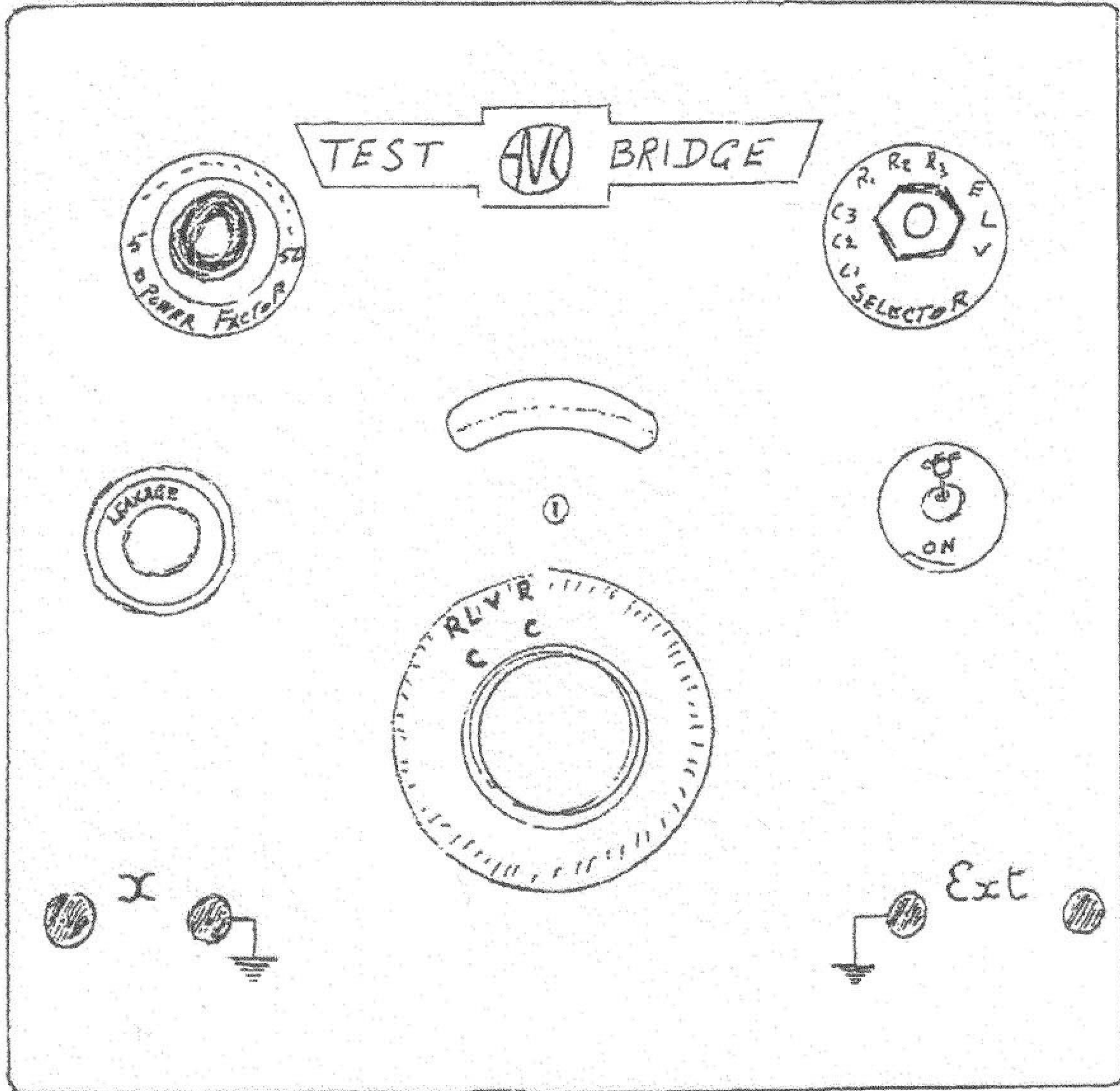


AVO TESTBRIDGE



THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO. LTD.
 WINDER HOUSE, DOUGLAS STREET, LONDON, S.W.1
 Telephone: VICTORIA 3404-9

AVO TEST BRIDGE - WORKING INSTRUCTIONS

Mains Supply

The instrument is normally suitable for use on 50 cycles A.C. mains supply of 220-240 volts, unless otherwise stated on Meter scale plate.

Range of Measurements

Condensers from 5 mmF.-50 mF. can be measured and resistance measurements can be made from 5 ohms - 50 megohms. Except at the extreme ends of the ranges, the accuracy of measurement is within 5%, whilst the logarithmic nature of the scales allows roughly constant percentage discrimination for all values of resistance and capacity. The bridge is also suitable for measurements against external standards.

The indicating valve voltmeter can be used as a sensitive measuring device for external alternating voltage up to medium broadcast frequencies with reasonable accuracy, the logarithmic nature of the scale shape giving the wide range of 0.1v - 15v.

