

communications



**OPERATING and SERVICE
INSTRUCTIONS**



the hallicrafters co.

MANUFACTURERS OF ELECTRONIC EQUIPMENT, CHICAGO 24, U. S. A.

www.shortwaveradio.ch



Fig. 1. Hallcrafters Model S-38D

9201247

GENERAL DESCRIPTION

Your new Hallcrafters Model S-38D tunes from 540 kilocycles to 31 megacycles to bring you the finest in world-wide radio reception. You'll hear foreign and domestic shortwave broadcasts, amateurs, police, aircraft, ships, and countless other exciting distant stations ... as well as all your favorite programs on standard broadcast. The receiver employs 5 tubes in the latest type superheterodyne circuit and provides for the reception of AM (voice) and CW (code) signals over its entire tuning range. It is designed to operate on 105 to 125 volt AC or DC current.

Good reception is usually possible without an outside antenna or ground and, in most localities, satisfactory results can be obtained with just the 15-foot antenna wire included with your receiver.

Special features in your receiver include an electrical bandspread dial for fine tuning of the amateur and shortwave bands, a powerful built-in Alnico V permanent magnet speaker, provisions for headphone operation, and a receive-standby switch on the front panel that permits you to silence the receiver without turning it off.

IMPORTANT

Your careful attention is especially invited to the installation and operating instructions. They have been provided to insure the satisfaction you have a right to expect from a Hallcrafters "Precision Built" product. Your receiver has an unusually high degree of sensitivity necessary to receive weak and distant stations. Careless operation of a high sensitivity receiver may result in excess noise or background hiss. These undesirable effects can be held to a minimum by careful adjustment of the tuning controls as well as the proper selection and arrangement of the antenna.

INSTALLATION

UNPACKING - After unpacking the receiver, examine it closely for damage which may have occurred in transit. Should any sign of damage be apparent, file a claim immediately with the carrier stating the extent of damage. Carefully check all shipping labels and tags for instructions before removing or destroying them.

LOCATION - The receiver is equipped with rubber feet for table or shelf mounting. When locating the receiver, avoid excessively warm locations such as those near radiators and heating vents. Allow at least an inch or two of clearance between the back of the receiver and wall for proper ventilation.

POWER SOURCE - The receiver is designed to operate on 105 to 125 volt AC or DC current. If in doubt about your power source, contact your local power company before plugging in the receiver.

The receiver may also be operated on 210 to 250 volt AC/DC current by using Line Cord Adapter 87D1566, available as an accessory from your Hallicrafters dealer.

HEADPHONES - A twin tip jack, marked "Phones" is provided at the rear of the receiver for connecting headphones or a hearing aid. The headphone output impedance is not critical and any commercial headphones may be used, including crystal types since no direct current flows in the headphone circuit. For maximum headphone output, the use of low-impedance headphones ranging from 50 to 5000 ohms is recommended. For headphone operation, set the Speaker-Phones selector switch at the rear of the receiver at "Phones".

ANTENNAS - The r-f input of the receiver is designed to operate from either a single-wire antenna, or a half-wave doublet or other tuned antenna employing a 52 to 600 ohm transmission line. Antenna connections are made to a three-terminal strip at the rear of the receiver marked "A1", "A2", and "G".

Single-Wire Antenna. The simplest antenna and one which will provide satisfactory performance throughout the entire tuning range is a conventional single-wire antenna. In most localities, satisfactory results can be obtained with just the 15-foot antenna wire included with the receiver. It is simply necessary to attach one end of this wire to terminal "A1", connect the jumper link between "A2" and "G", and then run the wire about the room in any convenient manner. (See Fig. 2.)

If the receiver is operated in a steel constructed building or where receiving conditions are exceptionally poor, an outside antenna 50 to 100 feet long may be necessary. In some locations, reception may be improved by connecting a ground wire (ordinary copper wire) from terminal "G" to a cold water pipe or outside ground rod.

Half-Wave Doublet Antenna. For top performance, especially on the shortwave and amateur bands, the use of a half-wave doublet or other type of antenna employing a 52 to 600 ohm transmission line is recommended. A typical doublet antenna installation is shown in Fig. 3. The doublet antenna should be cut to the proper length for the most used frequency or band of frequencies. The overall length in feet of a doublet antenna is determined by the following formula:

$$\text{Length in feet} = \frac{468}{\text{Frequency in megacycles}}$$

For maximum signal pickup, the doublet antenna should be erected with its length at right angles to the desired station.

