

MODEL TRG229 is a 5 valve (including rectifier) table radiogram, designed for reception on the L.W., M.W. and S.W. bands in three ranges and incorporating a 5 position switched tone control. The three speed automatic record changer and radio chassis operate from the A.C. supply only.

MAINS SUPPLY. 200-250 volts at 50 c.p.s. A.C.

MAINS CONSUMPTION

Radio, 180 mA at 230 volts input (41 watts).
Gram. 280 mA at 230 volts input.

CONTROLS. Front of the cabinet: 'TONE CONTROL/R-GRAM' switch (left), 'WAVEBAND SELECTOR' (centre), and 'TUNING' (right). On side of the cabinet: 'VOLUME/ON-OFF'.

PILOT LAMPS. 6.5 volts 0.3 amps. M.E.S.

VALVES.

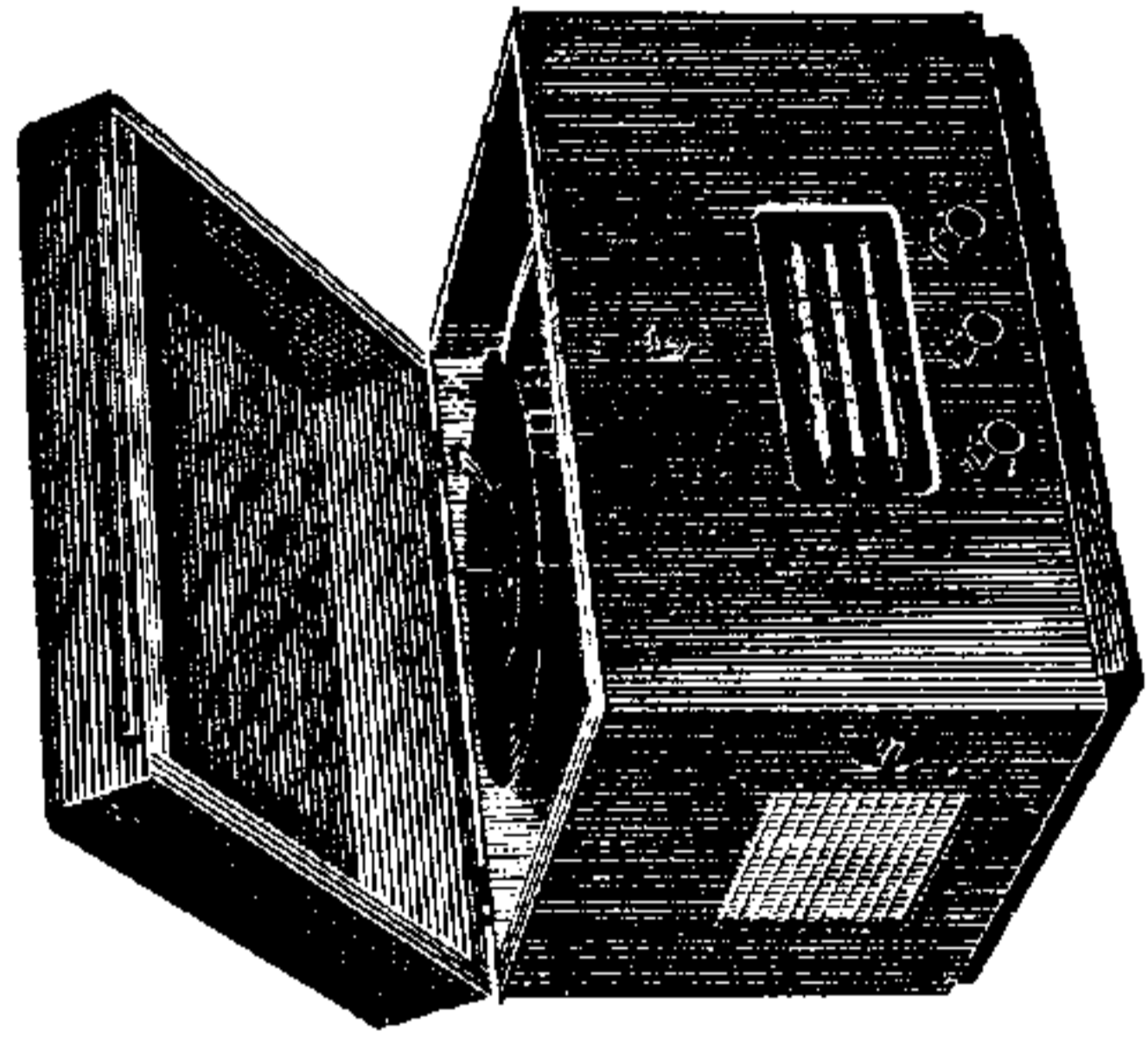
V1	ECH42	Frequency Changer
V2	EF41	I.F. Amplifier
V3	EBF80	Det., A.V.C. and A.F. Amplifier
V4	EL41	Output
V5	EZ40	H.T. Rectifier

All bases except V3 are B8A; V3 uses a type B9A.

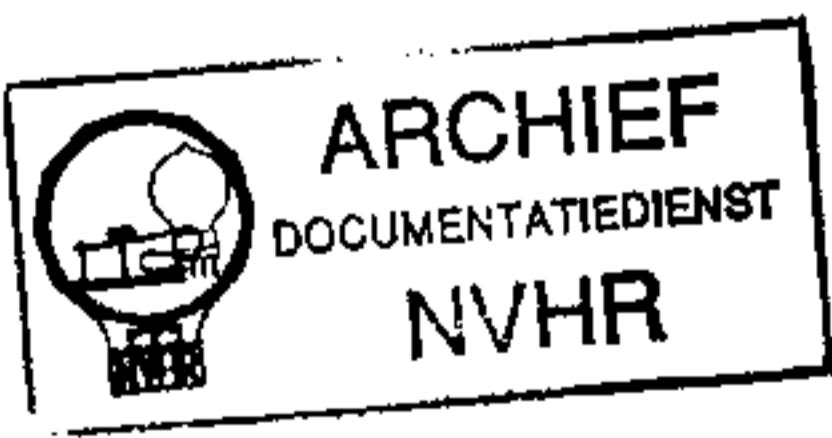
WAVEBANDS

Long	1,000-2,000 metres	300-150 Kc/s.
Medium	190- 570 metres	1,580-526 Kc/s.
Short	16- 52 metres	18.75-5.77 Mc/s.

