WIRELESS STATION MK 121 AND MK 122

TECHNICAL HANDBOOK - FAULT FINDING AND REPAIR DATA

Tels F 762 Part 1, F 763 and F 764 will not be published. This Part 2 contains fault finding and repair data in tabular and diagrammatic form.

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FREQUENCY COVERAGE

Mk 121

1. The Mk 121 may be operated in the following frequency ranges. The model is denoted by the suffix letter:-

Model	Frequency coverage
Mk 121 'A'	2.9Mc/s to 6Mc/s
Mk 121 'B'	4.4Mc/s to 9Mc/s
Mk 121 'C'	6.6Mc/s to 14Mc/s
Mk 121 'D'	8Mc/s to 17Mc/s
Mk 121 'E'	9.4Mc/s to 20Mc/s

Mk 122

2. The Mk 122 has a frequency coverage of 2.5Mc/s to 20Mc/s divided into three bands as follows:-

Band	Frequency coverage
1	2.5Mc/s to 5Mc/s
2	5Mc/s to 10Mc/s
3	10Mc/s to 20Mc/s

Table 2501 - List of components (Mk 121)

Circuit ref	Location of components		Value	Rating	Tolerance	Type
	Fig 2502	Fig 2504				
			RESISTORS			
R1	B3	G4	1MΩ	1/2W	±5%	carbon high stab
R2	C3		47kΩ	1/4W	±10%	carbon
R3	C3		1kΩ	2W	±20%	WW ins
R4	H1	G1	6.8kΩ	4.5W	±5%	WW non-ins
R5	E2		4.7kΩ	1/4W	±20%	carbon
R6	E4	G6	8.2kΩ	1/4W	±5%	carbon
R7	D4		200kΩ	1/4W		carbon variable inv log
R8	F3		100kΩ	1/4W	±20%	carbon

Table 2501 - (cont)

Circuit ref	Location of components		Value	Rating	Tolerance	Type
	Fig 2502	Fig 2504				
			RESISTORS (cont)			
R9	F3		100kΩ	1/4W	±20%	carbon
R10	G3		1MΩ	1/4W	±20%	carbon
R11	G3		560Ω	2W	±20%	WW ins
R12	H3		220kΩ	1/4W	±20%	carbon
R13	G2		100kΩ	1/4W	±20%	carbon
R14	A2		2.2kΩ	1/4W	±20%	carbon
R15	K4		100kΩ	1/4W	±10%	carbon
R16	O5	F2	2.7kΩ	4.5W	±20%	WW non-ins
R17	N5	EF1/2	22Ω	1.5W	±20%	WW non-ins
R18	M5/6		6.8kΩ	4.5W	±5%	WW non-ins
R19	M5/6		2.4kΩ	4.5W	±5%	WW non-ins
R20	M6		15Ω	1.5W	±5%	WW non-ins
R21	K6/7		68Ω	2W	±10%	WW ins
R22	J6		1kΩ	2W	±20%	WW ins
R23	J7		2.2kΩ		±20% at 20°C	surge reducing
R24	K6		2.2kΩ	1/4W	±10%	carbon
R25	K7/8		820Ω	2W	±10%	WW ins
R26	H5		8.2kΩ	4.5W	±5%	WW non-ins
R27	H6	B4	47Ω	1/4W	±20%	carbon
R28	H7/8	B4	5.6kΩ	4.5W	±10%	carbon
R29	G7	C4	82Ω	2W	±10%	WW ins
R30	F8	B5	100Ω	4.5W	±5%	WW non-ins
R31	G5		4MΩ	1/4W	±20%	carbon
R32	FG5		5.6kΩ	4.5W	±5%	WW non-ins
R33	F5		10kΩ	4.5W	±5%	WW non-ins
R34	E6	C5/6	22Ω	1/4W	±20%	carbon
R35	E8		100Ω	1/4W	±10%	carbon
R36	E7		56kΩ	1/4W	±10%	carbon
R37	C1	G4	2.2kΩ	1/4W	±20%	carbon
			CAPACITORS			
C1a	B3	FG3	182pF			gang
C1b	D3	FG3	182pF			gang
C2	B6	HJ1/2/3	3-33pF			trimmer
C3	C6	HJ1/2/3	3.5-30pF			trimmer
C5a	C6	HJ1/2/3	1200pF		±2%	mica
C5b	C6	HJ1/2/3	1800pF		±2%	1500pF mica
*C5c	C6	HJ1/2/3	4300pF		±2% ±5%	300pF mica 2 x 1500pF mica 1 x 1300pF mica
C5d	C6	HJ1/2/3	4500pF		±2%	3 x 1500pF mica
C5e	C6	HJ1/2/3	4500pF		±2%	3 x 1500pF mica
*C6a	C5	HJ1/2/3	82pF		±5%	mica

Table 2501 - (cont)

Circuit ref	Location of components Fig 2502	Location of components Fig 2504	Value	Rating	Tolerance	Type
			CAPACITORS (cont)			
C6b	C5	HJ1/2/3	82pF		±5%	mica
* C6c	C5	HJ1/2/3	82pF		±5%	mica
C6d	C5	HJ1/2/3	47pF		±5%	mica
C6e	C5	HJ1/2/3	47pF		±5%	mica
C7	A3	G1/2	100pF			Weymouth i.f. rejector (part)
C8	A3		0.01µF	350V	±25%	pap. met. tub.
C9	B3		100pF	350V	-0% +100%	mica
C10	C3		47pF	350V	±10%	mica
C11	D2/3		1000pF	350V	±10%	mica
C12a	C2		110pF	350V	±2%	silvd mica
C12b	D2		110pF	350V	±2%	silvd mica
C13a	E2		110pF	350V	±2%	silvd mica
C13b	F2		110pF	350V	±2%	silvd mica
C14	D3		0.01µF	350V	±25%	pap. met. tub.
C15	E3		0.01µF	350V	±25%	pap. met. tub.
C16	F3		330pF	350V	-0% +100%	mica
C17	F3		330pF	350V	-0% +100%	mica
C18	F4		330pF	350V	-0% +100%	mica
C19	G3	G4/5	0.1µF	350V	±20%	pap. met. tub.
C20	F2	G5	4.7pF	750V	±5%	ceramic ins
C21	G3	FG5	20µF	12V	-20% +50%	electrolytic
C22	H3		100pF	350V	±5%	silvd mica
C23	J3		68pF	350V	±20%	mica
C24	J3		68pF	350V	±20%	mica
C25	H3	J6	15pF	350V	±10%	ceramic ins
C26	J1	G1	0.1µF	350V	±20%	pap. met. tub.
C27	H2	G5	0.002µF	350V	±25%	pap. met. tub.
C28	G2		0.01µF	350V	±25%	pap. met. tub.
C29	H3	J6	1.7-15pF			variable
C30	J4	G5	1.0µF	350V	-20% +50%	pap. met. tub.
C31	N5	D1	8.0µF	450V	-20% +50%	electrolytic
C32	N5	D2	8.0µF	450V	-20% +50%	electrolytic
C33	N08		2 x 0.1µF +0.01µF	2250V		multiple block
C34	J6		1.5pF	750V	±0.25pF	ceramic ins
C35	J6		47pF	500V	±5%	ceramic ins
C36	K7		0.01µF	350V	±25%	pap. met. tub.

Table 2501 - (cont)

Circuit ref	Location of components		Value	Rating	Tolerance	Type
	Fig 2502	Fig 2504				
			CAPACITORS (cont)			
C37	HJ6	B1	100pF	750V	±10%	ceramic ins
C38	H6	A4	0.01μF	500V	±25%	pap. met. tub.
C39	J8	C1	6.8-150pF			variable
C40	G5		0.01μF	500V	±25%	pap. met. tub.
C41	F5		100pF	750V	±10%	ceramic ins
C42	F5		100pF	750V	±10%	ceramic ins
C43	F5		100pF	750V	±10%	ceramic ins
C44	F6		47pF	750V	±10%	ceramic ins
C45	FG6	C4	6.5-150pF			variable
C46	F8	C4	0.01μF	350V	±25%	pap. met. tub.
C47	E5		100pF	750V	±10%	ceramic ins
C48	E6	C6	560pF	350V	±20%	ceramic
C49	D6		6.8pF	750V	±10%	ceramic ins
C50	F7		30pF	500V	±5%	ceramic ins
C51	E7		0.03μF	350V	±25%	pap. met. tub.
C52	D7		0.01μF	350V	±25%	pap. met. tub.
C53	J5		0.01μF	350V	±25%	pap. met. tub.
C54	B1		0.002μF	500V	±25%	pap. met. tub.
C55	D3		10pF	500V	±5%	ceramic ins
C56	E8	A4	2μF	150V	±25%	pap. met. tub.

Circuit ref	Location of components		Value	Rating	Description
	Fig 2502	Fig 2504			
			INDUCTORS		
*L1a-e	B6	HJ1/2/3			Aerial coil
*L2a-e	B6	HJ1/2/3			Grid tuned winding
*L3a-e	BC6	HJ1/2/3			Oscillator booster coil
*L4a-e	C6	HJ1/2/3			Oscillator grid coil
*L5a-e	C6	HJ1/2/3			Oscillator anode coil
L6	A2/3	G1/2			I.F. rejector
L7	D2	FG4	415μH		R.F. choke
L8	J3				B.F.O. grid coil
L9	J3				B.F.O. anode coil
L10	G2	H6	2.5H	3mA	Choke
*L11a-e	J8	C2			P.A. coil
L12	H5	A1	350μH		R.F. choke
L13	G6	B4			P.A. grid stopper
L14	F5	B6	415μH		R.F. choke
L15	EF5	B6	415μH		R.F. choke
L16	E8	B4	415μH		R.F. choke
*L17a-e	G8	C4			Drive coil
L18	E6	C5/6			Driver grid stopper

Table 2501 - (cont)

Circuit ref	Location of components		Description
	Fig 2502	Fig 2504	
		TRANSFORMERS	
T1	CD1/2	H3/4	I.F. transformer
T2	EF1/2	H5	I.F. transformer
T3	MN07	E3/4	Mains transformer
		RECTIFIERS	
W1	H2		Miniature westecter
W2	H2	G6	Miniature westecter
W3	N06	E5	Selenium
W4	N06/7	E6	Selenium
W5	J5		Germanium
W6	K6/7		Uniplate
		VALVES	
V1	C2/3	HJ3/4	CV3888
V2	E2/3	H4	CV3883
V3	G2/3	HJ4	CV1833
V4	GH2/3	HJ5	CV3888
V5	H6	AB2/3	CV3990
V6	F6	B5	CV3889
V7	FG5	BC5	Neon lamp NE 48
		SWITCHES	
S1	MN05		5-pole, 3-positions
S2	MN7/8		Voltage selector
S3a	K8)		2-pole, 8-position
S3b	HJ8)		
		PLUGS AND SOCKETS	
PL1	MN9		8-pin plug
SKT1	N02		8-pin socket
SKT2	N03		8-pin socket
SKT4	E5/6		2-pin socket (crystal)
SKT5	JK2/3		2-pin connector (sliding contact)
SKT6	E8		2-pin socket (key)
		MISCELLANEOUS	
ILP1	L6/7	F6	Pilot lamp, 6.5V, 0.15A
M1	K7/8		Meter, 0-500μA
FS1	O7/8		Fuse, 2.5A

* Note: Suffix letter a-e on components, C5 and 6, L1, 2, 3, 4, 5, 11 and 17 indicate the particular model on which the components are used.

Table 2502 - Test equipment schedule, field and base repairs

Preferred instrument	Suitable alternative
Signal generator, No 12 (S.S.G.12)	Signal generator, No 1, Mk 3 (S.S.G.1)
Voltmeter, valve, No 3 (V.V.3)	Voltmeter, valve, No 2 (V.V.2)
Oscillator, beat frequency, No 8 (B.F.O.8)	Oscillator, beat frequency, No 5 or 7 (B.F.O.5 or 7)
Frequency meter, SCR 211 (SCR 211)	
Instrument, testing, Avometer, 8s (Avo 8)	Instrument, testing, Avometer, universal, 46 range, Mk 1 or 50 range (Avo)

Note: The following accessories will be required:-

40/60dB attenuator pad (see Fig 2508)
500Ω, 20W, non-inductive resistor
325Ω, 1/4W, non-inductive resistor
0.01μF, 350V capacitor
1.0μF, 350V capacitor
Variac
Crystals:-

2.5Mc/s	for Mk 122
5.0Mc/s	for Mk 122
10Mc/s	for Mk 122
3.0Mc/s	for Mk 121 'A'
4.5Mc/s	for Mk 121 'B'
7.0Mc/s	for Mk 121 'C'
8.0Mc/s	for Mk 121 'D'
10Mc/s	for Mk 121 'E'

Table 2503 - Valve testing data

Inter-service type	Commercial equivalent	Selector switch setting	Vf	Neg grid V	Anode V	Screen V	Anode selector	mA/V	Ia mA	Type
CV3888	ECH42	276454130	6	2	100	-	A1	2.2	5	a
				2	250	100	A2	2	3	a
		276454130	6	-	100	-	Normal	2.8	-	b
				-	100	100	A2	3.5	-	b
CV3883	EAF42	268154130	6	2	250	100	A1	1.8	5	a
		268154130	6	-	100	100	Normal	1.8	-	b
CV3889	EL41	26++54130	6	7	250	250	A1	10	36	a
		26++54130	6	-	100	PenLF	Normal	8	-	b

Table 2503 - (cont)

Inter service type	Commercial equivalent	Selector switch setting	Vf	Neg grid V	Anode V	Screen V	Anode selector	mA/V	Ia mA	Type
CV3990	2E26	125141300	6	20	200	200	A1 TC	3.5	20	a
		125141300	6	-	100	75	Normal TC	3.5	-	b
CV1833	0B2	61+16+100	-	-	90	-	-	-	3	a

Note: 1. 'a' refers to Tester, valve, Avo, CT160 or Tester, valve, Avo, No 3.

2. 'b' refers to Tester, valve, Avo, No 1, Mk 1 or Mk 2.

3. + This indicates that an unknown electrode may be connected to this pin internally. To obtain the complete selector switch coding, see 'special procedure for valves having internally connected pins', page 12 of the Avo valve data manual Z4/ZD 00305.

