Model 801

CALIBRATION

AND

CIRCUIT DESCRIPTION

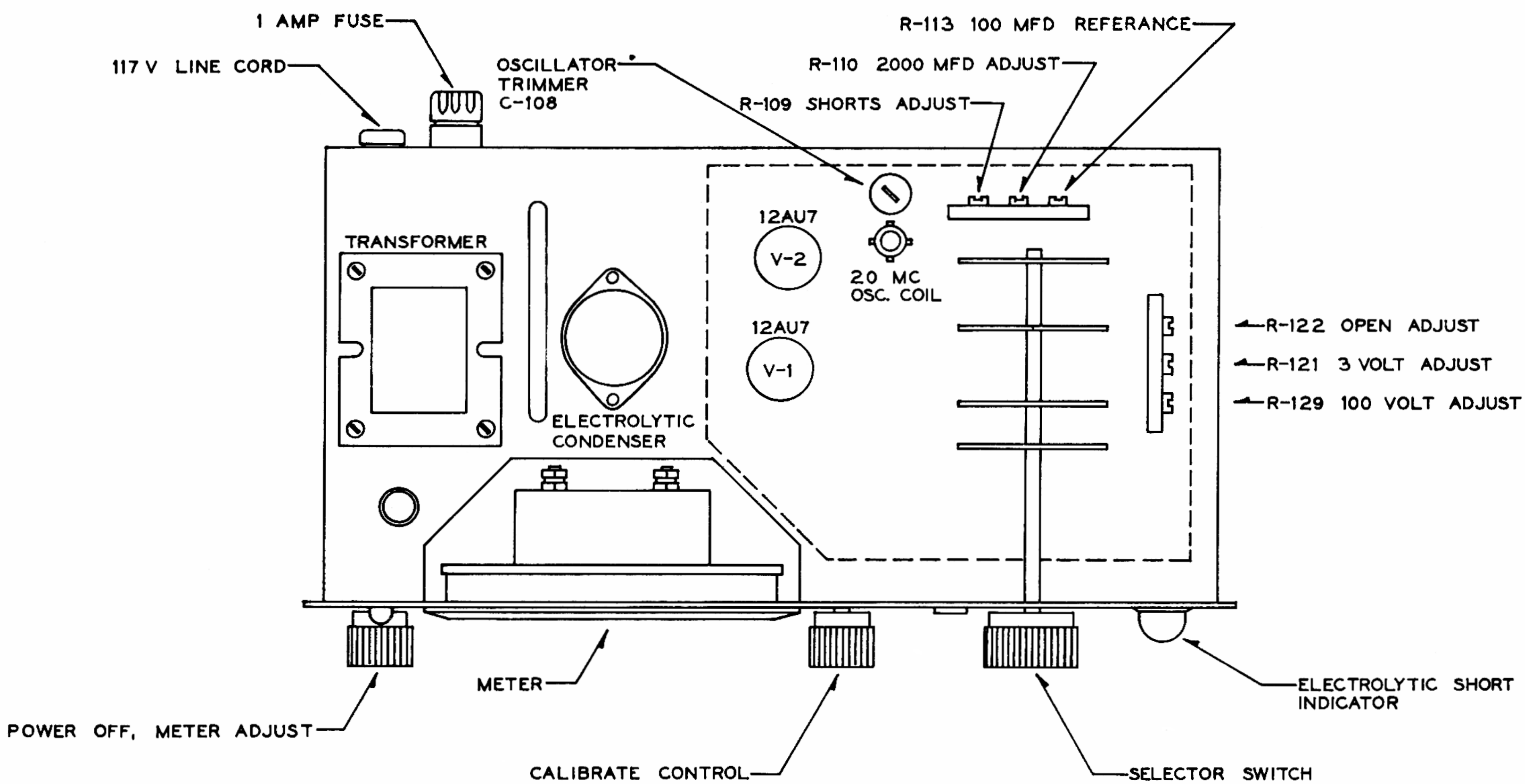

FIGURE 4. INTERNAL ADJUSTMENT LOCATIONS.

"SHORTS" TEST

CALIBRATION. See Figure 4.

1. To calibrate the meter accurately, place a precision 25 ohm resistor across the BLUE and BLACK test leads and adjust the *Shorts Adjust* control until the meter pointer rests on the line separating the red and blue areas of the GOOD-BAD scale.
2. Remove the resistor.

