

# the hallicrafters co.

## SERVICE BULLETIN No. 1 FOR MODELS S-40

**GENERAL:** Model S-40 is a 9 tube commercial superheterodyne table model, radio receiver, incorporating 4 bands of AM/CW reception, as follows: band #1, 540 kc to 1700 kc; band #2, 1.7 mc to 5.35 mc; band #3, 5.35 mc to 15.7 mc; band #4, 15.7 mc to 43 mc. Provision for variable sensitivity control; optional AVC, noise limiting, BFO pitch, tone, headset reception, and use of an external "S" meter; standby operation; and bandspreading are provided.

**REAR PANEL CONNECTIONS:** Consist of AC line cord with plug, antenna and ground connector strip, dc power input socket and external "S" meter connector socket.

**POWER SUPPLY DATA:** AC operation—117 volt, 50/60 single phase source. (Also, 110/130/150/220/250 volt, 25 cycles single phase source with special power transformer available, Hallicrafter's part #52CO27.) Power drain is 75 watts.

**DC operation**—filament 6.3 volt @ 5 amp; "B" supply 260 volt @ 70 ma. (The 6 volt battery drain for vibrator type supply for "B" voltage will run about 10 amp.)

**TUBE TYPES AND FUNCTION:** 6SG7—RF amplifier; 6SA7—mixer; 6SK7—(2 used)—1st and 2nd IF amplifiers; 6SQ7—detector, audio amplifier; 6F6G—audio power amplifier; 6H6—gas gate and noise limiter; 6J5—BFO; 80—power rectifier.

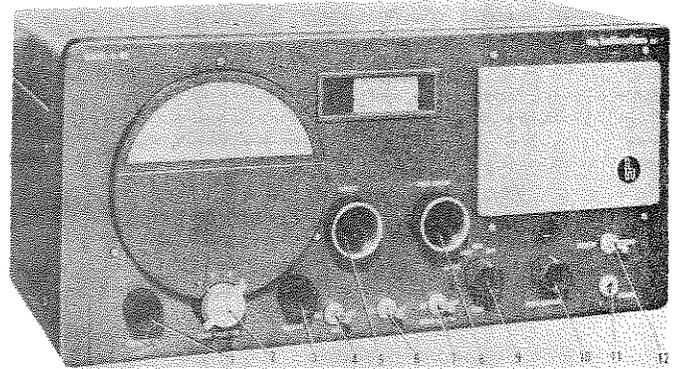


Fig. 1. Front view of receiver showing control locations.

### DETAILED SERVICE INFORMATION

IF FREQUENCY	IF SELECTIVITY	IMAGE RATIO	SENSITIVITY	AUDIO OUTPUT
455 kc	6.8 kc wide at 6 db down 40.7 kc wide at 60 db down (for 500 milliwatt output)	6:1 at 30 mc 15:1 at 14 mc 37:1 at 5 mc 1000:1 at 1500 kc	15 microvolt for 500 milliwatt output at 550 kc 8 microvolt for 500 milliwatt output at 40 mc	1 watt with less than 10% distortion

### CONTROL SETTINGS FOR PRELIMINARY TEST OPERATION (Broadcast Band)

REF. NO. (in Fig. 1)	NAME	FUNCTION	SETTING	REF. NO. (in Fig. 1)	NAME	FUNCTION	SETTING
1	SENSITIVITY	RF gain control	Maximum clockwise	7	NOISE LIMITER	Noise peak limiting	At "OFF"
2	BAND SELECTOR	Operating band selector	Counter clockwise to "1"	8	BAND SPREAD	Short wave band spreading	To "O" on small dial scale
3	VOLUME	Audio gain control	Half clockwise; adj. as necessary	9	TONE	Receiver on/off switch and tone control	Clockwise to "MED"
4	AVC	Automatic volume control	At "ON"	10	PITCH CONTROL	CW beat note pitch selector	Any position (not in use)
5	TUNING	Main tuning control	To local station freq. on main dial scale	11	PHONES jack	Headset connection	Not used
6	CW/AM	BFO on/off switch	At "AM"	12	STANDBY/RECEIVE	Receiver temporary standby	At "RECEIVE"

### HOW TO RESTRINGING DIAL CORDS

Removal of the front panel will be necessary in order to facilitate the restringing of the dial cords. A No. 6 Allen wrench will be required to loosen the set screws in the knobs. The Allen wrench can be obtained from most hardware stores. Use a No. X6337 kaurled Spintite wrench to remove kaurled ring nuts on the switch bushings.

