DECCA

SERVICE NOTES

DECOLA 8 WAVE-BAND

RADIO UNIT

DECCA RADIO AND TELEVISION

Branch of The Decca Record Co., Ltd.

1-3 BRIXTON ROAD, LONDON, S.W.9

RELiance 8111 (30 lines)

Decca Service Instructions

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Compiled and
checked by D.S.

8 Wave band R.F. unit

This is a 7 valve radio unit made for use with audio amplifie: and electric record reproducers such as the Decola.

It consists of:-

R.F. Amplifier (for short wave bands)	E.F.39
Mixer	E.C.H35
Local Oscillator	E.F.37
Two stages of I.F. amplification	2 X E.F.39
A.V.C. amplifier	6B8G
Demodulator and Phase Splitter	E.B.C.33

The unit is supplied with leads, plugs etc. for installation purposes, and is made to cover the following wave bands.

Long wave	1,000 to 2,000 metres.
Medium wave	200 to 550 metres.

Band spread on:-

49 metre band	6.23 to 5.99 M/cs
31 " "	9.9 to 9.4 "
25 " "	12.1 to 11.61 "
19 " "	15.45 to 15.0 "
16 " "	18.2 to 17.9 "
13 " "	22 to 21.3 "

It is fitted with controls for SELECTIVITY, TUNING and WAVE CHANGE. Six mechanical press buttons are also included. Audio volume control must be made on the audio amplifier, although a "pre-set" volume control is fitted which enables adjustment to be made so that high signal input will not overload the audio amplifier. The scale is of the edge lit drum type, each of the eight sides being calibrated for one wave band. This drum is rotated by means of a cord drive when the wave band is changed.

For ease of reference the remainder of these service instructions are divided as follows:-

SECTION 1. Technical description of the Circuit and Components
SECTION 2. The Coil Box and Re-alignment
SECTION 3. The Press buttons and Tuning Drive
SECTION 4. Service Data
(a) Voltages
(b) Resistances of various windings
(c) Notes

Diagrams

Section 1

Technical description of the circuit

R.F. stage E.F.39

Short Waves

The signal frequency is fed from the aerial socket over a 465 K/cs. filter L1, C1 via a coupling capacitor C90, to the switch S1. Each of the short wave grid windings are tapped down and it is to these tappings that the signal frequencies are fed. In this receiver the short wave bands are electrically band spread and the R.F. windings are tuned by their respective pre-set capacitors to a fixed frequency which is the centre of the appropriate band. S2 is the grid wave range switch selecting the correct tuned circuit for the grid of the R.F. amplifier valve E.F.39, C9 being the grid coupling capacitor. Grid loading is provided by R1 and it is through this resistor that A.V.C voltage is applied, C10 is the A.V.C. decoupling capacitor. The screen of the EF.39 is supplied with a potential via R2 and R3, screen decoupling to earth is carried out by C11. Fixed bias is obtained by the volts drop across the resistor R4, decoupled by C13. Anode volts are taken from the junction of R2 and R3, decoupled by C14 and C15, and supplied via the tuned windings to the anode.

Medium and Long waves

On Medium and Long waves the switch S1 selects the aerial coupling coils of L23 and L8, the R.F. amplifier valve is NOT used on these wave bands.

Mixer Stage E.C.H.35

Short waves.

When switched to short waves the tuned circuit in the anode of the R.F. amplifier valve is coupled to the signal grid of the frequency mixer valve E.C.H.35 by S8. Tuning and Band spreading is carried out by a combination of the tuning capacitor C29, C28 and C25. Band set is provided by C27 or C26.

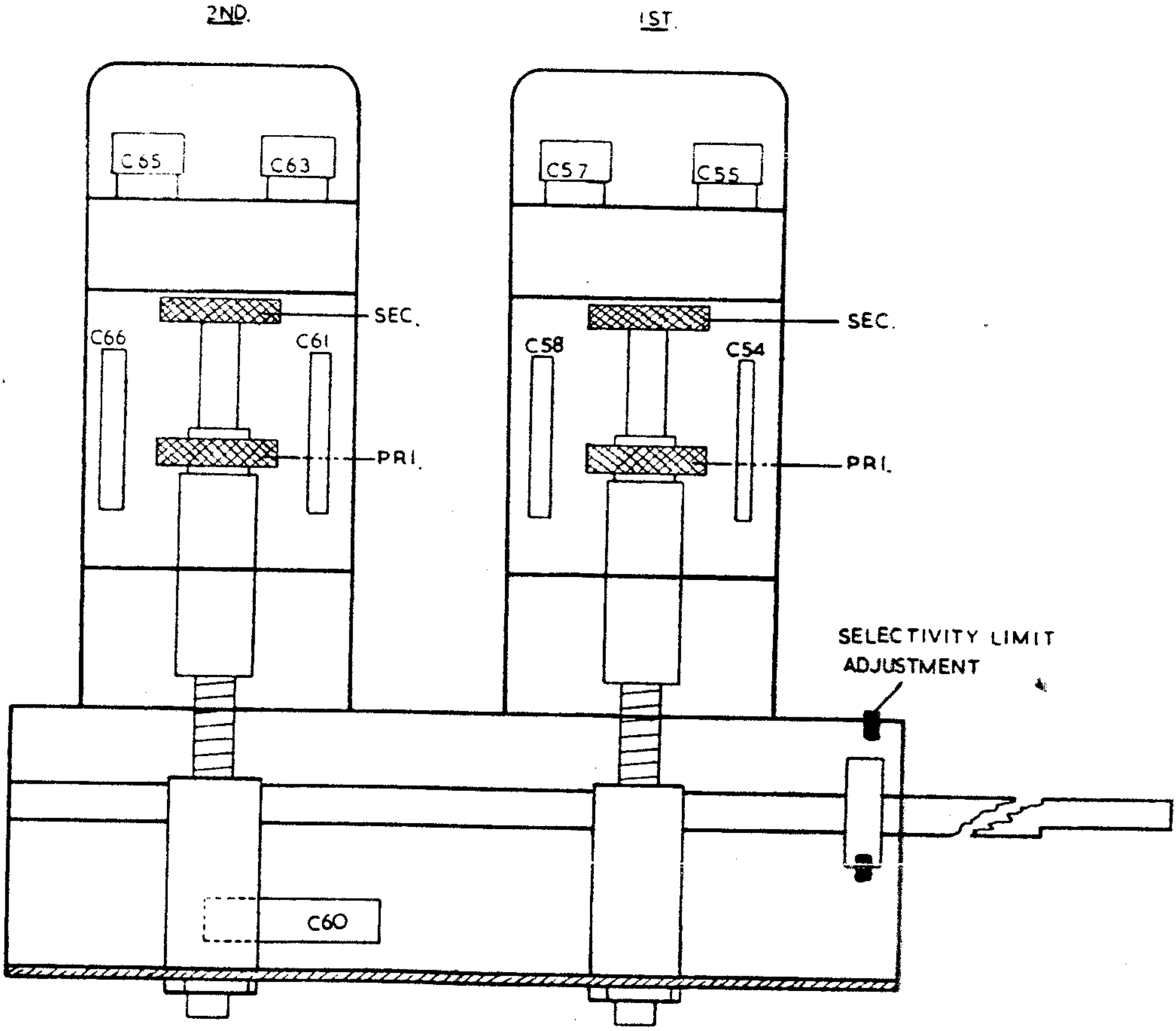


FIG. 1. INSIDE THE FIRST AND SECOND I.F. TRANSFORMERS.

Medium and Long waves

On Medium and Long waves the appropriate grid coil L23 or L8 is coupled to the signal grid via the switches S1 and S8. S9 removes the band spread and band set capacitors from circuit. S7 grounds the anode of the R.F. amplifier via C14 and C15. C15 also grounding the bottom end of the grid coils to R.F. S8 switches in the correct band for the grid, C24 being the coupling capacitor. Grid loading and A.V.C. supply is via R7. Screen potential is obtained from the potential divider formed by R5 and R6, decoupled to earth via C30. Cathode bias is derived by the voltage drop across R8 decoupled by C31. The anode is supplied by R9 and the primary of T1 from the H.T. line, the junction is decoupled by C56.

Local Oscillator Stage E.F.37

The local oscillator valve is an electron coupled pentode. The anode is supplied with H.T. from the main H.T. input via R11 and decoupled by C52 and C53. There is no further connection to the anode, the valve being cathode coupled via the tap on the tuned winding.

The cathode is also connected via C32 to the grid of the triode section of the E.C.H.35 acting as a buffer stage which prevents "pulling in" when the receiver is tuned to a very strong carrier. The band spreading is carried out by the same method as in the Ae and R.F. stages. A capacity (C44 and C45) in series with, and one capacitor (C47 or C48) in parallel with the main tuning capacitor C46. The band spreading capacity consists of a neg. coef. capacitor C44 with a trimmer C45 across it. The object of using the neg.coef. capacitor is to reduce the "drift" caused by heat, the other capacitor is made variable so that the overall capacity may be set accurately. The heater is decoupled by C50 and C51 from pins 2 and 7 of the valve base to earth. This is to prevent any feedback of R.F. from the oscillator valve to any other stage.

First I.F. Stage E.F.39 (With variable selectivity)

Intermediate frequencies appear across the primary winding and are induced into the secondary of the first I.F. transformer, T1. The coupling between the windings of this transformer is variable with a control on the front panel of the receiver, this is to give control over the selectivity of the I.F. stages. The secondary winding is returned to earth to obtain a high gain from the E.F.39. The screen and anode are supplied with H.T. via R15 decoupled by C62. R13 is the screen voltage dropping resistor, decoupled at the screen by C59. Bias volts are derived by the volts drop across R14 decoupled by C64. Anode volts are taken from the junction of R15 and R13 and fed via the primary of the 2nd I.F. transformer.

