

**MODEL B53** is a four-valve battery-operated superheterodyne receiver covering four wavebands.

It is tuned manually and has four controls evenly spaced across the lower front of the cabinet. From left to right these are, Volume ON/OFF, Tone, Waveband switch, Tuning.

Located on the centre rear panel are sockets for the connection of a pick-up and an external loud-speaker, the lower pair for the pick-up, and the upper pair for the external speaker. Also on this panel is the internal speaker muting screw switch, S7.

**BATTERIES.** H.T. 136.5V. Ever Ready Portable 56 or Drydex H1142. L.T. 2V. Maximum size 5 ins. by 3½ ins., by 10 ins. high. No G.B. battery is needed as the receiver is self biased.

**CONSUMPTION.** H.T. approx. 10 m.a. L.T. 500 m.a.

**VALVES.** V1—TP25, Frequency changer. V2—VP23, I.F. Amplifier. V3—HL23DD, Demodulator, AVC. L.F. Amplifier. V4—QP25, Quiescent Push-pull L.F. Amplifier.

**WAVERANGES.** SW1 19 to 56 metres, 15.8 to 5.36 Mc/s. SW2 56 to 195 metres, 5.36 to 1.54 Mc/s. M.W. 195 to 565 metres, 1540 to 530 Kc/s. L.W. 800 to 2,000 metres, 375 to 150 Kc/s.

**INTERMEDIATE FREQUENCY.** 460 Kc/s.

**SPEECH COIL IMPEDANCE.** 2.6 ohms at 400 c.p.s. An external speaker, if used, should have a similar impedance. The type as fitted in the receiver, or an Ekco Type ES31, low impedance extension speaker are suitable.

**PICK-UP.** With the two stages of L.F. amplification, most types of pick-up will give satisfactory results. When using a pick-up, tune the receiver to a quiet spot on any waveband.

When reverting to radio, the pick-up leads must be removed from the sockets.

**CIRCUIT DETAILS.** Across the aerial and earth is a 460 Kc/s. filter, L1.C1, to prevent unwanted signals at or about the I.F. from

reaching 11. The aerial coupling coils L2, L4, L6, are individually selected by S1.

Separate aerial coils are used on SW1 and SW2 and a common coil on M.W. and L.W. On M.W., L6 is self tuned by its own and aerial capacities while on L.W. a shunt capacity is switched in by S1A and tunes L6 to the lower frequency range.

There are individual signal grid coils for each waveband, selected by S2 and tuned by the gang section C8. To align the coils, a trimmer is shunted across each one. The slider section of S2 short circuits the lower frequency coils when a higher frequency coil is being used.

The oscillator circuits are the conventional HF transformer type with separate coils for each waveband. Each pair of coils is selected by switches S3, S4, the anode coils being tuned by the gang section C22. A short circuiting slider is incorporated with S4 and operates similarly to that of S2.

SW1 coils, aerial and oscillator, are fitted with iron dust cores while the remainder are air cored.

Aerial and oscillator signals, both applied to V1, beat together and reproduce the signal at the intermediate frequency in the tuned anode circuit of V1.

The 1st I.F.T. tuned secondary couples this signal to V2 where it is amplified and transformer coupled—2nd I.F.T.—to the signal diode of V3 for demodulation.

The L.F. component develops audio voltages across the diode load (potentiometer R7, R8) and the required voltage level is taken off by C30 and applied via the volume control R9 to the triode grid of V3. From V3 anode, the amplified L.F. is condenser (C35) coupled to the anode tap of T1. The section of T1 between the two tapping points forms the primary winding and the whole winding (grid to grid), the secondary. This is simply an auto-transformer. The alternating L.F. signal voltage operates the twin pentodes of V4 in push-pull. The amplified output of V4 anodes is coupled by the push-pull output transformer to a permanent-magnet loud-speaker. Across V4 anodes is connected the tone control R16, C39.

Grid bias voltage for all four valves is developed in the H.T. return lead across R14, R15. Full bias voltage is applied via the centre tap of T1 to the control grids of V4. A lower bias voltage taken from the

junction of R14.R15 is applied via the AVC line to the control grids of V1 and V2, and via the volume control to V3 grid. It is also used as the delay voltage for the AVC diode of V3. AVC voltage is obtained by coupling a small percentage of the signal from V2 anode by C27 to the second diode of V3. The rectified output, in excess of the delay voltage, is developed across R11.R12, the required level being taken off at the resistor junction and fed to V1 and V2 control grids.

*NOTE. Alignment and calibration can be completed without removing the chassis from the cabinet. Lay the H.T. battery external to the set and remove battery shelf to allow easy access to all trimmers.*

**POINTER SETTING.** Fully mesh the gang then slide the cursor either way along the drive cord as necessary until the pointer coincides with the datum line terminating the right hand end of the scale.

**ALIGNMENT.** Switch to M.W. and fully mesh the gang. Connect output meter to the external L.S. sockets. Connect the signal generator earth to chassis.