To restring the main tuning dial cord, cut a 25" length of 18 lb. test dial cord and tie one end to the tension spring of the main tuning capacitor drive pulley at position "1" on the diagram. Following the numbers 1 through 14, wind the cord on the pulley and knob drive shaft. At position "14," stretch the tension spring and tie the cord securely. Cut off the excess cord. Note that three turns are wound on the knob drive shaft.

To restring the bandspread tuning dial cord, cut a 35" length of dial cord and follow the procedure as explained above, except start at position "A" on the diagram and proceed through position "V." Note that the knob drive shaft has three turns and the dial drive pulley has one turn.

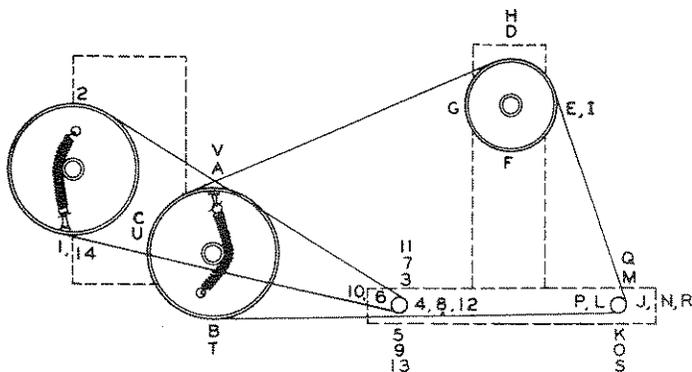


Fig. 2. Dial cable stringing procedure main tuning is indicated by numbers and bandspread tuning is indicated by letters

