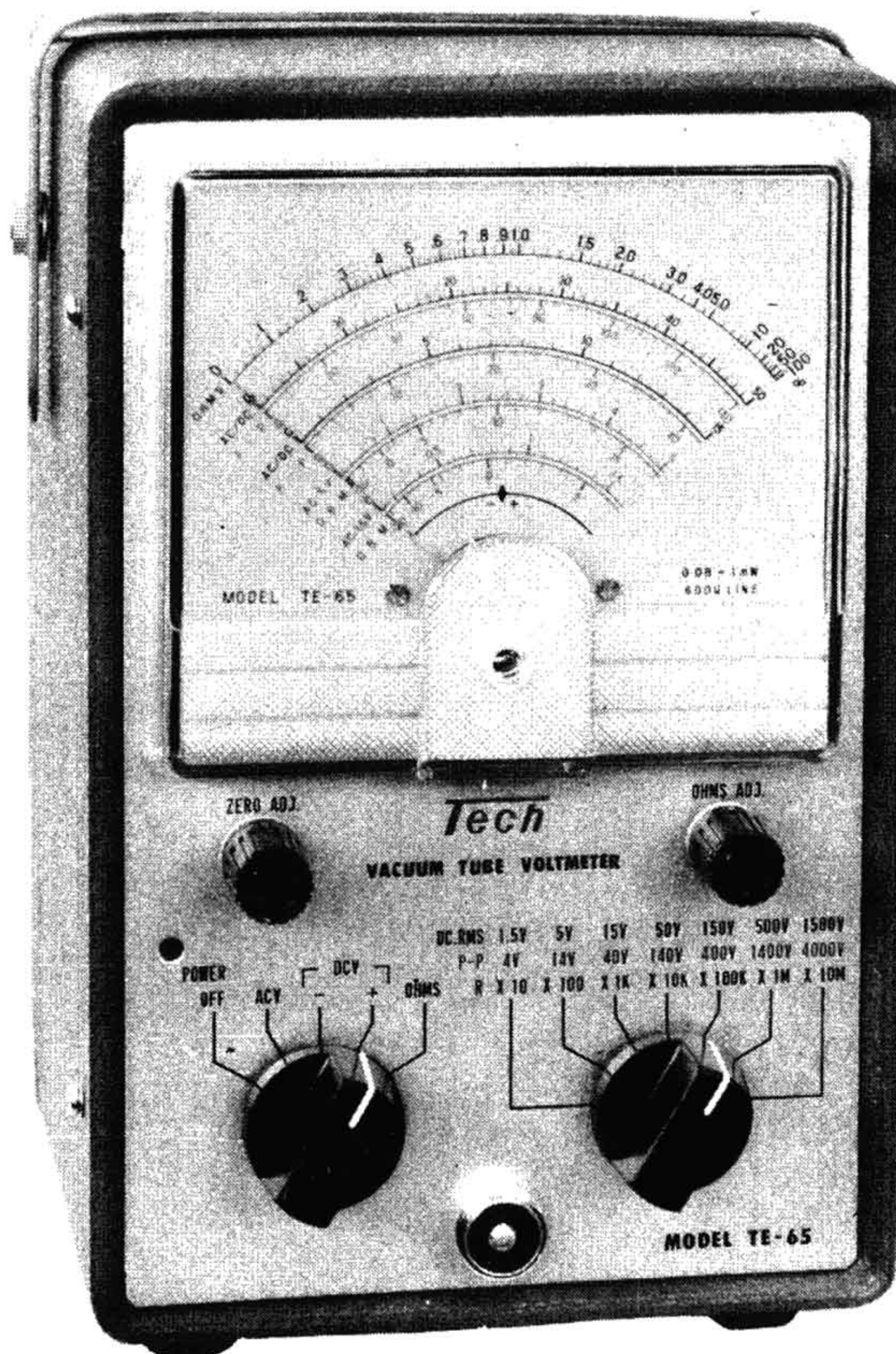




ELECTRONIC TEST INSTRUMENTS

INSTRUCTIONS FOR MODEL TE-65 VACUUM TUBE VOLTMETER



OPERATING INSTRUCTIONS

1. OUTLINE OF MODEL TE-65

The Model TE-65 is designed to suit all electronic testings by amateurs and servicemen of radio, TV and HiFi's or at factories for industrial use.

The Model TE-65 measures such values on AC, DC currents, resistance, Zero-Center, RF, and high voltage.

The high input resistance of the TE-65 makes the circuit free from the affection by load effect and assures you to get most stable and accurate readings on all ranges.

2. PRELIMINARY ADJUSTMENTS:

- 1) Plug the power cord into an AC concent. Set the selector SW on the left hand of the front panel to the "OHM" position, and a pilot lamp glows showing the AC mains are circulated.

The Meter Hand goes up nearly to the full scale.

- 2) Keep this left for about several minutes to warm up the heaters of the tubes, which is necessary for this Voltmeter to work in a more stable way.

- 3) Plug the "Volt-Ohms" testing probe into a jack terminal of "Volt-Ohms" located at the lower center of the front panel.

