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.)

Distribution - Class 870. Code No. 3 (double)

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 10mW. 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
S.W. (± 100kc/s above 12Mc/s (± 50kc/s below 12Mc/s	S.W.2 (± 100kc/s above 12Mc/s (± 50kc/s below 12Mc/s
M.W. ± 2.5m. L.W. ± 10m.	S.W.1 (± 50kc/s above 5Mc/s (± 25kc/s below 5Mc/s
	M.W. ± 2.5m.

END

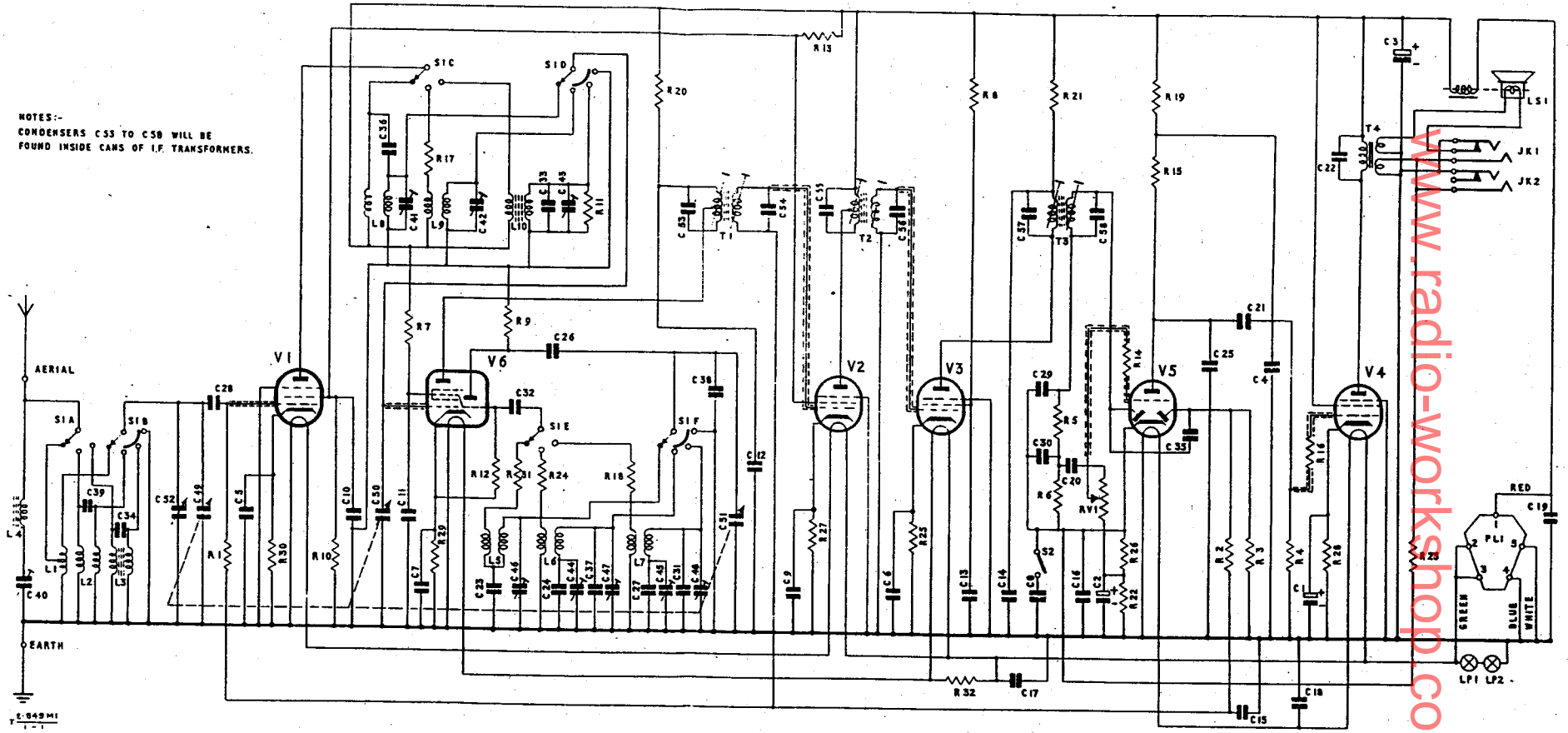


Fig. 1 - Reception set, P.C.R. No. 1

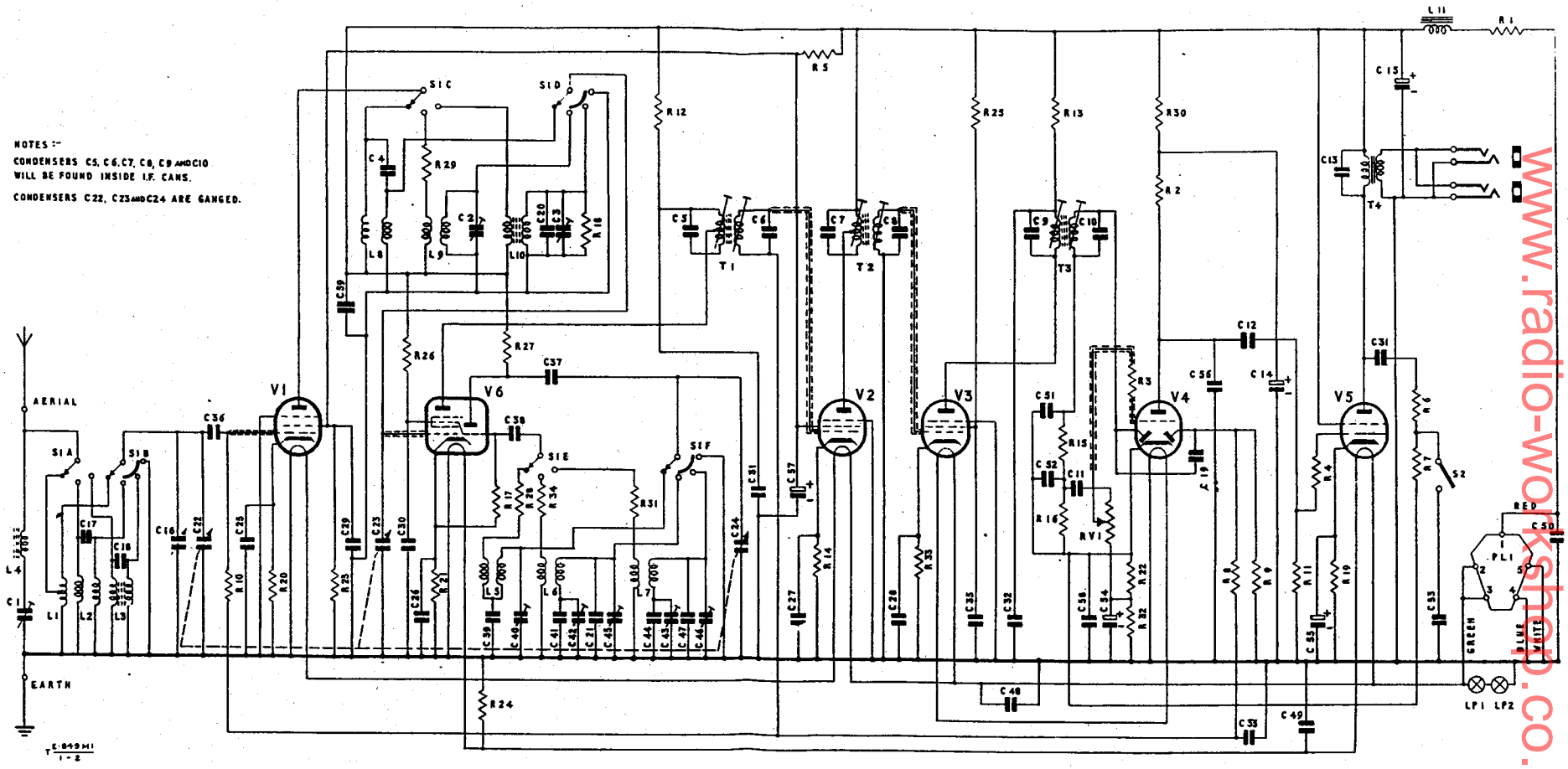


Fig. 2 - Reception set, P.C.R. No. 2

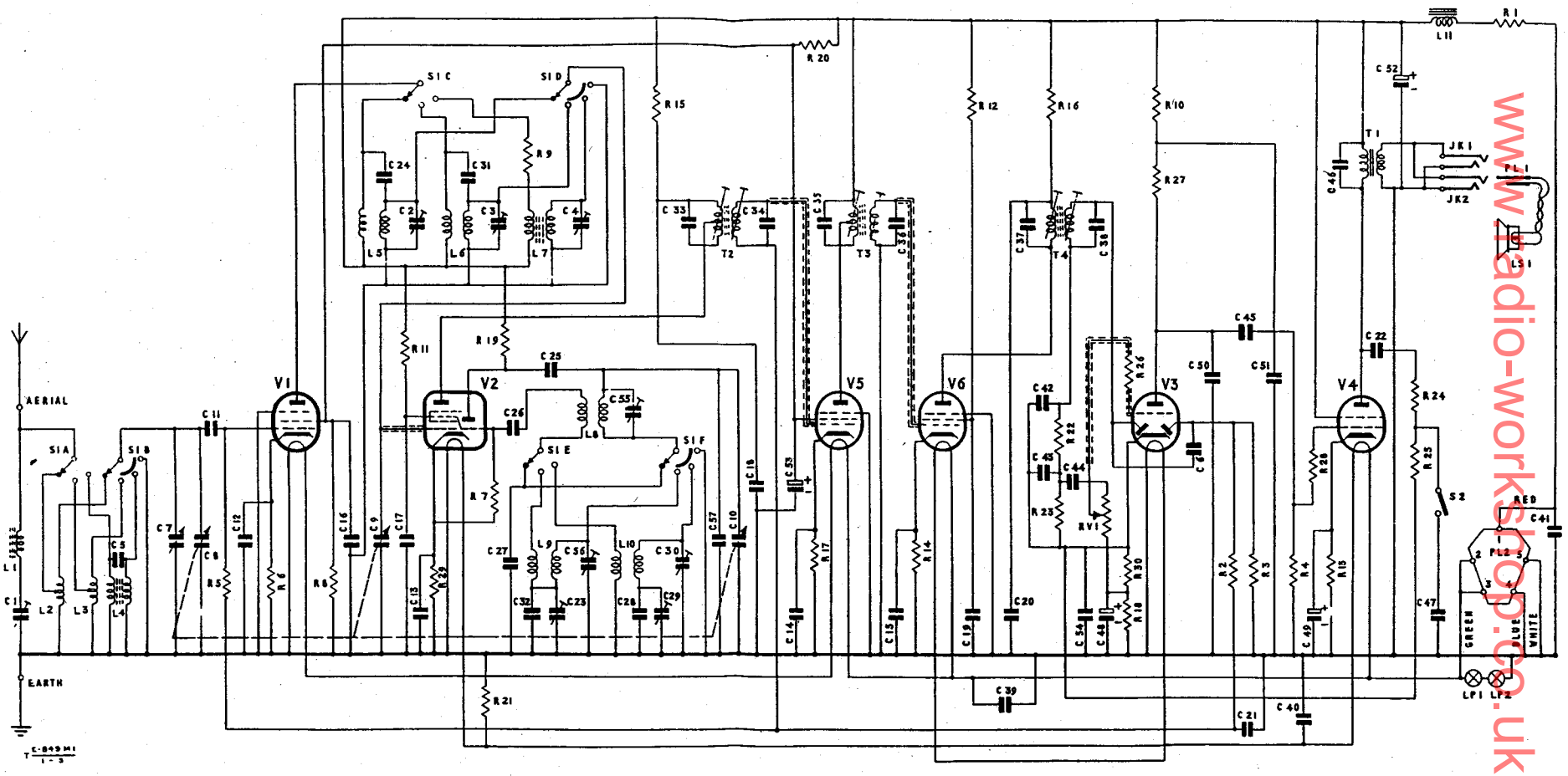


Fig. 3 - Reception sets P.C.R. Nos. 3 and 3 TPL

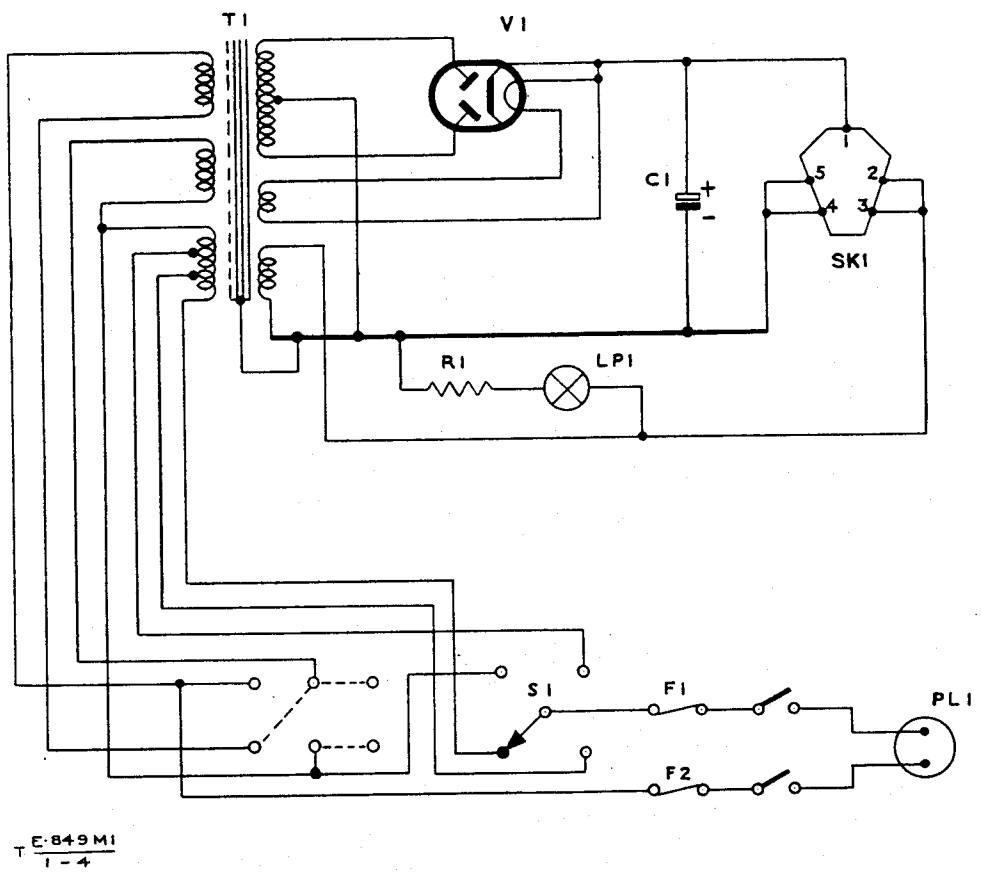


Fig. 4 - Supply unit, rectifier No. 17

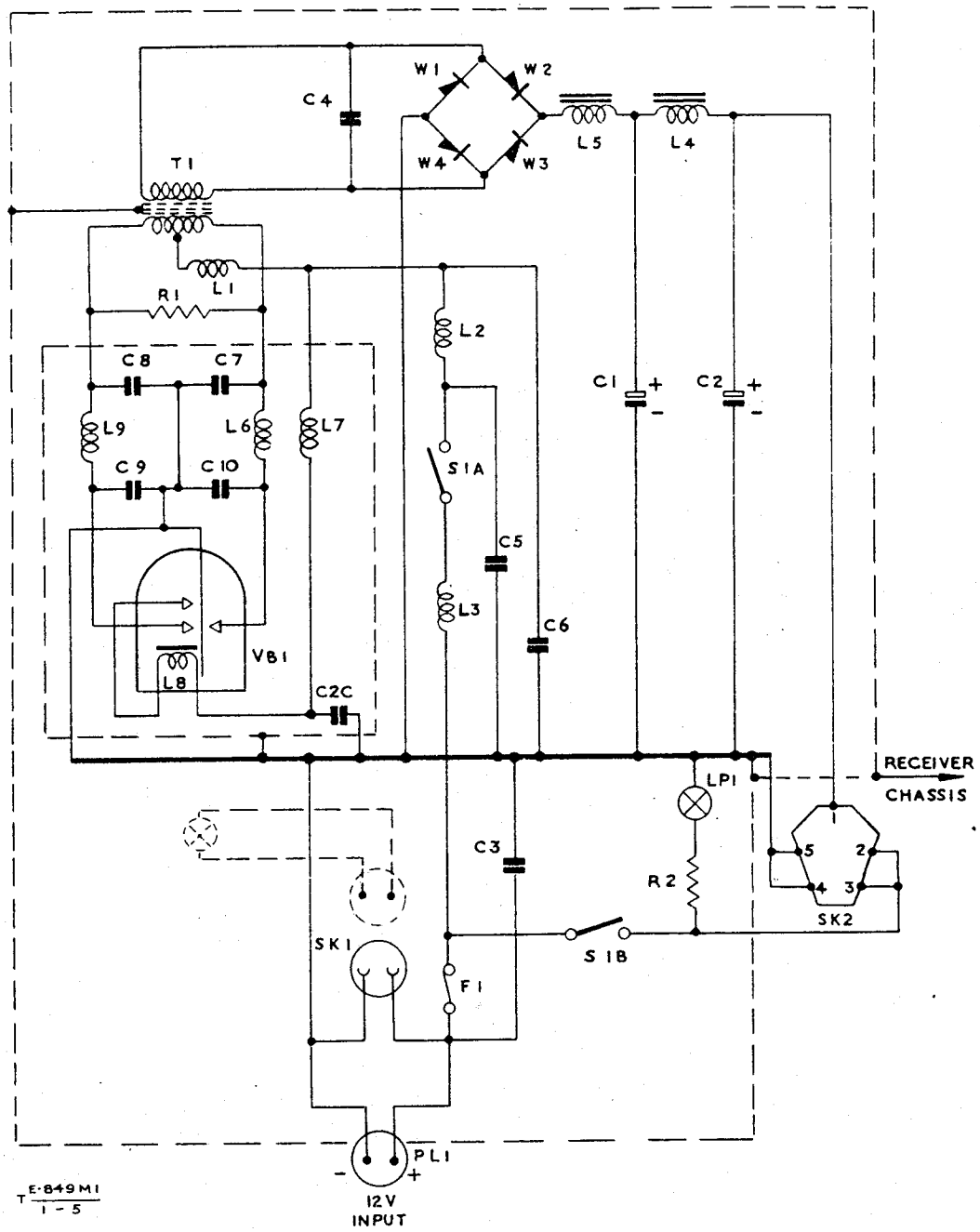


Fig. 5 - Supply unit, vibratory No. 8 and No. 9

END

NOTES:

TO DATE, FOUR MODELS OF P.C.R 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) P.C.R (2) P.C.R 1 (3) P.C.R 2 (4) P.C.R 3

