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communications

**OPERATING and SERVICE
INSTRUCTIONS**

S-38B

the hallicrafters co.

MANUFACTURERS OF RADIO, TELEVISION AND ELECTRONIC EQUIPMENT, CHICAGO 24, U. S. A.

DESCRIPTION

Hallicrafters Model S-38B is a table model, all-wave superheterodyne radio receiver which provides reception of the standard broadcast band and three shortwave bands with continuous coverage from 540 kilocycles (KC) to 32 megacycles (MC). The receiver employs five tubes including rectifier and provides AM (voice) and CW (code) reception over its entire frequency range.

FREQUENCY COVERAGE

BAND	FREQUENCY RANGE
1	540 KC - 1650 KC
2	1.65 MC - 5.1 MC
3	5 MC - 14.5 MC
4	13 MC - 32 MC

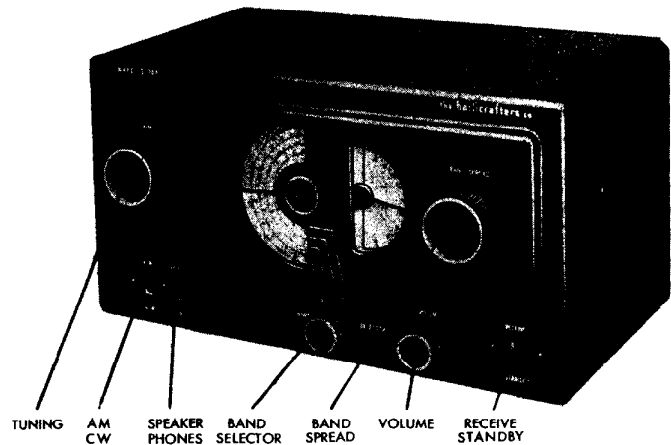


Fig. 1. Radio Receiver Model S-38B

92X1153-A

A bandswitch is provided for selecting any of the four ranges of reception which are indicated on the left hand or TUNING dial. An individual dial scale is provided for each of the four bands. The locations of the amateur bands and important shortwave channels are clearly marked on the TUNING dial. The BAND SPREAD dial is provided for fine tuning of the shortwave bands.

The RECEIVE/STANDBY switch permits disabling of the receiver for standby periods, the tube heaters being maintained at operating temperature for immediate operation.

The receiver is equipped with a built-in 5 inch permanent magnet speaker. Provision is also made in the receiver for the optional use of headphones.

The receiver is designed to operate from a 105-125 volt DC or 60 cycle AC power source. Before connecting the receiver to a wall outlet, carefully read the INSTALLATION INSTRUCTIONS which follow.

INSTALLATION INSTRUCTIONS

UNPACKING - Check all shipping labels and tags for instructions before removing or destroying them.

LOCATION - The receiver is equipped with rubber mounting feet for table top or shelf mounting. When locating the receiver, avoid excessively warm locations and recessed installations which prevent proper air circulation.

POWER SOURCE - The receiver is designed for operation from a 105-125 volt DC or 60 cycle AC power source. The power consumption is approximately 30 watts. If in doubt as to the frequency or voltage rating of your power source, contact the local power company representative to avoid damage to the receiver. When operating on DC, reverse the line cord plug at the wall outlet if the receiver does not operate after a one minute warm-up period. Operation from a 210-250 volt AC or DC source is possible by using a special line cord adapter available as an accessory from your Hallicrafters dealer (Hallicrafters part number 87D1566).

HEADPHONES - Tip jacks are provided on the rear apron of the chassis for headphone connection. Any standard pair of headphones with an impedance of 500 to 2000 ohms can be used with the receiver. For headphone operation, set the SPEAKER/PHONES switch located on the front panel at PHONES.

ANTENNA - A three terminal strip, marked A1, A2 and G, is provided on the rear apron of the chassis for antenna connection. Very satisfactory results can be obtained throughout the tuning range of the receiver with a conventional single wire antenna. In some instances, a length of wire strung about the room may suffice. However, it is recommended that a doublet antenna installation be employed on the shortwave bands for improved reception. Refer to page 3 for the construction and installation details of the single wire and doublet antennas.

SINGLE WIRE ANTENNA

1. Construct the antenna as shown in Fig. 2 and connect it to A1.
2. Connect the jumper between A2 and G.
3. Erect the antenna as high as possible and free of surrounding objects.
4. In some instances, a wire connected between G and a suitable ground such as a cold water pipe or outside ground rod may improve reception.

DOUBLET ANTENNA

1. The overall length (in feet) of the antenna is determined by dividing 468 by the frequency (in megacycles) at the high end of the range to which you wish to listen.
2. Construct the antenna as shown in Fig. 3.
3. A doublet antenna is directional broadside to its length and should be so oriented with respect to a desired station for maximum signal pickup.
4. When feeding the antenna with a twisted pair or ribbon type transmission line, connect the line to A1 and A2. The jumper between A2 and G should be disconnected.
5. When feeding the antenna with a coaxial transmission line, connect the inner conductor to A1 and the outer conductor to A2. Connect the jumper between A2 and G.
6. See Step 4 under SINGLE WIRE ANTENNA.

