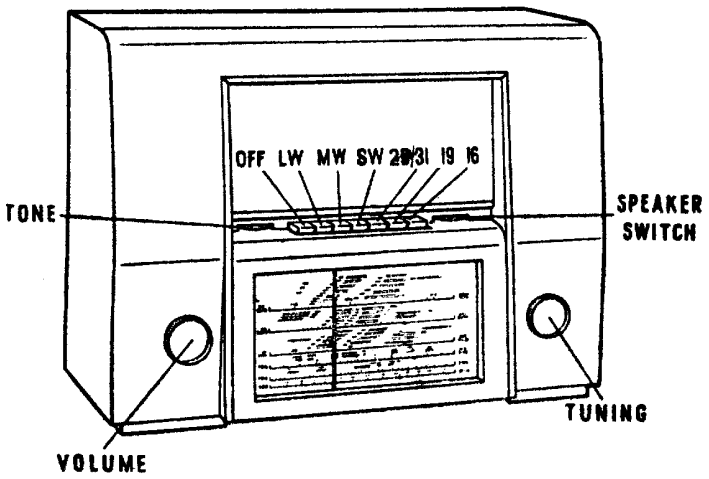
No. 123

G.E.C. RADIO

MADE IN ENGLAND

SERVICE BULLETIN FOR BC5068/L AND BC5070/L



SPECIFICATION

GENERAL DESCRIPTION	BC5070/L Five valve all-wave superheterodyne table model, with bandspread tuning, for A.C. mains. BC5068/L Five valve all-wave superheterodyne auto radio-gramophone with bandspread tuning, for A.C. mains.
POWER SUPPLIES	BC5070, BC5068—200/230/250 volts 40/100 c/s. BC5070L, BC5068L—115/125/220 volts 40/100 c/s.
POWER CONSUMPTION	BC5070/L—70 watts. BC5068/L—70 watts (Radio). —90 watts (Gram.).
WAVEBANDS	LONG, 300-150 kc/s. 1,000—2,000 metres. MEDIUM, 1·562—0·545 Mc/s. 192-550 metres. 40/120 Metres 7·5—2·5 Mc/s. 25/31 Metres 12—9·7 Mc/s. 19 Metre Band 15·8 Mc/s. 16 Metre Band 18·7 Mc/s.
INTERMEDIATE FREQUENCY	456 kc/s.
VALVES	V1—frequency changer —Osram X61M V2—I.F. amplifier —Osram KTW61 or W61 V3—{signal detector, A.G.C. rectifier, A.F. amplifier}—Osram DH63 V4—output tetrode —Osram KT61 V5—H.T. rectifier —Osram U50
LOUDSPEAKER	BC5070/L—6½-inch cone, permanent magnet. Speech coil—3 ohms impedance at 400 c/s. BC5068/L—10 inch cone, permanent magnet. Speech coil—3 ohms impedance at 400 c/s.
WEIGHT AND DIMENSIONS	BC5070/L. 28 lbs., 14½ ins. × 19 ins. × 8¾ ins. BC5068/L. 163 lbs., 36½ ins. × 34½ ins. × 16 ins.

