Mixed Signal Audio Measurement Set
AM700

This product is no longer carried in our catalog.

Features

- Two Channel FFT
- Graphic Plotting
- Multitone Measurements
- Distortion Analysis
- Digital Audio Analysis
- True Stereo Analyzer
- Analog Signal Generator
- Digital Signal Generator
- Min/Max Hold
- Headphone Output
- Digital Audio Reference
- GPIB Remote Control
- Hard Copy Output
- CE Certified

AM700 Mixed Signal Audio Measurement Set.

The AM700 is an easy-to-use, high performance audio analyzer. It combines the capability to make conventional electronic audio measurements with more advanced measurements designed for emerging audio technologies.

The AM700 accepts balanced and unbalanced analog signals as well as AES/EBU, SPDIF and optical digital signals. Once acquired, powerful signal processing software performs filtering, analysis and calculations of test results. Measurement applications include FFT (with multitone mode), Graphical Plotting, Monitor, and Digital Interface tools.

An advanced suite of measurements permits users to examine or measure important digital audio interface parameters including eye diagram analysis, timing measurements, data format analysis and jitter measurements. The AM700's reference capability permits the instrument to generate or measure digital audio signals while being synchronized with a house digital reference.

The AM700 has the capability to generate test signals in both analog and digital domains. Internal analog and digital audio generators operate in "true stereo" fashion providing independent signal generating capability for each/channel of each generator. Full support is provided for all conventional test signal needs.

The AM700's powerful measurement capabilities do not come at the expense of ease of use.

Operation is controlled by proven, simple combinations of hardkeys, softkeys, knob rotation and touch-screen entries.

The AM700 can be operated manually for R & D and service applications. Convenience features for manual operation include touch screen based controls and menus, intelligent cursors, and zoom and pan display capability. Test results may be saved on floppy disk or printed to external printers.

Automatic operation can be programmed through the AM700's function playback feature. Factory test and other manufacturing applications can employ IEEE-488 remote control capability.

Analysis Capabilities

Fast Fourier Transform Analyzer: Using any combination of analog and digital inputs the FFT analyzer produces displays of frequency domain data much like those of a spectrum analyzer. Signals to 80 kHz are acquired with an FFT record length of 1024 points. The span (bandwidth of the FFT display) may be zoomed (expanded or contracted horizontally) and panned (scrolled left or right through the display). Amplitude range can be either fixed or autoranging on the input signal. Users can make the optimal choice depending on the characteristics of the signal of interest.

FFT Analyzer can display two channels simultaneously. These displays can either be on separate frequency and amplitude axes or overlaid onto the same frequency and amplitude axis. Display update rate (at full span) exceeds 10 updates per second. From 16 to 428 frequency bins are displayed depending on the amount of zooming.

FFT Analyzer mode provides two cursors for marking and measuring frequency elements. Several cursor modes are supported. Window algorithms supported are Hann, Kaiser-Bessel, Blackman-Harris, Flattop, Uniform, and Saramaki-Rajan.

Special display modes including spectrogram, average, and min & max hold are supported.

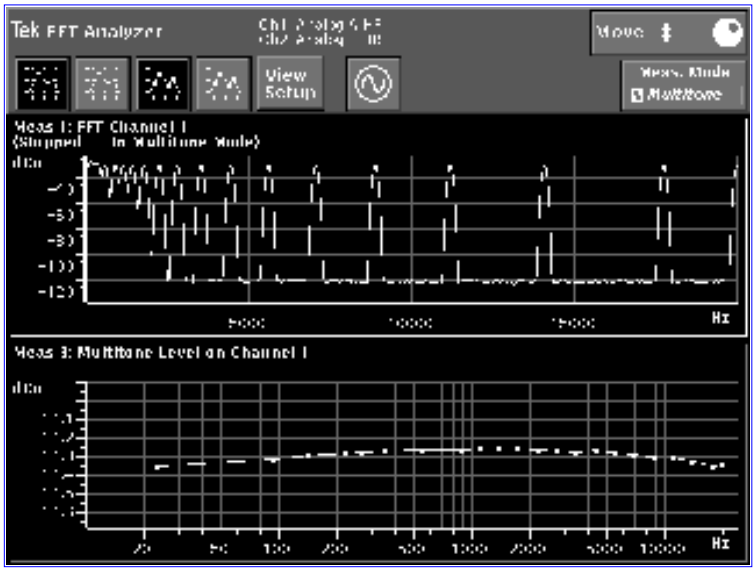

Figure 1. The FFT display allows detailed analysis of audio signals at near real-time update rates. Multitone mode characterizes up to six audio parameters in less than one second.