INTERMEDIATE FREQUENCY. 465 Kc/s.



Ned. Ver. v. Historie v/d Radio



groove is outside the limit and if it is desired to use these, they must always be played singly.
For operation and maintenance of the player see maker's instructions in a booklet supplied with the instrument.

PICK-UP. A light-weight turnover type crystal pick-up is provided with the record player. The pick-up head incorporates two permanent sapphire tipped styli and by means of a simple lever movement either stylus can be selected for long play or standard recordings.

REPLACEMENT OF STYLI. Should it become necessary to replace a stylus, it can be removed from the pick-up head simply by applying gentle leverage under the shank of the stylus with a pair of tweezers, or similar tool.

All styli are painted according to their function, i.e. red for 33-45 r.p.m. and green for 78 r.p.m.
After replacement always ensure that the two small claws, located at the head of the stylus, fit over the insulated transmission piece of the pick-up head.

CIRCUIT DETAILS.

FREQUENCY CHANGER AND I.F. STAGES. Signals from the aerial input are fed via a coupling capacitor C2 to the Short, Medium and Long wave series input circuits, each secondary of which is shunted by a trimmer and selected by the switch SW1 for connection across the aerial tuning capacitor C9.

L1.C1 form an effective I.F. trap against unwanted signals close to the receiver's intermediate frequency.

Signals are then fed via a coupling capacitor C10 to the grid of a triode-hexode frequency changer stage.

The oscillator section contains three individual tuned H.F. transformers covering the Short, Medium and Long wavebands. The grid coils of each transformer are selected by a switch SW2 which connects the appropriate coil to the triode section of V1. H.T. to

(Continued on page 3)

LOUD-SPEAKER IMPEDANCE. 3 ohms at 400 c.p.s.

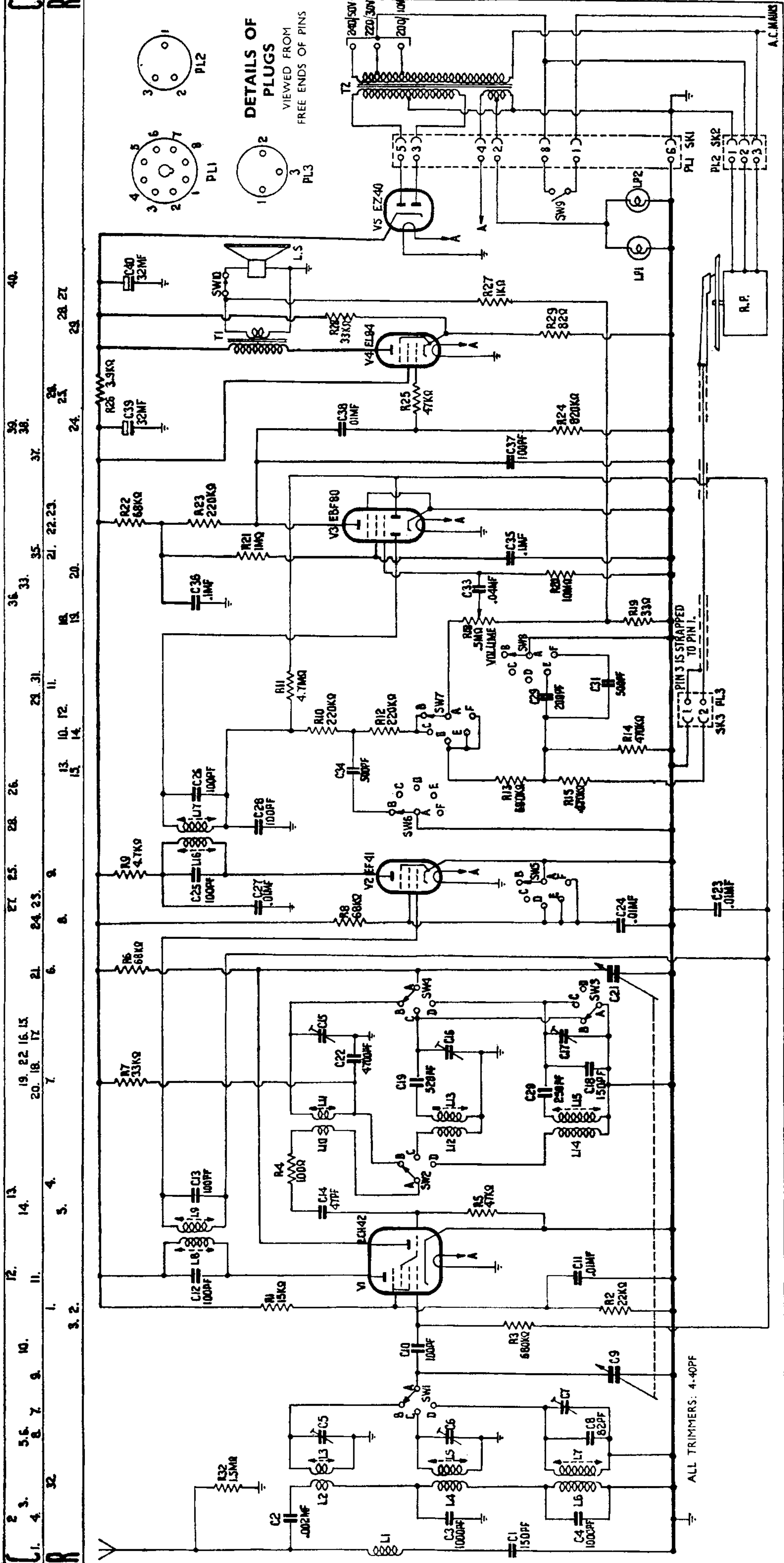
A high grade 6 in. diameter moving coil speaker, giving a wide frequency response, is fitted.