Second I.F. Stage E.F.39 (With variable selectivity)

Intermediate frequencies appear across the primary of the second I.F. transformer, T2 and are induced into the secondary. Variable selectivity is obtained by the same method as in the first I.F. transformer, the control is also ganged to that of the first. The bottom end of the secondary winding is taken to the A.V.C. line, and the top connected to the grid of the E.F.39. The screen and anode supplies of H.T. are taken through R19 and decoupled by C68. The screen voltage dropper is R17 decoupled at the screen C67. Anode volts taken from the junction of R19 and R17 are fed via the primary of the 3rd I.F. transformer. Standing bias is provided on the cathode of this valve by the volts drop across R18 decoupled by C69.

The Amplifier A.V.C. System 6B8G

R.F. voltage is taken from the anode of the second I.F. amplifier and through the small capacitor C74 to the grid of the A.V.C. amplifier 6B8G. The pentode section of this valve acts as a voltage amplifier and amplified R.F. appears at the anode. The anode load consists of L24 with C78 across it. The winding L24 has a variable iron dust core and is tuned to 465 K/cs. H.T. volts are supplied from the H.T. line via R16 decoupled by C76, it is from this decoupling point that the screen voltage is taken dropped through R21 and the screen is decoupled to earth by C77. The cathode bias resistor is R23 which is connected through R22 to earth. The grid load R20 is returned to this junction between R23 and R22, the volts drop across R22 provides delay volts for this system. The anode is strapped to the diode by C79 thus carrying R.F. to the diode where it is rectified across the load R24. The D.C. is then fed through R25 and decoupled by C60. From this point the A.V.C. voltage for the last I.F. amplifier is taken through the secondary of T2 to the grid of V5. The A.V.C. line continues through R12 and is then fed to both V2 and V1, decoupled by C10.

Demodulator and Phase splitter stage. E.B.C.33.

Signal voltages in the secondary of T3 are tapped off and taken to the two diodes strapped together. The bottom end of the secondary is taken to a filter network, the return of which is connected to the cathode. The "pre-set" volume control is connected from the top of this filter to the junction of R29 and R30. The slider of the volume control is connected to the grid of the triode section of the valve, across this volume control from grid to the bottom is the press-button muting switch S10.

The triode section is a cathode follower phase splitter. The anode is supplied with H.T. via the resistor R31 decoupled by C85. R32 and R30 are the anode and cathode loads and are matched,

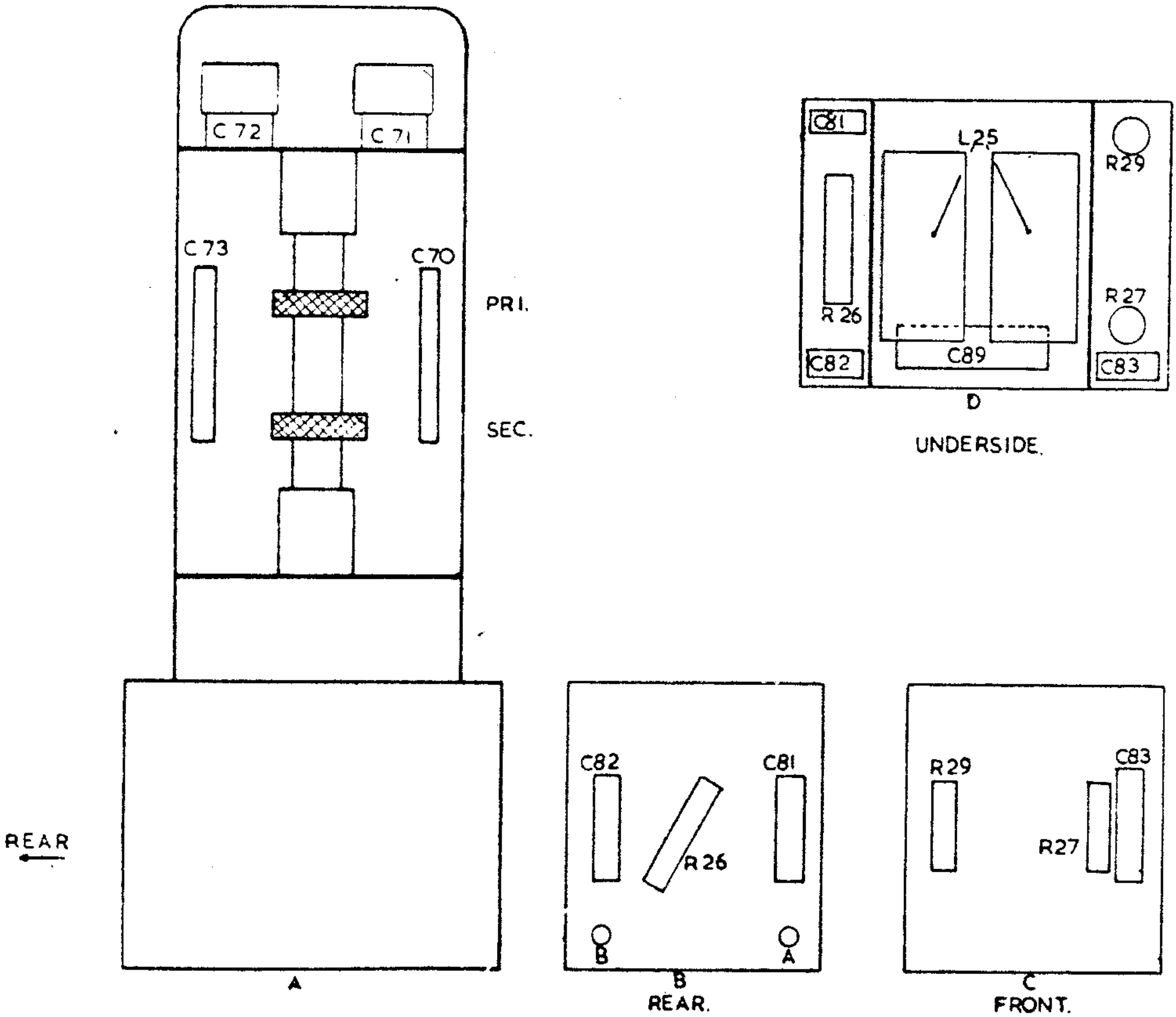


FIG.2. INSIDE THE THIRD I.F TRANSFORMER AND COMPONENTS MOUNTED INSIDE THE PEDESTAL.

R29 is the cathode bias resistor the volts drop across which provide the cathode bias.

The output is taken from the anode and bottom end of the cathode bias resistor and are therefore 180 degrees out of phase.

Power supply

Power supply is derived from an external source and is fed to the R.F. unit via the 4 pin socket on the side of the chassis.

Components List (See also Fig.4.)

Capacitors

	Type	Value	Position
C1.	Silver Mica	85 pf.	Fig. 3. D7
C2.	Trimmer	3/30 pf.	Fig. 6.
C3.	"	"	"
C4.	"	"	"
C5.	"	"	"
C6.	"	"	"
C7.	"	"	"
C8.	Silver Mica	30 pf	Fig. 5. (C)
C9.	Silver Mica	100 pf	Fig. 5. (C)
C10.	Paper	.01 mfd	Fig. 5. (C)
C11.	Paper 350 v.w.	.1 mfd	Fig. 3. D10
C12.	Paper 350 v.w.	.1 mfd	Fig. 3. C10
C13.	Paper 350 v.w.	.1 mfd	Fig. 3. D10
C14.	Paper 350 v.w.	.1 mfd	Fig. 3. C10
C15.	Mica	.002	Fig. 3. B8
C16.	Trimmer	3/30 pf	Fig. 6.
C17.	"	"	"
C18.	"	"	"
C19.	Trimmer	3/30 pf	Fig. 6.
C20.	"	"	"
C21.	"	"	"
C22.	"	"	"
C23.	"	"	"
C24.	Mica	100 pf	Fig. 5. (B)
C25.	Mica	60 pf	Fig. 3. C8
C26.	Silver Mica	170 pf	Fig. 3. B8
C27.	Silver Mica	275 pf	Fig. 3. B8
C28.	Mica	.01 mfd	Fig. 3. C7
C29.	Tuning Gang, (Rear section)		
C30.	Paper 350 v.w.	.1 mfd	Fig. 3. B10
C31.	Paper 350 v.w.	.1 mfd	Fig. 3. A10
C32.	Silver Mica	100 pf	Fig. 3. B9
C33.	Trimmer	3/30 pf	Fig. 6.
C34.	"	"	"
C35.	"	"	"
C36.	"	"	"
C37.	"	"	"
C38.	"	"	"
C39.	"	"	"
C40.	"	"	"
C41.	Silver Mica	475 pf	Fig. 5. (A)
C42.	Silver Mica	455 pf	Fig. 3. A8
C43.	Silver Mica	515 pf	Fig. 3. A8
C44.	Neg. Coef	45 pf	Fig. 3. A8
C45.	Trimmer (Band spread)	3/30 pf	Fig. 3. A8
C46.	Tuning Gang (Front section)		