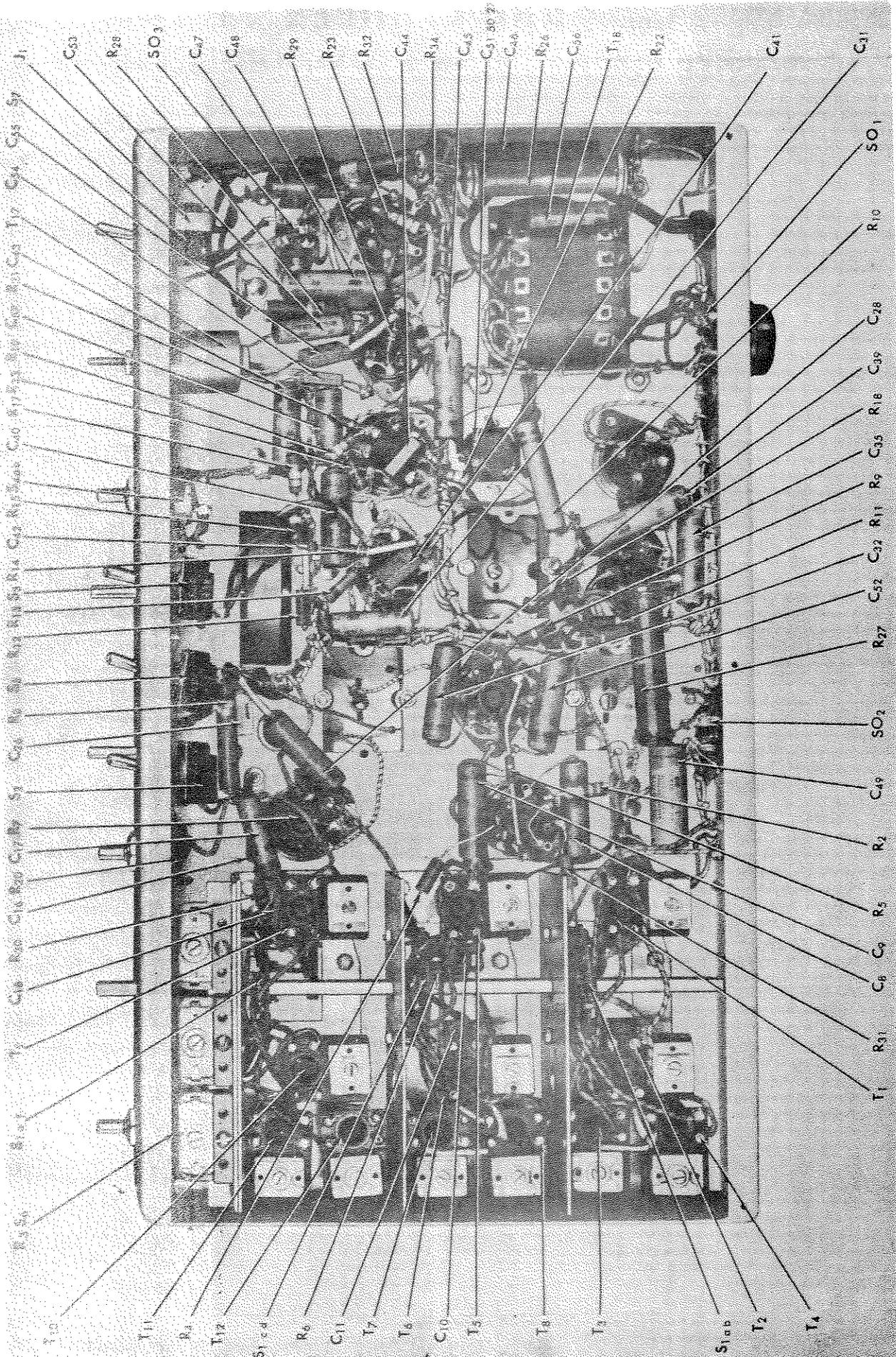


Fig. 3. Bottom view of the receiver showing components location.

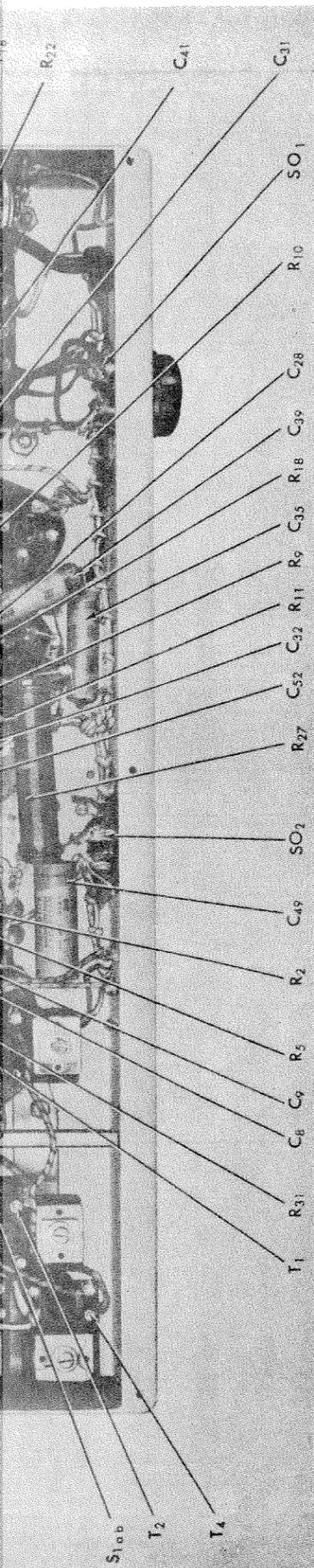


Fig. 3. Bottom view of the receiver showing components location.

