

"TRADER" SERVICE SHEET
1577

ROBERTS

Two-Band Seven Transistor Portable

SUB-UNIT assembly incorporating three printed circuit panels is a feature of the Roberts RT8 portable radio receiver. Three separate units comprising r.f., i.f. and audio sections are secured to the control panel which is also the chassis frame. It is housed in a cabinet of wood, covered in rexine material, which is fitted with a swivel base for easy rotation.

Operating normally from an internal ferrite rod aerial the receiver has a total complement of seven transistors and three diodes, and covers Medium (184-570m) and Long (1,132-2,000m) wavebands.

Two external sockets are fitted to provide output to a tape recorder and connection of a car-type aerial. Operating power is obtained from a 9V large capacity battery.

Release date and original price: Sept. 1962 £17 18s 6d including battery. Carrying case £1 12s 2d. Purchase tax extra.

CIRCUIT DESCRIPTION

The circuit is positively driven and chassis is connected to battery negative

via R21. VT1 operates as a self oscillating mixer and r.f. signals are applied to its base from L1 via coupling coil L2 and capacitor C2 (m.w.) and from L5 via L4 and C2 (l.w.).

Signals from the external aerial socket are coupled to the ferrite rod via L3. The variable gang capacitor CV1 is connected across the appropriate aerial coil by the action of S1 and S2. D.c. base bias for VT1 is established by the potential divider, R1, R2 in conjunction with R5. Local heterodyne signals are generated by feedback from collector to emitter and are tuned to the correct frequency by the oscillatory circuit comprising T1, CV5, R3 and the oscillator tuning gang section CV6 on m.w. and T1, CV4, C3 and CV6 on l.w.

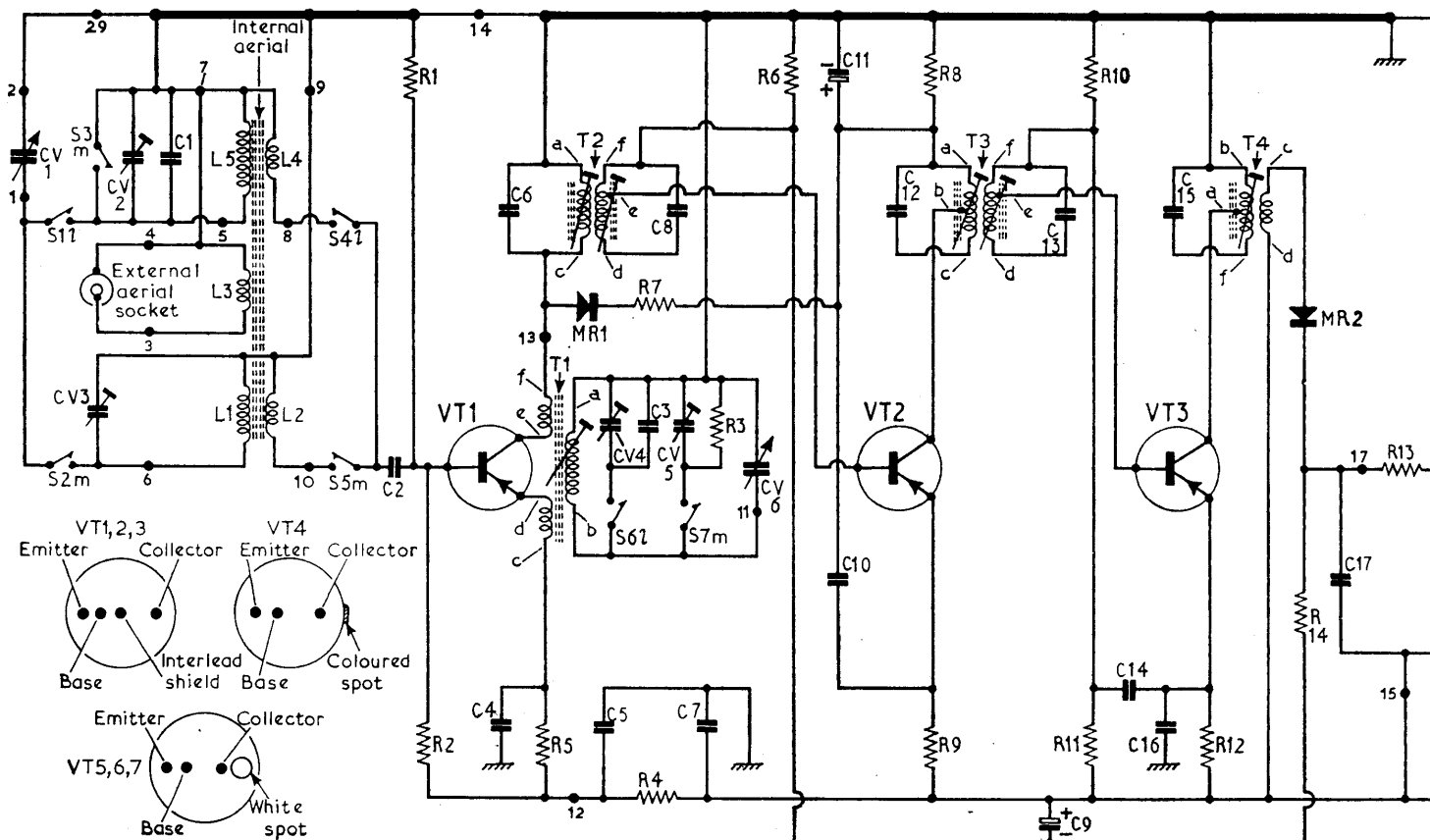
I.f. signals present in VT1 collector circuit are at 470kc/s and are selected by the primary of T2. From the secondary of T2 they are applied to the base of the first i.f. amplifier VT2. Following amplification by VT2 and VT3 at intermediate frequency the signals are then fed to the detector diode MR2. I.f. coupling transformers T2, T3 and T4 are

