3945

OPERATING INSTRUCTIONS

MARK 122

Equipment:

a) Combined Transmitter-Receiver-A.C. Mains Power Pack.

b) Vibrator Pack for 6v operation.

c) Hand Generator.

d) Spares box containing:

(1) One pair earphones
(2) One reel aerial
(3) One Neon mains voltage tester
(4) One OB2 voltage stabiliser
(5) One 2E26 beam tetrode valve
(6) Two ECH 42 triode hexode valve
(7) One EAF42 diode pentode valve
(8) One EL41 pentode valve
(9) One 6.3v 0.15A pilot lamp
(10) Two 20A fuses
(11) Two 2.5A fuses
(12) Two 2A fuses
(13) One universal mains plug
(14) One mains lead with plug and socket
(15) One vibrator pack input lead
(16) One vibrator pack output lead
(17) One adaptor for miniature crystals
(18) Two plastic inserts
(19) 120ft. insulated wire
(20) Two egg insulators
(21) One pair pliers
(22) One screwdriver
(23) One soldering iron
(24) One yard resin cored solder
(25) One plug for external key
(26) One piece of perspex $8\frac{3}{4}$" x 6" x $\frac{1}{8}$" (22 x 5 x $\frac{1}{2}$) cm.
(27) One reel of insulating tape
(28) Supply of lined paper
(29) Three pencils
(30) Two yards twin flex
(31) One pocket knife
(32) One red plug
(33) One black plug

Total weight = (62 lbs 8 ozs.
(28.4 Kilogrammes.

SPECIFICATION

Combined Transmitter-Receiver-AC Mains Power Pack

Size: 13" x 9" x $3\frac{3}{8}$" (33 x 23 x 8.5) cms

Weight: 12 lbs 4 oz 5.6 kilogrammes

6-volt Vibrator Pack for Battery Operation

Size: $8\frac{3}{4}$" x $6\frac{5}{8}$" x $3\frac{1}{8}$" (22 x 17 x 8) cms

Weight: 7 lbs 4 oz 3.3 kilogrammes

Hand Generator

Size: 16" x $11\frac{3}{4}$" x $10\frac{3}{8}$" (401 x 30 x 26) cms

Weight: approx. 35 lbs. including Charging Unit.

approx. 16.5 kilogrammes

Spares Box

Size: 13" x 9" x $3\frac{3}{8}$" (33 x 23 x 8.5) cms

Weight: 8 lbs 3.6 kilogrammes

Sockets are provided on the front panel in order that:

(a) an external key may be used
(b) a standard $\frac{3}{4}$" pin spacing crystal holder may be used or a crystal adaptor to permit $\frac{1}{2}$" pin spacing crystal holder to be used in the crystal sockets.

A pilot lamp on the front panel denotes when the power is on.

A multi-contact plug and socket arrangement is used to feed power to the transmitter-receiver from A.C. mains, vibrator unit, or hand generator.

The Transmitter and Receiver covers a range of 2.5 - 20 Mc/s in three Bands:

Band 1 : 2.5 to 5.0 Mc/s
Band 2 : 5.0 to 10.0 Mc/s
Band 3 : 10.0 to 20.0 Mc/s

TRANSMITTER

Power Consumption: From Mains Power Pack - key down: 65 watts
key up : 22 watts

Circuit: Crystal controlled oscillator doubler using EL 41 valve driving Class C amplifier 2E26. Oscillator doubler will accept crystals of fundamental frequency, half or one third of required frequency. Average power output : 10 to 13 watts.

RECEIVER

Power Consumption: From Mains Power Pack : 34 watts

Circuit: Three valve super-heterodyne receiver designed for RT and CW reception.

Valves: ECH42 frequency changer, EAF42 IF amplifier and second detector, ECH42 audio amplifier and BFO oscillator, OB2 voltage stabiliser.

Intermediate Frequency : 470 Kc/s

Sensitivity: 1 to 5 microvolts

Selectivity: 5.5 Kc/s 6dB down
13 Kc/s 20 dB down

Output: 30K Impedance at 1000 c.p.s.

A noise limiter is connected across the output when receiving CW and effectively reduces impulse noise and prevents overloading of the earphones.

POWER PACK: FOR A.C. MAINS ONLY. 40 to 400 cycles per second.

The Mains power transformer can be adjusted to accept any A.C. voltage from 100 to 250 volts in 10 volt steps.

Power Consumption:
(a) standby 20 watts
(b) receive 34 watts
(c) transmit 22-65 watts

VIBRATOR PACK: FOR 6-VOLT ACCUMULATOR.

Power Consumption:
(a) standby 3 amps
(b) receive 5 amps
(c) transmit 3.5 amps key up
10 amps key down

HAND GENERATOR:

Supplying 110v A.C. 200 c/s. 85 V.A.

INSTALLATION INSTRUCTIONS

The erection of an efficient aerial and earth system is of prime importance in the establishment of good communications. A reel aerial is provided for use on occasions when a temporary aerial will serve and when speed of erection is important. Alternatively, a length of wire 120 ft. (36 metres) is provided and from this a more permanent aerial system can be made. See page 5 for further details.

A good electrical connection must be made to Earth by connecting the earth wire to a mains water pipe or central heating system. Great care must be taken to scrape any dirt or paint off pipes and to make a firm connection to clean metal. An alternative earth system can be made by taking a length of wire similar to the aerial and suspending it underneath the aerial preferably two or three feet above the ground or across the floor of the room if an indoor aerial is being used.

Power supply: If mains are available ascertain whether they are A.C or D.C. A neon tester is supplied for this purpose. REMEMBER THIS APPARATUS MUST NOT BE USED ON DIRECT CURRENT MAINS SUPPLY. The Voltage can be checked by reference to the electric light meter, other electrical appliances in use or the markings on electric lamps.

Adjustment of the apparatus to the A.C. voltage available is made by removing the cover of the Mains Voltage Adjustment and replacing the two metal strips that they cover the figures of the voltage.

i.e. if the voltage is 210, one strip will cover 200 and the other strip will cover 10.

