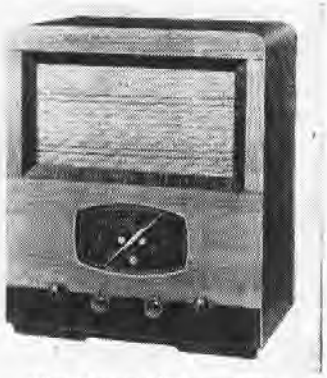
"TRADER" SERVICE SHEET

418

DECCA AW6

3-BAND AC SUPERHET



The Decca AW6 receiver.

THE Decca AW6 is a 4-valve (plus rectifier) AC 3-band superhet, suitable for mains of 200-250 V, 50-60 C/S. The SW range is from 12-32 m.

There is provision for a high impedance external speaker, and for a gramophone pick-up, a gram. position being provided on the wavechange switch. An IF filter and a 261 m rejector (on LW) are incorporated.

Release date : February, 1939.

CIRCUIT DESCRIPTION

Aerial input via series condenser **C2** and coupling coils **L3** (SW), **L4** (MW) and **L5** (LW) to single-tuned circuits **L6, C33** (SW), **L7, C33** (MW) and **L8, C33** (LW). IF filtering by **L1, C1** across aerial circuit. Rejector circuit **L2, C3,** connected in series with LW coupling coil, is tuned to 261 m to prevent MW break-through on LW band.

First valve (**V1, Mullard metallised TH62**) is a triode hexode operating as frequency changer with internal coupling. Triode oscillator grid coils **L9** (SW), **L10** (MW) and **L11** (LW) are tuned by **C34.** Parallel trimming by **C37** (SW), **C10, C38** (MW) and **C11, C39** (LW); series tracking by **C8** (SW), **C9, C35** (MW) and **C36** (LW). Reaction by coils **L12** (SW), **L13** (MW) and **L14** (LW). On SW, **C12** and **L15** are connected across the reaction circuit to maintain a constant oscillator efficiency throughout the band.

Second valve (**V2, Brimar 6U7G**) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C40, L16, L17, C41** and **C42, L18, L19, C43.**

Intermediate frequency 465 KC/S.

Diode second detector is part of double diode triode valve (**V3, Mullard 6Q7G**). Audio frequency component in rectified output is developed across load resistance **R11** and passed via IF stopper resistance **R10,** AF coupling condenser **C19,** switch **S23** and manual volume control **R12** to CG of triode section, which operates as AF amplifier. IF filtering by **C17, R10** and **C18.** Provision for the connection of a gramophone pick-up via switch **S24** across **R12**: when the waveband control is turned to the gramophone position, **S24** closes, while **S23** opens to mute radio.

Second diode of **V3,** fed from a tapping on **L19,** via **C21,** provides DC potential which is developed across load resistance **R16** and fed back through decoupling circuits as GB to FC and IF valves, giving automatic volume control. Delay voltage, together with GB for triode section is obtained from drop along resistance **R13,** which is connected in the cathode circuit of **V3.**

