

# FIM-71

# VHF Field Strength Meter

## Key Features

Direct Reading - Volts or dB

45 MHz to 225 MHz,  
Continuous Tuning

Peak or Averaging Detector

Wide or Narrow IF Bandwidth

20 dB or 60 dB Meter Bandwidth

AM or FM Demodulator

Calibrated Dipole Antenna,  
Case Mount or Removable

140 dB Measurement Range  
(1  $\mu$ V to 10 V)

4 1/2-inch, Mirrored Scale  
Taut-Band Meter

Front Panel Speaker

Rugged, Portable

Nylon Carrying Case



## Description

The Model FIM-71 is a portable, laboratory quality Field Strength Meter designed for rigorous field applications. Combining a calibrated half-wave dipole antenna and a highly accurate tuned voltmeter with a range of 140 dB, the FIM-71 is suitable for practically all types of RF emission measurements in the 45 MHz to 225 MHz spectrum. The operator can switch select wide or narrow bandwidth, peak or average value of TV or pulse modulated signals, AM or FM demodulation, and a meter dynamic range of either 20 dB or 60 dB. A dc analog output voltage, proportional to the meter indication, is provided for driving a chart recorder. A leveled output from the calibrating oscillator is available for measuring cable insertion loss, filter response, amplifier gain, and other signal ratio measurements. The 4 1/2-inch, taut band, mirrored scale meter is calibrated in volts and dB for precise measurements in field or laboratory environments.

The tuned voltmeter is a single conversion, super-hetrodyne receiver with carefully tailored sensitivity, gain, and linearity characteristics. The RF input is double tuned and designed for minimum VSWR and maximum out-of-band signal rejection. Uniform gain, independent of IF bandwidth, is provided by temperature compensated RF & IF amplifiers utilizing a combination of MOSFET, J-FET, bipolar, and monolithic integrated circuit devices. The linear detector is followed by an algorithmic shaping circuit which drives the meter in the LIN (20 dB) mode. In the LOG mode the meter indication (in dB) varies linearly over a one-thousand-to- one range of input levels.

Options: AC power adapter, rechargeable battery kit, unipod, spare antenna elements and balun, and headset.



