EDDYSTONE Models 680, 680X

General Description : Fifteen-valve (including rectifier and voltage stabiliser), five-waveband communications receiver with two stages of R.F. amplification, crystal filter, " S "-meter and noise limiter. Released 1949.

Power Supplies : A.C. mains, 110 and 200–250 volts.

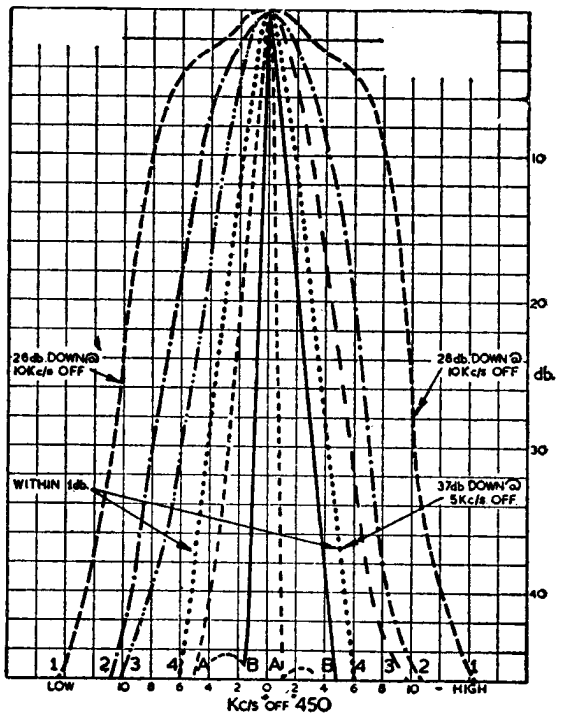
Intermediate Frequency : 450 kc/s. ± 1 kc/s. I.F. circuits should be peaked to exact frequency of crystal. The I.F. transformer cores, however, are sealed, and should not be disturbed unless there is good reason to believe that they require re-alignment.

Valves : (V1) 6BA6; (V2) 6BA6; (V3) 7S7, X81M or 6BE6; (V4) 8D3 (local oscillator); V5) 6BA6; (V6) 6BA6; (V7) 6AL5 or D77; (V8) 6AU6; (V9) 6AU6; (V10) 7D9; (V11) 7D9; (V12) 6BA6 (B.F.O.); (V13) 6AL5 or D77 (noise limiter); (V14) 5Z4G; (V15) VR150/30 (voltage stabiliser). Type 8D3 (V4) is now re-classified as type 6AM6, occasionally type Z77 is used in this position. Type 6BR7 (8D5) replaces type 6AU6 in the 1952 model, known as the 680X.

Modifications : Minor modifications may be found in later models, particularly in arrangement adopted for gain compensation with varying selectivity. Circuit Diagrams for the 680 and 680X are given.

Notes : Aerial input impedance 400 ohms (nominal). Output impedance 2·5 ohms. The pre-set controls at the back of the cabinet are for " S "-meter zero adjustment and for dial-illumination control (R61). The heater circuits are balanced to earth, the noise-limiter valve being supplied by a separate winding on the mains transformer. Fuse rating 1 amp.

Alignment Procedure : Trimmer lay-out and alignment frequencies are given on pages 196–7. Alignment of the I.F. stages should be made with the selectivity control in the position of maximum selectivity (curve 4 in the accompanying illustration). Alignment of the R.F. circuits follows normal procedure : the oscillator circuits are first adjusted to correct any calibration errors, then the F.C., second R.F. and first R.F. stages (in that order) are aligned for maximum response.

