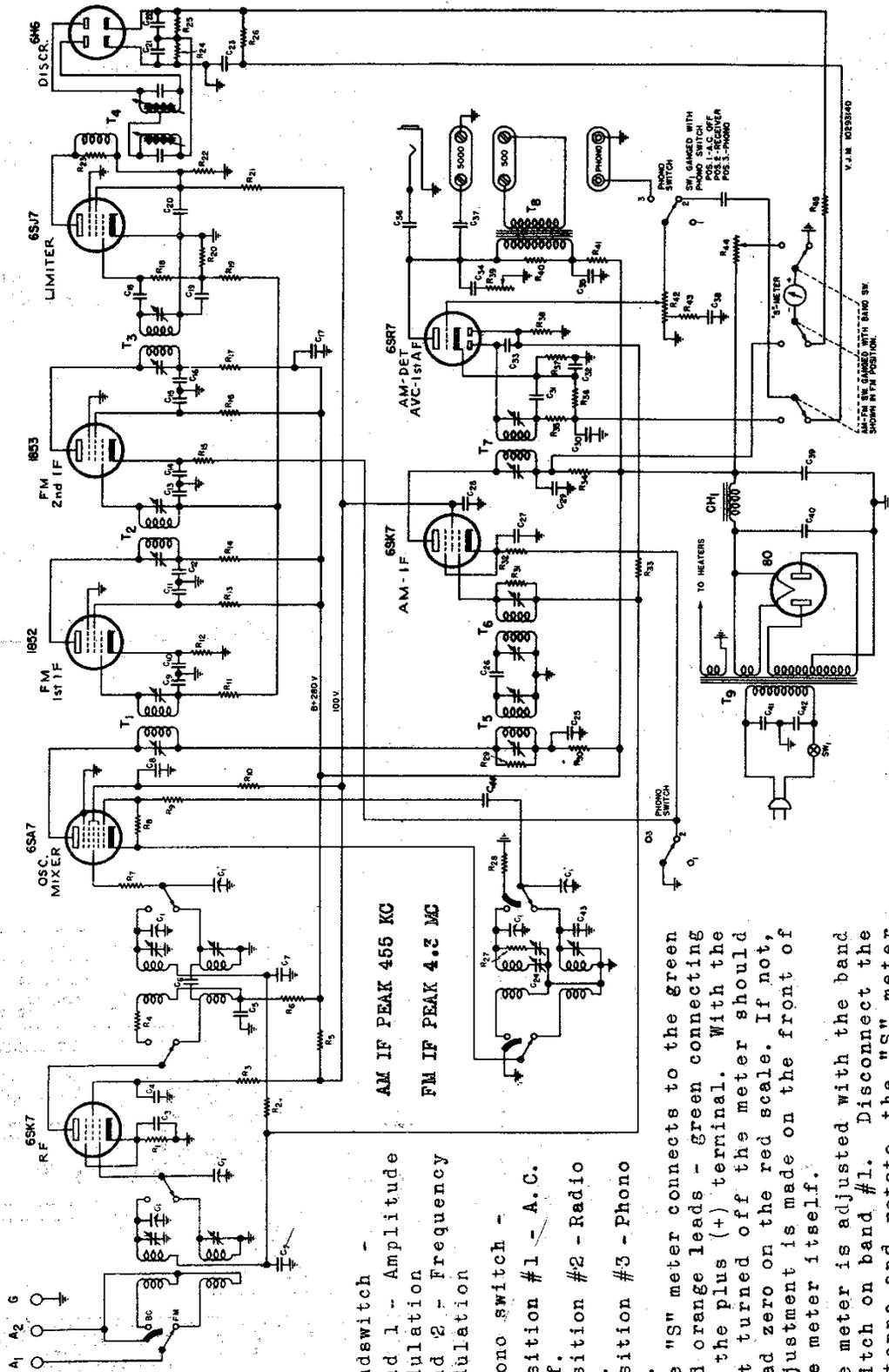


MODEL S-31

THE HALLICRAFTERS CO.

SCHEMATIC DIAGRAM-HIGH FREQUENCY I.M.-BROADCAST AM TUNER-MODEL S-31



Bandswitch -  
 Band 1 - Amplitude modulation  
 Band 2 - Frequency modulation

Phono switch -  
 Position #1 - A.C. Off.  
 Position #2 - Radio On.  
 Position #3 - Phono On.

The "S" meter connects to the green and orange leads - green connecting to the plus (+) terminal. With the set turned off the meter should read zero on the red scale. If not, adjustment is made on the front of the meter itself.

