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communications
OPERATING and SERVICE INSTRUCTIONS
S-38B
the hallicrafters co.

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

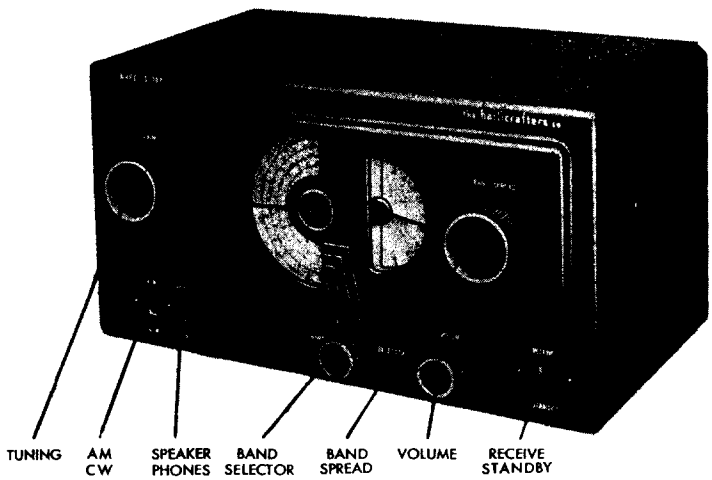


Fig. 1. Radio Receiver Model S-38B

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.

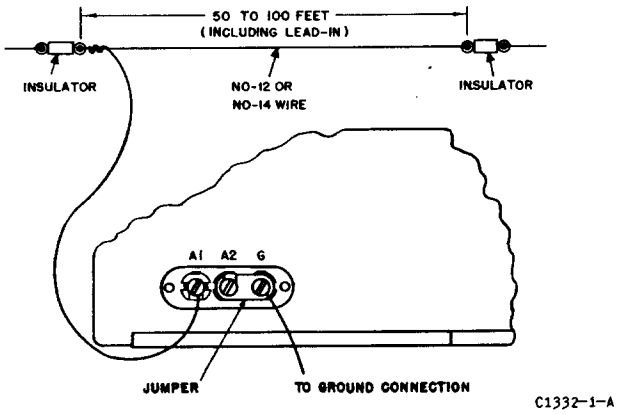


Fig. 2. Single Wire Antenna Installation

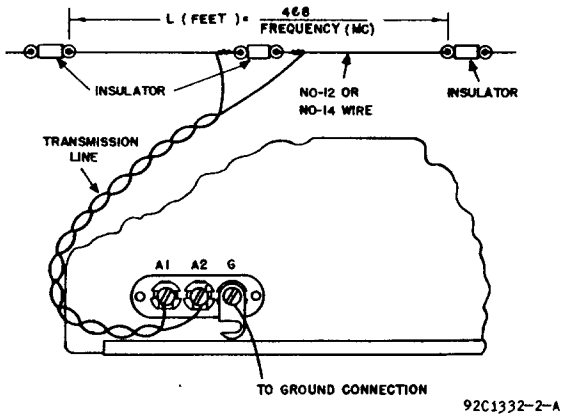


Fig. 3. Doublet Antenna Installation Using Twisted Pair Lead-In

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

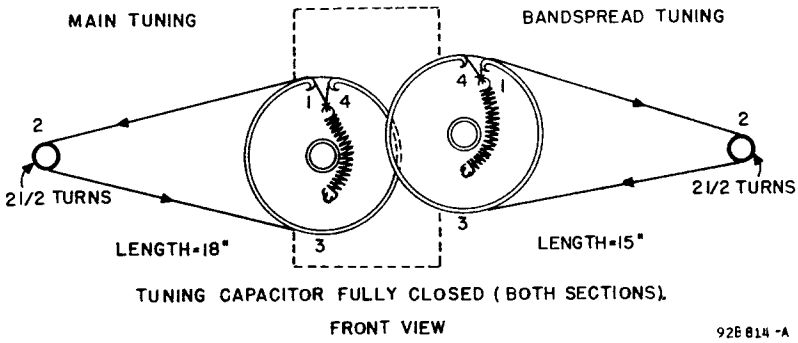


Fig. 4. Dial Cord Stringing Diagram

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.