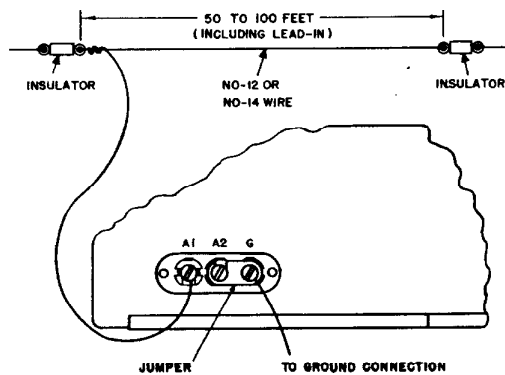


Fig. 2. Single Wire Antenna Installation

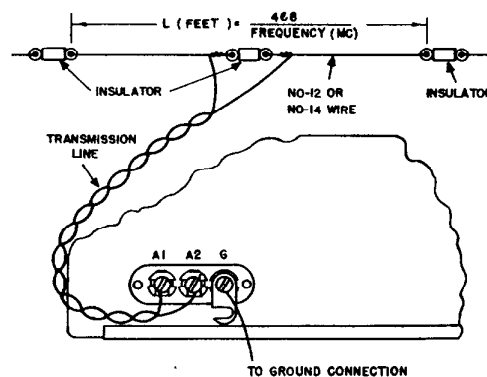


Fig. 3. Doublet Antenna Installation Using Twisted Pair Lead-In

OPERATING INSTRUCTIONS

STANDARD BROADCAST RECEPTION

1. Set the **BAND SELECTOR** at 1 for the standard broadcast band.
2. Set the **AM/CW** switch at **AM** and the **SPEAKER/PHONES** switch at **SPEAKER**.
3. Set the **RECEIVE/STANDBY** switch at **RECEIVE**. When set at **STANDBY**, the receiver is inoperative but the tube heaters remain at operating temperature.
4. Set the **BAND SPREAD** dial pointer at 0. **IMPORTANT** - The calibration of the **TUNING** dial scales will be correct only when the **BAND SPREAD** dial pointer is set at 0.
5. Turn the receiver **ON** by rotating the **VOLUME** control clockwise to a well advanced position. When operating on DC, reverse the line cord plug at the wall outlet if the receiver does not operate after a one minute warm-up period. The **VOLUME** control will have to be reset for the desired volume level after the station has been tuned in.
6. Tune in the desired station with the **TUNING** control. Read the station frequency from the dial scale which corresponds to the setting of the **BAND SELECTOR**.
7. To turn the receiver **OFF**, rotate the **VOLUME** control counterclockwise until the switch click is heard.

SHORT WAVE RECEPTION

1. Follow the procedure outlined for **STANDARD BROADCAST RECEPTION** but set the **BAND SELECTOR** at 2, 3 or 4 for the desired shortwave band. For code reception, the **AM/CW** switch must be set at **CW** and the **TUNING** control must be adjusted for the desired pitch of the code signal when tuning in the station.
2. For fine tuning of the shortwave bands, refer to **BAND SPREAD TUNING** below.

BAND SPREAD TUNING

1. The **BAND SPREAD** control is a fine tuning adjustment which electrically spreads out any narrow range of frequencies in the tuning range of the receiver. Band spread tuning is not necessary on the standard broadcast band.
2. To use the **BAND SPREAD** control for fine tuning: (1) Set the **BAND SPREAD** dial pointer at 0 (2) Set the **TUNING** dial pointer at the high frequency end of the amateur band or group of shortwave stations to be covered and (3) Tune in the stations with the **BAND SPREAD** control.
3. Logging of shortwave stations is possible by recording the settings of the **TUNING** and **BAND SPREAD** dials. See inside of back cover for the shortwave station log.

SERVICE INSTRUCTIONS

GENERAL SPECIFICATIONS

Tubes 5 including 1 rectifier
 Speaker 5 inch PM
 Voice Coil Impedance 3.2 ohms
 Headphone Output Impedance 15 ohms
 Antenna Provision for use of either a
 single wire or doublet antenna
 Intermediate Frequency 455 KC
 Frequency Coverage See page 2
 Power Supply . . 105-125 volts DC or 60 cycles AC
 Power Consumption 30 watts

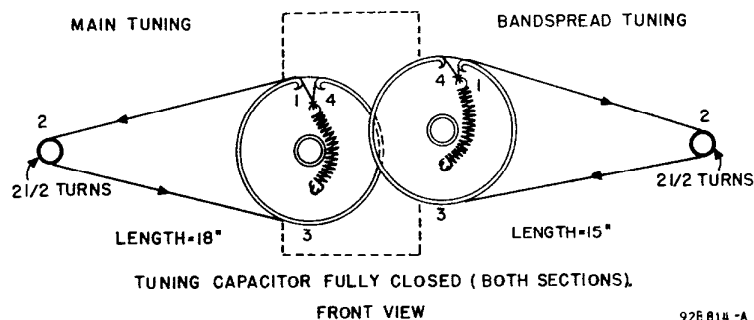


Fig. 4. Dial Cord Stringing Diagram

ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED

1. Signal generator, with amplitude modulated output, covering 455 KC to 30 MC. Use a modulated output for every step except step 2.
2. Output meter. Connect the meter across the speaker voice coil.
3. Standard RMA dummy antenna consisting of a 200 mmf. capacitor in series with a 20 microhenry choke which is shunted by a 400 mmf. capacitor in series with a 400 ohm carbon resistor.
4. Non-metallic alignment tool.