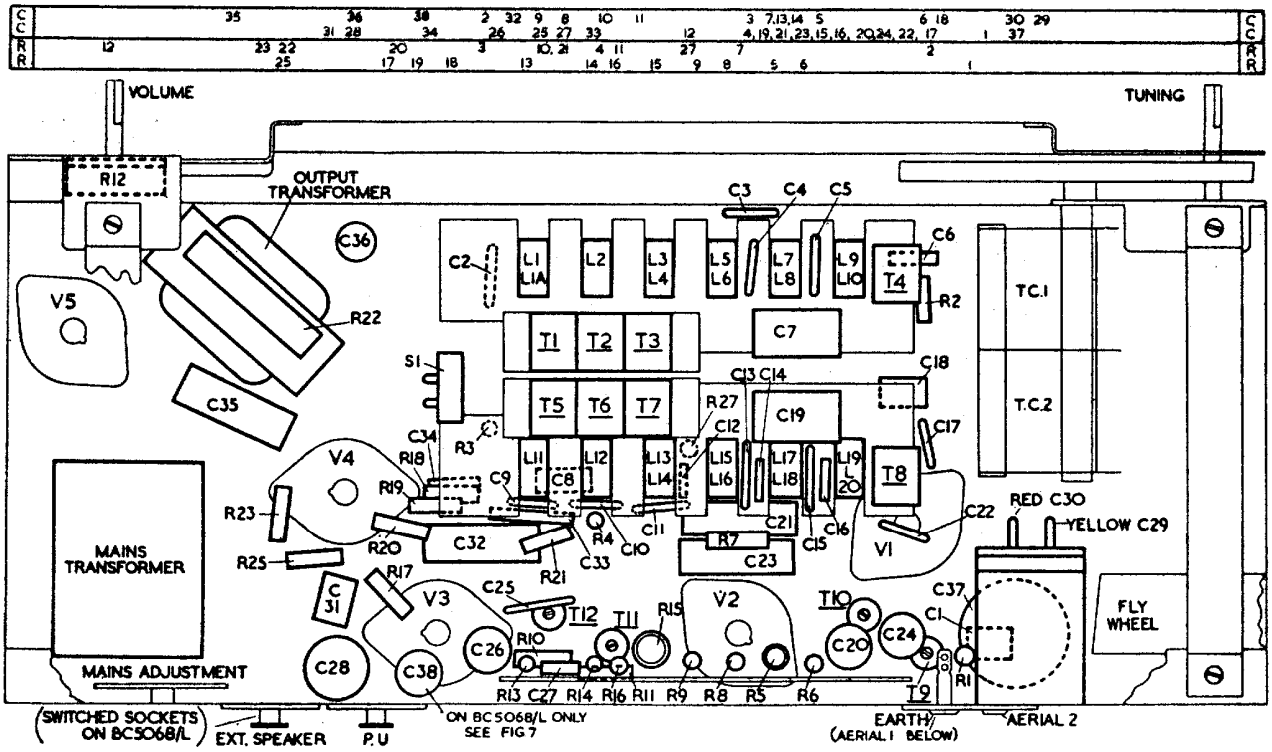


Fig. 2. UNDER CHASSIS

ALIGNMENT

Range	Alignment Frequency	Receiver Setting	Adjust	Notes	Average Sensitivity BC5068/L	Average Sensitivity BC5070/L
I.F	456 kc/s.	L.F. end of 40/120 M	T12, T11	Input to V2 grid	4,700	5,500
			T10, T9	Input to V1 grid Do not readjust T12, T11	65	77
LONG WAVE-BAND	160 kc/s. 300 kc/s. 160 kc/s. 300 kc/s.	1,875M. 1,000M. 1,875M. 1,000M.	L11, L1 T5, T1 L11, L1 T5, T1	 Check Check	 40 44	 47 51
MEDIUM WAVE-BAND	600 kc/s. 1·5 Mc/s. 600 kc/s. 1·4 Mc/s.	500M. 214·3M. 500M. 214·3M.	L12, L2 T6, T2 L12, L2 T6, T2	 Check Check	 24 25	 28 29
40/120 Metre Band	2·7 Mc/s. 7·5 Mc/s. 2·7 Mc/s. 7·5 Mc/s.	111M. 40M. 111M. 40M.	L14, L4 T7, T3 L14, L4 T7, T3	 Check Check	 30 22	 35 26
25/31 Metre Band	9·4 Mc/s. 11·9 Mc/s. 9·4 Mc/s. 11·9 Mc/s.	31·91M. 25·21M. 31·91M. 25·21M.	L16, L6 T8, T4 L16, L6 T8, T4	Check with sig. gen. and crystal calibrator Check with sig. gen. and crystal calibrator Check Check	 16 21	 19 24
19 Metre Band	15·2 Mc/s. 15·0 Mc/s.	19·74M. 20·0M.	L18, L8 L18	Adjust L18 for "furthest out" peak Check calibration is within limits Crystal calibrator check	16	19
16 Metre Band	18·0 Mc/s. 17·7 Mc/s.	16·67M. 16·94M.	L20, L10 L20	Adjust L20 for "furthest out" peak Check calibration is within limits Crystal Calibrator check	19	22

ALIGNMENT NOTES. Check that with the tuning capacitor at maximum, the pointer is straight and in line with the two brown dots at the right hand end of the register. Calibration points are indicated by brown dots placed below their respective tuning scales, and alignment should fall within the limits indicated by the two breaks in the tuning scale on either side of the calibration points, or by the gap in which the wavelength appears.

The I.F. output from the signal generator should be taken through a 0·01 μF capacitor, and the R.F. output through an all-wave dummy aerial.

A crystal calibrator giving 1 Mc/s. and 100 kc/s. spaced signals should be used for checking the calibration of the bandspread ranges. Closely spaced pairs of signals will appear at the 1 Mc/s. and 100 kc/s. points. With 100 kc/s. multiples the higher frequency signal is the correct one. With 1 Mc/s. multiples however the lower frequency signal is correct.

The sensitivity figures in the last column show the signal input in micro-volts required under the given alignment conditions to produce 50 milliwatts output (18·5 volts in BC5068/L, 14 volts in BC5070/L across C35).

