

S-76
&
S-76U
RUN 3

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



Fig. 1. Communications Receiver Model S-76 92X1778

DESCRIPTION

The Model S-76 is a precision built, highly sensitive, double conversion superheterodyne communications receiver employing 9 tubes plus voltage regulator and rectifier and covering the frequency range of 538 KC to 1580 KC and 1720 KC to 34 MC. It is the only communications receiver, at present, to employ a 50 KC second I.F. (intermediate frequency) and to provide the advantages of double conversion throughout its entire frequency range. The use of double conversion makes possible greater image rejection than is practical in a single conversion superheterodyne receiver.

The use of a 50 KC second I.F. provides a greater selectivity than most crystal circuits due to the extreme steepness of the selectivity curve. The five position SELECTIVITY control provides variable selectivity from 5 KC to 500 cycles at the nose of the curve and from 15 KC to 4 KC at the skirt. This high degree of selectivity makes possible a form of single side band reception of AM (phone) signals which is advantageous under crowded band conditions.

The four frequency ranges are clearly indicated on the large main tuning dial and provide complete coverage of the frequency spectrum between 538 KC and 34 MC with the exception of a small gap between bands 1 and 2 in the vicinity of 1650 KC, which is the first intermediate frequency of the receiver. In addition to the four frequency ranges, a special logging scale has been provided on the main tuning dial for logging shortwave stations of special interest.

The electrical BANDSPREAD control, calibrated specifically for the 80, 40, 20, 15, 11 and 10 meter amateur bands, provides a vernier or fine tuning adjustment throughout the entire tuning range of the receiver.

A 4-inch rectangular "S" meter, the largest presently being used on any receiver and calibrated in both "S" units and microvolts, has been provided to aid in tuning the receiver and to give a relative indication of received signal strength.

Other special features included in the S-76 are automatic volume control (AVC), automatic series noise limiter (ANL) and provision for headphone operation, standby operation and record player attachment. For speaker operation, a separate external loud speaker of either 3.2 or 500 ohms impedance is required.

The receiver is housed in an attractive, well ventilated metal cabinet which has a length of 18-1/2 inches, a height of 8-7/8 inches and a depth of 9-1/2 inches.

The S-76 normally operates from a 105-125 volt 50-60 cycle alternating current (AC) power source. The S-76U, a universal model of the S-76, permits operation from 25-60 cycle AC sources at voltages ranging from 115 to 250 volts. Both models have provision for operation from an external DC power source. The power consumption of each model is 77 watts.

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 Hallicrafters "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 sensitivity, tuning and tone controls as well as the proper selection and arrangement of the antenna.

INSTALLATION INSTRUCTIONS

UNPACKING - Check all shipping tags and labels 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. The separate loud speaker should not be placed on the top of the cabinet but should be located as far from the receiver as is practical.

