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

TELECOMMUNICATIONS
E 772

RECEPTION SETS AR88D AND AR88LF

TECHNICAL HANDBOOK - TECHNICAL DESCRIPTION

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INTRODUCTION

1. The Reception sets AR88D and AR88LF are high grade, superheterodyne, general purpose communication receivers. They are designed for C.W., M.C.W. and R.T. reception and will withstand wide climatic and line voltage variations without appreciable loss of performance.

2. Both receivers incorporate temperature-compensated oscillator circuits fed with a stabilized voltage supply; a selectivity control; optional A.V.C. and noise limitation, and a variable pitch B.F.O. The receivers are basically similar but have different frequency ranges and output impedances.

BRIEF DESCRIPTION

Electrical

3. Fig 1 gives the block diagram applicable to both receivers. The frequency range of each is covered in six bands as follows:-

Range	Model AR88D (I.F. = 455kc/s)	Model AR88LF (I.F. = 735kc/s)
1	535 - 1,600kc/s	73 - 205kc/s
2	1.57 - 4.55Mc/s	195 - 550kc/s
3	4.45 - 12.15Mc/s	1.48 - 4.40Mc/s
4	11.90 - 16.60Mc/s	4.25 - 12.15Mc/s
5	16.10 - 22.70Mc/s	11.90 - 19.50Mc/s
6	22.00 - 32.00Mc/s	19.00 - 30.50Mc/s

4. The receiver sensitivities over most of the bands are as follows:-

C.W. - Less than 3.0µV input for 20db signal-to-noise ratio at 500mW to loudspeaker.

M.C.W. - Less than 10µV input for 20db signal-to-noise ratio at 500mW to loudspeaker.

5. Headphone, loudspeaker and line outputs are available from both receivers at the following impedances.

AR88D 2.5Ω to speaker
600Ω to balanced line
? 20,000Ω to headphones
AR88LF 2.5Ω to speaker
20Ω to unbalanced line
20Ω to headphones

6. The maximum indistorted output from each set is 2.5W to loudspeaker or line.

7. A 5-position SELECTIVITY control is incorporated which varies the band-width of the I.F. channel. A crystal filter is employed in three positions for narrow band-widths. The approximate band-widths are as follows.

Position	Band-width at -6db		Operation
	AR88D	AR88LF	
1	13kc/s	16kc/s	For wide band-pass Rec. Mod.
2	7kc/s	8kc/s	For normal Rec. Mod.
3	3kc/s	4kc/s	For C.W. or Rec. Mod.
4	1.5kc/s	2kc/s	For sharper C.W.
5	0.4kc/s	0.5kc/s	For sharpest C.W.

8. Both receivers carry an A.C. mains power supply system; but a removable plug on the rear of the chassis permits D.C. supplies to be used. The power requirements are as follows.

A.C.	AR88D :	100-165V or 190-260V, 50-60c/s at 100VA
	AR88LF :	115 or 230V, 25-60c/s at 10CVA
D.C.	Both sets:	L.T. 6V at 4A
		H.T. 250-300V at 90mA

9. The aerial input circuits are designed for coupling to a 200Ω balanced transmission line except on the low frequency broadcast bands, ie band 1 on the AR88D and and bands 1 and 2 on the AR88LF. On these bands one side of the aerial input coil is connected to chassis and a normal single wire aerial, 25-50 ft long, and earth should be used. On all bands a single wire aerial and earth connection may be used without appreciable loss in performance.

10. A terminal marked DIVERSITY is provided on the rear of the chassis for diversity reception when required. A wire joining these terminals of two or more receivers having spaced aerials will tend to reduce selective fading (see Tels A 017, A 172). Figs 2 and 3 show the rear chassis views of the AR88D and the AR88LF respectively.

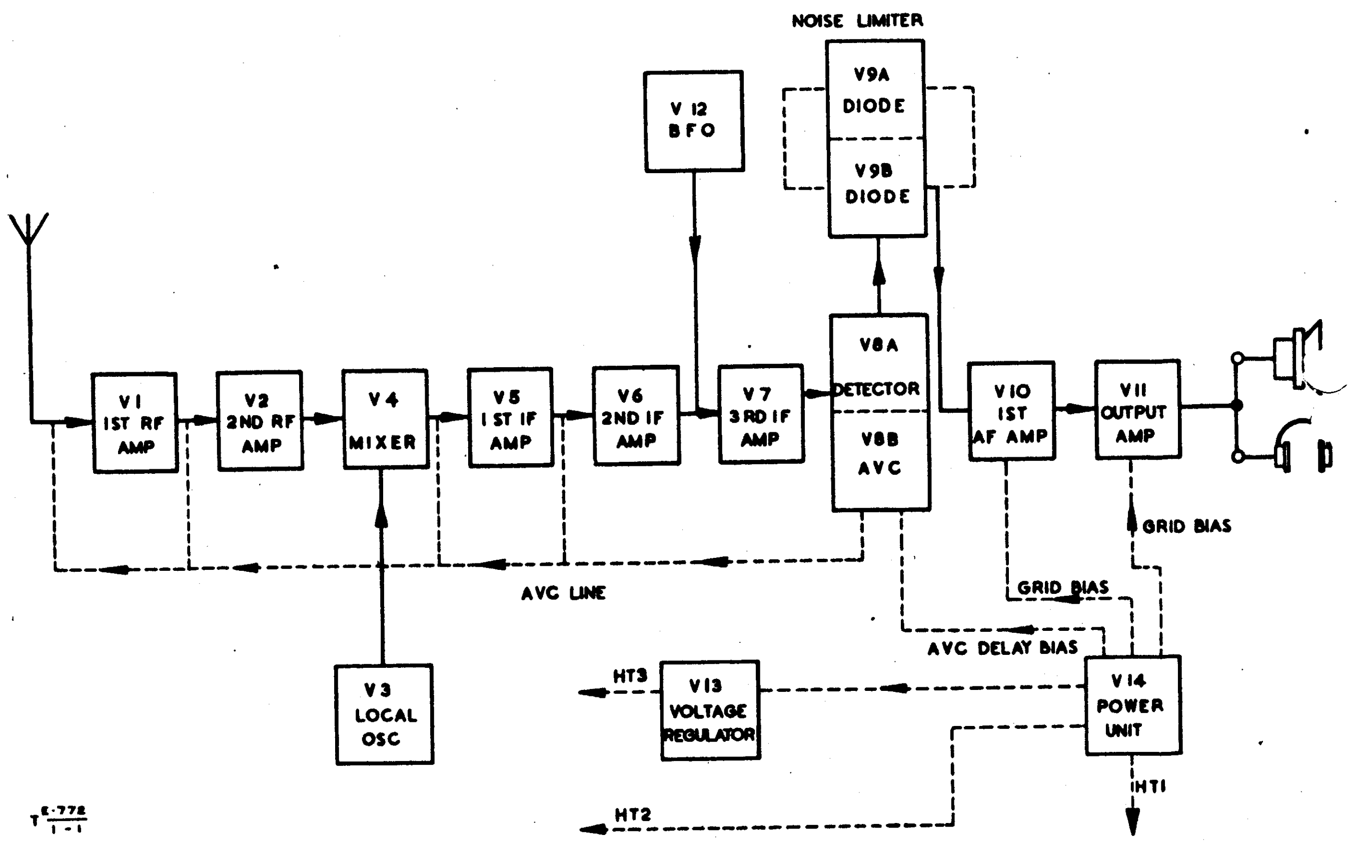


Fig 1 - AR88D and AR88LF - block diagram

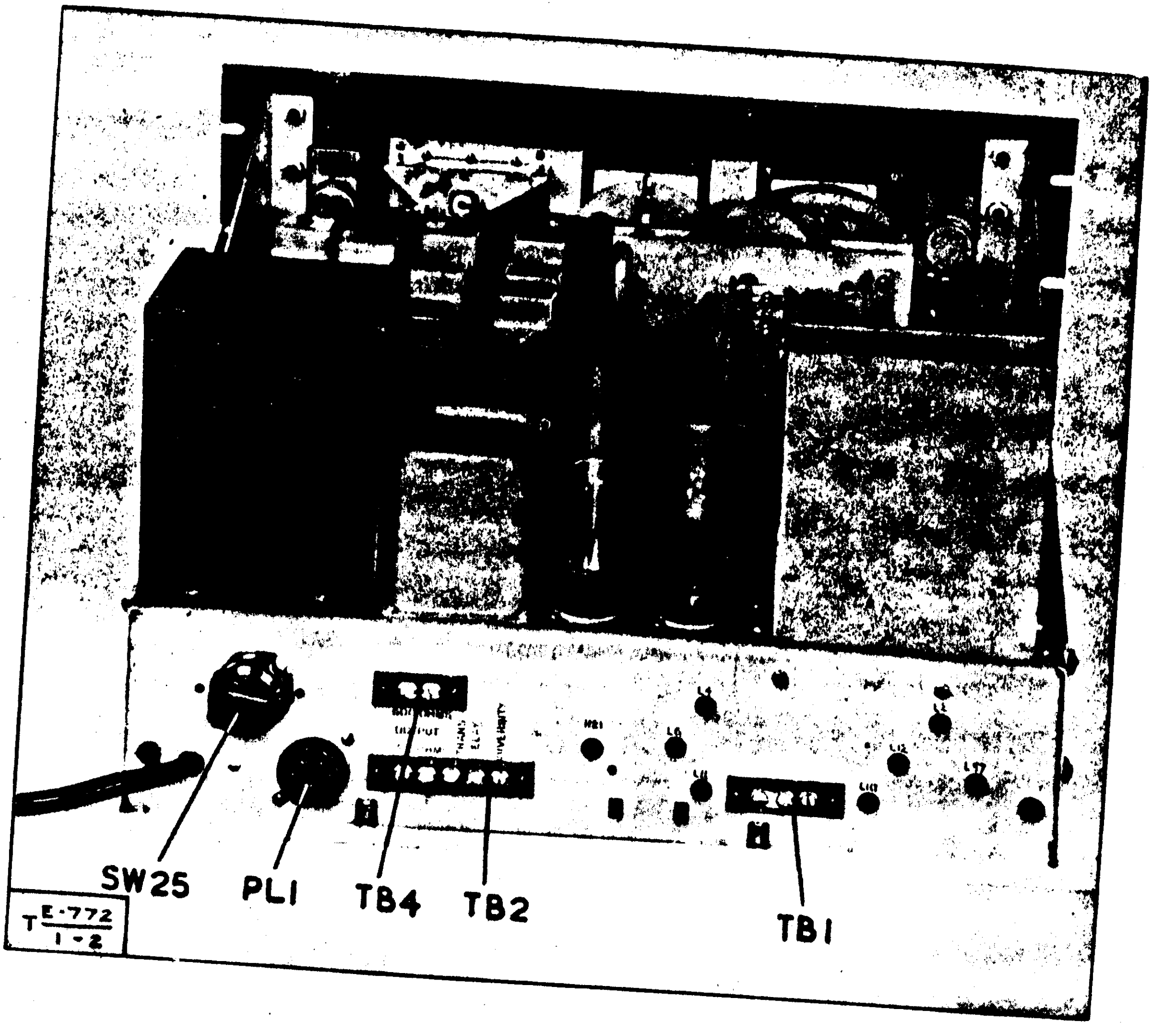


Fig 2 - AR88D - rear chassis view

Mechanical

11. The receivers are of similar mechanical construction and the following description refers to both.

12. The physical dimensions of the receiver in its steel case are as follows:-

Weight:	100 lb
Height:	11 in
Width:	19 in
Depth:	19¼ in

13. The receiver and its mains power unit are mounted on a heavy gauge plated steel chassis which is rigidly attached to an aluminium front panel. The front panel is heavily constructed and is slotted along each side so that the receiver may be rack mounted if desired. The chassis is normally housed in a steel case which bolts to the front panel. The case is provided with a hinged lid for easy access to the valves.

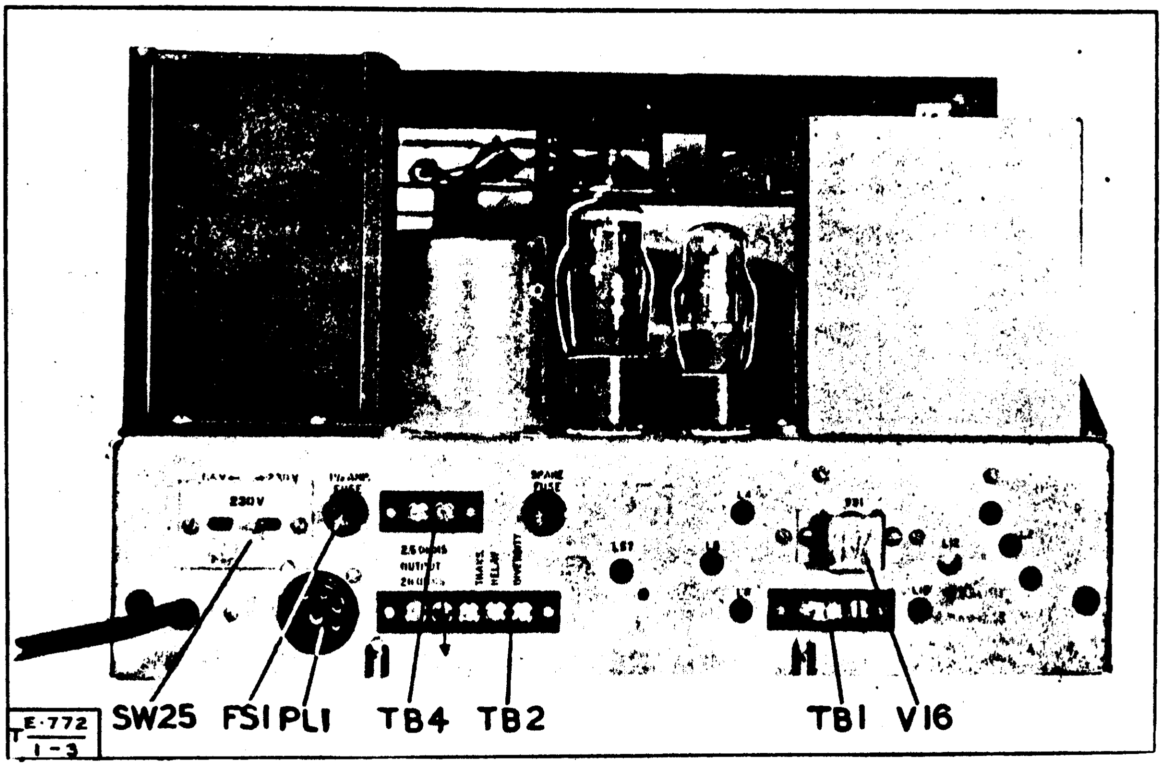


Fig 3 - AR88LF - rear chassis view

14. The ganged tuning capacitors and tuning coils in the oscillator and R.F. amplifier sections are thoroughly screened in order to minimize interaction and oscillator radiation. The R.F. amplifier and oscillator sections are mounted on a very rigid sub-chassis which can be removed from the main chassis.

15. The ganged tuning capacitors are driven via a slow-motion drive comprising a flywheel and a train of spring-loaded split gears. The system also drives two tuning dials and gives smooth operation with negligible backlash. The main tuning dial rotates with the tuning capacitors and is calibrated in frequency for each of the six ranges. The second tuning dial has a numerical scale, 0-100, and acts as a vernier in conjunction with a numerical scale, 0-22, on the main tuning dial. This facilitates accurate re-setting to any given dial position.

Controls

16. The front panels and the controls of the AR88D and AR88LF are identical. Fig 4 shows the front panel of the AR88D and Table 1 lists the functions of the controls.

Designation	Circuit ref	Function
H.F TONE	RV4	Varies high audio-frequency
ANT. ADJ.	C2	Trims first tuned circuit
OFF - TRANS - REC. MOD. - REC. C.W.	SW 23, SW 24	OFF - Mains power off TRANS - Valve heaters energized, H.T. off, transmitter relay terminals shorted REC. MOD. - Normal R.T. reception REC. C.W. - B.F.O. switched on
RANGE	SW1 - SW16	6-way frequency range switch, see para 3
R.F. GAIN	RV3	Manual gain-control, varies bias on R.F. and I.F. stages
TUNING CONTROL	C3, C6, C35, C40, C49, C50, C70, C77	Drives ganged tuning capacitors and two tuning dials
A.F. GAIN	RV2	Adjusts input to A.F. amplifier V10
SELECTIVITY	SW17 - SW20	Varies selectivity of I.F. channel, see para 7
MAN. - MAN. N.L. - A.V.C. N.L. - A.V.C.	SW21 - SW22	MAN. - A.V.C. and noise limiter off MAN. N.L. - A.V.C. off, noise limiter on A.V.C. N.L. - A.V.C. and noise limiter on A.V.C. - A.V.C. on, noise limiter off
B.F.O. ADJ.	C86	Varies frequency of beat oscillator and hence pitch of a C.W. signal
NOISE LIMITER	RV1	Sets depth of modulation above which noise limiter operates

NOTE: The small knurled screw beneath the TUNING CONTROL locks the tuning drive

Table 1 - Front panel controls

TECHNICAL DESCRIPTION

General

17. Fig 1001 shows a simplified circuit diagram of the AR88D in which switching has been reduced to a minimum. The switch wiring diagrams of the R.F., oscillator and selectivity circuits are given separately in Fig 1002 etc in order to avoid confusion on the main diagram. The circuit values given in Fig 1001 apply to the AR88D only.

18. The circuit of the AR88LF is similar to that of the AR88D. Differences occur, however, in the R.F., oscillator, mains transformer and output stage circuits; these are illustrated separetely in Fig 1003 etc.

19. Except where otherwise stated the following description refers to both receivers.

Aerial circuits

20. The aerial circuits are transformer coupled to the grid circuit of V1 on all ranges; wafers SW15 and SW16 of the RANGE switch perform the primary switching.

21. The AR88D, on range 1, incorporates an I.F. wave trap (455kc/s acceptor circuit, L57, C12) which is shunted across the primary of the aerial transformer.

22. The AR88LF has a neon tube, V16, connected permanently across the aerial terminals. This tube ionises when excessive R.F. voltages are picked up, thus protecting the aerial coils by acting as a low impedance shunt.

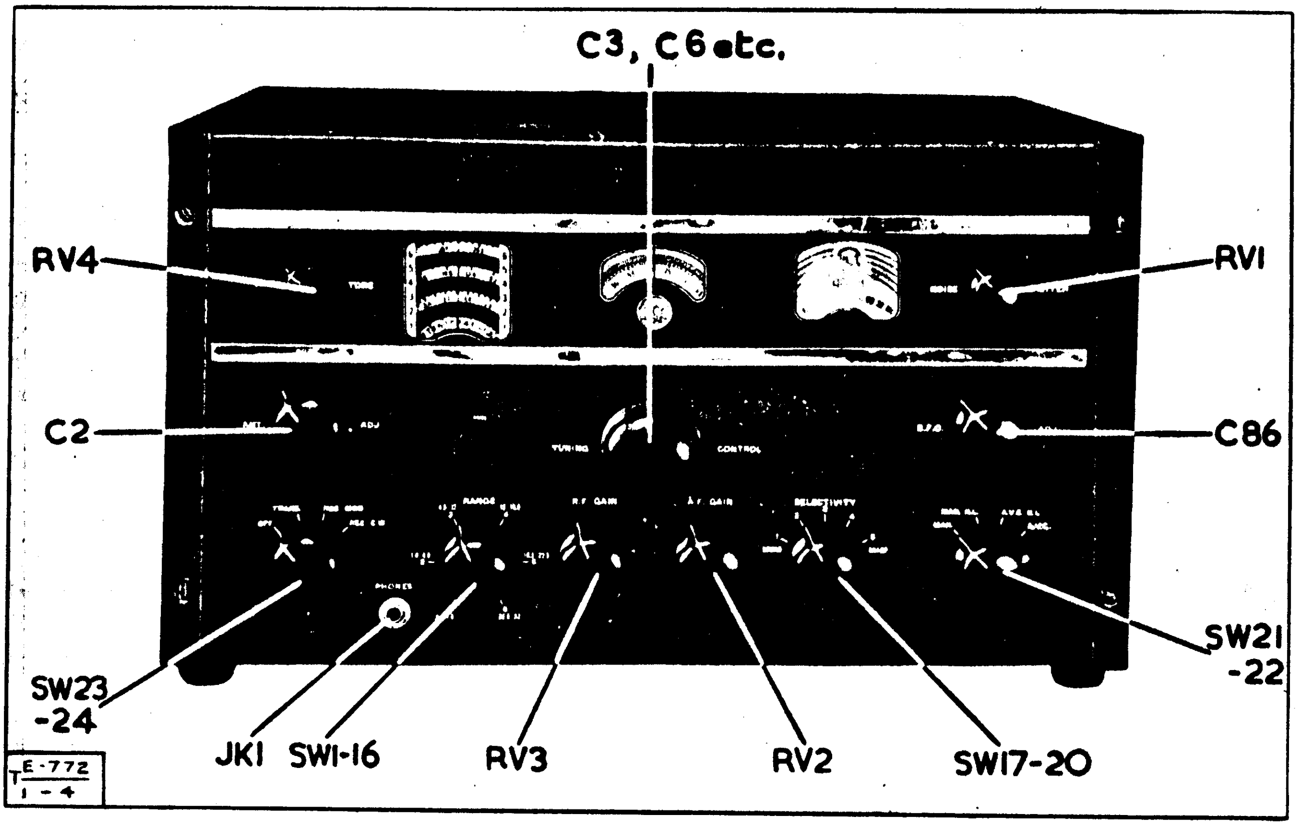


Fig 4 - AR88D - front panel view

R.F. stages

23. The secondary windings of the aerial transformers form part of the tuned grid circuit of V1 and are selected by SW13. SW13 also switches into circuit the tuning capacitors C3 and C6; these are employed either singly or in parallel according to the frequency range in order to maintain a suitable L to C ratio. SW14 short-circuits the windings which are not in use. C2 (ANT. ADJ.) trims the first tuned circuit to resonance and compensates for varying aerial impedances.

24. V1 is a high-grain R.F. amplifier. To maintain stability the anode loads on certain ranges are shunted by resistors and capacitors and the AR88D incorporates an anode stopper, R59. Coupling to the grid circuit of V2 is either by transformer or choke-capacity coupling. SW12 selects the primary windings of the transformers and the tuned secondaries are selected by SW9. On the AR88D the primary winding of range 3 is used as the inductive load for ranges 4, 5 and 6; on the AR88LF it is the primary winding of range 4 which is used as the load for ranges 5 and 6. SW11 short-circuits the primaries not in use; SW10 shorts out the secondaries not in use.

