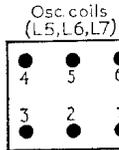
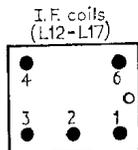


# ULTRA - 6130

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 AF117	1.18	1.3	7.5
TR2 AF117	0.36	0.55	7.5
TR3 AF117	1.0	1.25	7.5
TR4* AC155	0.1-0.3	0.2-0.4	0.63
TR5* AC113	0.52	0.63	4.85
TR6* AC154	5.0	5.2	9.0
TR7* AC157	5.0	4.85	—

\* In some receivers TR4 may be OC71, TR5 OC81DM TR6 OC81M and TR7 AC127.



Coil pins viewed from copper side of printed board

## Resistors

R1	33kΩ	B1
R2	6.8kΩ	B1
R3	1kΩ	B1
R4	220Ω	B1
R5	56kΩ	A1
R6	100kΩ	A2
R7	470Ω	A2
R8	22kΩ	A2
R9	4.7kΩ	A2
R10	820Ω	B2
R11	8.2kΩ	B2
R12	2.2kΩ	B2
R13	20kΩ	C1
R14	1kΩ	C1
R15	12kΩ	B1
R16	12kΩ	B1
R17	56kΩ	B1
R18	120Ω	B1
R19	680Ω	C1
R20	5.6Ω	B2
R21	390Ω	B2
R22	2.2Ω	B2
R23	2.2Ω	B2
R24	390Ω	C2

## Capacitors

C1	15pF	A1
C2	25pF	A1
C3	15pF	A1
C4	262pF	A1
C5	2,000pF	A1
C6	60pF	A1
C7	0.01μF	A1
C8	25pF	A2
C9	185pF	A1
C10	15pF	A1
C11	210pF	A1
C12	20pF	A2
C13	262pF	A1
C14	15pF	A2
C22	0.05μF	B1
C24	175pF	B1
C25	75μF	A1
C26	0.02μF	A2
C27	175pF	A2
C28	0.02μF	B2
C29	0.02μF	A2
C30	175pF	B2
C31	0.01μF	B2
C32	0.01μF	B2
C33	0.47μF	B1

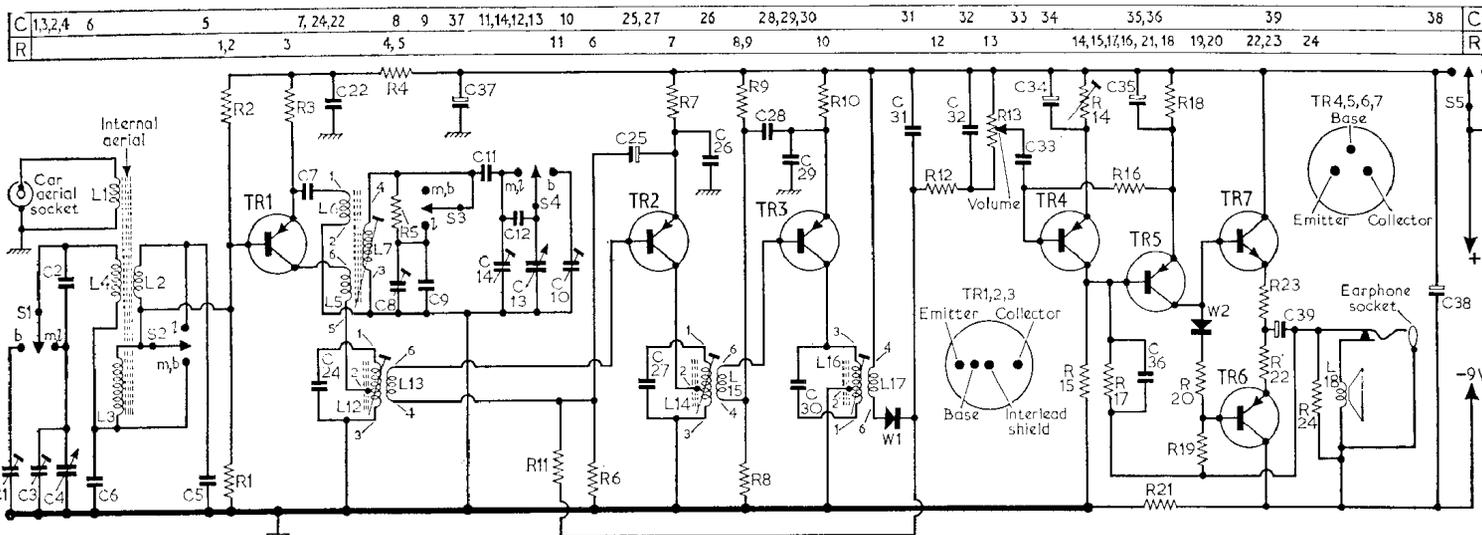
C34	75μF	C1
C35	75μF	B1
C36	1,000pF	B1
C37	75μF	B2
C38	75μF	B1
C39	150μF	B2