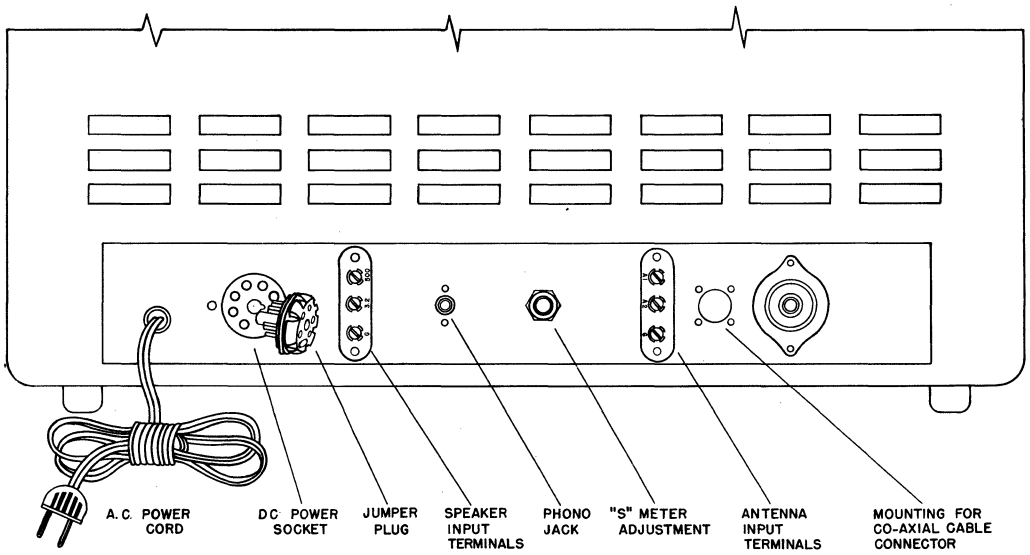


Fig. 2. Rear View of Cabinet

POWER SOURCE - This receiver may be operated directly from an AC source or indirectly from a DC or battery source.

AC OPERATION - The S-76 can be operated directly from a 105-125 volt, 50-60 cycle AC power outlet. The universal model, the S-76U, is designed for operation from 115, 130, 150, 220 and 250 volt, 25-60 cycle AC sources. A selector switch, located on the power transformer, permits operation of the S-76U on any of the line voltages shown. The normal power consumption of each model is 77 watts. If in doubt as to the frequency and voltage rating of your power source, contact the local power company representative. Attempting to operate the receiver from sources of power not specified may result in damage to the receiver.

> CAUTION - When operating the universal model, it is essential that the selector switch setting correspond to the operating line voltage before connecting the receiver to the AC power source.

NOTE: The receiver will not operate from an AC source unless the JUMPER PLUG is inserted in the DC POWER SOCKET. See Fig. 2.

DC OPERATION - The receiver may be operated from a 6 volt DC source (storage battery or equivalent) and a 280 volt DC supply in the form of "B" batteries, vibrator power supply or motor generator set. The voltage and current requirements for DC operation are listed below.

DC power is connected to the receiver through the DC POWER SOCKET located on the rear apron of the chassis. The JUMPER PLUG, normally located in this socket for AC operation, is replaced with a standard octal plug for DC operation. Wire the octal plug for DC operation as shown in Fig. 3.

VOLTAGE AND CURRENT REQUIREMENTS FOR DC OPERATION	
"B" Voltage	280 volts
"B" Current	115 ma
Heater Voltage	6.3 volts
Heater Current	3.3 amps

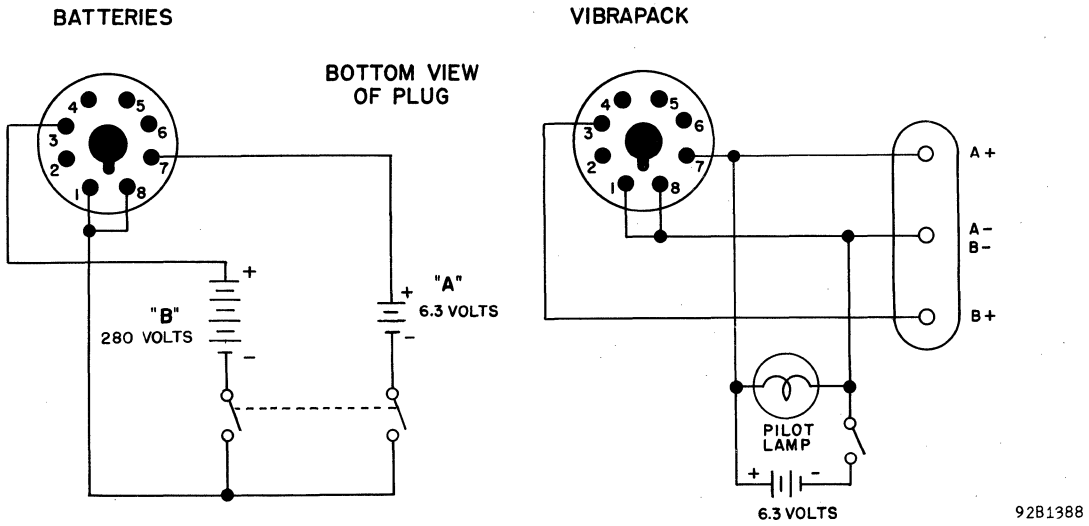


Fig. 3. Wiring Diagram for DC Operation

SPEAKER CONNECTION - Three screw type terminals, marked 3.2, 500 and G, are provided on the rear apron of the chassis for connection to an external 3.2 or 500 ohm speaker. It is recommended that Hallicrafters speaker R-46 be employed.

