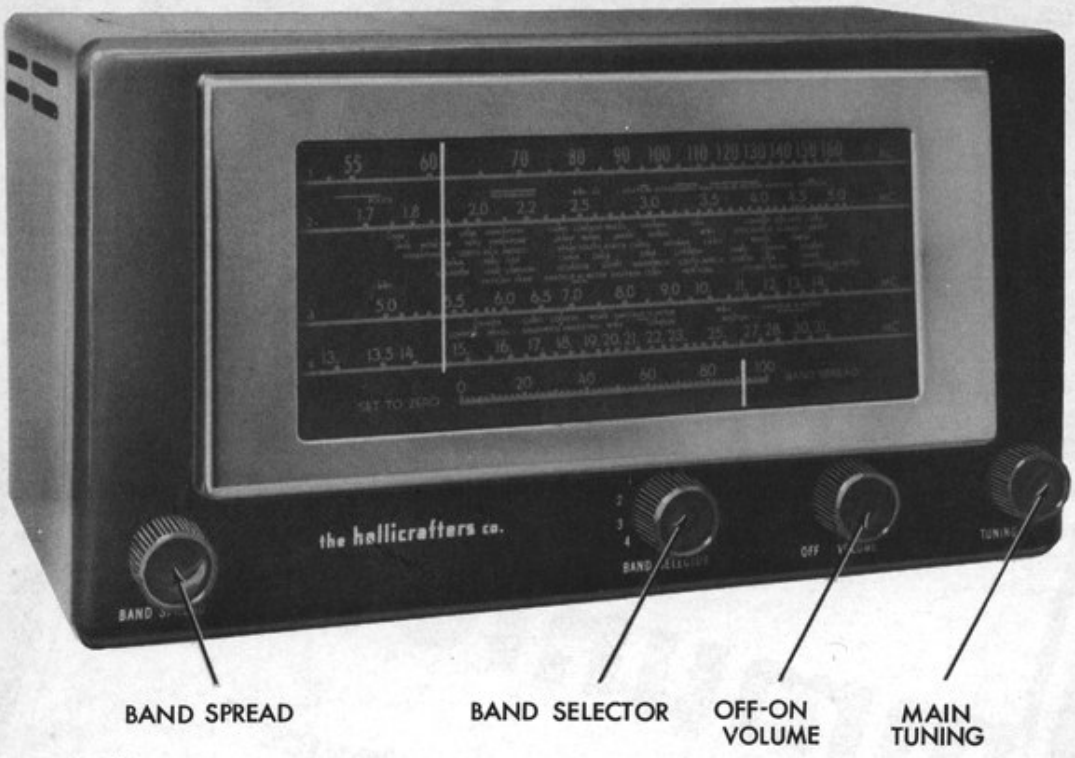
communications

OPERATING and SERVICE INSTRUCTIONS

5R10A

the hallicrafters co.
MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT, CHICAGO 24, U. S. A.



92X1331

FIG. 1 RADIO RECEIVER MODEL 5R10A

DESCRIPTION

Hallicrafters Model 5R10A is a table model, all-wave superheterodyne radio receiver which provides standard broadcast and shortwave reception with continuous coverage from 540 kilocycles (KC) to 31 megacycles. (MC). The receiver employs five tubes including a rectifier.

A bandswitch is provided for selecting any of the four frequency ranges covered by the receiver. An individual dial scale is provided for each of the four ranges on the large, easy-to-read slide rule dial. For the convenience of the shortwave listener, the locations of many shortwave stations are clearly indicated on the dial. In addition, a band spread dial is provided for fine tuning of the shortwave bands.

FREQUENCY COVERAGE

Band Selector Position	Frequency Range
1	540 KC - 1650 KC
2	1.65 MC - 5.1 MC
3	5 MC - 14.5 MC
4	13 MC - 31 MC

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

The receiver is designed for operation from a 105-125 volt DC or 60 cycle AC power source. To avoid damage to the receiver, carefully read the INSTALLATION instructions which follow before connecting the receiver to a wall outlet.

INSTALLATION

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

LOCATION - The receiver is equipped with rubber feet for table top or shelf mounting. When locating and mounting the receiver, avoid excessively warm locations or recessed installations which prevent proper air circulation. If the receiver is placed with its back to the wall, leave about an inch or two of clearance between the back of the cabinet and the wall for proper ventilation.

POWER SOURCE - The receiver operates from a 105-125 volt DC (direct current) or 60 cycles AC (alternating current) source. The normal power consumption of the receiver is 30 watts. If in doubt as to the voltage and frequency rating of your power source, contact the local power company representative. 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/DC source is possible by using a special line cord adapter available as an accessory. Consult your Hallicrafters dealer regarding this adapter unit (Hallicrafters part number 87D1566).

ANTENNA - A three terminal strip, marked A1, A2 and G, is provided on the chassis rear apron for antenna connection. Very satisfactory results can be obtained throughout the tuning range of the receiver with a conventional single wire antenna installation (see Fig. 2). However, it is recommended that a doublet antenna (see Fig. 3) be employed on the shortwave bands for improved reception.

