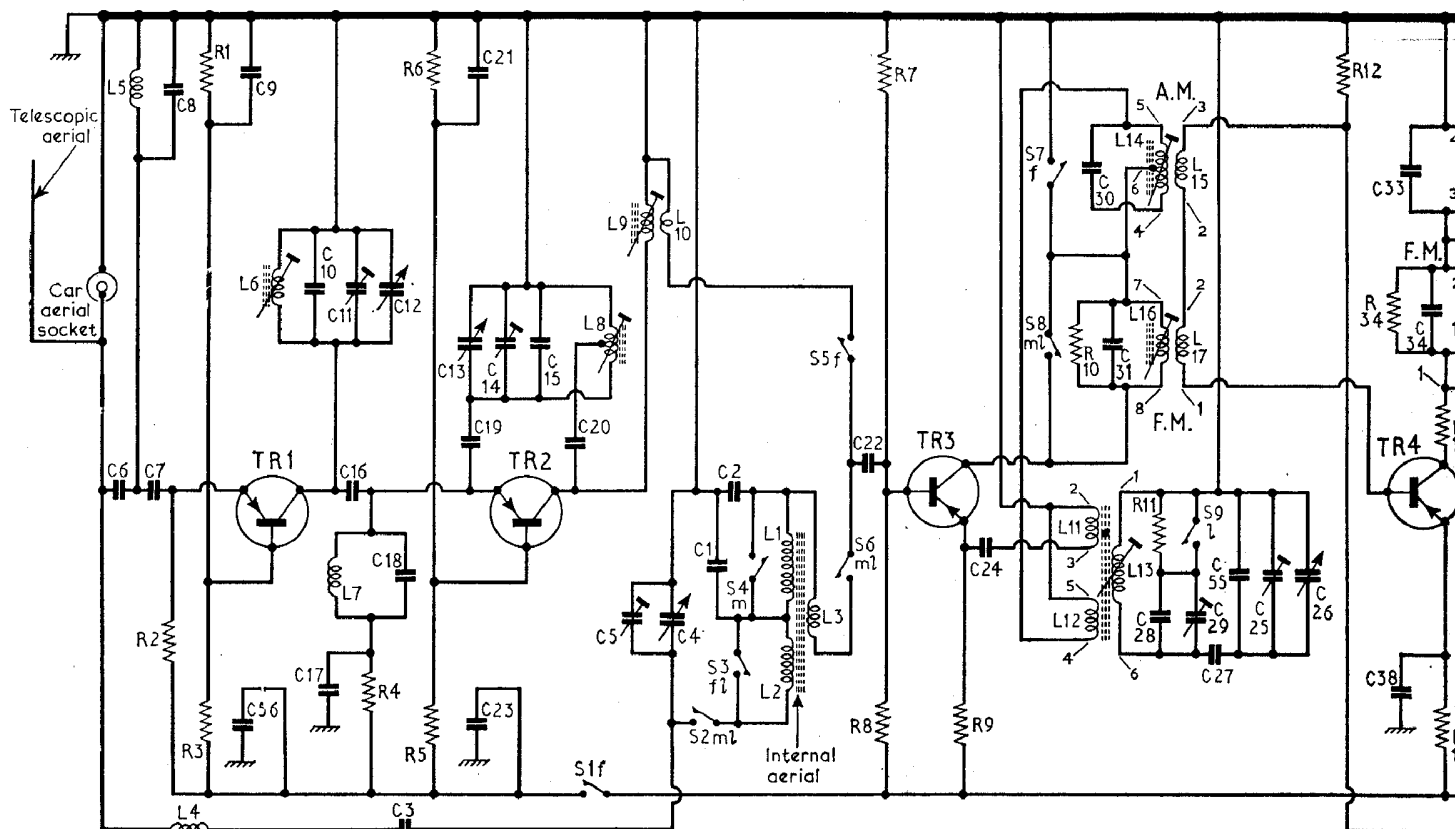
