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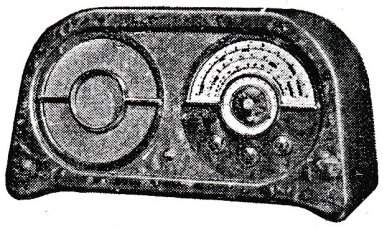
SERVICE INFORMATION



MODEL SW86

SHORT & MEDIUM WAVE RECEIVER

GENERAL DESCRIPTION OF CIRCUIT AND CHASSIS.

The SW86 employs a superheterodyne circuit using an R.F. amplifier (6D6), 1st detector (6C6), separate oscillator (76), I.F. amplifier (6D6), double diode triode (75), output pentode (42), and H.T. full-wave rectifier (80).

UNIT CONSTRUCTION.

The aerial and R.F. coils together with short wave shunt trimmers and switch members are assembled on a unit which is separate from the main chassis whilst the oscillator coils, switch member, padding and shunt trimmers form a second independent assembly. Both units are readily removable from the main chassis.

It is strongly recommended that spare units be kept in stock, as in the event of a fault developing in the R.F. or oscillator sections of the receiver, a complete replacement unit can be installed. The unit construction has been especially adapted to facilitate servicing of faults, as new units are fully tested at the factory. (For prices see page 12.)

GANG CONDENSER.

A three-gang split-section condenser is employed in the following manner;—

The low-capacity plates in each of the three gang sections are used on the two short wave bands Nos. 1 and 2. The two sets of plates in each section are switched in parallel on the medium wave band. The oscillator sections are at the front end of the gang, the aerial sections at the back, and the detector sections in the centre.

AERIALS.

Provision is made on the aerial panel for the optional use of inverted "L" type or doublet aerials.

When an inverted "L" type is used, connection is made to "A1." "A2" is connected to the earth socket "E" by a shorting strip, and to earth. If a "doublet" aerial is used, this should be connected to "A1" and "A2," and "E" connected to earth. The clip is then left unused.

When the receiver is switched to medium waves, the aerial primary coil is returned to earth. A doublet aerial is then equivalent to a "T" type, in which case one side of the "T" is connected direct to the receiver through L1, while the other side of the "T" is connected via the capacity of the doublet lead-in.

RADIO-FREQUENCY SECTION.

Low impedance couplings are employed on the two short wave ranges. On medium waves a high impedance aerial coupling is used, with resistance capacity coupling between the R.F. valve and the tuned detector circuit.

OSCILLATOR SECTION.

In this section of the receiver tuned grid coils with cathode taps are used in conjunction with a triode oscillator valve.

The oscillator is coupled to the 1st detector by direct connection between oscillator cathode and 1st detector suppressor grid, in conjunction with capacity coupling between the two cathodes.

I.F. AND A.V.C. SECTIONS.

The intermediate frequency is 460 kc/s. For aligning instructions refer to pages 4 and 5.

Automatic volume control is applied to the 1st detector and I.F. amplifier valves only, there being no A.V.C. on the R.F. valve. Upon reference to the circuit diagram it will be seen that the A.V.C. voltage is derived from one of the diodes of the 75 valve, the input to this diode being taken from the I.F. valve anode through a small condenser. No delay voltage is applied either to A.V.C. or demodulator diodes.

VOLUME CONTROL.

The volume control is connected in the grid circuit of the triode section of the "75" valve, which is resistance capacity coupled to the "42" output pentode valve.

TONE CONTROL.

The tone control is in the grid circuit of the output valve and also serves as a grid leak.

LOUDSPEAKER SILENCING DEVICE.

Provision is made for cutting out the internal loudspeaker when an external speaker is in use. This is effected by the insulated contact screw (indexed 19 Fig. 1) at the back of the chassis, which open-circuits the primary winding of the output transformer when unscrewed.

It is important to note, however, that the set speaker should only be silenced in this manner when another loudspeaker of about 7,000 ohms impedance has been connected across the "Ext. L.S." sockets. If this advice be disregarded the anode of V5 will be disconnected, thus causing the screen grid to carry the whole of the current and seriously impairing the efficiency of the valve.

ELECTROLYTIC CONDENSER PROTECTION.

The four loudspeaker sockets at the side of the receiver chassis are so wired that the 8 mfd. electrolytic condenser (C48) is disconnected from the rectifier when the four-pin plug is removed. This prevents damage to the condenser which would otherwise result should the plug be removed when the receiver is switched on.

REMOVAL OF CHASSIS FROM CABINET.

1. Remove all control knobs after slackening set screws. The large tuning knob is provided with a friction device to prevent damage to the drive when turned past the stops.

The set screw for removing this knob is accessible only when the screw hole is in line with one of the two black pointers behind the knob.

Turn the tuning knob until the illuminated pointer is against one of the stops, continue turning the knob until the set screw hole comes opposite one of the black pointers and insert screwdriver.

If the set screw is not found in this position rotate the knob a further 180°, when the screw will be found in line with the other pointer.

2. Remove the five screws which hold the back cover in position and remove back cover.
3. Withdraw loudspeaker plug from right-hand side of chassis.
4. Remove the six screws underneath the cabinet which hold the chassis bars in the cabinet.
5. Withdraw chassis from cabinet after lifting slightly to clear the rubber grommets.

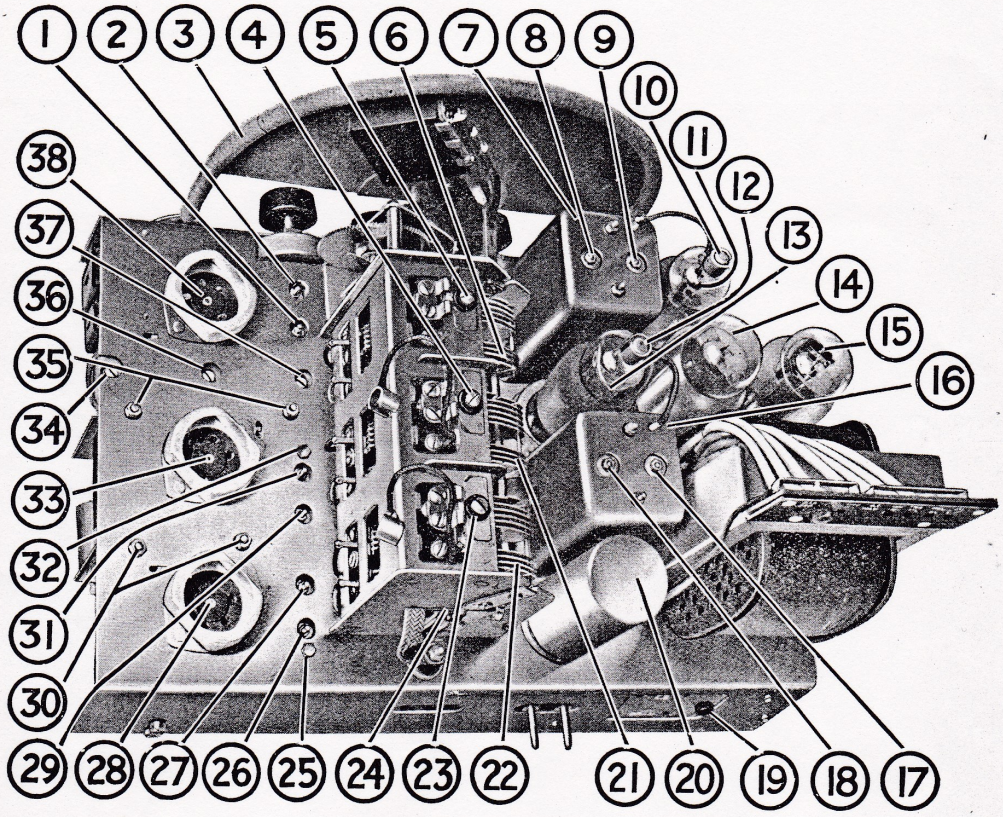


Fig. 1. Chassis illustration.

