

MODEL CR152 is a car radio Superheterodyne receiver designed for use with a telescopic aerial using approx. 3 feet of 10-15 pf/ft. connecting cable.

Three variable tuning units, operated on the cam principle, cover the M.W. and L.W. bands. Once these units are set up, the stations so tuned may be selected at will by the station selector switch, located on the right hand side of the receiver. The left hand control is the Volume, with on/off switch combined. The receiver and power pack are separate units for ease of installation and servicing, inter-connection being made by plugs and sockets via a single cable. Loud-speaker(s), also plug and socket connected, can be mounted to suit each type of vehicle.

CR152 VARIATIONS.

The CR152 without any suffix is the basic, general purpose, car radio. Other models will have one or more suffixed letters, such as CR152/G, CR152/YLR etc., which denote that the external assembly and brackets enable installation in specified makes of cars.

Those without a suffix 'X' are produced with two M.W. and one L.W. tuning units, whilst those with the suffix 'X' have three M.W. tuning units.

BATTERY CONSUMPTION. 3 amps at 13.5 volts.

FUSES. 5 amps.

Note: The fuse is inserted in a spring loaded fuse socket connected in the battery lead. The socket should be examined to see that it contains an insulated sleeve as the absence of this will cause the fuse to be short circuited, and thus offer no protection.

PILOT LAMPS. 12 volt. 2.2 watts M.E.S.

VALVES.

V1	R.F. Amplifier	.. .. .	EAF42
V2	Frequency Changer	.. .. .	ECH42
V3	I.F. Amplifier, Detector and A.G.C.	.. .. .	EAF42
V4	L.F. Amplifier	.. .. .	EBC41
V5	Output	.. .. .	EL42
V6	Rectifier	.. .. .	EZ41

All valves are Mullard, with B8A bases.

VIBRATOR. Non-Synchronous 12 volt Plessey type 1274.

WAVE BANDS (WITHOUT SUFFIX 'X').

M.W. High	.. .. .	190-340 metres	.. .. .	880-1620 Kc/s.
M.W. Low	.. .. .	330-570 metres	.. .. .	530- 920 Kc/s.
L.W.	.. .. .	1150-1850 metres	.. .. .	160- 260 Kc/s.

WAVE BANDS (WITH SUFFIX 'X').

M.W.1.	.. ..	190-340 metres	..	880-1620 Kc/s.
M.W.2.	.. ..	240-420 metres	..	720-1250 Kc/s.
M.W.3.	.. ..	330-570 metres	..	530- 920 Kc/s.

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

Note: Where more than one speaker is used reference should be made to the Ekco Car Radio General Installation Instructions wherein methods of connecting and installing are given.

INTERMEDIATE FREQUENCY. 465 Kc/s.

CIRCUIT DETAILS. Signals from the aerial pass through the H.F. choke L8, to the I.F. rejection circuit, comprising L1.C3, and then via the coupling capacitor C1 to the tuned grid circuit of the R.F. amplifier V1. At this juncture the aerial input is switched by S1 to the required tuned circuit, which is then shunted by the aerial tuning capacitor C7. The signal is then fed via the grid coupling capacitor C8 and resistor R1 to V1 for amplification. H.T. to V1 anode is fed via R3.4 with C9 decoupling whilst the screen is supplied through R21 with C35 decoupling. The amplified signal appearing at the anode is then fed to the frequency changer stage via a coupling capacitor C10 and resistor R7.

FREQUENCY CHANGER. A Colpitts oscillator is used to produce the required heterodyne frequency, the circuit comprising C15, C17, C21 and one of the oscillator coils selected by S2, S3, with tuning by the associated trimming capacitor and iron dust core. The circuit thus formed is coupled to the oscillator anode and grid via capacitors C16, C14 respectively, R8 being the gridleak. By means of electron coupling within V2, the R.F. and oscillator signals are heterodyned to produce a signal at I.F. at the hexode anode of V2.

I.F. AND DEMODULATOR. The output of V2 is transformer coupled (I.F.T.1.) to the I.F. amplifier valve V3 and, after amplification, the signal is transformer coupled (I.F.T.2.) to V3 diode for demodulation. The A.F. component developed across the diode load resistors R10,R11 is fed via C26 to the grid of V4 for A.F. amplification.

A.G.C. A part of the rectified signal is fed from R10.11 through R22 to V1.2 and 3 stages as a small bias voltage, to provide A.G.C. C23,24,29 decoupling capacitors bypass any R.F. or I.F. voltages to chassis.