suitably tapped to match the transistor input and output impedances.

The rectified positive d.c. component developed across R13 and RV1 varies with signal input and is fed via R14 back to the base of VT2 as a.g.c. Further a.g.c. on strong signals is provided by the action of MR1 in conjunction with R7. In weak signal conditions MR1 is reverse biased by VT1 collector voltage and the volts drop across R8, and is, therefore, equivalent to a high resistance connected effectively across the primary of T2. On strong signals, VT2 collector current falls as a result of normal a.g.c. action thus reducing the potential across R8 to the point where MR1 cathode becomes more negative than its anode, making it conductive. In this condition R7 is shunted across T2 primary heavily damping VT1 output.

Audio signals developed across the volume control RV1 are amplified by VT4 and then coupled to the driver VT5. S8 in conjunction with C20 is the tone control. Phase-splitting transformer T5 is connected in VT5 collector circuit and from its centre-tapped secondary,

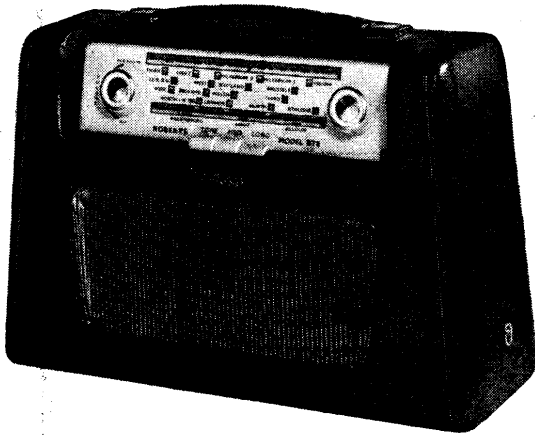
C	CV1, CV3, CV2, 1	2	4, 6	5, CV4, 3, 8, CV5, 7	CV6	11, 10	12	9, 13	14	15, 16	17
R		1, 2	5	7, 4	3	6	8, 9	10, 11	12	14	15



Circuit diagram of the RT8. MR1 provides additional a.g.c. on strong signals, MR3 com,

RT8

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Appearance of
the Roberts RT8 transistor portable receiver

voltages of equal and opposite amplitude are fed to the bases of the output pair VT6 and VT7. The speech coil L6 is driven via the output transformer T6. MR3 with RV2 is a base bias compensating device to prevent cross-over distortion with low ambient temperature.