OPERATING INSTRUCTIONS

The operator should make himself familiar with the following points:

RECEIVE/TRANSMIT/FORM SWITCH.

With new equipment or with equipment that has not been in recent use, this switch must be placed in form position, before switching on the mains. This ensures the correct reforming of the electrolytic condensers which are contained in the apparatus. The process will be completed in ten or fifteen minutes. It is IMPORTANT that this procedure is carried out at least once per annum if the equipment is held in storage or is not in regular use.

FREQUENCY COVERAGE

The receiver and transmitter will only work within the frequency range shown in Megacycles on the tuning scales, the Band required being selected by operation of the Band Change Levers.

Quartz Crystals: The transmitter will accept crystals that fall within the particular frequency range of the model or crystals whose frequency when doubled or trebled come within that range.

TO TUNE THE TRANSMITTER

(Already assuming that power supply adjustments have been made, aerial and earth connected and reforming - if necessary, has been completed).

1. Turn REC/TRANS/FORM switch to TRANS.
2. Set Transmitter Band lever to range required.
3. Insert suitable crystal.
4. Set the DRIVE TUNING and AERIAL TUNING controls approximately to the desired frequency.
5. Switch on Mains.
6. Press Key and adjust DRIVE TUNING for maximum brilliance of neon indicator.
7. Turn aerial matching control indicator to Band required.
8. Press key and adjust AERIAL TUNING for maximum reading on meter.
9. Release key, turn Aerial Matching Control to new position, press key and adjust AERIAL TUNING again for maximum reading on meter. Then try other positions until the position giving the maximum reading is found.

The transmitter is then ready for operation.

NOTE: In absence of a modulator unit ensure that modulation socket is closed by flap or dummy plug provided.

TO OPERATE THE RECEIVER

1. Turn the REC/TRANS/FORM switch to REC.

(a) For CW Reception:- Set the BFO pointer to centre of its tuning range.

(b) For RT Reception:- Set the BFO pointer to its "OFF" position. Advance the GAIN control to a suitable level.

(c) For CW Reception:- Set the tuning control to the frequency to be received and search for the required signal, having set the receiver Band Change Lever to the required Band. When the desired station is found the tuning control should be adjusted to give the lowest pitch possible and then the BFO control adjusted either side of its zero line to give the desired note for CW reception. If interference from another station is experienced the setting of this control to the other side of the zero line should be tried. This will give the same note for the wanted station but a different note to the interfering station thus permitting the operator to discriminate between them. When searching for a station the BFO should always be returned to ZERO. The receiver output is designed to give maximum volume for a note of approx. 1,000 c/s and the BFO control should be adjusted approximately to this frequency.

For RT Reception:- Set the tuning control to the frequency required to be received and search for required signal, having set the Receiver Band Change Lever to the required Band.

AERIALS

(a) OUTDOOR AERIAL: Erect an outdoor aerial if at all possible for it will prove much more efficient than one indoors. Erect it as high as possible keeping the greatest proportion of it horizontal to the ground. In this respect remember that the "Lead-in" portion counts as part of the aerial and should thus be kept as short as circumstances permit. Endeavour to keep clear of water pipes, over-head mains cables, telephone lines, etc.

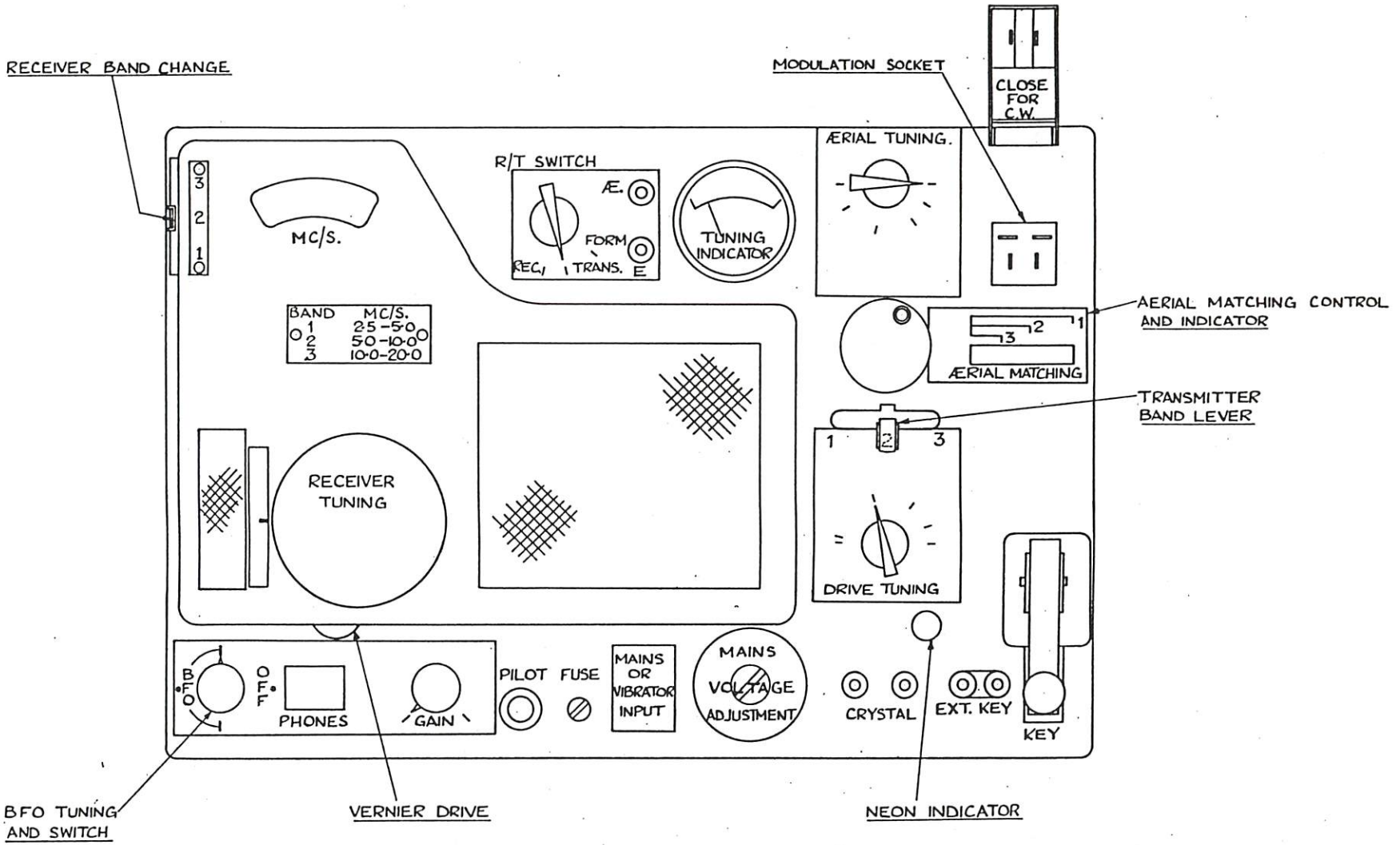
(b) INDOOR AERIAL: If it is impossible to erect an outdoor aerial you must choose your premises more carefully. You must avoid working from buildings of reinforced concrete or houses with iron or lead roofs as your valuable radiation energy will be absorbed in the metal of these walls or roofs and communication rendered extremely difficult, if not impossible. The ideal is a wooden house or one of old stone or dry brick.

