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

TELECOMMUNICATIONS
F 742

STATION, RADIO, 128 AND 128A

TECHNICAL HANDBOOK - TECHNICAL DESCRIPTION

Tels F 743 and F 744 will not be published in this series. Sufficient information is available in this regulation to cover Unit, Field and Base repairs.

SUBJECT INDEX

Distribution - Class 335. Code Special

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BRIEF TECHNICAL DESCRIPTION

1. The Station, radio, 128 is a portable transmitter/receiver operated from dry batteries; it is housed in a wooden case which is carried in a canvas pack. The Station, radio, 128A is a later version, the main differences being that the battery compartment has been redesigned to give greater storage space for the accessories and also the spare crystal compartment has been improved. These equipments cover the frequency range 2-8Mc/s in two bands; 2 to 4Mc/s and 4 to 8Mc/s. They can transmit c.w. signals only but are suitable for r.t., m.c.w. and c.w. reception.

2. The receiver is a superhet consisting of a combined oscillator/mixer stage, i.f. stage, detector and a.f. amplifier, and power amplifier stage which feeds a pair of high resistance headphones. A b.f.o. is incorporated for c.w. reception.

3. The transmitter consists of a crystal controlled oscillator (V1) and a power amplifier (V2) which may be hand-keyed and which can be matched to any type of antenna system likely to be used. It transmits only on fundamental frequencies and delivers approximately 1W of r.f. power to the antenna.

DETAILED TECHNICAL DESCRIPTION

RECEIVER (Fig 2001)

Antenna system

4. The r.f. signal is fed via C1 to the antenna coils L1 or L2 and thence to the third grid of the mixer/oscillator valve V1. The antenna coils are selected by SA1 and tuning over the range is accomplished by VC1.

Oscillator/frequency changer

5. Valve V1 is a heptode which combines the actions of oscillator and frequency changer. Grids 1 and 2 form the oscillator grid and anode respectively. The oscillator is a series fed, tuned grid circuit. L3 is the 4 to 8Mc/s coil and L4 is the 2 to 4Mc/s coil, tuning over the range is accomplished by VC2 and range switching is achieved with SA2. After mixing, in the valve V1, the 470kc/s difference frequency is selected at the anode by the i.f. transformer T1.

I.F. amplifier

6. The output from T1 is amplified in V2, a variable-mu valve, whose grid bias can be varied by adjusting RV1 to control the gain of the receiver. V2 is coupled to the detector by a second tuned transformer, T2 which completes the i.f. bandpass filter.

Detector and 1st a.f. amplifier

7. V3 contains the diode detector whose d.c. path is completed by R8, R6 and T2 secondary. C14 and C15, in association with R6, remove the i.f. component of the output while the a.f. component, developed across R8, is amplified in the pentode section of V3. After amplification the signal is fed via C19 to the power amplifier V4.

Power amplifier

8. The power amplifier is a straightforward output pentode, choke-capacity coupled to the jack socket JK1. C21 is incorporated to reduce the gain at the high frequencies. Voltage negative feedback is applied from anode to grid, via R12.

Beat frequency oscillator

9. The b.f.o. valve V5 is a pentode, strapped as a triode, used as a Hartley oscillator. The h.t. is applied to the anode via a tap on the coil (L5). The l.t. is supplied via SB which is the b.f.o. ON/OFF switch. With VC3 in its mid-position the b.f.o. is tuned for zero beat by the inductance L5. The variable capacitor VC3 gives the b.f.o. a frequency range of ±10kc/s.

Jack switch

10. The l.t. negative supply is normally open-circuited but is automatically connected to earth by contacts which operate when the jack plug is inserted. This acts as an on/off switch for the receiver and is also a safeguard against the receiver being left on since the lid of the set cannot be closed with the phone jack in position.

TRANSMITTER (Fig 2005a)

Oscillator

11. V1 is a crystal-controlled oscillator, choke-capacity coupled to the power amplifier V2.

Power amplifier

12. V2, the power amplifier, is screen keyed, the h.t. voltage being applied to the screen via the morse key. R3 and C6 form a key click filter. The r.f. output is then fed via C8 to the parallel tuned circuit of either L1/VC1 or L2/VC1. These coils, L1 and L2, have several taps selected by SB to enable various antenna impedances to be matched.

13. The capacitors C9 and C10 form an r.f. voltage divider and are connected across the antenna output terminals to produce a small r.f. potential which is rectified by MR2 to produce a d.c. component. This is applied to the meter M1, to indicate the voltage output. MR1 produces an approximate logarithmic scale and also prevents serious overloading of the meter whilst retaining good sensitivity to low level signals.

Operation of SA

14. The switch SA is a combined mode and range switch performing five operations, viz:

(a) SA1 returns the h.t. negative either to earth for the transmitter or through series resistors to produce the bias for the receiver gain control.

(b) SA2 switches VC1 either across L1 for the 2 to 4Mc/s band or across L2 for the 4 to 8Mc/s band.

(c) SA3 permits a common antenna to be employed and switches it either to the receiver or transmitter so preventing direct coupling of the transmitter output to receiver input.

(d) SA4 connects the appropriate output coil, L1 or L2, to the anode of V2 via C8.

(e) SA5 is the l.t. switch, switching the transmitter filaments off when the receiver is in use or the receiver filaments off when the transmitter is in use.

Netting switch SD

15. This pressel switch is provided on the transmitter to facilitate 'netting operations', that is, two or more stations working on the same frequency. With the mode switch set to receive and the net switch pressed the transmitter oscillator operates and the receiver is then tuned with the aid of the b.f.o. to the transmitter frequency.

Jack plug JK2

16. JK2 is incorporated to accommodate the reading lamp ILP1 which can be switched on and off by SC. The circuit is entirely separate from the transmitter or receiver circuit, having its own 1.1/2 volt dry battery A2.

SETTING UP PROCEDURE

Setting up a station

17. Unfasten the main flap and release the two press studs, fold this flap upwards out of the way. Pull out the two side flaps and the main flap is then folded in half and secured by the two press studs to form a top. The two buckles on the top are then secured to retain the folded half of the flap.

18. The front panel can now be lowered by pulling outwards on the bar. This panel forms a convenient writing surface. The accessories can now be unpacked from the lower right-hand compartment.

19. Link the terminal marked LINK RX.-AE to the AE terminal on the receiver and connect the antenna wire to the AE terminal on the transmitter. Drive the earth spike into the ground and connect it to the earth terminal on the transmitter.

20. Insert the morse key jack plug into the transmitter jack marked KEY and the crystal into the XTALS socket. Make sure that the transmit/receive switch on the transmitter is in the OFF position. Insert the headphones jack into the PHONE socket and the station is then ready for use.

RECEIVER

21. With conditions as in para 19-20 set the band switch to the required frequency range and the gain control to a suitable level.

22. Set the tuning dial to the frequency required and tune a few degrees either side of this position until the station is heard. If the signal being received is m.c.w., switch the B.F.O. to OFF. If the signal is c.w. switch the B.F.O. to ON and adjust the B.F.O. tuning knob in conjunction with the main tuning control until the signal is clear in tone and distinguishable from adjacent stations.

TRANSMITTER

23. Check that the appropriate crystal for the frequency being used is in position. Set the mode switch to TX1 or TX2, insert the key into JK1 and depress the key while setting the P.A. tuning knob to the correct frequency, adjusting the tuning until a reading is obtained on the meter. Try the AE LOAD switch in various positions and adjust the P.A. tuning in each position for maximum deflection on the meter. Reset the switch to the position which gives maximum deflection.

24. If either the antenna, or the crystal frequency are changed new settings will have to be found.

The NET switch

25. This pressel switch is provided on the transmitter to facilitate 'Netting Operations', that is, two or more stations working on the same frequency. To set up the receiver to the 'net' frequency:-

(a) Plug the 'net' crystal into the transmitter.

(b) Set the selector switch to RX.

(c) Set the receiver band switch to the appropriate frequency range.

(d) Set the receiver dial approximately to the 'net' frequency.

(e) Switch the B.F.O. on and centralize the B.F.O. tuning control.

(f) Press the NET button and tune the receiver for zero beat.

(g) Readjust the B.F.O. tuning to produce a suitable tone in the phones.

(h) The receiver is now set up to the network frequency for c.w., if m.c.w., is to be expected switch off the B.F.O.

ALIGNMENT AND SPECIFICATION TESTING

Test equipment

26. The following items of test equipment are required for the alignment of this equipment:-

(a) Signal generator, No 12 (Z4/ZD 02674)

(b) Frequency meter, SCR211 (ZA/2C/1411)

(c) Wattmeter, absorption, a.f., No 1 equipment (Z4/6625-99-949-0510).

(d) Wattmeter, absorption, h.f., No 2 equipment (Z4/ZD 00748)

(e) Signal generator, video frequency, No 1 equipment (Z4/ZD C4247)

(f) Oscilloscope set, CT436 (Z4/6625-99-913-8618)

(g) Multimeter, electronic, type 13267, CT429 (Z/6625-99-943-8384)
OR
Decibel meter, portable, No 4 (ZD 04092) and Voltmeter, valve, No 3 (Z/6625-99-949-0472)

(h) 500Ω 2W resistor ±1%

(j) Crystals 2, 3, 4, 6 and 8Mc/s (Type ZBC ref DEF spec 5271)

(k) Power supply unit, set (ZD 05566) used in conjunction with 1.5V batteries for heaters and operator's lamp
OR
4 off - Battery, dry, h.t. 67.5V No 1 (Y3/6135-99-910-1123)
1 off - Battery, dry, l.t. 1.5V No 11 (Y3/6135-99-910-1138)
1 off - Battery, dry, l.t., 1.5V No 14 (Y3/6135-99-910-1137)

RECEIVER

A.F. stages

27. Insert a plug into JK1 with leads to the wattmeter, a.f. No 1, setting the range to 2mW and the impedance to 20kΩ. Connect the signal generator, video frequency No 1 to pin 6 of V4 and V3, in turn, and check that the inputs required at 1kc/s to produce 1mW output are not greater than 400mV at V4 and 12mV at V3.

28. With the signal generator connected to pin 6 of V3 and using the 1mW output at 1kc/s as a reference level, note the output at 300c/s and 10kc/s. These should not fall below:-

Frequency	300c/s	1kc/s	10kc/s
Level	-2dB	0dB(1mW)	-8dB

I.F. stages

29. Set the gain control to maximum. Connect the signal generator, No 12 via a 0.01µF capacitor to pin 6 of V2. Inject a 470kc/s signal modulated 30% at 1kc/s. Peak the i.f. transformer T2 and note the signal generator setting for 1mW output. Connect the signal generator with the 0.01µF capacitor to pin 6 of V1; peak the i.f. transformers T1 and T2 and note the signal generator setting for an output of 1mW. Increase the signal generator output by 6dB and vary the frequency for an output of 1mW; check these frequencies using the SCR211. Increase the signal generator output by a further 34dB and again vary the frequency for 1mW output; check these frequencies with the SCR211. The specification figures are as follows:-

(a) Sensitivity at pin 6 of V2: 2.2 to 4.4mV

(b) Sensitivity at pin 6 of V1: 40 to 80µV

(c) Overall bandwidth, 6dB down: 3.5 to 4.5kc/s

(d) Overall bandwidth, 40dB down: not greater than 18kc/s.