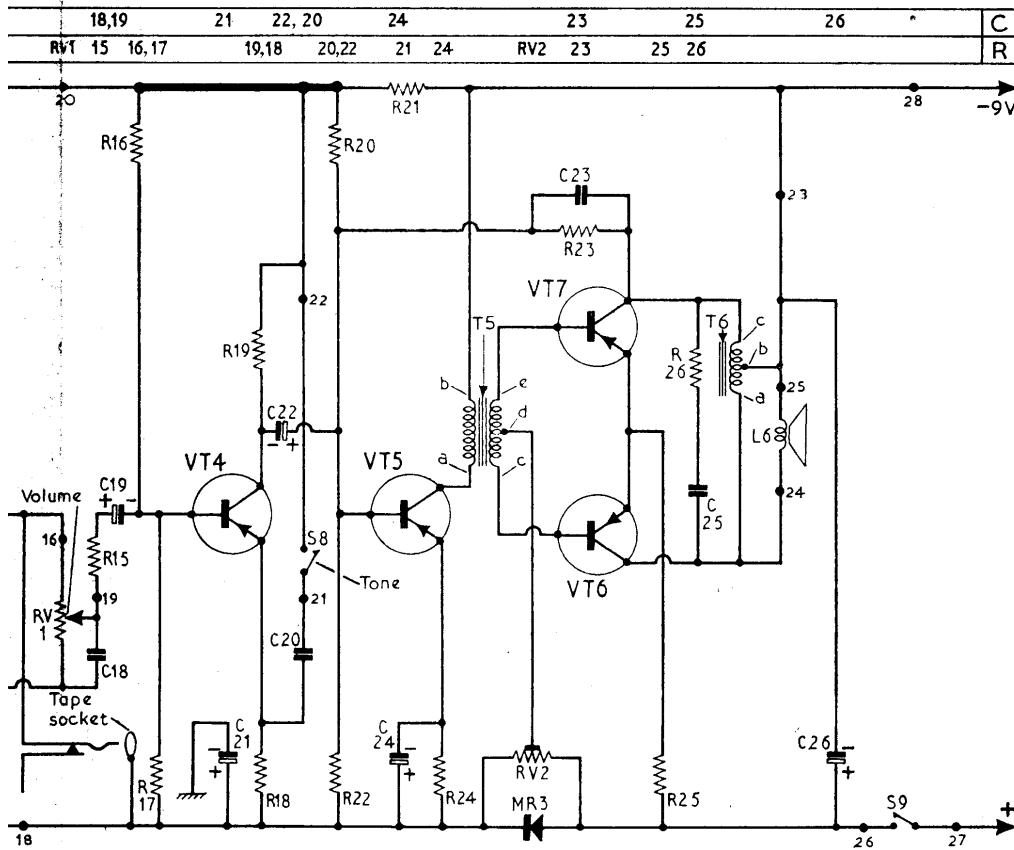
TRANSISTOR ANALYSIS

Instead of the usual voltage readings measured at transistor electrodes, the manufacturers' supply voltage readings which were taken at salient points in the circuit. These indicate correct emitter or collector currents of the associated transistors and were measured on a model 8 Avometer with no signal input. The receiver was switched to m.w. with the volume control set at minimum output.

Voltages are as follows:

- Measured across R4, 0.12V.
 - Measured across R5, 1.10V.
 - Measured across R8, 2.20V.
 - Measured across R9, 0.58V.
 - Measured across R12, 1.00V.
 - Measured across R18, 0.32V.
 - Measured across R19, 3.00V.
 - Measured across C21, 7.20V.
 - Measured across MR3, 0.20V.
 - Measured across R24, 1.70V.
 - Measured across R25, 0.28V.
- The total quiescent current should be 16.5mA.

(Continued overleaf, Col. 1)



compensates the output base bias for changes in temperature

Transistors

VT1, VT2, VT3	AF117
VT4	OC71
VT5	OC81D
VT6, VT7	OC81

Resistors

R1	33kΩ	G4
R2	6.8kΩ	G4
R3	180kΩ	G4
R4	100Ω	F3
R5	1kΩ	G4
R6	68kΩ	H6
R7	560Ω	H6
R8	2.2kΩ	H6
R9	560Ω	H6
R10	22kΩ	H7
R11	4.7kΩ	H7
R12	1kΩ	H7
R13	330Ω	E3
R14	8.2kΩ	H7
R15	2.2kΩ	F3
R16	100kΩ	F3
R17	8.2kΩ	F3
R18	560Ω	F3
R19	4.7kΩ	F3
R20	27kΩ	F3
R21	330Ω	E3
R22	8.2kΩ	F3
R23	100kΩ	E3
R24	330Ω	E3
R25	5.6Ω	D3
R26	100Ω	D3
RV1	5kΩ	C1
RV2	100Ω	D3

