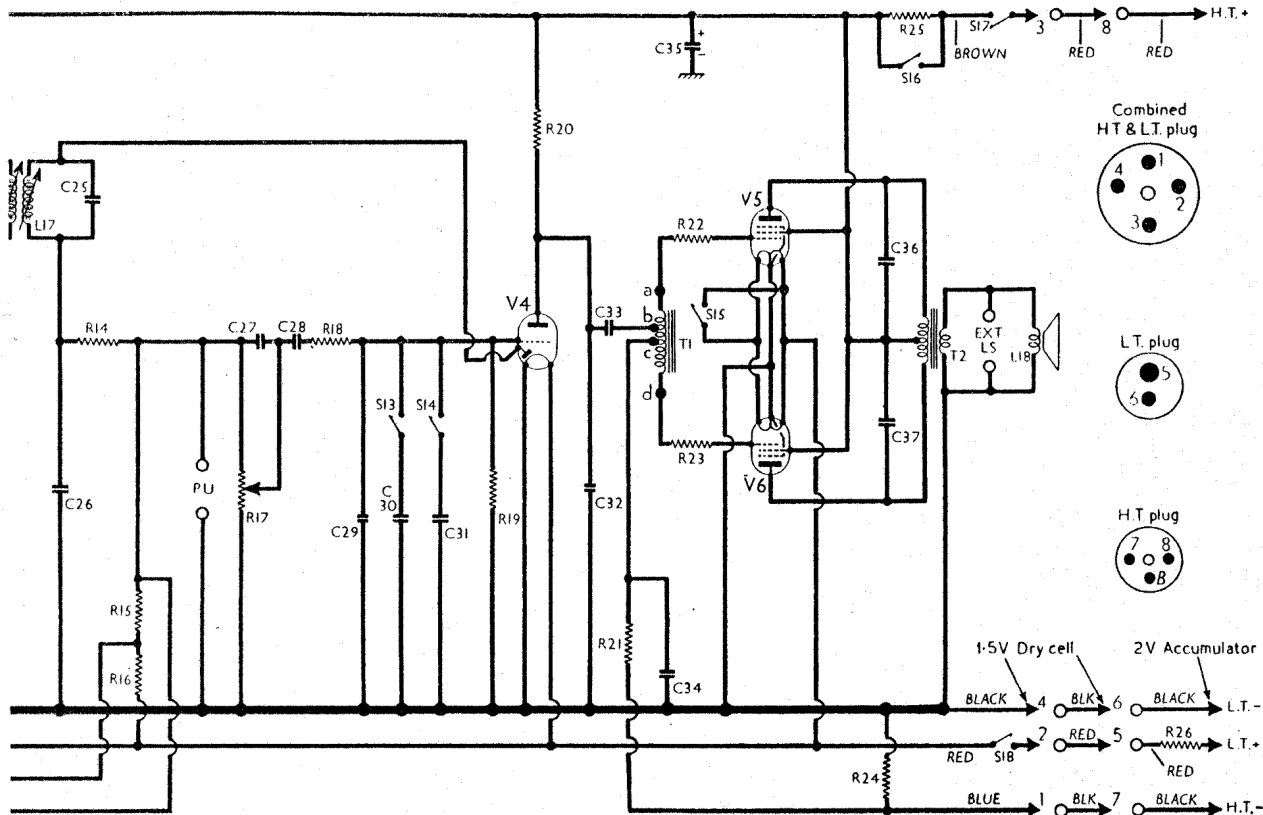
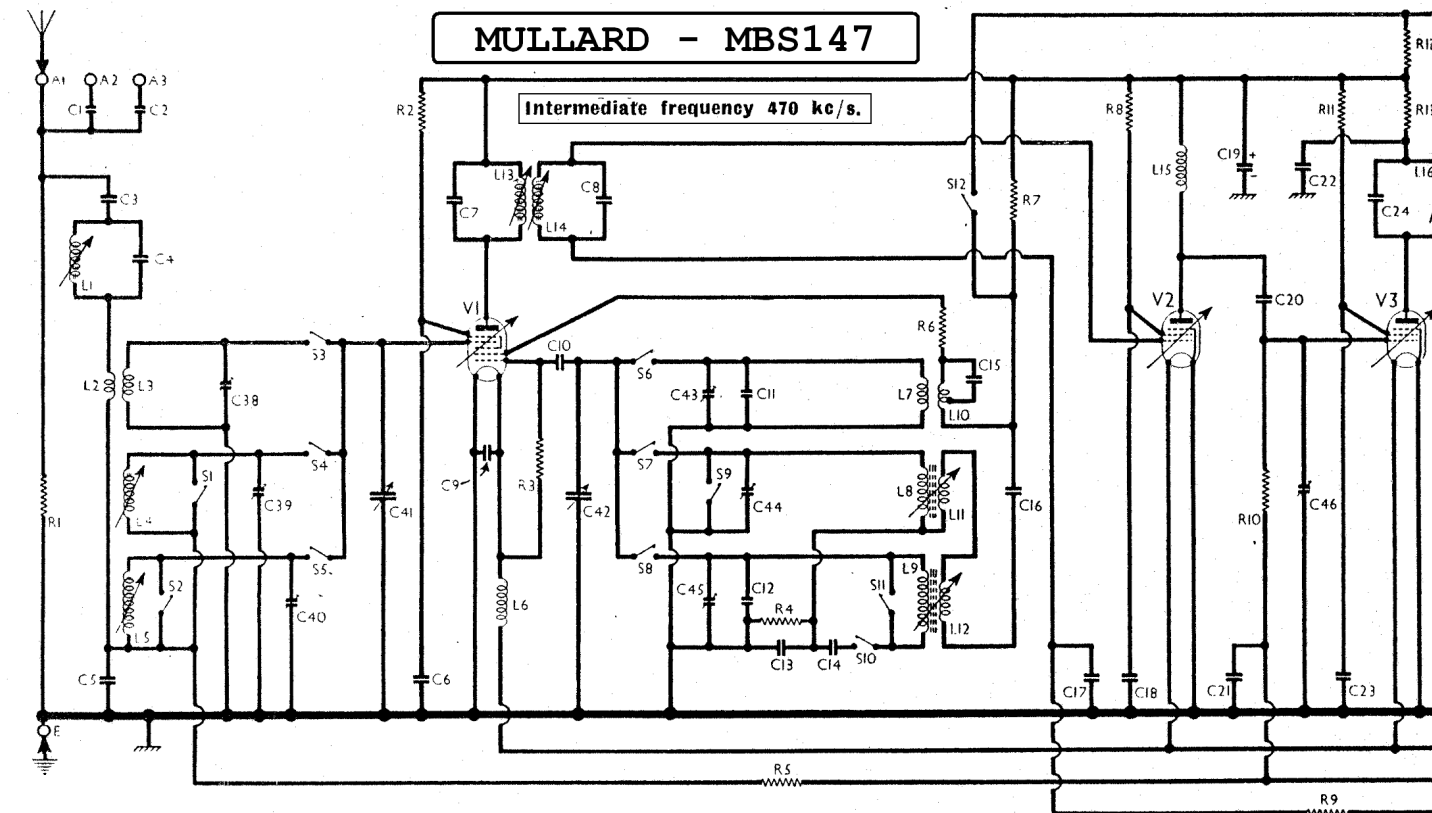
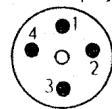


