



MODULATION METER for CB

By Herb Cenani

DO OTHER operators on the Citizens Band bug you about overmodulation, undermodulation or distorted modulation? You can squelch them once and for all with EI's low-cost modulation meter.

In addition to standard monitoring applications, a modulation meter is almost a necessity for adjusting speech clippers and compressors. Unless monitored, clipper/compressors frequently cause overmodulation because of their built-in microphone preamplification. While a meter is not as accurate as a peak-voltage indicating device (such as an oscilloscope), its rock-bottom cost (\$5 to \$6) and simple construction make it attractive for general CB use.

Construction. The modulation meter is built on the main section of a 5¼x3x2½-inch Minibox. Meter movement M1 is centered on the front panel in a hole cut with a 1½-inch chassis punch. Wiring is not critical but be sure that S1 is hooked up correctly or M1 will blow when the unit is turned on.

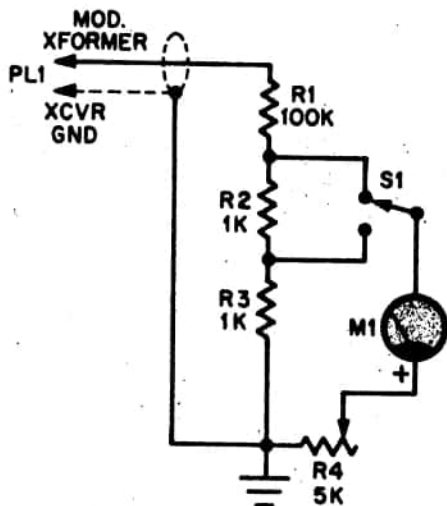
The modulation meter is connected to the transceiver's chassis ground and through capacitor C1 to point X, where the modulated B+ feeds the plate and screen of the final RF amplifier (see schematic). Mount a phono jack (J1) on the rear of your transceiver and capacitor C1 between the jack and point X as shown.

Operation. Plug the modulation meter into J1 on the transceiver and set S1 to *calibrate*, which connects M1 across R3. With the transmitter on, use a VOM or VTVM to measure the DC voltage between point X and ground. Next, set the voltmeter to the AC range leaving it connected to point X. If you're employing a VOM it will be necessary either to use the *output* jack of the instrument or to connect a .05 mf, 600 V capacitor between the positive test lead and point X.

Now, feed a 400 or 1,000 cycle tone into the microphone jack. (The tone can be obtained from an audio generator or the AF output of an RF signal generator.) Adjust the tone level so the AC voltage at point X is .707 of the DC voltage. For example, if the B+ voltage is 200 volts, adjust the tone level for an AC voltage of 141 volts (.707x200=141). Next, adjust R4 so M1 reads 100% (same point as 0db on the meter face). The modulation meter is now calibrated.

