EDDYSTONE

MODEL "680" COMMUNICATIONS RECEIVER

A high grade instrument with wide frequency coverage for PROFESSIONAL COMMUNICATIONS requirements

The "680" is a fifteen valve superheterodyne receiver embodying advanced technique. New features in the design add to the outstanding and reliable performance of which the receiver is capable. The appearance is impressive, whilst the construction and general workmanship is of the finest in the Industry.

SPECIAL FEATURES INCLUDE

- Continuous coverage from 30 Mc/s to 480 Kc/s.
- Two Radio-Frequency stages.
- Two I.F. stages.
- Crystal Filter.
- Beat frequency Oscillator.
- Push-pull output stage.
- Variable Selectivity.
- "S" Meter.
- Noise Limiter.
- Standby switch.
- Stabilised H.T. voltage to Oscillator, etc.
- Provision for relay operation of transmitter.
- High signal-to-noise ratio and sensitivity.
- Highly attenuated Image response.
- Very effective A.V.C.
- Large accurately calibrated dial.
- Provision for twin feeder and single aerial.
- Adjustable dial illumination.
- Modern miniature all-glass valves.
- Flywheel loaded tuning — 140 to 1 reduction ratio.
- Mechanical bandspread logging device.
- All controls separate and conveniently arranged.
- Robust construction.
- Finished for tropical service.

RADIO PRODUCTS EDDYSTONE TRADE MARK

Manufactured by

STRATTON & CO LTD

EDDYSTONE WORKS · BIRMINGHAM · ENGLAND

CABLES: STRATNOID BIRMINGHAM

THE EDDYSTONE "680" COMMUNICATIONS RECEIVER.

The Eddystone "680" is a high grade communications receiver, offered for use by professional services and the discriminating amateur expert. The basic circuit is a 15 valve (including rectifier and stabiliser) superheterodyne, incorporating several design features which add to the outstanding and reliable performance of which the receiver is capable.

The majority of valves are of the all-glass type. Each has been selected with care, to ensure maximum performance with an excellent signal-to-noise ratio.

Frequency Coverage.

The five switched coil assemblies give a continuous coverage from 30 Mc/s to 480 Kc/s (10 to 625 metres). The individual ranges are:-

Band 1	30 to 13 Mc/s.
Band 2	13 to 5.5 Mc/s.
Band 3	5.8 to 2.5 Mc/s.
Band 4	2.5 to 1.12 Mc/s.
Band 5	1120 to 480 Kc/s.

Tuning Dial.

The gear driven, flywheel controlled tuning drive has a reduction ratio of approximately 140 to 1, permitting very fine tuning on all ranges. The scale is clearly marked in frequency, with additional markings for the major broadcast and amateur bands.

The mechanical bandspread device greatly assists in the accurate logging of particular stations. It consists of a rotating scale, in the top right hand corner of the dial. One complete revolution of this scale corresponds to a movement of the main pointer over one division of the small inner scale on the main dial. The fine tuning scale is read against the vertical hair-line on the window. The actual scale length of a complete range is equivalent to ninety inches

Circuit and Valve Sequence.

The circuit comprises:- two RF stages, ensuring high sensitivity with an excellent signal-to-noise ratio; frequency-changer with a high conversion factor; separate oscillator, for maximum efficiency and freedom from drift; two high gain IF stages on 450 Kc/s, with manually phased crystal filter in first stage; double-diode for detection and AGC; another double-diode as noise limiter; audio frequency amplifier; phase inverter; two pentode valves in the push-pull output stage; beat frequency oscillator; full wave rectifier; gaseous voltage stabiliser.

The valves used are as follows:- (refer to Fig.1 circuit diagram and Fig.3 top plan drawing).

Position.	Function.	Type.	Make.
V1	1st RF Amplifier	6BA6	Brimar
V2	2nd RF Amplifier	6BA6	Brimar
V3	Frequency-Changer	7S7 or X81	Brimar, Osram
V4	Oscillator	6AM6 (8D3)	Brimar
V5	1st IF Amplifier	6BA6	Brimar
V6	2nd IF Amplifier	6BA6	Brimar
V7	AGC & Detector	6AL5	Brimar
V8	1st Audio Amplifier	6AU6	Brimar
V9	Phase Inverter	6AU6	Brimar
V10	Push-Pull)	6AM5	Brimar
V11	Output)	or EL91	Mullard
V12	BFOscillator	6BA6	Brimar
V13	Noise Limiter	6AL5	Brimar
V14	Full Wave Rectifier	5Z4G	Brimar
V15	Voltage Stabiliser	VR150/30	Brimar

Controls.

The major controls (all clearly marked) are conveniently grouped on the front panel. They consist of:-

Band Selector	Mains On/Off Switch
Main Tuning	Standby Switch
RF Gain	AGC On/Off Switch
AF Gain	Noise Limiter On/Off Switch
BFO Pitch	BFO Switch
Crystal Phasing	Crystal In/Out Switch
	Variable Selectivity

At the rear is a knob-operated rheostat for varying the dial illumination. Also at the rear is the "S" Meter zero adjuster, fitted with a screw-on cover.

Variable Selectivity

The pointer knob controls the coupling between the IF transformer windings. Four positions are provided, giving a wide range of selectivity, as follows:-

Minimum position	27 db	down,	10 Kc/s	off resonance
Intermediate "	12 db	"	5 Kc/s	" "
2nd " "	24 db	"	5 Kc/s	" "
Maximum "	30 db	"	4 Kc/s	" "

Switching in and suitably phasing the crystal enables extreme selectivity (for CW) to be obtained, with a 45 db drop 1 Kc/s off resonance.

The "S" Meter will be found useful as a tuning device, particularly when the selectivity switch is in the broad position, where a bandpass effect is evidenced. When switching from one degree of selectivity to another, a slight readjustment of the tuning may be necessary.

Sensitivity (refer also to curves in Fig 6)

The following average sensitivity figures are based on a 15 db signal-to-noise ratio and 50 milliwatts output, 30% modulation.

Range 1	Better than	5	microvolts
Range 2	"	" 5	"
Range 3	"	" 5	"
Range 4	"	" 5	"
Range 5	"	" 15	"

Image Attenuation (refer also to curves in Fig 6)

Average figures are given below:-

30 db	down at	24	Mc/s
60 db	" "	14	Mc/s
70 db	" "	8	Mc/s
100 db	" "	2.5	Mc/s

Greater than 100 db at lower frequencies

Automatic Gain Control (refer also to curves in Fig 6)

The AGC characteristic is such that a signal is maintained within 9 db for a change of input of 100 db (above 1 microvolt).

Aerial Input (refer to Fig 2)

The approximate impedance of the aerial circuit is 400 ohms but good results are obtainable with aerials of widely varying impedance. The terminals at the rear are arranged to take either a single wire aerial or balanced feeders.

Output Impedance.

An output transformer is fitted internally, the secondary winding being brought out to terminals at the rear, to take a speaker with a coil impedance of 2 to 3 ohms. A jack is provided on the left hand side of the receiver to take high resistance telephones (2000 - 4000 ohms). The Eddystone Cat.No.688 Diecast Speaker is recommended. It matches the "680" Receiver physically and electrically.

Gramophone Pick-up.

The two terminals situated below the L.S. terminals are for the connection of a gramophone pick-up, which may be of either the crystal or the lightweight magnetic type. The A.F. gain control remains operative. In addition to varying the I.F. transformer couplings, the variable selectivity control affects the audio response, and this feature can be taken advantage of and used as a tone control, to correct recording characteristics.

Power Supply.

The "680" Receiver operates off A.C. mains of 110 volts and 200/240 volts 40/60 cycles. The consumption is approximately 80 watts. Protecting fuses are incorporated.(Fuse rating is 1 amp)

"S" Meter.