OUTPUT STAGE. The A.F. Signal having been amplified, is fed from the anode of V4 to the grid of V5 via coupling capacitor C32, for final amplification. H.T. to the anode is through the primary of T2 output transformer whilst the screen is connected direct to the H.T. line.

Negative feedback between the anode and previous stage is obtained through C31 and R16.

A muting switch, S5, is provided to silence the loud-speaker during switching operation.

POWER SUPPLY. The heaters are arranged in a series-parallel circuit, current being obtained from the power supply via two filters L10.C101 and L12.11.C102.103, the former to prevent vibrator hash and ripple, the latter to suppress interference, which may be picked up by the car wiring from reaching the receiver via the heater and H.T. circuits. The action of the vibrator creates an alternating voltage across the primary of transformer T1, which in turn induces a higher voltage in its secondary. This voltage is then rectified by V6 and the D.C. appearing across the stabilising resistors R105.106.107 is smoothed by C107.108 and 109.

Two levels of H.T. are available, one feeding the anodes and screens of V1.2.3.4.5. (screen only in V5) the other supplying the anode of the output valve.

A pilot lamp is switched in circuit for each band by S4.

NOTES:

IMPORTANT. Vibrator mounting allows the vibrator to be rotated and it is essential that, unless otherwise instructed, the thick pin sockets of the vibrator base should be parallel to the power unit chassis.

LOW VOLTAGE OPERATION. The receiver will operate, without undue loss of sensitivity, with a supply of 11 volts (12v model) or pro-rata for other models.

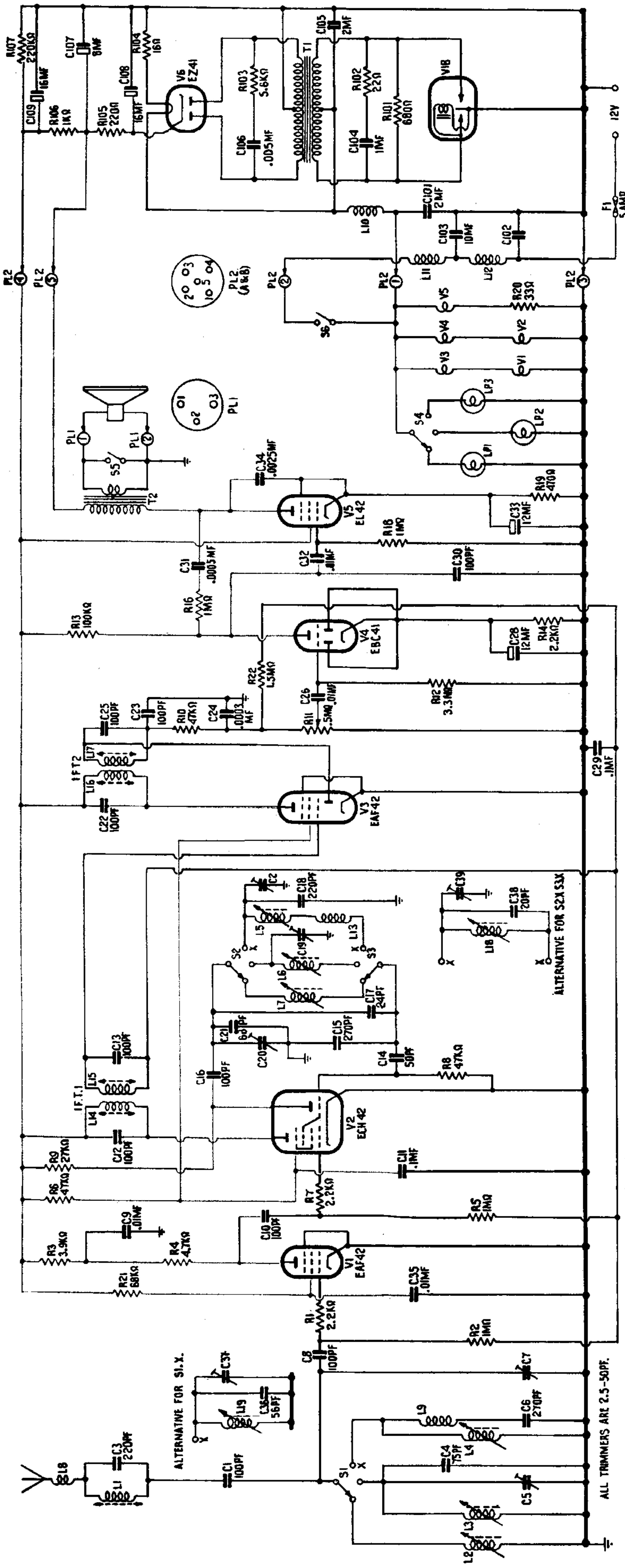
ALIGNMENT. This sequence must be rigidly adhered to. Set Volume control to fully clockwise and selector switch to M.W. (H.F.) range (fully clockwise).