Capacitors

C1	70pF	G4
C2	0.01μF	G4
C3	270pF	G4
C4	0.02μF	G4
C5	0.1μF	F3
C6	560pF	A2
C7	0.033μF	H6
C8	560pF	A2
C9	10μF	H6
C10	0.04μF	H6
C11	2μF	H7
C12	270pF	A2
C13	270pF	A2
C14	0.02μF	H7
C15	250pF	A2
C16	0.02μF	H7
C17	0.01μF	A2
C18	0.033μF	C1
C19	2μF	F3
C20	0.15μF	F3
C21	350μF	E3
C22	2μF	F3
C23	100pF	E3
C24	100μF	E3
C25	0.25μF	D3
C26	100μF	D3
CV1	—	A1
CV2	110pF	B1
CV3	40pF	B1
CV4	110pF	B1
CV5	40pF	B1
CV6	—	A1

Coils

L1	—	C1
L2	—	C1
L3	—	A1
L4	—	A1
L5	—	A1
L6	—	—

Transformers

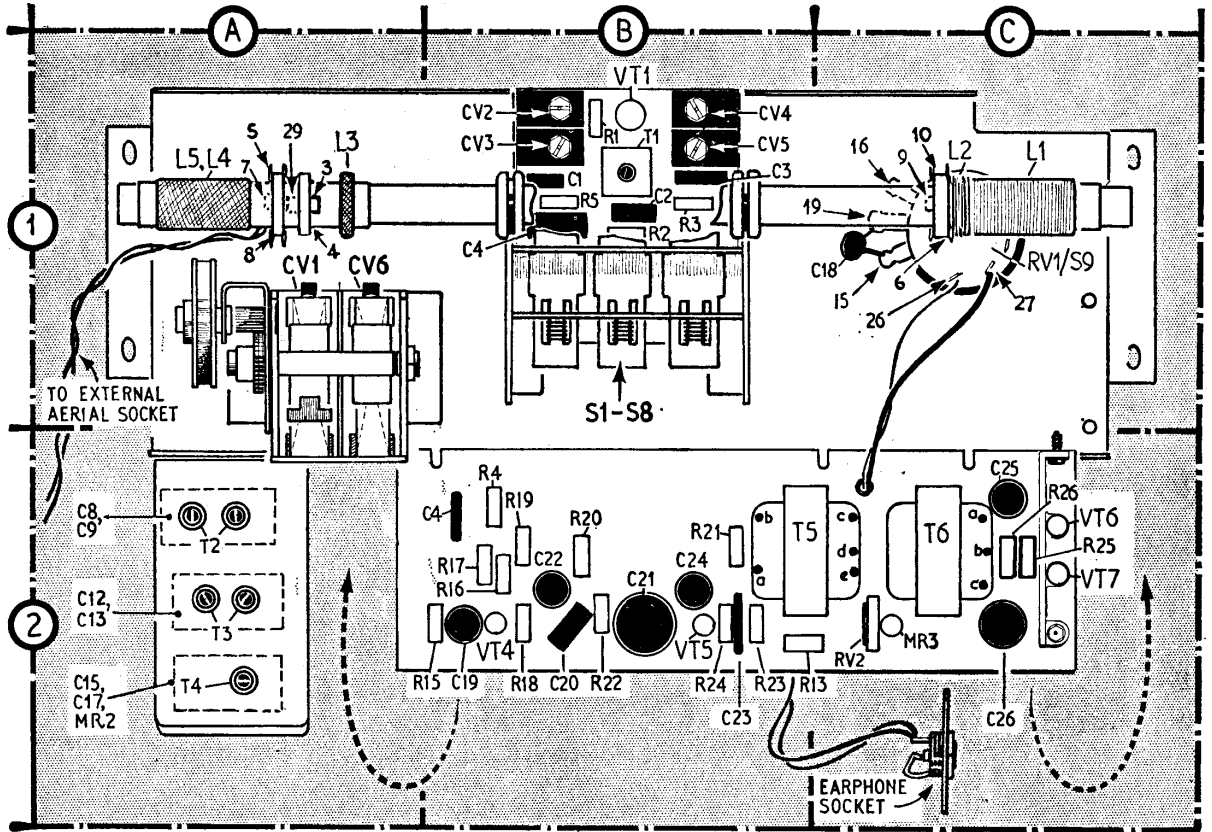
T1	—	B1
T2	—	A2
T3	—	A2
T4	—	A2
T5	{ a-b 100.0 c-d 36.0 c-d 36.0 }	E3
T6	{ c-b 0.8 a-b 0.8 }	D3