THE CIRCUIT DIAGRAM ABOVE REFERS TO THE TYPE P.C.R 2. BUT SINCE TYPE P.C.R 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 P.C.R HAS A BUILT-IN LOUDSPEAKER WHILST THE P.C.R 3 OMITS THE LONG-WAVE BAND TO INCORPORATE BETTER SHORT-WAVE COVERAGE. OTHER MINOR VARIATIONS IN CIRCUITRY OF THE P.C.R & P.C.R 3 ARE REPRODUCED ON THIS SHEET

GENERAL SPECIFICATIONS :

	P.C.R AND P.C.R 1 & 2	P.C.R 3
(1) FREQUENCY COVERAGE IN 3 SWITCHED BANDS	800 - 2100M 190 - 570M 6 - 18M/cs	190 - 570M 2·3 - 7·5M/cs 7 - 23M/cs

(2) POWER SUPPLIES BY EXTERNAL UNIT — ALL MODELS
H.T. 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 ½ WATT CARBON TYPE UNLESS OTHERWISE STATED

REFERENCE	P.C.R	P.C.R 1/2	P.C.R 3
R 1 A	470K	470K	470K
B	470K	470K	470K
C	470K	470K	470K
D	470K	470K	470K
R 2 A	220Ω	220Ω	220Ω
R 3 A (wire)	47K	47K	47K
R 4 A	10K	10K	-
B	10K	10K	-
C	10K	10K	10K
R 5 A	47K	47K	-
B	47K	47K	47K
R 6 A	150K	150K	150K
B	150K	150K	150K
R 7 A	470Ω	270Ω	270Ω
R 8 A	56K	56K	39K
R 9 A	68Ω	68Ω	-
R 10 A	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 1W	-	39Ω	39Ω
R 15 A	270K	270K	270K
B	270K	270K	270K
R 16 A VOLUME CONTROL	500K	500K	500K
R 17 A	-	15K	15K
B	-	15K	15K
R 18 A	22K	22K	22K
B	22K	22K	22K
C	22K	22K	22K
R 19 A	270Ω	470Ω	470Ω
B	1K	470Ω	470Ω
R 20 A 5 WATT W/W	-	500Ω	500Ω

NOTE :
IN TYPE P.C.R 3 R 4 A IS TO BE FOUND IN SERIES WITH L 7 A AND NOT L 6 A (10K) TYPE P.C.R HAS MODIFIED HEATER CONECTIONS INVOLVING 68 Ω 1W ACROSS V 3 A HEATER