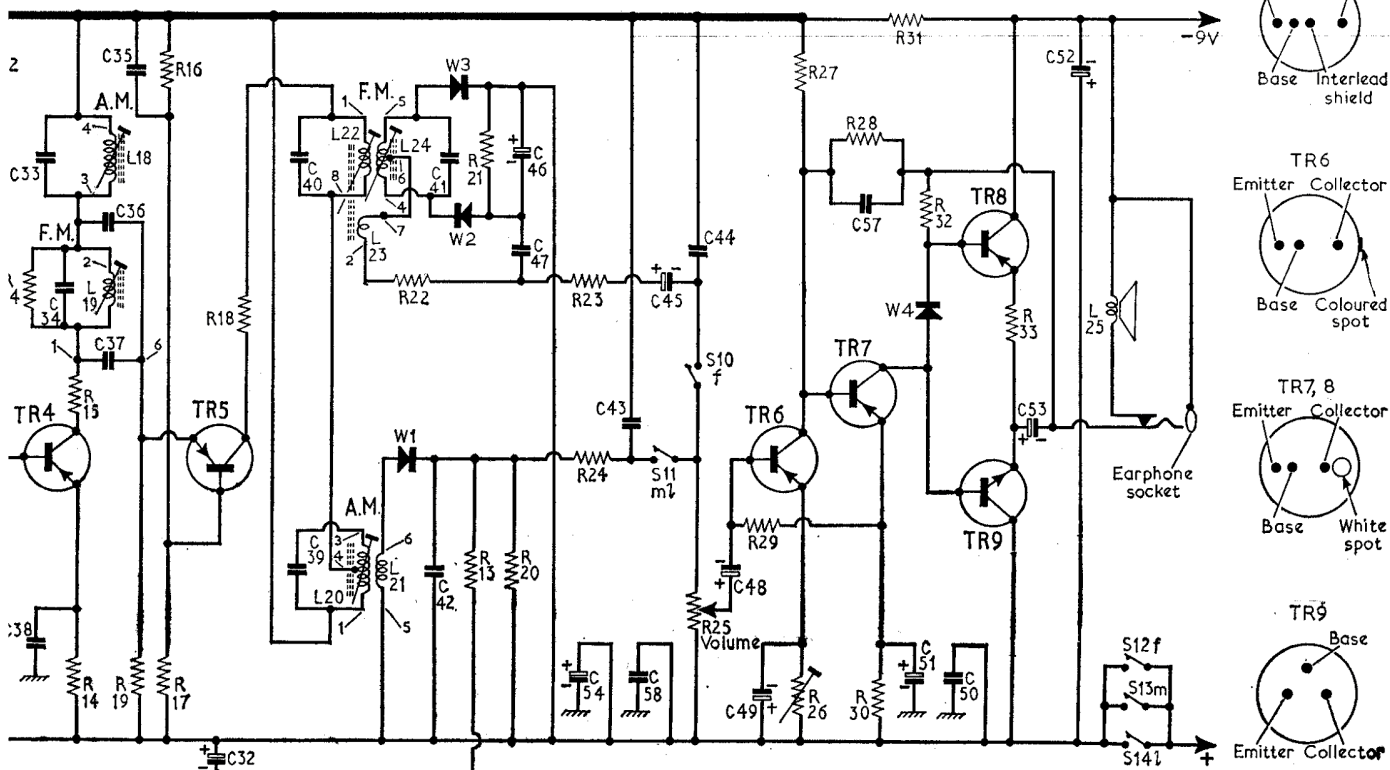


