

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 CG decoupling	100,000
R2	V2 pentode CG decoupling	100,000
R3	V2 SG HT feed	25,000
R4	V2 osc. CG resistance	50,000
R5	Osc. circuit SW damping	6,000
R6	V2 osc. anode HT feed	25,000
R7	V2 CG decoupling	1,000,000
R8	V4 signal diode load resistances	120,000
R9	V4 V2 anode load resistances	250,000
R10	V4 V2 anode load resistances	250,000
R11	V1, V2 and V3 HT feed	1,000
R12	IF stopper	200,000
R13	AVC line decoupling	250,000
R14	Manual volume control	500,000
R15	V5 CG decoupling	250,000
R16	Variable tone control	500,000
R17	V5 anode load resistance	50,000
R18	V6 GB resistance	50,000
R19	V6 grid stopper	50,000
R20	V6 GB resistance	50,000
R21	V6 GB resistance	50,000
R22	Negative feed-back resistances	50
R23	V1, V2 and V3 fixed GB, V5	15
R24	GB and AVC delay resistances	30
R25	V5 V6 HT feed	2,000,000
R26	T.L. CG decoupling	2,500,000

CONDENSERS		Values (μF)
C1	Alternative aerial series	0.00005
C2	V1 CG decoupling	0.05
C3	Aerial LW fixed trimmer	0.000067
C4	HT circuit RF by-pass	0.05
C5	AVC line decoupling	0.05
C6	V2 pentode CG decoupling	0.05
C7	RF LW sec. fixed trimmer	0.000067
C8	V2 SG decoupling	0.05
C9	1st IF transformer fixed tuning condensers	0.00015
C10	Osc. circuit LW fixed trimmer	0.000145
C11	Osc. circuit MW fixed tracker	0.000395
C12	Osc. circuit LW fixed tracker	0.000215
C13	V2 osc. anode coupling	0.05
C14	V3 CG decoupling	0.05
C15	HT circuit RF by-pass	0.05
C16	1st IF transformer fixed tuning condensers	0.00015
C17	2nd IF trans. 1 Pri.	12.0
C18	2nd IF trans. 2 Pri.	12.0
C19	2nd IF trans. 3 Pri.	12.0
C20	IP by-pass	0.000125
C21	Coupling to V4 AVC diode	0.00005
C22	V1, V2, V3 anodes decoupling	0.01
C23	AF coupling to V5	0.01
C24	V5 CG decoupling	0.05
C25	Part variable tone control	0.0004
C26	V5 to V6 AF coupling	0.01
C27	V6 cathode by-pass	25.0
C28	Fixed tone corrector	0.0005
C29	HT smoothing condensers	8.0
C30	Speaker field shunt	2.0
C31	V7 cathode RF by-pass	0.0002
C32	Mains RF by-pass	0.01
C33	Mains aerial coupling	0.0005
C34	Auto GB circuit by-pass	50.0
C35	T.L. CG decoupling	0.03
C36	Tuning motor by-pass condensers	0.02
C37	Aerial circuit SW trimmer	0.02
C38	Aerial circuit MW trimmer	0.00003
C39	Aerial circuit LW trimmer	0.00003
C40	Aerial circuit tuning	0.00003
C41	RF trans. sec. SW trimmer	0.00003
C42	RF trans. sec. MW trimmer	0.00003
C43	RF trans. sec. LW trimmer	0.00003
C44	Oscillator circuit tuning	—
C45	Osc. circuit MW trimmer	0.00003
C46	Osc. circuit LW trimmer	0.00003
C47	Osc. circuit MW tracker	0.00003
C48	Osc. circuit LW tracker	0.00003

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil	0.2
L2	Aerial MW coupling coil	20.0
L3	Aerial LW coupling coil	990.0
L4	Aerial SW tuning coil	0.3
L5	Aerial MW tuning coil	5.6
L6	Aerial LW tuning coil	13.0
L7	RF trans. SW pri. coil	0.3
L8	RF trans. MW pri. coil	1.4
L9	RF trans. LW pri. coil	6.5
L10	RF trans. SW sec. coil	0.1
L11	RF trans. MW sec. coil	5.6
L12	RF trans. LW sec. coil	13.0
L13	Osc. circuit SW tuning coil	0.005
L14	Osc. circuit MW tuning coil	2.3
L15	Osc. circuit LW tuning coil	4.4
L16	Oscillator SW resonance	10-25
L17	1st IF trans. 1 Sec.	12.0
L18	1st IF trans. 2 Sec.	12.0
L19	1st IF trans. 3 Sec.	12.0
L20	Speaker speech coil	2.5
L21	Speaker field coil	1,000.0
L22	HT smoothing choke	530.0
L23	Output trans. 1 Pri.	700.0
T1	Output trans. 1 Sec.	0.3
	Pri., total	23.0
	Heater sec.	0.05
T2	Mains Rect. heat. sec.	0.1
	HT sec., total	470.0
	Motor sec., total	1.0
Tuning Motor	Between either selector disc and chassis	6.3
Sr-S43	Waveband switches	—
S44-46	Radio/gram change switches	—
S47-48	Feed-back control switches	—
S49-52	Waveband indicator switches	—
S53	Receiver tuning switch	—
S54	Internal speaker switch	—
S55	Mains switch, ganged R15	—
S56-58	Manual auto change switches	—
S59-57	MW auto selector switches	—
S68-77	LW auto selector switches	—
S78	Auto indicator lamp switch	—

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 3) are those measured in our receiver when it was operating on mains of 230 V, tapping on the mains transformer. The "Manual" button was depressed, the receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input. Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP4B	220	5.7	220	2.0
V2 TH4B	Oscillator	85	5.3	—
V3 VP4B	85	5.4	220	3.4
V4 2D4B	220	9.2	—	—
V5 TDD4	152	1.9	—	—
V6 PenA4	225	38.0	252	5.9
V7 LW4/350	350†	—	—	—
T.L. TV4	18	0.13	—	—
	Target	0.48	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—S1-S52 are all ganged in nine rotary units beneath the chassis, the units being indicated in the under-chassis view, and shown in detail in the diagrams in col. 6. The arrows in the under-chassis view show the directions in which the units are to be viewed. The table (col. 5) gives the switch positions for the four manual settings, starting from fully anticlockwise. A dash indicates open, and C, closed.

