Resistive load at 1000 cycles	ΔDBM (to be added to the dbm value given on the chart for 600 ohms)
600 ohms	0
500 ohms	+ 0.8
300 ohms	+ 3.0
250 ohms	+ 3.8
150 ohms	+ 6.0
50 ohms	+ 10.8
15 ohms	+ 16.0
8 ohms	+ 18.8
3.2 ohms	+ 22.7

Note that for load values greater than 600 ohms, ΔDBM will be a negative quantity, as indicated in the formula:-

$$\Delta DBM = 10 \log. \frac{600}{R} \quad \ldots\ldots\ldots \quad (i)$$

Where R is the value of the resistance concerned.

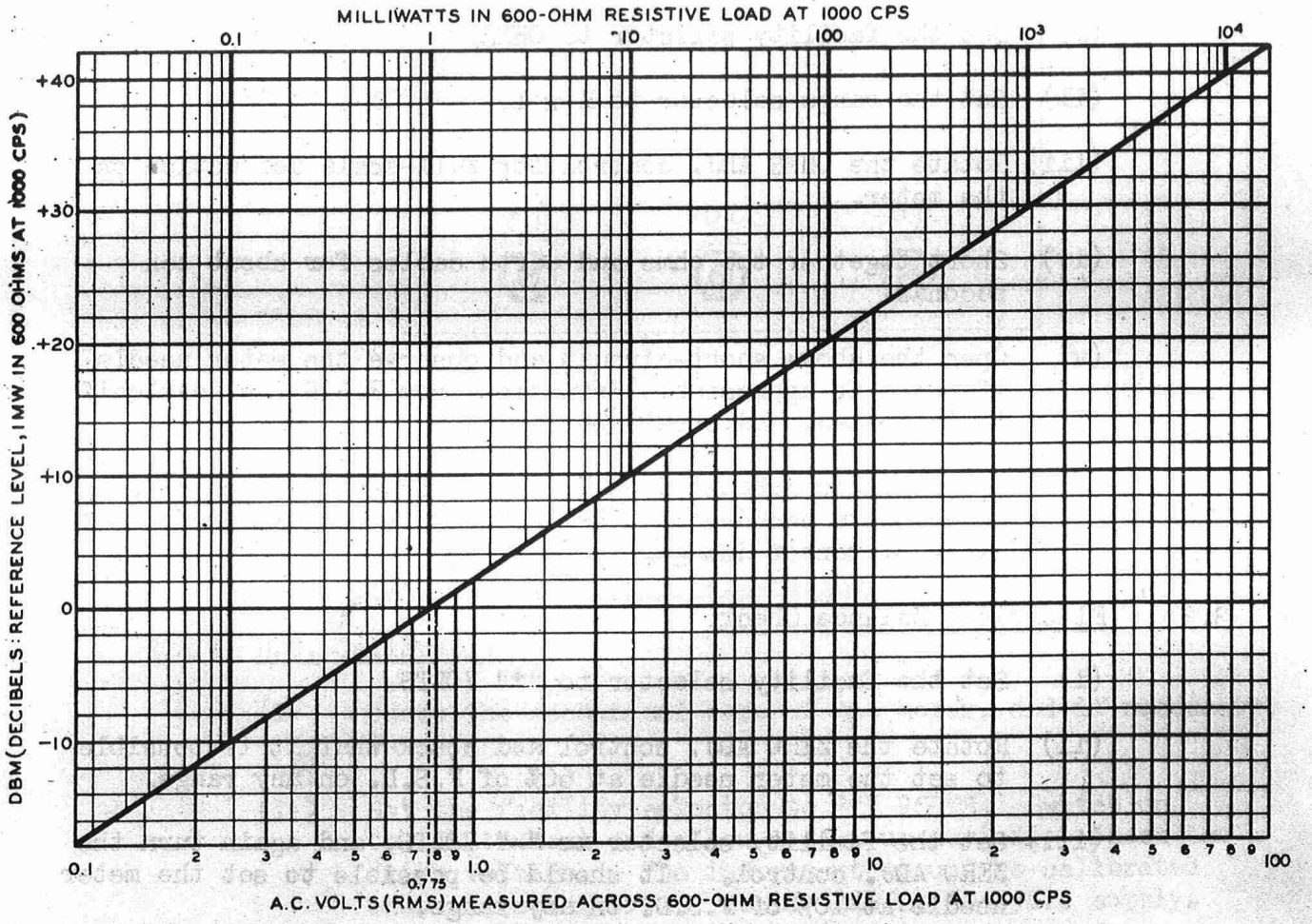


Fig. 5 Chart for conversion of R.M.S. Voltages to dbm values

3. MAINTENANCE

3.1 Valve Replacement

If at any time it becomes necessary to replace either of the type 6AL5 (alternative D77) or 12AU7 valves, they should be "aged" before installation, as follows:-

(a) Type 6AL5

Run the valve with heater voltage only applied for a period of 48 hours before placing it in the instrument.

(b) Type 12AU7

Connect together the grids and cathode, apply the normal heater voltage and, in addition, an A.C. voltage of approximately 100V., 50-cycle between anode and cathode. Allow to run thus for 24 hours.

3.2 Checking the Condition of the 1.5V. cell

(i) Set the facility selector to OHMS.

(ii) Set the range selector to R x 1.

(iii) Rotate the OHMS ADJ. control for full-scale deflection on the meter.

(iv) Short together the ohms and earth cables for about ten seconds.