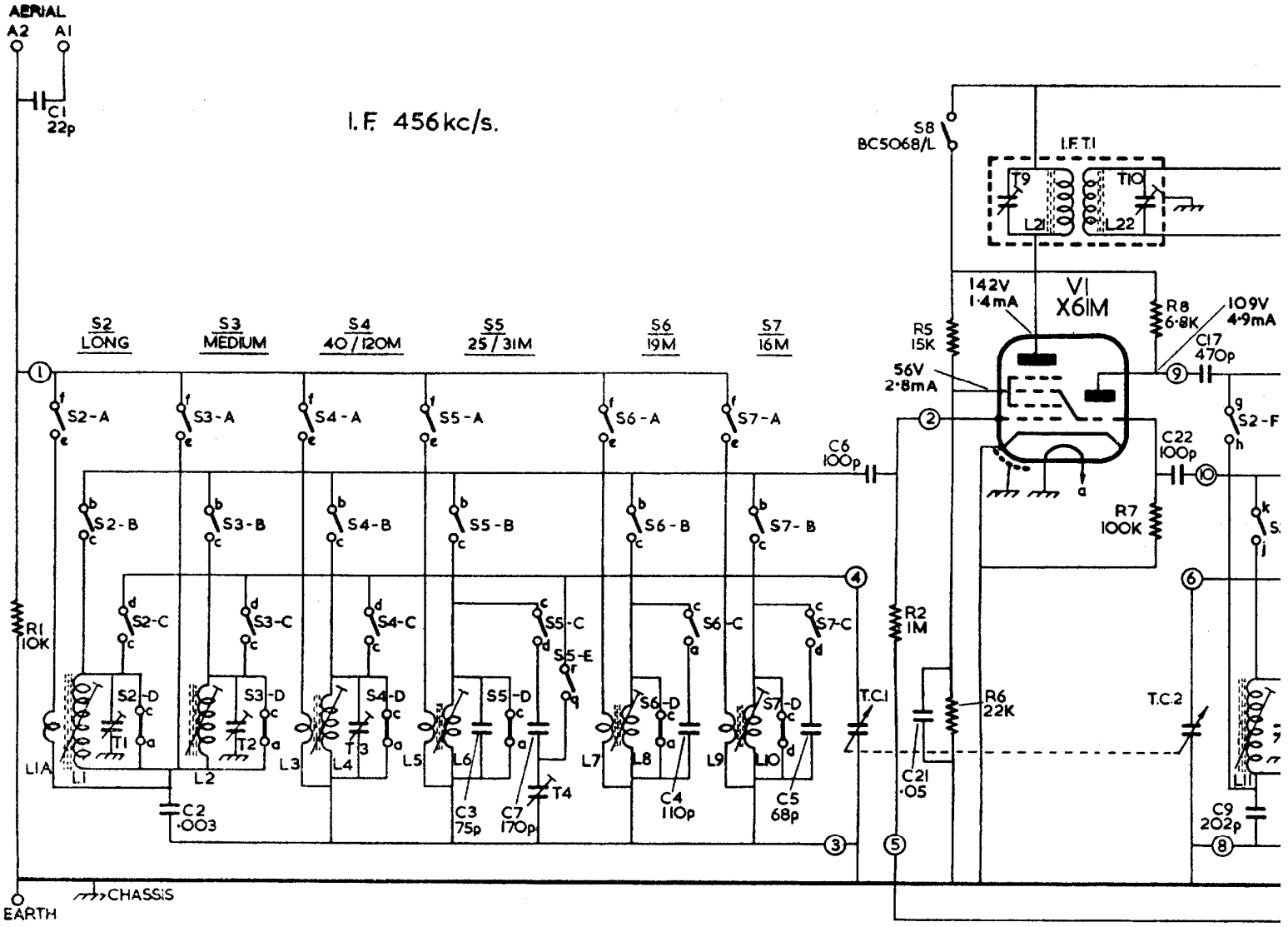
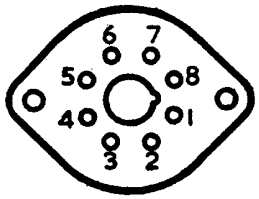


Fig. 3. CIRCUIT DIAGRAM

CIRCUIT NOTES. Switches are show
their operating key in accordance with the foll
1—OFF : 2—LONG : 3—MEDI
6—19 METRE BAND : 7—16 ME
Operation of any key causes its associated
A speaker switch is fitted in the table recei
the speakers in the radiogram is effected b
in fig. 7. R7 is 56K in some models.
All fixed resistors are ½ watt except R5—1
19—close-tolerance capacitors—and C12, 14, 16
correct types—see Replacement Parts Table.

