

General Description: A multi-band A.M./F.M. portable radio receiver operating from mains or battery supplies. A socket is provided for the connection of an earphone.

Mains Supply: 240 volts, 50Hz.

Batteries: 6 volts (4×HP2).

Wavebands: L.W. 150–300kHz; M.W. 520–1650kHz; F.M./Air 88–135MHz; Marine 4–6MHz; S.W. 7–23MHz; C.B. 27.56–28.1MHz.

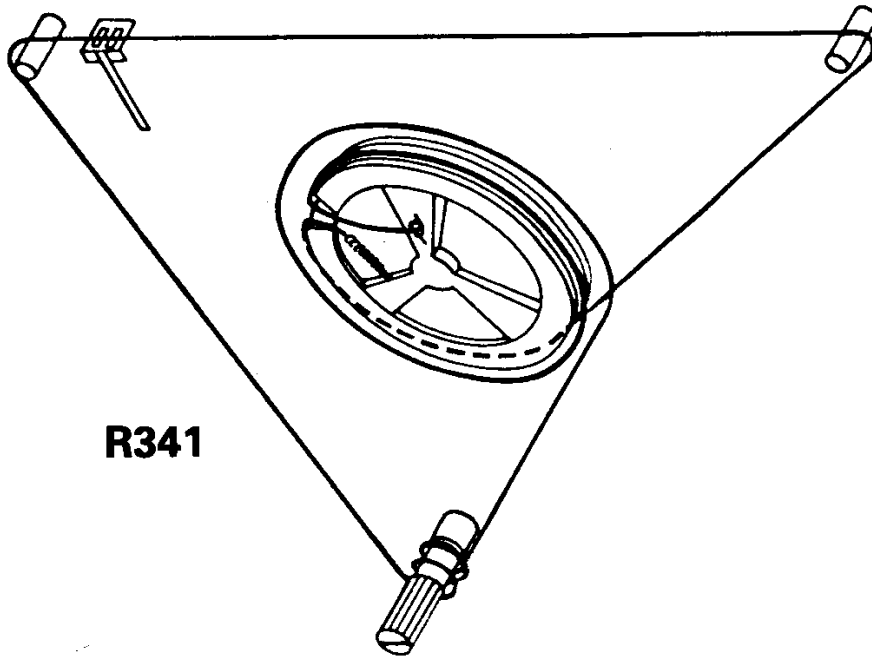
Transistor Voltages:

	<i>E</i>	<i>B</i>	<i>C</i>
TR1	0.9	1.0	4.3
TR2	1.55	1.1	4.35
TR3	3.8	4.1	4.35
TR4	3.7	0.9	4.35
TR5	0.3	0.85	3.3
TR6	0.3	0.9	3.15
TR7	0.45	1.1	3.45
TR8	0	0.6	3.4 (C.B.)
TR9	0	0.6	1.35 (C.B.)
TR10	0.7	1.35	4.5
TR11	4.8	0.7	4.2
TR12	0	0.6	0.8
TR13	1.5	0.8	1.5
TR14	2.7	1.1	4.9
TR15	0	0.6	2.65
TR16	3.0	2.25	0.65
TR17	0	0.65	2.95
TR18	3.6	4.2	0
TR19	3.6	3.0	0

All measurements volts D.C.

All voltages taken with AVO 8 Mk. V volume control at minimum. No signal conditions unless otherwise shown.

