

SERVICE DATA

MODEL S-214

the hallicrafters co.
A Subsidiary of Northrop Corporation

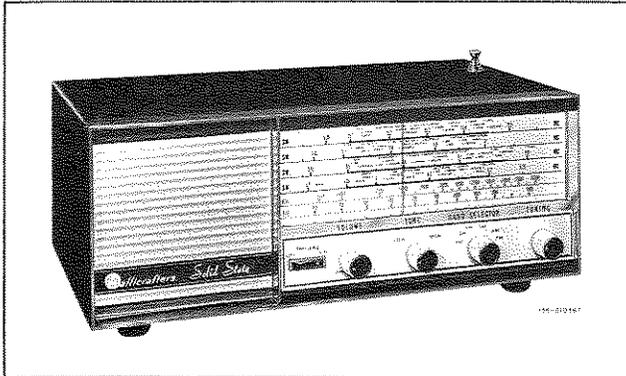


Figure 1. Hallicrafters Model S-214 AM-FM-SW Receiver.

SPECIFICATIONS

Circuit:	Six band superheterodyne containing 10 transistors and 9 diodes.
Tuning Range:	AM 550KHz - 1600KHz SW1 5.9MHz - 6.25MHz SW2 9.45MHz - 9.8MHz SW3 11.65MHz-12.05MHz SW4 15MHz - 15.5MHz FM 88MHz - 108MHz
Input Impedance (ext. ant.):	75 ohms
Sensitivity (12DB S/N):	0.6MHz to 1.6MHz - 200 μ V/M MAX. 5.9MHz to 15.5MHz - 15 μ V MAX. 88MHz to 108MHz - 10 μ V MAX. (20DB S/N)
Selectivity (IF):	AM/SW; 6KHz to 10KHz at 6DB. FM; 150KHz to 250KHz at 6DB.
IF Rejection:	AM; 25DB MIN at 600KHz FM; 37DB MIN at 90MHz
AFC Holding Range:	\pm 400KHz (FM)
AGC Figure of Merit:	40DB MIN (AM/SW)
IF Frequencies:	AM/SW; 455KHz FM; 10.7MHz
Audio Output:	1 watt

Audio Distortion: 10% MAX. at 1 watt output

Power Source: 117 VAC, 60Hz

CABINET REMOVAL

1. Remove the screw at the base of the telescopic antenna. Remove the antenna by pulling it through the top of the cabinet.
2. Remove the remaining screws on the bottom of the cabinet except the screws which retain the rubber feet.
3. Slide the receiver chassis forward through the front of the cabinet.

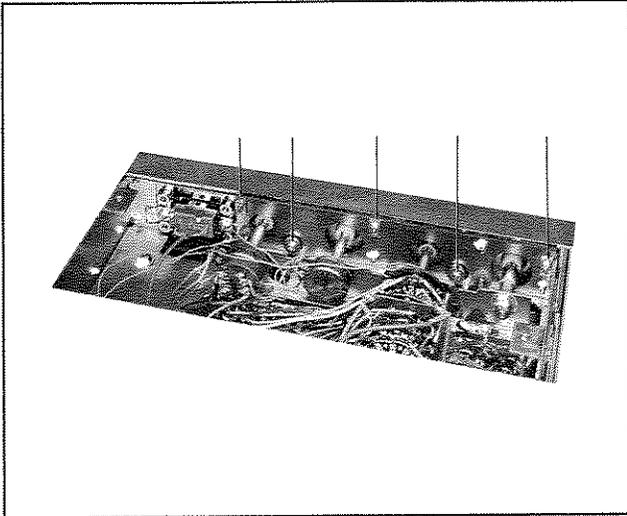
FRONT PANEL REMOVAL

1. Remove all knobs by pushing each knob forward from behind the front panel with the blade of a screwdriver.
2. Remove the overlay behind the knobs by removing the three speed-nuts and two screws (shown in figure 2) at the rear of the chassis front. CAUTION: The three studs, secured by the speed-nuts, are plastic and are easily damaged; do not twist the speed-nuts, but carefully pry up from the rear of each nut with the flat blade of a screwdriver while loosening the speed-nut at the top with the point of a pick.
3. The overlay is now clear and should be removed to expose three of the countersunk screws which secure the front panel casting.
4. Slip the dial cord from the slots in the dial pointer and remove the dial pointer by sliding it off one end of the dial plate. Remove the two screws at each end of the dial plate, and then the dial plate.
5. Remove the speaker and bend up the 8 tabs around the edges of the speaker grille. Apply pressure evenly to the rear of the speaker grille, over as great an area as possible, to separate the grille from the front panel casting. CAUTION: In some cases the grille may be damaged by removing it from the casting, necessitating its replacement.

