

MODEL CR74 is a five-valve, including rectifier, superheterodyne receiver, with pre-set tuning offering 6 M.W. or 5 M.W. and 1 L.W. stations. It is designed for use in motor vehicles and draws its supply from the vehicle's accumulator. Requiring only the connection of the accumulator, aerial, loud-speaker and pilot lamp, it is otherwise self-contained.

The controls are **VOLUME ON/OFF** and **STATION SELECTOR** with a subsidiary control to the right for the selection of a M.W. or L.W. station at position 1 of the station selector.

Flexible extensions are fitted to the two main controls.

BATTERY VOLTAGE AND CONSUMPTION. 12 volts.
2.7 amps.

BATTERY CONNECTION. The battery supply lead should be connected to the "A2" terminal on the voltage regulator unit mounted on the bulkhead of the car.

FUSE. 5 amps. Although the rating may seem high compared with the current drawn, the initial surge when switching on has to be allowed for. The fuse is inserted in the spring-loaded fuse socket in the battery lead. This socket should be examined to ensure that it contains an insulating sleeve, as its absence will cause the fuse to be shortcircuited.

VALVES. V1—ECH21—Frequency Changer.
V2—EF22—I.F. Amplifier.
V3—EBL21—Demodulator, L.F. Power Amplifier.
V4—EF22—L.F. Amplifier.
V5—EZ35—Indirectly heated, full-wave Rectifier.

V1 to V4 have loctal bases, and V5 an international octal base. All valves are Mullard.

WARNING RE VALVES. The valve heaters are wired in series parallel. Do not remove any valve while the supply is switched on, as the overloading of the remainder will result in either deterioration or damage.

NON-SYNCHRONOUS VIBRATOR. 12 volt. Part No. C19878.

INTERMEDIATE FREQUENCY. 465 Kc/s.

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

CIRCUIT DETAILS. Signals from the aerial pass through a U.H.F. filter L1.C8 and I.F. filter L16.C9, and a series aerial condenser C5 to the tuned grid circuit of V1.

The U.H.F. filter is effective over the accepted band-width of spark interference, and the I.F. filter is permeability tuned to 465 Kc/s. to suppress any breakthrough of signals at or about the intermediate frequency.

C6, the aerial trimming condenser, when set in conjunction with the aerial capacitance, forms the shunt capacity to allow the grid coils to be resonated by their cores over their allotted ranges.

Signal voltages developed in the tuned grid circuit are coupled by C2 via the grid stopper R2 to the control grid of V1.

The oscillator circuit formed by either one of the oscillator coils in conjunction with C1; C7 and C32, is a Colpitts type and operates on the high frequency side of the aerial signal. C10 is a D.C. blocking condenser and R4 the oscillator grid leak.

The beat, or intermediate, frequency signal appearing in V1 anode circuit is coupled by T1 to V2, amplified and then coupled by T2 to the diode of V3 for demodulation. C21 is an H.F. de-coupling condenser. The rectified L.F. component developed across the diode load R8 is passed via the potentiometer formed by R9, R10, partly to V4 control grid through the de-coupling resistor R14 and partly through R10 as A.V.C. voltage.

From V4 anode, the amplified output is R.C. coupled by C28, R16 (volume control) to the pentode section of V3 for final amplification and then transformer coupled to the loud-speaker.

A.V.C. voltage is filtered by R10, C15, R1, and applied to the control grids of V1, V2 and V4.

Bias is developed in the H.T. return lead across R13 and filtered by the network R12, C22, R15, C29 before being fed via R16 to V3 control grid and R21 to V1 grid.

Prior to the ON/OFF switch S6 in the battery input lead is included another U.H.F. filter L14, C33 and an additional 0.1 mfd condenser C13 to prevent any interference carried by the car's battery circuit from reaching the receiver by way of the H.T. system and heater wiring.

Between the vibrator and the valve heaters connection is a filter C20, L15, C16 to keep the vibrator hash and ripple from the heaters and car wiring.

The interrupted D.C. caused by the operation of the vibrator contacts induces an A.C. voltage in the vibrator transformer T4 primary, which in turn induces a higher A.C. voltage across the secondary to provide the anode potential for the rectifier V5. The D.C. cathode output of V5 is smoothed by C30, R19 and C24.

To eliminate the effects of sparking at the vibrator contacts, the latter are shunted by resistors R6, R7 and T4 secondary is tuned by C26, C27.

SWITCHING DETAILS. Switches S1, S2, S3, are the three main (coil) selectors and each occupies a rear face of the three wafers. S4 occupies the front face of the front wafer and therefore operates in tandem with the selectors. Its function is to short-circuit to chassis the screen grid (G2) of V4 during the interval of time between the break and remake of the selectors, thereby silencing switch clicks during station selecting. S8 is a subsidiary two-position selector used to provide alternative M.W./L.W. for position I of the main selectors.

S6 is the battery ON/OFF switch.

CHASSIS REMOVAL. Assuming that the complete receiver has been removed from the car, remove the two self-tapping screws from the top rim of the front plate, the two on the lower rim, then the two 4BA screws at the back of the case.

The chassis must be kept level when withdrawing from the case for, if tilted, there is a possibility of the thin stems of the R.F. and osc. adjustors and the trimmer C6 being damaged against the top edge of the case, especially if unnecessary force is used.

COMPONENT REPLACEMENT. As some of the components appear difficult to replace, the following notes are given to save unnecessary dismantling.

