

RECEPTION SETS, P.C.R., NOS. 1, 2 AND 3

TECHNICAL HANDBOOK - MISCELLANEOUS INSTRUCTION

(Service data - Second to fourth echelon)

ALIGNMENT AND PERFORMANCE TESTING

I.F. MEASUREMENTS

1. Sensitivity

Apply a signal of approx. 465kc/s modulated 30% at 400c/s to the F.C. grid. With the receiver gain at maximum, adjust the input for an output of 50mW, tuning the signal generator to resonance with the I.F. amplifier. The input must not be greater than 15µV. The resonance frequency must be within 465 ± 1kc/s.

2. Selectivity

With an input as described in para. 1 increase the input by the amounts given in the table below, and in each case detune the signal generator to each side in turn until the output drops to 50mW. Note the difference between the two frequencies at which this occurs to obtain the bandwidth, which must be within the tolerances in the following table:-

Input	Bandwidth
+ 6db.	4kc/s min.
+ 20db.	10.5kc/s max.
+ 40db.	16kc/s max.
+ 60db.	23kc/s max.

R.F. MEASUREMENTS

3. Adjustments

During trimming and while measuring the R.F. sensitivity, a load consisting of 3,000Ω in series with 0.1µF is connected between the second I.F. grid and the chassis. This reduces the I.F. amplification 40 to 50 times.

The following table gives the trimming points:-

P.C.R.2			P.C.R.3		
Band	Trim	Track	Band	Trim	Track
S.W.	20Mc/s	6.5Mc/s	S.W.2	20Mc/s	8.5Mc/s
M.W.	200m.	520m.	S.W.1	7Mc/s	2.6Mc/s
L.W.	1,000m.	1,800m.	M.W.	200m.	520m.

(Note: On the P.C.R.3., S.W.2 must be trimmed before S.W.1 and M.W.)

4. R.F. sensitivity

Connect a signal generator to the aerial and earth terminals via a standard dummy aerial on M.W. and L.W. and via a 400Ω non-inductive resistance on S.W. The signal generator should be modulated 30% at 400c/s. With the set damped as described in para. 3, the input for 50mW output must not be greater than the figures in the following table, which gives the production test frequencies and wavelengths:-

P.C.R.2		P.C.R.3	
Frequency	μV	Frequency	μV
20Mc/s	60	20Mc/s	60
14Mc/s	60	12Mc/s	60
9Mc/s	70	8.5Mc/s	70
6.5Mc/s	70	7Mc/s	30
		4Mc/s	30
200m.	20	2.6Mc/s	35
300m.	20		
520m.	25	200m.	20
		300m.	20
1,000m.	60	520m.	25
1,800m.	80		

5. I.F. rejection

With the set damped, apply an input of approx. 465kc/s connected as described in para. 4 with the set tuned to 520m. Tune the signal generator for maximum output from the set and adjust the input for an output of 50mA. The input must not be less than 40mV.

6. A.V.C.

With the signal generator connected as described in para. 4 and the set not damped, tune in a signal of 10μV at 300m., and adjust the gain-control for an output of 10mV. Increase the input to 100mV; the output must not rise more than 11db.

7. Over-all A.F. response

With the signal generator connected as described in para. 4 and the set not damped, tune in a signal of 10mV at 300m. Change the modulation frequency to 5,000c/s, and readjust both the tuning control and the aerial trimmer for the minimum between the two maxima indicated on the output meter. Return the modulation frequency to 400c/s, and adjust the gain for an output of 500mW (referred to as 0db.). Set the modulation frequency to the values given below and the output readings should be within the limits given:-

A.F.	Output
100c/s	+3 to -1db.
150c/s	+2 to -1db.

7. (contd.)

A.F.	Output
400c/s	0db.
1,000c/s	+2 to -1db.
2,000c/s	+3 to 0db.
3,000c/s	+2db.
4,000c/s	-1 to -6db.
5,000c/s	-8 to -17db.

Set the Tone switch to 'Low'

A.F.	Output
5,000c/s	-22 to -28db.

