

the hallicrafters co.

SERVICE BULLETIN No. 2 FOR MODEL S-38

GENERAL: Model S-38 is a 6 tube AC/DC superheterodyne table model, radio receiver, incorporating 4 bands of AM/CW reception, as follows: band #1, 540 kc to 1650 kc; band #2, 1650 kc to 5.0 mc; band #3, 5.0 mc to 14.5 mc; band #4, 13.5 mc to 32.0 mc. Provision for AVC, noise limiting, BFO pitch, headset reception, standby operation, and bandspreading are provided.

REAR PANEL CONNECTIONS: Consist of line cord with plug, antenna and ground connector strip, and headset connector plug strip.

POWER SUPPLY DATA: 105 to 125 volts AC/DC line voltage. Power drain is 30 watts.

TUBE TYPES AND FUNCTION: 12SA7—mixer-oscillator; 12SK7—IF amplifier; 12SQ7GT—detector, AVC, audio amplifier; 35L6GT—audio power amplifier; 12SQ7GT—BFO and ANL; 35Z5GT—power rectifier for AC operation.

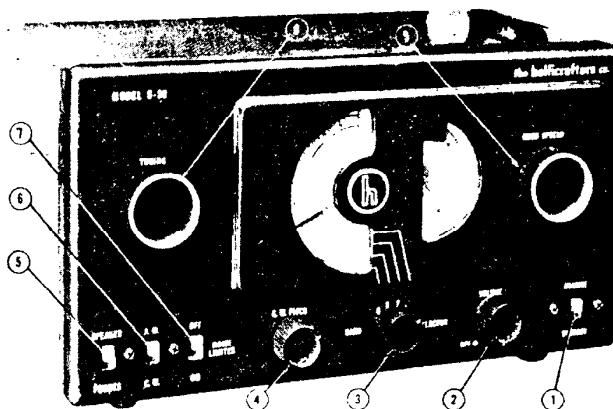


Fig. 1. Front view of receiver showing control locations.

DETAILED SERVICE INFORMATION

IF FREQUENCY	IF SELECTIVITY	IMAGE RATIO	SENSITIVITY	AUDIO OUTPUT
455 kc	7 kc wide at 6 db down 65 kc wide at 60 db down (for 50 milliwatt output)	2.7:1 at 30 mc 6:1 at 14 mc 10:1 at 5 mc 35:1 at 1500 kc	12 microvolt at 600 kc 12 microvolt at 5 mc 11 microvolt at 14 mc 23 microvolt at 30 mc (for 50 milliwatt output)	675 milliwatt with less than 10% distortion at 400 cycles

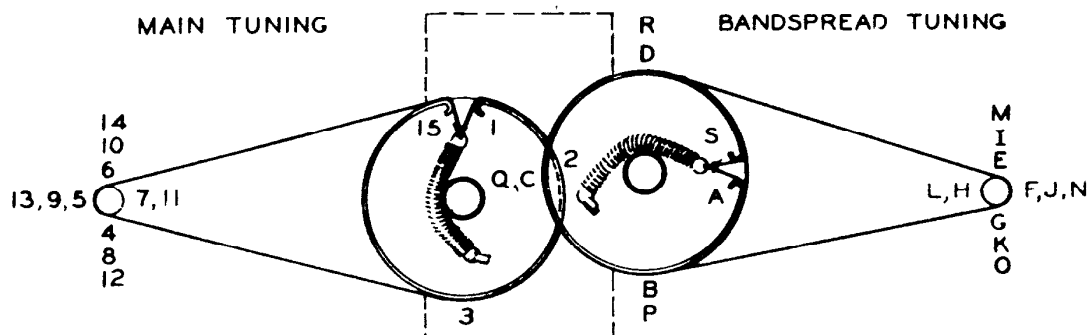
CONTROL SETTINGS FOR PRELIMINARY TEST OPERATION (Broadcast Band)

REF. NO. (in Fig. 1)	NAME	FUNCTION	SETTING	REF. NO. (in Fig. 1)	NAME	FUNCTION	SETTING
1	STANDBY RECEIVE	Receiver temporary standby	At "RECEIVE"	5	SPEAKER/ PHONES	Output selector switch	At "SPEAKER"
2	VOLUME	Audio gain control and receiver on/off switch	Half clockwise; adj. as necessary	6	CW/AM	BFO on/off switch AVC on/off switch	At "AM" (AVC on)
3	BAND SELECTOR	Operating band selector	Clockwise to "1"	7	NOISE LIMITER	Noise peak limiting	At "OFF"
4	PITCH CONTROL	CW beat note pitch selector	Any position (not in use)	8	TUNING	Main tuning control	To local station freq. on main dial scale
				9	BAND SPREAD	Short wave band spreading	To "0" on small dial scale

HOW TO RESTRING DIAL CORDS

To restring the main tuning dial cord, cut a 14" length of 30 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 15, wind the cord on the pulley and knob drive shaft. At position "15," stretch the tension spring and tie the cord securely. Cut off the excess cord. Note that two complete turns are wound on the knob drive shaft.

To restring the bandspread tuning dial cord, cut a 16" length of dial cord and follow the procedure as explained above, except start at position "A" on the diagram and proceed through position "S." Note that the knob drive shaft has two complete turns.



TUNING CAPACITOR FULLY CLOSED (BOTH SECTIONS).
FRONT VIEW

Fig. 2. Dial cable stringing procedure.

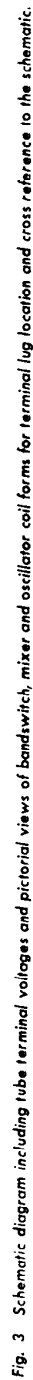


Fig. 3 Schematic diagram including tube terminal voltages and pictorial views of bandswitch, mixer and oscillator coil forms for terminal lug location and cross reference to the schematic.

ALIGNMENT INSTRUCTIONS

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 watt 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 "G" on the antenna strip; the "hot" lead is connected as indicated in the Chart.

Connect the output meter across the terminals of socket SO-1 and remove the speaker plug from the socket and adjust the meter for 3 ohms impedance.

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:

SPEAKER/PHONES switch at "SPEAKER."

VOLUME control at full clockwise (maximum).

CW/AM switch at "AM" (except for BFO adjustment).

NOISE LIMITER switch at "OFF."

HANDSPREAD TUNING control at "0." (min. cap.).

STANDBY/RECEIVE switch at "RECEIVE."

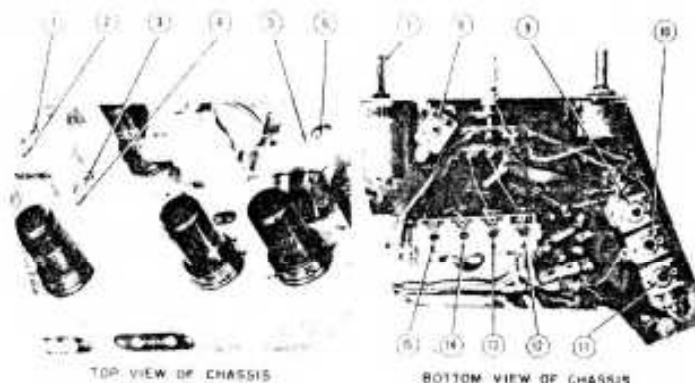


Fig. 5. Top and bottom views of the receiver locating slugs, padders and trimmers for alignment purposes.