Front Plate Assembly. Remove the three 4BA screws from the lower edge of each support "wing". The screw securing the tag panel is held with a nut and washer.

Disconnect C1, then the four leads from the base of the coil and switch unit, and then the eight leads to the volume control, switch and speaker socket. If necessary, disconnect the battery cable.

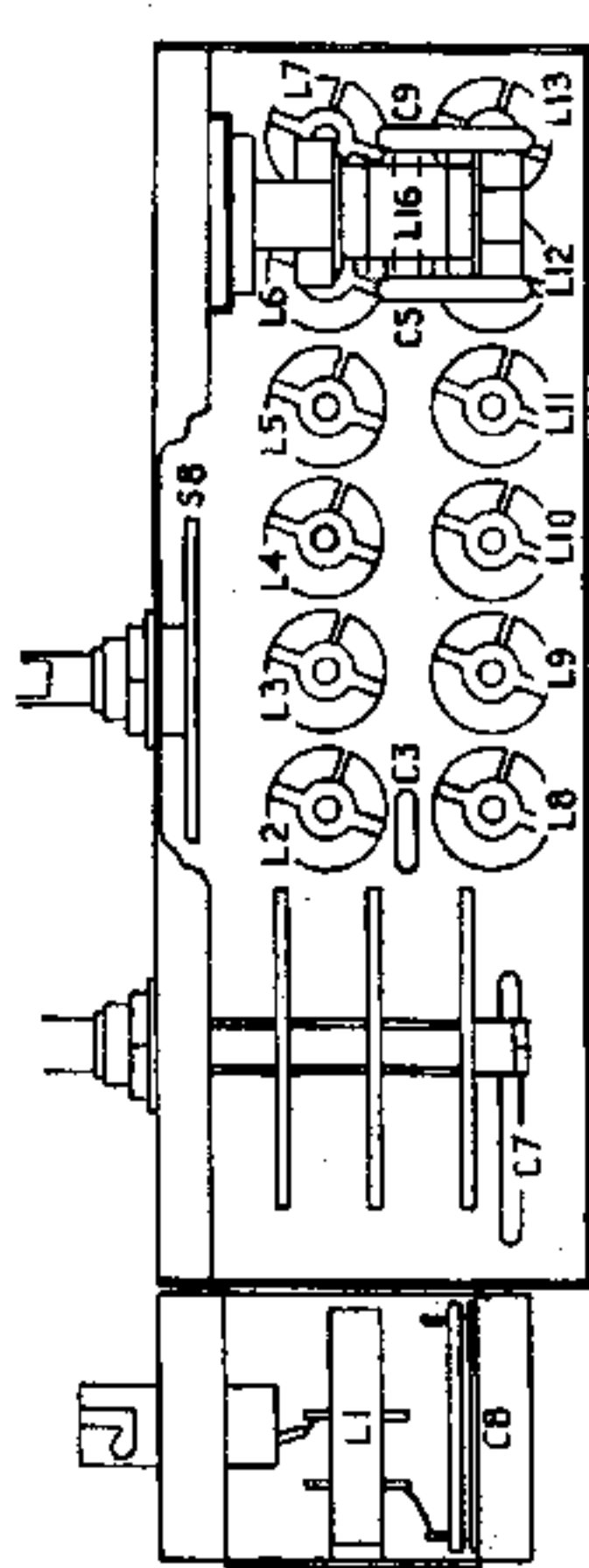
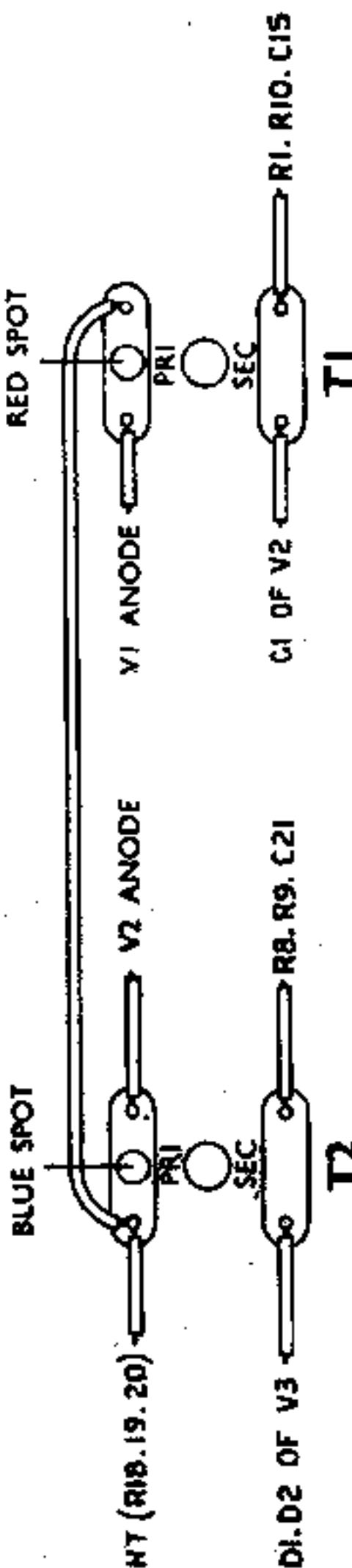
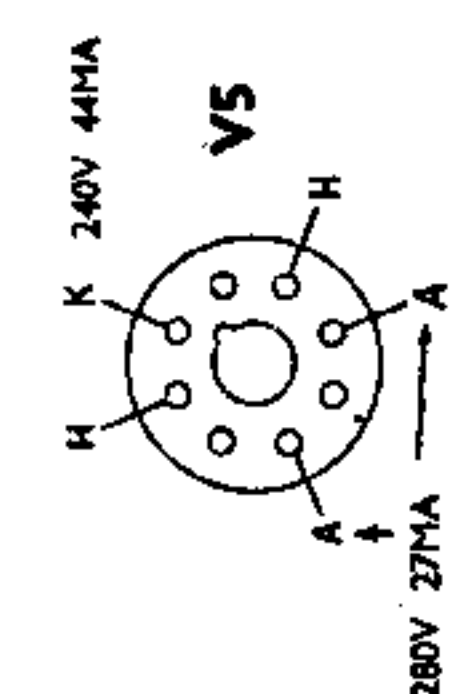
