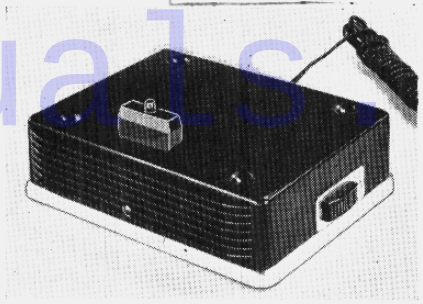
"TRADER" SERVICE SHEET
1113

DECCA "DE

All-dry Battery Portable usin
contained Mains Unit fo



The appearance of the mains unit showing the connector plug on top and the on/off switch at the side.

AN unconventional internal aerial, comprising two coils wound on an iron-dust rod, is used in the Decca "Deccette," a four-valve portable superhet operating from all-dry batteries.

A separate mains unit has been designed for use with the "Deccette," and enables it to operate from 200-250 V A.C. mains of 50 c/s.

When the receiver is operated in conjunction with the mains unit the internal batteries are automatically disconnected, and the receiver may be switched on and off from the mains unit without using the volume control on/off switch.

Although the receiver is a single-waveband model, covering the M.W. range of 200-600 m, provision is made for the reception of the L.W. Droitwich transmission. The pre-tuned L.W. circuits are brought into operation by tuning the receiver past the low-wavelength end of the M.W. band to the "Droitwich" setting on the tuning scale.

Release dates and original prices: Deccette, July 1953, £12 13s 7d, plus purchase tax; Mains Unit, July 1953, £5 5s.

CIRCUIT DESCRIPTION

The aerial input coils **L1** (M.W.) and **L2** (Pre-set L.W.) are mounted at opposite ends of a length of ferrite rod to form the internal aerial, and are tuned by **C26.** Tuning the receiver to the Droitwich setting on the tuning scale (gang at minimum capacitance) automatically opens switch **S1** (operated by the drive drum) bringing the L.W. pre-tuned circuit **L2, C1, C24** into operation.

Heptode valve **(V1, Osram X17)** operates as frequency changer with electron coupling. Oscillator coil **L3** is tuned by **C27.** Parallel trimming by **C28** and series tracking by **C7.** In the L.W. pre-tuned position **S2** closes, shunting **C8, C29** across the grid circuit. Inductive reaction coupling between the two halves of **L3.**

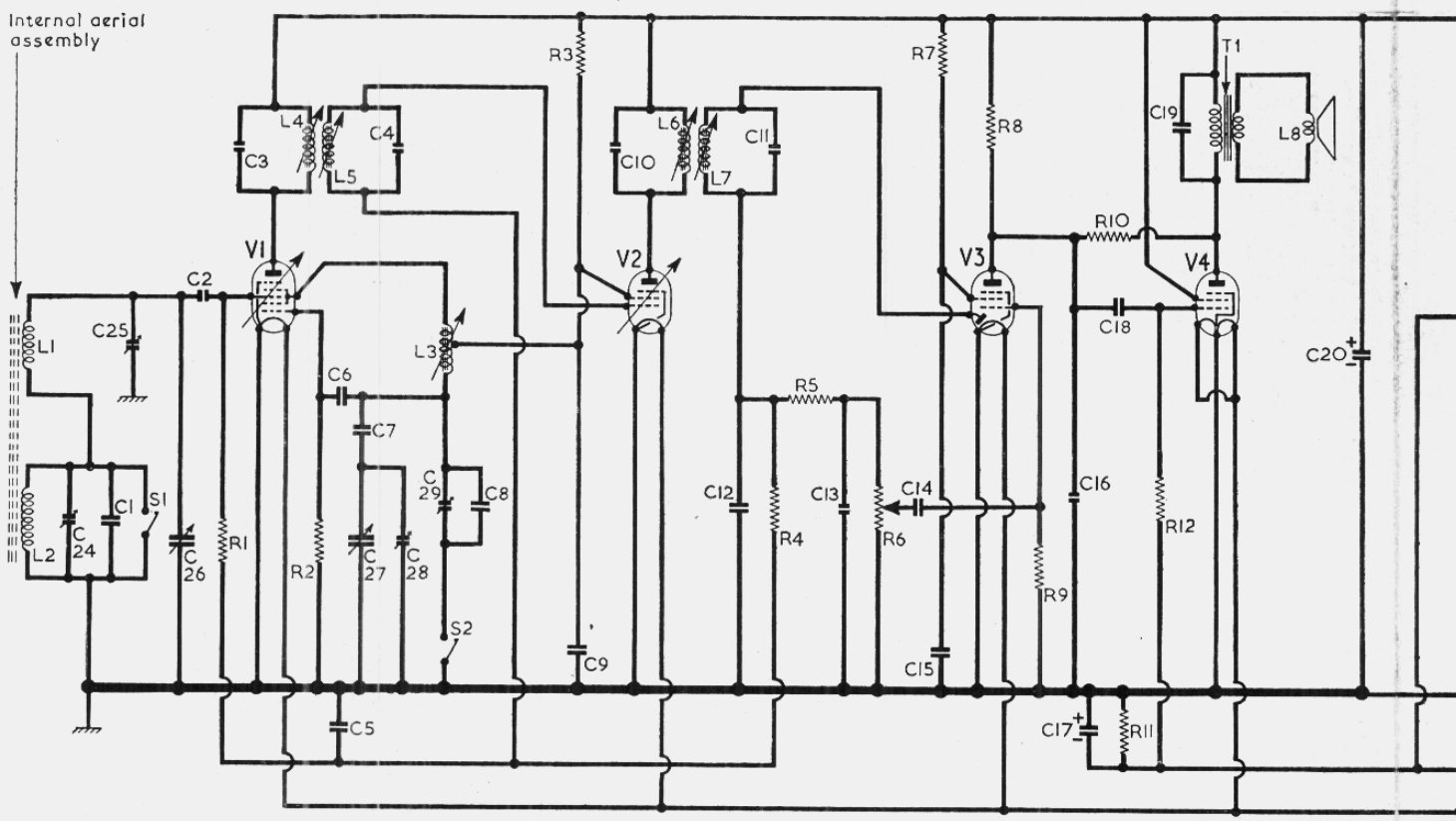
Second valve **(V2, Osram W17)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C3, L4, L5, C4** and **C10, L6, L7, C11.**