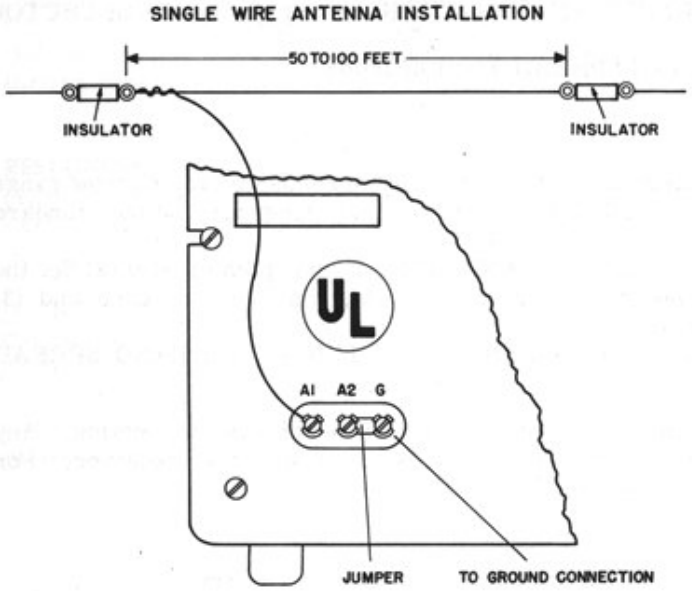


FIG. 2 SINGLE WIRE ANTENNA INSTALLATION

SINGLE WIRE ANTENNA - For a single wire antenna installation, connect the jumper between antenna terminals A2 and G. The single wire antenna 50 to 100 feet long (including lead-in) should be connected to terminal A1. Erect the antenna as high as possible and free of surrounding objects. In some instances a wire connected between terminal G and a suitable ground such as a cold water pipe or outside ground rod may improve reception.

DOUBLET ANTENNA - The overall length, in feet, of the doublet antenna may be determined by dividing 468 by the desired frequency in megacycles. A doublet antenna is somewhat directional broadside to its length and should be so oriented if maximum pickup from a given direction is to be expected.

When feeding the doublet antenna with a ribbon type transmission line (see Fig. 3), connect the transmission line to terminals A1 and A2, and disconnect the jumper between terminals A2 and G.

When using a coaxial transmission line, connect the inner conductor to terminal A1, the outer conductor to terminal A2 and place the jumper between terminals A2 and G.

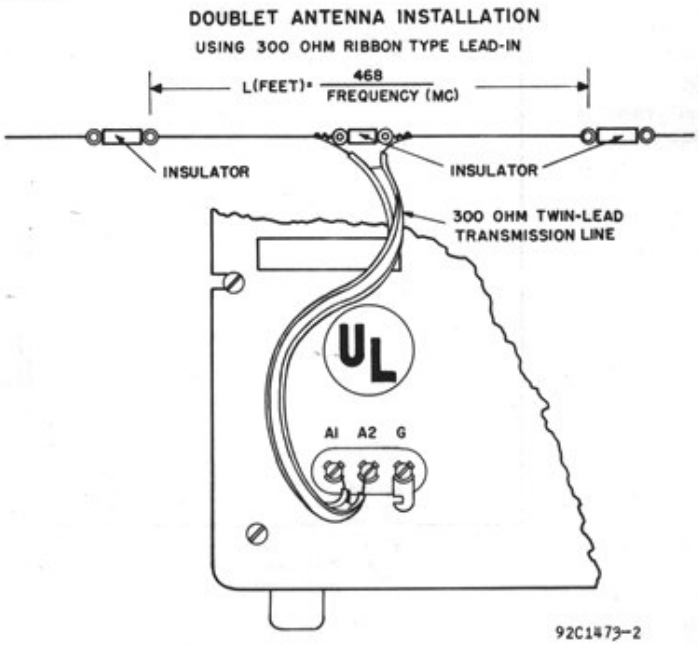


FIG. 3 DOUBLET ANTENNA INSTALLATION

OPERATION

STANDARD BROADCAST RECEPTION

1. Set the BAND SELECTOR at 1 for the standard broadcast band.
2. Set the SPEAKER/PHONES switch on the rear apron of the chassis to SPEAKER.
3. Set the BAND SPREAD dial pointer at 0. IMPORTANT - The calibration of the main tuning dial scales will be correct only when the BAND SPREAD dial pointer is set at 0.
4. 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.
5. Tune in the desired station with the TUNING control and adjust the VOLUME control for the desired volume level. Read the station frequency from the dial scale which corresponds to the setting of the BAND SELECTOR.
6. 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.
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 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 dial scales.

HEADPHONES - Tip jacks are provided on the rear apron of the chassis for headphone connection. Any standard pair of headphones with an impedance of 1500 to 5000 ohms can be used with the receiver. For headphone operation, set the SPEAKER/PHONES switch at PHONES.

