



As used by the Federal Aviation Administration and the US Navy

2947 Communications Service Monitor



- Militarized Rugged lightweight package -Tested and conforms to MIL-T-28800 Type II, Class 3
- Full span spectrum analyzer with 'live' look and listen
- Tracking generator with offset tracking
- 150 Watt RF power measurement to $\pm 10\%$ accuracy
- 5 W protection on all RF ports
- Two variable Audio Generators
- Superfast LCD with rapid refresh rate for easy monitoring and real time adjustment
- AMPS and TACS Cellular Testing
- PMR Testing
- RS-232 control interface for PC automated testing
- PCMCIA 2 memory card DOS formatted (for saving instrument settings, results, screens and transfer/storage of Autorun programs)
- 50 kHz DSO (digital storage oscilloscope) with anti-aliasing
- Comprehensive color coded keyboard for ease of use
- Fast response high resolution bar charts for peaking and nulling

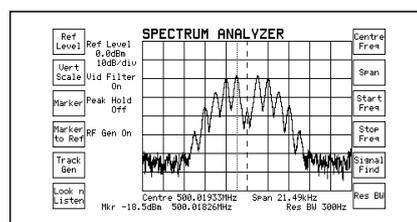
The 2947 communications service monitor was built to meet the requirements of the US Navy and Federal Aviation Administration. It is the lightest, most rugged service monitor available with a full performance spectrum analyzer. The 2947 provides an excellent combination of instruments for all types of maintenance work while providing exacting measurements for use in repair and calibration laboratories.

Field Operation

At under 26 lbs (12 kg) the 2947 TestMate lightens the load to remote sites. The form factor of the 2947 combined with the bail arm make it easy to carry and positioning for optimal usage. A front cover over the front panel for storage of adapters and further protection to the instrument's front panel.

Fast Full Performance Spectrum Analyzer

The spectrum analyzer provides spans from 100 Hz per division to full span and also has a fully adjustable reference level. Speed is comparable with analog analyzers, allowing real time adjustments over a full 50 dB dynamic range. With the tracking generator provided as standard, duplexers and filters can be aligned quickly and easily.



Live Look and Listen

This feature puts the 2947 TestMate above all of its peers with the ability to examine signals on the screen and demodulate them simultaneously. Intermittent interference can be isolated quickly and the signals then easily identified.

From 2 μ V to 150 Watts

The 2947 will measure the power of low level signals such as those off-air or those found when probing a circuit. 150 Watts measurement is provided without the need for external attenuators.

Accurate RF Signals

The signal generator provides coverage from 400 kHz to 1.05 GHz with +5 dBm output (+7 dBm overrange) and fast switching speed. Level accuracy is ± 2 dB at all levels above -127 dBm.

Duplex

Full duplex operation is provided by the 2947. This allows testing of duplex radios as well as simultaneous testing of repeater transmit and receive paths. There are no restrictions to the duplex offset.

Cellular and Trunking - built in

AMPS and TACS analog cellular standards testing.

SSB Demodulation

The SSB demodulator allows signals to be demodulated either via the internal loudspeaker or via the accessory socket. (upper and lower sideband in the 400 kHz to 1 GHz range).

Network Simulation

The 2947 simulates the signaling protocol that the radio would see from the real network. This allows calls to be set up and handled enabling receiver and

transmitter parametric measurements to be made.

Remote Control - RS-232 or GPIB

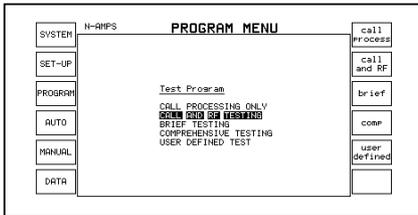
Remote control is provided with an RS-232 interface or by IEEE488.2 interface.

Autorun - internal control

Automatic testing without an external controller is possible. Custom tests may be written and run by the operator.