- 4) Set the Range SW on the right hand of the panel to the " $R \times 10$ " position. Make a shorting between a plus rod and a minus lead of the testing probe, and the Meter Hand gets back to the Zero position. Repeat this further adjustment with a "Zero-Adj" knob on the left hand of the panel under the meter cover.

Set off the plus rod from the minus lead and the Meter Hand indicates the maximum value.

Arrange the indication more precisely with a "Ohm-Adj" knob. With the above operations, Ohm testing is ready.

- 5) Set Selector-SW to position "DC" and the Meter Hand returns to Zero simultaneously. Repeat the adjustment more precisely with "Zero-Adj" knob. With this, DC measurements is ready.

- 6) In a like manner, you can measure all the necessary voltages by setting Selector SW respectively to the AC and DC position and Range SW to a respective range desired to measure.

REMARKS:

Being designed at high sensitivity, the Model TE-65 is feasible to an induction from the outside. In this case a shorting at the probe ends is necessary.

At a released state of the testing prods, the Meter Hand may go some times slightly off the Zero Scale. However, this is improved soon after the testing prods to be in touch with the circuit to be measured.

3. MEASUREMENTS:

DC Voltages;

- 1) Set Range SW to the position of a proper range presumed higher than the Voltage to be measured.
- 2) Touch a minus lead of the testing probe to the earth of a circuit given and touch the plus rod to the higher voltage.
- 3) Reset Range SW to a lower position so as the Meter Hand comes near to full scale. You should be careful not to let the Meter Hand go over

the full scale, otherwise there is a liability the Meter Hand may be destroyed.

- 4) Read the voltage carefully in comparison with the selected Range.

Zero-Center Indications: ;

- 1) Set Selector SW either to plus DC position or minus DC.
- 2) Place the Meter Hand on the center "—O—" with use of a "Zero-Adj."
- 3) Choose a range of at least twice the expected voltage, set Range SW accordingly.

AC Voltages (RMS);

- 1) Set Selector SW to position "AC" and follow the same way as done at DC measurement.
- 2) The testing probe measures the voltage from 30cps to as high as 100Kc.

AC Voltages (Peak-to-Peak);

- 1) Follow the same manner as done at RMS measurement, however read the "Peak-to-Peak" scale which is given below the RMS's.

Note: Of the Model TE-65, scale is given both in RMS and Peak-to-Peak. If either of them is calibrated, another can easily be calculated. For your reference, there is a relation between them as follows.

Resistance;

- 1) Set Selector SW to position "Ohm".
- 2) Set Range SW to a proper range presumed so as the Meter Hand stops at the center scale.
- 3) Adjust the Meter Hand each on Zero point and an Full Scale in the way as described at the NO.4 column of the preliminary adjustments.
- 4) Touch the testing prods to both leads of a resistor to be measured.

Decibel;

For level observation, the TE-65 is provided with decibel scale which is scaled from (—) 10 dB to (+) 5 dB, and further be read to (+) 65 dB with the help of the following table;

AC Volts Scale			dB Scale
0 to	1.5	volts	Read the dB directly
0 to	5	"	Add 10 dB to the reading
0 to	15	"	Add 20 dB "
0 to	50	"	Add 30 dB "
0 to	150	"	Add 40 dB "
0 to	500	"	Add 50 dB "
0 to	1,500	"	Add 60 dB "

The dB scale is based on a standard of 1mW into a 600ohms, and this corresponds to 0.774 volts AC on 1.5 volts range.

RF Measurements;

- 1) Plug the RF-22 probe into a jack in the lower center of the panel.
- 2) Set Selector SW to position (+) DC Range.
- 3) Set Selector SW to position 1.5 volts Range.
- 4) Read the value directly on the AC-RMS scale.

Note: In measurement of the voltage rating more than 60 V, the use of an RF-22 Crystal Probe is recommended, however, the maximum input permitted to the probe is 20 volts at RMS value over the existence of the 250 volts DC. Otherwise, the metal rectifier would suffer a destruction.

High Voltage Measurement;

- 1) Plug the HV-20 probe into a jack in the lower center of the panel.
- 2) Set Selector SW to position (+) DC Range.
- 3) Set Selector SW to position 1,500 volts Range.
- 4) Read the value at the multiplied one by a factor of 20 of the DC scale indication.

Note: In testment of high voltages, please be careful, and it may be good, we suggest you, to put a dry and clean grobe on in order to prevent an electric shock.

4. RE-ADJUSTMENT:

When the tube of the Model TE-65 either one or tow, is replaced, exercise an adjustment work of the meter in the following manner.

- 1) Adopt such tubes which has undergone an again test for the past four hundred hours or more.
- 2) DC Voltage; Adjust the Meter Hand with a variable resistor fixed on the right side of the shassis viewed from the back panel.
- 3) AC Voltage; Firstly, set Range SW to position 1.5 volts Range and adjust the Meter Hand to 0 value with a variable resistor in the center. Secondly make adjustment with a variable resistor on the left.

5. SCHEMATIC DIAGRAM:

