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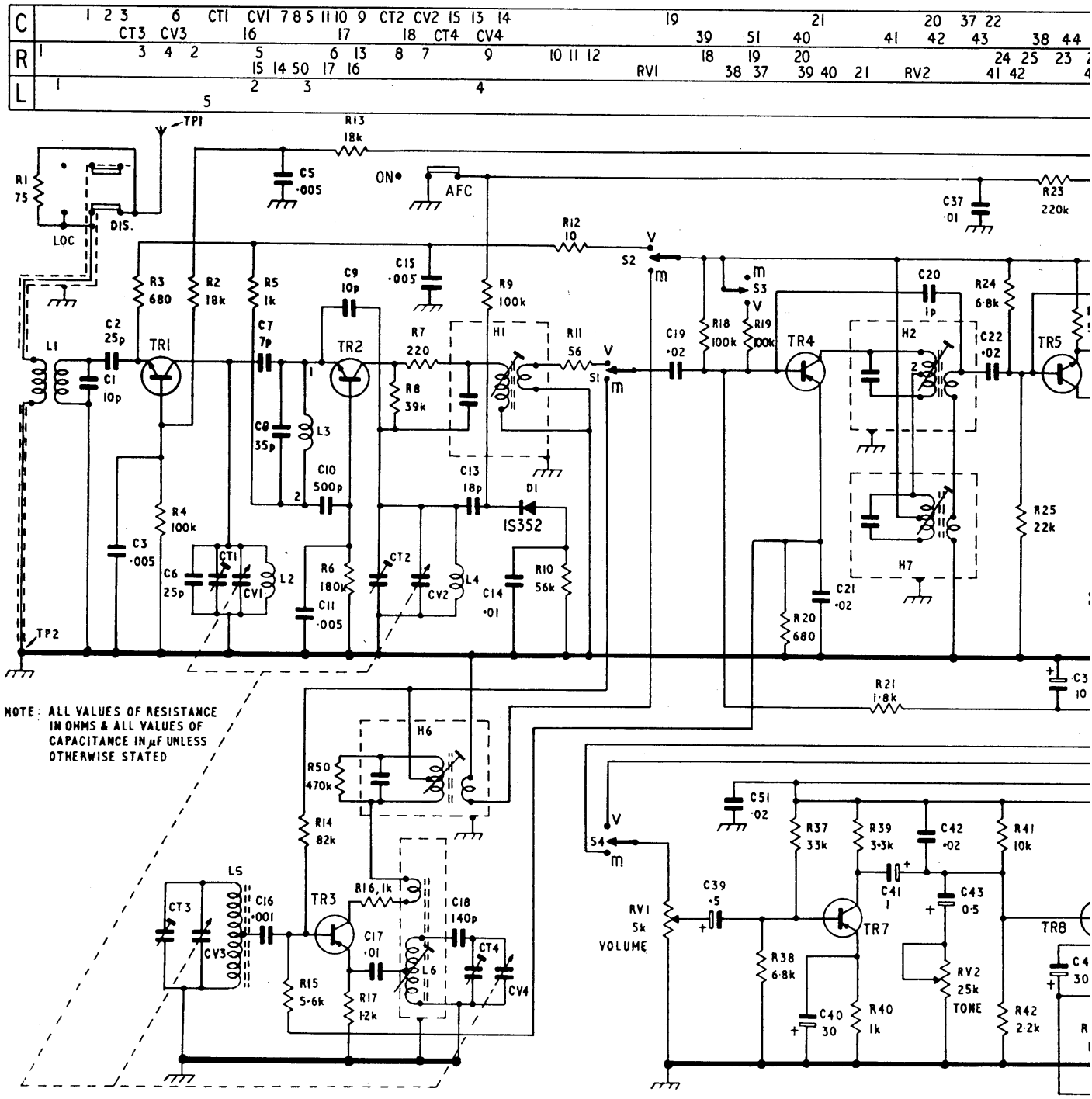
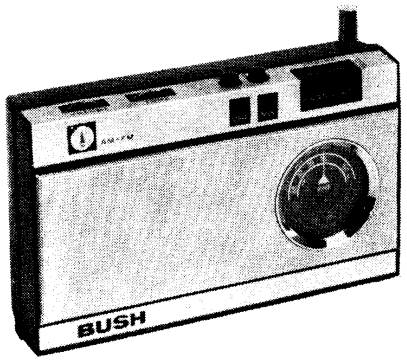
Trader
Service
Sheet