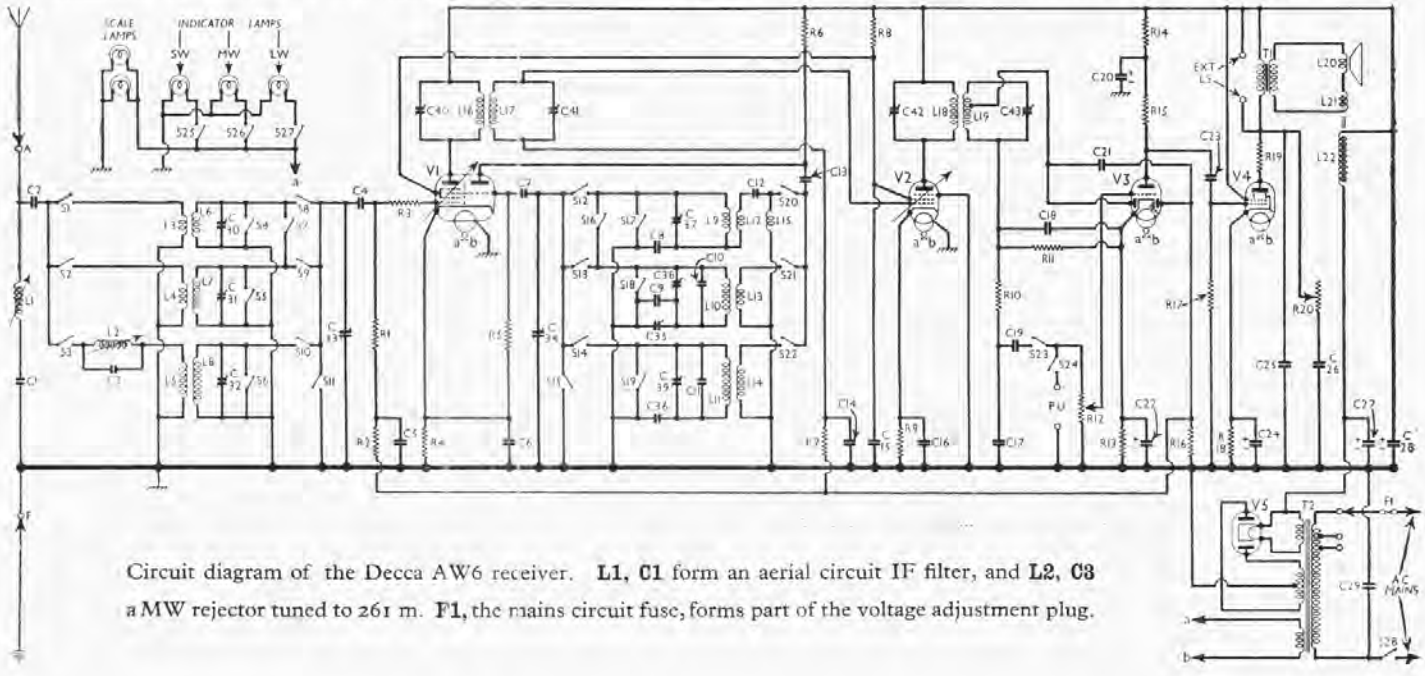
Resistance-capacity coupling by **R15, C23** and **R17** between **V3** triode and beam tetrode output valve (**V4, Mullard 6V6G**). Fixed tone correction by **C25** in anode circuit. Variable tone control by **R20, C26,** also in anode circuit. Provision for connection of external speaker between anode and HT positive line.

HT current is supplied by IHC full-wave rectifying valve (**V5, Brimar 5Z4G**). Smoothing is effected by speaker field **L22** and dry electrolytic condensers **C27** and **C28.** Mains RF filtering by **C29.** Fuse **F1,** which is located in the voltage adjustment plug, performs the dual functions of voltage adjustment connection and mains circuit fuse.