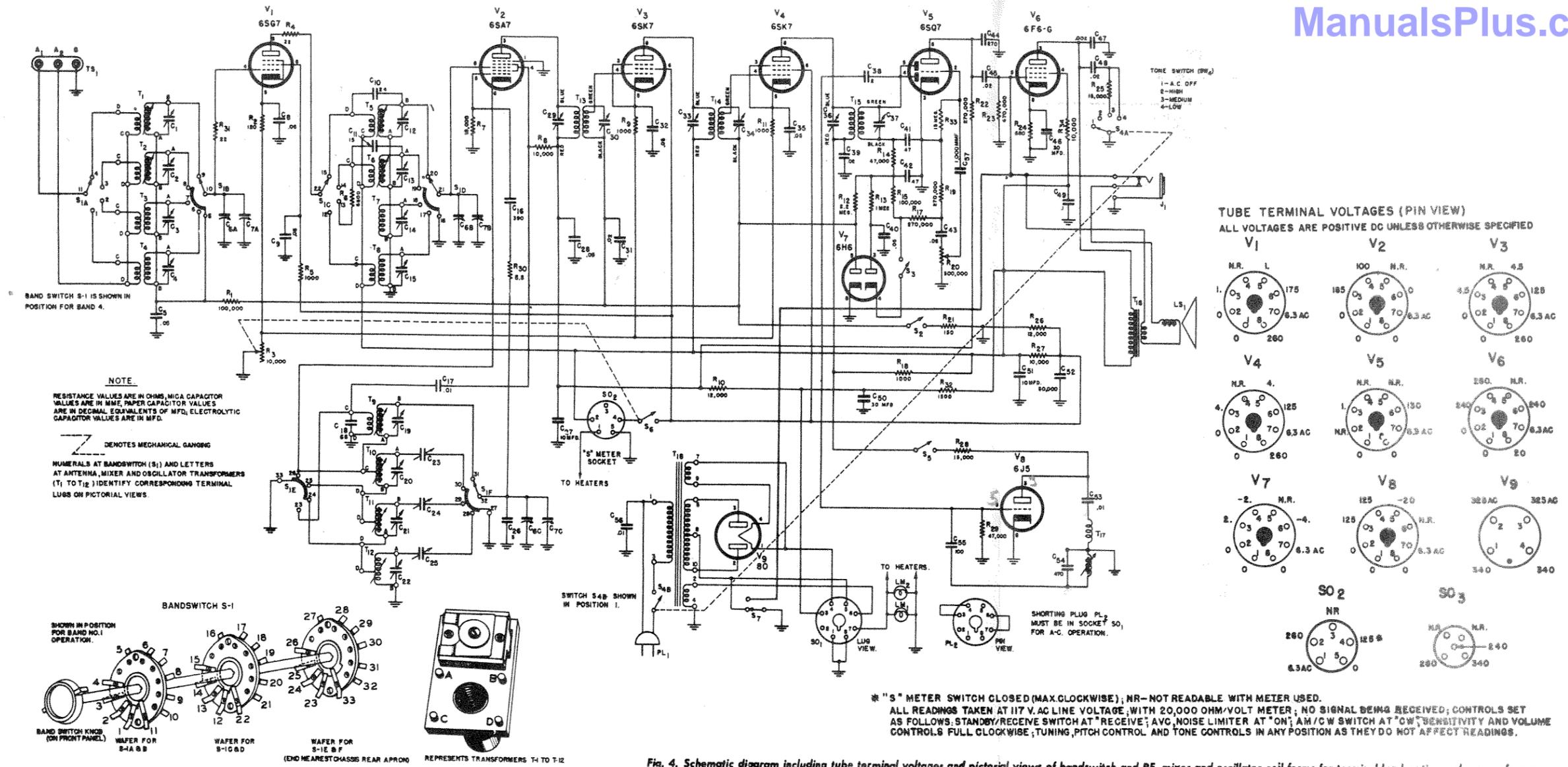


Fig. 4. Schematic diagram including tube terminal voltages and pictorial views of bandswitch and RF, mixer and oscillator coil forms for terminal lug location and cross reference to the schematic.

**REPLACEMENT PARTS LIST**

Note: All prices are subject to change without notice.