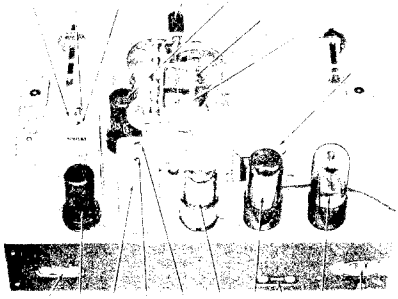


Fig. 5. Top View of Chassis Showing Location of Alignment Adjustments and Components

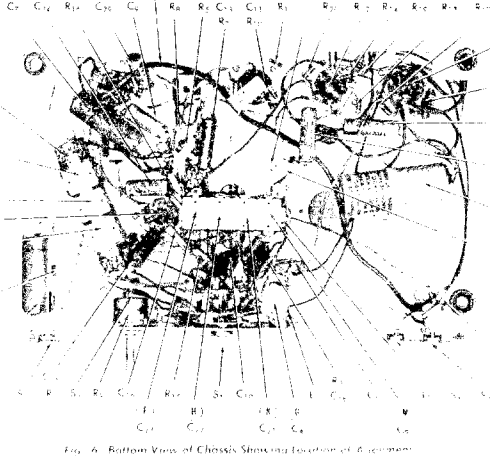


Fig. 6. Bottom View of Chassis Showing Location of Alignment Adjustments and Components

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.

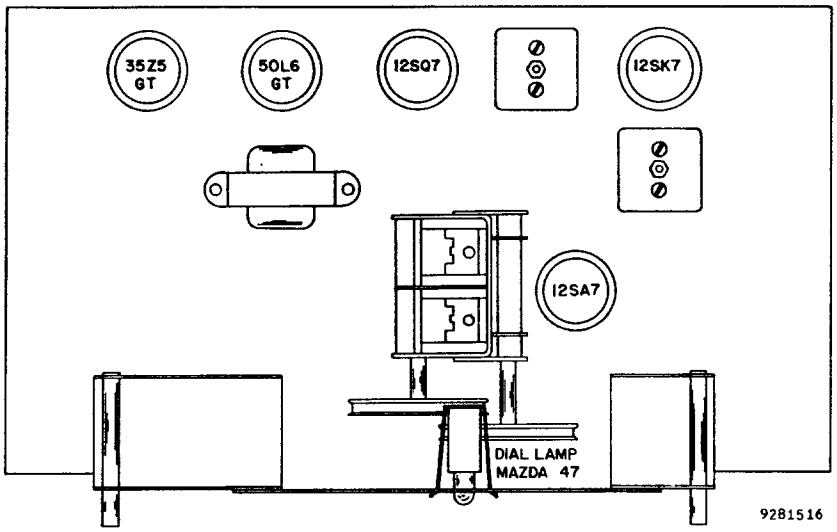
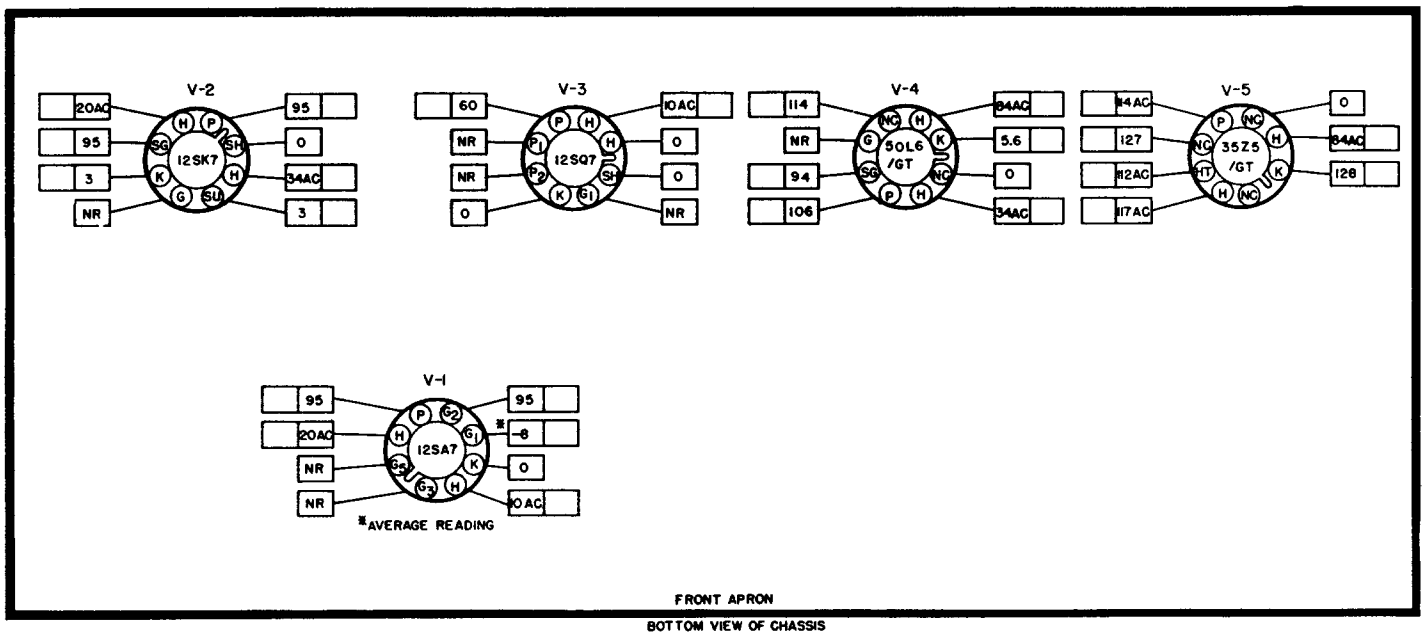