1. **Band 1 oscillator shunt trimmer (C18).**
2. **Band 2 oscillator shunt trimmer (C17).**
3. Rubber clamping ring.
4. **M.W. 1st detector gang trimmer (C12).**
5. **M.W. oscillator gang trimmer (C16).**
6. S.W. oscillator section of gang condenser (C5).
7. 2nd I.F. transformer (L17, L18).
8. **2nd I.F. primary trimmer (C21).**
9. **2nd I.F secondary trimmer (C22).**
10. Triode grid cap.
11. 2nd detector, A.V.C. and 1st L.F. valve (V4—type 75).
12. Control grid cap.
13. I.F. valve (V3—type 6D6).
14. Output valve (V5—type 42).
15. Rectifier valve (V7—type 80).
16. 1st I.F. transformer (L15, L16).
17. **1st I.F secondary trimmer (C20).**
18. **1st I.F. primary trimmer (C19).**
19. Loudspeaker silencing screw.
20. Electrolytic smoothing condensers (C47, C48).
21. S.W. 1st detector section of gang condenser (C3).
22. S.W. aerial section of gang condenser (C1).
23. **M.W. aerial gang trimmer (C9).**
24. Gang spindle friction spring.
25. Self-tapping screw holding R.F. unit to chassis.
26. **Band 1 aerial shunt trimmer (C7).**
27. **Band 2 aerial shunt trimmer (C8).**
28. R.F. valve (V1—type 6D6).
29. **Band 1 1st detector shunt trimmer (C10).**
30. Nuts holding R.F. unit to chassis.
31. **Band 2 1st detector shunt trimmer (C11).**
32. Self-tapping screw holding R.F. unit to chassis.
33. 1st detector valve (V2—type 6C6).
34. **M.W. oscillator series trimmer (C15).**
35. Nuts holding oscillator unit to chassis
36. **Band 2 oscillator series trimmer (C14).**
37. **Band 1 oscillator series trimmer (C13).**
38. Oscillator valve (V6—type 76).

CALIBRATION AND ALIGNMENT INSTRUCTIONS.

Calibration of a receiver consists of adjusting the oscillator circuits so that the signals or stations come in at their proper places on the dial scale. In the SW86 receiver this adjustment is made by setting the oscillator shunt trimmers to their correct position.

Alignment of a receiver consists of adjusting the various tuned circuits to give maximum sensitivity. In the SW86 receiver this is done by adjusting the I.F. trimmers, oscillator series trimmer and the aerial and R.F. shunt trimmers. A receiver may thus be out of adjustment if it is (1) Misaligned only, in which case re-aligning only is necessary; (2) mis-calibrated only; or (3) mis-aligned and mis-calibrated, in which case it is necessary both to calibrate and align.

In order properly to calibrate and align the SW86 receiver it is essential to use a good accurately calibrated modulated oscillator and output meter.

The oscillator must have sufficient attenuation to give very small outputs for alignment,, in order not to actuate the A.V.C. circuit. In addition it must be capable of large outputs for use when the receiver is badly mis-aligned or to provide harmonics for use on short waves. The oscillator must provide signals of 460 kc/s, 1,400 kc/s, 550 kc/s, 5.2 mc/s, 10 mc/s, 12 mc/s and 20 mc/s or other signals that will produce these frequencies as harmonics. Thus for a test oscillator which only goes to 4.0 mc/s (4,000 kc/s) use the third harmonic of 4.0 mc/s for the 12.0 mc/s signal, and the fifth harmonic of 4.0 mc/s for the 20 mc/s signal. Likewise the fifth harmonic of 1,040 kc/s may be used for the 5.2 mc/s (5,200 kc/s) signal.

An output meter of 0-3 volts range approximately should be used connected across the voice coil, or a higher range meter (0-50 volts approximately) can be connected to the external loud speaker terminals. In the latter case it is essential to connect a 350 D.C. test condenser of about 0.25 mfd. in series with the meter. The volume control should be turned to "maximum."

Always use the lowest output meter scale which will provide a steady reading and adjust oscillator output so that output meter reads near centre of scale.

A 500 ohm resistor must be used in series with the aerial lead to the oscillator for all adjustments except the alignment of the I.F. trimmers. The omission of this resistor will lead to incorrect alignment.

Note: All trimmers to which reference is made in the following sections are indicated on the chassis illustration (Fig. 1). *The metal end of the trimming tool used should be as small as possible.*

SETTING DIAL AND GANG CONDENSER.

Before starting calibration and alignment set the dial as follows:—

1. Tighten the 8 B.A. round headed screws in the scale holder.
2. Loosen the two set screws which hold the scale holder to the drive mechanism.
3. Turn the scale holder so that the bottom of the scale is horizontal and parallel with the top of the chassis.
4. Tighten the two set screws mentioned in 2.
5. With the wave change switch in the gramophone position (two dial lamps lighted) set the dial indicator to coincide with the datum line on the right of the scale and adjust the drive stop so that the indicator cannot be turned past the datum line. With the indicator in this position set the gang condenser so that the oscillator section is at full mesh, and tighten the set screws.
6. Check the indicator stop at the maximum position on the left (high frequency end of the dial) and make certain that the pointer can move to the 1,500 kc/s mark.

I.F. ALIGNMENT.

1. Connect one of the service oscillator output leads to the control grid of the 6C6 1st detector with a .02 mfd. condenser in series and connect the other oscillator lead to the chassis.
2. Set the oscillator exactly to 460 kc/s and carefully adjust the trimmers Nos. 18, 17, 8 and 9 for maximum output meter deflection.
3. Repeat the adjustment, as the setting of one trimmer has some effect upon the others.

MEDIUM WAVE BAND CALIBRATION.

1. Check the position of the illuminated pointer arm in relation to the condenser shaft. (See "Setting dial and gang condenser.")
2. Turn the wave change switch to the medium wave position (third in clockwise direction). Connect one of the service oscillator leads to A1, not forgetting to include a 500 ohm resistance in series with the aerial lead. Connect other service oscillator lead to both E and A2. Set oscillator to exactly 1,400 kc/s.
3. To calibrate this band tune in the 1,400 kc/s signal and adjust the oscillator shunt trimmer No. 5 until signal can be tuned in with maximum volume at its correct frequency setting on the scale.

