



### PHILIPS 301T/395T transistor radio receivers

THESE are 2-band 6-transistor portable radio receivers operating from a 9V battery, and featuring push-button wavechange. Apart from cabinet styling the two models are identical.

The internal rod aerial, tuned by C1 and C11, forms the input circuit for TR1. S3/S4 is the m.w. section, with S1/S2 switched in for l.w. TR1 is a self-oscillating mixer, feedback being from the collector via S5/S7a to the emitter. The oscillator trimmer is C10 on m.w., with C7 shunted across on l.w. Negative bias is applied to TR1 by R1/R2.

The i.f. amplifier comprises TR2 and TR3 connected in grounded emitter circuits. A.g.c. is applied to the TR2 base by returning the d.c. bias potentiometer R3/4 to the detector diode load R27. Additionally, TR2 is biased by the negative volts drop across R7.

The bias for TR3 is a combination of fixed negative voltage (via R10/8 junction) and the volts drop across R9. Both the i.f. amplifiers are neutralised, TR2 by C23/R5 and TR3 by C24/R6.

Audio signals appearing across the X1 diode load resistor R27 are fed via volume control R11 to the base of the driver stage TR4; due to the low input impedance of TR4 the coupling capacitor C21 is large in value. The driver is transformer coupled to a pair of matched OC78 transistors biased for Class B operation, a single-ended push pull circuit being used. Negative feed-

#### RELEASE DATES AND ORIGINAL PRICES

301T: 18 gns.  
(£15 1s. 1d., plus tax)

395T: 16½ gns.  
(£13 2s. 4d., plus tax)

Both models released August 1960.

back between output circuit of TR4 emitter is applied by R17.

Bias for TR4 is a combination of the negative potential applied to the base by R14/R18 and the volts drop across the emitter resistors R15/R16. TR5 and TR6 are biased by R20, R21, R22, R23.

#### ALIGNMENT

Set tuning gang to maximum and adjust pointer to r.h. edge of trimming line between the waveband blocks. Connect output meter in place of speaker, maintaining output of 50mW during alignment.

#### I.F. Circuits

Switch to m.w., connect signal generator to base of TR1 via 0.047µF in parallel with 2.2MΩ. Trim S14 at 470 kc/s, S11 at 472 kc/s and S8 at 468 kc/s, all for maximum output. To trim S14, remove metal coil cover.

#### Oscillator

Turn gang and volume to maximum. Inject 537 kc/s to base of TR1 as before and trim S7 for maximum output. Set gang so that pointer lines up with l.h. edge of scale trimming line. Inject 1,610 kc/s and trim C10 for maximum output.

#### Medium-wave

With volume control maximum, inject 640 kc/s modulated to base of TR1 as before and rotate gang for maximum output. Without altering gang, disconnect signal generator and loosely couple the signal to aerial circuit (by



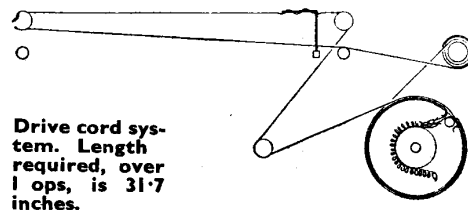
clipping output leads onto m.w.-l.w. connecting leads on internal aerial). Trim S3/S4 for maximum output. Retune generator to 1,425 kc/s, rotate gang for maximum output and trim C11 for maximum output.

#### Long-wave

Inject 180 kc/s to TR1 as before, rotate gang for maximum output. Transfer signal generator to aerial circuit as previously, then trim S1/S2 for maximum output. Repeat medium-wave operations.

#### Drive Cord Replacement

Turn gang to maximum. Fit one end of cord to tension spring and anchor other end to tuning drum. Wind on ¼-turn round drum, clockwise, pass cord round tuning spindle clockwise and wind on 2½-turns from back to front. Pass cord clockwise round left- and right-hand pulleys, then round bottom pulley anticlockwise. Finally, pass cord round tuning drum clockwise, wind on 1½ turns and anchor to tension spring. Fit pointer as shown in diagram.



Drive cord system. Length required, over 1 ops, is 31.7 inches.