The doublet antenna may be fed with either a balanced or unbalanced transmission line. When a balanced transmission line such as "twi-load" or a twisted pair is used, the transmission line connects to terminals "A1" and "A2", and the jumper link between "A2" and "G" is disconnected. When using an unbalanced transmission line such as coaxial cable, the inner conductor connects to "A1", the outer metal braid connects to "A2", and the jumper link connects between "A2" and "G". A ground wire may improve reception when using an unbalanced type transmission line.

The doublet antenna provides optimum performance only at the frequency for which it is cut. Therefore, it may be desirable for reception on frequencies remote from the antenna frequency to utilize the antenna as a single wire type. This is accomplished by connecting the two transmission line leads together and connecting them to terminal "A1". The jumper link in this case should be connected between terminals "A2" and "G".

In an installation where the receiver is used in conjunction with a transmitter, it may be advantageous to use the same antenna for receiving as for transmitting. This is especially true when a directive antenna is used since the directive effects and power gain of the transmitting antenna are the same for receiving as for transmitting. Switching of the antenna from the transmitter to the receiver may be accomplished with a double-pole, double-throw antenna changeover relay or knife switch connected in the antenna leads.

For further information regarding antennas, refer to the "Radio Amateur's Handbook" or the "A.R.R.L. Antenna Book", both published by the American Radio Relay League, West Hartford, Conn., U.S.A.



Fig. 2. Single Wire Antenna

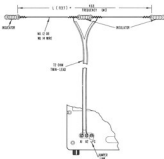


Fig. 3. Doublet Antenna using Twi-Lead Transmission Line

OPERATION

TUNING DIAL - The top dial scale is the standard broadcast band, calibrated in kilocycles minus the last zero. To convert the readings on this band to kilocycles, simply add one zero. For example: 70 on the dial is 700 kilocycles. The shortwave bands are marked 2, 3, and 4. The readings on these bands are in megacycles.

NOTE

The standard broadcast band is marked with a "CD" emblem and a dot at 640 and 1240 kilocycles to indicate the two official civil defense frequencies. In a civil defense emergency, tune to either of these two frequencies for official civil defense news, instructions, and information.

RECEIVE-STANDBY Switch - This switch is normally set at "Receive". When set at "Standby", the receiver is silenced but the tubes remain at operating temperature for instant use. To resume reception at any time, simply return the switch to the "Receive" position.

AM-CW Switch - Set this switch at "AM" to listen to voice or musical broadcasts. Set it at "CW" only if you wish to hear code signals.

BAND SELECTOR Control - Set this control for the band you wish to tune. The four positions of this control correspond to the band numbers at the left side of the dial.

OFF-VOLUME Control - Turn this control clockwise to turn the receiver on and to increase volume. Allow about one minute for the tubes to warm up.

IMPORTANT - When operating on DC (direct current), reverse the power plug in the wall outlet if the receiver does not operate after the one minute warm up. On DC, the receiver will operate **ONLY** with the plug in one position. When operating on AC (alternating current), try reversing the power plug for minimum hum after the receiver is in operation.

To turn the receiver off, simply rotate the Off-Volume control fully counterclockwise, until a click is heard.

SPEAKER-PHONES Switch - This switch is located at the rear of the receiver. Set it at "Speaker" to operate the built-in speaker or at "Phones" for headphone operation.

TUNING and BANDSPREAD Controls - The Tuning and Bandspread controls are used in conjunction with one another to tune in the desired signal. Wide tuning is performed with the Tuning control and fine tuning with the Bandspread control.

To tune the receiver, set the Bandspread dial pointer at "0" and then slowly turn the Tuning control to the desired station. After the station has been accurately tuned in, reset the Off-Volume control as desired. When trying to locate weak distant stations, it is suggested that the Off-Volume control be initially set near maximum and then readjusted for the desired level after the station has been tuned in. If the signal is too strong, always reduce it by means of the Off-Volume control, not by using the Tuning control. For CW (code) reception, adjust the Tuning control for the desired pitch when tuning in the station.

IMPORTANT: The dial readings will correspond to the station frequencies only if the Bandspread dial pointer is set at "0".

Fine Tuning with the Bandspread Control. The Bandspread control is an electrical fine tuning adjustment for use on all bands. Used in conjunction with the Tuning control, it permits you to accurately tune in stations on crowded bands by spreading them out so they can be more easily separated. The Bandspread control may be used in two different ways.

The first method of tuning is used when it is desired to tune in a single signal with precision accuracy. The Bandspread dial pointer is set at about "5", then the signal is located with the Tuning control, and finally the signal is accurately tuned in by "rocking" the Bandspread control (turning it a few degrees to the left and right) until the signal is loudest and clearest.