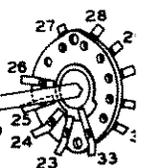
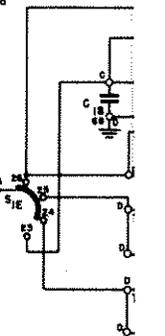
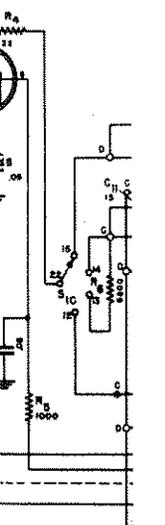
REF. NO.	DESCRIPTION	HALLCRAFTERS PART NUMBER	COMPONENT LIST PRICE	REF. NO.	DESCRIPTION	HALLCRAFTERS PART NUMBER	COMPONENT LIST PRICE	REF. NO.	DESCRIPTION	HALLCRAFTERS PART NUMBER	COMPONENT LIST PRICE
<b>CAPACITORS</b>											
C-1, 2, 12, 13 and 19	4 to 80 mmf trimmer for transformers T-1, T-2, T-5, T-6 and T-9.	44A149		C-38	2 mmf gimmick; formed by twisting two insulated wire leads: NOT AVAILABLE AS A REPLACEMENT PART, SHOWN FOR REFERENCE ONLY.			PL-3	Speaker connecting plug; Cinch type 2749; part of speaker LS-1 assembly	10A197	
C-3, 4, 14, 15, 20, 21 and 22	1.5 to 15 mmf trimmer for transformers T-3, T-4, T-7, T-8, T-10, T-11 and T-12	44A147		C-39, 45 and 48	0.02 mfd; +40-10%; 600 vdcw; paper	46AY203J		R-1 and 15	100,000 ohm; ±20%; 1/2 watt; carbon	RC20AE104M	
C-5	0.05 mfd; +60-20%; 300 vdcw; paper.	46A091		C-41 and 42	47 mmf; ±20%; 500 vdcw; mica	CM20A470M		R-2	120 ohm; ±10%; 1/2 watt; carbon	RC20AE121K	
C-6 and 7	Tuning capacitor; 3 sections ganged.	48C138		C-44	270 mmf; ±10%; 500 vdcw; mica	CM20A271K		R-3 and S-6	SENSITIVITY control; 10,000 ohm; includes SPST toggle action switch (S-6) on rear	25A533	
C-6, 32, 35 and 40	0.05 mfd; +40-10%; 200 vdcw; paper.	46AU503J		C-46	Electrolytic; 30 mfd; +250-10%; 25 vdcw; axial stranded wire leads	45A034		R-4	22 ohm; ±20%; 1/2 watt; carbon	RC20AE220M	
C-9, 28 and 52	0.05 mfd; +40-10%; 400 vdcw; paper	46AW503J		C-47	0.002 mfd; +40-15%; 800 vdcw; paper	46A104		R-5, 18 and 32	1,000 ohm; ±20%; 1/2 watt; carbon	RC20AE102M	
C-10	24 mmf; ±20%; 500 vdcw; neg. temp. coeff. 750 mmf/mmfd/deg. C.; ceramic	CC21UK240M		C-49	0.1 mfd; +40-10%; 400 vdcw; paper	CM25A561J		R-6	6,800 ohm; ±10%; 1 watt; carbon	RC20AE682K	
C-11	15 mmf; +20%; 500 vdcw; neg. temp. coeff. 750 mmf/mmfd/deg. C.; ceramic	CC21UK150M		C-54	560 mmf; ±5%; 500 vdcw; mica	CM20A101M		R-7	10,000 ohm; ±10%; 1/2 watt; carbon	RC20AE103K	
C-16	390 mmf; ±20%; 500 vdcw; mica	CM20A391K		C-55	100 mmf; ±20%; 500 vdcw; mica	46AZ302J		R-8	10,000 ohm; ±10%; 2 watt; carbon	RC20AE102K	
C-17, 53 and 56	0.01 mfd; +40-10%; 400 vdcw; paper	46AW103J		C-57	0.003 mfd; +40-10%; 600 vdcw; paper			R-9 and 11	12,000 ohm; ±10%; 4 watt; carbon	RC65CE123K	
C-18	68 mmf; ±10%; 500 vdcw; neg. temp. coeff. 0.00075 mmf/mmfd/deg. C.; ceramic	CC25UK680K		J-1	PHONES jack; closed circuit; short body; accepts standard headset plug	36A002		R-10	2.2 megohm ±20%; 1/2 watt; carbon	RC20AE225M	
C-23	2645 mmf nominal; padder for transformer T-10	44B141		L-1	6/8 v @ 250 ma; blue bead; G.E. type 44			R-12	1 megohm; ±20%; 1/2 watt; carbon	RC20AE105M	
C-24	1300 mmf nominal; padder for transformer T-11	44A024		LM-1 and 2	LOUDSPEAKER	39A003		R-13	47,000 ohm; ±20%; 1/2 watt; carbon	RC20AE473M	
C-25	490 mmf nominal; padder for transformer T-12	44A142		LS-1	5" P.M. speaker; 3.2 ohm voice coil	85C048		R-14 and 29	270,000 ohm; ±10%; 1/2 watt; carbon	RC20AE473M	
C-26	3 mmf ± 0.2 mmf at 25 deg. C.; temp. compensating for oscillator stage	44A158		PL-1	AC line cord and standard 2 prong plug	87A078		R-17, 19 and 22	AUDIO GAIN control; 500,000 ohm	25A534	
C-27, C-50 and C-51	Electrolytic; 3 section unit; coded lug terminals; sect. 1 (C-50) 30 mfd, +40-10%; sect. 2 (C-27) and sect. 3 (C-51) each 10 mfd, +40-10%; all sections 450 vdcw.	45A062		PL-2	AC operating shorting plug; Amphenol octal, male, type CP-8; includes jumpers wired between pins 3 & 4 and 5 & 7	35A003		R-20	150 ohm; ±20%; 1/2 watt; carbon	RC20AE151M	
C-29 and 30, 33 and 34	Dual trimmer unit for IF transformers T-13 and T-14	44A095						R-21	470,000 ohm; ±20%; 1/2 watt; carbon	RC20AE474M	
C-31 and 43	0.02 mfd; +40-10%; 200 vdcw; paper	46AU203J						R-22	680 ohm; ±10%; 1 watt; carbon	RC31AE681K	
C-36 and 37	Dual trimmer unit for IF transformer T-15	44A098						R-23	15,000 ohm; ±20%; 1 watt; carbon	RC31AE153M	