The meter is adjusted with the band switch on band #1. Disconnect the antenna and rotate the "S" meter adjustment on the rear of the chassis until the meter reads zero on the left side of the scale.

Note: Unground A<sub>2</sub> when using a doublet. Antenna should be erected as high as possible.

THE HALLICRAFTERS CO.

ALIGNMENT PROCEDURE	NO.	CAPACITY	VOLTAGE TYPE	NO.	OHMS	MATTAGE	NO.	OHMS	MATTAGE
Equipment needed and preliminary adjustments:									
An all wave signal generator which will provide an accurately calibrated signal at test frequencies listed.									
Output indicating meter.									
Non-metallic screw driver.									
Dummy antennas 100 ohm, and 0.1 mfd.									
Volume control - Maximum all adjustments.									
Tone control - Extreme clockwise position.									
Connect output meter across primary of output transformer.									
Allow chassis and signal generator to "heat up" for several minutes.									
Connect low side of generator to chassis (0mfd)									
Set gang condenser at minimum capacity for all I.F. adjustments.									
1 - 100,000 ohm resistor.	1								
1 - .002 mfd condenser.	1								
1 - 100 mfd condenser.	1								
<b>A.M. BROADCAST (BAND #1) ALIGNMENT. INTERMEDIATE FREQUENCY, (455 KC.)</b>									
1 - Tune signal generator to 455 kc.	1								
2 - Connect signal generator thru (kc.) tube.	2								
3 - Align T <sub>7</sub> for maximum output.	3								
4 - Connect generator to either stator lug on center section of gang condenser thru a 0.1 mfd. condenser.	4								
5 - Align T <sub>5</sub> and T <sub>6</sub> for maximum output. (Do not realign T <sub>7</sub> ).	5								
<b>R.F. STAGES.</b>									
1 - Tune signal generator to 1400 kc.	1								
2 - Connect signal generator thru 100 ohms to A <sub>1</sub> - Ground A <sub>2</sub> (140) output.	2								
3 - Set receiver dial at 1400 kc (140) output.	3								
4 - Adjust C <sub>A</sub> , C <sub>B</sub> and C <sub>C</sub> for maximum output.	4								
5 - Set generator at 600 kc.	5								
6 - Set dial at 600 kc. (60)	6								
7 - Adjust C <sub>P</sub> for maximum output.	7								
8 - Repeat steps 3 and 4.	8								
<b>F.W. BROADCAST (BAND #2) ALIGNMENT.</b>									
1 - Disconnect lead from high side of volume control.	1								
2 - Set benchswitch on #2 (FM) band.	2								
3 - Disconnect discriminator plate lead (white blue tracer) from plate (pin #8) of 6SR7 limiter tube.	3								
4 - Connect a 100,000 ohm resistor and an .002 mf. condenser in series from plate (pin #6) of limiter to grid (pin #2) of 6SR7 audio amplifier.	4								

ALIGNMENT PROCEDURE	NO.	CAPACITY	VOLTAGE TYPE	NO.	OHMS	MATTAGE	NO.	OHMS	MATTAGE
5 - Connect 100 mfd from (pin #2) grid of 6SR7 to chassis.	5								
6 - The 6SR7 will now operate as an amplitude modulation detector.	6								
7 - Set signal generator at 4.5 mc.	7								
8 - Connect signal generator thru 0.1 mf. condenser to lug on small stator center section of gang condenser.	8								
9 - Adjust T <sub>1</sub> , T <sub>2</sub> and T <sub>3</sub> for maximum output keeping the signal generator at as low an output as possible.	9								
10 - Connect signal generator thru 100 ohm resistor to A <sub>1</sub> - Ground A <sub>2</sub> .	10								
11 - Tune signal generator to 49 megacycles.	11								
12 - Set receiver dial at 49 megacycles.	12								
13 - Adjust C <sub>P</sub> , C <sub>B</sub> and C <sub>C</sub> for maximum output. NOTE: The coil-tuner tunes to the LOW frequency side of the signal.	13								
14 - Tune signal generator to 45 megacycles.	14								
15 - Set dial at 45 mc.	15								
16 - Adjust positions of coil leads for maximum output.	16								
17 - Repeat steps 11, 12 and 13.	17								
18 - Replace the wire on the volume control. Remove the resistor-condenser combination from limiter, and connect the wires as they were.	18								
19 - Reconnect signal generator as for I.F. alignment and tune to 4.5 mc.	19								
20 - Set signal generator for strong output signal.	20								
21 - Adjust S <sub>1</sub> on T <sub>4</sub> until a null is obtained as indicated both by the meter and aurally.	21								
22 - Detune signal generator 100 kilocycles.	22								
23 - Tune S <sub>2</sub> for maximum output.	23								
24 - Tune signal generator back thru resonance and 100 kc to the other side of the I.F. frequency. The output should first drop and then rise to a value equal on both sides of the dip.	24								
25 - If the output is not equal on both sides of resonance, readjust S <sub>1</sub> .	25								
26 - If the output is still not equal on either side of resonance a slight shift of the null point obtained with S <sub>1</sub> may be necessary.	26								