The second method of tuning is used when it is desired to tune through a range of frequencies, such as the amateur bands, a group of shortwave stations, etc. Set the Bandspread dial pointer at "0", set the Tuning control for the high end of the selected band or range of frequencies, and then tune through the range with the Bandspread control. Turning the Bandspread control from "0" to "100" tunes the receiver progressively lower in frequency.

Stations of special interest may be accurately logged and relocated by noting the settings of the tuning and bandspread dial pointers and recording them in the station log provided on the back cover.

SERVICE DATA

TECHNICAL SPECIFICATIONS

TUBES..... Five including rectifier
 SPEAKER..... 5-inch PM; 3.2-ohm voice coil
 HEADPHONE OUTPUT..... 15 ohms
 (See "Headphones", page 3)
 ANTENNA INPUT..... For single wire or 52-600 ohm
 balanced or unbalanced line
 POWER SOURCE..... 105-125 volts DC or 50/60 cycles AC
 POWER CONSUMPTION..... 30 watts
 RECEPTION..... AM and CW
 INTERMEDIATE FREQUENCY..... 455 KC
 WEIGHT..... Net-11 lb., Shipping-13 lb.
 DIMENSIONS..... 13" x 7 1/2" x 8 7/8" deep

TUBE AND DIAL LAMP REPLACEMENT

The dial lamp and tubes are accessible for replacement by removing the cabinet back. For types used and location, refer to Fig. 7.

CAUTION: Before attempting to make any replacement, rotate the Bandspread control fully clockwise and the Tuning control fully counterclockwise to prevent damage to the tuning gang.

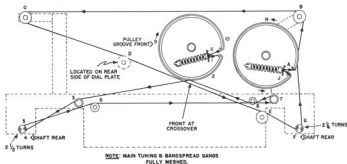


Fig. 4. Main Tuning Pointer Drive and Band Spread Gang and Pointer Drive Stringing Diagrams.

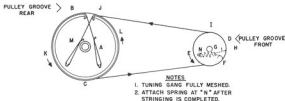


Fig. 5. Main Tuning Gang Drive Stringing Diagram

ALIGNMENT

- Use an amplitude modulated generator covering 455 KC to 30 MC. Use a modulated output for every step except Step 2.
- Connect output meter across speaker voice coil.
- Use a non-metallic alignment tool.
- Set the AM/CW switch at AM, (except for BFO adjustment), SPEAKER/PHONES switch at SPEAKER, VOLUME control at maximum, RECEIVE/STANDBY switch at RECEIVE and the BAND SPREAD control at 0.
- See Figs. 7 and 8 for location of alignment adjustments.



Fig. 4. RTMA Dummy Antenna

Step	Signal Generator Connections	Generator Frequency	Band Selector Setting	Receiver Dial Setting	Adjust
IF ALIGNMENT					
1	High side thru an .01 mfd. capacitor to stator plates of front section of TUNING gang. Low side to chassis.	455 KC	1	1.0 MC	A, B, C and D for maximum output. Keep reducing gen. output so that the reading on the output meter does not exceed 90 milliwatts.
BFO ADJUSTMENT					
*2	Same as Step 1.	455 KC (No Mod.)	1	1.0 MC	Set the AM/CW switch at CW. (Reset the switch at AM when Step 2 is completed.) For correct BFO operation, vary the coupling between lead E and pins 4 and 6 of the 12SG7 (V-2) for a maximum beat note. Pushing lead E toward pin 4 increases the strength of the beat.
RF ALIGNMENT					
3	High side thru RTMA dummy antenna (Fig. 4) to terminal A1 on back of chassis. Low side to chassis. Connect jumper between A2 and G.	30 MC	4	30 MC	F and G for maximum output as in Step 1.
4	Same as Step 3.	14 MC	3	14 MC	H and J for maximum output as in Step 1.
5	Same as Step 3.	5 MC	2	5 MC	K and L for maximum output as in Step 1.
6	Same as Step 3.	1500 KC	1	1.5 MC	M and N for maximum output as in Step 1.
		600 KC	1	.6 MC	P for maximum output as in Step 1.

* Step 2 is usually unnecessary. Adjustment should be made ONLY if a weak beat note is obtained on strong CW signals indicating lack of coupling between wire lead E and pins 4 and 6 of the 12SG7.

SERVICE OR OPERATING QUESTIONS -For any further information regarding operation or servicing of your receiver, contact your Hallicrafters dealer. The Hallicrafters Co. maintains an extensive system of authorized service centers where any required service will be performed promptly and efficiently at a nominal charge. All Hallicrafters Authorized Service Centers display the sign shown at the right. For the location of the one nearest you, consult your dealer or telephone directory.