REMOVING THE CHASSIS - The antenna and oscillator trimmers are accessible through the holes provided in the bottom cover. However, for complete alignment the chassis must be removed from the cabinet. To remove the chassis, proceed as follows: (1) Remove the cabinet back (2) Remove the four rubber mounting feet and the bottom cover (3) Remove the two screws at the bottom rear of the cabinet (4) Remove the front control knobs and (5) Remove the four screws which are located near the switches on the front panel.

CONTROL SETTINGS - BAND SPREAD control at 0, AM/CW switch at AM, SPEAKER/PHONES switch at SPEAKER, VOLUME control fully clockwise and RECEIVE/STANDBY switch at RECEIVE. For the settings of the remaining controls, see the ALIGNMENT CHART below. See Figs. 5 and 6 for the location of the alignment adjustments.

ALIGNMENT CHART

Step	Signal Generator Connections	Signal Gen. Frequency	Band Selector Setting	Receiver Dial Setting	Adjust	Instructions
1	High side to stator plates of front section of TUNING gang through a .01 mfd. capacitor. Ground side to G on antenna strip.	455 KC	1	1.0 MC	A,B, C,D	Adjust for maximum audio output at the speaker voice coil. Use just enough signal generator output to obtain a 50 milliwatt reading on the output meter.
2 [⊖]	Same as Step 1	455 KC (No Mod.)	1	1.0 MC	E	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 wire E and pins 4 and 8 of the 12SK7 tube for a maximum beat note. Pushing wire E toward pin 4 increases the strength of the beat.
3	High side to A1 on antenna strip through the RMA dummy antenna. Ground side to G. Connect jumper between A2 and G.	30 MC	4	30 MC	F,G	Maximum output as in Step 1.
4	Same as Step 3	14 MC	3	14 MC	H,J	Maximum output as in Step 1.
5	Same as Step 3	5 MC	2	5 MC	K,L	Maximum output as in Step 1.
6	Same as Step 3	1500 KC 600 KC	1 1	1.5 MC .6 MC	M,N P	Maximum output as in Step 1.

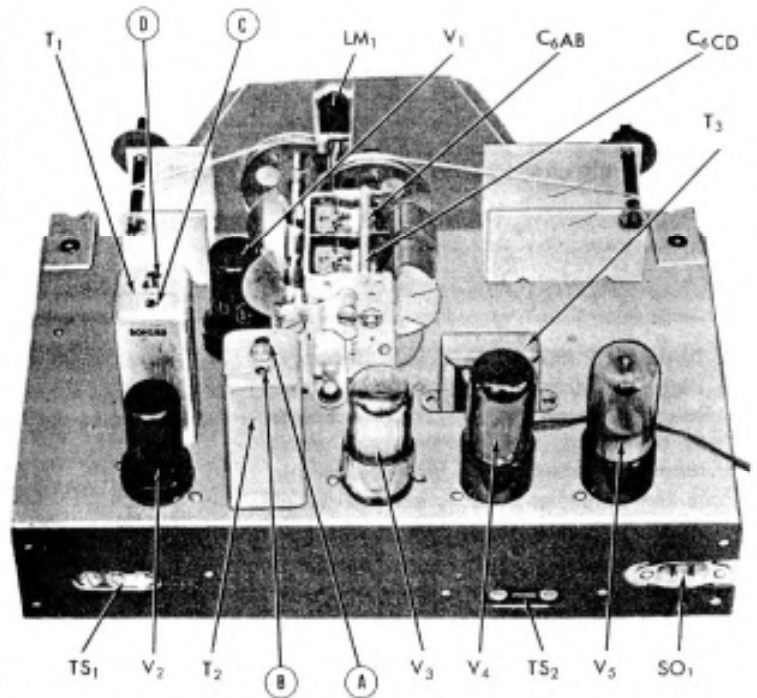
[⊖] Step 2 is usually unnecessary. Adjustment should be made ONLY if a weak beat note is obtained on strong CW signals indicating lack of coupling between wire E and pins 4 and 8 of the 12SK7.

SERVICE OR OPERATING QUESTIONS - For further information regarding operation or servicing of the receiver, contact your dealer. Make no shipments directly to the factory as the factory will not accept responsibility for unauthorized shipments. Factory type service is available at any **HALLICRAFTERS AUTHORIZED SERVICE CENTER** which displays the sign shown below. For the location of the **SERVICE CENTER** nearest you, consult your dealer or telephone directory.