The sensitive moving-coil microammeter is calibrated in divisions up to S9 and in decibels above S9. The current passing through the meter is limited by one half of a double diode valve, which also prevents reverse current flowing when the R.F. gain is reduced. To adjust, short out the aerial and earth terminals and, by means of the adjuster at the rear, bring the needle coincident with zero on the meter scale.

Reception of Telephony.

The panel controls should be set as follows:-

A.V.C.	"on"
B.F.O.	"off"
Crystal	"out" (to the left)
Phasing Knob	white spot at 3 o'c.
R.F.Gain	full on
A.F.Gain	about one third on.

With the range switch set to the required band, tuning is then carried out normally. It may be mentioned that if the aerial is a long one, a local broadcast station may overload the first stage, necessitating a reduction of R.F. gain.

Reception of C.W.

Panel controls:-

A.V.C.	"off"
B.F.O.	"on"
Crystal	"out"
Phasing Knob	white spot at 3 o'c.
R.F.Gain)	adjust as
A.F.Gain.)	necessary.
B.F.O. pitch control knob.	white spot slightly to one side of centre.

Then tune normally, varying the settings of the R.F. and A.F. gain controls for maximum signal intelligibility.

When severe fading is in evidence, the A.V.C.may be brought into circuit, resulting in a levelling off of signal strength. Switching on A.V.C. will have no noticeable effect on the sensitivity, when receiving weak signals.

Use of Crystal Filter.

The controls will be as for C.W. reception. On switching in the crystal, it will be noted that the noise level decreases somewhat, due to the increased selectivity permitting a narrower band of frequencies to pass. Rotation of the phasing control will result in the suppression of signals to a degree dependent upon their frequency separation from the desired signal.

Noise Limiter.

A highly effective series type of noise limiter is incorporated. The constants associated with it have been chosen carefully to give efficient limiting action without detriment to signal strength.

Standby Switch.

The standby switch on the front panel breaks the H.T. supply and is for use during periods when the associated transmitter is in operation. Additional contacts in this switch are brought out at the rear of the receiver to permit control of the transmitter, through an auxiliary relay (see Fig.2).

Installation.

The receiver has been aligned, calibrated and thoroughly tested before despatch and the only adjustment that may be necessary, before putting the receiver into use, is the mains voltage supply. A readily accessible selector panel is fitted on top of the mains transformer. The screw is normally inserted in the 230 volt position, where it may remain for mains voltages between 220 and 250 volts. Where the mains voltage is between 195 and 215 volts, the 200 volt tapping should be selected. The third position is for mains of 110 volts or near.

Should it be necessary to obtain access to the interior, the cabinet can be easily removed after withdrawal of the four large screws at the rear. The holders for the lamps which illuminate the dial are sprung into place. To change a lamp, all that is necessary is to press the holder and pull out. The lamp is of the miniature bayonet fixing type, rated at 6.3 volts, 0.3 amps.

ALIGNMENT INSTRUCTIONS.

I.F.Amplifier.

The alignment of a modern variable selectivity I.F. amplifier requires the use of a frequency modulated signal generator("Wobbulator") and an oscilloscope, presenting a visual display to the operator.

Should a fault develop in the receiver,it is unlikely to lie in one of the I.F. transformers and the adjustment of these should not be disturbed unless absolutely necessary. For check purposes, however, the following information and sensitivity figures may occasionally be useful. To obviate unsoldering the grid leads to the I.F. valves,the figures have been taken with these wires connected and are therefore not strictly true ones. Nevertheless, they are quite adequate for comparison purposes. Refer to Fig.3 and Fig.5 for locations of I.F. valves and transformers.

The intermediate frequency is 450 Kc/s (±1 Kc/s ± crystal tolerance). The following conditions apply when taking measurements:-

"680" Receiver

Wavechange Switch Range 1.
A.V.C., B.F.O., N.L. off.
Crystal out.
Selectivity max.
Phasing Control "3 o'c")

The intermediate frequency is 450 Kc/s (± 1 Kc/s ± crystal tolerance). The following conditions apply when taking measurements:-

680 Receiver	Wavechange Switch Range 1 AGC, BFO, NL off Crystal out Selectivity max. Phasing Control 3 o'c.
Sig. Gen.	30% Modulation Direct output Output meter across and matched to Speaker Terminals

Input for 50mW output (approximate)	Between grid V6	& chassis	13 millivolts.
	" " V5	"	220 microvolts.

To measure the overall sensitivity of the IF amplifier from the mixer valve signal grid (V3), it will be necessary to unsolder a lead in the frequency changer compartment of the coil box. The lead is identified in Fig.4 by an arrow and cross. The sig.gen. leads are connected between this lead and chassis. The sensitivity at this point should be in the region of 13 microvolts.

Alignment of RF Section

All receiver controls are left as for IF check. The dummy aerial of the signal generator is connected between aerial and earth terminals at the rear of the coil box. It will be found helpful to connect the speaker as well as the output meter for the first stage of the following procedure, which is calibration. For this, a 1000/100 Kc/s crystal oscillator, with harmonics usable up to 30 Mc/s, is essential, since the desired maximum calibration error on the dial of the receiver is 0.5%. As only the most expensive signal generators give an accuracy greater than some 1%, it is futile to use one as a calibration master.

The location of the various trimmers and cores is shown in Fig.4.

Connect the crystal oscillator in shunt with the dummy aerial, switch on the BFO with its spot at "12 o'c", and using the RF gain only as volume control, check on Range 1. Should the 28 Mc/s and 14 Mc/s harmonics be appreciably off their marks when tuned to zero beat, proceed to correct the 14 Mc/s harmonic by means of the Range 1 oscillator coil core. The 28 Mc/s harmonic is corrected by means of the trimmer. With these two points accurately fixed, the rest of the calibration will automatically conform to the desired 0.5% accuracy. The same procedure is used on all other ranges, the two setting points on each range being as follows:-

Range 1	28 Mc/s and 14 Mc/s
Range 2	13 Mc/s and 6 Mc/s
Range 3	5.8 Mc/s and 2.5 Mc/s
Range 4	2.5 Mc/s and 1.2 Mc/s
Range 5	1100 Kc/s and 500 Kc/s

Always, as on Range 1, adjust the trimmers at the high frequency ends of the bands and the cores at the low frequency end. This hard and fast rule applies also in the alignment of the RF and FC coils.

Remove the crystal oscillator leads and use only the signal generator with its attenuator set to give about 10 microvolts. Switch off BFO. Then proceed as follows:-

Inject a 13.3 Mc/s modulated signal into the receiver and tune in on Range 1 for maximum deflection on the output meter, using the RF gain to keep the needle on the scale. Now proceed to adjust the cores only of the two RF coils and the one FC coil for highest output as indicated on the output meter. Next, inject a 28 Mc/s signal and peak this by

means of the three appropriate trimmers. Repeat the whole procedure until no improvement is possible. Use the same procedure on all the other ranges. The high and low frequency alignment points on each range are as follows:-

Range 1	28 Mc/s and 13.3 Mc/s
Range 2	12.3 Mc/s and 6.1 Mc/s
Range 3	5.4 Mc/s and 2.6 Mc/s
Range 4	2.5 Mc/s and 1.2 Mc/s
Range 5	1050 Kc/s and 520 Kc/s

Graphs

The average sensitivity of each range on a standard "680" Receiver is indicated in the curves shown in Fig.6. Also given are typical selectivity curves for each position of the selectivity control switch, including (at maximum selectivity) crystal rejection curves.

Further curves show the audio frequency response and the AGC characteristic.

Issued by:-

STRATTON & CO.LTD.,
WEST HEATH.
BIRMINGHAM. 31.