OUTPUT. 3.0 watts.

RECORD CHANGER. A Garrard model RC110 is fitted, and it may be found that some records, not made to latest standards, will not carry the pick-up near enough to the centre spindle to operate the trip mechanism.

The changer mechanism is designed to operate when the pick-up stylus reaches a radius of 2 3/4 in. ± 1/8 in. and all modern record pressings have a run-off groove well within this radius.

There are, however, records still obtainable, on which the run-off



1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40.



ALL TRIMMERS: 4-40PF

CIRCUIT DIAGRAM

Kc/s. Adjust C16 and C6 at 1,400 Kc/s. Repeat as necessary. Switch to L.W. Adjust L15 core then L7 core at 160 Kc/s. and finally C17, C7 at 280 Kc/s. Repeat as necessary.

CHASSIS REMOVAL. Remove the back cover screws and withdraw the cover sufficiently to give access to the aerial, earth and Ext. L.S. leads, which should then be disconnected. Disconnect the mains transformer plug PL1 and gram plug PL2. Remove the control knobs.

Release the nut holding the Volume control to its bracket. Remove the four screws which hold the chassis to the cabinet base. Withdraw the chassis so that control spindles clear the front of the cabinet. Finally, the chassis should be turned at an angle and removed, end first.

NOTE. When testing, ensure that the case of the volume control is earthed externally to chassis, or hum will result.

GRAM REMOVAL. The gram unit is mounted by three screws fitted into hexagonal spring mounted spacers. When removing or replacing the screws it may be necessary to hold the spacer. Details of the dimensions of a spanner suitable for this purpose are shown in the accompanying diagrams.

DRIVE CORD REPLACEMENT. Before fitting new cord, it should be stretched for about 24 hours to prevent slack drive developing after a period of use.

CURSOR SETTING. With the tuning capacitors fully closed, the pointer should coincide with the small datum marks at the end of the scales. To adjust, slide the cursor along the cord as necessary.

latter provides auto bias. Feedback is obtained from the secondary of the output transformer T1 and fed to the grid circuit of V3 via R27,19,18 and C33.

POWER SUPPLIES. The mains transformer is located on the base of the cabinet, the primary switching and secondary connections being made via a plug and socket connection (PL1-SK1). The A.C. input is applied to the primary of the transformer and is adjustable by means of three tapping positions, which should be set to the local supply voltage at the time of installation.

Heater volts are supplied from a separate winding on T2 and pass to the parallel connected heaters of V1 to V5 and the two indicator lamps LPI.LP2.

H.T. is obtained from a full wave rectifier V5, the D.C. output being smoothed by C40, R26 and C39.

ALIGNMENT.

I.F. Switch to M.W. and fully mesh the tuning capacitors. Set the 'TONE' switch fully anti-clockwise and the 'VOLUME' control fully clockwise. Connect an output meter to the EXT. L.S. sockets leaving SW10 closed.

Inject a modulated 465 Kc/s. signal via a 0.1 mfd capacitor to pin 6 of V1, and adjust the I.F.T. cores for maximum output in the following order. 2nd I.F.T. upper and lower, then 1st I.F.T. upper and lower.

Inject the signal to the A.E. sockets, then adjust the I.F. filter core (L1) for minimum output, selecting the dip with the core mostly out.

R.F. Inputs to A.E. socket via a standard dummy aerial. Adjust in all cases for maximum output, consistent with calibration. Switch to S.W. Adjust L11 core then L3 core at 6 Mc/s., followed by C15 and C5 at 18 Mc/s. Repeat until satisfactory.

Switch to M.W. Adjust L13 core at 550 Kc/s. and L5 core at 650

the triode anode is shunt fed via R6 on L.W. and M.W., and series fed via R7 on the S.W. band.

Anode coils of the three transformers are selected by SW4 and connected across the oscillator tuning capacitor C21. SW3 ensures that the band lower to the one selected is in effect 'short circuited', thus rendering it inoperative and preventing absorption.

The oscillator signal combines with the incoming signal to form an intermediate frequency at the mixer anode which is subsequently fed via the 1st I.F. transformer L8,9 to the grid of V2 for amplification.

SW5 functions only on gram., positions D, E and F, connecting the screen of V2 down to chassis (earth) to render the stage inoperative, thereby preventing possible radio break-through whilst on gram. operation.