MULLARD - MBS147

Intermediate frequency 470 kc/s.



Combined HT & LT plug



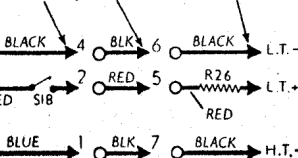
L.T. plug



H.T. plug



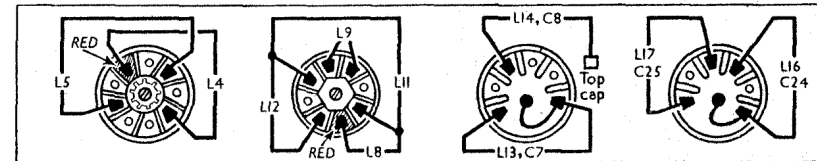
1.5V Dry cell 2V Accumulator



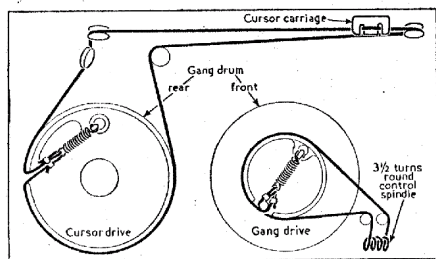
DRIVE CORD REPLACEMENT

Two drive cords are used in this receiver: one for the gang drive and one for the cursor drive. The courses taken by the two cords are shown in the sketches at the foot of cols. 4 and 5, in which the gang drive is drawn as seen from the front of the receiver, and the cursor drive as seen from the rear, in which positions they should be viewed when fitting. In both cases the gang is at minimum capacitance.

The gang drive requires about 2ft. of cord, and the cursor drive about 4ft. For convenience, it is advisable to start the run for the cursor drive in a clockwise direction round the gang drum, and the gang drive in an anti-clockwise direction, so that as the gang is at minimum, it can be pulled against its stop to maintain tension on the cord.

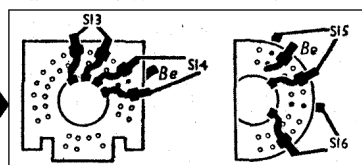


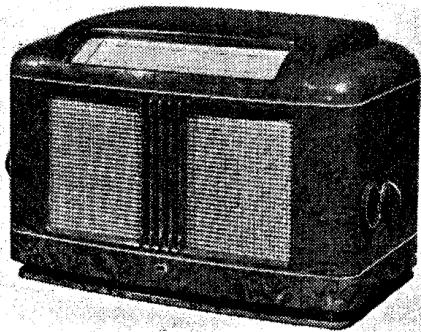
Underside view of the coil units, as seen from the rear, in which the tags are identi



Rear view (left) of the cursor drive system, and front view (right) of the gang drive system, in the Mullard MBS147. In each case the gang is at minimum capacitance.

Diagrams of the tone control (left) and economy (right) switch units, viewed in the direction of the arrows in our under-chassis view.





COMPONENTS AND VALUES

RESISTORS		Value (ohms)	Locations
R1	Aerial shunt ...	10,000	K4
R2	V1 S.G. H.T. feed	47,000	H4
R3	V1 osc. C.G.	100,000	H4
R4	Osc. stabilizer ...	27,000	H3
R5	V1 A.G.C. decoup.	1,000,000	H4
R6	Osc. stabilizer ...	47	H4
R7	Osc. anode load ...	47,000	H4
R8	V2 S.G. H.T. feed	180,000	G4
R9	V2 A.G.C. decoup.	2,200,000	G4
R10	V3 C.G. resistor ...	68,000	G4
R11	V3 S.G. H.T. feed ...	180,000	F4
R12	H.T. decoupling ...	3,300	E4
R13	V3 anode decoup. ...	1,200	F4
R14	I.F. stopper ...	47,000	F3
R15	A.G.C. potential divider ...	3,300,000	G4
R16		1,800,000	G4
R17	Volume control ...	1,000,000	D3
R18	V4 grid stopper ...	82,000	D3
R19	V4 C.G. resistor ...	3,300,000	E3
R20	V4 triode load ...	1,000,000	E3
R21	G.B. decoupling ...	270,000	E4
R22	V5 grid stopper ...	82,000	E4
R23	V6 grid stopper ...	82,000	E4
R24	V5, V6 G.B. res. ...	1,000	E4
R25	H.T. economy res. ...	8,200	F4
R26	Filament ballast ...	1·7	F4

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn the gang to minimum, the volume control to maximum, and the tone control to the "brilliant" position. Connect signal generator via an 0.032 μ F capacitor in the "live" lead to the control grid (top cap) of V1 and chassis (the control grid connection may be made at the top tag on the front section of the gang, C41). Feed in a 470 kc/s (638.3 m) signal, and adjust the cores of L16 and L17 (location reference B1); then adjust C46 (G4) by unwinding its wire; and finally adjust the cores of L13 and L14 (B2); all for maximum output. Repeat these operations (except C46) until no improvement can be obtained.