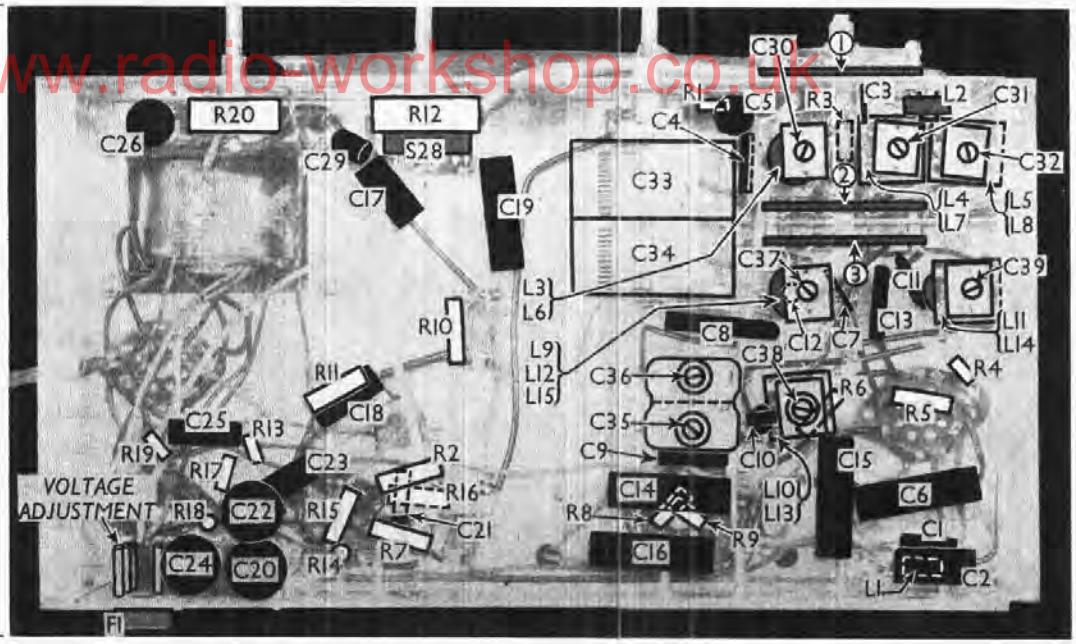
DISMANTLING THE SET

The cabinet is fitted with a detachable bottom, upon removal of which access may be gained to the underside of the chassis.

Removing Chassis.—If it should be necessary to remove the chassis from the cabinet, remove the four control knobs (recessed grub screws) from the front of the cabinet, and the four bolts (with lock-washers and claw washers) holding the chassis to the bottom of the cabinet, when the chassis may be with-



Circuit diagram of the Decca AW6 receiver. **L1, C1** form an aerial circuit IF filter, and **L2, C3** a MW rejector tuned to 261 m. **F1,** the mains circuit fuse, forms part of the voltage adjustment plug.



Under-chassis view. The RF and oscillator trimmers are shown mounted at the ends of their respective coil units. **C12** is mounted inside the **L9, L12, L15** unit. The three switch units are indicated by numbers in circles, and the arrows show the directions in which they are viewed in the diagrams overleaf.

drawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free the chassis entirely, unsolder the three leads from the paxolin connecting strip on the speaker transformer. *When replacing*, note that the two outer control knobs are those with flattened sides, while the two inner ones are circular; a felt washer should be fitted to each control spindle, between the knob and the cabinet; and the speaker leads should be connected as follows, numbering from bottom to top: 1, no connection; 2, red from chassis and red from speaker; 3, no connection; 4, black; 5, blue from chassis and blue from speaker.

Removing Speaker.—Should it be desired to remove the speaker from the cabinet, unsolder the three connecting leads from the panel on the speaker transformer and remove the four hexagon nuts (with lock-washers) holding the rim of the speaker frame to the sub-baffle, when the speaker may be withdrawn.

When replacing, see that the transformer is on the right of the speaker and connect the leads as indicated above.

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 5) are those measured in our receiver when it was operating on mains of 230 V, using the 220-230 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the MW 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.

If valve adaptors are used to connect the meter into circuit for current measurements, care should be taken to see that the valve screen is slipped over **V2** and earthed while the anode and screen currents are being observed, as otherwise instability may occur.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH62	280	2·0	111	2·4
	Oscillator			
	113	4·8		
V2 6U7G	280	8·7	111	2·7
V3 6Q7G	114	0·85	—	—
V4 6V6G	261	44·0	280	5·0
V5 5Z4G	292†			

† Each anode, AC.