MEDIUM WAVE BAND ALIGNMENT.

4. Align the medium wave band by adjusting the aerial trimmer No. 23 and the 1st detector trimmer No. 4 for maximum output meter reading. Retune the receiver and check the adjustments of these trimmers.
5. Set the service oscillator to 550 kc/s and tune the receiver to the signal. Adjust the oscillator

series trimmer No. 34 for maximum output. Retune the receiver and re-adjust the trimmer. Continue this procedure of adjusting the trimmer and retuning the receiver until the maximum output is obtained.

6. Set the service oscillator to 1,400 kc/s again. Tune in the signal at 1,400 kc/s on the receiver and check the alignment of trimmers Nos. 23 and 4.

No. 2 SHORT WAVE BAND CALIBRATION.

7. Set wave change switch to No. 2 short wave band (second position in clockwise direction). Adjust the service oscillator to 10 mc/s. If the oscillator does not reach this frequency use the second harmonic of 5 mc/s or the fourth harmonic of 2.5 mc/s (2,500 kc/s).

8. To calibrate band 2 set the illuminated pointer to the 10 mc/s line on the scale and adjust the oscillator shunt trimmer No. 2 so that the signal may be tuned in at maximum volume at its proper setting on the dial. If the signal is brought in at two different settings of the trimmer, the correct adjustment is the one with the trimmer farthest out.

Check this adjustment to make certain the oscillator is not tuned to the image signal. With a large test oscillator output the image may be heard at approximately 9.1 mc/s on the dial providing the oscillator trimmer is adjusted to the peak farthest out. If there is no signal at approximately 9.1 mc/s but a signal is found at approximately 10.9 mc/s dial setting then the oscillator trimmer No. 5 is not properly set. It must accordingly be re-adjusted until the image signal may be tuned in at 9.1 mc/s dial setting, and the signal at the proper 10 mc/s dial setting

No. 2 SHORT WAVE BAND ALIGNMENT.

9. Tune trimmers Nos. 27 and 31 to give maximum output. Trimmer No. 31 should now be detuned in either direction and the gang condenser retuned. Continue detuning trimmer No. 31 and retuning receiver until the maximum output meter reading is reached. Recheck aerial trimmer No. 27.

10. **Now check alignment as follows: Leaving service oscillator set at 10 mc/s increase its output. Tune in the image signal at about 9.1 mc/s on the receiver scale.**

This image signal should be weak compared with the correct signal at 10 mc/s. If it is nearly as strong as the 10 mc/s signal it indicates that trimmers Nos. 27 and 31 are not properly adjusted, and the aligning procedure in paragraph 9 must be repeated.

11. Set the service oscillator to 5.2 mc/s and tune the receiver to the signal.

Adjust the oscillator series trimmer No. 36 to give maximum output. Retune the receiver to a peak and again adjust the trimmer.

Continue this procedure of adjusting the trimmer and retuning the receiver until the output meter readings cannot be increased.

12. Check the adjustment of trimmers Nos. 27 and 31 with a 10 mc/s signal as in 9 and 10.

No. 1 SHORT WAVE BAND CALIBRATION.

13. Set wave change switch to No. 1 short wave band (turn fully in anti-clockwise direction).

Adjust the service oscillator to 20 mc/s. (If the oscillator does not reach this frequency, use the second harmonic of 10 mc/s or the fifth harmonic of 4 mc/s.)

14. To calibrate band 1 set the illuminated pointer to the 20 mc/s line on the scale and adjust the oscillator shunt trimmer No. 1 so that the signal may be tuned in at maximum volume at its proper setting on the dial. If the signal is brought in at two different settings of the trimmer the correct adjustment is the one with the trimmer farthest out.

Check this adjustment to make certain the oscillator is not tuned to the image signal. With a large test oscillator output the image may be heard at approximately 19.1 mc/s on the dial providing the oscillator trimmer is adjusted to the peak farthest out. If there is no signal at approximately 19.1 mc/s but a signal is found at approximately 20.9 mc/s dial setting then the oscillator trimmer No. 1 is not properly set. It must accordingly be re-adjusted until the image signal may be tuned in at 19.1 mc/s dial setting and the signal at the proper 10 mc/s dial setting.

No. 1 SHORT WAVE BAND ALIGNMENT.

15. Tune the trimmers Nos. 26 and 29 to give maximum output. Trimmer No. 29 should be detuned in either direction and the gang condenser retuned. Continue detuning trimmer No. 29 and retuning receiver until the maximum output meter reading is reached. Recheck aerial trimmer No. 26.

16. **Now check alignment as follows: Leaving service oscillator set at 20 mc/s, increase its output. Tune in the image signal at about 19.1 mc/s on the receiver scale.**

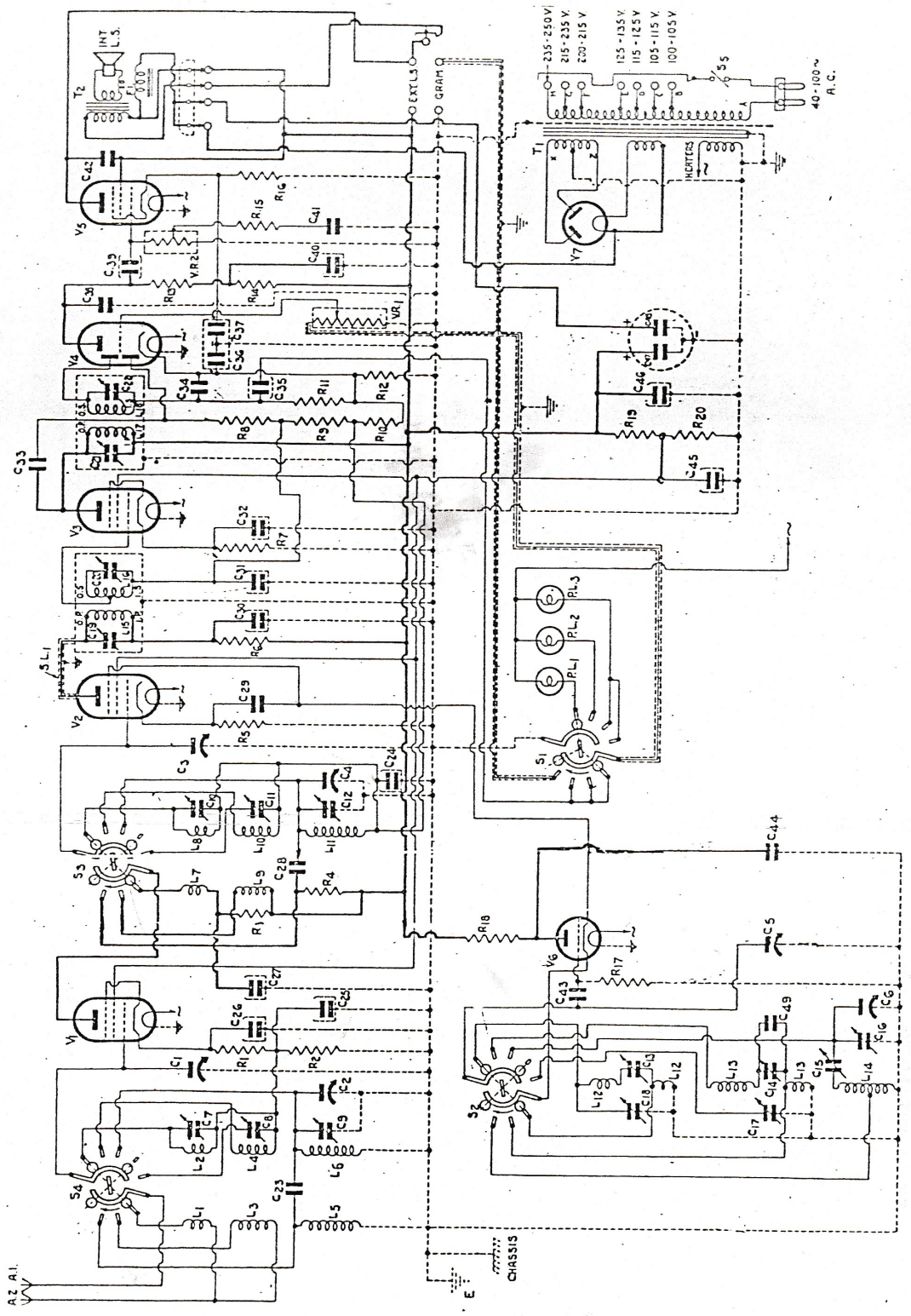
This image signal should be weak compared with the correct signal at 20 mc/s. If it is nearly as strong as the 20 mc/s signal it indicates that trimmers Nos. 26 and 29 are not properly adjusted and the aligning procedure in paragraphs 15 and 16 must be repeated.