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.

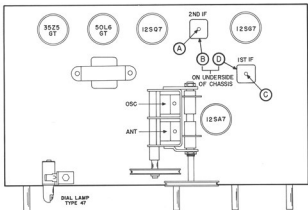


Fig. 7. Top View of Chassis Showing Location of Alignment Adjustments, Tubes and Dial Lamp

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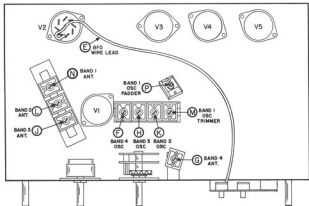
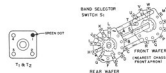
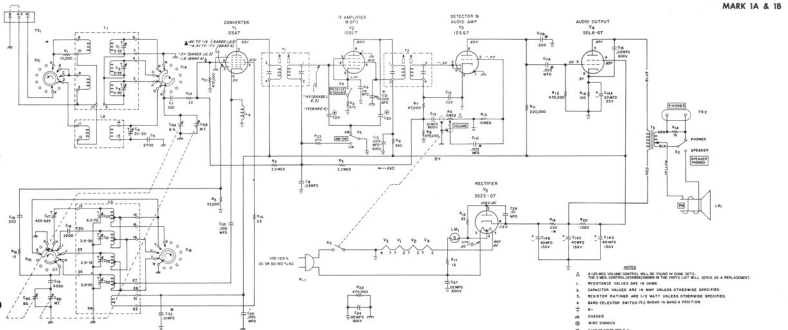
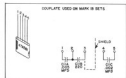
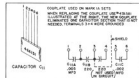


Fig. 8. Bottom View of Chassis Showing Location of Alignment Adjustments and Tubes.

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NOTE: VALUES & TOLERANCES SHOWN ARE NOMINAL AND VARIATIONS MAY BE FOUND. IT IS RECOMMENDED THAT THE VALUES OF ANY REPLACEMENT CORRESPOND TO THE NOMINAL VALUE OF THE PART BEING REPLACED.



- VOLTAGES**
- ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS AND GROUND (PIN 8 OF 12507) WITH ANTENNA TERMINALS SHORTED, BAND SWITCH AT RX, AND RECEIVE / STANDBY SWITCH AT RECEIVE.
 - LINE VOLTAGE - 117 VOLTS AC.
 - ALL VOLTAGES WERE MEASURED WITH A VACUUM TUBE VOLTMETER (VTVM) AND ARE DC AND POSITIVE UNLESS OTHERWISE SPECIFIED.
 - VARIES WITH TUNING GANG SETTING.