B.F.O. range and gain

30. Remove the wattmeter from JK1 and insert a pair of headphones. Connect the signal generator No 12 via a 0.01µF capacitor to pin 6 of V1. Inject a c.w. signal at 470kc/s. Switch on the b.f.o. and set the control knob to zero. Adjust the core of L5 for zero beat in the headphones. Remove the phones, insert a jack plug and take the receiver output to the Y plates of the oscilloscope. Connect the signal generator, video frequency to X plates and check that the frequency range of the b.f.o. is ±10kc/s ±1kc/s.

31. Set the b.f.o. frequency to 1kc/s and connect the a.f. output to the wattmeter, adjust the signal generator, No 12 input level for 1mW a.f. output. Check that the ratio of this input to the i.f. sensitivity figure (para 29(b)) is not less than +12dB.

Calibration

32. Using the signal generator, No 12, crystal checked at 2Mc/s, 4Mc/s and 8Mc/s, the calibration is carried out as follows:- Set the signal generator to 2Mc/s, modulated 30% at 1kc/s. Connect the 75Ω terminal of the signal generator direct to the AE terminal, set the receiver dial to 2Mc/s and adjust L4 for maximum audio output. Set the signal generator to 4Mc/s (crystal checked) and the receiver dial to 4Mc/s. Adjust C9 for maximum output. Repeat until the calibration on Range 1 is within ±1% at all Mc/s points.

33. Using alignment frequencies of 4Mc/s and 8Mc/s repeat para 32 for Range 2, adjusting L3 at 4Mc/s and C7 at 8Mc/s.

R.F. alignment

34. The r.f. alignment is carried out at 2.2Mc/s and 3.6Mc/s on Range 1 and 4.4 and 7.3Mc/s on Range 2. The procedure is as follows:- Connect the signal generator to the AE terminal. Set the frequency to 2.2Mc/s (crystal checked) modulated 30% at 1kc/s. Tune the receiver to 2.2Mc/s and adjust L2 for maximum a.f. output. Tune the receiver and signal generator (crystal checked) to 3.6Mc/s, adjust C3 for maximum output. Repeat the above to ensure correct alignment. Switch to Range 2, and using alignment frequencies of 4.4 and 7.3Mc/s, adjust L1 and C2 respectively.

Sensitivity

35. Using frequencies of 2, 3 and 4Mc/s for Range 1; and 4, 6 and 8Mc/s for Range 2, check the r.f. sensitivity at maximum gain for 1mW output (see Table 1). Having done this, check the i.f. rejection, signal-to-noise ratio and image rejection as in para 36-38.

I.F. rejection

36. Connect the signal generator, set to 2Mc/s and modulated 30% at 1kc/s, to the AE terminal. Tune the receiver to 2Mc/s and adjust the signal generator output level until the wattmeter indicates 1mW. Set the generator to 470kc/s and increase the output level until the wattmeter again indicates 1mW. The signal generator level should be greater than 50dB above the r.f. sensitivity figure.

Signal-to-noise

37. Connect the multimeter electronic (V.V.) across the a.f. wattmeter, ensuring that the earth terminal on the V.V. is connected to the earthy side of the wattmeter. Set the V.V. to the 10V range and the gain control to maximum. Adjust the signal input for 1mW on the a.f. wattmeter and note the V.V. deflection; call this (V1). Switch off the modulation and note the new V.V. deflection; call this (V2). Using the formula $dB = 20 \, Log_{10} \frac{V1}{V2}$ calculate signal-to-noise ratio; it should exceed 15dB at all frequencies in Table 1.

Image rejection

38. Setting the receiver and signal generator (connected as in para 33) to the frequencies shown in Table 1 in turn, adjust the input level to give 1mW output. Tune the signal generator to the Mc/s point +940kc/s (twice the i.f.) and increase the signal generator level until 1mW output is again achieved. Check that this increase exceeds the figure given in Table 1.

Mc/s	Sensitivity µV	Image rejection dB
2	15	>29
3	15	>24
4	15	>19
4	40	>26
6	40	>20
8	40	>18

Table 1 - R.F. sensitivity figures and image rejection

TRANSMITTER

Alignment of p.a. circuit

39. Set S4 to TX1. Connect either the h.t. wattmeter on the 50Ω range, or the 500Ω resistor and V.V. across the AE and E terminals. Using crystal frequencies of 2Mc/s and 4Mc/s adjust the core of L1 for the least calibration error at the band edges. Adjust AE LOAD for maximum output in each case.

40. Set SA to TX2 and repeat procedure for frequencies of 4Mc/s and 8Mc/s, adjusting the core of L2. Check that the circuits tune through the band edge frequencies.

Performance

41. Connect the h.f. wattmeter across the AE and E terminals. Set SB to 1 and SA to TX1. Using crystal frequencies of 2Mc/s, 3Mc/s and 4Mc/s check that the r.f. output is at least 800mW.

42. Set SA to TX2 and, using crystal frequencies of 4Mc/s, 6Mc/s and 8Mc/s, check that the r.f. output is at least 750mW.

43. Alternatively, connect a 500Ω resistor in place of the h.f. wattmeter and set SB to 3 and SA to TX1. Connect the V.V. across the 500Ω resistor and, using crystal frequencies of 2Mc/s, 3Mc/s and 4Mc/s check that V.V. deflection exceeds 20.5V. Repeat at frequencies of 4Mc/s, 6Mc/s and 8Mc/s, with SA at TX2; V.V. deflection should be at least 19.5V. Check that an output is indicated for all settings of the AE tapping switch SB.

AE matching

44. The output impedances for both bands for each position of the AE tap switch SB should be checked using a range of known value resistors or a potentiometer. The approximate values required for maximum power output are:-

TAP	1	2	3	4	5	6	7
IMPEDANCE (Ω)	50	180	500	1k	1.6k	2k	5k

Netting

45. Switch on the b.f.o. Set SA on the transmitter to both RX positions in turn. Operate the NET button and check that it is possible to tune the receiver to the crystal frequency.

Note: The next page is Page 1001

Table 2001 - Receiver, component schedule

Cct. ref.	Location: Circuit Diagram	Location: Layout Diagram	Value (Ω)	Tol (±%)	Rating (W)
RESISTORS					
R1	01D5	03E2	1M	10	0.25
R2	01E5	03E2	22k	10	0.25
R3	01F2	03E2	180k	10	0.25
R4	01G2	03F2	33k	10	0.25
R5	01H2	03B2	47k	10	0.25
R6	01H3	03C2	47k	10	0.25
R7	01J6	03D2	1M	10	0.25
R8	01J4	03C2	470k	10	0.25
R9	01J4	03C2	3.3M	10	0.25
R10	01J2	03C3	1M	10	0.25
R11	01J2	03C3	4.7M	10	0.25
R12	01K3	03C2	10M	10	0.25
R13	01J5	03B3	1M	10	0.25
R14	01K2	03B2	47k	10	0.25
R15	01L2	03C3	330k	10	0.25
R16	01M5	03B2	47k	10	0.25
R17	01M6	03F3	330k	10	0.25
R18	01N1	03B1	1k	5	0.25
R19	01M5	03F3	33k	10	0.25
R20	01M5	03E3	270	5	0.25
RV1	01N5	03F3	10k pot		

Cct. ref.	Location: Circuit Diagram	Location: Layout Diagram	Value (μF)	Tol (±%)	Rating (V)
CAPACITORS					
C1	01A4	04A3	1500P	20	500
C2	01B4	04B3	5-30P		350
C3	01B5	04B3	5-30P		350
C4	01D4	03E2	100P	5	350
C5	01E4	03E2	100P	5	350
C6	01F2	03E2	0.01	20	150
C7	01F4	04B2	5-30P		350
C8	01F4	03E3	1820P	2	350
C9	01F5	04B2	5-20P		350
C10	01F5	03F1	853P	2	350

Table 2001 - (cont)

Cct. ref.	Location		Value (μF)	Tol (±%)	Rating (V)
	Circuit Diagram	Layout Diagram			
CAPACITORS - (cont)					
C11	01G5	03E2	0.01	20	150
C12	01G5	03C2	0.01	20	150
C13	01H6	03C1	0.001	20	350
C14	01H5	03C2	100P	5	350
C15	01H5	03C2	0.001	20	400
C16	01J4	03C2	0.003	20	400
C17	01J5	03C3	0.01	20	150
C18	01K3	03C3	1.5P	±0.25P	750
C19	01K4	03C3	0.001	20	350
C20	01K5	03B3	0.01	20	150
C21	01L2	03B2	0.001	20	350
C22	01L2	03A2	0.1	20	150
C23	01L5	03B3	0.01	20	150
C24	01L4	04E3	100P	5	350
C25	01M4	03B3	47P	10	750
C26	01M6	03E2	0.01	20	150
C27	01M2	03D3	2	+50-20	150
C28	01L5	03B2	0.1	20	150
C29	01J2	03C3	47P	5	350
VC1	01D5	04D3	180P swing		
VC2	01E5	04D2	180P swing		
VC3	01M5	04F3	0-15P		

Cct. ref.	Location		Description
	Circuit Diagram	Layout Diagram	
INDUCTANCES			
L1	01B4	04C3	RF coil 4-8Mc/s
L2	01B5	04A3	RF coil 2-4Mc/s
L3	01F4	04C2	Oscillator coil 4-8Mc/s
L4	01F5	04B2	Oscillator coil 2-4Mc/s
L5	01M4	04E3	B.F.O. coil
L6	01K2	03B2	Low frequency choke 35H

Table 2001 - (cont)

Cct. ref.	Location		Description
	Circuit Diagram	Layout Diagram	
VALVES			
V1	01D4	04C2	DK96 heptode
V2	01M4	04E2	CV785 variable-mu pentode
V3	01J4	C4E3	DAF96 diode pentode
V4	01L4	04E3	DF96 r.f. pentode
V5	01M4	04F3	DF96 r.f. pentode
MISCELLANEOUS			
SA1a	01C4	)	)
SA1b	01C5	)04B3	)
SA1c	01B4	)	) Switch, rotary wafer, 2 bank, 6 pole, 2 way
SA2a	01F4	)	)
SA2b	01F5	)04B2	)
SA2c	01G4	)	)
T1	01E3	04D2	Transformer, i.f., 470kc/s
T2	01H3	04E2	Transformer, i.f., 470kc/s
PL1	0102	C4G3	Plug, electrical, 8 pole
SKT1	05M4		Socket, electrical, 8 pole
JK1	C1M3	03B3	Jack, telephone
AE	01A3	04B4	Terminal lug

Table 2002 - Transmitter, component schedule

Cct. ref.	Location		Value (Ω)	Tol (±%)	Rating (W)
	Circuit Diagram	Layout Diagram			
RESISTORS					
R1	05B6	07B3	27k	5	0.25
R2	05D2	07C3	33k	5	0.25
R3	05D5	07C2	6.8k	10	0.5
R4	05E6	07B1	22k	5	0.25
R5	05L6	06B2	1.2k	10	0.25
R6	05L6	06C2	2.2k	10	0.25

Table 2002 - (cont)

Cct. ref.	Location		Value (μF)	Tol (±%)	Rating (V)
	Circuit Diagram	Layout Diagram			
CAPACITORS					
C1	05B4	07B3	300p	10	350
C2	05B6	07B3	60p	10	750
C3	05D2	07C3	0.01	20	350
C4	05E2	07C2	0.01	20	350
C5	05D4	07B2	100p	5	350
C6	05D6	07D2	0.1	20	350
C7	05D6	07B2	0.1	20	350
C8	05F3	07C1	0.002	20	350
C9	05M5	06C2	4.7p	10	750
C10	05M6	06B2	30p	±1.5p	750
VC1	05F6	07E3	150p var.		