Inject a modulated 460 Kc s. signal via a 0.1 mfd condenser to the top cap of V1.

Adjust the cores of L19.L20 then L9.L10, in that order for maximum output. Reduce the input as low as practicable (below AVC operating level) and again adjust all four I.F.T. cores.

Inject the 460 Kc/s. signal via a 200 pf condenser to the aerial socket, then adjust the core of L1 for minimum output.

**CALIBRATION.** Switch to SW1.

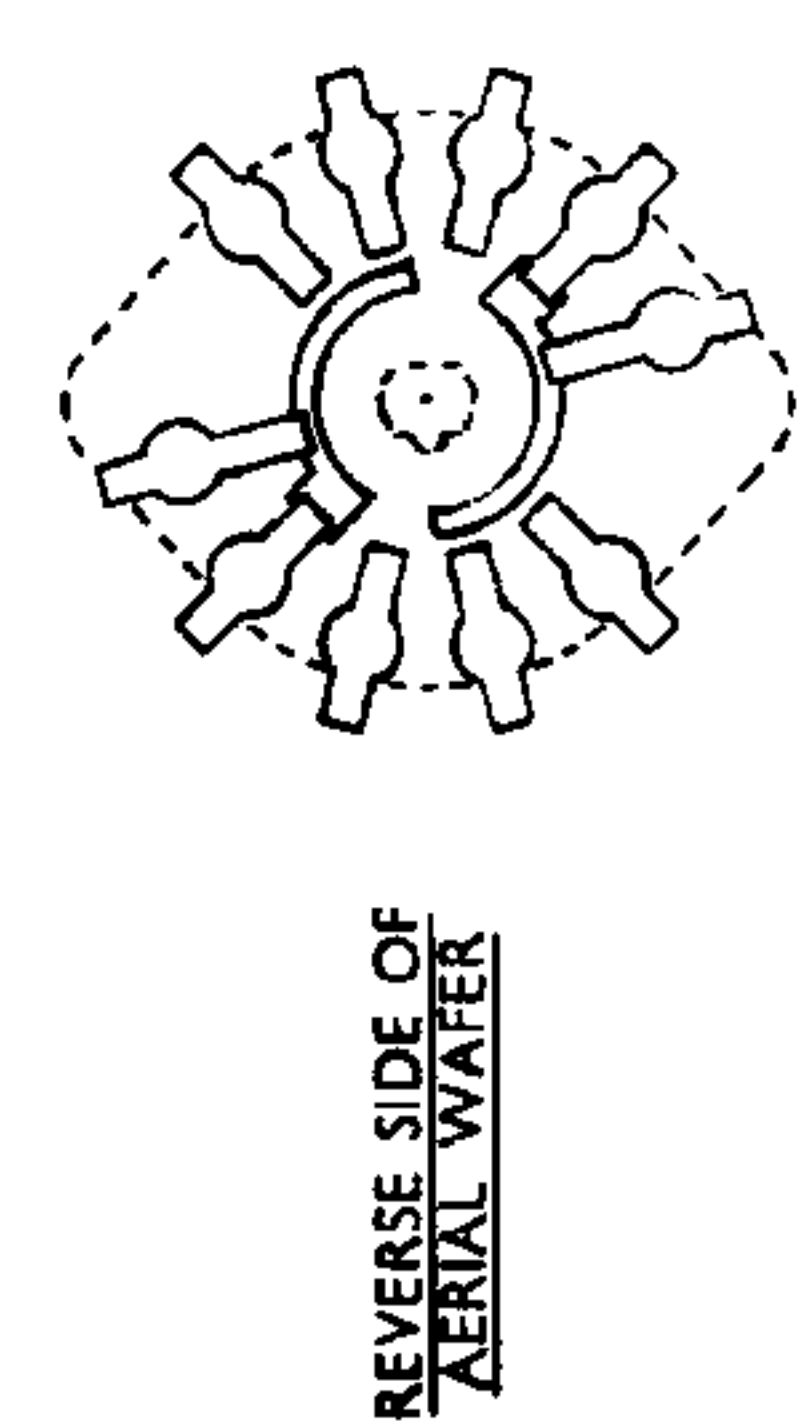
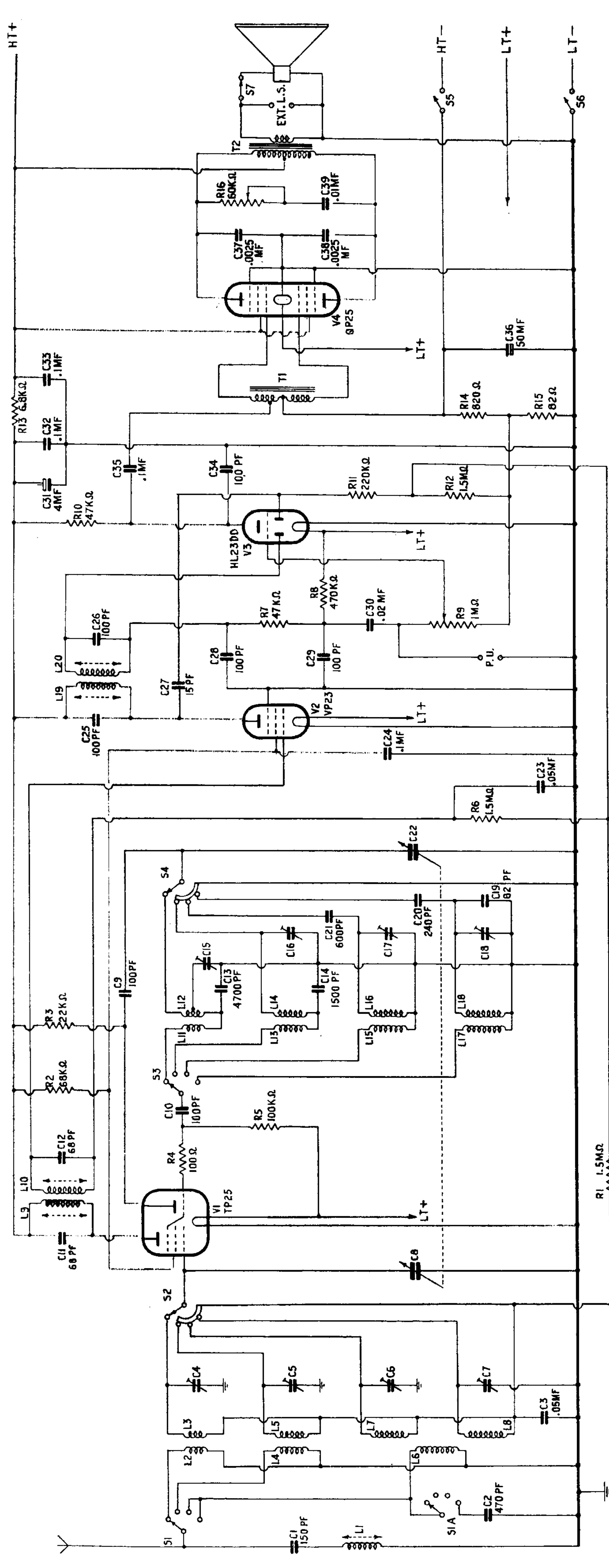
Tune to and inject 20 metres (15 Mc/s) signal to the aerial socket. Adjust C15 and C4 for maximum signal at the correct calibration point.