Intermediate frequency 472kc/s.

Diode signal detector is part of diode pentode valve **(V3, Osram ZD17).** Audio-frequency component in rectified output is developed across volume control **R6,** which operates as diode load, and passed via **C14** to control grid of pentode section, which operates as A.F. amplifier. I.F. filtering by **C12, R5, C13** and **C16.**

D.C. potential developed across **R5, R6** is fed back as bias via decoupling circuit **R4, C5** to **V1** and **V2** giving automatic gain control.

Resistance-capacitance coupling via **R8, C18** and **R12** between **V3** and pentode output valve **(V4, Osram N19).** Tone correction by **C19** in the anode circuit and by the negative feed-back between **V3** and **V4** anodes via **R10.** Grid bias voltage for **V4** is developed across **R11** in the H.T. negative lead.



Circuit diagram of the Decca "Deccette." Switches **S1** and **S2** are operated by the gang drive drum and bring the pre-tuned L.W. sta
The right-hand section of the circuit shows the A.C. mains unit. The connections to the mains unit socket in the base of the rece

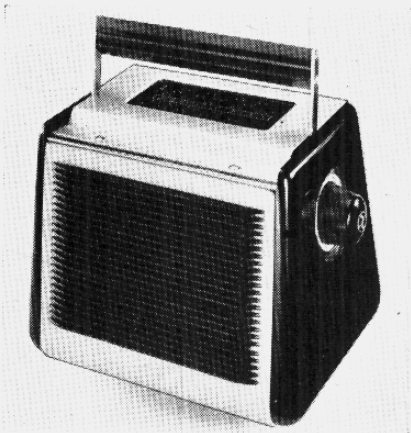
"DECCETTE"

