

CONFIDENTIAL —



NVHR

SERVICE INFORMATION



Model SH.25
FOR A.C. & D.C. MAINS

*For the Information of Ekco
Registered Factors and Registered
Dealers ONLY*

NOT TO BE COPIED

or disclosed to any third party

GENERAL NOTES

THE CIRCUIT

The signal is first fed through a band-pass filter consisting of two tuned circuits, the frequency of which is controlled by two sections of the gang condenser. It is then fed to the grid of the first detector, which is negatively biased by a 4000 ohm resistance to act as an anode bend detector. A small pre-set condenser connected between aerial and first detector grid is provided to minimise second channel interference. Even after the wanted signal has been tuned by the input filter, a small signal from an unwanted powerful station may be present. An equal and opposite signal is fed to the grid by the pre-set condenser and cancels the small remaining signal, so that only the wanted signal reaches the grid. The oscillator valve is arranged to generate oscillations at a frequency of 110 Kilocycles above that of the required signal, when it appears at the anode of the first detector. The signal, when it appears at the anode of the first detector, has been mixed with the oscillator frequency to produce the intermediate frequency and rectified. It is then passed to the grid of the variable-mu intermediate valve through an intermediate coupling tuned to 110 Kilocycles. The volume control varies the bias of this valve and reduces the aerial input simultaneously. The signal is fed through another I.F. Transformer to the second detector which is operated as a leaky-grid detector. The anode circuit is provided with a high note filter, consisting of an iron cored choke and two .001 mfd condensers. The intervalve transformer is parallel-fed with a resistance of 50,000 ohms. The auxiliary grid of the pentode is fed direct from the main H.T. This gives a stronger high note response compensating for the high note loss sustained in the earlier stages of the receiver.

In addition to the foregoing the following devices are included :

- (a) **110 K.C. Rejector.** This constitutes an inductance shunted by a condenser to tune to 110 K.C. It is included in the aerial circuit and ~~rejects all signals in the neighbourhood of 110 K.C. (2700 metres)~~. Several commercial transmitters work on or about this wavelength and would otherwise break through the input filter and cause interference.
- (b) **Local Distant Switch.** This is an arrangement which shunts the I.F. filter primary with a 4,000 ohm resistance at will. In flattening the tuning and reducing the sensitivity of the receiver, it allows full reception of the side bands, thus providing superior quality reproduction of local transmissions.
- (c) **External Loud Speaker Sockets.** These provide a connection across the output transformer primary.
- (d) **Gramophone Pick-Up Sockets.** When these sockets are in use the switch is turned to the "Gram" position and the bias on the second detector valve is altered to provide correct working conditions.
- (e) **The Long Wave Pointer** is provided with an adjustment to facilitate calibration on the long wave band.
- (f) **Tone Control Switch.** This is arranged to switch a condenser of .01 mfd. capacity, from the junction of the whistle choke with the feed resistance, to earth thereby lowering the cut-off frequency of the filter.

IN NO CIRCUMSTANCES MUST ANY ATTEMPT BE MADE TO ALTER THE SETTINGS OF ANY PRE-SET CONDENSERS ON THIS RECEIVER, WITH THE SOLE EXCEPTION OF THE CONDENSER OF WHICH THE CONTROL KNOB CAN BE REACHED THROUGH THE SPECIALLY CUT HOLE IN THE METAL BASEBOARD.

INTERFERENCE WITH ANY OTHER CONDENSER WILL CAUSE THE RECEIVER TO LOSE ITS SENSITIVITY AND SELECTIVITY, AND IT WILL THEN HAVE TO BE REGANGED ON A SPECIAL OSCILLATOR.