An aerial at least a quarter of a wave-length long (see following para) should be used and erected as high as possible in the house - preferably in zig-zag fashion in the rafter space under the roof. If circumstances restrict activities to only one room the aerial should be zig-zagged across the room about half a metre from the ceiling. Space the wires as widely apart as possible and ensure that no part of the wire runs

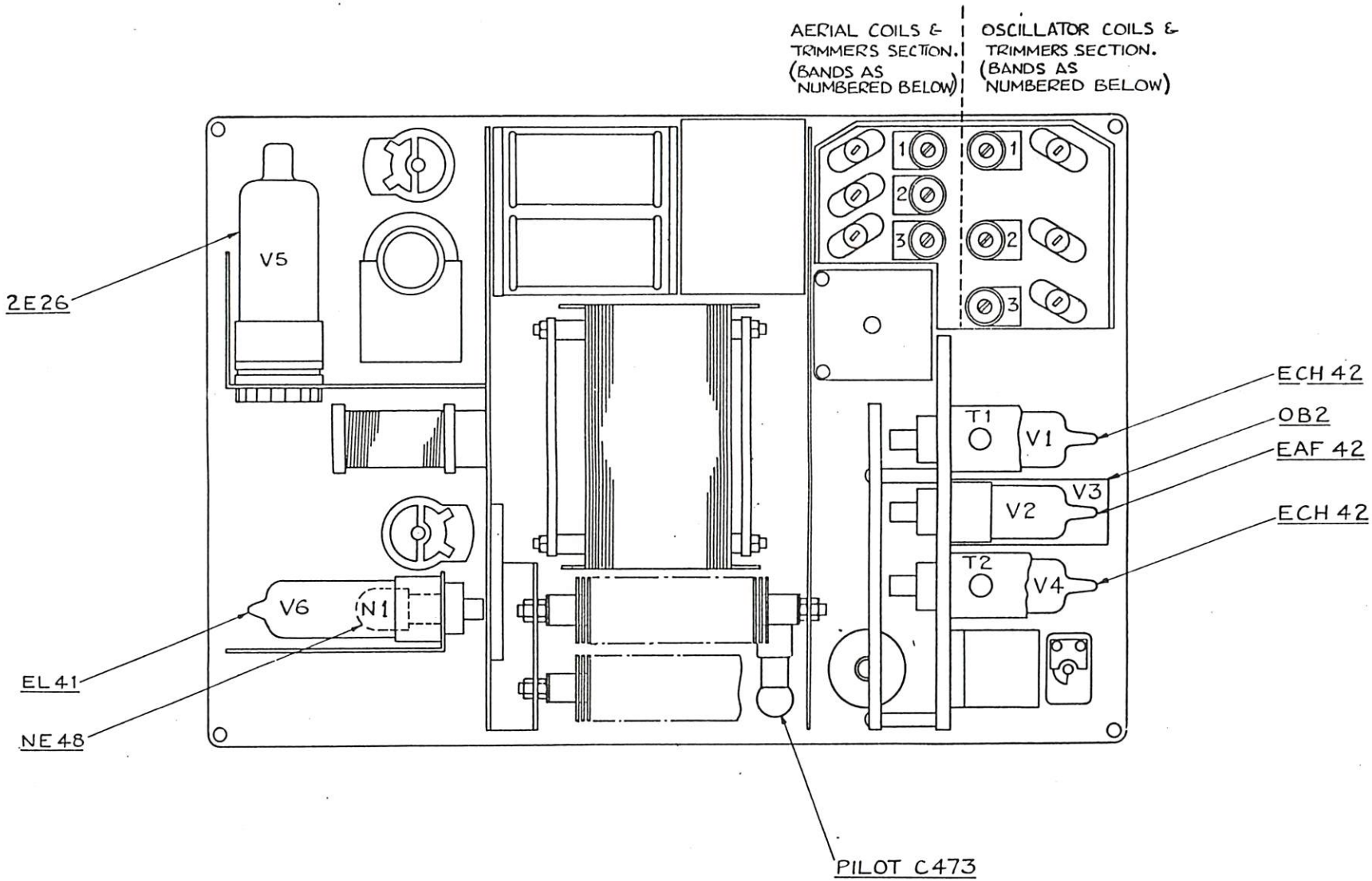
parallel to metal girders, electric wiring or water piping nor should the wire be doubled back on itself at any point.