Fig. 7. Top View of Chassis Showing Tube and Dial Lamp Location



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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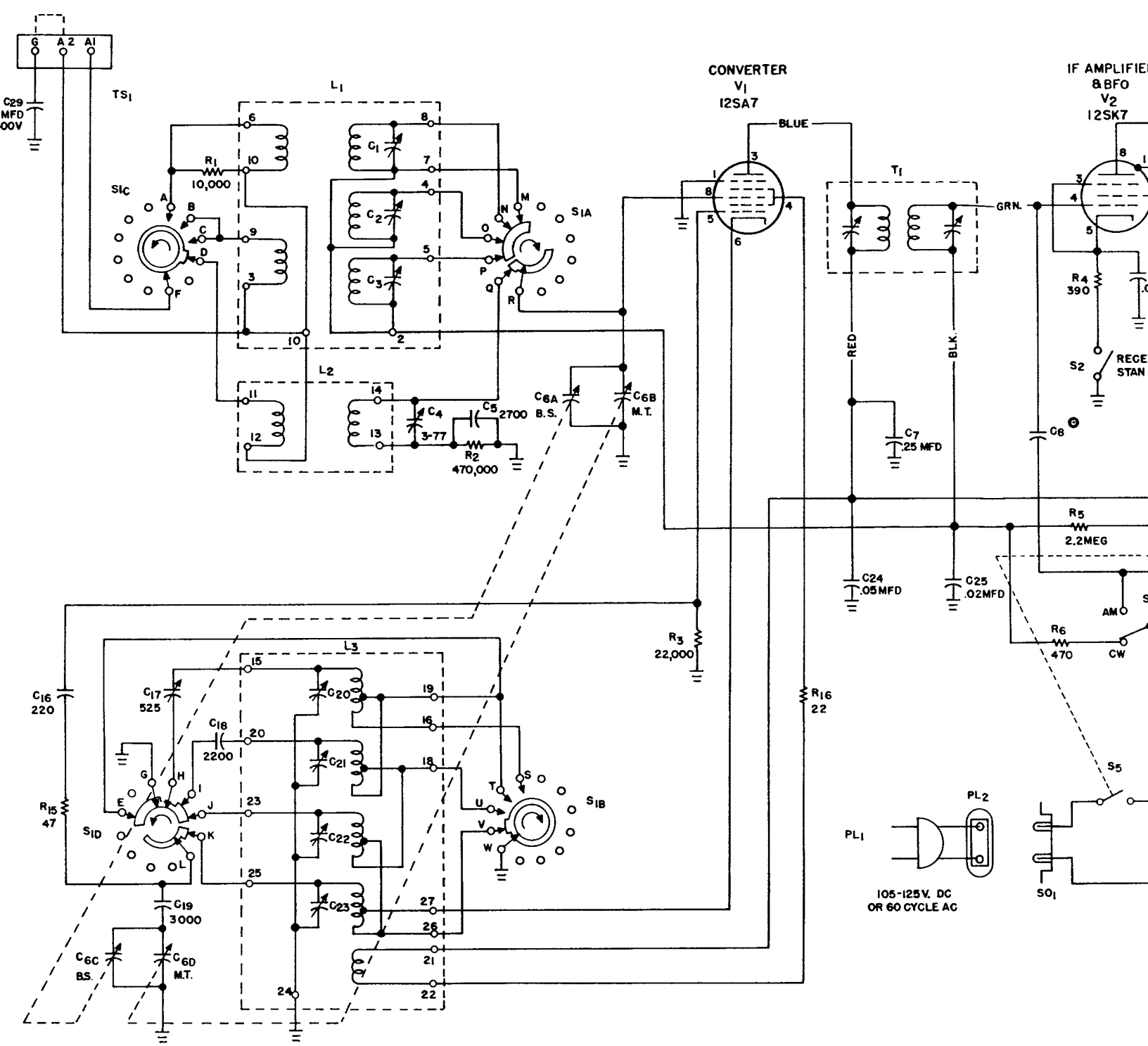
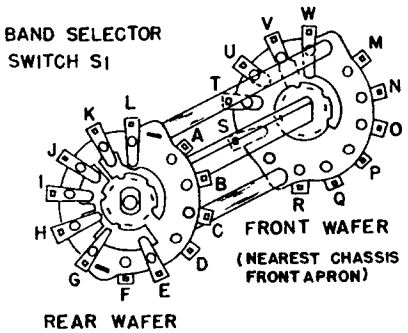
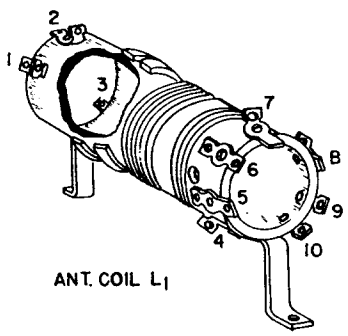
SERVICE PARTS LIST