DESCRIPTION. See Figure 5.

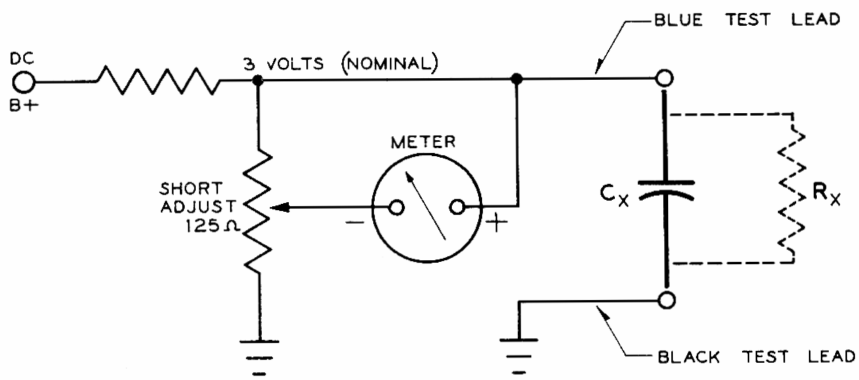

FIGURE 5. SIMPLIFIED SCHEMATIC OF SHORTS TEST.

The capacitor (C_X) under test is virtually placed across the terminals of the meter (M). The voltage at the meter terminals is then shunted by the internal resistance of the capacitor (R_X). If this shunting resistance is less than 25 ohms, the voltage across the meter is reduced to a point where the meter indicates "bad". If the shunting resistance is greater than 25 ohms, the meter will indiçate "good". In this test we are assuming anything under 25 ohms is a short.

"OPENS TEST"

CALIBRATION. See Figure 4.

1. Turn control R-122 (open adjust) fully counter-clockwise.
2. Separate BLUE and BLACK test leads. Do not hold onto them during adjustment.
3. Adjust C-108 (oscillator trimmer) for minimum reading on 801 meter (bottom of dip).

   If the dip cannot be observed, rotate R-122 a few degrees clockwise and repeat step 3.

5. Connect a 50 ohm 1% resistor between the BLUE and BLACK test leads. Connect as close to the body of the resistor as possible.
6. Adjust R-122 to the line between BAD and GOOD.
7. Verify that the addition of a 25 pfd capacitor connected in parallel with the 50 ohm resistor causes the needle to read in the GOOD region.

DESCRIPTION. See Figure 6.

The BLUE and BLACK test leads along with L1, C1, and C2 form approximately a quarter wave transmission line at 20 MC that terminates across the secondary of L2. The characteristics of this transmission line are such that a low impedance connected across the open end of the line will be reflected back as a high impedance across L2 secondary. Conversely, a high impedance will be reflected back as a low impedance.