Note: A flexible or short stemmed trimming tool will be required for the alignment of the I.F. transformers.

The "tracking mark" referred to in Alignment procedure consists of a spot located in the clear section of the scale and its position is quoted to the nearest calibration point in metres.

(Continued on page 3)

1. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 2. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120.



UNUSED DIODE OF V1 NOT SHOWN.

ALL TRIMMERS ARE 2.5-50PF.

INTERMEDIATE FREQUENCY. Inject a 465 Kc/s. signal (mod. 30 per cent. at 400 c.p.s.) through 0.1 mfd. capacitor to the control grid of V2. Adjust I.F.T.2. Primary, I.F.T.2. Secondary, I.F.T.1. Prim., and I.F.T.1. Sec., for maximum output in that order, then repeat procedure.

Note: The secondary core is at the top of each I.F. transformer.

I.F. REJECTION. Switch to M.W. H.F. range. Set to 290 metres and inject a 465 Kc/s. signal through an 82pf capacitor to the aerial socket.

Adjust I.F. rejector core L1 for minimum output.

M.W. (H.F. RANGE). Set selector to fully clockwise position. Set tuner to 340 metres tracking mark. Inject 890 Kc/s. signal (modulated) through 82pf capacitor to the aerial socket. Adjust C20 then C7 for maximum output. Set to 230 metres tracking mark. Inject 1300 Kc/s. signal (modulated).

Adjust L7 then L2 core for maximum output. Repeat whole procedure until there is no further improvement.

M.W. (L.F. RANGE). Set selector to middle position. Set tuner to 560 metres tracking mark. Inject 533 Kc/s. signal (modulated). Adjust C19 then C5 for maximum output. Set to 400 metres tracking mark.

Inject 743 Kc/s. signal (modulated).

Adjust L6 then L3 core for maximum output. Repeat procedure until there is no further improvement.

L.W. Set selector switch to fully anti-clockwise position. Set to 1,400 metres tracking mark. Inject 210 Kc/s. signal (modulated). Adjust L5 then L4 core for maximum output. Set to 1,200 metres.

Inject 250 Kc/s. signal (modulated). Adjust C2 for maximum output. Repeat procedure as before.

NOTE : For models with three M.W. tuners, correctly set the selector switch then adjust the H.F. and L.F. units as given in the foregoing M.W. (H.F.) and M.W. (L.F.) alignment.

To set up the remaining unit, set selector to fully anti-clockwise position. Set tuner to 400 metres tracking mark. Inject 743 Kc/s. signal (modulated). Adjust C39 then C37 capacitors for maximum output. Set tuner to 270 metres. Inject 1,090 Kc/s. signal (modulated). Adjust core L18 then L19 for maximum output. Repeat until no further improvement is obtained.

AERIAL TRIMMER. The aerial trimmer C7 will compensate over a range 50 to 200pf, this being the capacity of the aerial (including lead and plugs). To adjust the trimmer, receiver should be tuned to a weak signal at about 330 metres. (910 Kc/s.) on the H.F. range and the trimmer adjusted for maximum output. Adjustment should always be made at the time of installation and in cases where either the aerial or aerial lead has been changed.

CHASSIS REMOVAL CR152/F.

- (a) Remove control knobs.
- (b) Remove two securing nuts, then the front escutcheon.
- (c) Remove four countersunk screws to release small inner escutcheon.
- (d) Remove two 4BA screws now exposed, thus freeing the front chassis.
- (e) Remove screws located at top and bottom of case (rear) to release the back plate and rear of chassis.
- (f) Slide chassis and back plate out of the case.

Note: To remove back plate and expose valve bases remove four retaining screws and if necessary unscrew and remove cable securing cleat.

OTHER TYPES.

- (a) Remove two 4BA screws from sides of case.
- (b) Slide chassis and front plate out of case.

VOLTAGE AND CURRENT DATA.