4. Valve CV1833 tested with a 1kΩ resistor inserted in the anode link of Tester, valve, Avo, No 3:-

Maximum striking voltage: 127V
Maximum operating current: 30mA

Table 2504 - Specification tests and alignment procedure schedule

Serial No	Test		Detail	Remarks
1.	A.F. output			
	Condition	a1	Receive	
		a2	B.F.O. (set) to on	Mk 122 only
		a3	Volums control to minimum	
	Connections	b1	V.V.3 (to measure a.c.) across the phones	Across W2 in Mk 121 (G6 Fig 2504)
		b2	B.F.O.8 to tag 8 of RT2 (TP2) and chassis via 60dB pad and 1.0μF capacitor	B.F.O.8 frequency 1300 c/s (600Ω) see Fig 2504 and 2508
	Method	c1	With zero input, V.V.3 should read 0 - 0.4V	
		c2	With 10mV input from B.F.O.8, V.V.3 should read 0.6 - 0.8V	B.F.O.8 reads 10V
		c3	Substitute the 40dB pad for the 60dB pad	
		c4	With 100mV input from B.F.O.8, V.V.3 should read 1.0 - 2.0V	B.F.O.8 reads 10V
		c5	Substitute the 60dB pad for the 40dB pad	

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
		c6	With B.F.O. (set) to OFF and 10mV input from B.F.O.8, V.V.3 should read 0.8 - 2.0V	Mk 122 only
		c7	Substitute the 40dB pad for the 60dB pad	
		c8	Remove W1 and W2	Mk 121 only, see G6 Fig 2504
		c9	With 100mV input from B.F.O.8, V.V.3 should read approximately 6.0 - 10.0V	
2.	I.F. alignment Mk 121			
	Condition	a1	Receive	
		a2	Set tuned to low frequency end of band	
		a3	Volume control to maximum	
	Connections	b1	B.F.O. (set) inoperative	Short RT2 tag 9 to chassis (see Fig 2504) (V4 triode section to earth)
		b2	Local oscillator short-circuited	Short-circuit RT1 tags 5 and 6 (see Fig 2504)
		b3	S.S.G.12, 470kc/s, 30% mod at 1600c/s to junction R1, C9, pin 6 of V1 and chassis	Output from 75Ω dummy load termination via 325Ω in series with 0.01μF, 350V capacitor. Junction is located beneath tag 1 of RT2. When S.S.G.1 is used, the frequency must be determined using SCR 211.
		b4	V.V.3 (to measure d.c.) to tag 8 of RT2 (TP2) and chassis	
	Method	c1	Adjust T2 and T1 for maximum reading on V.V.3	Reduce output of S.S.G.12 to maintain reading on V.V.3 at approximately 5V
		c2	With 100μV input, V.V.3 should read 3.5 - 5V	
3.	I.F. alignment Mk 122			
	Condition	a1	Receive	
		a2	Set tuned to low frequency end of band 1	
		a3	B.F.O. (set) to OFF	
		a4	Volume control to maximum	

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
	Connections	b1	Local oscillator short-circuited	Short-circuit C3a (see Fig 2505)
		b2	S.S.G.12, 470kc/s, 30% mod at 1600c/s, to junction C9, R1, pin 6 of V1 and chassis	See Fig 2505 Output from 75Ω dummy load termination via 325Ω in series with 0.01μF, 350V capacitor. Junction located beneath tag 1 of RT2. When S.S.G.1 is used, the frequency must be determined using SCR 211.
		b3	V.V.3 (to measure d.c.) to TP2 (tag 8 of RT2) and chassis	See Fig 2503
	Method	c1	Adjust T2 and T1 for maximum reading on V.V.3	Reduce output of S.S.G.12 to maintain reading on V.V.3 at approximately 5V
		c2	With 100-220μV input, V.V.3 should read 3V	With local oscillator working, ie with short-circuit removed from C3a, V.V.3 should read greater than 1.5V for 220μV input
4.	I.F. selectivity			
	Condition	a1	As for I.F. alignment	Serial No 2 for Mk 121 Serial No 3 for Mk 122
	Connections	b1	As for I.F. alignment	Serial No 2 for Mk 121 Serial No 3 for Mk 122
	Method	c1	Adjust S.S.G.12 for 3V d.c. on V.V.3	Note input voltage (n)dB
		c2	Increase output of S.S.G. 12 to (n + 6)dB, and increase frequency until V.V.3 again reads 3V	Note new frequency F1
		c3	Decrease the S.S.G.12 frequency to below 470kc/s until the V.V.3 reads 3V again	Note new frequency F2. F1 must be 472.7kc/s ±0.5kc/s F2 must be 467.3kc/s ±0.5kc/s (F1-F2) must be 4.4 - 6.4 kc/s
		c4	With (n + 40)dB output from S.S.G.12 increase the frequency until V.V.3 reads 3V	Note new frequency F3

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
		c5	Decrease the S.S.G.12 frequency below 470kc/s until V.V.3 reads 3V	Note new frequency F4 F3 must be 483.5kc/s ± 2.0kc/s F4 must be 456.5kc/s ± 2.0kc/s (F3-F4) must be 23-31kc/s
		c6	Remove local oscillator short-circuit	
		c7	Remove B.F.O. (set) short-circuit	Mk 121 only
5.	B.F.O. alignment			
	Condition	a1	Receive	
		a2	B.F.O. (set) knob in its central position	Central on position for Mk 122
	Connections	b1	S.S.G.12, 470kc/s unmodulated, to junction R1, C9, pin 6 of V1 and chassis	Junction situated below tag 1 of RT2
	Method	c1	Adjust L8/L9 for zero beat	S.S.G.12 output sufficient to produce note in phones. On Mk 121 adjustment to L8/L9 is awkward with B.F.O. tuning capacitor in half open position
		c2	Set the S.S.G.12 to 480kc/s. Adjust B.F.O. tuning knob for zero beat in phones	The sweep of the B.F.O. tuning must cover the frequency range i.f. ± 10kc/s ie 460-480kc/s
		c3	Repeat c2 with S.S.G.12 at 460kc/s	It must be within the range 455-485kc/s
		c4	Disconnect S.S.G.12 and connect V.V.3 (to measure d.c.) to tag 8 of RT2 (TP2) and chassis	
		c5	At all combinations of GAIN and B.F.O. tuning controls, the V.V.3 should read 2.5-9.0V d.c.	The GAIN control setting alters cathode current of V2, and has slight effect on V.V.3 reading
6.	R.F. alignment Mk 121			
	Condition	a1	Receive	
		a2	B.F.O. (set) inoperative	Short tag 9 of RT2 to chassis (Fig 2504)
	Connections	b1	S.S.G.12 to aerial input and chassis	S.S.G.12, 30% mod at 1600 c/s, via 325Ω 1/4W non-inductive resistor from 75Ω dummy aerial termination

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
		b2	Avo 8 to tag 4 of RT2 (TP3) and chassis	Avo 8 on 1mA d.c. range with positive lead to chassis (Fig 2502 and 2504)
		b3	V.V.3 (to measure d.c.) to tag 8 of RT2 and chassis	(Fig 2502 and 2504)
	Method	c1	Tune set and S.S.G.12 to h.f. alignment point (Table 2508)	When S.S.G.1 is used, frequency must be determined using SCR 211
		c2	With 1mV input adjust C3 until a note is heard in the phones	See Fig 2504 and 2511 for location
		c3	Adjust C2 for maximum reading on V.V.3	Special trimming tool required. See Fig 2512
		c4	Tune set 940kc/s down from S.S.G.12 frequency	The local oscillator frequency should be above the signal frequency at all times; if a further response is obtained C3 has been adjusted correctly.
		c5	Tune set and S.S.G.12 to l.f. alignment point (Table 2508)	When S.S.G.1 is used, l.f. point must be determined using SCR 211
		c6	Adjust L5 until a note is heard in the phones	Tune the set until a note is heard and note calibration error; over-correct error by 1/3 on dial before adjusting L5.
		c7	Adjust L2 for maximum reading on V.V.3	
		c8	Repeat c1 to c7 until no further adjustment is necessary	
		c9	Tune set to l.f. and S.S.G.12 to 470kc/s	S.S.G.12 30% mod at 1600c/s, 1V output. Operations c9 and c10 refer only to the Mk 121 with 'A' coil pack
		c10	Adjust L6 for minimum reading on V.V.3	This is the l.f. rejector adjustment
		c11	With 100µV input at l.f., h.f. and c.f. (Table 2508) V.V.3 should read 2.8-6.5V	The calibration at the alignment points should be correct and at the check point within ±1%
		c12	With S.S.G.12 at c.f., tune set 940kc/s down	The local oscillator frequency at all times; if a response is heard in the phones, the set has been adjusted correctly. Avo 8 should read 160-270µA over nominal range

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
				of set. A further check of the local oscillator frequency can be made by heterodyning the output of the local oscillator with the SCR 211. The output of the local oscillator should be loosely coupled to the SCR 211
7.	R.F. alignment Mk 122			
	Condition	a1	Receive	
		a2	B.F.O. (set) to OFF	
	Connections	b1	S.S.G.12 to aerial input and chassis	S.S.G.12, 30% mod at 1600c/s via 325Ω, 1/4W non-inductive resistor from 75Ω dummy aerial termination
		b2	Avo 8 to tag 4 of RT2 (TP3) and chassis	Avo 8 on 250μA d.c. range with positive lead to chassis (Fig 2503 and 2505)
		b3	V.V.3 (to measure d.c.) to tag 8 of RT2 and chassis	(Fig 2503 and 2505)
	Method	c1	Tune set and S.S.G.12 to h.f. alignment point (Table 2509)	When S.S.G.1 is used, the frequency must be determined using SCR 211
		c2	With 1mV input, adjust C3a until a note is heard in the phones	See Fig 2505 The note will appear at two positions of C3a, the correct note is when the two black dots on the capacitor are farthest apart
		c3	Adjust C2a for maximum reading on V.V.3	
		c4	Tune set 940kc/s down from S.S.G.12 setting	The local oscillator frequency should be above the signal frequency at all times; if a further response is heard, C3a has been adjusted correctly. A further check of the local oscillator frequency can be made by heterodyning the

Table 2504 - (Cont)

Serial No	Test		Detail	Remarks
				output of the local osoillator with the SCR 211. The output of the local oscillator should be loosely coupled to the SCR 211
		c5	Tune set and S.S.G.12 to l.f. alignment point (Table 2509) band 1	When S.S.G.1 is used, l.f. point must be determined using SCR 211
		c6	Adjust L5a until a note is heard in the phones	Tune the set until a note is heard and note calibration error; over-correct error by 1/3 on dial before adjusting L5a
		c7	Adjust L2a for maximum reading on V.V.3	
		c8	Repeat c1 to c7 until no further adjustment is necessary	Calibration at c.f. check points (Table 2509) should be within ±1%
		c9	Repeat c1 and c7 for band 2 and 3	For band 2 adjust C2b, C3b, L5b and L2b and use frequencies noted in Table 2509. For band 3 adjust C2c, C3c, L5c and L2c and use frequencies notes in Table 2509
		c10	V.V.3 should read 3V over nominal range of set for the inputs shown under remarks column	Band 1.....80 - 160µV Band 2.....100 - 200µV Band 3.....100 - 200µV
	I.F. rejection	c11	Tune the set to 2.5Mc/s and S.S.G.12 to 470kc/s	Note input from S.S.G.12 for 3V on V.V.3
		c12	Tune the set and S.S.G.12 to 2.5Mc/s	Note input from S.S.G.12 for 3V on V.V.3, this should be 44-48dB down on level noted in c11
	Second channel rejection	c13	Tune the set to 2.5Mc/s and S.S.G.12 940kc/s up ie 3.44Mc/s	Note input from S.S.G.12 for 3V on V.V.3
		c14	Tune the set and S.S.G.12 to 2.5Mc/s	Note input from S.S.G.12 for a 3V reading on V.V.3, this should be 30dB down on level noted in c13. Carry out further tests at frequencies noted in Table 2510. Avo 8 (250µA range) should read 80-120µA over nominal range of set

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
8.	Sender oscillator alignment Mk 121			
	Condition	a1	Transmit	Plug in external key and screw key down
		a2	Aerial matching control fully anti-clockwise	
		a3	Insert crystal corresponding to l.f. end of range, for model in question	See Table 2508
	Connections	b1	Short-circuit p.a. tuning capacitor C39	See Fig 2504 ref C1
		b2	Turn drive tuning control to l.f. end of range	
	Method	c1	Adjust L17 for maximum on tuning meter (see Fig 2504 ref C4)	This corresponds to maximum neon brilliance
		c2	Tune to h.f. end of range and check that frequency calibration is approximately correct	Make small adjustment to minimise overall error if necessary. Tuning meter should read 2.5-8 divisions
		c3	Remove C39 short-circuit	
9.	Sender oscillator alignment Mk 122			
	Condition	a1	Transmit	
		a2	Insert 2.5Mc/s crystal	
		a3	Set range switch to band 1	
		a4	Set drive tuning control C45 to 2.5Mc/s	
		a5	Screw out core of L17 in an anti-clockwise direction until flush with former	Fig 2505 ref C4
	Connections	b1	Short-circuit p.a. tuning capacitor C39	Fig 2505 ref C1
	Method	c1	Screw in L17 until the neon is at maximum brightness	With this coupling the response is peaked. Further screwing in of the core broadens the response of the m.o. tuning, with no further increase in amplitude of output
		c2	Check that calibration at 5Mc/s is correct to within the width of the pointer	The calibration check ensures that when each harmonic of the crystal is selected by the tuned circuit (indicated by neon), the tuning knob pointer corresponds to the correct calibration mark on the dial

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
		c3	Set range switch to band 2	
		c4	Check calibration at 5Mc/s	If necessary, adjust for minimum error between bands 1 and 2
		c5	Insert 10Mc/s crystal and check calibration at 10Mc/s	
		c6	Set range switch to band 3	
		c7	Check calibration at 10 and 20Mc/s	
		c8	Remove C39 short-circuit	
10.	P.A. alignment Mk 121			
	Condition	a1	Transmit	Plug in external key and screw key down
		a2	Insert l.f. crystal	See Table 2508
		a3	P.A. tuning control to twice l.f. (crystal frequency)	
		a4	Aerial matching control to position 6	Counting from the right
	Method	c1	Adjust drive tuning control to crystal frequency	Maximum reading on tuning meter
		c2	Adjust L11 for maximum reading on tuning meter	This may coincide with maximum adjustment of the core which has a very limited range
		c3	Tune set to l.f. and h.f. frequencies	Calibration error of p.a. tuning control at h.f. should not exceed 1/16 in. and at l.f. 3/16 in.
11.	P.A. alignment Mk 122			
	Condition	a1	Transmit	Plug in external key and screw down
	Connections	b1	500Ω, 20W non-inductive resistor across the earth and aerial sockets as load	
	Method	c1	Adjust aerial matching control for maximum current on the meter	If calibration is not within these limits, mechanically adjust the relationship of the pointer to the tuning control shaft
		c2	Check that the p.a. tuning control calibration is within the width of the pointer for all bands when driven at the fundamental frequency of the crystal	

Table 2504 - (cont)

Serial No	Test		Detail	Remarks
12.	R.F. output			
	Conditions	a1	Transmit	Plug in external key and screw key down
	Connections	b1	500Ω, 20W non-inductive resistor between aerial and earth	
		b2	V.V.3 (connected to measure a.c.) across the resistor	
	Method	c1	Tune the set for maximum output at l.f. and h.f. frequencies of band 1, 2 and 3 of Mk 122, and l.f. and h.f. frequencies of Mk 121	See Table 2508 and 2509 Output should be 70-80V (10-13W) If no fault is apparent and output of 66-70V (9-10W) may be accepted. On band 3 Mk 122 lower output of 59-66V (7-10W) is permissible. When correctly tuned the tuning meter should read 4-7 divisions.
		c2	Remove the resistor and V.V.3	With no load and aerial matching control to maximum (position 8 counting from the right Mk 121; fully anti-clockwise Mk 122) the meter deflection should not exceed 10 divisions

Table 2505 - Test conditions

Test conditions	Remarks
B.F.O. (set) switch to OFF	Mk 122 only
Sender and receiver voltages	See Table 2506 and 2507
R.F. input	S.S.G.12 via 325Ω, 1/4W, non-inductive resistor
Volume control setting	Maximum
Telephones connected	Miniature deaf-aid telephones for Mk 121 and Amplivox Magnetic telephones for Mk 122
Reforming elextrolytic capacitors	With new sets, or with sets that have not been in recent use, place switch to FORM before switching on mains. This reforms the capacitors in ten to fifteen minutes. Reforming should be carried out once per annum if the equipment is held in storage or is not in regular use.
Modulation socket closed by flap	Mk 122 only

Note: All measurements are to be made under the standard test conditions listed above unless otherwise stated.

Table 2506 - Voltage table - sender

Test point	Readings	
	Key up	Key down
PT4 tag 6 (h.t.)	305 to 325V	260 to 270V
PT4 tag 3 (bias)	-43 to -55V	-11 to -15V
L.T. (a.c.)		6.1 to 6.35V
V6 anode	295 to 317V	
V6 screen	305 to 325V	120 to 125V
V5 anode	305 to 325V	260 to 270V
V5 screen	295 to 315V	208 to 225V
H.T. current	5 to 10mA	100 to 120mA

Note: For location of tag points see Fig 2504 and 2505.

Test conditions

1. The sender untuned and with no crystal fitted.

2. All voltage and current measurements taken with Instrument, testing, Avometer, 8s.

Table 2507 - Voltage table - receiver

Test point	Readings	
	Maximum gain	Minimum gain
PT2 tag 2 (h.t.)	235 to 255V	255 to 275V
PT2 tag 4 (bias supply)	-76 to -90V	-64 to -76V
Bias on valves	-2 to -2.6V	-40 to -50V
V4 cathode	3.4 to 5.0V	
L.T. (a.c.)	6.1 to 6.35V	
H.T. current	30 to 37mA	25 to 32mA

Note: V3 (OB2 regulator tube) should strike when the a.c. input, via a variac, to the power supply unit exceeds 180V. The main voltage adjustment should be set at 230V for this test.