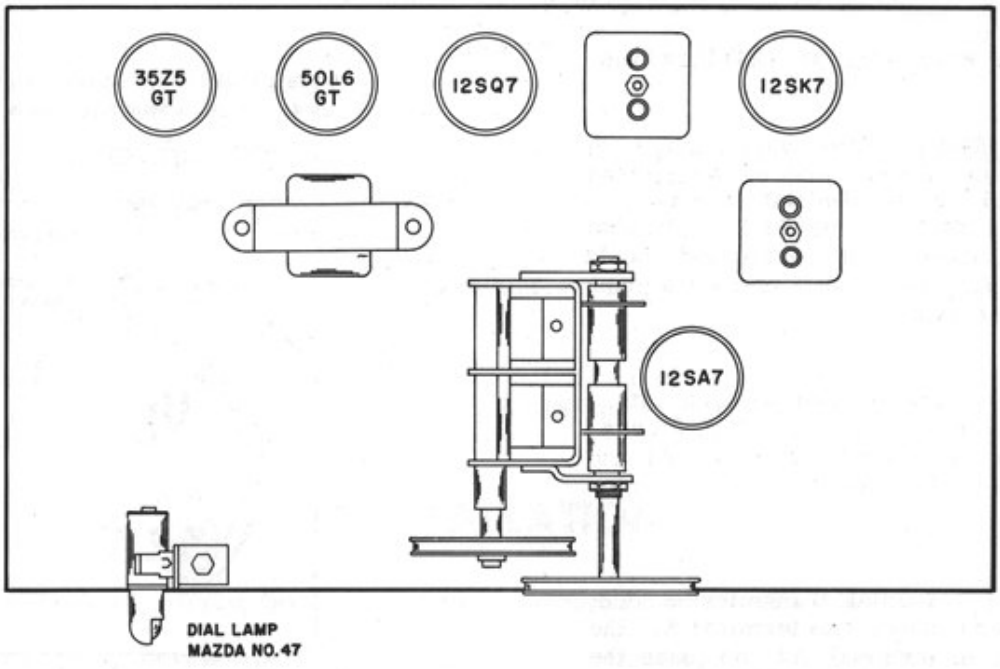


FIG. 4 TOP VIEW - LOCATION OF TUBES AND DIAL LAMP

SERVICE

GENERAL SPECIFICATIONS

Tubes	Four plus rectifier
Speaker	5-inch PM
Voice coil impedance	3.2 ohms
Headphone output impedance	15 ohms
Antenna	Provisions for external antenna with transmission line or single wire feed
Intermediate frequency	455 KC
Power Supply	105-125 volts DC or 60 cycles AC
Power Consumption	30 watts

TUBE REPLACEMENT - The tube types and their relative location in the receiver are shown in Fig. 4. When installing a replacement tube, insert the center guide pin into the center hole of the tube socket; rotate the tube until the key on the guide pin drops into the notch in the socket hole and then push down 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. 4 for the location of the dial lamp used in the receiver. To replace a defective lamp, the cabinet back and 35Z5GT tube must be removed from the receiver. Reach in through the rear of the cabinet and unclip the dial lamp socket from the mounting clip. The socket may then be brought out into the open for dial lamp replacement. Make replacement with a 6-8 volt Mazda #47 (brown bead) pilot lamp or equivalent.

RESTRINGING DIAL CORD - The dial drive system of the 5R10A consists of three separate string drives: (1) main tuning gang drive (2) main tuning dial pointer drive and (3) band spread gang and dial pointer drive. All restringing should be done with the main tuning and band spread gangs fully meshed.

MAIN TUNING GANG DRIVE - Refer to Fig. 5. Tie one end of a 32 inch length of 30 lb. test dial cord to the tie point at position A on pulley (Z). Follow the stringing procedure A through F. At position G, place the dial cord through one end of the tension spring. Leaving the other end of the spring disconnected, follow the stringing procedure H through M. At position M, take up the slack in the dial cord and tie the cord securely to the tie point. As the final step, stretch the tension spring and connect it to the tie point at position N.