When adjusting the primary of a transformer, a 0.0001 μ F damping capacitor must be connected across the secondary; and conversely, when adjusting the secondary, the capacitor must be shunted across the primary. Adjustment of C46 may be made only by unwinding turns from it until the peak is reached, when the end should be secured with wax; turns must not be added. If more turns are required, the capacitor must be replaced by a new one.

I.F. Rejector.—With set still switched to M.W., transfer signal generator "live" lead to A1 socket via a suitable dummy aerial, feed in a 470 kc/s signal and adjust core of L1 (location A2) for minimum output.

CAPACITORS		Values (μ F)	Locations
C1	Aerial series ...	0.000027	K4
C2	Aerial series ...	0.0000033	K4
C3	Aerial series ...	0.00022	K4
C4	I.F. rejector tune...	0.00056	K4
C5	Aerial coup. ...	0.0033	J4
C6	V1 S.G. decoup ...	0.047	H4
C7	1st I.F. transformer tuning ...	0.00015	B1
C8		0.00015	B2
C9	V1 fil. by-pass ...	0.1	H4
C10	V1 osc. C.G. ...	0.0001	J4
C11	Osc. S.W. trim ...	0.000012	H3
C12	Osc. L.W. trim. ...	0.000022	H3
C13	Osc. M.W. tracker	0.00036	J3
C14	Osc. L.W. tracker...	0.00015	J4
C15	S.W. react. shunt...	0.0001	H4
C16	Osc. coupling ...	0.00027	H4
C17	V2 C.G. decoup. ...	0.022	H4
C18	V2 S.G. decoup. ...	0.047	G4
C19*	H.T. decoupling ...	8.0	E4
C20	I.F. coupling ...	0.00056	G4
C21	V3 A.G.C. decoup.	0.01	H4
C22	V3 anode decoup. ...	0.047	F3
C23	V3 S.G. decoup. ...	0.047	F4
C24	2nd I.F. transformer tuning ...	0.00015	C1
C25		0.00015	C1
C26	I.F. by-pass ...	0.00018	F3
C27	Top boost ...	0.00015	E3
C28	A.F. coupling ...	0.01	D3
C29	I.F. by-pass ...	0.000082	D4
C30	Tone control capacitors ...	0.0022	D4
C31		0.001	D4
C32	I.F. by-pass ...	0.000056	E3
C33	A.F. coupling ...	0.1	E3
C34	G.B. decoupling ...	0.22	D4
C35*	H.T. decoupling ...	8.0	D3
C36	Tone correctors ...	0.0022	C1
C37		0.0022	C1
C38†	Aerial S.W. trim. ...	0.00003	J3
C39†	Aerial M.W. trim. ...	0.00003	K3
C40†	Aerial L.W. trim. ...	0.00003	K3
C41†	Aerial tuning ...	0.000492	A1
C42†	Oscillator tuning ...	0.000492	A2
C43†	Osc. S.W. trim. ...	0.000012	H3
C44†	Osc. M.W. trim. ...	0.00003	H3
C45†	Osc. L.W. trim. ...	0.00003	H3
C46†	V2 anode tuning ...	0.0002	G4

* Electrolytic. † Variable. ‡ Pre-set.