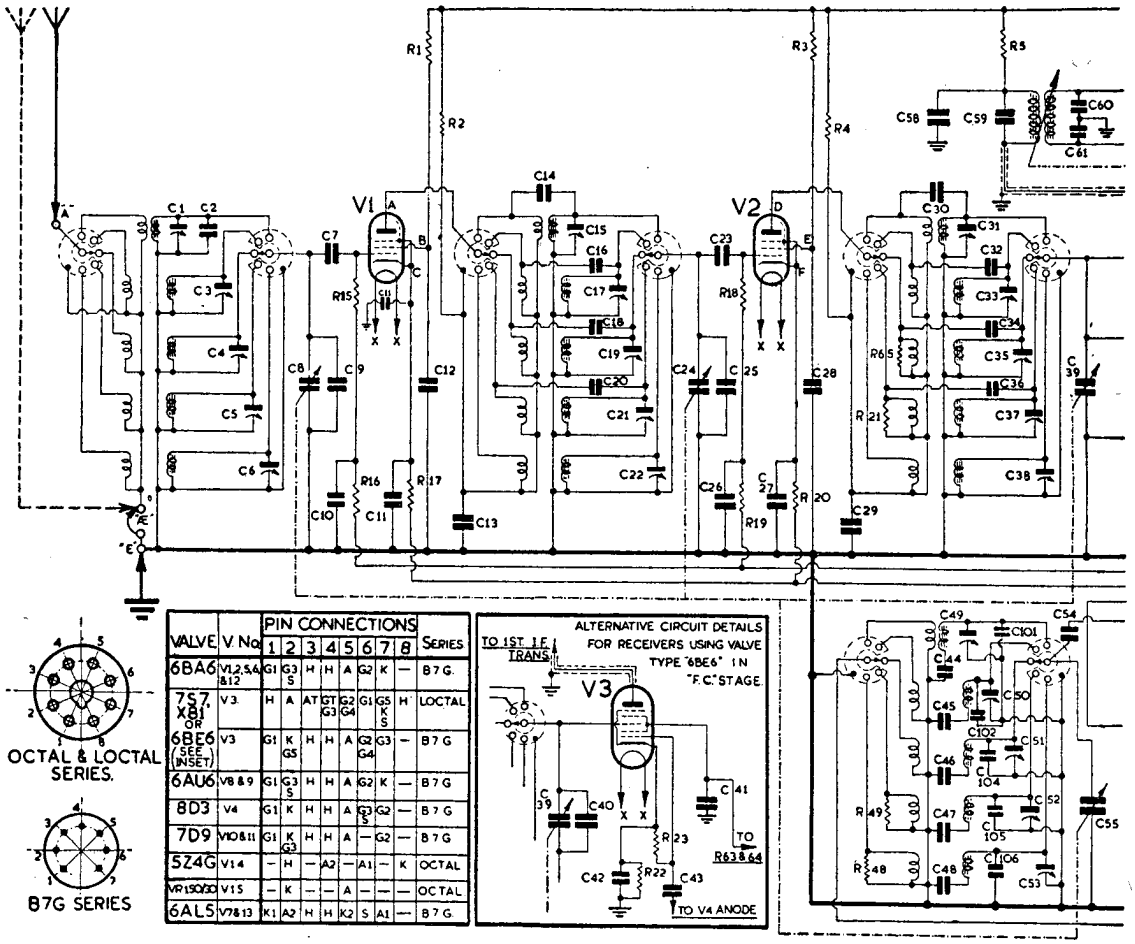


SELECTIVITY CURVES FOR THE " 680 " RECEIVER

(1) —— —— —— minimum position.
(2) — · — · — · — first intermediate position.
(3) — · · — · · — second intermediate position.
(4) . . . . . maximum selectivity.
(A) — — — — — maximum selectivity, with crystal filter in, and phased to reject signal on one side.
B) ———— as " A ", but with crystal phased on other side.

Voltage Values : Voltages given below are between the points indicated and chassis. Voltage indicated depends on the internal resistance of the particular meter employed. A tolerance of plus or minus 10 per cent should be allowed. Total H.T. current 115 mA.

Circuit Reference	1000 *ohms/volt Testmeter*	333 *ohms/volt Testmeter*	*Circuit Reference*	1000 *ohms/volt Testmeter*	333 *ohms/volt Testmeter*
A	218 v.	210 v.	Q	1·0 v.	1·0 v.
B	90 v.	82 v.	R	10·2 v.	9·5 v.
C	0·8 v.	0·8 v.	S	60 v.	35 v.
D	210 v.	208 v.	T	40 v.	30 v.
E	90 v.	85 v.	U	0·9 v.	0·7 v.
F	1·2 v.	1 v.	V	62 v.	38 v.
G	218 v.	215 v.	W	0·9 v.	0·7 v.
H	104 v.	100 v.	X	220 v.	220 v.
J	1·3 v.	1·3 v.	Y	222 v.	222 v.
K	104 v.	100 v.	Z	10·2 v.	9·5 v.
L	212 v.	210 v.	A–	85 v.	80 v.
M	90 v.	82 v.	B–	150 v.	150 v.
N	1·0 v.	0·9 v.	C–	260 v.	260 v.
O	200 v.	200 v.	D–	250 v. (A.C.)	250 v. (A.C.)
P	90 v.	82 v.	E–	150 v.	150 v.



VALVE	V No.	PIN CONNECTIONS 1	2	3	4	5	6	7	8	SERIES
6BA6	V1,2,5,&12	G1	G3 S	H	H	A	G2	K	—	B7G.
7S7 X81 OR	V3	H	A	AT	GT G3	G2 G4	G1	G5 K S	H	LOCTAL
6BE6 (SEE INSET)	V3	G1	K G5	H	H	A	G2 G4	G3	—	B7G
6AU6	V8 & 9	G1	G3 S	H	H	A	G2	K	—	B7G
8D3	V4	G1	K	H	H	A	G3 S	G2	—	B7G
7D9	V10&11	G1	K G3	H	H	A	—	G2	—	B7G
5Z4G	V14	—	H	—	A2	—	A1	—	K	OCTAL
VR150/30	V15	—	K	—	—	A	—	—	—	OCTAL
6AL5	V7&13	K1	A2	H	H	K2	S	A1	—	B7G

CIRCUIT DIAGRAM—

Capacitors.