25. On range 3 of the AR88LF the anode load is shunted by an I.F. wave trap (735kc/s acceptor circuit L57, C12).

26. The grid and anode circuits of V2 are similar to those of V1. Coupling to the grid of the mixer stage, V4, is also similar. A.V.C. is applied to the grids of both V1 and V2.

Local oscillator and mixer

27. The local oscillator V3, employs a modified shunt-fed Colpitts oscillator circuit. The circuit varies slightly according to the frequency range in use. It oscillates at a frequency 455kc/s (or 735kc/s) above the signal frequency. The anode circuit is selected by SW3 and the grid connection by SW2. SW1 and SW4 short-circuit certain coils when not in use in order to prevent absorption effects. The anode of V3 is tuned by C49 and/or C50. The H.T. supply is taken from the stabilized line HT3 via the filter circuit C121, R12, C51 and R11.

28. The output of the local oscillator is fed via C53 to the oscillator grid of the mixer, V4. The mixer operates with fixed cathode bias and A.V.C. is not applied. The anode circuit is tuned to the intermediate frequency by the primary of TR3 and H.T. is derived from the line HT2. The screen is fed from the line HT3 via R19.

I.F. stages

29. The three I.F. stages, V5-V7, provide the five degrees of selectivity of the receiver. This is achieved by overcoupling between stages for broad band-pass and by feeding the signal through a crystal filter for narrow band-pass.

30. In position 3 of the SELECTIVITY switch the output of the mixer, V4, is fed to the grid of V5 via the crystal filter. This consists of a bridge circuit formed by the centre-tapped secondary winding of TR3, a 455kc/s (or 735kc/s) crystal and the phasing capacitor C75, which neutralizes the capacity of the crystal in its holder. TR4 (L34) forms the crystal load and with C73, is tuned to the crystal frequency.

31. The selectivity or Q of a crystal filter is dependent upon the value of the impedance into which it feeds. Thus, the smaller the impedance presented by TR4 the greater will be the effective Q of the crystal. In selectivity position 3 the impedance of TR4 is comparatively large giving a low crystal Q. In positions 4 and 5 the impedance of TR4 is reduced by tapping down on L34 thus giving progressively sharper selectivity. Extra capacitors are switched in at each tap in order to maintain resonance at the intermediate frequency.

32. In position 2 of the SELECTIVITY switch the crystal is shorted out and the load circuit is disconnected. The secondary of TR3 feeds directly to the grid of V5 giving normal band-pass coupling. The crystal filter filter switching is performed by SW19 and SW20.

33. In selectivity position 2 the output of V5 is fed to the grid of V6 via the I.F. transformers TR5 and TR6. The primaries and secondaries of these transformers are critically coupled, giving a single peak resonance curve. The two transformers are mutually coupled by a common capacitor C92. In position 1 of the selectivity switch the primaries and secondaries in each transformer are over-coupled by the introduction of extra turns in the secondary of TR5 and in the primary of TR6 giving a broad selectivity curve. This is repeated in the transformers TR7 and TR8 which couple the stages V6 and V7. The selectivity switching is performed by SW17 and SW18.

34. The output of V7 is fed to the detector V8 via the I.F. transformer TR9, which is unaffected by the setting of the SELECTIVITY switch.

Beat-frequency oscillator

35. V12 is a shunt-fed Colpitts oscillator operating about the intermediate frequency. C86 (B.F.O. ADJ.) varies the frequency and hence the beat note. The B.F.O. excitation voltage is fed to the 3rd I.F. stage V7, stray capacity coupling being used. This is achieved by means of a lead connecting an unused pin (4) on V12 valve base to an unused terminal (A) on TR9.

Detector and A.V.C.

36. The detector and A.V.C. diodes are combined in V8. The detector circuit is conventional and the A.V.C. voltage is obtained from the detector load through R47. V8B is used to provide delayed A.V.C.

37. The anode of V8B is connected to the A.V.C. line while the cathode is held negative by RV3, the R.V. GAIN control. Until the A.V.C. voltage exceeds this bias the diode will conduct and hold the A.V.C. line at the voltage set by RV3. Thus RV3 provides a variable A.V.C. delay. When the A.V.C. voltage exceeds this delay V8B is cut off and the control voltage is applied to the A.V.C. line. A.V.C. is fed to the R.F. stages, V1 and V2, and the I.F. stages, V5 and V6.

38. Under manual gain conditions SW22 shorts out V8B and the A.V.C. line is connected via R42 to the slider of RV3.

Noise limiter

39. The noise limiter is another double-diode, V9. The products of detection, ie an A.F. signal superimposed upon a D.C. voltage, are developed across the detector load, RV1 and R49. The anode of V9B is connected to the junction of RV1 and R49, while the cathode is connected to the slider of RV1 via the A.F. filter R50, C109, C110 and R35.

40. Thus the cathode of V9B is held at a steady D.C. potential which is proportional to the mean carrier level. The mean D.C. level of the anode is either equal to or more positive than the cathode according to the setting of RV1. Thus V9B will conduct and freely pass all A.F. signals whose amplitude is less than the anode-cathode voltage. If the amplitude of the A.F. signal rises above this voltage, ie due to a noise pulse, the negative peak will drive V9B anode negative with respect to its cathode. V9B will be cut off for the duration of the pulse and the signal will not be passed to the A.F. stages.

41. Thus all negative noise peaks in exceed of a certain potential, set by RV1, are effectively limited. Since the potential of the slider of RV1 is proportional to the mean carrier level, the anode-cathode voltage of V9B is a constant proportion of the carrier amplitude for any one setting of RV1. The setting of RV1 therefore corresponds to a certain percentage of modulation above which signals will be limited.

42. If RV1 is set so that the anode-cathode voltage of V9B is zero, the noise limiter will operate at 0% modulation and limit the negative half-cycles of all signals, producing extremely high distortion. Thus the optimum setting of the NOISE LIMITER control is a compromise between A.F. distortion and noise limitation.

43. The second diode V9A has two functions. Firstly, it adds to the effectiveness of V9B as a series limiter and secondly, it limits noise pulses from previous stages in the absence of a carrier. The action in each case is similar.

44. V9A is normally cut off by the voltage across R50 due to the current in V9B. When a noise pulse commences to cut off V9B, the voltage across R50 falls and allows V9A to conduct slightly due to the contact potential effect. V9A conducts through R50 and the voltage developed opposes the current in V9B. The action is cumulative and the cut-off of V9B is accelerated. V9A conducts and acts as a shunt limiter, shunting the A.F. output to earth via C109 and C110.

45. SW24 permits the noise limiter to be switched in or out of circuit as desired.

A.F. and output stages

46. V10 and V11 are the A.F. and power output amplifiers respectively. The output stages of the two receivers differ and Fig 1007 gives the circuit of the AR88LF. Grid-bias voltages from the power supply system are fed to each stage, and negative feedback is applied to the cathode of V10, via R54 and R39, from the secondary winding of the output transformer TR2. RV4 (H.F. TONE) in series with C117 shunts the anode of V10 and provides a 'treble cut' tone control.

47. On the AR88LF, TR2 has one secondary winding which is tapped giving 2.5Ω and 20Ω outputs. The complete winding is used for headphone reception and when a phone plug is inserted in JK1, R56 is brought into circuit as an additional shunt load to provide correct matching.

48. On the AR88D, TR2 is provided with two secondary windings. One gives a 600Ω 'floating' output; the other is tapped and gives 2.5Ω and 20,000Ω outputs. The 20,000Ω output is fed to a 2-position jack for headphone reception. With a phone plug inserted in the first position of the jack, the phones are connected in parallel with the loudspeaker on the 2.5Ω output. In the second position the phones are across the 20,000Ω winding and the speaker output is disconnected. When no load is connected to the 2.5Ω or 600Ω output the phone plug should always be pushed fully home as in this position the 2.5Ω output is automatically loaded by R56.

Power supply system

49. The power supply system provides three H.T., and three negative bias lines and a valve heater supply. The H.T.3 line is stabilized and feeds the local oscillator, the beat-frequency oscillator and the screens of the mixer and I.F. stages. H.T.2 is fully smoothed and supplies all other valves except the anode of V11. This is fed by H.T.1 from the junction of L49 and L50. The grid-bias voltages are derived from the resistor chains R43, R44, R45 and R55, RV3 (R.F. GAIN) in the H.T. negative return line.

50. The two receivers employ different mains transformers, (TR1), The circuit of the AR88LF mains transformer is given in Fig 1008. The primary winding of the AR88D transformer is tapped for various voltage inputs whilst that of the AR88LF is designed for 115V or 230V only. Both transformers incorporate an electrostatically screened primary.

51. When the receivers operate from D.C. supplies, the D.C. voltages are fed into SK1 as follows.

Pin 4	LT +	6V
Pin 5	LT -	
Pin 6	HT -	250-300V
Pin 7	HT +	

Separate ON-OFF switches are necessary in each supply.

CHANGES OCCURING DURING MANUFACTURE

52. The reception set AR88D was originally manufactured as the AR88, the change in designation occurring somewhere between the serial Nos. 003000 and 010000. The two sets differ slightly in the output stage, and the AR88 incorporates a tuning meter in place of the illuminated name-plate now appearing on the AR88D. Despite the change in designation, the AR88D still bears the name AR88 on the nameplate.

53. The AR88 has two types of output circuit; these are given in Fig 1009. The following output impedances are provided:-

Receivers with serial Nos. below 003000

2.5Ω	to speaker
20Ω	to headphones

Receivers with serial Nos. above 003000

2.5Ω	to speaker
600Ω	to line (unbalanced)
600Ω	to headphones

The next page is Page 1001

Table 1001 - AR88D and AR88LF - components list

Circuit ref.	Value AR88D	Value AR88LF	Rating	Tolerance	Type
		RESISTORS			
R1	33kΩ	33kΩ	½W	±10%	Insulated carbon
R2	2.2MΩ	2.2MΩ	½W	±20%	Insulated carbon
R3	1kΩ	1kΩ	½W	±10%	Insulated carbon
R4	56kΩ	100kΩ	½W	±10%	Insulated carbon
R5	1MΩ	1MΩ	½W	±20%	Insulated carbon
R6	33kΩ	33kΩ	½W	±10%	Insulated carbon
R7	10Ω	330Ω	½W	±10%	Insulated carbon
R8	5.6kΩ	-	½W	±10%	Insulated carbon
R9	100kΩ	100kΩ	½W	±10%	Insulated carbon
R10	1kΩ	1kΩ	½W	±10%	Insulated carbon
R11	10kΩ	10kΩ	½W	±10%	Insulated carbon
R12	1kΩ	1kΩ	½W	±10%	Insulated carbon
R13	560Ω	560Ω	½W	±10%	Insulated carbon
R14	100kΩ	100kΩ	½W	±10%	Insulated carbon
R15	15kΩ	22kΩ	½W	±10%	Insulated carbon
R16	1kΩ	1kΩ	½W	±10%	Insulated carbon
R17	10Ω	330Ω	½W	±10%	Insulated carbon
R18	5.6kΩ	-	½W	±10%	Insulated carbon
R19	33kΩ	33kΩ	½W	±10%	Insulated carbon
R20	100Ω	100Ω	½W	±10%	Insulated carbon
R22	1kΩ	1kΩ	½W	±10%	Insulated carbon
R23	560kΩ	560kΩ	½W	±10%	Insulated carbon
R24	120kΩ	120kΩ	½W	±10%	Insulated carbon
R25	180Ω	47Ω	½W	±10%	Insulated carbon
R26	1kΩ	1kΩ	½W	±10%	Insulated carbon
R27	560kΩ	560kΩ	½W	±10%	Insulated carbon
R28	120kΩ	120kΩ	½W	±10%	Insulated carbon
R29	47kΩ	47kΩ	½W	±10%	Insulated carbon
R30	2.7kΩ	2.7kΩ	4W	±10%	Wire-wound
R31	1kΩ	1kΩ	½W	±10%	Insulated carbon
R32	390Ω	390Ω	½W	±10%	Insulated carbon
R33	2.2MΩ	2.2MΩ	½W	±10%	Insulated carbon
R34	1kΩ	1kΩ	½W	±10%	Insulated carbon
R35	680kΩ	680kΩ	½W	±10%	Insulated carbon
R36	2.2MΩ	2.2MΩ	½W	±20%	Insulated carbon
R37	1MΩ	1MΩ	½W	±20%	Insulated carbon
R38	1.5MΩ	1.5MΩ	½W	±10%	Insulated carbon
R39	100Ω	100Ω	½W	±10%	Insulated carbon
R40	270kΩ	270kΩ	½W	±10%	Insulated carbon
R41	100kΩ	100kΩ	½W	±10%	Insulated carbon
R42	390kΩ	390kΩ	½W	±10%	Insulated carbon
R43	100Ω	100Ω	4W	±10%	Wire-wound
R44	160Ω	160Ω	4W	±10%	Wire-wound
R45	15Ω	15Ω	½W	±10%	Insulated carbon
R47	2.2MΩ	2.2MΩ	½W	±10%	Insulated carbon
R49	33kΩ	33kΩ	½W	±10%	Insulated carbon
R50	560kΩ	560kΩ	½W	±10%	Insulated carbon
R53	330kΩ	330kΩ	½W	±10%	Insulated carbon

Table 1001 - (contd)

Circuit ref	Value AR88D	Value AR88LF	Rating	Tolerance	Type
RESISTORS					
R54	2.7kΩ	2.7kΩ	½W	±10%	Insulated carbon
R55	6.8kΩ	6.8kΩ	½W	±10%	Insulated carbon
R56	5Ω	39Ω	4W	±10%	Wire-wound
R58	-	5.6kΩ	½W	±10%	Insulated carbon
R59	15Ω	-	½W	±10%	Insulated carbon
R60	-	5.6kΩ	½W	±10%	Insulated carbon
R61	-	47Ω	½W	±10%	Insulated carbon
R62	-	47Ω	½W	±10%	Insulated carbon
R63	1MΩ	560kΩ	½W	±10%	Insulated carbon
R64	560kΩ	560kΩ	½W	±10%	Insulated carbon
R65	560kΩ	560kΩ	½W	±10%	Insulated carbon
R66	-	2.7kΩ	½W	±10%	Insulated carbon
R67	-	2.7kΩ	½W	±10%	Insulated carbon
POTENTIOMETERS					
RV1	66kΩ	66kΩ	NOISE LIMITER control		
RV2	2MΩ	2MΩ	A.F. GAIN control		
RV3	66kΩ	66kΩ	R.F. GAIN control		
RV4	1MΩ	1MΩ	H.F. TONE control		
CAPACITORS					
C1	0.0047μF	0.0047μF	500V	±10%	Mica
C2	3-25pF	3-25pF	-	-	Antenna trimmer
C3	10-410pF	10-410pF	-	-	Main gang assy
C4	220pF	220pF	500V	±10%	Ceramic tubular
C5	220pF	220pF	500V	±10%	Ceramic tubular
C6	8-68pF	8-88pF	-	-	Main gang assy
C7	18pF	-	500V	±5%	Ceramic tubular
C8	33pF	-	500V	±5%	Ceramic tubular
C9	22pF	10pF	500V	±10%	Ceramic tubular
C10	22pF	-	500V	±10%	Ceramic tubular
C11	0.0047μF	0.0047μF	500V	±10%	Mica
C12	56pF	56pF	500V	±10%	Ceramic tubular
C13	82pF	220pF	500V	±10%	Ceramic tubular
C14	220pF	220pF	500V	±10%	Ceramic tubular
C15	13pF	47pF	500V	±5%	Ceramic tubular
C16	2-12pF	2-20pF	-	-	Air trimmer
C17	525pF	68pF	500V	±10%	Mica
C18	13pF	39pF	500V	±5%	Ceramic tubular
C19	2-12pF	2-12pF	-	-	Air trimmer
C20	1,550pF	240pF	500V	±5%	Mica
C21	13pF	15pF	500V	±5%	Ceramic tubular
C22	2-12pF	2-12pF	-	-	Air trimmer
C23	0.003μF	0.001μF	375V	±5%	Mica
C24	0.0027μF	0.0025μF	500V	±5%	Mica
C25	2-20pF	2-12pF	-	-	Air trimmer

Table 1001 - (contd)

Circuit ref	Value AR88D	Value AR88LF	Rating	Tolerance	Type
		CAPACITORS			
C26	82pF	15pF	500V	±5%	Ceramic tubular
C27	2-20pF	2-25pF	-	-	Air trimmer
C28	0.003µF	0.003µF	375V	±5%	Mica
C29	82pF	30pF	500V	±5%	Ceramic tubular
C30	0.0039µF	0.0039µF	500V	±5%	Mica
C31	75pF	39pF	500V	±5%	Ceramic
C32	2-20pF	2-25pF	-	-	Air trimmer
C33	0.0047µF	0.0047µF	500V	±10%	Mica
C34	220pF	220pF	500V	±10%	Ceramic tubular
C35	10-370pF	10-370pF	-	-	Main gang assy
C36	180pF	0.0015µF	(600V (LF) (500V (D)	±20% (LF) ±10% (D)	Mica (LF) Ceramic tubular (D)
C37	2-12pF	22-20pF	-	-	Air trimmer
C38	2-20pF	2-20pF	-	-	Air trimmer
C39	2-20pF	2-20pF	-	-	Air trimmer
C40	8-128pF	8-128pF	-	-	Main gang assy
C41	2-20pF	2-20pF	-	-	Air trimmer
C42	82pF	-	500V	±5%	Ceramic tubular
C43	2-20pF	2-25pF	-	-	Air trimmer
C44	91pF	6.8pF	500V	±5%	Ceramic tubular
C45	2-20pF	2-25pF	-	-	Air trimmer
C46	85pF	15pF	500V	±5%	Ceramic tubular
C47	0.0047pF	0.0047pF	500V	±10%	Mica
C48	0.05µF	0.05µF	400V	-	3-section, oil filled
C49	8-128pF	8-128pF	-	-	Main gang assy
C50	10-370pF	10-370pF	-	-	Main gang assy
C51	0.0047µF	0.0047µF	500V	±10%	Mica
C52	0.0047µF	0.0047µF	500V	±10%	Mica
C53	6.8pF	6.8pF	500V	±10%	Ceramic tubular
C54	0.0047µF	0.0047µF	500V	±10%	Mica
C55	680pF	390pF	500V	±5%	Mica
C56	0.01µF	0.01µF	400V	-	3-section, oil filled
C57	220pF	220pF	500V	±10%	Ceramic tubular
C58	180pF	0.0015µF	(600V (LF) (500V (D)	±20% (LF) ±10% (D)	Mica (LF) Ceramic tubular (D)
C59	2-12pF	2-20pF	-	-	Air trimmer
C60	2-20pF	2-20pF	-	-	Air trimmer
C61	15pF	10pF	500V	±10%	Ceramic tubular
C62	2-20pF	2-20pF	-	-	Air trimmer
C63	0.0047µF	0.0047µF	400V	-	3-section, oil filled
C64	2-20pF	2-20pF	-	-	Air trimmer
C65	82pF	-	500V	±10%	Ceramic tubular
C66	2-20pF	2-25pF	-	-	Air trimmer
C67	82pF	22pF	500V	±10%	Ceramic tubular
C68	2-20pF	2-25pF	-	-	Air trimmer
C69	82pF	15pF	500V	±5%	Ceramic tubular
C70	8-128pF	8-128pF	-	-	Main gang assy
C71	0.1µF	0.1µF	400V	-	3-section, oil filled
C72	680pF	390pF	500V	±5%	Mica
C73	150pF	100pF	500V	±5%	Mica
C75	3-14pF	3-15pF			Crystal phasing trimmer

Table 1001 - (contd)

Circuit ref	Value AR88D	Value AR88LF	Rating	Tolerance	Type
		CAPACITORS			
C76	0.01μF	0.01μF	400V	-	3-section, oil filled
C77	10-370pF	10-370pF	-	-	Main gang assy
C78	680pF	390pF	500V	±5%	Mica
C79	0.1μF	0.1μF	400V	-	3-section, oil filled
C80	2-20pF	2-20pF	-	-	Airttrimmer
C81	2-20pF	2-20pF	-	-	Air trimmer
C82	56pF	56pF	500V	±5%	Mica
C83	0.0047μF	0.0047μF	500V	±10%	Mica
C84	0.1μF	0.1μF	400V	-	3-section, oil filled
C85	470pF	330pF	500V	±20%	Mica
C86	3-25pF	3-15pF	-	-	B.F.O. trimmer
C87	0.0022μF	0.0015μF	500V	±10%	Mica
C88	56pF	56pF	500V	±5%	Mica
C89	680pF	390pF	500V	±5%	Mica
C90	680pF	390pF	500V	±5%	Mica
C91	680pF	390pF	500V	±5%	Mica
C92	0.1μF	0.1μF	400V	-	3-section, oil filled
C93	0.01μF	0.01μF	400V	-	3-section, oil filled
C94	680pF	390pF	500V	±5%	Mica
C95	0.1μF	0.1μF	400V	-	3-section, oil filled
C96	4μF	4μF	-	+20%-10%	3-section, oil filled
C97	4μF	4μF	-	+20%-10%	3-section, oil filled
C98	4μF	4μF	-	+20%-10%	3-section, oil filled
C99	0.25μF	0.25μF	400V	-	3-section, oil filled
C100	680pF	390pF	500V	±5%	Mica
C101	680pF	390pF	500V	±5%	Mica
C102	0.1μF	0.1μF	400V	-	3-section, oil filled
C103	0.05μF	0.05μF	400V	-	3-section, oil filled
C104	680pF	390pF	500V	±5%	Mica
C105	560pF	560pF	500V	±10%	Mica
C106	0.05μF	0.05μF	400V	-	3-section, oil filled
C107	0.05μF	0.05μF	400V	-	3-section, oil filled
C108	180pF	100pF	500V	±5%	Mica
C109	0.05μF	0.05μF	400V	-	3-section, oil filled
C110	0.05μF	0.05μF	400V	-	3-section, oil filled
C111	0.0027μF	0.0027μF	500V	±5%	Mica
C112	0.25μF	0.25μF	400V	-	3-section, oil filled
C113	180pF	100pF	500V	±5%	3-section, oil filled
C114	180pF	100pF	500V	±5%	Mica
C115	180pF	180pF	500V	±5%	Mica
C116	0.0027μF	0.0027μF	500V	±10%	Mica
C117	0.0047μF	0.0047μF	500V	±10%	Mica
C118	0.0047μF	0.0047μF	500V	±10%	Mica
C119	0.0047μF	0.0047μF	500V	±10%	Mica
C120	15pF	-	500V	±10%	Ceramic tubular
C121	0.0047μF	0.0047μF	500V	±10%	Mica
C122	0.0047μF	0.0047μF	500V	±10%	Mica
C123	-	220pF	500V	±10%	Ceramic tubular