RECORD PLAYER CONNECTION - A shielded type phono jack is provided on the rear of the chassis to accommodate any record player employing a crystal pickup. Refer to Fig. 6 for wiring details.

ANTENNA - The terminals marked A1, A2 and G on the back of the receiver are for antenna and ground connection. Satisfactory results can be obtained in most localities with the 15 foot antenna wire included with your receiver. Simply uncoil the wire, connect one end of it to terminal A1 and then connect the jumper between terminals A2 and G. An outside antenna 50 to 100 feet long may be necessary if the receiver is operated in a difficult reception area or steel constructed building. Reception may be improved in some locations by connecting a lead from terminal G to a cold water pipe or outside ground rod.

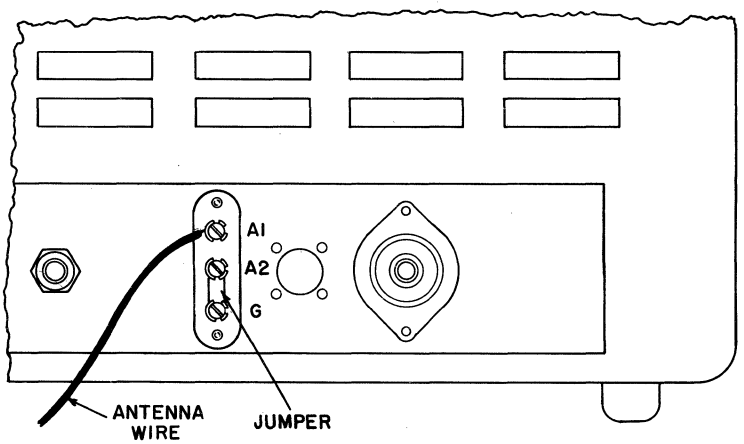


Fig. 4. Single Wire Antenna Installation

For really top performance on the shortwave bands, there is no substitute for an outside antenna such as used by the commercial radio stations. Provision has been made on your receiver for the connection of this type of antenna, commonly called a doublet. When properly constructed and installed, the doublet antenna will provide not only optimum shortwave reception but excellent standard broadcast reception as well. Refer to page 5 for installation details for the doublet antenna.

DOUBLET ANTENNA - The overall length (in feet) of the doublet antenna is determined by dividing 468 by the frequency (in megacycles) at the high end of the range to which you wish to listen. Construct the antenna as shown in Fig. 5. A doublet antenna is directional broadside to its length and should be so oriented with respect to a desired station for maximum signal pickup.

By feeding the doublet antenna with a transmission line of 300 ohms surge impedance, a broader frequency response is obtained than that possible with a 50-75 ohm line.

When feeding the antenna with a ribbon type transmission line, connect the line to terminals A1 and A2. Disconnect the jumper between A2 and G.