ALIGNMENT PROCEDURE	NO.	CAPACITY	VOLTAGE TYPE	NO.	OHMS	MATTAGE	NO.	OHMS	MATTAGE
Tuning Condenser	6	.05 mfd	Section.	R <sub>1</sub>	150	1/3	R <sub>24</sub>	100,000	1/3
200 Paper	2	100,000	200 Paper	2	100,000	1/3	25	100,000	1/3
400 Paper	3	1,000	400 Paper	4	500	1/3	26	200,000	1/3
400 Paper	4	500	400 Paper	5	7,500	3	27	300	1/3
25 mfd	5	1,000	Mica	6	1,000	1/3	28	8	1/3
.05 mfd	6	200	400 Paper	7	35	1/3	29	200,000	1/3
.02 mfd	7	400	400 Paper	8	20,000	1/3	30	1,000	1/3
.01 mfd	8	200	400 Paper	9	8	1/3	31	200,000	1/3
.02 mfd	9	400	400 Paper	10	1,000	1/3	32	500	1/3
.05 mfd	10	100,000	400 Paper	11	100,000	1/3	33	2,000,000	1/3
.02 mfd	11	400	400 Paper	12	400	1/3	34	35	1/3
.01 mfd	12	400	400 Paper	13	150	1/3	35	50,000	1/3
.02 mfd	13	400	400 Paper	14	40,000	1/2	36	250,000	1/3
.01 mfd	14	200	400 Paper	15	500	1/3	37	1,000	1/3
.02 mfd	15	400	400 Paper	16	150	1/3	38	1,000,000	1/3
.02 mfd	16	400	400 Paper	17	25,000	1/2	39	100,000	1/3
.1 mfd	17	400	400 Paper	18	500	1/3	40	100,000	1/3
50. mfd	18	400	Mica	19	50,000	1/3	41	2,000	1/3
2000. mfd	19	400	Mica	20	100,000	1/3	42	1,000,000	vol. Cont. tap at 20,000 Ohms
.02 mfd	20	400	400 Paper	21	4,000	1/2	43	4,000	1/3
.75 mfd	21	100	Mica	22	4,000	1/2	44	1,500	'5' meter adjustment Band #1
100 mfd	22	500	Mica	23	15,000	1/2	45	250,000	1/3
500 mfd	23	400	Paper						
Pad Band #1	24	400	Paper						
.02 mfd	25	400	Twisted Pair						
2.5 mfd	26	200	400 Paper						
.05 mfd	27	400	400 Paper						
.1	28	400	Mica						
.02	29	400	Mica						
.25 mfd	30	25	Mica						
10 mfd	31	25	Mica						
10 mfd	32	25	Mica						
25 mfd	33	400	Paper						
.05 mfd	34	400	Paper						
350	35	400	Elect.						
400	36	400	Paper						
1 mfd	37	400	Paper						
200	38	400	Paper						
350	39	400	Elect.						
300	40	400	Elect.						
600	41	400	Paper						
600	42	400	Paper						
Oscillator drift compensator	43	50							
50 mfd	44								

they may more easily be mounted vertically, removing all directional properties and producing polarization corresponding to that used by FM stations. If the antenna must be horizontal it should be placed broadside to the direction of the weakest received signal.

**FREQUENCY RANGE:**  
Band No. 1 - 540-1850 Kilocycles  
Band No. 2 - 40- 51 megacycles

**POWER OUTPUT:**  
130 Milliwatts undistorted  
50 watts

**POWER SOURCE:**  
115 volts 60 cycle A.C.

**CHASSIS DIMENSIONS:**  
Length 16-3/4", Depth 10-3/4", Height 8-5/8"

**SENSITIVITY:**  
Band 1 (AM) 40 microvolts at 6 milliwatts output.  
Band 2 (FM) 60 microvolts for full limiter action.