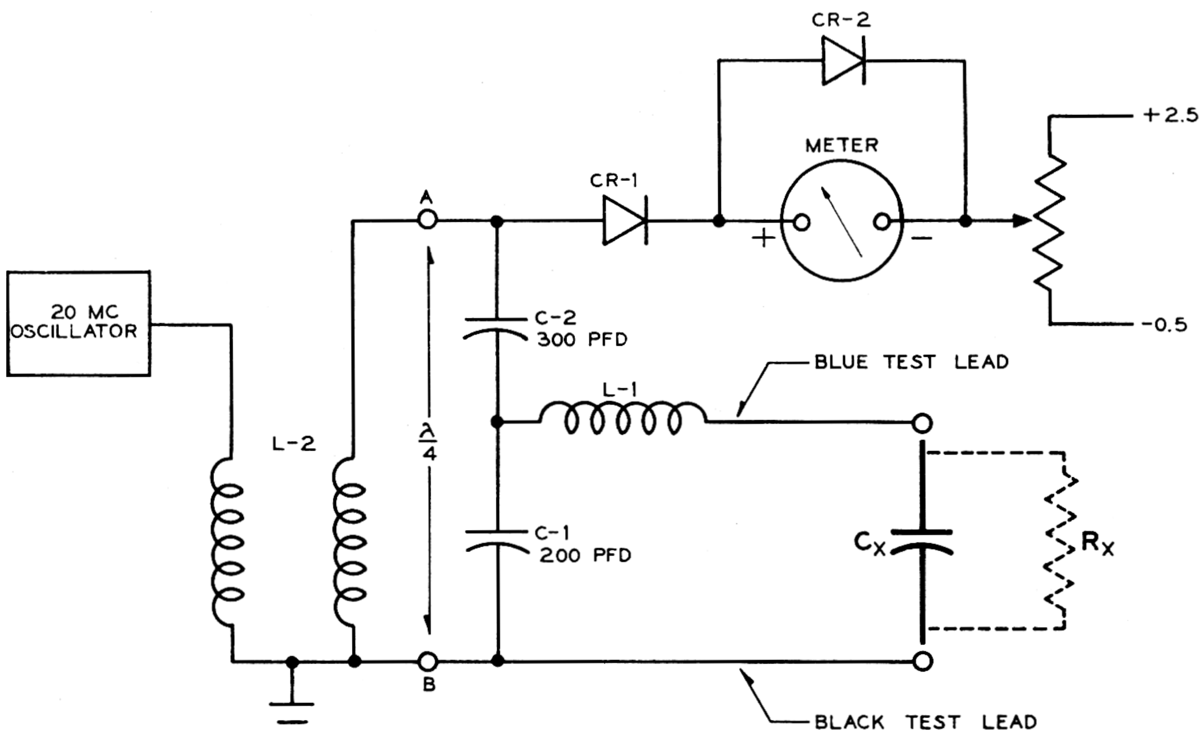

FIGURE 6. SIMPLIFIED SCHEMATIC OF OPENS TEST.

From this it can be seen that if C_X is open (infinite impedance) little or no voltage will be developed across the tank (points A and B) and the meter will register "BAD".

When a capacitor whose value is higher than 25 pfd shunted by 50 ohms is placed across the transmission line (low impedance), it is reflected back through the transmission line as a relatively high impedance across points A and B. This increased impedance causes a like increase in voltage across points A and B. CR_1 rectifies this voltage to drive the meter. The meter will now indicate some value in the "GOOD" area.

LEAKAGE TEST

CALIBRATION. See Figure 4.

1. Rotate the *Selector* switch to the 100 VOLT position.
2. Connect a 5 megohm resistor between the BLUE and RED test leads.
3. Rotate *Meter Adjust* (front panel) control until the meter pointer is at INFINITY at the left of the leakage scale.
4. Depress *Test* switch and adjust *100 Volt Adjust* (R129) for a 5 megohm reading on the leakage scale.
5. Release *Test* switch to see if meter is still at left hand *INF*. Readjust *Meter Adjust* if necessary.
6. Rotate *selector* switch to 3 VOLT position. Depress *Test* switch and rotate 3 *Volt adjust* (R121) for 5 megohm reading on the leakage scale.
7. Remove the 5 megohm resistor.

DESCRIPTION. See Figure 7.

The leakage test consists of a D.C. VTVM which measures the D.C. voltage drop across the internal resistance of C_x and a series resistor, R1. If the internal resistance of the capacitor is infinite, the meter will so indicate when the Test switch is depressed (0 volts). As the internal resistance (R_x) decreases, the voltage across the meter increases proportionately.

The meter is calibrated to give full scale deflection when the internal resistance of the capacitor is 2 megohms or less. This is approximately 0.65 volts.

In the *3 volt Leakage* position, R1 is 820K. In the *100 volt Leakage* position R1 is 12K.