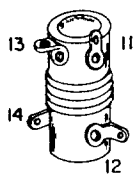
Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C-1,2,3	Trimmers; part of coil L-1	- - - - -
C-4	Trimmer, 3-77 mmf.	44A039
C-5	2700 mmf. 500 V., mica	47X30B272J
C-6A,B,C,D	Tuning capacitor, 2 section	48C162-1
C-7	.25 mfd. 200 V., tubular	46AT254J
C-8,10	Wiring capacity	- - - - -
C-9,24	.05 mfd. 200 V., tubular	46AU503J
C-11A,B,C,D	Composite capacitor: 5000, dual 220, 2000 mmf. 500 V.; ceramic	46A151
C-12	100 mmf. 500 V., mica	47X20B101K
C-13,29	.01 mfd. 600 V., tubular	46AZ103J
C-14A,B,C,D	20 mfd. 25 V., 60-40-40 mfd. 150 V., electrolytic	45B091
C-15,27	.02 mfd. 600 V., tubular	46AY203J
C-16	220 mmfd. 500 V., mica	47X20A221K
C-17	Padder, 525 mmf.	44A349
C-18	2200 mmf. 500 V., mica	47X30B222J
C-19	3000 mmf. 500 V., mica	47X30B302J
C-20,21,22, 23	Trimmers; part of coil L-3	- - - - -
C-25	.02 mfd. 400 V., tubular	46AW203J
C-26	.1 mfd. 400 V., tubular	46AV104J
C-28	470 mmfd. 500 V., mica	47X20B471M
	RESISTORS	
R-1	10,000 ohms 1/2 watt, carbon	23X20X103M
R-2,8,12	470,000 ohms 1/2 watt, carbon	23X20X474M
R-3	22,000 ohms 1/2 watt, carbon	23X20X223M
R-4	390 ohms 1/2 watt, carbon	23X20X391K
R-5	2.2 megohms 1/2 watt, carbon	23X20X225M
R-6	470 ohms 1/2 watt, carbon	23X20X471K
R-7	47,000 ohms 1/2 watt, carbon	23X20X473M
R-9	VOLUME control, 2 megohms; includes switch S-5	25B896
R-10	10 megohms 1/2 watt, carbon	23X20X106M
R-11	220,000 ohms 1/2 watt, carbon	23X20X224M
R-13	150 ohms 1/2 watt, carbon	23X20X151K
R-14	15 ohms 1/2 watt, carbon	23X20X150M
R-15	47 ohms 1/2 watt, carbon	23X20X470M
R-16,18	22 ohms 1/2 watt, carbon	23X20X220M
R-17	330 ohms 1/2 watt, carbon	23X20X331M
R-19	220 ohms 1 watt, carbon	23X30X221M
R-20	1000 ohms 1/2 watt, carbon	23X20X102M
	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
T-1	Transformer, 1st IF	50B183
T-2	Transformer, 2nd IF	50B184
T-3	Transformer, audio output	55A127