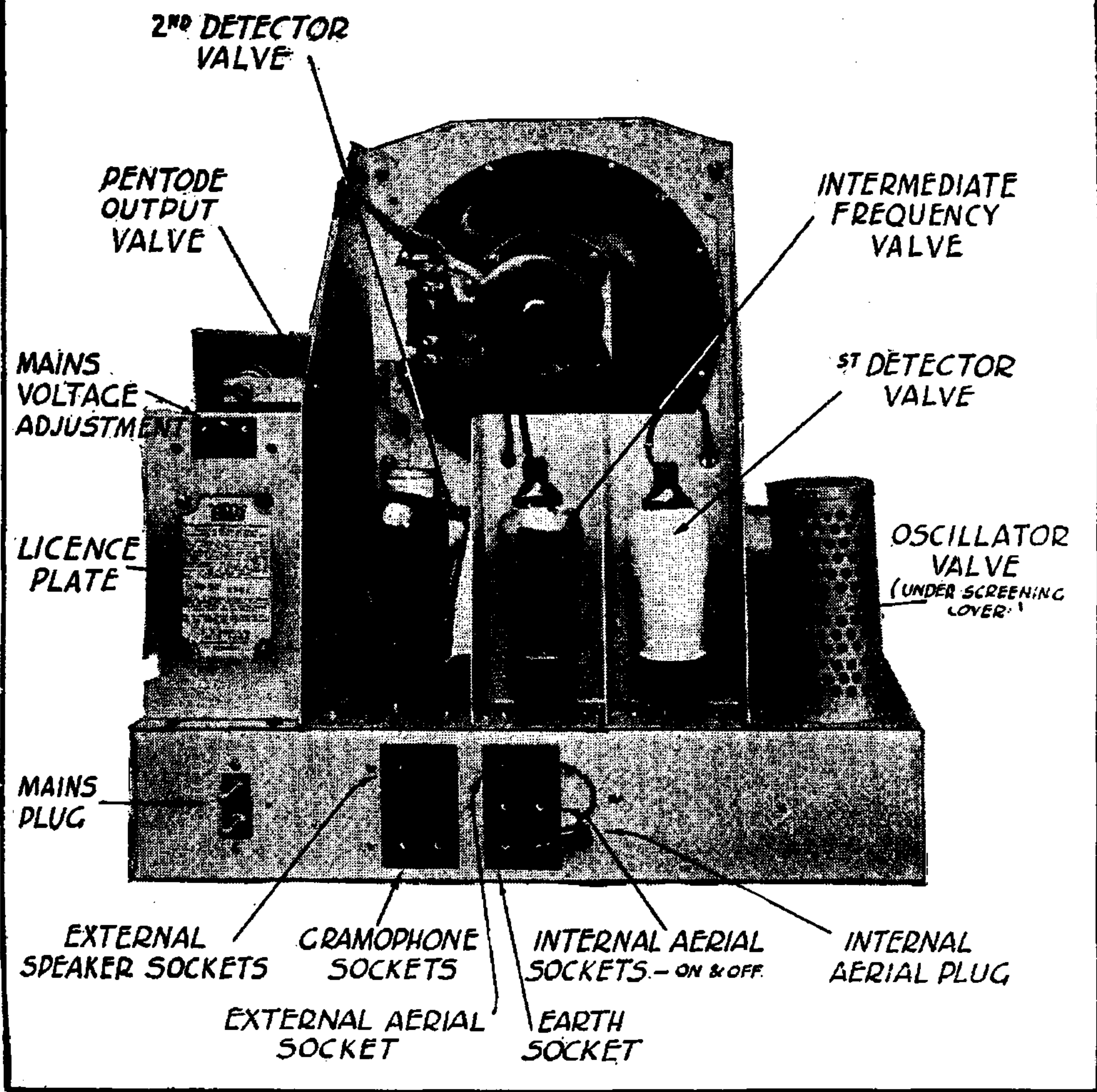
TO REMOVE RECEIVER FROM CABINET

Turn the receiver upon its side, when six cheese-head screws will be visible on the bottom of the cabinet, two each side, and two in front. These should be unscrewed (anti-clockwise), and removed.

Stand the receiver upright again and remove the back and knobs. Undo the hexagon nut holding the mains switch, and push switch back into chassis.

Undo the four dome headed bolts holding the metal grille in position, and remove grille. This will shew four countersunk bolts, which should be undone (anti-clockwise and removed). The cabinet may now be removed by standing in front of the receiver and pulling it towards you, as the chassis stands upon four rubber feet which lift it well clear of the bench.

Approved Valves for use in this Receiver (A.C. MODEL)