DUMMY ANT. IN SERIES WITH SIG. GENERATOR	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIG. GEN. FREQUENCY SETTING	BAND SWITCH SETTING	RECEIVER DIAL SETTING	ADJUST. SLUG, PADDER, OR TRIMMER NO.	DESCRIPTION	TYPE OF ADJUSTMENT —MAKE ADJUSTMENT FOR:	STEP NO.
*IF ADJUSTMENT								
None	Stator plates of rear sect. of tuning gang	455 kc	"1"	1000 kc	3 and 4	2nd IF	Maximum output	1
					1 and 2	1st IF	Maximum output	2
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.								
None	Stator plates of rear sect. of tuning gang	455 kc	"1"	1000 kc	7	BFO slug	Zero beat	3
BAND #4 ADJUSTMENT—NOTE: Make sure 400 cycle audio modulator is turned on; AM/CW switch should be at "AM."								
STANDARD	"A1" on antenna strip	30 mc	"4"	30 mc	12	Osc. Trimmer	Maximum output	4
RMA Dummy	strip	30 mc		30 mc	18	Mix. Trimmer	Maximum output	5
*BAND #3 ADJUSTMENT								
STANDARD	"A1" on antenna strip	14 mc	"3"	14 mc	13	Osc. Trimmer	Maximum output	6
RMA Dummy	strip	14 mc		14 mc	9	Mix. Trimmer	Maximum output	7
*BAND #2 ADJUSTMENT								
STANDARD	"A1" on antenna strip	5 mc	"2"	5 mc	14	Osc. Trimmer	Maximum output	8
RMA Dummy	strip	1.8 mc		1.8 mc	6	Osc. Padder	Maximum output and repeat step 8	9
		5 mc		5 mc	10	Mix. Trimmer	Maximum output	10
*BAND #1 ADJUSTMENT								
STANDARD	"A1" on antenna strip	1500 kc	"1"	1500 kc	15	Osc. Trimmer	Maximum output	11
RMA Dummy	strip	600 kc		600 kc	5	Osc. Padder	Maximum output and repeat step 11	12
		1500 kc		1500 kc	11	Mix. Trimmer	Maximum output	13

*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.

ATTENTION

Always give Model and Serial No. of equipment when ordering replacement parts or requesting information.