(v) Open the above short-circuit and observe the meter needle. If there is appreciable deviation from F.S.D., a weak cell is indicated, and should be replaced.

Do not allow exhausted cells to remain in the instrument and deteriorate because chemical action resulting therefrom can cause permanent damage.

3.3 Electrical Balance Check

(i) Set the facility selector to "+" VOLTS.

(ii) Rotate the ZERO ADJ. control and check that it is possible to set the meter needle at 60% of F.S.D. on any range.

(iii) Set the facility selector to "-" VOLTS, and again turn the ZERO ADJ. control. It should be possible to set the meter needle at 10% of F.S.D. on any range.

(iv) If the above results cannot be obtained, it is an indication of unbalance in the triode units of the type 12AU7 valve, and the latter should be replaced (refer to 3.1).

3.4 Calibration

If it becomes necessary to restore the initial accuracy of the instrument, i.e., to recalibrate, the following procedure should be carried out:-

Fig. 6 indicates the relevant positions of the adjustable controls used in the calibration.

Note that the accuracy of calibration can only be comparable with the accuracy of the voltage standards used in the procedure.

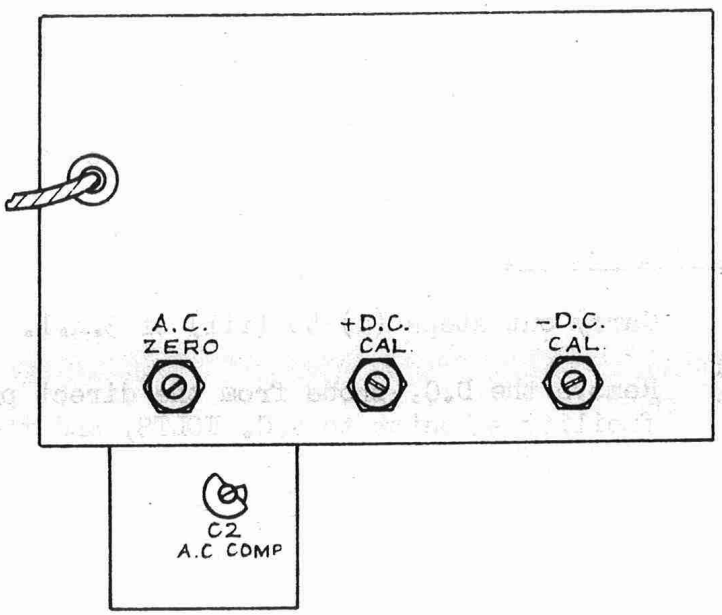


Fig. 6 Location of Calibration Controls

3.4.1 D.C. Calibration

(i) Check the mechanical zero of the meter, and if necessary, re-adjust.