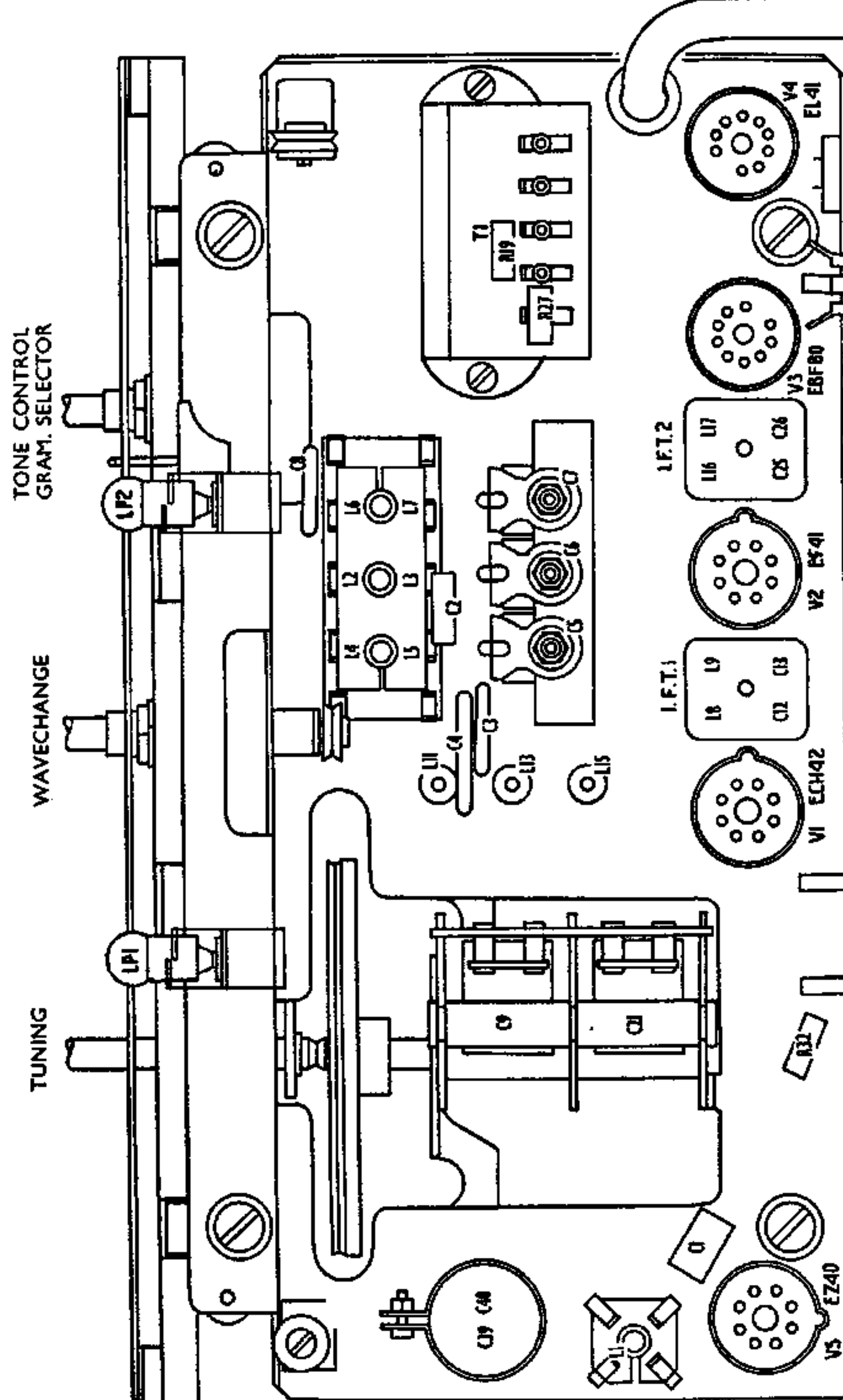
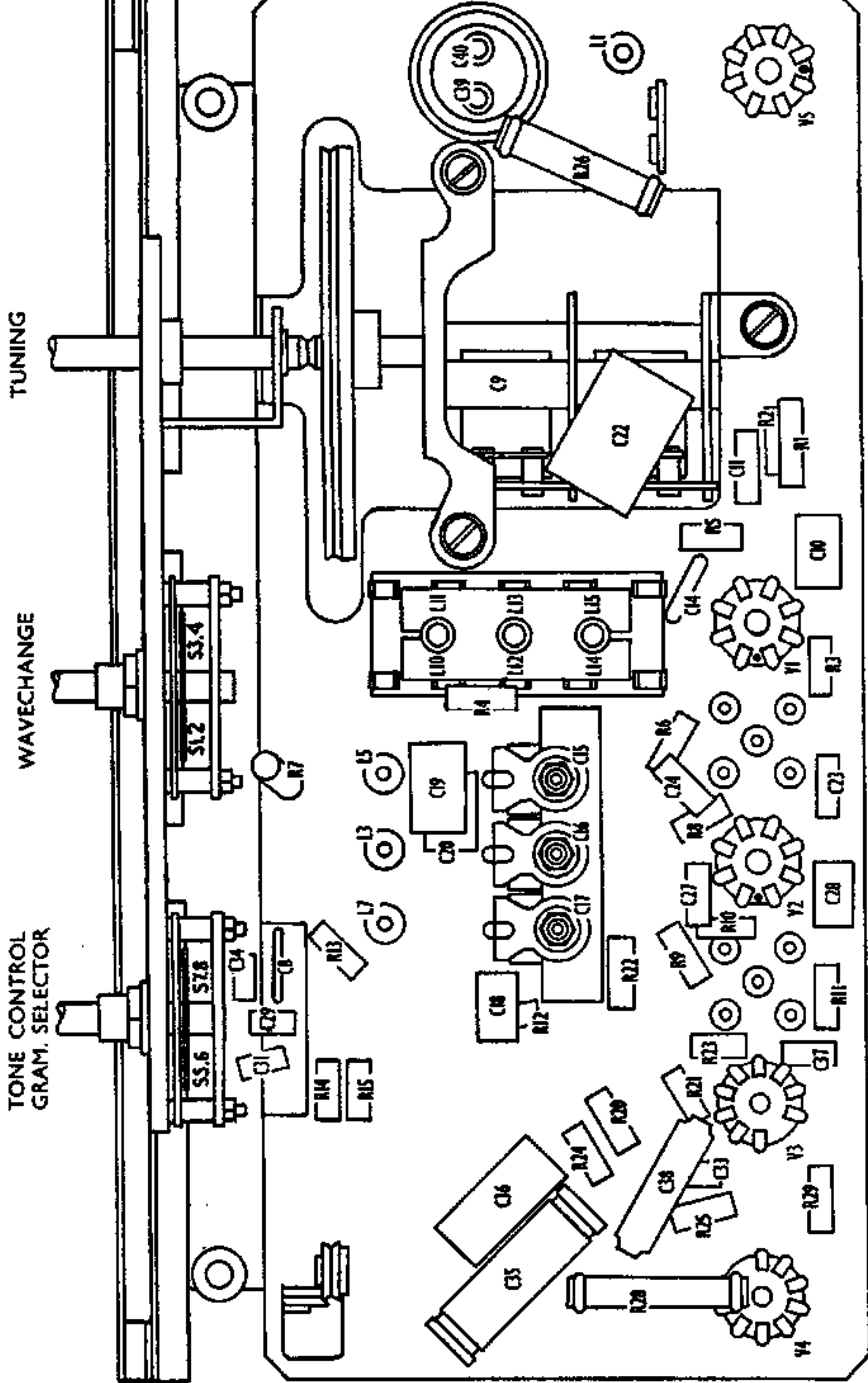
The amplified signal at the anode of V2 is passed via the 2nd I.F. transformer L16,17 to a diode of V3 for demodulation.