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

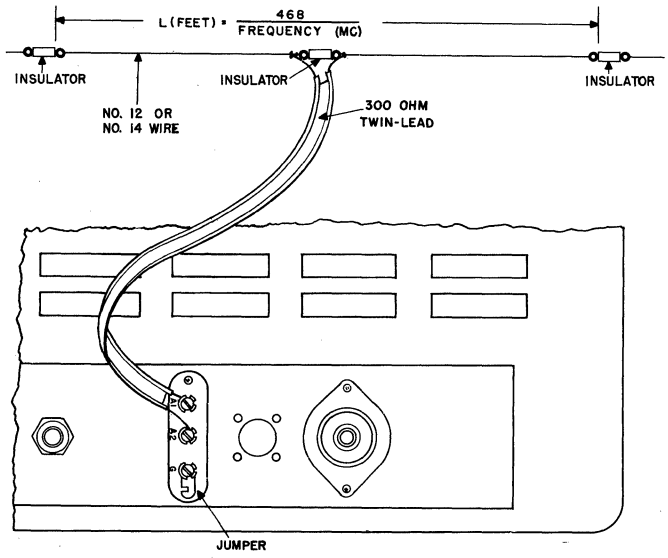


Fig. 5. Doublet Antenna Installation

REMOTE STANDBY/RECEIVE SWITCH CONNECTION - The receiver may be disabled remotely by connecting a remote spst switch between pins 1 and 4 of the JUMPER PLUG (see Fig. 2). To operate the receiver remotely, set the STANDBY/RECEIVE switch, located on the front panel of the receiver, to the STANDBY position. The receiver can then be placed in RECEIVE or STANDBY operation with the remote switch.

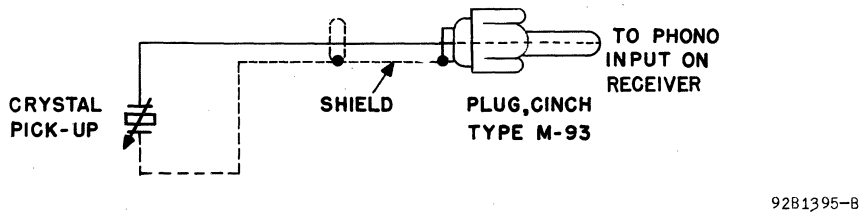


Fig. 6. Wiring Diagram for Record Player Connection

TRANSMITTER CONTROL SWITCH - One section of the dpst STANDBY/RECEIVE switch is available for transmitter relay control. This section of the switch connects to pins 2 and 5 of the DC POWER SOCKET (see Fig. 2) and is in the open position with the STANDBY/RECEIVE switch at STANDBY.

OPERATING INSTRUCTIONS

Each control of the receiver performs a definite function which contributes to the oustanding reception capabilities of the receiver. Full appreciation of the receiver is to be expected only after you have become familiar with the controls and the effect their operation has on the performance of the receiver. The control positions for standard broadcast reception are marked in RED for convenience to the listener.

RADIO TELEPHONE RECEPTION - To receive amplitude modulated (AM) radio telephone signals, the following use of the controls is recommended to obtain optimum performance from the receiver.

SENSITIVITY control	This control is normally set fully clockwise for maximum sensitivity. In some rare instances, strong local signals may overload the receiver input. Distortion, caused by this condition, can be eliminated by reducing the receiver sensitivity slightly. For a correct "S" meter indication, the SENSITIVITY control must be set fully clockwise.
BAND SELECTOR switch	This switch is used to select the desired band or frequency range. The frequencies covered by each position of the BAND SELECTOR are read directly from the main tuning dial.
VOLUME control	This control is used to regulate audio volume. Turning the control clockwise increases volume.

RADIO TELEPHONE RECEPTION (Cont.)

AVC switch — This switch should be set to the ON position to place the automatic volume control (AVC) circuit in operation. The AVC circuit provides a constant audio output level over large variations in signal strength at the antenna.

TUNING control — This control should be set for the desired station frequency after setting the BAND SELECTOR for the desired band. Frequencies on all bands are shown in megacycles.

IMPORTANT - The main tuning dial calibration is correct only when the BANDSPREAD control is fully clockwise.

CW/AM switch — This switch should be set at AM.

BANDSPREAD control — This control, calibrated specifically for the 80, 40, 20, 15, 11 and 10 meter amateur bands, is a fine tuning adjustment provided for electrically spreading out the congested amateur and shortwave bands.

AMATEUR BAND RECEPTION - To use the BANDSPREAD control on the amateur bands, set the BANDSPREAD control fully clockwise, index the TUNING control for the high end of any of the amateur bands as indicated by the white dots on the main tuning dial and then tune through the band using the BANDSPREAD control. The station frequency is read directly from the bandspread dial.