General Instructions

Connect the unknown condenser or resistance to the "x" terminals, and set the SELECTOR switch to the correct range, which will depend on the approximate capacity or resistance of the sample to be tested. Rotate the calibrated dial until the meter indicated minimum deflection, showing that the bridge is balanced. The value of the unknown will then equal the value of the internal standard capacity or resistance, depending on whether a condenser or resistance is being tested, multiplied by the reading on the calibrated scale. When testing components with one connection "earthy", such as condensers with one side connected to a shielding case, etc., the earthy connection should be made to terminal marked earth $\frac{1}{\infty}$

To Measure Capacity of Unknown Condenser

Proceed as above, using the selector ranges, C1, C2 or C3, and reading on the calibrated scale C. For capacities from 5 mmF. (.000005 mF.) to 1000 mmF. (.001 mF.), use range C1, the internal standard on this range being 100 mmF. (.0001 mF.). For capacities from 1000 mmF. (.001 mF.) to 100,000 mmF. (.1 mF.) use range C2, the internal standard on this range being 10,000 mmF. (.01 mF.). For capacities 0.1 mF. to 50 mF., use range C3, the internal standard on this range being 1 mF.

Example

Using range C1, balance is obtained with a reading of 2.4 on the calibrated scale C. The unknown therefore equals 100 mmF. x 2.4 = 240 mmF. (.00024 mF.).

To Measure Value of Unknown Resistance

Proceed as general instructions, using selector ranges R1, R2 or R3, and read on the calibrated scale R. For resistances from 5 ohms - 1000 ohms, use range R1, the value of the internal standard being 100 ohms. For resistances from 1000 ohms - 100,000 ohms, use range R2, the value of the internal standard being 10,000 ohms. For resistances from 100,000 ohms - 50 Megohms use range R3, the value of the internal standard being 1 megohm.

Example

A nominal $\frac{1}{4}$ megohm resistance, when measured on range R3, might give balance with a reading of 0.28 on the calibrated scale R. The actual value of the resistance is therefore 1 megohm x 0.28 = 280,000 ohms.

Power Factor Measurements

When testing large value condensers, especially electrolytics, on range C3, balance will often be indicated without the needle reaching its proper minimum reading. This is caused by condenser losses which may be balanced out by rotating the POWER FACTOR control until balance is obtained with meter needle at proper minimum. The reading of this control then indicates directly the percentage power factor of the unknown. When making normal measurements on range C3, this control should be left set at 0.

Leakage of Condensers

To test for leakage, leave the condenser connected to the terminals "x" as for capacity tests, and rotate the calibrated dial to the "click" position L. Set the SELECTOR switch to position L. The rate of flashing of the neon lamp will then indicate the amount of leakage in the condenser. It must be noted that for a given amount of leakage, in the rate of flashing will be greater and the amount of glow will become less as the capacity of the unknown decreases. As the condenser charges up, an initial flash will be noticed, but after this the lamp should remain unlighted for a perfect condenser.