Bush VTR 125

1923

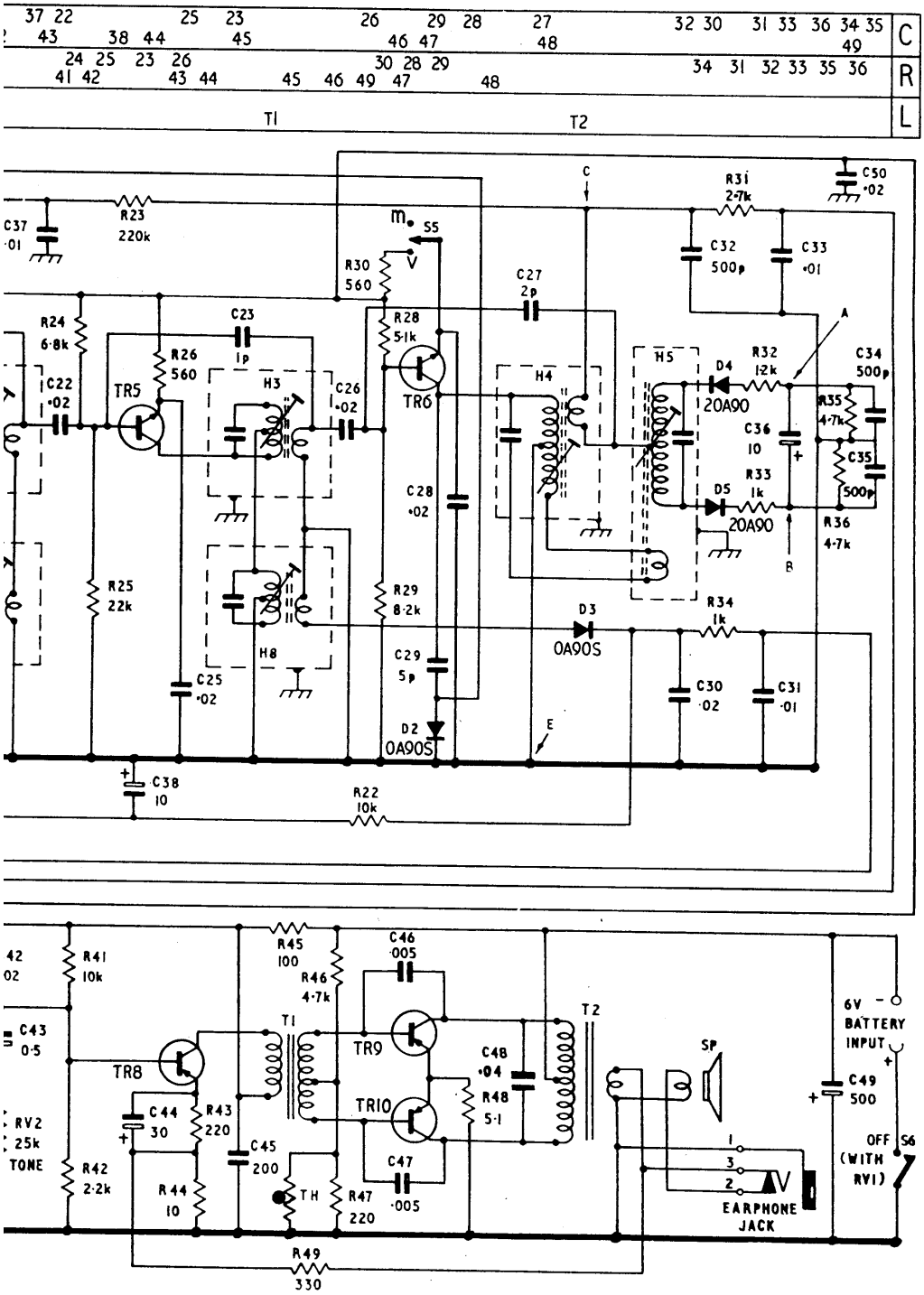
Battery operated portable a.m./f.m. radio receiver