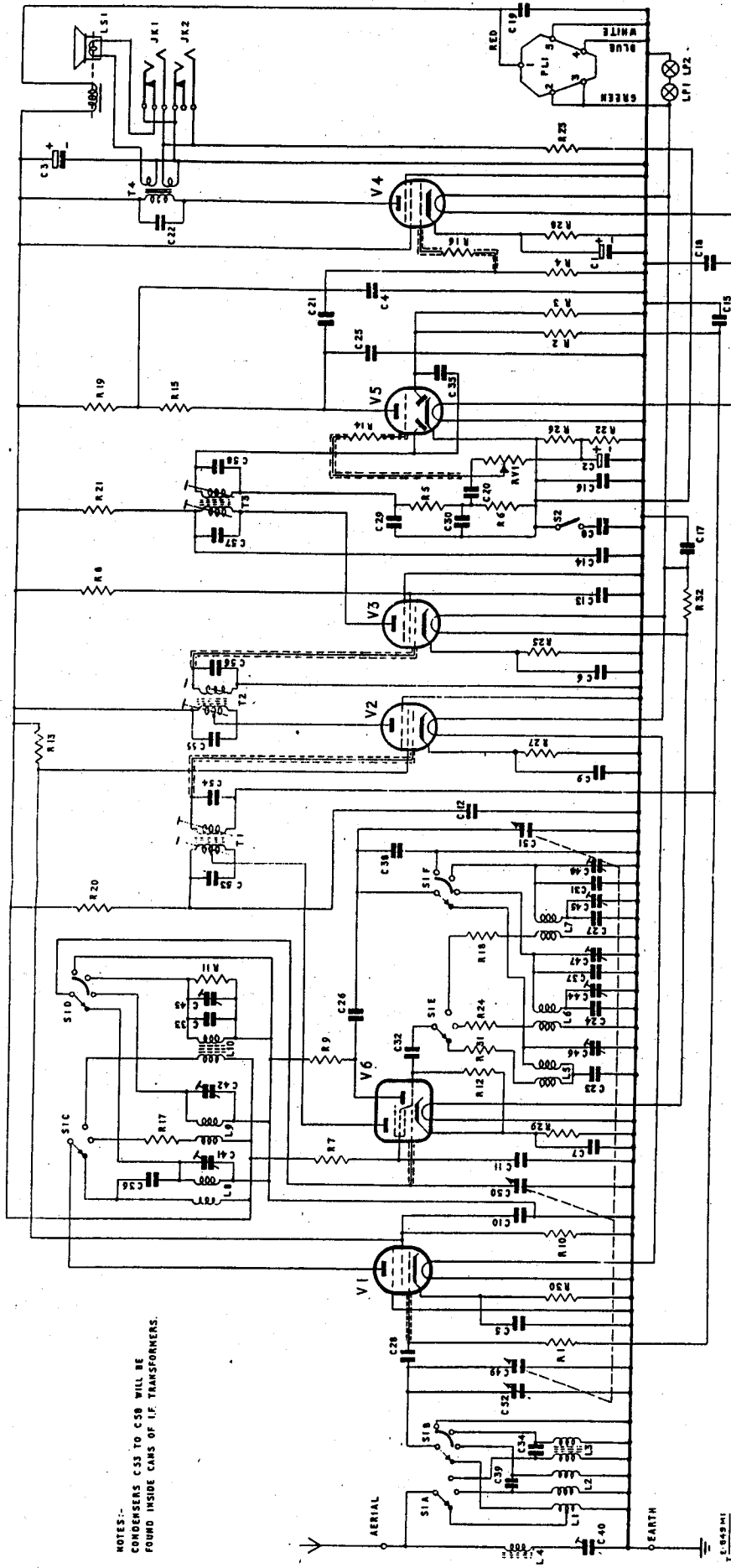
8. A.F. output

With input as described in para. 7 and 400c/s modulation, increase the gain-control until the point where distortion just becomes evident. Then measure the output, which should be at least 2W. Next turn the gain to maximum and again read the output, which should be at least 3W.