REPLACEMENT PARTS

REF. NO.	DESCRIPTION	HALLICRAFTER'S PART NUMBER	LIST PRICE PER COMPONENT	REF. NO.	DESCRIPTION	HALLICRAFTER'S PART NUMBER	LIST PRICE PER COMPONENT
CAPACITORS							
C-1	0.01 mfd; 500 vdc; paper	46A7001	10	SWITCHES			
C-2, 3 & 4	Tuning unit for antenna transformer T-2	440120	40	5-1a, 5, & 6	Bandswitch; two sections ganged; rotary; four position	88A240	1.95
C-5	Tuning unit for antenna transformer T-3	440121	10	5-7 & 8	"RECEIVE-STANDBY" and "NOISE LIMITER" switches; slide action; SPST	66A244	.20
C-6	2700 mfd; $\pm 5\%$; 500 vdc; mica	LM-21A270	30	5-9	"SPEAKER-PHONES" switch; slide action; SPST	66A243	.20
C-7	Tuning capacitor (a.c. 2 sections) ganged	460102	7.90	5-10	"R.M.C.W." switch; slide action; DPST	66A245	.25
C-8, 10, 27, & 28	270 mfd; 500 vdc; mica	LM-20A270	15	TRANSFORMERS			
C-9	3000 mfd; 5% ; 500 vdc; mica	GM-30A3000	15	T-1	Antenna coil for bands 1, 2 and 3	510R21	9.35
C-10 & 11	Dual capacitor for oscillator transformer T-2	440122	65	T-2	Antenna coil for band 4	510R18	.65
C-12, 13, 14, & 15	Tuning unit for oscillator transformer T-3	440123	50	T-3	Oscillator coil for bands 1, 2, 3 and 4	510R25	2.45
C-16 & 34	0.02 mfd; 400 vdc; paper	46A7005	10	T-4	Input IF transformer; 455 kc	500103	1.20
C-17 & 30	0.25 mfd; 200 vdc; paper	46A7042	15	T-5	Double IF transformer; 455 kc	500104	1.20
C-18, 19, 21, & 22	Tuning unit for IF transformers T-4 and T-5	440124	25	T-6	Full frequency oscillator coil; 455 kc	510R31	1.75
C-20 & 32	0.05 mfd; 200 vdc; paper	46A7001	10	T-7	Auto mutual transformer; 1,000 ohm primary — 15 ohm secondary tapped at 3 ohms	55A075	.95
C-24	0.045 mfd; 400 vdc; paper	46A7003	15	TERMINAL STRIPS			
C-25	2 mfd; feedback oscillator aux. leads; NEUT	AVAX-4011 AS A SPARE PART	15	TS-1	Antenna and ground connector strip	88A012	.10
C-26 & 29	470 mfd; 500 vdc; mica	LM-21A470	20	TS-2	Headset plug connector strip, bakelite	88A011	.10
C-28 & 37	0.01 mfd; 400 vdc; paper	46A7003	10	MISCELLANEOUS MECHANICAL COMPONENTS			
C-29, 31, 32, & 33	Electrolytic; four section unit; rubber socket leads; sect. 10C-29) 20 mfd, 25 vdc; sect. 2 & 31C-31 & 32) 20 mfd, 160 vdc; sect. 4C-33) 40 mfd, 150 vdc	45B091	30	QUANT. IN EQUIPMENT	DESCRIPTION	HALLICRAFTER'S PART NUMBER	LIST PRICE PER COMPONENT
C-30	0.50 mfd; 600 vdc; paper	46A7003	10	2	Knob; for Volume Control and Band Selector switches	15A048	15
PILOT LAMP				1	Knob; for C. W. PITCH Control	15A058	15
LM-1	6 V @ 150 ma; brown base; 1/2 E type A7	33A004	10	1	Knob; for main TUNING and BANDSPREAD tuning controls	15A047	.25
LOUDSPEAKER				1	Pointer; for main tuning dial	82A102	15
LS-1	5" P.M. speaker; 5.2 ohm voice coil	880835	2.50	1	Pointer; for bandspread tuning dial	82A103	15
PLUGS				1	Calibrated dial assembly, complete	830257	.15
PL-1	AC line cord with two prong plug at one end	87A078	.35	1	Dial window; glass	72B157	.30
PL-2	Speaker voice coil connector plug	88A072	.10	6	Dial tube sockets; Amphenol type MIP-8	6A035	.10
RESISTORS				1	Dial lamp socket; bayonet	88A011	.15
R-1 & 13	470,000 ohm; $\frac{1}{2}$ watt; carbon	RC20AE470M	10	2	Tuning capacitor dial drive pulley	76A062	.10
R-2	20,000 ohm; $\frac{1}{2}$ watt; carbon	RC20AE220M	10	1	Tuning capacitor rear mounting bracket	67A048	.10
R-3	47 ohm; $\frac{1}{2}$ watt; carbon	RC20AE470M	10	1	Tuning capacitor front mounting bracket	67A059	.15
R-4	200 ohm; $\pm 10\%$; $\frac{1}{2}$ watt; carbon	RC20AE200M	10	1	Left hand switch mounting bracket	67B060	.10
R-5	2.2 megohm; $\frac{1}{2}$ watt; carbon	RC20AE220M	10	2	Right hand switch mounting bracket	67B061	.10
R-6 & 10	47,000 ohm; $\frac{1}{2}$ watt; carbon	RC20AE470M	10	4	Pusher mounting feet for cabinet drive shafts	16A007	.10
R-7 & 9	Volume Control; $\frac{1}{2}$ megohm; includes SPST toggle action switch assembly on rear	75A094	50	1	"C" washers; train-on type	75A092	.10
R-8	10 megohm; $\frac{1}{2}$ watt; carbon	RC20AE100M	10	1	Rear cover plate; cardboard	35C318	.10
R-9 & 11	470 ohm; $\pm 10\%$; $\frac{1}{2}$ watt; carbon	RC20AE470M	10	1	Bottom cover plate; painted steel	43C220	.45
R-12	270,000 ohm; $\frac{1}{2}$ watt; carbon	RC20AE270M	10	NOTE: ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.			
R-14	150 ohm; $\pm 10\%$; $\frac{1}{2}$ watt; carbon	RC20AE150M	10	Explanation of abbreviations: mfd—microfarads; mfd—microfarads; vdc—DC working volts; v—volts; ma—milliamperes; IF—intermediate frequency; sect—section; REF. NO.—circuit symbol as on the schematic diagram.			
R-15	15 ohm; $\frac{1}{2}$ watt; carbon	RC20AE150M	10				
R-16	1,000 ohm; $\frac{1}{2}$ watt; carbon	RC20AE100M	10				
R-17	680 ohm; $\frac{1}{2}$ watt; carbon	RC20AE680M	10				
R-18 & 21	22 ohm; $\frac{1}{2}$ watt; carbon	RC20AE220M	10				
R-19	330 ohm; $\frac{1}{2}$ watt; carbon	RC20AE330M	10				
R-20	50,000 ohm; $\frac{1}{2}$ watt; carbon	RC20AE500M	10				