CONDENSERS :

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

REF.	P.C.R	P.C.R 1/2	P.C.R 3
C 1 A	C.T	C.T.	C
B	C.T	C.T	C
C	C.T	C.T	C
C 2 A	5pf ±10% S.M	5pf ±10% S.M	
C 3 A	20pf ±10% S.M	20pf ±10% S.M	5pf ±10% S.M
C 3 B	20pf ±10% S.M	20pf ±10% S.M	20pf ±10% S.M
C 4 A AE TRIMMER	50pf	50pf	5·0pf
C 5 A.B.C TUNING GANG	·0005	·0005	·0·005
C 6 A	100pf ±10% S.M	100pf ±10% S.M	10·pf ±10% S.M
C 7 A B C D	·1µf 350V	·1µf 350V	·µf 35·V
C 8 A B C D E F	·1µf 500V	1µf 500V	·µf 50·V
C 8 G	-	1µf 500V	µf 5·V
C 10 A B	30pf ±10% S.M	30pf ±10% S.M	
C 11 A	200pf ±2% S.M	200pf ±2% S.M	20·pf ±2% S.M
C 12 A	50pf ±10% S.M	50pf ±10% S.M	5·pf ±10% S.M

REF	P.C.R	P.C.R 1/2	P.C.R 3
C 13 A	4000pf ±2% S.M	4000pf ±2% S.M	-
C 14 A	540pf ±2% S.M	540pf ±2% S.M	-
C 15 A B	C.T	C.T	-
C 16 A B	B.T	B.T.	-
C 17 A	190pf ±2% S.M	190pf ±2% S.M	-
C 18 A	80pf ±2% S.M	80pf ±2% S.M	-
C 19 A B C D E F	180pf ±2% S.M	180pf ±2% S.M	180pf ±2% S.M
C 20 A B C	·01µf 1000 v	·01µf 1000V	·01µf 1000V
C 21 A.B	100pf M.M.	100pf M.M	100pf M.M
C 22 A B C	·005µf 1000 v	·005µf 1000V	·005µf 1000V
C 23 A	-	·02µf 750v	·02µf 750v
C 24 A.B	12µf 50v	12µf 50v	12µf 50v
C 25 A	10pf MM	10pf MM	10pf MM
B	-	10pf MM	10pf MM
C 26 A	1µf 500v	1µf 500v	1µf 500v
C 27 A	8µf 375v	8µf 375v	8µf 375v
C 28 A	-	2µf 350v	2µf 350v
C 29 A	·05µf 500v	·05µf 500V	·05µf 500V
C 30 A	B.T.	B.T.	

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

	P.C.R	P.C.R 1&2	P.C.R 3
	C.T.	C.T.	C.T.
	C.T.	C.T.	C.T.
	C.T.	C.T.	C.T.
A	5pf ±10% S.M	5pf ±10% S.M	
A	20pf ±10% S.M	20pf ±10% S.M	5pf ±10% S.M
B	20pf ±10% S.M	20pf ±10% S.M	20pf ±10% S.M
A	50pf	50pf	50pf
B C UHF G	·0005	·0005	·0005
A	100pf ±10% S.M	100pf ±10% S.M	100pf ±10% S.M
C.D	·1µf 350V	·1µf 350V	·1µf 350V
E F	·1µf 500V	·1µf 500V	·1µf 500V
G	-	1µf 350V	·1µf 500V
A.B	30pf ±10% S.M.	30pf ±10% S.M.	
A	200pf ±2% S.M	200pf ±2% S.M	200pf ±2% S.M
A	50pf ±10% S.M	50pf ±10% S.M	50pf ±10% S.M

REF	P.C.R	P.C.R 1&2	P.C.R 3
C13A	4000pf ±2% S.M	4000pf ±2% S.M	-
C14A	540pf ±2% S.M	540pf ±2% S.M	-
C15AB	C.T.	C.T.	-
C16AB	B.T.	B.T.	-
C17A	190pf ±2% S.M	190pf ±2% S.M	-
C18A	80pf ±2% S.M	80pf ±2% S.M	-
C19A B C D E F	180pf ±2% S.M	180pf ±2% S.M	180pf ±2% S.M
C20A B C	·01µf 1000V	·01µf 1000V	·01µf 1000V
C21 A.B.	100pf M.M.	100pf M.M.	100pf M.M.
C22 A. B. C.	·005µf 1000V	·005µf 1000V	·005µf 1000V
C23A	-	·02µf 750V	02µf 750V
C24 A.B.	12µf 50V	12µf 50V	12µf 50V
C 25 A	10pf MM	10pf MM	10pf MM
B	-	10pf MM	10pf MM
C26A	1µf 500V	1µf 500V	1µf 500V
C.27A	8µf 375V	8µf 375V	8µf 375V
C.28A	-	2µf 350V	2µf 350V
C.29A	·05µf 500V	·05µf 500V	·05µf 500V
C.30A	B.T.	B.T.	