9. Calibration

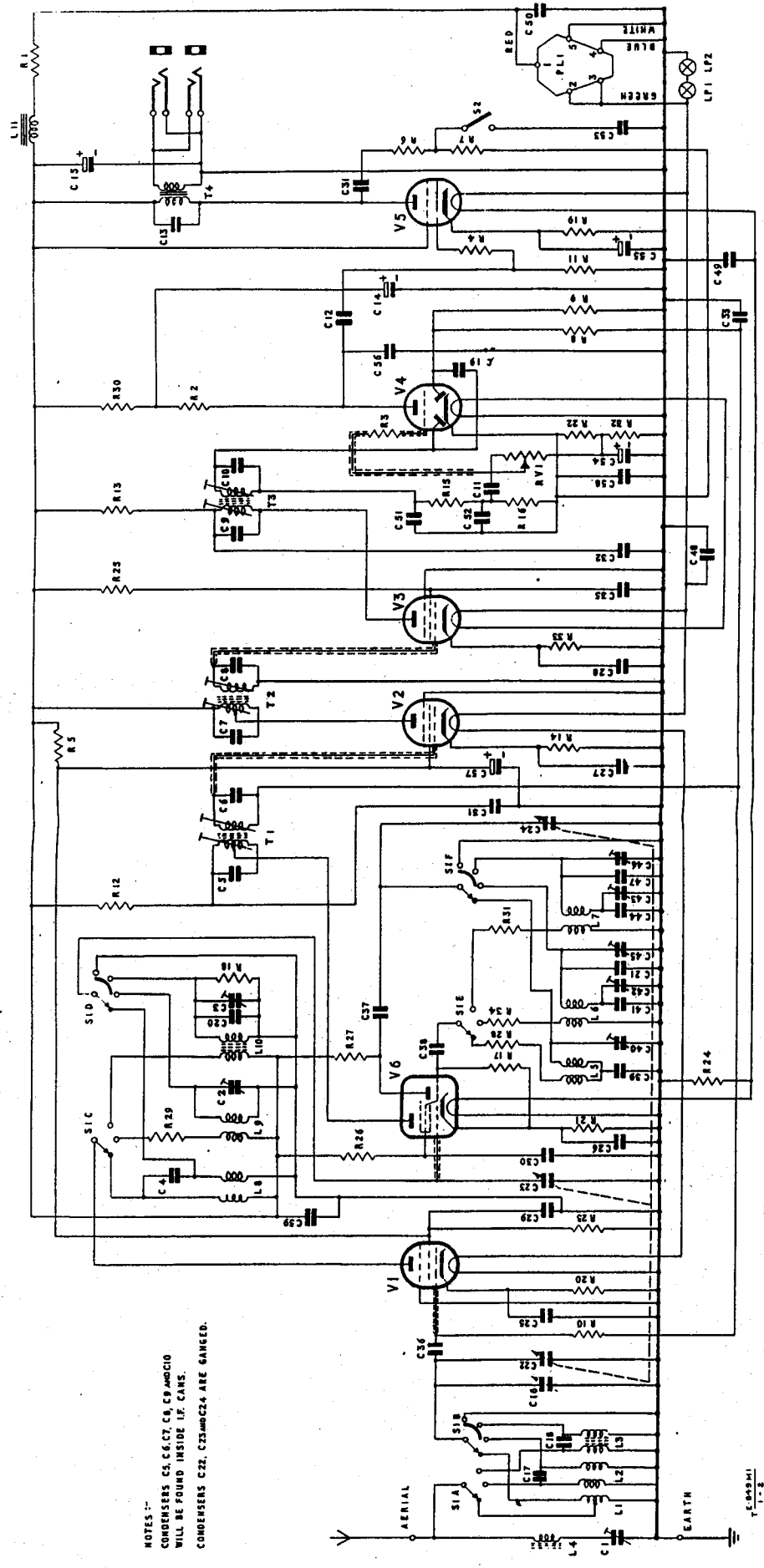
Maximum tolerances:-

P.C.R.2	P.C.R.3
<p>S.W. $\left(\begin{array}{l} + 100\text{kc/s above } 12\text{Mc/s} \\ \pm 50\text{kc/s below } 12\text{Mc/s} \end{array} \right)$</p> <p>M.W. $\pm 2.5\text{m.}$ L.W. $\pm 10\text{m.}$</p>	<p>S.W.2 $\left(\begin{array}{l} + 100\text{kc/s above } 12\text{Mc/s} \\ \pm 50\text{kc/s below } 12\text{Mc/s} \end{array} \right)$</p> <p>S.W.1 $\left(\begin{array}{l} + 50\text{kc/s above } 5\text{Mc/s} \\ \pm 25\text{kc/s below } 5\text{Mc/s} \end{array} \right)$</p> <p>M.W. $\pm 2.5\text{m.}$</p>



NOTES:-
CONDENSERS C51 TO C59 WILL BE
FOUND INSIDE CANS OF I.F. TRANSFORMERS.

Fig. 1 - Reception set, P.C.R. No. 1



NOTES:-
CONDENSERS C5, C6, C7, C9, C9 AMPCIO
WILL BE FOUND INSIDE I.F. CANS.
CONDENSERS C22, C23 AMPC24 ARE CHANGED.