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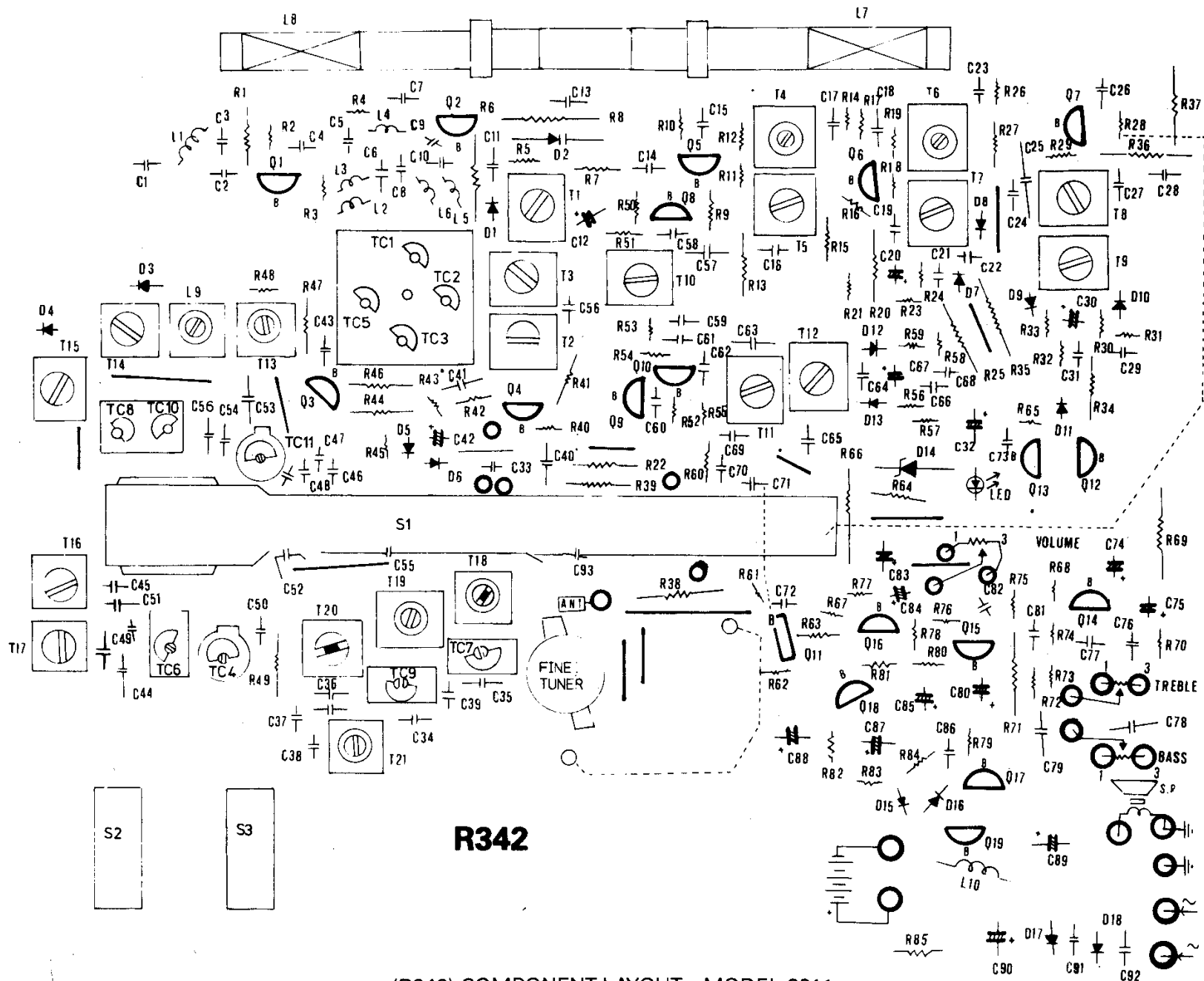


R341

(R341) DRIVE CORD—MODEL 6011

Component List

<i>Circuit Reference</i>	<i>Value</i>	<i>Circuit Reference</i>	<i>Value</i>
Resistors		Ceramic Capacitors	
R85	0.5 ohm	C6, 25, 55	3pf
R44	4.7 ohm	C11, 35, 37	5pf
R80	15 ohm	C34	7pf
R49	33 ohm	C9	10pf
R38, 39	56 ohm	C8	15pf
R3, 6, 66, 76	68 ohm	C1	18pf
R7, 41	100 ohm	C3	20pf
R47, 82, 83	150 ohm	C2	30pf
R22, 55, 84	220 ohm	C38	35pf
R10, 17, 28	330 ohm	C36	40pf
R11, 18, 65	470 ohm	C53	47pf
R29, 43, 62	680 ohm	C33, 56	50pf
R13, 20, 25, 30, 33, 36, 51, 56, 59	1K	C39, 50, 52	80pf
R1, 67, 70, 71, 81	1K5	C49	150pf
R48, 58, 60, 79	2K2	C57	250pf
R45	2K7	C51, 81	300pf
R4, 42	3K3	C54	380pf
R15, 63, 69, 72, 73, 75	4K7	C7, 86	500pf
R14, 26, 31, 32, 34, 52, 64	5K6	C27, 29, 31, 60, 72, 98	.001uf
R12, 19	6K8	C66, 68, 69	.003uf
R23, 24, 35, 46, 57, 58	10K	C4, 10, 46, 47, 48	.005uf
R16, 27	15K	C21, 22, 45, 65, 91, 92	.01uf
R9, 53	22K	C5, 13-19, 23, 24, 26, 28, 40, 41, 43, 58, 59, 61, 70, 73	.02uf
R77, 78	33K	C44, 62, 71, 82	.04uf
R21	47K		
R8	100K		
R37	220K		
R50	330K		
R2, 5	470K		
R40, 68, 74	680K		
R61	1M		



