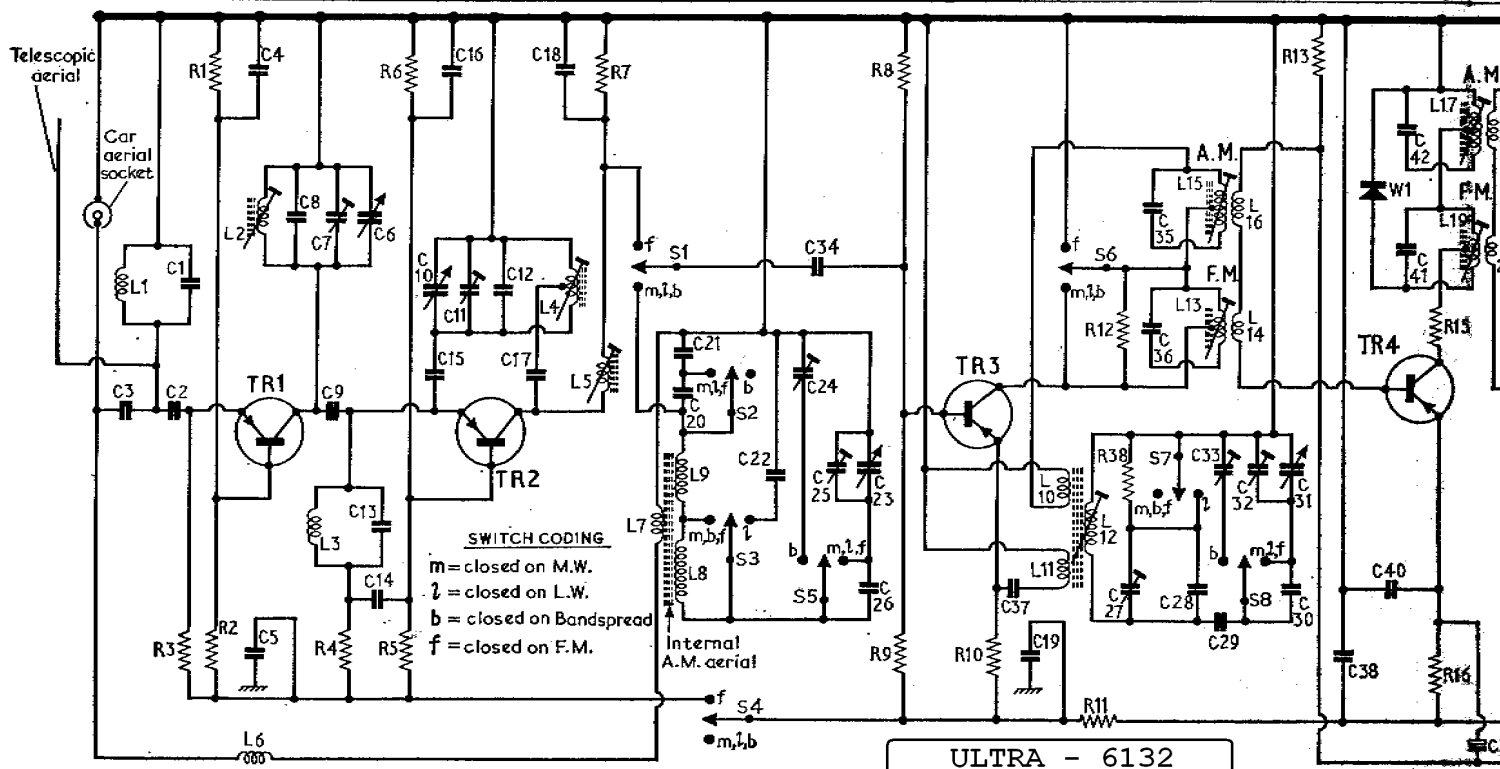


C	3	21	4,5	8	9,7	6,14,13	10,15,16,11,12	17	18	20,21	22	24,34,25,23,26	37,19	27,35,36,28,29,33,32	31,30	38	40,42,41	59
R	3	1,2			4	5,6			7			8,9	10	11	12,38	13		15,16