LENGTH OF AERIALS: Theoretically an aerial should be cut to a certain length in relation to the frequency or wavelength being transmitted. In our work, however, when each station may have about 20 different frequencies, it is impossible to cut an aerial to an exact dimension that will give maximum efficiency on more than one or two frequencies. A good general rule is to put up as long an aerial as is possible and it will be "matched" to the transmitter through the AERIAL TUNING process. Since the power radiated from a transmitter aerial is proportional to the square of the current, it is clearly desirable to have at least one current maximum occur somewhere along the aerial. The shortest aerial which can be considered reasonable is a quarter-wave aerial. i.e. for a transmitter working on 40 metres a quarter wave aerial would be approx. 10 metres in length.

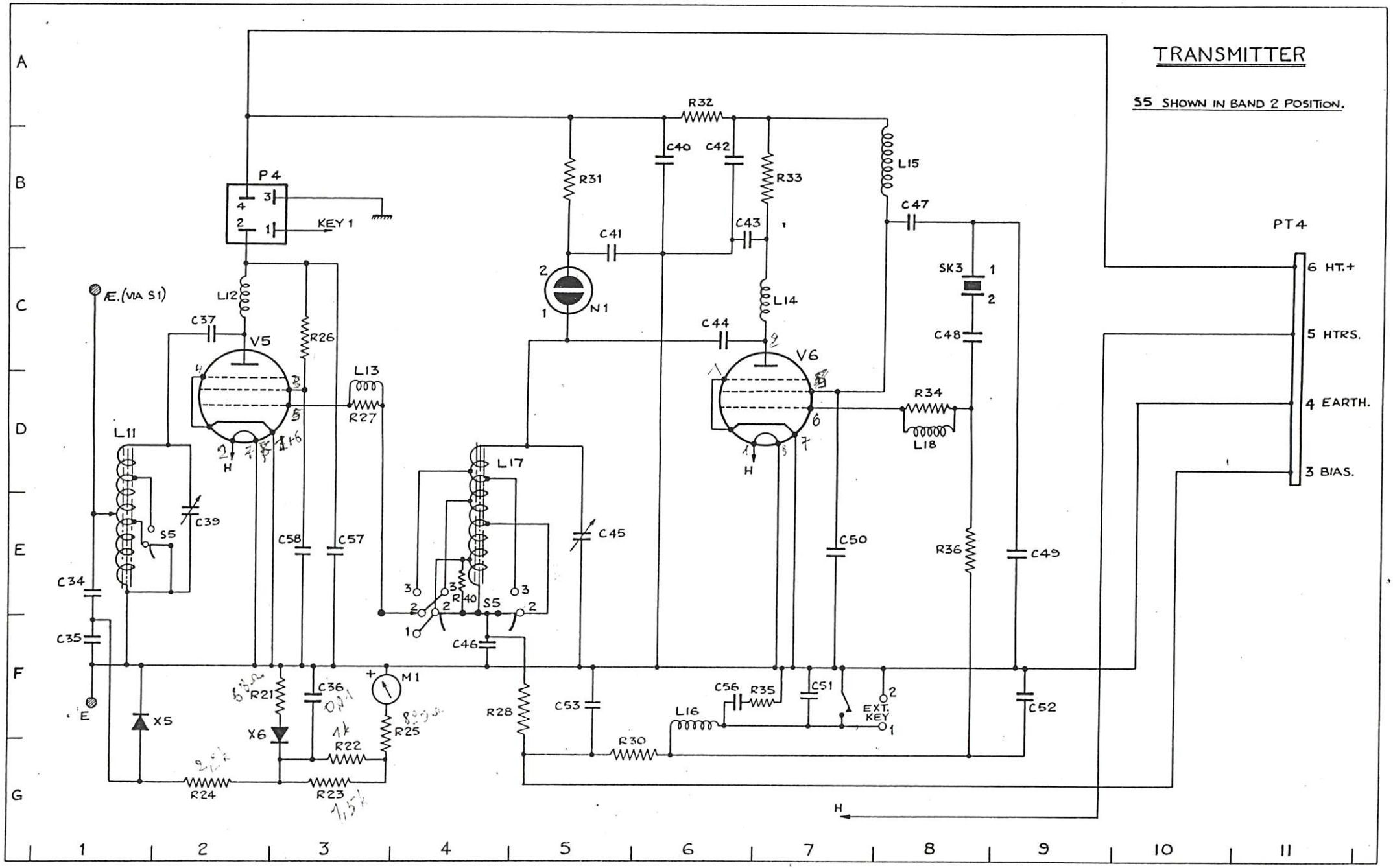
If circumstances permit you can make experiments with length, height and direction of your aerial in an effort to improve communication.



