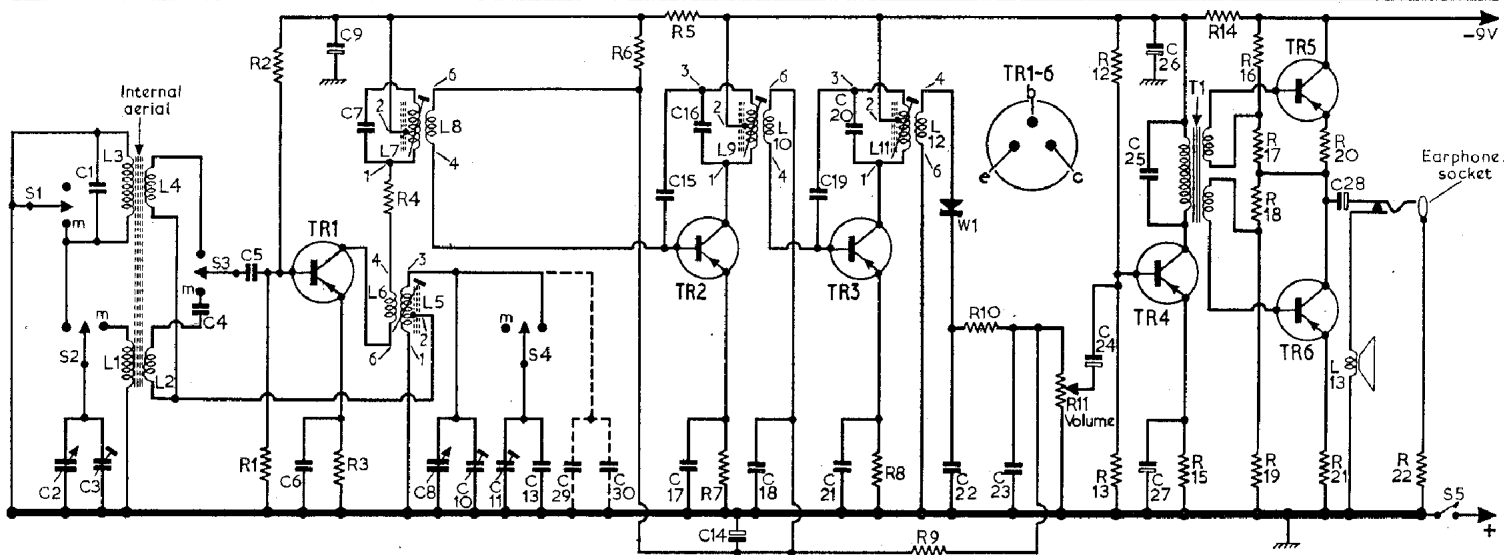


C	2	1,3	4	5	6	9	7	8	10	11	13	29	30	15	17,16	14,18	19,21,20	22	23	24	25,26,27	28	C		
R			1,2	3	4				6	5	7			8	9	10		11	12,13	15	14	16,17,18,19	20,21	22	R



Resistors

R1	5.6k Ω	B1
R2	27k Ω	B1
R3	3.9k Ω	B1
R4	150 Ω	B1
R5	100 Ω	B2
R6	120k Ω	B1
R7	820 Ω	B1
R8	390 Ω	B2
R9	6.8k Ω	B2
R10	820 Ω	B2
R11	5k Ω	A2
R12	27k Ω	B2
R13	6.8k Ω	B2
R14	220 Ω	A2
R15	1k Ω	B2
R16	3.3k Ω	A2
R17	150 Ω	A2
R18	3.3k Ω	A2
R19	150 Ω	A2
R20	5.6 Ω	A2
R21	5.6 Ω	A2
R22	56 Ω	A2

Capacitors

C1*	35pF	A1
C2	—	A1
C3	—	A1
C4	0.01 μ F	B1
C5	0.01 μ F	B1
C6	0.01 μ F	B1
C7	—	B1
C8	—	A1
C9	50 μ F	B1
C10	—	A1
C11	—	A1
C13†	20pF	A1
C14	30 μ F	B2
C15	6pF	B2
C16	—	B2
C17	0.04 μ F	B1
C18	0.04 μ F	B2
C19	5pF	B2
C20	—	B2
C21	0.04 μ F	B2
C22	0.01 μ F	B2
C23	0.01 μ F	B2