Tune to and inject 50 metres ( 6Mc/s) signal and adjust the cores of L11.L12 then L2.L3 for maximum output. Repeat both these adjustments until there is no further improvement.

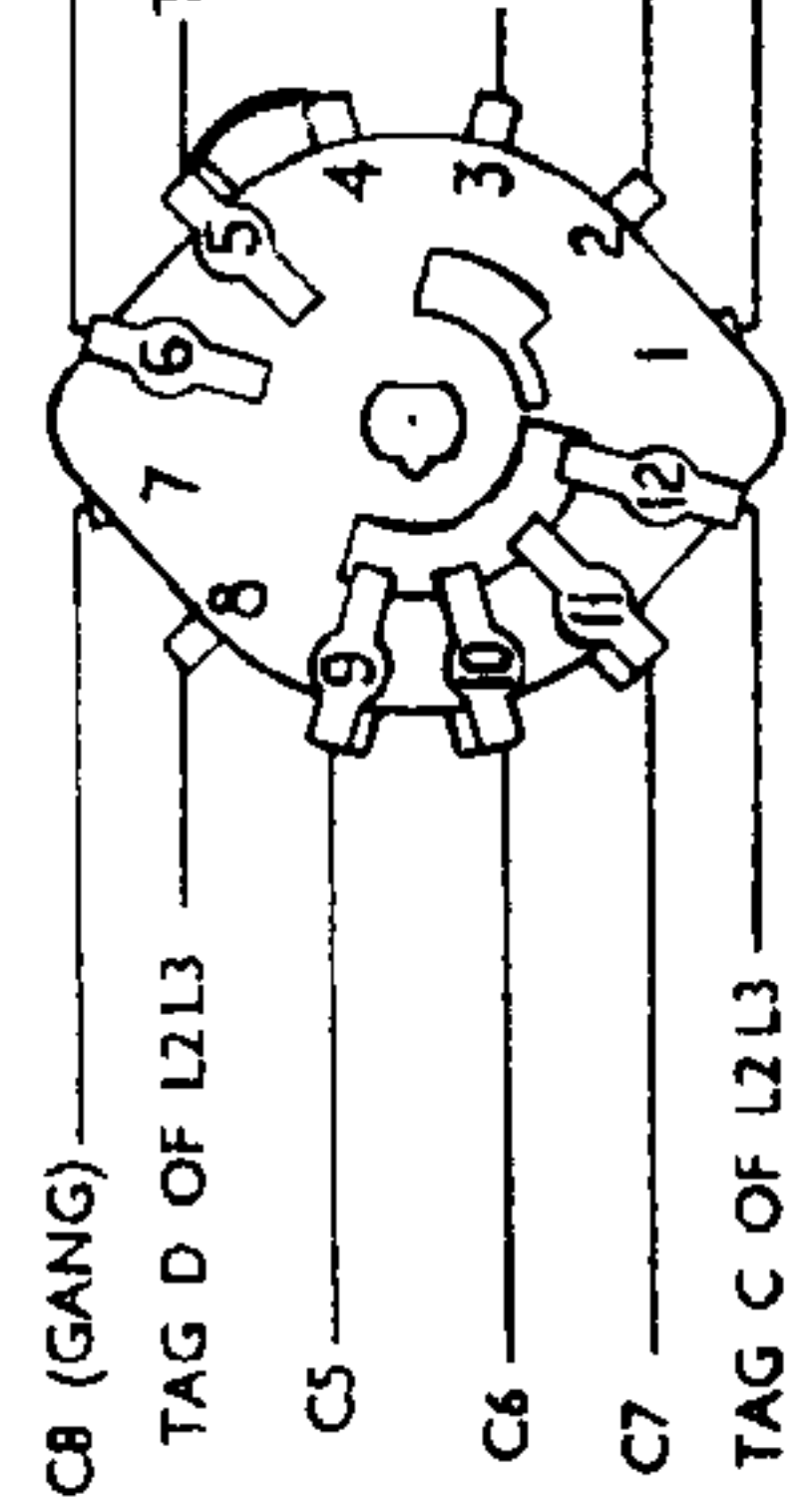
Switch to SW2.