- To free the front panel casting, the remaining two countersunk screws, exposed by removing the speaker grille, should be removed together with the three screws exposed by removing the overlay.

DIAL CORD RESTRINGING

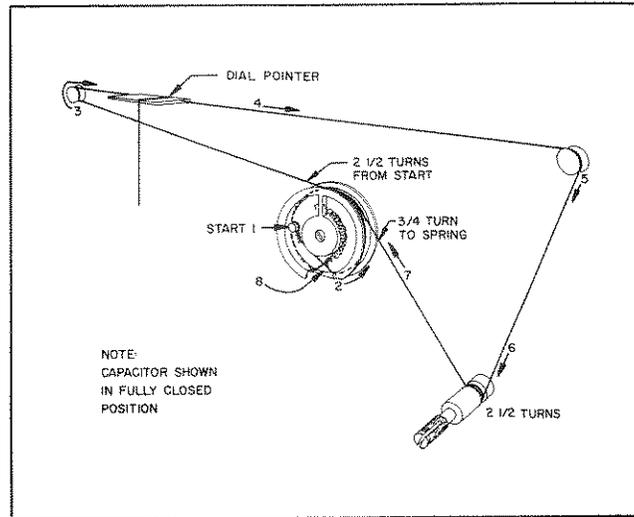
- Remove the cabinet and the front panel, as explained in the preceding paragraphs.



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Figure 2. Front Panel Retaining Screws and Nuts.

- Place the tuning capacitor drum in the position shown in figure 3. Start with the dial cord tied to the pin at location 1 and proceed to string along the direction of ascending numerical order. Finish by tying the cord to the spring at location 8.
- Secure the ends of the dial cord with a small amount of service cement before replacing the dial plate.



156-011924

Figure 3. Dial Cord Restringing Diagram.

ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED

- R.F. Signal Generator (FM) covering 85 MHz to 108 MHz.
- R.F. Signal Generator (AM) covering 455 KHz to 16 MHz.
- FM Sweep Generator capable of producing a 500 KHz deviation centered at 10.7 MHz, with a sweep marker at 10.7 MHz.
- Audio Output Meter having an 8-ohm input impedance.
- Oscilloscope of the TV alignment type.
- Tuning Wand with a powdered iron (ferrite) end and a brass end.
- Nonmetallic Alignment Tool.

GENERAL

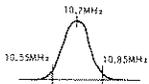
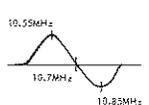
- Set the VOLUME control to maximum and the TONE control to LOW.
- Set the AM signal generator to produce 30% amplitude modulation (400 Hz or 1000 Hz) while performing the AM/SW alignment.
- Adjust the FM sweep generator to produce a swing of 500KHz (± 250 KHz) centered at 10.7 MHz. Set the marker generator to 10.7 MHz with additional markers at 10.55 MHz and 10.85 MHz, if available.
- Set the FM signal generator to produce 30% frequency modulation (deviation of ± 22.5 KHz) while performing the FM alignment.
- Set the audio output meter to its most sensitive range and make all adjustments, except those listed under FM-IF Alignment, for an indication of maximum output.
- Use the lowest signal generator output producing a 10 DB S/N ratio.