Table 1001 - (contd)

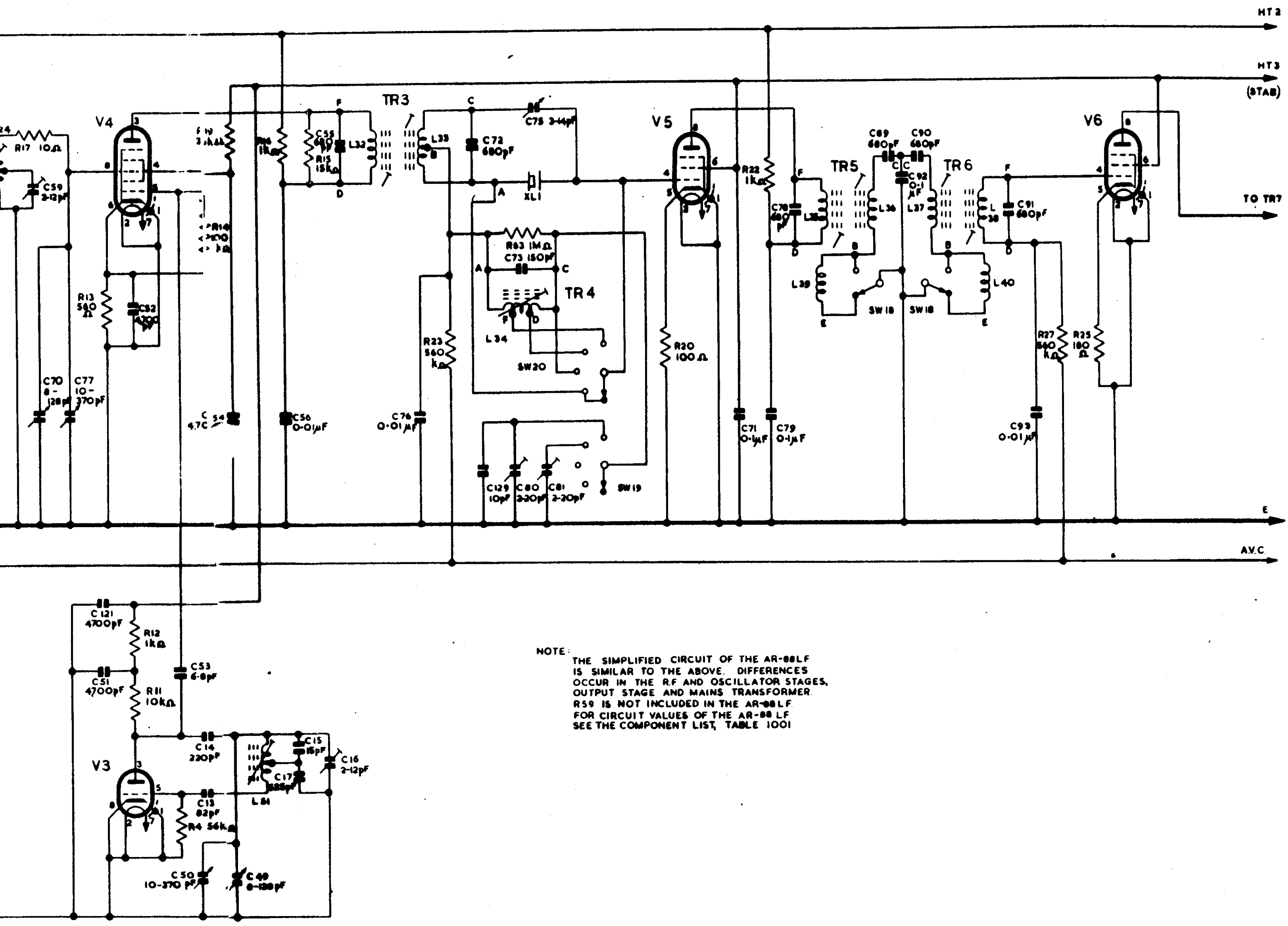
Circuit ref	Value AR88D	Value AR88LF	Rating	Tolerance	Type
CAPACITORS					
C124	-	150pF	500V	±10%	Ceramic tubular
C125	-	650pF	300V	±10%	Mica
C126	-	650pF	300V	±10%	Mica
C127	-	240pF	500V	±5%	Mica
C128	-	285pF	500V	±5%	Mica
C129	10pF	10pF	500V	±10%	Ceramic tubular
C130	-	560pF	500V	±10%	Mica

INDUCTORS

L1, 2	Antenna coil, band 1
L3, 4	Antenna coil, band 2
L5, 6	Antenna coil, band 3
L7, 8	Antenna coil, band 4
L9, 10	Antenna coil, band 5
L11, 12	Antenna coil, band 6
L13, 14	R.F. coil, band 1
L15, 16	R.F. coil, band 2
L17, 18	R.F. coil, band 3 (band 4 on AR88LF)
L19	R.F. coil, band 4 (band 3 on AR88LF with L61)
L20	R.F. coil, band 5
L21	R.F. coil, band 6
L23, 24	R.F. coil, band 1
L25, 26	R.F. coil, band 2
L27, 28	R.F. coil, band 3 (band 4 on AR88LF)
L29	R.F. coil, band 4 (band 3 on AR88LF with L60)
L30	R.F. coil, band 5
L31	R.F. coil, band 6
L49	L.F. choke
L50	L.F. choke
L51	Oscillator coil, band 1
L52	Oscillator coil, band 2
L53	Oscillator coil, band 3
L54	Oscillator coil, band 4
L55	Oscillator coil, band 5
L56	Oscillator coil, band 6
L57	Wave trap 455kc/s (AR88D) 735kc/s (AR88LF)
L60, L29	R.F. coil, band 3 (AR88LF)
L61, L19	R.F. coil, band 3 (AR88LF)

TRANSFORMERS

TR1	Power transformer
TR2	Output transformer
TR3	1st I.F. transformer
TR4	I.F. crystal load
TR5	2nd I.F. transformer
TR6	2nd I.F. transformer



1(A) - AR88D - simplied circuit diagram

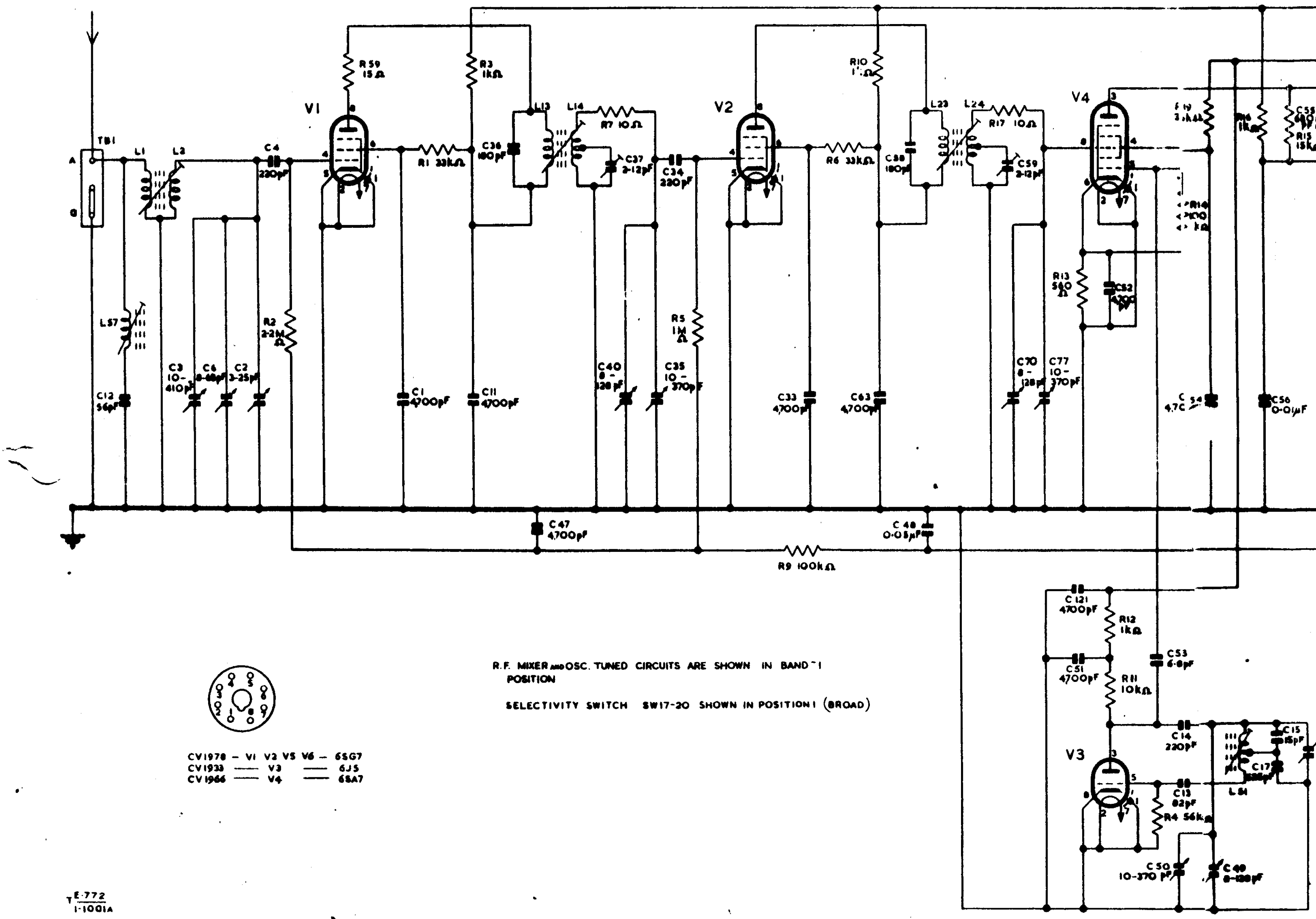


Fig 1001(A) - AR88D - simplied ci

Table 1001 - (contd)

Circuit ref	Value AR88D	Value AR88LF	Rating	Tolerance	Type

TRANSFORMERS

TR7	3rd I.F. transformer	
TR8	3rd I.F. transformer	
TR9	4th I.F. transformer	
TR10	B.F.O. coil	

VALVES

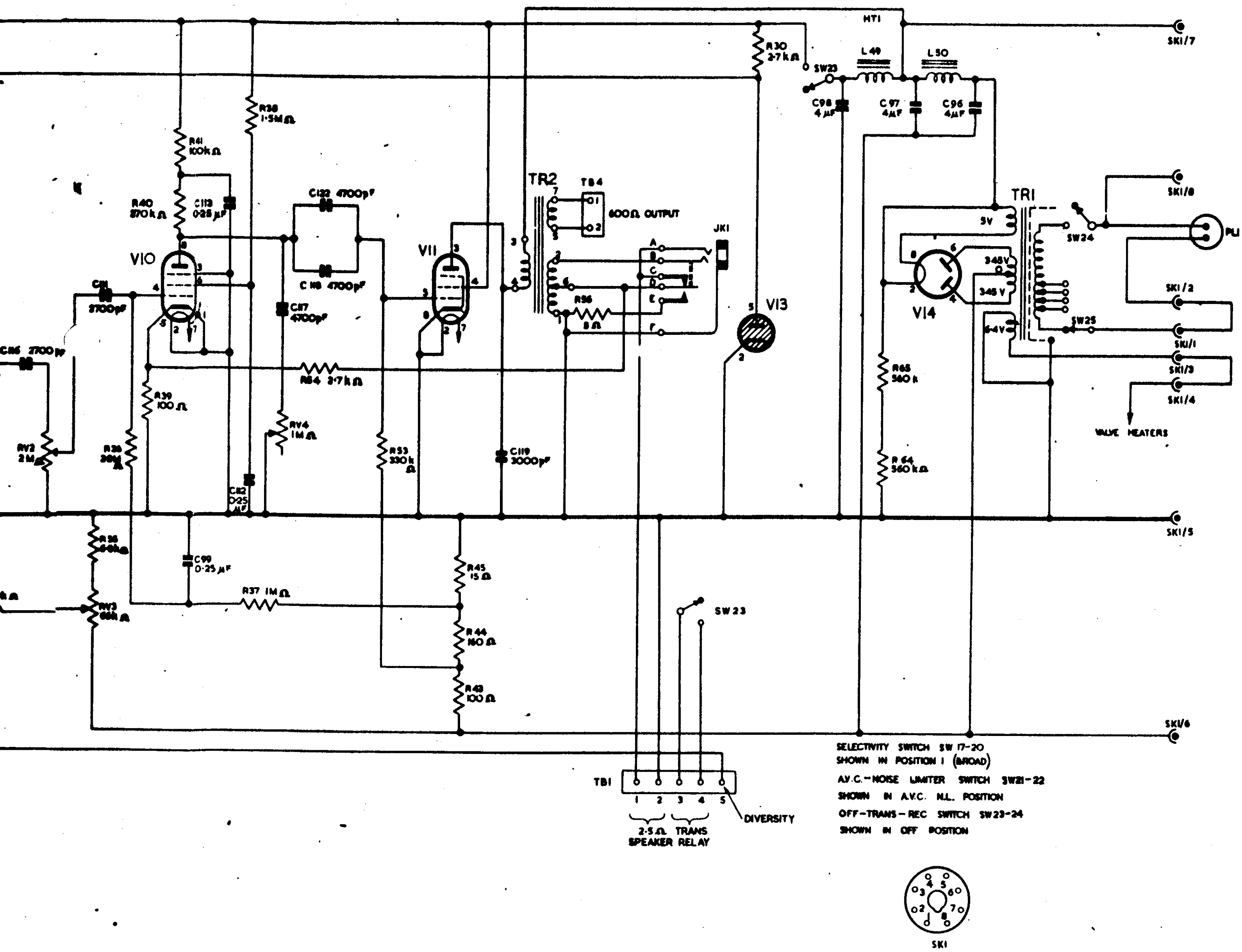
	AR88D	AR88LF
V1	CV 1978 (6SG7)	CV 1978 (6SG7)
V2	CV 1978 (6SG7)	CV 1978 (6SG7)
V3	CV 1933 (6J5)	CV 1933 (6J5)
V4	CV 1966 (6SA7)	CV 1966 (6SA7)
V5	CV 1978 (6SG7)	CV 1978 (6SG7)
V6	CV 1978 (6SG7)	CV 1978 (6SG7)
V7	CV 1978 (6SG7)	CV 1978 (6SG7)
V8	CV 1930 (6H6)	CV 1930 (6H6)
V9	CV 1930 (6H6)	CV 1930 (6H6)
V10	CV 591 (6SJ7)	CV 591 (6SJ7)
V11	CV 1940 (6K6GT)	CV 511 (6V6GT)
V12	CV 1933 (6J5)	CV 1933 (6J5)
V13	CV 216 (VR150)	CV 216 (VR150)
V14	CV 1856 (5Y3GT)	CV 1856 (5Y3GT)
V16	-	CV 651 (991)

SWITCHES

SW1-SW4	Range switch oscillator circuits
SW5-SW8	Range switch 2nd R.F. circuits
SW9-SW12	Range switch 1st R.F. circuits
SW13-SW16	Range switch antenna circuits
SW17-SW20	Selectivity switch
SW21-SW22	AVC - NL switch
SW23	OFF - TRANS - REC. MOD. - REC. C.W. switch
SW24	ON/OFF switch ganged to SW23
SW25	Voltage tap switch

CRYSTALS

XL1	455kc/s (AR88D)
XL1	735kc/s (AR88LF)



AR88D - simplified circuit diagram

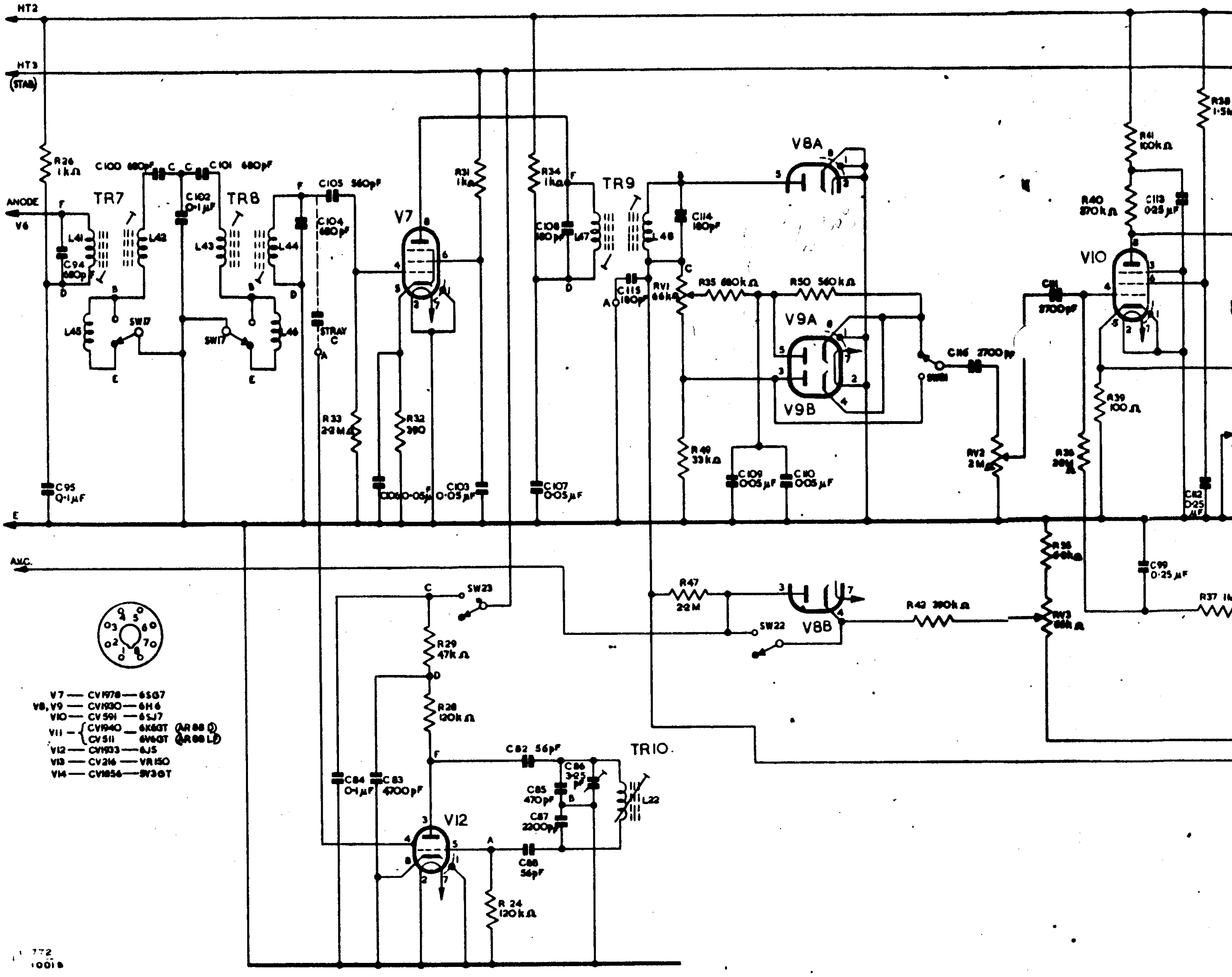
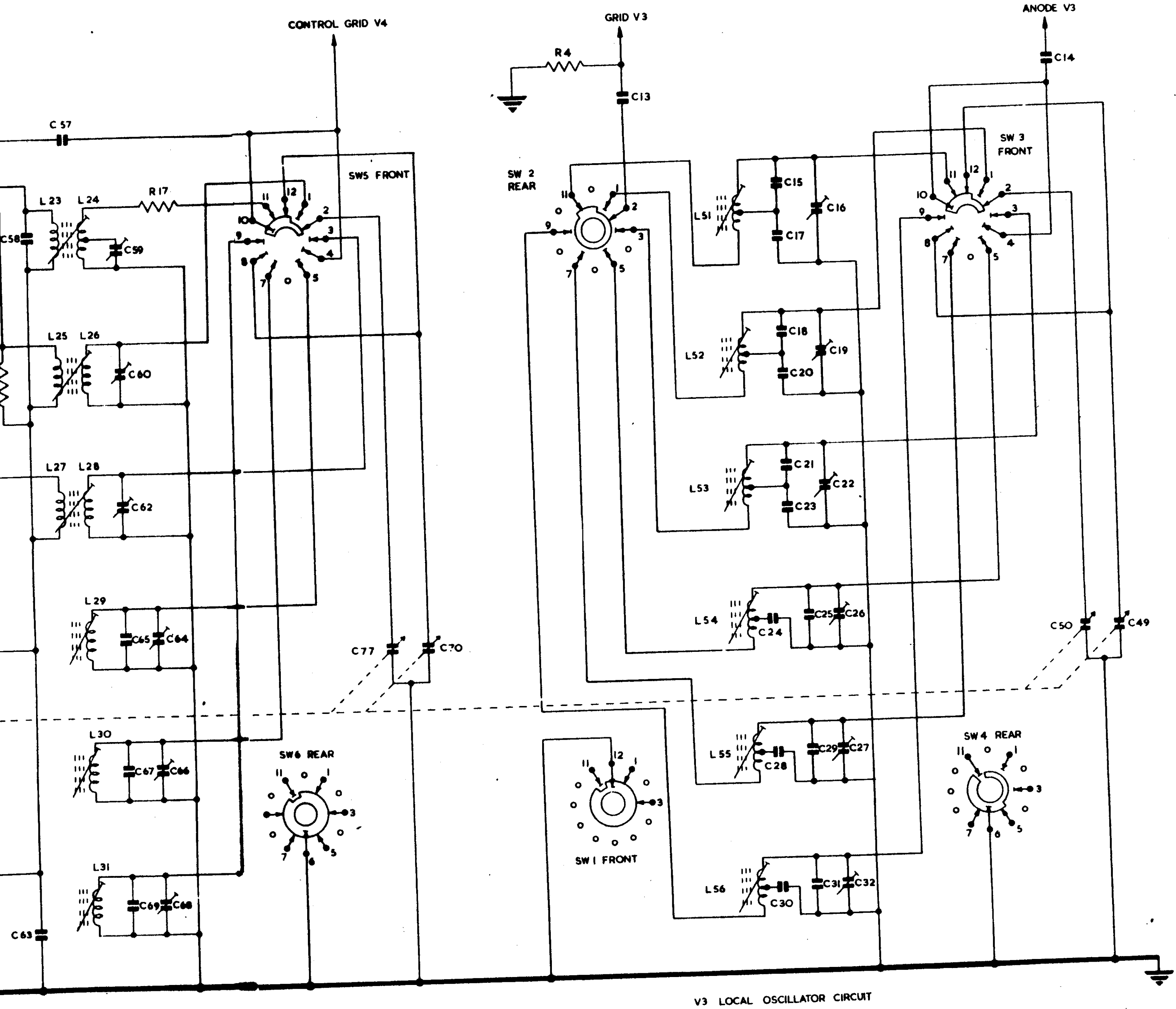