(ii) Set the facility selector to "+" VOLTS. Switch on the instrument and allow a warm-up period. Check the mains voltage. The instrument should be calibrated when operating from a steady 240V., 50-cycle supply.

(iii) Using the ZERO ADJ. control set the meter needle to "0", and leave the control set at this position throughout the remainder of the procedure.

(iv) Set the range selector to the 0-50V. range.

(v) Connect the earth cable to the negative terminal of an accurately adjusted 50V. D.C. source, and the D.C. probe (fitted over the direct probe) to the positive terminal of this source.

(vi) Adjust the "+" D.C. CAL. control (R27) to bring the pointer exactly to the 50V. mark on the "D.C. or R.M.S." scale.

(vii) Leaving the other conditions as set, reverse the connections to the 50V. source and set the facility selector to the "−" VOLTS position.

(viii) Check the other D.C. ranges against reliable voltage sources, making allowance for the tolerance given in the specification. If necessary, re-calibrate on a range other than 0-50V., and check all components associated with the facility.

3.4.2 A.C. Calibration

(i) Carry out steps (i) to (iii) of 3.4.1.

(ii) Remove the D.C. probe from the direct probe. Set the facility selector to A.C. VOLTS, and the range selector to 0-1.5V.

(iii) Short together the direct probe and earth cable, and adjust the A.C. ZERO control (R37) for a zero on the meter. If it is not possible to zero the needle, interchange the two type 6AL5 valves, and if a zero is still unobtainable, replace one or both of the latter valves.

(iv) Set the range selector to 0-50V.

(v) Connect the earth cable and tip of the direct probe to an accurate 50V., 50-cycle source, and check that the reading is within the tolerance stated in the electrical specification. If outside this tolerance, check the components associated with the facility.

3.4.3 A.C. Compensation Adjustment (C2)

(i) Set the facility selector to A.C. VOLTS. Check that the meter is positioned at zero, firstly by setting the mechanical zero, and later (after switching on) by adjusting the ZERO ADJ. control.

(ii) Set the range selector to 0-500V. and apply an accurate 50V., 100 kc. signal to the instrument using the direct probe (alone) and the earth cable.

(iii) Adjust the variable air trimmer (C2) at the rear of the instrument for a 50V. reading on the "D.C. or R.M.S." scale of the meter.

4. COMPONENT SCHEDULE

When ordering replacement parts please quote ALL details given below for a particular component.

Circ. Ref. No.	Description	A.W.A. Type Number (unless otherwise stated)
(a) Capacitors		
C1	0.1 uF., 600V.W., paper	
C2	2-18 uuF., variable air trimmer,	18836
C3	0.05 uuF., 400V.W., paper	
C4	0.05 uuF., 400V.W., paper	
C5	3,300 uuF., 500V.W., silvered ceramic	T.C.C. type CTH315
C6	3,300 uuF., 500V.W., silvered ceramic	T.C.C. type CTH315
C7	16 uF., 350V.P., electrolytic	Ducon type ET1043
C8	25 uuF., 500V.W., mica	Simplex PT or SM
(b) Connectors		
CM1	Single-point, female, coaxial	C102-M
CF1	Single-point, female, coaxial	S55178
CF2	Single-point, female, coaxial	S55178
(c) Meter		
M1	Moving coil, movement 0-200 uA. F.S.D., Master S34 square, fitted with knife-edge pointer. Scaled to Drg. 56010V7	464047
(d) Resistors		
R1	0.9 M.ohm ± 1%, 1W., carbon	Welwyn type A3634
R2	0.325 M.ohm ± 1%, 1/2W., carbon, insulated	Erie type 100
R3	0.15 M.ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R4	20.3 M.ohm ± 2%, 1W., carbon	Welwyn type A3635
R5	7 M.ohm ± 1%, 1W., carbon, high-stability	Welwyn type A3634
R6	2 M.ohm ± 1%, 1/2W., carbon, insulated	Erie type 100
R7	0.7 M.ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R8	0.2 M.ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108