C47.	Silver Mica	275 pf	Fig. 7.
C48.	Silver Mica	170 pf	Fig. 7.
C49.	Silver Mica	100 pf	Fig. 5. (A)
C50.	Paper 350 v.w.	.1 mfd	Fig. 3. A9
C51.	Paper 350 v.w.	.1 mfd	Fig. 3. A9
C52.	Paper 350 v.w.	.1 mfd	Fig. 3. A9
C53.	Elec. 500 v.w.	8 mfd	Fig. 3. A3
C54.	Silver Mica	200 pf	Fig. 1.
C55.	Trimmer	3/30 pf	Fig. 1.
C56.	Paper 350 v.w.	.1 mfd	Fig. 3. A2
C57.	Trimmer	3/30 pf	Fig. 1.
C58.	Silver Mica	200 pf	Fig. 1.
C59.	Paper 350 v.w.	.1 mfd	Fig. 3. A1
C60.	Paper 350 v.w.	.05 mfd	Fig. 1.
C61.	Silver Mica	200 pf	Fig. 1.
C62.	Paper 350 v.w.	.1 mfd	Fig. 3. C3
C63.	Trimmer	3/30 pf	Fig. 1.
C64.	Paper 350 v.w.	.1 mfd	Fig. 3. A1
C65.	Trimmer	3/30 pf	Fig. 1.
C66.	Silver Mica	200 pf	Fig. 1.
C67.	Paper 350 v.w.	.1 mfd	Fig. 3. C4
C68.	Paper 350 v.w.	.1 mfd	Fig. 3. C6
C69.	Paper 350 v.w.	.1 mfd	Fig. 3. C3
C70.	Silver Mica	170 pf	Fig. 1.
C71.	Trimmer	3/30 pf	Fig. 2.
C72.	Trimmer	3/30 pf	Fig. 2.
C73.	Silver Mica	200 pf	Fig. 1.
C74.	Silver Mica	15 pf 20%	Fig. 3. D4
C75.	Silver Mica	85 pf 20%	Fig. 3. D3
C76.	Paper 350 v.w.	.1 mfd	Fig. 3. C2
C77.	Paper 350 v.w.	.1 mfd	Fig. 3. C1
C78.	Silver Mica	200 pf	Fig. 3. D2
C79.	Silver Mica	100 pf	Fig. 3. D1
C80.	Paper 350 v.w.	.1 mfd	Fig. 3. C1
C81.	Silver Mica	150 pf	Fig. 2. (B & D)
C82.	Silver Mica	150 pf	Fig. 2. (B & D)
C83.	Silver Mica	150 pf	Fig. 2. (C & D)
C84.	Paper 350 v.w.	.1 mfd	Fig. 3. C6
C85.	Elec. 450 v.w.	12 mfd	Fig. 3. A1
C86.	Elec. 450 v.w.	12 mfd	Fig. 3. A1
C87.	Mica	150 pf	Fig. 3. D6
C88.	Mica	150 pf	Fig. 3. D5
C89.	Paper	.01 mfd	Fig. 2. (D)
C90.	Mica	.0003	Fig. 3. D7

Resistors

			Resistance		Position.
R1.	¼ watt		.5 meg.	ohm	Fig. 5. (C)
R2.	½ watt		10K	"	Fig. 3. C10
R3.	½ watt		90K	"	Fig. 3. C10
R4.	½ watt	10%	680	"	Fig. 3. C9
R5.	1 watt	10%	27K	"	Fig. 3. B9
R6.	½ watt		35K	"	Fig. 3. B10
R7.	¼ watt		.5 Meg.	"	Fig. 5. (B)
R8.	½ watt	10%	680	"	Fig. 3. B10
R9.	¼ watt		10K	"	Fig. 3. A2
R10.	¼ watt		68K	"	Fig. 5. (A)
R11.	2 watt		50K	"	Fig. 3. A2
R12.	¼ watt		.5 meg.	"	Fig. 3. D8
R13.	½ watt		90K	ohms	Fig. 3. C2
R14.	½ watt	10%	680	"	Fig. 3. B1
R15.	¼ watt		10K	"	Fig. 3. B2
R16.	¼ watt		10K	"	Fig. 3. B2
R17.	½ watt		90K	"	Fig. 3. C4
R18.	½ watt	10%	680	"	Fig. 3. C3
R19.	¼ watt		10K	"	Fig. 3. C6
R20.	¼ watt		2.2 meg.	"	Fig. 3. D3
R21.	¼ watt		68K	"	Fig. 3. C1
R22.x	¼ watt		3K	"	Fig. 3. C1
R23.	¼ watt		1.5K	"	Fig. 3. C1
R24.	¼ watt		2.2 meg.	"	Fig. 3. D1
R25.	¼ watt		.5 meg.	"	Fig. 3. D1
R26.	¼ watt		150	"	Fig. 2. (B and D)
R27.	¼ watt		1 meg.	"	Fig. 2. (C and D)
R28.	Vol. control		1 meg.	"	Fig. 3. D4-5
R29.	¼ watt		1K	"	Fig. 2. (C and D)
R30.	¼ watt		10K	"	Fig. 3. D4
R31.	½ watt		10K	"	Fig. 3. A2
R32.	¼ watt		10K	"	Fig. 3. D6
R33.	5 watt		5K	"	Fig. 3. A1-2
R34.	½ watt		150K	"	Fig. 3. B9

x. In some receivers this valve will be 17K. It should be replaced with a 3K.

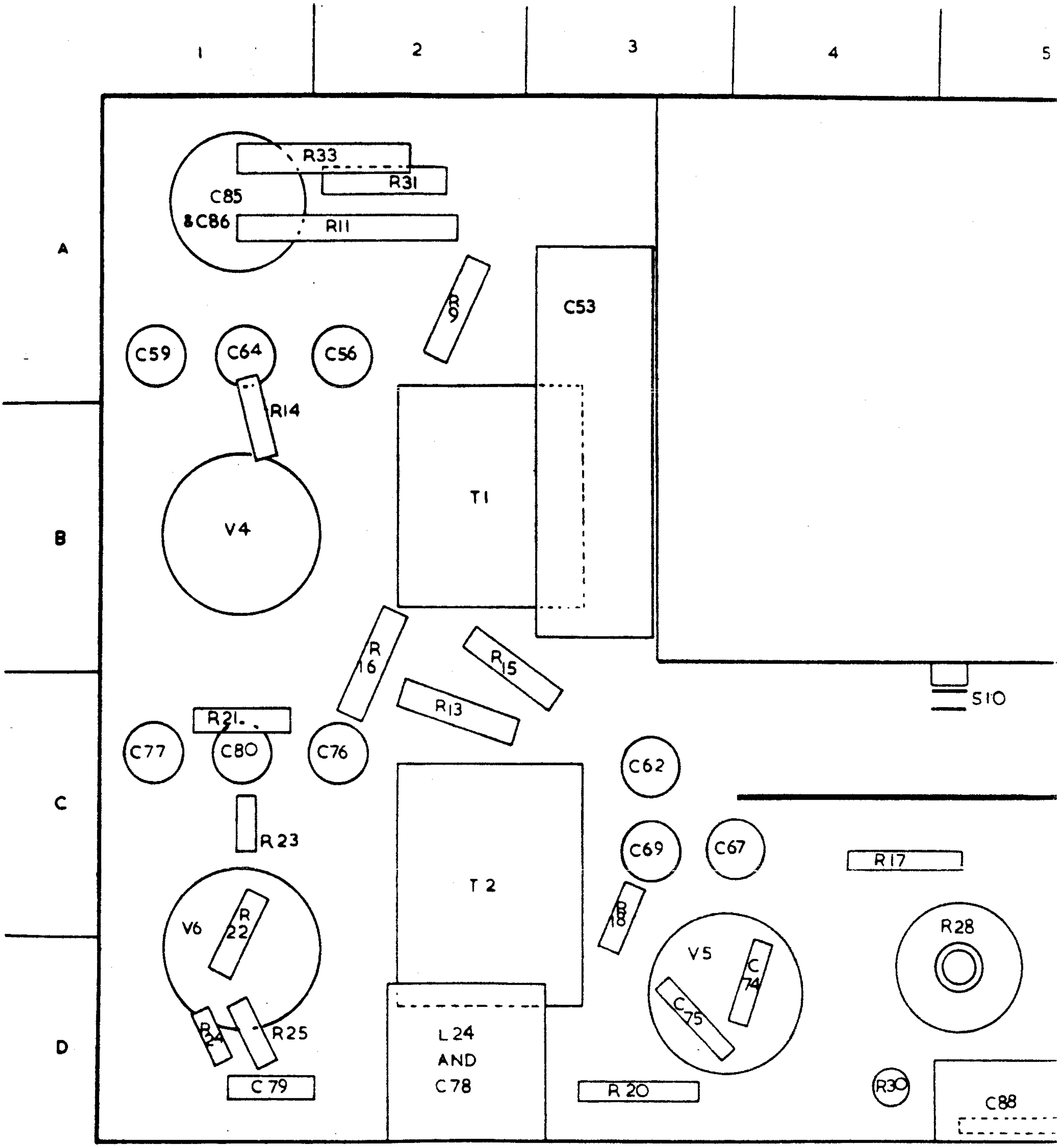
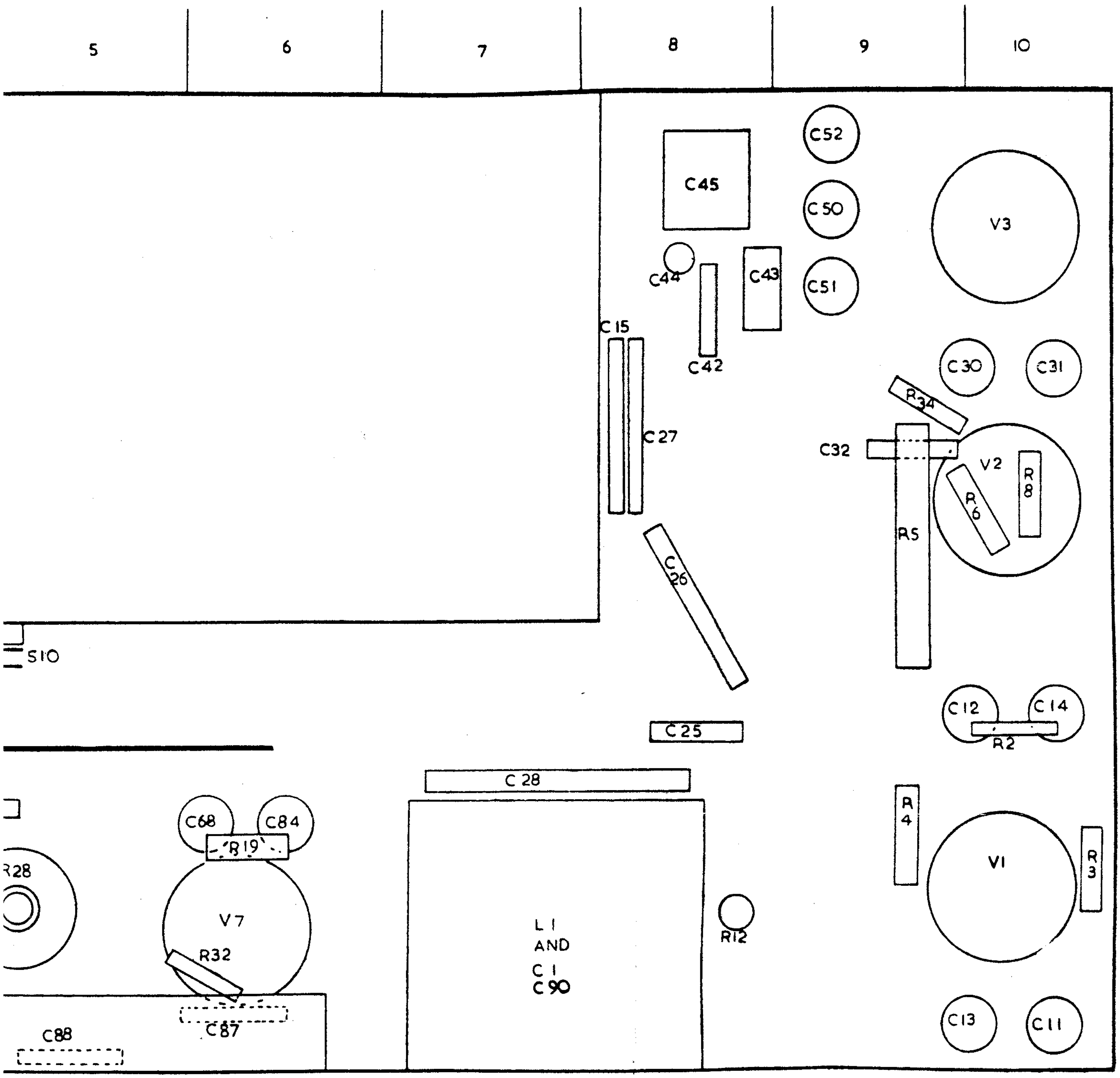