INDUCTANCES :

REF	P.C.R	P.C.R 1&2	P.C.R 3
L1A	WAVETRAP	WAVETRAP	WAVETRAP
L2A	SW.AE coil	SW.AE coil	SW2 AE COIL
L3A.B	MW AE COIL	MW AE coil	SW1 AE COIL
L4A.B	LW AE COIL	LW AE coil	MW AE COIL
L5AB	SW. RF COIL	SW. RF COIL	SW2 RF COIL
L6AB	MW RF COIL	MW. RF COIL	SW1 RF. COIL
L7AB	LW RF COIL	LW. RF. COIL	MW RF. COIL
L8AB	SW. OSC COIL	SW OSC COIL	-
L9AB	MW. OSC. COIL	MW OSC COIL	-
L10AB	LW. OSC. COIL	LW OSC. COIL	-
L11AB	I.F. TRANS	I.F TRANS	I.F. TRANS
L12A	I.F. TRANS	I.F. TRANS	I.F. TRANS
L14A	L.S FIELD	H.T. CHOKE	H.T. CHOKE
T1A	OUTPUT TRANSFORMER 6000Ω - 3Ω		

VALVES ALL INTERNATIONAL OCTAL CIVIL AND MILITARY NOTATIONS ARE LISTED

REF	P. C. R		P.C.R. 1&2		P.C.R. 3	
V1 A.B.C	EF 39	ARP 34	EF 39	ARP 34	EF 39	ARP 34
V2A	ECH 35	ARTH2	ECH 35	ARTH2	ECH 35	ARTH2
V3A	EBC 33	AR21	EBC 33	AR21	EBC 33	AR21
V4A	EL32	VT52	6V6-G		6V6-G	

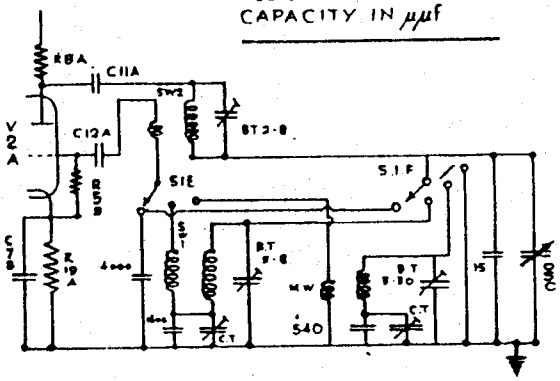
SWITCHES : ALL MODELS

S1 A B C D E F	WAVE CHANGE SWITCH 6-POLE 3 POSITION SWITCH IN 3 WAFERS SECTIONS B, D & F ARE FITTED WITH MUTING WIPERS
S2A	SINGLE POLE ON-OFF WAFER TYPE.

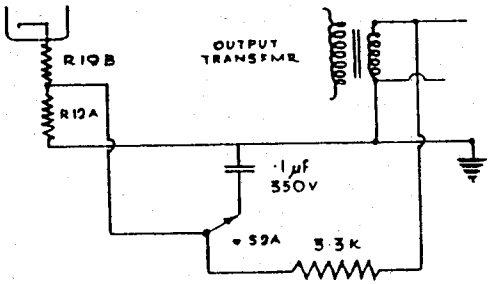
MODIFIED CIRCUITRY

① P.C.R 3 OSC CIRCUIT

RESISTANCES IN OHMS
CAPACITY IN µµf



② P.C.R. TONE CIRCUIT



USEFUL TECH... DATA

① INTERMEDIATE FREQ 465 K/s

② I.F. SENSITIVITY ...

1µV SIGNAL 30% MOD AT 800 ~ APPLIED TO MIXER GRID GIVES ROUGHLY 1·25 ... OUTPUT

③ OUTPUT IMPEDANCE 3...