Tune to and inject 60 metres (5 Mc/s) signal and adjust C16 for maximum output.

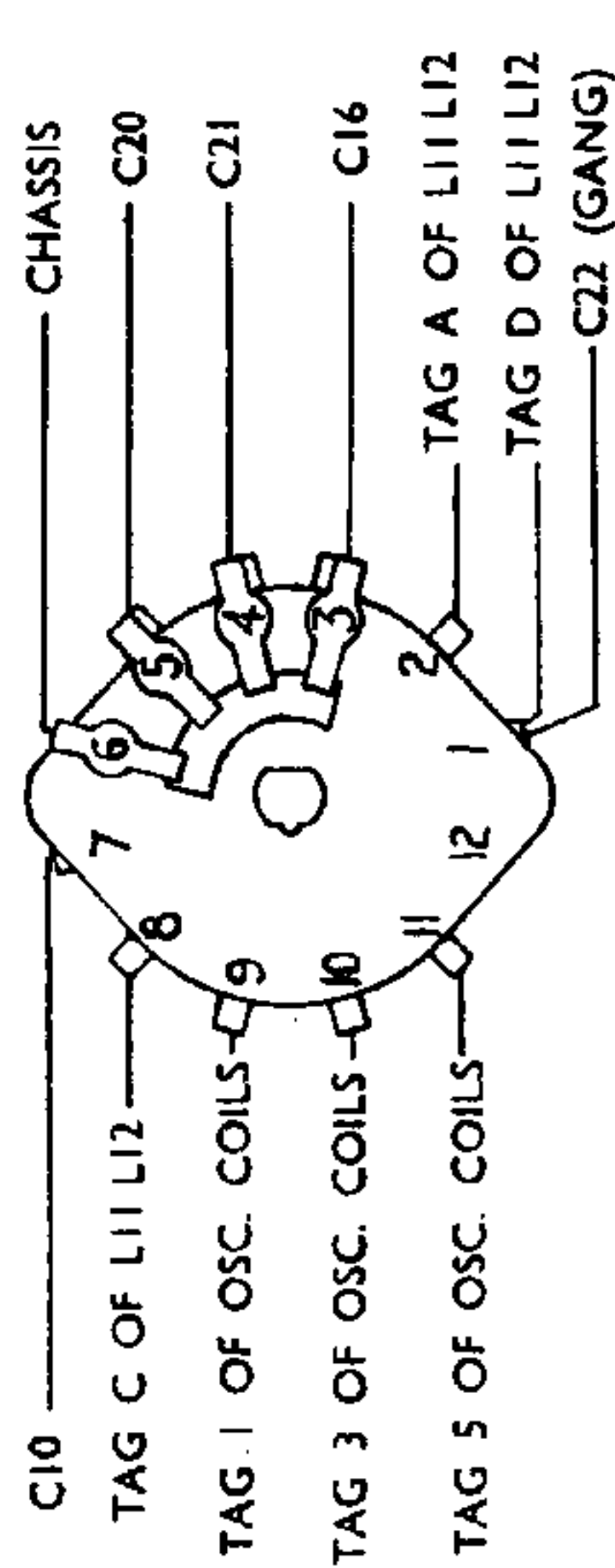
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REVERSE SIDE OF  
AERIAL WAFER