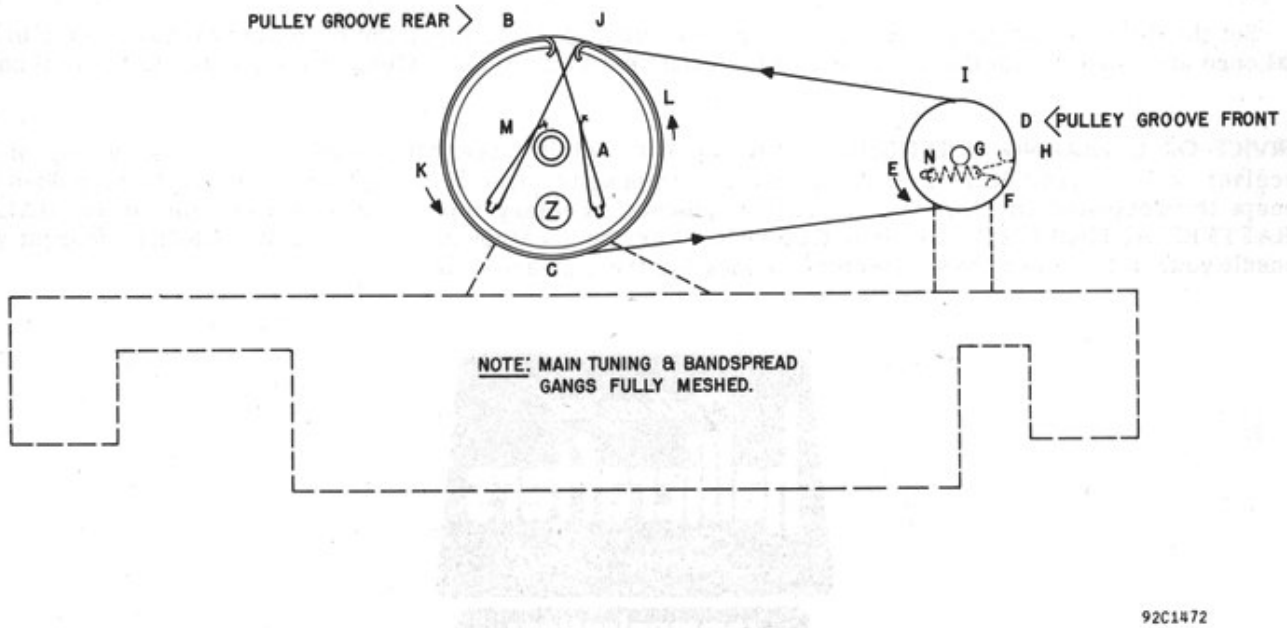


FIG. 5 MAIN TUNING GANG DRIVE STRINGING PROCEDURE

MAIN TUNING DIAL POINTER DRIVE - Refer to Fig. 6. Tie one end of a 50 inch length of 30 lb. test dial cord to the tension spring at position A on pulley (X). Follow the stringing procedure A through M. At position M, stretch the tension spring and tie the cord securely to the spring. Note that 2-1/4 turns of dial cord are wrapped around the main tuning drive shaft for proper traction.

Set the main tuning gang at maximum capacity (fully meshed), attach the main tuning dial pointer to the dial cord and align it with the left hand index mark on the band 1 dial scale. Cement the pointer to the dial cord.

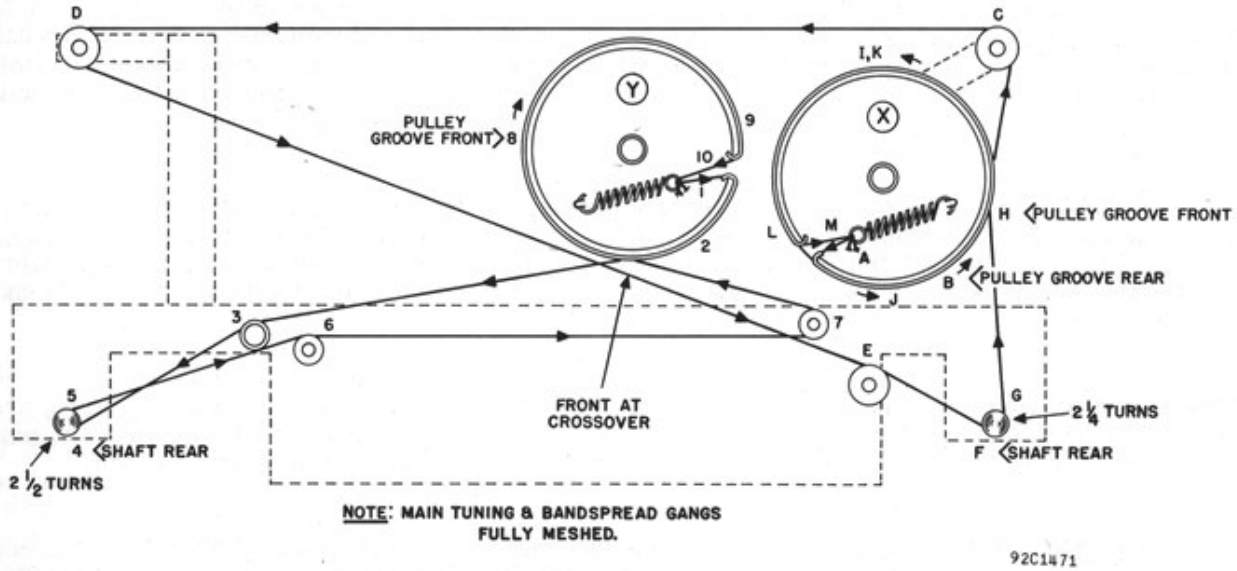


FIG. 6 MAIN TUNING DIAL POINTER DRIVE AND BAND SPREAD GANG AND DIAL POINTER DRIVE STRINGING PROCEDURES

BAND SPREAD GANG AND DIAL POINTER DRIVE - Refer to Fig. 6. Tie one end of a 41 inch length of 30 lb. test dial cord to the tension spring at position 1 on pulley (Y). Follow the stringing procedure 1 through 10. At position 10, stretch the tension spring and tie the cord securely to the spring. Note that 2-1/2 turns of dial cord are wrapped around the band spread drive shaft for proper traction.