FIG. 3. COMPONENTS POSITION UNDER-CHASSIS.



5
6
7
8
9
10
C52
C45
C50
V3
C44
C43
C51
C42
C15
C30
C31
R34
C27
C32
V2
R8
R6
R5
C26
S10
C25
C12
C14
R2
C28
R4
C68
C84
R19
V1
R3
R28
V7
L1 AND C1
C90
R12
R32
C87
C88
C13
C11

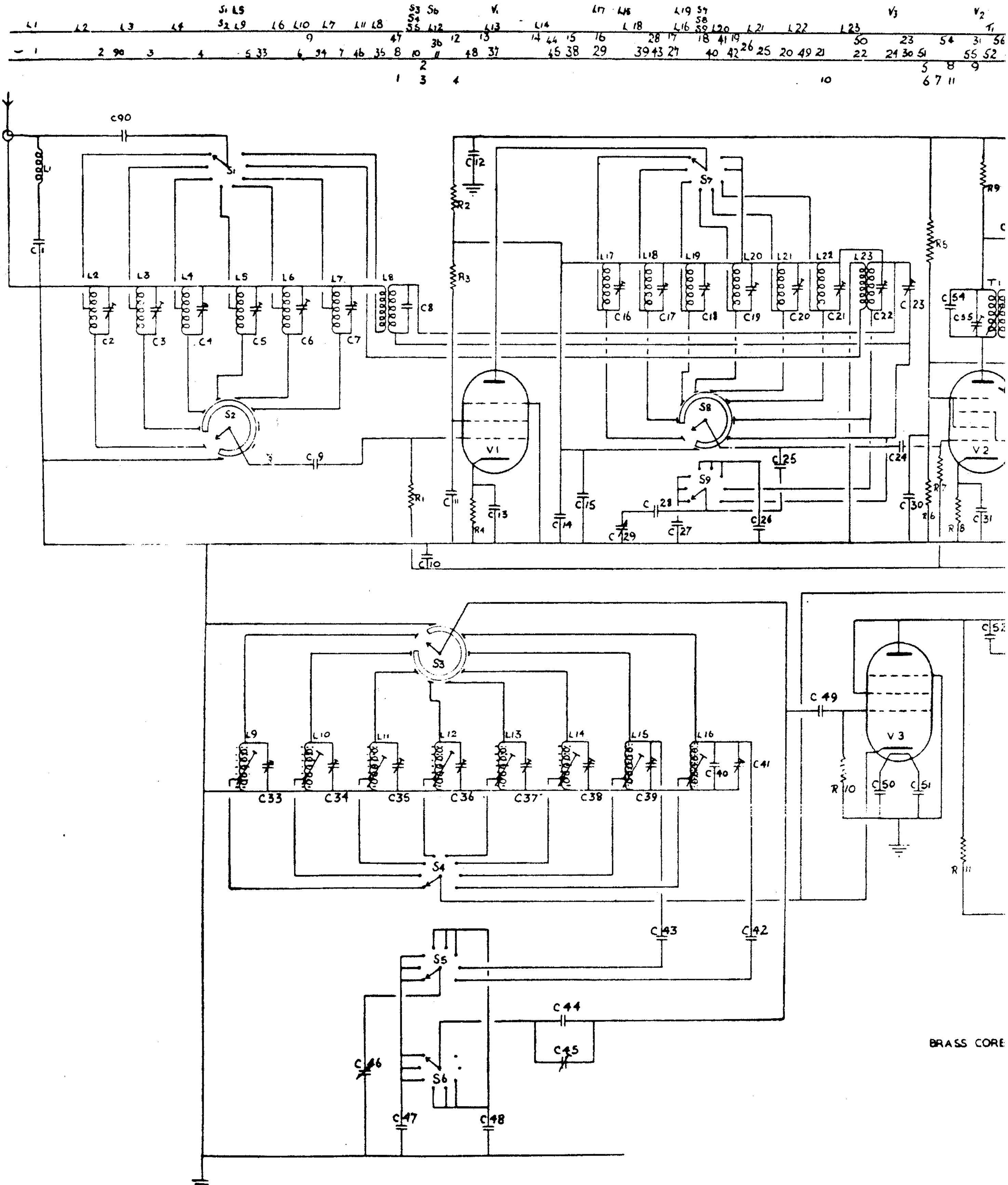
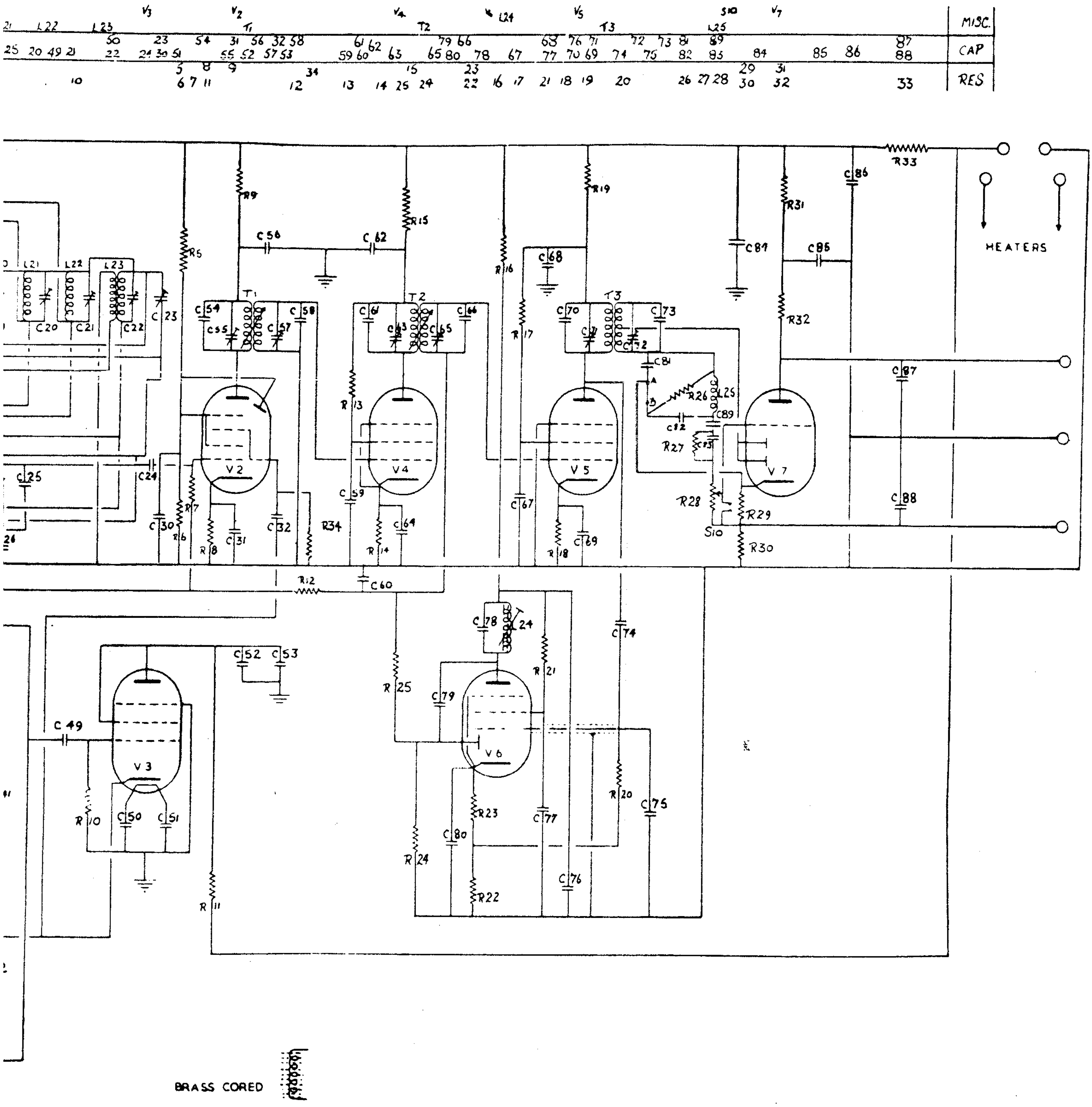


FIG. 4. CIRCUIT DIAGRAM 8 WAVE BAND R.F. UNIT.