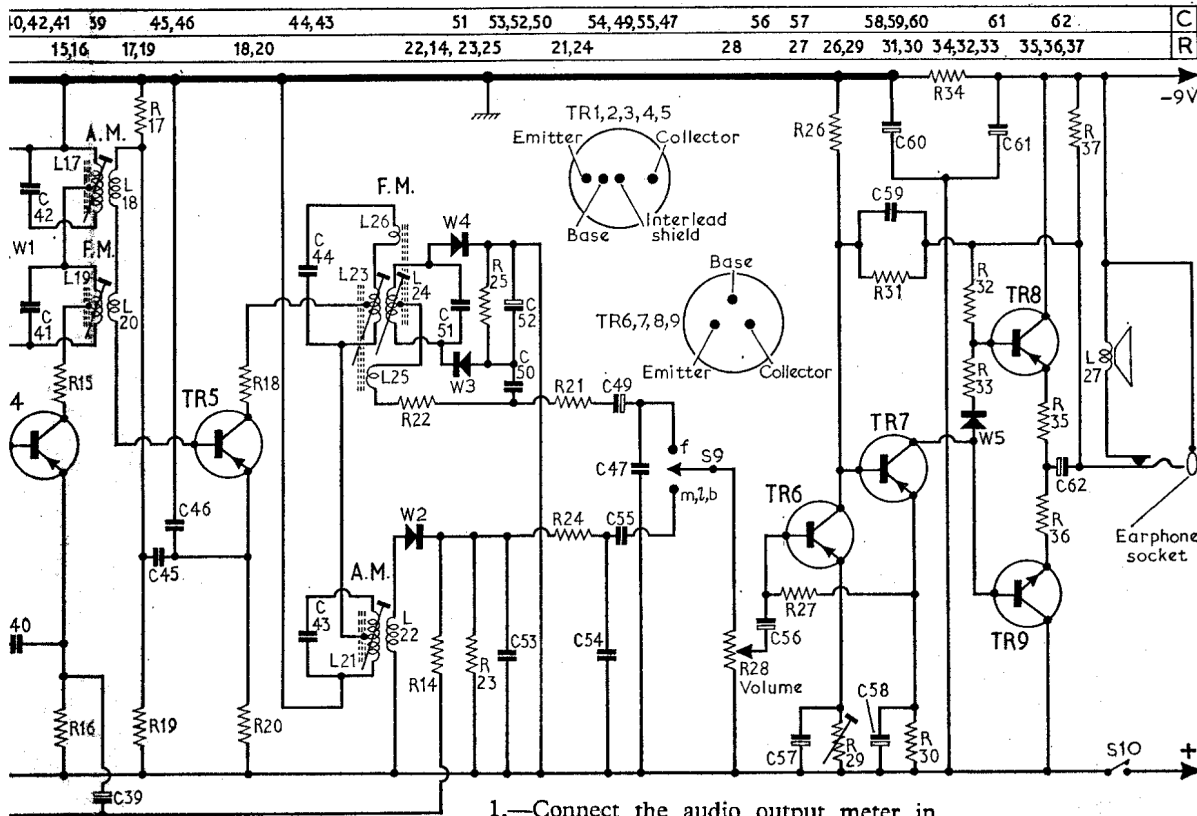


ULTRA - 6132

Transistor Table

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 AF114	0.63	0.82	5.5
TR2 AF114	0.65	0.8	5.5
TR3 AF116	0.63	0.7	5.6
TR4 AF116	0.97	1.1	7.2
TR5 AF116	0.3	0.5	5.7
TR6 AC156	0.35	0.55	6.4
TR7 AC113	0.75	0.95	5.4
TR8 AC154	0.43	1.15	6.3
TR9 AC157	0.42	0.54	0.79
	0.64	0.79	0.85
	0.7	0.85	4.5
	—	4.9	9.0
	—	5.4	9.0
	—	4.5	—

\*Receiver switched to f.m.  
\*Receiver switched to a.m.  
\*Measured with respect to the S4 side of R11.



## CIRCUIT ALIGNMENT

### A.M. Circuits

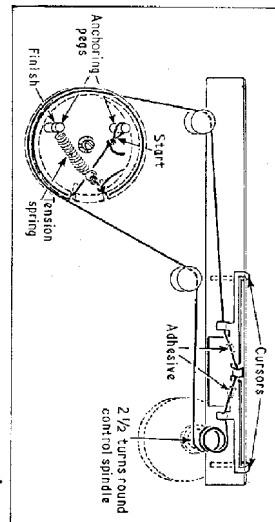
**Equipment Required.**—An a.m. signal generator with 30 per cent modulation; an audio output meter with an impedance to match 15Ω or alternatively a 20,000Ω/V a.c. voltmeter; a length of insulated wire formed into an r.f. coupling loop and a 0.1μF capacitor.