(R342) COMPONENT LAYOUT—MODEL 6011

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Mylar Capacitors

0.022uf	C76, 77
0.2uf	C78, 79

Polyester Capacitor

250pf	C63
650pf	C64

Electrolytic Capacitor

0.5uf/16V	C74
1uf/16V	C84
5uf/16V	C75, 80
10uf/16V	C20, 30, 42, 67
100uf/16V	C12, 83, 85, 87
220uf/16V	C32
470uf/16V	C90
1000uf/16V	C88, 89

Transistors

Q1, 2, 3, 4	1417H, BF595
Q5, 10	460C, BF595
Q11, 14, 15, 17	458C, BC237
Q12	9013H, BC237
Q13, 16	9015C, BC212
Q18	5609C, BD371
Q19	5610C, BD370

Diodes

D8-13, 17	1N60
D5, 6, 15, 16	CDG24 1S44
D3, 4, 7	CDG00 1N60
D2	varicap-diode IS2193B
D14	zener 4.5V D.C.
D17, 18	IN4001
L.E.D.	TIL220

Trimmer

TC6, TC7, TC9	8pf
TC8, TC10	2×8pf
TC4, TC11	20pf

Alignment Procedure (See Fig. R342)

A.M. Alignment: Equipment required: R.F. Signal generator. Output coupling coil. V.T.V.M.

Step	Function	Signal in	Signal out	Method	Remarks
1	A.M. I.F. alignment	465KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Adjust T2, T3, T5, T7, to get max. output at 465kHz	<ol style="list-style-type: none"> 1. Ensure set switched to M.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position 4. Tune to bottom end of scale
2	M.W. osc. alignment—low frequency 525KHz	525KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 525kHz. Adjust T16 for max. output	<ol style="list-style-type: none"> 1. Ensure set switched to M.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
3	M.W. osc. alignment—high frequency 1650KHz	1650KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 1650kHz. Adjust TC6 for max. output	<ol style="list-style-type: none"> 1. Ensure set switched to M.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position

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Step	Function	Signal in	Signal out	Method	Remarks
4	Repeat steps 2 and 3 until no further improvement				
5	M.W. aerial alignment—low frequency 600KHz	600KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 600KHz. Adjust aerial coil L8 for max. output	1. Ensure set switched to M.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
6	M.W. aerial alignment—high frequency 1400KHz	1400KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 1400kHz. Adjust TC5 for max. output	1. Ensure set switched to M.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume at minimum and tone controls at mid position M.W. alignment now complete. Seal L8 to ferrite rod with wax
7	Repeat steps 5 and 6 until no further improvement				
8	L.W. osc. alignment—low frequency 145KHz	145KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 145kHz. Adjust T17 for max. on meter	1. Ensure set switched to L.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume controls at minimum position and tone controls at mid position
9	L.W. osc. alignment—high frequency 310KHz	310KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 310kHz. Adjust TC4 for max. on meter	1. Ensure set switched to L.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume controls at minimum and tone controls at mid position
10	Repeat steps 8 and 9 until no further improvement				
11	L.W. aerial alignment—low frequency 180KHz	180KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 180KHz. Adjust L7 for max. on meter	1. Ensure set switched to L.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume controls at minimum and tone controls at mid position
12	L.W. aerial alignment—high frequency 280KHz	280KHz gen. via coupling coil to ferrite rod	Monitor signal on V.T.V.M. across C82 & ground	Tune pointer to 280KHz. Adjust TC3 for max. on meter	1. Ensure set switched to L.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume controls at minimum and tone controls at mid position
13	Repeat steps 11 and 12 until no further improvement				
					L.W. alignment now complete—Seal L7 to ferrite rod with wax

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C.B. Alignment: Equipment required: F.M. Signal generator. V.T.V.M.

Step	Function	Signal in	Signal out	Method	Remarks
1	C.B. Osc. alignment—low frequency 27.56MHz	Disconnect C.B. antenna wire at point S1C on P.C.B. and inject 27.56MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust T13 for max. output at 27.56MHz	1. Ensure set switched to C.B. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone control to mid position
2	C.B. Osc. alignment—high frequency 28.1MHz	Disconnect C.B. antenna wire at point S1C on P.C.B. and inject 27.8MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust TC11 for max. on meter	1. Ensure set switched to C.B. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone control to mid position
Repeat steps 1 and 2 until no further improvement					
3	C.B. aerial alignment 27.69MHz	Disconnect C.B. antenna wire at point C93 on P.C.B. and inject 27.69MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust T20 for max. on meter	1. Ensure set switched to C.B. 2. Reduce output control to avoid A.G.C. action 3. Ensure volume control at minimum and tone control to mid position
4	C.B. aerial alignment 27.89MHz	Disconnect C.B. antenna wire at point C93 on P.C.B. and inject 27.89MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust T21 for max. on meter	1. Ensure set switched to C.B. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone control to mid position
Repeat steps 3 and 4 until no further improvement					

F.M./Air Alignment: Equipment required: R.F. Signal generator (88–108MHz). 10.7MHz Sweep generator. Oscilloscope. V.T.V.M.