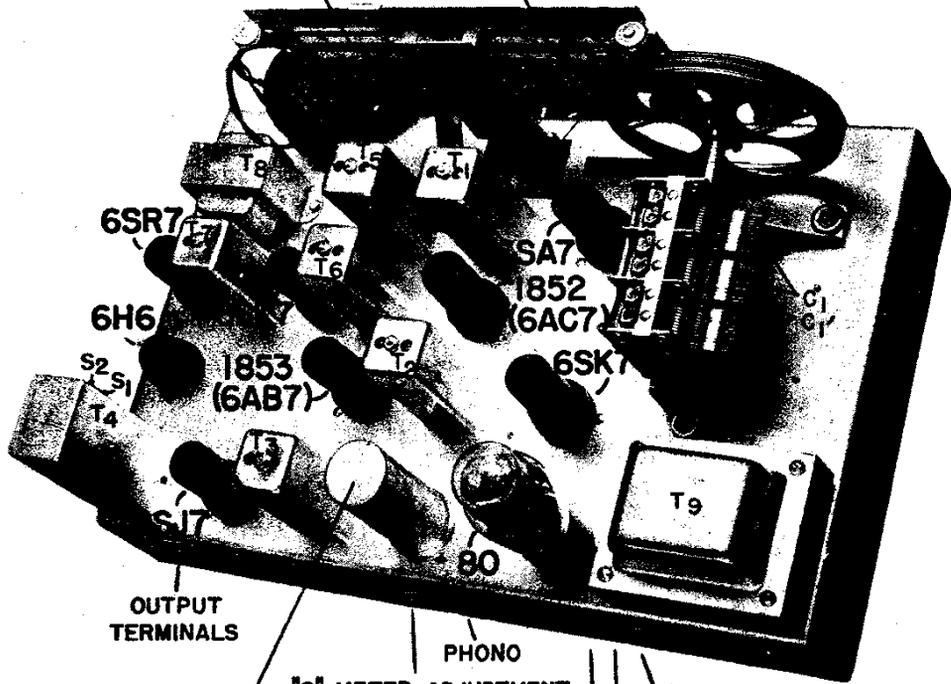
**SELECTIVITY:**  
25 kc at 1000 times down at 1000 kc.  
150 kc on #2 band (40-51 mc)

For best results an antenna should be cut to resonate at the high frequency end of the FM band. Probably the simplest and most effective antenna would be a half wave dipole consisting of two quarter wave (4-1/2 feet) rods placed end to end with a few inches space between them. Connect a twisted pair to the ends of the rods close to each other. A wire one half wave (9 feet) length long may be cut at the center and an insulator inserted between the halves. The feeders then connect to the wires at either side of the insulator. The advantage of using rods rather than wire for the antenna is that

MODEL S-31

THE HALLICRAFTERS CO.

150 MILLIAMPERE PILOT LIGHTS



OUTPUT TERMINALS

PHONO

"S" METER ADJUSTMENT

A1 A2 GND

ELECTROLYTIC C35-C39-C40

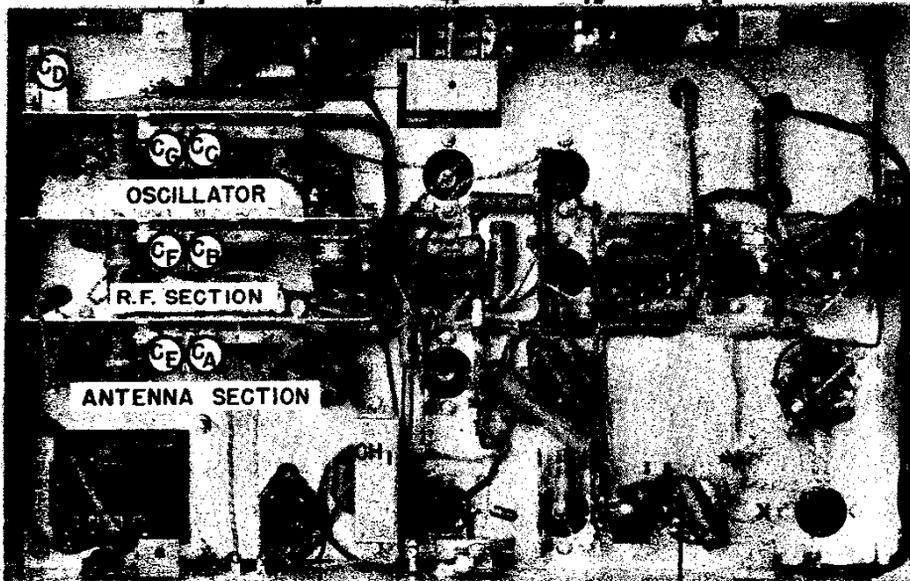
BANDSWITCH

A.C.-PHONO-RADIO-SWITCH

TUNING CONTROL

AUDIO GAIN CONTROL

STONE CONTROL



6SR7

"S" METER ADJUSTMENT

6SJ7