TSD/JNW/MBP/150

COMMUNICATIONS RECEIVER

TYPE 680/2A

COMPONENT VALUES

C1	3-20pF Air Trimmer	C51	15-45pF Ceramic Trimmer
C2	10pF Silvered Mica	C52	15-45pF " "
C3	3-20pF Air Trimmer	C53	15-45pF " "
C4	3-20pF " "	C54	200pF Silvered Mica ±2%
C5	3-20pF " "	C55	10-367.75pF (Osc. section Tuning Condr.)
C6	3-20pF " "		
C7	100pF Silvered Mica.	C56	50pF Silvered Mica
C8	10-367.75pF (1st RF Tuning Condenser)	C57	.1mfd Tub. Paper.
		C58	.1mfd " "
C9	25pF Silvered Mica ± 5%	C59	400pF Silvered Mica ±2%
C10	.1mfd Tub. Paper	C60	800pF " " ±2%
C11	.01 - .1mfd Tub.Paper (in parallel)	C61	800pF " " ±2%
		C62	Crystal Phasing Condenser
C12	.1mfd Tub. Paper.	C63	20pF Silvered Mica
C13	.1mfd " "	C64	500pF " " ±2%
C14	20pF Silvered Mica.	C65	400pF Silvered Mica ±2%
C15	3-20pF Air Trimmer	C66	.1mfd Tub.Paper
C16	6pF Silvered Mica	C67	400pF Silvered Mica ±2%
C17	3-20pF Air Trimmer	C68	.01mfd Tub. Paper
C18	3pF Silvered Mica	C69	.1mfd " "
C19	3-20pF Air Trimmer	C70	400pF Silvered Mica ±2%
C20	3pF Silvered Mica	C71	400pF Silvered Mica ±2%
C21	3-20pF Air Trimmer	C72	8pF " " ±2%
C22	3-20pF " "	C73	.002mfd Moulded Mica
C23	100pF Silvered Mica	C74	8mfd Tub.elect.350v DC Wkg.
C24	10-367.75pF (2nd RF sect.Tuning Condr.)	C75	.01mfd Moulded Mica
		C76	.01mfd Tub. Paper
C25	25pF Silvered Mica ± 5%	C77	.1mfd Tub. Paper
C26	.01mfd Tub.Paper	C78	.1mfd Tub. Paper
C27	.1mfd " "	C79	.1mfd Tub. Paper
C28	.1mfd " "	C80	.1mfd Tub. Paper
C29	.1mfd " "	C81	.1mfd Tub. Paper
C30	20pF Silvered Mica	C82	100pF Silvered Mica
C31	3-20pF Air Trimmer.	C83	100pF " "
C32	6pF Silvered Mica	C84	.01mfd Tub. Paper
C33	3-20pF Air Trimmer	C85	.4mfd.Tub.elect.350v DC wkg.
C34	3pF Silvered Mica	C86	.01mfd Moulded Mica
C35	3-20pF Air Trimmer	C87	25mfd Tub.elect.25v.DC wkg.
C36	3pF Silvered Mica	C88	.01mfd Moulded Mica
C37	3-20pF Air Trimmer	C89	6pF Silvered Mica
C38	3-20pF " "	C90	100pF Silvered Mica
C39	10-367.75pF (FC sect.Tuning Condenser)	C91	BFO Pitch Condenser
		C92	100pF Silvered Mica
C40	25pF Silvered Mica ± 5%	C93	.01mfd Tub. Paper
C41	.1mfd Tub. Paper	C94	16mfd Tub.elect.450v DC Wkg.
C42	.1mfd " "	C95	40mfd " " 350v DC Wkg.
C43	10pF Silvered Mica	C96	.0005mfd Moulded Mica
C44	2,400pF Silvered Mica ± 1%	C97	.0005mfd " "
C45	2,500pF " " ± 1%	C98	.01mfd " "
C46	1,625pF " " ± 1%	C99	.01mfd Tub. Paper
C47	900pF " " ± 1%	C100	.01mfd " "
C48	400pF " " ± 1%	C101	6pF Silver Mica
C49	3-20pF Air Trimmer	C102	6pF " "
C50	3-20pF " "	C103	100pF " "

Continued.....

R1	33,000 ohms	1W	R35	7,500 ohms	± 5%
R2	1,000 ohms		R36	13,000 ohms	± 5%
R3	33,000 ohms	1W	R37	.47 megohm	
R4	1,000 ohms		R38	1.0 megohm	
R5	1,000 ohms		R39	.5 megohm Pot.	
R6	15,000 ohms	½W	R40	560 ohms	½W
R7	15,000 ohms	½W	R41	3.0 megohm	± 5%
R8	1,000 ohms		R42	560 ohms	½W
R9	33,000 ohms	1W	R43	.47 megohm	
R10	2,700 ohms		R44	620 ohms 1W	± 5%
R11	.1 megohm	± 5%	R45	.47 megohm	
R12	.18 megohm	± 10%	R46	7,500 ohms	± 5%
R13	10,000 ohms		R47	3.0 megohm	± 5%
R14	.1 megohm	± 5%	R48	2,200 ohms	
R15	.47 megohm		R49	2,200 ohms	
R16	.47 megohm		R50	10,000 ohms	
R17	68 ohms		R51	1,000 ohms	
R18	.47 megohm		R52	22,000 ohms	
R19	.47 megohm		R53	27,000 ohms 1W	
R20	68 ohms		R54	5,000 ohms Pot.	
R21	150 ohms		R55	12,500 ohms ½W	
R22	200 ohms	± 5% ½W		(Two 25,000 ohms in parallel)	
R23	.1 megohm		R56	2.2 megohms	
R24	.47 megohm		R57	47,000 ohms	
R25	68 ohms		R58	560 ohms	½W
R26	.47 megohm		R59	10,000 ohms	½W
R27	750 ohms	± 5%	R60	10,000 ohms Pot.	
R28	4,700 ohms		R61	5 ohms Pot.	
R29	8,200 ohms		R62	2,700 ohms w.w.	± 5%
R30	68 ohms		R63	4,700 ohms	½W
R31	1.0 megohm		R64	15,000 ohms 1W	
R32	.1 megohm		R65	1,500 ohms	
R33	47,000 ohms	± 5%	R66	100,000 ohms	½W
R34	22,000 ohms	± 5%	R67	6,800 ohms	½W

ALL FIXED RESISTORS (EX CEPT WIRE WOUND) OF UNSPECIFIED WATTAGE ARE UNDER ½ WATT.

VOLTAGE VALUES.

POINT	AVO	WESTON (1000 o.p.v.)	POINT	AVO	WESTON (1000 o.p.v.)
A	210	218	Q	1.0	1.0
B	82	90	R	9.5	10.2
C	.8	.8	S	35	60
D	208	210	T	30	40
E	85	90	U	.7	.9
F	1	1.2	V	38	62
G	215	218	W	.7	.9
H	100	104	X	220	220
J	1.3	1.3	Y	222	222
K	100	104	Z	9.5	10.2
L	210	212	A	80	85
M	82	90	B	150	150
N	.9	1.0	C	260	260
O	200	200	D (AC)	250	250
P	82	90	E	150	150

DC TOTAL CURRENT 115 M/A
HEATER VOLTAGE Heater to Heater 6.3v.
ALL VOLTAGE FIGURES)
ALL CURRENT FIGURES) Within 10%

Issued by:

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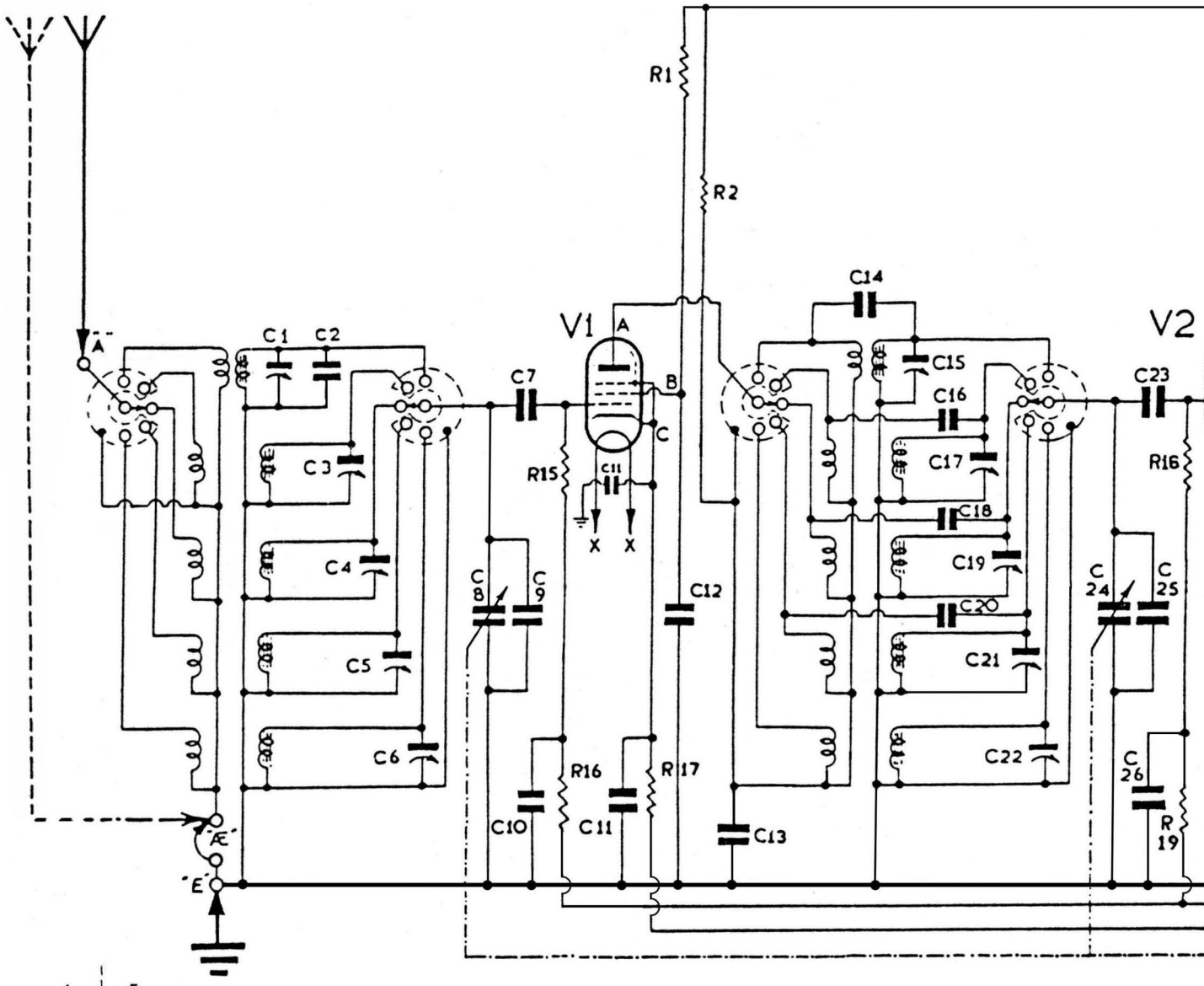
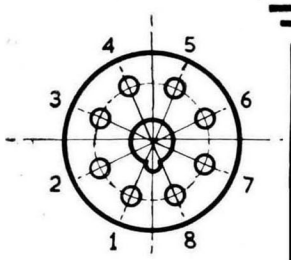
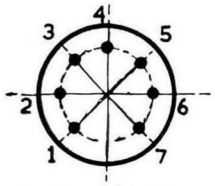
WEST HEATH.
BIRMINGHAM.31.

TSD/JNW/MBP/150



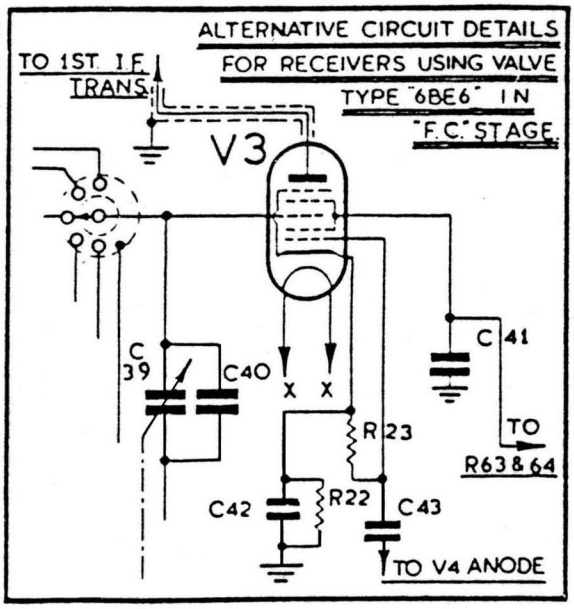


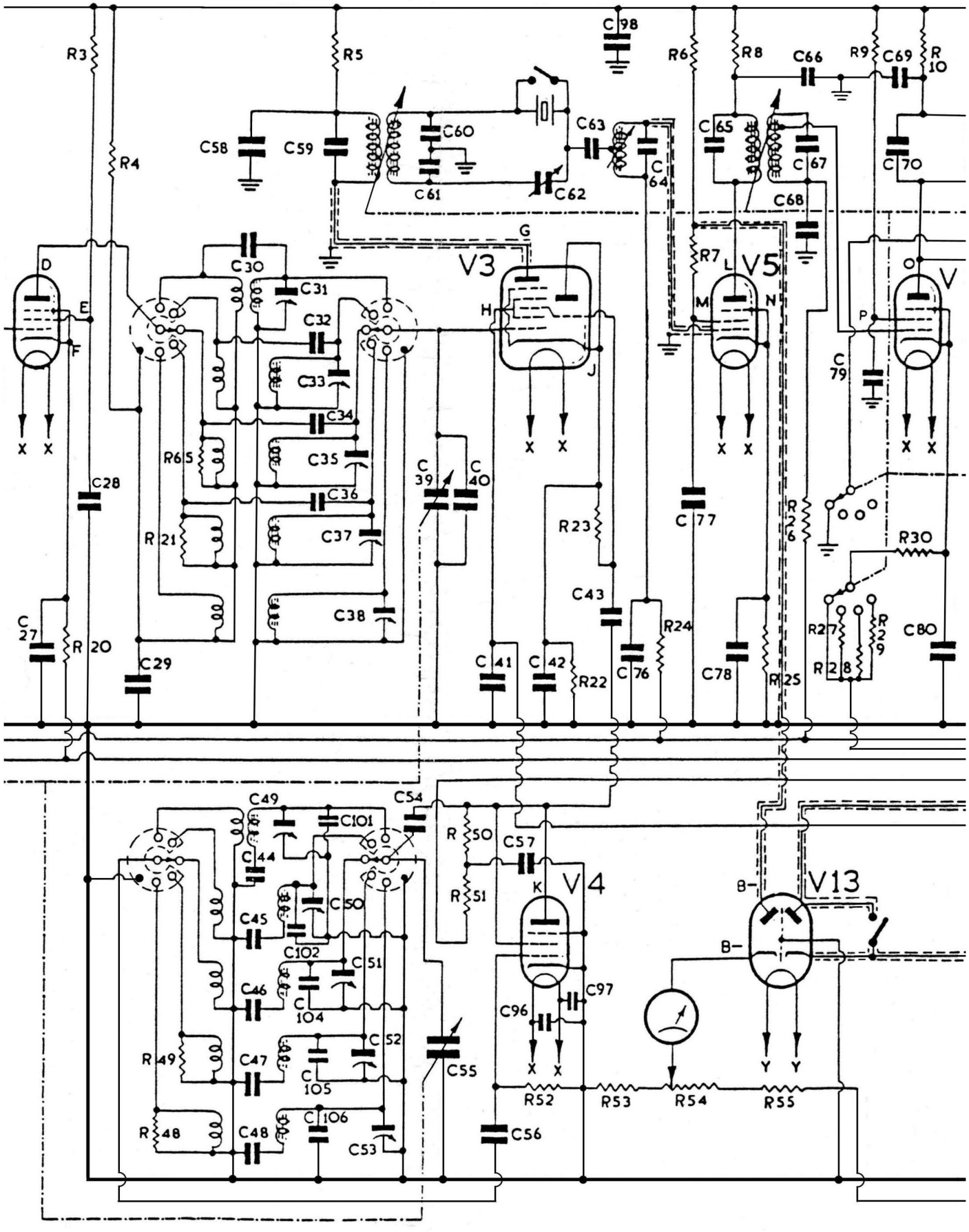
OCTAL & LOCTAL SERIES.



