



EKCO BPT333 and FERRANTI PT1010 transistor portables

THE printed circuit chassis has six transistors and a crystal diode. Output is 200mW via a 5 in. speaker, and coverage is given of both m.w. and l.w. bands. The on-off switch is plunger-operated by the lid, a friction support holding the lid open at any desired angle up to 80 degrees. The two models are identical.

CIRCUIT DETAILS

All transistors operate in the common emitter configuration and the frequency changer V1 operates also in the common base mode as a local oscillator. The average power gain of each stage is approx. 30dB.

C1 with its trimmer C2 tunes the m.w. coil L1. Switch S2 effectively short circuits the l.w. coil L2 via C10, C28, to prevent absorption. The oscillator signal is generated by collector-emitter feedback via L5, L6, the exact frequency being determined by L7, C9, C3 and C4. On the l.w. band, S2 connects C10, C28, across L7.

V2 and V3 are i.f. amplifiers. The first stage is neutralised by C13, R7, and the second stage by C19, R12. Although the values are critical, they should not normally need altering after replacing V2 or V3.

V4 is the detector and is specially selected from normal batches and is coded with a black spot. R28, R14/R15 form the d.c. load for V4 which is initially forward-biased (by R5, R9, and the load) to approx. 0.07V to improve performance at low

input signal levels. C18 is an i.f. bypass and R28, C27, is an extra i.f. filter.

The rectified voltage developed across the volume control is filtered by R9, C15, and fed as a.g.c. bias to the V2 base to reduce its collector current and thus its stage gain. V4 circuit is decoupled from the audio stages by R20, C22.

V5 is an audio amplifier, the output of which is transformer coupled to the Class B push-pull output stage V6, V7. The d.c. operating conditions of the matched pair are fixed by R22, R23, R24, so that the transistors pass a small current in the quiescent state, thus minimising crossover distortion. R24 prevents "thermal runaway" of V6, V7, at high ambient temperatures. R25 provides additional d.c. stability.

Negative feedback is applied via R27, R16, from T2 secondary to V5 input circuit. R26, C25, prevent spurious oscillations at very high audio frequencies. C26 decouples the internal resistance of the battery.

ALIGNMENT

I.F.: Turn volume control to maximum. Connect low range output meter across speaker tags. Switch receiver to m.w. and tune to a signal-free spot around 700 kc/s. Inject a 470 kc/s signal via 0.1µF capacitor in each lead to L1, between tap and earthy end. Adjust input level to give output not exceeding 50mW. Trim L12, L10 and L8 for maximum output, repeating as necessary for optimum results.

R.F.: Signals should be injected via a transmitting loop placed about 12 in. from, and coaxial with, the aerial coils. The loop can be made up in the form of a coil 4 in. in diameter x 2½ in. deep, wound on an air-cored former with 20 turns of 20 SWG copper enamelled wire fully spaced.

With gang fully meshed, check that pointer is coincident with a point ¼ in. from the left side of scale backing plate to correspond with datum line on scale. Trim L7 at 800 kc/s (1½ in. from datum line) and C4 at 1,500 kc/s (2½ in.). Repeat as necessary, rocking gang.

Switch to l.w., trim C28 and L2 at 200 kc/s (1½ in.). Then recheck m.w. adjustment.



RELEASE DATE AND ORIGINAL PRICE

Ekco BPT333 and Ferranti
PT1010: June, 1958. 20 gns.
(£16 13s. 10d., plus tax)

SERVICING NOTES

Removal of Chassis

Remove two screws securing lid stay to lid, detach lid by removing screws securing hinges to case. Remove two 6BA screws thus exposed under each hinge and release slotted screw through base of cabinet. Withdraw chassis and speaker escutcheon as complete unit.

Remove three nuts (two at front, one at rear) securing chassis to escutcheon, then remove self-tapping screw adjacent to on-off switch. Chassis may then be withdrawn to extent of speaker leads, which should be unsoldered to allow access to chassis components.

Drive Cord Replacement

Remove chassis. Remove scale backing plate by withdrawing two self-tapping screws in flanged edge. Tie cord to one end of tensioning spring, pass it over drive drum, then once round drive spindle. Loop once round pointer carriage, pass over idler pulley at left side of scale and, taking cord over drive drum, tie to tensioning spring, maintaining tension so that spring expands about ¼ in. Replace backing plate and position pointer to coincide with a point ¼ in. from left side of scale backing plate with gang fully meshed.

SERVICE SNAPS

EKCO BPT333

Transistors: One XA102, XB103, two XA101, two XC101 (matched pair).

Germanium Diode: CG12E (black spot).

Thermistor: VA1039.