122 FRONT PANEL.

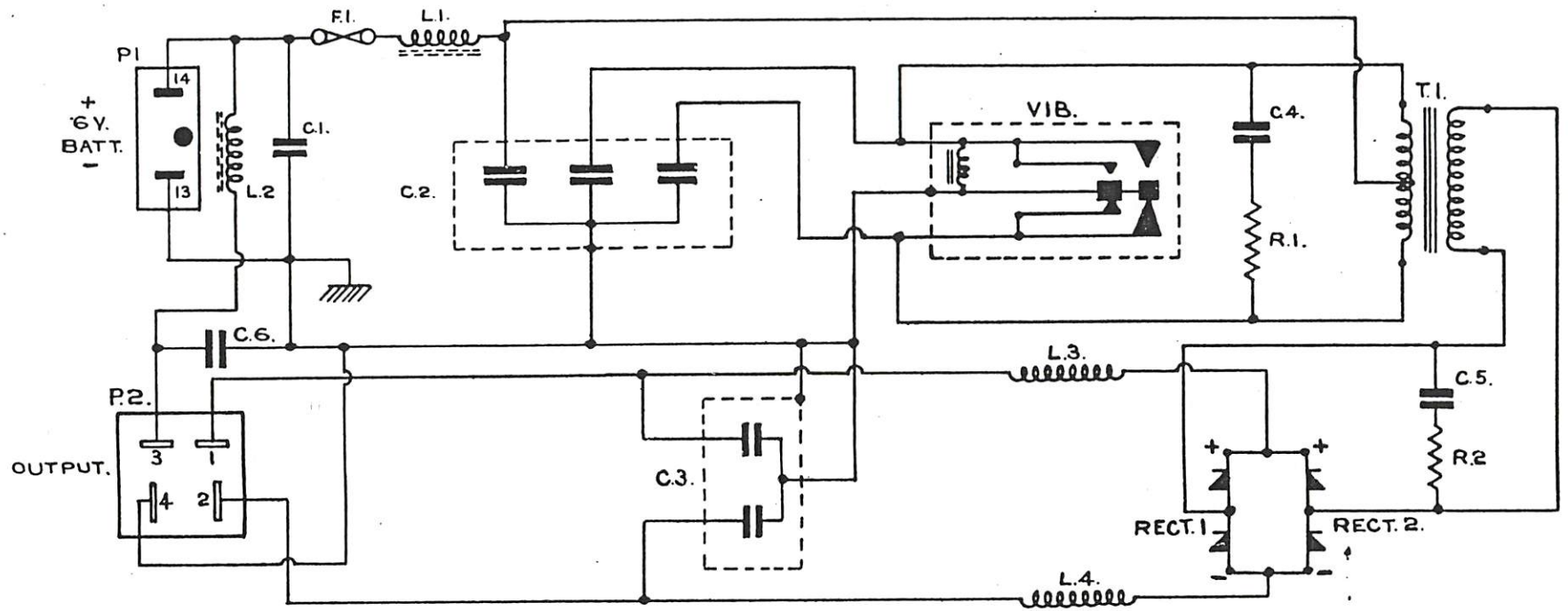


VALVE POSITIONS


TRANSMITTER
S5 SHOWN IN BAND 2 POSITION.
P4
KEY 1
Æ. (VIA S1)
E
L12
C37
V5
R26
L13
R27
L11
S5
C39
C34
C35
X5
R21
X6
C36
0.1
R22
1k
R25
R24
R23
1.5k
C58
C57
L17
C45
R40
C46
M1
R28
C53
R30
L16
C56
R35
C51
EXT. KEY
C52
R32
C40
C42
R31
C41
C43
N1
L14
C44
V6
L15
C47
SK3
C48
R34
L18
R36
C50
C49
PT4
6 HT.+
5 HTRS.
4 EARTH.
3 BIAS.
H
A
B
C
D
E
F
G
1
2
3
4
5
6
7
8
9
10
11

Circuit Ref	Location	Description
N1	C5	Neon Lamp Type NE48
M1	F4	Meter 0.500 Mic.Amps 180 ohms ± 10%
X5	F1	Germanium Rectifier B.T.H. type CG1C
X6	F3	Uniplate Rectifier S.T.C. type H.T.
S5	E2, E4.	Switch Oak, Min. 2 Sect., 3 positions
V5	D2	Valve R.C.A. 2 E 26
V6	D7	" Mullard EL 41
L11	D1	P.A. Coil
L12	C2	R.F. Choke 350 MIC. H
L13	D3	P.A. Grid Stopper
L14	C7	R.F. Choke 415 MIC. H.
L15	B8	" " " "
L16	F6	" " " "
L17	D4	Driver Coil
L18	D8	" Grid Stopper
C34	E1	Condr. 1.5 Pfd ± 0.25 Pfd. 750V. Erie type P100K
C35	F1	" 47 Pfd. ± 5% 500V. Erie type N750K
C36	F3	" 0.01 mfd. 350V T.C.C. type CP32N (Sleeve)
C37	C2	" 100 Pfd. ± 10% 500V Erie N750L
C39	E2	" Variable 6.5 Pfd. -150 Pfd. W & R type C8-04
C40	B6	" .01 mfd. ± 25% 500V. T.C.C. type CP 33S
C41	B5	" 100 Pfd. ± 10% 500V Erie N750L
C42	B6	" " " " " "
C43	B6	" " " " " "
C44	C6	" 47 Pfd. ± 10% 500V Erie N750K
C45	E5	" Variable, 6.5 Pfd.-150 Pfd. W & R type C8-04
C46	F4	" .01 mfd. ± 25% 350V T.C.C. type CP32N (Sleeved).

Circuit Ref.	Location	Description
C47	B8	Condr. 100 Pfd. ± 10% 500V Erie N750L
C48	C8	" 560 Pfd. ± 20% 350V Erie HI-K
C49	E9	" 6.8 Pfd. ± 10% 500V Erie P100K
C50	E7	" 30 Pfd. ± 1.5 Pfd. Erie N750K
C51	F7	" .03 mfd. ± 25% Dubilier type 412
C52	F9	" .01 mfd. ± 25% 350V T.C.C. type CP32N (Sleeved).
C53	F5	" " " " " "
C56	F6	" 2 mfd. ± 25% 150V D.C. 71° wkg. Dubilier type 412
C57	E3	" .002 mfd. 1500V. D.C. wkg. T.C.C. type M360
C58	E3	" .001 mfd. CTH/315/LT. T.C.C.
R21	F3	Resistor 68 ohms ± 10% Dubilier BWF 2 insul.
R22	G3	" 1 K/ohm ± 20% " " "
R23	G3	" 1.5 K/ohms ± 20% @ 20° C S.T.C. Brimistor CZ3
R24	G2	" 2.2 K/ohms ± 10% Dubilier type B.T.S. ¼
R25	F3	" 820 ohms ± 10% Dubilier type B.W.F. 2 insul.
R26	C3	" 8.2 K/ohms ± 5% Welwyn type AW3111
R27	D3	" 47 ohms ± 20% Erie type 9 insul.
R28	F5	" 5.6 K/ohms ± 10% Erie type 8
R30	F6	" 100 ohms ± 5% Welwyn type AW 3111
R31	B5	" 10 M/ohm ± 20% Dubilier type B.T.S. ¼
R32	A6	" 5.6 K/ohms ± 5% Welwyn type AW3111
R33	B7	" 10 K/ohms ± 5% " " "
R34	D8	" 22 ohms ± 20% Erie type 9
R35	F7	" 100 ohms ± 10% " "
R36	E8	" 56 K/ohms ± 10% Dubilier type B.T.S. ¼. Insulated
R40	E4	" 10 K/ohms ± 10% Dubilier type B.T.S. ¼



