



### COMPONENTS AND VALUES

CONDENSERS	Values (μF)
C1	Aerial IF filter tuning .. 0.000068
C2	Aerial coupling condenser .. 0.0004
C3	Aerial circuit LW fixed trimmer .. 0.00003
C4	V1 pentode CG condenser .. 0.0001
C5	V1 pentode CG decoupling .. 0.02
C6	V1 osc. CG condenser .. 0.000025
C7	1st IF trans. top coupling .. 0.000068
C8	V1 osc. CG condenser .. 0.000068
C9	HT circuit RF by-pass .. 0.1
C10	V1 osc. anode coupling .. 0.0002
C11	V2 CG decoupling .. 0.02
C12	2nd IF trans. top coupling .. 0.000025
C13	V3 CG decoupling .. 0.0001
C14	IF by-pass condensers .. 0.0001
C15	AF coupling to V5 .. 0.02
C16	Coupling to V4 AVC diode .. 0.0001
C17	Fixed tone corrector .. 0.006
C18	Part of variable tone control .. 0.01
C19	HT reservoir condenser .. 4.0
C20	Aerial circuit LW trimmer .. —
C21	Aerial circuit MW trimmer .. —
C22	Aerial circuit manual tuning .. —
C23	Oscillator circuit manual tuning .. —
C24	1st IF trans. pri. tuning .. —
C25	1st IF trans. sec. tuning .. —
C26	2nd IF trans. pri. tuning .. —
C27	2nd IF trans. sec. tuning .. —
C28	3rd IF trans. pri. tuning .. —
C29	3rd IF trans. sec. tuning .. —
C30	—
C31	AUTO-TUNING UNIT
C32	Aerial LW coupling condenser .. 0.00125
C33	—
C34	—
C35	Aerial circuit automatic tuning trimmers .. 0.000175
C36	—
C37	—
C38	—
C39	—
C40	—
C41	—
C42	—
C43	Oscillator circuit automatic tuning trimmers .. 0.000175
C44	—
C45	—
C46	—
C47	—
C48	Oscillator circuit LW trimmers .. 0.000175
C49	—
C50	Osc. circuit MW trimmer .. —
C51	Osc. circuit LW tracker .. 0.00101
C52	Osc. circuit MW tracker .. 0.000541

\*Electrolytic. †Variable. ‡Pre-set. §Made up of two in parallel.

### OTHER COMPONENTS

	Approx. Values (ohms)
L1	Aerial IF filter coil .. 9.0
L2	Aerial coupling coil .. 14.0
L3	Aerial LW tuning coil .. 12.0
L4	Aerial MW tuning coil .. 2.7
L5	Osc. circuit LW tuning coil .. 3.5
L6	Osc. circuit MW tuning coil .. 1.6
L7	Oscillator reaction coil .. 6.5
L8	1st IF trans. Pri. .. 6.0
L9	1st IF trans. Sec. .. 6.0
L10	2nd IF trans. Pri. .. 6.0
L11	2nd IF trans. Sec. .. 6.0
L12	3rd IF trans. Pri. .. 6.0
L13	3rd IF trans. Sec., total .. 6.0
L14	Speaker speech coil .. 1.7
Tr	Speaker input trans. Pri. .. 650.0
S1x, x	Aerial circuit manual wave-band switches .. 0.15
S8a, x	—
S7a to S2x to	Aerial circuit auto selector switches .. —
S7x	—
S8a, x	Oscillator circuit manual wave-band switches .. —
S16a, x	—
S10a to S15a	Oscillator circuit auto selector switches .. —
S10x to S15x	—
S17	HT and GB circuits switch .. ganged
S18	LT circuit switch .. R11

### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an HT battery reading 120 V. 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 TP23 ..	118	1.1	54	0.6
	50	1.6	—	—
V2 VP2B	118	0.7	118	0.3
V3 VP2B	118	0.9	118	0.3
V4 2D2	—	—	—	—
V5 PM22D	116	3.5	118	0.6

### GENERAL NOTES

**Switches.**—S1a to S16x are all push-button switches contained in a 2-bank push-button unit with eight plungers. Each plunger controls four switches, two on the upper and two on the lower paxolin terminal strip. S1x to S16x are of the "series" type, incorporating "L" shaped moving contacts, while S1a to S16a are of the ordinary type, consisting of two straight contacts which are shorted when

Circuit diagram of the Decca PT/ML/B 2-band battery press-button superhet. The auto-unit is shown in a dotted enclosure at the bottom left-hand corner of the diagram. Note that in the main part of the diagram the MW coils are placed below the LW ones, a reversal of the usual practice. Thus L4 and L6 are the MW coils. The battery connections are explained under General Notes.

the plunger is depressed. Push-button switch units of this type were described in articles 8 and 9 of the series "Automatic Tuning" (April 30 and May 7, 1938).