SERVICE PARTS LIST

Schematic Symbol	Description	Hollcrafters Part Number	Schematic Symbol	Description	Hollcrafters Part Number
CAPACITORS			SWITCHES		
C-1-2-3	Trimmer assembly, 3 section; 2-25 mmfd., 2-25 mmfd., 4-40 mmfd.	44B829 44A424 47X308272	S-1A-B-C- D.	Switch, rotary wafer; Band Selector.	60C322
C-4	20-125 mmfd., mica trimmer.	47X308272	S-2,5	Switch, spot slide; Speaker- Phones and AM-CW	66A477
C-5	2700 mmfd. 5%, 500 V.; mica	48-289	S-3	Switch, on-off; part of Volume control R-9	-----
C-6A-B-C-D	Tuning capacitor, 2 section; includes drive pulleys	47X208221K 46A Y303J 46A Y303J 46A Z302F	S-4	Switch, spot slide; Receiver- Standby	66A476
C-7,12,16	220 mmfd. 10%, 500V.; mica	47X208221K	SOCKETS AND CONNECTORS		
C-8,15	0.02 mfd. 600V., tubular paper	46A Y303J	T8-1	Terminal strip, antenna	66A971
C-9	0.05 mfd. 200V., tubular paper	46A Y303J	T8-2	Twin jack strip, Phones	66A971
C-10	0.003 mfd. 600V., tubular paper	46A Z302F	Socket, dial lamp; with leads	66A122	
C-11A-B-C	Printed circuit capacitor plate, .005 mfd., 220 mmfd., .002 mfd.	47A581	Socket, octal tube	6A250	
C-12	0.01 mfd. 600 V., tubular paper	46A Z103J	TUBES AND DIAL LAMP		
C-16A-B-C- D.	Filter capacitor, 4 section; 20 mfd. 25V, 60-40-60 mfd., 150V.	45B091 44A349 47X308222J 47X308222J	V-1	12SA7; converter	60X12SA7
C-17	425-625 mmfd., mica padder	44A349	V-2	12SG7; IF amplifier and BFO	60X12SG7
C-18	2200 mmfd. 5%, 500V.; mica	47X308222J	V-3	12SQ7; detector and audio amplifier	60X12SQ7
C-19	3000 mmfd. 5%, 500V.; mica	47X308222J	V-4	50L6GT; audio output	60X50L6GT
C-20-21-22- 23	Trimmer assembly, 4 section; 6.5-70 mmfd., 2.5-30 mmfd., 2.5-10 mmfd., 3.5-30 mmfd.	44B159 46A Y303J 47A168	V-5	35Z5GT; rectifier	60X35Z5GT
C-24	0.05 mfd. 600V., tubular paper	46A Y303J	LM-1	Lamp, dial; type 47	38A064
C-25,26,31	0.005 mfd. 450V., ceramic disc	47A168	MISCELLANEOUS		
C-27	0.02 mfd. 600V., molded tubular paper	46B1203L6	Cabinet	66C1070	
C-28	0.01 mfd. 450V., ceramic disc	47A124	Cabinet back	33C600	
C-32	0.01 mfd. 200V., tubular paper	46A U103J	Cabinet bottom cover	33C601	
* RESISTORS			Channel, rubber; for escutcheon glass	16A212	
R-1	10,000 ohms	23X20X100K	Cip, dial mtg.	76A646	
R-2,5	2.2 megohms	23X20X220K	Cip, escutcheon glass mtg.	76A645	
R-3	22,000 ohms	23X20X220K	Cip, IF mtg.	76A385	
R-4	270 ohms	23X20X271K	Cip, mtg.; for coil L-2	76A326	
R-6	330 ohms	23X20X331K	Cip, mtg.; for dial lamp socket	76A660	
R-7	47,000 ohms	23X20X473K	C-vanish	4A139	
R-8,12,21,22	470,000 ohms	23X20X474K	Dial background, paper	32B979	
R-9	2 megohms, variable; Volume control (includes on-off switch S-1)	25B096	Dial cord (specify length)	38A026	
R-10	10 megohms	23X20X100K	Dial scale	22B426	
R-11	220,000 ohms	23X20X220K	Escutcheon, front panel	7C587	
R-13	100 ohms	23X20X101K	Glass, escutcheon	22B419	
R-14,15,17	15 ohms	23X20X150K	Grommet, rubber; gang mtg.	16A015	
R-16,18,24	22 ohms	23X20X220K	Grommet, rubber; switch bracket mtg.	16A125	
R-19	220 ohms, 1 watt	23X20X221K	Knob, Band Selector	15B323	
R-20	1000 ohms	23X20X102K	Knob, Bandspread, Off-Volume, and Tuning	15B322	
R-23	470 ohms	23X20X471K	PL-1	Line cord and plug	87A078
* All resistors are 1/2 watt, 10%, carbon type unless otherwise specified.			Line cord lock	76A397-1	
COILS AND TRANSFORMERS			male section	76A397-2	
**L-1, C-1-2- 3	Coil and trimmer assembly, antenna; bands 1,2, and 3	51C821	female section	76A397-3	
L-2	Coil, antenna; band 4	51B015	Mounting foot, rubber	16A244	
**L-3, C-20- 21-22-23	Coil and trimmer assembly, oscillator; all bands	51C822	Pointer, dial bandspread tuning	82A198	
L-4	Choke, RF; 540 oh	55A197	main tuning	82A251	
T-1	Transformer, 1st IF	50C531	Pulley, 1-12/32" od	28A290	
T-2	Transformer, 2nd IF	50C532	Pulley, 3/625" od	28A291	
T-3	Transformer, audio output	55A127	Retaining ring, "E" type (for bandspread idler pulleys)	76A776	
** The trimmer capacitor assemblies are also available separately. See "Capacitors".			Retaining ring, "E" type (for tuning and bandspread shafts)	76A811	
			Shield, dial lamp	8A1249	
			LS-1	Speaker, 5-inch PM; 3.2 ohm voice coil	85C020
				Spring, dial drive; 11/32"	75A812
				Spring, dial drive; 1/8"	75A173

Warranty

"The Hallicrafters Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to our authorized radio dealer, wholesaler, from whom purchased, or, authorized service center, intact, for examination, with all transportation charges prepaid within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory or authorized service center, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products."

Form No. 948822

the Hallicrafters co.