Test conditions

1. All voltage and current measurements taken with an Instrument, testing, Avometer, 8s.

2. For location of tag points see Fig 2504 and 2505.

3. The receiver should be fed from a normal power unit with 230V a.c. input.

Table 2508 - R.F. alignment frequencies (Mk 121)

Model	Frequency coverage	Alignment points		Check point
		l.f.	h.f.	c.f.
A	2.9Mc/s to 6.0Mc/s	3.0Mc/s	6.0Mc/s	4.5Mc/s
B	4.4Mc/s to 9.0Mc/s	4.5Mc/s	9.0Mc/s	6.0Mc/s
C	6.6Mc/s to 14.0Mc/s	7.0Mc/s	14.0Mc/s	10.0Mc/s
D	8.0Mc/s to 17.0Mc/s	8.5Mc/s	17.0Mc/s	10.0Mc/s
E	9.4Mc/s to 20.0Mc/s	10.0Mc/s	20.0Mc/s	14.0Mc/s

Table 2509 - R.F. alignment frequencies (Mk 122)

Band	Frequency coverage	Alignment points		Check point
		l.f.	h.f.	c.f.
1	2.5Mc/s to 5.0Mc/s	2.5Mc/s	5.0Mc/s	3.75Mc/s
2	5.0Mc/s to 10.0Mc/s	5.0Mc/s	10.0Mc/s	7.5Mc/s
3	10.0Mc/s to 20.Mc/s	10.0Mc/s	20.0Mc/s	15.0Mc/s

Table 2510 - Second channel rejection ratio (Mk 122)

Band	Frequency	Rejection ratio	Frequency	Rejection ratio	Frequency	Rejection ratio
1	2.5Mc/s	30dB	3.75Mc/s	26dB	5.0Mc/s	20dB
2	5.0Mc/s	23dB	7.5Mc/s	18dB	10.0Mc/s	14dB
3	10.0Mc/s	22dB	15.0Mc/s	14dB	20.0Mc/s	10dB

Table 2511 - Voltage table - Supply units, vibratory, No 14, 6V

Receiver at maximum gain:-

H.T. voltage	220V-240V measured at receiver
L.T. voltage	5.75V
Input current	4.8A-5.5A measured at input to vibrator unit

Sender - key up:-

Input current	3.0A-3.7A measured at input to vibrator unit

Sender - key down - no crystal:-

H.T. voltage	240V-260V measured at sender
L.T. voltage	5.7V
Input current	10A-11A measured at input to vibrator unit

Table 2511 - (cont)

Note: 1. The input voltage should be 6V d.c. measured at vibrator pack battery clips.

2. The sender and receiver must operate in a normal manner when the input to the vibrator pack varies from 5.4V-6.6V d.c.

3. Over the full frequency range it should be possible to operate a set having a short insulated aerial placed close to the vibrator supply case without hash being audible.

4. Low output voltage may be due to a high resistance contact in the fuse.

5. A vibrator transformer suspected of shorted turns should have 200V, 50c/s, a.c. applied to the h.t. winding. The transformer must be isolated from the rest of the pack for this test. A normal transformer will draw 20mA-30mA a.c.

6. The vibrator pack should be tested in conjunction with a Mk 121 known to have average voltage test figures and current consumption.

Table 2512 - List of components (Mk 122)

Circuit ref	Location of components		Value	Rating	Tolerance	Type
	Fig 2503	Fig 2505				
			RESISTORS			
R1	B3	G3	1MΩ	1/2W	±5%	high stab ins
R2	C3		47kΩ	1/4W	±10%	carbon
R3	C4		1kΩ	2W	±10%	WW ins
R4	G1	H3	6.8kΩ	4.5W	±5%	WW non-ins
R5	EF2		4.7kΩ	1/4W	±25%	carbon
R6	F4	G6	8.2kΩ	1/4W	±5%	carbon
R7	F4/5		200kΩ	1/4W		variable inv log
R8	FG4		100kΩ	1/4W	±10%	carbon
R9	G3	G5	100kΩ	1/4W	±10%	carbon
R10	GH3/4		1MΩ	1/4W	±20%	carbon
R11	H3		560Ω	2W	±10%	WW ins
R12	H3		220kΩ	1/4W	±20%	carbon
R13	J2	G5	100kΩ	1/4W	±10%	carbon
R14	B2		2.2kΩ	1/4W	±20%	carbon
R15	G5		100kΩ	1/4W	±20%	carbon
R16	N5	EF1	2.7kΩ	4.5W	±20%	WW non-ins
R17	MN5	F1	22Ω	1.5W	±20%	WW non-ins
R18	M5	EF1/2	6.8kΩ	4.5W	±5%	WW non-ins
R19	L5	EF2	2.4kΩ	4.5W	±5%	WW non-ins
R20	L5		15Ω	1.5W	±5%	WW non-ins
R21	E8		68Ω	2W	±10%	WW ins
R22	E9		1kΩ	2W	±20%	WW ins
R23	EF9		1.5kΩ		±20%	surge reducing
R24	D9		2.2kΩ	1/4W	±10%	carbon
R25	F8		820Ω	2W	±10%	WW ins

Table 2512 - (cont)

Circuit ref	Location of components Fig 2503	Location of components Fig 2505	Value	Rating	Tolerance	Type
			RESISTORS - cont			
R26	E6		8.2kΩ	4.5W	±5%	WW non-ins
R27	EF7	C3	47Ω	1/4W	±20%	carbon
R28	G8	B3	5.6kΩ		±10%	carbon
R30	G8/9	A4	100Ω	4.5W	±5%	WW non-ins
R31	G6		10MΩ	1/4W	±20%	carbon
R32	H6	A4	5.6kΩ	4.5W	±5%	WW non-ins
R33	H6		10kΩ	4.5W	±5%	WW non-ins
R34	J7	C6	22Ω	1/4W	±20%	carbon
R35	GH8		100Ω	1/4W	±10%	carbon
R36	J7		56kΩ	1/4W	±10%	carbon
R37	C1	G4	2.2kΩ	1/4W	±20%	carbon
R39	A6		68Ω	2W	±10%	WW ins
R40	G7		10kΩ	1/4W	±10%	carbon
			CAPACITORS			
C1a	B3	G3	180pF			gang
C1b	E3	G3	180pF			gang
C2a-c	A4	G1/2	3.5-30pF			trimmer
C3a C3b C3c	B5) A5) D3)	H1/2/3	3.5-30pF			trimmer
C5a	B5		1,200pF	350V	±2%	silvd mica (band 1)
C5b	A5		2,000pF	350V	±2%	2 x 1,000pF silvd mica (band 2)
C5c	D3		4,500pF	350V	±2%	3 x 1,500pF silvd mica (band 3)
C8	B2		0.01µF	350V	±25%	pap. met. tub.
C9	B3		100pF	350V	+100% -0%	mica
C10	D3		47pF	350V	±10%	mica
C11	D2		1000pF	350V	±10%	mica
C12a	C2		110pF	350V	±2%	silvd mica
C12b	C2		110pF	350V	±2%	silvd mica
C13a	F2		110pF	350V	±2%	silvd mica
C13b	G2		110pF	350V	±2%	silvd mica
C14	E4	G4	0.01µF	350V	±25%	pap. met. tub.
C15	EF3		0.01µF	350V	±25%	pap. met. tub.
C16	G3		330pF	350V	+100% -0%	mica
C17	F3/4		330pF	350V	+100% -0%	mica
C18	G4		330pF	350V	+100% -0%	mica
C19	G3	H3	0.1µF	350V	±20%	pap. met. tub.
C20	G2	G5	4.7pF	500V	±0.5pF	cerm ins
C21	H3	G5	20µF	12V	+50% -20%	electrolytic

Table 2512 - (cont)

Circuit ref	Location of components		Value	Rating	Tolerance	Type
	Fig 2503	Fig 2505				
			CAPACITORS - cont			
C22	H4		100pF	350V	±5%	silvd mica
C23	J3		68pF	350V	±20%	silvd mica
C24	J3		68pF	350V	±20%	silvd mica
C25	G4	HJ6	15pF	500V	±10%	
C26	G1		0.1μF	350V	±20%	
C27	G2	G5	0.002μF	500V	±25%	
C28	H2	G5/6	0.01μF	500V	±25%	
C29	H4	J6	1.7-15pF			variable
C30	F5	G5	1.0μF	275V	+50% -20%	electrolytic
C31	N5	DE1	8μF	450V		electrolytic
C32	M4	DE2	8μF	450V		electrolytic
C33	MN8		2 x 0.1μF +0.01μF	2,250V		multiple block
C34	C7		1.5pF	750V	±0.25pF	cerm ins
C35	C7/8		47pF	500V	±5%	cerm ins
C36	E8		0.01μF	350V	±25%	pap. met. tub.
C37	D6	B1	100pF	750V	±10%	cerm ins
C39	D7	C1	6.5-150pF			variable
C40	G6		0.01μF	500V	±25%	pap. met. tub.
C41	G6		100pF	750V	±10%	cerm ins
C42	H6	A6	100pF	750V	±10%	cerm ins
C43	H6	B6	100pF	750V	±10%	cerm ins
C44	H6	C5	47pF	750V	±10%	cerm ins
C45	H7	C4	6.5-150pF			variable
C46	G7		0.01μF	350V	±25%	pap. met. tub.
C47	J6	C6	100pF	750V	±10%	cerm ins
C48	J6	C6	560pF	350V	±20%	cerm
C49	J7		6.8pF	750V	±10%	cerm ins
C50	HJ7		30pF	500V	±5%	cerm ins
C51	H8	B4	0.3μF	350V	±25%	pap. met. tub.
C52	J8		0.01μF	350V	±25%	pap. met. tub.
C53	G8		0.01μF	350V	±25%	pap. met. tub.
C54	B2		0.002μF	500V	±25%	pap. met. tub.
C55	D4		47pF	350V	±5%	mica
C56	G8	B4	2μF	150V	±25%	pap. met. tub.
C57	E7		0.002μF	1,500V		mica
C58	E7		0.001μF	350V		high K ceramic
C59	E3		10pF			ceramic ins

Table 2512 - (cont)

Circuit ref	Location of components: Fig 2503	Location of components: Fig 2505	Value	Rating	Description
		INDUCTORS			
L1a-c	A3				Aerial coupling
L2a-c	B3	G1/2			Aerial grid
L4a	B6				Oscillator grid
L4b	A6				
L4c	D3/4				
L5a	B5				Oscillator anode
L5b	A5	J1/2/3			
L5c	D3				
L6	D3/4				Booster coil
L7	B2	G4	415µH		R.F. choke
L8	HJ4				B.F.O. grid
L9	J4				B.F.O. anode
L10	H2	H6	2.5H	3mA	Choke
L11	C7	C2			P.A. coil
L12	E6	AB1	350µH		R.F. choke
L13	EF6	C3			P.A. grid stopper
L14	HJ6	B6	415µH		R.F. choke
L15	H6	B6	415µH		R.F. choke
L16	G9	B4	415µH		R.F. choke
L17	G7	C4			Driver coil
L18	J7	C6			Driver grid stopper
		RECTIFIERS			
W1	J4				Miniature westector
W2	J4				Miniature westector
W3	MN6	E5			Selenium
W4	MN6	E6			Selenium
W5	D8				Germanium diode
W6	E8				Uniplate
		VALVES			
V1	BC3	H4			CV3888
V2	F3	H4			CV3883
V3	G2	HJ4			CV1833
V4	H3	H5			CV3888
V5	E6/7	B2/3			CV3990
V6	H6/7	B5			CV3889
V7	G6	BC5			Neon NE48
		SWITCHES			
S1	LMN4				5-pole, 3-position
S2	M78				Voltage adjuster
S4-1	A3				4-pole, 3-position
S4-2	B3				

Table 2512 - (cont)

Circuit ref	Location of components		Value	Rating	Description
	Fig 2503	Fig 2505			
		SWITCHES -(cont)			
S4-3	D4 A6/7 B6				4-pole, 3-position
S4-4	D3 A5 B5				
S5-1	D7				
S5-2	F7				
S5-3	FG7				
S5-4	G7				
S6-1	J1	J6			2-pole
S6-2	J3	J6			
		PLUGS AND SOCKETS			
PL1	L8/9				8-pin plug
SKT1	LM1				8-pin socket
SKT2	LM2				8-pin socket
SKT3	E5/6	A2			4-pin socket with flap
SKT4	J6				2-pin socket
SKT5	J3				2-pin socket
SKT6	J8				2-pin socket
		MISCELLANEOUS			
ILP1	L5/6	F6			Pilot lamp, 6.5V, 0.15A
M1	F8				Meter, 0-500μA, 180Ω±10%
FS1	N7				Fuse, 2.5A

Table 2513 - List of components - Supply units, vibratory, No 14, 6V

Circuit ref	Location of components		Value	Rating	Tolerance	Type
	Fig 2509	Fig 2510				
			RESISTORS			
R1	F2	G2	22Ω	1/2W	±20%	carbon
R2	J5		2.2kΩ	1/4W	±20%	carbon

Table 2513 - (cont)

Circuit ref	Location of components		Value	Rating	Tolerance	Type
	Fig 2509	Fig 2510				
CAPACITORS						
C1	AB2	E2	0.5μF	150V	±25%	pap. met. tub.
C2	E2	G2	3 x 0.1μF	300V	±20%	multiple block
C3	EF5	CD2	2 x 0.1μF	700V	±20%	multiple block
C4	F2	GH2	2μF	150V	±25%	pap. met. tub.
C5	J4	D4	0.01μF	1,200V	±10%	pap. met. tub.
C6	C4	E2	0.5μF	150V	±25%	pap. met. tub.