SHORTWAVE RECEPTION - To tune in shortwave stations with the BANDSPREAD control, set the BANDSPREAD control fully clockwise, position the TUNING control for the high frequency end of the range of frequencies to be covered and then tune through the frequency range with the BANDSPREAD control. Note that the station frequency CANNOT be read directly from either the main tuning or bandspread dials. However, it is possible to log shortwave stations by recording the settings of both the bandspread dial and the main tuning logging scale. See inside of back cover for the shortwave station log.

NOISE LIMITER switch — This switch is normally set at OFF. Set the switch at ON when severe electrical disturbances interfere with reception.

SELECTIVITY switch — This switch is normally set at BROAD for maximum fidelity. Positions 2, 3, 4 and 5 provide increasing steps of selectivity. Note that as the receiver is made more selective (clockwise rotation of the SELECTIVITY control), the background noise and interference from nearby stations is reduced. The setting of the SELECTIVITY control is generally best determined by receiving conditions, the SHARP position providing maximum selectivity. A slight readjustment of the BANDSPREAD control may be necessary when changing the position of the SELECTIVITY control.

SINGLE SIDE BAND RECEPTION - The method of bandwidth expansion used in this receiver makes possible a form of single side band reception. As the selectivity is changed from the SHARP to the BROAD position the bandwidth of the receiver not only increases but also shifts in reference to the 50 KC intermediate frequency, permitting only one side band to be accepted. For single side band reception, set the SELECTIVITY control to SHARP, tune in the AM signal and then set the SELECTIVITY control to BROAD. The "S" meter level will decrease with an increase in bandwidth and if the receiver is not retuned, only one side band will be accepted.

PITCH CONTROL — This control is not used for RADIO TELEPHONE RECEPTION.

TONE control — This control turns the receiver on and off and also attenuates the high audio frequencies to the extent required by the various receiving conditions. To turn the receiver on, turn the TONE control clockwise beyond the point of switch action. For maximum high frequency audio response, turn the TONE control fully clockwise.

STANDBY/RECEIVE switch	This switch, normally set at RECEIVE, is particularly useful to the "ham" as it permits disabling of the receiver for standby periods, at the same time maintaining the tube heaters at operating temperature for instant use. The receiver is disabled by setting this switch to the STANDBY position.

CW RECEPTION - The following use of the controls is recommended for CW (code) reception.

SENSITIVITY control	Increase receiver sensitivity by turning the SENSITIVITY control clockwise. If strong code signals block the receiver, reduce the sensitivity slightly.
BAND SELECTOR	Same as for RADIO TELEPHONE RECEPTION.
VOLUME control	Set the VOLUME control clockwise near the maximum volume position and use the SENSITIVITY control to regulate the audio output.
AVC switch	This switch should be set at OFF.
TUNING control	Same as for RADIO TELEPHONE RECEPTION.
CW/AM switch	This switch should be set at CW to place the 50 KC beat frequency oscillator circuit in operation.
BANDSPREAD control	Same as for RADIO TELEPHONE RECEPTION.
NOISE LIMITER switch	This switch should be set at OFF.
SELECTIVITY switch	The setting of the SELECTIVITY control for CW reception is generally best determined by receiving conditions. Note that as the SELECTIVITY is increased from the BROAD to the SHARP position, the background noise and interference is considerably reduced. CW reception under extremely congested conditions is possible with the SELECTIVITY control set at SHARP. A slight readjustment of the BANDSPREAD control may be necessary when changing the position of the SELECTIVITY control.
PITCH CONTROL	This control varies the frequency of the beat frequency oscillator thus varying the pitch of the CW code signal. It may be necessary, after setting the PITCH CONTROL, to readjust the tuning of the receiver slightly with the BANDSPREAD control. Alternately adjust the PITCH CONTROL and BANDSPREAD control for a maximum audible signal.
TONE control	This control should be turned counterclockwise.
STANDBY/RECEIVE switch	Same as for RADIO TELEPHONE RECEPTION.