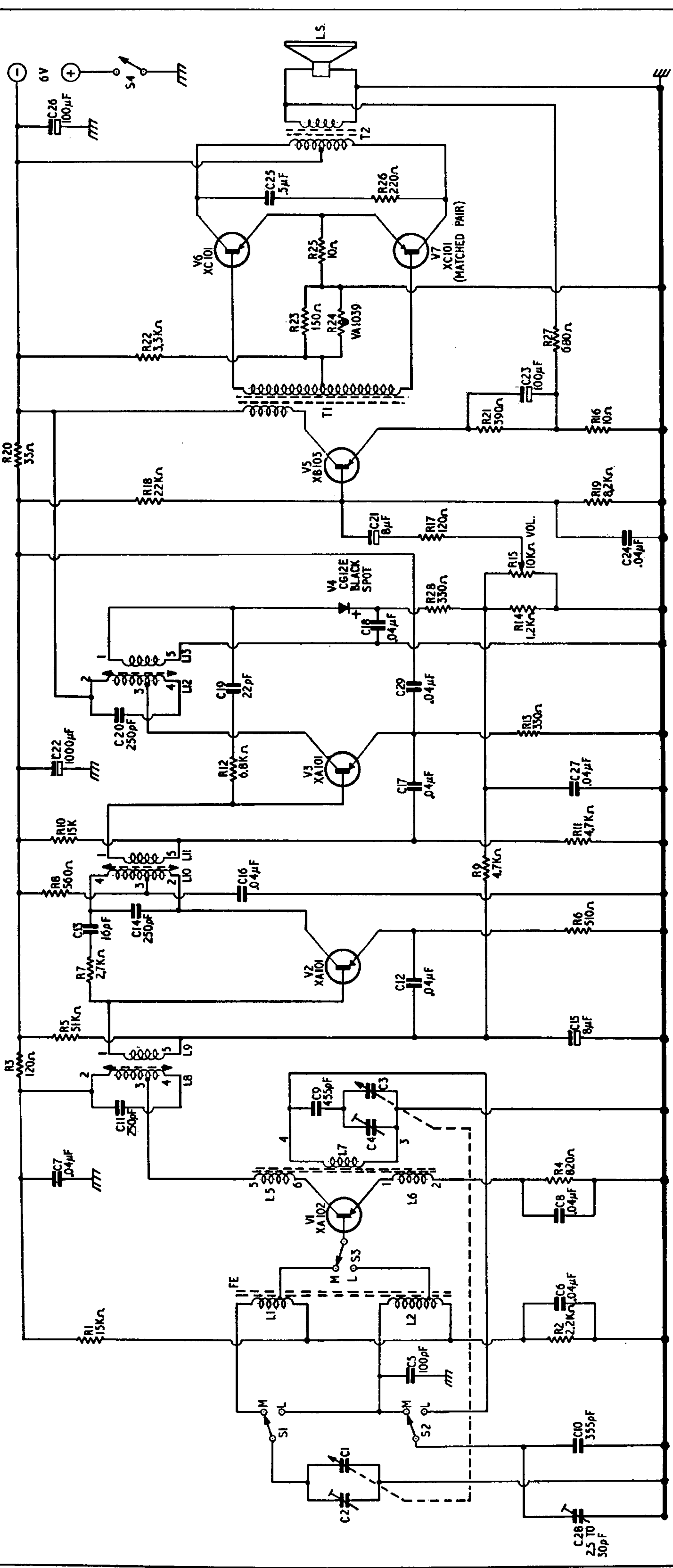
Electrolytics: Two 8µF, 6V; two 100µF, 6V; one 1,000µF, 6V.

I.F.: 470 kc/s.

Volume Control: 10kΩ.

Wavebands: 185-555m. M.W.; 1,090-1,930m. L.W.