MISC.
CAP
RES
HEATERS
R33
V 2
V 3
V 4
V 5
V 6
V 7
T1
T2
T3
L21
L22
L23
L24
L25
S10
BRASS CORED

Section 2

The Coil Box and Re-alignment

The Coil Box (see Fig. 5)

The coils in this receiver are enclosed in a metal box on the right hand side of the chassis, with the trimmers mounted on the top and cores for the oscillator windings on the front (see Figs. 6 and 7).

To remove the Coil Box from the chassis.

1. Release the I.F. rejector box by undoing the two bolts securing it to the chassis.
2. Unsolder the leads to the 15 tags on the base of the coil box and on the front switch.
3. Unscrew the 8 P.K. tapping screws which hold the coil box to the chassis.
4. Unscrew and slide back the connecting collar of the switch.
5. Lift off the coil box.

The coil box is in three sections held together by the side-plates and P.K. screws. The section nearest the front of the chassis is the oscillator section, the middle section is R.F., and the rear one is the aerial section (see Figs. 5 and 6). The switch rod should be pulled out before the sections are separated.

Note. The long wave aerial coil is in the aerial section although the trimmer is mounted over the R.F. section. The medium wave aerial coil is in the R.F. section with its trimmer.

To Re-align the Decca 8 wave-band Radio Unit See Figs. 6 - 7.

The following procedure is for the complete re-alignment of the 8 w/b R.F. unit, if calibration is only slightly out, the remarks at the end of this section should be read first.

For the alignment procedure to be carried out, the instruments required are a signal generator covering from 158 K/cs to 22 M/cs, a 200 K/cs Crystal Calibrator and a 50 micro-ampere meter.

Preparation

1. Connect the radio chassis to a source of supply and audio amplification.
2. Disconnect the diode load at the test link point A-B (at the rear of the 3rd. I.F. Transformer see Fig. 2). and connect in the 50 micro-ampere meter. The standing current on this meter should be in the order of 2 to 3 micro-amps.

I.F. Alignment.

Great care must be taken when aligning the I.F. amplifier on this receiver; if this is not done, the frequency response curve will be distorted. One indication of this fault is when any variation of the Selectivity control varies the tuning. The I.F. Alignment of this receiver is simplified, and greater accuracy is obtained, if a Cathode Ray Oscilloscope and a Wobbulator are used. In this case the signal should be wobbulated through 25 K/cs. i.e. 12½ K/cs each side of 465 K/cs.

The intermediate frequency of this receiver is 465 K/cs and one method of alignment is as follows:-

1. Remove the local oscillator valve EF37.
2. Turn the Selectivity control to the optimum position (2/3 of the travel from Selective to Brilliant)
3. Inject a 465 K/cs audio modulated signal into the grid of the last I.F. amplifier valve (EF39). Trim the last I.F. transformer for maximum gain.
4. Inject the 465 k/cs signal the grid of the first I.F. amplifier valve (EF39) and trim the second I.F. transformer for maximum gain.
5. Inject the 465 K/cs signal into the grid of the mixer valve (ECH35) and trim the first I.F. transformer for maximum gain.
6. Adjust the 465 K/cs tuned anode load of the AVC amplifier valve (6B8G) for minimum indication on the meter. This adjustment is the iron dust core at the rear of the chassis.
7. Inject the 465 K/cs signal via a dummy aerial into the aerial socket of the receiver and adjust the iron dust core on the aerial panel for minimum signal. This is the I.F. rejector coil.

R.F. Alignment.

Long Wave

1. Tune the receiver to 1,100 metres and inject a signal of 272 K/cs.
2. Adjust the long wave oscillator trimmer for correct calibration and the R.F. trimmer for maximum signal.
3. Tune to 1,900 metres and inject a signal of 600 K/cs. Adjust the core of the oscillator coil for correct calibration.
4. Repeat 1, 2 and 3 for maximum sensitivity.

Medium Wave

1. Tune the receiver to 200 metres and inject a signal of 1,500 K/cs.
2. Adjust the oscillator trimmer for correct calibration and the R.F. trimmer for maximum signal.

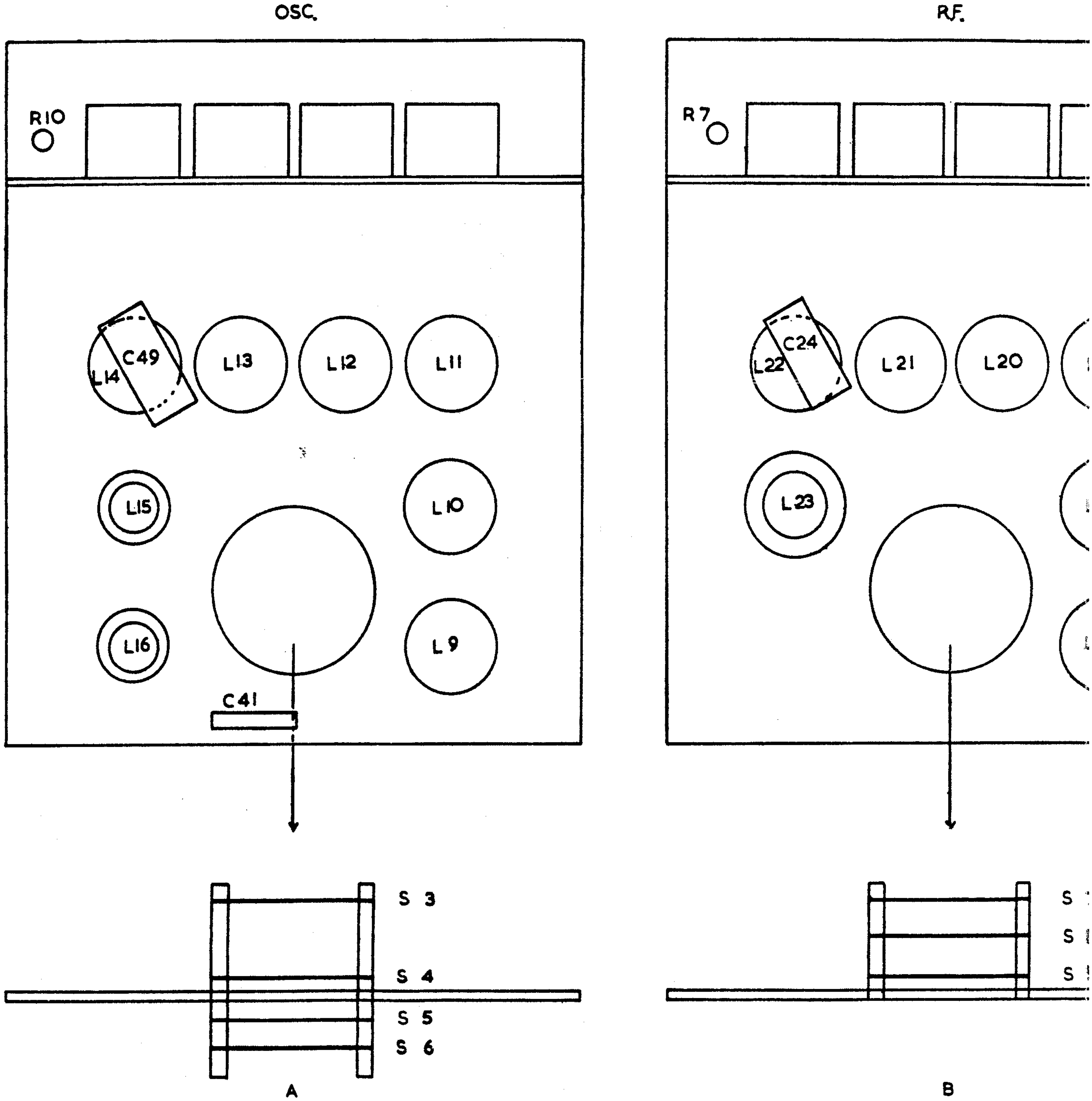
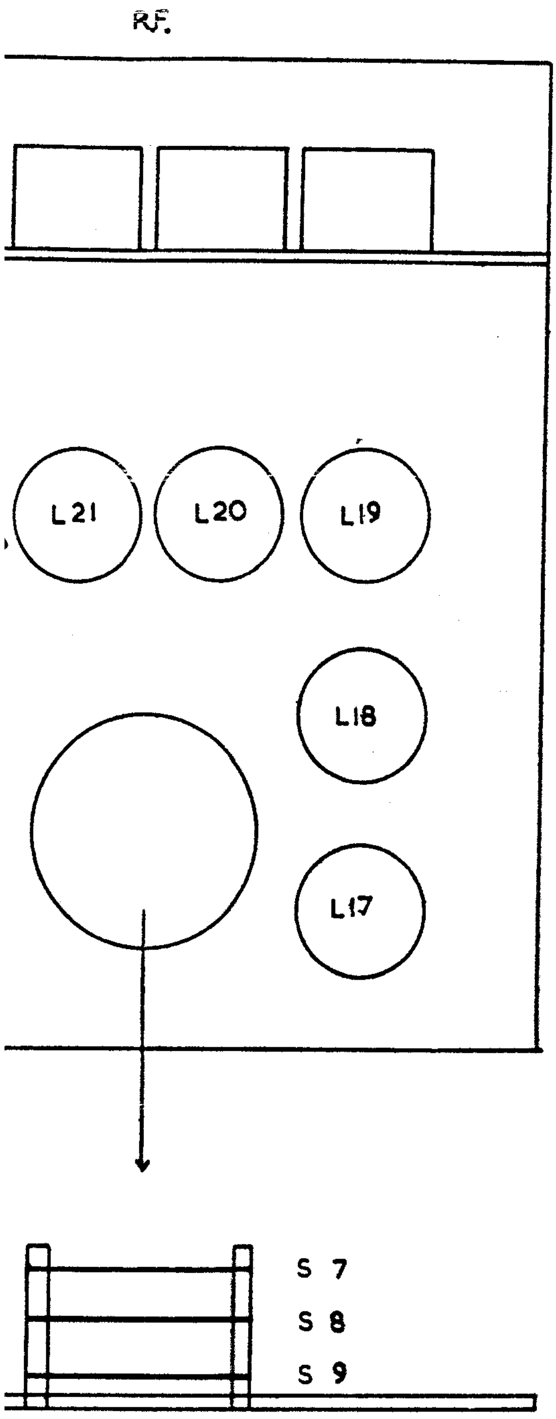
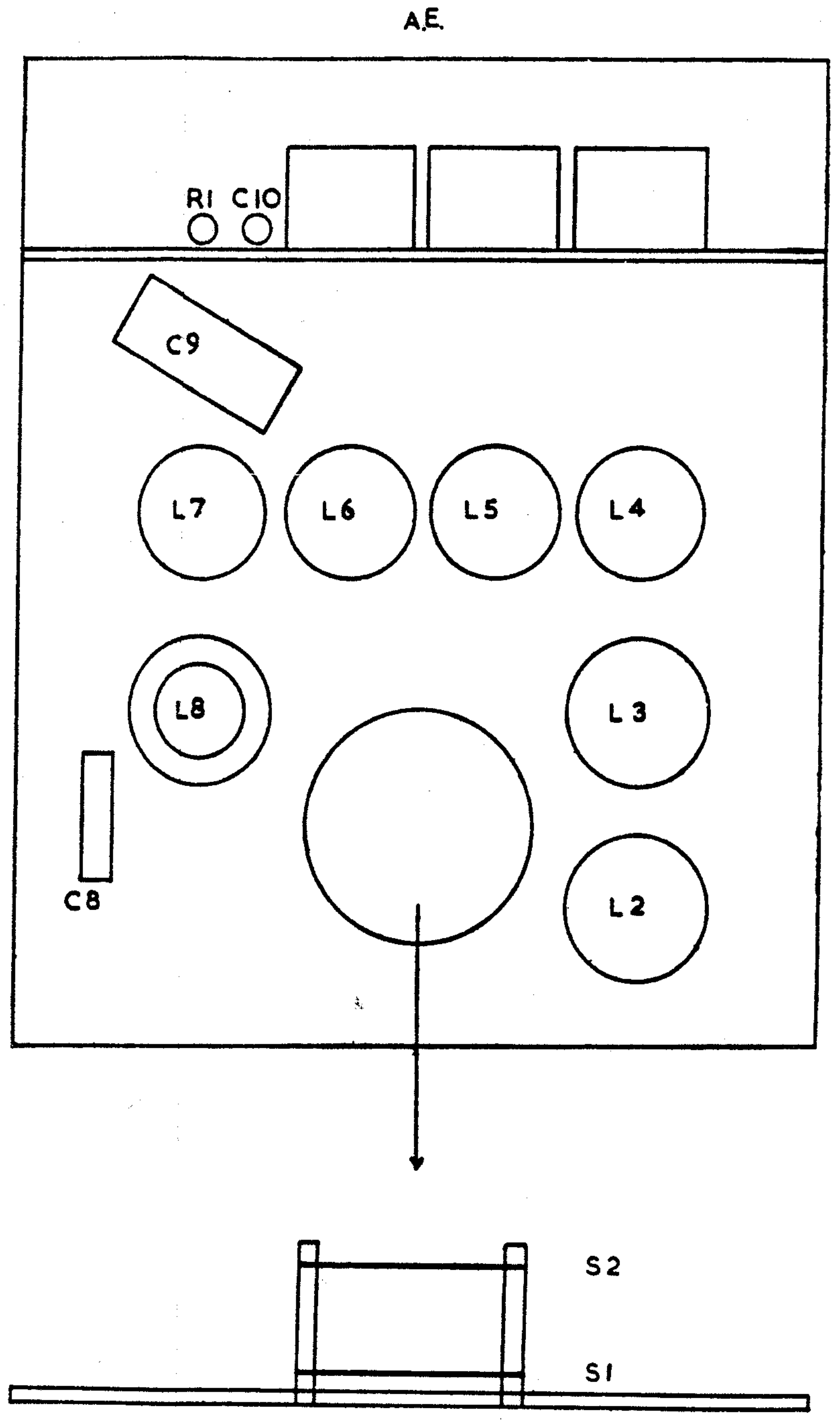