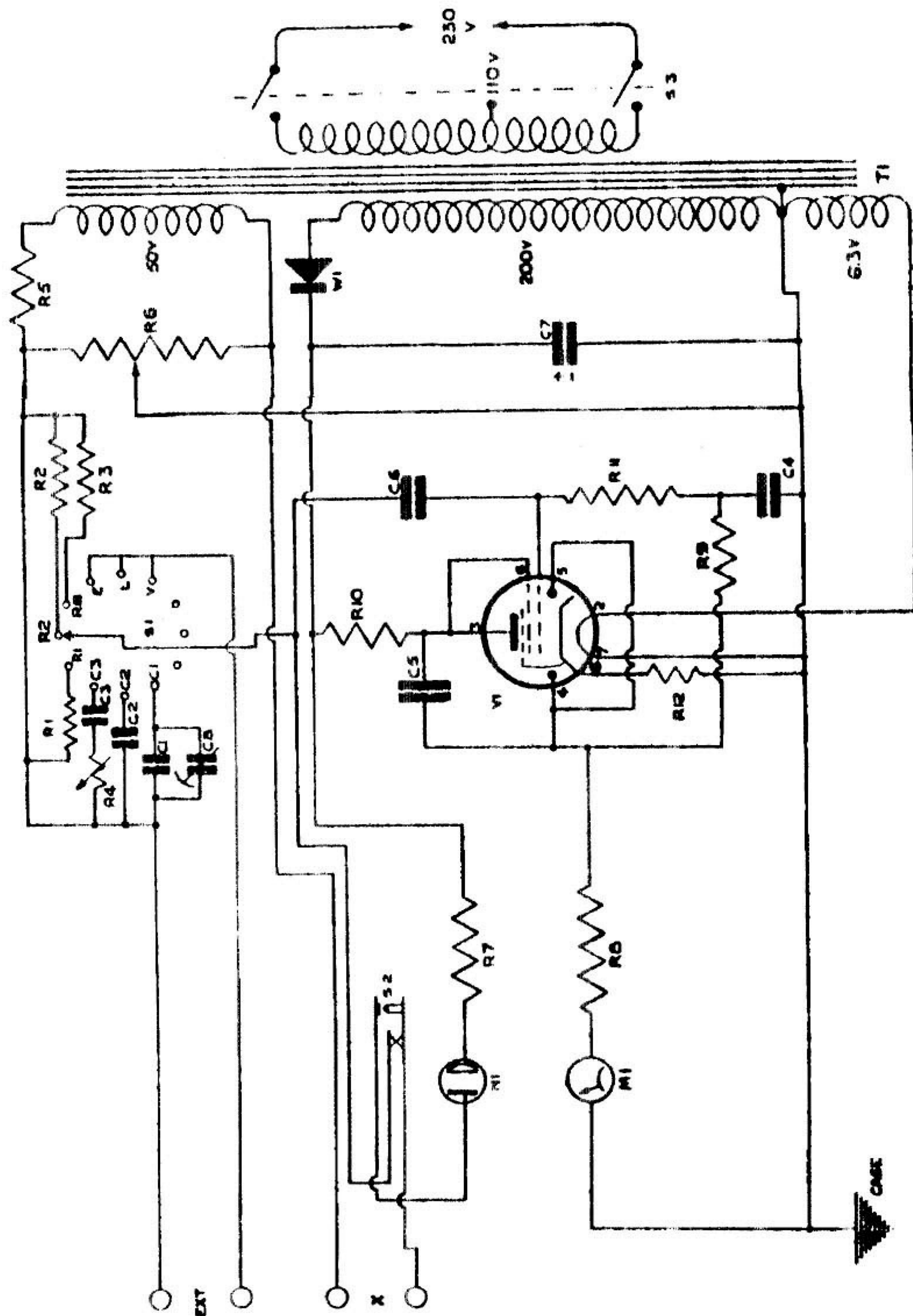
Measurements Against External Standards

If desired, measurements of resistance, capacity and inductance may be made against external standards by connecting the unknown to the "x" terminals and the standard to the terminals marked "ext". The SELECTOR switch should be set to E and the dial rotated for balance in the normal way. The value of the unknown will be the reading on the dial, multiplied by the value of the standard. Dial readings should be made on Scale C for condensers and scale R for resistances or inductances. Owing to the low test frequencies, large errors may be caused if the inductance being tested has a high D.C. resistance compared with its reactance (low Q). For this reason, the Bridge is most suitable for measurements of inductance above 0.1 H.

Use of Valve Voltmeter for External Voltage Measurements

To use the indicating valve voltmeter for external voltage measurements, set the dial to "click" position V and the SELECTOR switch to V. The voltage to be read should be applied to the terminals "ext"., the terminal marked \oplus being earthy. The voltage is then indicated directly in volts on the meter scale.

C3 CONDENSER MADE UP TO
 ± 2% BY INCLUDING EXTRA
 CONDENSER IN PARALLEL



DESIG	PT N ^o	DESCRIPTION	N ^o
R1	TB 30	100R RESISTANCE ± 3%	1
R2	39	10000R " ± 1%	1
R3	40	1MΩ " ± 2%	1
R4	34	1900R PF RHEOSTAT	1
R5	35	350R RESISTANCE ± 10%	1
R6	33	1000R BRIDGE POT RESISTANCE	1
R7	37	50000R RESISTANCE	1
R8	41	1M5000R " ± 10%	1
R9	63	2MΩ " ± 20%	1
R10	42	100000R " ± 10%	1
R11	43	5MΩ " ± 20%	1
R12	87	250R "	1
C1	TB 57A	85mf4 CONDENSER ± 5%	1
C2	TB 36	01mf4 " ± 1%	1
C3	TB 73	1M4 CONDENSER ± 2% ± 0.2%	1
C4	AVO 54	02 mf4 CONDENSER	1
C5	TB 31	25 mf4 "	1
C6	AVO 38	05 mf4 "	1
C7	AVO 77	4 mf4 "	1
C8	TB 37A	3-30 mf4 "	1
S1	TB 56	12 WAY SELECTOR SWITCH	1
S2	TB 24	CHANGE OVER SWITCH	1
S3	AVO 80	OP ARROW SWITCH	1
M1	AVO 75	150 METAL RECTIFIER	1
N1	AVO 68	NEON LAMP	1
M1	TB 22	MOVEMENT	1
T1	28	TRANSFORMER	1
V1	TB 67	500G BRMAR VALVE	1

AVO TEST BRIDGE SCHEMATIC DIAGRAM