AM/SW ALIGNMENT

Step	Band	AM Signal Generator		Receiver	
		Connection To Receiver	Input Signal Frequency	Dial Setting	Adjust
1	AM	High side of the AM signal generator output connected to C18 at the junction of S1C. Low side connected to chassis.	455KHz	Tuning gang set at MAXIMUM capacity.	T7, T8, T9
2	AM	AM signal generator connected to a radiating loop of several turns of wire, close to the receiver.	525KHz	Tuning gang set at MAXIMUM capacity.	L6
3	AM	Same as step 2.	1650KHz	Tuning gang set at MINIMUM capacity.	C81G
4	AM	Same as step 2.	600KHz	600KHz	L5 (see note)
5	AM	Same as step 2.	1400KHz	1400KHz	C81D
6	AM	Repeat steps 2, 3, 4 and 5 until no further improvement is obtained.			
7	SW1	AM signal generator loosely coupled to AM antenna terminal.	6.27MHz	Tuning gang set at MINIMUM capacity.	L8
8	SW1	Same as step 7.	5.90MHz	5.90MHz	C85, L7
9	SW1	Same as step 7.	6.25MHz	6.25MHz	C84
10	SW1	Repeat steps 7, 8 and 9 until no further improvement is obtained.			
11	SW2	Same as step 7.	9.81MHz	Tuning gang set at MINIMUM capacity.	L10
12	SW2	Same as step 7.	9.45MHz	9.45MHz	C87, L9
13	SW2	Same as step 7.	9.80MHz	9.80MHz	C86
14	SW2	Repeat steps 11, 12 and 13 until no further improvement is obtained.			
15	SW3	Same as step 7.	12.05MHz	Tuning gang set at MINIMUM capacity.	L12
16	SW3	Same as step 7.	11.65MHz	11.65MHz	C89, L11
17	SW3	Same as step 7.	12.00MHz	12.00MHz	C88
18	SW3	Repeat steps 15, 16 and 17 until no further improvement is obtained.			
19	SW4	Same as step 7.	15.52MHz	Tuning gang set at MINIMUM capacity.	L14
20	SW4	Same as step 7.	15.05MHz	15.05MHz	C91, L13
21	SW4	Same as step 7.	15.50MHz	15.50MHz	C90
22	SW4	Repeat steps 19, 20 and 21 until no further improvement is obtained.			

NOTE: Use a tuning wand to check the alignment and adjust by sliding the coil towards the middle of the core, to increase inductance, or towards the end of the core, to decrease inductance.

FM-IF ALIGNMENT

Step	Band	FM Sweep Generator		Receiver		
		Connection to Receiver	Input Signal Frequency	Dial Setting	Oscilloscope	Adjust
1	FM	Connect the high side of the FM sweep generator through a 300PF capacitor to the junction of L5 and R7. Connect the low side to the chassis.	Sweep Frequency centered at 10.7MHz Sweep Markers set at 10.55MHz, 10.7MHz and 10.85MHz.	Tuning gang set at MAXIMUM capacity.	Connect the high side of the oscilloscope vertical amplifier input to the emitter of Q5. Connect the low side to the chassis.	T1, T2, T3 and T4 for maximum gain with a symmetrical curve centered at 10.7 MHz. 
2	FM	Same as step 1.	Same as step 1.	Same as step 1.	Connect the high side of the oscilloscope vertical amplifier input to the high side of the volume control (R70). Connect the low side to the chassis.	T5 and T6 for maximum gain with a symmetrical "S" curve centered at 10.7MHz. 

FM ALIGNMENT

Step	Band	FM Signal Generator		Receiver	
		Connection to Receiver	Input Signal Frequency	Dial Setting	Adjust
1	FM	High side of the FM signal generator loosely coupled to the FM antenna terminal. Low side connected to the chassis.	88MHz	Tuning gang set at MAXIMUM capacity.	L4 (turn spacing)
2	FM	Same as step 1.	110MHz	Tuning gang set at MINIMUM capacity.	C83
3	FM	Same as step 1.	88MHz	88MHz	L2 (turn spacing)
4	FM	Same as step 1.	108MHz	108MHz	C82
5	FM	Repeat steps 1, 2, 3 and 4 until no further improvement is obtained.			