Miscellaneous

MR1	OA7	H6
MR2	OA90	A2
MR3	OC78*	D3
S1-S8	—	G5
S9	—	C1

*With collector/base diode s/c.
†Approximate D.C. resistance in ohms

The complete chassis viewed from the rear with the audio panel turned downwards from its normal horizontal position to illustrate the components mounted on it more clearly. Contacts of the waveband switches, which are on the reverse side of the unit from this angle, are soldered directly to the r.f. panel connections. A separate unit containing the i.f. amplifier stages is seen attached to the chassis below the tuning gang assembly



Continued from overleaf

CIRCUIT ALIGNMENT

Equipment Required.—An a.m. signal generator; an output meter of 20Ω impedance, or an a.c. voltmeter; an r.f. coupling coil and a narrow-bladed-type trimming tool.

During alignment the signal input should be kept as low as possible to prevent a.g.c. action.

All adjustments are made with the signal fed in via the coupling coil.

1.—Connect the output meter in place of the loudspeaker or connect the a.c. volt-

meter across the loudspeaker. Tune the receiver to a quiet spot at the h.f. end of the medium waveband.

2.—Feed in a 470kc/s modulated signal and adjust the cores of T2, T3 and T4 for maximum output.

3.—Fully mesh the tuning gang and check that the cursor lines up with the edge of the m.w. scale window at the l.f. end, allowing for backlash in the tuning drive.

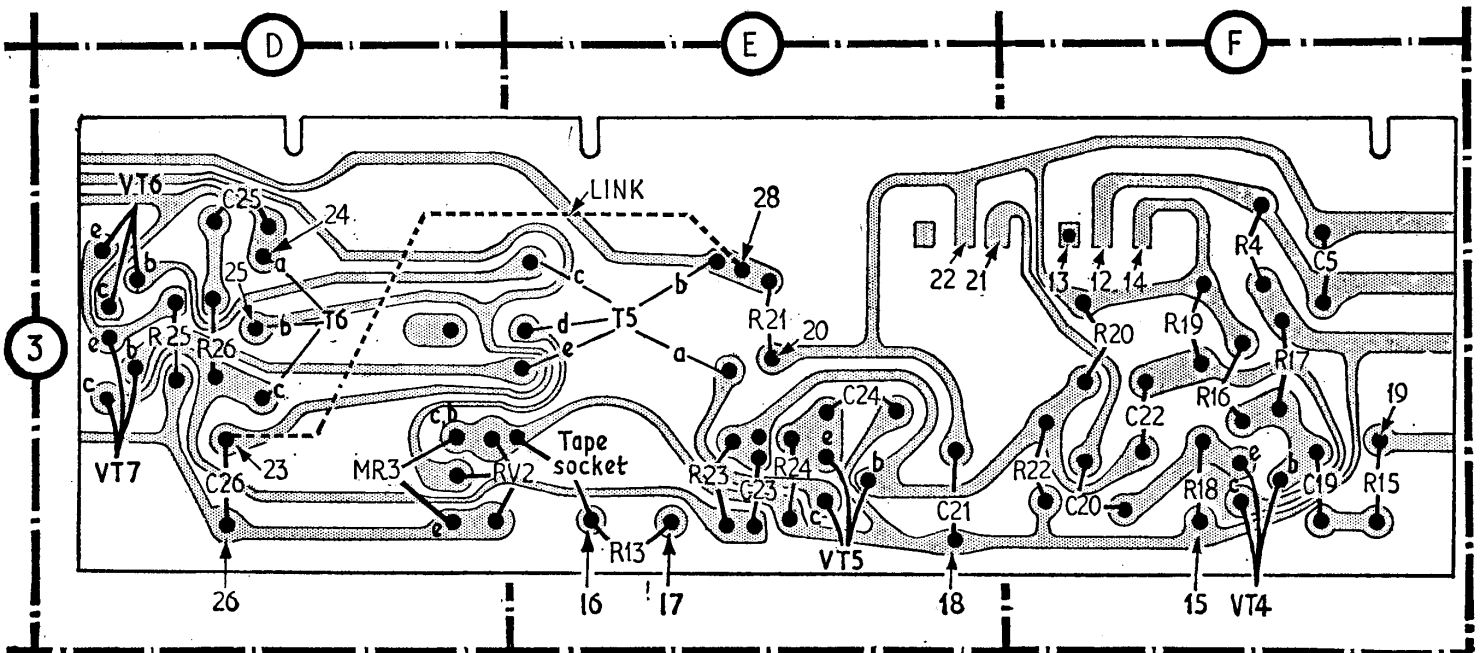
4.—Switch to m.w. and set the cursor at 191m (calibration mark on scale). Feed in a 1,570kc/s signal and adjust CV5 and CV3 for maximum output.