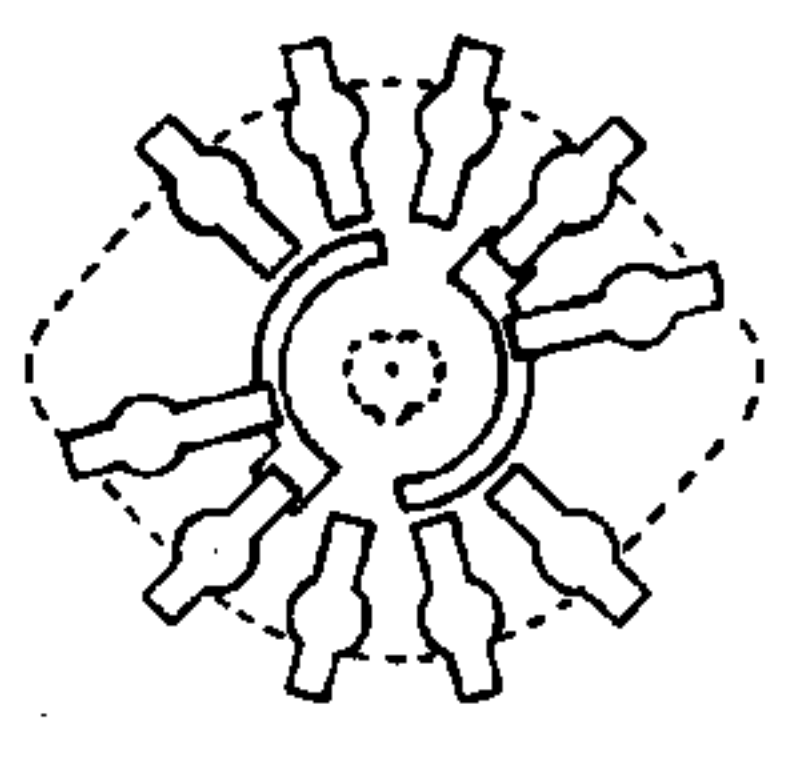


AERIAL WAFER S1, IA & 2



OSCILLATOR WAFER S3 & 4

REVERSE SIDE OF  
OSCILLATOR WAFER



W/C SWITCH DETAILS WAFERS VIEWED FROM THE REAR WITH CHASSIS INVERTED

- C8 (GANG) \_\_\_\_\_ C2 \_\_\_\_\_
- TAG D OF L2L3 \_\_\_\_\_ TAG 2 OF AER COILS \_\_\_\_\_
- C5 \_\_\_\_\_
- C6 \_\_\_\_\_ TAG 1 OF AER COILS \_\_\_\_\_
- C7 \_\_\_\_\_ TAG A OF L2L3 \_\_\_\_\_
- TAG C OF L2L3 \_\_\_\_\_ TAG A OF L1 \_\_\_\_\_

- C10 \_\_\_\_\_ CHASSIS \_\_\_\_\_
- TAG C OF L1L1L2 \_\_\_\_\_ C20 \_\_\_\_\_
- TAG 1 OF OSC. COILS \_\_\_\_\_ C21 \_\_\_\_\_
- TAG 3 OF OSC. COILS \_\_\_\_\_ C16 \_\_\_\_\_
- TAG 5 OF OSC. COILS \_\_\_\_\_ TAG A OF L1L1L2 \_\_\_\_\_
- TAG D OF L1L1L2 \_\_\_\_\_ TAG D OF L1L1L2 \_\_\_\_\_
- \_\_\_\_\_ C22 (GANG) \_\_\_\_\_