Cct. ref.	Location		Description
	Circuit Diagram	Layout Diagram	
MISCELLANEOUS			
V1	05C5	06F2	CV1758 r.f. pentode
V2	05E5	06F1	CV2390 output pentode
RFC1	05C3	07C3	Radio frequency choke, 2mH
RFC2	05E3	07C2	Radio frequency choke, 350μH
L1	05H6	06E2	P.A. coil, 2-4Mc/s
L2	05K6	06E3	P.A. coil, 4-8Mc/s
PL2	05M2/6	06F3	Plug, electrical, 9 pole
JK1	05C1	07B4	Jack, telephone
JK2	05H1	06F3	Jack, telephone
SA1	05G5	07D3	)
SA2	05G5	07D3	)
SA3	05G3	07D2	) Switch, 5 pole, 9 way
SA4	05G4	07D2	)
SA5	05G6	07D1	)
SB1	05J6	06D3	} Switch, 2 pole, 7 way
SB2	05K6	06D2	}
SC	05K1	06E3	Switch, single pole
SD	05G8	06A3	Switch, push button

Table 2002 - (cont)

Cct. ref.	Location		Description
	Circuit Diagram	Layout Diagram	
MISCELLANEOUS - (cont)			
M1	05L6	06C3	Meter, indicating, 500μA f.s.d.
ILP1	05G1		Lamp, indicating
MR1	05L6	06B2	Rectifier, selenium, 280-LU-1457A
MR2	C5M6	06B2	Semiconductor device, diode CV425
SKT1	05M5		Socket, electrical, 8 pole
SKT2	05M2/6		Socket, electrical, 9 pole
SKT3	05A4	07B3	Socket, crystal, 2 pole
MK1	05B1		Key, telegraph
B1	0507		Battery, dry, 67.5V (4 off)
A1	05N3		Battery, dry, 1.5V
A2	05N3		Battery, dry, 1.5V

Measurements are made using an Avo, model 9SX or 8S					
Electrodes	V1	V2	V3	V4	V5
Anode	78-92	78-92	35-45	74-88	22-28
Screen (G2)	28-35	54-66	21-30	56-69	-
Grid 4	44-55	-	-	-	-

Table 2003 - Receiver voltage measurements

Tests are made with Avo, model 9SX or 8S The keyed condition is with the transmitter tuned to a frequency of 3Mc/s and loaded with 500Ω		
Test point	Keyed	Unkeyed
V1 Anode and screen	50 ±5V	50 ±5V
V2 Anode	135V ±5V	135 ±5V
V2 Screen	80 ±5V	0
H.T. consumption	25mA	2mA

Table 2004 - Transmitter voltage and current measurements

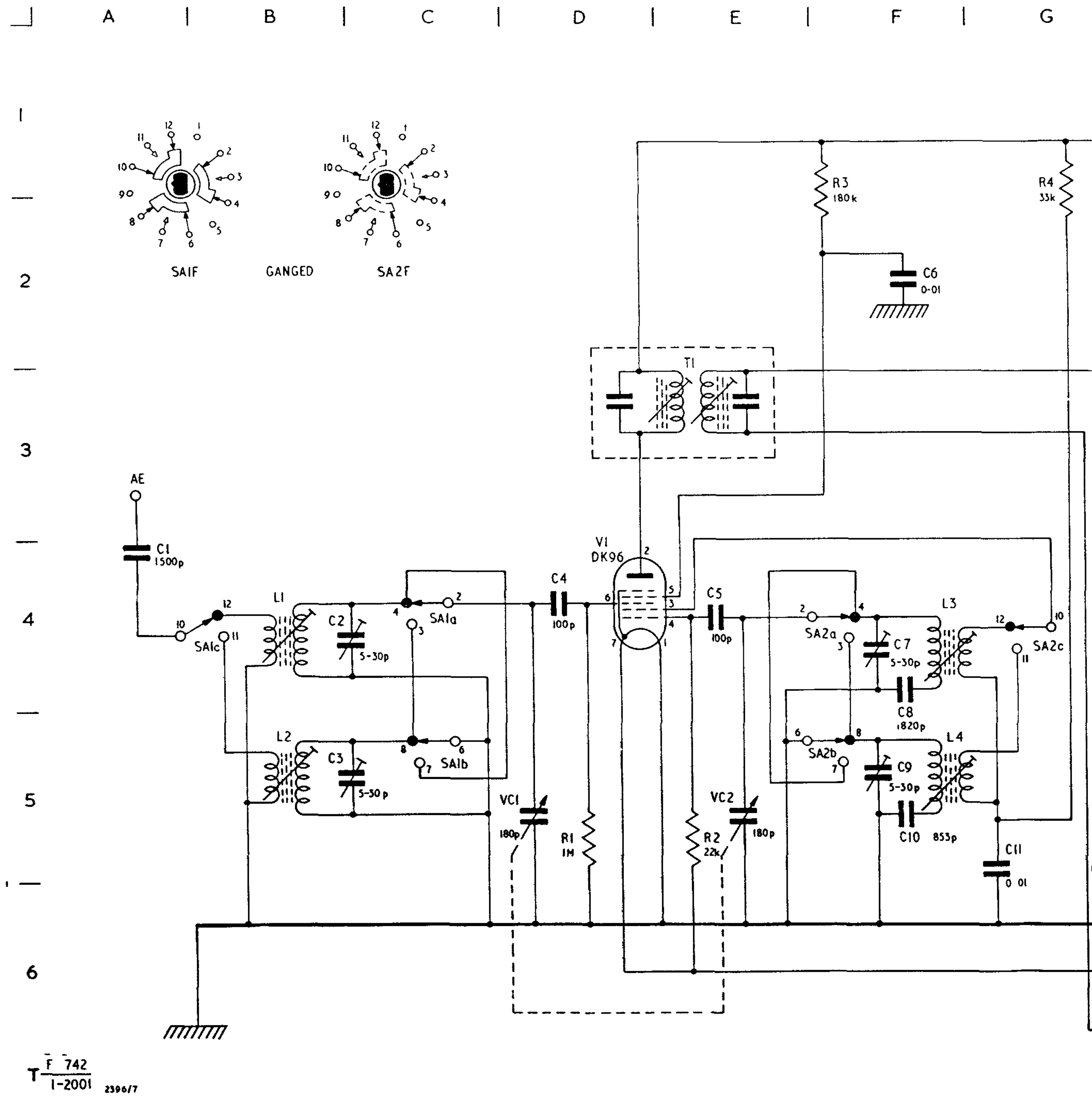
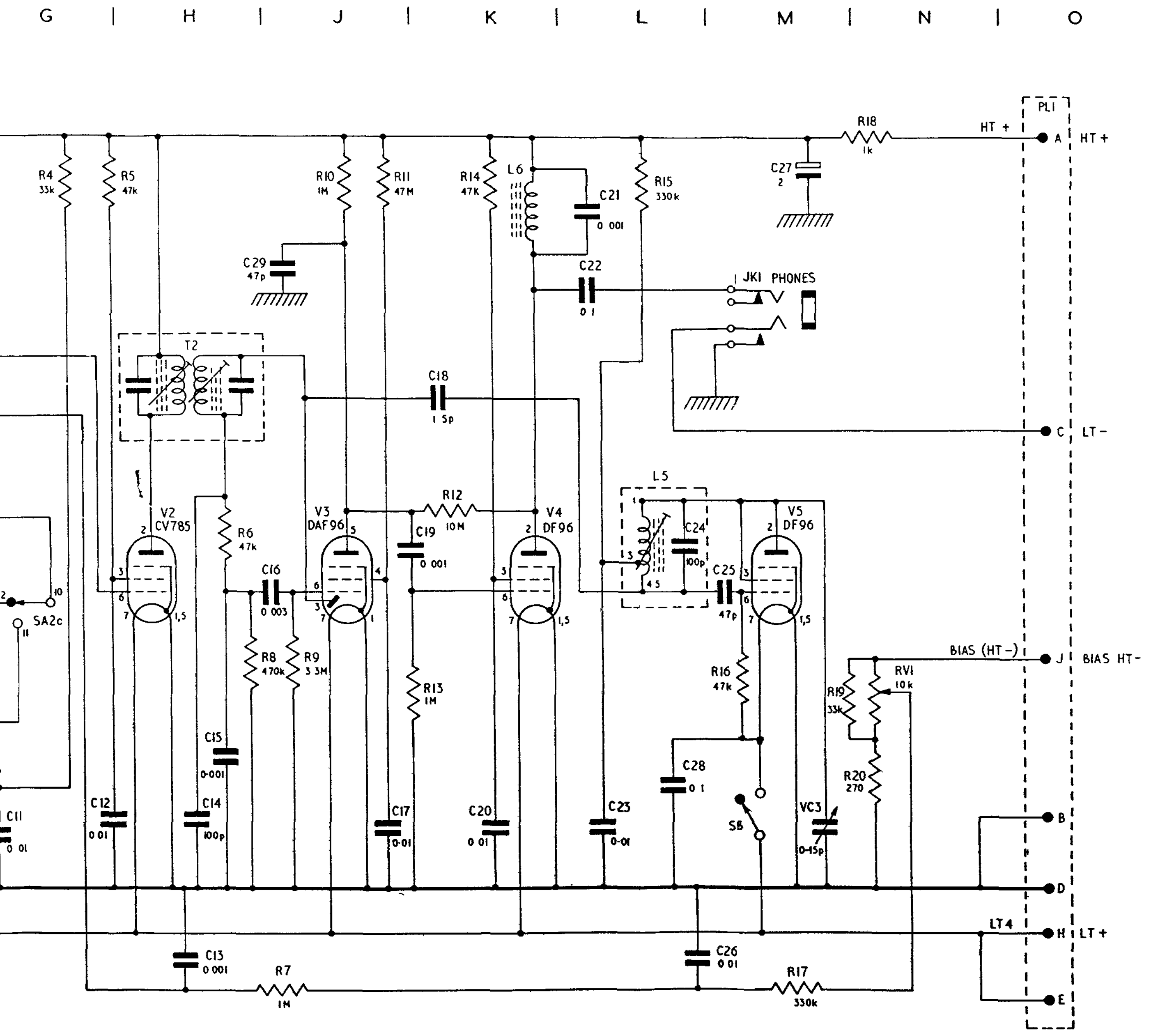
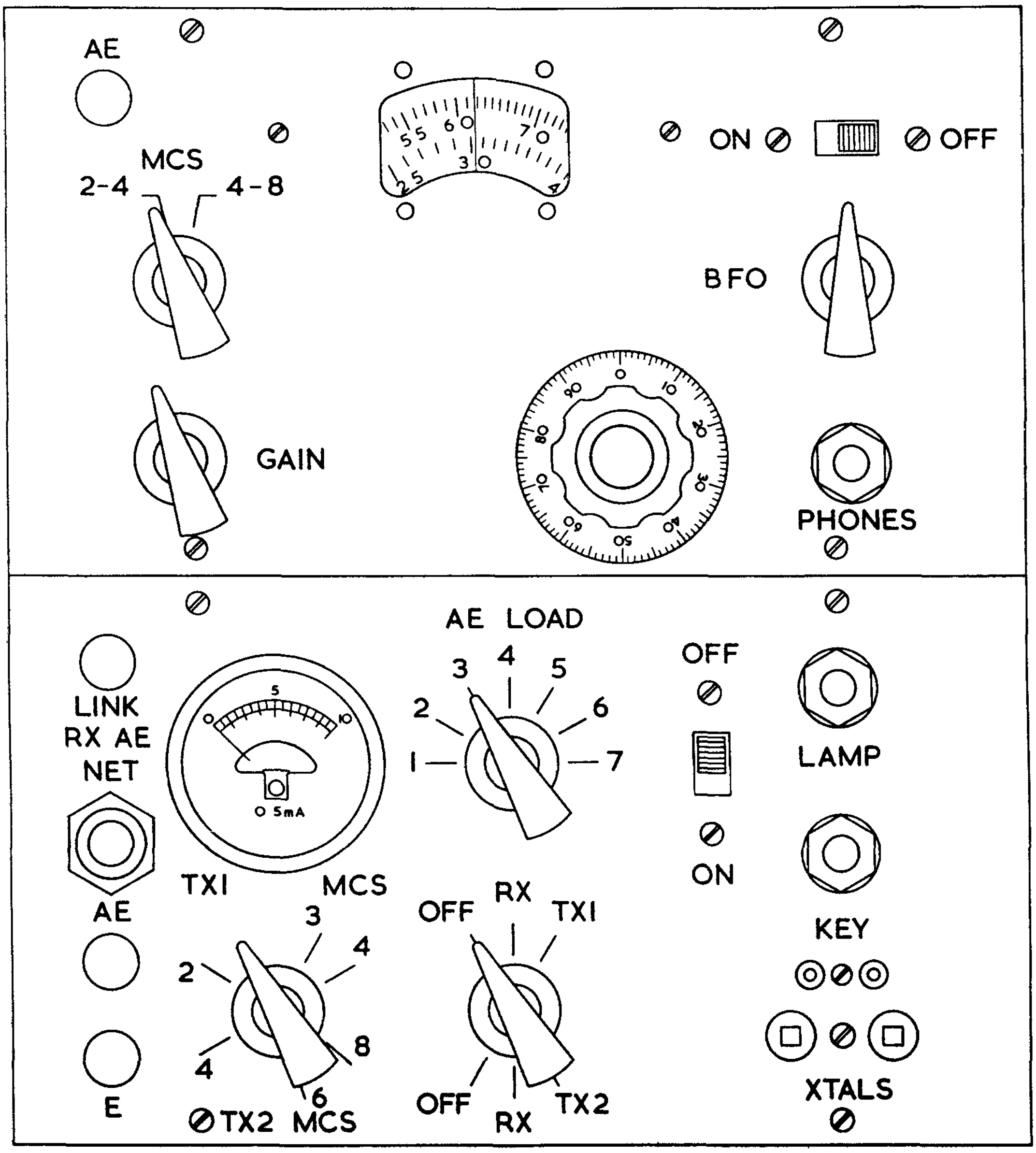