Circuit ref	Location of components		Value	Description
	Fig 2509	Fig 2510		
INDUCTORS				
L1	CD1	F2	1.4μH	Filter choke l.t.
L2	B2	E2	1.4μH	Filter choke l.t.
L3	FG4/5	CD2/3	350μH	R.F. choke
L4	FG6	CD2	350μH	R.F. choke
MISCELLANEOUS				
T1	H1/2/3	DEF3/4/5		Vibrator transformer
Vib	G2	GH3/4/5	6V	Vibrator
W1	H5	C3/4/5		Selenium
W2	H5	C3/4/5		Selenium
PL1	A2	E2		2-pin plug
SKT1	B5/6	DE2		4-pin socket
FS1	C1	F2		Fuse, 2●A

Table 2514 - Location of test points

Mk 121	Fig 2502	Fig 2504
TP1	H3	RT2 tag 9
TP2	FG4	RT2 tag 8
TP3	C3	RT2 tag 4
Mk 122	**Fig 2503**	**Fig 2505**
TP1	J3	RT2 tag 9
TP2	G4	RT2 tag 8
TP3	C3	RT2 tag 4

Table 2515 - Summary of specification tests

Table reference	Test	Spec limits Min	Max	Units
2506	Current consumption - Mk 121 and Mk 122			
	Sender			
	Sender untuned and without crystal			
	Current readings:-			
	H.T. current - key up	5	10	mA
	H.T. current - key down	100	120	mA
2507	Receiver			
	230V a.c. input from normal power unit			
	Current readings:-			
	H.T. current - minimum gain	25	32	mA
	H.T. current - maximum gain	30	37	mA
	Test point readings - Mk 121 and Mk 122			
2506	Sender			
	Sender untuned and without crystal			
	Test point readings on Avo 8:-			
	PT4 tag 6 (h.t.) - key up	305	325	V
	PT4 tag 6 (h.t.) - key down	260	270	V
	PT4 tag 3 (neg bias) - key up	43	55	V
	PT4 tag 3 (neg bias) - key down	11	15	V
	L.T. (a.c.) - key down	6.1	6.35	V
	V6 anode - key up	295	317	V
	V6 screen - key up	305	325	V
	V6 screen - key down	120	125	V
	V5 anode - key up	305	325	V
	V5 anode - key down	260	270	V
	V5 screen - key up	295	315	V
	V5 screen - key down	208	225	V
2507	Receiver			
	Normal power unit with 230V a.c. input			
	Test point readings on Avo 8:-			
	PT2 tag 2 (h.t.) - minimum gain	255	275	V
	PT2 tag 2 (h.t.) - maximum gain	235	255	V
	PT2 tag 4 (neg bias) - minimum gain	64	76	V
	PT2 tag 4 (neg bias) - maximum gain	76	90	V
	Neg bias on valves - minimum gain	40	50	V
	Neg bias on valves - maximum gain	2	2.6	V
	V4 cathode - maximum gain	3.4	5.0	V
	L.T. (a.c.) - maximum gain	6.1	6.35	V
2507	V3 striking voltage			
	Mains voltage adjustment at 230V			
	A.C. input to power supply (regulated by variac)			
	To exceed:	180	-	V

Table 2515 - (cont)

Table reference	Test	Spec limits Min	Max	Units
2504/	A.F. output - Mk 121 and Mk 122			
/1.a.	Function switch to receive. B.F.O. (set) switch to on (Mk 122 only). Volume control to minimum			
/1.b.	V.V.3 (a.c. range) across W2 in Mk 121 V.V.3 (a.c. range) across phones on Mk 122 B.F.O.8, 1300c/s, 600Ω source, to RT2/8 (TP2), via 40 or 60dB pad and 1.0μF capacitor			
/1.c.	Output readings on V.V.3:-			
	Zero input	0	0.4	V
	10mV input (B.F.O.8, 10V and 60dB pad)	0.6	0.8	V
	100mV input (B.F.O.8, 10V and 40dB pad)	1.0	2.0	V
	B.F.O. (set) to OFF)Mk 122 10mV input (B.F.O.8 and 60dB pad)only W1 and W2 removed)	0.8	2.0	V
	100mV input (B.F.O.8 and) Mk 121 only 40dB pad)	6	10	V
2504/	I.F. alignment Mk 121			
/2.a.	Function switch to receive. Tuning control to l.f. Volume control to maximum			
/2.b.	B.F.O. (set) inoperative (RT2/9(TP1) earthed). Local oscillator short-circuited (RT1, tag 5 to 6). S.S.G.12, 470kc/s, 30% mod at 1600c/s, 75Ω termination via 325Ω and 0.01μF to pin 6 of V1. V.V.3 (d.c. range) to RT2/8 (TP2) and chassis.			
/2.c.	T2 and T1 adjusted for maximum on V.V.3, keeping V.V.3 reading about 5V by adjusting S.S.G.12 attenuator 100μV input, V.V.3 to read:	3.5	5.0	V
2504/	I.F. alignment Mk 122			
/3.a.	Function switch to receiver. Tuning control to l.f. end of band 1. B.F.O. (set) to OFF. Volume control to maximum			
/3.b.	Local oscillator short-circuit (C3a). S.S.G.12 470kc/s, 30% mod at 1600c/s, to pin 6 of V1. V.V.3 (d.c. range) to RT2/8 (TP2)			

Table 2515 - (cont)

Table reference	Test	Spec limits Min	Max	Units
/3.c.	T2 and T1 adjusted for maximum on V.V.3, keeping V.V.3 reading about 5V by adjusting S.S.G.12 attenuator			
	V.V.3 reading 3V, input to be:	100	220	μV
	Short-circuit removed from local oscillator (C3a).			
	220μV input, V.V.3 reading to exceed:	1.5	-	V
2504/ /4.a.	I.F. selectivity - Mk 121 and Mk 122 As for I.F. alignment. /2.a. for Mk Mk 121,/3.a. for Mk 122			
/4.b.	As for I.F. alignment./2.b. for Mk 121,/3.b. for Mk 122			
/4.c.	Constant reading on V.V.3 (d.c.) of 3V			
	Input at 470kc/s	-	n	dB
	Input at (n + 6)dB, frequency increased to:	472.2	473.2	kc/s
	Input at (n + 6)dB, frequency decreased to:	466.8	467.8	kc/s
	Frequency difference to be:	4.4	6.4	kc/s
	Input at (n + 40)dB, frequency increased to:	481.5	485.5	kc/s
	Input at (n + 40)dB, frequency decreased to:	454.5	458.5	kc/s
	Frequency difference to be:	23	31	kc/s
2504/ /5.a.	B.F.O. alignment - Mk 121 and Mk 122 Function switch to receive. B.F.O. (set) control in central position (central on for Mk 122).			
/5.b.	S.S.G.12, 470kc/s unmodulated, to pin 6 of V1			
/5.c.	L8/L9 adjusted for zero beat			
	B.F.O. tuning sweep - S.S.G.12 at 480kc/s:	460	480	kc/s
	B.F.O. tuning sweep - S.S.G.12 at 460kc/s:	455	485	kc/s
	S.S.G.12 disconnected. V.V.3 (d.c. range) to RT2/8 (TP2).			
	At all combinations of GAIN and B.F.O. tuning controls			
	V.V.3 to read:	2.5	9.0	V
2504/ /6.a.	R.F. alignment Mk 121 Function switch to receive. B.F.O. (set) inoperative (RT2/9 (TP1) to chassis).			

Table 2515 - (cont)

Table reference	Test	Spec limits Min	Max	Units
/6.b.	S.S.G.12 30% mod at 1600c/s, 75Ω termination via 325Ω to aerial input. Avo 8 (1mA d.c. range) to RT2/4 (TP3), positive lead to chassis. V.V.3 (d.c. range) to RT2/8 (TP2) and chassis			
/6.c11.	100μV input at l.f., h.f., and c.f., V.V.3 to read:	2.8	6.5	V
	Calibration limits:-			
	Model l.f. alignment point			
	A 3.0Mc/s	*	*	–
	B 4.5Mc/s	*	*	–
	C 7.0Mc/s	*	*	–
	D 8.5Mc/s	*	*	–
	E 10.0Mc/s	*	*	–
	c.f. check point			
	A 4.5Mc/s	4.455	4.545	Mc/s
	B 6.0Mc/s	5.94	6.06	Mc/s
	C 10.0Mc/s	9.9	10.1	Mc/s
	D 10.0Mc/s	9.9	10.1	Mc/s
	E 14.0Mc/s	13.86	14.14	Mc/s
	h.f. alignment point			
	A 6.0Mc/s	*	*	–
	B 9.0Mc/s	*	*	–
	C 14.0Mc/s	*	*	–
	D 17.0Mc/s	*	*	–
	E 20.0Mc/s	*	*	–
	Over nominal range of receiver Avo 8 to read:	160	270	μA
	* Correct as indicated on frequency meter			
2504/	R.F. alignment			
	Mk 122			
/7.a.	Function switch to receive. B.F.O. (set) to OFF			
/7.b.	As in /6.b. with Avo 8 on 250μA d.c. range			
/7.c8.	Calibration at c.f. check points:-			
	Band 1 - 3.75Mc/s	3.7125	3.7875	Mc/s
	Band 2 - 7.5Mc/s	7.425	7.575	Mc/s
	Band 3 - 15.0Mc/s	14.85	15.15	Mc/s
	Inputs required for V.V.3 to read 3V:-			
	Band 1	80	160	μV
	Band 2	100	200	μV
	Band 3	100	200	μV
/7.c11.	I.F. rejection (470kc/s) ratio at 2.5Mc/s(3V on V.V.3):	44	48	dB

Table 2515 - (cont)

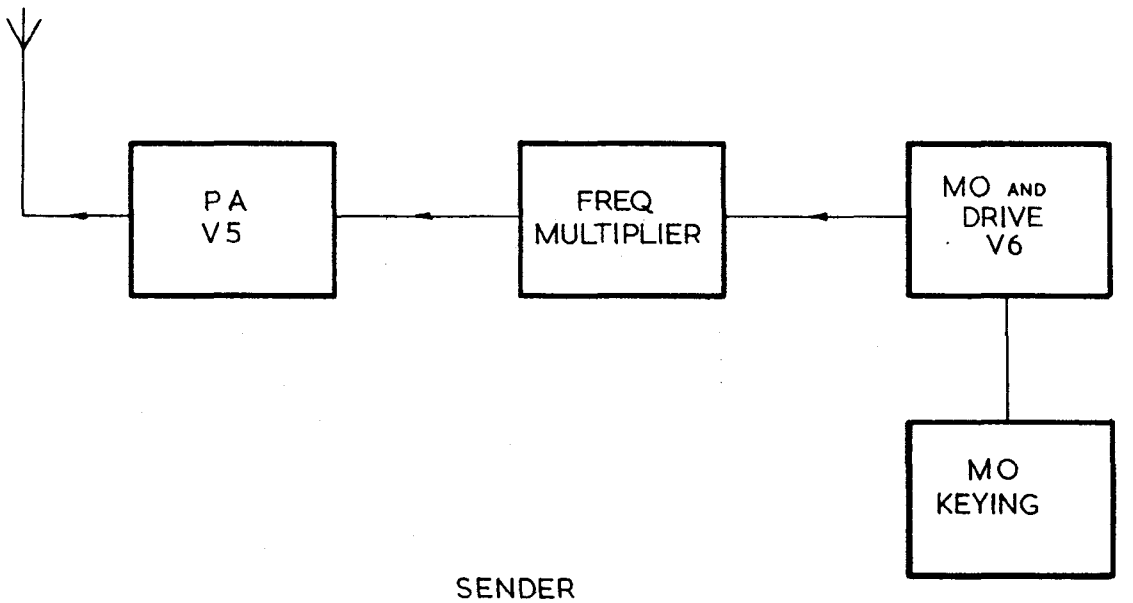
Table reference	Test	Spec limits Min	Max	Units
/7.c13.	Second channel (940kc/s above signal frequency) rejection ratios:-			
	Band 1 - 2.5Mc/s	30	-	dB
	3.75Mc/s	26	-	dB
	5.0Mc/s	20	-	dB
	Band 2 - 5.0Mc/s	23	-	dB
	7.5Mc/s	18	-	dB
	10.0Mc/s	14	-	dB
	Band 3 - 10.0Mc/s	22	-	dB
	15.0Mc/s	14	-	dB
	20.0Mc/s	10	-	dB
	Over nominal range of receiver, Avo 8 to read:	80	120	µA
2504/	Sender oscillator alignment			
	Mk 121			
/8.a.	Function switch to transmit. External key in and screwed down. Aerial matching fully anti-clockwise. L.F. crystal inserted, as given below			
	Model			
	A - 3.0Mc/s			
	B - 4.5Mc/s			
	C - 7.0Mc/s			
	D - 8.0Mc/s			
	E - 10.0Mc/s			
/8.b.	C39 short-circuit. Drive tuning control to l.f. end of range			
/8.c.	Tuning meter to read:	2.5	8	divisions
2504/	Sender oscillator alignment			
	Mk 122			
/9.a.	Function switch to transmit			
/9.b.	C39 short-circuit			
/9.c.	Calibration limits:-			
	Band 1 - 5Mc/s (2.5Mc/s crystal)	pointer width		
	Band 2 - 5Mc/s (2.5Mc/s crystal)	pointer width		
	Band 2 - 10Mc/s (10Mc/s crystal)	pointer width		
	Band 3 - 10Mc/s (10Mc/s crystal)	pointer width		
	Band 3 - 20Mc/s (10Mc/s crystal)	pointer width		
2504/	P.A. alignment			
	Mk 121			
/10.a.	Function switch to transmit. External key in and screwed down. L.F. crystal inserted, as in /8.a. Aerial matching to position 6 counting from the right. P.A. tuning to twice crystal frequency			

Table 2515 - (cont)

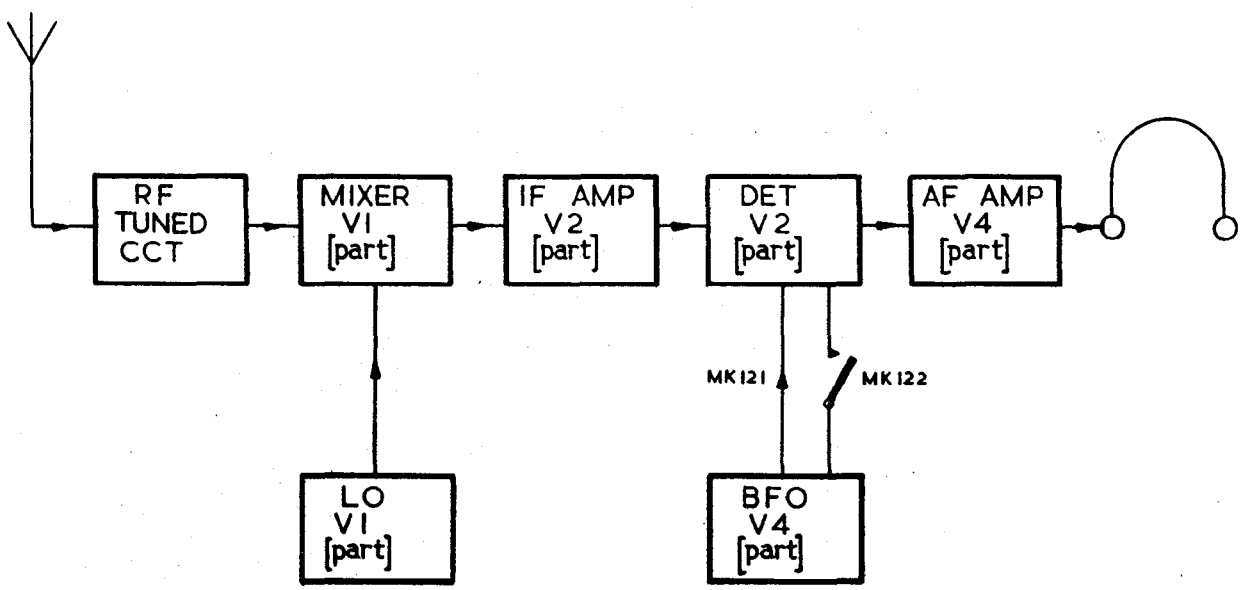
Table reference	Test	Spec limits Min	Max	Units
2504/ /10.c.	Calibration error of p.a. tuning:-			
	H.F.	-	1/16	in.
	L.F.	-	3/16	in.
2504/	P.A. alignment Mk 122			
/11.a.	Function switch to transmit. External key in and screwed down			
/11.b.	500Ω resistor across aerial and earth sockets			
/11.c.	P.A. tuning control calibration at fundamental crystal frequency, all bands:	pointer width		
2504/	R.F. output			
/12.a.	As in /11.a.			
/12.b.	As in /11.b. with V.V.3 (a.c. range) across resistor			
/12.c1.	Output at l.f. and h.f. end of bands, 1, 2 and 3 of Mk 122, and l.f. and h.f. end of Mk 121:	70 10	80 13	V W
	If no fault apparent:	66 9	70 10	V W
	On band 3, Mk 122, lower output permissible:	59 7	66 10	V W
	When correctly tuned, tuning meter to read:	4	7	divisions
/12.c2.	Resistor and V.V.3 removed. Aerial matching to maximum			
	Tuning meter reading:	-	10	divisions
2511	Vibrator pack			
	Tested in conjunction with a Mk 121 of average voltage and current figures			
	Voltages			
	Sender and receiver to operate normally when battery input varies:	5.4	6.6	V
	Receiver at maximum gain			
	H.T. at receiver:	220	240	V
	L.T.:	5.75	-	V
	Sender - key down - no crystal			
	H.T. at sender:	240	260	V
	L.T.:	5.7	-	V

Table 2515 - (cont)

Table reference	Test	Spec limits Min	Max	Units
	Current figures			
	Input to vibrator units:-			
	Receiver at maximum gain	4.8	5.5	A
	Sender - key up	3.0	3.7	A
	Sender - key down - no crystal	10	11	A
	Suspected transformer			
	Transformer isolated. 200V, 50c/s a.c. applied to h.t. winding. Current consumption for normal transformer	20	30	mA