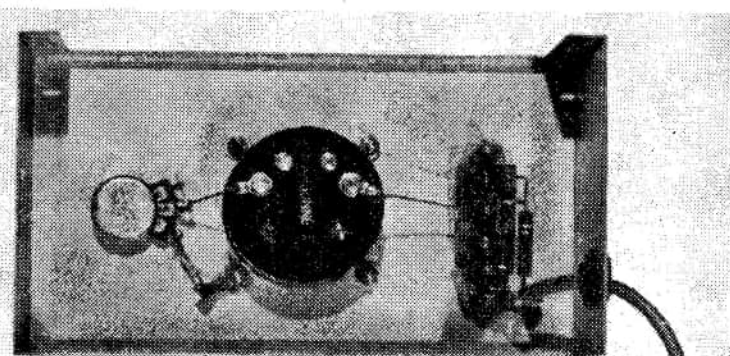
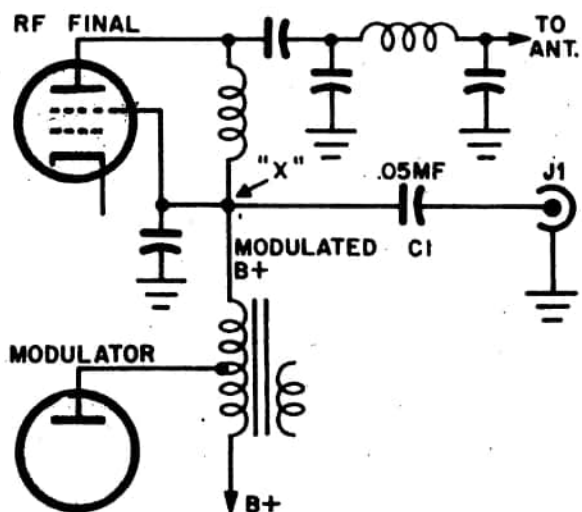
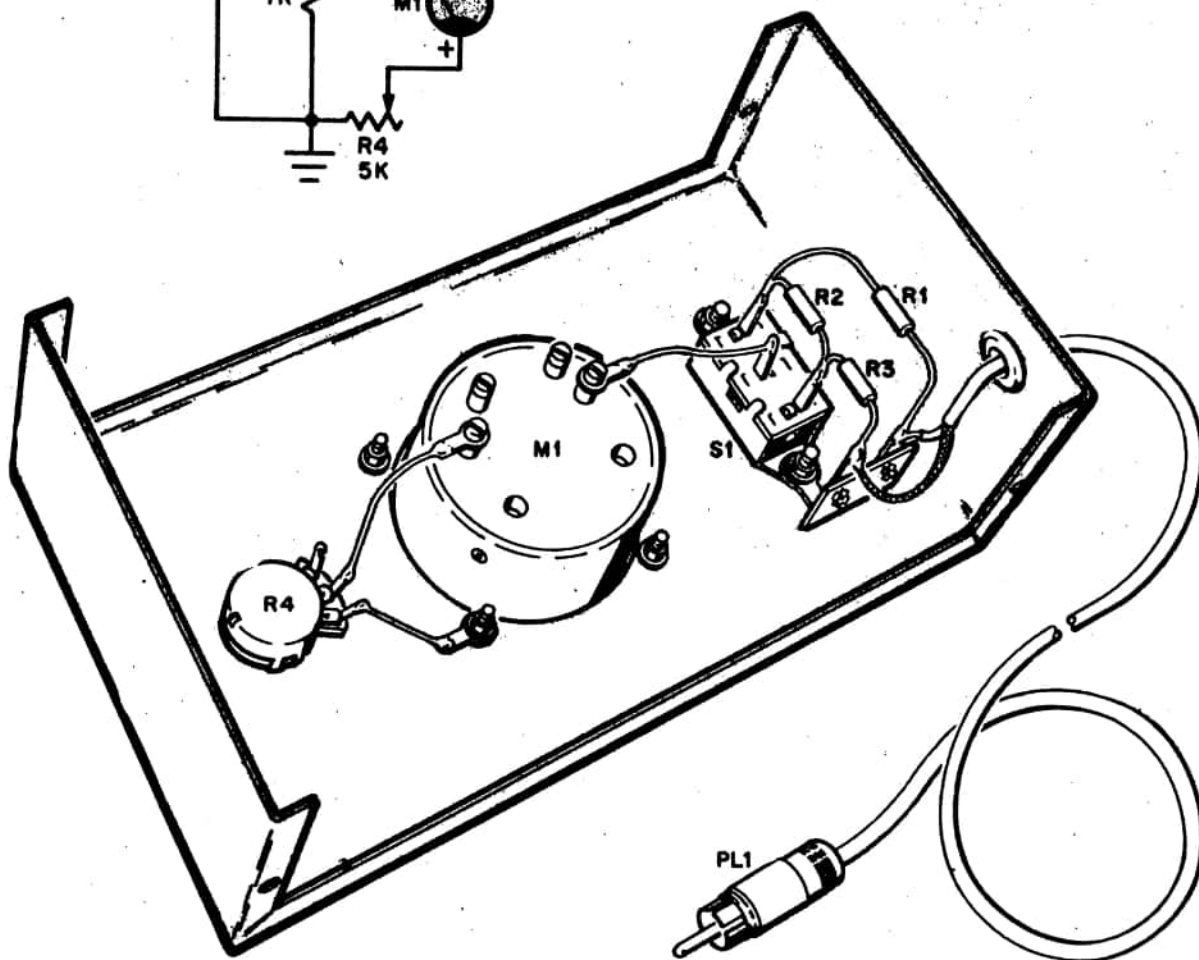
Set S1 to *modulation* (M1 connected across R2 and R3) and the meter will read voice modulation percentage directly.

Calibration control R4 can adjust for transceivers with B+ voltages between 175 and 250. If your rig uses a B+ lower than 175 volts, drop R1 to about 75,000 ohms. If the B+ is above 250 volts, raise R1 to 125,000 ohms. -



PARTS LIST

R1—100,000 ohm resistor (see text)
 R2,R3—1,000 ohm resistor, 1/2 watt, 5%
 R4—5,000 ohm pot
 C1—.05 mf, 600 VDC capacitor (installed in transceiver, see text)
 M1—VU meter, Lafayette Radio TM-10 (Calibration may not be accurate for any other meter)
 J1—Phono jack installed on transceiver (RCA type)
 PL1—Plug to match J1
 Misc.—Minibox, terminal strips, etc.



Tap-off point for transceiver's modulation voltage is shown at left; no other connection is required.