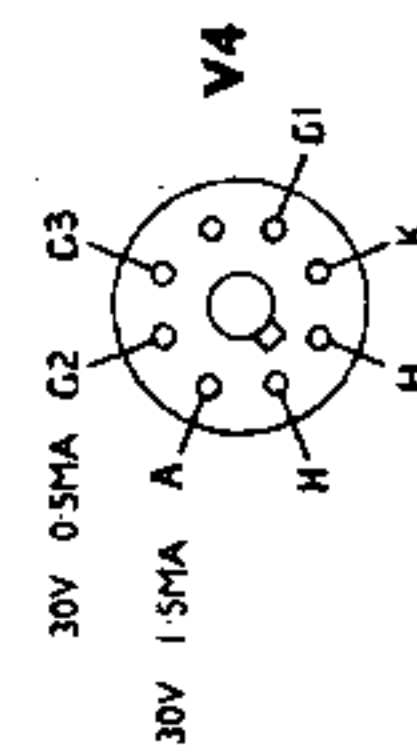
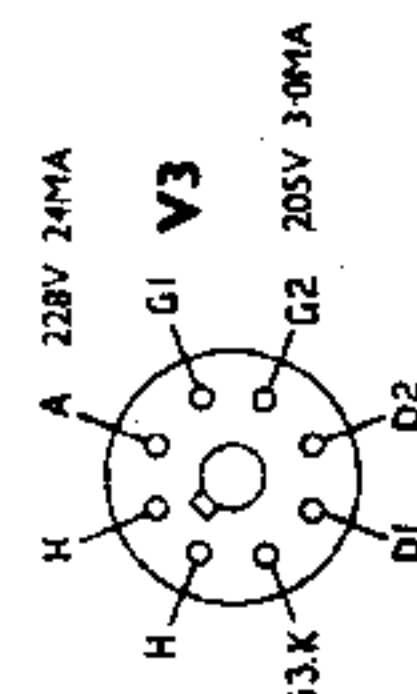
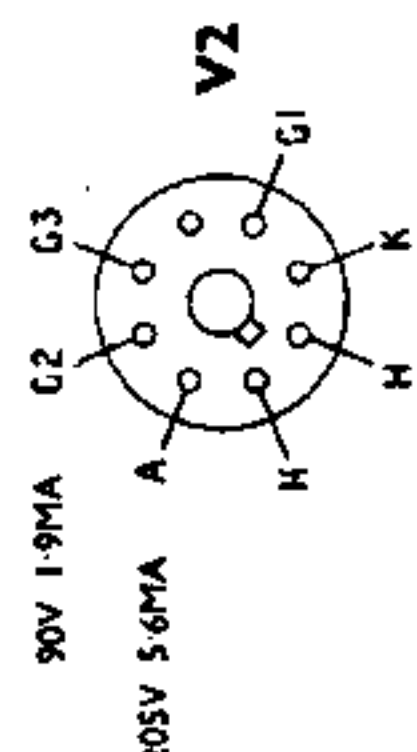
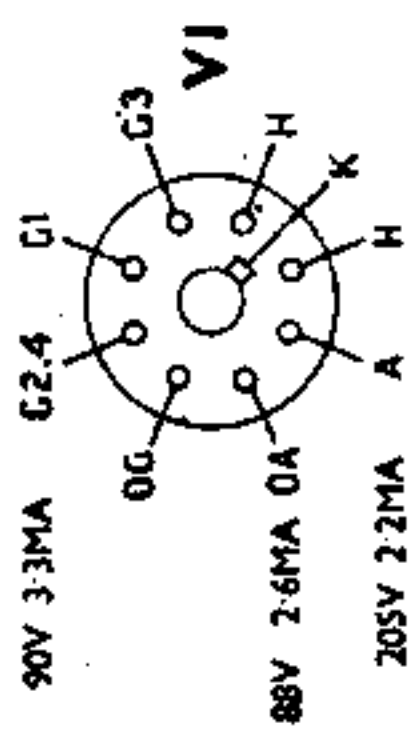
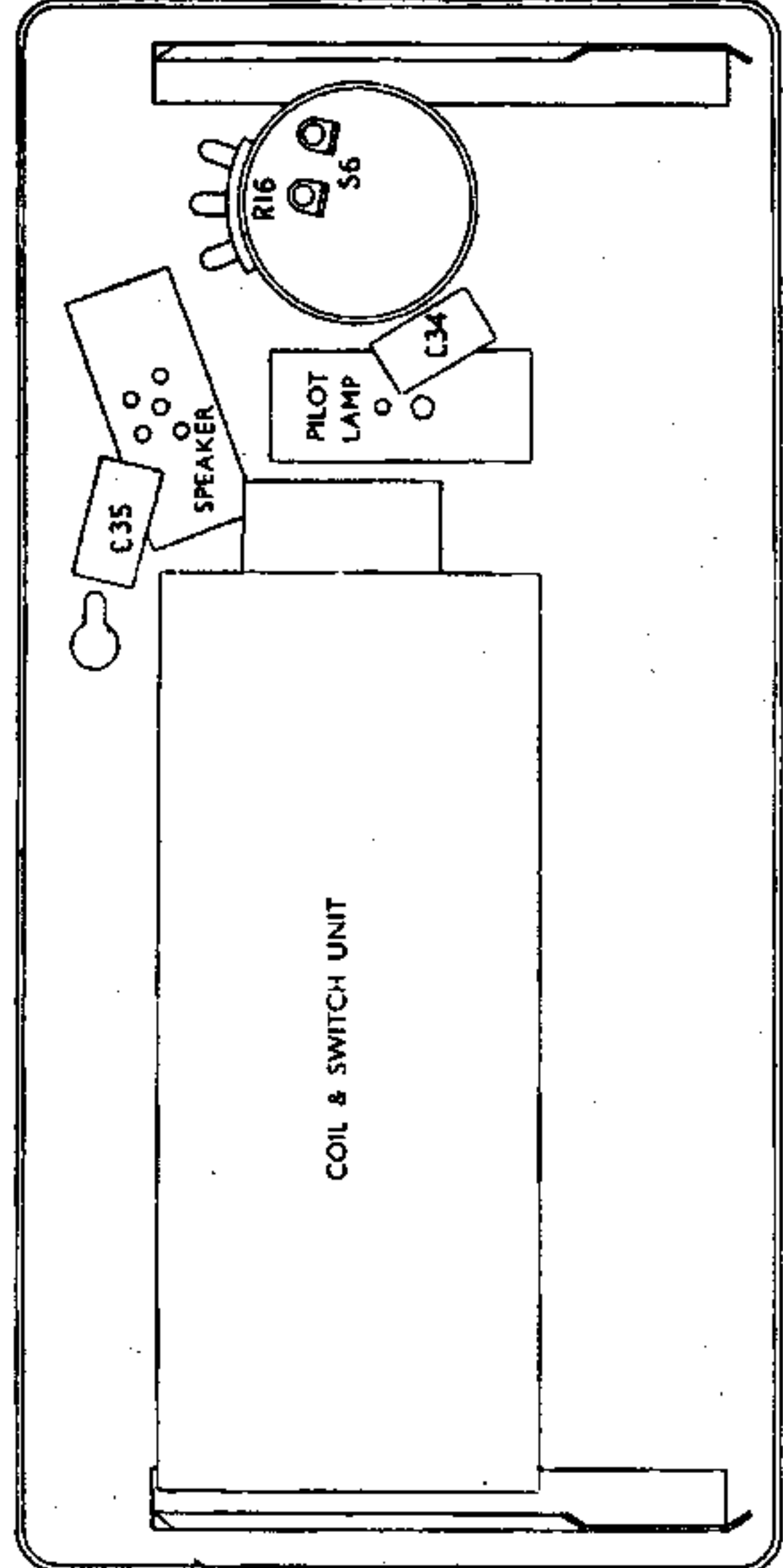
Coil and Switch Unit. Remove the front plate as above.