Receiver tuned to 290 metres and no signal input. All voltages and currents measured on AVO Model 7, 1000 volt and 0.01A ranges respectively unless otherwise indicated. Voltage readings taken with respect to chassis with battery voltage 13.5v at fuse holder.

| VALVE | ANODE | | SCREEN | | CATHODE | |
|----------|--------|------------|--------|-----|------------|------------|
| | Volts | mA | Volts | mA | Volts | mA |
| V1 | 172 | 6.64 | 94 | 2.0 | — | — |
| V2 Mixer | 243 | 2.1 | 53 | 2.7 | — | — |
| V2 Osc. | 109 | 4.35 | — | — | — | — |
| V3 | 243 | 3.35 | 53 | 1.0 | — | — |
| V4 | 132 | 0.68 | — | — | 1.5(10V) | — |
| V5 | 262 | 21.5(0.1A) | 243 | 3.9 | 11.9(100V) | 25.4(0.1A) |
| V6 | 328 AC | — | — | — | 286 | 53.0(0.1A) |

H.T. measured at output socket on Vibrator Unit.
H.T.1. 280 volts. H.T.2. 243 volts.

VALVE BASE DATA.

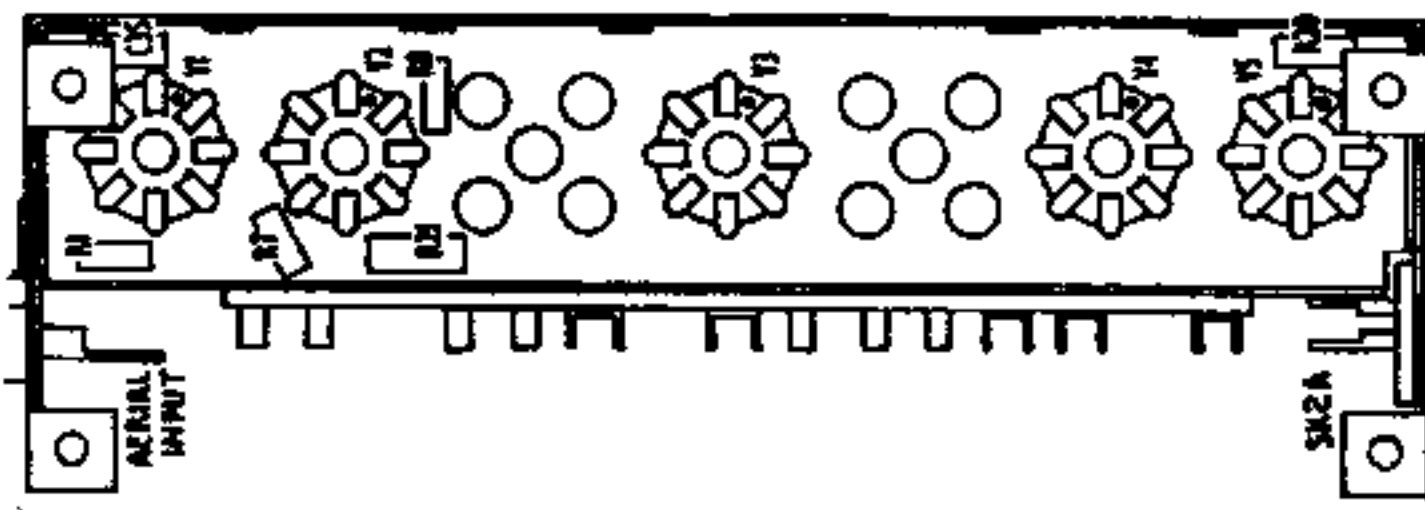