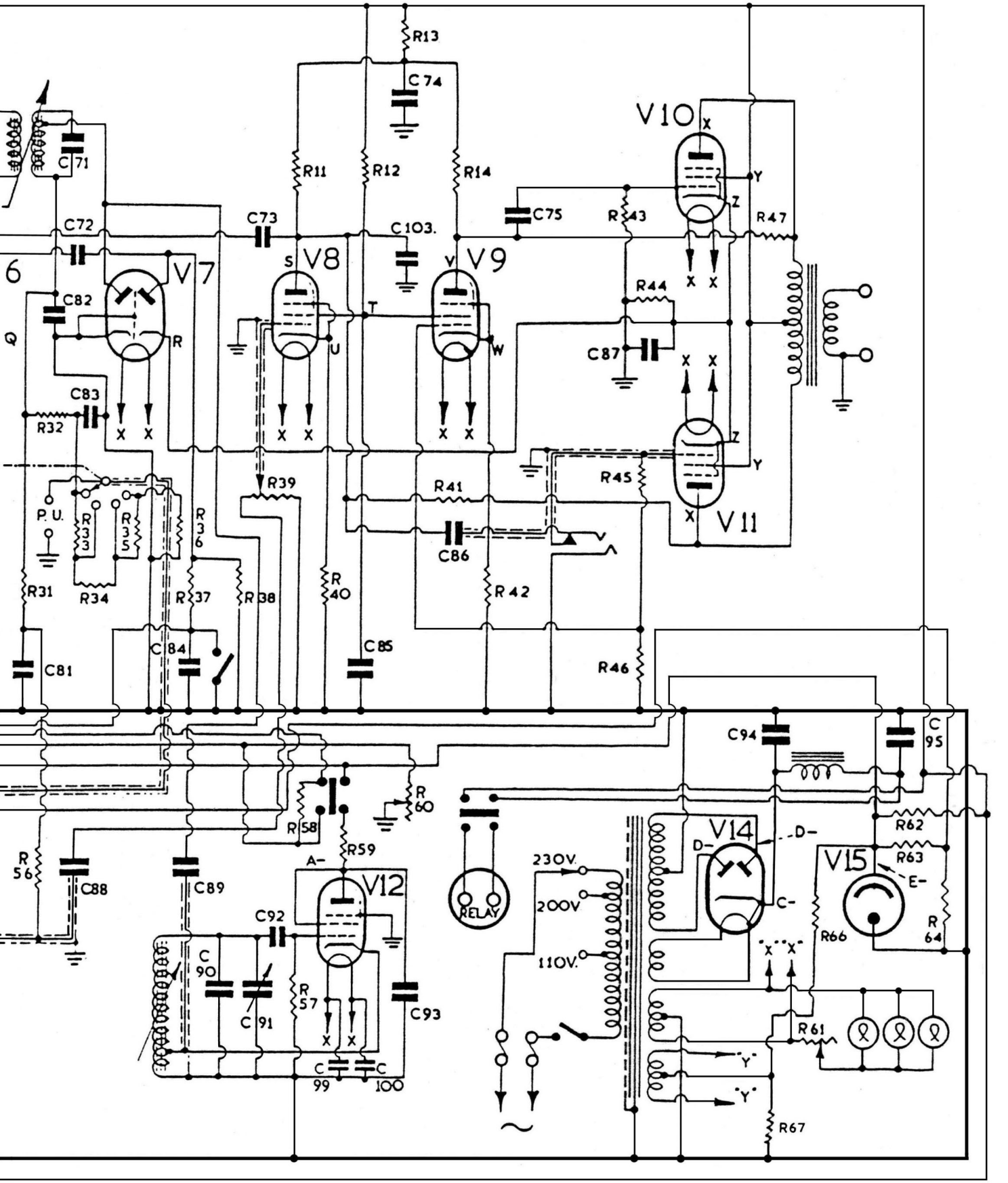
B7G SERIES.

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





COMMUNICATIONS RECEIVER.


R13
C74
C71
R11
R12
R14
V10
C75
R43
R47
C72
C73
C103.
V7
V8
V9
R44
C82
C87
C83
R32
R39
R41
R45
V11
P.U.
R33
R35
R36
C86
R31
R34
R37
R38
R40
R42
C84
C85
C81
R46
C94
C95
R60
R58
R59
R62
R63
V14
V15
R56
C88
C89
A-
V12
230V.
200V
110V.
RELAY
C92
C90
C91
R57
C93
C99
C100
R66
R64
R61
R67

TYPE S680/2.

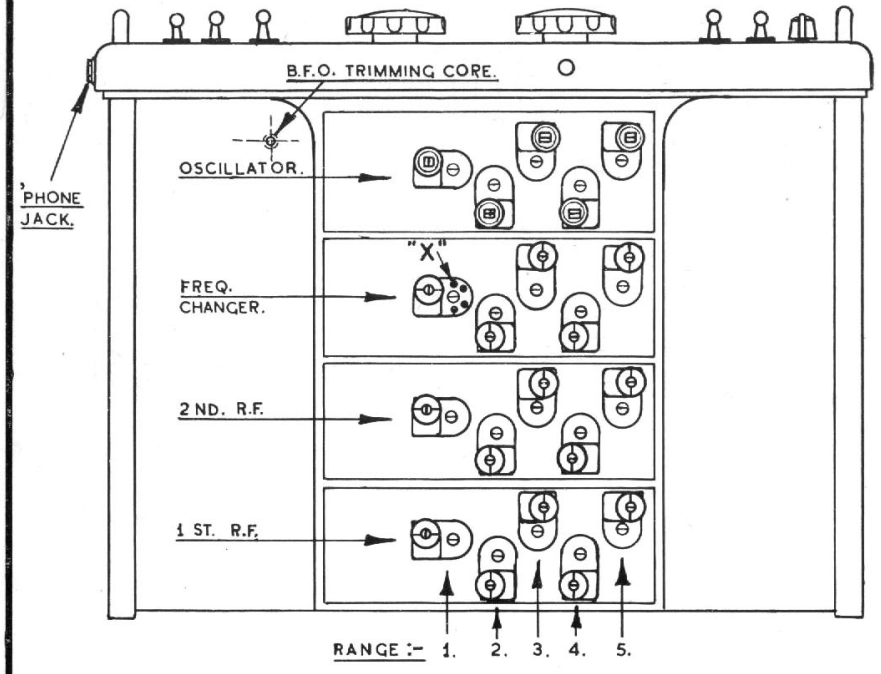


FIG. 4.