17. Set the service oscillator to 12 mc/s and tune the receiver to the signal.

Adjust the oscillator series trimmer No. 37 to give maximum output. Retune the receiver to a peak and again adjust the trimmer.

Continue this procedure of adjusting the trimmer and retuning the receiver until the output meter readings cannot be increased.

18. Check the alignment of trimmers Nos. 26 and 29 with a 20 mc/s signal as in 15 and 16.


INT L.S.
T2
EXT L.S.
GRAM
235-250 V
215-235 V
220-215 V
125-135 V
115-125 V
105-115 V
100-105 V
40-100~ A.C.
S5
T1
HEATERS
Y7
V5
V4
V3
V2
V1
V6
S1
S2
S3
S4
PL1
PL2
PL3
A2 A1
CHASSIS
E

CIRCUIT KEY AND PRICE LIST.

Ref.	Description.	Part No.	Price.
L 1	Band 1 prim.) Aerial coil	DP815	1/9
L 2	Band 1 sec.) assembly.		
L 3	Band 2 prim.) Aerial coil	DP816	2/-
L 4	Band 2 sec.) assembly.		
L 5	M.W. primary (28 ohms) ...)	DP804	1/9
L 6	M.W. secondary (2½-3 ohms))		
L 7	Band 1 prim.) R.F.	DP813	2/-
L 8	Band 1 sec.) transformer.		
L 9	Band 2 prim.) R.F.	DP814	2/-
L10	Band 2 sec.) transformer.		
L11	M.W. tuned grid coil (3 ohms)	DP805	1/6
L12	Band 1)	DP809	1/9
L13	Band 2 Oscillator	DP810	1/9
L14	M.W. (1¼ ohms)) coil.	DP806	1/6
L15	Primary (13 ohms)) 1st I.F.	SA116	5/6
L16	Secondary (13 ohms)) transf.		
L17	Primary (13 ohms)) 2nd I.F.	SA115	5/6
L18	Secondary (13 ohms)) transf.		
C 1	S.W. aerial section)		
C 2	M.W. „ „)		
C 3	S.W. 1st detec. sec.) Gang		
C 4	M.W. „ „) cond'ser	D5749	42/6
C 5	S.W. oscillator sec.)		
C 6	M.W. „ „)		
C 7	Band 1 aerial shunt pre-set condenser	DP827	1/9
C 8	Band 2 aerial shunt pre-set condenser		
C 9	Gang trimmer (M.W. aerial section)	—	—
C10	Band 1 1st detector shunt pre-set condenser	DP827	1/9
C11	Band 2 1st detector shunt pre-set condenser		
C12	Gang trimmer (M.W. 1st detector section)	—	—
C13	Band 1st oscillator series trimming condenser ...	A5681	2/9
C14	Band 2nd oscillator series trimming condenser ...	A5680	2/3

Ref.	Description.	Part No.	Price.
C15	M.W. oscillator series trimming condenser	A5679	1/9
C16	Gang trimmer (M.W. oscillator section)	—	—
C17	Band 2 oscillator shunt pre-set condenser	DP827	1/9
C18	Band 1 oscillator shunt pre-set condenser		
C19	Primary trimmer) 1st I.F.		
C20	Secondary „) transf'er	—	—
C21	Primary trimmer) 2nd I.F.	—	—
C22	Secondary „) transf'er		
C23	5 cm. condenser	A5540	1/6
C24	.25 mfd. „	A5521	1/3
C25	.05 mfd. „	A5745	1/-
C26	.05 mfd. „	A5745	1/-
C27	.02 mfd. „	A5512	1/-
C28	5 cm. „	A5540	1/6
C29	.0005 mfd. „	A5547	6d.
C30	.02 mfd. „	A5512	1/-
C31	.02 mfd. „	A5512	1/-
C32	.1 mfd. „	A5511	1/3
C33	5 cm. „	A5540	1/6
C34	.0005 mfd. „	A5747	6d.
C35	.02 mfd. „	A5513	1/-
C36	25 mfd. electrolytic condenser)	B5522	2/6
C37	25 mfd. „ „)		
C38	.0005 mfd. condenser ...	A5747	6d.
C39	.02 mfd. „	A5513	1/-
C40	.1 mfd. „	A5511	1/3
C41	.005 mfd. „	A5508	1/3
C42	.003 mfd. „	A5799	1/9
C43	.0001 mfd. „	A5747	6d.
C44	.002 mfd. „	A5274	9d.
C45	.1 mfd. „	A5511	1/3
C46	.25 mfd. „	A5521	1/6
C47	8 mfd.) electrolytic block	B5526	5/-
C48	8 mfd.) condenser ...		
R 1	325 ohm resistance	A5539	6d.
R 2	1,500 ohm resistance	A5539	6d.