TONE CONTROL CIRCUIT. Three positions of tone balance

for gram., and two for radio, are provided. Top cut for gram. operation is obtained from an R.C. network connected to positions E and F of SW8, whilst on radio it is provided by C34 connected to position B of SW6. Switch SW7 selects the feed to the audio circuits for either gram. or radio operation.

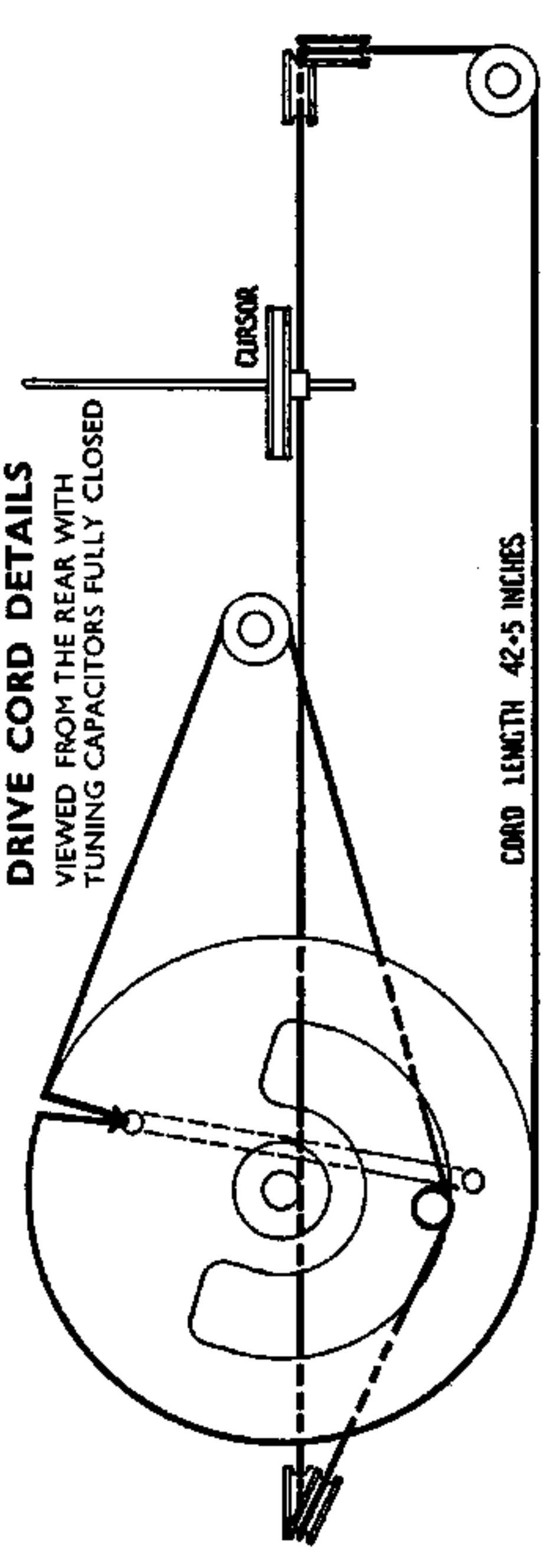
DET. A.V.C. AND AMPLIFIER CIRCUITS. After rectification, the A.F. feed is taken via the diode load circuit R10, I2, I8 and C33 to the grid of the pentode section of V3.

A part of the rectified component is fed back as a bias voltage to the grids of V1 and V2 stages to provide A.V.C. The amplified audio signal at the anode of V3 is then fed via C38, R25 to the grid of V4 for final amplification. In the cathode circuit of V4 are two resistors R28, 29; the former reduces any small amount of hum that may be present, whilst the