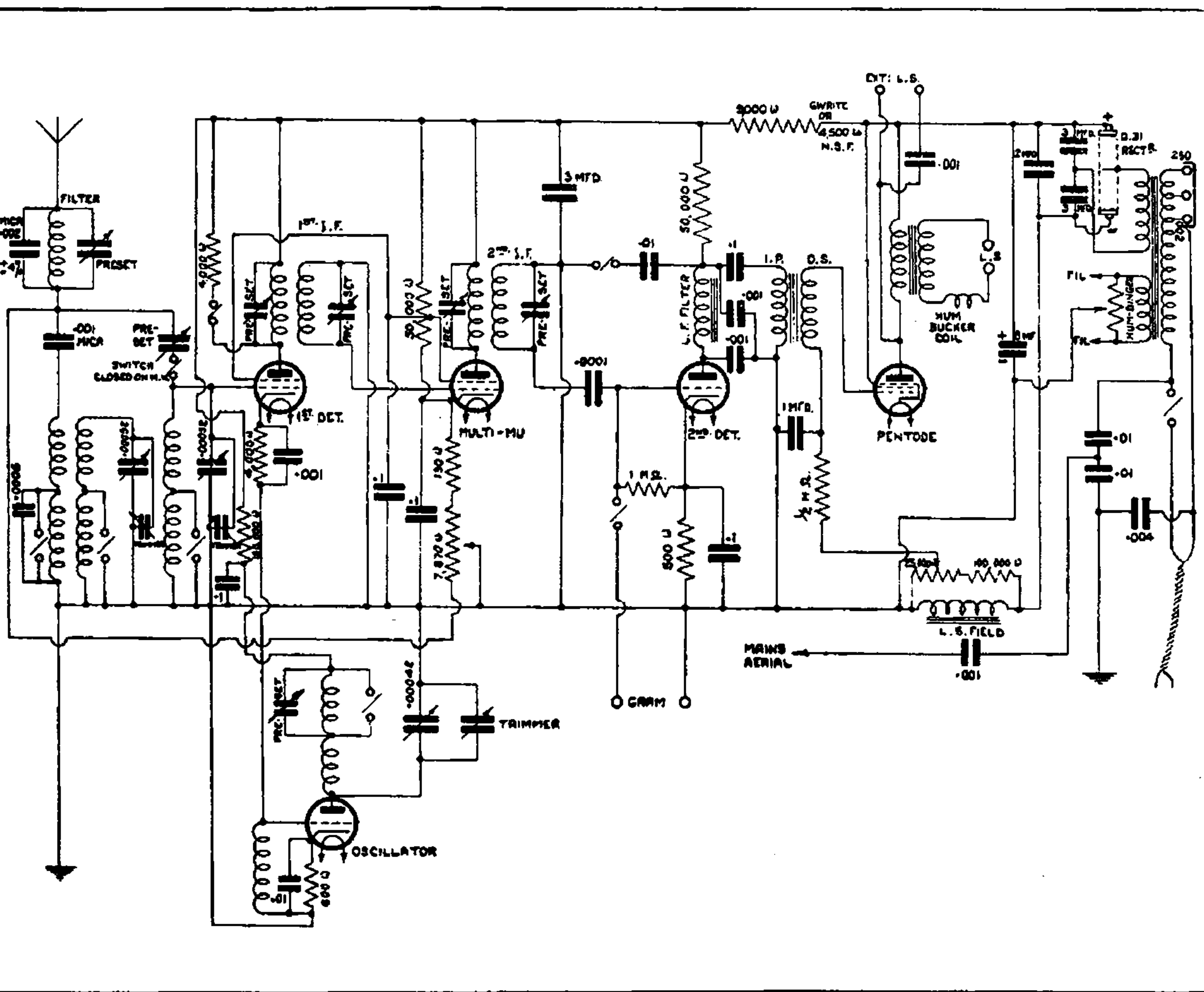


Chassis of the Ekco 5 valve Super Heterodyne Receiver for A.C. mains

1st Detector	...	Cossor MSG/LA
Oscillator	...	Mullard 354V
V.M.I.F.	...	Mullard VM4V or Cossor MVSG
2nd Detector	...	Ma ⁷ da AC/HL or Mullard 354V
Output	...	Mullard PM24M, Cossor PT41, Marconi PT4

S.H.25 AC RECEIVERS AVERAGE READINGS AND CONSTANTS

Volume Control	Total Resistance 7,200-8,800 ohms.
	Residual resistance at maximum setting : 98-162 ohms.
Switch Contacts	Resistance of switch contact at any point must not exceed 1 ohm.
Hum Control Resistance	51-69 ohms.
Loudspeaker Field	2375-2625 ohms approx.
110 K.C. Aerial Filter	9.5 ohms approx.
Band Pass Coils	
M.W. Primary	2 ohms approx
M.W. Secondaries	2.5-3 ohms approx.
L.W. Primary	9-10 ohms approx.
L.W. Secondaries	13-14 ohms approx.
Local-Distant Resistance	4,000 ohms
Gramophone Bias Resistance	475-525 ohms
Oscillator Cathode Resistance	
Rated 600 ohms	540-660 ohms
Whistle Choke	340 ohms approx.
Intervalve Transformer	
Primary	460 ohms approx.
Secondary	5,000 ohms approx.
Oscillator : Anode Coil	
M.W.	4.2 ohms approx.
L.W.	7.0 ohms approx.
Grid Coil	3.5 ohms approx.
Output Transformer Primary	
Magnavox	400 ohms approx.
Rola	700 ohms approx.
Intermediate Transformers	
Windings are identical	150 ohms approx.



Mains Consumption

Input 230v to 220/230 tap : 280 milliamps.

Constants checked with 230v supply to 220/230 mains Tap.

Total H.T. current, i.e. current through loudspeaker field 50 ma.

L.T. measured on pentode valve-holder : 4 volts.

Voltages checked with meter resistance—500,000 ohms.

Pentode auxiliary grid to chassis 265 volts.

Second detector 75 volts

Oscillator anode to cathode

 M.W. 25 volts.

 L.W. 35 volts.

Voltages measured from cathode of valve.

1st Det & I.F. anodes 200-240v
 screens 60v-80v

M.W. 1st Det. Bias 6v., I.F. bias 1v-30v (min.-max. vol. control).

Grid Bias

L.W. 1st Det. Bias 4v

Pentode :—15 volts.

2nd Limits take 16 volts, measured from low potential end of decoupling leak.

Gramophone— 2 volts

Oscillator : M.W. 2 volts

 L.W. 1.7 volts

PRICE LIST OF SPARES FOR MODEL SH.25.