USE OF THE "S" METER - The "S" meter has been provided to aid in tuning the receiver for RADIO TELEPHONE RECEPTION and to give an indication of the relative carrier strength of each incoming AM signal. For a correct "S" meter indication; the SENSITIVITY control must be fully clockwise, the AVC switch must be in the ON position and the receiver must be tuned for a maximum reading on the "S" meter.

To afford greater utility of the "S" meter, it has been calibrated in both "S" units and microvolts. It is suggested that the limitations of these microvolt indications be fully appreciated before any assumption as to the indicated signal voltages be accepted. The meter indicates approximate microvolts of signal strength as developed at the 300 ohm antenna input terminals of the receiver at 14 MC. This approximation

will have a variation of ± 5 db on a new receiver and, obviously, as the receiver tubes age the variations may be greater.

Variations in the microvolt indication between receivers is not indicative of the overall sensitivity variation but is caused by normal tolerances in vacuum tube conductances which are reflected in variations in the AVC/S METER curve. Thus, two similar receivers with identical overall sensitivities could, under the same signal conditions, indicate signal levels of 5 microvolts and 25 microvolts and yet each be a perfect receiver. All readings 60 microvolts or less will be more accurate and correlate more closely than those higher.

The indicated microvolt reading at 30, 7 and 3.5 MC will vary ± 3 db from that at 14 MC. While these variations may seem large, the microvolt calibration is advantageous as it provides a useful tool for antenna work and harmonic measurements with a suitable converter.

RECORD PLAYER OPERATION - Set the SELECTIVITY control to PHONO. Turn the receiver ON by rotating the TONE control clockwise beyond the point of switch action. Operate the VOLUME and TONE controls as explained under RADIO TELEPHONE RECEPTION. The settings of the remaining controls is immaterial as they are not in use for record player operation.

HEADPHONE OPERATION - The PHONES jack, located on the front panel, permits the use of headphones with this receiver. Insertion of the headphones disables the speaker. Use any standard headset with an impedance of 500 to 12,000 ohms.