SENDER



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RECEIVER

Fig 2501 - Block diagram (Mk 121 and Mk 122)

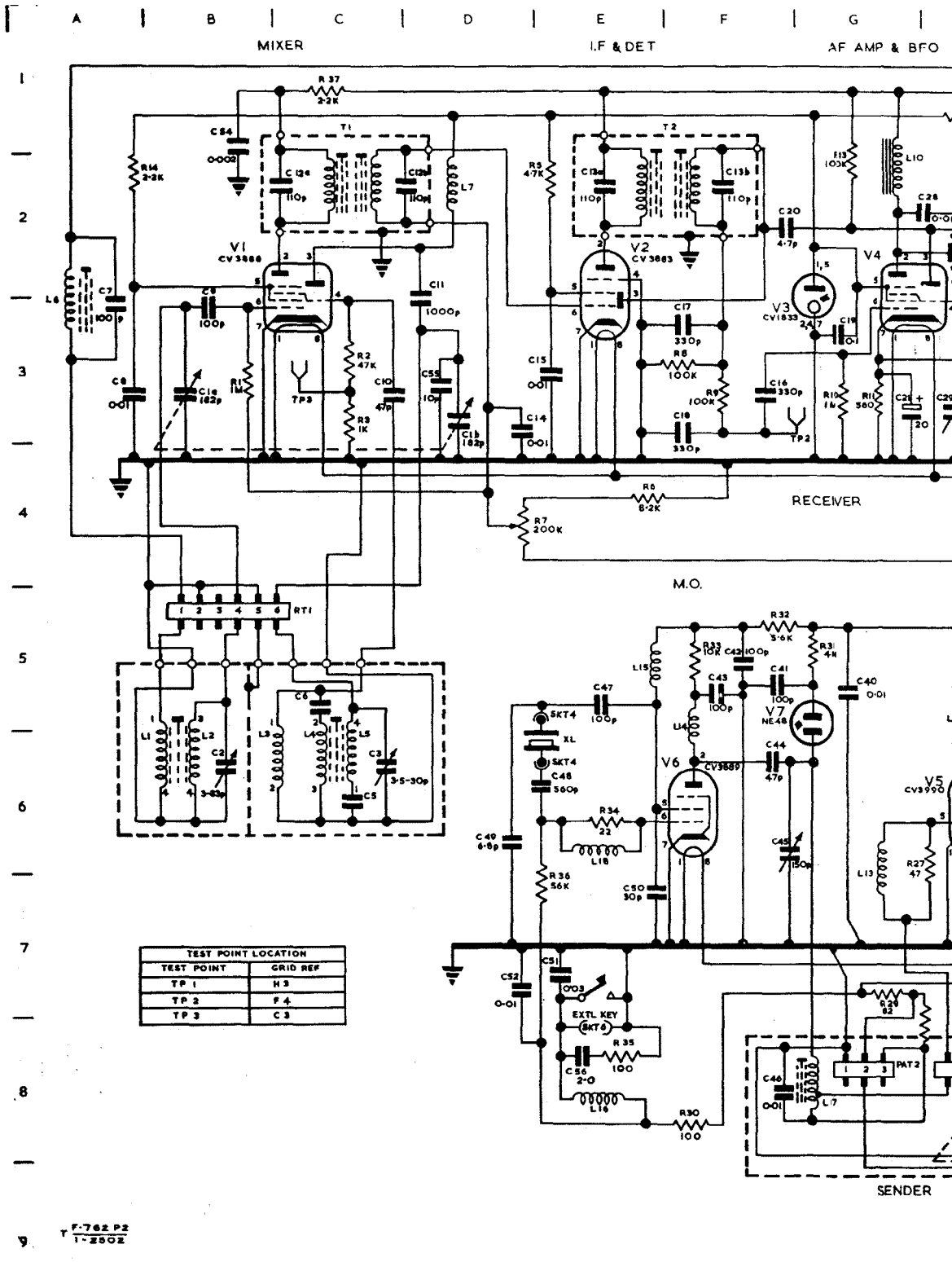
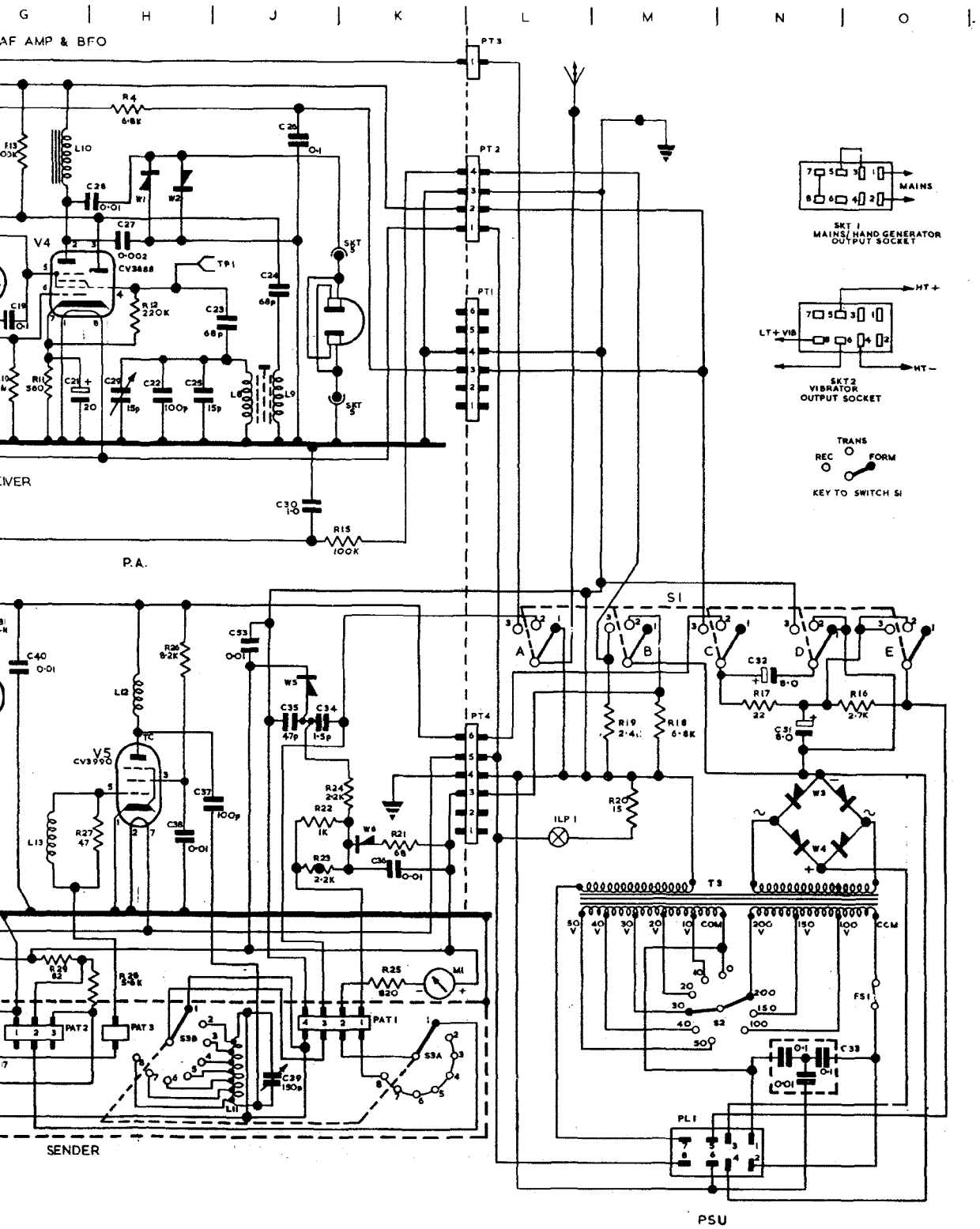


Fig 2502 - Circuit diagram of recei



m of receiver, sender and p.s.u. (Mk 121)

R E S T R I C T E D

Fig 2502 - Circuit diagram of receiver, sender and p.s.u. (Mk 121)

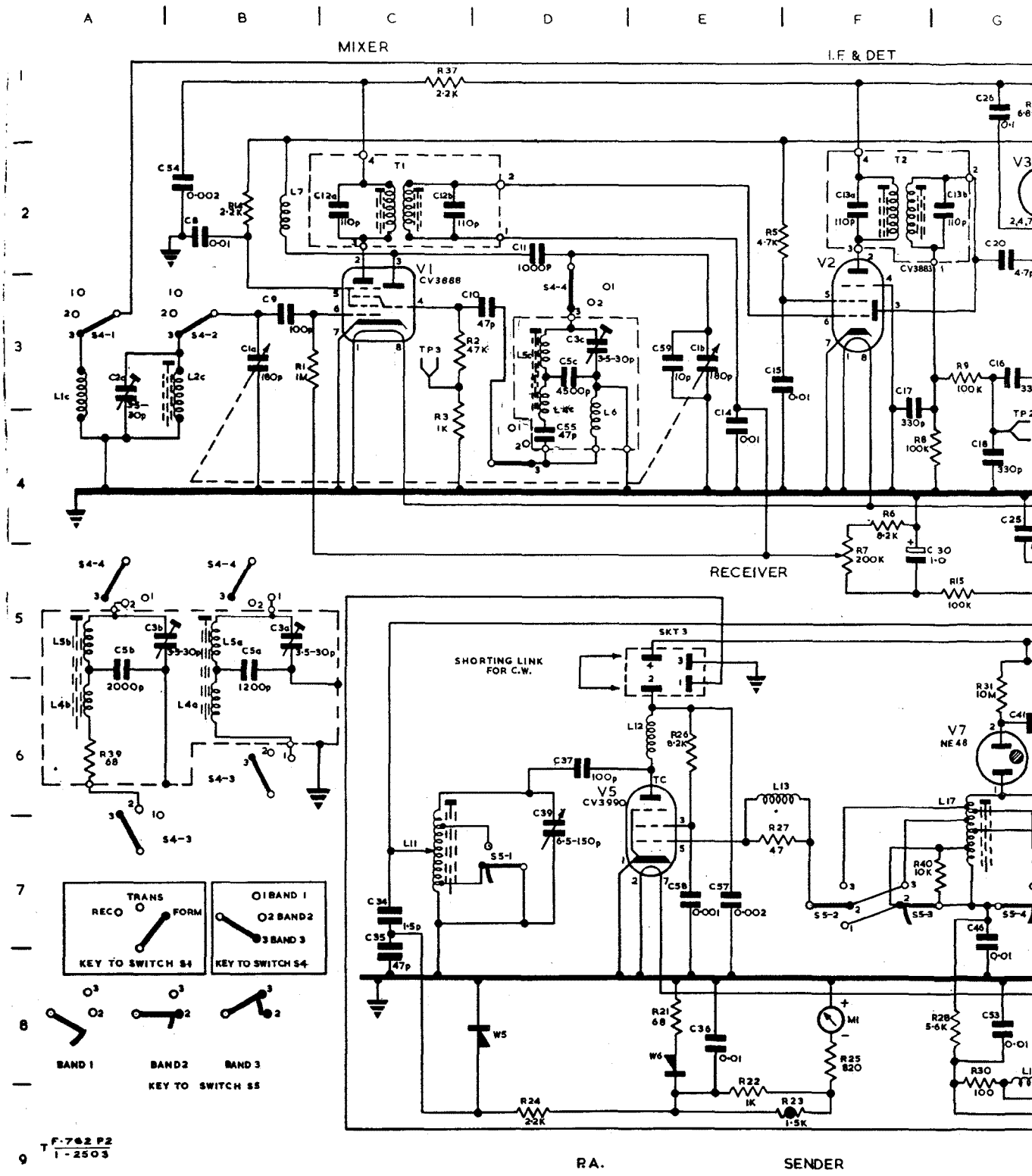


Fig 2503 - Circuit diagram of rece

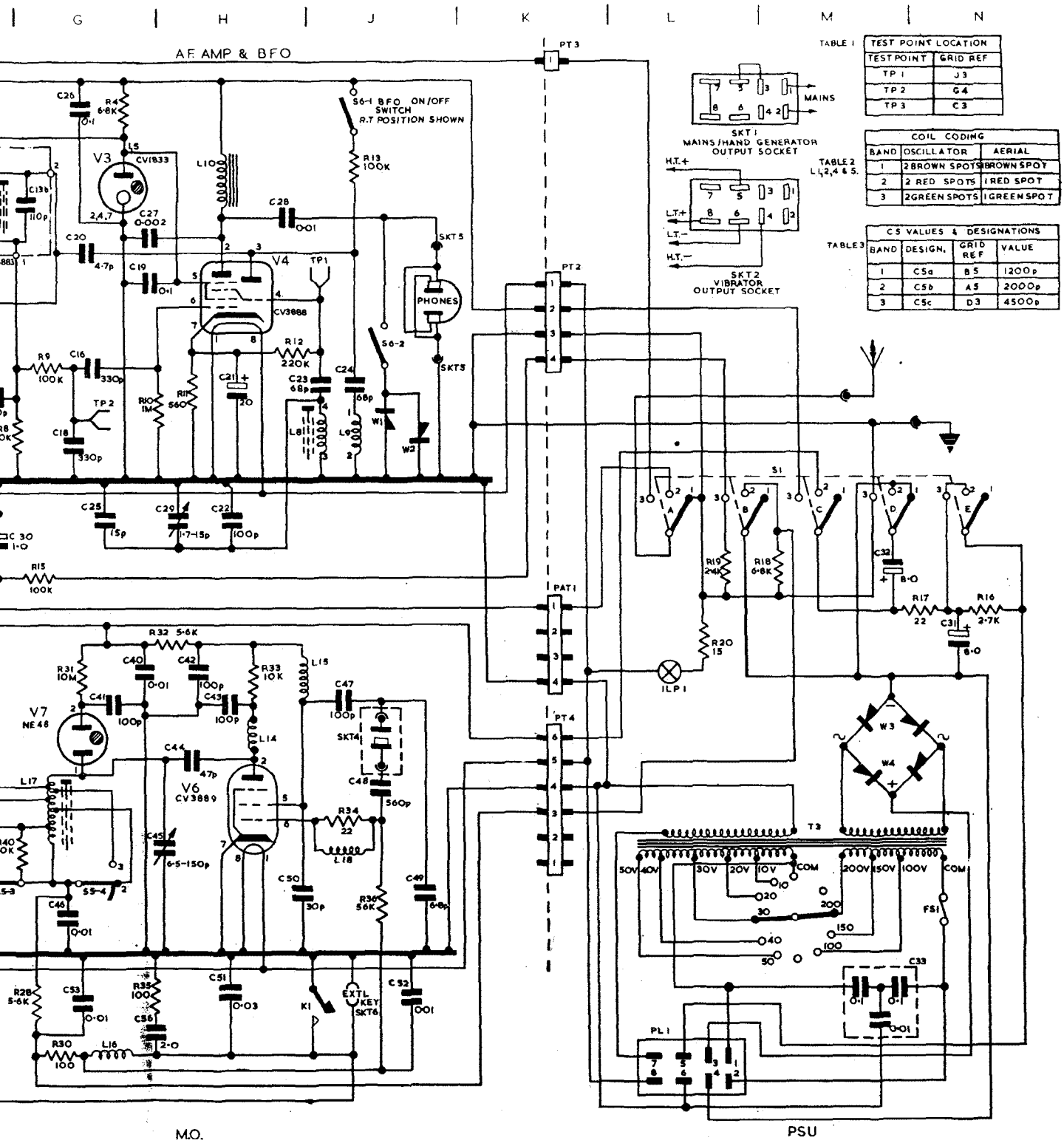


TABLE 1 — TEST POINT LOCATION

TEST POINT	GRID REF
TP 1	J 3
TP 2	G 4
TP 3	C 3

TABLE 2 L1,2,4 & 5. — COIL CODING

BAND	OSCILLATOR	AERIAL
1	2 BROWN SPOTS	1 BROWN SPOT
2	2 RED SPOTS	1 RED SPOT
3	2 GREEN SPOTS	1 GREEN SPOT

TABLE 3 — C5 VALUES & DESIGNATIONS

BAND	DESIGN.	GRID REF	VALUE
1	C5a	B 5	1200p
2	C5b	A 5	2000p
3	C5c	D 3	4500p

am of receiver, sender and p.s.u. (Mk 122)

