

Megohmmeter RM 175-LZ MK II

S.N. 12583. Condition: pretty good – unmodified. Article in 1957 December Wireless World.

4x Tx – marked KB1017, ?, ?, ?. PT with 1.4A of heaters.

Caps: Dubilier Nitrogel B255 1250VDC ; Statis 4uF 800V SD 4 C

Pots Colvern WW

Diode: BYY34

Senter K3/45 A66 (x2 tubes)

EZ80 Mullard ?C5 ±6E3 ; power supply rectifier (90mA max)

12AU7 USA 23C 56-43 ; relay RL1 driver

EF37A (x2) Mullard EP2 B6C2 ; meter driver

Large meter; 100uA

Other functional uses:

1. High voltage DC supply between '+' and Guard terminals, with metering (keyswitch set to "Test Voltage"). Current limited droop from series 25k (ie. about 52mA short circuit). Instant current limit from series 10k (ie. about 100mA short circuit).
2. uA/pA FS meter between '-' and Guard terminals, with metering (keyswitch set to "Measure").
 - Multiply x0.1: 555uA FS; 250mV drop; 444ohm sense;
 - Multiply x1: 55.5uA FS; 250mV drop; 4.44kohm sense;
 - Multiply x10: 5.55uA FS; 250mV drop; 44.4kohm sense;
 - Multiply x100: 0.555uA FS; 250mV drop; 444kohm sense;
 - Multiply x1000: 55.5pA FS; 250mV drop; 4.44Mohm sense;
 - Multiply x10,000: 5.55pA FS; 250mV drop; 44.4Mohm sense;

Issues:

- mains side control parts: panel pot (set volts); trim pot; 4uF oilcan cap.
- No mains fuse, or power supply secondary fuse, or HV secondary fuse
- T4 is HT step-up. T3 is power transformer for valves. Schematic is vice-versa.
- Electrolytic filter cap C5 - old.

To do:

- Add fuses.
- Series diodes with EZ80 anodes.
- Add switch to turn HV supply off (ie. just use to measure for uA/pA measurement).
- Check PT winding resistances, and see what filter capacitance can be used for C5.
- Check other caps for values, and check 1.25k caps for leakage resistance at 1kV.
- Check '+' resistance to ground with keyswitch to Measure (it should be 4M7).
- The schematic shows how the keyswitch was modified to "give a check voltage position, as well as earth and test."



BPL 1956 RM 175-LZ II Megohmeter

1-DESCRIPTION

- 1.1 This instrument is capable of measuring, to a high degree of accuracy, the value of insulation resistances from under one megohm up to five million megohms. In operation it is exceptionally stable and its simplicity of control, together with the very thorough character of the incorporated protective devices, renders it entirely suitable for use by unskilled operators.
- 1.2 The circuit used combines the advantages, such as stability and accuracy, of the bridge with the direct indication of the ohmmeter; this is a feature of exceptional value, in that the effect of physical treatment of test samples (e.g. changes in ambient temperature, pressure, humidity, configuration, etc.) can be observed immediately without the readjustment delay inevitable in a simple null bridge system. In effect, the operation of this instrument is equivalent to that of a self-balancing bridge.
- 1.3 Two other valuable features are the complete protection of the indicator circuit—the meter will not be damaged even should the test terminals be short-circuited—and the fact that the polarizing voltage is substantially independent of the resistance of the circuit or component under test.
- 1.4 The RM-175 Megohmmeter is made in three standard types; all have the same resistance ranges but see paragraphs 3.1 and 3.2.
- 1.41 The RM-175-CX is the basic model, with a test pressure of 500 volts D.C. and includes an adjustable automatic delay circuit which does not insert the indicating circuit until a pre-determined charging period has elapsed; it is, therefore, particularly suitable for measuring the insulation resistance of large capacitors.
- 1.42 The RM-175-LZ includes this feature, and in addition the test voltage can be continuously varied from zero up to 1000 volts D.C.; the actual voltage is directly indicated by an additional meter. The measuring range is increased to 10×10^6 ohms.
- 1.43 Instruments with the suffix S have the low terminal connected to chassis and earth.

2-INSTALLATION

- 2.1 This instrument is suitable for 200 to 250 volts A.C. at 50 cycles per second; within this range no other mains adjustment is necessary. No mains fuses are provided; power consumption is of the order of 70 watts.
- 2.2 It is most desirable that the instrument should be earthed and a third core (not red or black) is provided in the mains lead for this purpose.
- 2.21 For notes on guarding see paragraph 6.

- 2.3 The exact valve arrangement varies with each model; the appropriate holders are clearly indicated by labels on the chassis. It is essential that the correct replacement types be used.

RM-175-CZ	RM-175-LZ	RM 175-LZ Mk II
V.1 ... 6X5-G	6X5-G	E2-80
V.2 ... U50	HVR2	K3-45 2-F
V.3 ... 6SN7	6SN7	EC-692
V.4 ... ME 1400	ME 1400	EF37A
V.5 ... ME 1400	ME 1400	EF37A
V.6 ... ME 1400	ME 1400	EF37A
- 2.33 In all cases the ME 1400 can be used as a replacement for the EF 37, used previously.

3-RANGES

- 3.1 On all instruments the same six ranges are provided; selection is made by use of the "MULTIPLY BY" Switch.