Fig 1001(B) - AR88D - simplified c



V2 ANODE AND V4 CONTROL GRID CIRCUITS

V3 LOCAL OSCILLATOR CIRCUIT

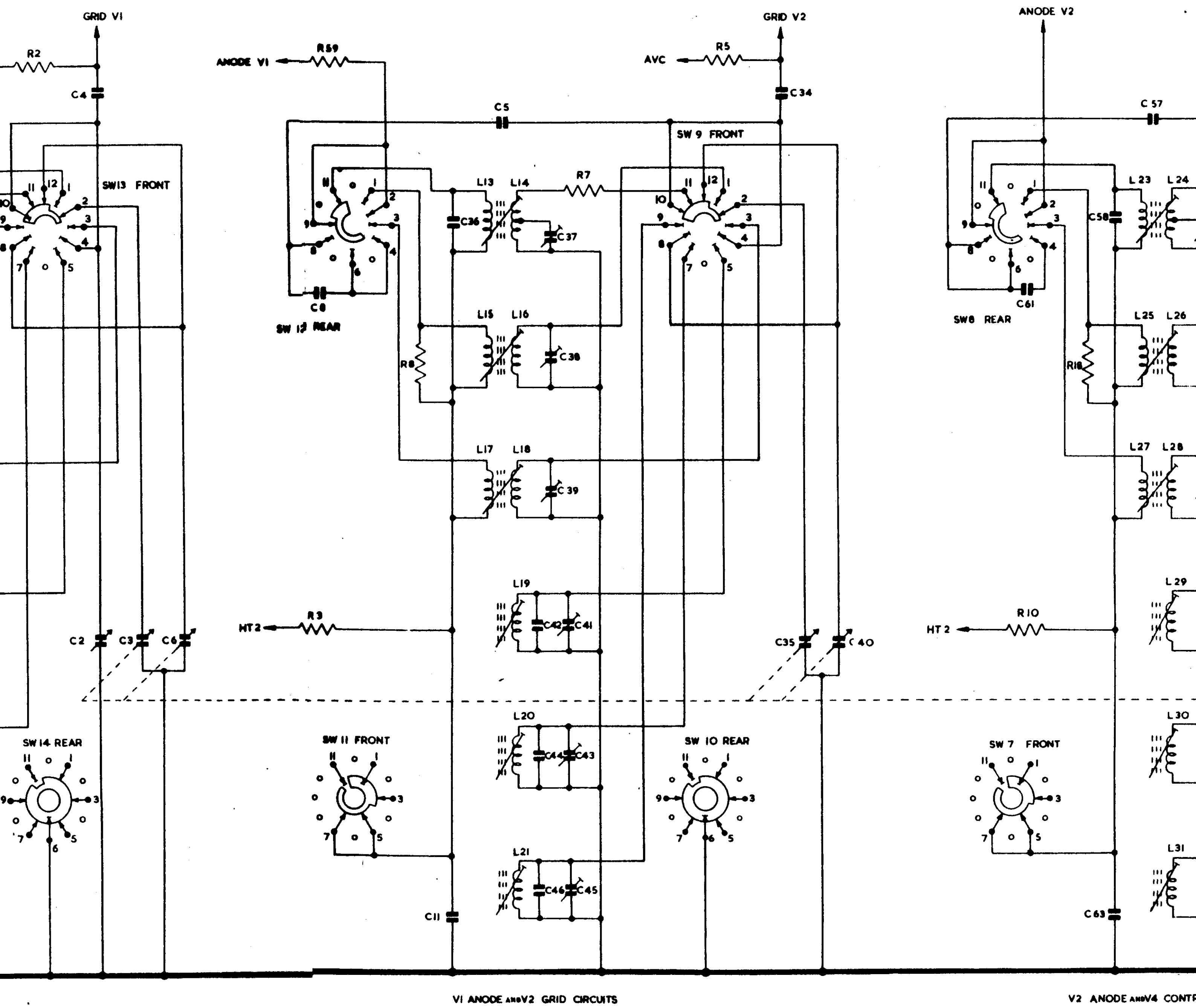


Fig. 1002 — AR88D — R.F. and oscillator coil switching

AR88-D

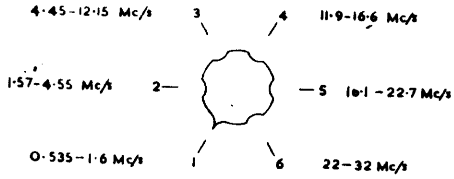
NOTE

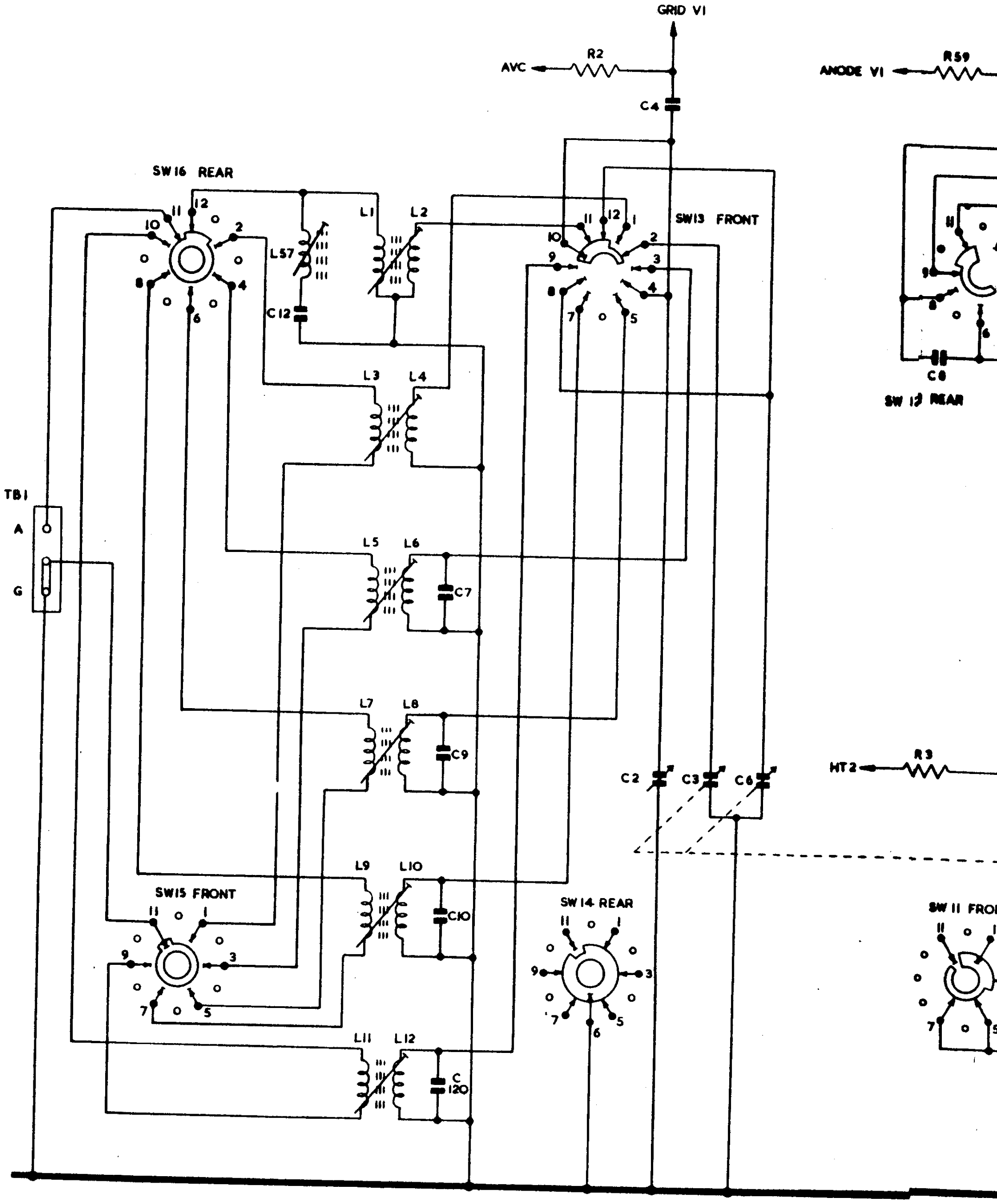
THE RANGE SWITCH SW1-16 CONSISTS OF EIGHT PAIRS OF SWITCHES, EACH PAIR FORMING THE FRONT AND REAR PORTIONS OF A SWITCH BANK EACH SWITCH IS DRAWN AS VIEWED FROM THE FRONT OF THE SET

THE FOLLOWING SWITCH PAIRS HAVE CORRESPONDINGLY NUMBERED TERMINALS CONNECTED TOGETHER

SW 13 AND SW 14	SW 11 AND SW 12
SW 9 AND SW 10	SW 7 AND SW 8
SW 5 AND SW 6	SW 3 AND SW 4
SW 1 AND SW 2	

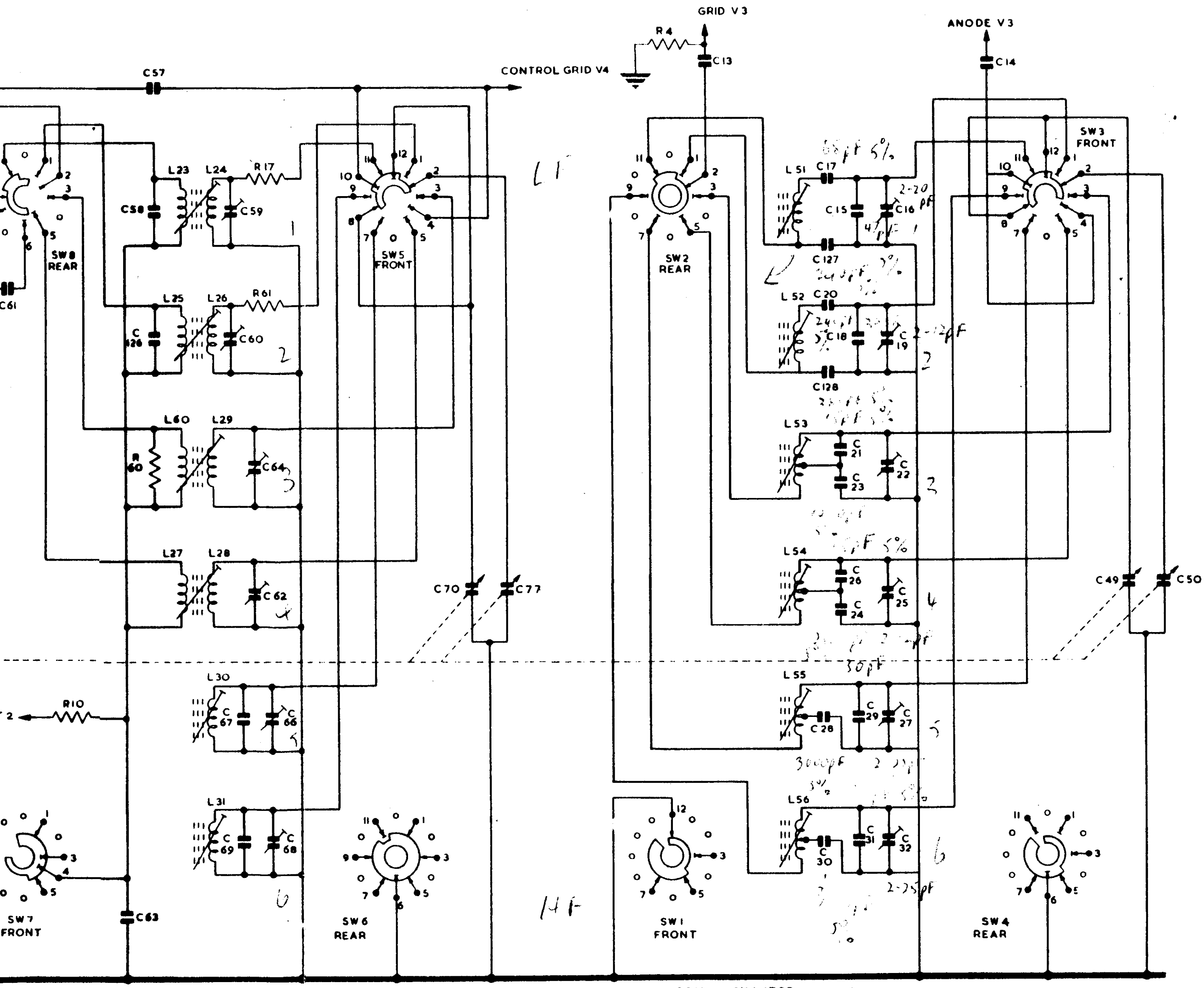
FOR CLARITY THE CONNECTIONS ARE NOT SHOWN IN THE DIAGRAM





AERIAL AND V1 GRID CIRCUITS

T $\frac{E \cdot 772}{1 \cdot 1002}$



...ODE AND V4 CONTROL GRID CIRCUIT

V3 LOCAL OSCILLATOR CIRCUIT

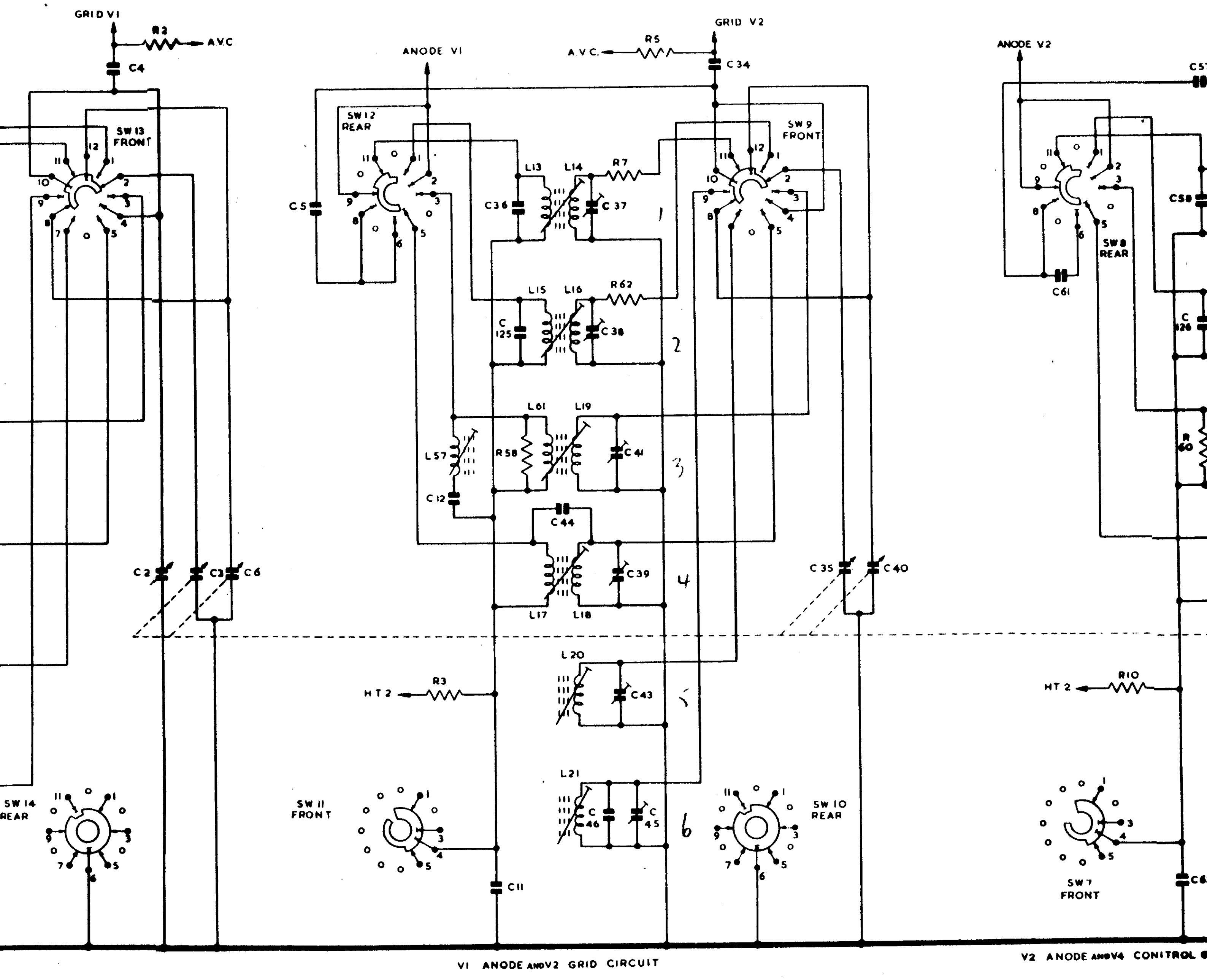


Fig. 1003 — AR88LF — R.F. and oscillator coil switching

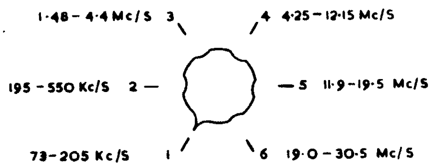
AR 88 - LF

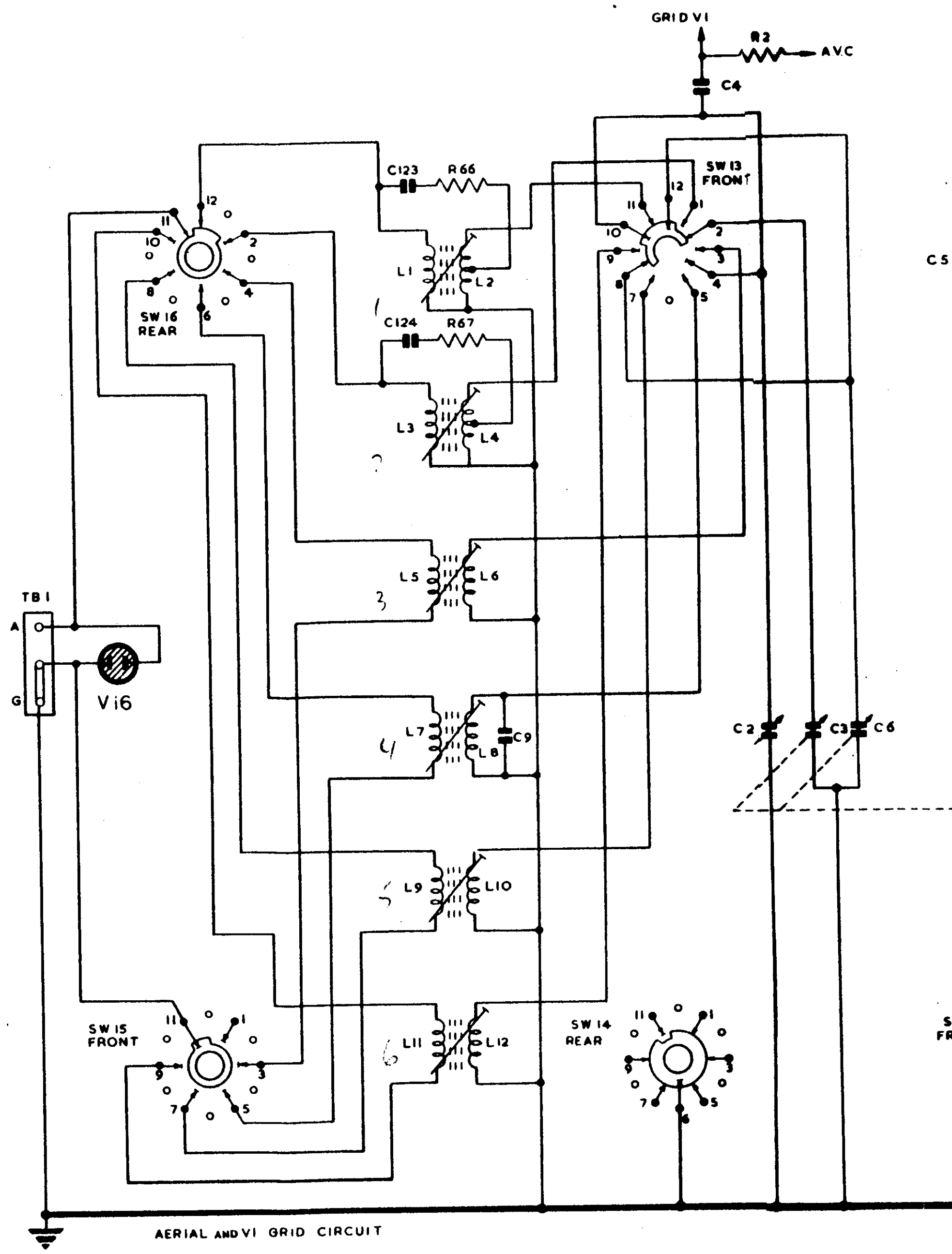
NOTE:-
THE RANGE SWITCH SW1-16 CONSISTS OF EIGHT PAIRS OF SWITCHES, EACH PAIR FORMING THE FRONT AND REAR PORTIONS OF A SWITCH BANK. EACH SWITCH IS DRAWN AS VIEWED FROM THE FRONT OF THE SET