# CIRCUIT DIAGRAM



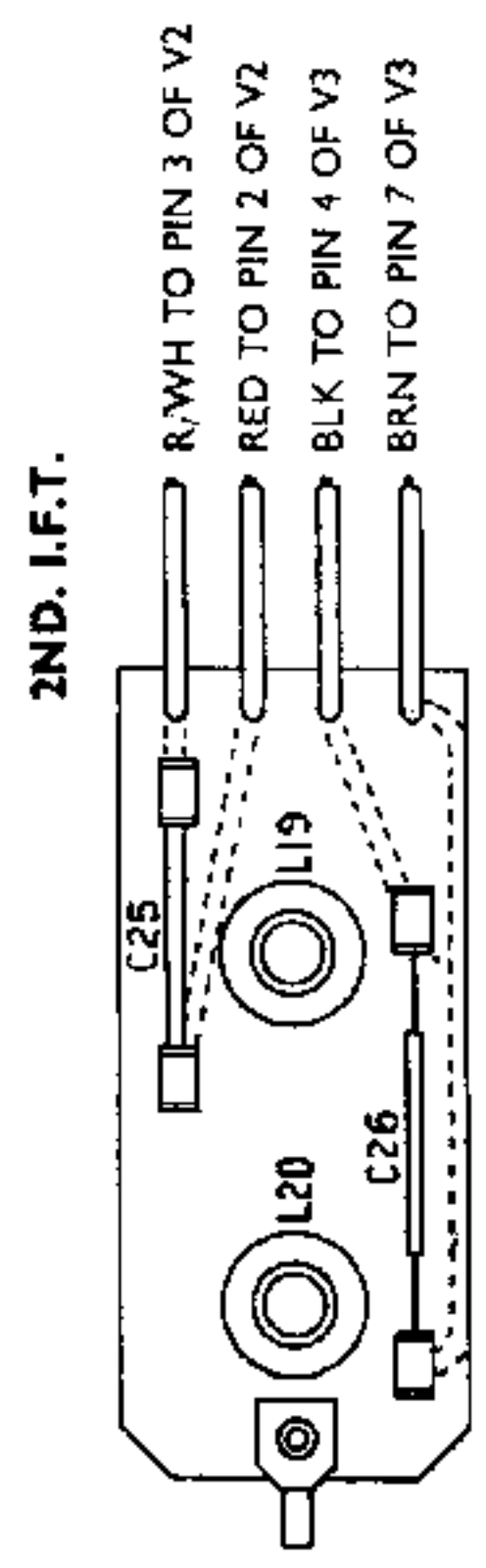
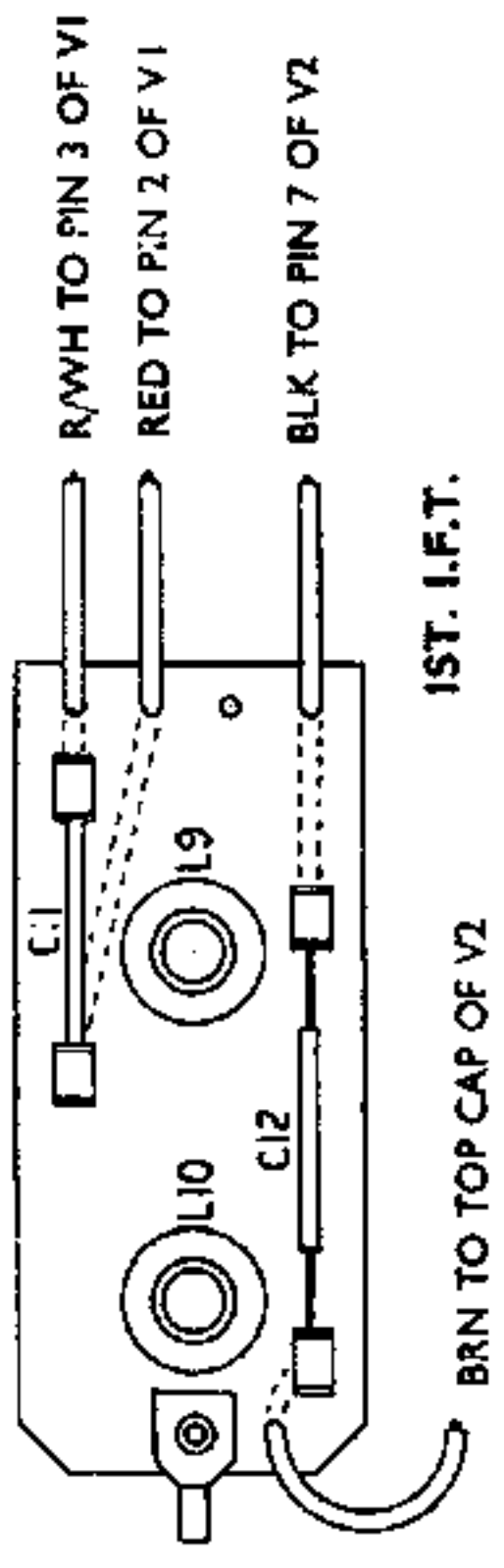