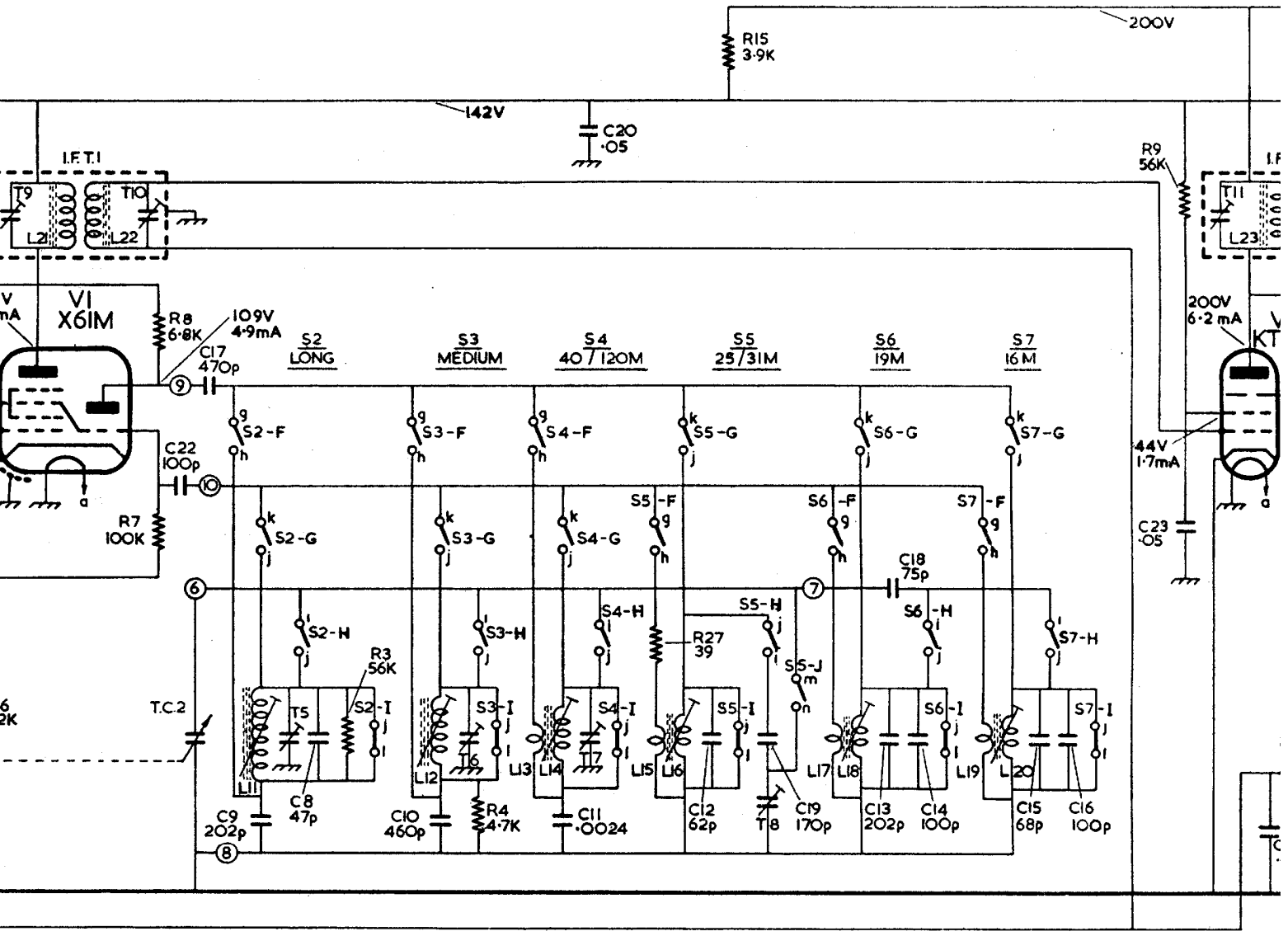


VALVE BASE CONNECTIONS

PIN No.	1	2	3	4	5	6	7	8	Top Cap.
X61M	M	H	A	Gs	Go	Ao	H	C	Gc
KTW61	—	H	A	Gs	Ge		H	C	Gc
DH63	—	H	A	D1	D2		H	C	Gc
KT61	—	H	A	Gs	Gc		H	C	
U50	—	F		A1		A2		F	

H—Heater : F—Filament : C—Cathode : Gc—Control Grid : Gs—Screen Grid : Ge—Suppressor: Go—Oscillator Grid : Ao—Oscillator Anode : A—Anode : D1, D2—Diode Anodes : M—Metallising.

Description	Resistance in ohms	C
Mains Transformer BC5070 BC5068		R8
primary 0—200 volt ...	27	
0—230 volt ...	31	
0—250 volt ...	34	
secondary—total H.T. ...	310	
—rec. fil. ...	0·14	
—heater ...	0·16	
Mains Transformer BC5070L, BC5068L		R8
primary 0—115 volt ...	10	
0—125 volt ...	10·9	
0—220 volt ...	24·5	
secondary—total H.T. ...	415	
—rec. fil. ...	0·13	
—heater ...	0·16	