S53 is the receiver muting switch, mounted on the tuning motor, and indicated in our plan chassis view. It is operated by a sliding movement of the motor spindle and is closed while the motor is running.

S54 is the internal speaker switch, associated with the external speaker sockets at the rear of the cabinet. When the special plug is inserted and rotated anti-

Scale and Indicator Lamps.—There are four scale lamps, five indicator lamps for the wave ranges, etc., and one station setting indicator lamp (on the rear member of the chassis). They are all Gram MESS types, rated at 3.5 V, 0.15 A, having small bulbs. They are run from a tapping on the motor secondary of T2.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator between control grid (top cap) of V2 and chassis. Switch set to MW, turn volume control to maximum, and short-circuit V2 (see col. 6). Feed in a 495 KC/S signal, and adjust cores of L17, L18, L19 and L20 in turn for maximum output. Check these settings, then remove short from C47.

RF and Oscillator Stages.—With gang at maximum, pointer should be under small green cross about 1 in. below left-hand end of MW scale.

Connect signal generator to A and E sockets, via a suitable dummy aerial.

AUTO-TUNING ADJUSTMENT

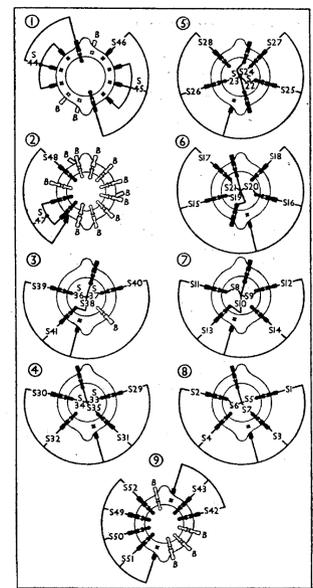
The circuit details of the automatic tuning arrangement is described under "Automatic Tuning Circuit." For fuller information on the direct homing type of motor tuning, see *Radio Maintenance Supplement* for July 23, 1938, or the *ABC of Automatic Tuning*, pages 15 to 18.

Setting up Stations.—Switch set to the appropriate waveband, tune to the required station manually, and then press the button which is to select the station, and the manual button at the same time, so that both remain depressed. Locate the contact clip on the selector rails which has the same number as the auto button chosen, and slide the clip towards the white line on the selector disc. If other contacts are in the way, the clip must be removed from the rail (by unscrewing knurled screw) and replaced where there is no obstruction between it and the white line. If another clip is in the way, being close to the white line, place clip under adjustment on the other rail. The station setting lamp (rear of chassis) should be alight until the clip is over the white line (gap between the two sections of selector plate). Move clip carefully until the lamp goes out, and it is mid-way between the two settings at which the lamp lights up. Screw up knurled screw, and place correct name tab in escutcheon at front of receiver.

Altering No. of MW and LW Stations.—When the set is sent out, it is set up for five MW and three LW stations. If, say, four MW and four LW are required, certain of the press-button switch wiring must be altered. If the circuit diagram and press-button switch diagram are examined it will be seen that certain switches are dotted in, and are marked "not used." These are brought into use when transferring buttons to another band. The leads from the contact clips which go to switch contacts in the upper row on the unit (looking from beneath the chassis) belong to MW stations; those from contact clips going to contacts in the lower row belong to LW stations. To change a button from MW to LW, or vice-versa, its lead is unsoldered from the tag on the press-button unit and transferred to the corresponding tag in the other row of contacts. Thus to set up for eight MW stations, all the leads from the clips will be on tags in the upper row.

TABLE AND DIAGRAMS OF ROTARY SWITCH UNITS

Switch	LW	MW	SW	Gram.
S1	—	—	C	—
S2	—	—	C	—
S3	—	—	C	—
S4	—	—	C	—
S5	—	—	C	—
S6	—	—	C	—
S7	—	—	C	—
S8	—	—	C	—
S9	—	—	C	—
S10	—	—	C	—
S11	—	—	C	—
S12	—	—	C	—
S13	—	—	C	—
S14	—	—	C	—
S15	—	—	C	—
S16	—	—	C	—
S17	—	—	C	—
S18	—	—	C	—
S19	—	—	C	—
S20	—	—	C	—
S21	—	—	C	—
S22	—	—	C	—
S23	—	—	C	—
S24	—	—	C	—
S25	—	—	C	—
S26	—	—	C	—
S27	—	—	C	—
S28	—	—	C	—
S29	—	—	C	—
S30	—	—	C	—
S31	—	—	C	—
S32	—	—	C	—
S33	—	—	C	—
S34	—	—	C	—
S35	—	—	C	—
S36	—	—	C	—
S37	—	—	C	—
S38	—	—	C	—
S39	—	—	C	—
S40	—	—	C	—
S41	—	—	C	—
S42	—	—	C	—
S43	—	—	C	—
S44	—	—	C	—
S45	—	—	C	—
S46	—	—	C	—
S47	—	—	C	—
S48	—	—	C	—
S49	—	—	C	—
S50	—	—	C	—
S51	—	—	C	—
S52	—	—	C	—



Diagrams of the nine rotary switch units, as seen looking at the underside of the chassis, in the directions of the arrows in the under-chassis view.