



FM Stereo Modulation Monitor/Analyzer

Features & Benefits

- Three Major Sub-Systems in one package:
 - Frequency Synthesized Pre-Selector
 - FM Baseband Demodulator
 - Stereo Demodulator
- Complete FM Stereo measurements
 - L + R, L - R
 - Pilot Injection
 - 38 kHz Suppression or RDS/RBDS Injection (optional)
 - 38 kHz Suppression
 - Left and Right Channel
 - Stereo Separation
 - Frequency Response
 - Signal-to-Noise Ratio
 - AM Noise
- Peak Modulation Duration Differentiator
 - Separates Transients from True Modulation Peaks

- Built-in Super Stable Frequency Synthesized FM Modulation Calibrator
- ± 1 % Accuracy
- No need for Bessel Null

General Description

The TFT Model 884 FM Stereo Modulation Monitor is a low cost FM Stereo Modulation Monitor/Analyzer. The 884 allows users to maximize coverage at maximum legal modulation limits while maintaining the highest signal quality.

The 884 can be used for transmitter proof-of-performance measurements or for off-air monitoring away from the transmitter site. The frequency-synthesized preselector provides convenient digital tuning of multiple broadcast stations.

In addition to the high and low level RF inputs a composite input allows measurements of the baseband

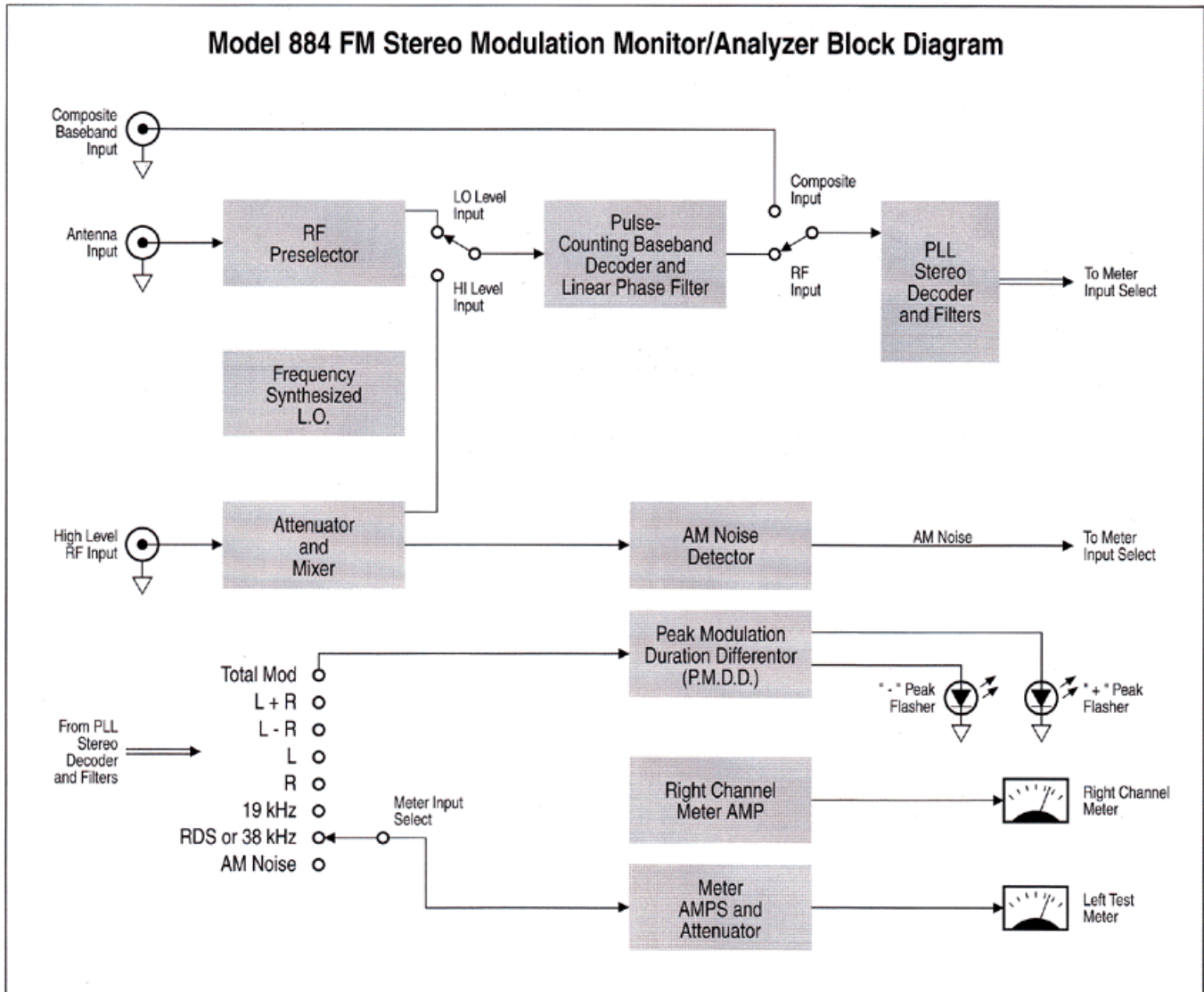
composite signal from a stereo generator or output of an STL receiver. An attenuator is built-in for high RF levels.