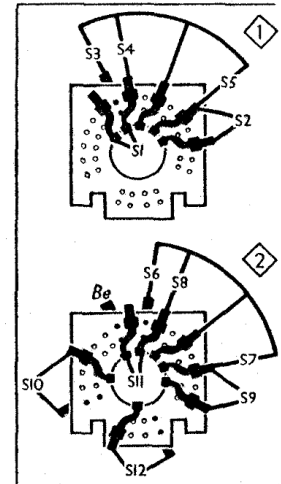
R.F. and Oscillator Stages.—With the gang at minimum capacitance the pointer should be perpendicular and coincident with zero on the S.W. logging scale; at maximum capacitance the pointer should coincide with the "180" on the same section of the scale. Note that the local oscillator frequency in this receiver is higher than the signal frequency on all bands. In order to adjust the trimmer capacitors the yellow wax may be broken with tweezers.

M.W.—With set still switched to M.W., tune to 500 m on scale, feed in a 500 m (600 kc/s) signal and adjust the core of L8 (H4) for maximum output; tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal and adjust C44 (H3) for maximum output. Retune to 500 m on scale, feed in a 500 m signal, and adjust core of L4 (K4) for maximum output; retune to 200 m, feed in a 200 m signal, and adjust C39 (K3) for maximum output. Repeat these operations until no improvement results.

L.W.—Switch set to L.W., tune to 1,700 m on scale, feed in a 1,700 m (176.5 kc/s) signal, and adjust the core of L9 (A1) for maximum output; tune to 850 m on scale, feed in an 850 m (353 kc/s) signal, and adjust C45 (H3) for maximum output. Retune to 1,700 m on scale, feed in a 1,700 m signal, and adjust the core of L5 (A1) for maximum output; retune to 850 m on scale, feed in an 850 m signal, and adjust C40 (K3) for maximum output. Repeat until no improvement results.

S.W.—Switch set to S.W., tune to 20 m on scale, feed in a 20 m (15 Mc/s) signal, adjust C38 and C43 (J3 and H3) for maximum output.

OTHER COMPONENTS		Approx Values (ohms)	Locations
L1	I.F. rejector coil ...	4.0	K4
L2	Aerial S.W. coup.	1.5	J3
L3	Aerial tuning coils	Very low	J3
L4		2.0	K4
L5		18.0	A1
L6	Fil. R.F. choke ...	Very low	H4
L7	Oscillator tuning coils ...	Very low	H4
L8		3.0	H4
L9	Oscillator coupling coils ...	11.0	A1
L10		2.0	H4
L11		1.0	H4
L12	1st I.F. trans. { Pri. ...	3.5	A1
L13		7.0	B2
L14	2nd I.F. trans. { Pri. ...	7.0	B2
L15		10.0	F4
L16	V2 anode load trans. { Sec. ...	7.0	B1
L17		7.0	B1
L18	Specimen coil	3.5	—
T1	Intervalve trans. { a, b, ...	1,500.0	E4
S13, S14		4,000.0	
S15, S16		3,750.0	
T2	Output trans. { Pri. total	1,000.0	C1
S17, S18		0.5	
S1-S12	W/band switches ...	—	J4
S13, S14	Tone switches ...	—	D4
S15, S16		—	
S17, S18	Economy switches	—	E4
S17, S18	Battery switches	—	D3
S17, S18	g'd R17...	—	



Diagrams of the waveband switch units, as seen in the direction of the arrows in our under-chassis view. Be indicates a bearer tag. On the right is the associated switch table.

Switch	S.W.	M.W.	L.W.
S1	o	—	—
S2	o	—	—
S3	o	—	—
S4	—	—	—
S5	—	o	—
S6	—	—	o
S7	o	—	—
S8	—	—	—
S9	o	—	—
S10	—	—	—
S11	o	—	—
S12	o	—	—

Valve	Anode		Screen	
	V	mA	V	mA
V1 DK32	93	0.7	42	1.1
V2 DF33	45	0.98	—	—
V3 DF33	93	0.68	45	0.15
V4 DAC32	17	0.05	—	—
V5 DL33	106	2.5	107	0.25
V6 DL33	106	2.5	107	0.25