## Coils

L1	—	A1
L2	—	B1
L3	—	A1
L4	—	B1
L5	—	B1
L6	—	B1
L7	—	B1
L12	—	B1
L13	—	B1
L14	—	A2
L15	—	A2
L16, L17	—	B2
L18	15Ω	B1

## Miscellaneous

S1-S5	—	C2
W1	OA70	B2
W2	AA120	B2



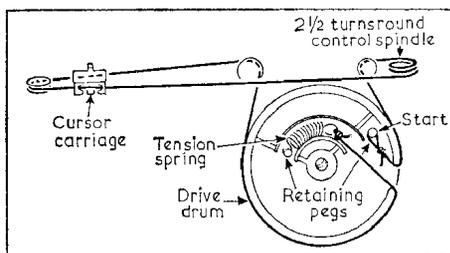
## CIRCUIT ALIGNMENT

**Equipment Required.**—An a.m. signal generator; an audio output meter with an impedance to match 15Ω or alternatively a model 8 Avometer; an r.f. coupling coil and a 0.1μF capacitor.

During alignment the signal input level should be adjusted to maintain a receiver output of 50mW with the volume control at maximum.

- 1.—Remove the receiver back cover. Connect the audio output meter in place of the loudspeaker. (A convenient method is via the earphone socket using the correct type of plug). Alternatively, connect the Avometer, switched to its 10V a.c. range, across the speech coil (tags 7 and 8 on the printed panel).
- 2.—Switch receiver to m.w. and turn the tuning gang to maximum capacitance. Turn the volume control to maximum. Connect the signal generator between chassis and, via a 0.1μF blocking capacitor, the junction of L4 and C2 (tag 1 on the printed panel).
- 3.—Feed in a 475kc/s 30 per cent modulated signal and adjust L16, L14 and L12, in that order, for maximum output. Repeat until there is no further improvement.
- 4.—Connect the signal generator to the r.f. coupling coil and loosely couple the coil to the ferrite rod aerial. Check that with the tuning gang at maximum capacitance, the cursor is in line with the datum spot on the scale. Then tune receiver to 500m. Feed in a 600kc/s signal and adjust L7, and L4 adjusting ring for maximum output.

- 5.—Switch receiver to bandspread and tune to 200m. Feed in a 1,500kc/s signal and adjust C10 and C1 for maximum output.
- 6.—Switch receiver to m.w. and adjust C14 and C3 for maximum output at 200m.



Scale drive assembly seen from the front of the receiver with the drive drum fully anticlockwise

- 7.—Repeat operations 4, 5 and 6 as necessary for good calibration and output.
- 8.—Switch receiver to l.w. and tune to 1,500m. Feed in a 200kc/s signal and adjust C8 and L3 for maximum output.

**Output Balance.**—Output transistors TR6 and TR7 are series connected across the 9V battery supply. To ensure a balanced supply voltage to each, an adjustment R14 is incorporated in the emitter circuit of TR4. This resistor sets the emitter potential and collector potential of TR4 and will, therefore, determine the base potential of the driver TR5. This bias controls the collector potential of TR5 which in turn controls the base voltages of TR6 and TR7. Correct balance is obtained when the potential of TR6/TR7 emitter junction is 5V with respect to the positive line. The discrepancy from half battery voltage (4.5V) is due to the emitter bias voltage developed across R18 which determines the limit of negative signal excursion before bottoming of TR5 takes place.

An alternative method of balancing TR6 and TR7 operating voltages is by visual observation of the waveform on an oscilloscope. Adjustment should be made for symmetry of both waveform and clipping at high output.