FIG.5. COMPONENTS POSITION INSIDE THE COIL BOX.


R.F.
L21
L20
L19
L18
L17
S 7
S 8
S 9

B


A.E.
R1
C10
C9
L7
L6
L5
L4
L8
L3
C8
L2
S2
S1

C

3. Tune the receiver to 500 metres and inject a signal of 600 K/cs. Adjust the core of the oscillator coil for correct calibration.
4. Repeat 1, 2 and 3 to obtain maximum sensitivity.

Short Wave Bands

Care must be taken when aligning the short wave bands that these instructions are followed exactly.

At all calibration points the signal from the crystal calibrator is used for alignment, the standard signal generator is used to select the correct harmonic of 200 K/cs. The accuracy of calibration should be within plus or minus 10 K/cs on all wave bands.

Pre-alignment procedure and notes.

Inspect the 6 volt leads to the dial lamps. These should run close to the scale mounting bracket and as far away as possible from the oscillator valve grid lead. This grid lead must not run close to the metal of the coil box. Inspect the lead to the oscillator section of the gang; this must be kept as far away from the chassis and coil box as possible. The "hot" lead from the band-spread capacitor must have a free run.

The local oscillator frequency is, on some wave bands, lower and on others higher than the signal frequency; this must be remembered when selecting the correct "peak" on the trimmers.

Unscrew the band-spread capacitor (on the front of the chassis) until the lower rim of the top half is level with the top rim of the bottom half, now screw in two complete turns.

Unscrew the 6 M/cs and 18 M/cs oscillator coil cores fully anti-clockwise.

The receiver is now ready for realignment of short waves.

6 M/cs. Band — Local Oscillator Low

1. Tune the receiver to 6.2 M/cs and inject the correct harmonic of the crystal. Adjust the oscillator trimmer for correct calibration.
2. Adjust the R.F. and aerial trimmers for maximum gain.
3. Tune to 6 M/cs; inject the harmonic of the crystal and adjust the BAND SPREAD capacitor for correct calibration.
4. Check at 6.2 M/cs and 6 M/cs.

18 M/cs. Band — Local Oscillator Low

1. Tune the receiver to 18.2 M/cs and inject a frequency of this order.
2. Screw the oscillator trimmer right in; the correct peak is the first one that is reached as the trimmer is unscrewed.

3. Tune the receiver to 17.8 M/cs and inject a frequency of this order into the aerial, adjust calibration by means of the Band-spread capacitor. THIS IS A MOST CRITICAL ADJUSTMENT and should be carried out with the maximum care and precision. Check and recheck at 18.2 M/cs and 17.8 M/cs.
4. Tune to 18 M/cs and adjust the R.F. and aerial trimmers for maximum gain.

6 M/cs Band

1. Return to the 6 M/cs band and check at 6.2 M/cs, adjust the oscillator trimmer as necessary for correct calibration. The R.F. and aerial trimmers should also be checked at this point for maximum gain.
2. Tune to 6 M/cs and if the calibration is out, adjust by means of the Oscillator coil core.

N.B. Great care must be taken in setting the band-spread capacitor as detailed. Unless these instructions are carried out accurately, difficulty will be found in calibrating the remaining wave bands.

22 M/cs Band — Local Oscillator High

1. Set the receiver to 22 M/cs and inject a frequency of this order. Adjust the oscillator trimmer for correct calibration.
2. Tune to 21.6 M/cs and, injecting a signal of this frequency adjust the R.F. and aerial trimmer for maximum gain.
3. Tune to 21.4 M/cs and inject a signal of this frequency. Adjust the oscillator coil core for correct calibration.
4. Check 1, 2 and 3 to obtain maximum sensitivity and accuracy of calibration.

15 M/cs Band — Local Oscillator High

1. Set the receiver at 25.4 M/cs and inject a signal of this frequency. Adjust the oscillator trimmers for calibration.
2. Tune 15.2 M/cs and, injecting a signal of this frequency, adjust the R.F. and aerial trimmers for maximum gain.
3. Set the receiver to 15 M/cs and inject a signal of this frequency. Adjust the oscillator coil core for correct calibration.
4. Check 1, 2 and 3 to obtain maximum sensitivity and accuracy of calibration.

12 M/cs band — Local Oscillator Low

1. Set the receiver to 12 M/cs and inject a signal of this frequency. Adjust the oscillator trimmer for correct calibration.