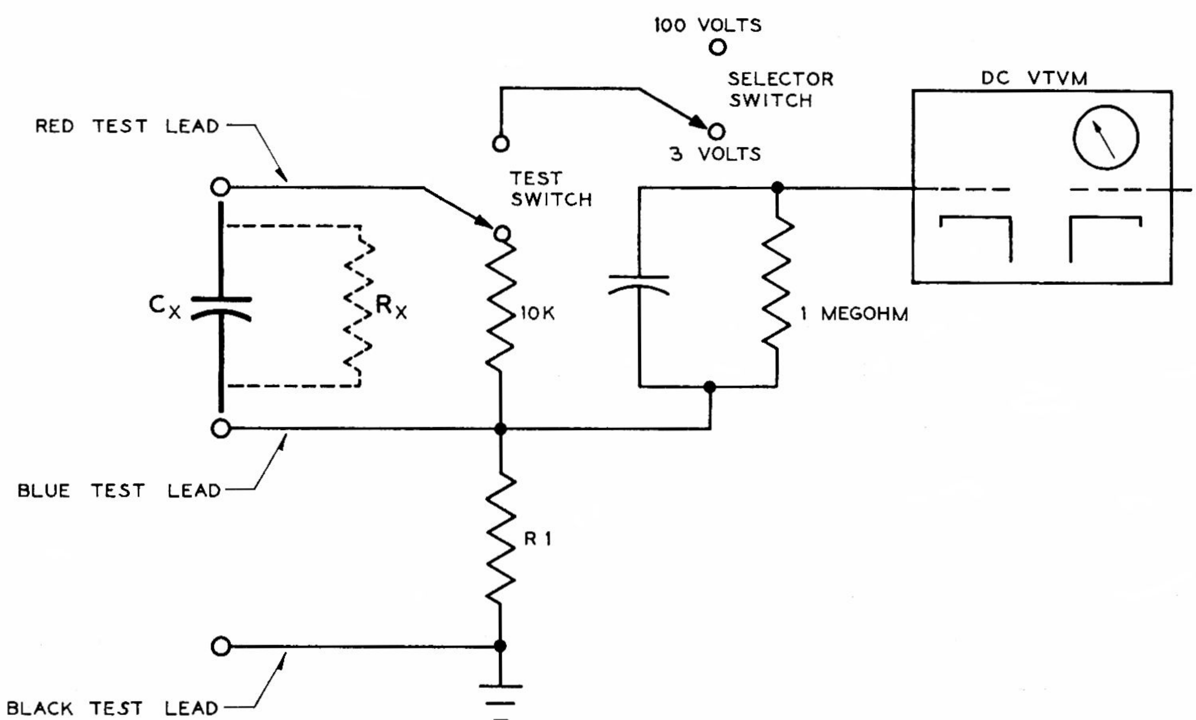

FIGURE 7. SIMPLIFIED SCHEMATIC OF LEAKAGE TEST

"CAPACITY VALUE" TEST

DESCRIPTION. See Figure 8.

The capacity meter is essentially an A.C. VTVM. A full scale of 60 cycle reference voltage is established by the Calibrate control on the front panel while C_x is out of the circuit. When load C_x is connected across the BLUE and BLACK test leads, the voltage across voltage divider R and C_x is lowered in proportion to the reactance of C_x. The higher the capacity, the lower the reactance and, thus, a lower voltage.

This voltage is fed to the grid of a cathode follower whose output is rectified by CR1 and filtered to drive the meter. The resultant D.C. output is relative to the A.C. input voltage. R in the voltage divider will vary with the range chosen by the Selector switch.

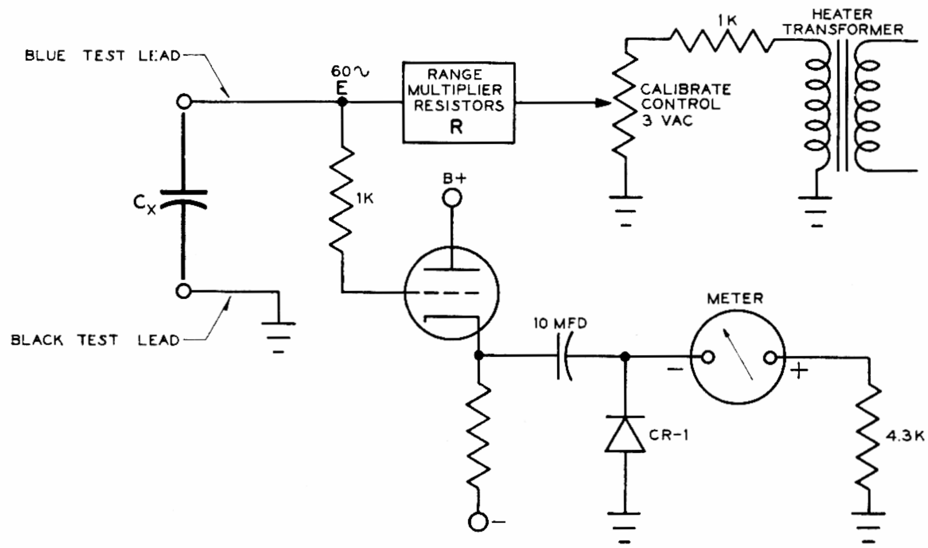

FIGURE 8. SIMPLIFIED SCHEMATIC OF CAPACITY VALUE TEST.