COMPONENT	PART NO.	PRICE
CHOKES.		
Filter	CP2550	4/6
High Frequency		3/6
Low Frequency	CP2705	10/6
Whistle	CP2532	7/-
COILS.		
Band Pass Medium Wave	CP2588	5/6
Band Pass Long Wave	CP2587	5/6
I.F. 1st Stage	CP2545	5/6
I.F. 2nd. Stage	CP2546	5/6
Oscillator	CP2558	5/6
CONDENSERS.		
Block.		
AC Large	T8	14/-
DC Small	T8	8/-
AC or DC	B14B or T14B	10/6
Electrolytic.		
T.C.C.	P2073	12/6
Fixed.		
.0001 T.C.C.		9d.
.0002 "		9d.
.0003 "		9d.
.0005 "		9d.
.004 "		9d.
.1N.I. "		1/-
KNOBS.		
Per Set		5/-
LEADS.		
Mains		3/6
MOTORS.		
Gramophone RG25 AC		£2/10/-
PLUGS.		
Red or Black	CP1643	2d.
RESISTANCES.		
Mains DC	CP6288	7/6
1 Megohm New type	P2071	1/-
2 Megohm New type	—	1/-
600 ohm	—	1/-
2800 ohm Carbon with clip	—	9d.
50000 ohm Carbon SH25		
AC	—	1/-
25000 ohm Carbon or		
N.S.F. SH25 AC	—	9d.
250000 ohm Carbon SH25		
AC	—	1/-
100000 ohm Carbon SH25		1/-
4000 ohm N.S.F. SH25		9d.
50000 ohm Carbon SH25		9d.
1000 ohm Carbon SH25		9d.
Volume Control 8000 ohms		
SH.25	P2616	7/6d.
SPEAKERS.		
Complete AC		35/-
Complete DC		35/-
SWITCHES.		
Nickel or Oxy. Mains Snap	P1538	1/9d.
TRANSFORMERS.		
Intervalve	CP2531	10/6d.
Mains	CP2538	30/-

PRICES SHEWN ABOVE ARE SUBJECT TO 30% DISCOUNT TO EKCO REGISTERED
FACTORS AND DEALERS ONLY.

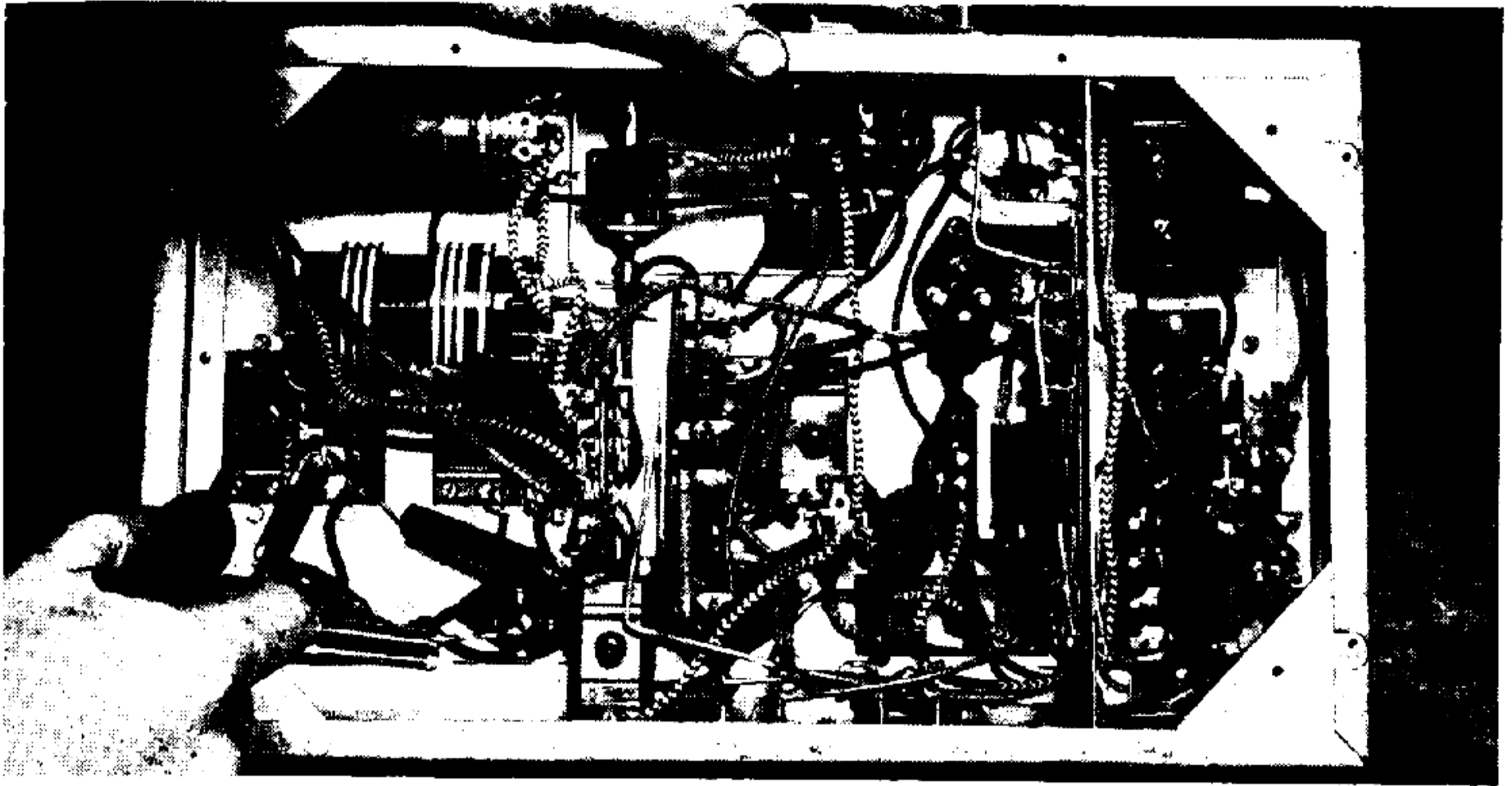


Fig. 28.—SETTING THE PRE-SET CONDENSER OF THE S.H.25 RECEIVER.
This photograph also shows the general appearance of the base.