Step	Function	Signal in	Signal out	Method	Remarks
1	F.M. I.F. alignment 10.7MHz	Inject 10.7MHz sweep sig to base Q2	Connect osc. to junction R36/C28	Adjust T1, 4, 6, 8, 9 for symmetrical S curve	1. Ensure set switched to F.M. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
2	F.M. osc. alignment—low frequency 87.5MHz	Inject 87.5MHz sig to base Q2	Monitor V.T.V.M. across C82 and ground	Tune pointer to 87.5MHz. Adjust L5 and L6 for max. output	1. Ensure set switched to F.M. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position

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Step	Function	Signal in	Signal out	Method	Remarks
3	F.M. osc. alignment—high frequency 136MHz	Inject 136MHz sig to base Q2	Monitor V.T.V.M. across C82 and ground	Tune pointer to 136MHz. Adjust TC2 for max. output	1. Ensure set switched to F.M. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
4	Repeat steps 2 and 3 until no further improvement				
5	F.M. low frequency— 90MHz	Inject 90MHz sig to base Q2	Monitor V.T.V.M. across C82 and ground	Tune pointer to 90MHz. Adjust L2 and L3 for max. output	1. Ensure set switched to F.M. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
6	F.M. high frequency— 130MHz	Inject 130MHz sig to base Q2	Monitor V.T.V.M. across C82 and ground	Tune pointer to 130MHz. Adjust TC1 for max. output	1. Ensure set switched to F.M. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
7	Repeat steps 5 and 6 until no further improvement				
					F.M. alignment now complete

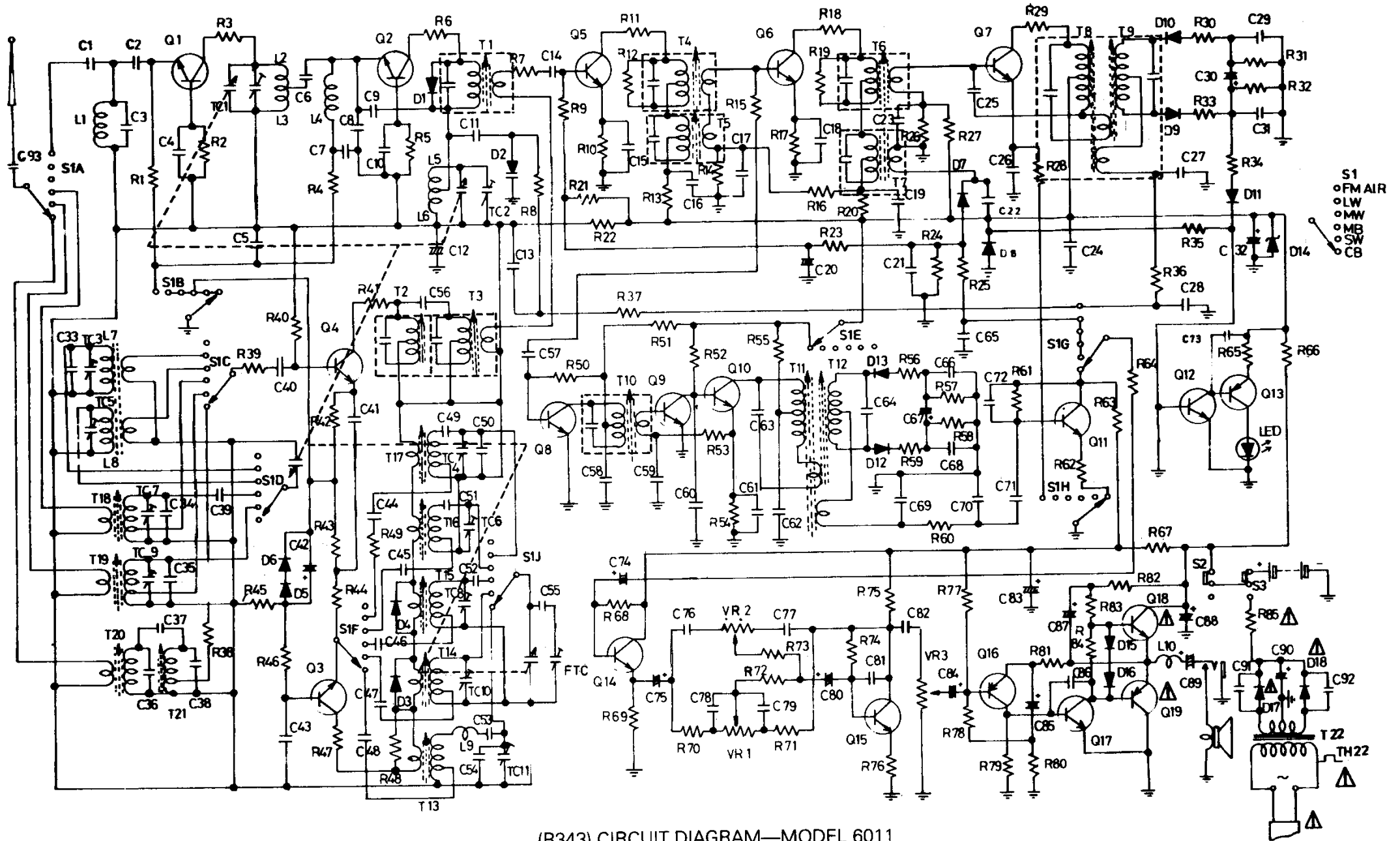
S.W./M.B. Alignment: Equipment required: R.F. Signal generator.
Output coupling coil. V.T.V.M.