R9	70,000 ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R10	20,000 ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R11	10,000 ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R12	90 ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R13	8.6 ohm ± 1%, wire-wound	56010V30
R14	900 ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R15	9,000 ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R16	90,000 ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R17	0.9 M.ohm ± 1%, 1/4W., carbon, high-stability	Erie type 108
R18	9 M.ohm, ± 1%, 2W., carbon	Welwyn type A3635
R19	3.3 M.ohm ± 10%, 1/2W., carbon, insulated	I.R.C. type BT½
R20	39,000 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. type BT½
R21	20,000 ohm, variable potentiometer, carbon; less switch. Dim. A, B and C respectively:- 3/4" x 0.218" x 3/8"	I.R.C. type C.S.
R22	33,000 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. type BT½
R23	1,800 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. type BT½
R24	1,800 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. type BT½
R25	47,000 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. type BT½
R26	20,000 ohm, variable potentiometer, carbon; less switch. Dim. A, B and C respectively:- 3/4" x 0.218" x 3/8"	I.R.C. type C.S.
R27	10,000 ohm, variable potentiometer, carbon; less switch. Dim. A, 7/16"; screwdriver slotted	I.R.C. type C.S.
R28	10,000 ohm, variable potentiometer, carbon; less switch. Dim. A, 7/16"; screwdriver slotted	I.R.C. type C.S.
R29	1,800 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R30	56,000 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R31	47,000 ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R32	6.8 M.ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R33	1.8 M.ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R34	0.68 M.ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R35	0.18 M.ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R36	0.1 M.ohm ± 5%, 1/2W., carbon, insulated	I.R.C. BT½
R37	2 M.ohm, variable potentiometer; log or linear	I.R.C. Type C.S. or Morganite type A
R38	107.8 ohm ± 1%, wire-wound	56010V109
R39	30.8 ohm ± 1%, wire-wound	56010V109-1
R40	10.78 ohm ± 1%, wire-wound	56010V109-2
R41	3.08 ohm ± 1%, wire-wound	56010V109-3
R42	1.078 ohm ± 1%, wire-wound	56010V109-4
R43	0.308 ohm ± 1%, wire-wound	56010T114
R44	0.154 ohm ± 1%, wire-wound	56010T115

(e) Sockets

V1	7-pin miniature	19965
V2	7-pin miniature	19965
V3	9-pin miniature	Code No. 793037