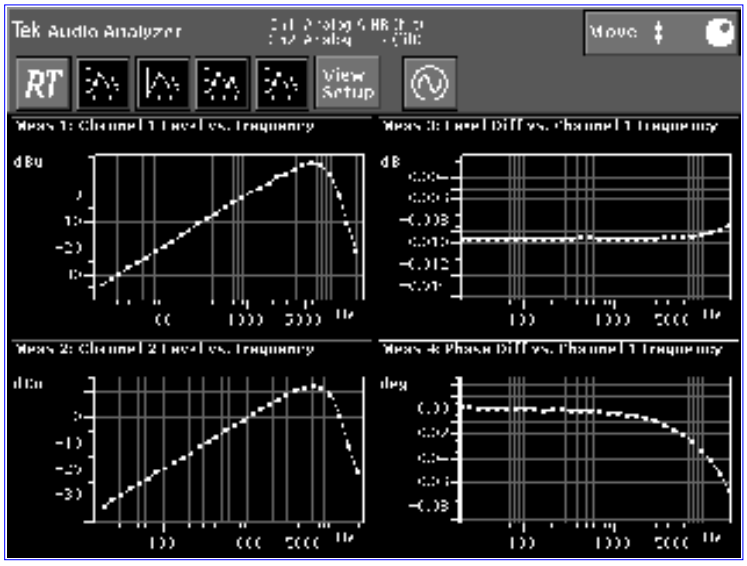

Figure 2. Audio Analyzer plots up to four parameters at once.

Multitone Analyzer: The Multi-tone Analyzer uses special test signals to measure a wide variety of audio system

parameters with samples of test signal as brief as one second or less. Multitone test signals employ mixtures of tones selected so that individual elements and their respective harmonic and intermodulation products do not coincide in the frequency domain. Differences between the known test signals and the acquired response from the system under test are rapidly analyzed to determine frequency response, distortion and noise, and channel separation, etc. Multitone measurements may be performed on any combination of analog or digital input signals.

The Multitone mode, a sub-mode of the FFT Analyzer, can recognize any signal selected from a set of Multitone signals found in other Tektronix audio test equipment. User-created multitone signal files can easily be added to the recognition set.

Audio Analyzer: Using any combination of analog or digital input signals, the Audio Analyzer produces graphs of measurements versus frequency or amplitude. Measurements include level, phase, distortion, IMD, crosstalk, etc. As many as four different graphs can be produced simultaneously. The Audio Analyzer automatically detects the beginning and end of sweep signals and signal sequences.

Multiple plots may be overlaid on any graph to compare to previous measurements or to groups of like measurements. Special analysis modes include Relative-to-Reference mode and Regulation Mode.

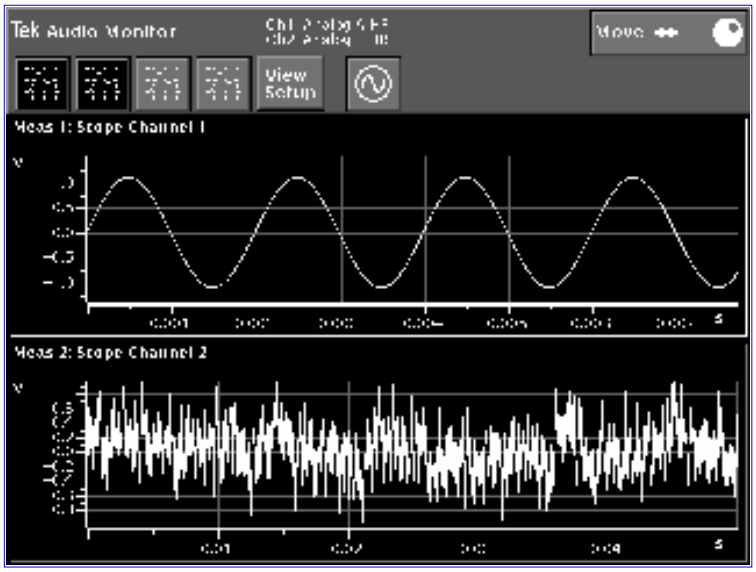

Figure 3. Monitor mode provides a convenient, two-channel oscilloscope display for time-domain audio analysis.