R E S T R I C T E D

Fig 2503 - Circuit diagram of receiver, sender and p.s.u. (Mk 122)

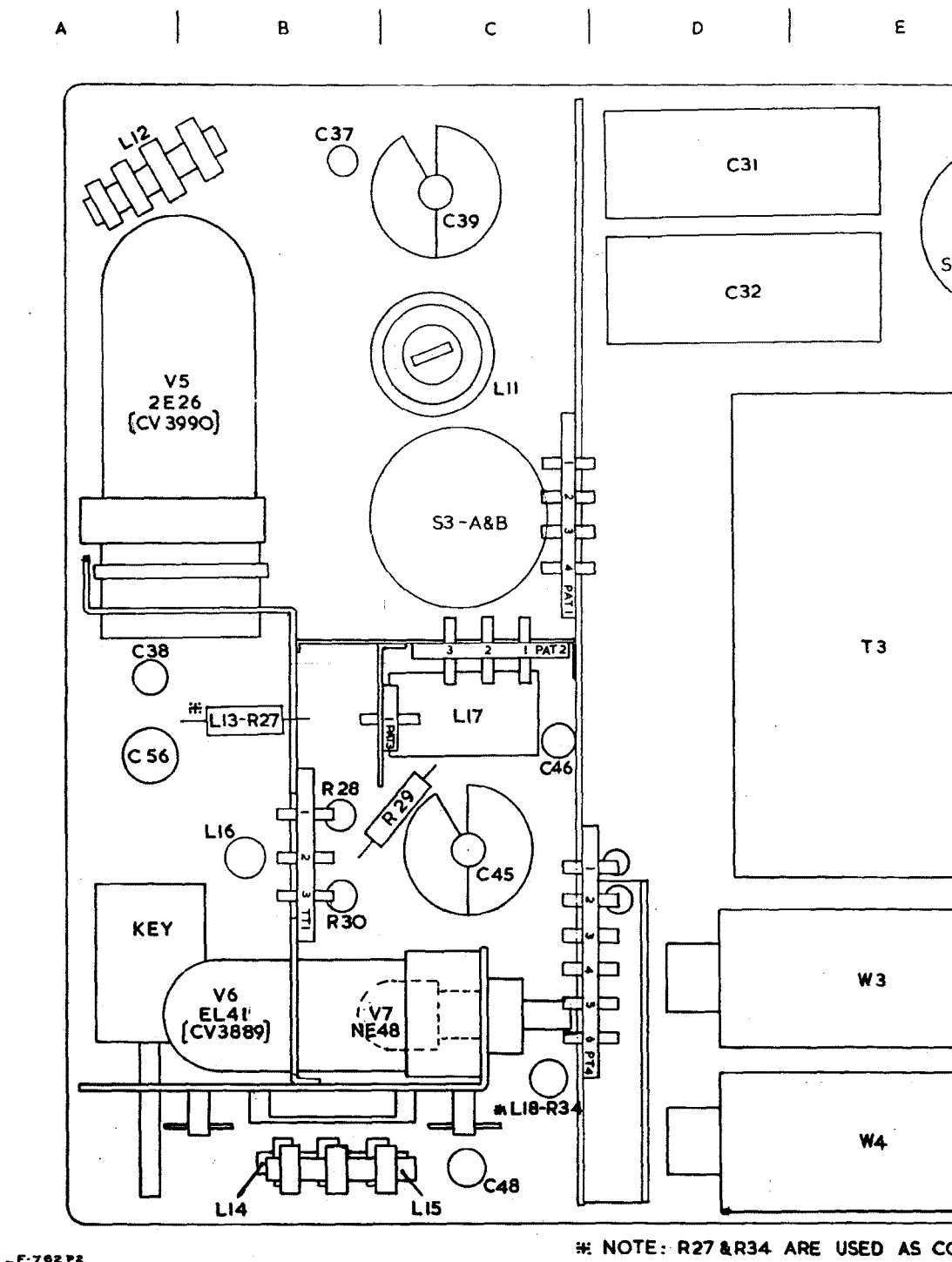
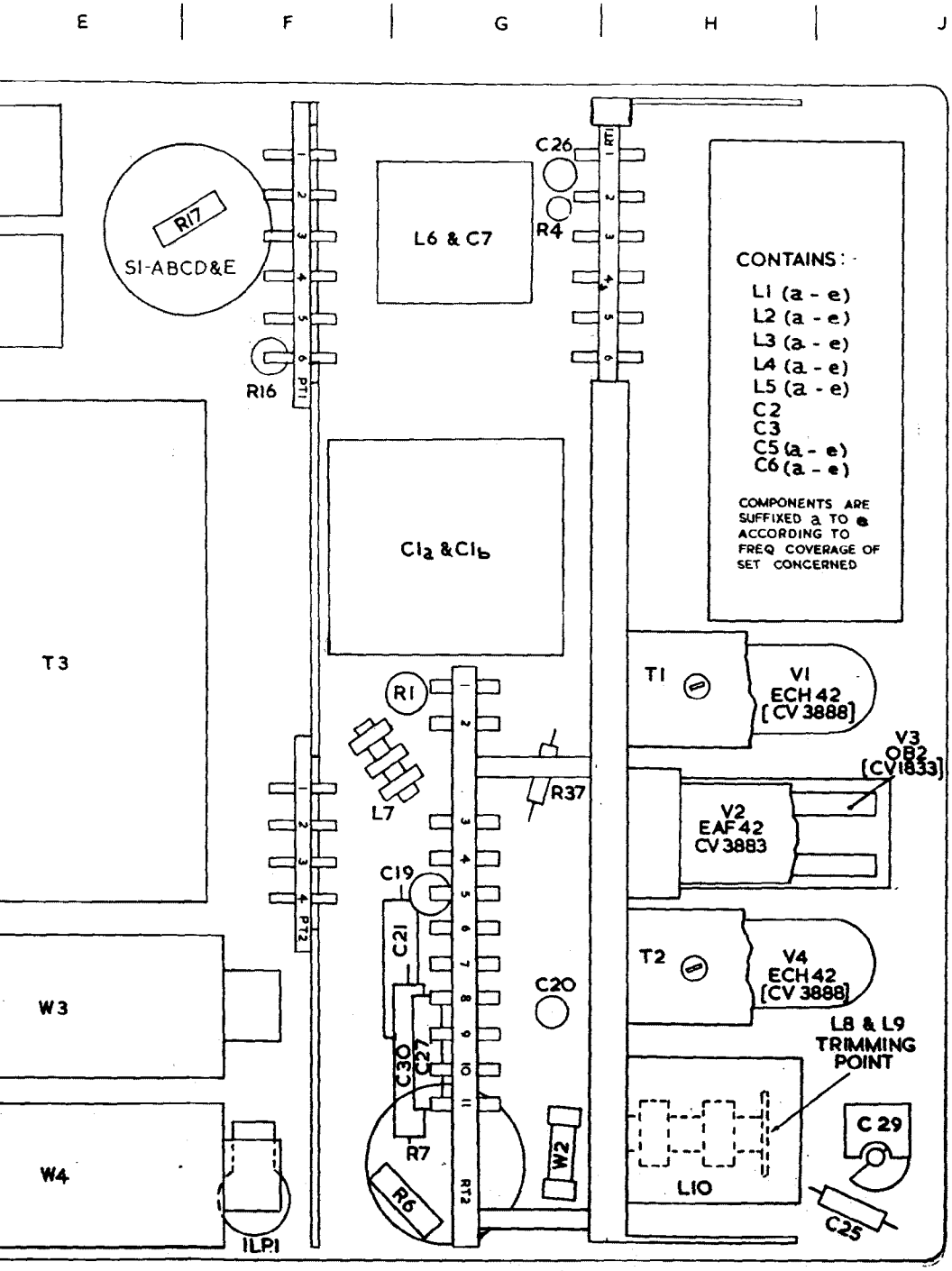


Fig 2504 – Component layout of rec



USED AS COIL-FORMS RESPECTIVELY

TEST POINT LOCATION		
TEST POINT	TAG STRIP	TAG No
TP1	RT2	9
TP2	RT2	8
TP3	RT2	4

yout of receiver, sender and p.s.u. (Mk 121)

R E S T R I C T E D

Fig 2504 - Component layout of receiver, sender and p.s.u. (Mk 121)

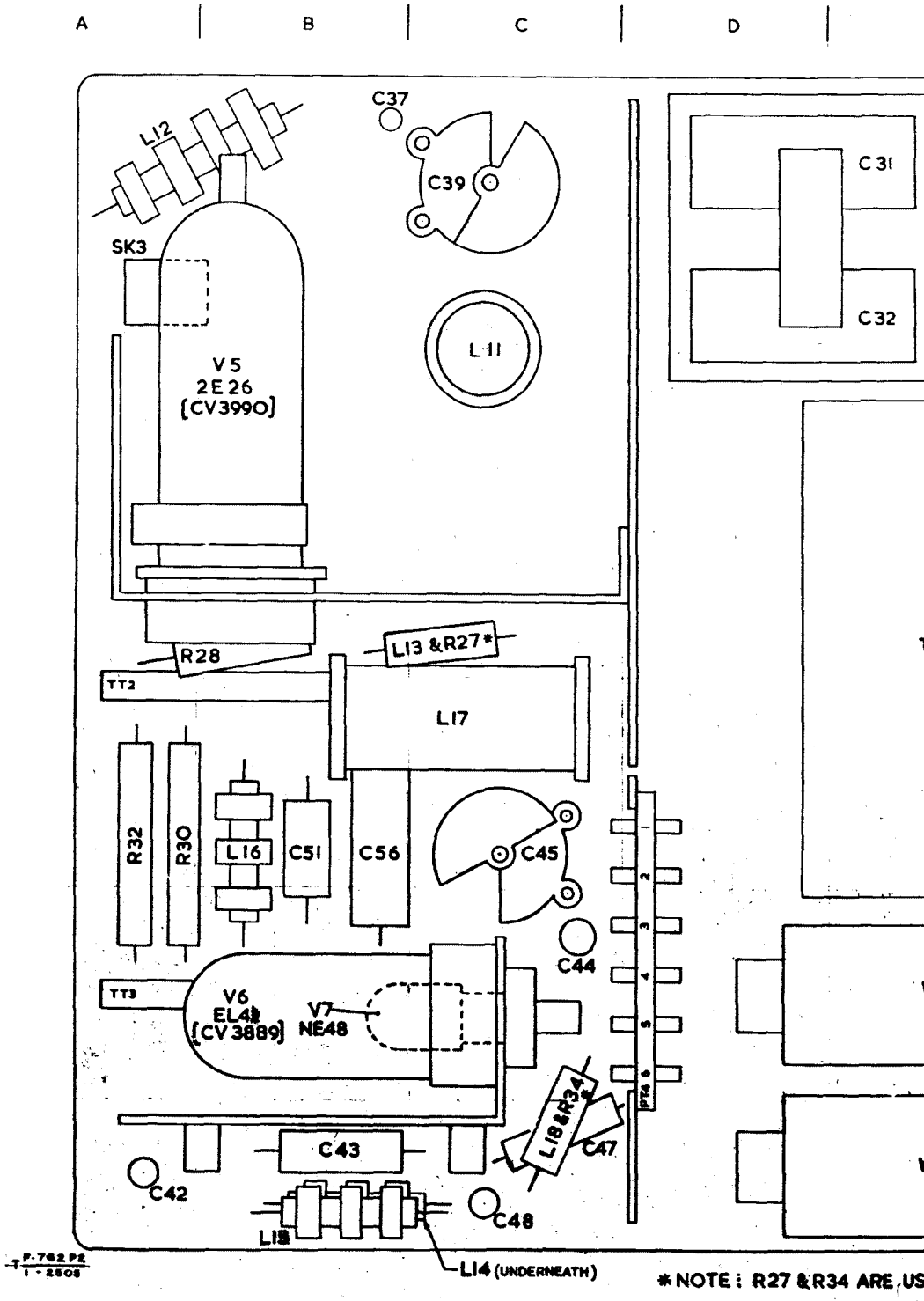
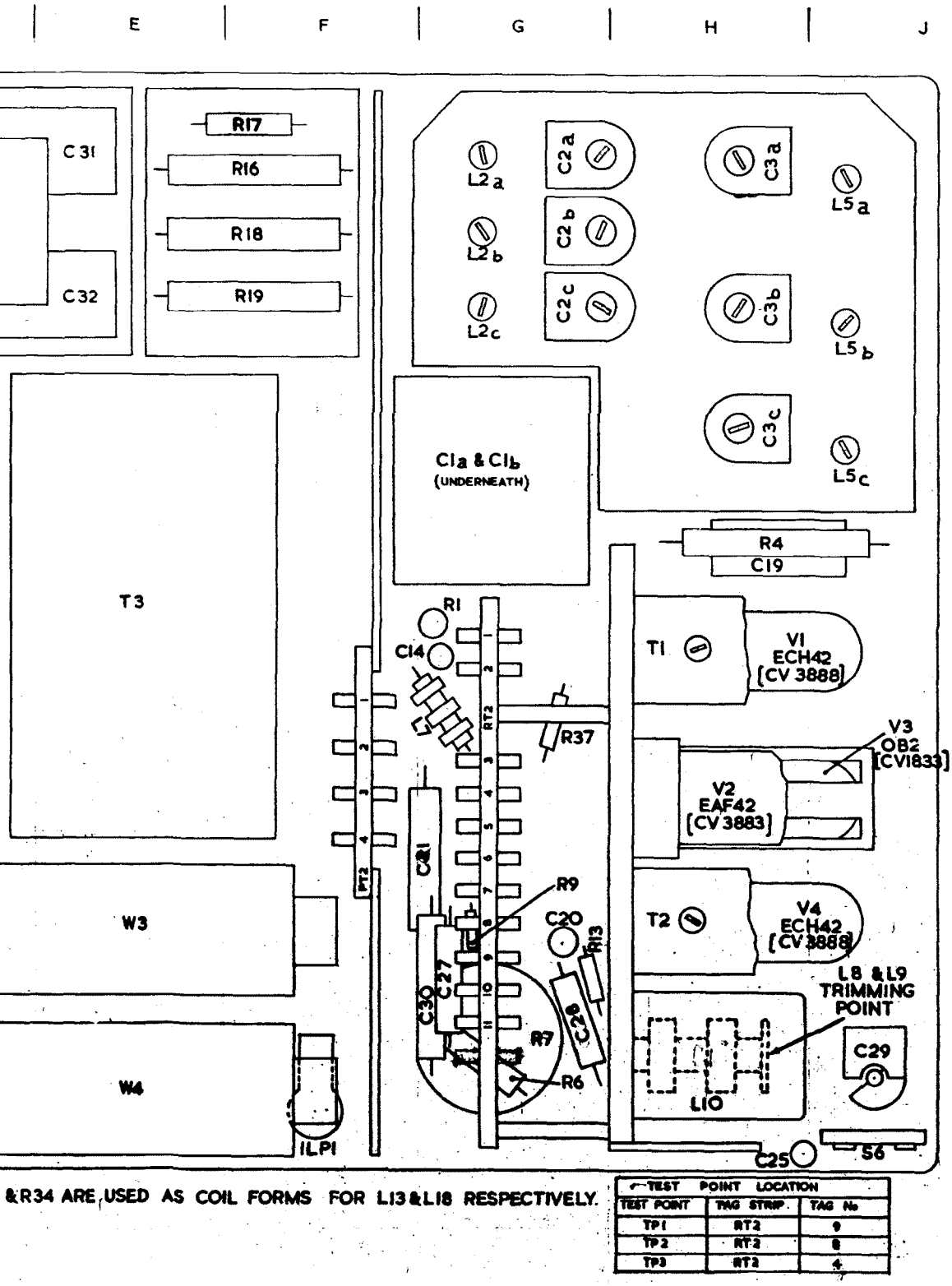


Fig 2505 - Component layout of re



&R34 ARE USED AS COIL FORMS FOR L13 & L18 RESPECTIVELY.