C24	5 μ F	B2
C25	7,500pF	B2
C26	50 μ F	A2
C27	30 μ F	B2
C28	50 μ F	A2
C29‡	2pF	A1
C30‡	2pF	A1

Coils and Transformers

L1	—	A1
L2	—	A1
L3	—	B1
L4	—	B1
L5	—	B1
L6	—	B1
L7	—	B1
L8	—	B1
L9	—	B2
L10	—	B2
L11	—	B2
L12	—	B2

L13	60 Ω	B2
T1	—	A2

Miscellaneous

S1-S4	—	**
S5	—	
W1	1S188	B2

Transistor analysis

Transistor voltages given in the table below, were taken from information supplied by the manufacturers. They were measured with a 20,000 Ω /V meter, and are negative with respect to the positive line, except where otherwise indicated.

Transistor table

Transistor		Emitter (V)	Base (V)	Collector (V)
TR1	2SA321	1.1	1.2	8.3
TR2	2SA203	0.6	0.7	8.3
TR3	2SA202	0.6	0.7*	8.3
TR4	2SB185	1.3	4.6*	7.5
TR5	2SB187	4.5	4.6*	9.0
TR6	2SB187	0.03	0.21*	4.5

* Measured between emitter and base.
Quiescent current 7mA.
Current for 150mW audio output 40mA

ULTRA 6148

Circuit alignment

Equipment required. — An a.m. signal generator; an r.f. coupling loop; an audio output meter with an impedance of 60 Ω , alternatively, a model 8 Avometer set to its 10V a.c. range connected in parallel with the loudspeaker may be used.

Disconnect the loudspeaker and connect the output meter in its place, and turn the volume control to maximum.

During alignment the input signal should be progressively attenuated in order to maintain an output of 50mW. All signals are fed in via the the r.f. coupling loop, which should be loosely coupled to the ferrite rod aerial, and all adjustments are made for maximum output.

1. — Switch receiver to m.w.; rotate tuning capacitor to maximum capacity, and feed in a 470kc/s a.m. signal. Adjust **L11/L12**, **L9/L10** and **L7/L8** in that order, and repeat until no further improvement is obtained.
2. — Feed in a 525kc/s a.m. signal, and adjust **L5/L6**.
3. — Tune receiver to 187m on scale, and feed in a 1,650kc/s a.m. signal. Adjust **C10**.
4. — Tune receiver to 500m on scale, and feed in a 600kc/s a.m. signal. Adjust **L1/L2** by sliding former along ferrite rod.
5. — Tune receiver to 214m on scale, and feed in a 1,400kc/s a.m. signal. Adjust **C3**.
6. — Switch receiver to l.w.; tune to 1,200m on scale, and feed in a 250kc/s a.m. signal. Adjust **C11**.

7. — Tune receiver to 1,875m, and feed in a 160kc/s a.m. signal. Adjust **L3/L4** by sliding former along ferrite rod.

8. — Repeat operations 2-7 until no further improvement is obtained.

Servicing notes

Make full use of the voltage measurements given in the transistor table overleaf. Although the receiver will still operate when the battery voltage is low, a new battery should be used for checking purposes.

To check oscillator operation, measure voltages at the emitter and base of **TR1**. These should be approximately as given in the transistor table with the base voltage slightly more negative than the emitter. Failure to oscillate is indicated when this relationship is reversed, and the base voltage is more positive than the emitter.

Should the output stage fail to operate, check first the switch associated with the earphone jack. The loudspeaker circuit in the output stage is completed via the spring contacts of this switch which should be closed with the earphone plug removed. Adjust spring tension if necessary.

Apart from total current consumption, no other current measurements should be attempted. Under "no signal" conditions, the total current consumption will be approximately 7mA. Consumption rises immediately a signal is applied, to approximately 27mA for average listening levels.