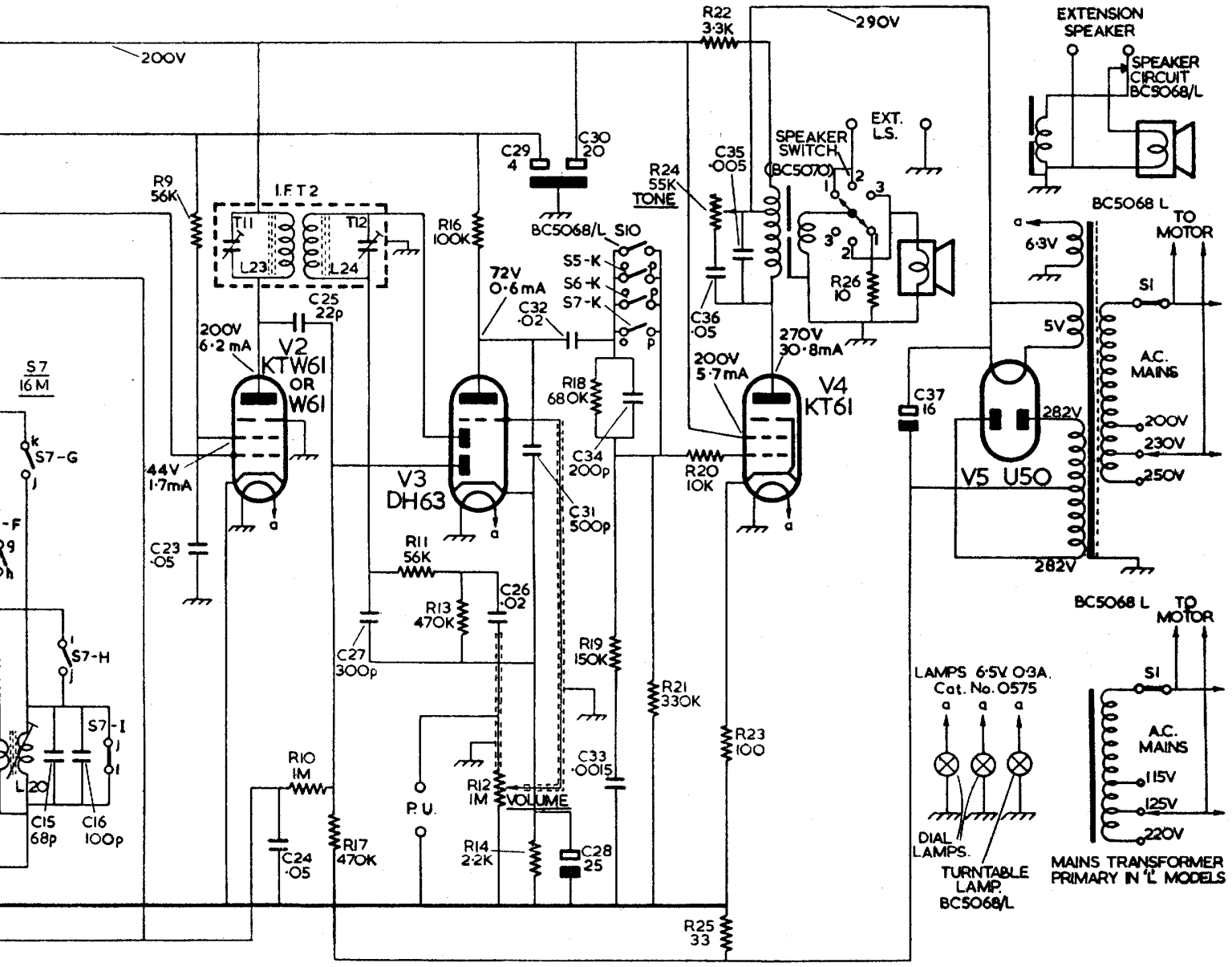
OTES. Switches are shown as they appear when all keys are released and are numbered to indicate in accordance with the following code:—
: 2—LONG : 3—MEDIUM : 4—40/120 METRE BAND : 5—25/31 METRE BAND :
ETRE BAND : 7—16 METRE BAND.
ny key causes its associated switches D and I to open and all others to close.
ch is fitted in the table receivers and is replaced by a Radio/Gram switch in the radiograms. Control of e radiogram is effected by switched extension sockets ; the two gram input circuits used are shown K in some models.
ors are ½ watt except R5—1 watt ; R15, R22—2 watt ; R26—4 watt : C2, 3, 4, 5, 7, 9, 10, 11, 13, 15, 18, capacitors—and C12, 14, 16—negative-temperature-coefficient capacitors—should only be replaced by the Replacement Parts Table. Potentials are measured on a 1,000 volt meter of 500,000 ohms resistance.

LOU
Exter
Intern

COIL AND TRANSFORMER DATA

	Resistance in ohms	Order Ref.
070		
...		R802339
...	27	
...	31	
...	34	
T. ...	310	
...	0·14	
...	0·16	
070L,		
...		R802343
...	10	
...	10·9	
...	24·5	
T. ...	415	
...	0·13	
...	0·16	

No.	Description	Resistance in ohms	Inductance in μH.	Order Ref.
L1	L.W. aerial coil	19·2	2,305	RP113446
L1A	L. W. image loop	0·12		
L2	M.W. aerial coil	2·3	178·6	RP111589
L3	40/120M. aerial primary ...	0·31		
L4	40/120M. aerial secondary ...	0·2	7·17	RP111595
L5	25/31M. aerial primary ...	0·27		
L6	25/31M. aerial secondary ...	0·045	0·955	RP114151
L7	19M. aerial primary	0·21		
L8	19M. aerial secondary ...	0·04	0·653	RP115159
L9	16M. aerial primary ...	0·21		
L10	16M. aerial secondary ...	0·04	0·653	RP115159
L11	L.W. oscillator coil	6·2	299·5	RP113447
L12	M.W. oscillator coil ...	1·6	94·1	RP111592
L13	40/120M. oscillator anode	0·27		
L14	40/120M. oscillator grid ...	0·19	6·18	RP111598
L15	25/31M. oscillator grid ...	0·27		
L16	25/31M. oscillator anode ...	0·046	0·9	RP114652



to indicate

Control of
d are shown

, 13, 15, 18,
aced by the
resistance.