3/20 pF. (air)	C1, C3, C4, C5, C6, C15, C17, C19, C21, C22, C31, C33, C35, C37, C38, C49, C50, C51, C52, C53
3 pF.	C18, C20, C34, C36
6 pF.	C16, C32, C89
8 pF.	C72
10 pF.	C2, C43, C104, C105, C106
20 pF.	C14, C30, C63
25 pF.	C9, C25, C40
50 pF.	C5 6
100 pF.	C7, C23, C82, C83, C90, C92, C103
200 pF.	C54
2400 pF.	C44
2500 pF.	C45
1625 pF.	C46
900 pF.	C47
400 pF.	C48, C59, C65, C67, C70, C71
500 pF.	C64
800 pF.	C60, C61
0·0005 (mica)	C96, C97, C107
0·002 (mica)	C73
0·01 (mica)	C75, C86, C88, C98
0·01 (paper)	C11,* C26, C68, C76, C84, C93, C99, C100
0·1	C10, C11,* C12, C13, C27, C28, C29. C41, C42, C57, C58, C66, C69, C77, C79, C80, C81
8 (350 v.)	C74
25 (25 v.)	C87
4 (350 v.)	C85
16 (450 v.)	C94
40 (350 v.)	C95

C8, C24, C39, C55 4 Gang capacitor. 10–368 pF. per section.

C62 Crystal phasing capacitor. C91 BFO pitch condenser.

C44, C45, C46, C47, C48 ± 1% tolerance.

* One each, 0·01 and 0·1 in parallel.

C59, C60, C61, C64, C65, C67, C70, C71, C72 ± 2% tolerance.

C9, C25, C40 ± 5% tolerance.

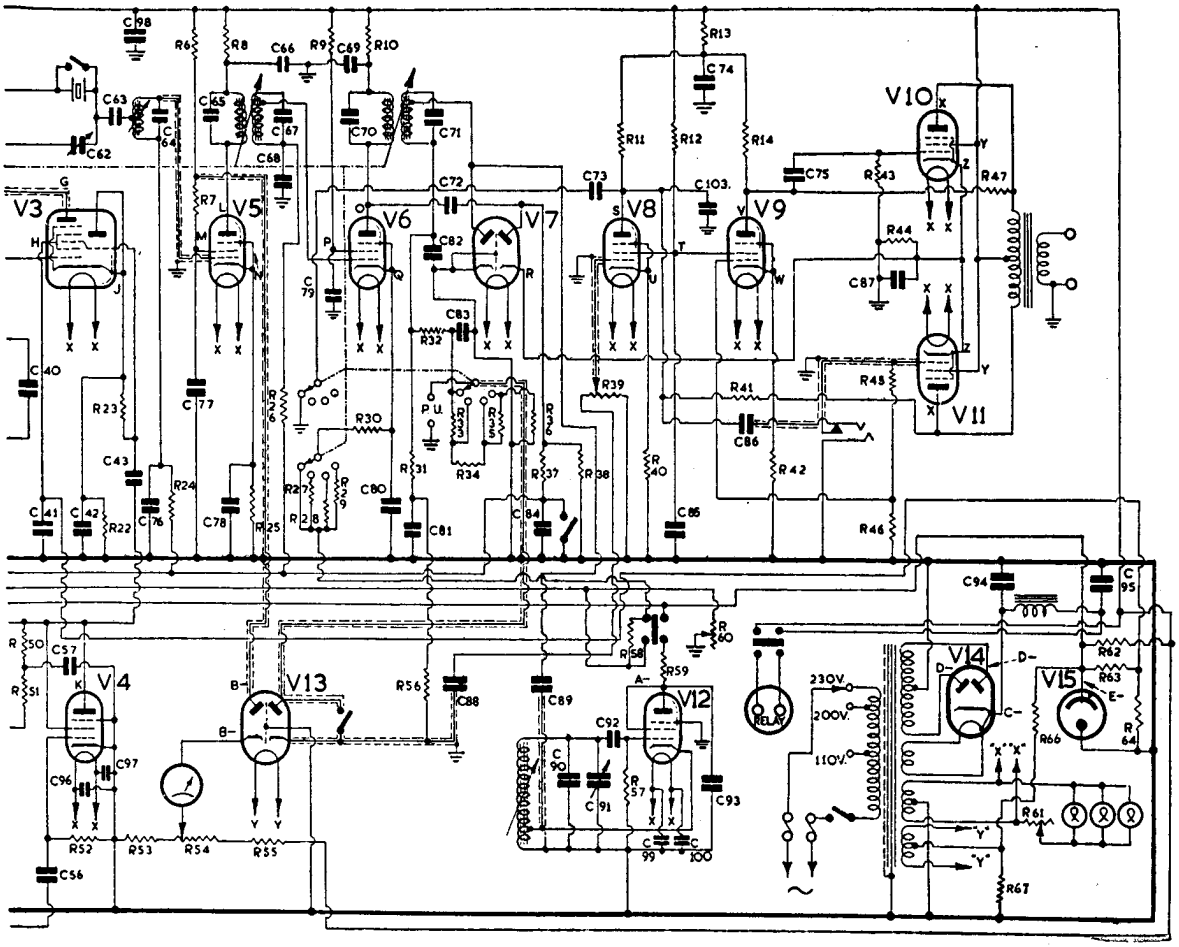
Resistors.