Disconnect the bonding lead between the coil box (near C6) and the front plate. Remove S8 knob, then the three 4BA screws securing the box to the front plate. See later notes on the interior.

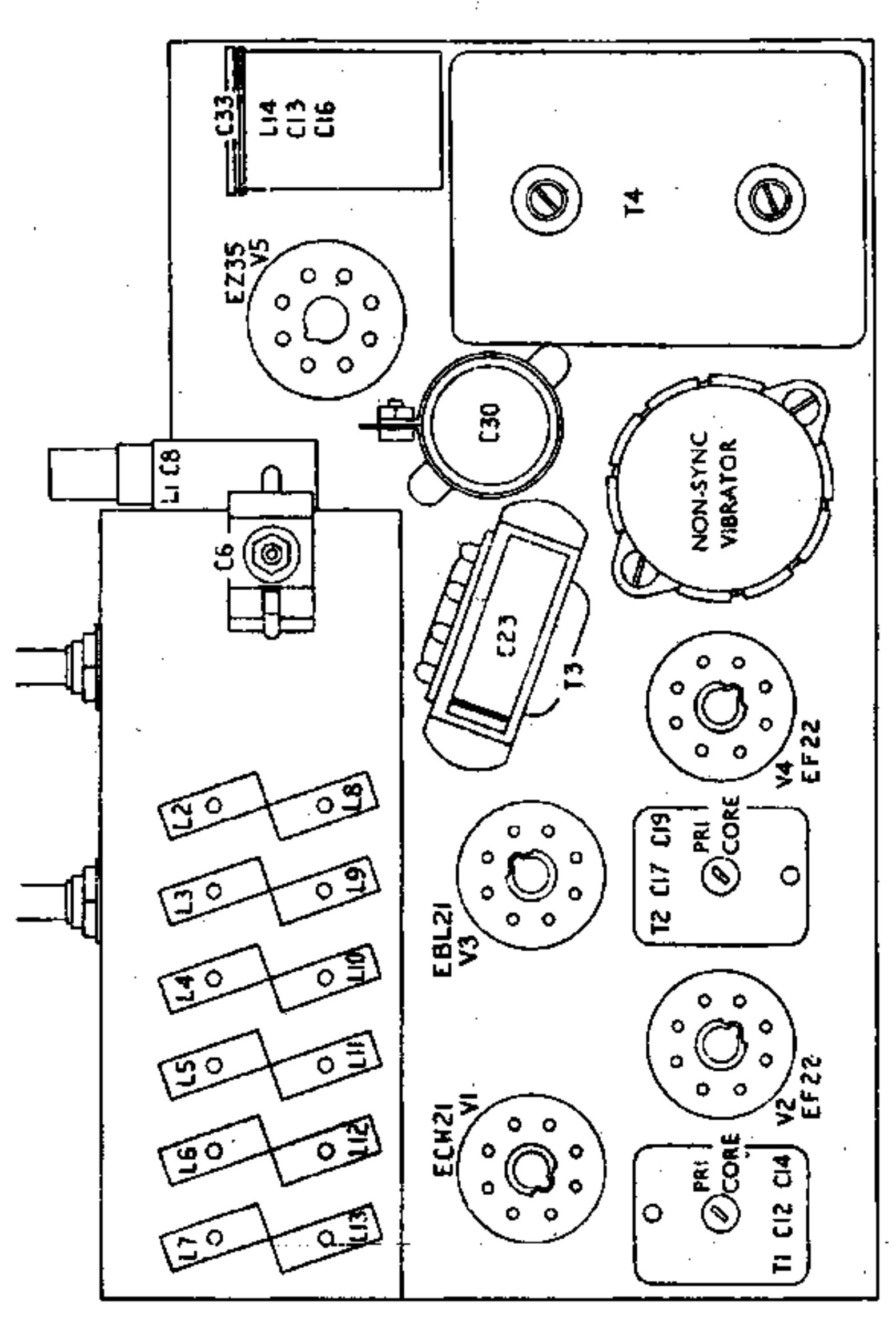
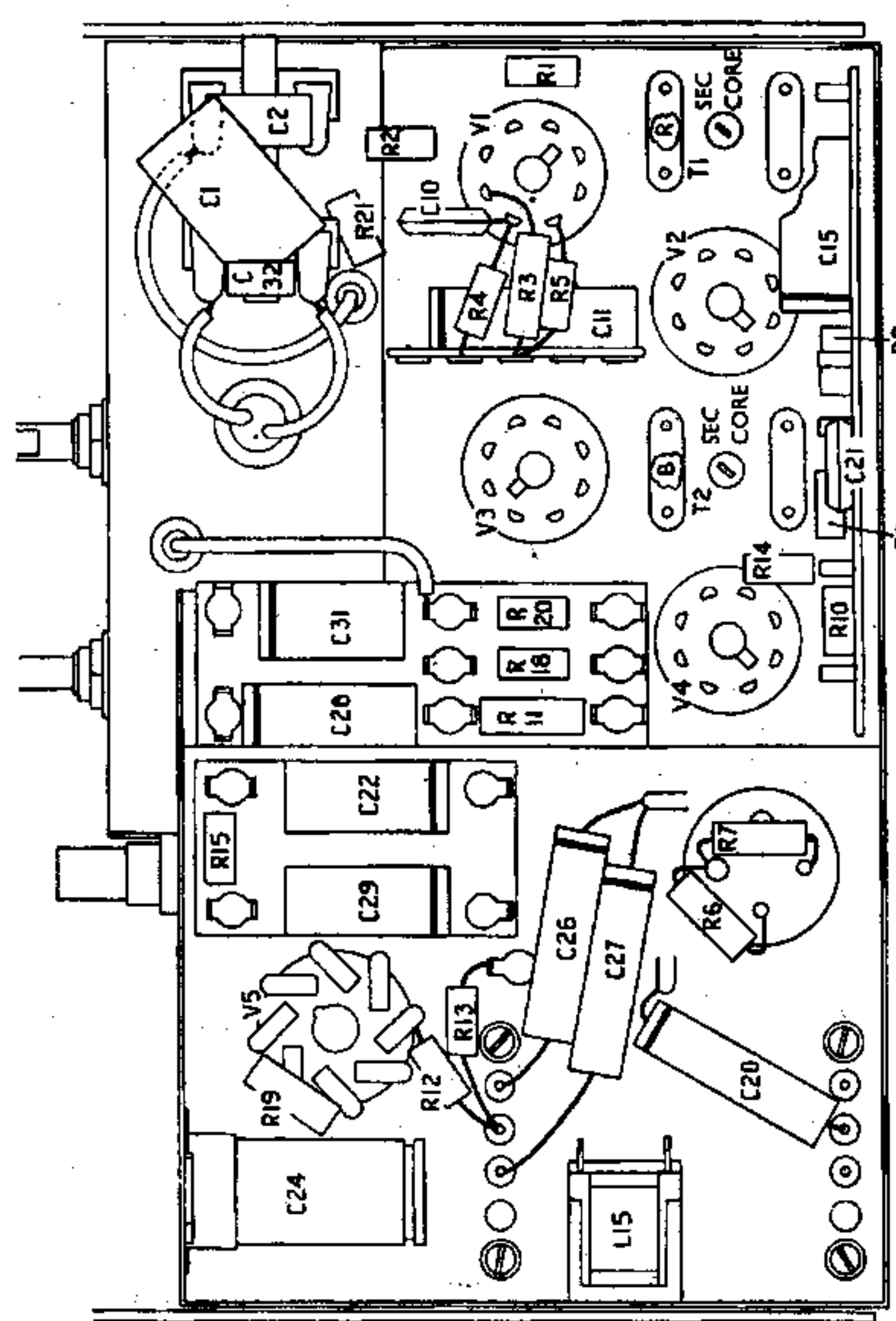
Battery Filter Unit. Remove the front plate. Disconnect the lead from the unit to L15. Remove the base mounting screws of C24 (4 mfd) and move the condenser to one side. Removing the two self-tapping screws so exposed will release the filter unit.