ble using a Detachable Self-Unit for A.C. Operation

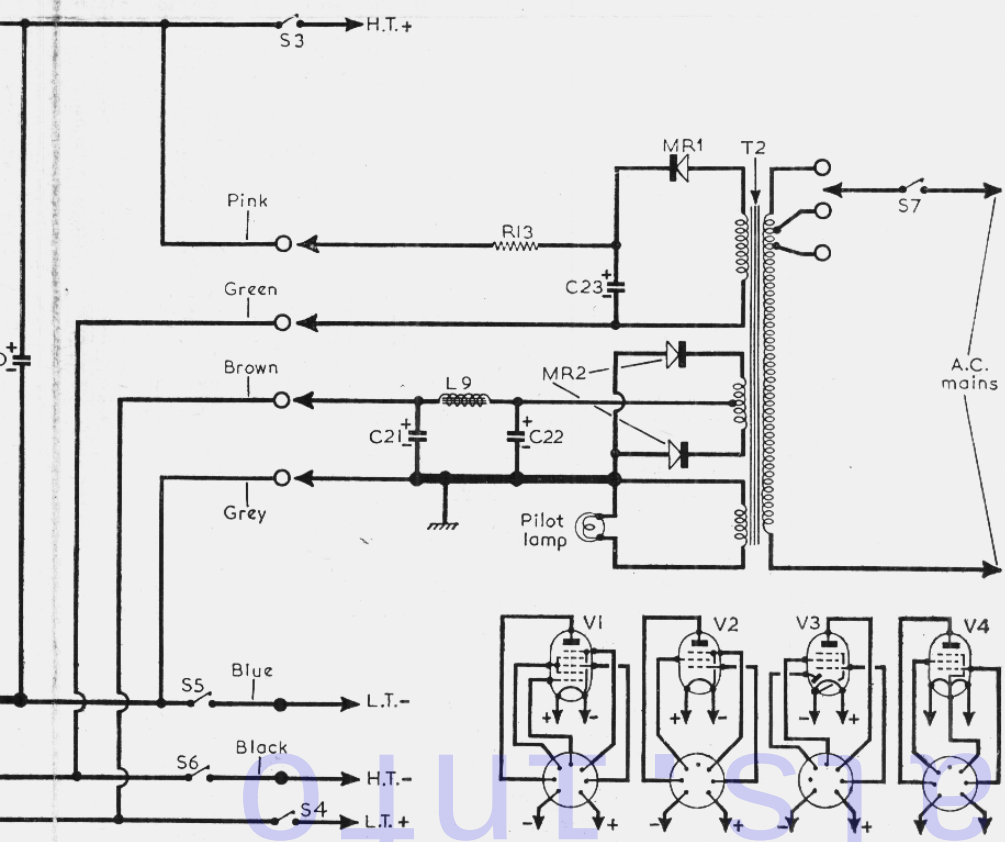
The receiver, which is designed primarily for operation from all-dry batteries, may be powered from an A.C. mains supply by means of a separate add-on mains unit. When in use this mains unit forms a base on which the receiver stands, H.T. and L.T. connections between the two being made by a four-contact plug on top of the unit and a corresponding socket in the base of the receiver (this socket is closed by a rubber plug when not in use). A small plastic peg on the end of the mains unit connector plug operates switches **S3, S4** in the receiver, disconnecting the internal batteries. A slide-type on-off switch is fitted to the side of the mains unit.

For mains operation H.T. current is supplied by half-wave metal rectifier **(MR1, Westinghouse U429).** Smoothing by **C23, R13** and **C20,** the latter being located on the receiver chassis and for battery operation functioning as the normal H.T. battery by-pass capacitor. L.T. current is supplied by full-wave metal rectifier **(MR2, Westinghouse 16K7).** Smoothing by choke **L9** and electrolytic capacitors **C21, C22.** The two halves of **V4** filament are connected in parallel for 1.4 V operation, and together with the filaments of the remaining valves are parallel-fed for both mains and battery operation.

The six leads connecting the receiver chassis to the mains unit socket on the underside of the carrying case are colour coded in the circuit diagram and refer to the coloured lead terminations shown at the foot of column 3 overleaf.



The appearance of the Decca " Deccette " portable superhet battery receiver. Its associated mains unit is shown in col. 2.



ed L.W. station circuits into operation when the gang is tuned to minimum capacitance. e of the receiver are shown in detail in the drawing at the foot of column 3 overleaf.