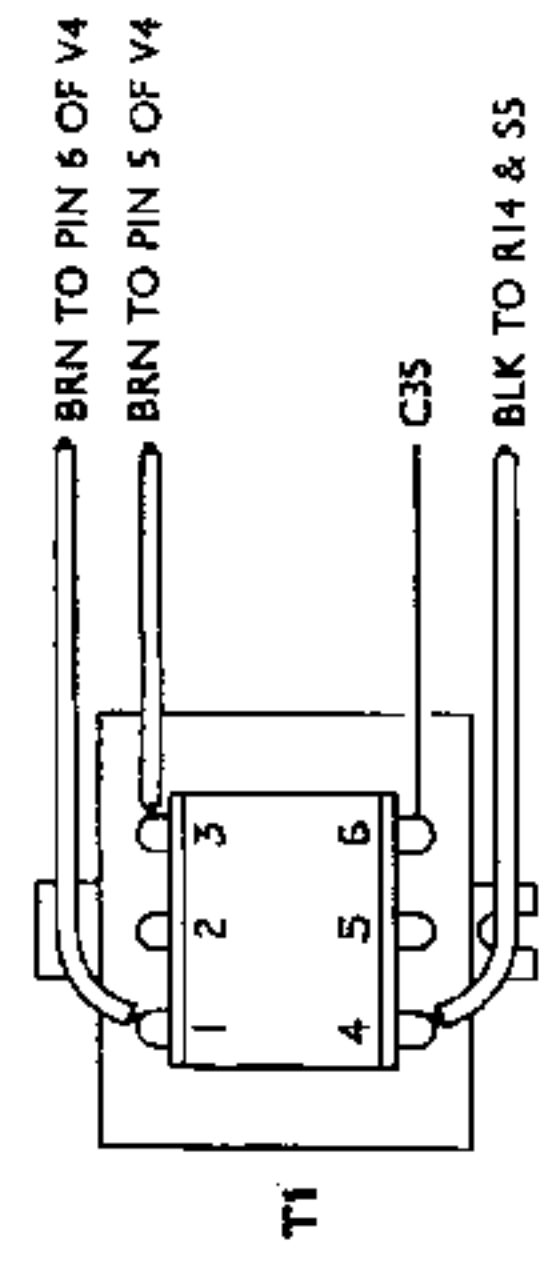
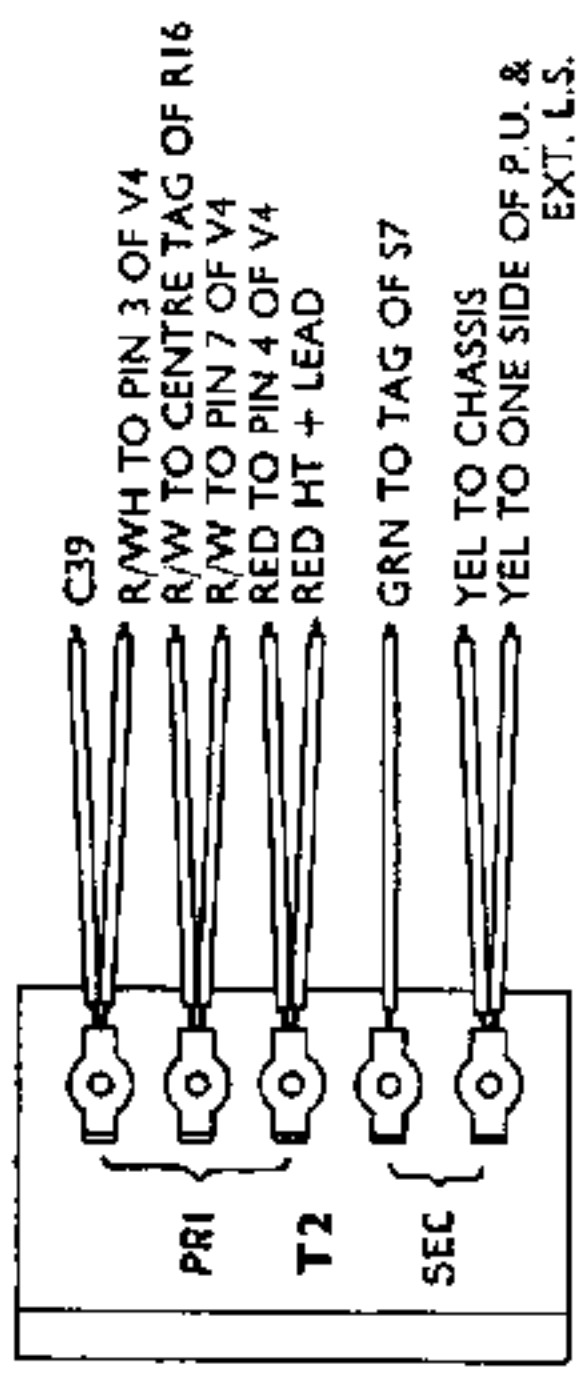
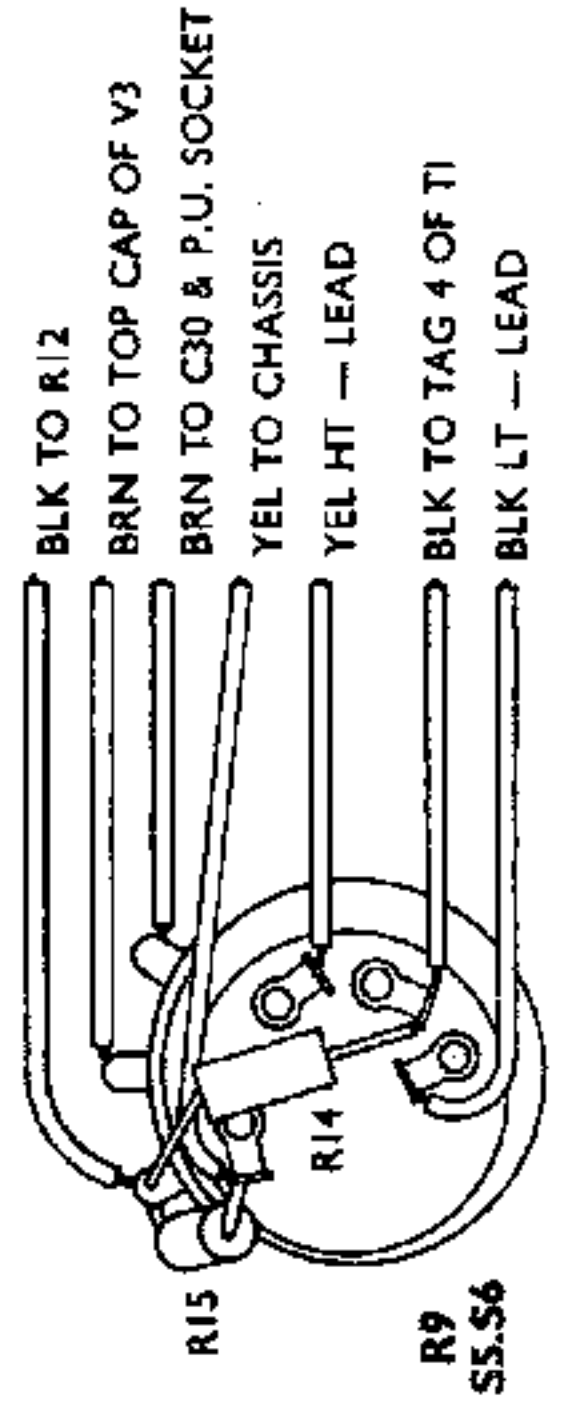