92X1403

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.



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Fig. 5. Top View of Chassis Showing Location of Alignment Adjustments and Components

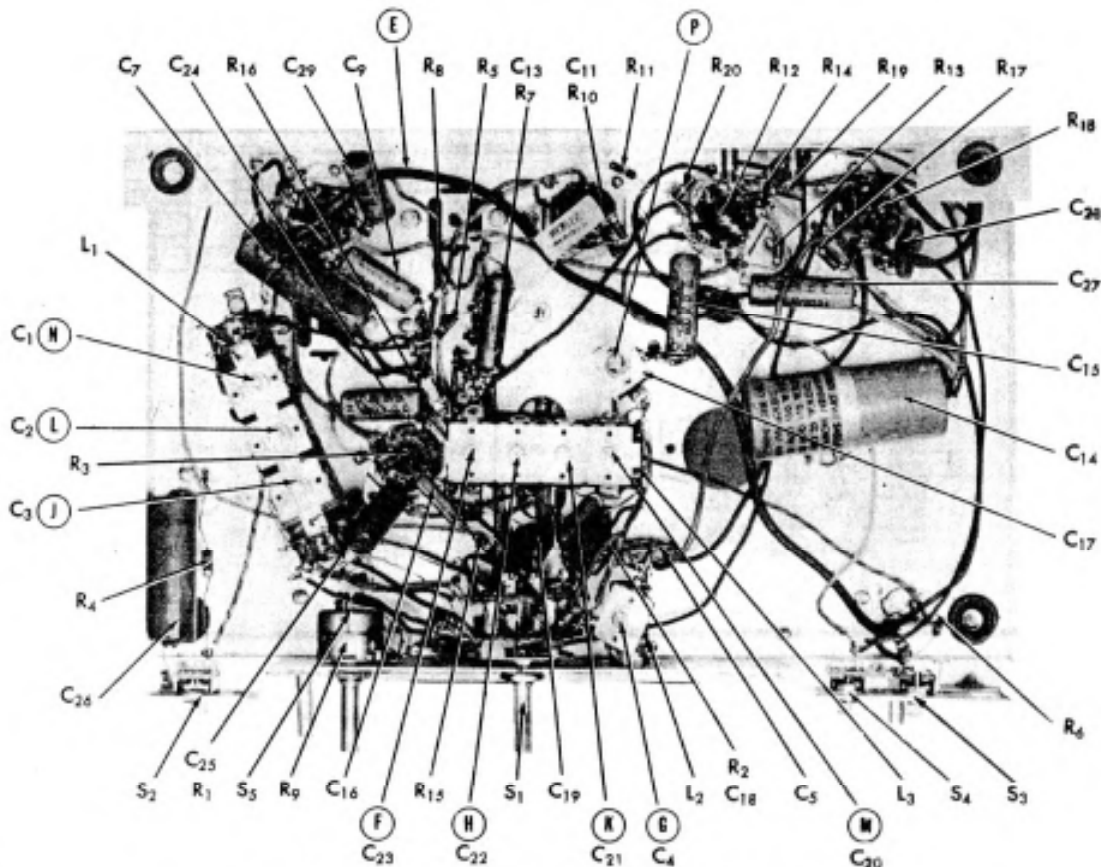


Fig. 6. Bottom View of Chassis Showing Location of Alignment Adjustments and Components

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TUBE REPLACEMENT - The tube types and their location in the receiver are shown in Fig. 7. To gain access to all tubes, remove the back cover from the cabinet. Before attempting to replace the 12SA7, set the BAND SPREAD control fully clockwise and the TUNING control fully counterclockwise to prevent damage to the tuning capacitor. To replace a tube: (1) Insert the center guide pin of the tube into the center hole of the tube socket (2) Rotate the tube until the key on the guide pin drops into the notch in the socket hole and (3) Push down on the tube until the base of the tube rests firmly on the socket. Handle all tubes with care as they are fragile and will not withstand mechanical abuse.

DIAL LAMP REPLACEMENT - Refer to Fig. 7 for the location of the dial lamp used in the receiver. To gain access to the lamp, remove the back cover from the cabinet. To prevent damage to the tuning capacitor, set the BAND SPREAD control fully clockwise and the TUNING control fully counterclockwise before attempting to replace the lamp. Remove the dial lamp socket by compressing the side springs. The socket and defective lamp can then be brought out into the open. Make replacement with a 6-8 volt, Mazda #47 (brown bead) pilot lamp or equivalent.

