

Introduction

The M1 is the latest advancement in hand-held frequency test instruments. It excels at finding and recording frequencies for security, law enforcement, commercial and recreational applications. Patented technology developed by Optoelectronics employs statistical analysis to filter out actual radio transmission frequencies from the background RF.

The M1 is more than a test instrument in the traditional sense because it is useful for finding frequencies being used for two way radio communications. Designed to work with an antenna to pick up transmitted radio frequencies, it is actually a frequency recorder. Up to 100 unique frequencies can be stored in memory. For in circuit measurement of frequencies from oscillators or test points, the 1Meg input impedance amplifier can be used with a scope probe for direct connection to test points.

The counter circuitry produces a coherent and stable count when there is a single dominant signal 10 to 20 dB stronger than any other signal or the RF floor. An embedded microprocessor evaluates each measurement statistically to determine when an actual RF frequency is dominant. This is the digital filter processing which makes automatic capture and recording possible.

The M1 includes an AC-90 power adapter.

Display Resolution

Frequency Display Resolution

Least significant digit displayed (LSD) as a function of Gate Time and Range

<u>Range</u>	<u>Gate Time</u>	<u>Meas. Time</u>	<u>LSD</u>	<u>Sample Display</u>
250MHz	100us	13mS	10kHz	150.00
	1mS	13mS	1kHz	150.000
	10mS	13mS	100kHz	150.0000
	100mS	110mS	10Hz	150.00000
	1S	1S	1Hz	150.000000
	10S	10S	0.1Hz	150.0000000
2.8GHz	6.4mS	13mS	10kHz	2000.00
	64mS	75mS	1kHz	2000.000
	640mS	640mS	100Hz	2000.0000
	6.4S	6.4S	10Hz	2000.00000

Specifications

The M1 has the maximum amount of broad gain possible without driving the front end circuitry into hard self oscillation. The purpose of this concept is to permit the maximum possible pick-up distance from radio transmitters. There is no gain or sensitivity adjustment possible in the circuit. Specific sensitivities at particular frequencies are difficult to predict with precision in production units. The input sensitivity specifications below are intended to be a rough indication as to what may be expected. Defective components such as blown amplifiers, broken or unsoldered chip resistors, capacitors and inductors will cause a drastic reduction in performance. These typical sensitivity specifications should not be relied upon for the purposes of incoming inspection or evaluation. Contact the factory if the results obtained are significantly different than those below. Performance on an antenna does not always relate exactly to input sensitivity as measured on a signal generator. The purpose is to provide the best possible antenna performance regardless of sensitivity.

<u>Input Amplifier:</u>	<u>1Meg Ohm</u>	<u>50 Ohm</u>
Impedance:	1Meg Ohm, 30pF	50 Ohm VSWR <2:1
Range:	50Hz-40MHz	10MHz-2.8GHz
Sensitivity:	<20mV 1KHz-10MHz <50mV 10MHz-40MHz	<10mV @ 10MHz <1mV @ 150MHz <7mV @ 800MHz <12mV @ 1GHz <100mV @ 2.8GHz
Maximum Input:	50V AC + DC	+15dBm, 50 milliwatts

Specifications (cont.)

Time Between Measurements:	10 milliseconds, all range & gate times
Display:	10 digit LCD. Decimal at MHz point
Timebase:	10MHz setable to +/- 1ppm (Option .5ppm TCXO)
RF Signal Strength Bargraph:	16 segments, approximately 3dB segments, Relative indication only
Size:	3.7" x H x 2.75"W x 1.2" D
Weight:	8.5 oz
Battery:	Internal shrink wrapped 4 cell AA NiCad
Operating Time:	Approximately 5 Hours
Charging Time:	Approximately 8 hours
Power:	9-12VDC AC90 adapter supplied
Power Connector:	2.1 mm coax, center positive
Cabinet:	Stamped aluminum with black painted finish