The Model 884 is an analyzer and modulation monitoring instrument at a very economical price. It is ideal for use at either the studio or the transmitter site.

Complete Stereo Measurements

The 884 makes complete measurements of total modulation, left and right channel modulation and frequency response, stereo separation, main and sub-channel crosstalk, L + R, L - R, 38 kHz suppression and 19 kHz injection level. All measurements can be made with front panel pushbuttons and are displayed on a large test meter. T.H.D. and phase measurements of L and R channels are accomplished by using external test equipment.

Model 884 FM Stereo Modulation Monitor/Analyzer Block Diagram



Uncompromised Technology

The 884 shares the technology of the proven and popular Model 844A, including frequency synthesized preselector, PLL stereo decoder, pulse-counting discriminator and super-stable modulation calibrator.

Simultaneous L and R Monitoring

Two separate meters permit simultaneous monitoring of Left and Right channel modulation. One of the meters can be switched to monitor Total Modulation as well as measurements associated with a transmitter proof-of-performance. The

RDS/RBDS option measures 57 kHz subcarrier injection.

Lowest T.H.D. and SNR

The 884 utilizes a pulse-counting FM discriminator to minimize T.H.D. in the demodulation circuit. Consequently, T.H.D. is less than 0.2% and the Signal-to-Noise Ratio is better than 70 dB.

Front Panel Test Output

A BNC connector is provided on the front panel to monitor the signals under test. These signals can be fed to an external oscilloscope or distortion analyzer.

Frequency Synthesized Modulation Calibrator

A frequency-synthesized FM modulation calibrator is built-in for calibration of the modulation meters and peak flashers. Frequency markers representing ± 75 kHz peak deviation are generated with crystal oscillators. These markers remain stable, regardless of temperature or aging. No external equipment is required to calibrate the modulation accuracy of the monitor.

Adjustable Peak Modulation Indicators

LED Flashers may be Calibrated from 50% to 199% in one percent steps via a pushbutton digital switch located on the front panel to indicate plus and minus modulation peaks. This eliminates the ambiguity and imprecision of a potentiometer.

Peak Modulation Duration Differentiator (P.M.D.D)

TFT's exclusive P.M.D.D. circuit is used to differentiate peak spikes and overshoots from true peak modulations. This circuit provides a one millisecond pulse detection window and prevents false indications caused by noise and overshoot.

Built-In Voltmeter and Attenuator

For pilot and subcarrier injection and signal-to-noise ratio

measurements, a switchable 50 dB meter attenuator is provided (10 dB steps). To perform a complete proof of performance measurements, the only other required test equipment are a distortion analyzer and audio frequency generator.

Direct AM Noise Measurements

The 884 can also measures incidental and residual AM modulation of the FM carrier. The dynamic range of this measurement is 70 dB below 100% AM modulation. It can measure both synchronous and asynchronous AM Noise.

Switchable De-Emphasis

When measuring noise or modulation, a 75 μ sec de-emphasis circuit can be switched into the meter circuit. 50 μ sec de-emphasis is available on request.

RBDS Injection Level (Optional)

The 884 can be used to monitor the injection level of a 57 kHz RDS/RBDS subcarrier when it is equipped with an optional RDS/RBDS filter. Accurate 57 kHz injection level is essential to reduce interference to the 67 kHz SCA.