NOTE: Mica dielectric capacitors have a tolerance of $\pm 10\%$, unless otherwise specified; paper dielectric capacitors have a tolerance of $\pm 10\%$ to $\pm 20\%$, unless otherwise specified.

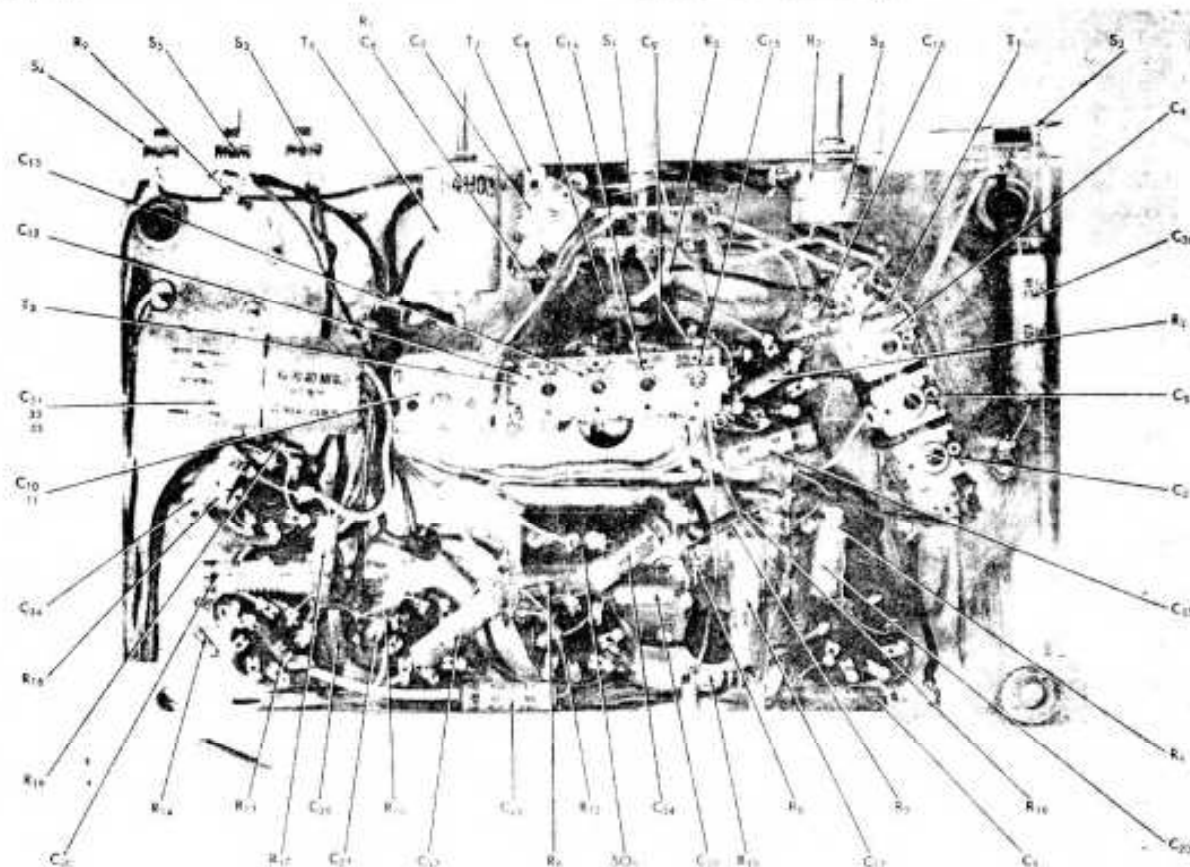
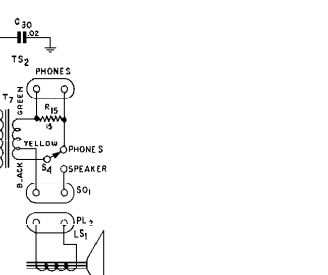
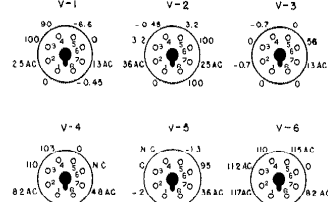