Left: Threequarter view of the Bush VTR 125.

Below: Circuit diagram of the Bush VTR 125. Except for the transistors component numbers correspond with those used in the manufacturer's service manual.



Introduction

Bush model VTR 125 is a battery operated a.m./f.m. portable radio receiver incorporating ten transistors and five semi-conductor diodes.

Two wavebands only are covered: mw 1,620-505kHz (185-594m) and vhf/f.m. 87·5-104·5MHz, selection by press-button operated switch. It features on vhf; afc, a resistive attenuator (local/distant), both switched, agc to the rf amplifier, balanced ratio detector and a telescopic aerial. Reception on mw is via an internal ferrite rod aerial and the first stage (mixer/oscillator) is completely independent of the vhf tuner.

An audio output power of 300mW is handled by an 8Ω 3in diameter loudspeaker which is muted when an earphone jackplug is inserted in the normally closed jack provided for the connection of an earphone of 8Ω (or greater) impedance. An external loudspeaker of 8Ω impedance, or greater, or a tape recorder terminated in 8Ω may also be connected via this source if so desired.

Operating power is supplied by four 1·5V Ever Ready type HP7 cells (6V) or their equivalent type and the quiescent current is 10mA m.w.; 14mA v.h.f.

Transistor analysis

Transistor voltages quoted in the table overleaf were obtained from information supplied by the manufacturers. They are negative with respect to chassis, and were measured under quiescent conditions with the volume control at minimum, with a model 8 Avometer.

Circuit alignment (a.m.)

Equipment required.—An r.f. signal generator covering the range 100-2,000kHz, with provision for 30 per cent amplitude modulation at 400Hz; an audio output meter of 8Ω impedance to be used in place of the loudspeaker, or alternatively a model 8 Avometer switched to the 2·5V ac range and connected in parallel with the loudspeaker; an r.f. coupling coil and a non-inductive trimming tool. In order to avoid alignment error, the printed circuit panel should be installed in the case front in the normal operating position. Pre-set the volume and tone controls for maximum (fully anti-clockwise when viewed from the rear). Check that the battery is 6V on load and terminate the output meter in a miniature jackplug to facilitate connection to receiver. Allow the test equipment a warm-up period of approximately 15 minutes, and during the alignment procedure attenuate the signal generator output so that the audio output does not exceed 50mW thereby ensuring that the agc remains inoperative.

(Continued overleaf col. 1)

· PLEASE CUT OFF HERE—— ———

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Bush VTR 125

Continued from overleaf

1. – Connect, in the appropriate manner the output meter to be used, switch receiver to m.w. and tune to 185m on scale.

2. – Loosely couple r.f. coupling coil to ferrite rod aerial, all a.m., i.f. and r.f. signals are fed via this source, and feed in a 470kHz a.m. signal. Adjust **H6, H7** and **H8** in that order for maximum output and repeat in the same order until no further improvement can be obtained.

3. – Re-tune signal generator to 1,620kHz a.m. and adjust **CT4** for maximum output.

4. – Tune receiver to 500m on scale, feed in a 600kHz a.m. signal and adjust **L6** for maximum output.

5. – Repeat operations 3 and 4 for optimum output and tracking.