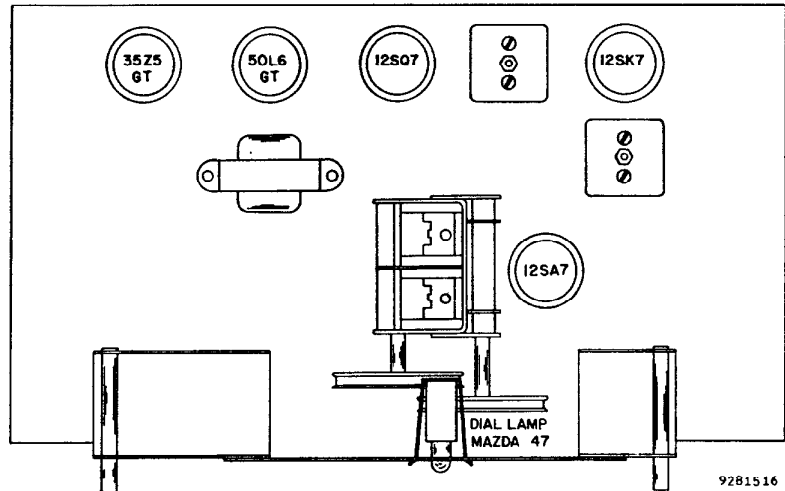
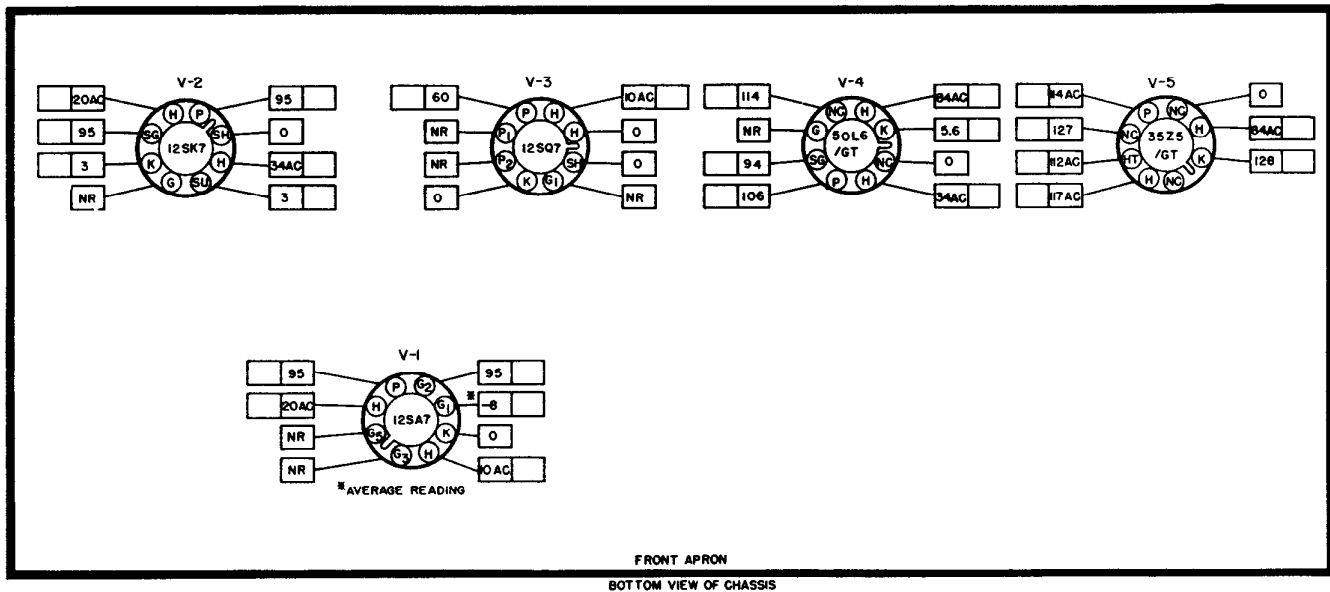