68	R17, R20, R25, R30
150	R21
200	R22
560	R40, R42, R58
620	R44
750	R27
1k	R2, R4, R5, R8, R51
1·5k	R65
2·2k	R48, R49
2·7k	R10, R62
4·7k	R28, R63
6·8k	R67
7·5k	R35, R46
8·2k	R29
10k	R13, R50, R59
12·5k	R55 *
13k	R36
15k	R6, R7, R64
22k	R34, R52
27k	R53
33k	R1, R3, R9
47k	R33, R57
0·1M	R11, R14, R23, R32, R66
0·18M	R12
0·47M	R15, R16, R18, R19, R24, R26 R37, R43, R45
1M	R31, R38
2·2M	R56
3M	R41, R47

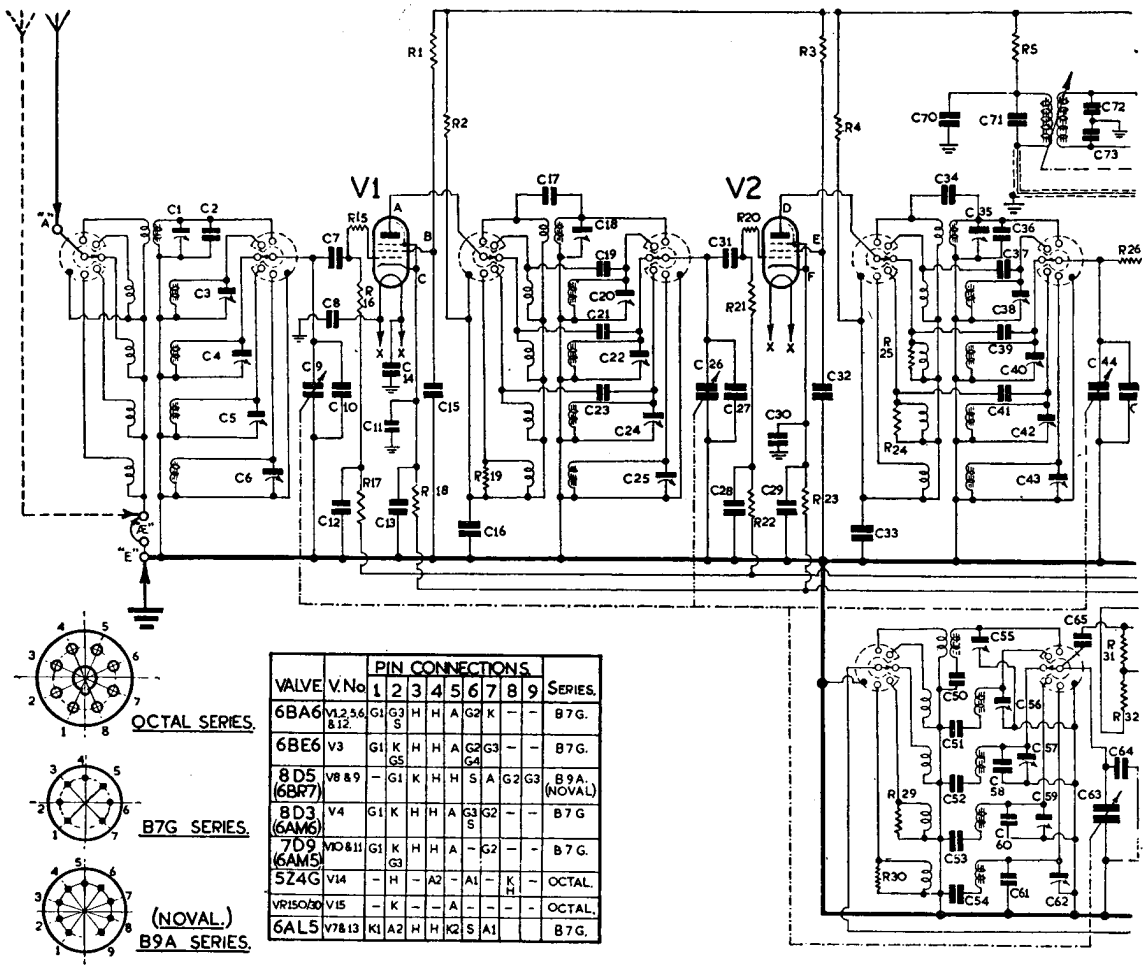
R1, R3, R9, R53, R64 1-watt. R62 5-watt. Remainder ½-watt.

Potentiometers: R60 10,000 ohms; R61 5 ohms; R39 0·5M; R54 5,000 ohms.

* Two 25,000-ohm resistors in parallel.