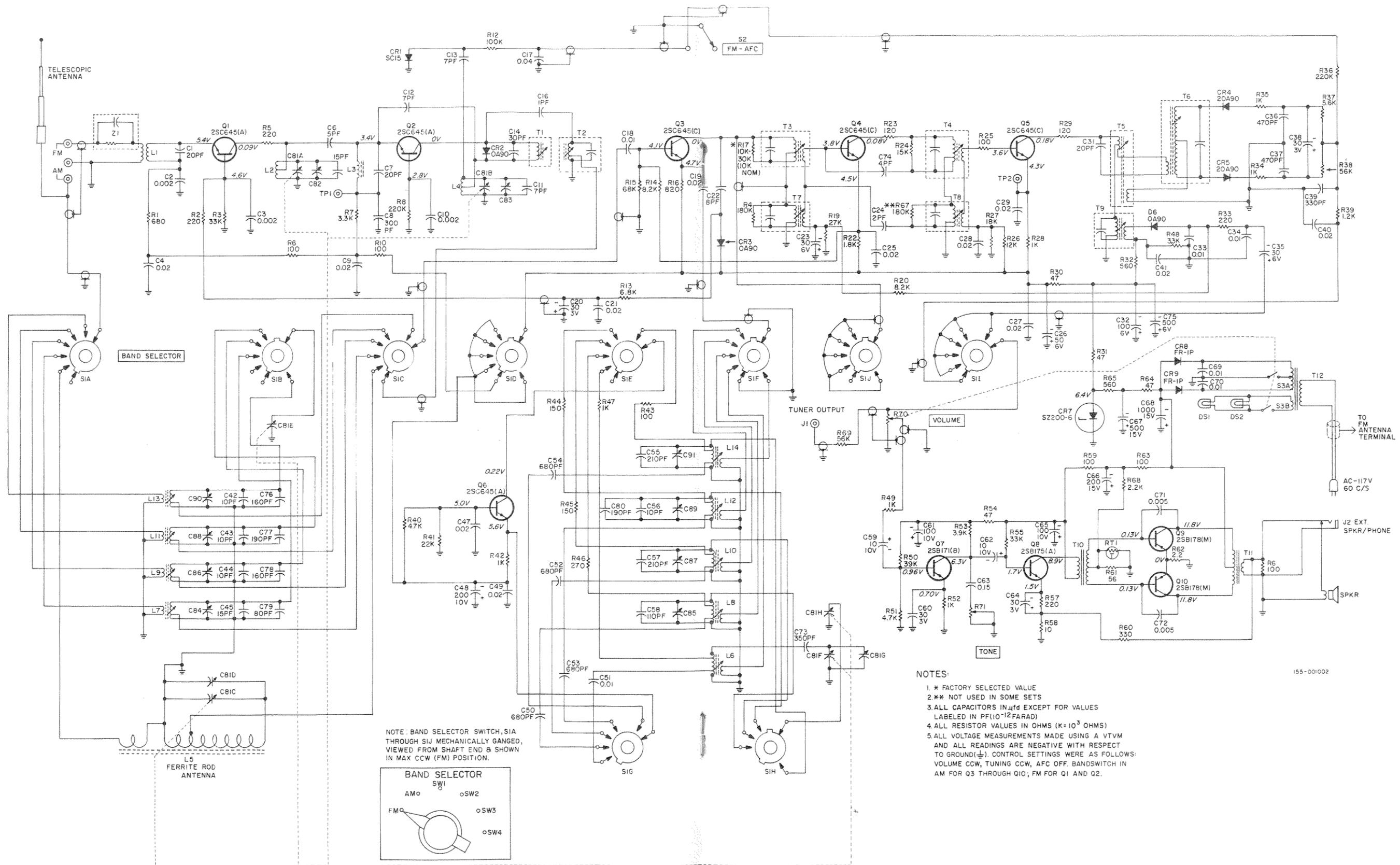