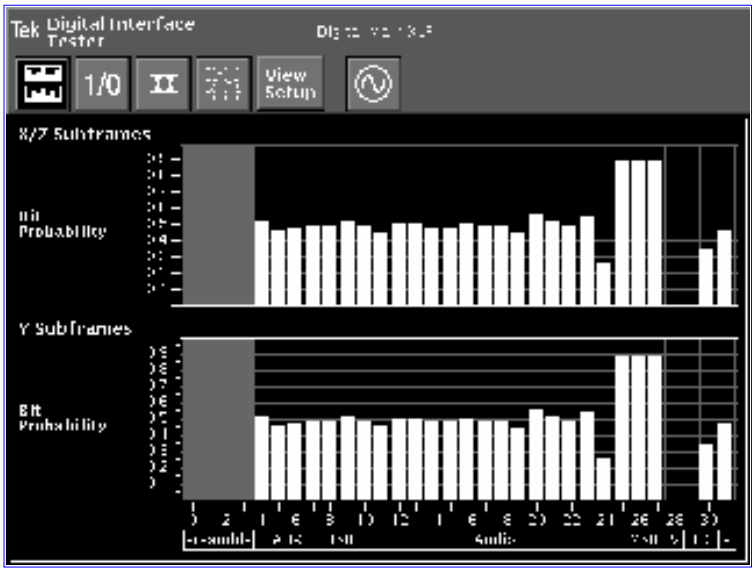

Figure 4. Bit Activity display.

Audio Scope: Two channels of digitizing oscilloscope-like display of the selected input signals are produced by the Audio Monitor application. Conventional oscilloscope controls for channel selection, time-base selection, and triggering are provided. Zooming and cursor capabilities are included.

Digital Interface Tester: This analyzer application permits extensive evaluation of the electrical and data characteristics of industry standard digital audio interfaces including AES/EBU, SPDIF (also known as "consumer"), and optical consumer.

The Bit Activity display provides a graphical display of the statistical activity of subframe bits. This application permits users to determine the following characteristics of a digital audio signal at a glance: Parity, Validity, Channel Status and User Bit states, digital audio sample length, and the presence of stuck bits.

The Channel Status display permits users to examine the contents of the Channel Status bytes in either raw binary, decoded (English language), or hexadecimal forms. From this display sources of interface problems caused by data

format or content can be uncovered. The appropriate decoding format (from AES/EBU or IEC 958 standards) is selected automatically.

Eye Diagram displays provide straight forward indications of the "health" of a digital audio interface. Jitter, rise time, and interfering signal problems are all quite apparent in the Eye Diagram format.

Jitter Spectrum provides a frequency domain display of the jitter components giving an indication of possible sources of jitter such as power-line hum, switching power supply ripple or interface clocks.

Analog Generator Capabilities

Channel Independence: The output signal on each channel is independently specified for "true stereo" operation up to 20 kHz in high resolution mode. It is possible to produce different types of signals on each channel. Channel A, for example, can produce a sine-wave signal while Channel B is producing pink noise. Of course, either channel may be turned off and identical signals may be generated on both channels. In high bandwidth mode, the generator produces monaural output on two channels up to 80 kHz.

Output Signals: Many types of output signals can be produced including the familiar Sine, Tone Burst, SMPTE/DIN and CCIF IMD test tones, Polarity test signals, Amplitude and Frequency Sweep signals, and Shaped Noise signal (White and Pink). Other signals include Multitone signals, Arbitrary Waveforms, and Periodic Chirp.

Digital Generator Capabilities

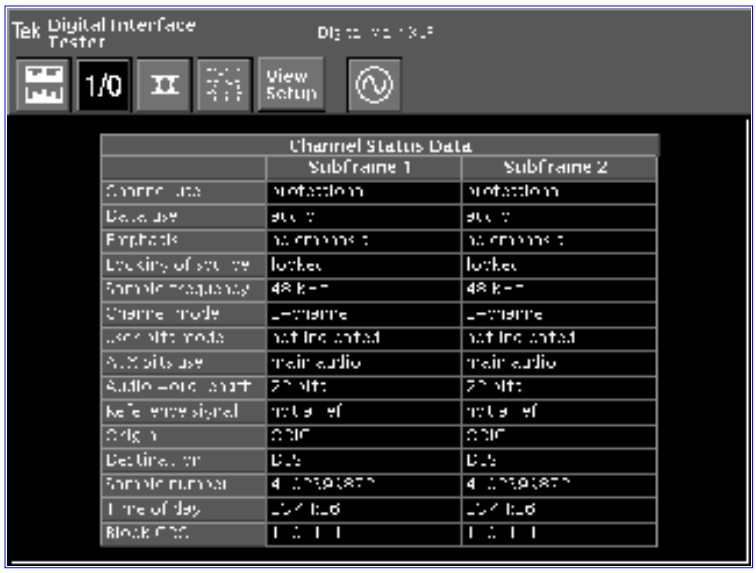

Figure 5. Channel Status Decoder display.