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# Specifications

<b>FREQUENCY RANGE</b>	45 MHz - 225 MHz; continuous.
<b>RF INPUT IMPEDANCE/VSWR</b>	50 ohms VSWR 1.2:1, 100 $\mu$ V full scale and greater. VSWR 1.5:1, 10 $\mu$ V full scale.
<b>VOLTAGE MEASUREMENT</b>	1 $\mu$ V to 10 V rms in seven switch selected ranges.
<b>METERING</b>	4- $\frac{1}{2}$ inch meter, mirror backed scale, taut band meter
<b>INDICATION MODES</b>	LINear and LOGarithmic, switch selected.
<b>METER SCALES</b>	LIN mode: 1-10 (logarithmic scale) and 0-20 dB (linear scale). LOG mode: -20 to +40 dB (60 dB range, linear scale) Battery voltage/External supply voltage scale.
<b>METERING DETECTORS</b>	Average responding and peak responding (for television sync pulse), switch selected.
<b>RECEIVER BANDWIDTHS</b>	AM/FM: 190 kHz at -3 dB, and TV: 450 kHz at -3 dB, front panel switch selected
<b>ABSOLUTE ACCURACY</b>	Voltage: $\pm 1.5$ dB (LIN), $\pm 2.0$ dB (Log); for voltage > 1.5 $\mu$ V (AM/FM) or > 3 $\mu$ V (TV) Field Strength: $\pm 3.0$ dB (LIN), $\pm 3.5$ dB (LOG) for field strengths > 1.8 $\mu$ V/M (AM/FM) or > 3.7 $\mu$ V/M (TV) at 45 MHz; > 9.1 V/M (AM/FM) or 18.1 $\mu$ V/M (TV) at 225 MHz; using the supplied antenna.
<i>Note: These figures apply when using the Average Detector; for the Peak Detector, noise correction factors (supplied) are required below 10 mV</i>	
<b>RELATIVE ACCURACY</b>	$\pm 1$ dB at one frequency, for voltage or field strength, LIN mode, for voltages > 10 $\mu$ V, with noise correction factors.
<b>HARMONIC MEASUREMENT</b>	Measures second harmonic field strength of 87.5 Mhz - 108 MHz signals to -80 dB for fundamental voltage less than 100mV
<b>CALIBRATING OSCILLATOR</b>	Output switched to receiver for internal calibration, to external output (BNC connector) or OFF. Tracks receiver frequency when connected to receiver.
<b>Output Level and Accuracy</b>	100 mV $\pm 0.3$ dB across 50.0 ; (45 MHz to 225 MHz.)
<b>FREQUENCY DIAL</b>	Six-turn spiral, continuous tuning, movable cursor.
<b>Accuracy</b>	$\pm 0.5\%$ of indicated frequency without cursor correction. $\pm 200$ kHz typical, 87.5 MHz - 108 MHz, after setting cursor on known signal
<b>RCVR SPURIOUS RESPONSE</b>	Image Rejection, 55 dB typical; IF Rejection, 100 dB typical.
<b>LOCAL OSC RADIATION</b>	45 MHz, 2 $\mu$ V; 225 MHz, 35 $\mu$ V; typical values across 50 ohm load at RF input connector
<b>DEMODULATORS</b>	AM and FM; switch selected, phone jack (0.25") output connector
<b>Video Frequency Response</b>	50 Hz - 100 kHz, 3 dB max. variation.
<b>Output Level</b>	4.5 V p-p max. across 75 ohm load, front panel adjustable
<b>AUDIO MONITORING</b>	Internal loudspeaker; headphones plug into demodulator output jack (disconnecting speaker); AM or FM selected by DEMOD switch: level control with disabling switch
<b>RECORD OUTPUT</b>	Two-circuit phone jack (.25") output.
<b>Tip Contact</b>	DC analog of meter indication -0.8 V to -8 V (open circuit), 2000 ohm source resistance.
<b>Ring Contact</b>	DC output of FM discriminator, @ -5 V $\pm 3$ V, 10,000 ohm source resistance. (Single circuit phone plug provides tip contact output only.)
<b>POWER SUPPLY</b>	
<b>Internal Batteries</b>	1.5 volt size "D" batteries, ten required.
<b>Battery Life</b>	1500 readings or 18 hours continuous operation using Eveready No. 950 batteries (or equivalent) at 70°F.
<b>External Supply</b>	11.5 volts to 19.0 volts DC, positive ground, 120 mA, Switchcraft No. 760 Connector (or equivalent).
<b>TEMPERATURE RANGE</b>	+15°F to +105 °F (-10°C to +40°C).
<b>DIMENSIONS, INCHES (CM)</b>	Without Antenna: 9.5 (24) high, 12.25 (31) wide, 7.25 (18.4) deep With Antenna attached and retracted, 9.9 (25) high, 13.5 (34.3) wide, 7.25 (18.4) deep
<b>WEIGHT, POUNDS (KG)</b>	20 (9.1) with batteries, antenna, cover, cables and softcase

*Note: Values without limits are typical only. Field strength data are with ANT-71 Antenna*

## Antenna Ant-71

<b>Type:</b>	Tunable half-wave dipole with continuously adjustable telescoping elements.
<b>Frequency Range:</b>	45 Mhz to 225 MHZ.
<b>Calibration:</b>	Antenna Factor data supplied based on NIST calibration; overall error including NIST calibration uncertainty, $\pm 1.5$ dB max.
<b>Load Impedance:</b>	50 ohms
<b>Mounting:</b>	Mounts on case for hand-held measurements at an antenna height of approx. 7ft.; has 1/4-20 threaded hole for mounting to other masts.

*Specifications subject to change without notice.*



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