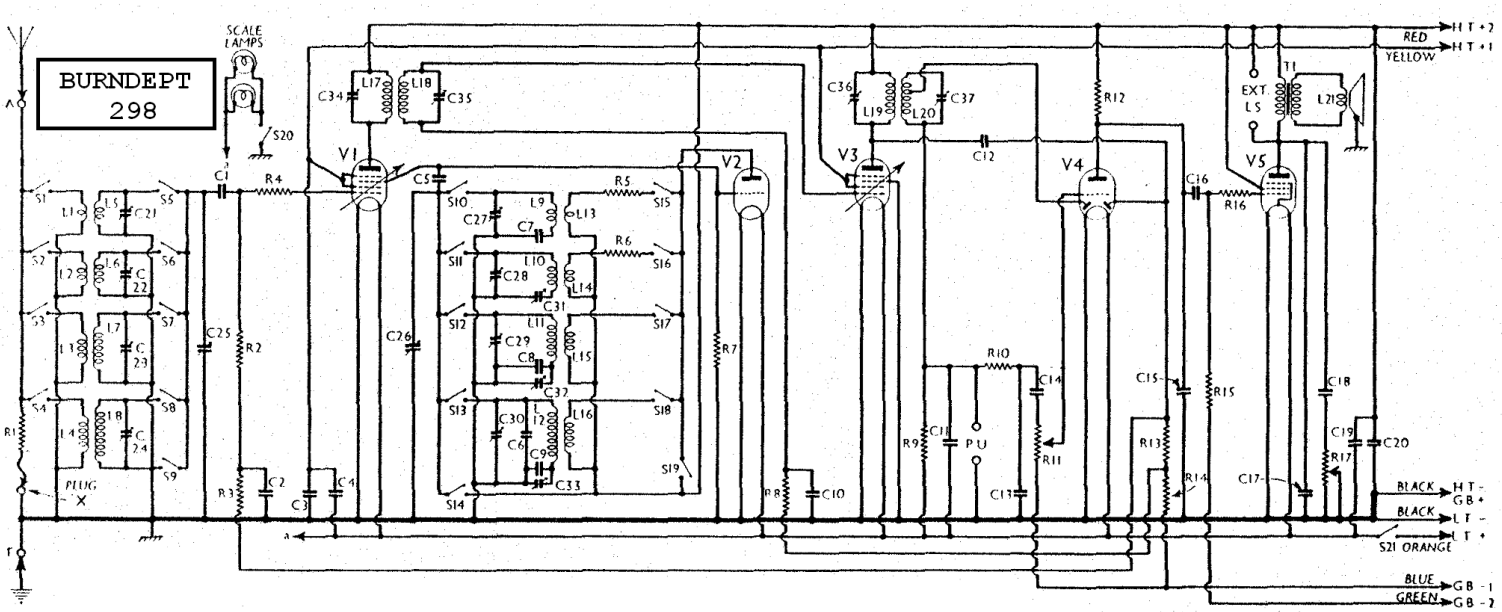


Removing Speaker.—If it is desired to remove the speaker from the cabinet, unsolder the leads and remove the nuts and lock washers from the four screws holding it to the sub-baffle. *When replacing*, see that the transformer is at the bottom and connect the leads as above.

COMPONENTS AND VALUES

	CONDENSERS	Values (μF)
C1	V1 CG condenser	0·0001
C2	V1 CG decoupling	0·1
C3, C4	V1, V2 SG's by-pass condensers	0·1
C5	V2 CG condenser	0·0001
C6	Osc. circuit LW fixed trimmer	0·00004
C7	Osc. circuit SW1 tracker	0·005
C8	Osc. circ. MW fixed tracker	0·00048
C9	Osc. circ. LW fixed tracker	0·00015
C10	V3 CG decoupling	0·1
C11	IF by-pass	0·0001
C12	Coupling to V4 AVC diode	0·0001
C13	IF by-pass	0·001
C14	AF coupling to V4 triode	0·05
C15	IF by-pass	0·0005
C16	AF coupling to V5	0·05
C17	Fixed tone corrector	0·001
C18	Part of variable tone control	0·05
C19, C20	HT circuit RF by-passes	0·1, 0·25
C21‡	Aerial circuit SW1 trimmer	—
C22‡	Aerial circuit SW2 trimmer	—
C23‡	Aerial circuit MW trimmer	—
C24‡	Aerial circuit LW trimmer	—
C25†	Aerial circuit tuning	—
C26†	Oscillator circuit tuning	—
C27‡	Osc. circuit SW1 trimmer	—
C28‡	Osc. circuit SW2 trimmer	—
C29‡	Osc. circuit MW trimmer	—
C30‡	Osc. circuit LW trimmer	—
C31‡	Osc. circuit SW2 tracker	—
C32‡	Osc. circuit MW tracker	—
C33‡	Osc. circuit LW tracker	—
C34‡	1st IF trans. pri. tuning	—
C35‡	1st IF trans. sec. tuning	—
C36‡	2nd IF trans. pri. tuning	—
C37‡	2nd IF trans. sec. tuning	—

† Variable. ‡ Pre-set.