COMP.	LOCATION	DESCRIPTION
R1.	B8	RESISTOR 22Ω ± 20% ERIE TYPE 9
R2.	C9	" 2200Ω ± 20% " " 16
C1	B3	CONDENSER 0·5μFD. ± 25%, 150 v. D.C @ 71°C DUBILIER TYPE 418
C2	B4	" 3 x 0·1μFD ± 20% 300 v. D.C. @ 85°C. DUB & NITROGOL BOX N°2
C3	C5	" 2 x 0·1μFD. ± 20%, 700 v. D.C. @ 85°C " " " N°2
C4	B8	" 2μFD. ± 25%, 150 v. D.C. @ 71°C DUBILIER TYPE 418
C5	C9	" ·01μFD. ± 10%, 1200 v. A.C. DUBILIER TYPE 4704 A/SP
C6	C2	" 0·5μFD. ± 25%, 150 v. D.C. @ 71°C. DUBILIER TYPE 418.
L1	A4	FILTER CHOKE (L.T.) 1·4 μH
L2	B2	" " " 1·4 μH

COMP	LOCATION	DESCRIPTION
L3	C7	RF. CHOKE 350 μH.
L4	D7	" " 350 μH.
T1	B9	VIBRATOR TRANSFORMER, PARMEKO TO SPECIFICATION.
VIB	B7	6 v. VIBRATOR, WIMBLEDON TYPE S.P.C.6
RECT.1	D8	SELENIUM RECTIFIER D25-18-IRG
RECT.2	D9	" " D25-18-IRG.
P1	A2	2 POINT PLUG TYPE JP-2-CB.
P2.	C2	4 " SOCKET " 500,467
F1.	A3	FUSE HOLDER TYPE L356 WITH 20A. FUSE TYPE L1055

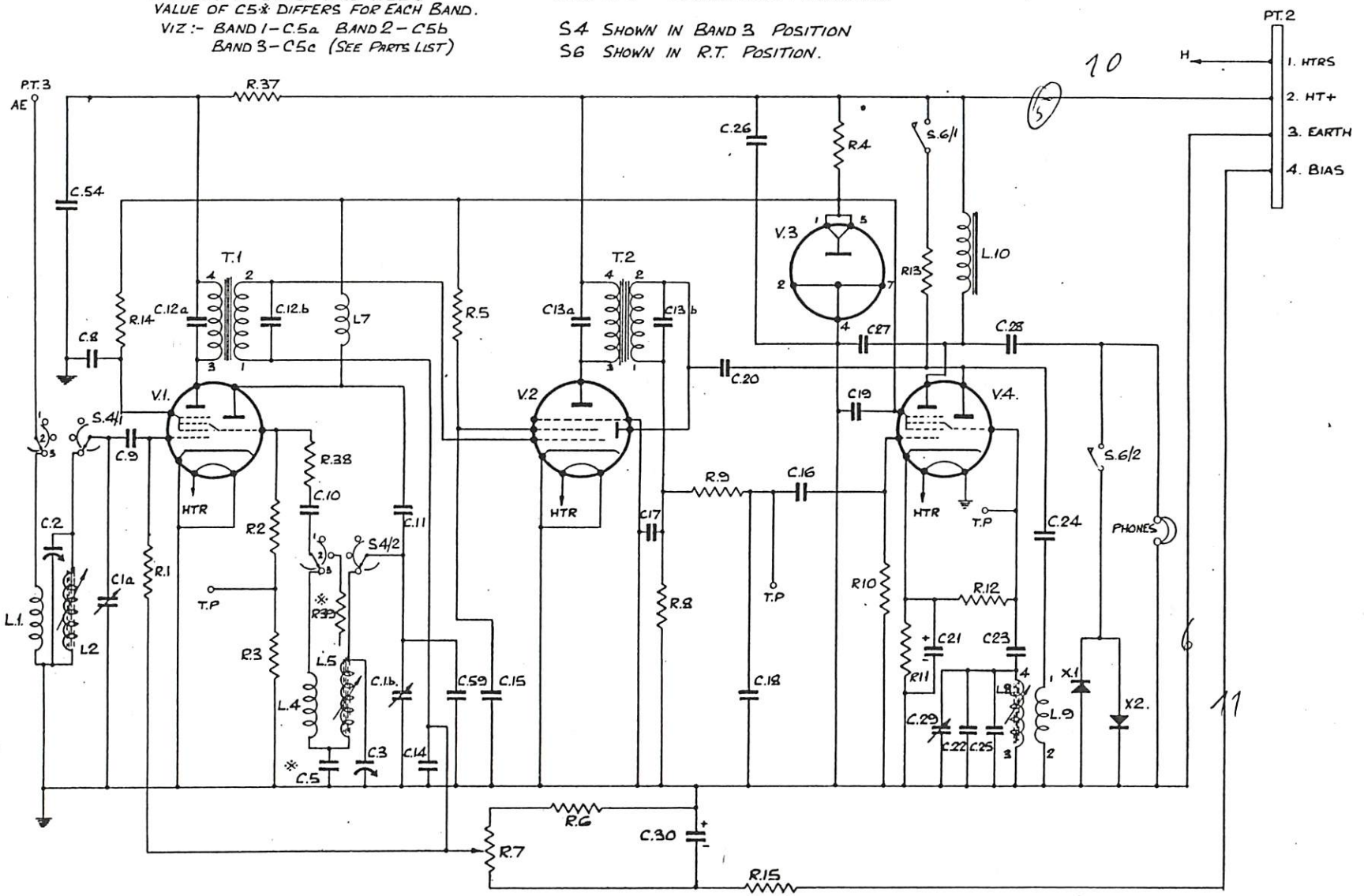
VIBRATOR

RECEIVER

NOTE :- ONLY ONE BAND IS SHOWN. COILS FOR OTHER TWO BANDS ARE CONNECTED IN A SIMILAR FASHION TO TAGS 1 & 2 OF SWITCH 4.
BAND 2 OSC COIL GRID WINDING CONNECTS TO SWITCH THRO' R39 ※
VALUE OF C5 ※ DIFFERS FOR EACH BAND.
VIZ :- BAND 1 – C5a BAND 2 – C5b
BAND 3 – C5c (SEE PARTS LIST)