Ref.	Description.	Part No.	Price.
R 3	1,000 ohm resistance ...	A5539	6d.
R 4	4,000 „ „ ...	A3263	6d.
R 5	15,000 „ „ ...	A3263	6d.
R 6	1,000 „ „ ...	A5539	6d.
R 7	500 „ „ ...	A5539	6d.
R 8	100,000 „ „ ...	A3263	6d.
R 9	250,000 „ „ ...	A3263	6d.
R10	250,000 „ „ ...	A3263	6d.
R11	500,000 „ „ ...	A3263	6d.
R12	7,000 „ „ ...	A3263	6d.
R13	200,000 „ „ ...	A3263	6d.
R14	40,000 „ „ ...	A3263	6d.
R15	10,000 „ „ ...	A3263	6d.
R16	420 „ „ ...	A5678	9d.
R17	75,000 „ „ ...	A3263	6d.
R18	30,000 „ „ ...	A5780	6d.
R19	10,000 „ „ ...	A5527	1/-
R20	8,000 „ „ ...	A5527	1/-
VR1	250,000 „ volume control .	B3800	3/9
VR2	250,000 „ tone control ...	B4635	3/-
S1	8 point switch contact plate ...	B5530	2/-
S2	7 „ „ „ „ ...	B5529	2/-
S3	7 „ „ „ „ ...	B5529	2/-
S4	7 „ „ „ „ ...	B5529	2/-
S5	"On-off" switch (ganged to VR1)	—	—
T1	Mains trans. (load 55 watts) 'A' to 'B'—4.9 ohms; 'A' to 'C'—5.4 „; 'A' to 'D'—6.0 „; 'A' to 'E'—6.5 „; 'A' to 'F'—17 „; 'A' to 'G'—20 „; 'A' to 'H'—23 „; 'X' to 'Z'—775 „	SA118	25/-
T2	Output trans. Prim. —750 „; Sec. —0.2 „	SA121	7/6
F1	Loudspeaker field (1,150 ohms)	—	—
PL1-3	Pilot lamps	A5767	9d.

See page 12 for prices of parts not mentioned above.

All prices given in this manual are retail and subject to alteration without notice.

Delivery is "F.O.B." English port.

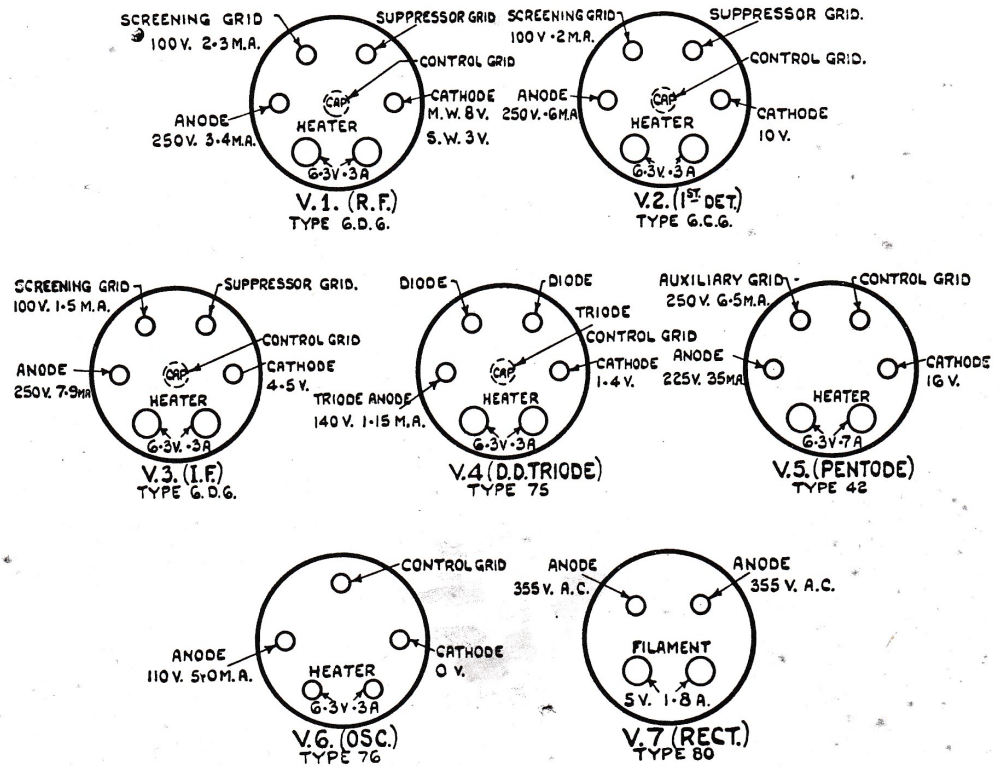


Fig. 3. View of underside of valve holders. Voltages shown are to chassis and measured with a voltmeter having a resistance of 1,000 ohms per volt.

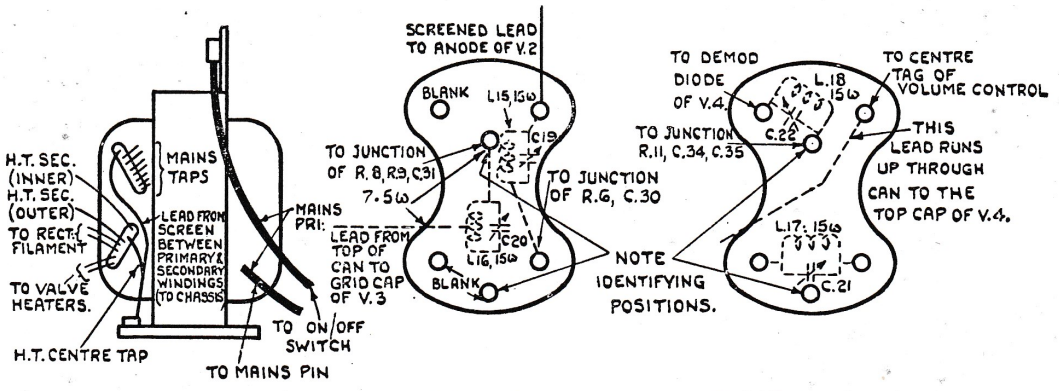


Fig. 4. Connections of the mains and two I.F. transformers.

FAULT FINDING

On the occurrence of a fault resulting in no radio reception on any wave band, a systematic test should be made, commencing at the L.F. end and proceeding through the receiver to the R.F. end.

L.F. SECTION.

To ascertain whether the low frequency part of the receiver is functioning, turn the volume control to maximum and touch the grid cap of the 75 valve. Normally a loud hum will be heard.

If the receiver seems dead, an examination of the L.F. section should be made as follows:—

Check the voltage across the loudspeaker field, the main H.T. voltage, the anode, screen and bias voltages of the output valve, and anode and bias voltages of the 75 valve. Use a high resistance voltmeter (at least 1,000 ohms per volt). If a meter of lower resistance be used, the readings will be correspondingly lower.

An incorrect voltage will generally indicate the fault. For example (1) No pentode anode voltage—check continuity of primary winding of output transformer, including wiring (see that the loudspeaker silencing screw is not unscrewed). (2) No bias voltage on triode—check for short circuit in cathode wiring or in by-pass condenser (C36).

I.F. SECTION.