C	6	7, 8	56, 9	10, 17, 16, 11, 12, 18, 3, 13, 19, 21, 23, 14, 15, 20	5	4	1, 2	22	24	30, 31	28	29, 27, 55, 25	26	38, 33, 34,	
R	2	1, 3		4	6, 5			7, 8	9	10	11		12	34	15,
L	5	4	6	7		8	9, 10	1, 2, 3		11, 12, 13	14, 15, 16, 17				



Circuit diagram of Ultra 6114 portable a.m./f.m. radio receiver. On f.m. the r.f. amplifier and self-oscillating mixer stages (TR1 and TR2 out of circuit and the receiver comprises TR3 operating as the self-oscillating mixer stage, and a two-stage i.f. amplifier (TR4 and TR5).

38,33,34,36,37,35	32	40,39	42,41	46,47	54	43,58,45,44,48,49	57	51	50	53	52	C	
34	15,14	19	16,17	18	22	13,21,20	23,24	25	29	27,26	28,30,31,32	33	R
18,19	20,21,22,23,24										25	L	



and TR2 connected in common base mode), are followed by three i.f. amplifier stages (TR3, TR4 and TR5). On a.m., TR1 and TR2 are switched and TR5). The audio section is common to both f.m. and a.m. transmissions and is fed with the output from the respective detectors via S10 or S11

Resistors

R1	33kΩ	C3
R2	390kΩ	D3
R3	6.8kΩ	D3
R4	560kΩ	D2
R5	6.8kΩ	D2
R6	33kΩ	C2
R7	33kΩ	B1
R8	6.8kΩ	C1
R9	1kΩ	C1
R10	12kΩ	B2
R11	220kΩ	C2
R12	68kΩ	C2
R13	8.2kΩ	C3
R14	470kΩ	C3
R15	330kΩ	C2
R16	22kΩ	C3
R17	4.7kΩ	C3
R18	330kΩ	B3
R19	820kΩ	B3
R20	3.9kΩ	C3
R21	15kΩ	A3
R22	220kΩ	B3
R23	1kΩ	B3
R24	12kΩ	C3
R25	5kΩ	B1
R26	550kΩ	B2
R27	12kΩ	B2
R28	82kΩ	B2
R29	12kΩ	B2
R30	100kΩ	B2
R31	150kΩ	B2
R32	680kΩ	A2
R33	4.7kΩ	B2
R34	27kΩ	C2

Capacitors

C1	65pF	B1
C2	1,310pF	B1
C3	9pF	D3
C4	266pF	D2
C5	10pF	C3
C6	56pF	D3
C7	1,000pF	D3
C8	9pF	D3
C9	1,000pF	C3
C10	38pF	C3
C11	10pF	C3
C12	20pF	D2
C13	20pF	D2
C14	10pF	D3
C15	32pF	C2
C16	7pF	D2
C17	510pF	D2
C18	15pF	D2
C19	3.3pF	D2
C20	60pF	C2
C21	1,000pF	C2
C22	5,000pF	C1
C23	0.02μF	C2
C24	0.01μF	B1
C25	10pF	C2
C26	266pF	D2
C27	215pF	C2
C28	200pF	C2
C29	25pF	C3
C30	250pF	C2
C31	150pF	C2
C32	20μF	C2
C33	1,310pF	C3
C34	150pF	C3

C35	4,700pF	C3
C36	150pF	C3
C37	20pF	C3
C38	0.05μF	B3
C39	375pF	B3
C40	100pF	B3
C41	50pF	B3
C42	0.01μF	C3
C43	0.02μF	C3
C44	5,000pF	B2
C45	20μF	B3
C46	8μF	A3
C47	220pF	B3
C48	20μF	B1
C49	20μF	B2
C50	0.02μF	B3
C51	100μF	B2
C52	100μF	B3
C53	100μF	B2
C54	100μF	C3
C55	5pF	C2
C56	0.01μF	E5
C57	1,500pF	G4
C58	0.01μF	F5

Coils*

L1	12.0	C1
L2	4.0	A1
L3	—	A1
L4	—	D3
L5	—	D3
L6	—	C3
L7	—	D2
L8	—	C2
L9	—	C2
L10	—	C2

L11	—	C2
L12	—	C2
L13	2.0	C2
L14	8.0	B2
L15	—	B2
L16	—	B2
L17	—	B2
L18	2.2	B3
L19	—	C3
L20	5.0	B3
L21	—	B3
L22	—	B3
L23	—	B3
L24	—	B3
L25	15.0	B3

Transistors

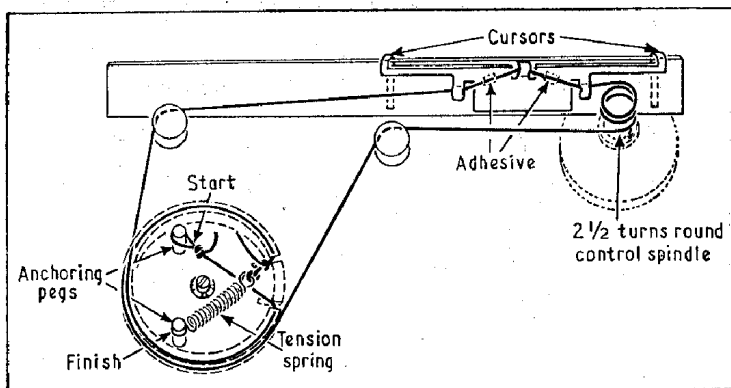
TR1	AF114	C3
TR2	AF115	D2
TR3	AF116	C2
TR4	AF116	B2
TR5	AF116	C3
TR6	OC75	B2
TR7	OC81D	B2
TR8	OC81	A2
TR9	AC127	B2

Miscellaneous

SI-S14	—	C1
W1	OA90	B3
W2	OA90	B3
W3	OA90	B3
W4	AA120	B2

*Approximate d.c. resistance
in ohms.