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial IF filter tuning	0·00006
C2	Aerial series condenser	0·00043
C3	LW aerial 261 m rejector tuning	0·000012
C4	V1 hexode CG condenser	0·0001
C5	V1 hexode CG decoupling	0·02
C6	V1 cathode by-pass	0·1
C7	V1 osc. CG condenser	0·00006
C8	Osc. circuit SW tracker	0·005
C9	Osc. circuit MW fixed tracker	0·0003
C10	Osc. circuit MW fixed trimmer	0·000012
C11	Osc. circuit LW fixed trimmer	0·00006
C12	Part of SW reaction equaliser	0·000025
C13	V1 osc. anode coupling	0·002
C14	V2 CG decoupling	0·1
C15	V1, V2 SG's decoupling	0·1
C16	V2 cathode by-pass	0·1
C17	IF by-pass condensers	0·0001
C18	IF by-pass condensers	0·0001
C19	AF coupling to V3 triode	0·02
C20*	V3 triode anode decoupling	4·0
C21	Coupling to V3 AVC diode	0·0001
C22*	V3 cathode by-pass	50·0
C23	V3 triode to V4 AF coupling	0·01
C24*	V4 cathode by-pass	50·0
C25	Fixed tone corrector	0·006
C26	Part of variable tone control	0·05
C27*	HT smoothing condensers	10·0
C28*	HT smoothing condensers	10·0
C29	Mains RF by-pass	0·000
C30‡	Aerial circuit SW trimmer	
C31‡	Aerial circuit MW trimmer	
C32‡	Aerial circuit LW trimmer	
C33†	Aerial circuit tuning	
C34†	Oscillators circuit tuning	
C35‡	Osc. circuit MW tracker	
C36‡	Osc. circuit LW tracker	
C37‡	Osc. circuit SW trimmer	
C38‡	Osc. circuit MW trimmer	
C39‡	Osc. circuit LW trimmer	
C40‡	1st IF trans. pri. tuning	
C41‡	1st IF trans. sec. tuning	
C42‡	2nd IF trans. pri. tuning	
C43‡	2nd IF trans. sec. tuning	

* Electrolytic. † Variable. ‡ Pre-set.

RESISTANCES		Values (ohms)
R1	V1 hexode CG resistance	500,000
R2	V1 hexode CG decoupling	500,000
R3	V1 CG stabiliser	40
R4	V1 fixed GB resistance	300
R5	V1 osc. CG resistance	50,000
R6	V1 osc. anode HT feed	35,000
R7	V2 CG decoupling	500,000
R8	V1, V2 SG's HT feed	35,000
R9	V2 fixed GB resistance	300
R10	IF stopper	70,000
R11	V3 signal diode load	300,000
R12	Manual volume control	500,000
R13	V3 triode GB: AVC delay	3,000
R14	V3 triode anode decoupling	25,000
R15	V3 triode anode load	100,000
R16	V3 AVC diode load	500,000
R17	V4 CG resistance	250,000
R18	V4 GB resistance	250
R19	V4 anode stabiliser	100
R20	Variable tone control	50,000

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial IF filter coil	8·5
L2	LW aerial 261 m rejector coil	5·5
L3	Aerial SW coupling coil	0·2
L4	Aerial MW coupling coil	14·0
L5	Aerial LW coupling coil	75·0
L6	Aerial SW tuning coil	Very low
L7	Aerial MW tuning coil	4·0
L8	Aerial LW tuning coil	17·0
L9	Osc. circuit SW tuning coil	Very low
L10	Osc. circuit MW tuning coil	2·5
L11	Osc. circuit LW tuning coil	5·0
L12	Oscillator SW reaction	0·5
L13	Oscillator MW reaction	0·7
L14	Oscillator LW reaction	7·5
L15	Osc. SW reaction equaliser	2·5
L16	1st IF trans. Pri.	8·5
L17	1st IF trans. Sec.	8·5
L18	2nd IF trans. Pri.	8·5
L19	2nd IF trans. Sec., total	8·5
L20	Speaker speech coil	1·7
L21	Hum neutralising coil	0·15
L22	Speaker field coil	1,200·0
T1	Speaker input trans. Pri.	350·0
	Speaker input trans. Sec.	0·2
T2	Mains trans. Pri., total	34·0
	Mains trans. Heater sec.	0·1
	Mains trans. Rect. heat. sec.	0·1
	Mains trans. HT sec., total	580·0
S1-S22	Waveband switches	—
S23,24	Radio/gram change switches	—
S25-27	Indicator lamps switches	—
S28	Mains switch, ganged R12	—
F1	Mains circuit fuse	—

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GENERAL NOTES

Switches.—**S1-S27** are the waveband, radio/gram and scale lamp switches in three rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams in col. 3, where they are drawn as seen looking from the underside of the chassis, in the directions of the arrows in the under-chassis view.