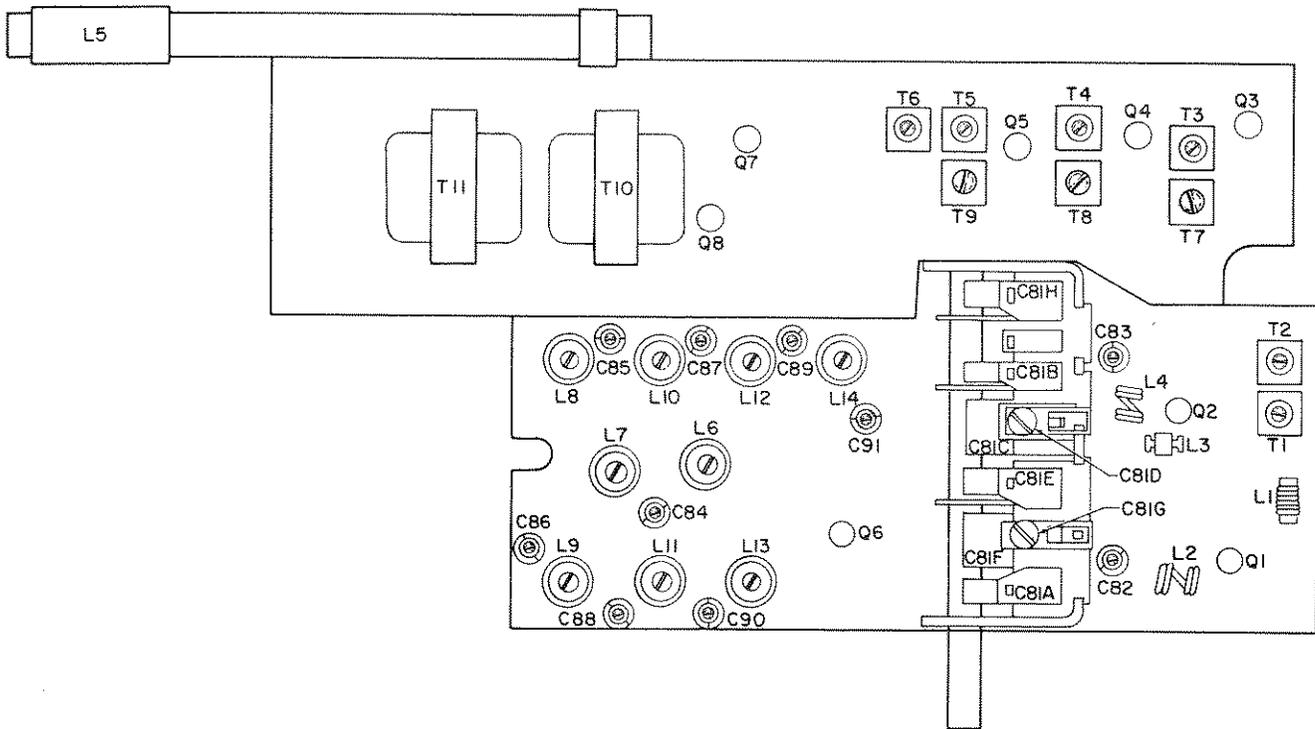