ELECTROLYTIC TEST

CALIBRATION. See Figure 4.

CAUTION: Do not attempt any adjustment of the *100 mfd Reference* (R113) and the *2000 mfd Adjust* (R110) unless standard capacitors of 100 mfd and 2000 mfd are available. These controls were adjusted at the factory and should not require readjustment. However, if you do have the standard capacitors mentioned above and wish to recalibrate, proceed as follows:

NOTE: Be sure line voltage is 117V A.C.

1. Rotate the *Selector* switch to the 100 MFD position.
2. Connect the BLUE test lead to the + terminal of the 100 mfd standard capacitor. Connect the BLACK test lead to the – terminal of the capacitor.

3. Adjust the *Calibrate* control on the front panel for a reading of 100 MFD on top scale.

4. Rotate the *Selector* switch to the CALIBRATE position and adjust the *100 mfd Reference* control for a reading of 100 MFD on top scale.

5. Rotate the *Selector* switch between the 100 MFD position and the CALIBRATE position. Both readings should be identical.

6. Rotate the *Selector* switch to the 2000 MFD position.

7. Remove the 100 mfd standard and insert the 2000 mfd standard in its place, observing the same polarity.

8. Adjust the *2000 mfd Adj.* control for a reading of 2000 mfd on the lower top scale.

9. Remove the 2000 mfd standard from the 801.

DESCRIPTION. See Figure 9.

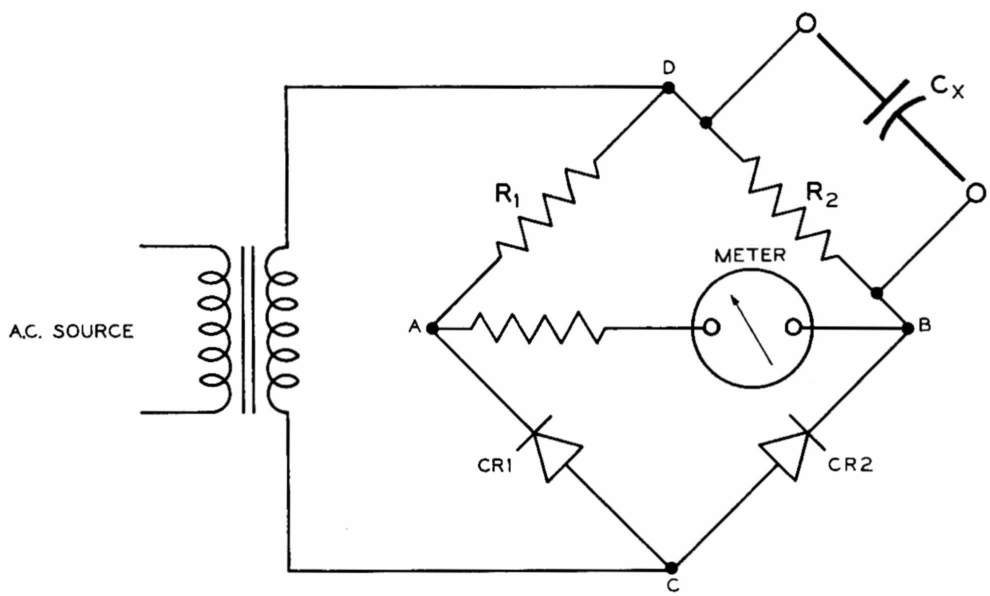

FIGURE 9. SIMPLIFIED SCHEMATIC OF ELECTROLYTIC TEST.

The basic circuit is the bridge shown in Figure 9. Without C_x, a current flows from C to D when the voltage at C is positive with respect to D, that is, over half the cycle. Since each leg is identical, like currents flow from CR_1 and from CR_2 through R_2. The voltage across A to B is zero. When C_x is added, it charges up during the time the current flows through CR_2 and appears as an equivalent battery in series with that leg of the bridge. This causes a voltage difference bewteen A. and B.

Between charging cycles, a portion of the capacitor charge is discharged by R_2 (and the parallel circuit of R_1 in series with the meter resistance). This lowers the average voltage across the capacitor. See Figure 9A. The average voltage (or charge stored in the capacitor) is proportional to the capacity of C_x providing there are no series or shunt leakage paths in the capacitor, thus the voltage difference from A to B may be calibrated in capacity.