Of the four switches controlled by each plunger, two are of the "L" type, and two of the ordinary type. Thus the left-hand plunger (in our view of the auto-unit), controls S1x, S1a, S9x and S9a. The second from the left controls S2x, S2a, S10x and S10a, and so on.

When all the buttons are out, S1x to S16x are closed and S1a-S16a are open.

When any button is depressed, only its four associated switches are affected: the two "L" types open, while the two ordinary types close.

Thus when the left-hand button is depressed, S1x and S9x open, and S1a and S9a close. All the other switches remain unaltered.

The tags of all the switches are shown in our view of the auto-unit. The tags of the "L" contacts have no external connection to them; in addition, two tags (second from the right, top and bottom bank) are blank, and do not form part of the circuit.

The functions of the various switches are given in the table "Other Components."

S17, S18 are the QMB battery circuit switches, in the main chassis, ganged with the volume control R11.

**Coils.**—L1; L3; L2, L4 and L5-L7 are in four unscreened units beneath the main chassis. The IF transformers L8, L9; L10, L11 and L12, L13 are in three screened units on the chassis deck, with their associated Tempa trimmers.

**V2, V3 Valveholders.**—Note that the tag of socket 6 on each of these holders is used as a bearer. Pin 6 on the Tungstam VP2B is blank.

**Condensers C1, C8.**—Note that these each consist of two disc-type condensers in parallel.

**Resistance R8.**—This has a value of 70,000  $\Omega$  in our chassis, but is shown as 700,000  $\Omega$  in the makers' diagram.

**Batteries.**—LT, 2 V accumulator cell; HT, 120 V dry HT battery (no tappings needed); GB, 9 V tapped GB battery.

**Battery Leads and Voltages.**—Black lead, spade tag, LT negative; red lead, spade tag, LT positive 2 V; black lead and plug, HT negative; red lead and plug, HT positive 120 V.

The GB leads are a little confusing, since part of the battery is used to provide a positive bias relative to chassis. The red lead and plug, marked Grid +, goes into the positive socket of the GB battery. The yellow lead and plug, marked Grid — 2, goes into the negative 6 V socket of the battery, which is thus connected to chassis. The black lead and plug, marked Grid — 1 goes into the negative 9 V socket of the battery, thus applying a negative voltage of 3 V, with respect to chassis.

**Auto-Tuning Unit.**—This is shown, with all the components included in it, at the bottom left-hand corner of the circuit diagram, and in a separate chassis illustration. All the interconnecting leads (of which there are eight) are indicated and colour-coded on the circuit diagram and on the under-chassis view. Their connection points on the auto-tuning unit are also indicated and numbered on the illustration of this unit. In addition, although there is no wire connecting them the auto-unit and the main chassis are connected electrically by the bolts holding them together.

The auto-unit contains the switches **S1a** to **S16x** (see under switches), the fourteen Tempa trimmers, external parallel fixed trimmers across certain of the Tempa types (**C34**, **C38**, **C42**, **C46** and **C48**), the LW coupling condenser **C31** and the fixed trackers **C51** and **C52**.

Of the Tempa trimmers, **C49** and **C50** are LW and MW trimmers (the former having **C48** across it). The remaining twelve are for the six pre-set stations.

The circuit may seem a little confusing in that **C31** and **C48** to **C52** are shown in the auto-unit, but as they are actually in this part of the receiver it was thought best to place them similarly in the circuit diagram. By tracing this out, it will be seen that they are actually in their usual positions relative to the tuning coils and the gang condenser. Note, however, that the LW coils are *above* the MW coils, a reversal of the usual practice. Thus **L3** and **L5** are LW coils, and **L4** and **L6** MW coils.

## CIRCUIT ALIGNMENT

**IF Stages.**—According to the makers, the IF trimmers are adjusted at the factory for the correct response curve with an oscilloscope, and should not be touched unless they have been tampered with, or a new transformer has been fitted. The IF is 465 KC/S and alignment follows the usual practice.

**IF Filter.**—To adjust this, feed a 465 KC/S signal into the **A** and **E** sockets, tune to bottom of LW band, and adjust core of **L1** for *minimum* output.

**RF and Oscillator Stages.**—Set pointer so that it is vertical when gang is at maximum.

**MW.**—Press MW manual button, connect signal generator to **A** and **E** sockets and feed in a 200 m (1,500 KC/S) signal. Tune to 200 m on scale, and adjust **C22** (under main chassis) and **C50** (on auto unit) for maximum output.

**LW.**—Press LW manual button, feed in a 1,200 m (250 KC/S) signal, tune to 1,200 m on scale and adjust **C21** (under main chassis) and **C49** (on auto unit) for maximum output.

Adjustment of the trimmers for the pre-set stations is best carried out on the signals from the stations themselves.