WINDING	OHMS
L1	8.5
L2	LESS THAN 1
L3	"
L4	"
L5	"
L6	30
L7	5
L8	32
L9	16
L10	16
L11	LESS THAN 1
L12	"
L13	"
L14	"
L15	2
L16	3
L17	4
L18	9.5
L19	13
L20	13
T1	650 + 310 + 1300
PR1	1300
T2 SEC	0.28

**VOLTAGE & CURRENT DATA (135V. H.T.)**

VALVE	ANODE		SCREEN	
	VOLTS	M.A.	VOLTS	M.A.
1	98	.3	40	.6
OSC	57	1.25		
2	98	.75	40	.25
3	67	.5		
4	125	2.5	126	1.2
	125	2.5		

VOLTS ACROSS R14 + R15 ——— 88V  
" " R15 ——— .8V



Tune to and inject 75 metres (4 Mc.s) and adjust C5 for maximum output.  
Switch to M.W.

Tune to and inject 200 metres (1,500 Kc.s) and adjust C17.  
Tune to and inject 231 metres (1,300 Kc.s) and adjust C6.  
Switch to L.W.

Tune to and inject 1,000 metres (300 Kc.s) and adjust C18 and C7.

**CHASSIS REMOVAL.** Remove the back cover. Disconnect and remove both batteries. Slide out battery shelves. Remove the four control knobs. Inside, remove the scale backing plate (a 4BA screw in each corner) then the 4BA screws securing the extreme ends of the cursor guide rail. Remove the four 2BA chassis fixing screws under the cabinet.

Draw chassis clear to the extent of the speaker leads. Re-assemble in reverse order.

**DRIVE CORD RENEWAL.** In the rare event of the steel wire section breaking, a new length with ready-made loop ends may be obtained under Part No. B.33563.

To renew the cord section, take a new length of approximately 36 inches and securely tie off one end to the wire loop. Pass the free wire loop through the left hand upper rim slot (gang fully meshed) in the drive wheel and hook on to the corresponding lug. See diagram. Lay in the wire and cord as shown, and finish up by passing the cord end through the right-hand rim slot, pulling the cord reasonably taut. Hook on the spring to the second lug on the drive wheel and pass the cord through the free loop of the spring.

Pull the cord end until the spring expands half an inch and tie off at this point. To facilitate the tie off, hold the cord and spring together with a pair of tweezers or similar and release the lug end of the spring, then tie off, taking care that the correct point is maintained. Hook on the spring. The cursor is then fitted to the cord, see diagram, and adjusted to the scale datum line.

**INTERVALVE TRANSFORMER, T1.** A small number of these items have been released with the internal (and therefore external) tapping connections to tags 4 and 6 reversed. Such transformers are coded with a red spot. It is pointed out that when replacing such transformers, the replacement must be wired according to the data given in this manual and not as the component just removed. To correctly position T1, one foot is slotted, and should be positioned as shown in the chassis diagram.

**SERVICE DEPT., E. K. COLE Ltd.,**  
Somerton Works, Arterial Road,  
Southend-on-Sea  
'Phone: Southend 2296  
Head Office: Ekco Works, Southend-on-Sea

**SCOTTISH SERVICE DEPOT:**  
Ekco Works, Duchess Road,  
Rutherglen, Lanarkshire  
'Phone: Rutherglen 2240/3

**NORTHERN SERVICE DEPOT:**  
55, Whitworth Street,  
Manchester  
'Phone: Central 6711/2

**WESTERN SERVICE DEPOT:**  
14, Redcross Street,  
Bristol  
'Phone: Bristol 26311