If the L.F. part of the receiver is in order, proceed to the I.F. amplifier section. Connect a modulated service oscillator to the grid of the 1st detector valve and tune the oscillator to the Intermediate Frequency of the receiver, i.e., 460 kc/s. The receiver tuning indicator should be turned to the middle of the medium wave band, and a suitable output meter connected to the EXT. L.S. sockets through a .25 mfd. condenser (see paragraph 5, page 4). Adjust the output of the oscillator to give half scale deflection on the output meter.

Transfer the oscillator lead to the grid of the I.F. valve (top cap) and increase the oscillator output to give same reading on the output meter (half scale deflection). The increase in output required should give an indication of the gain of the 1st detector.

If no increase in oscillator output is required to give the same output meter reading, then there is clearly no gain in the 1st detector, and an investigation of this portion of the circuit should be carried out, e.g., check 1st detector valve voltages, resistance of 1st I.F. transformer windings. (Secondary winding is centre tapped to grid of I.F. valve.)

If the I.F. amplifier from the grid of the 1st detector appears to be functioning correctly except for general low sensitivity, the I.F. alignment instructions on page 4 should be carried out.

OSCILLATOR SECTION.

Having ascertained that the receiver is in order from the 1st detector grid, proceed to the oscillator section. Set the tuning indicator to the middle of the medium wave band and connect a high resistance voltmeter across the oscillator anode resistance (R18 mounted on resistance panel at right hand side of chassis).

Note the voltage across this resistance, and observe the change in voltage when the grid (top cap) of the oscillator valve is shorted to chassis. If the valve is oscillating correctly the voltage drop across R18 should be 135 volts, changing to 170 volts when earthing the grid cap.

In the event of the oscillator section of the receiver being found at fault, it is recommended that the complete unit be changed (for procedure see opposite page).

R.F. SECTION.

If the oscillator is working correctly, connect the service oscillator to the grid (top cap) of the R.F. valve. Set the oscillator to 1,400 kc/s and tune the receiver to the oscillator signal. Adjust the oscillator output to give half scale deflection on the output meter and transfer the service oscillator lead to the 1st detector grid (top cap). An increase in oscillator output should be required to give the same output meter reading if the R.F. valve is giving its correct gain.

In the same way check the gain of the aerial coil by connecting the oscillator first to the aerial terminal A1 and then to the grid of the R.F. valve.

A similar procedure may be adopted in the case of bands 1 and 2, using 20 mc/s and 10 mc/s inputs respectively.

If the R.F. section is proved to be faulty in any way, it is preferable to replace the complete unit (for procedure see opposite page).

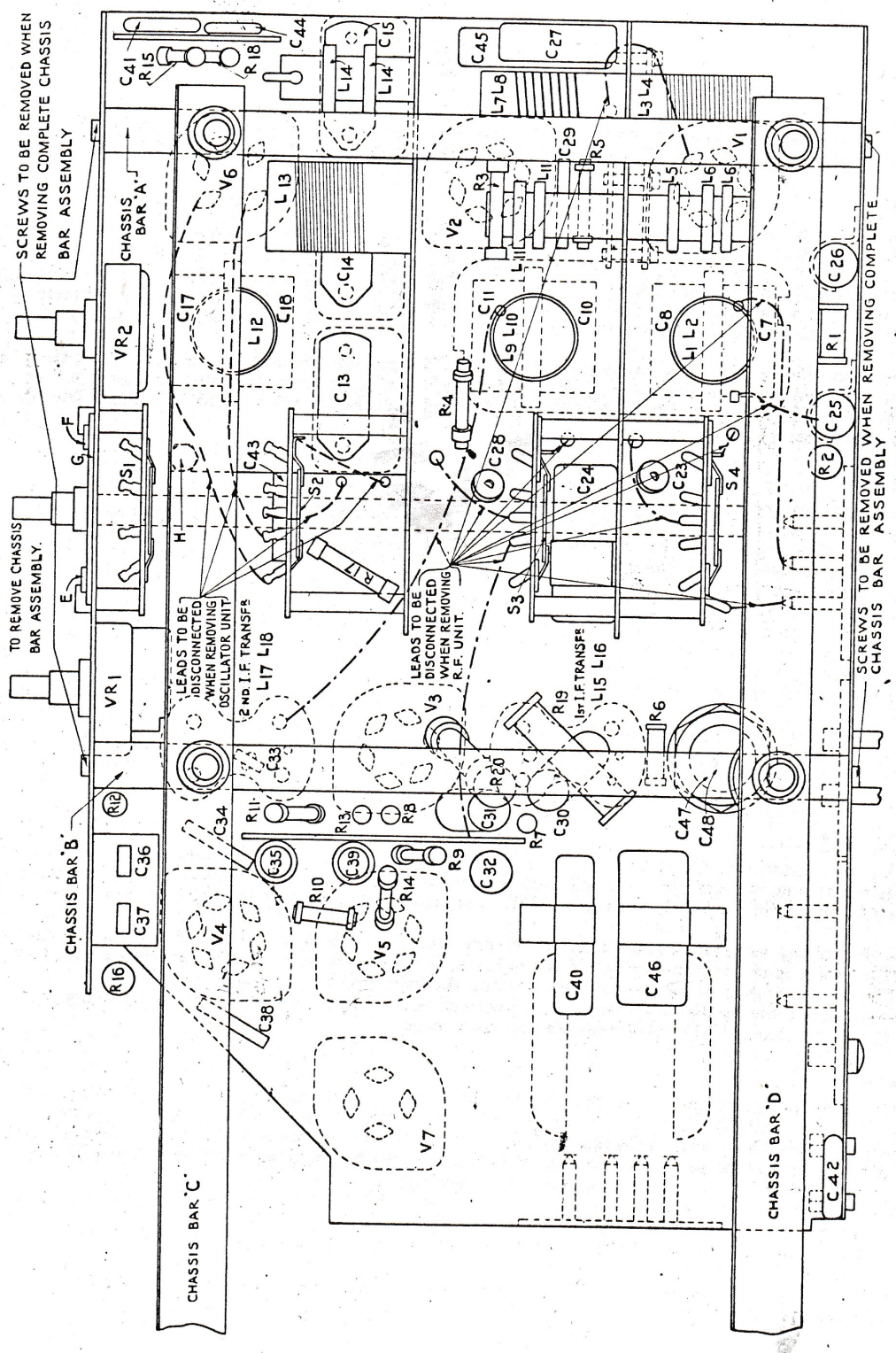


Fig. 5. View of underside of chassis.

REMOVAL OF OSCILLATOR & R.F. UNITS FROM CHASSIS.

To remove either unit first remove the eight cheese headed screws which hold the transverse chassis bars (A and B Fig. 5) to the vertical faces of the chassis. The transverse bars may now be removed with the two longitudinal bars (C and D Fig. 5) still mounted thereon.

Also unscrew the two self tapping screws (E and F Fig. 5) which hold the switch location plate (G Fig. 5) to the front of the chassis, and after turning the switch to the gramophone position (fully clockwise) withdraw the switch spindle complete.

OSCILLATOR UNIT.

1. Unsolder the oscillator grid and cathode wires which run from the oscillator valve holder to the switch member (S2 Fig. 5) and disconnect the two wires from the gang condenser. All four wires are indicated on Fig. 5 and should be unsoldered at the switch end.