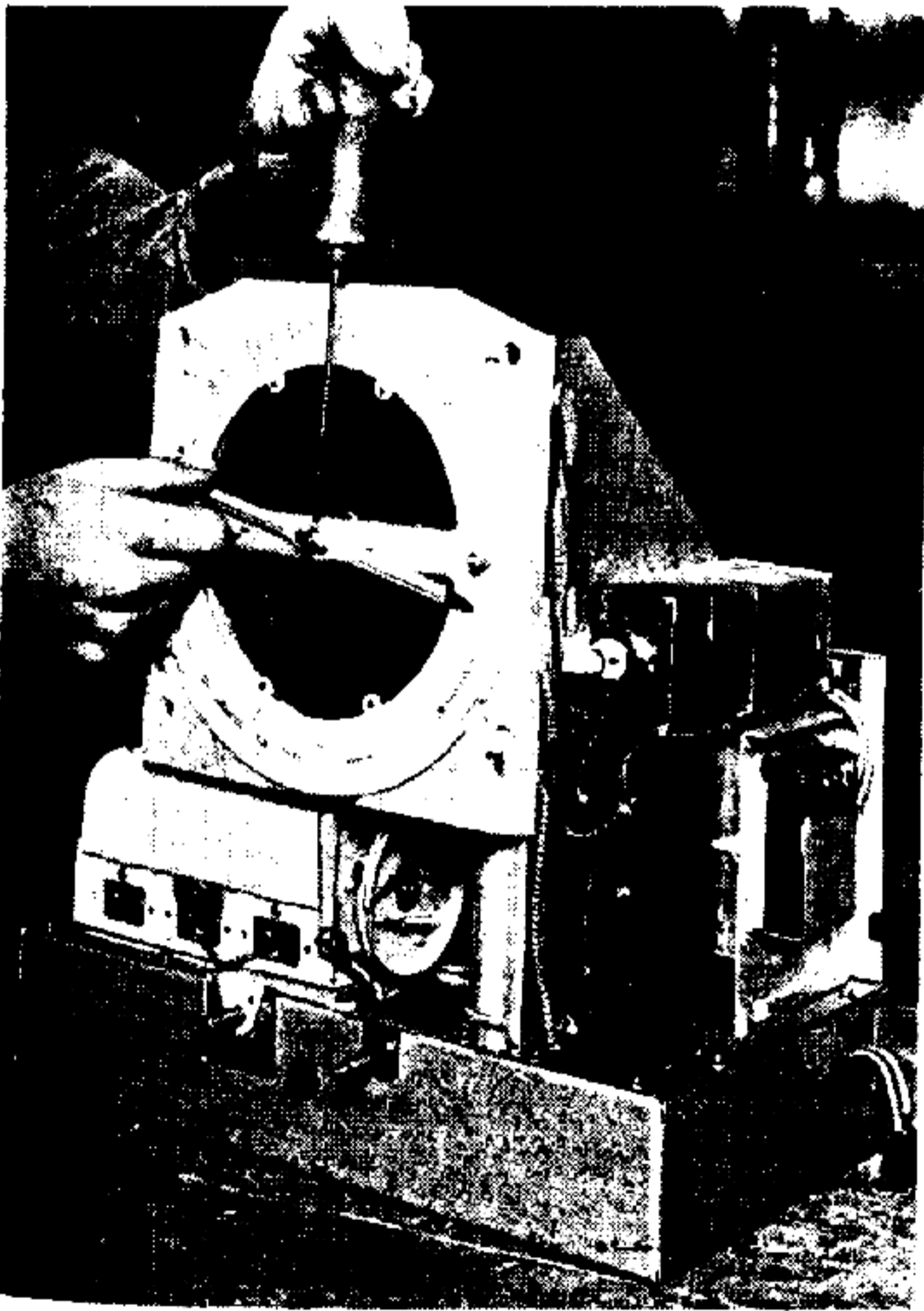


Fig. 29.—SHOWING THE METHOD OF TIGHTENING THE POINTER INDICATOR OF THE S.H.25 RECEIVER.

It will be seen that two screws are provided for this purpose. The pointer is held firm while these screws are tightened up.