COMPONENTS AND VALUES

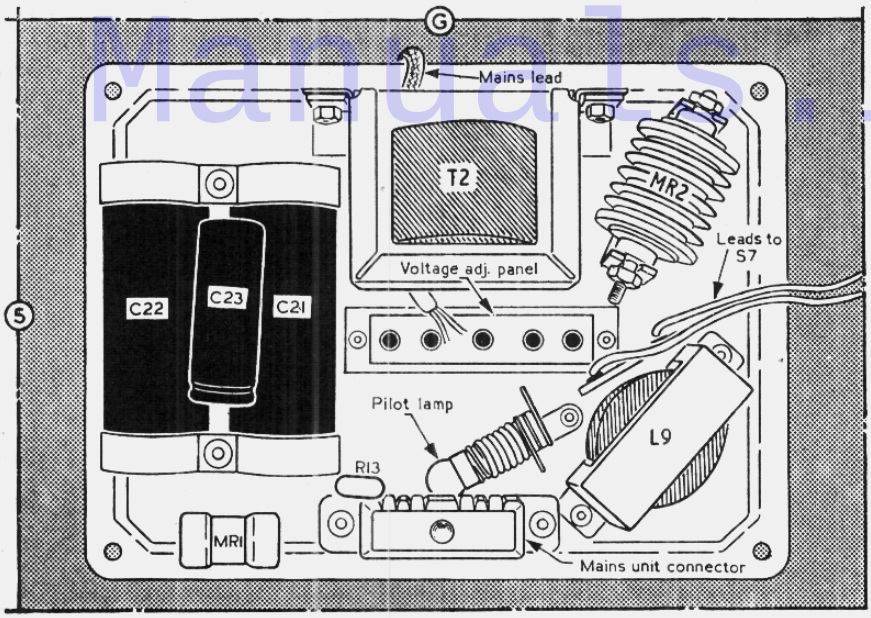
	CAPACITORS	Values	Locations
C1	L.W. aerial trim ...	160pF	C1
C2	V1 C.G.	60pF	A2
C3	1st I.F trans.	65pF	A1
C4	tuning ...	65pF	A1
C5	A.G.C. decoupling	0·04μF	B2
C6	V1 osc. C.G. ...	100pF	A2
C7	Osc. tracker ...	565pF	E4
C8	L.W. oscillator trim.	0·004μF	E4
C9	V2 S.G. decoupling	0·04μF	B2
C10	2nd I.F. trans.	650F	B1
C11	tuning ...	65pF	B1
C12	I.F. by-passes ...	100pF	B2
C13		47pF	D3
C14	A.F. coupling ...	0·002μF	D4
C15	V3 S.G. decoupling	0·04μF	D4
C16	I.F. by-pass ...	45pF	B2
C17*	G.B. decoupling ...	25μF	D4
C18	A.F. coupling ...	0·001μF	C2
C19	Tone corrector ...	0·005μF	E3
C20*	Battery reservoir...	16μF	D3
C21*	Filament	2,000μF	G5
C22*	smoothing	2,000μF	G5
C23*	H.T. reservoir ...	16μF	G5
C24‡	L.W. aerial tune ...	70pF	F3
C25‡	M.W. aerial trim....	70pF	F4
C26†	Aerial tuning ...	—	E3
C27†	Oscillator tuning ...	—	E3
C28‡	M.W. osc. trim. ...	70pF	F4
C29‡	L.W. osc. tune ...	0·001μF	B2

* Electrolytic. † Variable. ‡ Pre-set.

	RESISTORS	Values	Locations
R1	V1 C.G.	2·2MΩ	A2
R2	V1 osc. C.G. ...	100kΩ	A2
R3	S.G. feed	4·7kΩ	B2
R4	A.G.C. decoupling	3·3MΩ	B2
R5	I.F. stopper ...	47kΩ	E3
R6	Volume control ...	1MΩ	D3
R7	V3 S.G. feed ...	3·9MΩ	D4
R8	V3 anode load ...	1·2MΩ	D4
R9	V3 C.G.	10MΩ	C2
R10	Neg. feed-back ...	6·8MΩ	C2
R11	V4 G.B.	390Ω	D4
R12	V4 C.G.	2·2MΩ	D4
R13	H.T. smoothing ...	1kΩ	G5

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Internal aerial coils	1·0	A2
L2		4·0	C2
L3	Oscillator coil ...	2·0	A2
L4	1st I.F. trans. Pri.	14·0	A1
L5	1st I.F. trans. Sec.	14·0	A1
L6	2nd I.F. trans. Pri.	14·0	B1
L7	2nd I.F. trans. Sec.	14·0	B1
L8	Speech coil ...	2·8	—
L9	L.T. smoothing choke	3·0	G5
T1	O.P. trans. Pri.	400·0	E3
	O.P. trans. Sec.	—	
T2	Mains trans. Pri., total	420·0	
	Mains trans. H.T. sec.	250·0	G5
	Mains trans. L.T. sec., total	1·8	
	Mains trans. Pilot sec.	2·0	
S1, S2	L.W. pre-set sw. ...	—	B1
S3, S4	Mains/batt. sw. ...	—	H6
S5, S6	Batt. sw., g'd R6 ...	—	E3
S7	Mains unit switch...	—	—
MR1	H.T. rect.	—	G5
MR2	L.T. rect.	—	G5

Dealers are reminded that the component numbers used in the above tables may be different from those used in the makers' circuit diagram. If our component numbers are used, therefore, when ordering spares, it is advisable to mention the fact on the order.