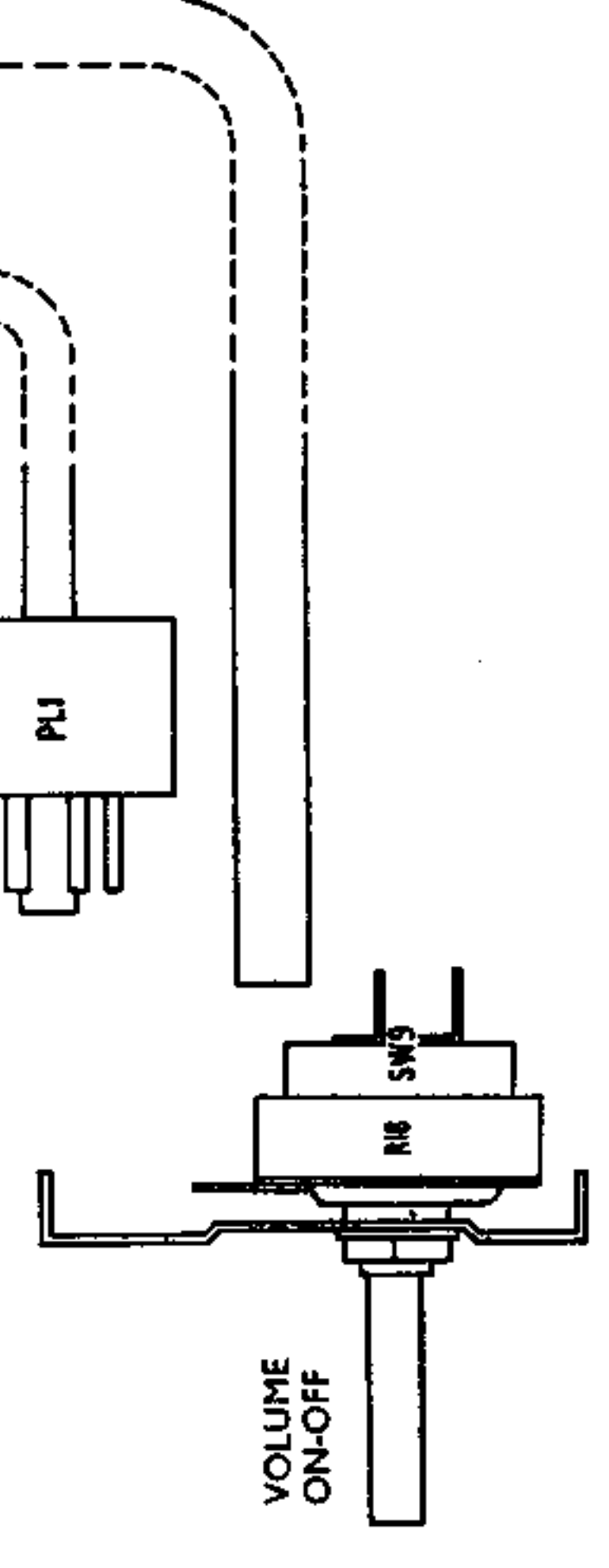


DRIVE CORD DETAILS

VIEWED FROM THE REAR WITH TUNING CAPACITORS FULLY CLOSED



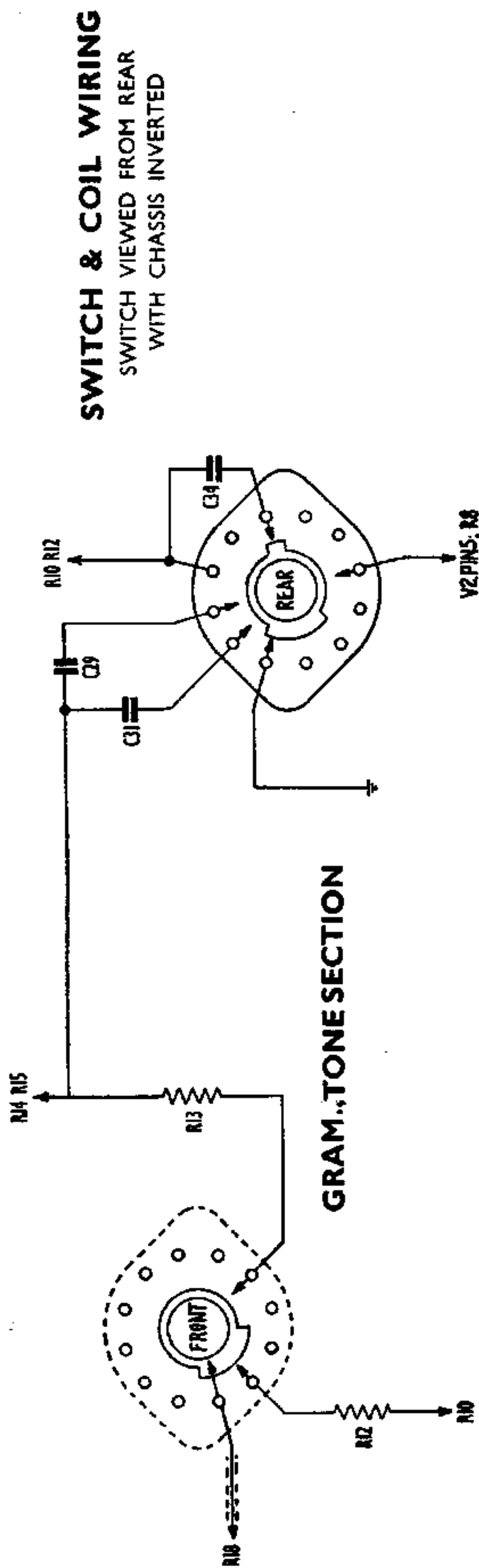