THE FOLLOWING SWITCH PAIRS HAVE CORRESPONDINGLY NUMBERED TERMINALS CONNECTED TOGETHER:-

SW13 AND SW14   SW11 AND SW12
SW9 AND SW10   SW7 AND SW8
SW5 AND SW6   SW3 AND SW4
SW1 AND SW2

FOR CLARITY THE CONNECTIONS ARE NOT SHOWN IN THE DIAGRAM

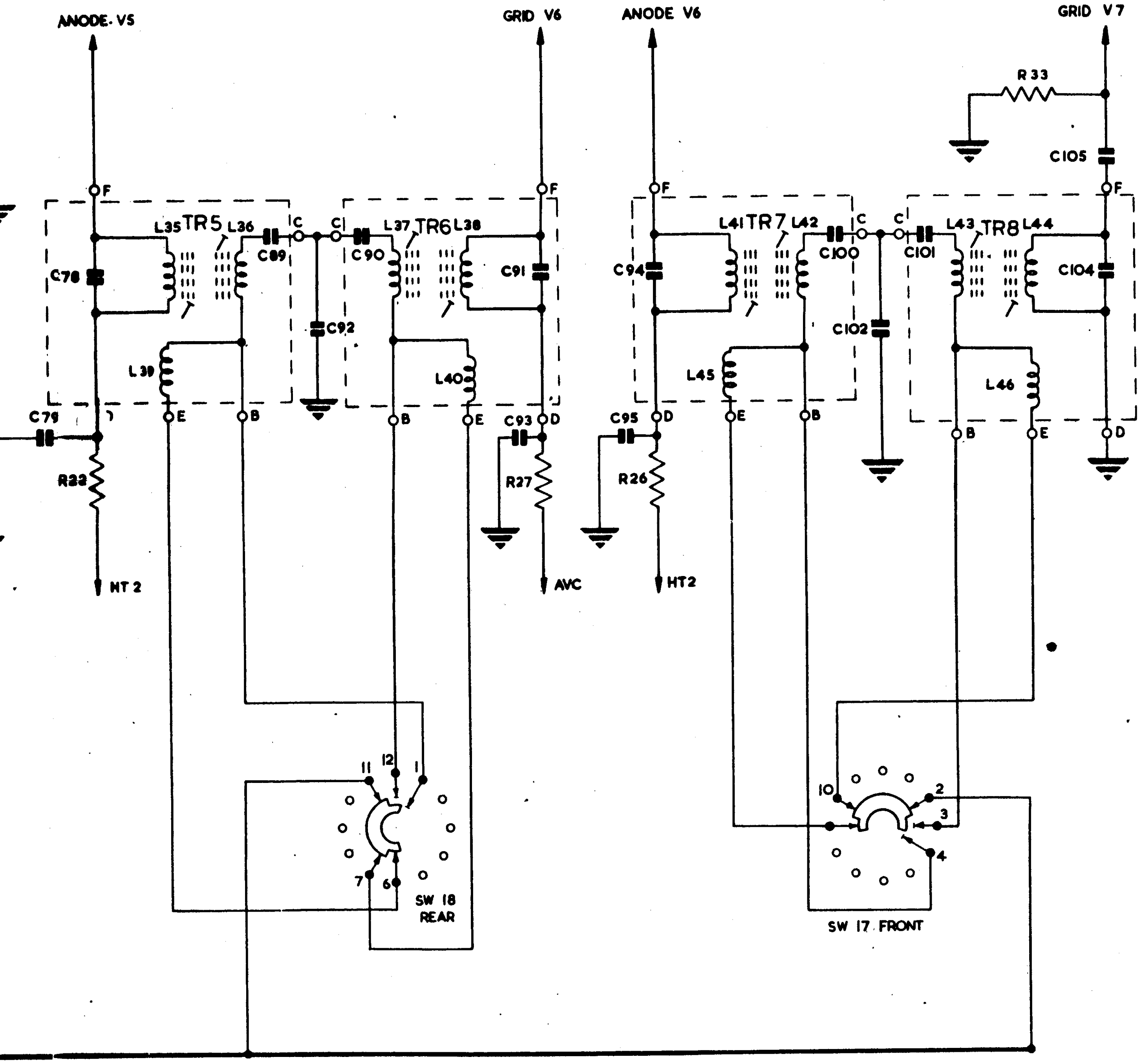




AERIAL AND V1 GRID CIRCUIT

T E·772 / 1-1003

C.B.H. 22604 - Wt. 40710 - Dd. 8632 - 3000 - 3/53



ALL SWITCHES SHOWN IN POSITION I (BROAD)

LF - wiring of SELECTIVITY switch, SW17-20

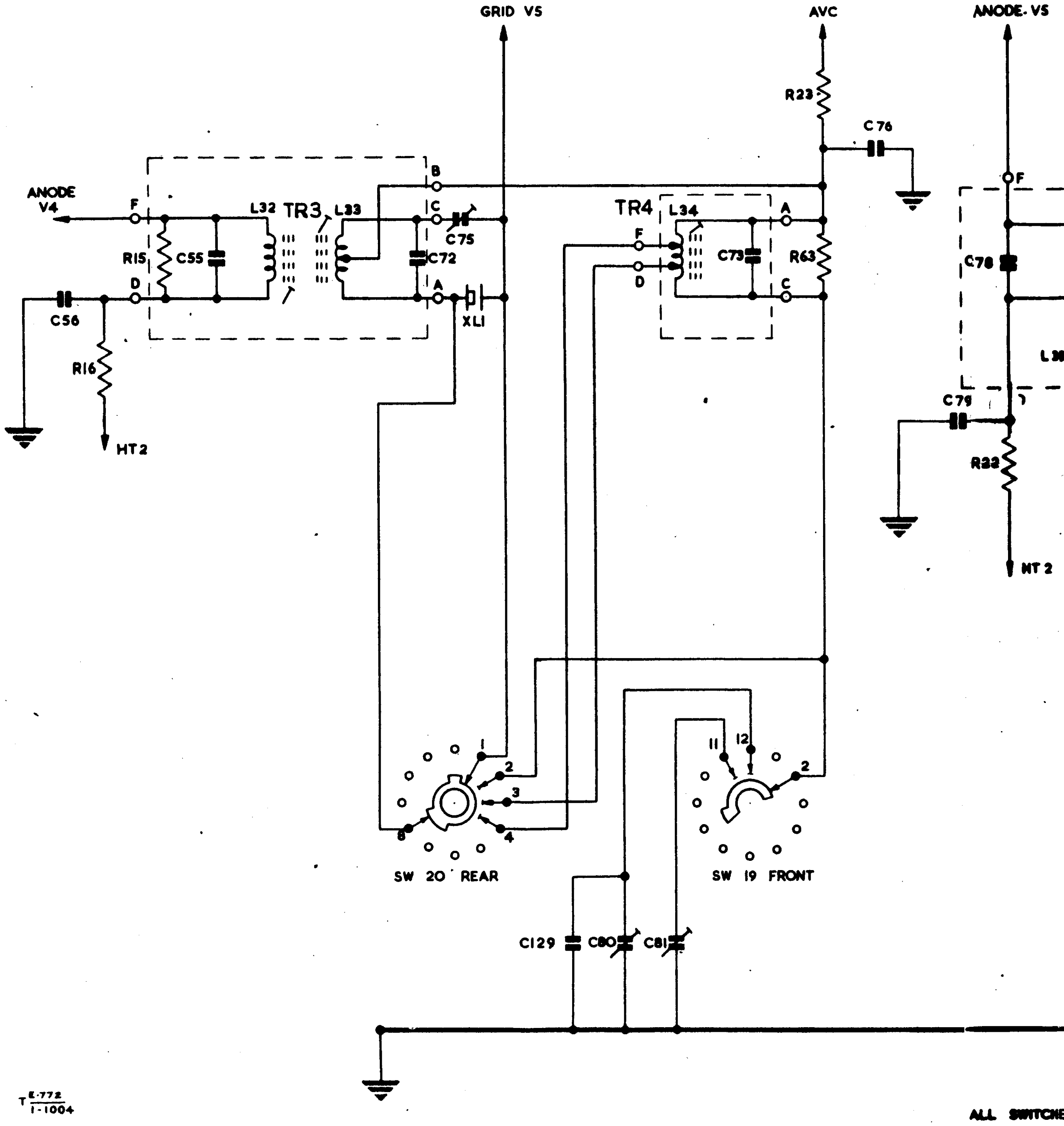
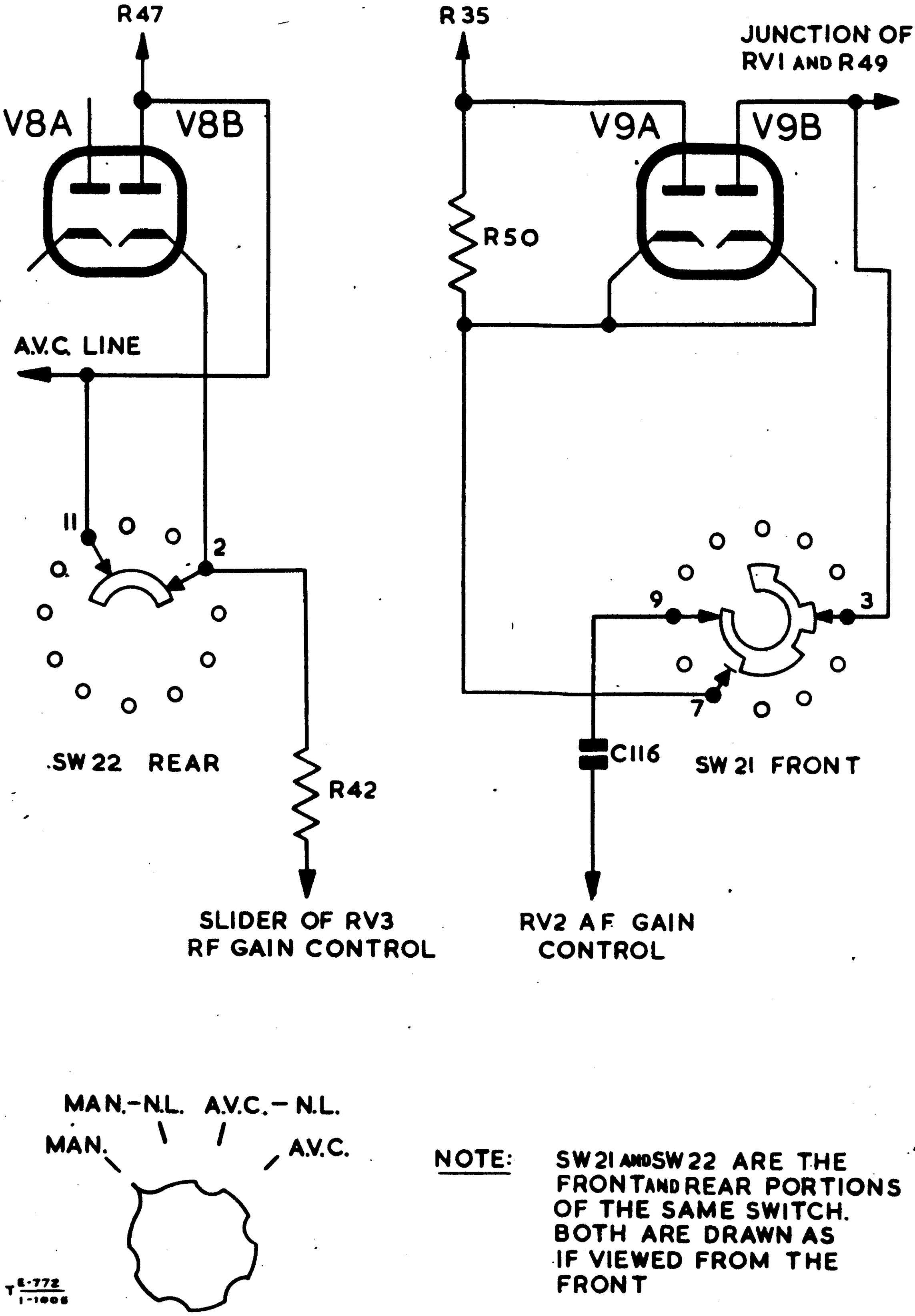