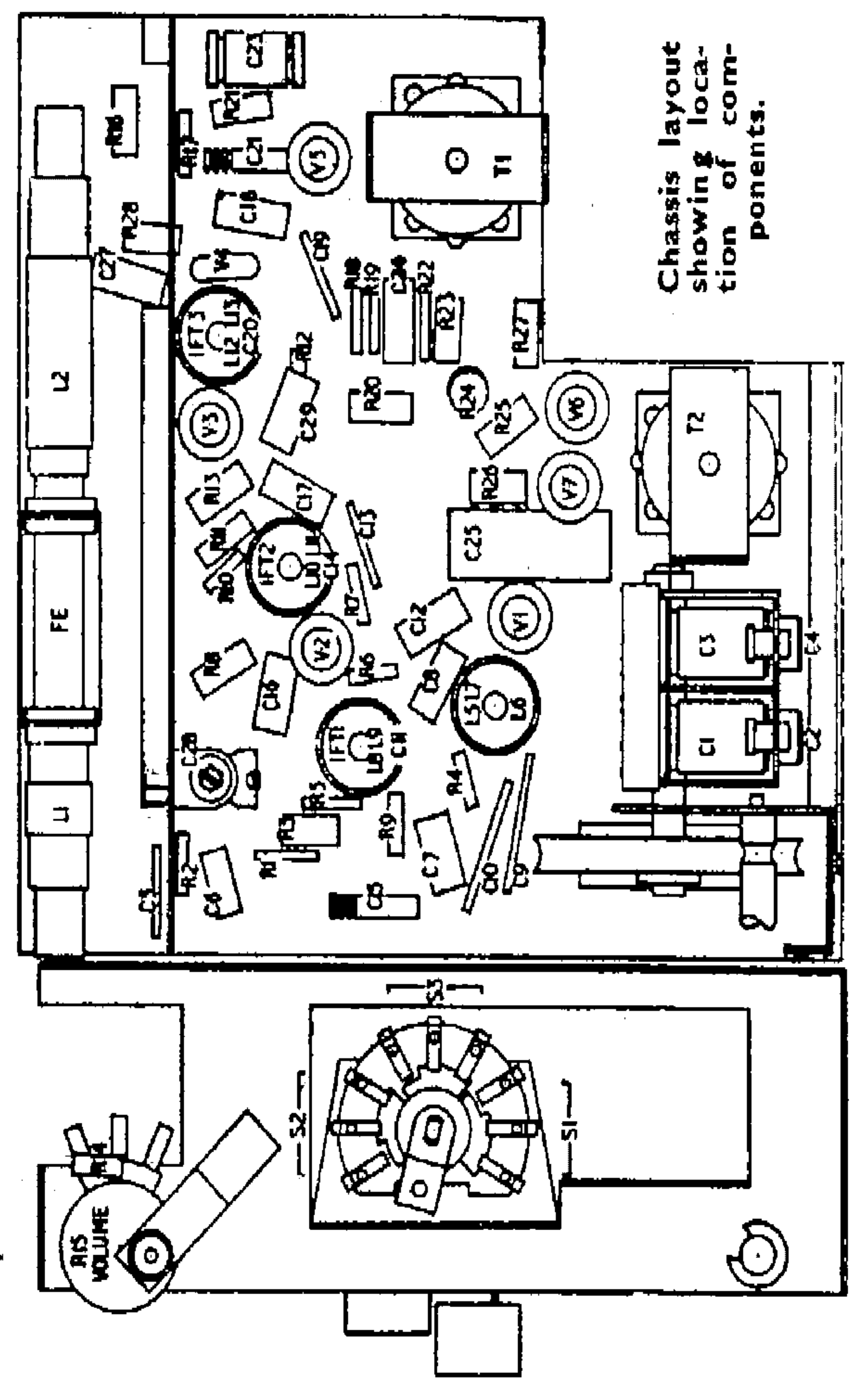
Battery: 6V (Ever Ready PP1, Vidor T6001, or equivalent).



CIRCUIT DIFFERENCES

In some receivers, one or more of the following divergencies may exist. These modifications should not be carried out unless required by local circumstances.

- (1) C16 ~~is~~ be connected between R8 and C12/~~to~~ function, L9 may be shunted by a 820 resistor. The battery leads may not be screened.
 - (2) The positions of C22 and C26 have been changed during manufacture.
 - (3) Copper foil may be inserted beneath the aerial support bracket and the aluminium screen.
- The following modifications have been made to overcome distortion at low volume levels. Later receivers have been modified but trouble on earlier chassis may be remedied as follows:
- (1) C29 and C24 should be added (both 0.04µF, 150V). Check that R28 is 330Ω and R27 is 680Ω.
 - (2) If a 0.003µF capacitor is connected across the T1 primary or if a 0.001µF



Chassis layout showing location of components.

capacitor is connected from collector to base of V5 these should be removed.

(3) The leads to the volume control should be tightly twisted. This is best done by withdrawing the control from the support bracket and turning it bodily then refitting in the bracket.

(4) It may be necessary to check alignment after modification.

VOLTAGES AND CURRENTS

Transistor	Emitter V	Collector	
		V	mA
V1	-0.5	-5.7	-0.6*
V2	-0.32	-5.2	-0.6
V3	-1.02	-5.83	-3.0
V5	-1.215	-5.7	-3.0
V6	-0.041	-6.0	-2.0
V7	-0.041	-6.0	-2.0

* In the non-oscillating condition. While oscillating, collector current varies from 0.7 to 0.85mA (m.w.) or 0.72 to 0.77mA (l.w.). The forward bias on the diode V4: 0.07V.