Step	Function	Signal in	Signal out	Method	Remarks
1	S.W. osc. alignment—low frequency 6.9MHz	Disconnect S.W. ant. wire at point S1C on P.C.B. and inject 6.9MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust T14 for max. output at 6.9MHz	1. Ensure set switched to S.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position 4. Tune pointer to low frequency end
2	S.W. osc. alignment—high frequency 23.5MHz	Disconnect S.W. ant. wire at point S1C on P.C.B. and inject 23.5MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust TC10 for max. on meter	1. Ensure set switched to S.W. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position 4. Tune pointer to high frequency end
3	Repeat steps 1 and 2 until no further improvement				

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<i>Step</i>	<i>Function</i>	<i>Signal in</i>	<i>Signal out</i>	<i>Method</i>	<i>Remarks</i>
4	S.W.1 aerial alignment—low frequency 8MHz	Disconnect S.W. ant. wire at point S1C on P.C.B. and inject 8MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Tune pointer to 8MHz. Adjust ant coil T19 for max. on meter	<ol style="list-style-type: none"> 1. Ensure set switched to S.W.1 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
5	S.W.1 aerial alignment—high frequency 22MHz	Disconnect S.W. ant. wire at point S1C on P.C.B. and inject 22MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Tune pointer to 22MHz. Adjust TC9 for max. on meter	<ol style="list-style-type: none"> 1. Ensure set switched to S.W.1 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
6	Repeat steps 4 and 5 until no further improvement				
8	M.B. osc. alignment—low frequency 3.9MHz	Disconnect M.B. ant. wire at point S1C on P.C.B. and inject 3.9MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust T15 for max. on meter	<ol style="list-style-type: none"> 1. Ensure set switched to M.B. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position 4. Tune pointer to low frequency end
9	M.B. osc. alignment—high frequency 6.5MHz	Disconnect M.B. ant. wire at point S1C on P.C.B. and inject 6.5MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Adjust TC8 for max. on meter	<ol style="list-style-type: none"> 1. Ensure set switched to M.B. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
10	Repeat steps 1 and 2 until no further improvement				
11	M.B. aerial alignment—low frequency 4MHz	Disconnect M.B. ant. wire at point S1C on P.C.B. and inject 4MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Tune pointer to 4MHz. Adjust T18 for max. on meter	<ol style="list-style-type: none"> 1. Ensure set switched to M.B. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
12	M.B. aerial alignment—high frequency 6MHz	Disconnect M.B. ant. wire at point S1C on P.C.B. and inject 6MHz direct into P.C.B.	Monitor signal on V.T.V.M. across C82 and ground	Tune pointer to 6MHz. Adjust TC7 for max. on meter	<ol style="list-style-type: none"> 1. Ensure set switched to M.B. 2. Reduce output as necessary to avoid A.G.C. action 3. Ensure volume control at minimum and tone controls at mid position
13	Repeat steps 4 and 5 until no further improvement				

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(R343) CIRCUIT DIAGRAM—MODEL 6011