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

S28 is the QMB mains switch, ganged with the volume control **R12.**

Coils.—**L1** and **L2** are two small variable iron-cored units mounted on the rear and front members of the chassis respectively. **L3, L6 ; L4, L7 ; L5, L8 ; L9, L12, L15 ; L10, L13** and **L11, L14** are in six uncreened tubular units beneath the chassis.

The IF transformers **L16, L17** and **L18, L19** are in two screened units on the chassis deck, with their associated trimmers.

Scale and Indicator Lamps.—The two scale lamps are Philips MES types, with tubular frosted bulbs, and are marked 5-0·55. The three indicator lamps, switched by **S25-S27,** are Osram MES types, with small bulbs, and are rated at 6·5 V, 0·3 A.

Fuse F1.—This is contained in the mains voltage adjustment plug, and consists of a length of 2A fuse wire.

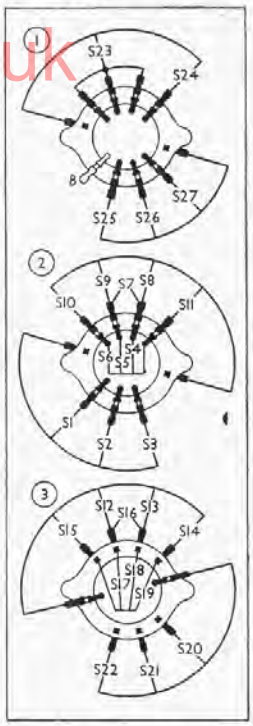
External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance (8,000 Ω) external speaker. The sockets are not isolated from the HT supply.

Condensers C27, C28.—These are two 10 μF (450 V) dry electrolytics in a single midget tubular metal cased unit on the chassis deck, the case being the common negative connection. The tag connected to **V5** holder is the positive of **C27,** while that connected to **V4** holder and one of the Ext. LS sockets is the positive of **C28.**

Condenser C12.—This is inside the **L9, L12, L15** coil unit, and is hidden by **C37.**

TABLE AND DIAGRAMS OF THE SWITCH UNITS

Switch	LW	MW	SW	Gram.
S1	—	—	C	—
S2	C	C	—	—
S3	C	—	—	—
S4	C	C	—	—
S5	C	—	C	—
S6	—	C	C	—
S7	—	—	—	C
S8	—	—	C	—
S9	—	C	—	—
S10	C	—	—	—
S11	—	—	—	C
S12	—	—	C	—
S13	—	C	—	—
S14	C	—	—	—
S15	—	—	—	C
S16	—	—	—	C
S17	C	C	—	—
S18	C	—	C	—
S19	—	C	C	—
S20	—	—	C	—
S21	—	C	—	—
S22	C	—	—	—
S23	C	C	C	—
S24	—	—	—	C
S25	—	—	C	—
S26	—	C	—	—
S27	C	—	—	—



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

Chassis Divergencies.—Receivers with chassis numbers above 96,500 are not fitted with variable trackers on the MW and LW band. Thus **C9, C35** and **C36** are omitted, and in their place is a fixed 0·00045 μF condenser for MW tracking, and a fixed 0·000168 μF condenser for LW tracking. Our chassis had a number below 96,500.