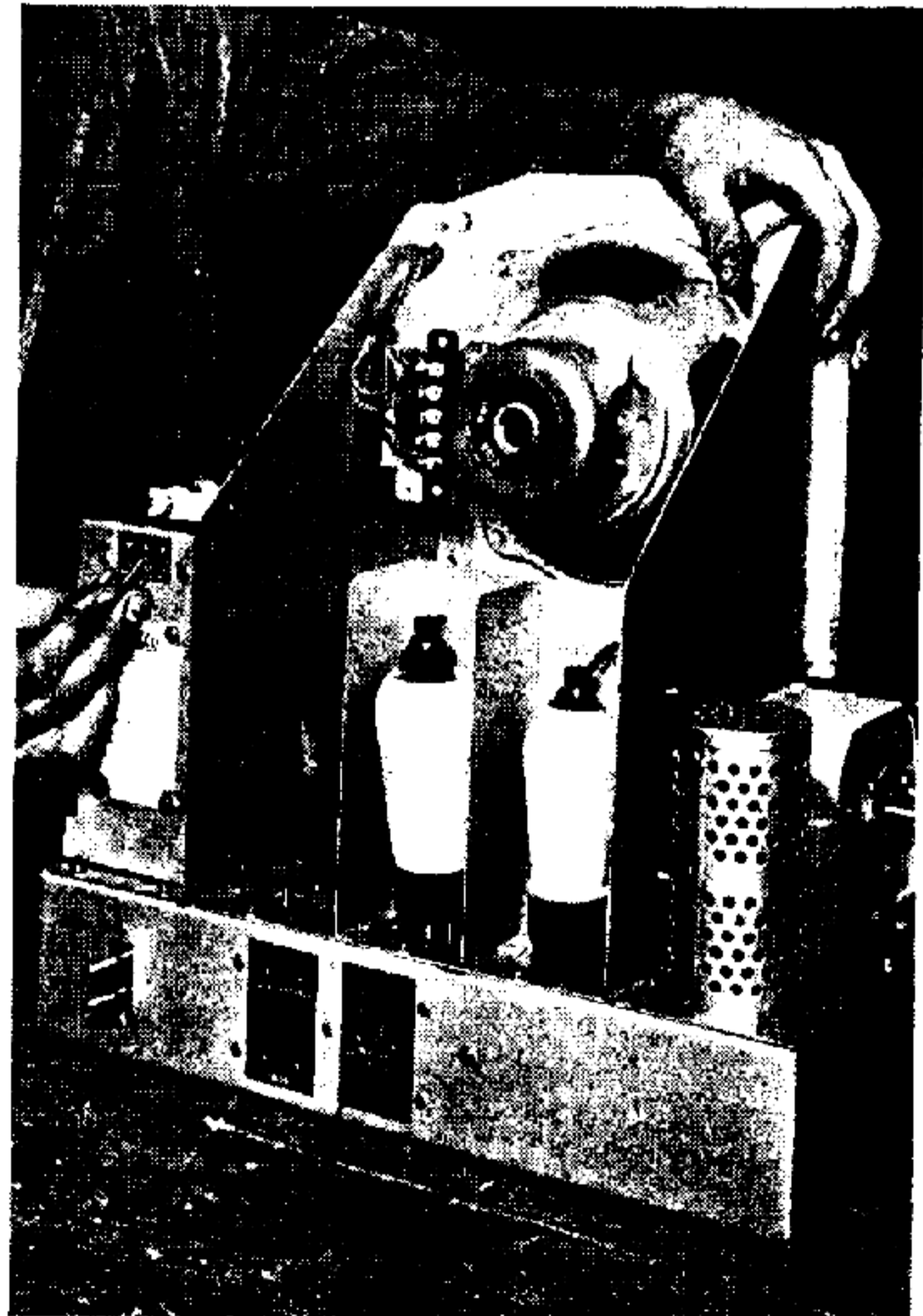
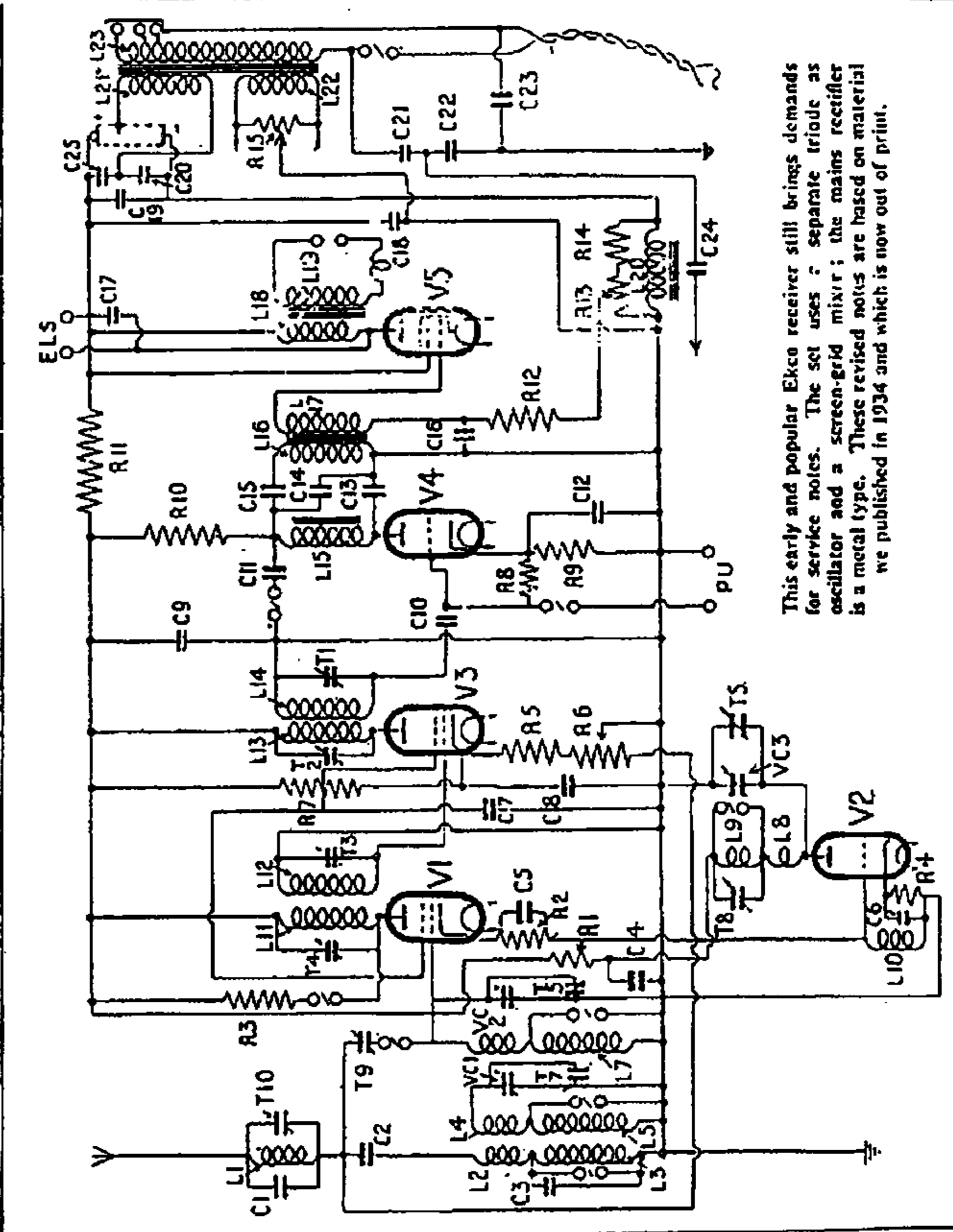