EDDYSTONE MODEL 680

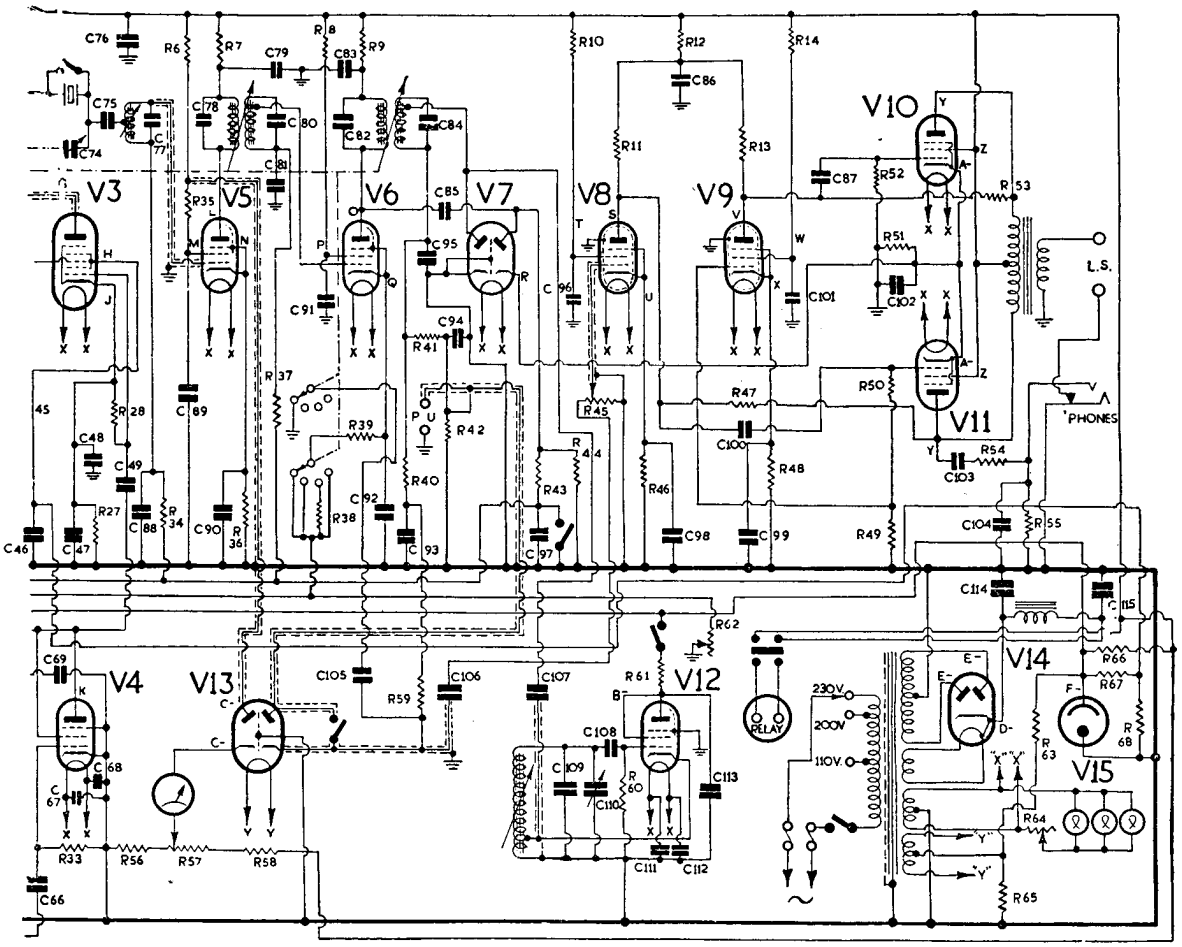


VALVE	V. No	PIN CONNECTIONS 1	2	3	4	5	6	7	8	9	SERIES.
6BA6	V1,2,5,6 & 12.	G1	G3 S	H	H	A	G2	K	–	–	B7G.
6BE6	V3	G1	K G5	H	H	A	G2 G4	G3	–	–	B7G.
8D5 (6BR7)	V8 & 9	–	G1	K	H	H	S	A	G2	G3	B9A. (NOVAL)
8D3 (6AM6)	V4	G1	K	H	H	A	G3 S	G2	–	–	B7G
7D9 (6AM5)	V10 & 11	G1	K G3	H	H	A	–	G2	–	–	B7G.
5Z4G	V14	–	H	–	A2	–	A1	–	K H	–	OCTAL.
VR150/30	V15	–	K	–	–	A	–	–	–	–	OCTAL.
6AL5	V7 & 13	K1	A2	H	H	K2	S	A1			B7G.

CIRCUIT DIAGRAM—

Capacitors.