### SERVICE SNAPS

#### PHILIPS 301T and 395T

**Transistors:** Two OC45, OC78 or OC81 (matched pair), one OC44, OC78D or OC81D.

**Germanium Diode:** One OA70

**Volume Control:** 50kΩ, log.

**Electrolytics:** Two 100µF, 6V; one 1µF, 50V; 10µF, 50V; 100µF, 12V.

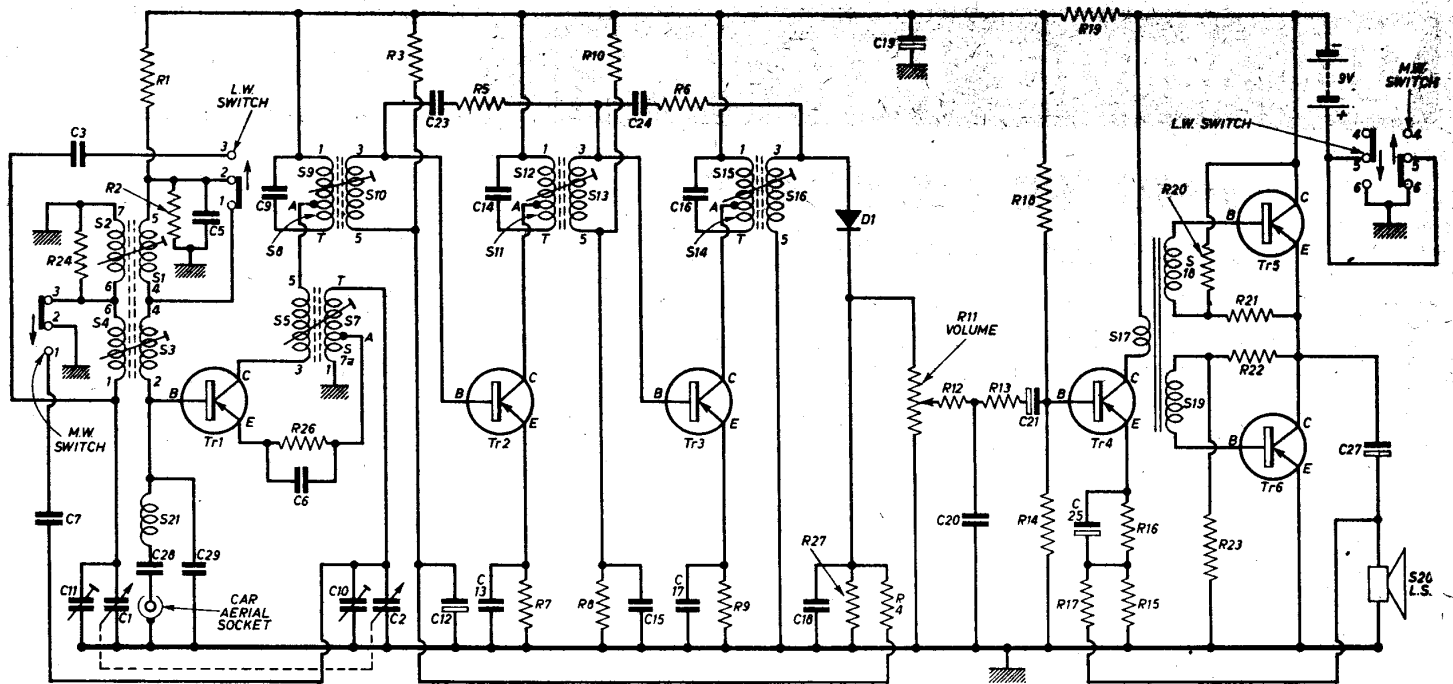
**I.F.:** 470 kc/s.

**Battery:** 9V, Ever Ready PP9, Vidor T6009, etc.

## Radiospares

## QUALITY · RANGE · SERVICE

FOR  
*all your Component needs*



Resistors	
R1	39kΩ
R2	10kΩ
R3	68kΩ
R4	12kΩ
R5	1.2kΩ
R6	3.3kΩ
R7	680Ω
R8	4.7kΩ
R9	1kΩ
R10	22kΩ
R11	50kΩ
R12	1kΩ
R13	1.5kΩ
R14	12kΩ
R15	15Ω
R16	470Ω
R17	2.2kΩ
R18	47kΩ
R19	680Ω
R20	2kΩ
R21	100Ω
R22	2kΩ
R23	100Ω
R24	220kΩ
R26	3.9kΩ
R27	18kΩ
All fixed resistors 1/2-watt.	
Capacitors	
C1	196.1pF
C2	110pF
C3	68pF
C5	0.01μF
C6	0.0068μF
C7	250pF
C9	91pF
C10	2-30pF
C11	2-30pF
C12	10μF, 50V