Companion 3-Channel SCA Monitor, Model 845. (See separate brochure)



Specifications

INPUT

RF SECTION

Frequency Range	88 - 108 MHz, tunable in 50 kHz steps
Antenna Input	250 μ V to 100 mV, 75 ohms
High Level RF Input (for AM noise measurements only)	1 to 10 Vrms, 50 ohms
Tuning	4-digit pushbutton switch, 50 kHz steps
AGC Range	40 dB
Composite Input	3.5 Vp-p, 1 k Ω , BNC

METERS

Characteristics	Quasi-peak reading circuit. Approximately 90 msec rise time
Accuracy	\pm 2.0% at all modulation levels
AC Voltmeter Range	0 to -50 dB in 10 dB steps

MODULATION METER, TOTAL/TEST

Total Modulation:

Deviation for 100% indication	\pm 75 kHz peak-to-peak.
Meter Range	0 to 133% modulation
Frequency Response	\pm 0.5 dB typical, \pm 1 dB maximum from 30 Hz to 75 kHz
Left Channel Modulation	\pm 0.5 dB, 50 Hz to 15 kHz
Right Channel Modulation	\pm 0.5 dB, 50 Hz to 15 kHz.
L + R	\pm 0.5 dB, 50 Hz to 15 kHz
L - R	\pm 0.5 dB, 23 kHz to 53 kHz
38 kHz Level	Measures down to -60 dB
Pilot Level	Measures down to -60 dB (0.1%). (Accuracy: \pm 1.0% from 6.0% to 12%)
AM Noise	Measures AM Noise down to -70 dB from 100% AM Modulation
De-emphasis	Applies 75 μ sec de-emphasis to meter display
Meter Calibration	Front panel mounted potentiometer to calibrate both meters to 100% modulation
Positive & Negative Modulation Polarity	Allows meter to read positive or negative modulation

RIGHT MODULATION METER

Right Channel Modulation	Indicates and measures right channel modulation, \pm 0.5 dB, 50 Hz to 15 kHz
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PEAK MODULATION INDICATORS

Deviation for 100% Indication	\pm 75 kHz
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Peak Level	Set by a front panel 3-digit pushbutton switch in 1.0% steps from 50% to 199% on both positive and negative peaks
Accuracy (5 kHz tone)	\pm 1% at 100% modulation
Peak Duration Differentiation	1 msec

MODULATION CALIBRATOR

A built-in frequency-synthesized calibrator is included for meter and peak flasher calibration of 100% modulation from the front panel. It has a \pm 1.0% accuracy.

FRONT PANEL OUTPUTS

Test Meter Output	Output signal selected on the Total/Test Meter; 2.0 Vp-p, 1 M Ω , BNC
Headphones	Standard 1/4" jack for headphone

REAR PANEL OUTPUTS

Balanced Audio Output Level	0 dBm (.775 Vrms) at 100%, barrier strip de-emphasis strappable in or out
Output for SCA Monitor	1.0 Vrms, 100% modulation, 10 k Ω , BNC
Received Signal Strength	DC voltage proportional to the RF input level: 50 μ V = 0.8 - 0.9 Vdc 100 μ V = 1.0 Vdc 500 μ V = 1.2 - 1.3 Vdc

AUDIO PERFORMANCE

Signal-to-Noise Ratio	70 dB at 400 Hz with de-emphasis, composite
Harmonic Distortion	0.2% max. (de-emphasized @ 1.0 kHz), composite
Frequency Response	\pm 0.5 dB from 50 Hz to 15 kHz, L and R channels
Separation (L-to-R & R-to-L)	45 dB typical, 40 dB minimum from 50 Hz to 15 k Hz
Crosstalk (L + R)-to-(L - R)	50 dB
(L - R)-to-(L + R)	60 dB

MECHANICAL & ENVIRONMENTAL

Input Power	117/230 VAC, \pm 10%, 50 to 400 Hz, 40 watts maximum
Operating Temperature	0°C to +50°C (+32°F to +122°F); 90% humidity, non-condensing
Size	7" (17.78 cm) H x 19" (48.26 cm) W x 15" (38.10 cm) D
Net Weight	Approximately 19.5 lbs. (8.9 kg).
Shipping Weight	Approximately 22.5 lbs. (10.2 kg).