6. – Tune receiver to 214·3m on scale, feed in a 1,400kHz a.m. signal and adjust **CT3** for maximum output.

Transistor table

Transistor		A.M. Emitter (V)	Base (V)	Collector (V)	F.M. Emitter (V)	Base (V)	Collector (V)
TR1	2SC645B	—	—	—	4·45	3·7	0
TR2	2SC645A	—	—	—	3·85	1·95	0·25
TR3	2SA1028A	0·54	0·6	4·6	—	—	—
TR4	2SA104P	0·74	0·94	4·9	0·42	0·58	5·05
TR5	2SC829BB	4·5	3·4	0	4·8	3·6	0
TR6	2SC829BY	—	—	—	3·8	2·9	0
TR7	2SB175A	0·6	0·72	3·2	0·6	0·72	3·2
TR8	2SB175B	0·61	0·79	4·2	0·61	0·79	4·2
TR9	2SB475E	0·06	0·13	6·0	0·06	0·13	6·0
TR10	2SB475E	0·06	0·13	6·0	0·06	0·13	6·0

Component locations

Resistors

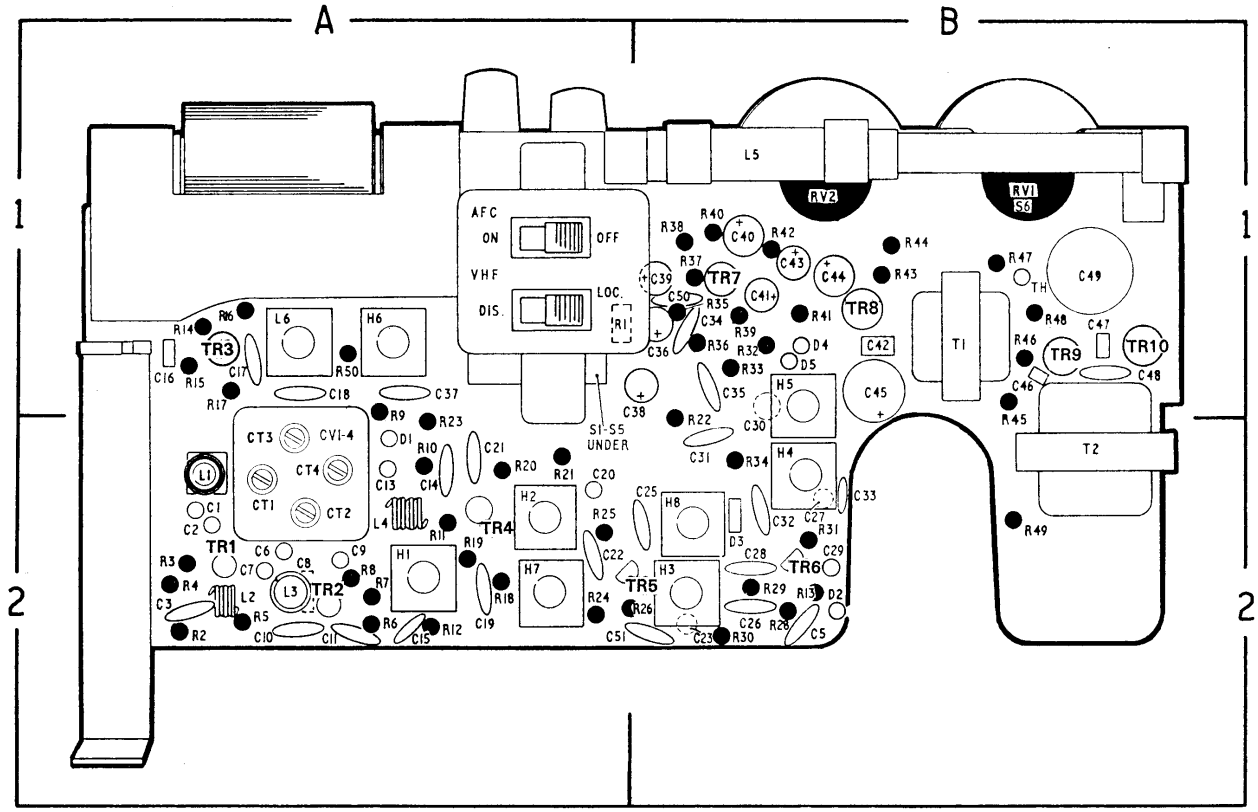
R1	A1	R16	A1	R34	B2
R2	A2	R17	A1	R35	B1
R3	A2	R18	A2	R36	B1
R4	A2	R19	A2	R37	B1
R5	A2	R20	A2	R38	B1
R6	A2	R21	A2	R39	B1
R7	A2	R22	B1	R40	B1
R8	A2	R23	A2	R41	B1
R9	A1	R24	A2	R42	B1
R10	A2	R25	A2	R43	B1
R11	A2	R26	B2	R44	B1
R12	A2	R28	B2	R45	B1
R13	B2	R29	B2	R46	B1
R14	A1	R30	B2	R47	B1
R15	A1	R31	B2	R48	B1
		R32	B1	R49	B2
		R33	B1	R50	A1

