated signaling PCM lines. The unit is compatible with all country specific A, B, C, D bit signaling and MF-R1, MF-R2, CCITT #5, DTMF, and dial pulse protocols.

The AM8e provides for emulation and non-intrusive monitoring of 2 Mbps PCM circuits. Specific channels can also be monitored. Also provided is a drop and insert capability which allows testing of individual PCM channels.

Complete decoding and analysis of MF-R1, MF-R2, CCITT #5, DTMF, and dial pulse signaling is provided. Precise, one-millisecond time stamping of digits and events will tell you exactly what happened and when.

Exception reports can be printed by connecting an accessory printer and using the built-in programmable signaling thresholds to automatically screen out of tolerance digits and events.

User Programmable Signaling Protocols
To provide the utmost in flexibility to accommodate worldwide signaling variations, the AM8e is protocol driven. Protocols may be purchased from Ameritec or developed by the user. The AM8e can store up to 10 complex protocols which can be simply recalled and executed. The protocols allow for various WAIT conditions, such as Wait for 3 Seconds, Wait For Call Progress Tone, Wait For Wink and so on. The protocols can select any of the available 10 autodial strings and each string can point to another string for virtually unlimited dialled digit lengths. Calling and called party numbers may be stored in different autodial strings and executed at the appropriate stimulus from within the protocol. Dialing may be dependent upon a Wait condition. These capabilities allow the user to test complex Intelligent Network functions as well as CTI applications such as Voice Mail.

Protocols can also cause tones to be transmitted with a specific level and frequency. For dual tone dialing, the level and frequency of each tone of the two tones can be specified, allowing for testing of an application over the full range of specified dialled digit capability. Simple loops can be set up in a protocol for incremental worst case testing.

Analog Loop Trunk/Line Emulation
The AM8e is also compatible with two-wire analog type trunks and lines. User programmable emulation, monitoring and analysis are provided for the following parameters:
- Battery Voltage, Loop Length & Termination
- Start Dial Signals including Dial Tone
- MF-R1, DTMF & Dial Pulse Signaling
- Dial Pulse Speed, Make/Break & Interdigit Time
- Dial Tone Delay, Cadence, Frequencies & Level
- Hookflash & Line Unbalance
- Ringing Voltage, Frequency & Cadence
- Delay & Wink Start Signals
- Single Test Tone Frequency & Level

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AM8e E&M Adapter
The AM8e E&M Adapter replaces the protective front panel cover of the AM8e and offers convenient access to analog E&M signaling emulation, monitoring, and analysis capabilities. This includes North American E&M signals too! Simply attach the E&M Adapter to the LINE/TIMS Connector of your AM8e with the ribbon cable and you are ready to apply the same troubleshooting and testing power available for PCM and two-wire loop circuits.

In combination with the AM8e, the E&M Adapter provides the following analog E&M capabilities:
- E&M Signaling Emulator/Monitor/Analyzer
- E&M Types I through V, 2-Wire and 4-Wire
- 4-Wire E&M and 4-Wire Phantom E&M
- Programmable Signaling Protocols to Control E&M Leads
- Digit Emulator/Monitor/Analyzer (MF-R1, MF-R2, CCITT #5, DTMF, Dial Pulse)
- Complex Sequence Dialer
- High/Low Thresholds for Capturing Erroneous Digits and Events
- Precise, One-Millisecond Time Stamping of Digits and Events
- VF Level, Frequency and Noise Measure
- CO Battery and Dial Tone Generator
- Ameritec E&M signaling protocols are available or users may develop their own protocols.

TI/E1 Adapter
The AM8e T1/E1 Adapter replaces the protective front panel cover of the AM8e. The Adapter converts the AM8e E1 input/output to T1 input/output and accommodates both PCM1 and PCM2. With this Adapter the power of the AM8e protocols can be used in a T1 environment to allow testing of very complex interface protocols.

Additionally, an AM8e with this Adapter can also be used for standard T1 testing, significantly improving the utility and versatility of the AM8e.
Detailed Digit, Event Analysis

When connected to a circuit, the unit will display signaling events occurring in either direction on a high-contrast liquid crystal display (LCD). Up to 80 dialed digits and/or events (on hook, off hook, wink, etc.) are collected and displayed for each call. The operator can observe, on the second line of the display, all details associated with that event. For example, when observing a DTMF digit, the unit will display the time of the digit and its duration, as well as the measured high and low band frequency and level.

If the operator had previously entered good/bad thresholds, then any out-of-spec detail would be highlighted to the operator.

With each event in a complex sequence captured in detail, troubleshooting becomes a matter of searching for the problem instead of solving the problem.
**Built-in Voltmeter**

A dual multimeter with analog and digital display is provided. AC volts, DC volts, and current measurements may be operator selected for tip to ring, tip to ground or ring to ground connections. PCM signal amplitude can be measured when using the AM8e in PCM mode.

**Portable or Rack Mount**

No other signaling test set of this type is as full featured, small and convenient. About the size and weight of a telephone directory, it is easily transported from lab to field. For permanent installations, a rack mounting kit is available which will allow 19” relay rack mounting in only two rack increments (3 1/2”) of space.

**European Community Standards**

The AM8e is fully certified to meet the safety and emission standards of the European Community. The ce marked version of the AM8e is designated the AM8e (ce).

**Accessories and Options**

**Provided**

Model AM8e, removable front cover with storage, power cord, monitor cables and instruction manual.

**Optional Battery**

An optional internal, rechargeable battery pack is available for fully portable "cordless" operation. The batteries are of sealed lead-acid type and require no maintenance. A front panel low battery indicator indicates when recharging is needed.

The built-in charger allows the batteries to be charged even while the unit is in operation.

**Options**

- **30-0056** AM8e E&M Adapter
- **19-0004** Protocol Development Kit (softtools® Assembler/linker & PC required)
- **24-0018** Internal Power Pack (Sealed Rechargeable Lead Acid Batteries) and Internal Charger. (included in the AM8e (ce)).
- **85-0233** 19” Rack Mount Shelf.
- **48-0062** 6 Ft. Bantam to Clip Input Cable.
- **48-0047** 6 Ft. Bantam to Bantam Input Cable.
- **48-0048** 6 Ft. Bantam to 310 Input Cable.
- **87-0070** Padded Carrying Case

**Dual multimeter display showing battery and loop current measurements.**

**AM8e shown in rack mount configuration.**

**AM8e with manual, cables, cover, and optional soft carrying case.**