

**COMPONENTS AND VALUES**

RESISTANCES		Values (ohms)
R1	V1 hexode CG decoupling	1,000,000
R2	V1 fixed GB resistance	100
R3	V1 osc. CG resistance	30,000
R4	V1 SG and osc. anode HT feed	20,000
R5	V2 CG decoupling	2,000,000
R6	V2 grid stabiliser	50
R7	V2 SG HT feed	50,000
R8	V2 anode HT feed	10,000
R9	IF stopper	250,000
R10	Manual volume control	500,000
R11	V3 triode grid stopper	100,000
R12	V3 signal diode load	500,000
R13	V3 GB and AVC delay	1,000
R14	V3 triode anode decoupling	10,000
R15	V3 triode anode load	50,000
R16	V3 AVC diode load	1,000,000
R17	V4 CG resistance	500,000
R18	V4 grid stopper	100,000
R19	V4 GB resistance	200
R20	Variable tone control	50,000

CONDENSERS		Values (μF)
C1	Aerial SW series condenser	0.00005
C2	Aerial LW circuit shunt	0.0008
C3	V1 hexode CG decoupling	0.5
C4	Aerial SW fixed trimmer	0.000005
C5	Aerial MW fixed trimmer	0.00018
C6	Aerial LW fixed trimmer	0.00003
C7	1st IF trans. pri. trimmer	0.00018
C8	1st IF trans. sec. trimmer	0.00018
C9	V1 cathode by-pass	0.05
C10	V1 osc. CG condenser	0.00003
C11	Auto osc. part trimmer (with C12)	0.00034
C12	Osc. circuit LW tracker (manual) part osc. circuit trimmer (auto)	0.000376
C13	Osc. circuit MW tracker	0.000556
C14	Osc. circ. SW fixed trimmer	0.00015
C15	Osc. circ. MW fixed trimmer	0.00001
C16	Osc. circ. LW fixed trimmer	0.000135
C17	V1 osc. anode SW coupling	0.00005
C18	V1 SG and osc. anode decoupling	0.05
C19	V2 CG decoupling	0.05
C20	V2 SG decoupling	0.05
C21	V2 anode decoupling	0.05
C22	2nd IF trans. pri. trimmer	0.00018
C23	2nd IF trans. sec. trimmer	0.00018
C24	Coupling to V3 AVC diode	0.0001
C25	Coupling to V3 signal diode	0.0001
C26	IF by-pass	0.0001
C27	AF coupling to V3 triode	0.0005
C28*	V3 triode anode decoupling	2.0
C29*	V3 cathode by-pass	50.0
C30	V3 triode to V4 AF coupling	0.03
C31*	V4 cathode by-pass	50.0
C32	Fixed tone corrector	0.003
C33	Part of variable tone control	0.03
C34*	HT smoothing	16.0
C35*	HT smoothing	16.0
C36†	Aerial circuit SW trimmer	0.00001
C37†	Aerial circuit MW trimmer	0.00001
C38†	Aerial circuit LW trimmer	0.00001
C39†	Aerial circuit tuning	—
C40†	Oscillator circuit tuning	—
C41†	Osc. circuit SW trimmer	0.00001
C42†	Osc. circuit MW trimmer	0.00001
C43†	Osc. circuit LW trimmer	0.00001
C44†	1st IF trans. pri. tuning	0.00006
C45†	1st IF trans. sec. tuning	0.00006
C46†	2nd IF trans. pri. tuning	0.00006
C47†	2nd IF trans. sec. tuning	0.00006
C48†	Aerial LW auto tuning	0.00045
C49		0.00025
C50†		0.00015
C51	Aerial circuit MW automatic tuning trimmers	0.00016
C52†		0.00015
C53		0.00006
C54†		0.00015
C55†		0.00015
C56	Auto osc. circuit LW trimmer	0.000316

\* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil	0.1
L2	Aerial MW coupling coil	0.6
L3	Aerial LW coupling coil	30.0
L4	Aerial SW tuning coil	0.05
L5	Aerial MW tuning coil	1.3
L6	Aerial LW tuning coil	14.0
L7	Osc. circuit SW tuning coil	0.1
L8	Osc. circuit MW tuning coil	1.6
L9	Osc. circuit LW tuning coil	3.0
L10	Oscillator SW reaction	0.2
L11	Oscillator MW reaction	1.1
L12	Oscillator LW reaction	2.2
L13	1st IF trans. Pri.	4.0
L14	1st IF trans. Sec.	4.0
L15	2nd IF trans. Pri.	4.0
L16	2nd IF trans. Sec.	4.0
L17	Osc. circuit LW auto tuning coil	2.0
L18		1.4
L19	Oscillator circuit automatic tuning coils	1.2
L20		1.0
L21		0.7
L22		2.0
L23	Speaker speech coil	—
L24	Hum neutralising coil	0.15
L25	Speaker field coil	2,000.0
T1	Speaker input trans. Pri.	650.0
	Sec.	0.1
	Pri., total	38.0
T2	Heater sec.	0.1
	Rect. heat. sec.	0.15
	HT sec., total	500.0
S3a	Waveband and manual auto switches	—
S3b		—
S3c		—
S4a	Aerial circuit auto tuning trimmer selector switches	—
S4b		—
S4c		—
S12a	Oscillator circuit auto tuning coil selector switches	—
S12b		—
S12c		—
S17-19	Scale lamp switches	—
S20	Mains switch, ganged R20	—

**VALVE ANALYSIS**

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6X4	256	1.9	75	5.0
V2 6V4	75	4.5	127	2.4
V3 6DD4	96	2.5	—	—
V4 6EN4	240	27.0	256	4.1
V5 6DW4/350	337†	—	—	—

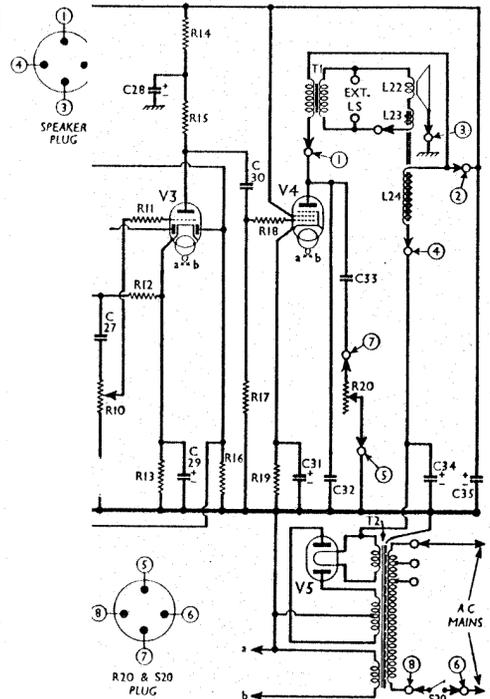
† Each anode, AC.

Valve voltages and currents given in the table above are those measured in our receiver when it was operating on mains of 230 V, using the 230 V tapping on the mains transformer. 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.

**GENERAL NOTES**

**Switches.**—There are eight press-buttons, and each one controls six 2-pole shorting switches, three on each side of the unit. In our circuit diagram and other illustrations the switches are grouped in threes, so that in this way each button controls two numbered groups of three, the individual switches in each group being indicated by suffix letters a, b and c following the group number. There are thus sixteen group numbers, and forty-eight individual switches in the press-button unit.



The arrangement and operation of the switches is fully explained near the beginning of the Circuit Description, and it should be noted that when a button is "out," the associated a and b switches are open, and the c switches closed. When a button is "in," its a and b switches are closed and its c switches are open.

This holds for all buttons, and there is therefore no point in giving a switch table.

Numbering the buttons from left to right looking at the front of the receiver, the first five buttons control pre-set stations, the sixth is the LW button, the seventh the SW and the eighth, on the right, the MW.

The switch groups controlled by the various buttons are: Button 1, S4 and S12; 2, S5 and S13; 3, S6 and S14; 4, S7 and S15; 5, S8 and S16; 6, S3 and S11; 7, S1 and S9; 8, S2 and S10.

In addition to the actual press-button switches, there are three scale lamp switches, S17-S19, controlled by the three right-hand (wavechange) buttons. These switches are formed by the metal plungers of the three press-buttons (which are earthed) and three spring contacts into which the plungers slide when the buttons are depressed.