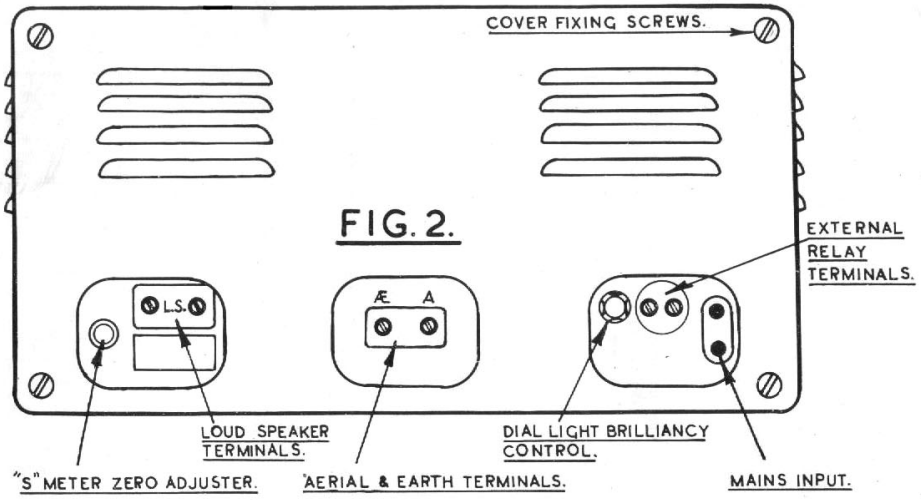


FIG. 2.

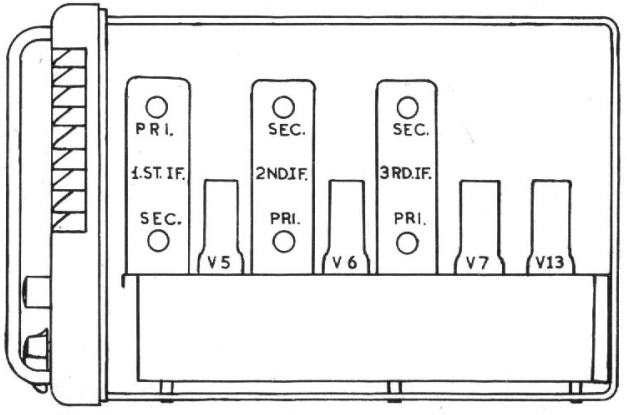
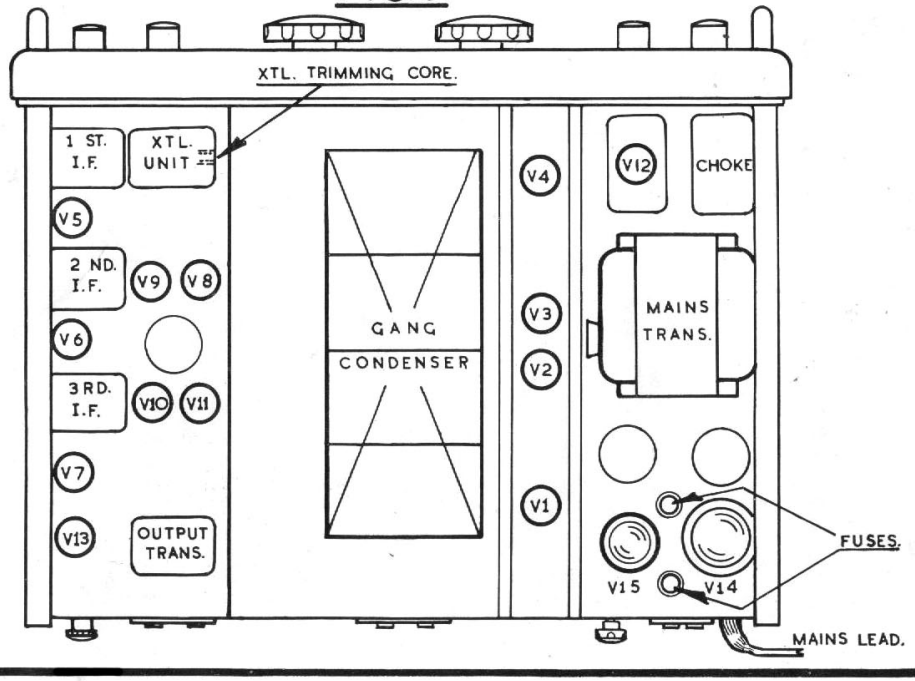
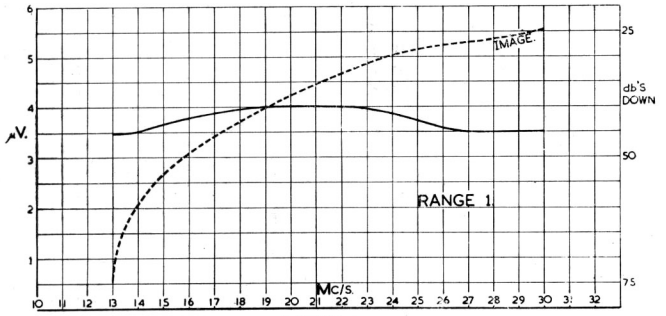


FIG. 5.

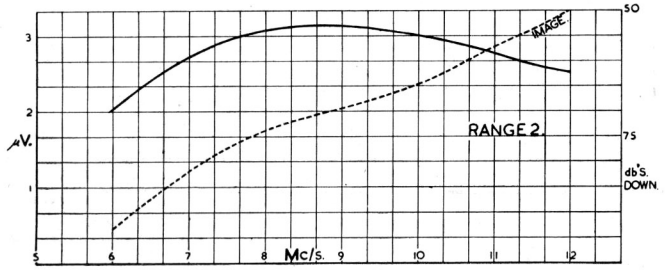
FIG. 3.



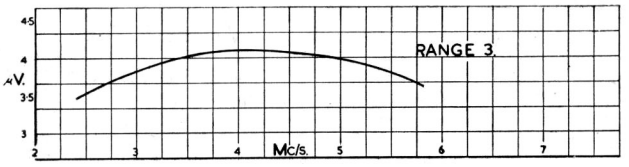
PERFORMANCE CURVES FOR THE EDDYSTONE '680' RECEIVER



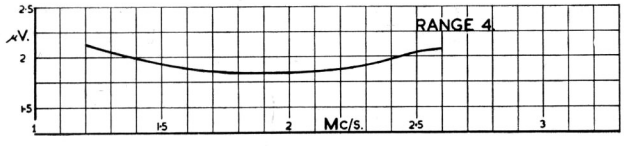
RANGE 1



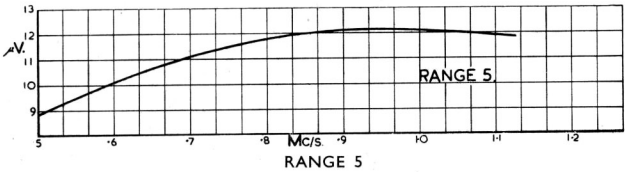
RANGE 2



RANGE 3

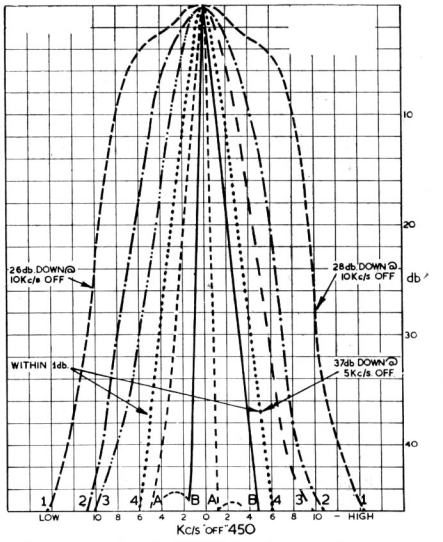


RANGE 4



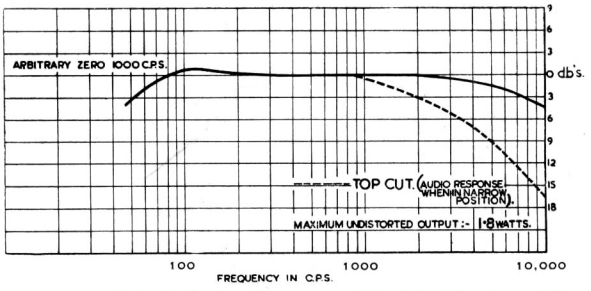
RANGE 5

Above are sensitivity curves for an average "680" Receiver. They are based on a 15 db signal-to-noise ratio and an audio output of 50 milliwatts.



