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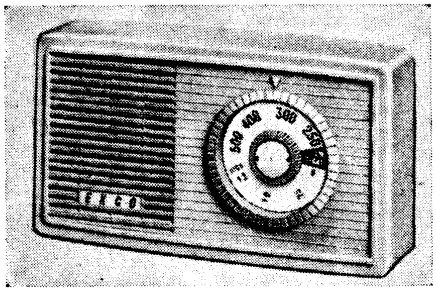
"TRADER" SERVICE SHEET

1514

EKCO PT352

A Pocket Portable 9V Transistor Receiver



Appearance of the Ekco PT352

SIX transistors and one crystal diode are employed in the Ekco PT352 which is a pocket portable radio receiver. Using an internal ferrite rod aerial, it covers M.W. and the B.B.C. Light programme on L.W.

The waveband range is 190-490m (M.W.) and 1,500m (L.W. pre-set). The receiver, which is constructed on a printed circuit panel, together with its single 9v battery, are housed in a moulded plastics case which measures 6½in long by 3⅝in high by 1¾in deep.

A choice of colours is provided, and a carrying case is available at a cost of 12s 6d.

Release date and original price: August 1960, £10 6s 8d. *Purchase tax extra.*

Transistor Table

Transistor		Emitter (V)	Base (V)	Collector (V)
VT1	OC44	1·2	1·2	7·2
VT2	OC45	0·6	0·7	7·2
VT3	OC45	0·9	1·0	7·5
VT4	OC78D	1·3	1·3	8·5
VT5	OC78	—	0·2	8·8
VT6	OC78	—	0·2	8·8

TRANSISTOR ANALYSIS

Transistor voltages shown in the table, (col. 1) are derived from information supplied by the manufacturer. They were measured on a 20,000Ω/V meter with the positive terminal connected to the common positive line (outer perimeter foil) in every case. The receiver was tuned to about 700 kc/s and the volume control was set at minimum.

CIRCUIT DESCRIPTION

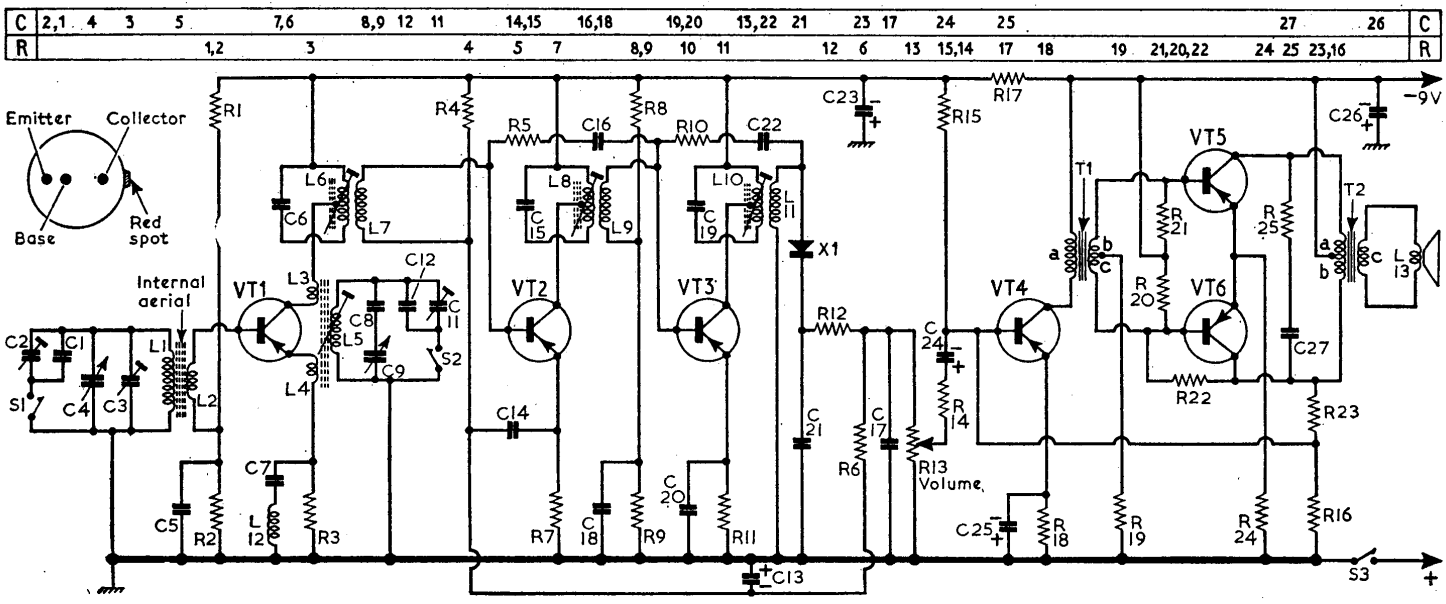
Aerial coil **L1** is tuned by **C3** and **C4** on M.W. and **C1** and **C2** are switched (*Continued col. 1 overleaf*)