	RESISTANCES	Values (ohms)
R1	Aerial sensitivity shunt	150
R2	V1 CG resistance	500,000
R3	V1 CG decoupling resistance	500,000
R4	V1 CG circuit stabiliser	50
R5	Oscillator SW1 reaction stabiliser	100
R6	Oscillator SW2 reaction stabiliser	250
R7	V2 CG resistance	50,000
R8	V3 CG decoupling resistance	500,000
R9	V4 signal diode load	500,000
R10	*IF stopper*	50,000
R11	Manual volume control	500,000
R12	V4 triode anode load	100,000
R13, R14	V4 AVC diode load resistances	1,000,000, 500,000
R15	V5 CG resistance	1,000,000
R16	V5 CG IF stopper	50,000
R17	Variable tone control	50,000

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial SW1 coupling coil	0·7
L2	Aerial SW2 coupling coil	0·4
L3	Aerial MW coupling coil	1·2
L4	Aerial LW coupling coil	95·0
L5	Aerial SW1 tuning coil	0·05
L6	Aerial SW2 tuning coil	0·4
L7	*Aerial MW tuning coil*	2·0
L8	Aerial LW tuning coil	10·0
L9	Osc. circuit SW1 tuning coil	0·05
L10	Osc. circuit SW2 tuning coil	0·3
L11	Osc. circuit MW tuning coil	5·6
L12	Osc. circuit LW tuning coil	4·6
L13	Oscillator SW1 reaction	0·4
L14	Oscillator SW2 reaction	38·0
L15	Oscillator MW reaction	60·0
L16	Oscillator LW reaction	1·5
L17	1st IF trans. Pri...	5·0
L18	1st IF trans. Sec...	5·0
L19	2nd IF trans. Pri...	5·0
L20	2nd IF trans. Sec...	5·0
L21	Speaker speech coil	2·5
T1	Speaker input trans. Pri...	630·0
	Speaker input trans. Sec...	0·3
S1-S19	Waveband switches	—
S20	Scale lamps switch	—
S21	LT circuit switch, ganged R11	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new HT battery reading 137 V on the HT section, on load. The receiver was tuned to the lowest wavelength on the medium band, the volume control was at maximum, and the local-distant plug was in the distant position. There was no signal input.

If, as in our case, **V1** should become unstable when its anode current is being measured, it can be stabilised by connecting a non-inductive condenser of about 0.1 μF from grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2B	137	0·5	54	0·8
V2 210DET	137	5·7	—	—
V3 VP2B	137	1·3	54	0·4
V4 TDD2A	75	0·4	—	—
V5 PM22A	134	3·2	137	0·5

GENERAL NOTES

Switches.—The wavechange switches **S1-S19** are in two ganged rotary units beneath the chassis, indicated in our under-chassis view, and shown in detail in the diagrams on page iv. It will be noted on examining the actual units that each has a large plate on the rotor which shorts together all the switches, except the two in use in each unit. On gram. the switches **S9** and **S14** mute the radio circuits.

The makers' diagram shows the contact which is marked blank (B) in our diagrams connected to chassis. This modification would add a switch which would provide extra muting on gram.

In our circuit and switch diagrams we have omitted the switches formed by the

centre plates for the sake of clarity. If they were included the total number of wavechange and gramophone switches would be considerably increased.

The table (col. 2) gives the switch positions for the five control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

S20 is the scale lamps switch, incorporated in the volume control knob. It is normally open, but when the small button is pressed, it closes and switches on the scale lamps.

S21 is the LT circuit switch, ganged with the volume control, **R11.**

Coils.—**L1, L5**; **L2, L6**; **L9, L13** and **L10, L14** are on four tubular unscreened units beneath the chassis, **L3, L4, L7, L8**; **L11, L12, L15, L16,** and the IF transformers **L17, L18** and **L19, L20** are in four screened units on the chassis deck.

Scale Lamps.—These are two Tre Vita MES types, rated at 2·0 V, 0·3 A. They are switched in circuit by **S20.**

External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance external speaker.