Output Transformer. Disconnect the six leads from the tag panel. One securing screw is accessible near V3 socket, and the other is covered by C26.

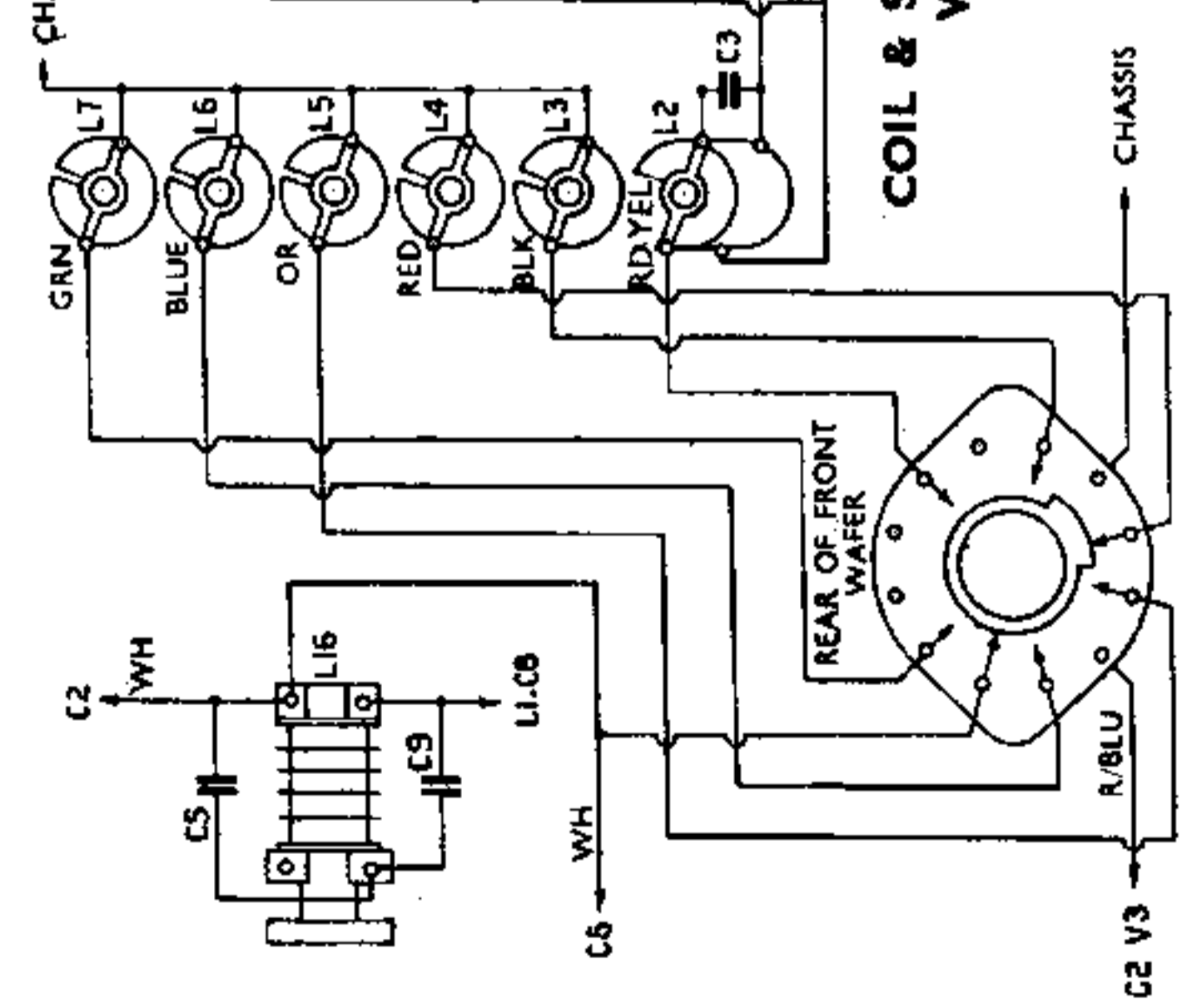
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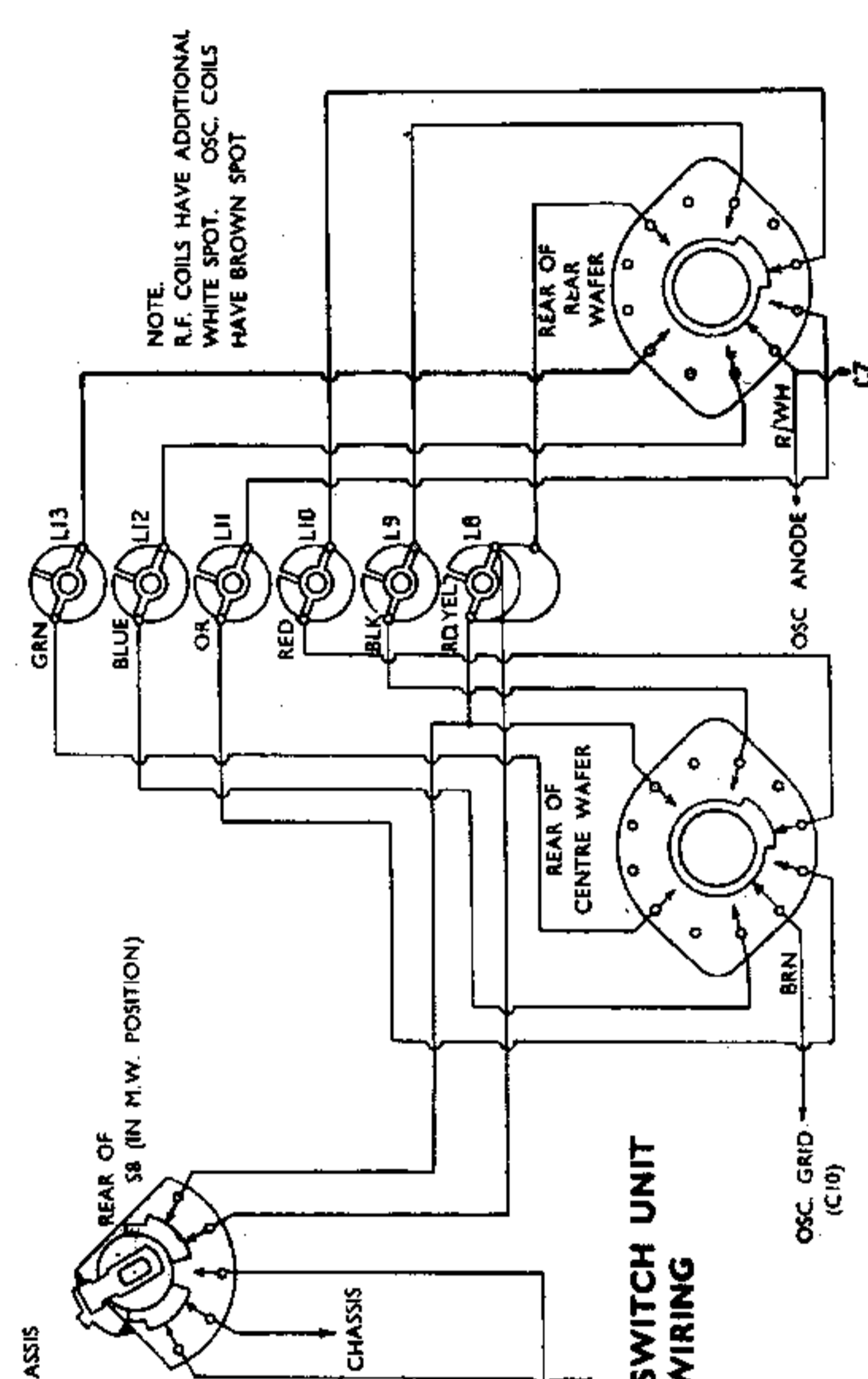
COIL & SWITCH UNIT