COMPONENT VALUES & LOCATIONS

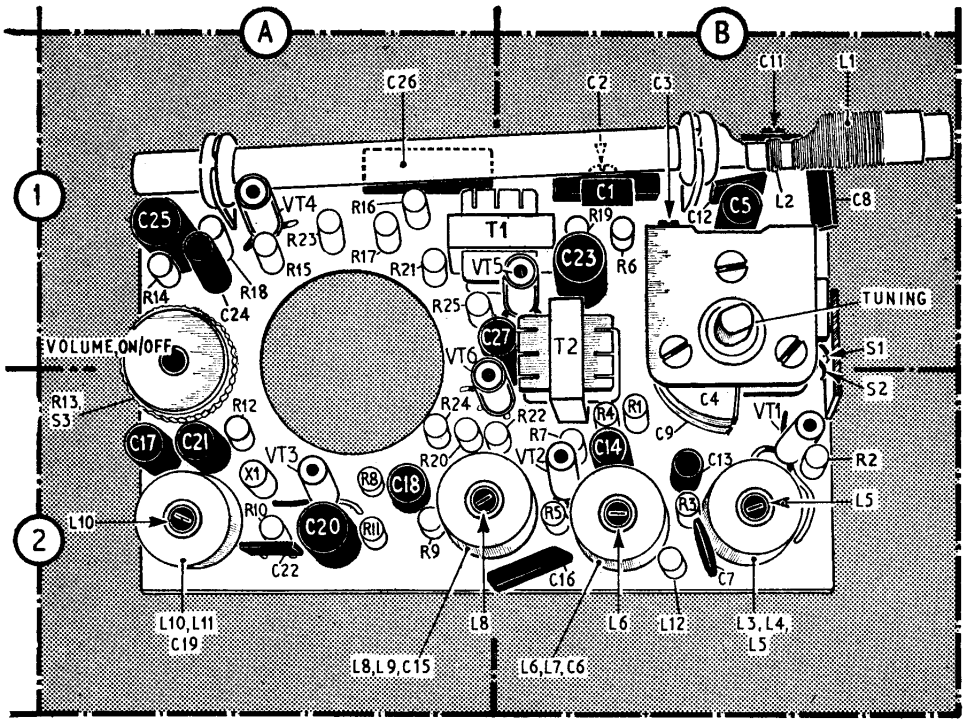
Coils*		
L1	1·7	B1
L2	—	B1
L3	4·4	B2
L4	4·4	B2
L5	—	B2
L6	5·5	B2
L7	—	B2
L8	5·5	A2
L9	—	A2
L10	5·5	A2
L11	—	A2
L12	—	B2
L13	3·0	—
Resistors		
R1	56kΩ	B2
R2	10kΩ	B2
R3	3·6kΩ	B2
R4	68kΩ	B2
R5	1·2kΩ	B2
R6	8·2kΩ	B1
R7	680Ω	B2
R8	22kΩ	A2
R9	4·7kΩ	A2
R10	3·9kΩ	A2
R11	1kΩ	A2
R12	470Ω	A2
R13	5kΩ	A2
R14	1kΩ	A1
R15	39kΩ	A1
R16	12kΩ	A1
R17	680Ω	A1
R18	560Ω	A1
R19	56Ω	B1
R20	15kΩ	A2
R21	7·5kΩ	A1
R22	15kΩ	B2
R23	1MΩ	A1
R24	4·7Ω	A2
R25	150Ω	A1
Capacitors		
C1	1500pF	B1
C2	250pF	B1
C3	15pF	B1
C4	153pF	B2
C5	0·04μF	B1
C6	250pF	B2
C7	0·01μF	B2
C8	200pF	B1
C9	15pF	B2
C10	—	†
C11	80pF	B1
C12	150pF	B1
C13	8μF	B2
C14	0·04μF	B2
C15	250pF	A2
C16	56pF	B2
C17	0·04μF	A2
C18	0·04μF	A2
C19	250pF	A2
C20	0·1μF	A2
C21	0·04μF	A2
C22	18pF	A2
C23	50μF	B1
C24	8μF	A1
C25	100μF	A1
C26	50μF	A1
C27	0·04μF	B1
Transformers*		
T1 a	170·0	B1
T1 b	35·0	
T1 c	35·0	
T2 a	9·8	B1
T2 b	9·8	
T2 c	—	
Miscellaneous		
X1	OA70	A2

**Approximate D.C. resistance in ohms.*
†No component.

If component numbers in these tables are used when ordering spare parts, dealers are requested to mention the fact on the order, as these numbers may differ from those used by the manufacturers in their service manual.



Circuit diagram of the Ekco PT352. The receiver has a panel on which component numbers are printed. These numbers have therefore been used in our diagram. A key is provided above it.



View of the front or component side of the printed circuit panel. In location B1 the ferrite rod aerial is shown partly cut away to reveal the adjusting screw of **C11.**

Circuit Description—*continued*

in parallel for the reception of 1,500m on L.W. **VT1** operates as a local oscillator-mixer and receives its bias from the potential divider **R1, R2.** Oscillator coil **L5** is tuned by **C8** and **C9** on M.W. On 1,500m (L.W.) **C11** and **C12** are switched in parallel by **S2.** Feedback from collector to emitter is provided by coupling coils **L3** and **L4.**

The 470 kc/s intermediate frequency which is produced in **VT1** collector is transformer coupled via **L6** and **L7** to **VT2. VT1** collector is connected to a tapping on **L6** for the purpose of output impedance matching.