Resistances **R4** and **R9** were 300 Ω in our chassis, but are shown as 250 Ω in the makers' diagram. The small fixed trimmer **C10** is not shown in the makers' diagram, and may not be present in some chassis. **C26** and **R20** are transposed in the makers' diagram, while **R7** is shown in series with the AVC line beyond the grid return of **V2,** whereas it is in series with this grid return in our chassis.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator to control grid (top cap) of **V1,** via a 0·1 μF condenser, and chassis. Short-circuit **C34,** switch set to MW and turn volume control to maximum. Feed in a 465 KC/S signal, and adjust **C40, C41, C42** and **C43** for maximum output. Check these settings, then remove short circuit from **C34.**

IF Filter.—If this should need adjustment, connect signal generator to **A** and **E** sockets, switch set to LW, tune to bottom of band, and feed in a 465 KC/S signal. Adjust core of **L1** for *minimum* output.

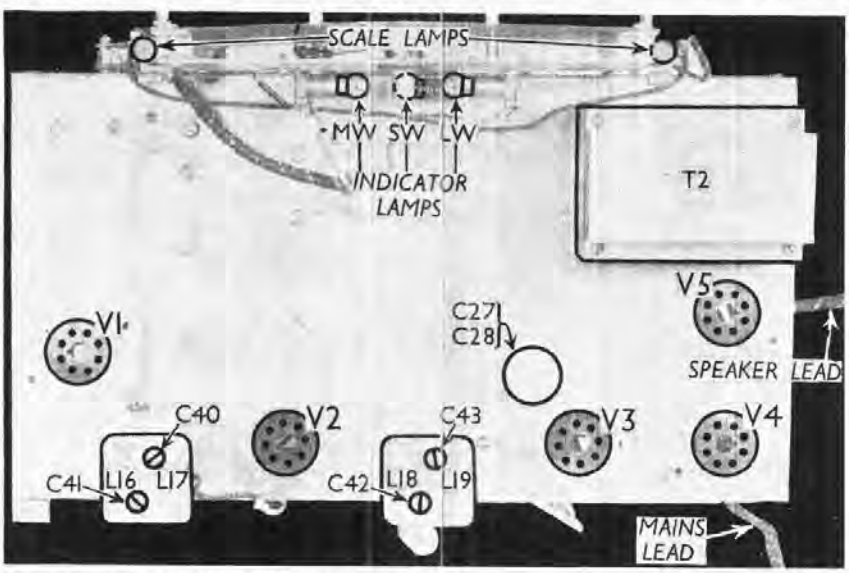
RF and Oscillator Stages.—With gang at maximum, scale pointer should be vertical. Connect signal generator, via a suitable dummy aerial, to **A** and **E** sockets. Turn receiver volume control to maximum.

LW.—Switch set to LW, tune to 1,200 m on scale, feed in a 1,200 m (250 KC/S) signal, and adjust **C39,** then **C32,** for maximum output. With sets using variable trackers, feed in a 1,800 m (166·7 KC/S) signal, tune it in, and adjust **C36** for maximum output, while rocking the gang for optimum results. Return to 1,200 m, and re-adjust **C39** and **C32,** if necessary.

MW.—Switch set to MW, tune to 220 m on scale, feed in a 220 m (1,362 KC/S) signal, and adjust **C38,** then **C31,** for maximum output. With sets using variable trackers, feed in a 500 m (600 KC/S) signal, tune it in, and adjust **C35** for maximum output, while rocking the gang for optimum results. Return to 220 m, and re-adjust **C38** and **C31,** if necessary.

SW.—Switch set to SW, tune to 16 m on scale, feed in a 16 m (18·75 MC/S) signal, and adjust **C37,** then **C30,** for maximum output. A fixed tracker is used in all sets on this band.

261m Rejector.—If this should need adjustment, switch set to LW, feed in a *strong* 261 m (1,149 KC/S) signal, and adjust core of **L2** for *minimum* output.



Plan view of the chassis. The two IF transformers are shown and their trimmers indicated.