Set the band spread gang at minimum capacity (fully opened), attach the band spread dial pointer to the dial cord and align it with the 0 position on the band spread dial scale. Cement the pointer to the dial cord.

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

Authorized hallicrafters Service Center
communications equipment

92X1401

SERVICE PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C-1,2,3	Trimmer, adjustable (part of antenna coil L-1)	- - - - -
C-4	Trimmer, adjustable; 3-77 mmf.	44A039
C-5	2700 mmf. 5%, 500 V.; mica	47X30B272J
C-6A,B, C,D	Tuning capacitor; 2 gang	48-269
C-7	220 mmf. 10%, 500 V.; ceramic	47B20221K5
C-8	.02 mfd. 400 V., tubular paper	46AW203J
C-9	.05 mfd. 200 V., tubular paper	46AU503J
C-10	.1 mfd. 600 V., tubular paper	46AZ104J
C-11A,B, C,D	Capacitor, composite: 5000, dual 220 and 2000 mmf. 500 V.; ceramic	46A151
C-12	100 mmf. 10%, 500 V.; mica	47X20B101K
C-13	.01 mfd. 600 V., tubular paper	46AZ103J
C-14A,B, C,D,	60-40-40 mfd. 150 V., 20 mfd. 25 V.; electrolytic	45B091
C-15	.02 mfd. 600 V., tubular paper	46AY203J
C-16	220 mmf. 10%, 500 V.; mica	47X20B221K
C-17	Padder, adjustable; 525 mmf.	44A349
C-18	2200 mmf. 5%, 500 V.; mica	47X30B222J
C-19	3000 mmf. 5%, 500 V.; mica	47X30B302J
C-20,21, 22,23	Trimmer, adjustable (part of oscillator coil L-3)	- - - - - -
C-24	.05 mfd. 600 V., tubular paper	46AY503J
C-25,26	5000 mmf. 450 V., ceramic disc	47A168
C-27	.02 mfd. 600 V., molded tubular paper	46BR203L6
	RESISTORS	
R-1	10,000 ohms 1/2 watt, carbon	23X20X103M
R-2,5	2.2 megohms 1/2 watt, carbon	23X20X225M
R-3	22,000 ohms 1/2 watt, carbon	23X20X223M
R-4.6	390 ohms 1/2 watt, carbon	23X20X391K
R-7	47,000 ohms 1/2 watt, carbon	23X20X473M
R-8,12,21	470,000 ohms 1/2 watt, carbon	23X20X474M
R-9	2 megohms; VOLUME control	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-14,17	15 ohms 1/2 watt, carbon	23X20X150M
R-15	10 ohms 1/2 watt, carbon	23X20X100K
R-16,18	22 ohms 1/2 watt, carbon	23X20X220M
R-19	220 ohms 1 watt, carbon	23X30X221M
R-20	1000 ohms 1/2 watt, carbon	23X20X102M
	TRANSFORMERS AND COILS	
L-1	Coil, antenna; bands 1, 2 and 3	51C821
L-2	Coil, antenna; band 4	51B1015
L-3	Coil, oscillator; all bands	51C822
L-4	Choke, RF	53A107
T-1	Transformer, 1st IF	50B183
T-2	Transformer, IF; detector circuit	50B184
T-3	Transformer, audio output	55A127

Schematic Symbol	Description	Hallicrafters Part Number
	SWITCHES	
S-1A,B, C,D	Bandswitch assembly; BAND SELECTOR	60C393
S-2	Switch, spdt; SPEAKER/ PHONES	60A243
S-3	Switch, power; spst (part of VOLUME control R-9)	- - - -
	SOCKETS AND CONNECTORS	
TS-1	Terminal strip, antenna	88A671
TS-2	Jack, PHONES	88A071
	Socket, dial lamp; with leads	86A122
	Socket, octal; tube	6A250
	TUBES AND DIAL LAMPS	
V-1	12SA7: converter	90X12SA7
V-2	12SK7: IF amplifier	90X12SK7
V-3	12SQ7: detector and audio amplifier	90X12SQ7
V-4	50L6GT: audio output	90X50L6GT
V-5	35Z5GT: rectifier	90X35Z5GT
LM-1	Lamp, dial; Mazda #47	39A004
	MISCELLANEOUS PARTS	
	Cabinet	66-702
	Cabinet back	32C500
	Channel, rubber (for escutcheon glass)	16A212
	Clip, dial mtg.	76A646
	Clip, mtg. (for antenna coil L-2)	76A326
	Cover, cabinet bottom	32C501
	Dial background	32B488
	Dial cord, 123"	38A001
	Dial scale	22B318
	Escutcheon	7C248
	Foot, mounting; rubber	16A244
	Glass, escutcheon	22B319
	Grommet, rubber	16A015
	Knob, BAND SELECTOR	15B323
	Knob, BANDSPREAD, OFF-VOLUME and TUNING	15B322
PL-1	Line cord and plug	87A078
	Line cord lock	76A397
	Pointer, dial; bandspread tuning	82A198
	Pointer, dial; main tuning	82A199
	Shield, dial lamp	8A1249
LS-1	Speaker, PM; 5 inch	85C030
	Spring, dial drive; 17/32"	75A012
	Spring, dial drive; 3/8"	75A173

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.

ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED

1. Signal generator covering 455 KC, 600 KC, 1500 KC, 5 MC, 14 MC and 30 MC. Generator must have amplitude modulated output.

2. Standard RMA dummy antenna which consists of a 200 mmf. capacitor in series with a 20 microhenry RF choke which is shunted by a 400 mmf. capacitor in series with a 400 ohm carbon resistor.

3. Alignment tool made of polystyrene or other similar material.

Holes in the bottom cover provide access to the antenna and oscillator coil trimmers; however, for complete alignment, the chassis will have to be removed from the cabinet. To separate the chassis from the cabinet, the following will have to be removed: cabinet back, bottom cover, front control knobs, speaker and the four rubber mounting feet.

The alignment should be made with the SPEAKER/PHONES switch at SPEAKER, the VOLUME control fully clockwise and the BAND SPREAD control fully counterclockwise. Refer to Figs. 7 and 8 for the location of all adjustments.

ALIGNMENT CHART

Step	Signal Generator Coupling	Signal Generator Frequency (Modulated)	Band Selector Setting	Receiver Dial Setting	Adjust	Remarks
1	Connect the high side of the generator through a .01 mfd. capacitor to the stator plates of the front section of the tuning gang. Connect the ground side of the generator to the chassis.	455 KC 455 KC	1 1	1000 KC 1000 KC	A,B C,D	Adjust for max. audio output at speaker voice coil. Use just enough signal generator output to obtain a suitable output indication
2	Connect the high side of the generator through the RMA dummy antenna to terminal A1 on the antenna terminal strip. Connect the jumper between terminals A2 and G. Connect the ground side of the generator to the chassis.	30 MC 30 MC	4 4	30 MC 30 MC	F *G	Max. output as in step 1. Max. output as in step 1.
3	See step 2.	14 MC 14 MC	3 3	14 MC 14 MC	H *J	Max. output as in step 1. Max. output as in step 1.
4	See step 2.	5 MC 5 MC	2 2	5 MC 5 MC	K *L	Max. output as in step 1. Max. output as in step 1.
5	See step 2.	1500 KC 600 KC	1 1	1500 KC 600 KC	M,N P	Max. output as in step 1. Max. output as in step 1.

*Note - Rock the main tuning capacitor slightly when making these adjustments.