LOUDSPEAKER SWITCH TABLE

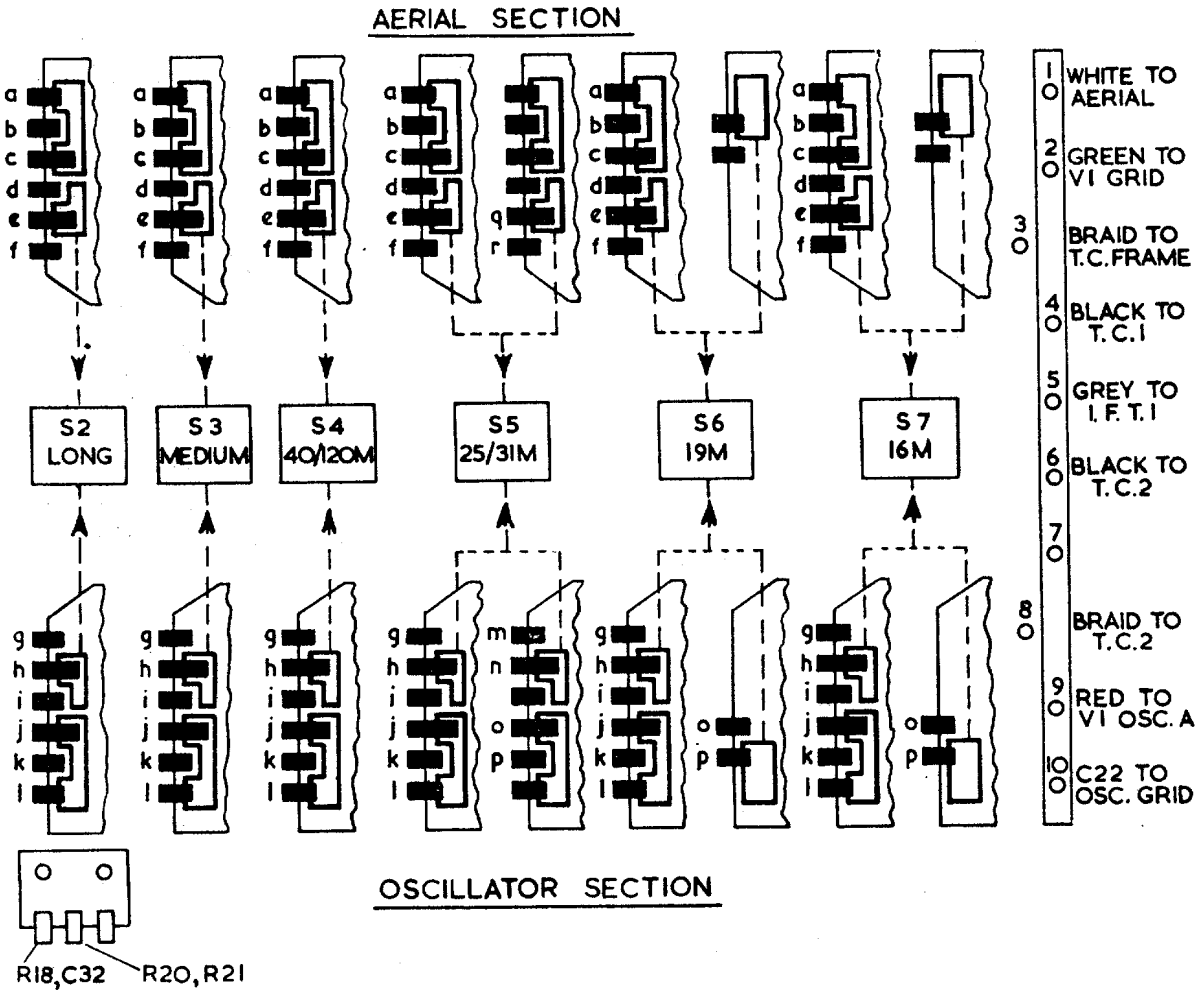
	1	2	3
External	In	In	Out
Internal	Out	In	In

RADIO/GRAM SWITCH TABLE

	S8	S9	S10
Gram	Open	Closed	Closed
Radio	Closed	Open	Open

ANSFORMER DATA

Inductance in μH.	Order Ref.	No.	Description	Resistance in ohms	Inductance in μH	Order Ref.
2,305	RP113446	L17	19M. oscillator grid ...	0·39		RP114650
		L18	19M. oscillator anode ...	0·01	0·144	
178·6	RP111589	L19	16M. oscillator grid ...	0·39		RP114650
		L20	16M. oscillator anode ...	0·01	0·144	
7·17	RP111595	L21/22	I.F.T.1 both coils	7	1,100	RK201299 Ass. No. 3
0·955	RP114151	L23/24	I.F.T.2 both coils	4	470	RK201308 Ass. No. 1
0·653	RP115159		BC5068/L output transformer primary—total ...	430		RK202824
0·653	RP115159		—tap to R22	12·5		
299·5	RP113447		secondary ...	0·325		
94·1	RP111592		BC5070/L output transformer primary—total ...	430		RK202327
6·18	RP111598		—tap to R22	12·5		
0·9	RP114652		secondary ...	0·61		
			BC5068/L L.S. speech coil ...	2·8		RK202903
			BC5070/L L.S. speech coil ...	2·6		RK203412