Fig. 4. Bottom view of the receiver showing components location.



ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED



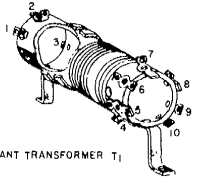
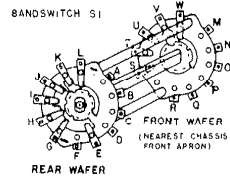
"N.C." MEANS NO CONNECTION

VOLTAGES LISTED WERE TAKEN WITH AN ELECTRONIC VOLTMETER; AT 117V A-C LINE VOLTAGE; NO SIGNAL BEING RECEIVED. CONTROLS SET AS FOLLOWS:

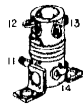
VOLUME	MAX CLOCKWISE
TUNING	SET AT 550 K G
BANDSPREAD	SET AT 100
A.M./C.W.	SET AT 'C' W
RECEIVE/STANDBY	SET AT 'RECEIVE'
NOISE LIMITER	SET AT 'OFF'
BAND SELECTOR	SET AT '1'
SPEAKER/PHONES	SET AT 'SPEAKER'

NOTE:

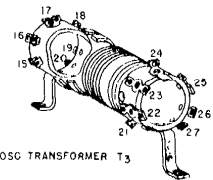
NOTE:
RESISTANCE VALUES ARE IN OHMS; MICA CAPACITOR
VALUES ARE IN MMF; PAPER CAPACITOR VALUES ARE
IN DECIMAL EQUIVALENTS OF MFD; ELECTROLYTIC
CAPACITOR VALUES ARE IN MFD.



ANT TRANSFORMER T₁



OSC TRANSFORMER T



----- DENOTES ELECTRICAL SHIELD.
 - - - - - DENOTES UNSHIELDED UNIT ASSEMBLY
 /----- DENOTES MECHANICAL GANGING.

LETTERS AT BANDSWITCH (S₁) AND NUMERALS AT
ANTENNA AND OSCILLATOR TRANSFORMERS
(T₁, T₂ & T₃) IDENTIFY CORRESPONDING
TERMINAL PINS ON PICTORIAL VIEWS.

the hallicrafters co.
MODEL S-38

NOTE: DIMENSIONS & PROPORTIONS SHOWN IN PICTORIAL VIEWS HAVE BEEN EXAGGERATED FOR CLARITY OF TERMINAL LUG LOCATION.