COIL	OHMS
L1	0.93
L2	4.0 or 42
L3	6.0
L4	6.8
L5	8.5
L6	10.0
L7	13.0
L8	2.2 or 6.5
L9	2.5
L10	2.8
L11	3.0
L12	3.3
L13	3.6
L14	0.06
L15	0.07
L16	10.3
T1 {PRI	14.3
SEC	14.3
T2 {PRI	14.3
SEC	14.3
T3 {PRI	490
SEC	0.48
T4 {PRI	0.46 + 0.52
SEC	540 + 600

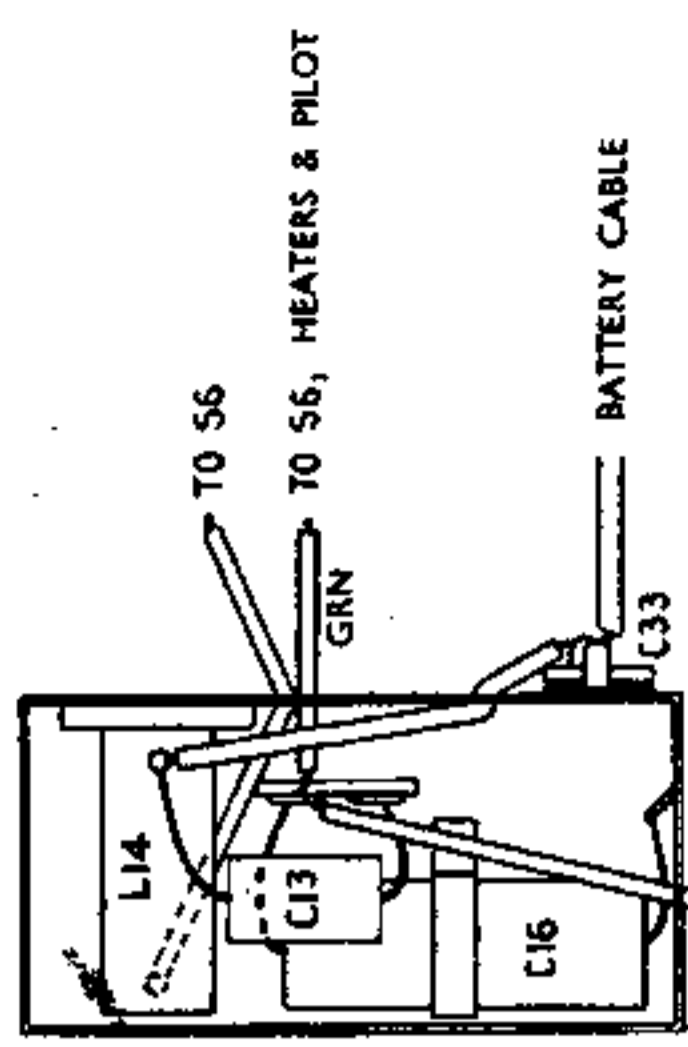


COIL & SWITCH UNIT

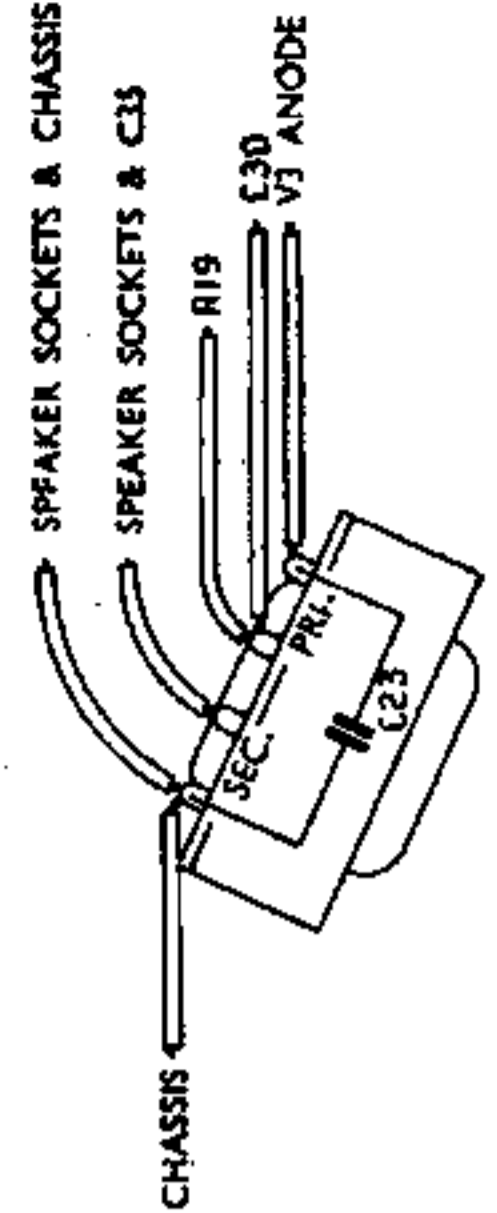


COIL & SWITCH UNIT

NOTE. R.F. COILS HAVE ADDITIONAL WHITE SPOT. OSC. COILS HAVE BROWN SPOT



BATTERY INPUT FILTER



OUTPUT TRANSFORMER

INTERIOR OF COIL AND SWITCH UNIT. Having removed this unit from the chassis, remove the 14 self-tapping screws round the box edges to release the cover.

Each pair of coils L2.L8, L3.L9, etc. are colour coded and the leads to each are similarly coded.

To remove a coil, fully unscrew its core anti-clockwise, taking care not to force it beyond the end of its travel, then remove the two small screws from the tension spring and coil base. The coil former can then be lifted off its core. Care must be taken to avoid damage to the coil former and core.

According to which coil is being changed, varying amounts of wiring will have to be removed first or, if preferred, other coils removed complete and folded back on the wiring to expose the faulty coil.

To replace S8, the R.F. coils will have to be so removed. The main selector switch can, with care, be dismantled in situ and a water cleaned or replaced as necessary.

A complete internal wiring diagram of this unit is given above.

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

I.F. ALIGNMENT. Note. When adjusting each I.F.T. core, two peaks will be noticed, one each side of the coil centre. Tune to the first peak encountered when screwing in.

Turn the station selector to position 6 (low frequency end of medium waveband) and connect output meter to the loud-speaker tags.