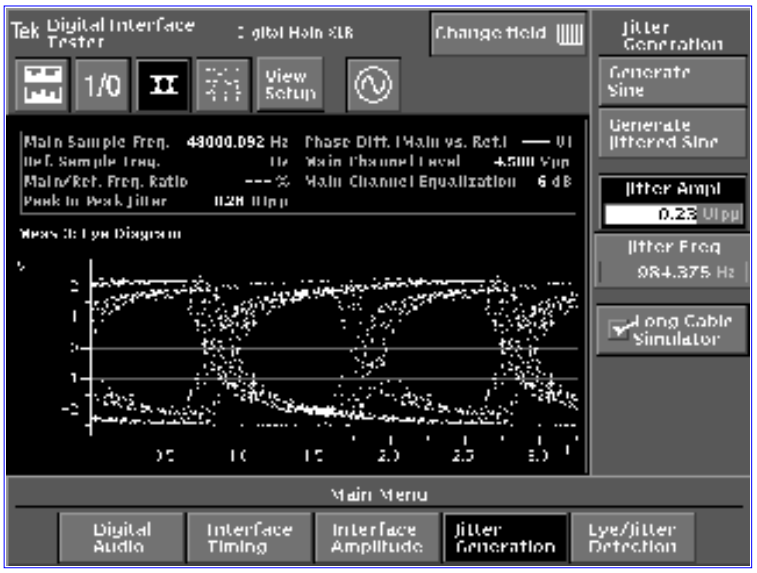

Figure 6. Eye Diagram display.

Channel Independence: The Digital Generator shares the same characteristic as the Analog Generator, achieving "true stereo" operation. The Digital Generator always drives the front panel digital, rear panel optical, and rear panel unbalanced outputs with the same signals.

Output Signals: Within the constraints imposed by the digital sample rate range (30 to 52 kilosamples per second), the Digital Generator can produce all of the signals described above for the Analog Generator. Digital audio sample length can be user-defined for 8 to 24 bits.

Postprocessing: Several different types of processing are possible for the digital output signal. A phase offset can be imposed between the output signals of the Digital Generator and the Digital Audio Reference input and output. The Digital Generator can simulate the output signal attenuation effects of long cables. Clock jitter can be added to the

output signal to simulate real-world system jitter effects.

Channel Status and User Data Bits: The Channel Status and User Data bits of each subframe can be controlled by the user. Common Channel Status configurations are accessed via menus while unique configurations can be created through user-defined files.

Synchronization: The Digital Generator can use the clock present on the Digital Audio Reference input or output as its reference. By doing so, a constant sample relationship between the Digital Generator and external device is possible.

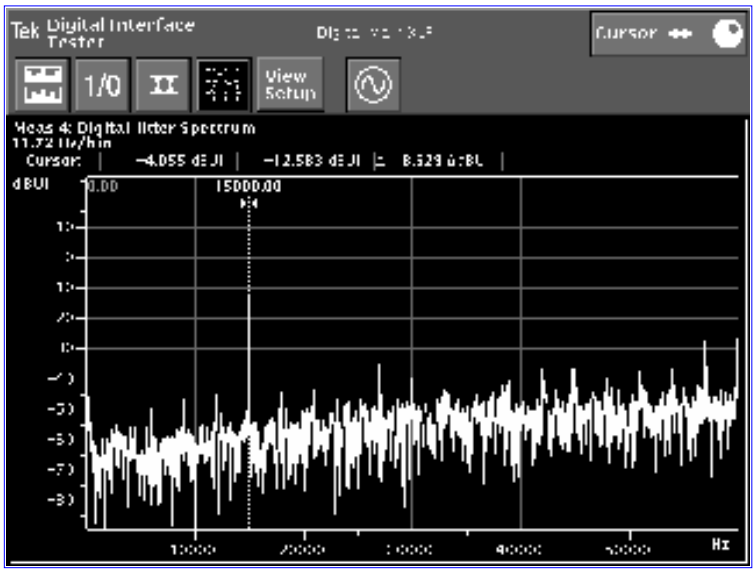

Figure 7. Jitter Spectrum Display.

AM700 | Characteristics | Ordering Information

Tektronix Measurement products are manufactured in ISO registered facilities.

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