The mains unit, drawn as seen when its plastic cover is removed. The on/off switch **S7** is mounted on the cover. The voltage adjustment is accessible from the underside of the unit.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a new set of batteries. Readings taken in conjunction with the mains unit, from 240 V A.C. mains were approximately the same.

Valve	Anode		Screen	
	V	mA	V	mA
V1 X17	63	0.64	49	2·0
V2 W17	63	1·5	49	1·0
V3 ZD17 ...	20	0.032	19	0.012
V4 N19	61	4·8	63	1·1

The receiver was tuned to a point at the high wavelength end of M.W. where there was no signal pick-up, and the volume control was turned to maximum. When operating from 240 V A.C. mains the voltage adjustment was set to the 240-250 V tapping.

Voltages were measured with an Avo Electronic Test Meter, and as this instrument has a high internal resistance, allowance should be made for the current drawn by other types of meter. Chassis was the negative connection in every case.

The total H.T. current drawn by the receiver was 11 mA. When the mains unit was used, the voltage measured across **C22** was 2.2 V and that measured across **C23** was 80 V. The A.C. voltage measured across the winding feeding **MR1** was 72 V and the A.C. voltage measured from cathode to cathode of **MR2** was 5.7 V. The total mains input current drawn by the unit was 30 mA.

DISMANTLING THE SET

Removing Receiver Chassis.—Remove two large instrument head screws from front edge of tuning scale escutcheon (in carrying handle recess);

slide escutcheon as far as it will go towards rear of carrying case;

remove two self-tapping screws from left-hand edge of scale backing plate (now revealed);

lay carrying case on its back and remove the base cover of the battery compartment (90 degree turn of locking screw);

withdraw batteries (if fitted) and remove 4 BA countersunk bolt (with cup washer) from left-hand side of battery compartment;

stand receiver upright and gently lever off the plastic side-panel on the left side of carrying case (control knob passes through hole in panel);

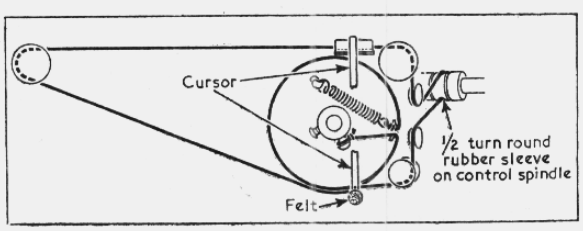
at this point it may be found convenient to detach the tuning scale escutcheon (now loose) from the chassis by releasing the left-hand side of the carrying handle from its securing pin (by slight outward pressure) and by lifting the now free end of the handle up to allow the escutcheon to be withdrawn sideways;

the chassis and speaker, the latter being mounted separately on a baffle, may now be slid out of the carrying case.

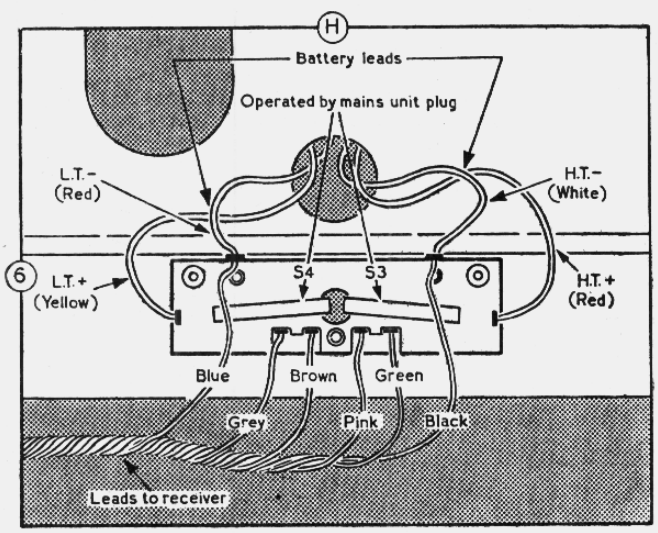
The chassis is still attached to the carrying case by the battery and mains unit connector leads, but these are of sufficient length to allow for normal servicing needs. If however it is necessary to free the chassis completely, the mains unit connector can be released from the carrrying case by removing two 6 BA nuts and bolts.