Fig. 2 - Reception set, P.C.R. No. 2

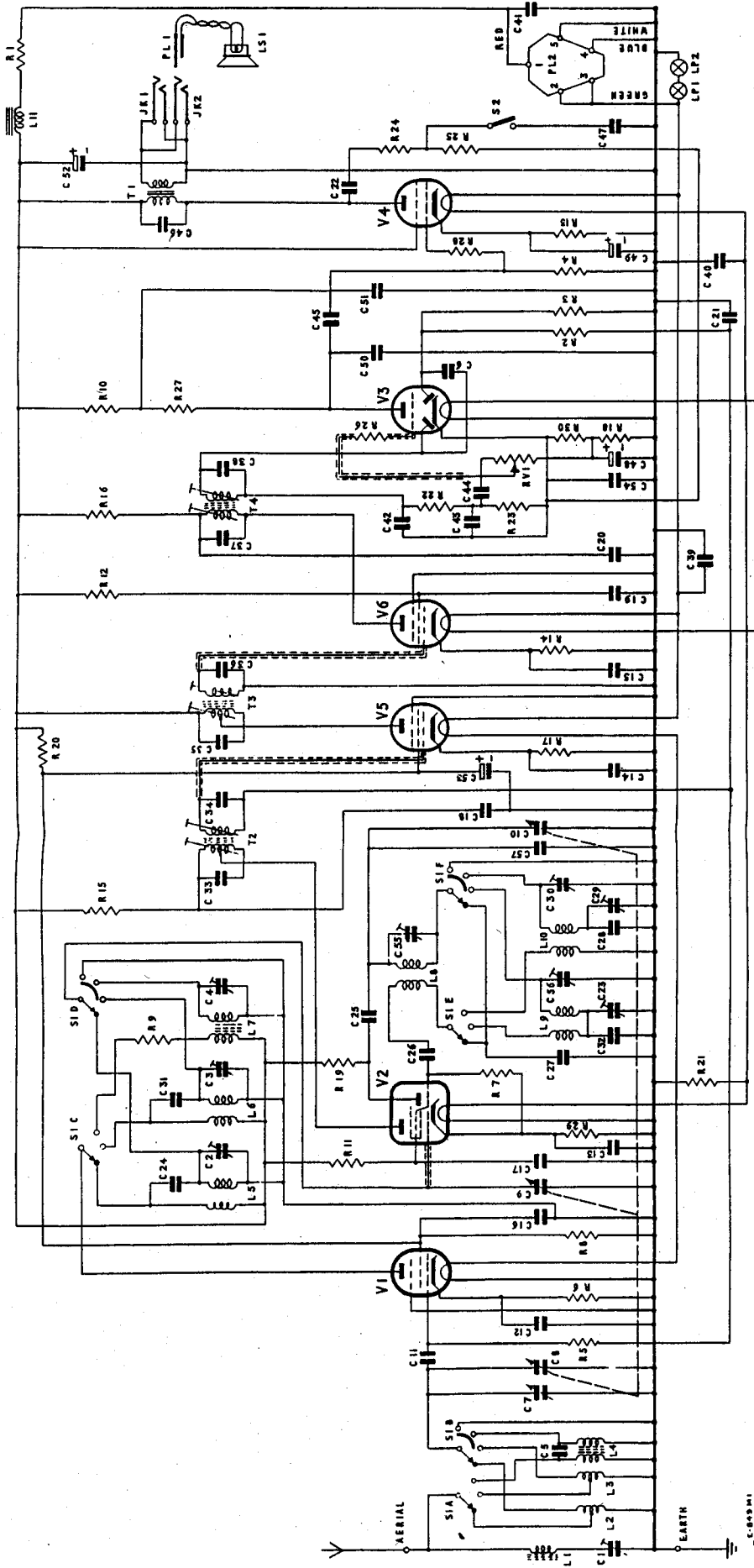


Fig. 3 - Reception sets P.C.R. Nos. 3 and 3 TFL

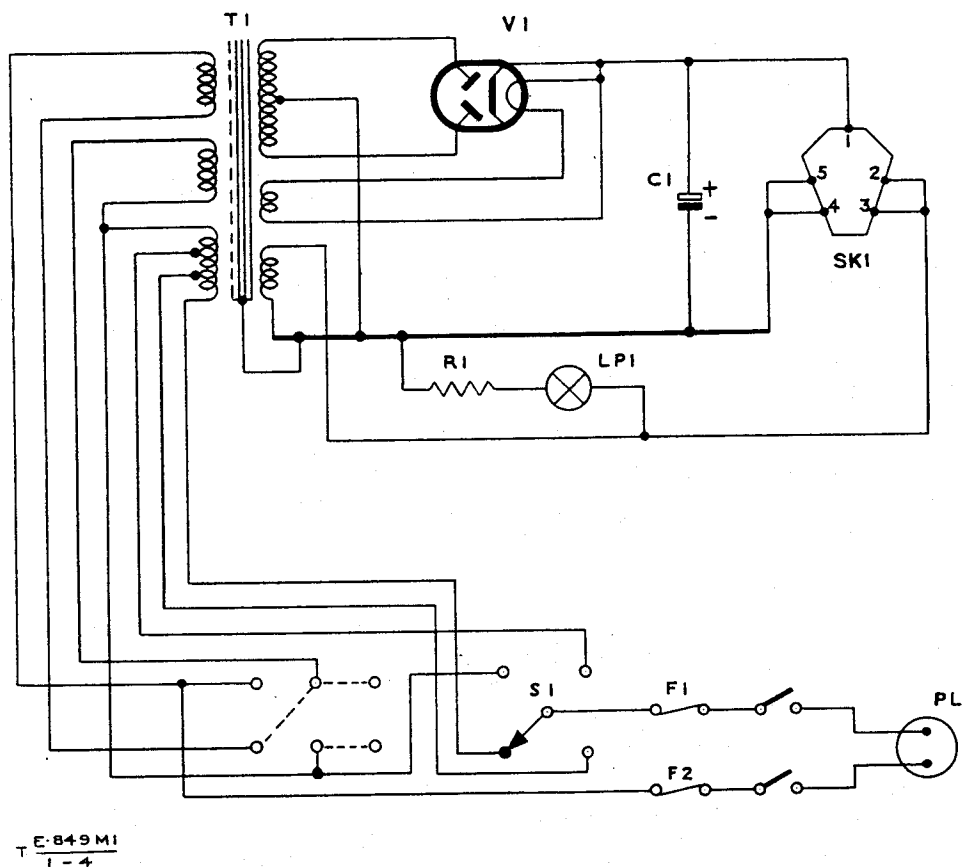


Fig. 4 - Supply unit, rectifier No. 17

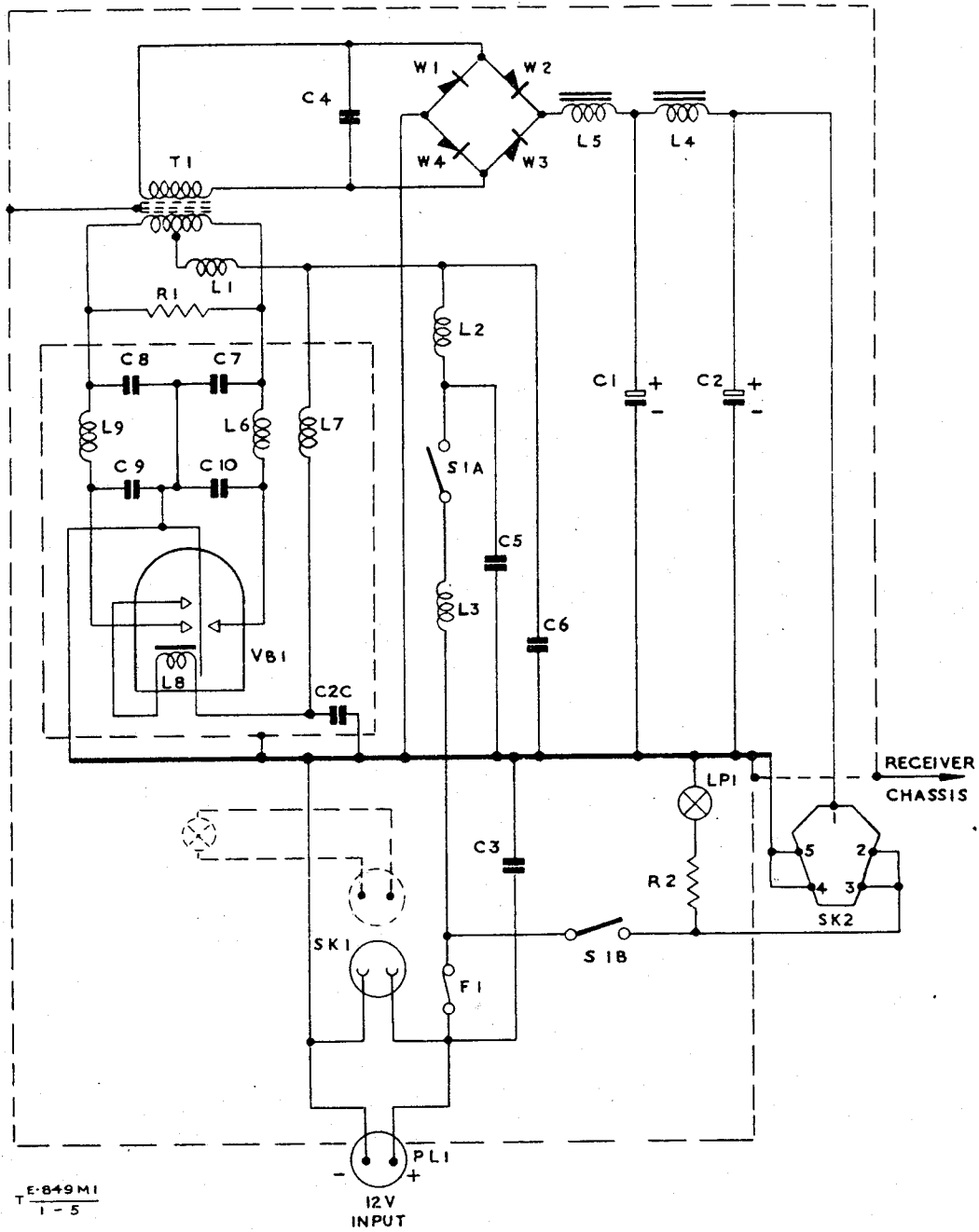


Fig. 5 - Supply unit, vibratory No. 8 and No. 9

END

NOTES:

TO DATE FOUR MODELS OF PCR RECEIVER ARE AVAILABLE. ALTHOUGH ALL THESE MODELS ARE OF SIMILAR APPEARANCE & CONSTRUCTION, THEY CAN BE CLASSIFIED BY REFERENCE TO THE MAKERS' LABEL WHICH IS ON THE FRONT PANEL. THE FOUR TYPES OF RECEIVER ARE AS FOLLOWS:

(1) PCR (2) PCR 1 (3) PCR 2 (4) PCR 3
THE CIRCUIT DIAGRAM ABOVE REFERS TO THE TYPE PCR 2. BUT SINCE TYPE PCR 1 IS ALMOST IDENTICAL TO THIS, THEY ARE GROUPED TOGETHER FOR THE PURPOSES OF THIS DESCRIPTION.