Capacitors

C1	A2	C18	A1	C36	B1	T1	B1
C2	A2	C19	A2	C37	A1	T2	B2
C3	A2	C20	A2	C38	B1		
C5	B2	C21	A2	C39	B1	**Inductors**	
C6	A2	C22	A2	C40	B1	L1	A2
C7	A2	C23	B2	C41	B1	L2	A2
C8	A2	C25	B2	C42	B1	L3	A2
C9	A2	C26	B2	C43	B1	L4	A2
C10	A2	C27	B2	C44	B1	L5	B1
C11	A2	C28	B2	C45	B1	L6	A1
C13	A2	C29	B2	C46	B1	H1	A2
C14	A2	C30	B2	C47	B1	H2	A2
C15	A2	C31	B2	C48	B1	H3	B2
C16	A1	C32	B2	C49	B1	H4	B2
C17	A1	C33	B2	C50	B1	H5	B1
		C34	B1	C51	B2	H6	A1
		C35	B1			H7	A2
						H8	B2

Miscellaneous

D1	A2
D2	B2
D3	B2
D4	B1
D5	B1
RV1	B1
RV2	B1
S1-5	A1
S6	B1
CT1-4	A2
CV1-4	A2



Component locations as viewed from component side of printed panel.

7. – Tune receiver to 500m on scale, feed in a 600kHz a.m. signal and adjust position of **L5** on ferrite rod for maximum output.

8. – Repeat operations 6 and 7 for optimum output and tracking.

Circuit alignment (f.m.)

Equipment required. – A v.h.f./f.m. signal generator, deviation ±22·5kHz; an electronic voltmeter with dc probe and an ac voltmeter or output meter as prescribed under a.m. alignment.

1. – Connect signal generator output between telescopic aerial and chassis, the electronic voltmeter (10V dc range) across **C36** – points A and B on circuit diagram – negative to A. Tune receiver to 104·5 MHz on scale and feed in at 100mV, a 10·7MHz f.m. signal.

6. – Tune receiver to 104MHz and feed in a 104MHz f.m. signal. Adjust **CT1** for maximum output.

7. – Tune receiver to 88MHz and feed in an 88MHz f.m. signal. Adjust **L2** for maximum output.

8. – Repeat operations 4 to 7 until no further improvement can be obtained.

Dismantling

To gain access to foil side of printed panel, first unscrew captive screw in the centre of, and securing rear of, case. Slide out earpiece socket, then remove hexagonal spacer and the four Phillips head screws located at each corner of circuit panel. The panel may now be removed to the extent of loudspeaker leads.