Custom Programs

Users may program the instrument to suit their own specific needs by configuring any of the 4 built-in programs or by using the MIBASIC interpreter.



Memory Card - with real time clock

Test setups, test results, screen dumps, spectrum analyzer co-ordinates and test sequences can all be stored on a PCMCIA memory card drive allowing information to be easily stored and retrieved by the monitor a PC when required.

Environmental

Tested and conforms to MIL-T-28800 Type II, Class 3 for shipboard applications.

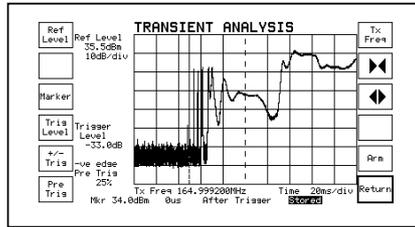
Audio Analysis

Comprehensive filters are provided including band pass, low pass and high pass. The direct measurement of CTCSS is possible with the 300 Hz LP filter, even with speech present.

Two comprehensive audio generators are provided for internal modulation or audio sources for transmitter stimulus. External DC coupled FM is provided.

Comprehensive Oscilloscope

Analysis of audio signals, whether from the demodulated signal or the audio input direct can be viewed for further inspection. The oscilloscope can either be combined with the measurement screen in the Tx, Rx or AF test modes or 'zoomed' to a full screen display.



Transient Analysis

The ability to capture transients on the rising or falling edge of a waveform provides a valuable tool for fault finding radios and radio systems.

Harmonic Analysis

An automatic harmonic analysis function is included to complement the fast spectrum analyzer.

Tones Generation and Decoding

The tones menus now include full remote control so that radio workshops can further automate their tasks.

Specification

RF Signal Generator

- FREQUENCY**
- Frequency Range: 400 kHz to 1.05 GHz
- Resolution: 10 Hz
- OUTPUT LEVEL**
- Output Level Range:
 - N-Type socket: -141 dBm to -21 dBm
 - BNC socket: -115 dBm to +5 dBm (overrange to +7dBm)
- Resolution: 0.1 dB
- Accuracy: ± 2 dB for level above -127 dBm on N-Type socket up to 1 GHz
- SPECTRAL PURITY**
- Residual FM: Less than 12 Hz RMS (0.3 to 2.4 kHz)
- Harmonics: Better than -25 dBc
- Spurious Signals: Better than -50 dBc
- SSB Phase Noise: Better than -108 dBc/Hz (20 kHz offset) up to 1 GHz

AMPLITUDE MODULATION - INTERNAL

- Frequency Range: 400 kHz to 1.05 GHz
- AM Depth Range: 0 to 99%
- Accuracy: ± 5% ± 1digit for modulation frequency of 1 kHz
- Modulation Frequency Range: 20 Hz to 20 kHz

AMPLITUDE MODULATION - EXTERNAL

- Input Impedance: Nominally 10 kΩ || 40 pF
- Frequency Range: As internal AM
- Modulation Frequency: As internal AM
- Range Sensitivity: 1 VRMS for 100% AM

FREQUENCY MODULATION - INTERNAL

- Frequency Range: 400 kHz to 1.05 GHz
- Maximum Deviation: 75 kHz
- Accuracy: ± 7% at 1 kHz modulating frequency.
- Modulation Frequency: 20 Hz to 25 kHz
- Range Pre-emphasis: 750 μs selectable

FREQUENCY MODULATION - EXTERNAL

- Input Impedance: Nominally 10 kΩ || 40 pF
- Frequency Range: As internal FM
- Modulation Frequency: DC to 100 kHz
- Range: Pre-emphasis: 750 μs selectable
- Sensitivity: 1 VRMS for 0 to 75 kHz deviation

MICROPHONE INPUT Press To Talk (PTT)
When using the microphone in Tx Test mode, the PTT will switch instrument to Rx Test. For additional specifications please refer to the 2948 Data Sheet