TEST POINT LOCATION

TEST POINT	TAG STRIP	TAG No
TP1	RT2	9
TP2	RT2	8
TP3	RT2	4

ayout of receiver, sender and p.s.u. (Mk 122)

R E S T R I C T E D

Fig 2505 - Component layout of receiver, sender and p.s.u. (Mk 122)

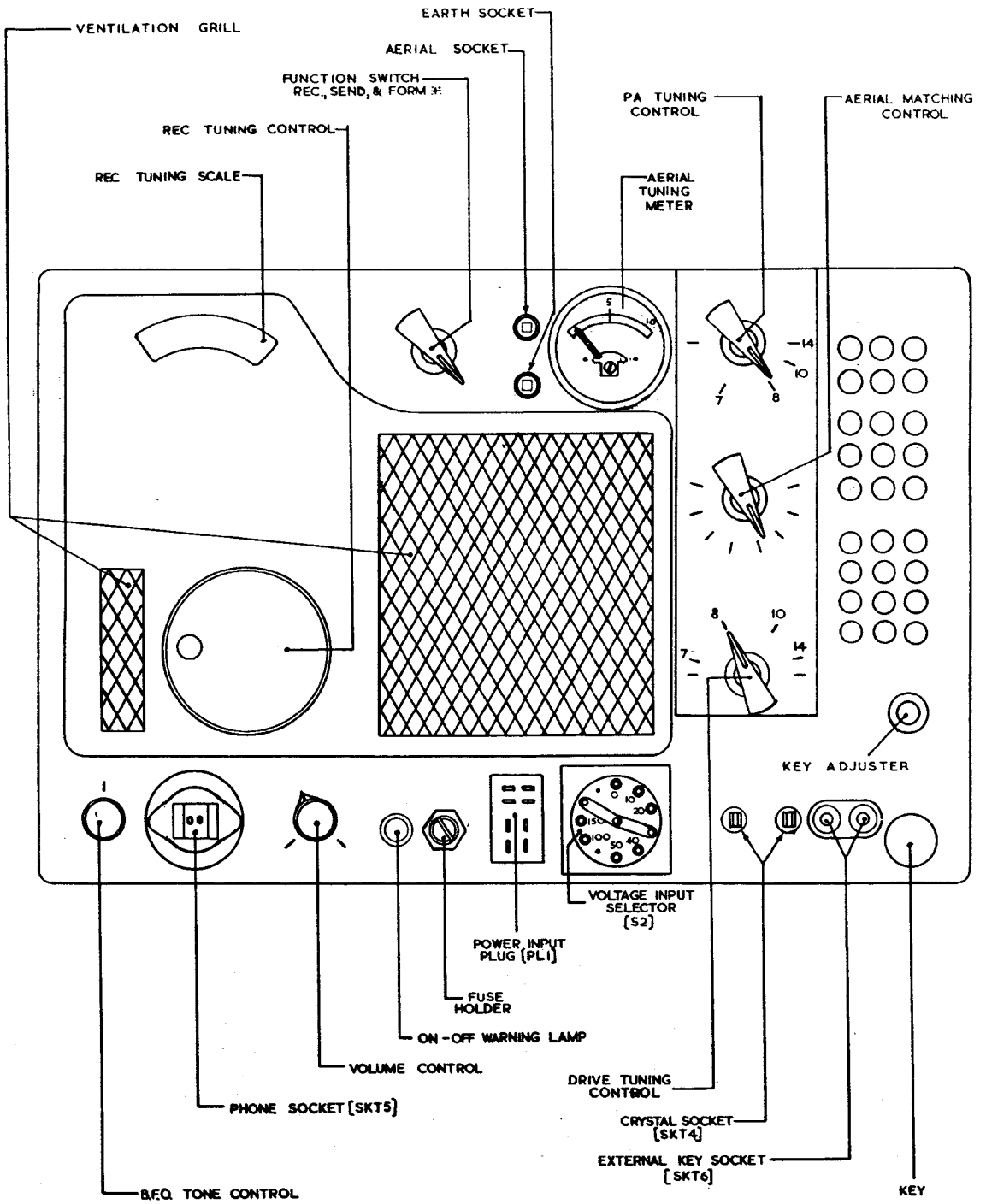
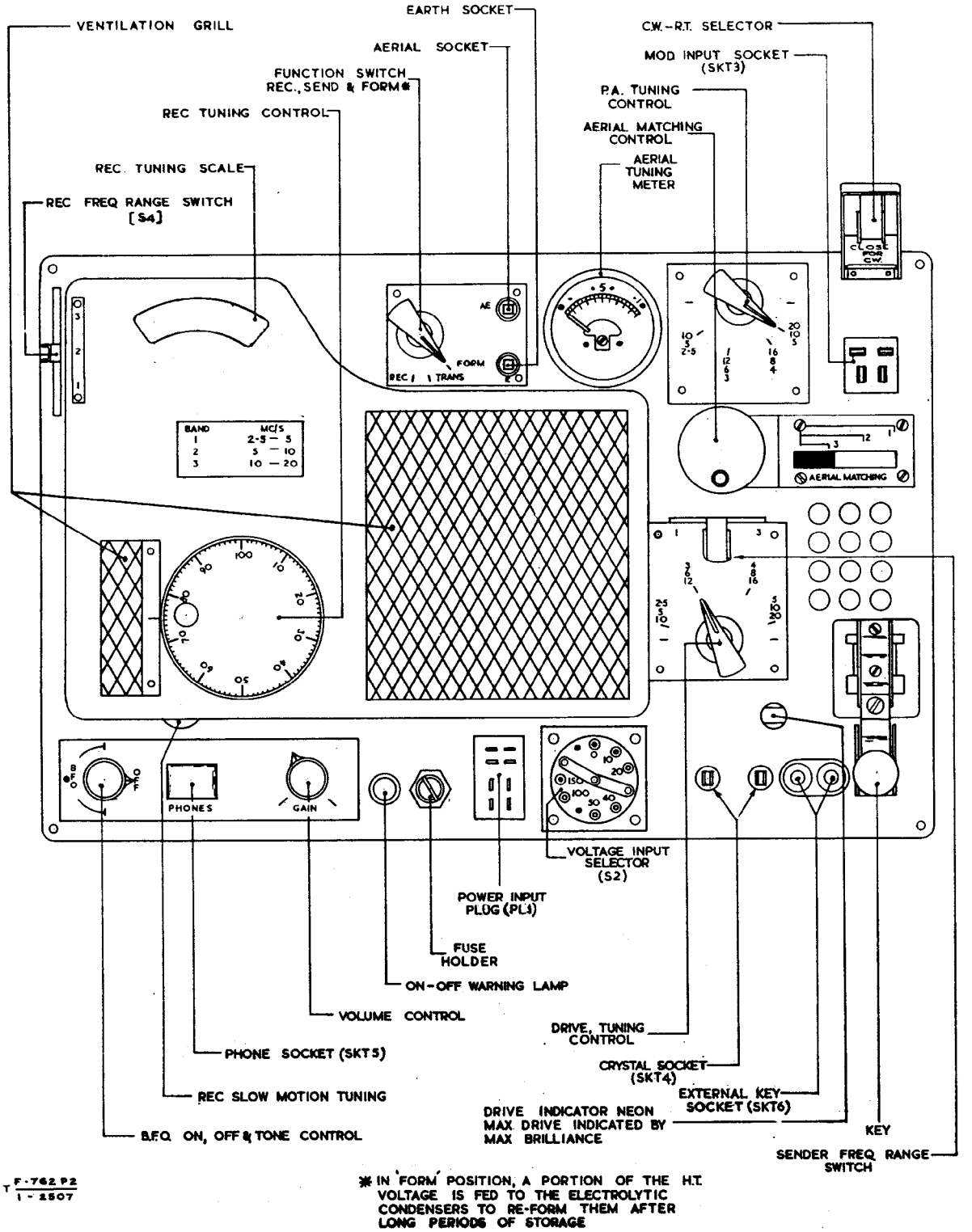


Fig 2506 - Layout of controls (Mk 121)



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* IN 'FORM' POSITION, A PORTION OF THE H.T. VOLTAGE IS FED TO THE ELECTROLYTIC CONDENSERS TO RE-FORM THEM AFTER LONG PERIODS OF STORAGE

Fig 2507 – Layout of controls (Mk 122)

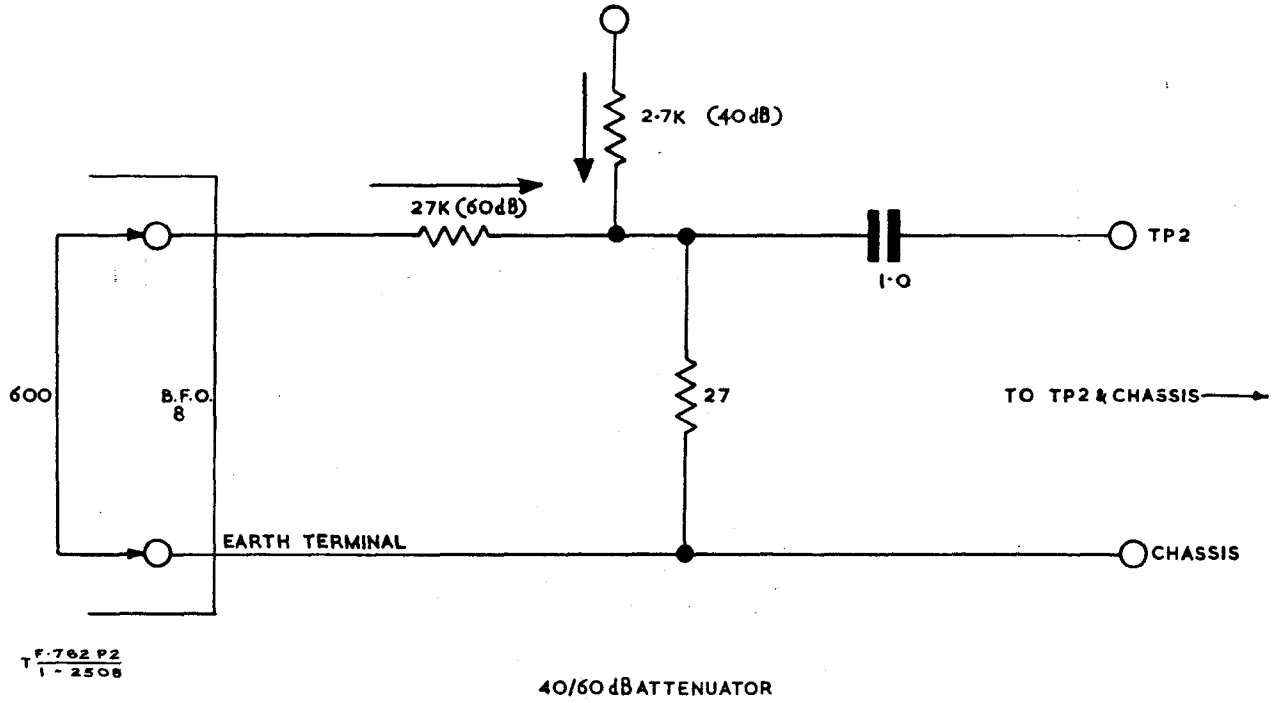


Fig 2508 - Attenuator pads

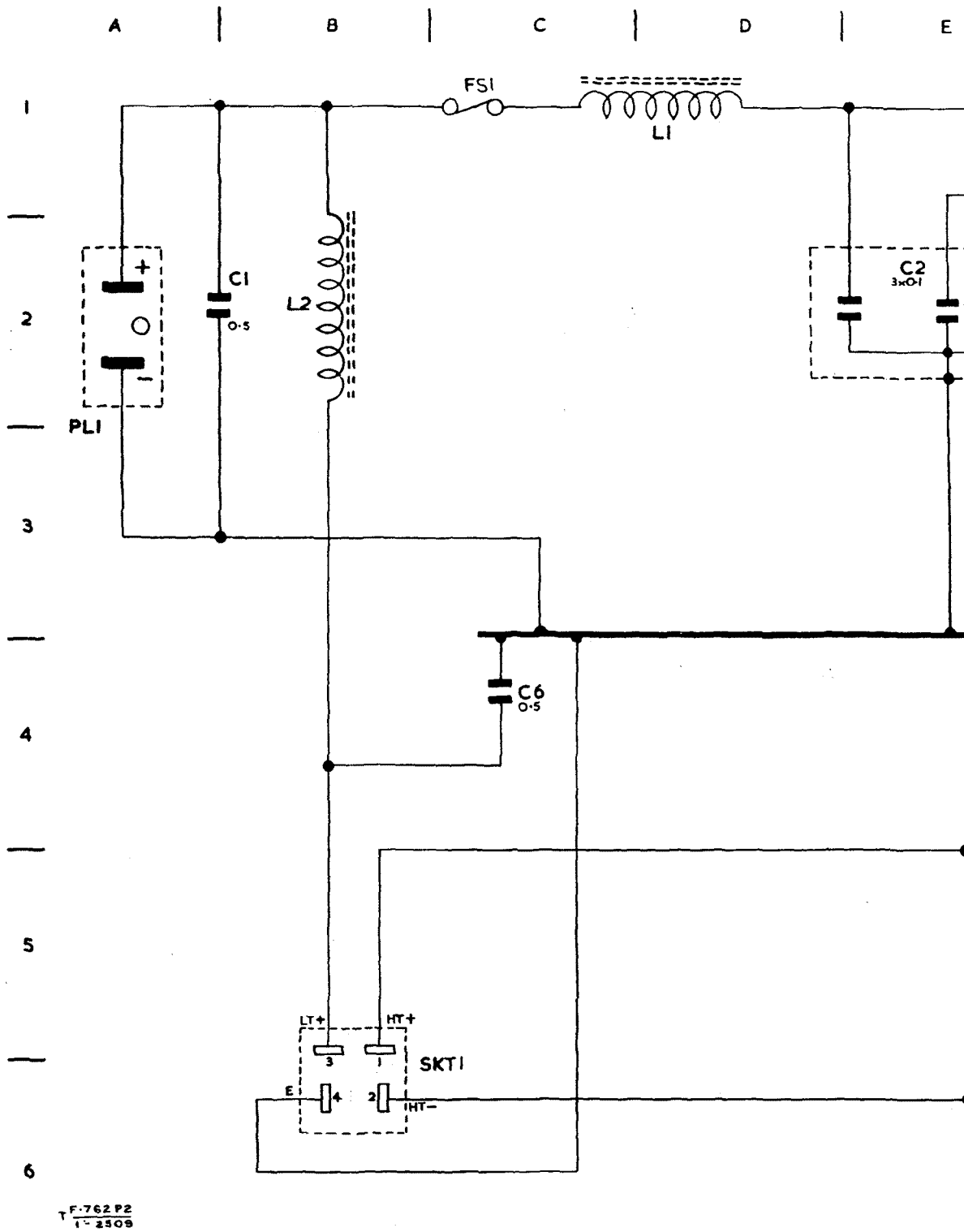
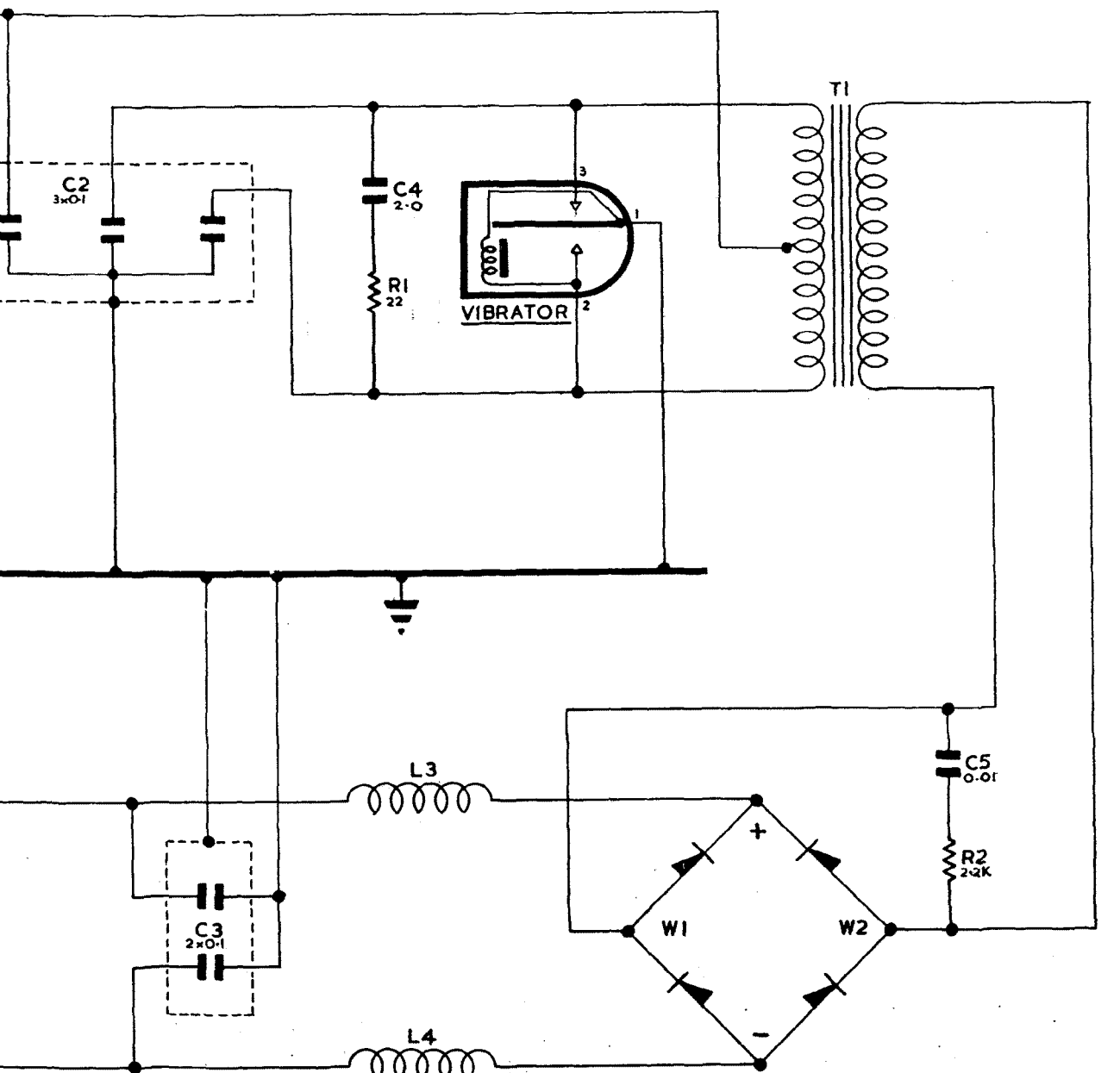
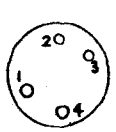