"The Hallicrafters Co. reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate these revisions in earlier models."

REPLACEMENT PARTS LIST

Note: All prices are subject to change without notice.

REF. NO.	DESCRIPTION	HALLICRAFTER'S PART NUMBER	LIST PRICE PER COMPONENT
<b>SWITCHES</b>			
S-1	BAND SELECTOR; 3 sections ganged; 4 position; each wafer is individually mounted in chassis, ganged by indexing shaft. 2 bakelite wafers (S-1A through D) 1 bakelite wafer (S-1E and F) Shaft and index assembly	62B039 62B044 74C172	
S-2, 3, 5 and 7	A. V. C. ON/OFF; SPST; toggle; 3 amp @ 250 volts	60A138	
S-4	TONE and AC line switch; 2 sections ganged; 1 sect. (S-4A) Single Pole 4 Position; 2 sect. (S-4B) SPST; rotary action; sect. 2 rated 3 amp @ 125 volts or 1 amp @ 250 volts, AC; bushing mtg.	60A225	
S-6	"S" meter; SPST; refer to R-3; NOT AVAILABLE AS A SEPARATE REPLACEMENT PART.		
<b>SOCKETS</b>			
SO-1	DC power source input socket; octal, female, Amphenol type MIP-6	6A035	
SO-2	Connection for external "S" meter; 5 contacts, female, Amphenol type MIP-5	6A186	
SO-3	Speaker plug connection; 5 contacts, female, Cinch type 2649-B	6A246	
<b>TRANSFORMERS</b>			
T-1†	Antenna coil for Band 4; variable iron core	51B783	
T-2†	Antenna coil for Band 3; variable iron core	51B782	
T-3	Antenna coil for Band 2; air core	51B781	
T-4	Antenna coil for Band 1; air core	51B780	
T-5†	Mixer coil for Band 4; variable iron core	51B787	
T-6†	Mixer coil for Band 3; variable iron core	51B786	
T-7	Mixer coil for Band 2; air core	51B785	
T-8	Mixer coil for Band 1; air core	51B784	
T-9†	Oscillator coil for Band 4; variable iron core	51B791	
T-10†	Oscillator coil for Band 3; variable iron core	51B790	
T-11†	Oscillator coil for Band 2; variable iron core	51B789	
T-12†	Oscillator coil for Band 1; variable iron core	51B788	
T-13	1st IF transformer; 455 kc; shielded	50C185	
T-14	2nd IF transformer; 455 kc; shielded	50C186	
T-15	Diode IF transformer; 455 kc; shielded	50C192	
T-16	Audio output transformer; part of loudspeaker LS-1 assembly but is available as a separate replacement part.		
T-17	BFO coil; 455 kc; shielded	54B028	
T-18	Power transformer; primary—117 volt AC, 50/60 cycle; high voltage secondary 342 volts each side of center tap (no load); filament secondary 6.3 volts @ 3.5 amp; rectifier filament secondary 5 volt @ 2 amp; solder lug terminals at base	52C026	
T-18*	Power transformer; same as T-18 above, except primary—110/130/150/220/250 volt AC, 25 cycles. *This transformer is available on special order only, and is not standard equipment for this model	52C027	
<b>TERMINAL STRIPS</b>			
TS-1	Antenna and ground connector strip; marked "A1", "A2" and "G" on face; Cinch type 1738	88A032	
<b>MISCELLANEOUS MECHANICAL COMPONENTS</b>			
9	Octal tube sockets	6A035	
1	4 prong tube socket; for rectifier	6A025	
1	Pilot lamp socket; main tuning dial; bayonet base	86A033	
1	Pilot lamp socket; bandspread dial light; bayonet base	86A034	
1	Bandspread knob drive shaft	74A170	
1	Main tuning knob drive shaft	74A171	
1	Bandspread dial drive shaft	74A169	
1	Bandspread dial drive pulley	28A012	
1	Bracket; main tuning and bandspread dial drive	67B503	
1	Flywheel; bandspread tuning	71A169	
1	Pulley; 2" O.D.; capacitor drive; main tuning	28A002	
1	Pulley; 2" O.D.; capacitor drive; bandspread tuning	28A019	
1	Calibrated scale; main tuning	83C240	
1	Calibrated scale; bandspread tuning	83B254	
1	Escutcheon; main tuning dial; includes window	7B017	
1	Escutcheon; bandspread tuning dial; includes window	7C034	
2	Tension springs; dial cabling	75A012	
4	Cabinet mounting feet; rubber	16A007	
2	Knobs; main tuning and bandspread controls	15A047	
3	Knobs: SENSITIVITY, VOLUME and TONE controls	15A049	
1	Knob; BANDSWITCH control; aluminum	15B053	
1	Knob; PITCH CONTROL	15A058	
1	Top cover for receiver cabinet	66D285	
1	Receiver cabinet	66E284	
8	Iron core slugs for transformers T-1, T-2, T-5, T-6, T-9, T-10, T-11 and T-12	77A068	