(f) Switches

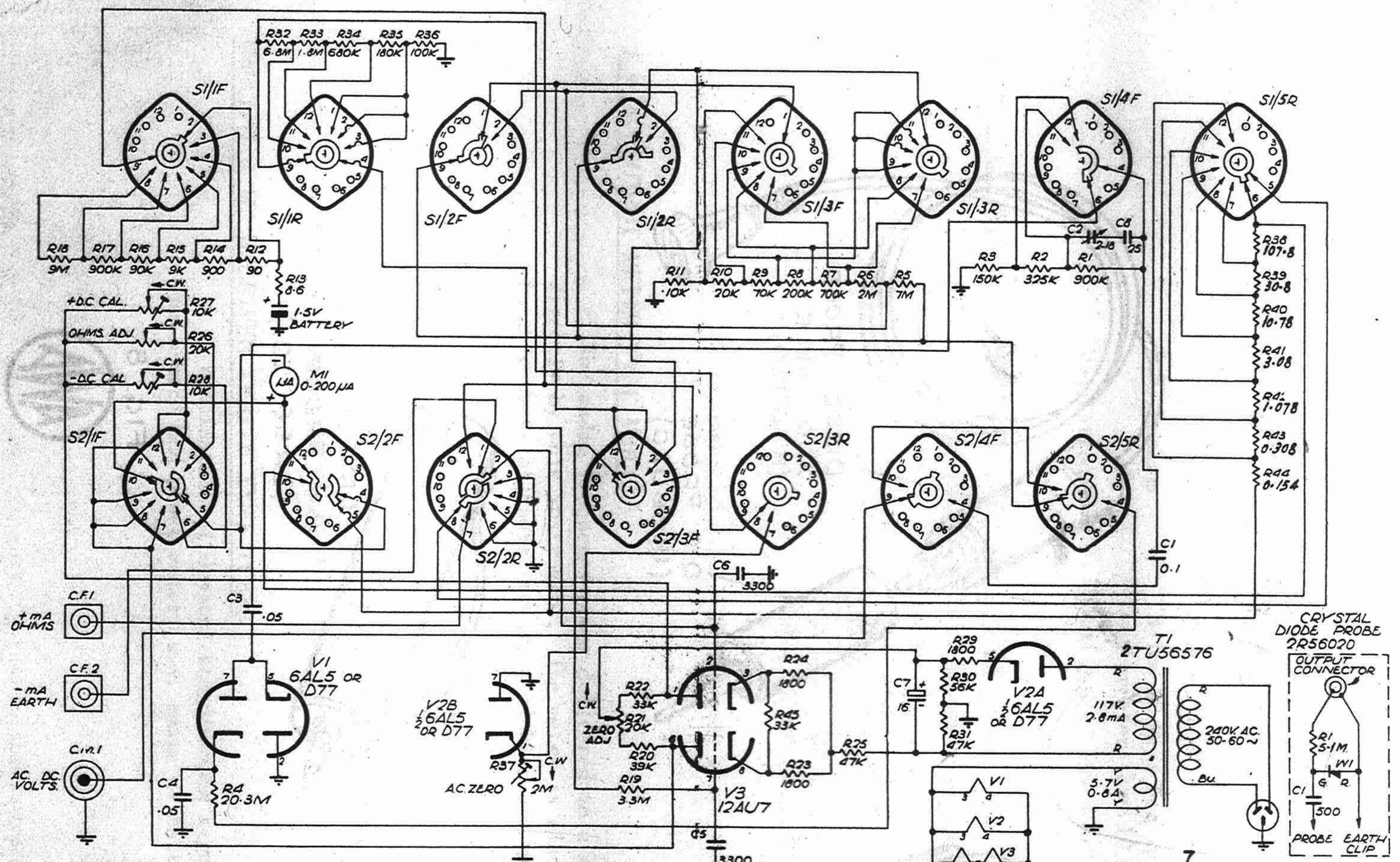
S1	Oak "H" type, rotary wafer	56010V13
S2	Oak "H" type, rotary wafer	56010V14

(g) Transformer

T1	Power Transformer	2TU56576

(h) Crystal Diode Probe

C1	500 uuF., ± 20%, mica	T.C.C. type CM30
R1	5.1 M.ohm ± 5%, IW., carbon	I.R.C. B.T.A.
W1	Rectifier	G.E.X. 55-1


S1/1F
S1/1R
S1/2F
S1/2R
S1/3F
S1/3R
S1/4F
S1/5R
S2/1F
S2/2F
S2/2R
S2/3F
S2/3R
S2/4F
S2/5R
R32 6.8M
R33 1.8M
R34 680K
R35 180K
R36 100K
R18 9M
R17 900K
R16 90K
R15 9K
R14 900
R12 90
R13 8.6
1.5V BATTERY
+DC CAL.
R27 10K
OHMS ADJ
R26 20K
-DC CAL
R28 10K
M1 0-200μA
R11 10K
R10 20K
R9 70K
R8 200K
R7 700K
R6 2M
R5 7M
R3 150K
R2 325K
R1 900K
C2 2-18
C8 25
R38 107.8
R39 30.8
R40 10.78
R41 3.08
R42 1.078
R43 0.308
R44 0.154
C1 0.1
C6 3300
C3 .05
C.F.1
+mA OHMS
C.F.2
-mA EARTH
C.in.1
AC. DC. VOLTS.
V1 6AL5 OR D77
C4 .05
R4 20.3M
V2B ½6AL5 OR D77
R37 2M
AC ZERO
C.W.
R22 33K
R21 20K
ZERO ADJ
R20 39K
R19 3.3M
V3 12AU7
R24 1800
R45 33K
R23 1800
R25 47K
C5 3300
C7 16
R29 1800
R30 56K
R31 47K
V2A ½6AL5 OR D77
T1 2TU56576
117V. 2.8mA
240V. AC. 50-60~
5.7V 0.6A
CRYSTAL DIODE PROBE 2R56020
OUTPUT CONNECTOR
R1 5.1M.
W1
C1 500
PROBE
EARTH CLIP