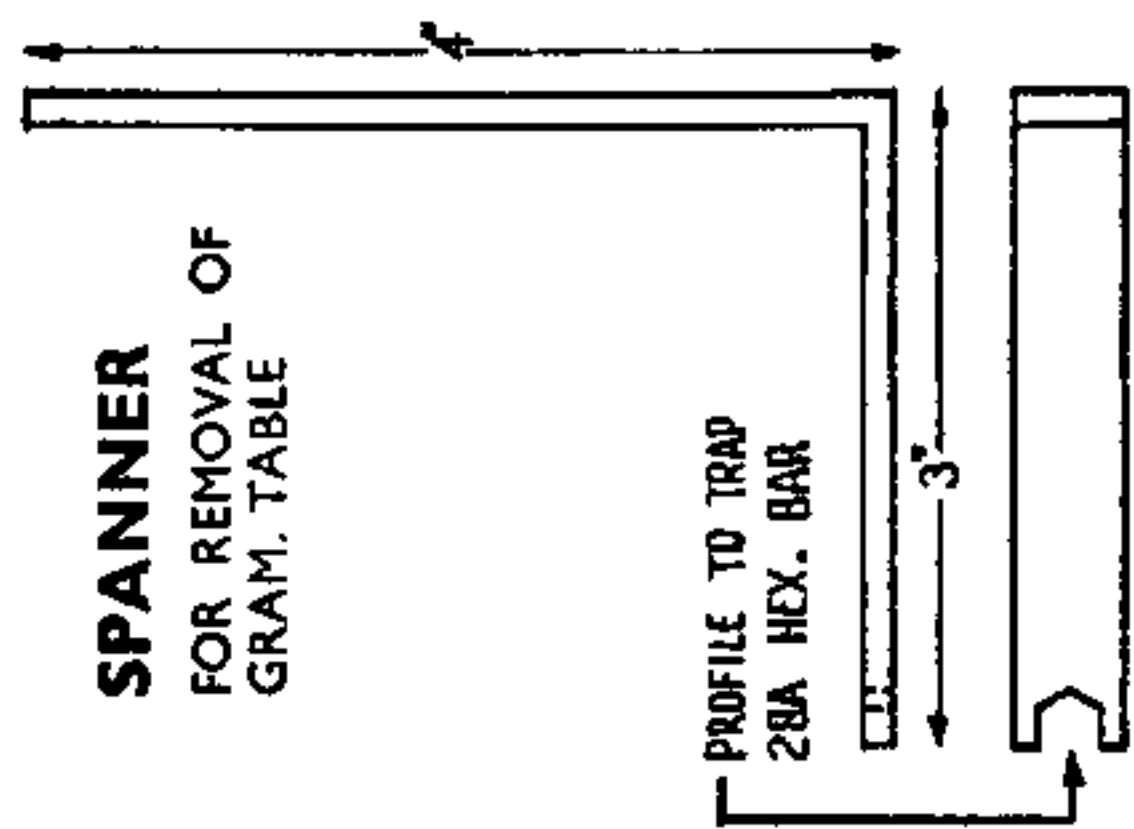
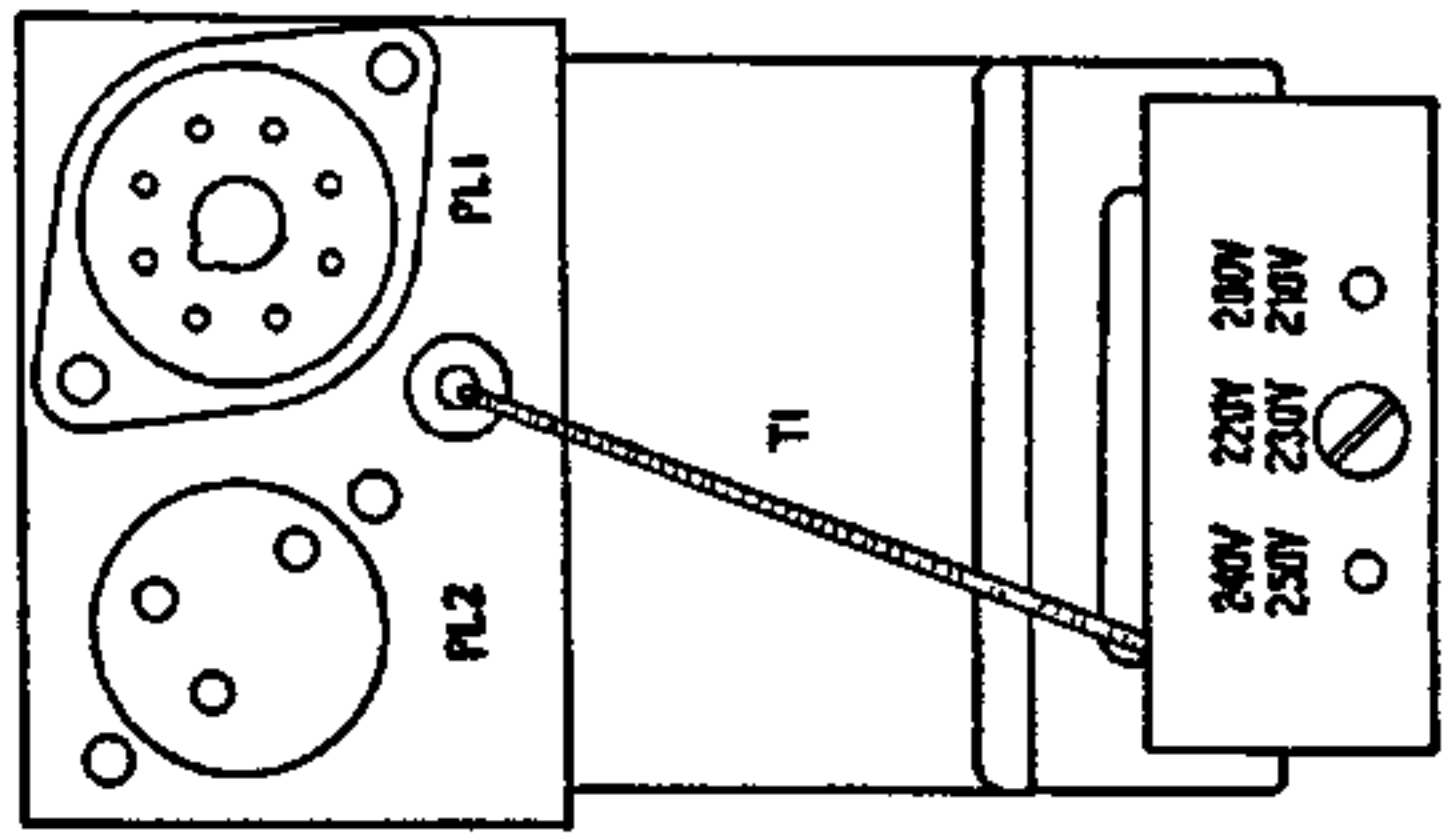
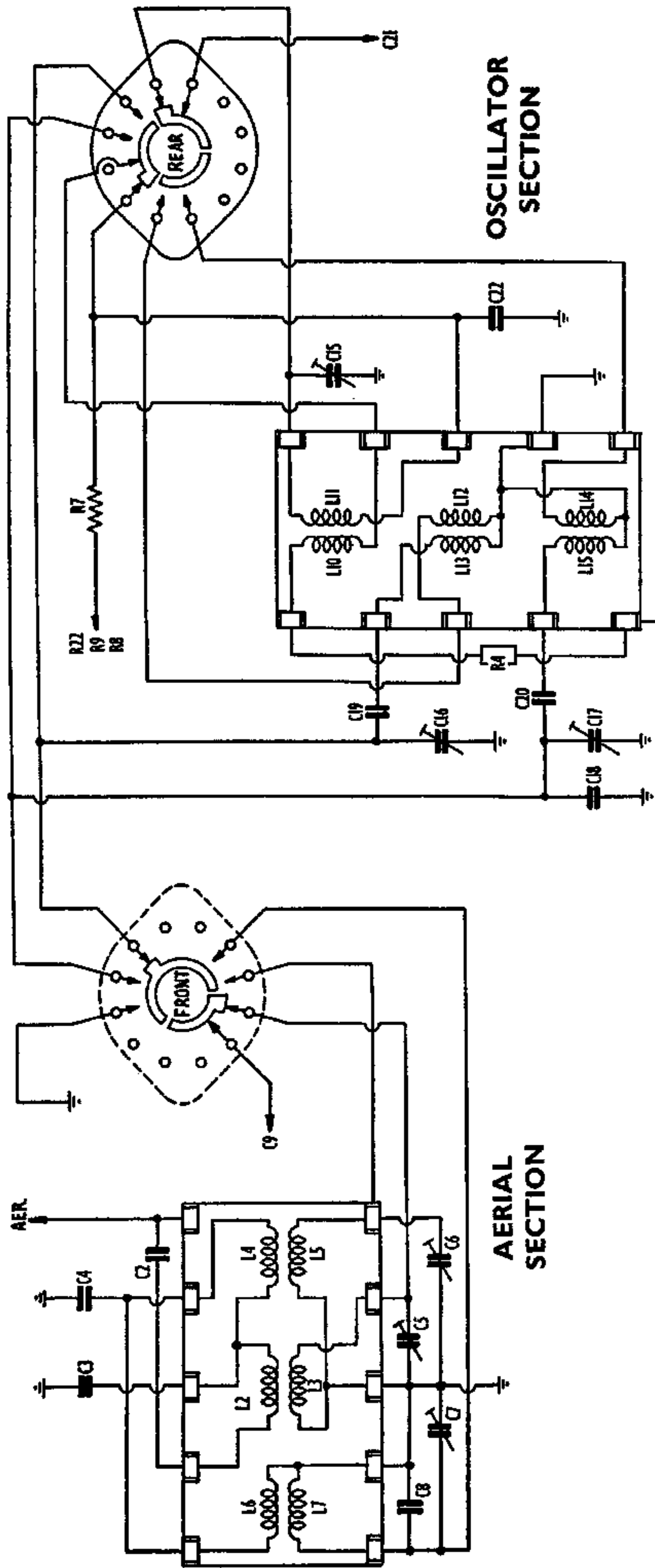
CORD LENGTH 42.5 INCHES