C13	0.082μF
C14	91pF
C15	0.047μF
C16	91pF
C17	0.082μF
C18	0.01μF
C19	100μF, 12V
C20	0.01μF
C21	1μF, 50V
C23	56pF
C24	22pF
C25	100μF, 6V
C27	100μF, 6V
C28	0.01μF
C29	18pF
Transistors, Diode	
TR1	OC44
TR2	OC45

TR3	OC45
TR4	OC78D
TR5	OC78
TR6	OC78
D1	OA70
Inductors	
S2	3.8Ω
S4	1.6Ω
S7	5Ω
S8	4.6Ω
S9	1Ω
S11	4.5Ω
S12	1Ω
S14	4Ω
S15	1.3Ω
S17	240Ω
S18	55Ω
S19	51Ω
S20	24Ω

	TRANSISTOR VOLTAGES			
	Collector		Base	Emitter
	-V	mA	-V	-V
TR1	7	0.4	1.3	1.6
TR2	7	0.8	0.66	0.56
TR3	7.42	0.95	1	0.9
TR4	8.42	2.2	1.12	1.13
TR5	9	0.8	4.66	4.5
TR6	4.5	0.8	0.16	—

The above (negative) voltages were obtained with respect to chassis, using a 20,000Ω/V meter.

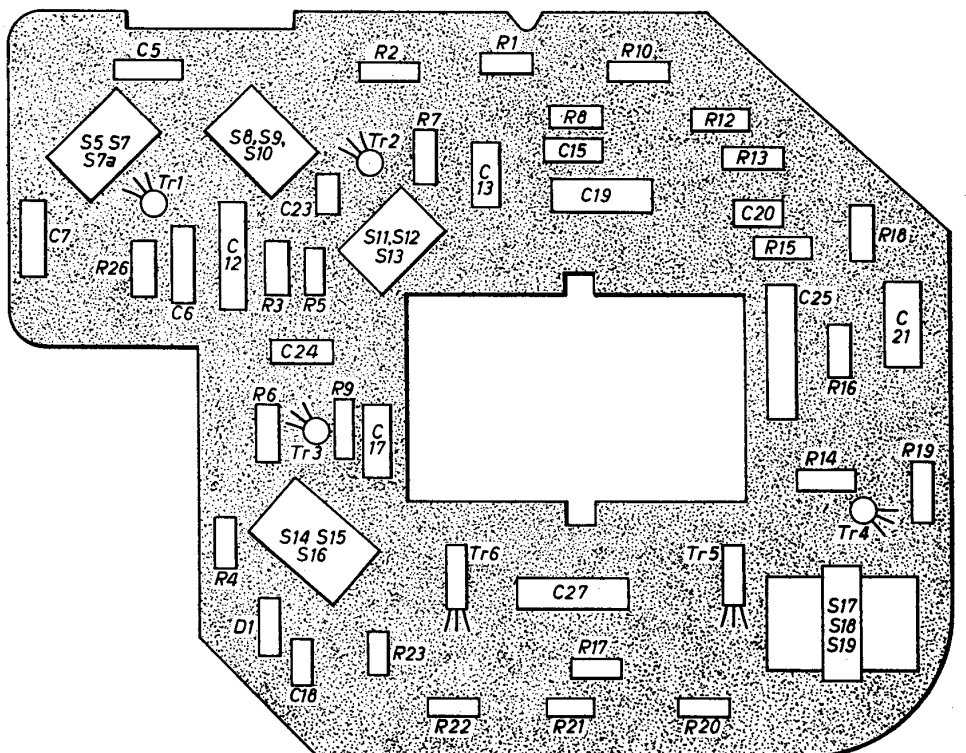
## DISMANTLING

**395T:** Remove rear section of cabinet by unscrewing two ornamental fixing screws. Unsolder car radio aerial socket connections. Pull off knobs, remove springs, station scale, two long fixing pillars and bottom fixing nut. Centre section of cabinet can then be removed and, if necessary, chassis separated from front section of cabinet.

**301T:** Procedure is as above except that backplate is held by coin slot screw at bottom of cabinet and cabinet is in two sections only. The printed plate is held in position on chassis plate by two spring clips fitted to speaker magnet. If panel is separated from chassis, it is important to replace insulating washer fitted between speaker and printed plate when reassembling.

## Circuit Variation

In some models a 2.7MΩ resistor is fitted between emitter of TR6 and chassis and another 2.7MΩ resistor between emitter of TR5 and R21. In these sets TR4 is Type OC81D and TR5 and TR6 are Type OC81.



Component side of printed circuit panel.