Fig. 7. Top View of Chassis Showing Tube and Dial Lamp Location



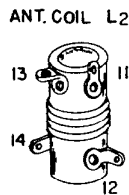
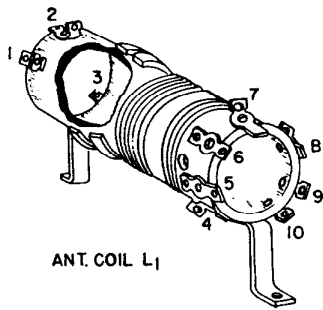
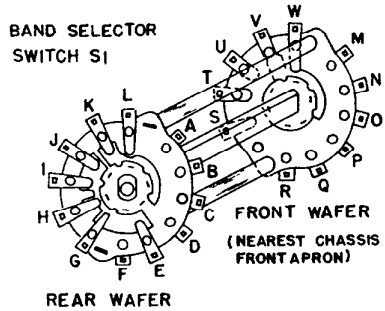
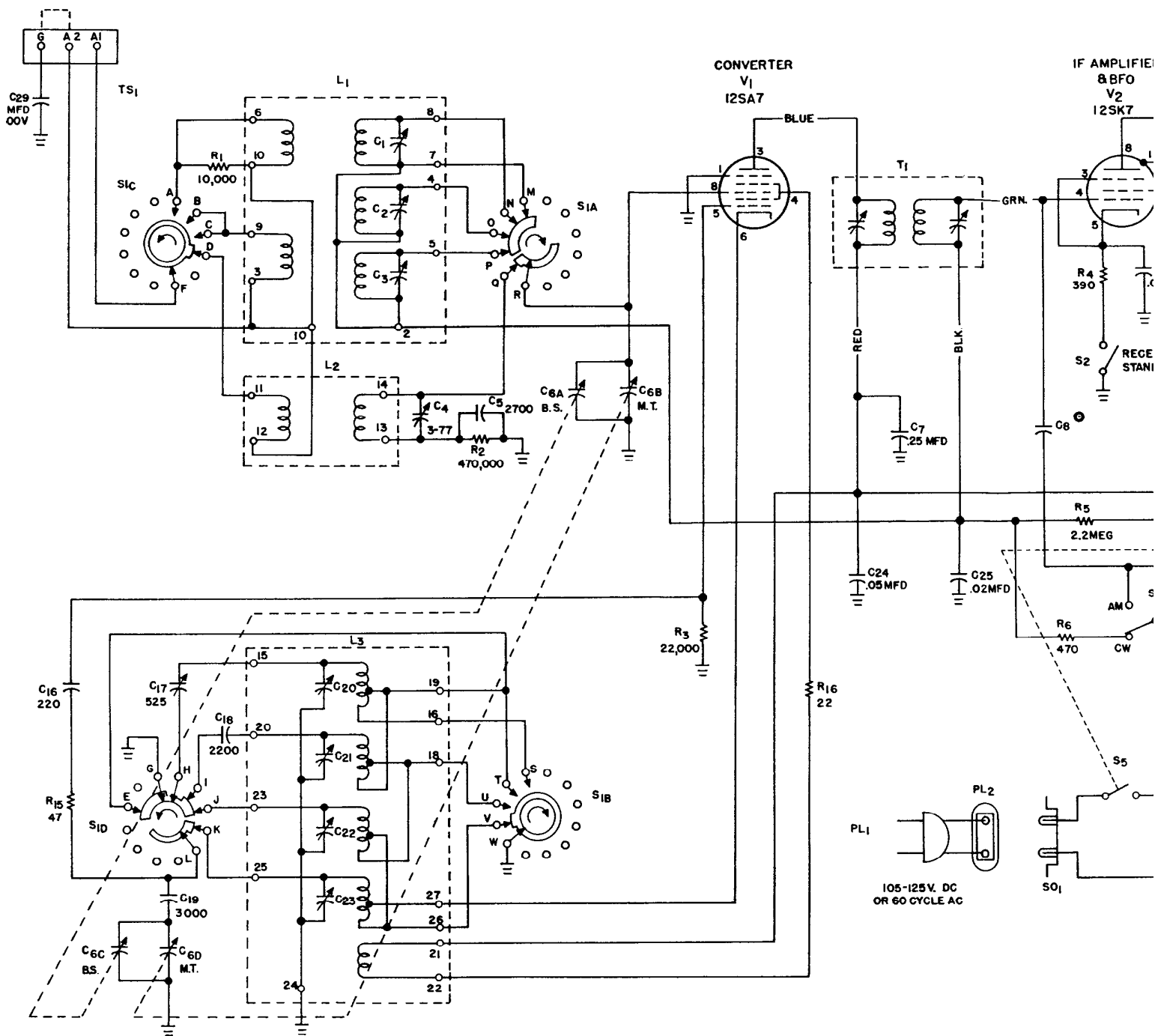
1. SOCKET VIEWS ARE BOTTOM VIEWS.
2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS & CHASSIS, WITH ZERO SIGNAL INPUT.
3. LINE VOLTAGE—117 V. AC. AC VOLTAGES WILL BE DC VOLTAGES WHEN OPERATING FROM A DC SOURCE.
4. ALL VOLTAGES SHOWN ARE DC UNLESS OTHERWISE SPECIFIED.
5. DC VOLTAGES SHOWN WERE MEASURED WITH AN ELECTRONIC VOLTMETER.
6. "NC" NO CONNECTION. (VOLTAGES SHOWN FOR THIS TERMINAL ONLY WHEN TERMINALS ARE USED AS A TIE LUG.)
7. "NR" NOT READABLE. (READING GENERALLY MEANINGLESS)
8. SPACE PROVIDED FOR SERVICE METER READINGS.