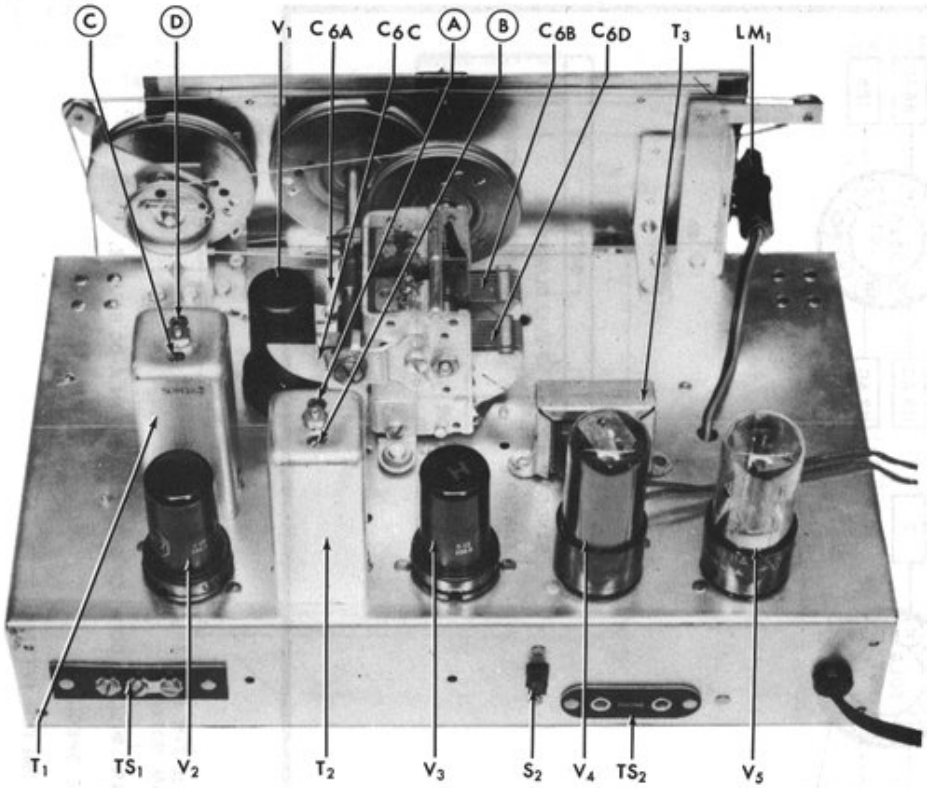


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FIG. 7 TOP VIEW - ALIGNMENT POINTS AND COMPONENT LOCATION

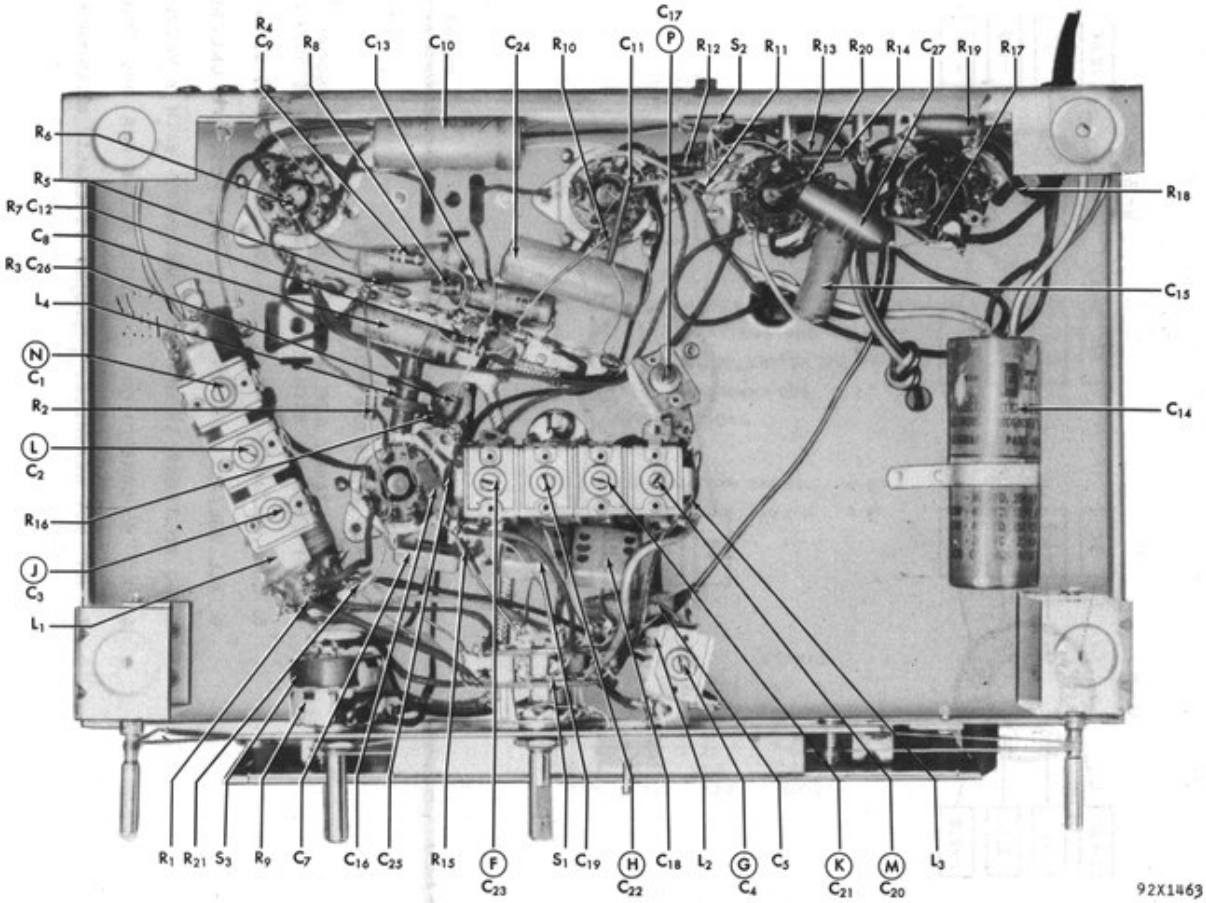

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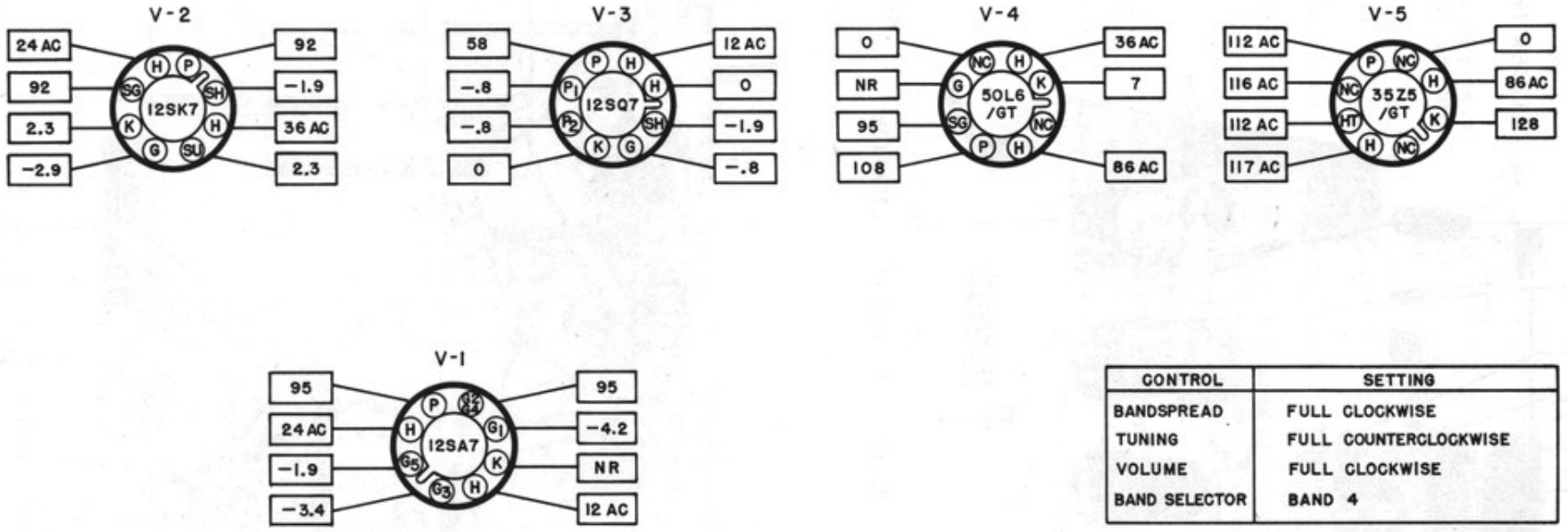
FIG. 8 BOTTOM VIEW - ALIGNMENT POINTS AND COMPONENT LOCATION



