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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR,
ORGANIZATIONAL AND
FIELD MAINTENANCE MANUAL

ELECTRONIC VOLTMETER AN/URM-145

This copy is a reprint which includes current pages from Changes 1 through 3.

HEADQUARTERS, DEPARTMENT OF THE ARMY
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OPERATOR, ORGANIZATIONAL AND FIELD MAINTENANCE MANUAL
ELECTRONIC VOLTMETER AN/URM-145

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SECTION I
MODEL 91 CA
SPECIFICATIONS

- | | | | | | | | | |
|-------------------------|---------------------|--|-------------------------|---|--|--------------------|---|---|
| 1.1 | Measurement Range: | 300 microvolt to 3 volts | | | | | | |
| 1.2 | Full Scale Ranges: | .001, .003, .01, .03, .1, .3,
1, 3 volts. | | | | | | |
| 1.3 | Frequency Range: | 10 KC to 600 MC | | | | | | |
| 1.4 | Accuracy: | <table border="0" style="margin-left: 20px;"> <tr> <td style="vertical-align: middle;">.003 range
and above</td> <td style="font-size: 3em; vertical-align: middle;">{</td> <td style="vertical-align: middle;">5% of full scale to 200 MC
10% of full scale above 200 MC</td> </tr> <tr> <td style="vertical-align: middle;">.001 range
only</td> <td style="font-size: 3em; vertical-align: middle;">{</td> <td style="vertical-align: middle;">10% of full scale to 200 MC
15% of full scale above 200 MC</td> </tr> </table> | .003 range
and above | { | 5% of full scale to 200 MC
10% of full scale above 200 MC | .001 range
only | { | 10% of full scale to 200 MC
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10% of full scale above 200 MC | | | | | | |
| .001 range
only | { | 10% of full scale to 200 MC
15% of full scale above 200 MC | | | | | | |
| 1.5 | Input Impedance: | <p><u>91-3B RF Probe</u>
 See curve for shunt resistance data on high impedance probe. Shunt capacitance varies inversely with input voltage from 2 to 5 $\mu\mu\text{f}$.</p> <p><u>91-8B 50 Ω BNC Adapter</u>
 Max. VSWR 1.2 up to 600 MC.</p> <p><u>91-13A Probe Tip</u>
 For direct measurements up to 250 MC.</p> | | | | | | |
| 1.6 | Tube Complement: | 1 each: BEC 525001, 12AT7, 6AU6, OA2, and 6X4. | | | | | | |
| 1.7 | Power Requirements: | 105-125 volts, 55-65 \sim 30 watts. | | | | | | |
| 1.8 | Dimensions | 7-1/9 W, x 9-1/2 D, x 11 H
excluding handle | | | | | | |
| 1.9 | Weight | 12 pounds | | | | | | |

SECTION II

GENERAL DESCRIPTION

The 91CA RF Voltmeter is a sensitive instrument for the measurement of voltages of 300 microvolt to 3 volts spanning a wide frequency range of 10 kilocycles to 600 megacycles. In addition to conveniently measuring voltage levels in a diversity of rf circuits, the instrument has application for many associated tests. Such measurements include: the frequency response of both active and passive networks, i.e., amplifiers and filters; VSWR and return loss on transmission lines and attendant systems; attenuation and insertion loss of rf attenuators; and high frequency parameters of transistors. With true rms response below 0.03 volt (up to 3 volts with the 91-7B, 100:1 divider), wide band noise can be measured, and using suitable null networks measurement of the harmonic distortion of RF waveforms can be performed without the attendant errors of average type meters.

The instrument is also useful as an rf null detector for bridge measurements and analogous techniques when a sensitivity in the order of 200 microvolt will suffice.

Supplied with each instrument is a general purpose probe, 50 ohm adapter, and probe tip. The adapter is fitted with a BNC coaxial connector and provides a 50 ohm termination with a low VSWR up to at least 600 megacycles. The probe tip and companion ground clip are useful for direct measurement to approximately 100 megacycles. Above 100 megacycles, the probe may be used directly without the tip or" ground clip, but the connecting leads must be extremely short to avoid resonant effects. In the special case where it is possible to connect the probe directly to the voltage source, the specified tolerance is maintained to at least 600 megacycles. The impracticability of such a connection, however, precludes our assuring the accuracy of the 91CA RF Voltmeter above 250 megacycles without the use of the 91-8B BNC 50 ohm adapter.