Schematic Symbol	Description	Hallicrafters Part Number
	SWITCHES	
S-1A,B,C,D	Switch assembly, BAND SELECTOR	60C393
S-2	Switch, spst slide; RECEIVE/STANDBY	60A244
S-3,4	Switch, spdt slide; AM/CW and SPEAKER/PHONES	60A243
S-5	Switch, power; part of VOLUME control R-7	- - - - -
	CONNECTORS	
PL-1	Line cord and plug PL-2	87B1668-1
PL-2	Line cord plug	- - - - -
	Socket, dial lamp; includes leads	86A011
	Socket, octal tube	6A250
SO-1	Socket, power input	10A286
TS-1	Terminal strip, antenna	88A671
TS-2	PHONE jacks	88A071
	TUBES AND DIAL LAMPS	
V-1	12SA7: converter	90X12SA7
V-2	12SK7: IF amplifier and B.F.O.	90X12SK7
V-3	12SQ7: detector and audio amplifier	90X12SQ7
V-4	50L6GT: audio output	90X50L6GT
V-5	35Z5GT: rectifier	90X35Z5GT
LM-1	Lamp, pilot; Mazda #47	39A004
	MISCELLANEOUS PARTS	
	Cabinet	66B625
	Cabinet back	8C1139
	Cabinet bottom	8C1140
	Clip, coil L-2 mtg.	76A362
	Dial cord, 30½ inches	38A019
	Dial scale	83C373
	Grommet, rubber; for insulating cabinet from chassis	16A201
	Insulator, nylon; fits in grommet 16A201	4A646
	Knob, BAND SPREAD and TUNING	15A048
	Knob, BAND SELECTOR and VOLUME	15A049
	Mounting foot, rubber	16A007
	Pointer, BAND SPREAD	82A103
	Pointer, TUNING	82A177
	Shaft, BAND SPREAD	74A319
	Shaft, TUNING	74A318
LS-1	Speaker, 5 inch PM	85C030
	Spring, dial cord	75A012
	Washer, fiber; for insulating cabinet from chassis	4A647
	Window, dial	22B311