**Scale and Indicator Lamps.**—In all five lamps are used in this receiver, and they are all Ever Ready MES types, rated at 6.2 V, 0.3 A. Three of them are for illuminating the manual tuning scale, and fit into a holder at the back of the scale. If one of these lamps has to be replaced, see that the holder is replaced the correct way round, otherwise the LW scale will be illuminated on MW, and vice versa. The lamps are switched by S17-S19, ganged with the waveband press-buttons.

The other two lamps are mounted in holders at the front of the chassis, and serve to illuminate the press-button indicators.

## ALIGNMENT OF MANUAL CIRCUITS

**F Stages.**—Press MW manual tuning ton, tune to 300 m on the scale, turn volume control to maximum, and tone control to “low.” A damping circuit consisting of a 30,000  $\Omega$  resistor in series with a 0.05  $\mu\text{F}$  condenser in series must be used where indicated below.

Connect signal generator between control grid (top cap) of **V2** and chassis, and feed in a 465 KC/S signal. Connect damping circuit between anode of **V2** and chassis, and adjust **C47** for maximum output. Connect damping between **V3** signal diode (pin 1) and chassis, and adjust **C46** for maximum output.

Connect signal generator between control grip (top cap) of **V1** and chassis, connect damping between anode of **V1** and chassis, and adjust **C45** for maximum output. Connect damping circuit between control grid (top cap) of **V2** and chassis, and adjust **C44** for maximum output.

**RF and Oscillator Circuits.**—With gang at maximum, indicator should coincide with the tops of the wavelength scales. Remove the escutcheon plate from front of cabinet if chassis has not been removed. Turn volume control to maximum, and tone control to “low.” Connect signal generator to A and E sockets.

**SW.**—Press SW button, and tune to 18 m on scale. Feed in an 18 m (16.67 MC/S) signal, and adjust **C41** (above SW button) and **C36** (below SW button) for maximum output. Check calibration at 50 m.

**MW.**—Press MW button, and tune to 300 m on scale. Feed in a 300 m (1,000 KC/S) signal, and adjust **C42** (above MW button) and **C37** (below MW button) for maximum output. Check calibration at 500 m.

**LW.**—Press LW button, and tune to 1,500 m on scale. Feed in a 1,500 m (200 KC/S) signal, and adjust **C43** (above LW button) and **C38** (below LW button) for maximum output. Check calibration at 1,900 m.

## PRE-SET STATION SELECTION

Stations can be selected by buttons 1 to 5, numbering from the left. The wavelength ranges covered by each button are: 1,

**BUSH**  
**PB51**

1, 200-2,000 m; 2, 450-550 m; 3, 375-475 m; 4, 275-375 m; 5, 200-300 m.

To select a station accurately, it is advisable to use a DC voltmeter (0-60 V), connected across the two tags on the chassis deck, as an indicator. Adjustments should always be made for *minimum* reading on the meter.

If the chassis is still in the cabinet, remove the escutcheon of the press-button unit (two instrument-head screws).

Connect the aerial and earth to the receiver and press the button to be used for the desired station. Turn the core adjustment for the associated oscillator coil (above the button) until the index mark is at the approximate wavelength on the small calibrated scale. Then carefully turn the adjustment until the loudest output from the desired station (*minimum* voltmeter reading) is obtained.

Adjust the associated aerial circuit trimmer (below the button) for maximum output (*minimum* voltmeter reading).

Re-adjust both trimmers carefully as a final check.

**NOTE.**—Any adjustment of the manual tuning trimmer **C43** will affect the tuning of the pre-selected stations. After manual circuit alignment, therefore, the cores of **L17-L21** must be re-adjusted.

Any adjustment of the MW manual tuning aerial trimmer **C37** will necessitate re-adjustment of the MW pre-set station trimmers **C50, C52, C54, C55**. Similarly any adjustment of the LW manual tuning aerial trimmer **C38** will affect the setting of **C48**.

If a new TH<sub>4</sub>A valve has to be fitted, it may be found necessary to re-adjust the pre-set oscillator circuits. The best way to do this is to use the LW manual trimmer **C43** for correction purposes. Press the fifth button, which controls a station near the bottom of the MW band, and adjust **C43** until this station is at its maximum volume. When this is so, all the other pre-selected stations will be correct. The slight adjustment of **C43** which is necessary will not affect the LW manual alignment appreciably.