Fig 2001 - Recei



– Receiver, circuit diagram



T F 742 / 1-2002 2390/5

Fig 2002 - Transmitter and receiver, front panel

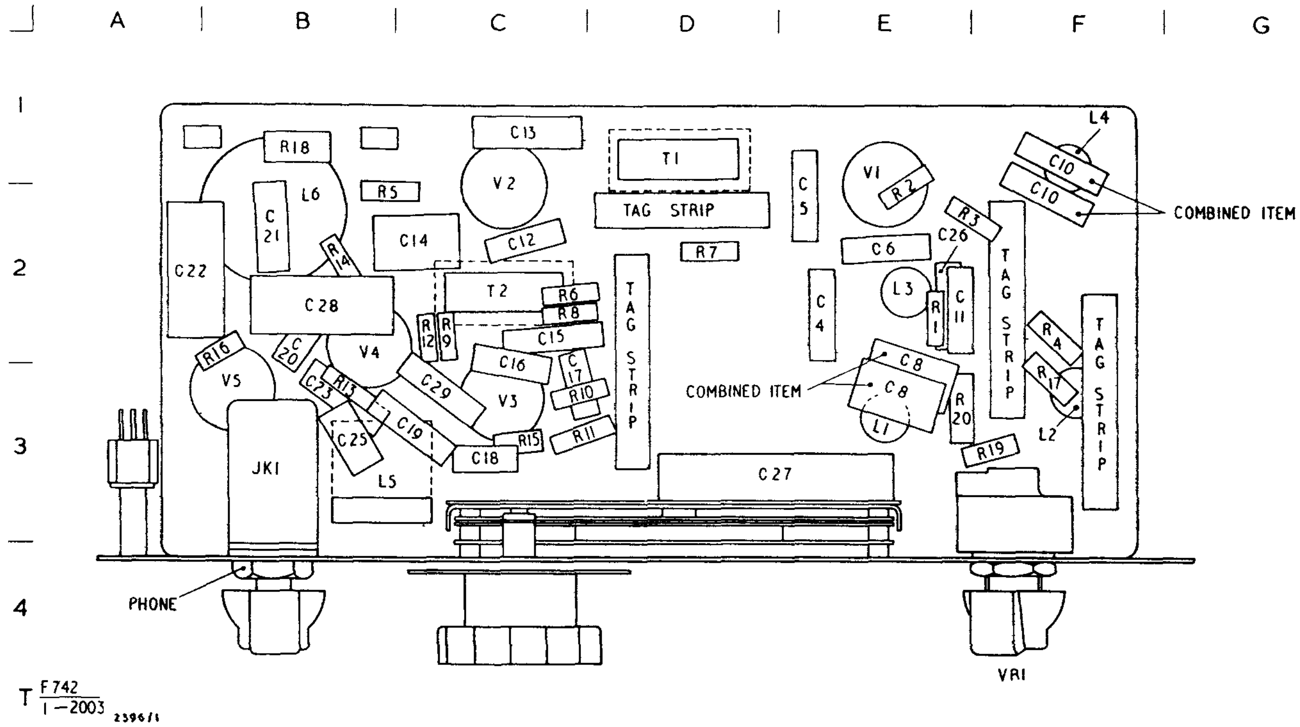


Fig 2003 - Receiver, component layout (underside)