5.—Set the cursor to 484m (calibration mark on scale). Feed in a 620kc/s signal and adjust the core of T1, and L1 by sliding its former along the ferrite rod, for maximum output.

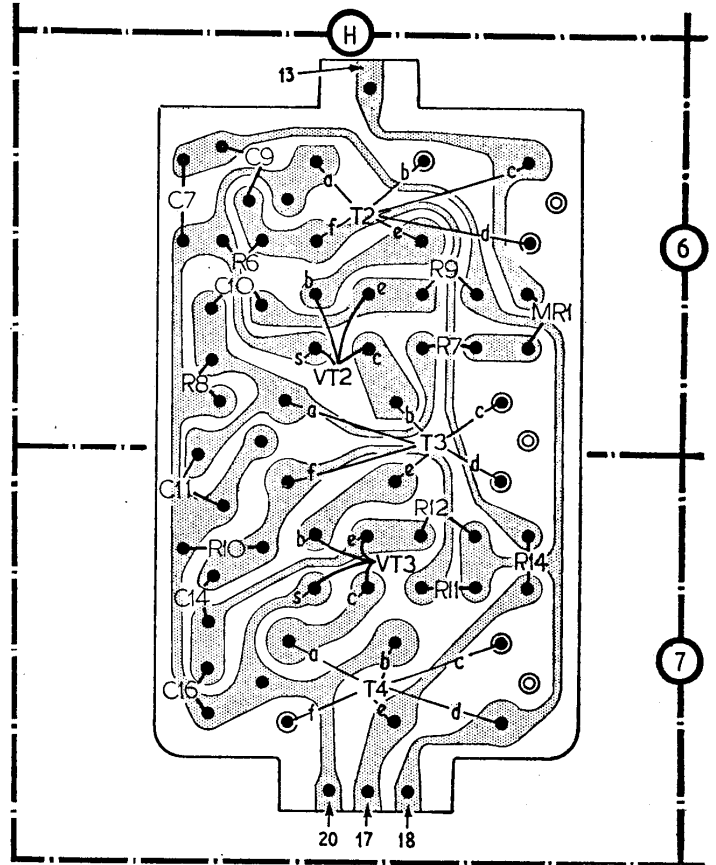
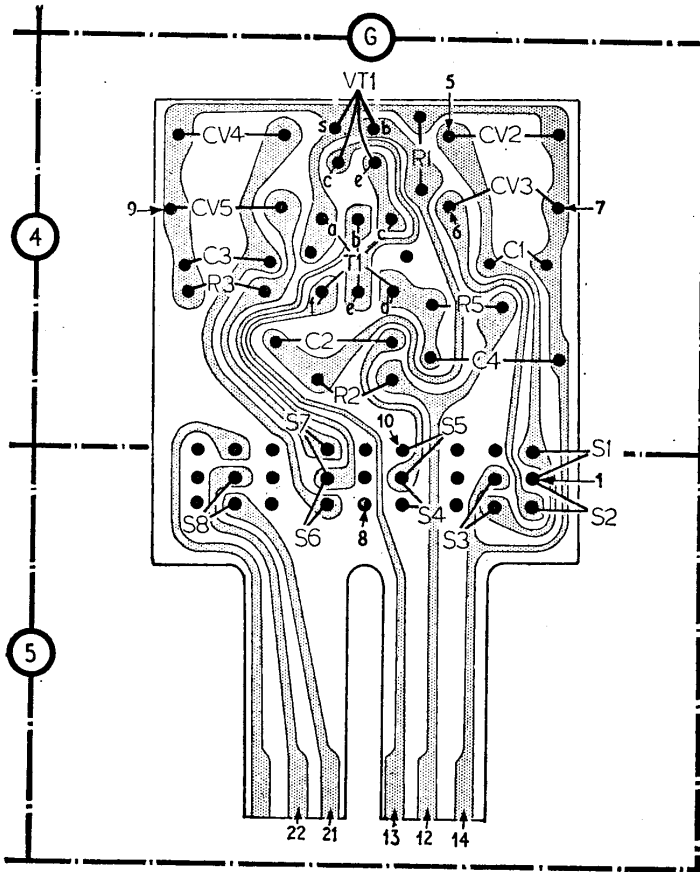
6.—Repeat operations 4 and 5 for optimum output with correct calibration.