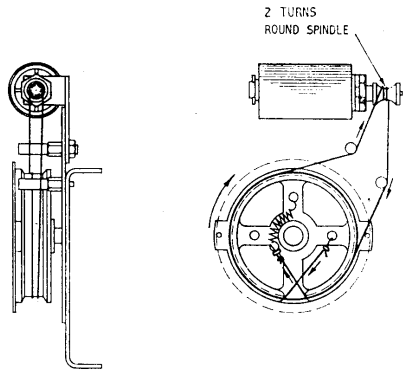
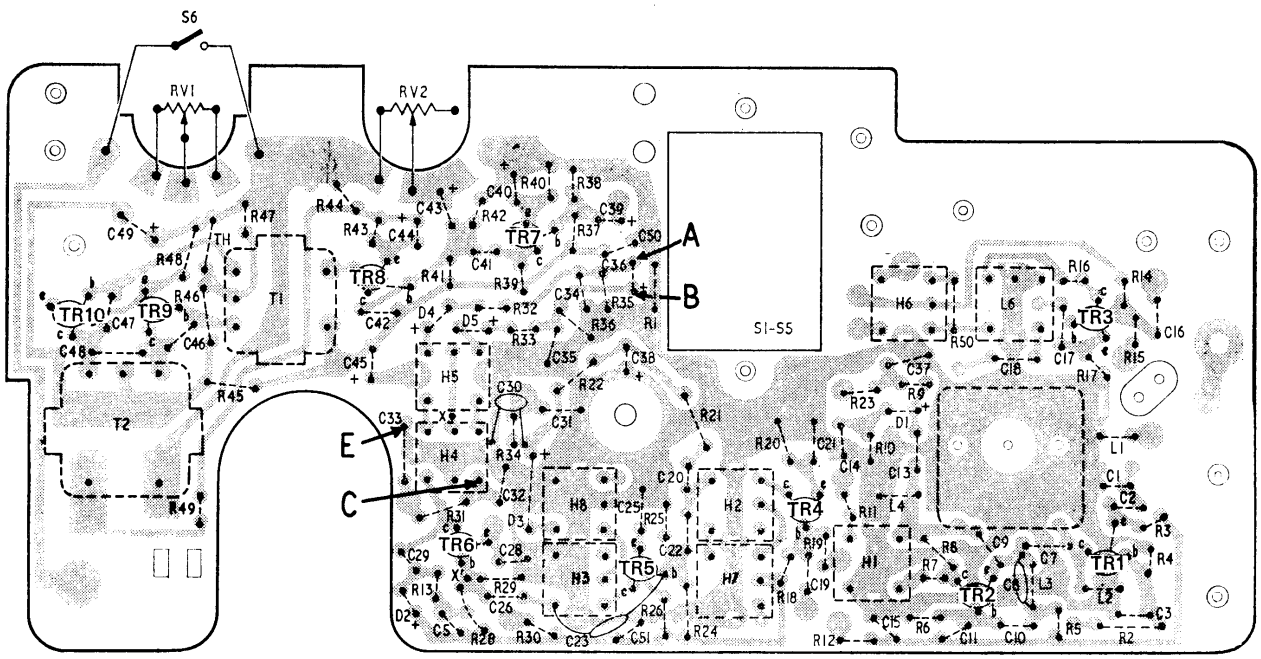


Illustration of drive cord assembly.



NOTE: C27 BETWEEN X-X'

Foil side view of printed panel showing component connections.

Adjust **H4, H3, H2** and **H1** in that order for maximum output.

2. – Transfer electronic voltmeter (dc) to, between, junction **R31/C32** and chassis – points C and E. Feed in a 10·7MHz f.m. signal and adjust **H5** for zero output on meter.

3. – Disconnect electronic testmeter and connect output meter to receiver output in the manner appropriate to type of meter being used.

4. – Tune receiver to 104·5MHz and feed in a 104·5MHz f.m. signal. Adjust **CT2** for maximum output.

5. – Tune receiver to 87MHz and feed in an 87MHz f.m. signal. Adjust **L4** for maximum output.

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