C1	3–23 pF.
C2	10 pF.
C3	3–23 pF.
C4	3–23 pF.
C5	3–23 pF.
C6	3–23 pF.
C7	100 pF.
C8	0·0005
C9	10–367·75 pF.
C10	25 pF.
C11	0·01
C12	0·01
C13	0·1
C14	0·0005
C15	0·1
C16	0·1
C17	20 pF.
C18	3–23 pF.
C19	6 pF.
C20	3–23 pF.
C21	3 pF.
C22	3–23 pF.
C23	3 pF.
C24	3–23 pF.
C25	3–23 pF.
C26	10–367·75 pF.
C27	25 pF.
C28	0·01
C29	0·1
C30	0·01
C31	100 pF.
C32	0·1
C33	0·1
C34	20 pF.
C35	3–23 pF.
C36	3 pF.
C37	6 pF.
C38	3–23 pF.
C39	3 pF.
C40	3–23 pF.
C41	3 pF.
C42	3–23 pF.
C43	3–23 pF.
C44	10–367·75 pF.
C45	25 pF.
C46	0·1
C47	0·1
C48	0·01
C49	10 pF.
C50	7000 pF.
C51	3625 pF.
C52	1625 pF.
C53	900 pF.
C54	440 pF.
C55	3–23 pF.
C56	3–23 pF.
C57	3–23 pF.
C58	10 pF.
C59	3–23 pF.
C60	20 pF.
C61	20 pF.
C62	3–23 pF.
C63	10–367·75 pF.
C64	12 pF.
C65	200 pF.
C66	50 pF.
C67	0·0005
C68	0·0005
C69	0·1
C70	0·1
C71	400 pF.
C72	800 pF.
C73	800 pF.
C74	
C75	20 pF.
C76	0·01
C77	500 pF.
C78	400 pF.
C79	0·1
C80	400 pF.
C81	0·01
C82	400 pF.
C83	0·1
C84	400 pF.
C85	10 pF.
C86	8
C87	0·01
C88	0·01
C89	0·1
C90	0·1
C91	0·1
C92	0·1
C93	0·1
C94	100 pF
C95	100 pF.
C96	0·5
C97	0·01
C98	30
C99	30
C100	0·01
C101	0·5
C102	30
C103	0·002
C104	0·01
C105	0·002
C106	0·01
C107	8 pF.
C108	100 pF.
C109	100 pF.
C110	
C111	0·01
C112	0·01
C113	0·01
C114	16
C115	40



EDDYSTONE MODEL 680X

Resistors.

R1	33,000 (1 W.)	R36	68
R2	1,000	R37	0·47M
R3	33,000 (1 W.)	R38	560
R4	1,000	R39	68
R5	1,000	R40	1M
R6	15,000	R41	100,000
R7	1,000	R42	100,000
R8	33,000	R43	0·47M
R9	1,000	R44	1M
R10	1M	R45	0·5M (Pot.)
R11	0·27M	R46	1,500
R12	10,000	R47	3M
R13	0·27M	R48	1,500
R14	1M	R49	6,800
R15	12	R50	0·47M
R16	0·47M	R51	620
R17	0·47M	R52	0·47M
R18	68	R53	3M
R19	150	R54	100,000
R20	12	R55	2,200
R21	0·47M	R56	27,000
R22	0·47M	R57	5,000 (Pot.)
R23	68	R58	10,000
R24	150	R59	2M
R25	1,500	R60	47,000
R26	12	R61	10,000
R27	150	R62	10,000 (Pot.)
R28	100,000	R63	0·27M
R29	2,200	R64	5 (Pot.)
R30	2,200	R65	6,800
R31	10,000	R66	2,700 (W.W.)
R32	1,000	R67	4,700
R33	22,000	R68	22,000 (1 W.)
R34	0·47M		
R35	15,000		

VOLTAGE VALUES.

The voltages are between the point indicated and the chassis. Set the receiver at 1000 kc/s on Range 5 with the aerial shorted out, R.F. control set at maximum. A.F. gain control set at minimum with B.F.O. on. Two sets of values are given using different meters as shown. It will be evident that the actual voltage indicated depends on the meter employed. A tolerance of plus or minus 5 per cent should be allowed on the values given.

Point	333 *o.p.v.*	1000 *o.p.v.*	*Point*	333 *o.p.v.*	1000 *o.p.v.*
A	205 v.	218 v.	R	11·5 v.	11·5 v.
B	80 v.	84 v.	S	20 v.	25 v.
C	0·8 v.	1 v.	T	18 v.	25 v.
D	210 v.	218 v.	U	0·7 v.	0·8 v.
E	80 v.	83 v.	V	18 v.	22 v.
F	1 v.	1·9 v.	W	15 v.	22 v.
G	212 v.	220 v.	X	0·8 v.	0·8 v.
H	100 v.	100 v.	Y	218 v.	220 v.
J	1·1 v.	1·2 v.	Z	220 v.	225 v.
K	85 v.	100 v.	A—	11·5 v.	11·5 v.
L	206 v.	210 v.	B—	85 v.	85 v.
M	88 v.	93 v.	C—	142 v.	150 v.
N	1 v.	1 v.	D—	252 v.	260 v.
O	206 v.	210 v.	E—	240 v. (A.C.)	245 v. (A.C.)
P	75 v.	80 v.	F—	150 v.	150 v.
Q	1 v.	1 v.			

Total H.T. current: 110 mA. Heater-to-heater voltage: 6·3 A.C.

EDDYSTONE RECEIVERS

INTRODUCTORY NOTES

Manufacturers : Messrs. Stratton and Co. Ltd., Eddystone Works, Alvechurch Road, West Heath, Birmingham 31.

The front panel and the coil-box of all models are stout diecastings, while separate chassis are used for the power unit, I.F. section and output stage.

In each model, the cabinet is easily removable by withdrawing four large screws at the rear. Most parts of the receiver are then readily accessible.