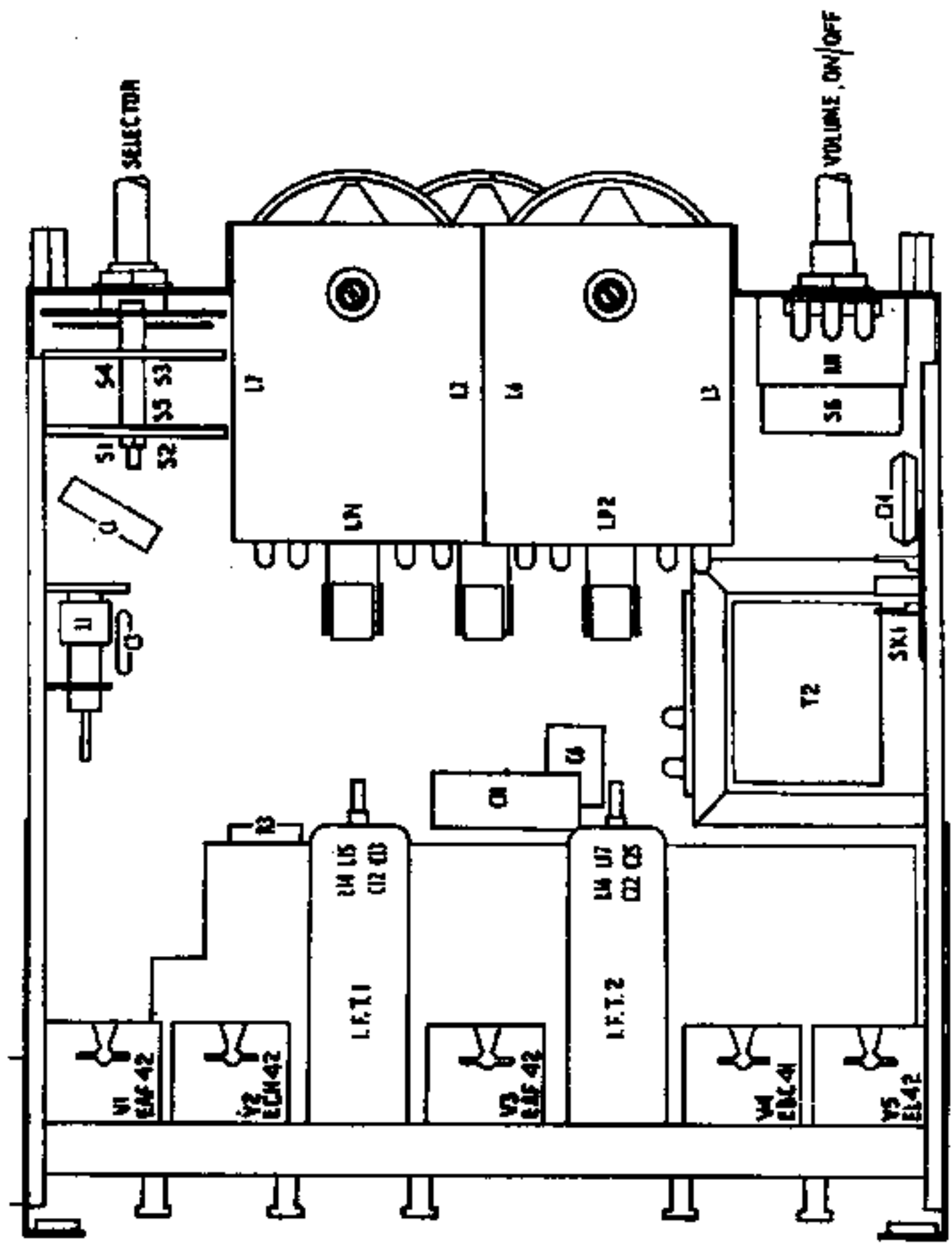
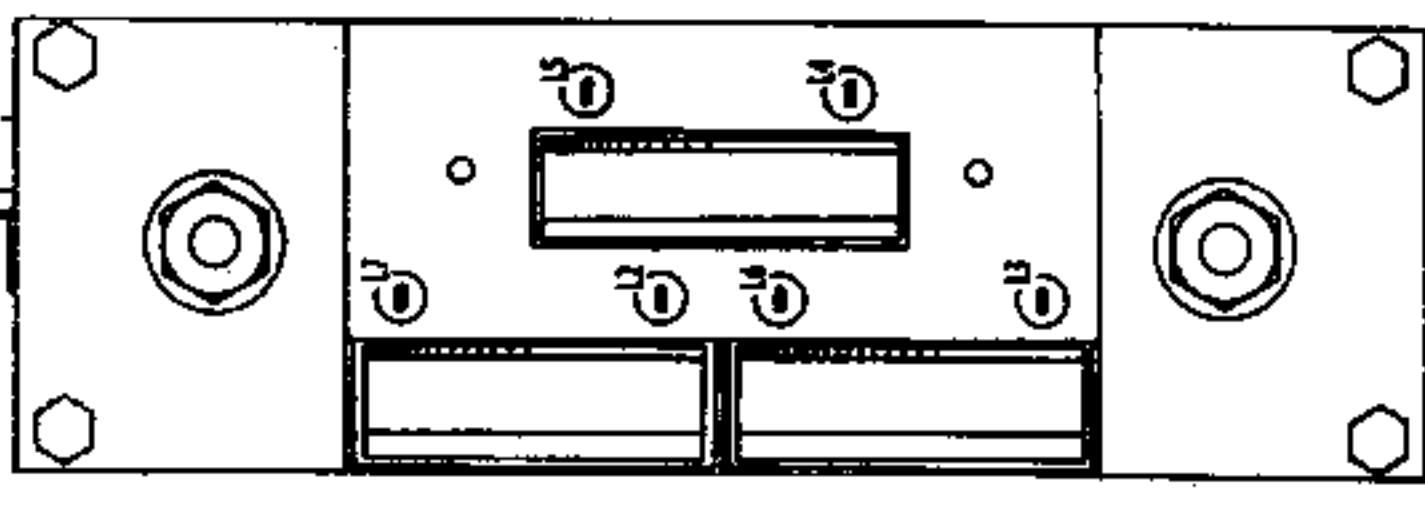
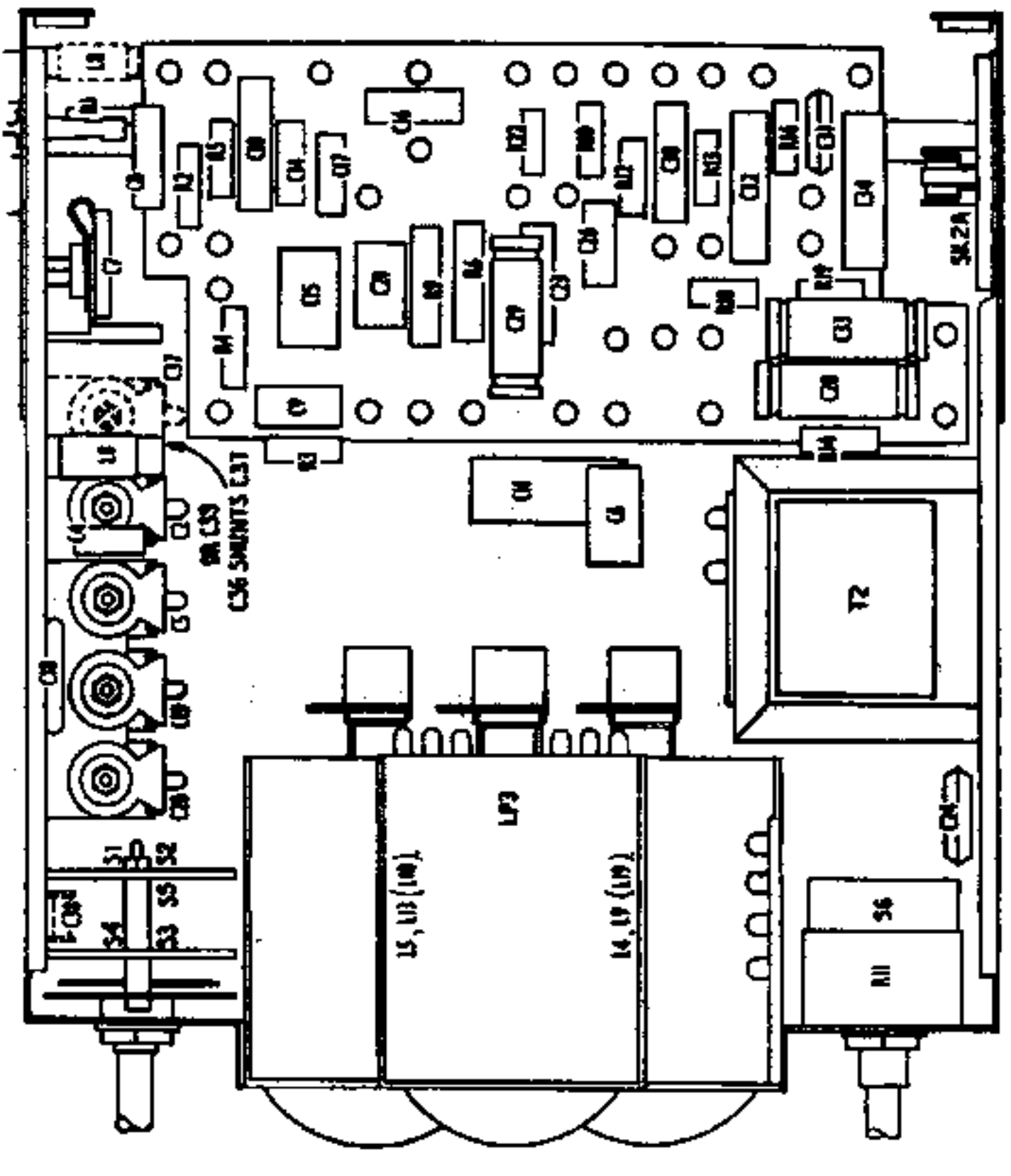
| VALVE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------|---|---|-----|----|----|----|-----|---|
| EAF42 | H | A | D | G3 | G2 | G1 | K | H |
| ECH42 | H | A | AT | GT | SG | G1 | K | H |
| EBC41 | H | A | G1 | S | D2 | D1 | K | H |
| EL42 | H | A | G3K | — | G2 | G1 | G3K | H |
| EZ41 | H | A | — | — | — | A2 | K | H |