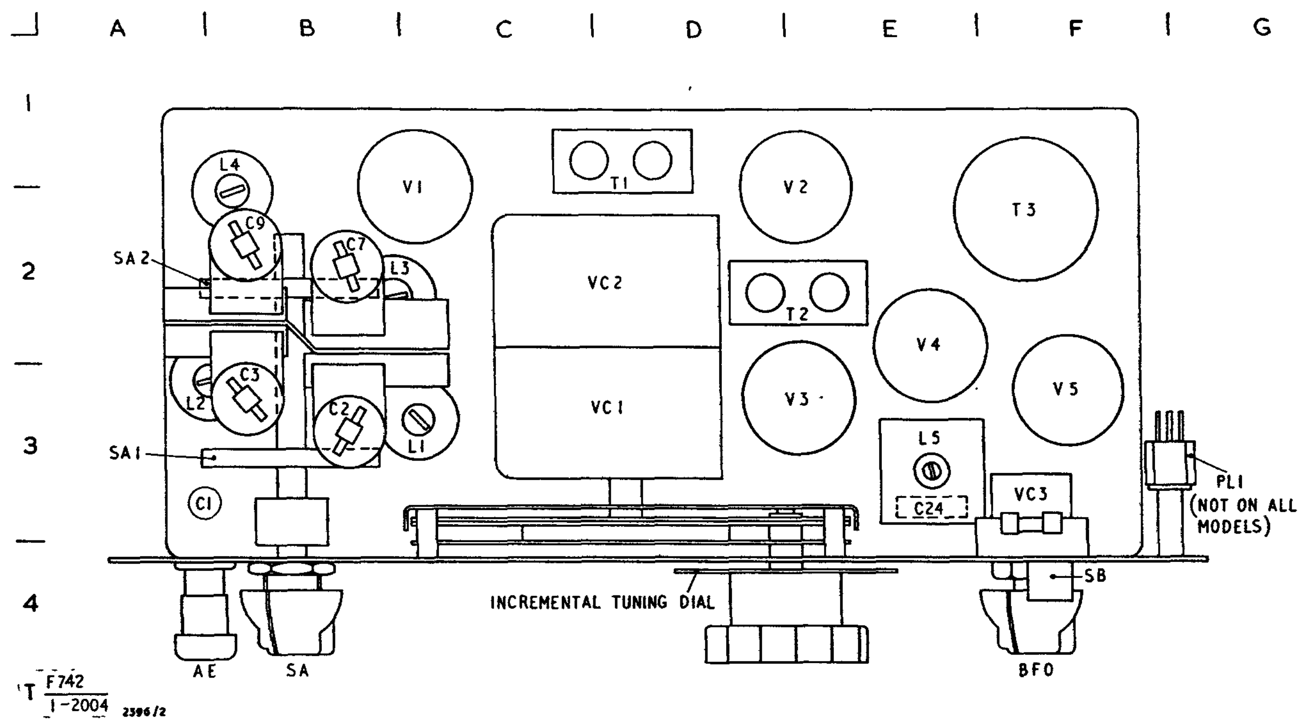
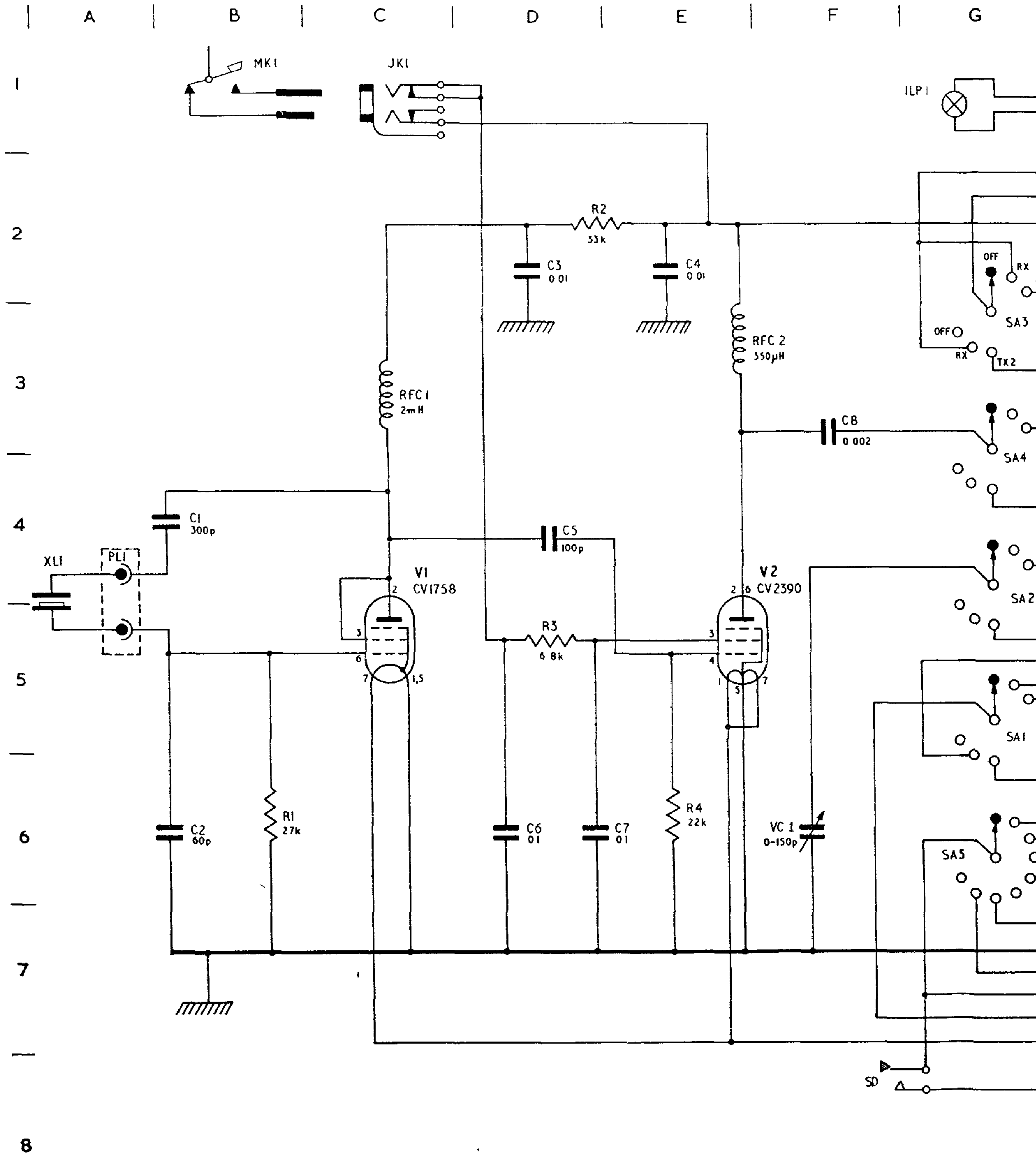
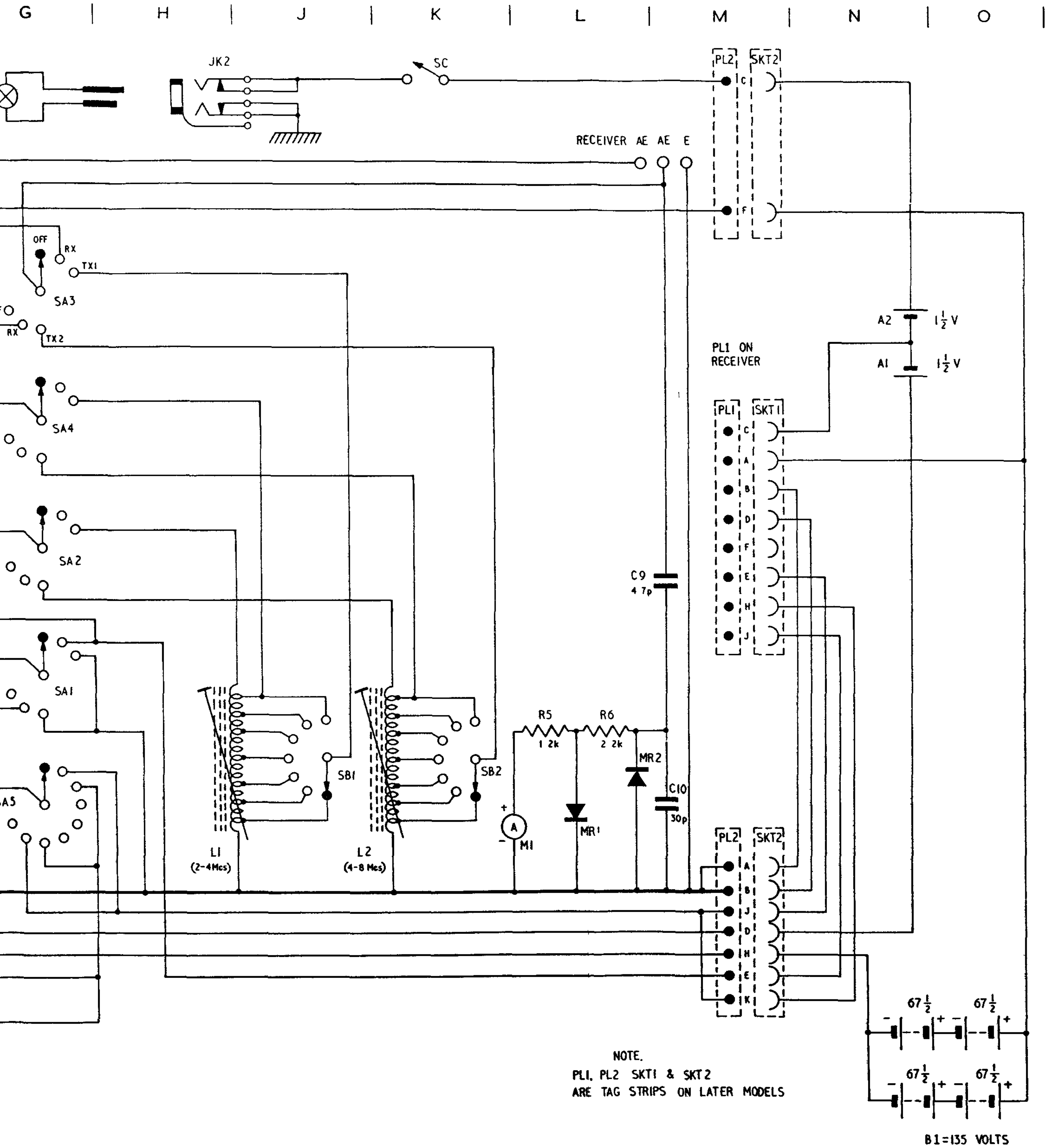


Fig 2004 - Receiver, component layout (top)



T F 742 / I-2005 A 2396/15

Fig 2005a – Transmi



NOTE.
PL1, PL2 SKT1 & SKT2
ARE TAG STRIPS ON LATER MODELS

Transmitter, circuit diagram

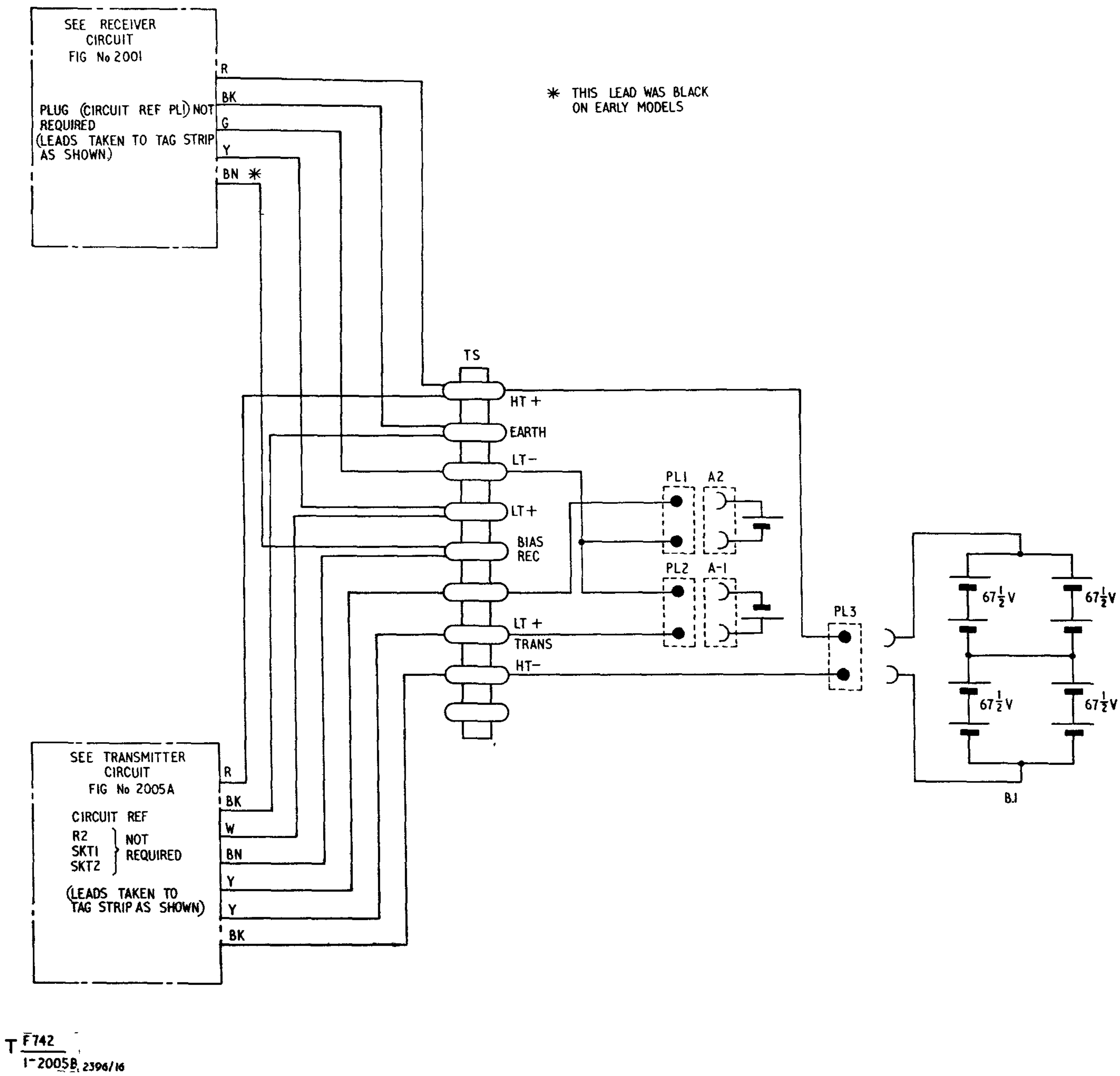


Fig 2005b - Modification to battery circuit on 128A

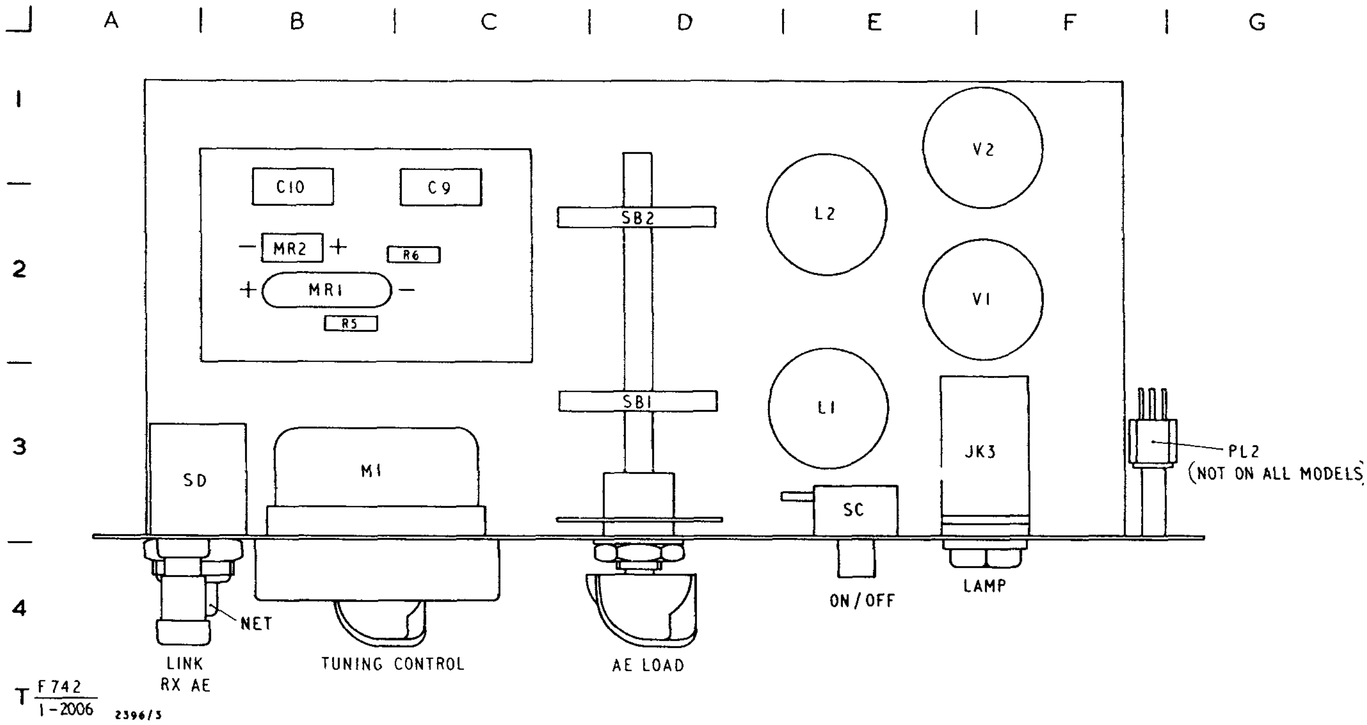


Fig 2006 - Transmitter, component layout (top)