Fig 1004 - AR88D and AR88LF - wiring

$T\frac{E \cdot 772}{1 \cdot 1004}$



NOTE: SW21 AND SW22 ARE THE FRONT AND REAR PORTIONS OF THE SAME SWITCH. BOTH ARE DRAWN AS IF VIEWED FROM THE FRONT

Fig 1005 - AR88D and AR88LF - wiring of A.V.C. - N.L. switch, SW21-22

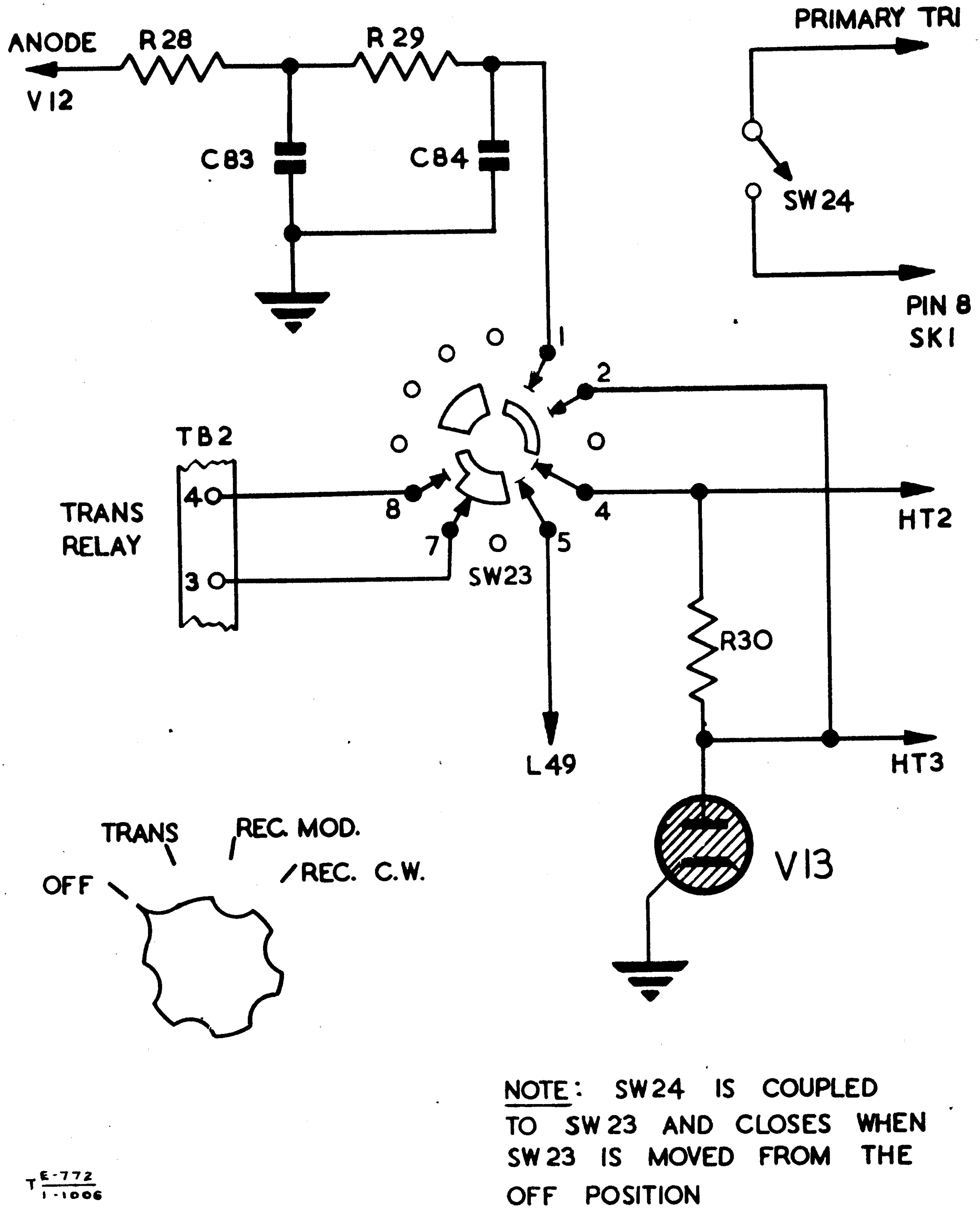


Fig 1006 - AR88D and AR88LF - wiring of OFF-TRANS. switch, SW23-24

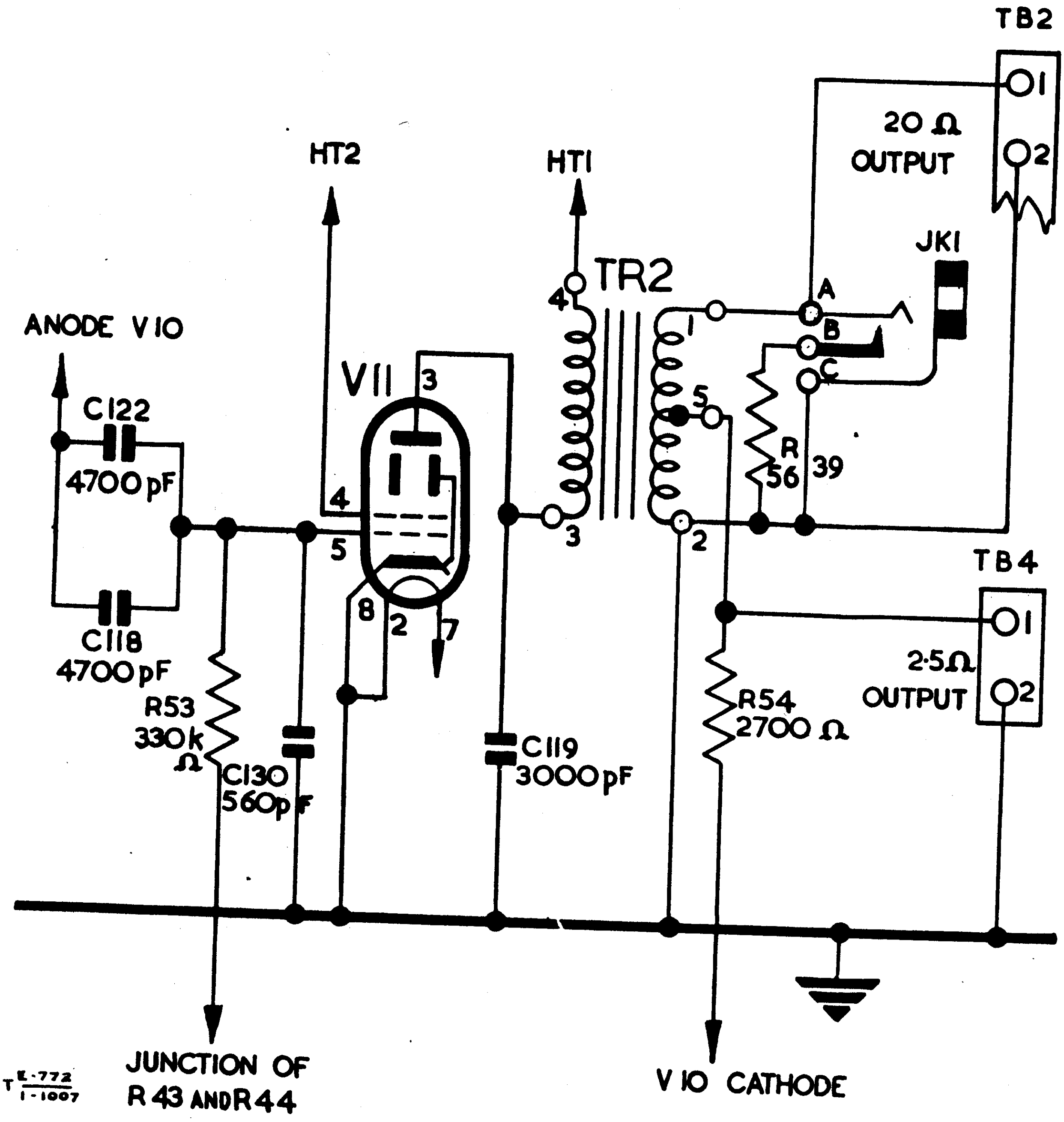


Fig 1007 - AR88LF - output stage

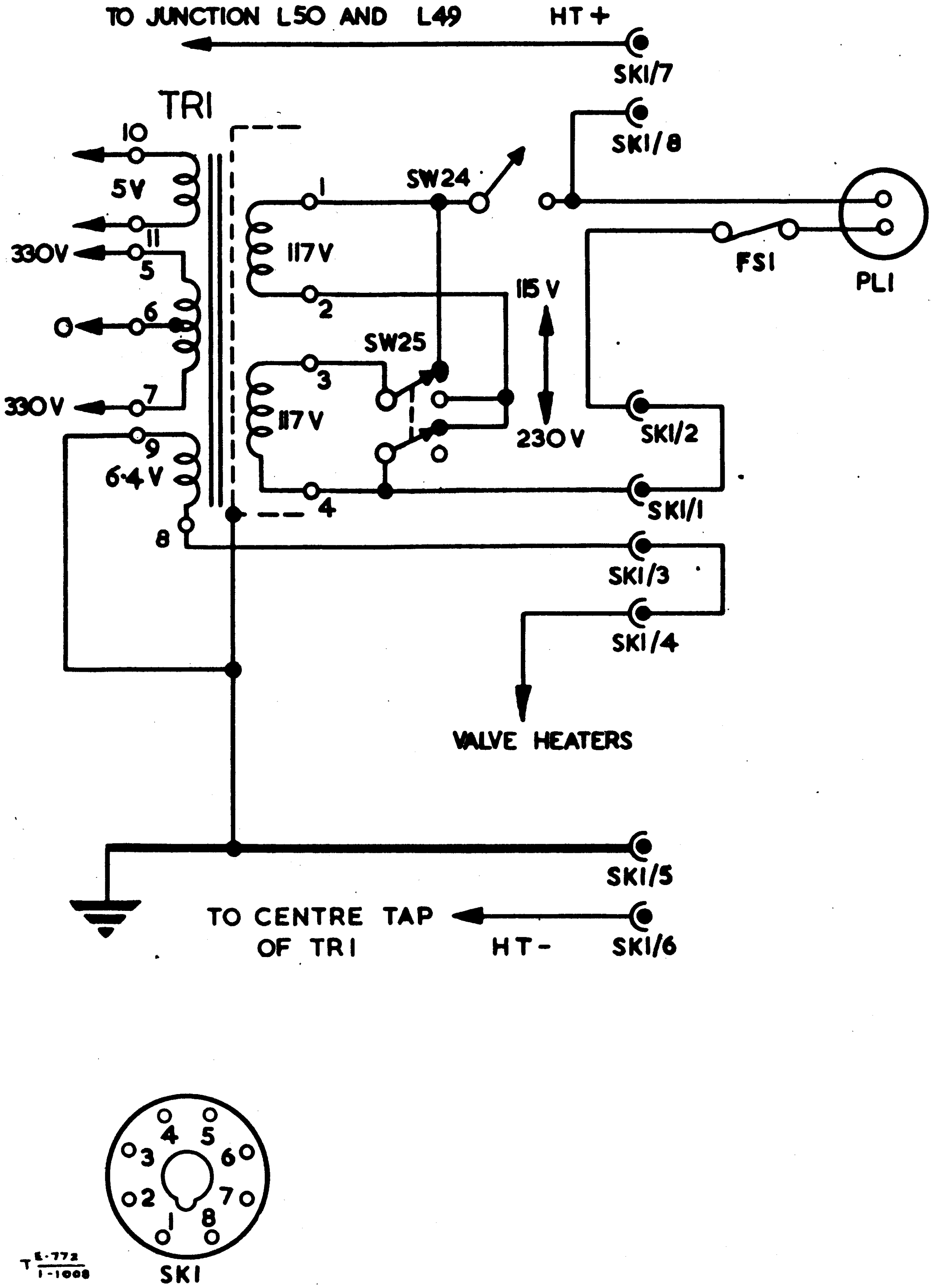


Fig 1008 - AR88LF - mains transformer

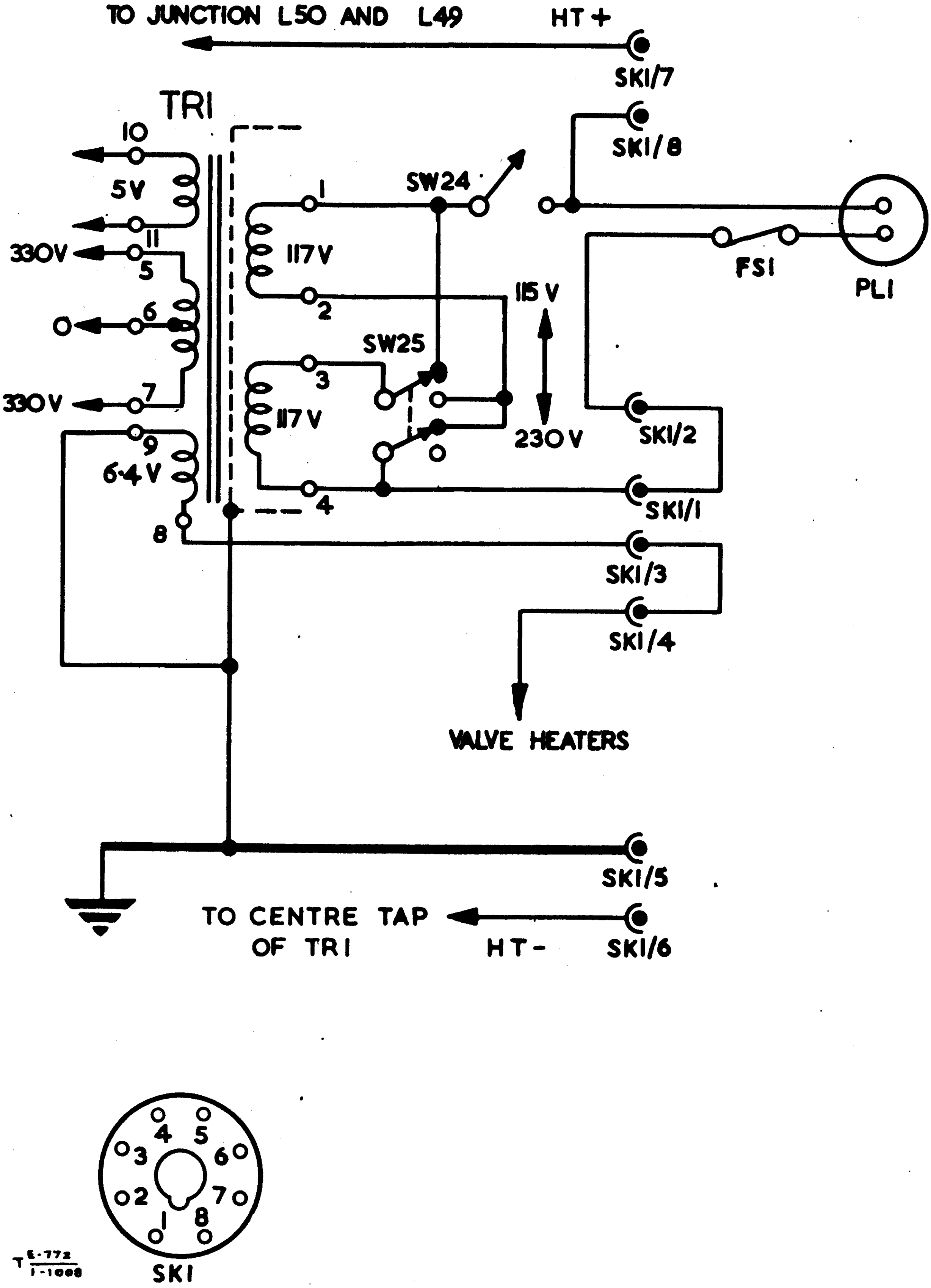
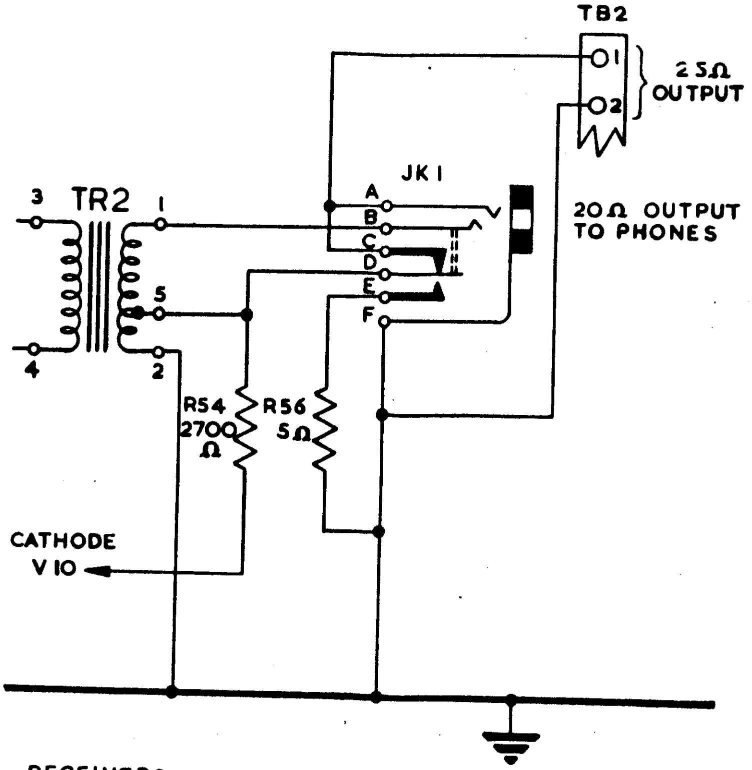
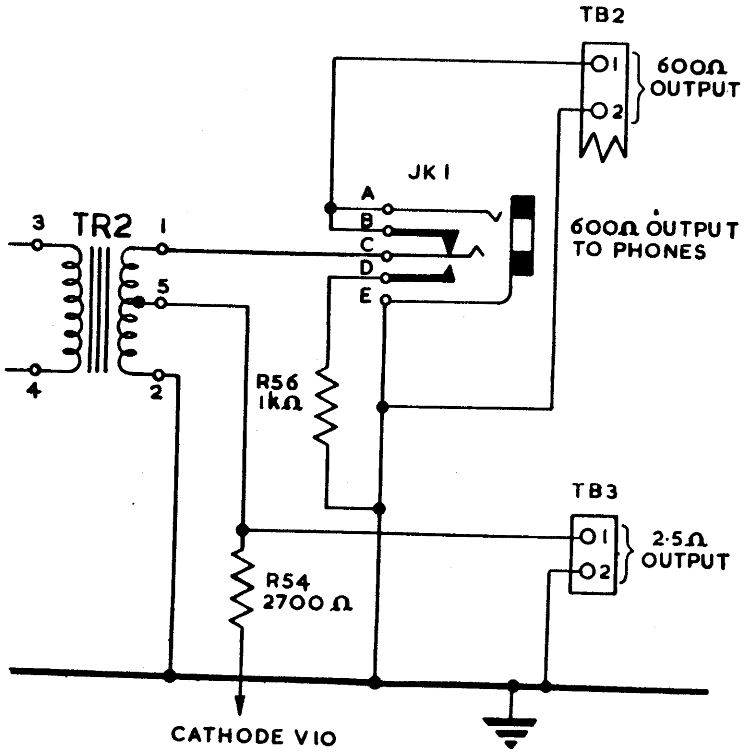


Fig 1008 - AR88LF - mains transformer



RECEIVERS WITH SERIAL NUMBERS BELOW 003000



RECEIVERS WITH SERIAL NUMBERS ABOVE 003000

T E-772/1-1009

Fig 1009 - AR88 - output circuits

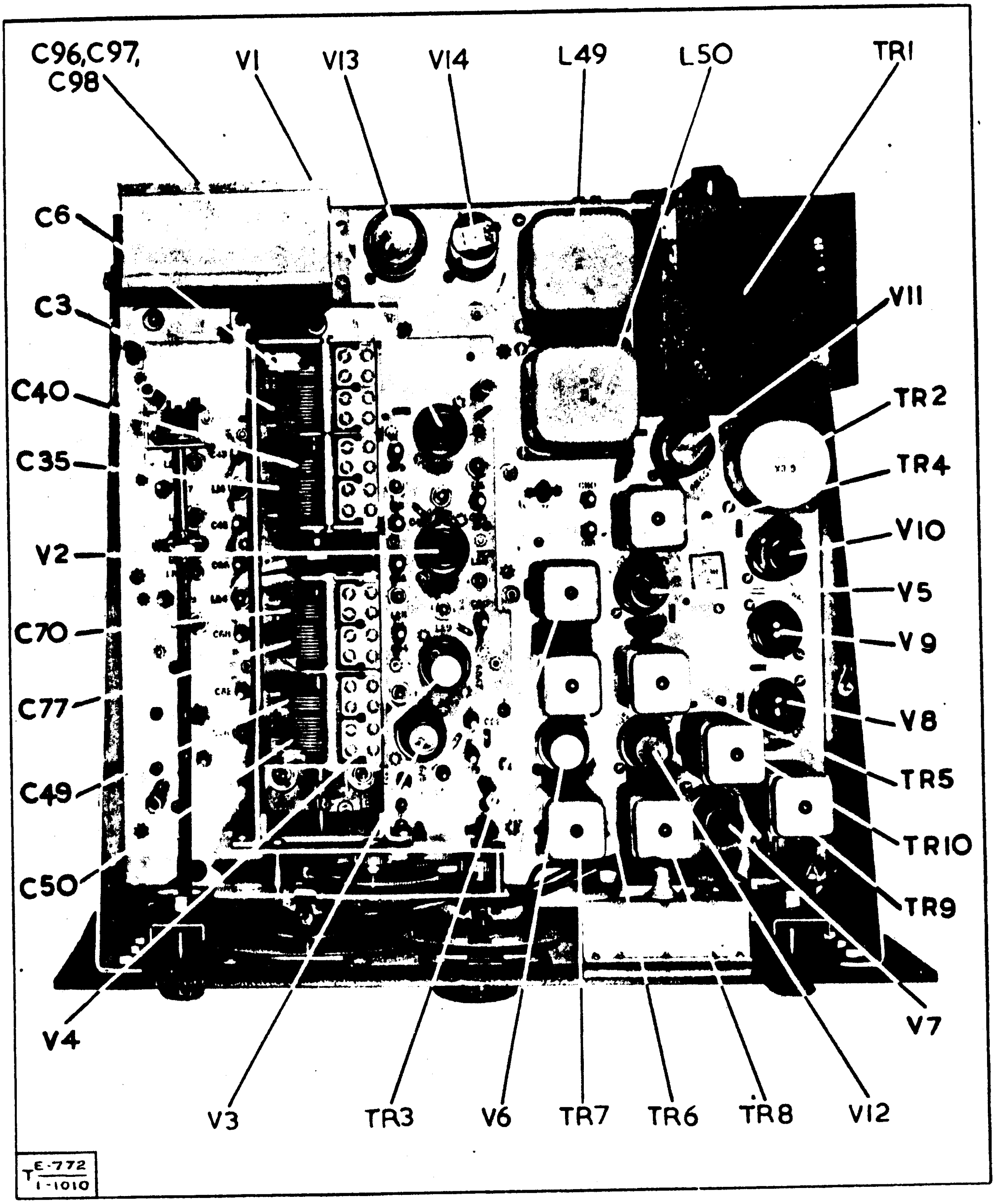


Fig 1010 - AR88D - top view

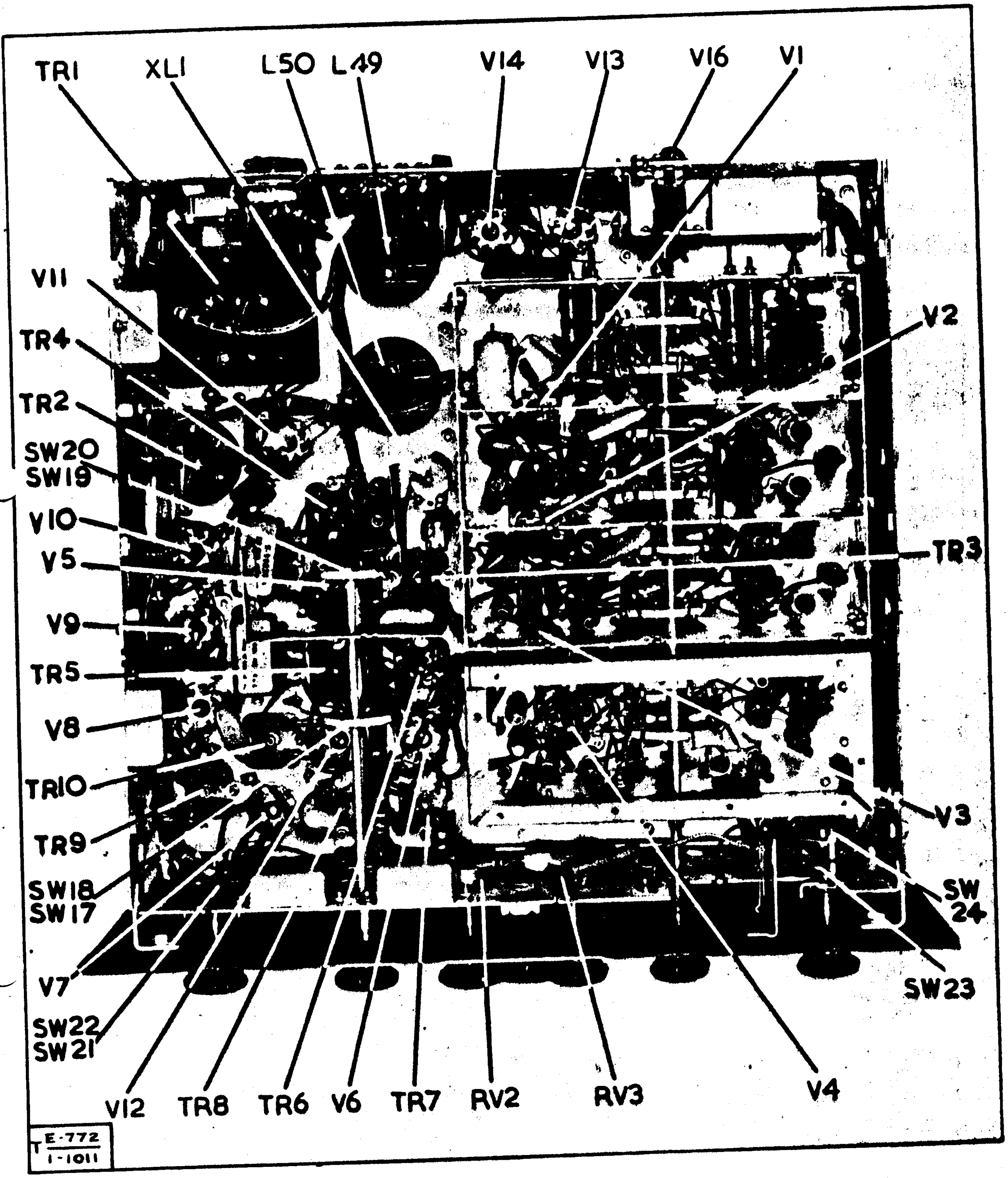


Fig 1011 - AR88LF - bottom view

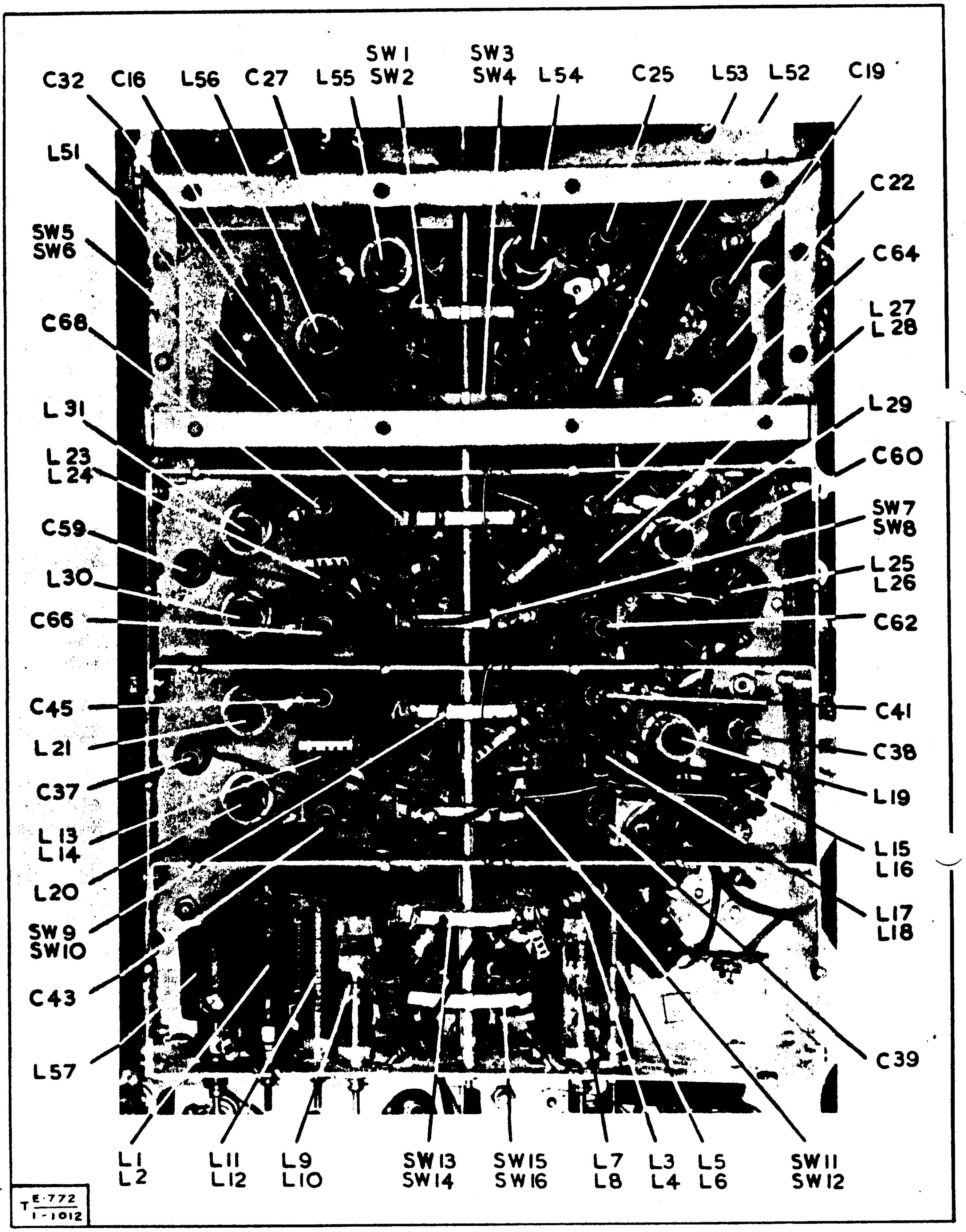


Fig 1012 - AR88D - view of R.F. and oscillator sections

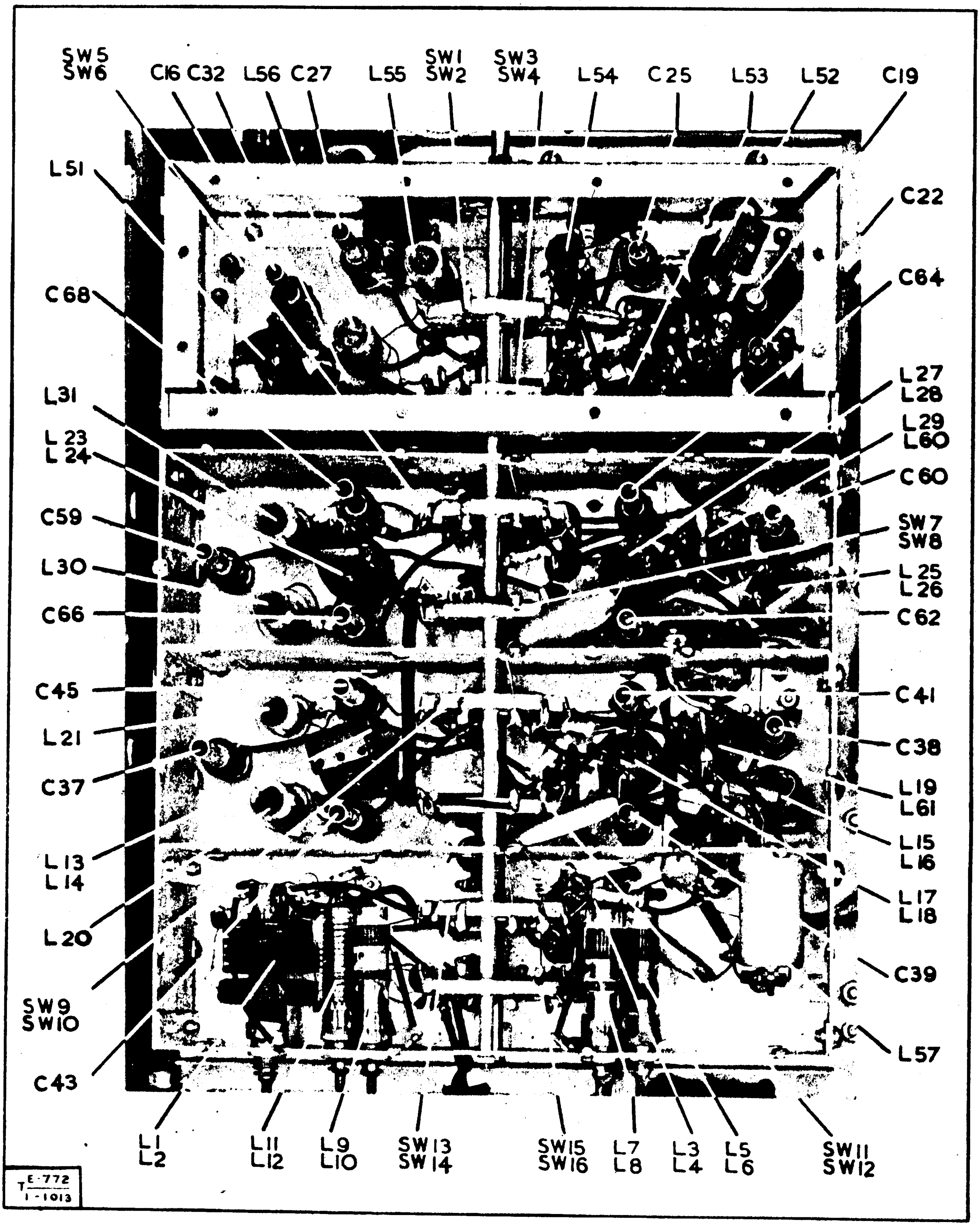


Fig 1013 - AR88LF - view of R.F. and oscillator sections

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

TELECOMMUNICATIONS
E 774

RECEPTION SETS AR88D AND AR88LF

TECHNICAL HANDBOOK - FIELD AND BASE REPAIRS

SUBJECT INDEX

INDEX TO TABLES

Distribution - Class 910. Code No. 4

INDEX TO TABLES (contd)

INDEX TO FIGURES

INTRODUCTION

1. Since the two receivers covered by this regulation are basically similar only one will be referred to in the text. Differences between the two models will be specified as they occur.