Drive cord assembly
shown with the drive
drum turned fully
clockwise



CIRCUIT ALIGNMENT

Calibration markers provided on the scale backing plate are (reading from left to right), 1 Set Cursor, 2 88Mc/s, 3 96Mc/s, 4 220kc/s, 5 600kc/s, 6 1,500kc/s.

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

A.M. Circuits.—Connect the audio output meter in place of the loudspeaker, or connect the a.c. voltmeter across the loudspeaker speech coil. Turn the volume control to maximum and during alignment maintain the output at 50mW except where stated otherwise.

- 1.—Switch receiver to m.w. and connect the a.m. signal generator via the 0.1μF capacitor across the tuning gang aerial section C4. Feed in a 470kc/s 30 per cent modulated signal and adjust L14, L18 and L20 for maximum output. Repeat until there is no further improvement.
- 2.—Fully close the tuning gang and check that the cursor lines up with the "Set Cursor" marker on the scale backing plate. Connect the signal generator to the r.f. coupling loop and loosely couple the loop to the ferrite rod aerial.
- 3.—Set cursor to 600kc/s marker, feed in a 600kc/s signal and adjust L13 for maximum output.
- 4.—Set cursor to 1,500kc/s marker, feed in a 1,500kc/s signal and adjust C5 for maximum output.
- 5.—Reset cursor to 600kc/s marker and feed in a 600kc/s signal. Adjust L13 and L2 for maximum output.

- 6.—Reset cursor to 1,500kc/s marker and feed in a 1,500kc/s signal. Adjust C5 and C25 for maximum output.
- 7.—Repeat operations 3, 4, 5 and 6 as necessary for correct calibration and output.
- 8.—Switch receiver to l.w. and set cursor to 220kc/s calibration marker. Feed in a 220kc/s signal and adjust C29 and L1 for maximum output.

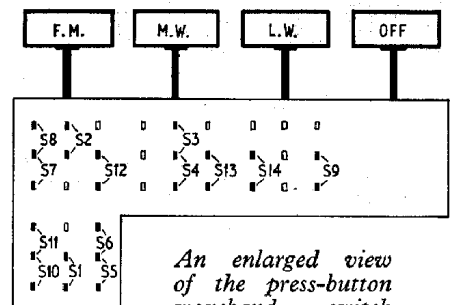
F.M. Circuits.

- 1.—Connect the f.m. signal generator via the 0.1μF capacitor to the junction L7, C18, C17, R4 (tag 10 on the printed panel). Switch receiver to f.m., feed in a 10.7Mc/s 25kc/s deviated signal and adjust L16, L19 and L24 for maximum output.
- 2.—Increase the signal input level by 6dB and adjust the volume control to maintain the output at 50mW. Switch the signal generator to a.m. and adjust L22 for minimum output (maximum a.m. rejection).
- 3.—Switch the signal generator to f.m. and reset receiver volume control to maximum, reducing the signal input level to maintain 50mW output. Then adjust L16, L9 and L24 for maximum output.
- 4.—Unsolder the lead from the telescopic aerial tag and connect the signal generator between this lead and "chassis" line. Set cursor to 88Mc/s marker and feed in an 88Mc/s signal. Adjust L8 and L6 for maximum output.
- 5.—Set cursor to 96Mc/s marker and feed in a 96Mc/s signal. Adjust C14 and C11 for maximum output.
- 6.—Repeat operations 4 and 5 as necessary for correct calibration and output.

Output Balance Adjustment.—R26 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 R26 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 TR8 emitter and R33 is 5V with respect to battery positive.

Battery.—9V Ever Ready PP6 or equivalent.



An enlarged view
of the press-button
waveband switch
unit. Depressing the
"off" button merely
releases the other
three buttons

ULTRA - 6114