S1-RANGE
POS. 1 1.5mA & V RX1
POS. 2 5mA & V RX10
POS. 3 15mA & V RX100
POS. 4 50mA & V RX1000
POS. 5 150mA & V RX10K
POS. 6 500mA & V RX100K
POS. 7 1500mA & V RX1M

S2 SELECTOR
POS. 1 mA
POS. 2 - VOLTS
POS. 3 + VOLTS
POS. 4 AC VOLTS
POS. 5 OHMS

ALL SWITCHES VIEWED FROM KNOB END IN ANTI-CLOCKWISE POSITION

RESISTORS IN OHMS
K = 1000 M = 1,000,000
CAPACITORS IN [illegible]
OR UUF (eg. 150)
ELECTROLYTICS IN UF

7

VOLTOHMYST A56010
DRG. 56010C2
(FOR SERIAL Nos 51 & ONWARDS)

APR.	DATE.	CHANGES	Nº
		ORIGINAL	0
	21.5.53	FCD. [illegible] CKD. [illegible]	1
		S1/ 2F, 3F, 3R, 4F, 5R; S2/ 2F, 3F, 4F, 5R; 5969	2
	22.9.53	R1 2R56020; R1 5.1M; 1111	3
	12.10.53	T1 WAS 1TU5G576	4
	13.10.53	C38 WAS .03 R42; C39 15.4Ω; C40 5.39Ω; R41 1.54Ω; R42 .539Ω; R43 .154Ω; R44 .0770Ω; 1881	5
	19.10.53		

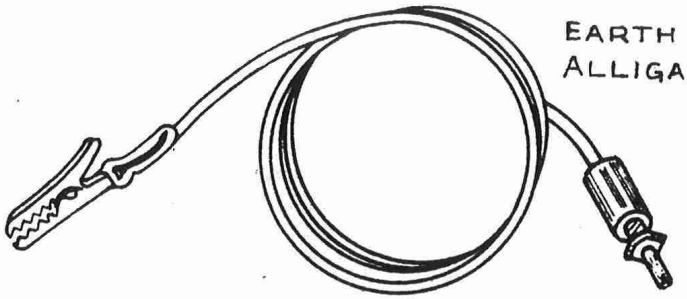
AMALGAMATED WIRELESS (AUSTRALASIA) LTD. - SYDNEY

ARCT.	P. GRAVES	20.4.53
DRN.	W. NICHOLS	20.4.53
TRCD.		
CKD.	W. BURNS	5.5.53
APP.		

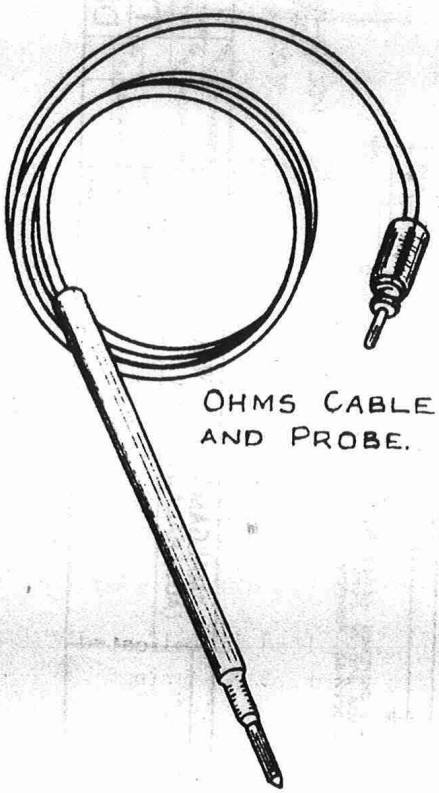
1st SHEET
REF.