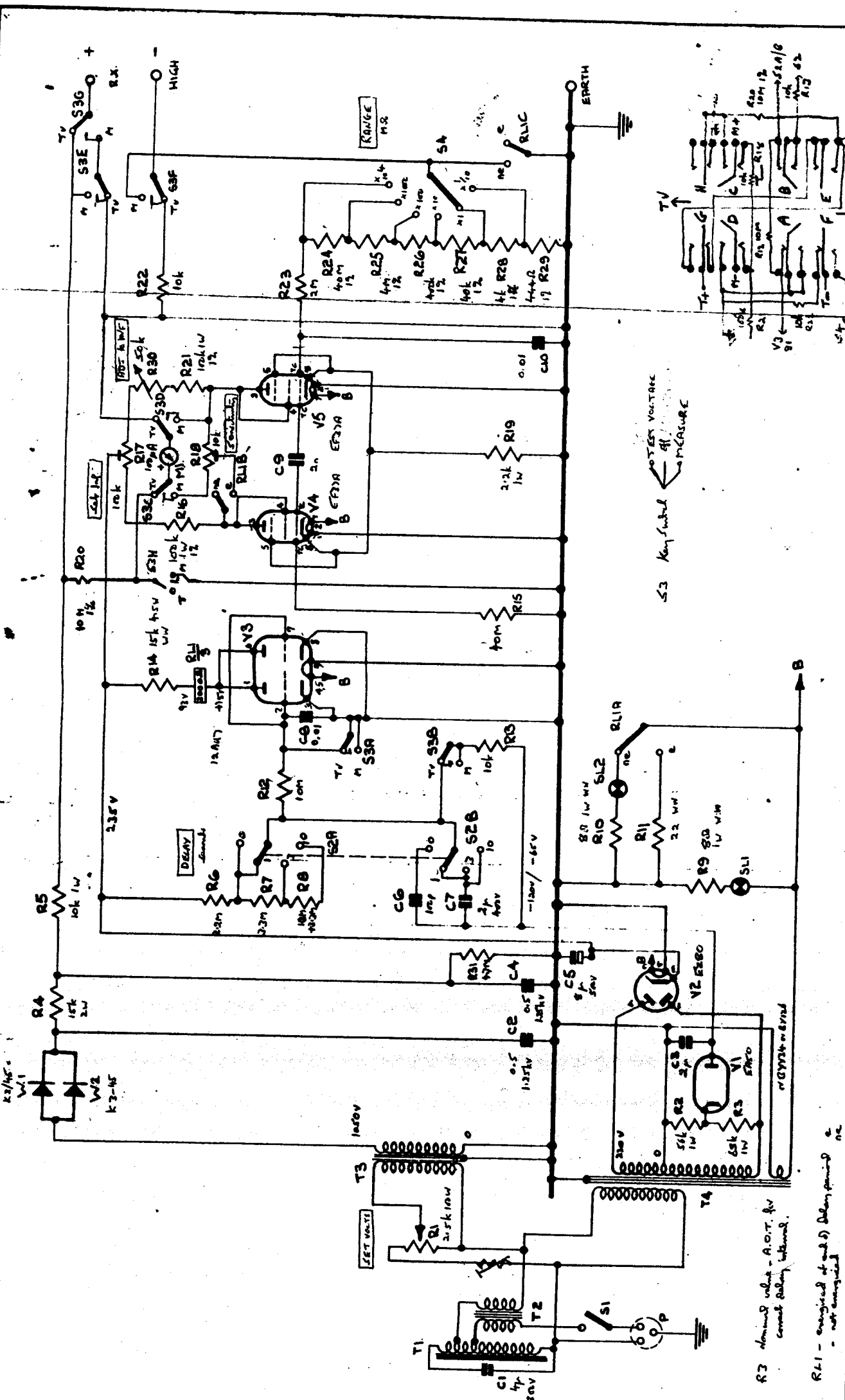
Range 1 x 1/10	0.9 to 50	megohms
Range 2 x 1	9 to 500	megohms
Range 3 x 10	90 to 5000	megohms
Range 4 x 100	900 to 50000	megohms
Range 5 x 1000	9000 to 500000	megohms
Range 6 x 10000	90000 to 5000000	megohms
- 3.2 Since the range is a function of the test voltage, on the RM-175-LZ model, for any voltage other than 500 a very simple correction must be applied, i.e. Reading x $\frac{500}{\text{Test Voltage}}$. For example, if the test voltage is adjusted to 1000 each of the above ranges is doubled.
- 3.3 On models which incorporate a charging delay circuit, four time ranges are provided, 0, 1, 3 and 10 seconds. The most suitable range varies both with the capacitance of the condenser and with its expected leakage resistance.

4-ACCURACY

- 4.2 On the RM-175-LZ model the voltage under test is correctly indicated within 2%, unaffected by the resistance of the circuit under test.
- 4.3 The time delay circuit is adjusted to within -0. + 1 sec. of the indicated time.

5-OPERATION

- 5.1 If possible the instrument should be allowed to warm up for about 20 minutes before use.
- 5.2 The component or circuit, the resistance of which is to be measured should be connected to the terminals marked Rx.
- 5.3 Using the ADJ. TO INFINITY control, set the MEGOHMS meter to read infinity.



S2E2 TRANSFORMER WIRING CHANGED A.H. 15.5.57		PARTS LIST No. D.9506B.		BRITISH PHYSICAL LABORATORIES,	
T.C.D.		PAGE 544.		RADLEY, HERTS.	
C.K.D.		TITLE		DIAGRAM No	
DATE		RM 175 - L7 MK II MEGOHMMETER		D.143	
				SHEET .2.	

R3 nominal value - A.O.T. 4V
control battery internal.

R11 - original of (and) delay period = 2
- not completed

S3 Key Switched
METER VOLTAGE
MEASURE

PLV