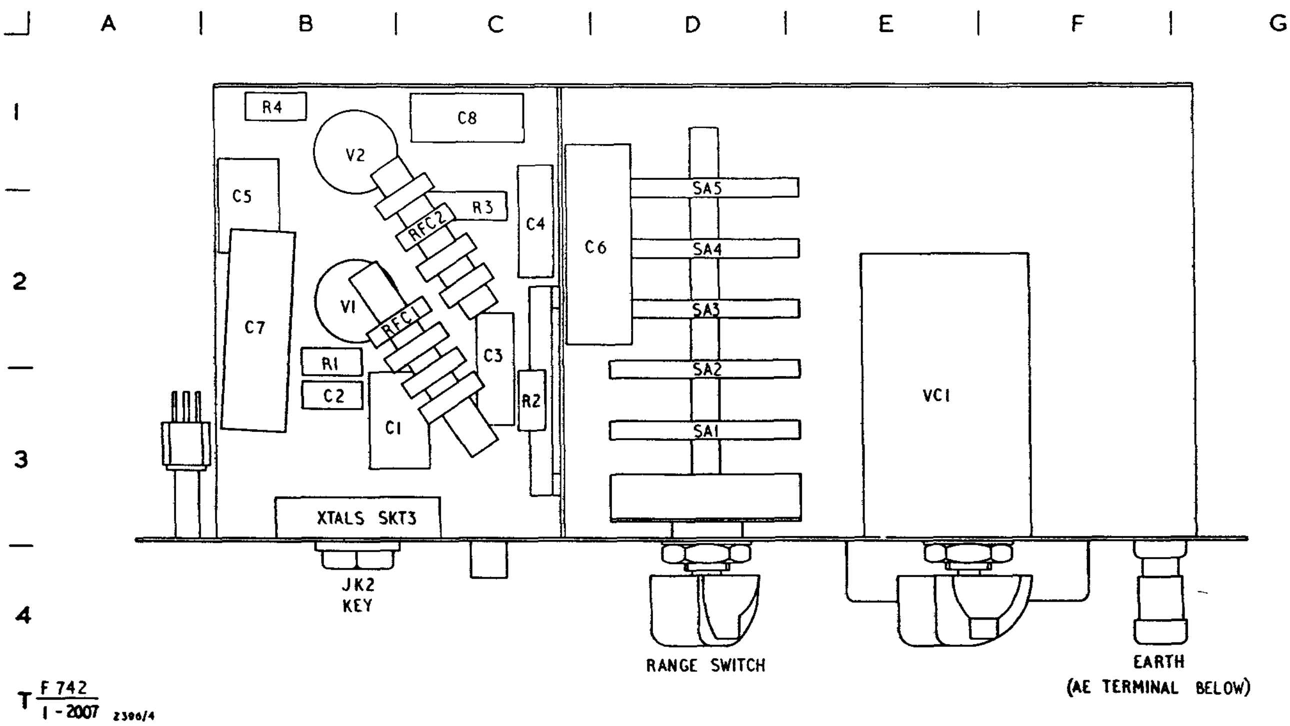
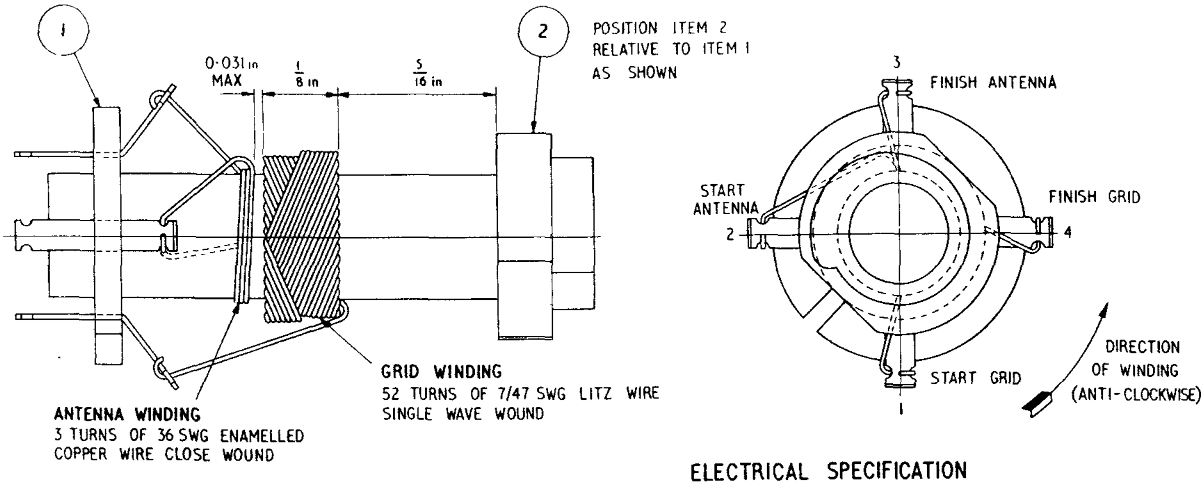


Fig 2007 - Transmitter, component layout (underside)