TYPE

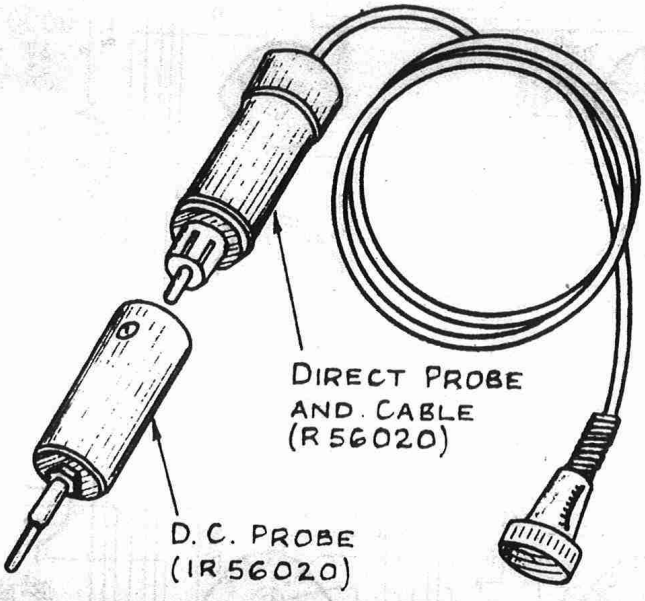
DRG. 56010C2



EARTH CABLE AND
ALLIGATOR CLIP.

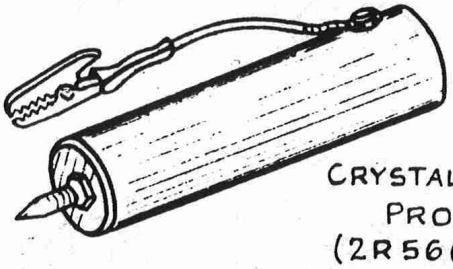


OHMS CABLE
AND PROBE.



DIRECT PROBE
AND CABLE
(R 56020)

D. C. PROBE
(1R 56020)



CRYSTAL DIODE
PROBE.
(2R 56020.)

FIG. 8

PROBES AND CABLES USED
WITH VOLTOHMYST.
DRG. 5601007

FURTHER INSTRUMENTS FOR THE RADIO SERVICEMAN

A.W.A. MODULATED OSCILLATOR TYPE 4J6726

An instrument eminently suitable for maintenance of radio receivers, as it is easily portable and has sufficient calibration accuracy for all service requirements.

Frequency range:	140 kc - 30 mc/s in 6 bands Accuracy ±2%.
R.F. Output:	Approx. 1 uV - 300mV across 20 uuF.
R.F. Leakage:	Below 20 Mc/s negligible, high frequency not greater than 10 uV.
Modulation:	400 c.p.s. ±5% depth, fixed at 30%.

A.W.A. CATHODE RAY OSCILLOSCOPE TYPE R6673

A general purpose C.R.O. incorporating a 2" tube and adaptable for portable or rack mounting.

Sensitivity:	Direct vertical 75 V/1", horizontal 85 V/1"
Amplifiers:	30 c/s - 200 kc gain x 40 on the range 30 - 12,000 c/s response flat within 0.5 db.
Time base:	30 c/s - 30 kc.

A.W.A. OUTPUT METER TYPE M8832

The audio frequency power delivered to a given load is indicated directly by this instrument. The meter is also used for measuring power outputs of radio-receiver, pick-up and microphone amplifiers.

Power range:	0.1 mW to 5W.
Meter Calibration:	0-50 mW calibrated every 1mW, -60 to + 0 db calibrated every 1 db.
Accuracy:	0.5 db. 100 - 3,000 c/s 2 db. 30 - 10,000 c/s
Impedance range:	200 - 20,000 ohms.

MARCONI A.M. RECEIVER TESTER TYPE TF888

A combination of crystal-standardised signal generator, a.f. tone source and power meter; a.c. mains or battery operated.