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DECCA AW6
ML4

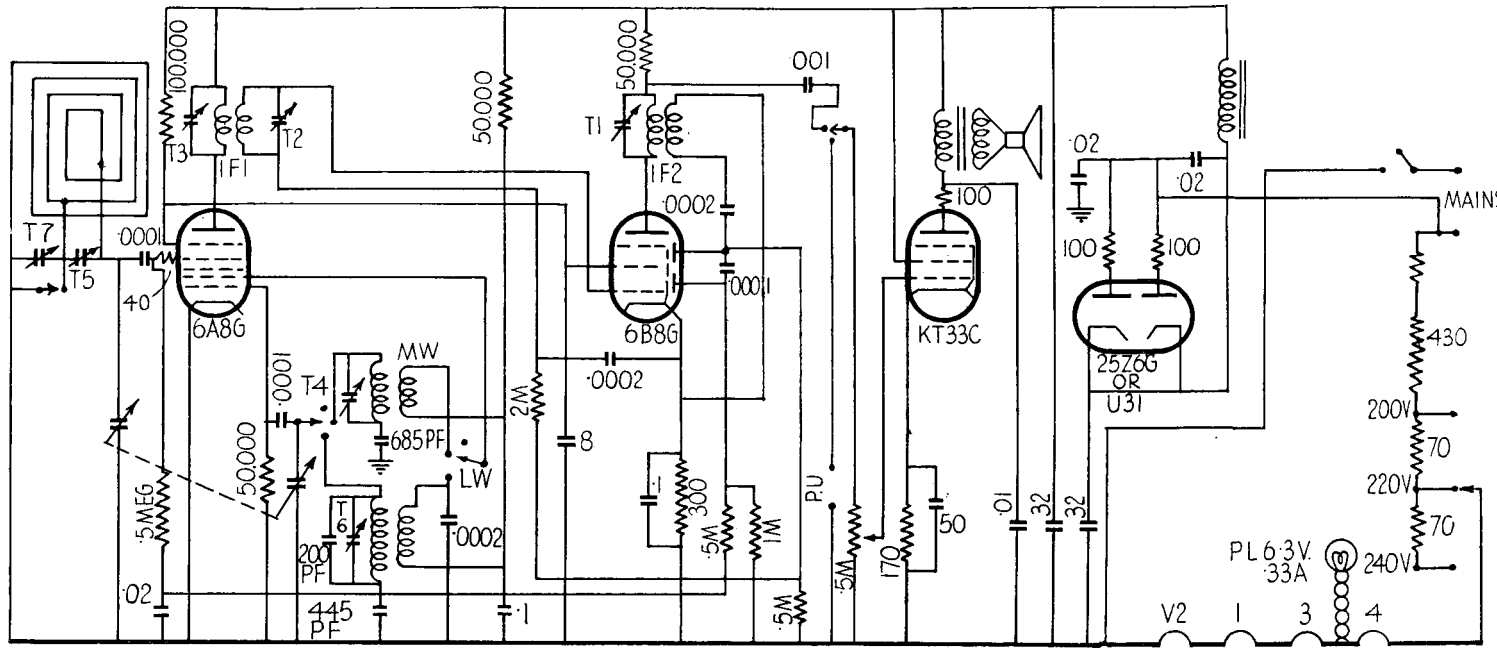
Model AW6: Four-valve, plus rectifier, three waveband A.C. superhet.

Model ML4: three-valve, plus rectifier, two-waveband, reflex compact transportable with frame aerial, for A.C.–D.C.