MECHANICAL ADJUSTMENTS AND REPLACEMENTS

Removal of R.F. unit

2. The R.F. unit contains the R.F. mixer and oscillator valves, ganged tuning capacitors, RANGE switch and all the R.F. and oscillator coils with their associated trimmers. It is mounted on a separate sub-chassis which is bolted to the main chassis. To remove the R.F. unit proceed as follows:-

(a) Remove the large cover from the top of the R.F. unit and remove the small cover from the ganged tuning capacitors.

(b) Unclip the dial lamp sockets from the vernier drive assembly. Remove the TUNING CONTROL knob and the RANGE switch knob.

(c) Loosen the screws in the ANT ADJ extension shaft coupling and withdraw the extension shaft from the front of the set.

(d) Unsolder the following eight leads which connect the R.F. unit to the remainder of the receiver.

(i) Blue lead to terminal A of TB1.
(ii) Black lead to centre terminal of TB1.
(iii) Brown lead to pin 7 of V11.
(iv) Yellow lead to terminal E of TR4.
(v) Red lead to terminal E of TR3.
(vi) Blue lead to terminal F of TR3.
(vii) Green lead to pin 6 of V6.
(viii) Brown lead to pin 7 of V6.

(e) Disconnect C121 from its earthing point on the R.F. unit.

(f) Loosen the screws in the coupling between the vernier drive assembly and the ganged tuning capacitors.

(g) Remove the four screws securing the vernier drive assembly to the ganged tuning capacitors.

(h) Remove the four nuts securing the vernier drive assembly to the R.F. unit sub-chassis.

(j) Remove the 11 screws which secure the R.F. unit to the main chassis (eight screws on top of the unit, three screws underneath).

(k) Invert the receiver, lift up the rear of the R.F. unit and slide it back out of the opening in the main chassis.

3. To replace the R.F. unit, reverse the procedure detailed in para 2.

Removal of RANGE switch wafers

4. (a) Turn the RANGE switch to position 1.

(b) Remove the R.F. unit from the main chassis as detailed in para 2.

(c) Remove the bottom coverplates from the oscillator and R.F. sections of the R.F. unit.

(d) Remove the nut securing the click plate to the oscillator section screen.

(e) Remove the oscillator section screen by removing the 12 screws securing it to the R.F. unit sub-chassis.

(f) Remove the two nuts securing the switch stator support shafts at the rear of the R.F. unit.

(g) Carefully draw the click plate and the stator support shafts to the front and remove the spacers between each switch wafer.

(h) Unsolder the leads to the defective switch wafer and remove the wafer.

5. To replace the RANGE switch wafer reverse the procedure detailed in para 4 ensuring that:-

(a) The flat sides of the central holes in each switch rotor are vertical, with the grooved side to the left in the case of the AR88D, and to the right in the case of the AR88LF as viewed from the front.

(b) The wafer is replaced in the correct way round.

(c) The three shaft guides and earthing springs are in position.

Removal of SELECTIVITY switch wafers

6. To remove the rear wafer, switch to position 1 and proceed as follows:-

(a) Unsolder the leads to the wafer.

(b) Remove the two nuts securing the wafer to the support shafts.

(c) Withdraw the wafer to the rear, slightly bending the copper shield if necessary.

7. To remove the front wafer proceed as follows:-

(a) Remove the rear wafer as detailed above.

(b) Unsolder the leads to the switch wafer.

(c) Remove the SELECTIVITY switch knob.

(d) Undo the nut securing the switch click plate to the chassis.

(e) Remove the two nuts securing the shield which lies between the two switch wafers.

(f) Raise the rear end of the switch assembly until the shield securing screws clear the chassis and withdraw the switch assembly to the rear.

(g) Remove the spacers and the shield; the wafer can now be removed.

8. To replace the SELECTIVITY switch wafers reverse the procedures detailed ensuring that:-

(a) The flat sides of the central hole in each switch rotor are vertical with the grooved side to the left as viewed from the front when the switch is in position 1.

(b) The wafer is replaced the correct way round.

(c) The shaft guide and the earthing spring are in position.

Removal of front panel

9. (a) Remove all control knobs.

(b) Remove the phone jack.

(c) Remove the two screws securing the dial lamp bracket over the nameplate on the front panel.

(d) Remove the eight nuts securing the front panel to the main chassis.

(e) Draw forward the front panel.

10. To replace the front panel reverse the procedure detailed in para 9.

Removal of vernier drive assembly

11. (a) Remove the front panel as detailed in para 9.

(b) Unclip the dial lamp holders.

(c) Remove the flywheel bracket.

(d) Loosen the two grubscrews in the coupling between the drive assembly and the ganged capacitor assembly.

(e) Remove the four screws securing the drive assembly to the ganged capacitor assembly.

(f) Remove the four nuts securing the drive assembly to the main chassis.

(g) The vernier drive assembly may now be removed by drawing it forward.

12. To replace the vernier drive assembly reverse the procedure detailed in para 11.

Adjustment of dial drive mechanism

13. The tuning dials and the couplings to the ganged capacitor assembly must be adjusted before the alignment of the R.F. and oscillator circuits. Proceed as follows:-

(a) Remove the covers from the R.F. unit and the ganged capacitor assembly.

(b) Loosen the grubscrews in the coupling between the vernier drive assembly and the ganged capacitor assembly.

(c) Rotate the ganged capacitor assembly shaft until the capacitor plates are fully meshed. Check that both front and rear portions of the capacitor assembly are fully meshed.

(d) Rotate the TUNING CONTROL fully counter-clockwise until the dial stop engages.

(e) Tighten the grubscrews in the coupling between the vernier drive assembly and the ganged capacitor assembly.

(f) Loosen the grubscrews securing the main tuning dial to its shaft.

(g) Rotate the main tuning dial until the zero line on the bottom scale is directly behind the cursor.

(h) Tighten the grubscrews.

(j) Loosen the two grubscrews securing the vernier tuning dial to its shaft.

(k) Rotate the vernier dial until its zero line is directly behind its cursor.

(l) Tighten the grubscrews.

ALIGNMENT AND SPECIFICATION TESTING

General

14. It is essential that all receiver tests and alignments be carried out in a completely screened compartment. Failure to do this is likely to result in false readings being obtained due to stray pick up.

B.F.O. attenuator

15. The output meter of Oscillators, beat frequency No. 5, 7 or 8 on the 10Ω range is scaled up to 5V. To permit voltages of the order of 0 - 0.5V to be measured, a simple attenuator is used between the output of the B.F.O. and the circuits under test. Suitable values for an attenuator giving an attenuation of 10 : 1 are given in Fig 1. The reading on the B.F.O. meter is then divided by 10.

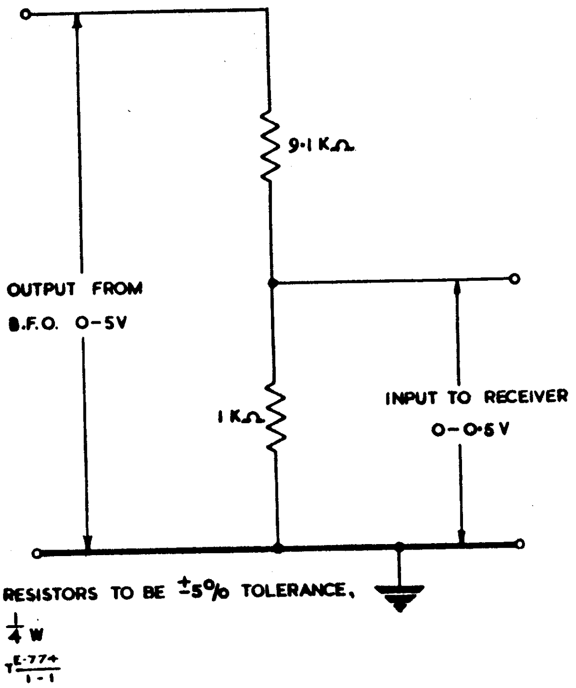


Fig 1 - B.F.O. attenuator circuit

Adjustments to tuned circuits

16. When making adjustments to the trimming capacitors and iron-dust cored coils the trimming tools provided with the set must be used. These trimming tools are carried in clips on the sides of the ganged capacitors' cover. Great care should be taken when making adjustments to the local oscillator trimming capacitors and coils as their settings are very critical. When the alignment of any particular section is completed, the iron-dust core adjusting screws should be sealed with a drop of Compound, sealing, nitro-cellulose (WB 3621). To free adjusting screws which have been sealed, dissolve the sealing compound with Acetone, commercial (HA 0001) applied with a brush.

Test equipment

17. The following test equipment is required for alignment and specification testing:-

Wattmeter, absorption, A.F., No. 1
Oscillator, beat frequency, No. 5, 7 or 8.
B.F.O. attenuator (see para 15).
Signal generator No. 1, Mk 2 or
Signal generator No. 12
Oscillograph, C.R., No. 1 or
Oscillograph type 13A.
Oscillator, ganging, No. 2, Mk 1 or Mk 2 (see note). — Cossor 343
Signal generator No. 2, Mk 1/2, Mk 3 or Mk 4, or
Signal generator No. 15
Frequency meter SCR-211. — BC 221

Note: The Oscillator, ganging, No. 2 is obsolescent, but should be used wherever available for the I.F. channel alignment procedure given in paras 26 to 35. A new method of I.F. channel alignment, which does not involve the use of a ganging oscillator, is now being developed for receivers employing over-coupled I.F. coils. Instructions detailing this method will be issued in due course as additional pages to this regulation.

General test conditions

18. (a) Set to be switched on for a period of at least 15 minutes before any circuit adjustment is made.

(b) The wattmeter on the 2.5Ω impedance range to be connected across the speaker terminals on all tests unless otherwise specified.

(c) Receiver at REC MOD unless otherwise stated.

(d) When aligning or testing the I.F. circuits, modulate the signal generator output at 150c/s to a depth of 30% using external modulation.

(e) When aligning or testing the R.F. circuits, modulate the signal generator output at 400c/s to a depth of 30%.

A.F. stages

19. Set the receiver controls as follows:-

A.F. GAIN - fully clockwise.
H.F. TONE - fully clockwise.

Connect the output of the B.F.O. across RV2 (A.F.GAIN) via the B.F.O. attenuator. With a constant input of 0.15V, the A.F. output should not be less than 500mW at any frequency between 150c/s and 3,000c/s. At 3,000c/s adjust RV2 to give 500mW. Turn RV4 (H.F. TONE) fully anti-clockwise; the output should fall to below 25mW.

20. Return RV4 to fully clockwise and switch to TRANS. Remove the wattmeter from the 2.5Ω output and connect it on the appropriate impedance range across the line output. For the AR88LF connect a 10Ω ¼W resistor in series with the wattmeter on the 10Ω impedance range and multiply the scale reading by two. Switch to REC MOD; the A.F. output should be as in Table 1. Similarly check the output of the headphone circuit, ensuring in the case of the AR88D that the headphone plug is pushed fully home.

Output circuit	AR88D		AR88LF	
	Impedance	Output	Impedance	Output
Speaker	2.5Ω	500mW	2.5Ω	500mW
Line	600Ω	>400mW	20Ω	>400mW
Headphone	20kΩ	>6mW	20Ω	>250mW

Table 1 - Line and headphone circuit outputs

I.F. channel performance

21. As a crystal filter is employed in positions 3, 4 and 5 of the SELECTIVITY switch on both receivers it is essential that the I.F. channel be aligned at the crystal frequency (this may differ slightly from the nominal intermediate frequency). Alignment of the I.F. channel is exceedingly difficult to perform and must not be attempted unless the performance is outside the limits specified in the following paragraphs.

22. Set the receiver controls as follows:-

H.F. TONE	: fully clockwise.
R.F. GAIN	: fully clockwise.
A.F. GAIN	: fully clockwise.
NOISE LIMITER	: fully anti-clockwise.
SELECTIVITY	: position 4.
A.V.C./N.L. switch	: MAN
RANGE switch and TUNING CONTROL	: AR88D to 535kc/s. AR88LF to 550kc/s.

Remove the local oscillator valve V3. Set up the Signal generator No. 1 to give a 1mV modulated signal at the nominal I.F. Apply the output via a 0.1µF, 350V D.C. paper capacitor to the grid (pin 8) of V4.

23. Adjust the frequency of the signal generator, with the incremental dial set to zero, for maximum response as indicated on the wattmeter. The signal generator is now set to the crystal frequency. Note the input required to give 500mW A.F. output. This must be within the limit specified in column 2 of Table 2. Increase the input by 6db and detune the signal generator, using the incremental dial only, either side of resonance until the A.F. output again falls to 500mW. Note the two frequencies at which this occurs and calculate their mean and their difference. The mean frequency must not differ from the crystal frequency by more than the amount given in column 3 of Table 2. The frequency difference is the band-width at -6db and must be within the limits specified in column 5.

24. Repeat the procedure of para 23 for each of the other four selectivity positions. In each case (except position 1) the frequency of maximum response must not differ from the crystal frequency by more than the amount given in column 6 of Table 2.

SELECTIVITY position	Max input for 500mW output	Max deviation of mean from Xtal frequency	Nominal band-width at -6db	Acceptable limits of band-width	Max deviation of peak from Xtal frequency
		AR88D	I.F. = 455kc/s		
1	2.5mV	2kc/s	13kc/s	11.5-14.5kc/s	-
2	1.0mV	1kc/s	7kc/s	6 - 8kc/s	1kc/s
3	1.5mV	500c/s	3kc/s	2.5- 3.5kc/s	500c/s
4	1.9mV	350c/s	1.5kc/s	1.2- 1.8kc/s	Xtal freq
5	4.0mV	200c/s	400c/s	250- 550c/s	200c/s
		AR88LF	I.F. = 735kc/s		
1	600µV	2kc/s	16kc/s	14.5-17.5kc/s	-
2	400µV	1kc/s	8kc/s	7 - 9kc/s	1kc/s
3	850µV	500c/s	4kc/s	3.5- 4.5kc/s	500c/s
4	950µV	350c/s	2kc/s	1.7- 2.3kc/s	Xtal freq
5	1.6mV	200c/s	550c/s	400- 700c/s	200c/s

Table 2 - I.F. channel response

25. If the I.F. channel response in any SELECTIVITY position is outside the specified limits, the I.F. channel must be re-aligned.

I.F. channel alignment, using Oscillator, ganging, No. 2

26. With the SELECTIVITY switch at position 2 and other conditions as in para 22, adjust the frequency of the signal generator to the nominal I.F. using the frequency meter. Adjust the cores of all the I.F. transformers for maximum response as indicated on the wattmeter, reducing the input to maintain the A.F. output around 500mW.

27. Set the phasing capacitor C75 to half-capacity by inspection of the vanes and fully screw in the core of TR4, the crystal load. Switch to SELECTIVITY position 4 and adjust the frequency of the signal generator for maximum reading on the wattmeter. Next, adjust the core of TR4 for maximum response. Readjust the signal frequency and TR4 until no further increase in output can be obtained. The signal generator is now set to the crystal frequency.

28. Switch to SELECTIVITY position 2 and adjust the cores of all the I.F. transformers for maximum reading on the wattmeter, reducing the input to maintain the output around 500mW. Remove the signal generator input and set A.F. GAIN to minimum.

29. Connect up the oscilloscope and the ganging oscillator using a 25c/s sweep. The output of the ganging oscillator is fed to the grid of V4. Connect the DIVERSITY terminal to the A1 terminal on the oscilloscope and set the A1 amplifier to maximum gain. Adjust the length of the oscilloscope trace to exactly 6 cm and set the output of the ganging oscillator to 30kc/s deviation. Switch to SELECTIVITY position 4 and adjust the oscillator frequency until the peak of the response curve lies in the exact centre of the oscilloscope trace. Check this adjustment frequently.

30. Switch to SELECTIVITY position 2 and check that the peak of the response curve in this position lies in the centre of the trace. If it is displaced to one side, carefully bring it to the centre by making slight adjustments to all the transformer cores. Take care not to reduce the sensitivity of the I.F. channel or to destroy the symmetry of the curve.

31. Compare the I.F. response curves in SELECTIVITY positions 1, 2 and 3 with those illustrated in Fig 2 or 3. These are idealized response curves which would be obtained from a perfectly aligned I.F. channel. The respective heights of the response curves indicate the relative responses of the I.F. channel in the different SELECTIVITY positions. These curves however are very difficult to reproduce exactly and approximations within the limits specified in Table 2 are sufficient for all purposes.

32. The procedure for obtaining the desired curves consists of making small adjustments to the following:- the bottom cores only of TR5, TR6, TR7 and TR8, C75 and TR4. First adjust the bottom cores of TR5 to TR8 in SELECTIVITY positions 1 and 2 observing the effects on the oscilloscope until the correct curves are obtained. Switch to position 3 and adjust C75 and TR4 for the best symmetrical curve. The correct setting of C75 is very close to its half-capacity position. It must never be set to either maximum or minimum capacity. Note that the symmetry of the curves in positions 1 and 2 is affected by C75, therefore check these after each adjustment.

Note: It may save time to align position 3 after only partially aligning positions 1 and 2.

33. It may not be possible to obtain the correct response in position 3 by means of TR4 and C75 alone. In this case an adjustment to one or more of the bottom cores of TR5 to TR8 will be necessary. Note the effect of such an adjustment on the response in positions 1 and 2 and correct for it by adjusting the remaining bottom cores of TR5 to TR8.

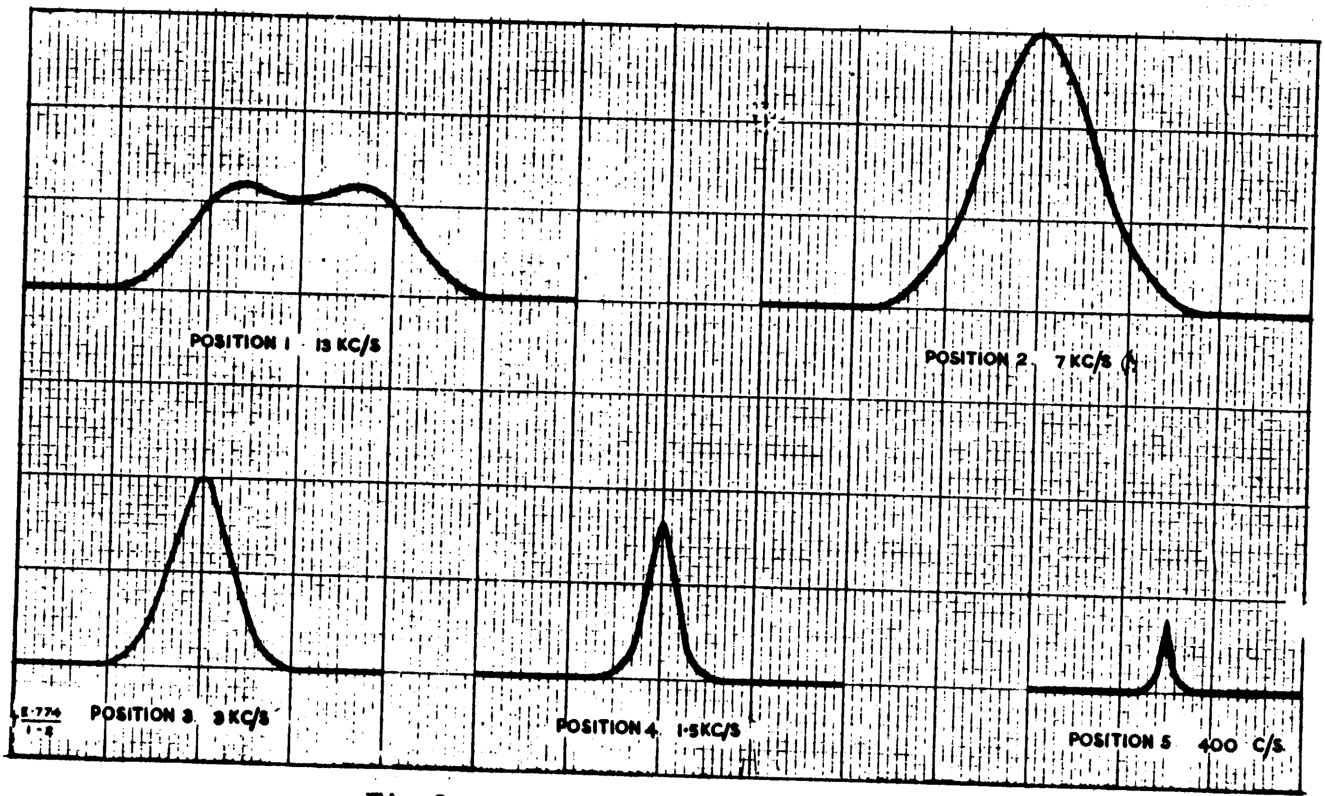


Fig 2 - I.F. response curves, AR88D

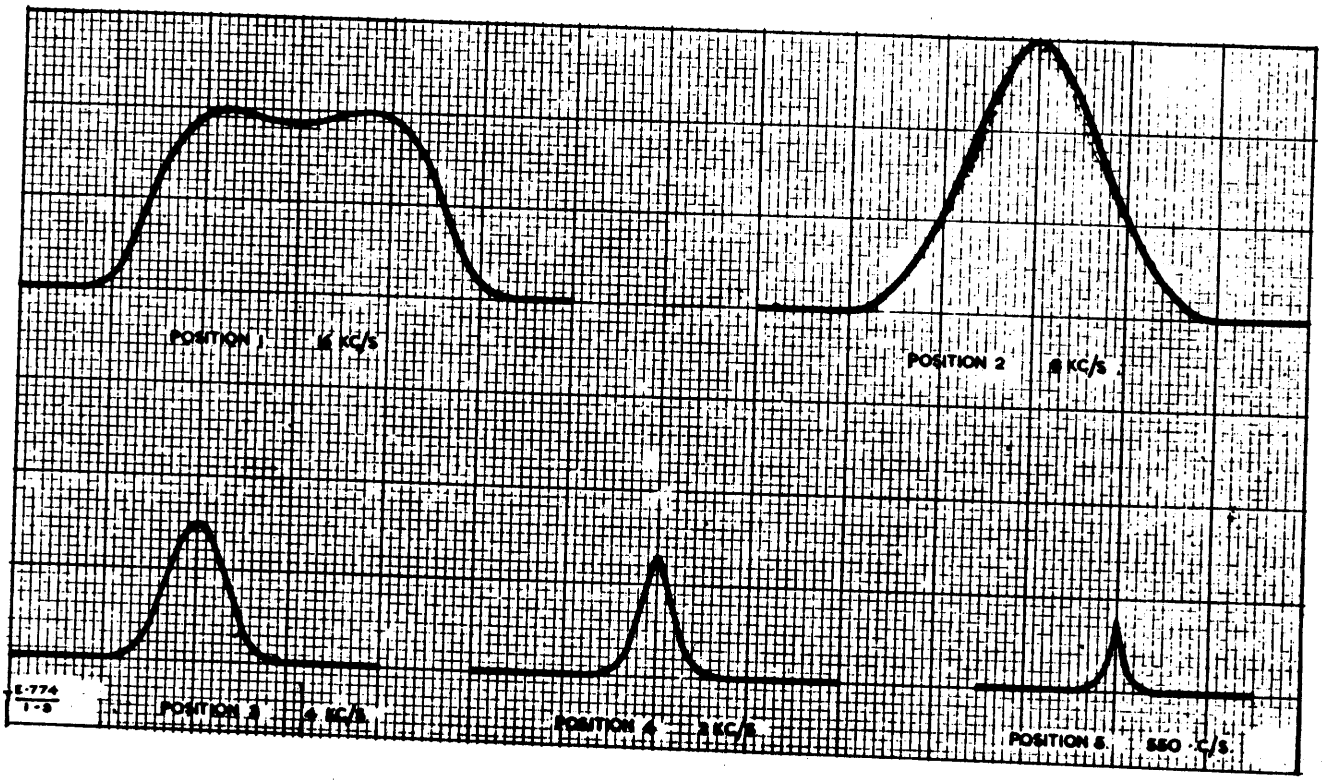


Fig 3 - I.F. response curves, AR88LF

34. After SELECTIVITY positions 1, 2 and 3 have been satisfactorily aligned obtain the best response curves for positions 4 and 5 by adjusting C81 and C80 respectively.