2. From the bottom of the chassis, unscrew the self tapping screw (H Fig. 5) which holds the front edge of the oscillator unit to the chassis. This screw is located one inch from the front edge of the chassis and one inch to the right hand side of the gang spindle.

3. Remove the three hexagonal nuts which hold the oscillator unit to the chassis. Two of these are indexed "35" on Fig. 1, while access to the third (not shown) may be gained by turning the gang condenser to full mesh.

4. The complete oscillator unit may now be withdrawn from the chassis.

R.F. UNIT.

The R.F. Unit comprises two complete sections (aerial and 1st detector) mounted on a metal frame and separated by a common partition.

Each section includes a set of three coils and a switch member together with one short wave shunt trimmer, associated components and wiring.

The aerial section is that nearer the back of the chassis. In this section there are five wires (indicated on Fig. 5) to be disconnected as follows :—

1. Unsolder the two gang condenser leads to the switch member (S4 Fig. 5) at the switch end.
2. Disconnect the lead from the aerial socket A1 at the switch (S4 Fig. 5) and that from aerial socket A2 at the short wave coil (L1, L2).
3. Unsolder the common lead which goes from the bottom of the short wave coils (L1, L2) to the tubular condenser (C25) mounted on the back of the chassis nearest the aerial panel (unsolder at the condenser end).

In the 1st detector section there are five leads (indicated in Fig. 5) to be disconnected in the following order :—

1. Unsolder the two gang condenser leads from switch member (S3 Fig. 5).
2. Disconnect the A.V.C. lead (brown insulation) running from the resistance panel to the dummy lug on the switch member (S3 Fig. 5) and also the H.T. lead (red insulation) running from the 1st I.F. transformer to the top of the band 2 short wave coil (L9, L10).
3. Lastly disconnect the R.F. valve plate lead from the band 1 short wave coil (L7, L8). This lead (blue insulation) will be found running from the R.F. valve holder under the common partition up and around the base of band 1 short wave coil (L7, L8) to a tag riveted to the coil former.
4. From the top of the chassis, unscrew the two self tapping screws (indexed 25 and 32 Fig. 1) which hold the R.F. unit to the chassis.
5. Remove the three hexagonal nuts which hold the R.F. unit to the chassis. Two of these are indexed "30" on Fig. 1, while access to the third (not shown) may be gained by turning the condenser to full mesh.

The complete R.F. unit may now be withdrawn from the chassis.

MICROPHONY.

This may be experienced on band 1 if the chassis is replaced in the cabinet without due care being taken to see that the gang condenser is free to move on its rubber mountings. The tuning scale is mounted on the gang condenser drive mechanism, and it is therefore important that it should only rest lightly against the inside face of the cabinet.

The same applies to the rubber clamping ring (see 3, Fig. 1) and the back of the scale.

BACKLASH IN CONDENSER DRIVE.

This may take two forms.

1. To tune to a given station, it may be necessary to turn the tuning knob until the dial light is just past the normal position. When the knob is released the dial light springs back slightly to the normal tuning position. This is due to excessive drag on the ganged condenser spindle, and is generally caused by the spring indexed 24 on Fig. 1 bearing too heavily on the spindle. If this is the case, remove the spring, flex slightly to relieve pressure, and replace.

2. It may be found possible to turn the tuning knob through an appreciable angle either way before the dial indicator moves. This is probably due to the teeth of a pair of the large gear wheels coinciding exactly with one another, possibly as the result of burred edges on the teeth, or presence of foreign matter between the two wheels. It is essential for the wheels to move freely against one another under the influence of the small incorporated coil springs, and if necessary the drive should be taken down to clean the surfaces of the wheels or to remove any burred edges on the teeth.

PRICES OF PARTS NOT SHOWN IN CIRCUIT DIAGRAM

Description.	Part No.	Price
Cabinet (black and chromium)	DP885	37/6
„ (dark walnut)	DP884	30/–
Scale (white or buff)	A5741	1/6
Tuning knob (walnut or black)	C3839	3/6
Tuning knob handles (walnut or chromium)	A5795	2d.
Volume control knob ... { walnut,	C3920	6d.
Tone control knob ... { black and		
W/C switch knob ... { chromium	C3920	9d.
Loudspeaker	M62	30/–
Back cover	E5742	2/6
Mains lead assembly	DP881	1/6

Description.	Part No.	Price
Complete R.F. unit (refer page 11) ...	SA120	27/6
Complete oscillator unit (refer page 11) ...	SA119	25/–
Switch stop plate and spindle	B5682	2/–
Valve screen	C5794	6d.
Rubber gang condenser grommet	A5673	2d.
Rubber foot	P1791	1d.
Foot cup	A5769	1d.
Insulated screw (transformer tapping) ...	P1531	2d.
Insulated screw (loudspeaker cut-out) ...	P1532	2d.
Plug (red or black)	A3654	1d.

E. K. COLE LTD., EKCO WORKS, SOUTHEND-ON-SEA, ENGLAND.

A.G.C. MODIFICATIONS FOR SW86

There is little point in carrying out modifications unless the chassis has been fully serviced and the equipment working correctly.

