

# ULTRA - 6144

Resistors		
R1	47Ω	C1
R2	5-6kΩ	C2
R3	1-5kΩ	B1
R4	680Ω	B1
R5	100kΩ	C1
R6	100kΩ	B2
R7	820Ω	B2
R8	22kΩ	C2
R9	3-3kΩ	B2
R10	1-2kΩ	B2
R11	8-2kΩ	B2
R12	4-7kΩ	B2
R13	5kΩ	A1
R14	500Ω	B2
R15	12kΩ	A1
R16	12kΩ	B1
R17	56kΩ	A1
R18	180Ω	B1
R19	1-5kΩ	A2

### Transistor Table

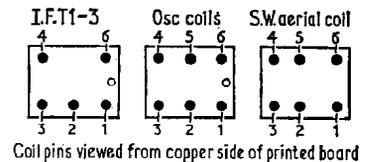
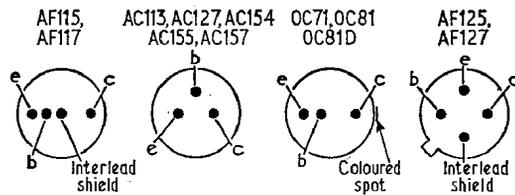
Transistor	Emitter (V)	Base (V)
TR1 { AF115 AF125†	1-5	1-55
TR2 { AF117 AF127†	1-0	1-2
TR3 { AF117 AF127†	1-85	2-1
TR4 { OC71 AC155†	0-3	0-45
TR5 { OC81DM AC113†	0-9	1-0
TR6 { OC81M AC154†	10-0*	10-0
TR7 { AC127 AC157†	10-0*	9-5

\* Measured at the junction of R22/R23.  
† Alternative type.

R20	5-6kΩ	A1
R21	390kΩ	B2
R22	4-7kΩ	B2
R23	4-7kΩ	B1
R24	390Ω	B2
R25	470kΩ	C1
R26	1kΩ	B1
<b>Capacitors</b>		
C1	20pF	C1
C2	267pF	C2
C3	15pF	C2
C4	60pF	C1
C5	25pF	C1
C6	15pF	C2
C8	2,000pF	C1
C9	15pF	C2
C10	5,000pF	C1
C11	5,000pF	C1
C12	0-01μF	C2
C13	25pF	B1
C14	2,000pF	C1
C15	20pF	C2
C16	6-2pF	C1
C17	210pF	C2
C18	25pF	C2
C19	210pF	C2
C20	267pF	C2
C21	15pF	C2
C22	0-05μF	B1
C23	4-7pF	C2
C24	175pF	B2
C25	75μF	C2
C26	0-02μF	C2
C27	175pF	C2
C28	0-02μF	B2
C29	0-02μF	B2
C30	175pF	B2
C31	0-01μF	B2
C32	0-02μF	B2
C33	0-47μF	B1
C34	75μF	B1
C35	75μF	B2
C36	1,000pF	A1
C37	100μF	B2
C38	100μF	B2
C39	150μF	A1
<b>Coils*</b>		
L1	—	C1

L2	—	C1
L3	2Ω	B1
L4	—	C1
L5	10Ω	B1
L6	—	B2
L7	1Ω	B2
L8	—	B2
L9	—	C2
L10	—	C2
L11	2-5Ω	C2
L12	6-5Ω	B2
L13	—	B2
L14	6-5Ω	C2
L15	—	C2
L16	5Ω	B2
L17	—	B2
L18	—	B1
L19	35Ω	†
<b>Miscellaneous</b>		
S1-S8	—	C1
S9, S10	—	A1
D1	OA90	A1
D2	AA120	B2

\* Approximate resistance in ohms.  
† Loudspeaker.



Coil pins viewed from copper side of printed board

### TRANSISTOR ANALYSIS

Transistor voltages given in the table in col. 1 were taken from information supplied by the manufacturers. They were measured with a 20,000Ω/V meter, and are negative with respect to the relevant transistors positive power supply line.