Fig. 30.—SETTING THE MAINS CONTACT SCREW TO UNIT SUPPLY VOLTAGE.

*This is the method employed in all Ekco receivers. Three variations in voltage are provided, *i.e.*, 200-210, 220-230, and 240-250, and the screw is inserted in whichever voltage is required.

EKCO SH25

Five-valve, plus metal rectifier, two-waveband superhet. Provision is made for the connection of a pick-up and a high impedance extra loud-speaker. For operation from AC mains 200-250 v, 40-100 cycles. Made by E. K. Cole, Ltd., Service Department, Southend-on-Sea.



This early and popular Ekco receiver still brings demands for service notes. The set uses a separate triode as oscillator and a screen-grid mixer; the mains rectifier is a metal type. These revised notes are based on material we published in 1934 and which is now out of print.

The aerial input is via a .1F filter and coupling condenser C2 to a band-pass coil assembly with aperiodic coupling coils L2, L3, L4 and L6 are the medium-wave coils tuned by VC1 and VC2 of the triple ganged condenser while L5 and L7 are the L-W coils.

An image suppressor trimming condenser T9 is brought into circuit on MW. The aerial signals are fed into the grid of the mixer valve V1, the cathode circuit of which is connected via the bias resistance R2 and the oscillator grid coil L10 to chassis.

The separate oscillator valve V2, has a tuned anode circuit L8 (MW), L9 (LW), tuned by VC3 section of the gang.

The IF output from V1 is transferred by the IF transformer L11, L12 to the grid of the IF amplifying valve V3. A local-distance switch connects the resist-

ance R3 across L11 to lower the efficiency of the circuit.

The cathode circuit of V3 comprises the standing bias resistance R5 and the variable resistance, which is also the volume control R6. This control varies the bias on V3 as well as providing a variable shunt across the aerial to earth circuit.

A second IF transformer L13, L14 hands on the signal to V4, a triode valve operating as a power grid detector. The pick-up circuit is in the grid circuit of this valve which is biased by R9.

The anode circuit of V4 incorporates a whistle filter L15, C14 and further top note reduction may be effected by switching in C11. C13 is the anode by-pass condenser while LF signals are coupled by R10 and C15 to the primary L16 of the intervalva transformer, the secondary winding of this transformer L17 hands on

the signal to the grid of the output pentode valve V5.

Bias for the grid of V5 is obtained from a resistance network comprising R14 and the tapped resistance R13, both of which are across the speaker field L2.

The output transformer L18, L19 couples V5 to the low impedance energised loud-speaker. Extra loudspeaker terminals are connected across L18 so that extra loud-speakers must incorporate their own high impedance matching transformers. A permanent degree of tone correction is effected by C17.

The HT supply circuit comprises a full-wave metal rectifier in a voltage doubler circuit with smoothing effected by C18, C19 and L20. The mains input is HF filtered by C21, C22 and C23, while C24 is for the use of the mains as an aerial.