VOLUME ON-OFF

SWS

P1



VALVE BASE DATA

| VALVE | BASE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------|------|----|----|------|------|----|----|------|---|------|
| ECH42 | B8A | H | A | A.T. | G.T. | G2 | G1 | K | H | — |
| EF41 | B8A | H | A | K.G3 | K.G3 | G2 | G1 | K.G3 | H | — |
| EBF80 | B9A | G2 | G1 | K.G3 | H | H | A | D | D | K.G3 |
| EL41 | B8A | H | A | K.G3 | — | G2 | G1 | K.G3 | H | — |
| EZ40 | B8A | H | A | — | — | — | A | K | H | — |

D.C. RESISTANCE OF WINDINGS

| WINDING | OHMS | PART NO. |
|-------------------|------|----------|
| L1 | 10.8 | DP13936 |
| L2 | * | DP22063 |
| L3 | * | |
| L4 | 6.9 | |
| L5 | 3.8 | |
| L6 | 16.7 | |
| L7 | 24.8 | SA1704 |
| L8 | 14 | |
| L9 | 14 | DP22064 |
| L10 | * | |
| *Less than 1 ohm. | | |

| WINDING | OHMS | PART NO. |
|----------|------|----------|
| L11 | * | DP22064 |
| L12 | * | |
| L13 | 2.40 | |
| L14 | 3.30 | |
| L15 | 7.50 | |
| L16 | 14 | SA1704 |
| L17 | 14 | SA5076/1 |
| T1 Pri. | 470 | |
| Sec. | * | |
| T2 Pri. | 131 | SA5303 |
| (HT)Sec. | 555 | |
| (LT)Sec. | * | |

VOLTAGE AND CURRENT DATA

| VALVE | ANODE | | GRID 1 | | GRID 2 | | CATHODE | |
|-------|------------|-----|--------|----|--------|------|---------|------|
| | V | mA | V | mA | V | mA | V | mA |
| V1 | 175 | 4.1 | -1.1* | — | 60 | 3.0 | — | 8.5 |
| V2 | 152 | 4.8 | -1.1* | — | 80 | 1.4 | — | 6.2 |
| V3 | 55 | 0.4 | -0.9* | — | 12 | 0.13 | — | 0.53 |
| V4 | 223 | 34 | — | — | 175 | 4.2 | 3.9 | 38.2 |
| V5 | 245 (A.C.) | — | — | — | — | — | 240 | 60.0 |

ECH42 TRIODE ANODE CURRENT

| BAND | FREQUENCY | CURRENT (mA) |
|------|-------------|--------------|
| S.W. | 6 Mc/s. | 3.4 |
| S.W. | 15 Mc/s. | 3.5 |
| M.W. | 550 Kc/s. | 1.7 |
| M.W. | 1,500 Kc/s. | 1.4 |
| L.W. | 150 Kc/s. | 1.9 |
| L.W. | 300 Kc/s. | 1.7 |

All measurements are taken with a 20,000 ohm/volt meter and voltages are in respect to the chassis.

Conditions : Receiver quiescent and set to the L.F. end of the Medium waveband. 230 volts mains input.

*Measure with valve voltmeter.

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