1. Locate R2 and connect a 180-200 ohm ½ watt resistor in parallel (A).

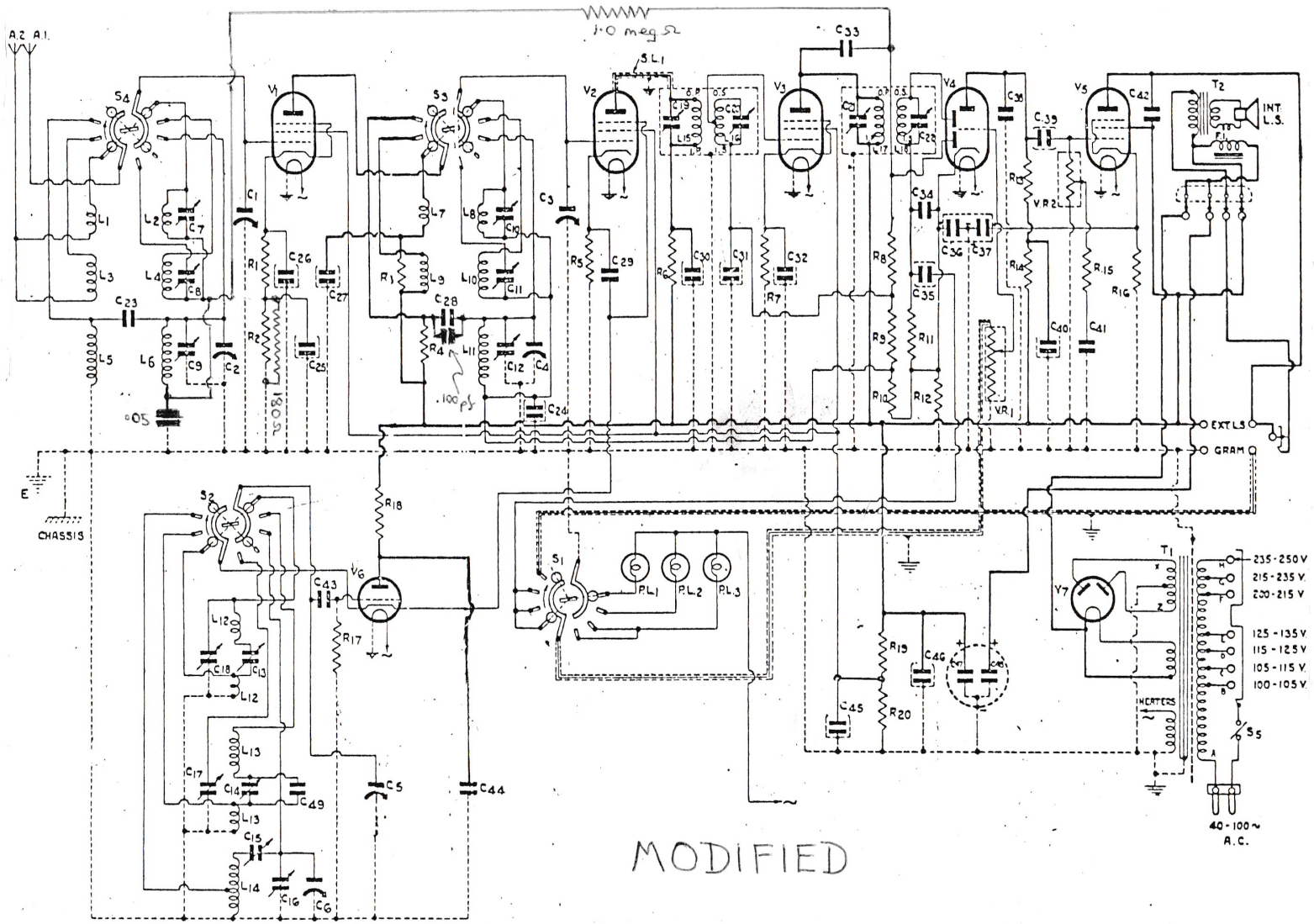
2. Disconnect lead between the bottom of L2 and C25 at (B). Call this Tag X.

3. Locate Tag for the earthed end of L6 winding (C) and disconnect from earth. Connect this tag to point X.

4. Connect a .05 mf or thereabouts capacitor between tag X and earth.

5. Solder a short lead 1.0 megohm resistor to pin 4 of the 75 socket (D). Connect the other end of the resistor to Tag X. It is a good idea to use an insulated stand off to support this end of the resistor.

P.M. LANKSHEAR
22/8/84


A2 A1
1·0 meg Ω
S.L.1
INT. L.S.
EXT L.S.
GRAM
E
CHASSIS
.05
.0081
.100 pf
P.L.1
P.L.2
P.L.3
235-250 V.
215-235 V.
200-215 V.
125-135 V.
115-125 V.
105-115 V.
100-105 V.
INVERTERS
40-100~ A.C.
MODIFIED

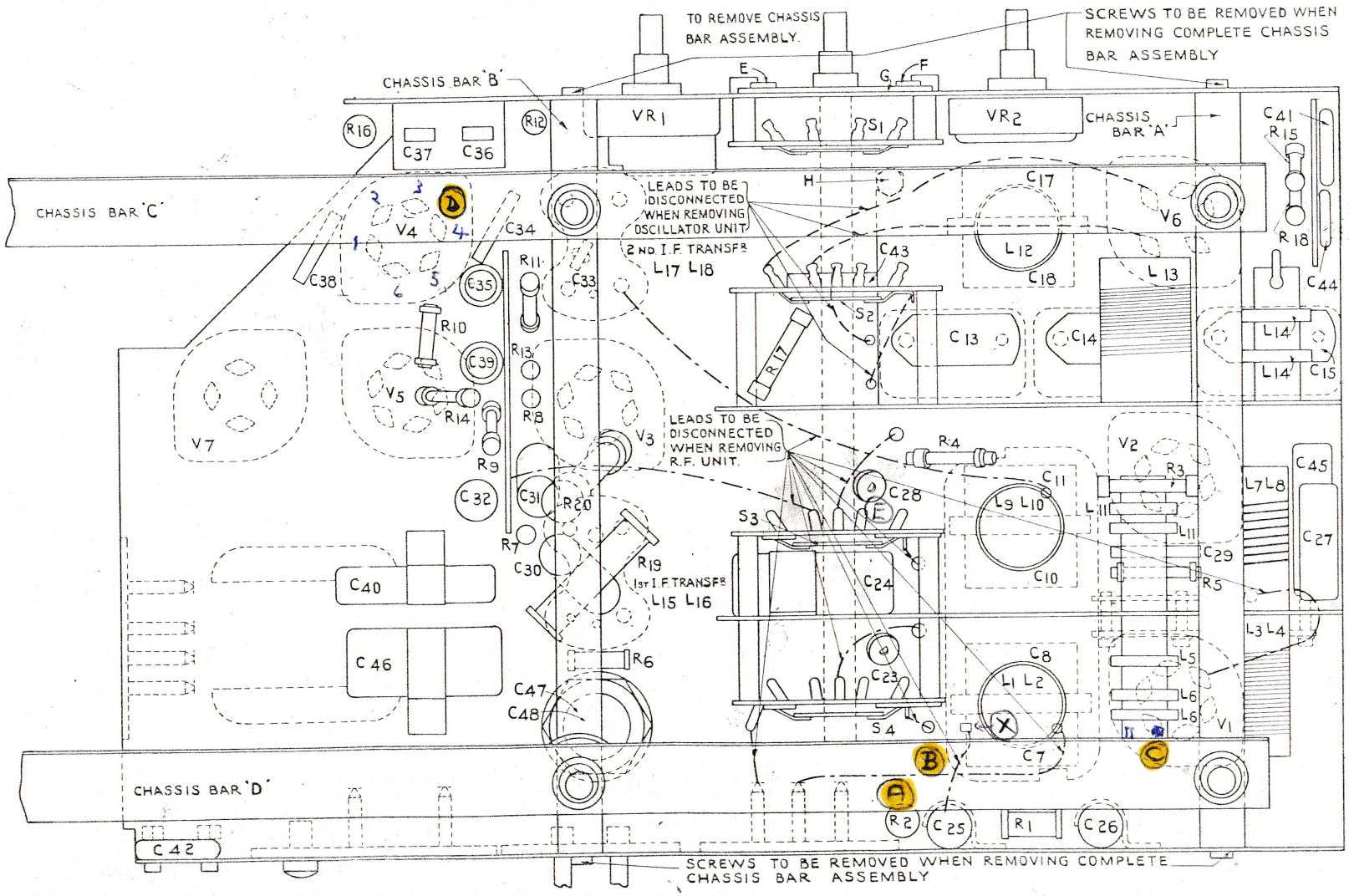


Fig. 5. View of underside of chassis.

MODIFIED

EKCO SW86 SN8962. Photo: James Davidson