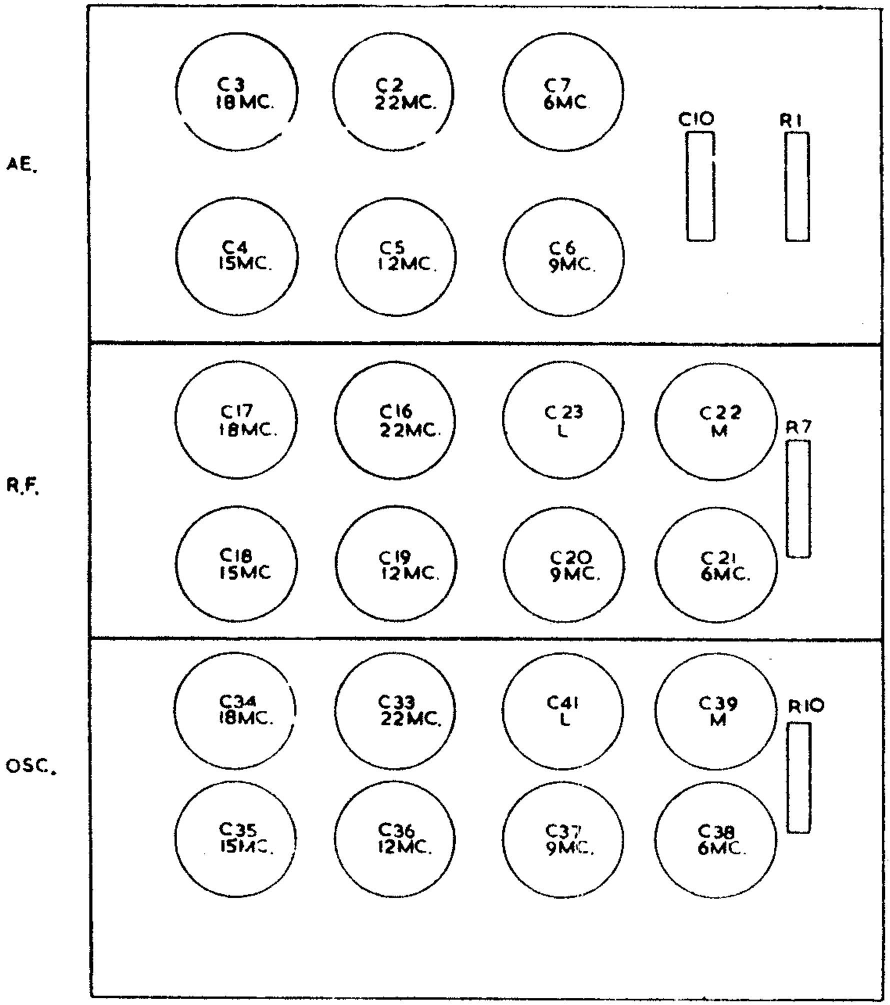


FIG. 6. TOP VIEW OF THE COIL BOX.

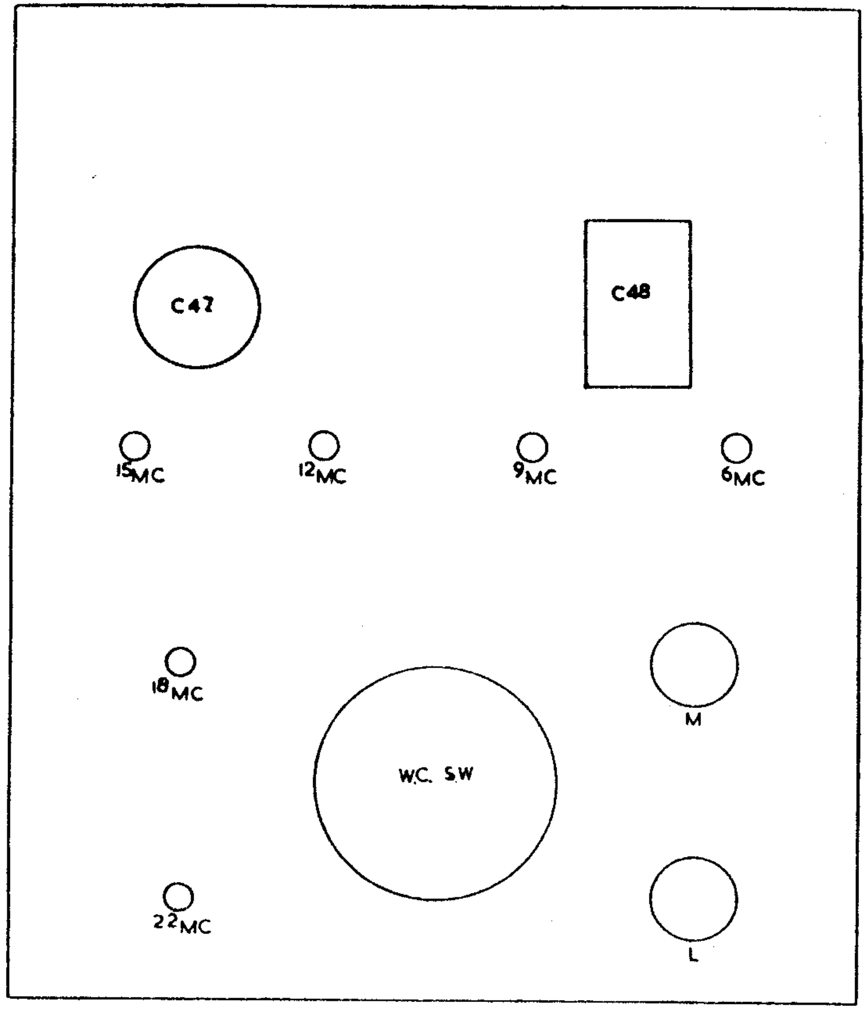


FIG. 7 FRONT VIEW OF THE COIL BOX.

2. Tune to 11.8 M/cs and, injecting a signal of this frequency, adjust the R.F. and aerial trimmers for maximum gain.
3. Set the receiver to 11.6 M/cs and inject a signal of this frequency. Adjust the oscillator coil core for accurate calibration.
4. Check 1, 2 and 3 to obtain maximum sensitivity and accuracy of calibration.

9 M/cs Band

1. Set the receiver to 9.8 M/cs and inject a signal of this frequency. Adjust the oscillator trimmer for correct calibration.
2. Tune the receiver to 9.6 M/cs and, injecting a frequency of this order; adjust the R.F. and aerial trimmers for maximum gain.
3. Set the receiver to 9.4 M/cs and inject a signal of this frequency. Adjust the oscillator coil core for correct calibration.
4. Check 1, 2 and 3 to obtain maximum sensitivity and accuracy of calibration.

NOTES for slight errors of calibration

If the calibration is slightly out on any wave band, this band may be adjusted individually.

In the event of the calibration error increasing as the tuned frequency increases on the short wave bands, then a slight adjustment of the band-spread capacitor will correct it.

In the event of the Selectivity control changing the tuning, then this is an indication that the I.F. stages are not correctly aligned.

Section 3

The Press Buttons and Tuning Drive

The Press Buttons

The press buttons on this receiver are mechanical and operate by means of half moon shape cams operating a rocker bar which in turn is connected by links to the tuning capacitor shaft. The brake is released on pressing the buttons and applied again when the buttons are allowed to return to the normal position. The noise of passing through stations is prevented by a muting switch which shorts the grid of the EBC.33 to cathode as soon as the press buttons start on the downward travel. The brake is held under pressure against the milled edge of the epycyclic drive by a spring at one end pivoted at the other end.

Servicing Points

1. It should be ensured that the brake fits snug when it is in position against the milled edge of the drive.
2. When the brake returns from the off position it must hit the drive square, if one end strikes the drive edge before the other end, the drive will be rotated and it will be impossible to set the press buttons correctly.
3. The tension applied by the spring should be enough to hold the drive when it is being tuned by hand, if this is not so the drive will rotate and the gang will not turn. This may be cured by bending the brake bar towards the drive edge.
4. Anti back-lash springs are fitted to the links and if these are not in position the settings will vary.

Setting the Press buttons

The 6 press buttons may be used on any wave band providing the correct band is selected, by means of the wave change switch, before use. These buttons may be set to the desired stations by the following method:-

1. Turn the press-button knob in an anti-clockwise direction until the movement is free.
2. Manually tune the receiver to the station it is required to set that particular button to.
3. Depress the button and at the limit of its run turn the knob in a clockwise direction until it is tight.
4. Allow the button to resume its normal position.

This may be carried out on any button or wave band.

The Tuning Drive

The tuning scale on this receiver is made of perspex and the pointer which is of the cursor type, is viewed through it.

To record the drive the following instructions should be followed:

1. Close the gang and fit the drive drum on so that the cord aperture in the rim is uppermost.
2. Knot one end of the cord round the small tag just inside the aperture, and pass it in an anti-clockwise direction round the rim of the drum up to the right-hand meeting pulley.
3. The cord, once passed round this pulley must then be taken round the bakelite wheel at the end of the scale and through the scale drum to the left-hand bakelite wheel.
4. The cord should now be firmly pulled until the gang opens.

5. Keeping the cord tight it should be passed over the left-hand meeting pulley and down to the drive drum.
6. The cord should be passed $1\frac{1}{4}$ times round the drum rim in an anti-clockwise direction and then through the fixing hole. The tension spring should now be attached and the other end of it fixed to the small tag on the front face of the drum.
7. The pointer should be fitted to the cord so that with the gang closed it lines up with the right-hand datum line on the scale.

To re-cord the scale drum drive

1. Set the W/C switch to the 13M Band and turn the scale to the 13M Band. The drum fitted to the W/C switch shaft should have the aperture in the rim downwards. Knot one end of the cord to the tag and bring it out through the aperture.
2. Pass the cord in an anti-clockwise direction round the drum and over the top of the cord drum on the scale drum.
3. Take the cord one turn round this drum and in through the cord aperture in the rim. Loop the cord round the tags on the face of the drum and out again through the aperture.
4. Take the cord $\frac{1}{2}$ a turn round the drum and round the guide pulley and on to the switch drum.
5. The cord should now be passed $1\frac{1}{4}$ turns round this drum going under the vertical cord rim through the aperture in the switch drum rim and fixed with the tension spring.

Note. Cords will jump off if the guide pullies are not in line with drums.