Fig. 8. Tube Socket Voltage Chart

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SERVICE PARTS LIST

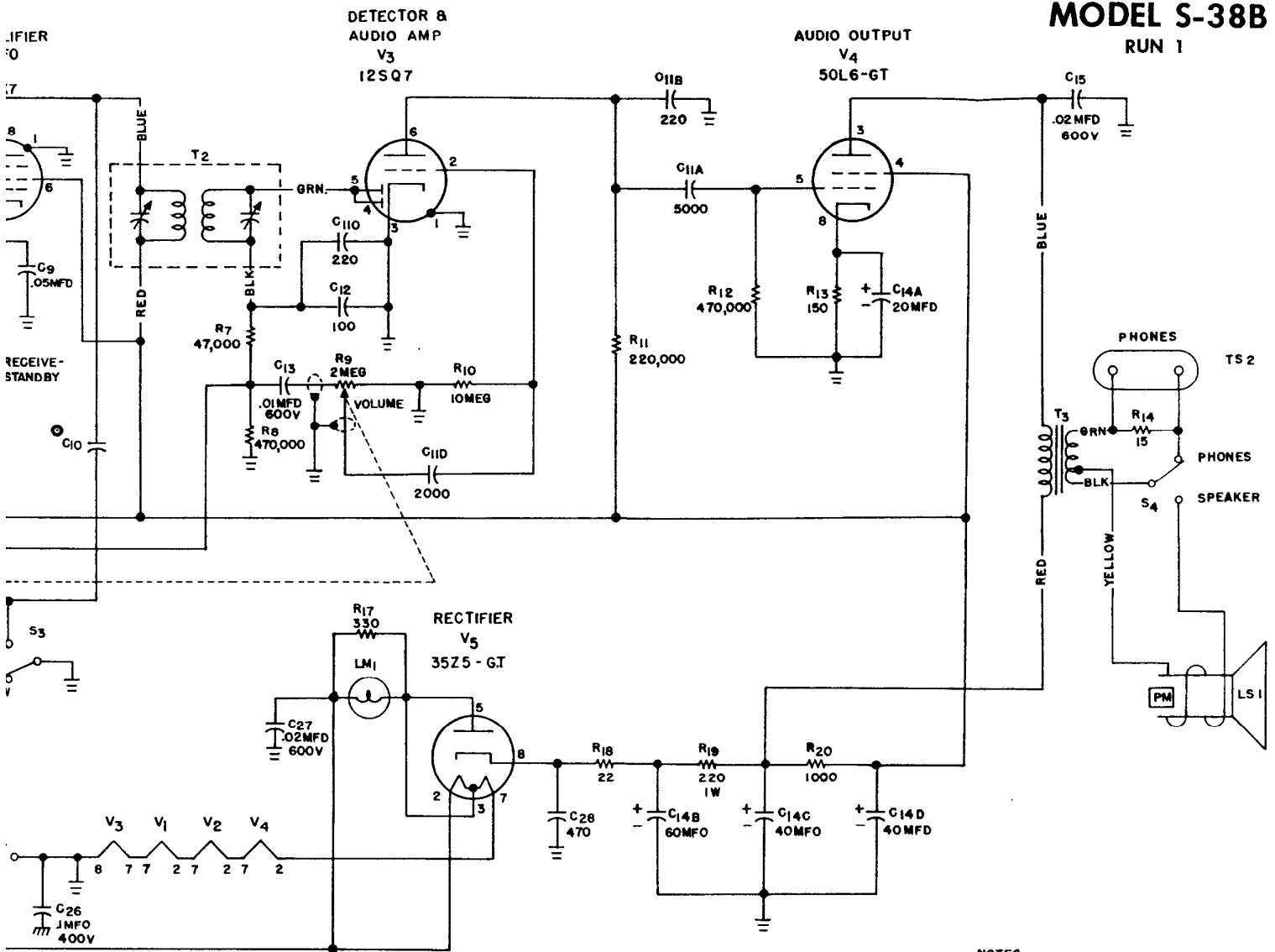
Schematic Symbol	Description	Hallicrafters Part Number	Schematic Symbol	Description	Hallicrafters Part Number
CAPACITORS			SWITCHES		
C-1,2,3	Trimmers; part of coil L-1	- - - - -	S-1A,B,C,D	Switch assembly, BAND SELECTOR	60C393
C-4	Trimmer, 3-77 mmf.	44A039	S-2	Switch, spst slide; RECEIVE/ STANDBY	60A244
C-5	2700 mmf. 500 V., mica	47X30B272J	S-3,4	Switch, spdt slide; AM/CW and SPEAKER/PHONES	60A243
C-6A,B,C,D	Tuning capacitor, 2 section	48C162-1	S-5	Switch, power; part of VOLUME control R-7	- - - - -
C-7	.25 mfd. 200 V., tubular	46AT254J	CONNECTORS		
C-8,10	Wiring capacity	- - - - -	PL-1	Line cord and plug PL-2	87B1668-1
C-9,24	.05 mfd. 200 V., tubular	46AU503J	PL-2	Line cord plug	- - - - -
C-11A,B,C,D	Composite capacitor: 5000, dual 220, 2000 mmf. 500 V.; ceramic	46A151		Socket, dial lamp; includes leads	86A011
C-12	100 mmf. 500 V., mica	47X20B101K	SO-1	Socket, octal tube	6A250
C-13,29	.01 mfd. 600 V., tubular	46AZ103J	TS-1	Socket, power input	10A286
C-14A,B,C,D	20 mfd. 25 V., 60-40-40 mfd. 150 V., electrolytic	45B091	TS-2	Terminal strip, antenna PHONE jacks	88A671 88A071
C-15,27	.02 mfd. 600 V., tubular	46AY203J	TUBES AND DIAL LAMPS		
C-16	220 mmfd. 500 V., mica	47X20A221K	V-1	12SA7: converter	90X12SA7
C-17	Padder, 525 mmf.	44A349	V-2	12SK7: IF amplifier and B.F.O.	90X12SK7
C-18	2200 mmf. 500 V., mica	47X30B222J	V-3	12SQ7: detector and audio amplifier	90X12SQ7
C-19	3000 mmf. 500 V., mica	47X30B302J	V-4	50L6GT: audio output	90X50L6GT
C-20,21,22, 23	Trimmers; part of coil L-3	- - - - -	V-5	35Z5GT: rectifier	90X35Z5GT
C-25	.02 mfd. 400 V., tubular	46AW203J	LM-1	Lamp, pilot; Mazda #47	39A004
C-26	.1 mfd. 400 V., tubular	46AV104J	MISCELLANEOUS PARTS		
C-28	470 mmfd. 500 V., mica	47X20B471M	Cabinet		66B625
RESISTORS			Cabinet back		8C1139
R-1	10,000 ohms 1/2 watt, carbon	23X20X103M	Cabinet bottom		8C1140
R-2,8,12	470,000 ohms 1/2 watt, carbon	23X20X474M	Clip, coil L-2 mtg.		76A362
R-3	22,000 ohms 1/2 watt, carbon	23X20X223M	Dial cord, 30 $\frac{1}{2}$ inches		38A019
R-4	390 ohms 1/2 watt, carbon	23X20X391K	Dial scale		83C373
R-5	2.2 megohms 1/2 watt, carbon	23X20X225M	Grommet, rubber; for insul- ating cabinet from chassis		16A201
R-6	470 ohms 1/2 watt, carbon	23X20X471K	Insulator, nylon; fits in grommet 16A201		4A646
R-7	47,000 ohms 1/2 watt, carbon	23X20X473M	Knob, BAND SPREAD and TUNING		15A048
R-9	VOLUME control, 2 megohms; includes switch S-5	25B896	Knob, BAND SELECTOR and VOLUME		15A049
R-10	10 megohms 1/2 watt, carbon	23X20X106M	Mounting foot, rubber		16A007
R-11	220,000 ohms 1/2 watt, carbon	23X20X224M	Pointer, BAND SPREAD		82A103
R-13	150 ohms 1/2 watt, carbon	23X20X151K	Pointer, TUNING		82A177
R-14	15 ohms 1/2 watt, carbon	23X20X150M	Shaft, BAND SPREAD		74A319
R-15	47 ohms 1/2 watt, carbon	23X20X470M	Shaft, TUNING		74A318
R-16,18	22 ohms 1/2 watt, carbon	23X20X220M	Speaker, 5 inch PM		85C030
R-17	330 ohms 1/2 watt, carbon	23X20X331M	Spring, dial cord		75A012
R-19	220 ohms 1 watt, carbon	23X30X221M	Washer, fiber; for insulating cabinet from chassis		4A647
R-20	1000 ohms 1/2 watt, carbon	23X20X102M	Window, dial		22B311
COILS AND TRANSFORMERS					
L-1	Coil, antenna; bands 1, 2 and 3	51C821			
L-2	Coil, antenna; band 4	51B1015			
L-3	Coil, oscillator; bands 1, 2, 3 and 4	51C822	LS-1	Speaker, 5 inch PM	85C030
T-1	Transformer, 1st IF	50B183			
T-2	Transformer, 2nd IF	50B184			
T-3	Transformer, audio output	55A127			