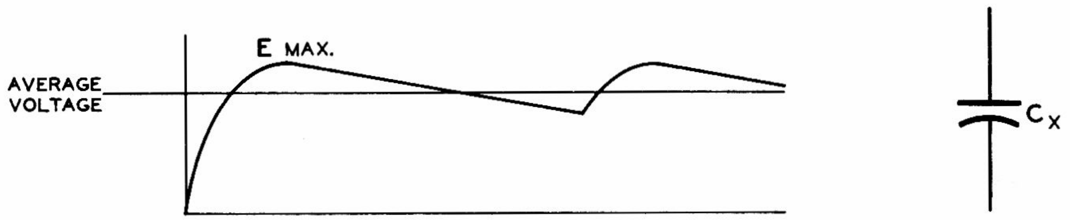

FIGURE 9A.

If a series resistance is present in the capacitor, the capacitor will not charge to as high a voltage as it would without the limiting resistance; or, if the leakage resistance is low, the capacitor discharges to a lower value. In either case, the potential difference from A to B is lower, and the observed capacity is lower. This is shown in Figures 9B and 9C.

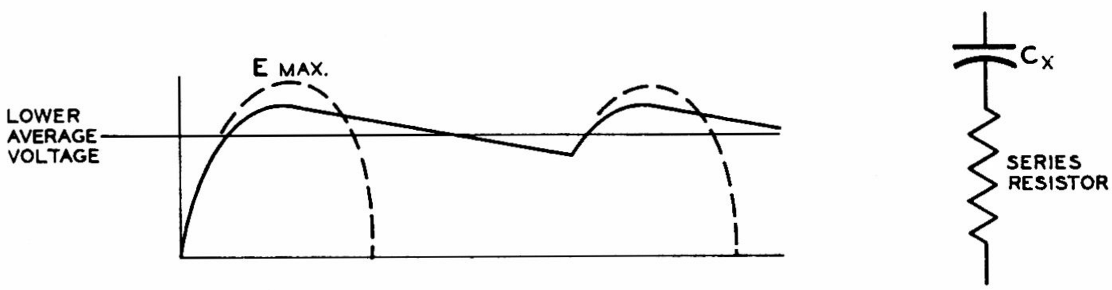

FIGURE 9B.

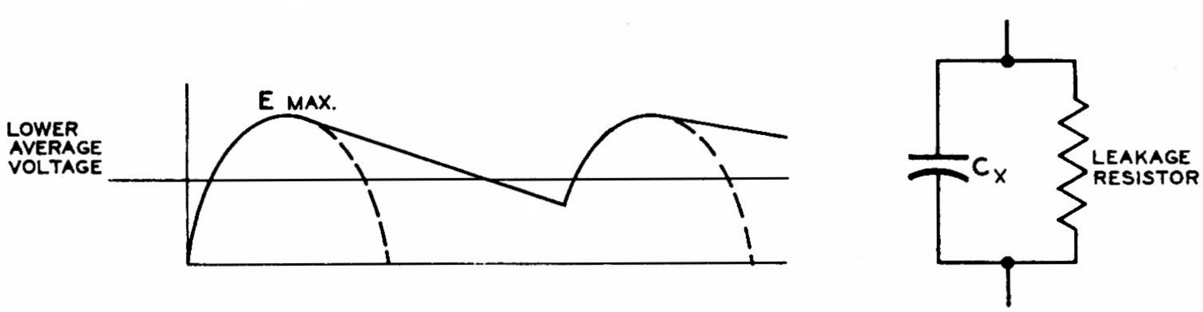

FIGURE 9C.

WARRANTY SERVICE INSTRUCTIONS

1. Refer to the instruction manual for adjustments that may be applicable.
2. Check common electronic parts such as tubes. Always check instruction manual for applicable adjustments after such replacement.
3. Defective parts removed from units which are within the warranty period should be sent to the factory prepaid with model and serial number of product from which removed and date of product purchase. These parts will be exchanged at no charge.
4. If the above mentioned procedures do not correct the difficulty, pack the product securely (preferably double packed). A detailed list of troubles encountered must be enclosed as well as your name and address. Forward prepaid (express preferred) to the nearest B&K authorized service agency.

Contact your local B&K Distributor for the name and location of your nearest service agency, or write to

Service Department

B & K MANUFACTURING CO.

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