During alignment, adjust the signal input level to maintain a receiver output of 50mW with the volume control at maximum, except where otherwise stated.

- 1.—Connect the audio output meter in place of the loudspeaker or connect the a.c. voltmeter across the internal loudspeaker terminals. Connect the signal generator via a 0.1μF capacitor across the tuning gang aerial section C23.
- 2.—Switch receiver to m.w. and feed in a 475kc/s 30 per cent modulated signal. Adjust the cores of L21, L17 and L15 for maximum output. Repeat as necessary.
- 3.—Rotate the tuning gang from maximum to minimum capacitance and check that the cursor moves an equal distance either way from the scale

centre, i.e., the gap between the cursor and the edge of the scale window is the same at both ends. Connect the signal generator to the r.f. coupling loop and loosely couple the loop to the ferrite rod aerial.

- 4.—Tune receiver to 500m (m.w.). Feed in a 600kc/s signal and adjust L12 and L9 for maximum output.
- 5.—Tune receiver to 200m. Feed in a 1,500kc/s signal and adjust C32 and C25 for maximum output.
- 6.—Repeat operations 4 and 5 as necessary for correct calibration and maximum output.



Resistors									Coils		
R1	33k $\Omega$	D3	R33	5.6k $\Omega$	A2	C26	18pF	D2	L1	—	D3
R2	6.8k $\Omega$	D3	R34	390 $\Omega$	A2	C27	25pF	C2	L2	—	C3
R3	390 $\Omega$	C3	R35	2.2 $\Omega$	B2	C28	210pF	C2	L3	—	D2
R4	560 $\Omega$	D3	R36	2.2 $\Omega$	B2	C29	210pF	C2	L4	—	C2
R5	6.8k $\Omega$	D2	R37	390 $\Omega$	A2	C30	18pF	C2	L5	—	D2
R6	33k $\Omega$	D2	R38	56k $\Omega$	D2	C31	266pF	C2	L6	—	D3
R7	68 $\Omega$	D2	Capacitors			C32	5pF	C2	L7	—	C1
R8	33k $\Omega$	C2	C1	20pF	D3	C33	8pF	C2	L8	—	D1
R9	6.8k $\Omega$	C2	C2	1,000pF	D3	C34	5,000pF	C2	L9	—	B1
R10	1k $\Omega$	C2	C3	20pF	D3	C35	175pF	C2	L10	—	C1
R11	220 $\Omega$	B2	C4	1,000pF	D3	C36	50pF	C2	L11	—	C1
R12	10k $\Omega$	C2	C5	0.02 $\mu$ F	D3	C37	0.01 $\mu$ F	C2	L12	—	C1
R13	100k $\Omega$	C3	C6	20pF	C3	C38	0.05 $\mu$ F	A3	L13	—	C2
R14	8.2k $\Omega$	C3	C7	5pF	C2	C39	75 $\mu$ F	C3	L14	—	C2
R15	1k $\Omega$	C3	C8	36pF	C3	C40	0.02 $\mu$ F	C2	L15	—	C2
R16	470 $\Omega$	C2	C9	5pF	D3	C41	50pF	C3	L16	—	C2
R17	22k $\Omega$	C3	C10	20pF	C2	C42	175pF	C3	L17	—	C3
R18	1k $\Omega$	B3	C11	5pF	C2	C43	175pF	B3	L18	—	C3
R19	4.7k $\Omega$	C3	C12	27pF	D2	C44	30pF	B3	L19	—	C3
R20	820 $\Omega$	C3	C13	15pF	D2	C45	0.02 $\mu$ F	C3	L20	—	C3
R21	1k $\Omega$	B3	C14	510pF	D2	C46	0.02 $\mu$ F	C3	L21	—	B3
R22	100 $\Omega$	B3	C15	3.3pF	D2	C47	0.02 $\mu$ F	B2	L22	—	B3
R23	5.6k $\Omega$	B3	C16	1,000pF	D2	C49	25 $\mu$ F	B2	L23	—	B3
R24	4.7k $\Omega$	B3	C17	60pF	D2	C50	1,000pF	B3	L24	—	B3
R25	6.8k $\Omega$	A3	C18	510pF	D2	C51	510pF	B3	L25	—	B3
R26	12k $\Omega$	A1	C19	0.05 $\mu$ F	B2	C52	8 $\mu$ F	A2	L26	—	B3
R27	12k $\Omega$	B2	C20	2,000pF	C2	C53	0.01 $\mu$ F	B3	L27	15 $\Omega$	B2
R28	5k $\Omega$	B1	C21	2,000pF	D1	C54	0.01 $\mu$ F	B3	Miscellaneous		
R29	1k $\Omega$	B2	C22	60pF	C3	C55	0.04 $\mu$ F	C1	S1-S9	—	C1
R30	120 $\Omega$	B2	C23	266pF	C2	C56	2 $\mu$ F	B2	S10	—	B1
R31	56k $\Omega$	A2	C24	25pF	D2	C57	75 $\mu$ F	B2	W1	OA70	C3
R32	680 $\Omega$	A2	C25	5pF	C3	C58	75 $\mu$ F	B2	W2	OA70	B3
						C59	1,000pF	B2	W3	OA79	B3
						C60	75 $\mu$ F	B3	W4	OA79	B3
						C61	75 $\mu$ F	B2	W5	AA120	A2
						C62	150 $\mu$ F	A2			