### CIRCUIT ALIGNMENT

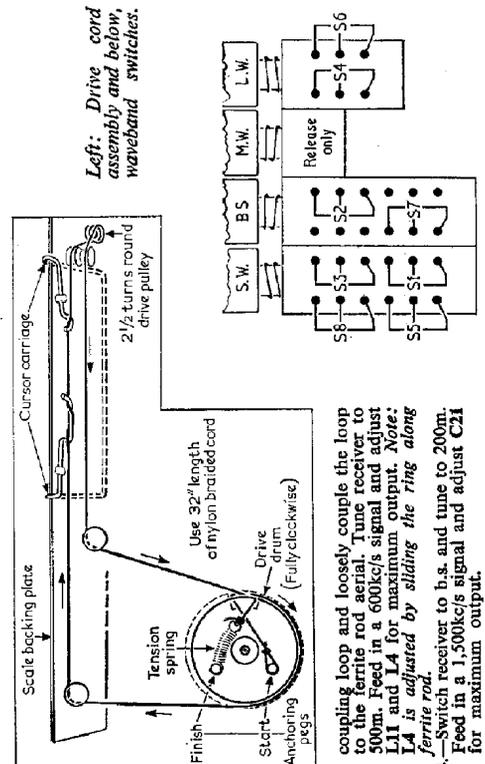
**Equipment Required.**—An a.m. signal generator modulated 30 per cent; an audio output meter with an impedance of 35Ω, or alternatively a model 8 Avometer set to its 10V a.c. range; a 0-1μF capacitor; and a length of insulated wire to be used as an r.f. coupling loop.

During alignment the input signal level should be attenuated to maintain a receiver output level of 50mW (approximately 1V using an Avometer).

- 1.—Switch receiver to m.w. and turn the tuning capacitor to maximum capacitance. Set the volume control to maximum, and connect the output meter via a jack plug to the earphone socket, or connect the Avometer across the loudspeaker speech coil.
- 2.—Connect the signal generator via the 0-1μF capacitor across the tuning gang aerial section C2. Feed in a 475kc/s 30 per cent modulated signal and adjust L16, L14 and L12 for maximum output, repeating until there is no further improvement.
- 3.—Check that cursor travel is central in scale window, i.e. the gap between cursor and edge of window, is equal at both ends. Connect the signal generator to the r.f.

coupling loop and loosely couple the loop to the ferrite rod aerial. Tune receiver to 500m. Feed in a 600kc/s signal and adjust L11 and L4 for maximum output. Note: L4 is adjusted by sliding the ring along ferrite rod.

- 4.—Switch receiver to b.s. and tune to 200m. Feed in a 1,500kc/s signal and adjust C21 for maximum output.
- 5.—Switch receiver to m.w. and tune to maximum output at 200m. Adjust C6 for maximum output.
- 6.—Switch receiver to b.s., tune to 200m. and adjust C3 for maximum output.
- 7.—Repeat operations 3-6 as necessary for accurate calibration and maximum output.
- 8.—Switch receiver to l.w. and tune to 1,500m. Feed in a 200kc/s signal and adjust C18 and L5 for maximum output. Note: L5 is adjusted by sliding coil former along ferrite rod.
- 9.—Switch receiver to s.w., extend the telescopic aerial and place signal generator lead nearby to provide a loose coupling. Tune receiver to 7Mc/s. Feed in a 7Mc/s signal and adjust L7 and L1 for maximum output.
- 10.—Tune receiver to 16Mc/s. Feed in a 16Mc/s signal and adjust C13 and C9 for maximum output. Note: In order to prevent pulling, the tuning gang should be rocked when C9 is being adjusted.
- 11.—Repeat operations 9 and 10 as necessary for accurate calibration and maximum output.



coupling loop and loosely couple the loop to the ferrite rod aerial. Tune receiver to 500m. Feed in a 600kc/s signal and adjust L11 and L4 for maximum output. Note: L4 is adjusted by sliding the ring along ferrite rod.

4.—Switch receiver to b.s. and tune to 200m. Feed in a 1,500kc/s signal and adjust C21 for maximum output.