7.—Switch receiver to l.w. and set the cursor to the 191m calibration mark on the m.w. scale. Feed in a 262kc/s signal and adjust CV4 and CV2 for maximum output.

8.—Set the cursor to 525m dot on m.w. scale. Feed in a 157kc/s signal and adjust L5 by sliding its former along



Foil side of audio panel with schematic drawing of component connections



Left: Reverse, or foil side of the r.f. panel. On the lower portion are the points which constitute connections made to the press-button switches, showing the switch numbers between the relevant points. Right: Foil side of the i.f. panel

the ferrite rod for maximum output.
9.—Repeat operations 7 and 8 for optimum results.

GENERAL NOTES

Dismantling.—To remove the chassis from its cabinet first remove the two front control knobs (grub screws).

Next place the receiver face down on the bench, open the back and unplug and remove the battery.

Release the tape recorder socket panel by undoing two 4BA nuts and unsolder the leads from the external aerial socket.

Undo four 4BA nuts (two at each end)

securing the control panel to the cabinet. The chassis can now be lifted out to the extent of the speaker leads.

When servicing the printed panels the usual precautions should be taken against the use of excessive heat or pressure.

RV2 Adjustment.—This pre-set control is correctly set in manufacture and should not require re-adjustment unless replacements are fitted for **VT6** and **VT7** or **MR3**. It should be adjusted to give a quiescent output stage collector current of 5mA at 20 deg C (68 deg F).

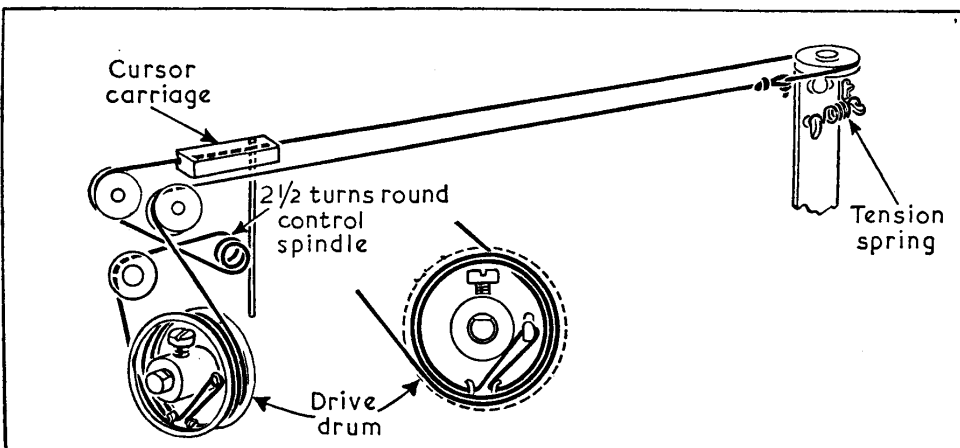
Switches.—**S1-S7** are the waveband switches which with the tone switch **S8**

are combined in a press-button unit shown in location reference G5. On the circuit diagram the switch numbers carry a suffix letter *m* or *l* to indicate the waveband on which they close.

S9 is the battery on/off switch which is ganged to the volume control.

Battery.—9V Ever-Ready PP10.

ADDITIONAL NOTES AND MODIFICATIONS



Scale drive cord assembly as seen from the rear with the tuning gang fully closed.