I.F. Stages

The signal receives two stages of amplification at intermediate frequency by **VT2** and **VT3,** which are coupled by transformer **L8, L9,** and operate as first and second I.F. amplifiers respectively. Amplified output from **VT3** is applied via **L10, L11** to the detector diode **X1.**

Detector Stage

X1 receives a slight forward bias from the potential dividing network **R4, R6** and **R13** to increase its sensitivity at low input levels. Rectified audio output from **X1** is developed across load resistor and volume control **R12.** Positive D.C. potential across **R13** due to diode current is fed via **R6** to **VT2** as A.G.C. bias. **C13** is the A.G.C. bypass capacitor.

Audio Stage

Audio signals are taken from the volume control slider via electrolytic coupling capacitor **C24** to audio amplifier **VT4.** The output from **VT4** drives the push-pull output stage using phase-splitting transformer **T1.** Speech coil **L13** is fed from the output transistors **VT5** and **VT6** by transformer **T2. R25** and **C27** prevent oscillations in the output stage at spurious frequencies. A measure of feedback is applied from **R16** to the base of **VT4** in the correct phase to provide negative feedback.

CIRCUIT ALIGNMENT

Equipment Required.—An A.M. signal generator modulated 30 per cent; an output watt meter; an aerial coupling coil comprising 200 turns of 20 S.W.G. enamelled copper wire wound to a length of $2\frac{1}{8}$ inches on a 4in diameter former; two 0.1μF capacitors and a narrow-bladed screwdriver-type trimming tool.

1.—Connect the output meter across the speech coil connections. Connect the signal generator with a 0.1μF capacitor in each lead across coupling coil **L2** (location reference B1). Turn the volume control clockwise to its maximum position.

2.—Tune the receiver to a quiet spot about 430m. Feed in a modulated 470 kc/s signal and adjust **L10, L8** (A2) and **L6** (B2) for maximum output, regulating the input level so that the output does not exceed 50 mW. Repeat until no further improvement can be obtained.

3.—Disconnect the signal generator and connect the aerial coupling coil across its output leads. Place the coupling coil about 12 inches from the receiver, coaxial with the ferrite rod aerial. Fully mesh the tuning gang and check that the pointer on the case is in line with the centre of the "M" on the tuning scale.

4.—Tune receiver to 428m. Feed in a modulated 700 kc/s signal and adjust **L5** (B2) and **L1** (B1) for maximum output. Note: **L1** is sealed at the factory and should not be disturbed unless it is obviously necessary.

5.—Tune receiver to 250m. Feed in a modulated 1,200kc/s signal and adjust **C3** (B1) for maximum output at the same time rocking the tuning capacitor about 250m to prevent "pulling."

6.—Rotate the tuning scale fully anti-clockwise (L.W.). Feed in a 200 kc/s signal and adjust **C11** and **C2** (B2) for maximum output.

SERVICE NOTES

The manufacturers make a number of recommendations for the benefit of service engineers when servicing transitorized receivers. They are as follows: do not disconnect a base or emitter circuit component with the receiver operating, nor shunt any such component by a low resistance.

Transistors should be removed from the circuit before making continuity tests to associated coils or transformers.

Do not use multirange meters on ohms ranges which employ an internal battery voltage greater than 1.5V while other transistors are in circuit.

When mains or battery operated test instruments are used they should be connected via an isolating capacitor. Suitable capacitors would be 50μF 12V type for A.F. purposes and 0.1μF 150V type for I.F. or R.F. purposes.

GENERAL NOTES

Dismantling. — Unscrew coin-slotted screw in receiver rear and remove rear section of case.

Disconnect and remove battery. Unscrew brass centre of tuning knob using a suitable two-pronged tool.

Pull off small tuning knob and felt washer.

Rotate the tuning knob spindle so that the two "flats" on the spindle circumference align with the "flats" on the tuning scale spindle. When these "flats" are not in line the brass part of the inner spindle may be seen through the hole in the centre of the tuning scale, but the brass disappears from view when the scale is turned to its withdrawal position.

(Before replacing the scale, it is necessary to ensure once more that the "flats" are in line.)

Pull off tuning scale and felt washer.

Take out three fixing screws thus revealed, withdraw chassis from the rear and unsolder speaker leads.

Battery.—Ever Ready PP4, 9V is recommended by the makers or any equivalent. It fits into a small compartment moulded in the receiver case.

Switches.—**S1** and **S2** switch the receiver from M.W. to the preset L.W. station at 1,500m. They are constructed as an integral part of the tuning gang unit and are closed when the tuning scale is rotated to its maximum anti-clockwise position. **S1** and **S2** are shown in the plan view diagram in location reference B2. **S3** is the battery on/off switch and is ganged with the volume control.

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