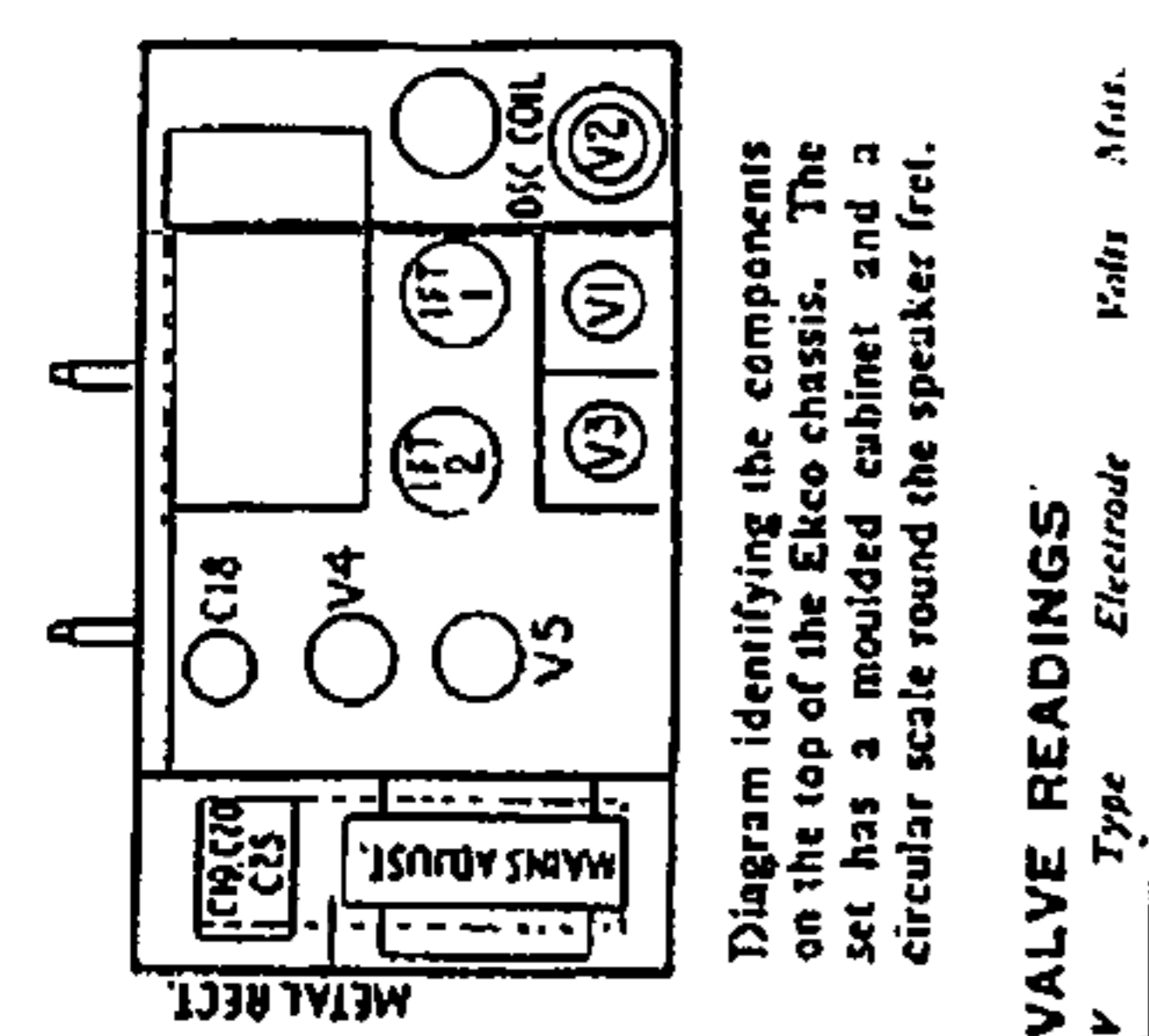


Diagram identifying the components on the top of the Ekco chassis. The set has a moulded cabinet and a circular scale round the speaker fret.

VALVE READINGS

V	Type	Electrode	Volts	Ampl.
1	MSG/LA	Anode	200	1.6
		Screen	85	
2	354V	Anode	35	1.25
3	MM4V	Anode	200	4.1
		Screen	85	
4	AC/HL	Anode	80	2.6
5	PH24M	Anode	226	2.1
		Screen	240	3

RESISTANCES

R	Ohms	R	Ohms
1	150,000	9	500
2	4,000	10	50,000
3	4,000	11	4,500 or 9,000
4	600	12	5 mks.
5	130	13	25,000
6	7,870	14	100,000
7	50,000	15	55
8	1 meg		

GANGING

IF Circuits.—Inject a 110-kc signal into the grid of V1 and trim T1, T2, T3 and T4 for maximum output.

MW Band.—Switch receiver to MW and adjust T5, T6 and T7 for maximum output on a 210-m signal.

LW Band.—Switch to LW and adjust T8 for maximum output on a 1,100-m signal.

Image Suppressor.—Tune in the undesired image on MW and adjust T9 for minimum output.

IF Filter.—Inject a signal of 110 kc into the aerial circuit and adjust T10 for minimum output.

CONDENSERS

C	Mfd	C	Mfd
1	.002	14	.031
2	.001	15	.1
3	.0005	16	.001
4	.1	17	.8
5	.001	18	.2
6	.01	19	.3
7	.1	20	.01
8	.1	21	.01
9	.0001	22	.004
10	.01	23	.001
11	.1	24	.3
12	.001	25	
13			

WINDINGS

L	Ohms	L	Ohms
1	9.5	13	150
2	—	14	150
3	—	15	340
4	2	16	460
5	9.5	17	5,000
6	2.5	18	Depends on type of speaker fitted.
7	13.5	19	
8	4.5	20	75
9	1.5	21	Very low
10	150	22	35
11	—	23	
12	—		