NOTES. The switches are shown as they appear when all keys are released, and operation of any key causes the appropriate switching links to move in the direction of the arrows. The switches in the aerial section are as they appear in the switch and coil unit when viewed with the aerial coils uppermost and the press key levers pointing away from the viewer. The switches in the oscillator section are as they appear when viewed with the oscillator coils uppermost and the press key levers pointing towards the viewer.

The terminal strip is as viewed from the back (trimmer side) of the unit, and is numbered to correspond with the junctions shown as encircled numbers in the circuit diagram Fig. 3. The switch contacts are lettered to correspond with the " detached " contacts in the circuit diagram.

Fig. 4. SWITCH CONTACTS

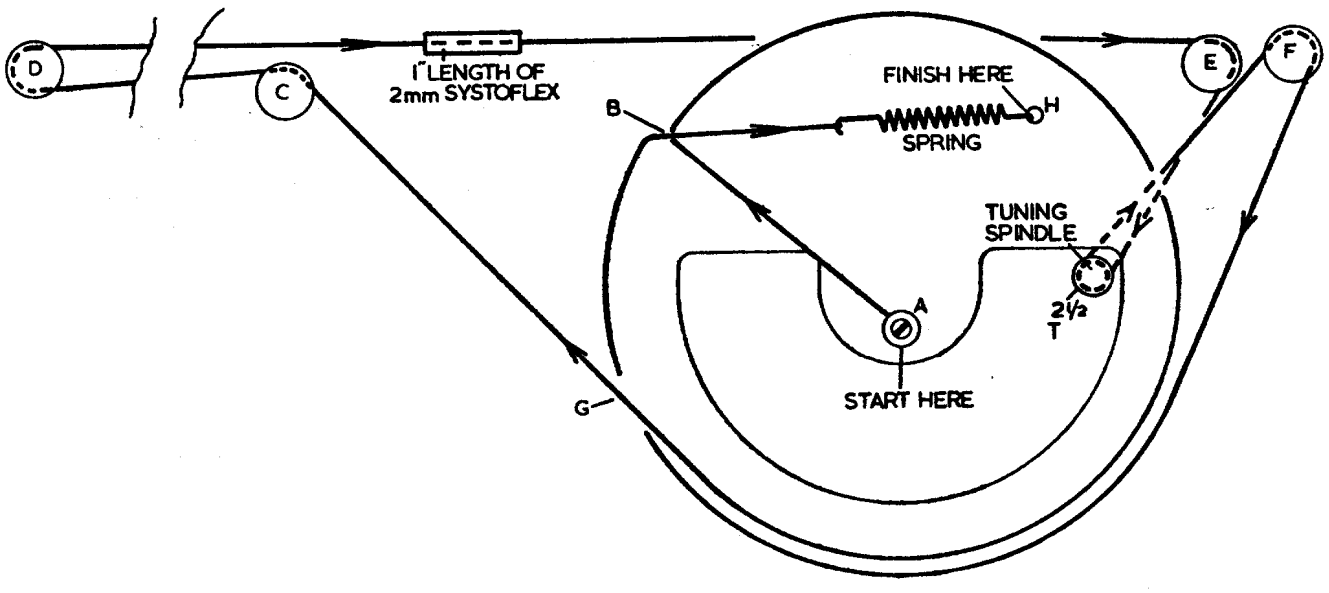


Fig. 5. DRIVE CORD REPLACEMENT

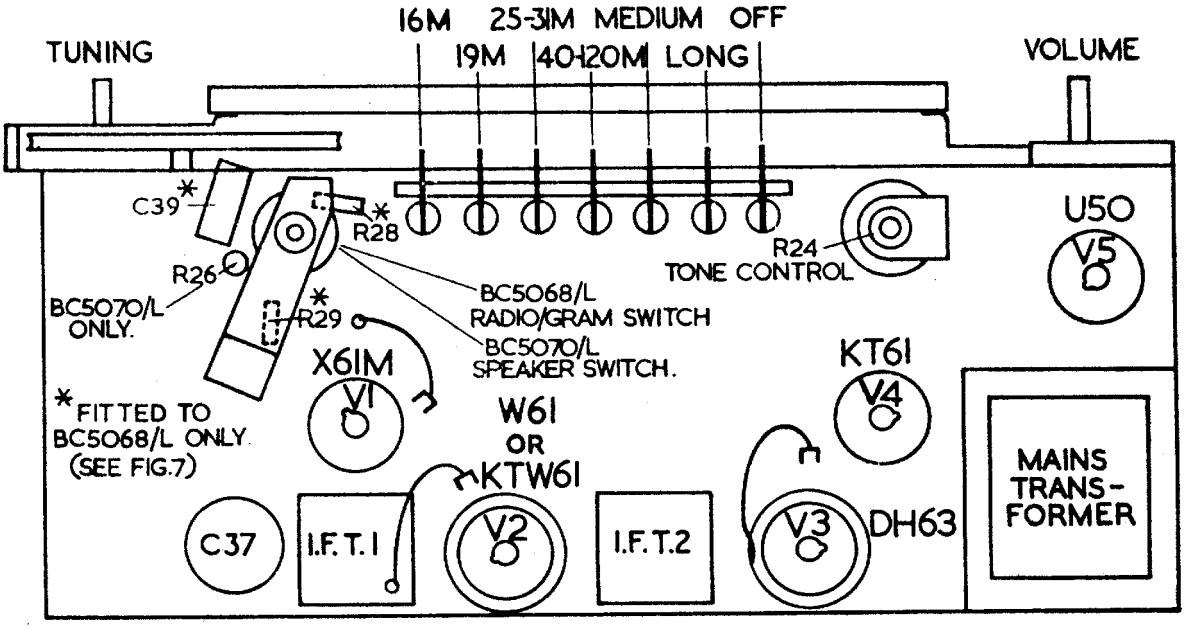


Fig. 6. UPPER CHASSIS

GRAMOPHONE INPUT CIRCUIT. A Garrard Lightweight or a Standard type pick-up is fitted, and the input circuit used for each is shown below.

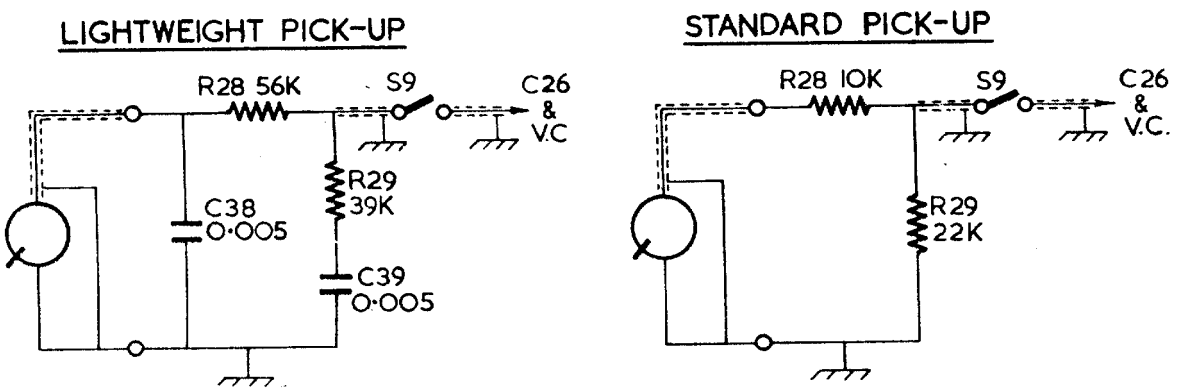


Fig. 7. GRAMOPHONE INPUT CIRCUIT