Valveholder tags are numbered clockwise from the key when viewed from underneath. Bases B8A.

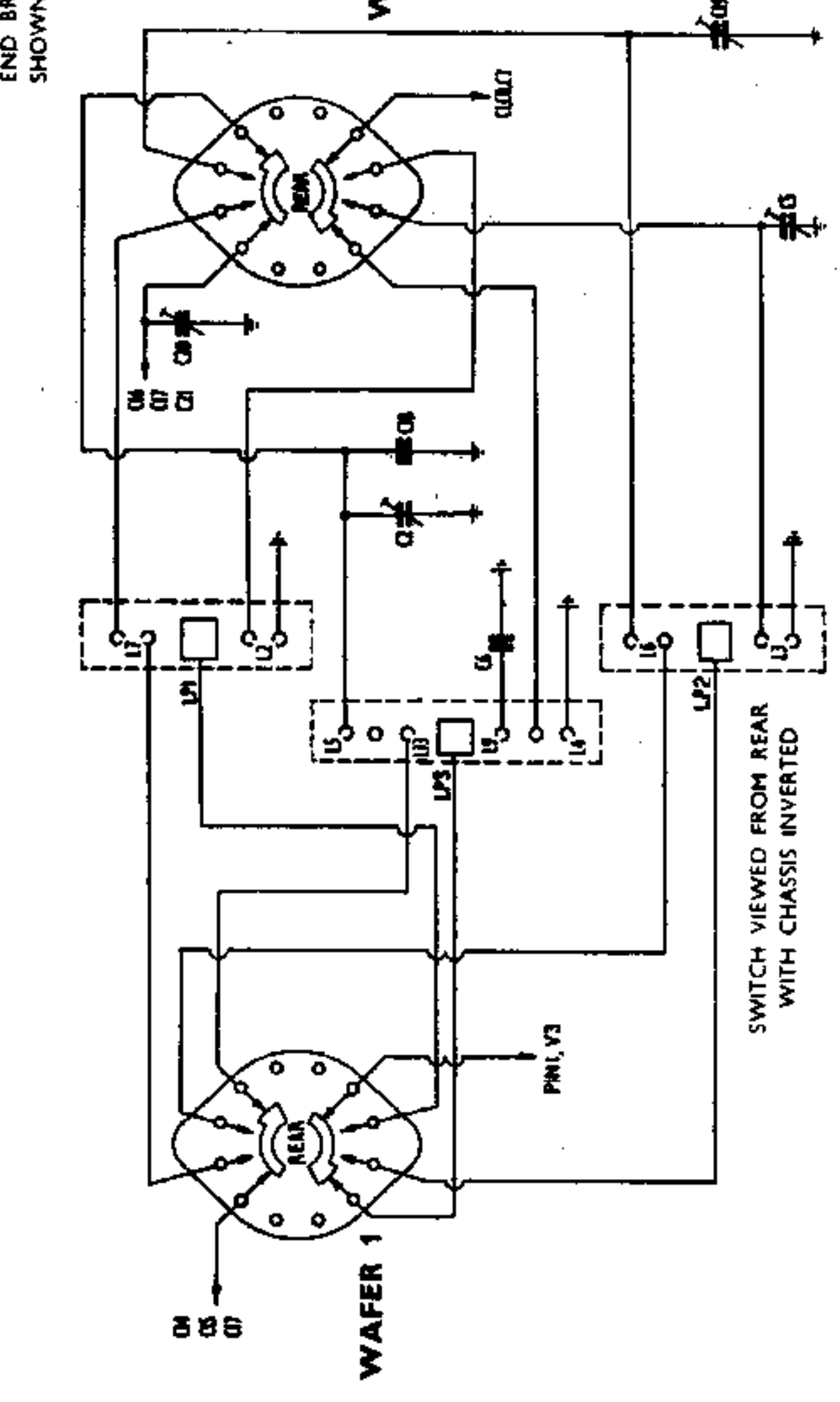
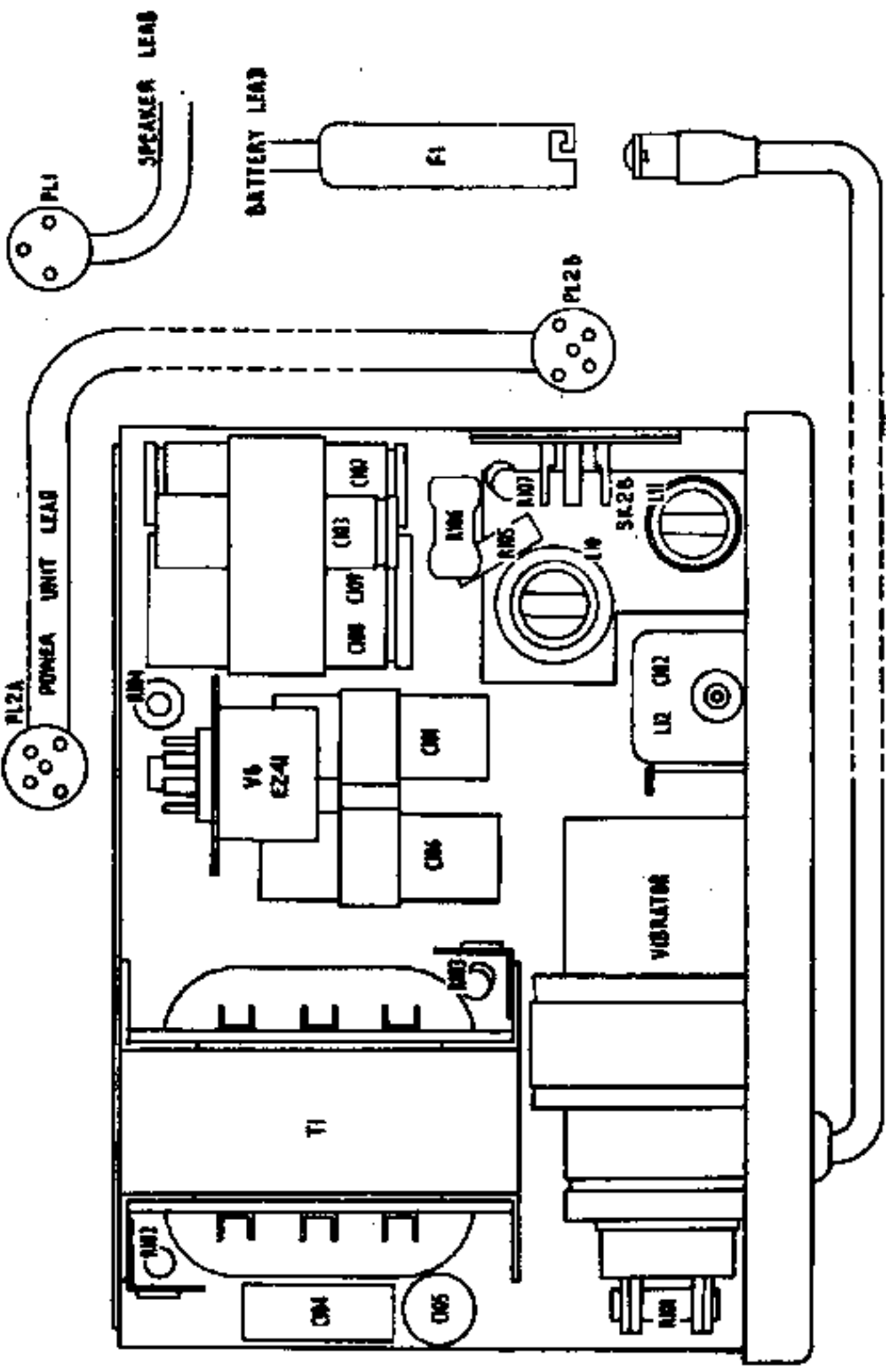
RESISTANCE OF WINDINGS.

| Winding | Ohms | Winding | Ohms |
|---------|-------------|---------|-------------|
| L1 | 24 | L12 | 0.03 |
| L2 | 8.7 | L13 | 8.5 |
| L3 | 11 | L14 | 14.65 |
| L4 | 30.3 | L15 | 14.65 |
| L5 | 4.75 | L16 | 14.65 |
| L6 | 9.25 | L17 | 14.65 |
| L7 | 5.8 | T1 PRI | 0.56 + 0.65 |
| L8 | *2.7 or 1.9 | T1 SEC. | 330 + 520 |
| L9 | 6.6 | T2 PRI. | 604 |
| L10 | 0.06 | T2 SEC. | 0.22 |
| L11 | 0.03 | — | — |

*2.7 ohms for coils wound on former 15/16 in. long.
1.9 ohms for coils wound on former 11/16 in. long.



END BRACKETS AND RAISED AERIAL SOCKET SHOWN ARE FOR SPECIAL FORD MODELS



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