WAFER FOR S-1E & F (END NEAREST CHASSIS)

**QUANTITY IN EQUIP.**

9	Transformers T-1, T-2,
1	Transformers T-3,
1	and T-12
1	low; paper.
1	ganged.
1	low; paper.
1	low; paper
1	neg. temp. coeff.
1	ceramic
1	neg. temp. coeff.
1	mic.
1	nica
1	low; paper
1	neg. temp. coeff.
1	ceramic.
1	transformer T-10
1	transformer T-11
1	transformer T-12
2	; temp. compen-
2	ed lug terminals;
2	—10%; sect. 2
3	each 10 mfd, +40
1	w.
1	Transformers T-13
1	low; paper
1	former T-15

### EQUIPMENT:

1. Signal Generator capable of the ranges indicated in the Alignment Chart, including a 400 cycle audio modulator.
2. Output meter capable of handling 1.5 watts of audio power.
3. Standard RMA dummy consisting of a 200 mmf condenser in series with a 20uh r-f choke which is shunted by a 400 mmf condenser in series with a 400 ohm carbon resistor.
4. Non-metallic screw driver.

**CONNECTIONS:** Connect the Sig. Gen. "cold" lead to the receiver's chassis; the "hot" lead is connected as indicated in the Chart.

Connect the output meter across the speaker voice coil. Caution: Set the meter at a sufficiently high range to prevent possible damage from overload.

**CONTROL SETTINGS:** After allowing about a ten minute warm up period, set the receiver's control as follows:

- SENSITIVITY control at full clockwise (maximum).
- VOLUME control at full clockwise (maximum).
- CW/AM switch at "AM" (except for BFO adjustment).
- A.V.C. switch at "OFF."
- NOISE LIMITER switch at "OFF."
- TONE control at "HIGH".
- STANDBY/RECEIVE switch at "RECEIVE."

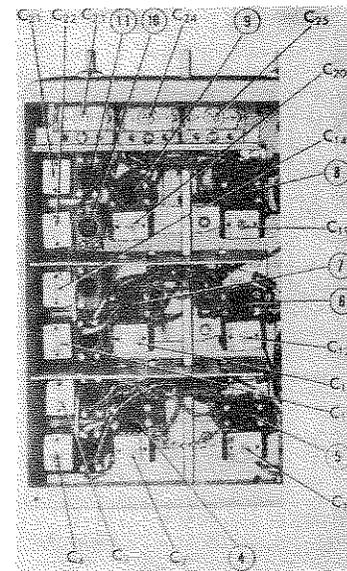
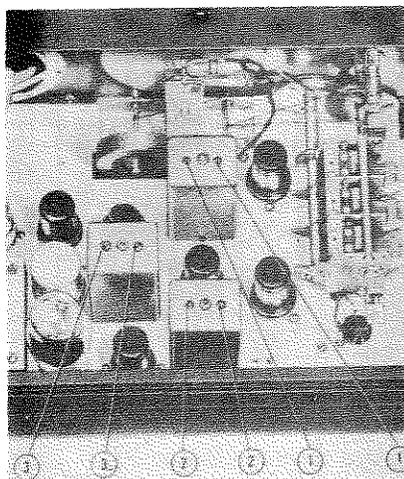


Fig. 5. Top and bottom views of the receiver locating slugs, padders and trimmers for alignment purposes.