FINISH – OVEN DRIED FOR ½ HOUR AT 85°C AND IMMEDIATELY BRUSHED WITH IMPREGNATING VARNISH VAOS 8010 - 99 - 942 - 3116

AIR DRIED FOR 2HRS AND FINALLY STOVED FOR 2HRS AT 105°C

ELECTRICAL SPECIFICATION

COIL WITHOUT CORE

GRID TUNED WINDING

SELF CAPACITY 8·75p

INDUCTANCE 24 μH ± 3%

AERIAL COUPLING WINDING

INDUCTANCE 0·185 μH

BOTH WINDINGS

SERIES AIDING INDUCTANCE 25 μH ± 3%

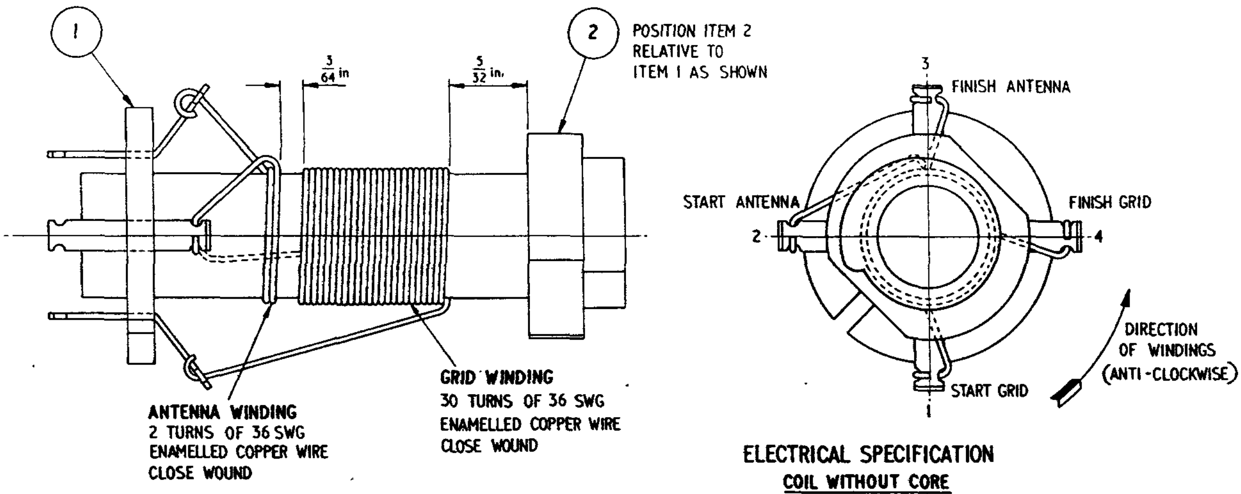
COIL WITH CORE

TUNE COIL WITH 50p FOR Q READING AT 4 Mc/s

Q > 60

T F 742 / 1 - 2008 2390/10

Fig 2008 – R.F. coil, 2-4Mc/s



FINISH:– OVEN DRIED FOR ½ HOUR AT 105°C AND IMMEDIATELY BRUSHED WITH IMPREGNATING VARNISH VAOS 8010 -99 -942 -3116

AIR DRIED FOR 2 HRS. AND FINALLY STOVED FOR 2 HRS AT 105°C

ELECTRICAL SPECIFICATION

COIL WITHOUT CORE

GRID TUNED WINDING

SELF CAPACITY 2·3p

INDUCTANCE 4·7μH ± 3%

AERIAL COUPLING WINDING

INDUCTANCE 0·145μH

BOTH WINDINGS

SERIES AIDING INDUCTANCE 5·0μH ± 3%

COIL WITH CORE

TUNE COIL WITH 50p FOR Q READING AT 8 Mc/s

Q > 60

T F 742 / 1 - 2009 2396/11

Fig 2009 – R.F. coil, 4-8Mc/s

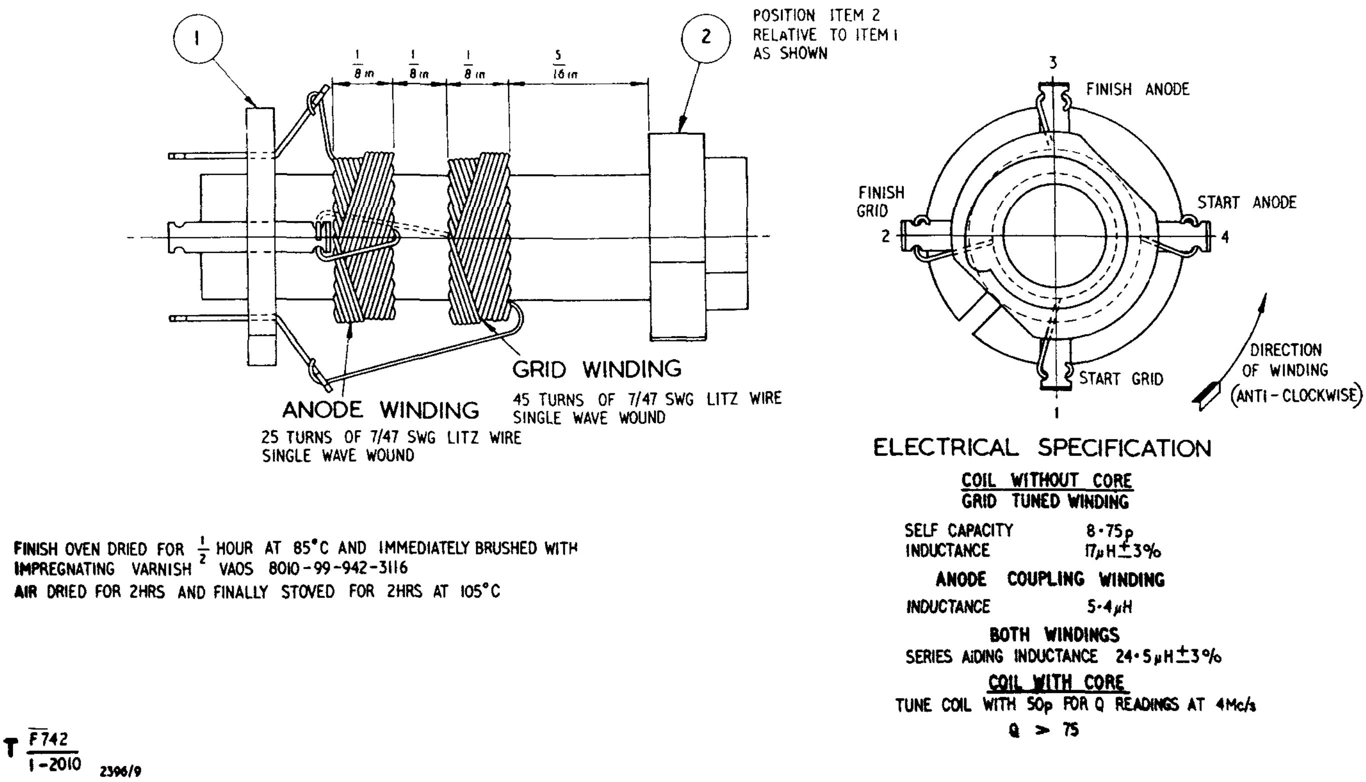


Fig 2010 - Oscillator coil, 2-4Mc/s

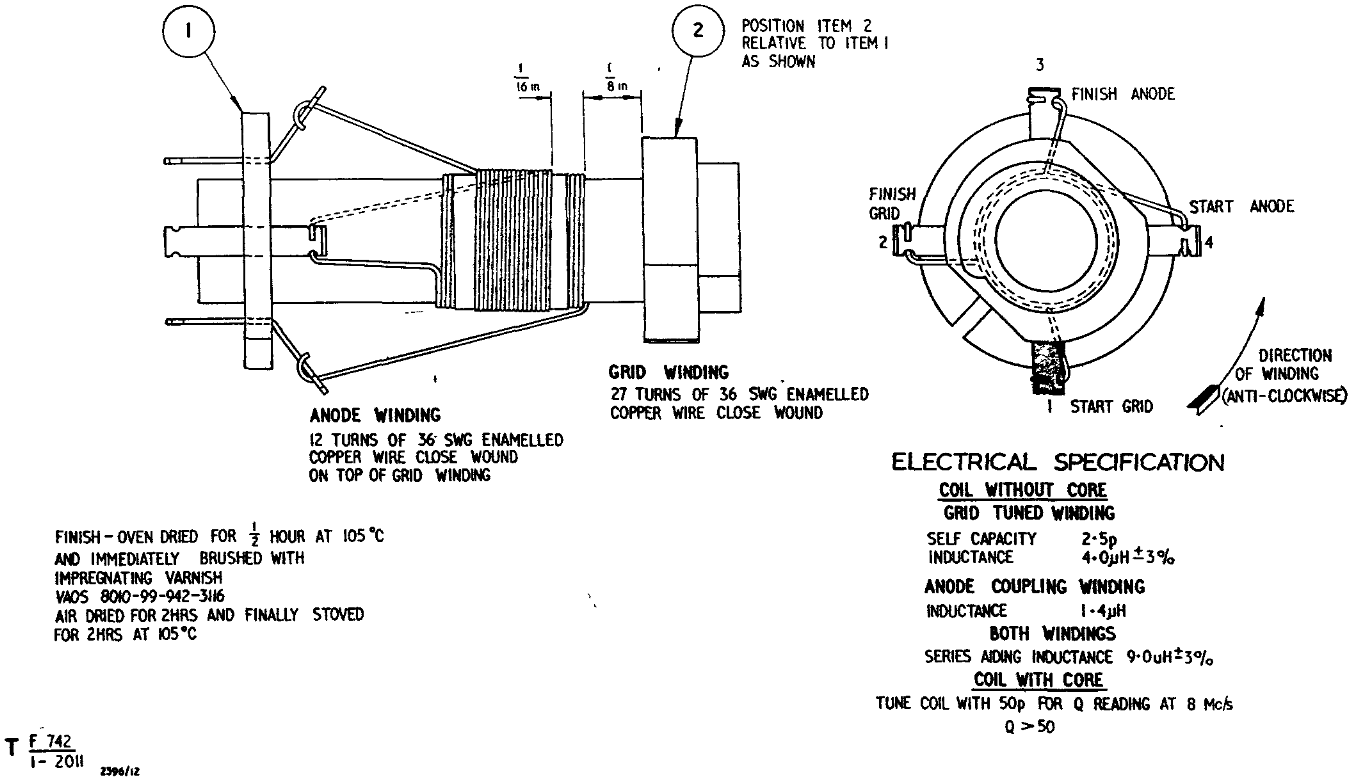
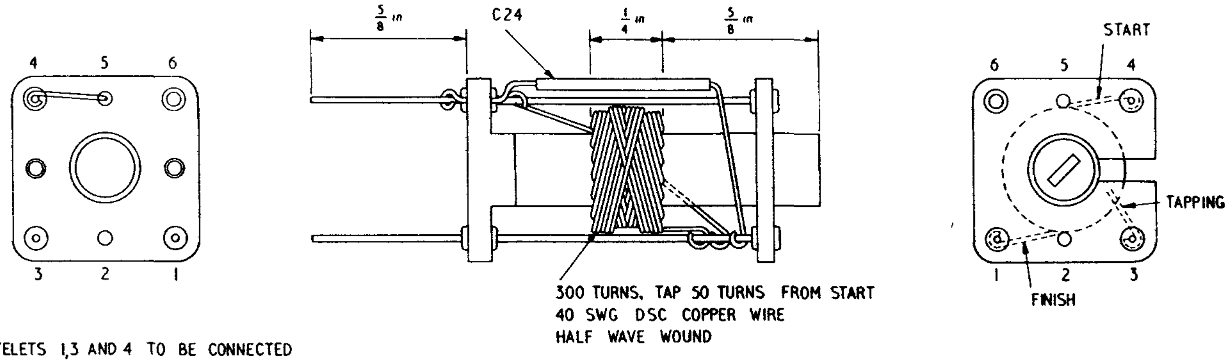


Fig 2011 - Oscillator coil, 4-8Mc/s



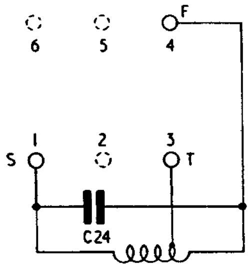
EYELETS 1,3 AND 4 TO BE CONNECTED TOGETHER WITH 18 SWG TINNED COPPER WIRE TO FORM 3 POSTS AND TO PROJECT AS SHOWN

FINISH~ OVEN DRIED FOR ½ HOUR AT 85°C AND IMMEDIATELY BRUSHED WITH IMPREGNATING VARNISH VAOS 8010-99-942-3116

AIR DRIED FOR 2 HRS AND FINALLY STOVED FOR 2 HRS AT 105°C

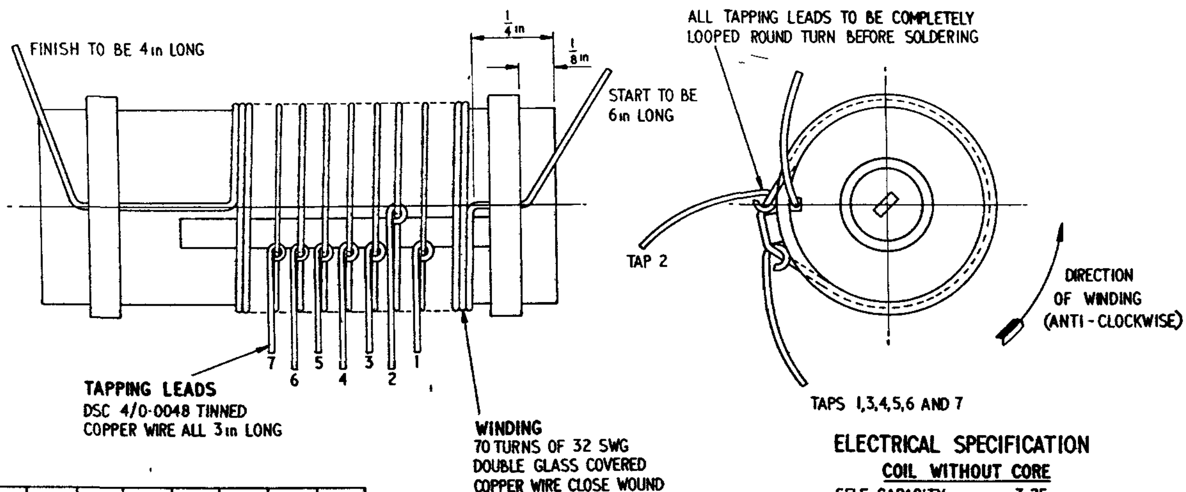
ELECTRICAL SPECIFICATION

COIL WITHOUT CORE AND CAPACITOR DISCONNECTED
SELF CAPACITY 7·5p
COMPLETE COIL
INDUCTANCE 645 µH ± 3%
TAP TO FINISH
INDUCTANCE 480 µH ± 3%
Q AT 250p > 35
DC RESISTANCE 14·25 Ω