ESSENTIAL DIFFERENCES OF THE OTHER TYPES ARE THAT THE PCR HAS A BUILT-IN LOUDSPEAKER WHILST THE PCR 3 OMMITS THE LONG-WAVE BAND TO INCORPORATE BETTER SHORT-WAVE COVERAGE. OTHER MINOR VARIATIONS IN CIRCUITRY OF THE PCR & PCR 3 ARE REPRODUCED ON THIS SHEET

GENERAL SPECIFICATIONS:

PCR AND PCR 1 & 2	PCR 3
800-2100M	190-570M
120-180kHz	2.3-7.5 MHz
	7-13 MHz

(1) FREQUENCY COVERAGE
IN 3 SWITCHED BANDS

(2) POWER SUPPLIES
BY EXTERNAL UNIT
ALL MODELS
HT 250 V (ABOUT 65 MA)
L.T. 12 V (ABOUT .7 A)

(3) DIMENSIONS & WEIGHT
ALL MODELS
17" 8" 10" 25 lbs

RESISTORS:

ALL RESISTORS ARE 1/2 WATT CARBON TYPE UNLESS OTHERWISE STATED

REFERENCE	PCR	PCR 1	PCR 3	REFERENCE	PCR	PCR 1	PCR 3
R 1 A	470k	470k	470k	R 16 A	500k	500k	500k
B	470k	470k	470k	VOLUME CONTROL			
C	470k	470k	470k	R 17 A	-	15k	15k
D	470k	470k	470k	B	-	15k	15k
R 2 A	220n	220n	220n	R 18 A	22k	22k	22k
B	47k	47k	47k	B	22k	22k	22k
R 3 A	10k	10k	10k	C	22k	22k	22k
R 4 A	10k	10k	10k	R 19 A	270n	470n	470n
B	10k	10k	10k	B	1k	470n	470n
R 5 A	47k	47k	47k	R 20 A	-	500n	500n
B	47k	47k	47k	3 WATT W/V			
R 6 A	150k	150k	150k				
B	150k	150k	150k				
R 7 A	470n	270n	270n				
R 8 A	56k	56k	39k				
R 9 A	68n	68n	-				
R 10 A	1k	1k	1k				
B	1k	1k	1k				
R 11 A	2.2k	2.2k	2.2k				
B	2.2k	2.2k	2.2k				
C	2.5k	2.2k	2.2k				
R 12 A	3.3k	1.5k	1.5k				
R 13 A	39k	39k	39k				
R 14 A	-	39k	39k				
R 15 A	270k	270k	270k				
B	270k	270k	270k				

NOTE:
IN TYPE PCR 3, R 4 A IS TO BE FOUND IN SERIES WITH L 7 A AND NOT IN PARALLEL WITH L 7 A. TYPE PCR 3 HAS MODIFIED HEATER CONNECTIONS INVOLVING 68k IN ACROSS VSA HEATER

CONDENSERS:

C - COMPRESSION TRIMMER
S - SILVER MICA
B - BEEHIVE TRIMMER
M - M - MOULDED MICA

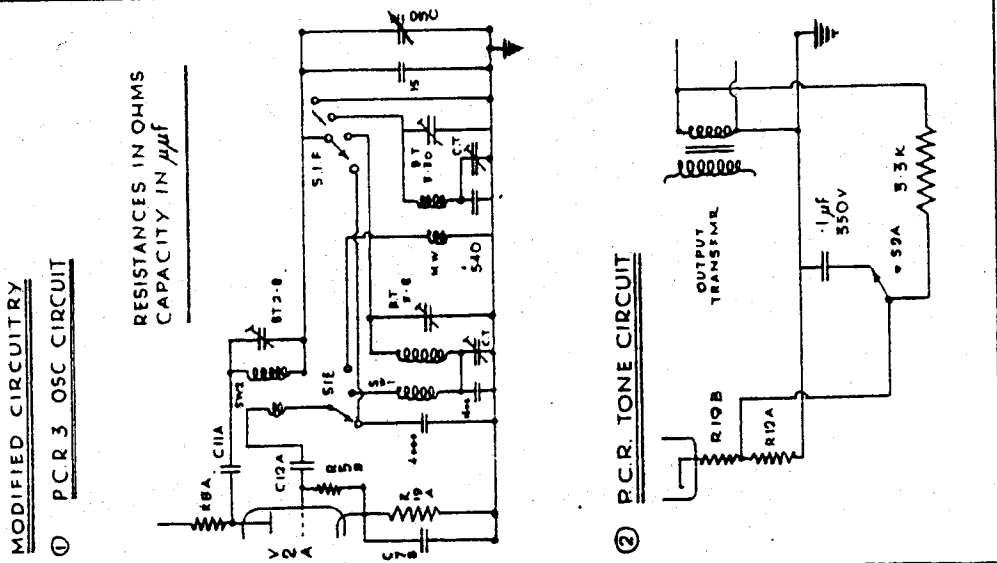
REF.	PCR	PCR 1	PCR 3	REF.	PCR	PCR 1	PCR 3
C 1 A	CT	CT	CT	C 13 A	400pF	400pF	400pF
B	CT	CT	CT	C 14 A	540pF	540pF	540pF
C	CT	CT	CT	C 15 A	375pF	375pF	375pF
C 2 A	5pF	5pF	5pF	C 15 B	CT	CT	CT
C 3 A	20pF	20pF	20pF	C 16 A	BT	BT	BT
B	20pF	20pF	20pF	C 17 A	190pF	190pF	190pF
C	20pF	20pF	20pF	C 18 A	80pF	80pF	80pF
C 4 A	50pF	50pF	50pF	C 19 A	180pF	180pF	180pF
C 5 A	100pF	100pF	100pF	C 20 A	1000V	1000V	1000V
C 6 A	100pF	100pF	100pF	C 21 A	100pF	100pF	100pF
C 7 A	100pF	100pF	100pF	C 22 A	1000V	1000V	1000V
C 8 A	100pF	100pF	100pF	C 23 A	750V	750V	750V
C 9 A	100pF	100pF	100pF	C 24 A	100pF	100pF	100pF
C 10 A	100pF	100pF	100pF	C 25 A	100pF	100pF	100pF
C 11 A	200pF	200pF	200pF	C 26 A	100pF	100pF	100pF
C 12 A	50pF	50pF	50pF	C 27 A	100pF	100pF	100pF
				C 28 A	100pF	100pF	100pF
				C 29 A	100pF	100pF	100pF
				C 30 A	100pF	100pF	100pF

USEFUL TECHNICAL DATA

① INTERMEDIATE FEED 46.1 K²S

② IF SENSITIVITY 1 μV SIGNAL 30% MOD AT 800% ATTEN TO MIXER GRID GIVES ROUGHLY 75% OUTPUT

③ OUTPUT IMPEDANCE 70 Ω



CIRCUIT DIAGRAM OF PCR.2.

REF NO C 92156
DRN
TRD
CHKD
APPD

INDUCTANCES:

REF	PCR	PCR 162	PCR 3
L1A	WAVE TRAP	WAVE TRAP	WAVE TRAP
L2A	SW. A.E. COIL	SW. A.E. COIL	SW. A.E. COIL
L3A,B	MW. A.E. COIL	MW. A.E. COIL	MW. A.E. COIL
L4A,B	LW. A.E. COIL	LW. A.E. COIL	MW. A.E. COIL
L5A,B	SW. R.F. COIL	SW. R.F. COIL	SW. R.F. COIL
L6A,B	MW. R.F. COIL	MW. R.F. COIL	SW. R.F. COIL
L7A,B	LW. R.F. COIL	LW. R.F. COIL	MW. R.F. COIL
L8A,B	SW. OSC. COIL	SW. OSC. COIL	-
L9A,B	MW. OSC. COIL	MW. OSC. COIL	-
L10A,B	LW. OSC. COIL	LW. OSC. COIL	-
L11A,B	I.F. TRANS	I.F. TRANS	I.F. TRANS
L12A	I.F. TRANS	I.F. TRANS	I.F. TRANS
L14A	LS FIELD HT. CHOK	HT. CHOK	-
T1A	OUTPUT TRANSFORMER	6000:3:2	-

VALVES: ALL INTERNATIONAL OCTAL CIVIL AND MILITARY NOTATIONS ARE LISTED

REF	P. C. R.	PCR 112	PCR 3
V1A,B,C	EF 59	AR 24	EF 59
V2A	6X4	AR 24	6X4
V3A	6X4	AR 21	6X4
V4A	EL 32	VT 52	6V 6-G

SWITCHES: ALL MODELS

REF	SWITCH	MODEL
S1A	WAVE CHANGE SWITCH	6-POLE
S2A	3 POSITION SWITCH IN 3 WAFER SECTIONS B, D & F ARE FITTED WITH MUTING WIPERS	SINGLE POLE ON-OFF WAFER TYPE

DENSERS: C.T. - COMPRESSION TRIMMER
S.M. - SILVER MICA
B.T. - BEEHIVE TRIMMER
M.M. - MOULDED MICA

RECEPTION SETS, PCR, NOS 1, 2 AND 3
(PCR No 3 and 3 TPL)

TECHNICAL HANDBOOK - MISCELLANEOUS INSTRUCTION

Drive-box mechanism wear

SUMMARY

1. Cases of wear occur in the drive-box mechanism of the Reception set, PCR, No 3 and 3 TPL resulting in the holes through which the spindle passes becoming elongated.

This instruction details the action to be taken when such wear occurs.