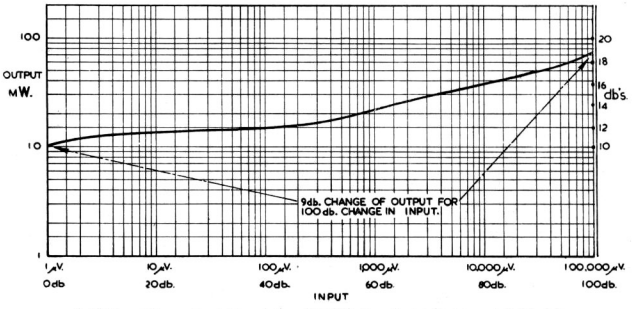
Selectivity curves for the "680" Receiver.

(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.



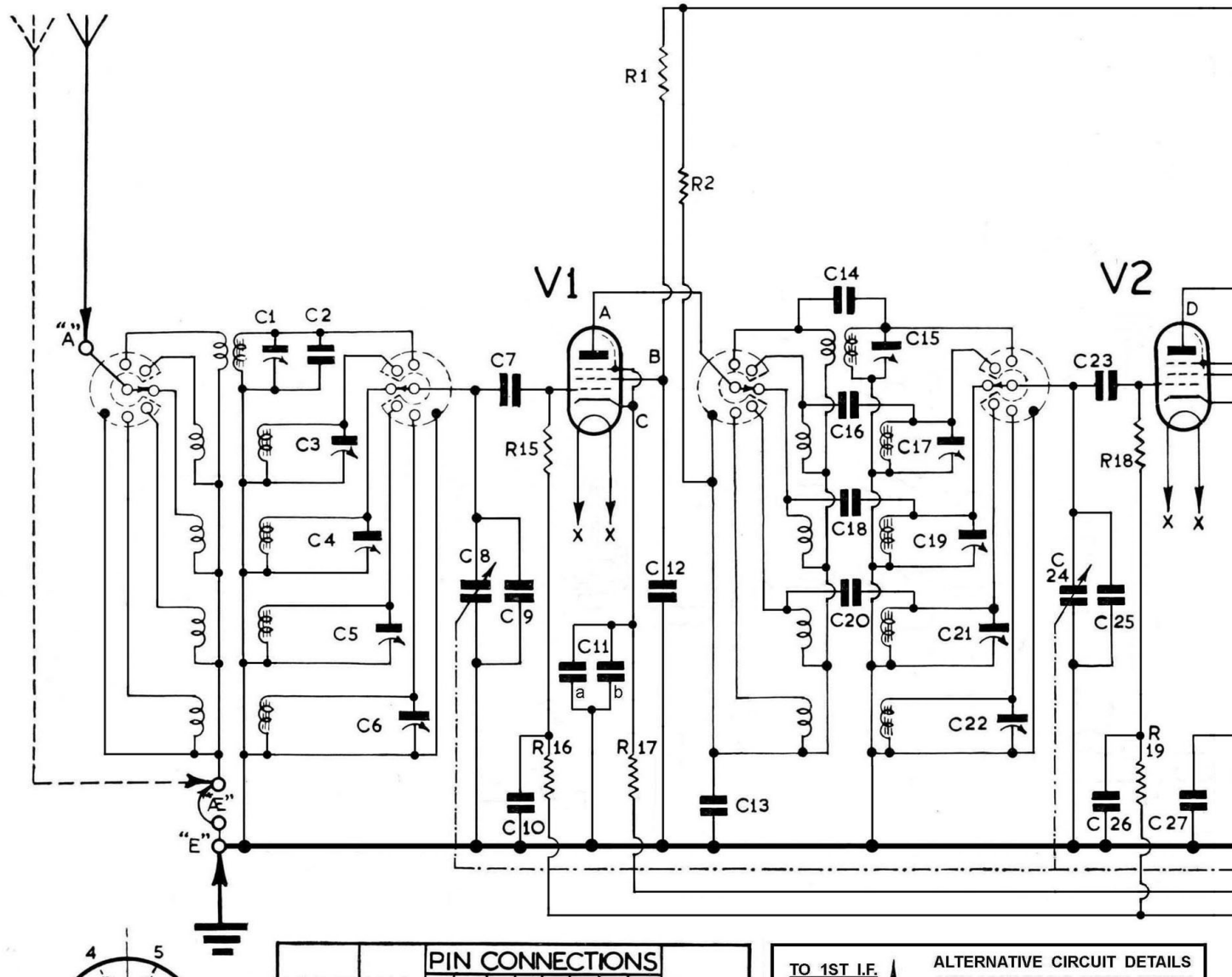
Response curve of the Audio Amplifier stages of the "680" Receiver. When the selectivity switch is at maximum, an additional top cut is introduced, the effect being indicated above by the dotted line curve.

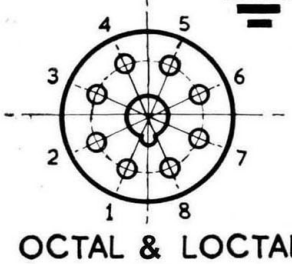
The figure of 1·8 watts represents distortionless output, over a wide range of frequencies. Considerably more output power is actually available, without appreciable distortion.



A.V.C. Characteristic of the "680" Receiver (taken at 9 Mc/s).

FIG. 6.