Figure 4. Model S-214 Schematic Diagram.



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Figure 6. Alignment Points and Transistor Location.

SERVICE REPAIR PARTS LIST

Schematic Symbol	Description	Hallcrafters Part Number	Schematic Symbol	Description	Hallcrafters Part Number
CAPACITORS			C84,85,86,87,88,89,90,91	Capacitor, Trimmer	120-005570
C1,7,31	20PF ±10%, Ceramic	120-004508	RESISTORS AND THERMISTORS		
C2,3,10	0.002µ F ±10%, Ceramic	120-004531	R1	*680 ohm	120-005585
C4,9,19,21,25,27,28,29,40,41,47,49	0.02µ F ±10%, Ceramic	120-004532	R2,5	*220 ohm	120-005584
C5,45	15PF ±10%, Ceramic	120-005229	R3	*33K ohm	120-005588
C6	5PF ±0.5PF, Ceramic	120-004527	R4,67	180K ohm	120-005579
C8	300PF ±10%, Ceramic	120-004530	R6,10	*100 ohm	120-005583
C11,12,13	7PF ±0.5PF, Ceramic	120-004528	R7	*3.3K ohm	120-005586
C14	30PF ±10%, Ceramic	120-004529	R8	*220K ohm	120-005590
C16	1PF ±0.5PF, Ceramic	120-005259	R12	*100K ohm	120-005589
C17	0.04µ F ±10%, Ceramic	120-004533	R13	6.8K ohm	120-004125
C18,33,34,51,69,70	0.01µ F ±10%, Ceramic	120-005554	R14,20	8.2K ohm	120-005575
C20,38,60,64	30µ F, 3V, Electrolytic	120-004521	R15	68K ohm	120-004124
C22	8PF ±0.5PF, Ceramic	120-005552	R16	820 ohm	120-004549
C23,35	30µ F, 6V, Electrolytic	120-004522	R17	10K ohm-30K ohm; nominal 10K ohm	120-004556
C24	2PF ±0.5PF, Ceramic	120-004504	R19	27K ohm	120-004110
C26	50µ F, 6V, Electrolytic	120-005558	R22	1.8K ohm	120-004116
C32	100µ F, 6V, Electrolytic	120-004085	R23,29	120 ohm	120-004137
C36,37	470PF ±5%, Styrol	120-005557	R24	15K ohm	120-004558
C39	330PF ±5%, Styrol	120-005556	R25,43,59,63,66	100 ohm	120-004543
C42,43,44,56	10PF ±10%, Ceramic	120-004507	R26	12K ohm	120-004557
C48	200µ F, 10V, Electrolytic	120-004524	R27	18K ohm	120-005576
C50, 52,53,54	680PF ±5%, Styrol	120-005568	R28,34,35,42,47,49,52	1K ohm	120-004119
C55,57	210PF ±5%, Styrol	120-005566	R30,31,54,64	47 ohm	120-004542
C58	110PF ±5%, Styrol	120-005563	R32,65	560 ohm	120-004111
C59,62	10µ F, 10V, Electrolytic	120-004519	R33,57	220 ohm	120-004136
C61,65	100µ F, 10V, Electrolytic	120-005559	R36	220K ohm	120-004568
C63	0.15µ F ±10%, Mylar	120-005555	R37,38	5.6K ohm	120-004117
C66	200µ F, 15V, Electrolytic	120-004525	R39	1.2K ohm	120-004551
C67	500µ F, 15V, Electrolytic	120-004537	R40,51	4.7K ohm	120-004112
C68	1000µ F, 15V, Electrolytic	120-005560	R41	22K ohm	120-004559
C71,72	0.005µ F ±10%, Ceramic	120-005553	R44,45	150 ohm	120-005580
C73	350PF ±5%, Styrol	120-005567	R46	270 ohm	120-004138
C74	4PF ±0.5PF, Ceramic	120-004506	R48	3.3K ohm	120-004131
C75	500µ F, 6V, Electrolytic	120-005257	R50	39K ohm	120-005577
C76,78	160PF ±5%, Styrol	120-005564	R53	3.9K ohm	120-004123
C77,80	190PF ±5%, Styrol	120-005565	R55	33K ohm	120-004560
C79	80PF ±10%, Ceramic	120-005561	R56	10K ohm	120-004558
C81A,81B,81C,81D,81E,81F,81G,81H	Capacitor, TUNING	120-005569	R58	10 ohm	120-005573
C82,83	Capacitor, Trimmer	120-005571	R60	330 ohm	120-004545
			R61	56 ohm	120-005574

SERVICE REPAIR PARTS LIST (CONTINUED)