CONTROL	SETTING
BANDSPREAD	FULL CLOCKWISE
TUNING	FULL COUNTERCLOCKWISE
VOLUME	FULL CLOCKWISE
BAND SELECTOR	BAND 4

FRONT APRON

1. SOCKET VIEWS ARE BOTTOM VIEWS.
2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS & THE ELECTRICAL GROUND BUS (NOT CHASSIS) WITH ZERO SIGNAL INPUT. SEE SCHEMATIC DIAGRAM NOTES.
3. LINE VOLTAGE — 117 V. AC. ALL VOLTAGES SHOWN AS AC IN VOLTAGE CHART WILL BE DC WHEN OPERATING FROM A DC SOURCE.
4. ALL VOLTAGES SHOWN ARE DC AND POSITIVE UNLESS OTHERWISE SPECIFIED.
5. DC VOLTAGES SHOWN WERE MEASURED WITH A VACUUM TUBE VOLTMETER (VTVM).
6. "NC" NO CONNECTION. (VOLTAGES SHOWN FOR THIS TERMINAL ONLY WHEN TERMINAL IS USED AS A TIE LUG).
7. "NR" NOT READABLE. (READING GENERALLY MEANINGLESS).

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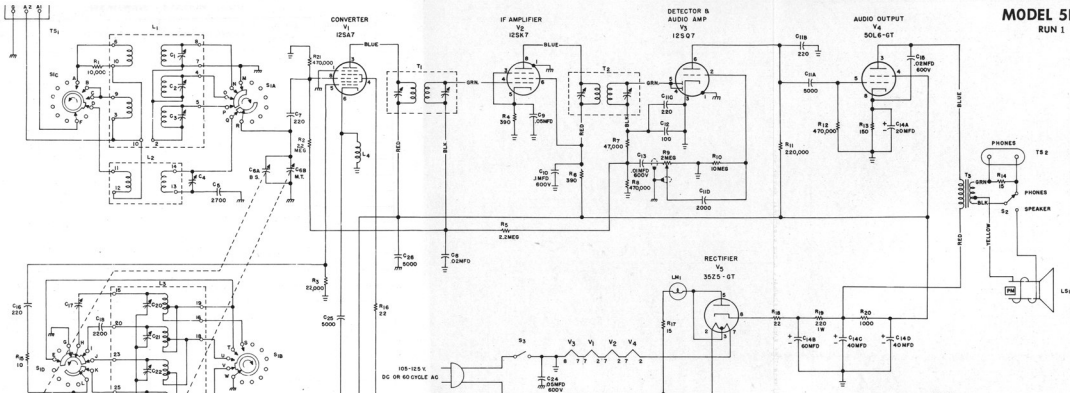
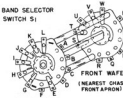
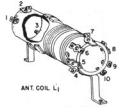
FIG. 9 TUBE SOCKET VOLTAGE CHART

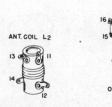
MODEL 5R10A
RUN 1

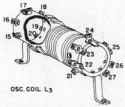


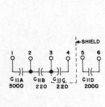
BAND SELECTOR SWITCH S1











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-A POSITION.

⏚ ELECTRICAL GROUND BUS (B-)

⏥ CHASSIS GROUND

LAST CAPACITOR SYMBOL C-27
LAST RESISTOR SYMBOL R-21

89E379

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.

FIG. 10 SCHEMATIC DIAGRAM

SHORTWAVE STATION LOG

STATION	CITY	TIME	BAND	TUNING DIAL SETTING	BAND SPREAD DIAL SETTING

Warranty

"The Hallicrafter's 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. 94X622

the Hallicrafters co.

BOOK NO. 94X747
851-RUN 1