2. Items affected:-

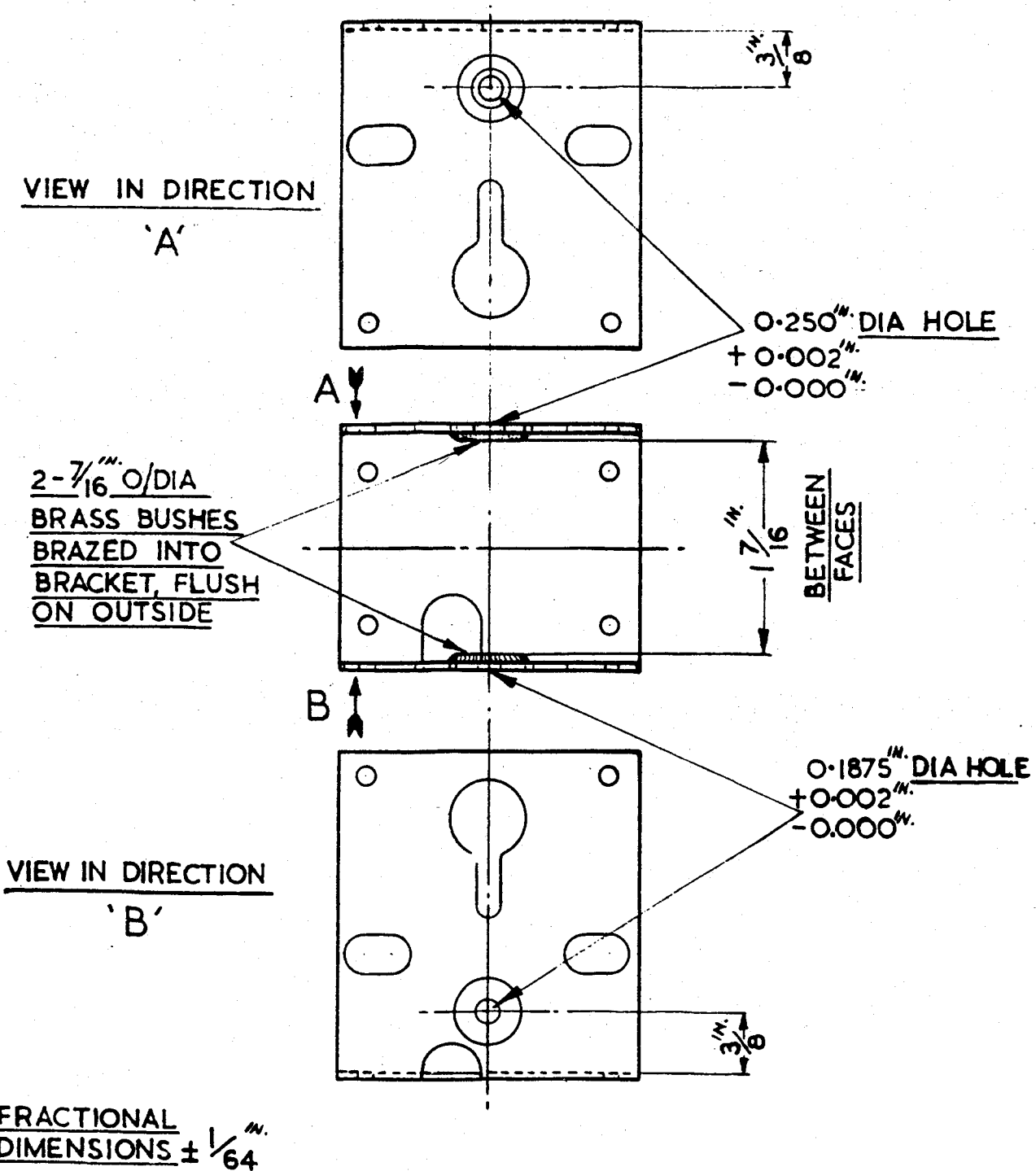
Reception sets, PCR, No 3 and No 3 TPL drive-box mechanism.

3. Action required by:-

- (a) REME workshops authorized to carry out field and base repairs
 - (i) Carry out this instruction when necessary.

DETAIL

4.
 - (a) Remove and strip the drive-box mechanism
 - (b) Enlarge front and back bearing holes to $3/8$ inch diameter
 - (c) Prepare two brass bushes, one drilled with a $1/4$ inch hole and the other with a $3/16$ inch diameter hole
 - (d) Insert each bush in turn into position from inside the box, using the bush with the $3/16$ inch diameter hole in the rear position. Silver solder both bushes into position
 - (e) Turn back the rear shoulder of the spindle $1/64$ inch approx, ie, the thickness of the flange on the rear-bearing bush
 - (f) In cases of severe wear it may be necessary to turn up new spindles as a badly grooved spindle can damage the new bearings
 - (g) Re-assemble and refit the drive-box mechanism



E-849M2
1-1

Fig 1 - Fitting of bushes

END