COIL CODING	OSC	AERIAL
BAND 1 :-	2 BROWN SPOTS	1 BROWN SPOT
BAND 2 :-	2 RED SPOTS	1 RED SPOT
BAND 3 :-	2 GREEN SPOTS	1 GREEN SPOT

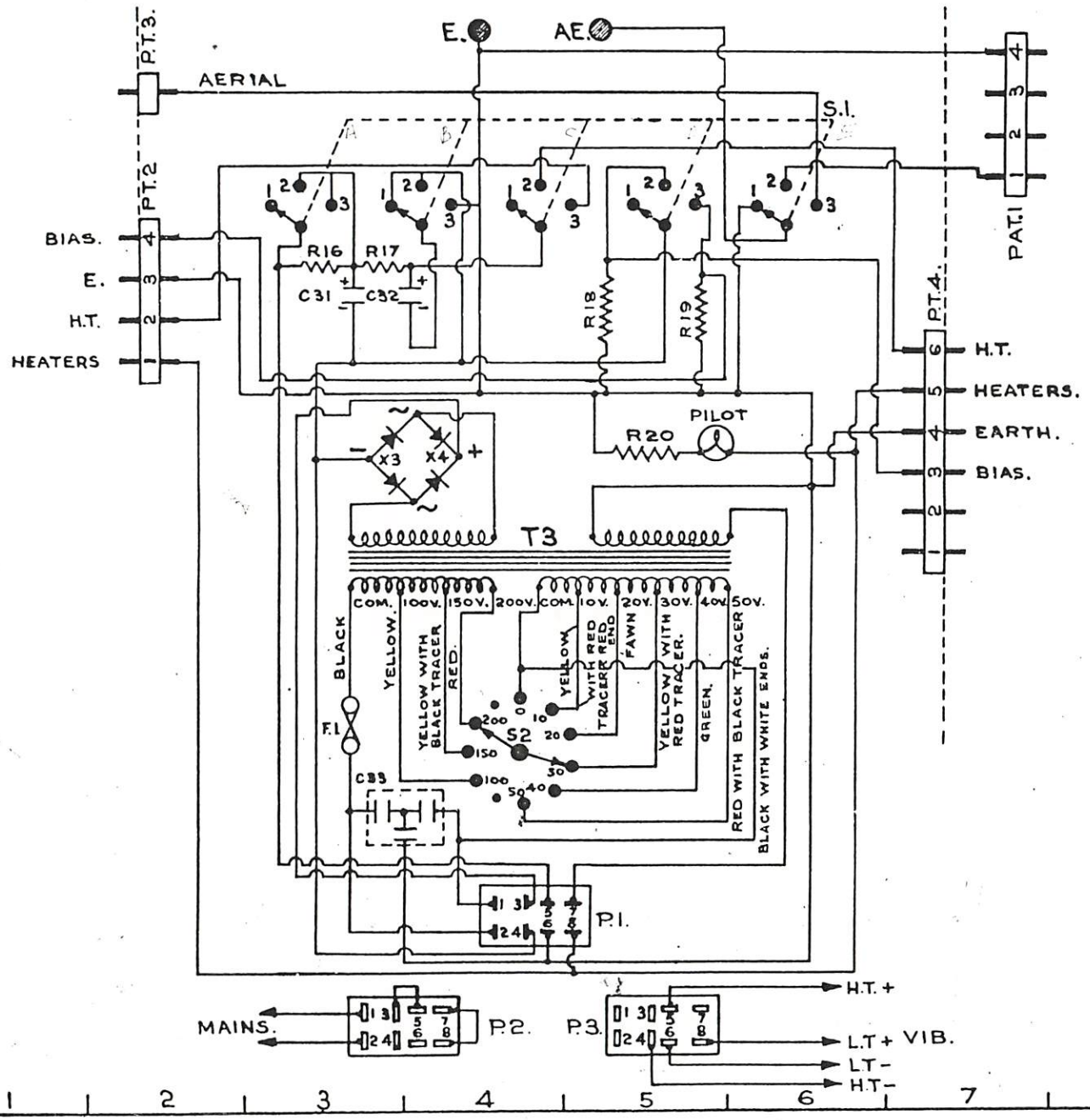
S4 SHOWN IN BAND 3 POSITION
S6 SHOWN IN R.T. POSITION.



Circuit Ref	Location	Description
X1	F8	Miniature Westector type W (Half wave)
X2	F8	" " " " " "
S4 D1,	E3	Switch Oak, Min, 2 Sect. 3 positions.
S6 B7,	D8	" " 2 position (special)
V1	D2	Valve - Mullard E.C.H. 42
V2	D5	" " E.A.F. 42
V3	C7	" Hytron OB 2
V4	D7	" Mullard E.C.H. 42
T1	C2	IF Transformer Type P3A
T2	C5	" " " "
L1 a-c	E1	Aerial Coupling Winding } Aerial Coil
L2 a-c	E1	Grid Tuned Winding } Band 1-3.
L4 a-c	F3	Osc. Grid Coupling Winding } Osc. Coil
L5 a-c	F3	Osc. Plate tuned winding } Band 1-3
L7	C3	R.F. Choke 415 mH
L8	F8	B.F.O. Grid winding } B.F.O. Coil Assy.
L9	F8	" Plate winding }
L10	C7	Choke 2.5H @ 3Ma. Wright & Weaire type 280
C1a	E2	Twin Gang Variable Condenser 180 Pfd.
C1b	F4	Wingrove & Roger type No. C70-02-11-12/.009.
C2	E1	Trimmer Condr. 3.5-30 Pfd. T.C.C. type
C3	F3	T.C.K. 0330
C5a	F3	Condr. 1200 Pfd. ± 2% Dubilier type S635
C5b	F3	" 2000 Pfd. 2 x 1000 Pfd. Dubilier type S635.
C5c	F3	Condr. 4500 Pfd. 3 x 1500 ± 2% Dubilier type S635.
C8	D1	Condr. .01 mfd. ± 25% T.C.C. type CP32H (Sleeved).
C9	D2	Condr. 100 PFD -0 + 100% 350V Dubilier type 635
C10	D3	Condr. 47 PFD ± 10% 350V Dubilier type 635
C11	E4	Condr. 1000 PFD ± 10% 350V Dubilier type 635
C12a	C2	Condr. 110 PFD ± 2% Part of IF Trans. Weymouth P3A