NOTE: VALUES & TOLERANCES SHOWN ARE NOMIN
IT IS RECOMMENDED THAT THE VALUES OF
TO THE NOMINAL VALUE OF THE PART BEIN

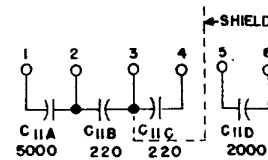
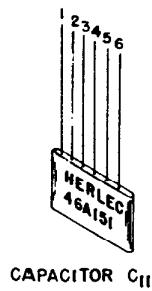
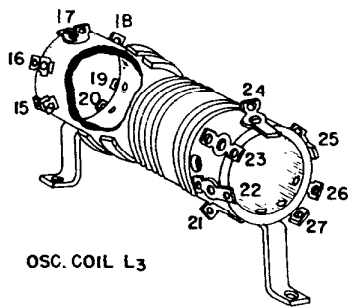
MODEL S-38B

RUN 1



NOTES

1. RESISTANCE VALUES ARE IN OHMS.
 2. CAPACITOR VALUES ARE IN MMF UNLESS OTHERWISE SPECIFIED.
 3. RESISTOR RATINGS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.
 4. BAND SELECTOR SWITCH (S₁) SHOWN IN BAND 4 POSITION.
- ⊥ CHASSIS GROUND
 ⊔ CABINET GROUND
 ⊙ WIRE GIMMICK
- LAST CAPACITOR SYMBOL C-29
 LAST RESISTOR SYMBOL R-20



89F 326-E

MINOR VARIATIONS MAY BE FOUND.
 IF ANY REPLACEMENT CORRESPOND
 TO BE REPLACED.

Fig. 9. Schematic Diagram