T F 742 / 1-2012 2396/8

Fig 2012 - B.F.O. coil



TAPPING LEADS
DSC 4/0·0048 TINNED COPPER WIRE ALL 3in LONG

WINDING
70 TURNS OF 32 SWG DOUBLE GLASS COVERED COPPER WIRE CLOSE WOUND

TAPPING	1	2	3	4	5	6	7
TURNS FROM START	6	11	15	20	28	36	45

FINISH~ OVEN DRIED FOR ½ HOUR AT 105°C AND IMMEDIATELY BRUSHED WITH IMPREGNATING VARNISH, VAOS 8010-99-942-3116

AIR DRIED FOR 2 HRS AND FINALLY STOVED FOR 2 HRS AT 105°C

ELECTRICAL SPECIFICATION

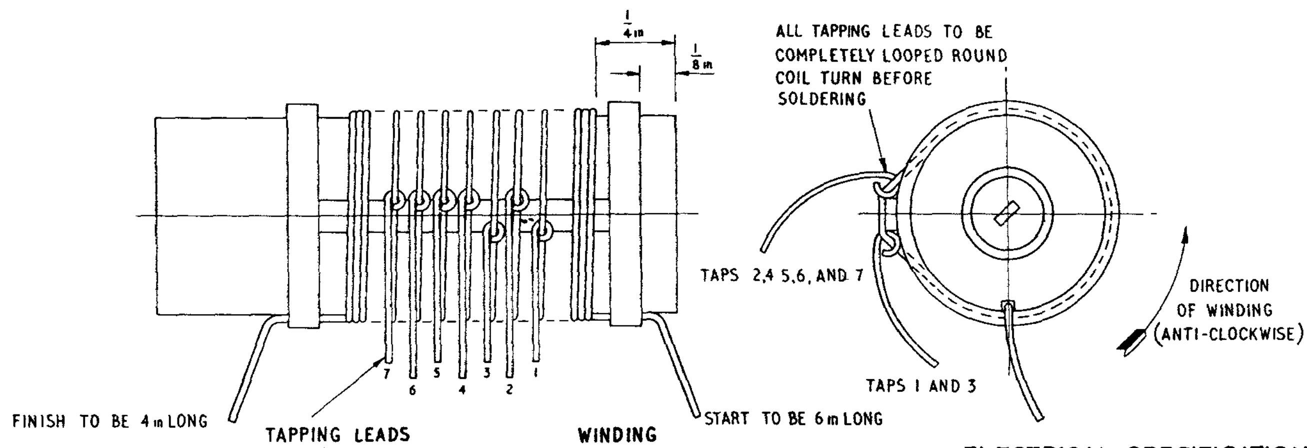
COIL WITHOUT CORE
SELF CAPACITY 3·25p
INDUCTANCE 46µH ± 3%
Q > 100

COIL WITH CORE
INDUCTANCE { CORE AT TOP 55µH ± 3%
CORE AT BOTTOM 62µH ± 3% }

NOTE COIL SHOULD RESONATE AT 3Mc/s WITH CAPACITOR SETTING BETWEEN 55 AND 59p

T F 742 / 1-2013

Fig 2013 - Antenna coil, transmitter, 2-4Mc/s



TAPPING LEADS
DSC 4/0 0045 TINNED COPPER WIRE ALL 2 in LONG

TAPPING	1	2	3	4	5	6	7
TURNS FROM START	2¾	4¾	6¾	8¾	12¾	15¾	19¾

WINDING
30 TURNS OF 22 SWG DOUBLE GLASS COVERED COPPER WIRE CLOSE WOUND

FINISH-OVEN DRIED FOR ½ HOUR AT 105°C AND IMMEDIATELY BRUSHED WITH IMPREGNATING VARNISH VAOS 8010-99-942-311

AIR DRIED FOR 2 HRS AND FINALLY STOVED FOR 2 HRS AT 105°

ELECTRICAL SPECIFICATION

COIL WITHOUT CORE
SELF CAPACITY 3 8p
INDUCTANCE 11 3μH
Q > 150

COIL WITH CORE
INDUCTANCE { CORE AT TOP 10 5 μH ± 3%
CORE AT BOTTOM 11 25μH ± 3% }

NOTE - COIL SHOULD RESONATE AT 6 Mc/s WITH CAPACITOR SETTING BETWEEN 73 AND 77p

T F 742 / 1-2014 2396/13

Fig 2014 - Antenna coil, transmitter, 4-8Mc/s

EME/8c/2396

END

For Editors Working Set 3368.

STATION, RADIO, 128 AND 128A

FORWARD CODING

Note: The following list of Assembly Codes must be used in conjunction with EMER Mgmt J 021 Part 4.

Assembly code	Designation
0001	Complete station (less transmitter and receiver)
0002	Transmitter
0003	Receiver

END

Distribution - Class 335. Code No Special

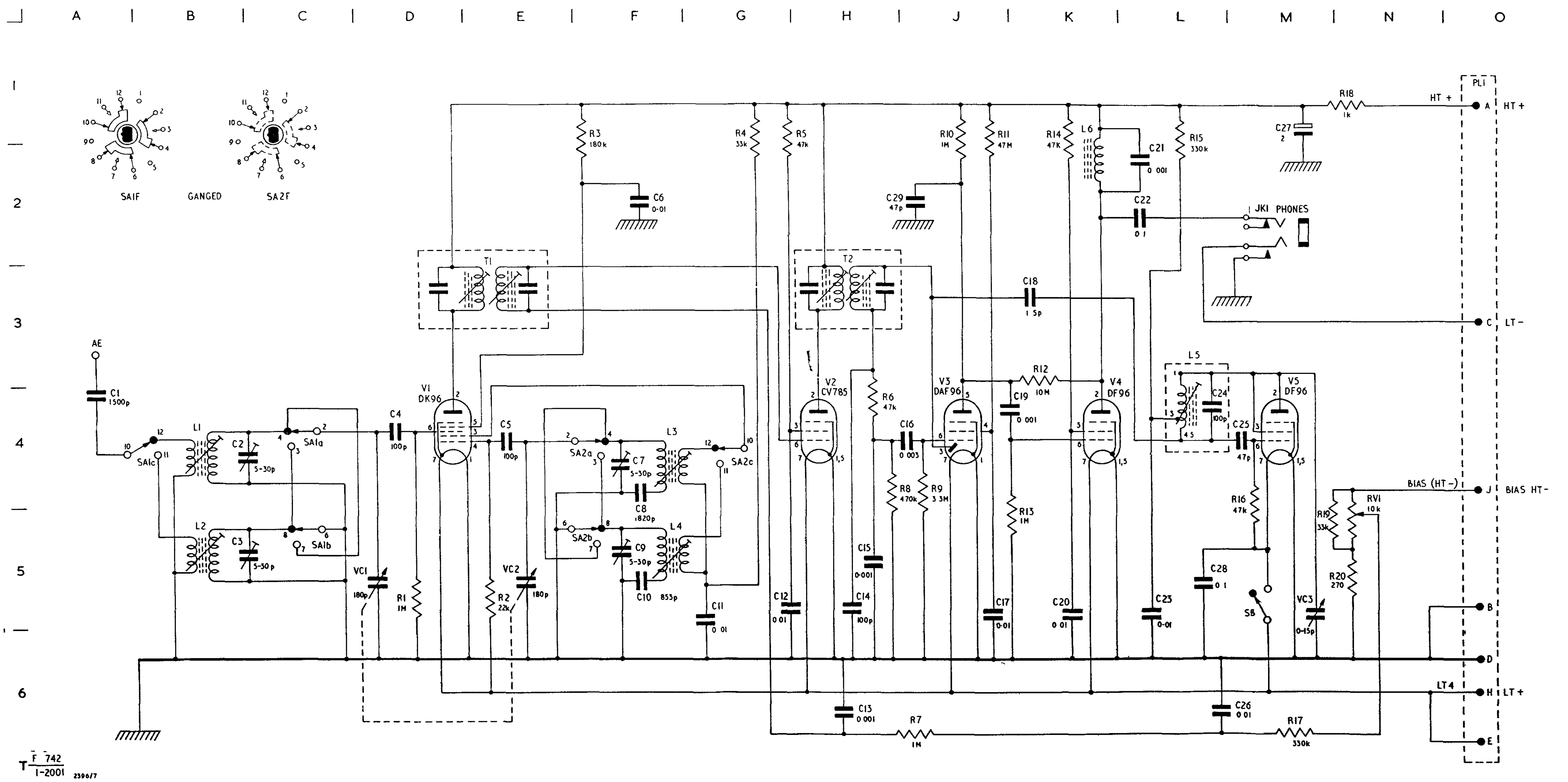


Fig 2001 - Receiver, circuit diagram

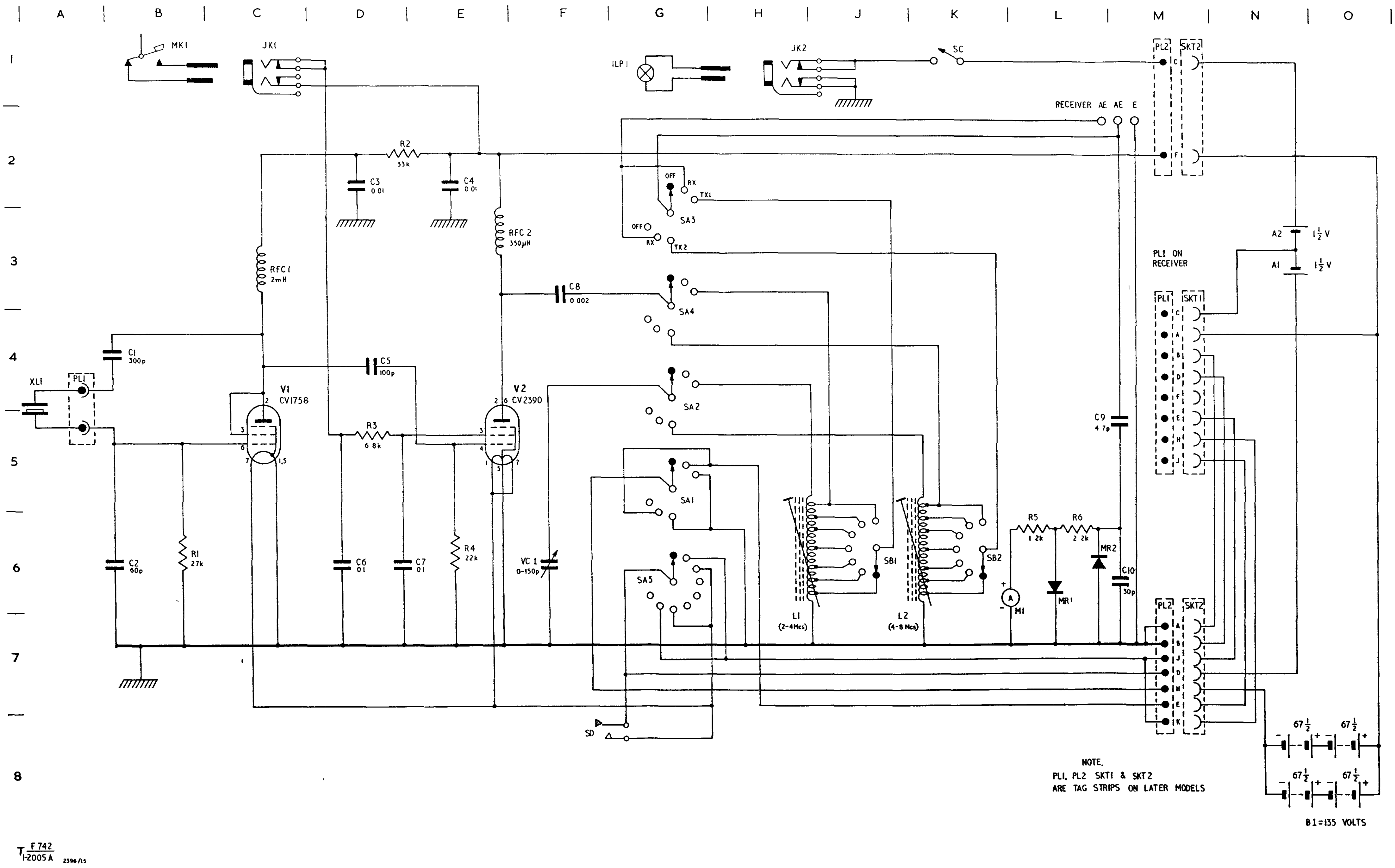


Fig 2005a – Transmitter, circuit diagram