Circuit Ref	Location	Description
C12b	C3	Condr. 110 PFD ± 2% Part of IF Trans. Weymouth P3A.
C13a	C5	" 110 PFD ± 2% " " " " Weymouth P3A
C13b	C5	" 110 PFD. ± 2% " " " " Weymouth P3A.
C14	F4	" .01 mfd. ± 25% T.C.C. type CP32N (Sleeved)
C15	F4	" .01 mfd. ± 25% " " " (Sleeved)
C16	D6	" 330 PFD -0 + 100% 350V Dubilier type 635
C17	D5	" 330 PFD -0 + 100% 350V Dubilier type 635
C18	F6	" " " " " " "
C19	D7	" 0.1 mfd. ± 20% 350V D.C. T.C.C. CP37N (sleeved).
C20	C6	" 4.7 PFD ± 0.5 PFD 500V Erie type P100K.
C21	E7	" 20 mfd. - 20% + 50% 12V T.C.C. ty CE 308 (Sleeved).
C22	F8	" 100 PFD ± 5% 350 V U.I.C. type 401 S.M.F.
C23	E8	" 68 PFD ± 20% 350V Dubilier S635
C24	E8	" " " " " " " "
C25	F8	" 15 PFD ± 10% Erie type N750K
C26	B6	" 0.1 mfd. ± 20% 350V D.C. T.C.C. CP 37N (Sleeved).
C27	C7	" .002 mfd. ± 25% 500V T.C.C. CP30S (sleeved).
C28	C8	" .01 mfd. ± 25% 500V T.C.C. CP33S (sleeved).
C29	F7	" Trimmer 1.7 PFD - 15 PFD S.S. Bir No. CA1746-50
C30	G6	" 1 mfd. - 20% + 50% 275V T.C.C. CE 30N (Sleeved).
C54	B1	" .002 mfd. ± 25% 500V T.C.C. type CP30S (sleeved)
C59	F4	" 10 PF.

Circuit Ref	Location	Description	Circuit Ref	Location	Descripti
R1	E2	Resistor 1 M/ohm ± 5% Erie type 100 High stability.			
R2	E3	Resistor 47 K/ohm ± 10% Dubilier type B.T.S. ¼ insul.			
R3	F3	" 1 K/ohm ± 10% Dubilier type BWF 2 insul.			
R4	B7	" 68 K/ohms ± 5% Welwyn type AW 3111.			
R5	C4	" 4.7 K/ohms ± 25% Dubilier type B.T.S. ¼ insul.			
R6	G5	" 8.2 K/ohms ± 5% Erie type 9 insul.			
R7	G4	" Variable 200 K/ohms inverse log. Morganite.			
R8	E5	" 100 K/ohms ± 10% Dubilier B.T.S. ¼			
R9	D6	" " " " "			
R10	E7	" 1 M/ohm ± 20% Dubilier B.T.S. ¼.			
R11	E7	" 560 ohms ± 10% Dubilier B.W.F. 2 insul.			
R12	E8	" 220 K/ohms ± 20% Dubilier B.T.S. ¼.			
R13	C7	" 100 K/ohms ± 10% Dubilier B.T.S. ¼.			
R14	C2	" 2.2 K/ohms ± 20% Dubilier B.T.S. ¼.			
R15	G6	" 100 K/ohms ± 10% Dubilier B.T.S. ¼.			
R37	B3	" 2.2 K/ohms ± 20% Dubilier type B.T.S. ¼. insul.			
R38	D3	" 100 ohms ± 10% Dubilier type B.T.S. ¼ insul.			
R39	E3	" 68 ohms ± 10% Dubilier BWF 2.			



COMP.	LOCATION	DESCRIPTION
R16	B3	2·7KΩ ±20% WELWYN A.W.3111
R17	B3	22Ω ±20% " A.W.3101
R18	C5	6·8KΩ ±5% " A.W.3111
R19	C5	2·4KΩ ±5% " A.W.3111
R20	C5	15Ω ±5% " A.W.3101
C31	B3	8μf 450V WKG. T.C.C. TYPE CE.19.P.
C32	B4	8μf 450V " " " CE.19.P.
C33	F3	·1μf + ·1μf + ·01μf. 2250V. D.C. TEST. T.C.C. TYPE S.2342
T3	D4	MAINS TRANS. PRIMARY AS SHOWN. SEC.1. 270v A.C. ±2% @100M/A. SEC.2 6·3v. A.C. ±·1v @2·3 AMPS.
S1	B4	2 SECTION, 3 POSITION; TRANS/REC/FORM SW.
S2	E4	MAINS VOLTAGE ADJUSTER DEVICE.
X3	C3	HIGH VOLTAGE RECTIFIER TYPE D25-18-IRG.
X4	C4	" " " " D25-18-IRG.
F1	E3	2·5 AMP FUSE. BELLING-LEE.
P1	F4	FLANGED 8 PIN PANEL PLUG. PAINTON TYPE 500474
P2	G3	8 POINT CABLE SOCKET. PAINTON TYPE 500476
P3	G5	8 " " " " " 500476
PILOT	C5	6·3/6·5v., ·15A, M.E.S. VITALITY TYPE G.473.

POWER PACK.