CIRCUIT DIAGRAM OF P.C.R.2.

REF Nº	C 92156
DRN	
TRD	
CHEKD	
APPD	

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS
(By Command of the Army Council)

TELECOMMUNICATIONS
E 849 Misc Instr No 2

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

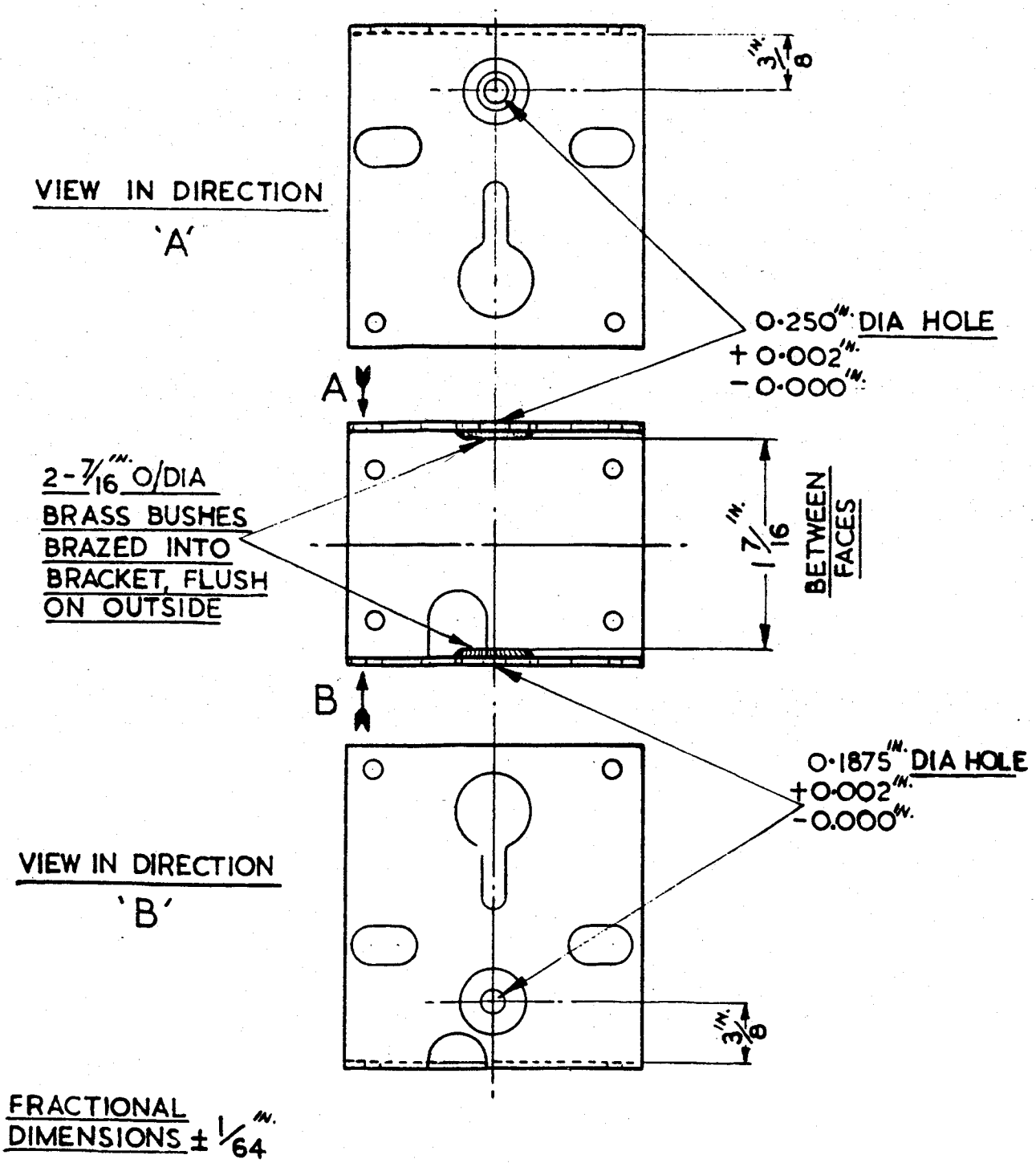
(c) Prepare two brass bushes, one drilled with a 1/4 inch hole and the other with a 3/16 inch diameter hole

(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



T E-849M2
1-1

Fig 1 - Fitting of bushes

END