Section 4 (A)

Voltages taken under the following conditions:

			Volts Range	Avo.7.
H.T. voltage input		415 volts	1,000	
" " after the 5K dropper		258v.	"	
No Sigs	49m band	Tuned to 50m.		
V1	RF amp.	EF39		
Anode	Pin 3	200v	1,000	
Screen	Pin 4	90v	"	
Cathode	Pin 8	3.2v	10v	
V2 Frequency Mixer.		ECH35.		
	Hexode.			
Anode	Pin 3	240	1,000	

Screen	Pin 4	90	1,000
Osc.Anode	Pin 6		
Cathode	Pin 8	2.95	10v

V3. Local Osc. EF37

Anode	Pin 3	158	1,000
Cathode	Pin 8	No reading due to Low D.C.Res. of Cathode windings	

V4. 1st I.F. Amplifier EF39

Anode	Pin 3	200v	1,000
Screen	Pin 4	92v	"
Cathode	Pin 8	3.15	10v

V5. 2nd I.F. Amplifier EF39

Anode	Pin 3	200	1,000v
Screen	Pin 4	90	1,000v
Cathode	Pin 8	3.1	10v

V6. A V C Amp. 6B8G

Anode	Pin 3	200v	1,000v
Screen	Pin 6	128v	1,000v
Cathode	Pin 8	21.2v	100v
Voltage at Cathode tap		14.5v	100v

V7. Demodulator & Phase Splitter EBC33

Anode	Pin 3	187v	1,000
Cathode	Pin 8	32v	"

Voltage on output sockets

Right Hand. 187v Left Hand 27v

Section 4 (B)

D.C. Resistances of various windings

I.F. Transformers.	Primary	Secondary
1st	14 ohms	10 ohms
2nd	10 "	14 "
3rd	10 "	Overall 8.5 "
		From top to the tapping 5 ohms.

Aerial Coils

Long Wave	17 ohms	28 ohms
Medium Wave	13 "	2 "

Oscillator Coils	Overall	From bottom to Cathode Tap
Long Wave	1.5 ohms	.5 ohms
Medium Wave	1.25 "	.5 ohms

On the short wave bands all the windings are less than 1 ohm

465 K/cs. Rejector Circuit	8 ohms
Amplified AVC Anode Load Coil	4 "

Section 4 (C)

The following are a few notes on the special points of this receiver which may prove to be of some assistance when routine checks have failed to reveal a fault.

Due to the band spreading on short waves the setting up of these bands must be carried out with great care, calibration does not suffer unduly with changes in temperature. This later point is due to the 45pf. fixed band spreading capacitor having Neg.Coe., therefore counter-acting positive changes in the other components. The slight variation is in the order of 10 K/cs for a change of 20 degrees C on the 13m band. On the other wave bands the variation is less because of the larger capacities in use, the rates of change is therefore less.

Any change of pointer position may be taken up by releasing and rotating the pointer drum on the tuning drive, it should be ensured that the cause is pointer slip and not calibration change. Pointer slip will be the same distance out on all wave bands but calibration error will vary from band to band.

A.V.C. Faults

When A.V.C. faults appear it must be remembered that on this receiver an amplified A.V.C. system is used. The 6B8G amplifier valve for the A.V.C. should therefore be checked.

If the receiver becomes unstable the cover to the anode load of the 6B8G should be checked to ensure that it has a good earth connection. The screen on the grid lead to the 6B8G should also be checked for good earthing.

Poor results

Ensure that the pre-set volume control R28 is adjusted correctly. If all voltages are O.K. check the windings of the I.F. transformers.

Distortion

This may be caused by the 6B8G or EBC33 not up to standard. The two matched 10K resistors R30 and 32 in the anode and cathode lines should be checked, if there is any mis-matching the output will not be balanced.

Tuning Change with Selectivity Control

If, when the Selectivity control is rotated, the tuning changes, it is an indication that the I.F. transformers are not aligned correctly. (See Section 2)

No Output

If routine checks do not indicate the trouble, the press-button muting switch S10 should be inspected.

Calibration error after changing the EF37

When changing the EF37 the calibration might alter due to the changed inter-electrode capacities. The receiver should be re-calibrated (See Section 4)

DECCA SERVICE INSTRUCTIONS

Date of Issue
28.9.48

Compiled and
checked by D.S.

MODIFICATION TO DECOLA

In cases where the 8 wave band receiver is being used close to a local transmitter, it may be found that when the pre-set volume control is adjusted for the local station, the distant stations are weak. The following modification may be carried out to the A.V.C. system, which will improve the results when working under such conditions.

Components required

1	off.	.05 mfd. Paper capacitor 350vw
1	"	.5 meg. ohm resistor ½ watt
2	"	200 ohm resistor ½ watt
2	"	400 ohm resistor ½ watt
1	"	Tag panel

1. Remove the left hand mounting bracket, EF39 and 6B8G. The side plate of the first and second I.F. transformer pedestal should now be removed by undoing the two bolts at the front and two bolts at the rear of the main pedestal casting.

2. Tag 4 (see Fig.1) is used as a junction point on the underside and all the leads soldered to it should be removed and a suitable junction tag provided.

3. Unsolder the lead from the I.F. transformer to Tag. No.2 inside the pedestal, increase the length slightly and solder to Tag No.4. The 0.5 mfd. capacitor should not be moved.

4. Fit a .5 meg.ohm resistor inside the pedestal, between Tags 6 and 4.

5. Ensure that no leads foul the selectivity control and replace the pedestal side plate.

6. Remove the cathode bias resistors of the first and second I.F. amplifier valves and fit to each a 200 ohm. and a 400 ohm. resistor connected in series as in the circuit diagram (Fig.2).

7. Connect the decoupling capacitors to the junction of these two resistors. This will leave the 200 ohm. resistor un-by-passed and these will give slight degeneration.

8. Remove the 85pf. capacitor, which is connected between the grid of the 6B8G and earth. Bond the cover to the tuned anode load of the 6B8G to earth.

9. Replace mounting bracket, EF39, 6B8G etc. and test. It will be noticed that the pre-set volume control may now be set higher without the local stations over-loading.

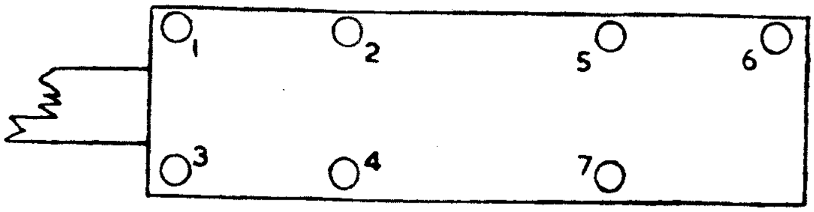


FIG 1 TAG POSITIONS ON UNDERSIDE OF FIRST AND SECOND I F TRANSFORMERS

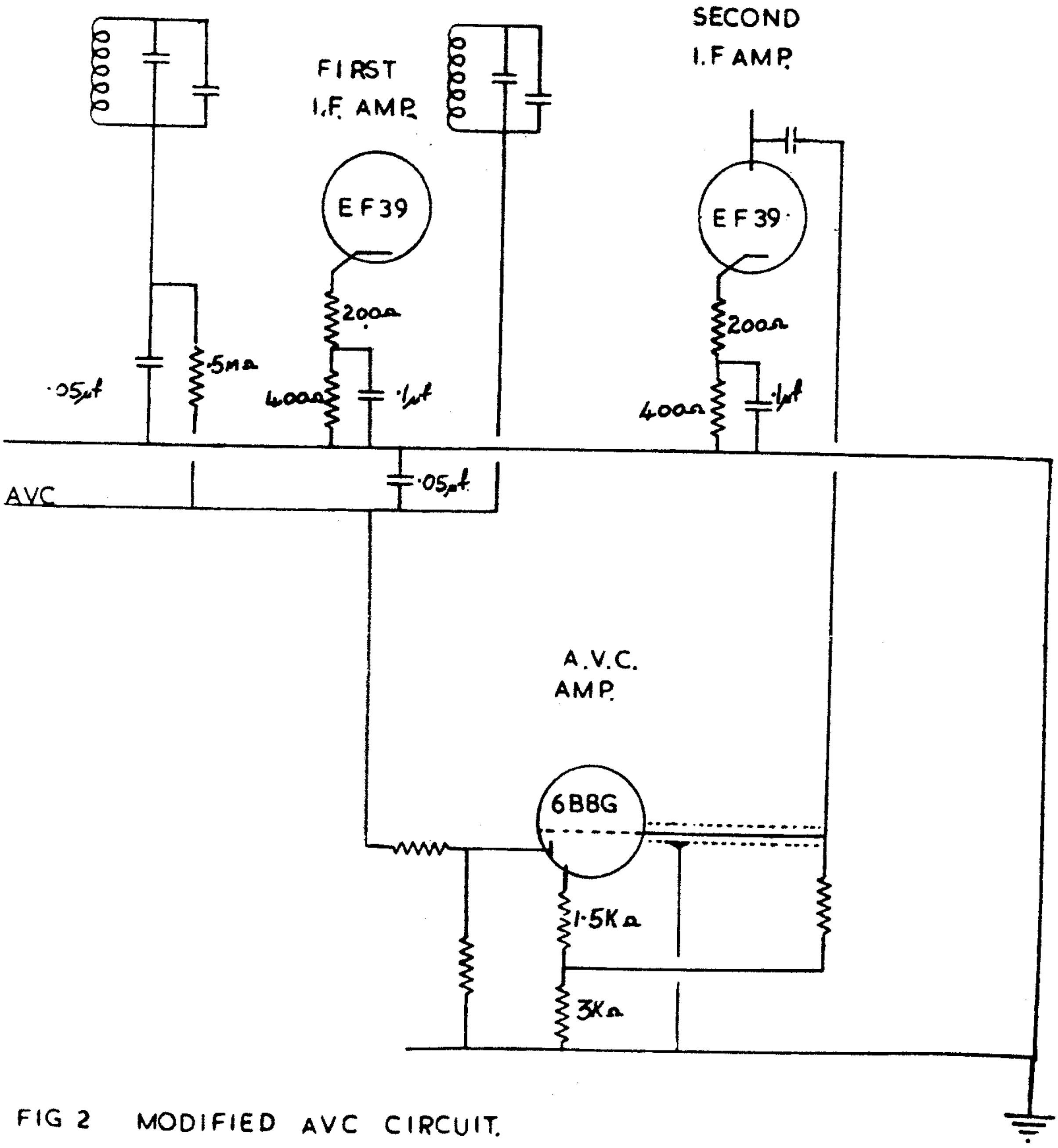


FIG 2 MODIFIED AVC CIRCUIT.