7.—Switch receiver to l.w. and tune to 1,500m. Feed in a 200kc/s signal and adjust C27 and L8 for maximum output.

8.—Switch receiver to "Bandspread" and tune to 200m. Feed in a 1,500kc/s signal and adjust C33 and C24 for maximum output.

**Note:** The bandspread aerial adjustment C24 should always be checked after adjustment to C25 or L9 adjusting ring. Also after reassembling in the case, check that Radio Luxembourg is receivable on the bandspread range, readjusting the oscillator trimmer C32 if necessary.

### F.M. Circuits

**Equipment Required.**—As for "a.m. circuits" plus an f.m. signal generator. If this generator is capable of being switched to 30 per cent a.m. a separate a.m. signal generator is not required.

1.—Connect the audio output meter or a.c. voltmeter as in "a.m. circuits" operation 1. Connect the f.m. signal generator via the 0.1 $\mu$ F capacitor to the switch side of C34 (tag 6 on the printed panel). Switch receiver to f.m.

2.—Feed in a 10.7Mc/s signal deviated 25kc/s and adjust the cores of L24, L23, L19, L13 and L5 for maximum output.

3.—Increase the signal input level by 6dB and readjust the receiver output to 50mW by use of the volume control. Switch the signal generator to a.m. and adjust L24 for maximum output (maximum a.m. rejection). Then switch the signal generator to f.m. and check that the f.m. output has not been reduced. Repeat as necessary for maximum f.m. output and minimum a.m. output.

**Note:** L24 should be tuned to the outer peak, i.e., with the core protruding from the top of the can by approximately  $\frac{1}{8}$  in.

4.—Fully close the tuning gang and unsolder the lead from the telescopic aerial tag. Connect the signal generator between the free end of the lead and chassis.

5.—Tune receiver to 96Mc/s. Feed in a 96Mc/s signal and adjust C11 and C7 for maximum output.

6.—Tune receiver to 88Mc/s, feed in an 88Mc/s signal and adjust L4 and L2 for maximum output.

7.—Repeat operations 5 and 6 as necessary for correct alignment. While tuned to an r.f. signal check the adjustment of L5 for maximum output.

### GENERAL NOTES

**Dismantling.**—To remove the chassis from the case, rotate the coin-slotted stud on the underside and take out the battery.

Take off the back cover by removing two screws at the bottom of the case.

Remove the screw in the base of the case securing the telescopic aerial and withdraw the aerial.

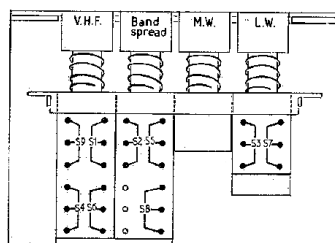
Unsolder the loudspeaker chassis earthing lead from the printed panel (tag 10) and take out four screws and washers securing the printed panel to the case.

Release the panel by lifting from the lower edge and withdrawing the controls through the case.

**Output Balance Adjustment.**—R29 is incorporated in the emitter circuit of TR6, and its adjustment sets the collector potential of TR6 and hence the base potential of the driver TR7. TR7 collector is in turn directly coupled to the bases of TR8 and TR9 so that the setting of R29 ultimately determines the base bias of TR8 and TR9, which should be such that the output transistors are correctly balanced across the battery supply.

Correct balance is obtained when the potential at the junction of R35 and R36 is 5V with respect to battery positive.

**Battery.**—9V Ever Ready PP7 or equivalent.



Waveband switch connections as they appear when looking on to the contacts from the component side of the printed panel. When the main button is depressed it merely releases the other three buttons.