REPLACEMENT PART NUMBERS

BC5070/L Cabinet... ...	R805500	C2—·003 μF. ±4%	RP101630
BC5068/L Cabinet... ...	R803808	C3—75p. ±½p.	RK202607
Needlecup	RP109170	C4—110p. ± 2%	RK202803
Register	R803973	C5, C15—68p. ±½p. ...	RK202637
Window	RK203253	C7, C19—170p. ±1% ...	RK202640
Volume and Tuning Knob	RP112186	C9, C13—202p. ±1% ...	RK202639
Speaker and Gram. Knob	RP117805	C10—460p. ±1%	RK202610
Tone Control Knob ...	RP112424	C11—·0024 μF. ±2% ...	RK202611
BC5070/L Speaker Switch	RK202527	C12—62p. ±2%	RK203016
BC5068/L Gram. Switch ...	RK202907	C14, C16—100p. ±2% ...	RK202643
Record Changer RC65/D16	RK202832	C18—75p. ±½p.	RK202607
Tuning Capacitor	RK202392	C33—·0015 μF. ±15% ...	RP100934
Tone Control	RK200438		
Volume Control	RK200475	C28—25μF. 25v. wkg. ...	RK200598
Terminal Screws	RP103583	C29/C30—(20+4) μF. ...	RK202682
Switch and Coil Unit ...	R805292	C37—16μF. 450v. wkg. ...	RK201574
Carriage and Pointer ...	RP111375		
Tuning Drum	RP110918	R5—15,000 ohms 1 watt ...	RK191348
Spring	RP110921	R15—3,900 ohms 2 watt ...	RK191611
Flywheel	RP111297	R22—3,300 ohms 2 watt ...	RK191610
Spindle	RP111497		
		BC5070/L	
		R26-10 ohms 4 watt ...	RK203155