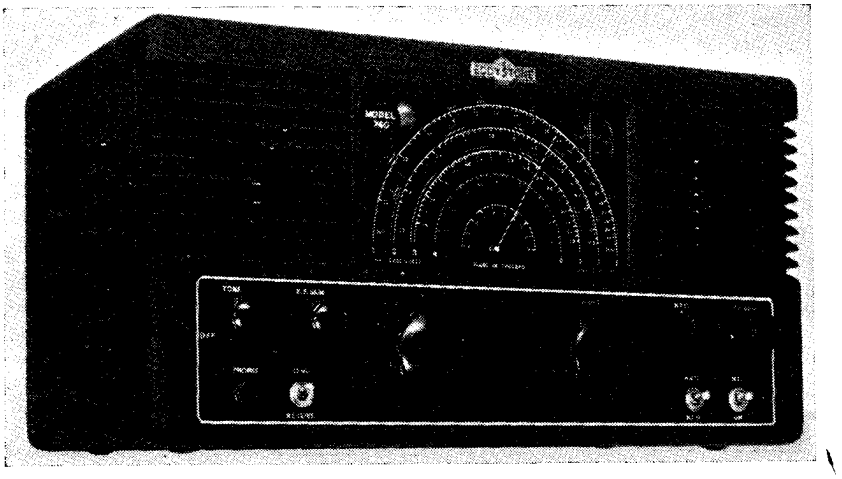
All coils (R.F. and I.F.) are permeability tuned, trimmers also being provided in the R.F. and oscillator sections. Alignment is carried out following the normal procedure, variations being indicated where necessary. When changing a valve, it is usually only necessary to re-adjust the appropriate trimmer capacitors to correct any differences in stray capacitance, and there is then no need to remove the lid of the coil-box. For full alignment, however, this lid must be taken off. Always remember to adjust the trimmers at the high-frequency end of a range and the cores at the low-frequency end. The correct alignment points are given in the table below. Where variable selectivity is fitted (Models 750, 680), alignment should be carried out with the control set at *maximum* selectivity.

Models 640, 740 and 750 are adapted for operation from a 6-volt accumulator and auxiliary H.T. supply. The octal plug which completes the L.T. connections must be inserted in the socket at the rear. This plug and its internal connections should be examined if any failure of or variation in the heater supply occurs.

During manufacture, all receivers are subjected to an ageing process and are then calibrated to an accuracy of plus or minus 0·5 per cent.

The transformers fitted to mains models are for 40–60 c/s. operation and are not suitable for 25 c/s. supplies.

The glass and dial can be cleaned by using a thin artist's brush, long enough



GENERAL APPEARANCE OF POST-WAR EDDYSTONE RECEIVERS (MODEL 740)

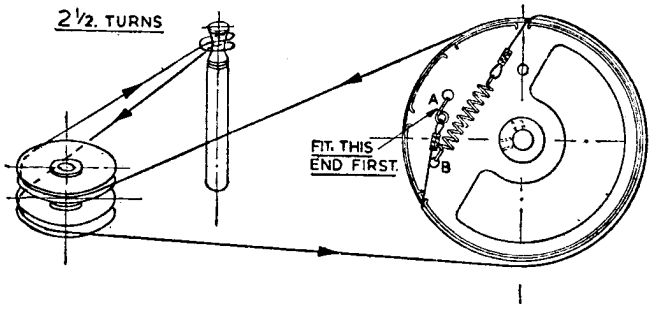
to reach all parts of the glass. The dial lights are standard in all receivers, bulbs with miniature bayonet caps, rated at 6·3 volts, 0·3 amp., being used. To change a lamp, it is only necessary to press the holder, which is sprung into place, and pull out.

A standard wiring code is used as follows :

A.C. mains	Grey	Heaters	Yellow
H.T.	Red	Negative to chassis	Brown
Anodes	Light blue	Chassis potential	Black
Grids	Green	Other leads	White

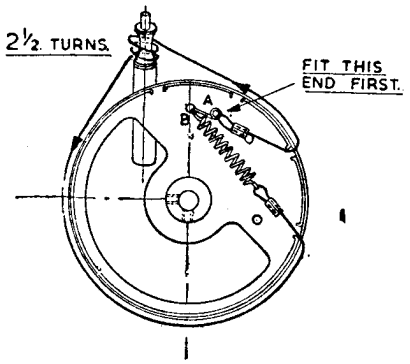
ALIGNMENT FREQUENCIES

Model	*Range 1*		*Range 2*		*Range 3*		*Range 4*		*Range 5*	
	High (Mc/s.)	*Low (Mc/s.)*	*High (Mc/s.)*	*Low (Mc/s.)*	*High (Mc/s.)*	*Low (Mc/s.)*	*High (kc/s.)*	*Low (kc/s.)*	*High (kc/s.)*	*Low (kc/s.)*
556, 504	30	14	13	6·5	6·5	3	2800	1400	1300	600
659, 670	28	13	12	6	2·6	1·3	1200	600	—	—
640	30	13	12	5	4	2	—	—	—	—
710, 740	28	12	9	4	3·2	1·5	1200	550	—	—
750	30	13	11	4·7	4·2	2	1350	550	—	—
680	28	14	13	6	5·8	2·5	2500	1200	1100	500



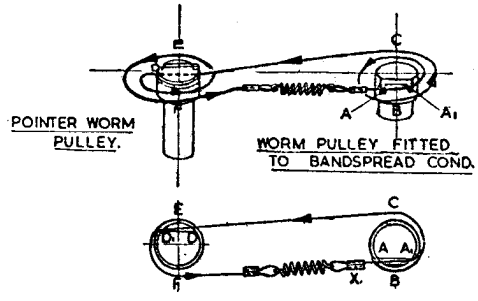
BANDSET.