When replacing, the chassis and the speaker should be slid into the carrying case together, making sure that the speaker baffle engages in its slot in the base of the carrying case.

Removing Mains Unit Chassis.—The chassis may easily be withdrawn from its plastic case after removing the four rubber feet (secured by 4 BA countersunk screws), from the base of the unit.



Above : Sketch of the tuning drive system, drawn as seen from the top of the chassis with the tuning scale and mounting brackets removed.



Right: Sketch of the connections to the mains unit socket in the base of the receiver case. It is drawn as viewed from the top of the carrying case with the chassis removed. The leads are all colour coded and correspond to similarly coded leads in the circuit diagram overleaf. Switches **S4** and **S3** open automatically when the mains unit is attached.

GENERAL NOTES

Switches.—**S1, S2** are the L.W. pre-set station switches and are operated by a flange on the gang drive drum. When the receiver is tuned to any point on the M.W. tuning scale, **S1** remains closed and **S2** open, but on tuning past the lowest wavelength end of the scale to the Droitwich calibration mark, **S1** opens and **S2** closes bringing the L.W. pre-tuned circuits into operation.

S3, S4 are the mains/battery switches mounted on the mains connector socket in the underside of the receiver. They are normally closed for battery operation but when the receiver is operated from mains, with the mains unit attached, the plastic peg on the top of the mains unit connector plug opens these switches and disconnects the internal batteries.

S5, S6.—These are the normal "on/off" battery switches and are ganged with volume control **R6.**

S7 is the single-pole slide-type "on/off" switch mounted on the side of the mains unit.

Internal Aerial.—This consists of a length of ferrite rod on which are wound the M.W. and L.W. aerial coils. The assembly is supported by three rubber grommets which are mounted on the chassis by means of loops of heavy gauge wire. This wire is also used to connect the internal aerial coils to the chassis, and because of its heavy gauge care should be taken when handling the chassis not to disturb the assembly, or the soldered joints at the ends of the wire may fracture.

Batteries.—The L.T. battery recommended is an Ever Ready AD35, rated at 1.5 V. The H.T. battery recommended is an Ever Ready B101, rated at 67.5 V.

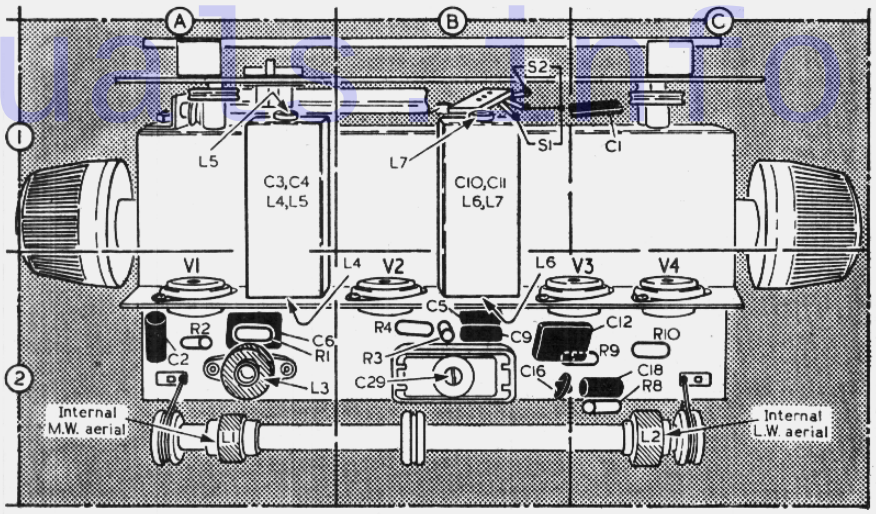
Mains Unit.—When in use this unit forms a base on which to stand the receiver. The rubber plug covering the mains connector socket in the base of the receiver should be removed, and the receiver carefully placed on top of the mains unit so that the connector plug in the unit engages in the socket in the base of the receiver. If the receiver and the mains unit are then picked up together, the mains unit should be supported from beneath as it is only attached to the receiver by the connector plug.