35. On completion of the I.F. channel alignment check the performance as detailed in paras 22 to 25.

B.F.O. adjustment

36. Set the receiver controls as given in para 22 and apply a modulated signal at the intermediate frequency. Adjust the frequency for maximum A.F. output and set the input to give 100mW on the wattmeter. Switch off the modulation and plug in the headphones; reduce A.F. GAIN. Switch to REC C.W. and set the B.F.O. ADJ capacitor, C86, so that at half-capacity the control knob points vertically upwards. Adjust the core of TR10 for zero beat in the headphones.

37. By rotating B.F.O. ADJ check that it is possible to vary the beat note to 3,000c/s, judged aurally, either side of zero beat.

B.F.O. efficiency

38. With an input applied as in para 36 set B.F.O. ADJ to give a beat note of approximately 1,000c/s. Remove the headphones and increase A.F. GAIN to maximum. The A.F. output should be greater than 500mW as indicated on the wattmeter.

Wave-trap adjustment

39. Remove the signal input from the grid of V4 and plug in V3. Set the receiver controls as follows:-

H.F. TONE	:	fully clockwise
R.F. GAIN	:	fully clockwise
A.F. GAIN	:	mid - position
NOISE LIMITER	:	fully anticlockwise
SELECTIVITY	:	position 2
A.V.C./N.L. switch	:	MAN
RANGE switch	:	(AR88D to range 1 (AR88LF to range 3

Set the signal generator to give 100mV signal modulated 30% at 400c/s at the intermediate frequency. Apply the signal input between terminals A and G of TB1 via the appropriate dummy aerial (200pF capacitor for AR88D; 200Ω resistor for AR88LF, see para 41). Check that the centre terminal of TB1 is shorted to G. Adjust the frequency for maximum A.F. output, setting this to about 500mW with the A.F. GAIN control. Adjust L57 for minimum receiver response. This adjustment is not critical and L57 need not be sealed.

R.F. and local oscillator alignment

40. Before attempting this alignment check that the dial drive mechanism is correctly adjusted as detailed in para 13.

41. Set the receiver controls as in para 39 with the RANGE switch set to range 1. The alignment procedure is given in Table 3 (AR88D) or Table 4 (AR88LF). Set the signal generator to give a 10µV modulated signal and apply it in series with the dummy aerial (value given in Tables 3 and 4) across terminals A and G of TB1. The centre terminal must be shorted to G. The dummy aerial capacitor should be a high grade ceramic type; the resistor should be ±5% tolerance ¼W, non-inductive.

Table 3 - R.F. and oscillator alignment, AR88D

Operation	Range switch position	Position of dial	Generator frequency	Dummy Aerial	Position of C2, ANT ADJ	Trimmer adjustments
1	1	Extreme low end	535kc/s	200pF	-	L51
2	1	Extreme high end	1,600kc/s	200pF	-	C16
3	Repeat 1 and 2 until end frequencies are as indicated					
4	1	1,500kc/s	1,500kc/s	200pF	Max output	C37, C59
5	1	600kc/s	600kc/s	200pF	Untouched	L2, L14, L24
6	Repeat 4 and 5 until circuits remain in alignment over the band					
7	2	Extreme low end	1,570kc/s	200Ω	-	L52
8	2	Extreme high end	4,550kc/s	200Ω	-	C19
9	Repeat 7 and 8 until end frequencies are indicated					
10	2	4,300kc/s	4,300kc/s	200Ω	Max output	C38, C60
11	2	1,700kc/s	1,700kc/s	200Ω	Untouched	L4, L16, L26
12	Repeat 10 and 11 until circuits remain in alignment over the band					
13	3	Extreme low end	4,450kc/s	200Ω	-	L53
14	3	Extreme high end	12,150kc/s	200Ω	-	C22
15	Repeat 13 and 14 until end frequencies are as indicated					
16	3	11,500kc/s	11,500kc/s	200Ω	Max output	C39, C62
17	3	4,600kc/s	4,600kc/s	200Ω	Untouched	L6, L18, L28
18	Repeat 16 and 17 until circuits remain in alignment over the band					
19	4	Extreme low end	11,900kc/s	200Ω	-	L54
20	4	Extreme high end	16,600kc/s	200Ω	-	C25
21	Repeat 19 and 20 until end frequencies are as indicated					
22	4	16,400kc/s	16,400kc/s	200Ω	Max output	C41, C64
23	4	12,100kc/s	12,100kc/s	200Ω	Untouched	L8, L19, L29
24	Repeat 22 and 23 until circuits remain in alignment over the band					

Table 3 - contd

Operation	Range switch position	Position of dial	Generator frequency	Dummy aerial	Position of C2 ANT ADJ	Trimmer adjustments
25	5	Extreme low end	16,100kc/s	200Ω	-	L55
26	5	Extreme high end	22,700kc/s	200Ω	-	C27
27	Repeat 25 and 26 until end frequencies are as indicated					
28	5	22,500kc/s	22,500kc/s	200Ω	Max output	C43, C66
29	5	16,400kc/s	16,400kc/s	200Ω	Untouched	L10, L20, L30
30	Repeat 28 and 29 until circuits remain in alignment over the band					
31	6	Extreme low end	22,000kc/s	200Ω	-	L56
32	6	Extreme high end	32,000kc/s	200Ω	-	C32
33	Repeat 31 and 32 until end frequencies are as indicated					
34	6	31,500kc/s	31,500kc/s	200Ω	Max output	C45, C68
35	6	22,500kc/s	22,500kc/s	200Ω	Untouched	L12, L21, L31
36	Repeat 34 and 35 until circuits remain in alignment over the band					

Table 4 - R.F. and oscillator alignment, AR88LF

Operation	Range switch position	Position of dial and Generator frequency	Dummy aerial	Position of C2, ANT ADJ	Trimmer adjustments
1	1	85kc/s	700pF	-	L51
2	1	200kc/s	700pF	-	C16
3	Repeat 1 and 2 until end frequencies are as indicated				
4	1	195kc/s	700pF	Max output	C37, C59
5	1	85kc/s	700pF	Untouched	L2, L14, L24
6	Repeat 4 and 5 until circuits remain in alignment over the band				
7	2	200kc/s	700pF	-	L52
8	2	545kc/s	700pF	-	C19
9	Repeat 7 and 8 until end frequencies are as indicated				
10	2	500kc/s	700pF	Max output	C38, C60

Table 4 - contd

Operation	Range switch position	Position of dial and Generator frequency	Dummy aerial	Position of C2 ANT ADJ	Trimmer adjustments
11	2	205kc/s	700pF	Untouched	L4, L16, L26
12	Repeat 10 and 11 until circuits remain in alignment over the band				
13	3	1,500kc/s	200Ω	-	L53
14	3	4,350kc/s	200Ω	-	C22
15	Repeat 13 and 14 until end frequencies are as indicated				
16	3	4,250kc/s	200Ω	Max output	C41, C64
17	3	1,600kc/s	200Ω	Untouched	L6, L19, L29
18	Repeat 16 and 17 until circuits remain in alignment over the band				
19	4	4,300kc/s	200Ω	-	L54
20	4	12,100kc/s	200Ω	-	C25
21	Repeat 19 and 20 until end frequencies are as indicated				
22	4	11,900kc/s	200Ω	Max outout	C39, C62
23	4	4,400kc/s	200Ω	Untouched	L8, L18, L28
24	Repeat 22 and 23 until circuits remain in alignment over the band				
25	5	12,000kc/s	200Ω	-	L55
26	5	19,400kc/s	200Ω	-	C27
27	Repeat 25 and 26 until end frequencies are as indicated				
28	5	19,000kc/s	200Ω	Max output	C43, C66
29	5	12,150kc/s	200Ω	Untouched	L10, L20, L30
30	Repeat 28 and 29 until circuits remain in alignment over the band				
31	6	19,100kc/s	200Ω	-	L56
32	6	30,400kc/s	200Ω	-	C32
33	Repeat 31 and 32 until end frequencies are as indicated				

Table 4 - contd

Operation	Range switch position	Position of dial and Generator frequency	Dummy aerial	Position of C2 ANT ADJ	Trimmer adjustments
34	6	30,000kc/s	200Ω	Max output	C45, C68
35	6	19,500kc/s	200Ω	Untouched	L12, L21, L31
36	Repeat 34 and 35 until circuits remain in alignment over the band				

42. Set the frequency of the signal generator at each step using the Frequency meter SCR-211. For 85kc/s in the case of the AR88LF, use the second harmonic of the signal and adjust for zero beat against a 170kc/s setting of the frequency meter. Adjust each trimmer for maximum reading on the wattmeter, setting the A.F. GAIN to give approximately 500mW output. If the R.F. circuits are considerably out of alignment a higher R.F. input will be necessary. If more than one peak is obtainable when adjusting the oscillator circuits, use the higher frequency peak. The oscillator should track at a higher frequency than the signal frequency on all bands.

43. Note that on all coils, except L54, L55 and L56 on the AR88D and L55 and L56 on the AR88LF, turning the core clockwise increases the inductance. On the above-mentioned coils the reverse applies.

Over-all receiver performance

44. Tables 5 and 6 give performance data for both receivers. The figures given have been taken from sample receivers and are for reference only. The performance limits for each receiver are given in the following paragraphs.

Table 5 - Receiver performance data

Range	Frequency in kc/s		Input in µV for 20db signal-to-noise ratio		I.F. rejection ratio	
	AR88D	AR88LF	AR88D	AR88LF	AR88D	AR88LF
1	600	85	5.0	8.0	31,000	>100,000
	1,000	140	9.0	7.0	>100,000	>100,000
	1,500	195	11.5	8.0	>100,000	>100,000
2	1,700	205	4.0	5.0	>100,000	>100,000
	3,000	375	4.0	6.0	>100,000	>100,000
	4,300	500	4.0	7.0	>100,000	37,000
3	4,600	1,600	6.0	6.0	>100,000	>100,000
	8,000	3,000	3.5	5.0	>100,000	>100,000
	11,500	4,250	3.5	5.0	>100,000	>100,000

Table 5 - contd

Range	Frequency in kc/s		Input in µV for 20db signal-to-noise ratio		I.F. rejection ratio	
	AR88D	AR88LF	AR88D	AR88LF	AR88D	AR88LF
4	12,100	4,400	4.0	8.0	>100,000	>100,000
	14,300	7,500	2.5	5.0	>100,000	>100,000
	16,400	11,900	3.0	4.0	>100,000	>100,000
5	16,400	12,100	3.0	4.0	>100,000	>100,000
	19,500	15,500	2.5	3.0	>100,000	>100,000
	22,500	19,000	3.0	2.5	>100,000	>100,000
6	22,500	19,500	6.0	2.5	>100,000	>100,000
	27,000	27,500	5.0	3.0	>100,000	>100,000
	31,500	30,000	3.0	2.0	>100,000	>100,000

Range	Signal frequency in kc/s		2nd channel frequency in kc/s		2nd channel ratio	
	AR88D	AR88LF	AR88D	AR88LF	AR88D	AR88LF
1	1,500	195	2,410	1,665	>100,000	>100,000
2	4,300	500	5,210	1,970	6,800	>100,000
3	11,500	4,250	12,410	5,720	5,800	28,000
4	12,100	4,400	13,010	5,870	2,200	>100,000
	16,400	11,900	17,310	13,370	1,200	1,850
5	16,400	12,100	17,310	13,570	6,000	2,500
	22,500	19,000	23,410	20,470	320	800
6	22,500	19,500	23,410	20,970	800	1,600
	27,000	27,500	27,910	28,970	210	220 (S/be 320)
	31,500	30,000	32,410	31,470	220	280

Table 6 - Second-channel ratios

Dial calibration

45. Set the receiver controls as in para 39. Using the frequency meter, set the frequency of the signal generator in turn to each of the frequencies given in Table 5. Set the generator to give a 10μV modulated signal and apply it via the appropriate dummy aerial between terminals A and G of TB1. Tune the receiver to resonance reducing A.F. GAIN to give approximately 500mW A.F. output. The setting of the tuning dial should be within ±0.5% of the signal frequency.

Signal-to-noise ratio

46. With the receiver adjusted as in para 45, set the A.F. GAIN to give exactly 500mW A.F. output. Switch off the signal modulation; the resultant A.F. output due to noise should be less than 5mW. For test frequencies below 1.5Mc/s the modulated input may be increased to 15μV.

I.F. rejection ratio

47. Set the signal generator to give a 10μV signal modulated 30% at 400c/s at the following frequency:- AR88D, 600kc/s; AR88LF, 500kc/s. Tune the receiver to resonance and adjust A.F. GAIN to give 500mW A.F. output.

48. Without altering the receiver controls change the signal frequency to the receiver intermediate frequency. Increase the input and adjust the signal generator frequency for maximum receiver response. The input required for 500mW A.F. output must exceed 150mV (AR88D) or 200mV (AR88LF); ie at the test frequencies the I.F. rejection ratio must exceed 15,000 (AR88D) or 20,000 (AR88LF).

49. At any other frequency the I.F. rejection ratio of each receiver must exceed 100,000.

Second-channel ratio

50. Adjust the signal generator to give a 10μV modulated signal and set it in turn to each of the signal frequencies given in Table 6. Tune the receiver to resonance and adjust A.F. GAIN to give 500mW A.F. output. Without altering the receiver controls, change the signal frequency to the second-channel frequency given in Table 6. Adjust the signal generator frequency for maximum receiver response and note the input required to give 500mW A.F. output. At frequencies below 1.5Mc/s the ratio of the inputs at the signal and second-channel frequencies should exceed 100,000. At frequencies above 1.5Mc/s the ratio should exceed 200.

Automatic volume-control

51. Set the receiver controls as follows:-

H.F. TONE	:	fully clockwise
R.F. GAIN	:	fully clockwise
A.F. GAIN	:	mid-position
SELECTIVITY	:	position 2
A.V.C./N.L.	:	A.V.C.
NOISE LIMITER	:	fully anti-clockwise

Set the signal generator to give a 10μV modulated signal at 3Mc/s. Tune the receiver to resonance. Increase the input to 100mV and set the A.F. GAIN to give 500mW A.F. output. Slowly reduce the input to 10μV. The output should fall smoothly, and at 10μV input it should exceed 15mW.

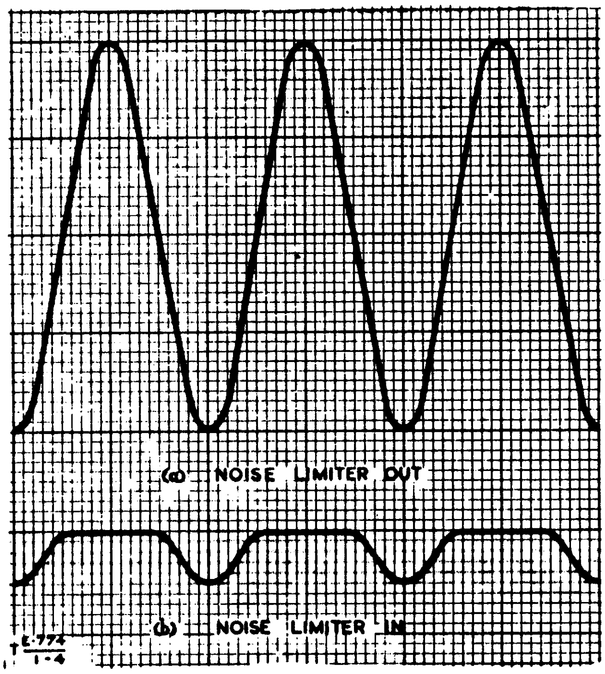


Fig 4 - Action of noise limiter

Noise-limiter control

52. Set the receiver controls as follows:-

H.F. TONE	:	fully clockwise
R.F. GAIN	:	fully clockwise
A.F. GAIN	:	mid-position
SELECTIVITY	:	position 2
A.V.C./N.L.	:	MAN. N.L.
NOISE LIMITER	:	fully clockwise

Set the signal generator to give a 10µV modulated signal at 3Mc/s. Tune the receiver to resonance and adjust A.F. GAIN to give 500mW. Connect the live terminal of the speaker output to the A1 amplifier of the oscilloscope. Adjust the oscilloscope controls to give a stationary waveform as illustrated in Fig 4(a). Rotate the NOISE LIMITER control to the fully anti-clockwise position; the waveform should gradually assume the shape illustrated in Fig 4(b).

Para	Spec figure	Fig obtained	Pass
19	Greater than 500mW		
	Less than 25mW		
20	Line - greater than 400mW		
	Headphone - greater than 6mW (AR88D)		
	Headphone - greater than 250mW (AR88LF)		
23) 24)	As in Table 2		
37	To 3,000c/s either side		
38	Greater than 500mW		
45	$\pm 0.5\%$		
46	Less than 5mW		
48	AR88D - greater than 15,000		
	AR88LF - greater than 20,000		
49	Greater than 100,000		
50	Below 1.5Mc/s - greater than 100,000		
	Above 1.5Mc/s - greater than 200		
51	Greater than 15mW		
52	As in Fig 4		

Tests recorded correspond with those detailed in Tels E 774 against the para Nos shown

Result of Test

Signature

Table 7 - Extract from A.F. G3504, Specification tests

FAULT FINDING

I.F. stages

53. Table 8 gives stage-by-stage sensitivity figures of the I.F. channel with each I.F. transformer peaked for maximum response at the crystal frequency (see paras 26 - 28). The test conditions are given in para 54.

54. Set the receiver controls as follows:-

H.F. TONE	:	fully clockwise
R.F. GAIN	:	fully clockwise
A.F. GAIN	:	fully clockwise
NOISE LIMITER	:	fully anti-clockwise
SELECTIVITY	:	position 2
A.V.C./N.L.	:	MAN
RANGE switch and TUNING CONTROL	:	AR88D to 535kc/s AR88LF to 550kc/s

Remove the local oscillator V3. Set the signal generator to give a signal modulated 30% at 150c/s at the nominal intermediate frequency. Apply the signal to the grid of each stage in turn and adjust the signal generator frequency for maximum response. The inputs required for 500mW A.F. output should be of the order of those given in Table 8, which have been taken from a sample receiver.

Receiver	Input for 500mW A.F. output			
	Pin 8, V4	Pin 4, V5	Pin 4, V6	Pin 4, V7
AR88D	270µV	320µV	3.4mV	20mV
AR88LF	75µV	190µV	3.1mV	19mV

Table 8 - I.F. channel peak sensitivity figures

R.F. stages

55. Table 9 gives sensitivity figures for the R.F. stage (V2) and mixer (V4). The sensitivity figure of the R.F. stage (V1) is comparable with the noise level at this stage and cannot readily be measured. The test conditions are given in para 56.

56. Set the receiver controls as follows:-

H.F. TONE	:	fully clockwise
R.F. GAIN	:	fully clockwise
A.F. GAIN	:	fully clockwise
NOISE LIMITER	:	fully anti-clockwise
SELECTIVITY	:	position 2
A.V.C./N.L.	:	MAN
RANGE switch and TUNING CONTROL	:	3Mc/s

Set the signal generator to give a 3Mc/s signal modulated 30% at 400c/s. Apply the signal to the grid of each stage in turn and tune the receiver for maximum response. The inputs required for 500mW A.F. output should be of the order of those given in Table 9, which have been taken from a sample receiver. This test is made with the I.F. channel fully aligned as detailed in paras 26 - 35.

Receiver	Input for 500mW A.F. output	
	Pin 4, V2	Pin 8, V4
AR88D	42µV	900µV
AR88LF	10µV	200µV

Table 9 - R.F. sensitivity figures

57/Maint/4017

END