Batteries.—LT 2 V cell, Vidor 2V 45 AH mass type; HT and GB, Vidor combined HT and GB battery, 135 V HT plus 9 V GB (Type L5014/18496).

Battery Leads and Voltages.—Black lead, spade tag, LT negative; orange lead, red spade tag, LT positive 2 V; black lead and plug, HT negative; yellow lead and plug, HT positive 1, + 54 V; red lead and plug, HT positive 2, + 135 V; blue lead and plug, GB negative 1, — 1·5 V; green lead and plug, GB negative 2, — 4·5 V.

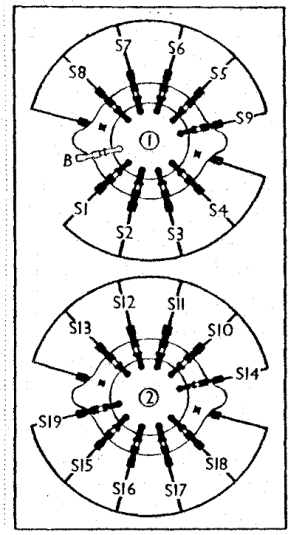
Sensitivity Device.—A plug and socket arrangement (**X**) at the rear of the chassis serves to connect **R1** to chassis (and thus across the **A** and **E** connections) when receiving powerful stations.

Tone Control R17.—This is normally fitted on an escutcheon at the right of the cabinet, but is shown on the right of our under-chassis view.

TABLE AND DIAGRAMS OF THE SWITCH UNITS

Switch	Gram. (G)	SW1 (1)	SW2 (2)	MW (3)	LW (4)
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	—	—	—	—

Diagrams of the switch units, drawn as seen when looking from the rear of the under-side of the chassis. The table on the left shows the switch positions for the five control settings.



CIRCUIT ALIGNMENT

For alignment the volume control should be at maximum. With the gang fully meshed the pointer should coincide with the two ends of the scales.

IF Stages.—Remove the grid connector from the top of **V1,** and connect signal generator to top cap of the valve and chassis, with a 0·25 MO resistance across these two points. Short **C26.**

Feed in a 473 KC/S (634·2 m) signal, and adjust **C37, C36, C35** and **C34** in that order for maximum output. Repeat with low signal input, and check by swinging generator from 468 to 478 KC/S, noting that resonance occurs exactly at 473 KC/S.

Remove short from **C26** and replace normal top cap of **V1.**

RF and Oscillator Stages.—Connect signal generator to **A** and **E** sockets, and see that **R1** is out of circuit.

Switch set to LW tune to 750 m on scale, feed in a 750 m signal, and adjust **C30,** then **C24** for maximum output. Feed in a 2,000 m signal, tune it in on receiver, and adjust **C33** for maximum output, rocking the gang slightly for optimum results. Re-trim **C30** and **C24** and re-track **C33** until no further improvement results.

On the MW (3) band and SW2 (2) band a similar procedure is adopted. On MW adjust **C29** and **C23** at 200 m and **C32** at 550 m. On SW2, adjust **C28** and **C22** at 50 m, and **C31** at 170 m.

On the SW1 (1) band, there is no variable tracker, so **C27** and **C21** are adjusted at 15 m. Trimming is very critical on this band, and care must be taken to see that the pressure of the trimming tool is not affecting the process. If a dummy aerial is used with the signal generator, it should be replaced by a 40 $\mu\mu$F fixed condenser on the SW1 band.

PRESS-BUTTON UNIT

The system used in this set was fully described and illustrated in Part 3c of the series of articles on Automatic Tuning, published in *Radio Maintenance*, dated May 28, 1938. It is also given in the *ABC of Automatic Tuning*, pp. 2 and 3.

The makers' instructions for setting stations are as follows:

Behind the cabinet will be found a large knob, in the centre of which is a slotted screw. Hold the knob and undo the screw about one turn with a coin. Decide upon the six stations desired for push button tuning and select the one with the lowest wavelength. Carefully tune to this station and then depress the push button to its fullest extent. Now tune to the next station and depress the second button, and so on until each station has been tuned and its button set. To make quite certain all selected stations are accurately in tune, check each again. *It is important to commence and finish setting and checking on the station with the lowest wavelength required.*

These settings must now be locked, and to do this tune the receiver to 350 m, then while holding the large knob at the back of the cabinet tighten the slotted screw.

The above operations must be repeated when changing a button setting, always remembering to check the existing unchanged settings before again locking the slotted screw.

It is essential that the buttons must be fully pushed down to tune accurately. Incidentally, push-button tuning is only intended for the MW and LW ranges.