DUMMY ANT. IN SERIES WITH SIG. GENERATOR	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GEN. FREQUENCY SETTING	BAND SWITCH SETTING	RECEIVER DIAL SETTING	ADJUST SLUG, PADDER, OR TRIMMER NO.	DESCRIPTION	TYPE OF ADJUSTMENT —MAKE ADJUSTMENT FOR:	STEP NO.
<b>IF ADJUSTMENT</b>								
None	Stator plates of center sect. of tuning gang	455 kc	"1"	1000 kc	3 (both)	3rd IF	Maximum output	1
					2 (both)	2nd IF	Maximum output	2
					1 (both)	1st IF	Maximum output	3
Repeat steps 1, 2 and 3								
<b>BFO ADJUSTMENT—NOTE: Turn off Sig. Gen. 400 cycle modulation; set CW/AM switch at "CW"; remove Pitch Control knob and adjust slotted screw shaft.</b>								
None	Stator plates of center sect. of tuning gang	455 kc	"1"	1000 kc	T-17 slug (See Fig. 3 for location)	BFO slug	Zero beat	4
<b>BAND #4 ADJUSTMENT—NOTE: Make sure 400 cycle audio modulator is turned on; AM/CW switch should be at "AM."</b>								
STANDARD "A1" on antenna RMA Dummy strip		36 mc	"4"	36 mc	C-19	Osc. Trimmer	Maximum output	5
		18 mc		18 mc	*18	Osc. Slug	Maximum output and repeat step 5	6
		36 mc		36 mc	†C-1	RF Trimmer	Maximum output	7
		36 mc		36 mc	†C-12	Mix. Trimmer	Maximum output	8
		18 mc		18 mc	*†5	RF Slug	Maximum output and repeat step 7	9
18 mc	18 mc	18 mc	18 mc	*†6	Mix Slug	Maximum output and repeat step 8	10	
<b>BAND #3 ADJUSTMENT</b>								
STANDARD "A1" on antenna RMA Dummy strip		14 mc	"3"	14 mc	C-20	Osc. Trimmer	Maximum output	11
		7 mc		7 mc	C-23	Osc. Padder	Maximum output and repeat step 11	12
		10 mc		10 mc	* 9	Osc. Slug	Maximum output and repeat steps 11 & 12	13
		14 mc		14 mc	†C-2	RF Trimmer	Maximum output	14
		14 mc		14 mc	†C-13	Mix. Trimmer	Maximum output	15
		7 mc		7 mc	*† 4	RF Slug	Maximum output and repeat step 14	16
		7 mc		7 mc	7 mc	7 mc	*† 7	Mix. Slug
<b>BAND #2 ADJUSTMENT</b>								
STANDARD "A1" on antenna RMA Dummy strip		5 mc	"2"	5 mc	C-21	Osc. Trimmer	Maximum output	18
		1.8 mc		1.8 mc	C-24	Osc. Padder	Maximum output and repeat step 18	19
		3 mc		3 mc	* 11	Osc. Slug	Maximum output and repeat steps 18 & 19	20
		5 mc		5 mc	C-3	RF Trimmer	Maximum output	21
		5 mc		5 mc	5 mc	5 mc	C-14	Mix. Trimmer
<b>BAND #1 ADJUSTMENT</b>								
STANDARD "A1" on antenna RMA Dummy strip		1500 kc	"1"	1500 kc	C-22	Osc. Trimmer	Maximum output	23
		600 kc		600 kc	C-25	Osc. Padder	Maximum output and repeat step 23	24
		1000 kc		1000 kc	* 10	Osc. Slug	Maximum output and repeat steps 23 & 24	25
		1500 kc		1500 kc	C-4	RF Trimmer	Maximum output	26
		1500 kc		1500 kc	1500 kc	1500 kc	C-15	Mix. Trimmer

\*It may be necessary to repeat the indicated adjustments several times.

†Rock the main tuning capacitor slightly (turn back and forth) when making these adjustments.