Fig 2509 - Circuit diagram, Supp

E | F | G | H | J





VIBRATOR PIN LAYOUT

gram, Supply units, vibratory, No 14, 6V

R E S T R I C T E D

Fig 2509 - Circuit diagram, Supply units, vibratory, No 14, 6V

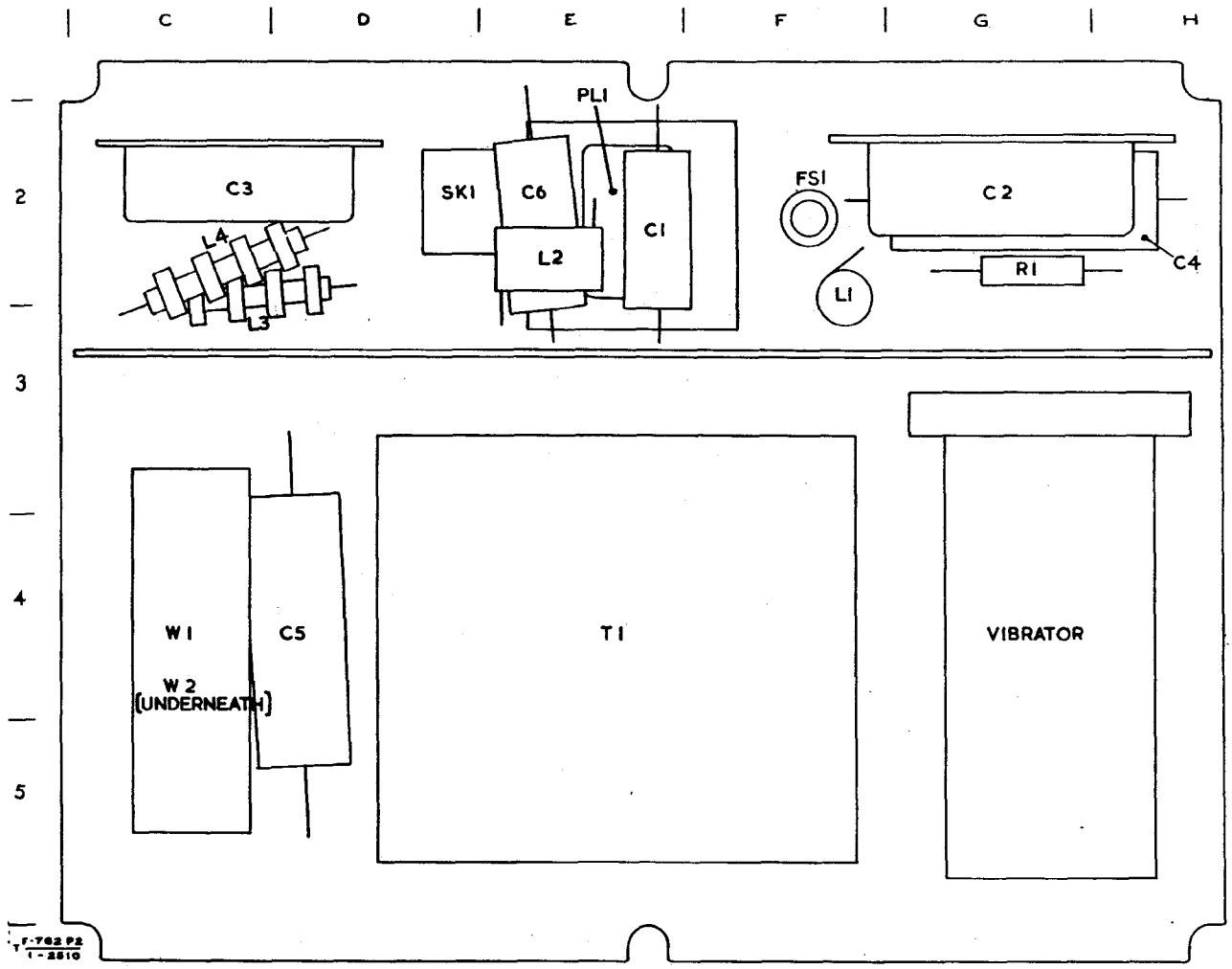


Fig 2510 – Component layout, Supply units, vibratory, No 14, 6V

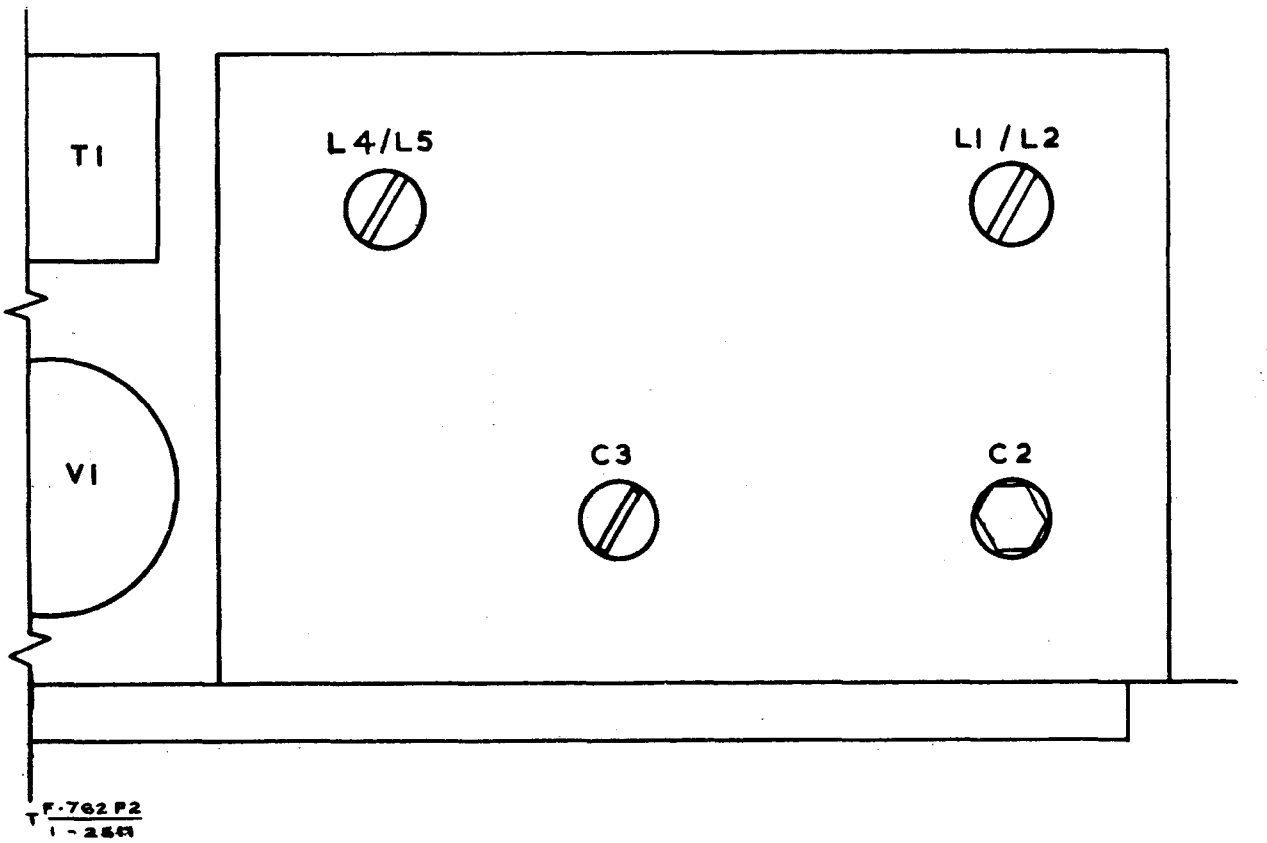


Fig 2511 – R.F. alignment points (Mk 121)

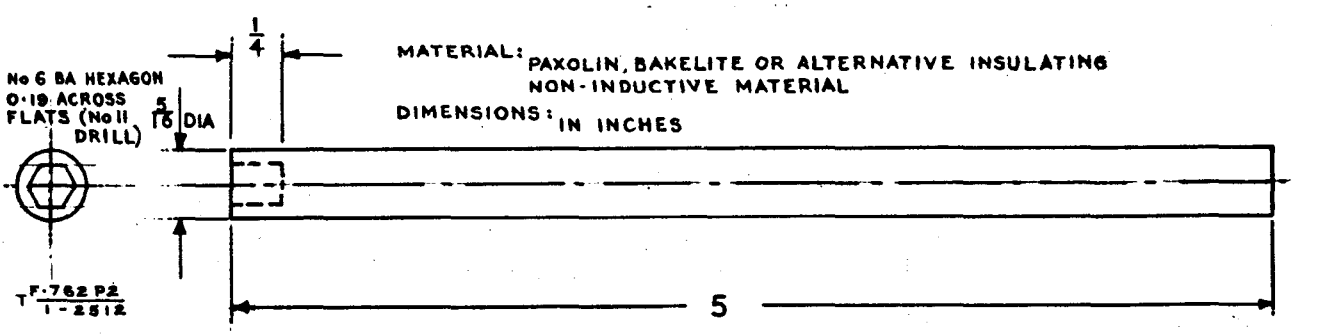


Fig 2512 – R.F. alignment tool

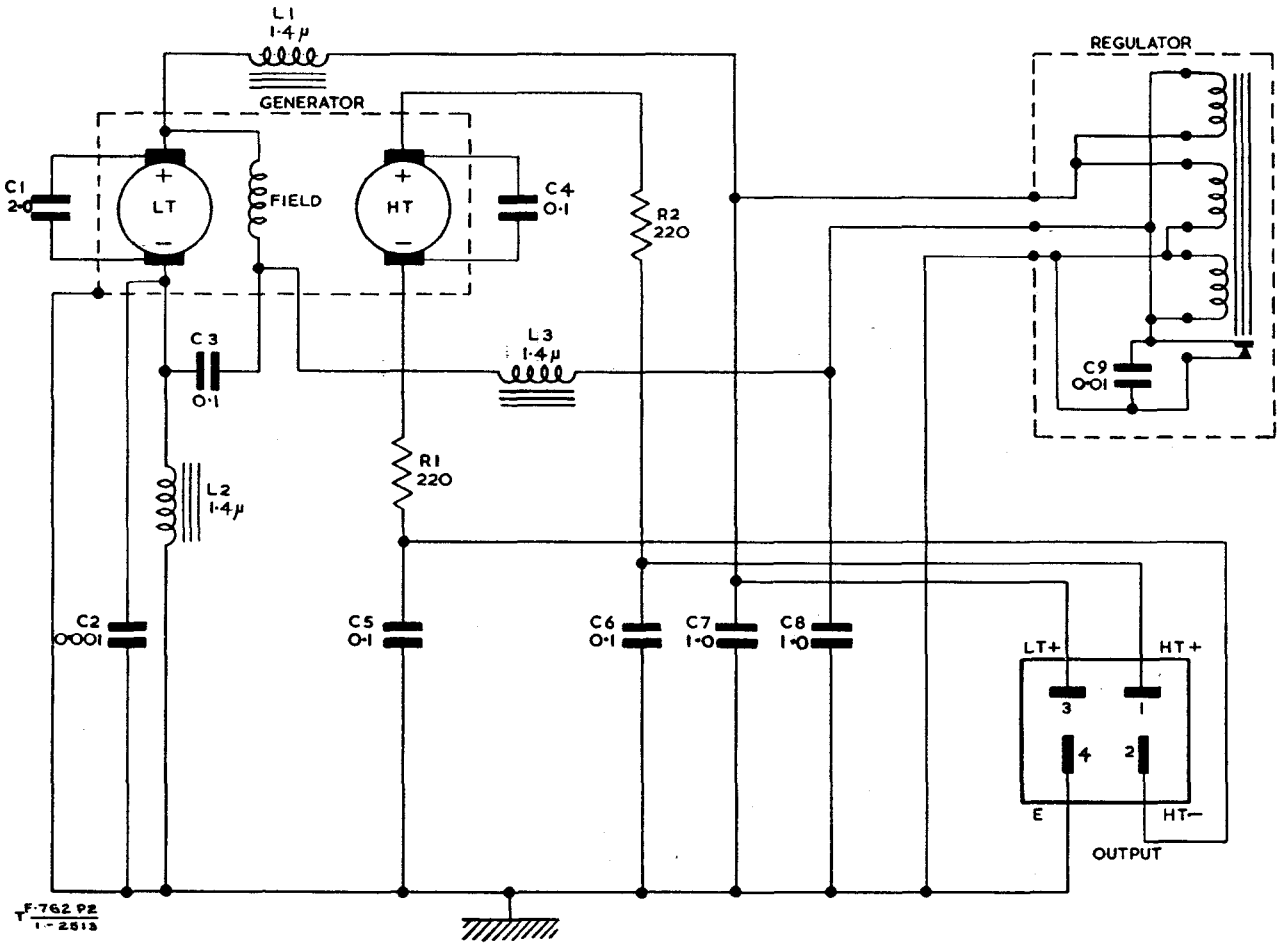


Fig 2513 - Circuit of hand generator

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END