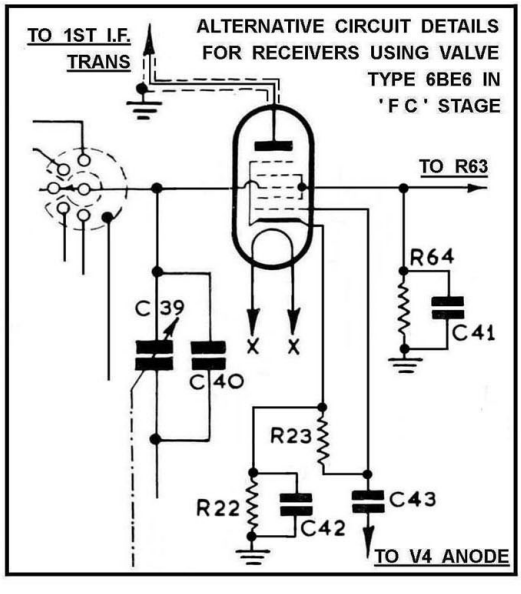


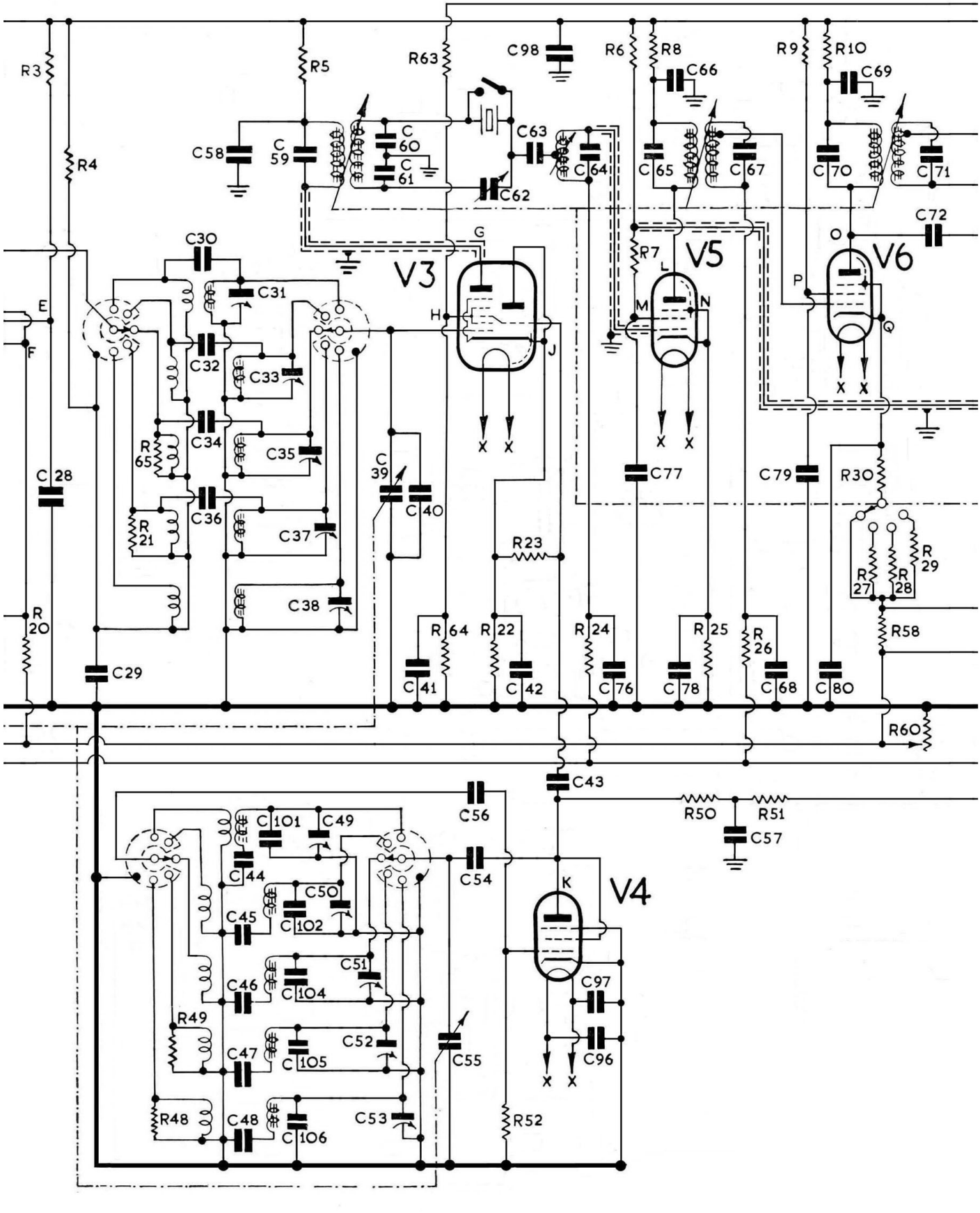


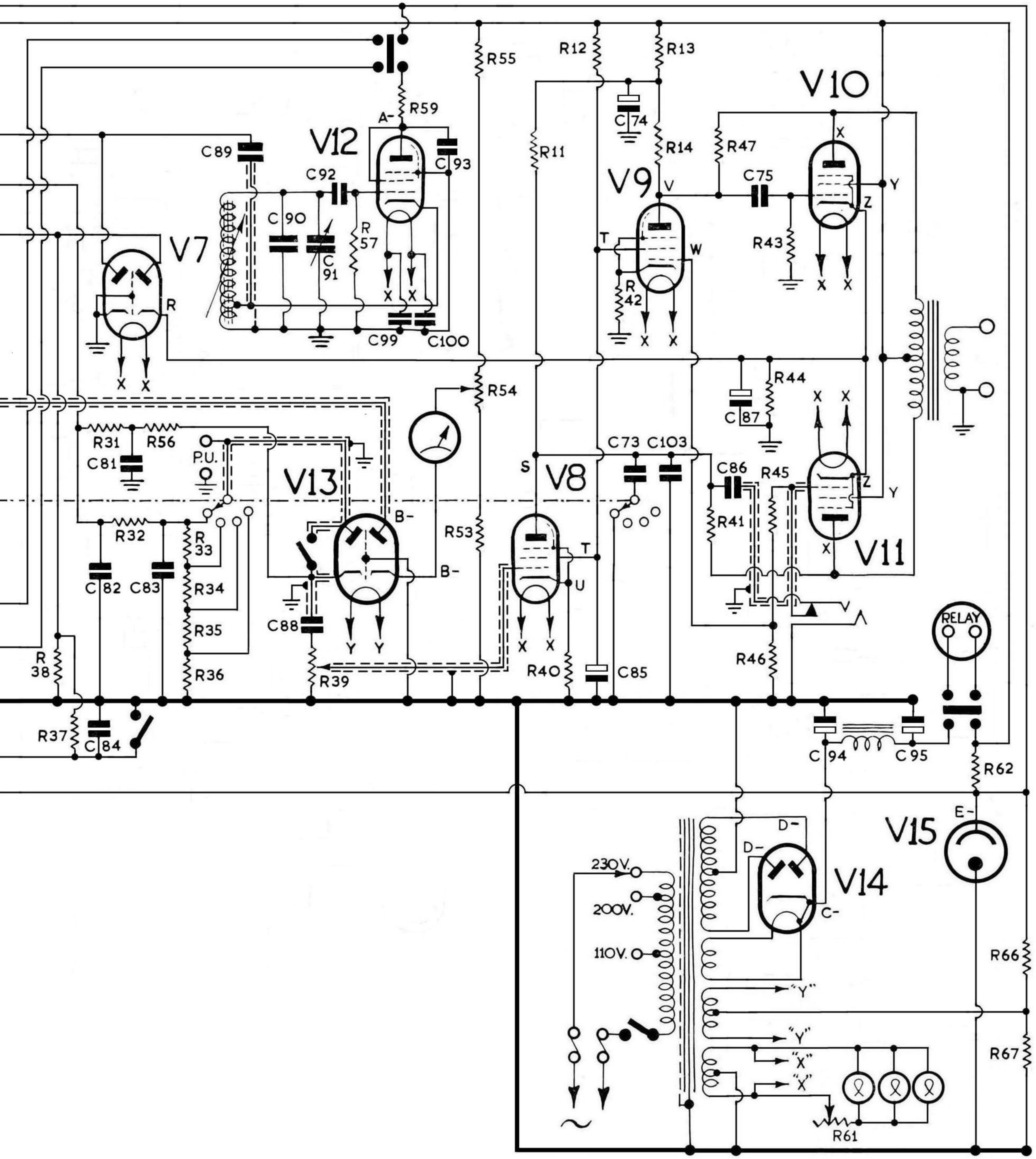
OCTAL & LOCTAL SERIES.

B7G SERIES.

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




R3
R4
R5
R63
C98
R6
R8
C66
R9
R10
C69
C58
C59
C60
C61
C62
C63
C64
C65
C67
C70
C71
C72
V3
V5
V6
G
H
J
L
M
N
O
P
Q
X
E
F
C30
C31
C32
C33
C34
C35
C36
C37
C38
R65
R21
C28
R20
C29
C39
C40
R23
C77
C79
R30
R27
R28
R29
R58
R64
R22
R24
R25
R26
C41
C42
C76
C78
C68
C80
R60
C43
C56
R50
R51
C57
C101
C49
C44
C50
C102
C45
C51
C104
C46
R49
C52
C105
C47
C55
C54
K
V4
C97
C96
R48
C48
C106
C53
R52


V7
V12
V13
V9
V10
V8
V11
V14
V15
R
R55
R59
A-
C89
C92
C90
C91
R57
C93
X
C99
C100
R11
R12
R13
C74
R14
R47
C75
Y
Z
R43
T
W
R42
V
R54
R53
B-
R31
R56
C81
P.U.
R32
R33
R34
R35
R36
C82
C83
R38
R37
C84
R39
C88
S
C73
C103
R40
C85
U
R44
C87
C86
R45
R41
R46
RELAY
C94
C95
R62
E-
D-
230V.
200V.
110V.
C-
"Y"
"X"
R61
R66
R67