TURN BANDSET CONDENSER TO MAXIMUM CAPACITY; THE DRIVE DRUM FITTED TO THE CONDENSER SPINDLE SHOULD THEN BE ORIENTATED AS SHOWN.
USE CORD. D.1069. COMMENCE AT 'A' & FINISH AT 'B'.



BANDSPREAD.

WITH THE BANDSPREAD CONDENSER SET AT MAX. CAPACITY: THE DRIVE DRUM IS FITTED IN THE POSITION SHOWN.
USE CORD. D.1070. COMMENCE AT 'A' & FINISH AT 'B'.

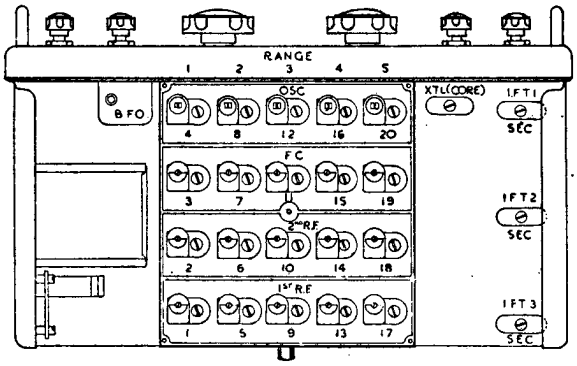


BANDSPREAD POINTER DRIVE.

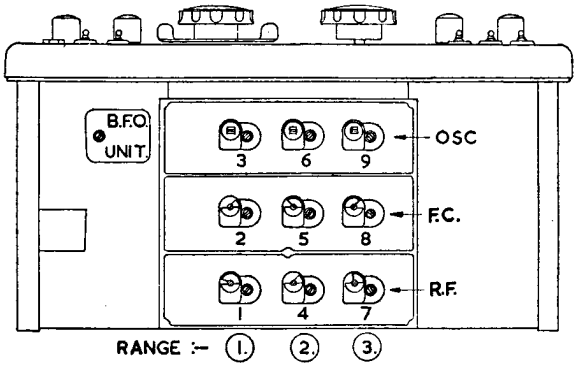
SET BANDSPREAD CONDENSER AT MAX. CAPACITY. WITH WORM PULLEYS IN POSITIONS SHOWN. FIT CORD D.1071. IN SLOT. A.A1. SO THAT THE CORD CLIP 'X' JUST CLEARS THE PULLEY. NOW COMPLETE ASSEMBLY BY FOLLOWING. A1-B-C-D-D-E-F.

CORD DRIVE REPLACEMENT—EDDYSTONE MODEL 640

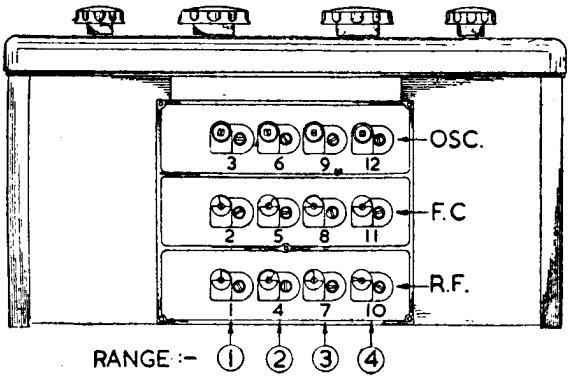
Turn receiver panel downwards top towards you; then with cover removed and looking down on the receiver, the cord drives would appear similar to the inverted rear views shown. To fit cords, remove dial bulbs and reflector plate and proceed as indicated in the diagrams.



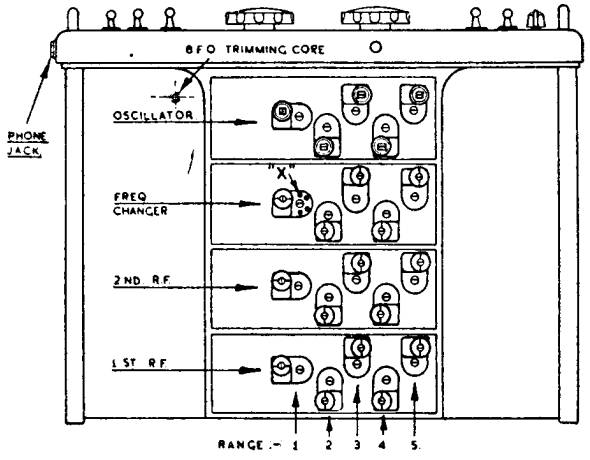
CORE AND TRIMMER LAY-OUT—
EDDYSTONE MODELS 504, 556



CORE AND TRIMMER LAY-OUT—
EDDYSTONE MODEL 640



CORE AND TRIMMER LAY-OUT—
EDDYSTONE MODELS 659, 670, 740, 710



CORE AND TRIMMER LAY-OUT—
EDDYSTONE MODEL 680