Do not disconnect the speaker. Connect the receiver to the battery and switch on.

Inject a modulated 465 Kc/s signal via a 0.1 mfd condenser to the grid G1 of V1.

Adjust all I.F.T. cores for maximum output in the following order: T2 upper and lower, T1 upper and lower, reducing the signal input as necessary when peaking.

I.F. FILTER ADJUSTMENT. Remain on position 6 and inject a 550 Kc/s signal into aerial socket then adjust the cores of L13 and L7 for maximum output. Inject a 465 Kc/s signal then adjust the core of L16 for minimum output.

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Ekco Works, Duchess Road,
Rutherglen, Lanarkshire
Phone: Rutherglen 2240/3

NORTHERN SERVICE DEPOT:
55, Whitworth Street,
Manchester.
Phone: Central 6111/2

COIL UNIT ALIGNMENT. Note. In order to ensure that the adjusters will cover their allotted ranges in accordance with the station setting details in the Instruction Booklet, the coil unit should be re-aligned as follows: Switch to position 2 (H.F. end of M.W. band) and inject a 200 metres (1,500 Kc/s) signal to the aerial socket via a capacity of approx. 100 pf. Fully unscrew the core of L3 (see footnote) then adjust L9 core and C6 trimmer for maximum output. C6 is now correctly set to match the circuits to the dummy aerial in use and all adjusters (including No. 2) may now be reset to the required wavelengths, the calibration being in accordance with the printed instructions.

Note. Do not use unnecessary force when fully unscrewing the adjusters as this may cause the iron dust cores to be broken from the brass stems.

AERIAL MATCHING. When the set is finally installed in the car, the only adjustment necessary will be as for the initial installation, i.e. switch to the weakest M.W. station and readjust C6 for maximum output.

WESTERN SERVICE DEPOT:
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Phone: Bristol 26311