Drive Cord.—About 22 inches of high-quality flax fishing line, plaited and waxed, is required for a new drive cord. It should be run as shown in the sketch of the drive cord in column 1 starting from the drive drum boss and ending with the tension spring.

In order to make the drive drum and the drive cord pulleys accessible, the tuning scale, with its four rubber mounting blocks, should be carefully detached from the two aluminium brackets to which it is cemented. The aluminium brackets should then be released by removing the four 6BA roundhead bolts which secure them to the chassis.

When the tuning scale is finally replaced it should be re-secured by a suitable rubber cement to the brackets.

Indicator Lamp.—This is housed in the mains unit and is an Osram 6.5 V 0.3 A lamp with a small clear spherical bulb and an M.E.S. base.



Front view of the chassis showing the drive drum operated switches **S1, S2** in location B1

CIRCUIT ALIGNMENT

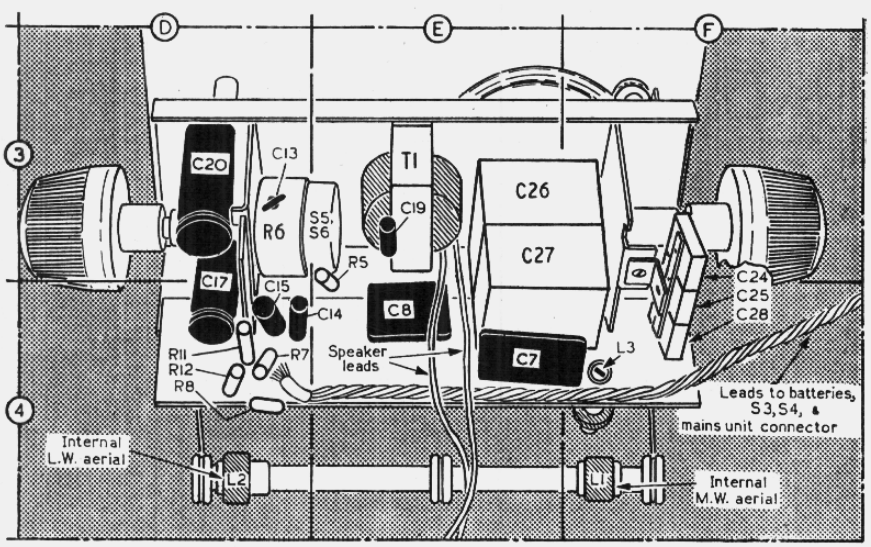
Remove chassis from carrying case as described under "Dismantling."

I.F. Stages.—Turn gang to maximum capacitance and connect output of signal generator, via an 0.01μF capacitor in the "live" lead to control grid (pin 6) of **V1** and chassis. Feed in a 472 kc/s (635.6m) signal and adjust the cores of **L7** (location reference B1), **L6** (B2), **L5** (A1) and **L4** (A2) for maximum output, reducing the output from the signal generator as the circuits come into line to avoid A.G.C. action. Repeat these adjustments until no further improvement results.

R.F. and Oscillator Stages.—Disconnect signal generator leads from chassis and lay them near to the internal aerial assembly. If insufficient signal is injected by this means, a short length of wire, attached to the "live" signal generator lead, should be looped round the ferrite rod core. Check that with the gang at maximum capacitance, the cursor coincides with the thick vertical line at the lower edge of the tuning scale.

M.W.—Tune receiver to 500m on scale, feed in a 500m (600 kc/s) signal and adjust the core of **L3** (F4) for maximum output while rocking the gang for optimum results. Tune receiver to 200m on scale, feed in a 200m (1,500 kc/s) signal and adjust **C28** (F4) and **C25** (F4) for maximum output. Repeat these adjustments until no further improvement results.

L.W. Pre-set.—Tune receiver to the "Droitwich" setting on the tuning scale (gang at minimum capacitance). Feed in a 1,500m (200 kc/s) signal and adjust **C29** (B2) and **C24** (F3) for maximum output. Final adjustments to these trimmers should be made while receiving a transmission. If the M.W. adjustments are subsequently disturbed it may be necessary to reset the L.W. adjustments.



Rear view of the chassis showing the M.W. and L.W. internal aerial.

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