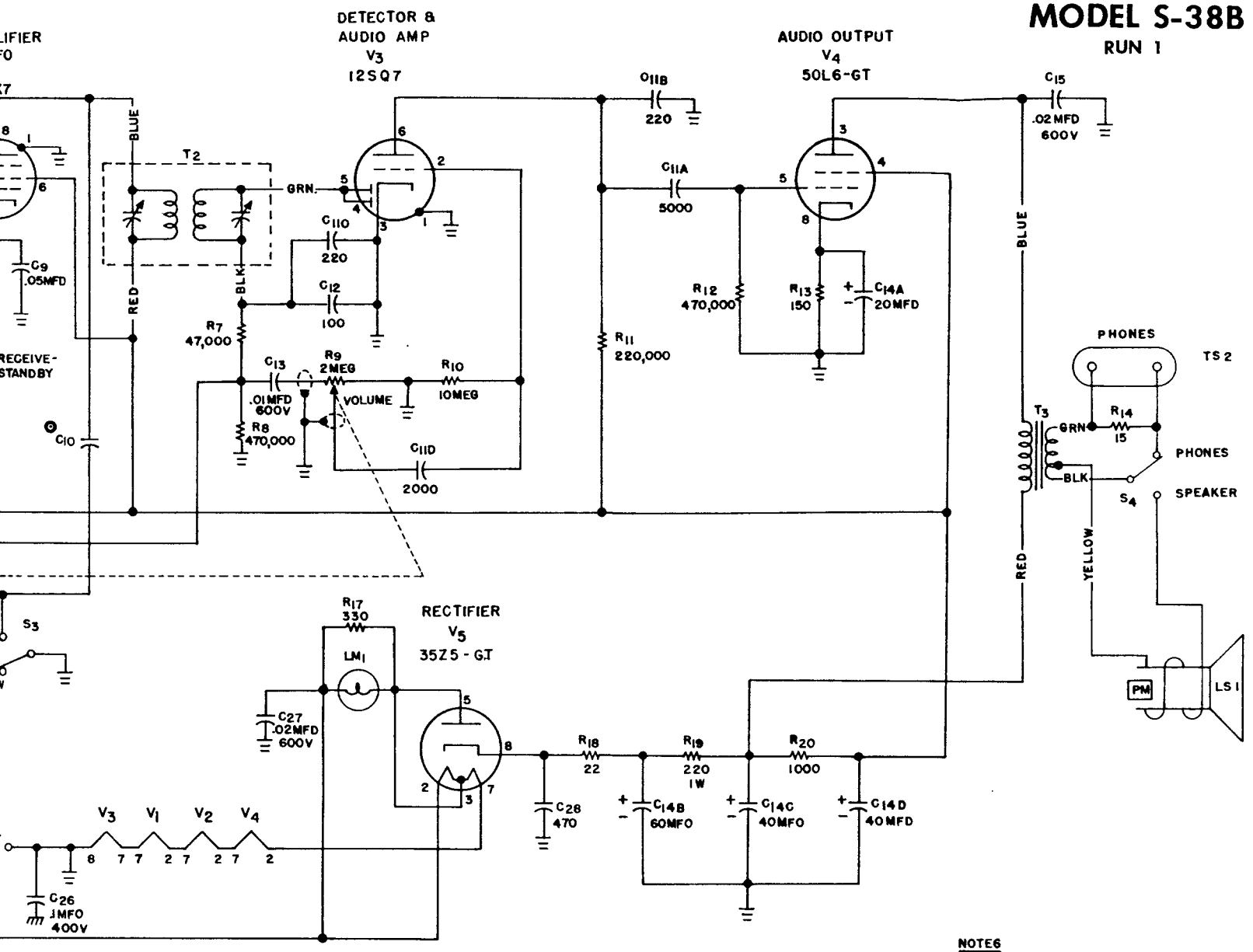






NOTE: VALUES & TOLERANCES SHOWN ARE NOMIN
IT IS RECOMMENDED THAT THE VALUES OF
TO THE NOMINAL VALUE OF THE PART BEI

MODEL S-38B
RUN 1



NOTES

1. REBISTANCE VALUES ARE IN OHMS.
2. CAPACITOR VALUES ARE IN MMF UNLESS OTHERWISE SPECIFIED
3. RESISTOR RATINGS ARE 1/2 WATT UNLESS OTHERWISE SPECIF
4. BAND SELECTOR SWITCH (S_1) SHOWN IN BAND 4 POSITION.

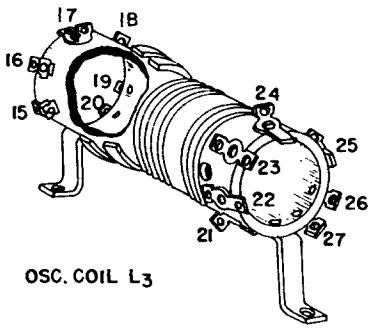
⏚ CHASSIS GROUND

⏚ CABINET GROUND

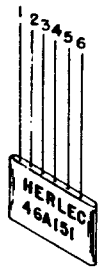
⊙ WIRE GIMMICK

LAST CAPACITOR SYMBOL C-29

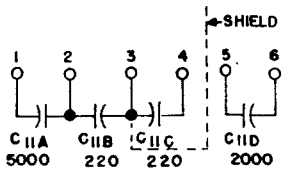
LAST RESISTOR SYMBOL R-20



OSC. COIL L_3



CAPACITOR C_{11}



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MINAL AND VARIATIONS MAY BE FOUND.
OF ANY REPLACEMENT CORRESPOND
EING REPLACED.

Fig. 9. Schematic Diagram