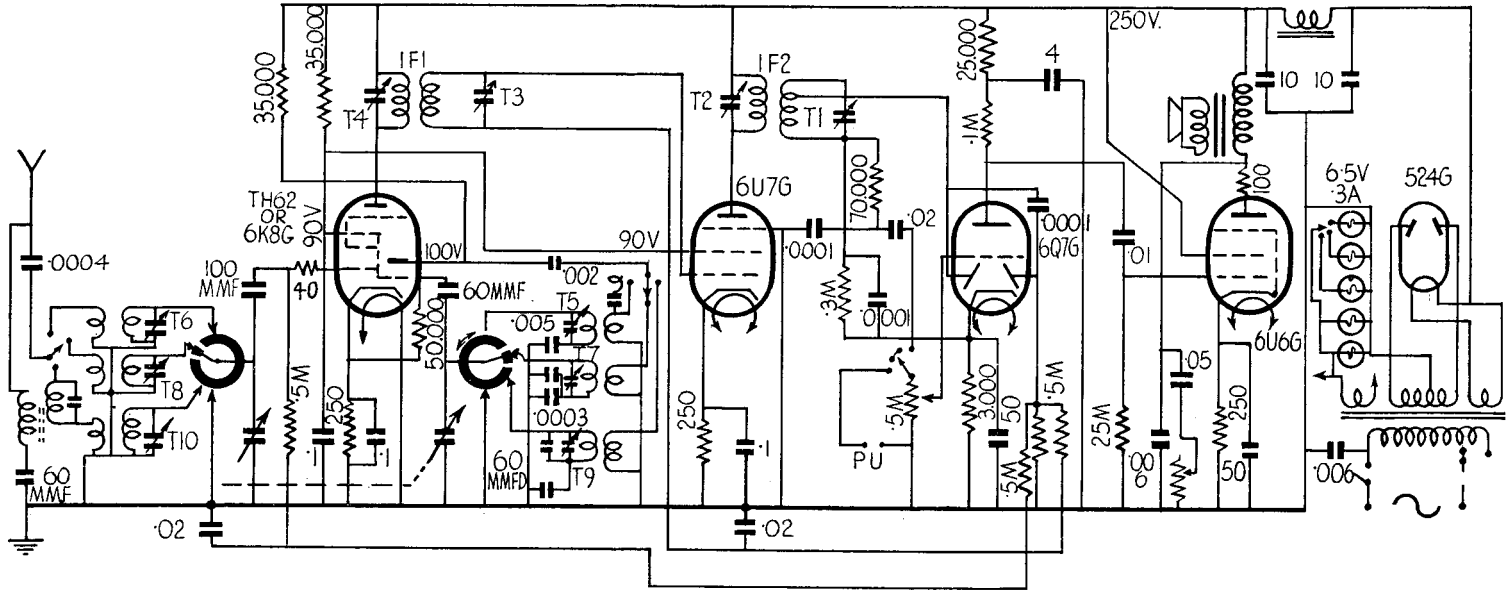
Made by Decca Radio and Television, Ltd., 1–3, Brixton Road, London, S.W.9.

HERE are circuit diagrams for two Decca models. The receivers are fairly simple and so the usual chassis diagrams are omitted. Each circuit gives the values of the resistances and condensers and also the voltages and currents measurable in each stage.

Ganging frequencies are given in tabular form on this page.



Model ML4 (above): This is a small A.C.-D.C. transportable with frame aerials. The 6B8G is reflexed, the demodulation diode being coupled back to the grid so that the valve acts as an L.F. as well as an I.F. amplifier. Other arrangements are conventional.



Model AW6 (left): A table A.C., three-waveband set with a circuit that is absolutely typical of the four-valve, plus rectifier, superhet. There are trimmers for both oscillator and aerial circuits on each band, but the padding is fixed throughout.

GANGING

Model AW6.—This is a three-waveband model and no special procedure is necessary. Trimming frequencies (there are only fixed padders) are:

Band	*Frequency*	*Trim*	*Pad*
I.F.	465 kc.	T1–4	—
S.W.	15 mc.	T5, T6	—
M.W.	1,500 kc.	T7, T8	—
L.W.	300 kc.	T9, T10	—

Model ML4.—This is a simple ganging job needing trimming on two bands only.

Band	*Frequency*	*Trim*	*Pad*
I.F.	365 kc.	T1–3	—
M.W.	1,200 kc.	T4, T5	—
L.W.	250 kc.	T6, T7	—