Schematic Symbol	Description	Hallcrafters Part Number	Schematic Symbol	Description	Hallcrafters Part Number
R62	2.2 ohm	120-005572		Nut, M3	120-004616
R68	2.2K ohm	120-004120		Nut, Speed	120-005651
R69	56K ohm	120-005578		Washer, Cabinet feet	120-004618
R70/S3A/S3B	5K ohm, VOLUME Control (includes ON-OFF switch)	120-005581		Washer, Speaker Mounting	120-004619
R71	20K ohm, TONE Control	120-005582		Washer, PC board Mounting	120-004619
RT1	Thermistor, Type 16D47	120-005619		Washer, Drum Gear	120-004619
				Washer, Chassis to Cabinet Mounting	120-005656
				Washer, Lock (Chassis)	120-004617
				Washer, Lock (see-saw switch)	120-005653
				Washer, Lock (ferrite antenna)	120-005656
				Washer, Vinyl, Knob	120-005628
NOTE: All resistors are $\pm 10\%$ carbon; those with an asterisk are 1/8 watt while those without are 1/4 watt.					
COILS AND TRANSFORMERS					
L1	Coil, FM Antenna	120-005539			
L2	Coil, FM RF	120-005538			
L3	Coil, FM Choke	120-005537			
L4	Coil, FM Oscillator	120-005539			
L5	Coil, AM Antenna (Ferrite Loop)	120-005540			
L6	Coil, AM Oscillator	120-005532			
L7	Coil, SW1 Antenna	120-005528			
L8	Coil, SW1 Oscillator	120-005533			
L9	Coil, SW2 Antenna	120-005529			
L10	Coil, SW2 Oscillator	120-005534			
L11	Coil, SW3 Antenna	120-005530			
L12	Coil, SW3 Oscillator	120-005535			
L13	Coil, SW4 Antenna	120-005531			
L14	Coil, SW4 Oscillator	120-005536			
T1	Transformer, FM 1st IF (Pri)	120-005544			
T2	Transformer, FM 1st IF (Sec)	120-005545			
T3	Transformer, FM 2nd IF	120-004485			
T4	Transformer, FM 3rd IF	120-005543			
T5	Transformer, FM Ratio Detector (Pri)	120-004487			
T6	Transformer, FM Ratio Detector (Sec)	120-004488			
T7	Transformer, AM 1st IF	120-005541			
T8	Transformer, AM 2nd IF	120-005542			
T9	Transformer, AM Detector	120-004483			
T10	Transformer, Audio Driver	120-005546			
T11	Transformer, Audio Output	120-005547			
T12	Transformer, AC Power	120-005548			
TRANSISTORS AND DIODES					
Q1,2,6	Transistor, 2SC645(A)	120-004496			
Q3,4,5	Transistor, 2SC645(C)	120-004497			
Q7	Transistor, 2SB171(B)	120-004493			
Q8	Transistor, 2SB175(A)	120-004494			
Q9, 10	Transistor, 2SB178(M)	120-005549			
CR1	Diode, Varicap, SC-15	120-005551			
CR2,3,6	Diode, OA-90	120-004499			
CR4,5	Diode, 20A-90	120-005550			
CR7	Diode, Zener SZ-200-6	120-005452			
CR8,9	Diode, Silicon Rectifier	120-004503			
*SCREWS-NUTS-WASHERS					
	Screw, Dial Cord Pulley	120-005641			
	Screw, Gear Set	120-005634			
	Screw, Machine R.H. 3 x 4	120-005645			
	Screw, Machine R.H. 3 x 6	120-004607			
	Screw, Machine R.H. 3 x 10	120-004609			
	Screw, Machine R.H. 3 x 12	120-004615			
	Screw, Machine R.H. 4 x 6	120-005646			
	Screw, Machine R.H. 4 x 10	120-005647			
	Screw, Machine R.H. 3 x 8	120-004612			
	Screw, Machine R.H. 3 x 14 (Ferrite Antenna)	120-005648			
	Screw, Machine F.H. 3 x 8	120-005649			
	Screw, Tapping R.H. 3 x 6	120-005650			
	Nut, Gear Bracket	120-005633			
			J2	Jack, Ext. Spkr/Phone	120-005612
			J1	Jack, Tuner Output	120-005613
				Knob, Band Selector	120-005625
				Knob, Volume-Tone-Tuning	120-005624
				Mount, Ferrite Antenna	120-005630
				Mount, Speaker Grille	120-005597
				Name Plate, Control Position	120-005603
				Name Plate, "hallcrafters"	120-005599
				Panel, Front Die Cast	120-005594
				Panel, Decorative	120-005602
				Paper, Black Dial Backing	120-005605
				PC Board, Tuner Assembly	120-005616
				PC Board, Main Chassis	120-005617
			DS1,2	Pilot Lamp	120-005639
				Plate, Antenna Terminal	120-005614
				Plate, Dial Back	120-005629
				Pointer, Dial	120-005606
				Pulley, Dial Cord	120-005640
			Z1	RC Network, Antenna Couplate	120-005620
				Shaft, Tuning	120-005637
			SPKR	Speaker	120-005623
				Spring, Dial	120-005609
				Stand, Telescopic Antenna	120-005622
				Stand-off, Wire (ant. leads)	120-005635
			S1A/1B/1C/1D/1E/1F/1G/1H/1I/1J	Switch, Rotary (band selector)	120-005591
			S2	Switch, See-Saw (FM-AFC)	120-005592
				Styrofoam, Packing	120-005655
				Trim, Panel	120-005601
				Window, Dial	120-005604