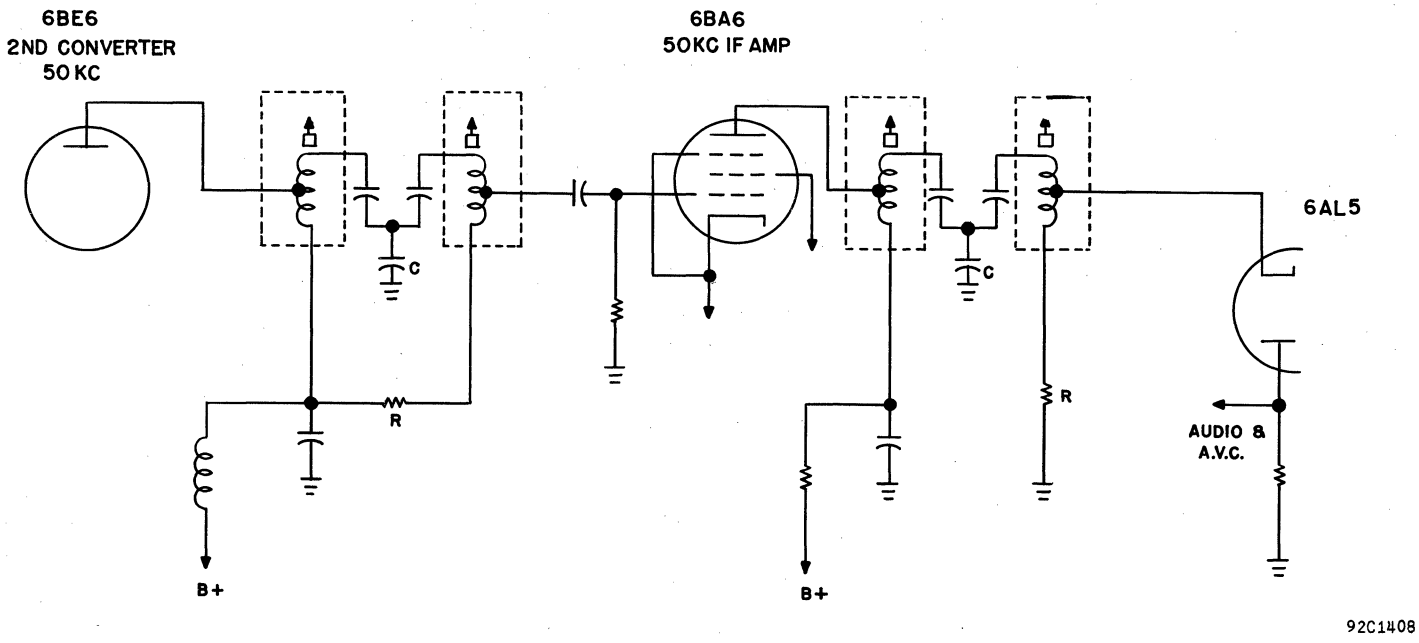


Fig. 7. 50 KC I.F. System

50 KC I. F. SYSTEM - Figure 7 is a simplified schematic diagram of the 50 KC I.F. system. It is unique in that the coupling between primary and secondary coils is through a resistive-capacitive network instead of the more common mutual inductive arrangement. All coupling occurs through C and R since each 50KC coil is completely shielded to prevent inductive coupling. By increasing the value of C and R the selectivity can be made broad or conversely, by decreasing C and R, made sharp. This coupling arrangement affords a more accurate means of selectivity control than that readily obtainable by any other method.

SERVICE INSTRUCTIONS

GENERAL SPECIFICATIONS

Tubes	9 plus voltage regulator and rectifier
Power Supply - Model S-76	105-125 volts, 50-60 cycles AC
- Model S-76U	105-250 volts, 25-60 cycles AC
Power Consumption	77 watts
Speaker Output Impedances	3.2 and 500 ohms
Headset Output Impedance	500 ohms
Antenna Input Impedance	300 ohms
Phono Input Impedance	High impedance
1st Intermediate Frequency	1650 KC
2nd Intermediate Frequency	50 KC

"S" METER ADJUSTMENTS

MECHANICAL ADJUSTMENT - Turn the receiver OFF. The "S" meter mechanical adjustment screw is located on the "S" meter escutcheon. Carefully rotate this screw until the pointer is in line with the right hand index mark on the "S" meter.

ELECTRICAL ADJUSTMENT

1. Short the antenna terminals to the chassis.
2. Set the STANDBY/RECEIVE switch at RECEIVE, AM/CW switch at AM, AVC switch at ON, NOISE LIMITER switch at OFF and the SENSITIVITY control fully clockwise.
3. Turn the receiver ON.
4. The electrical adjustment control for the "S" meter is located on the rear apron of the chassis. Turn this control slowly until the "S" meter pointer indicates 0 on the microvolt scale.

DIAL LAMP REPLACEMENT - Refer to Fig. 9 for the location of the dial lamps used in the receiver. To gain access to defective lamps, open the hinged top cover of the cabinet.

CAUTION - To avoid electrical shock, disconnect the receiver from the power source before making any dial lamp replacement.

To replace the bandspread and main tuning dial lamps, unclip the dial lamp assembly from the mounting bracket. This enables the defective lamp to be brought out into the open where it may be replaced. Make replacements with a 6-8 volt 250 ma (blue bead) Mazda #44 pilot lamp or equivalent.

To replace the pilot lamps which illuminate the "S" meter, remove either socket assembly from the meter by pulling it slightly sideways. The socket assembly and defective lamp may then be brought out into the open for service. Make replacements with a 6-8 volt, 1 c.p. (pink bead) Mazda #51 pilot lamp or equivalent.

TUBE REPLACEMENT - The tube types and their relative location in the receiver are shown in Fig. 9. Access to all tubes is possible by opening the hinged top cover of the cabinet. When installing a replacement octal 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 push down until the base of the tube rests firmly on the socket. A slightly different technique must be used on the miniature tubes. They have seven small pins which must be lined up with the socket holes before pushing the tube into place. Handle all tubes with care as they are fragile and will not withstand mechanical abuse.

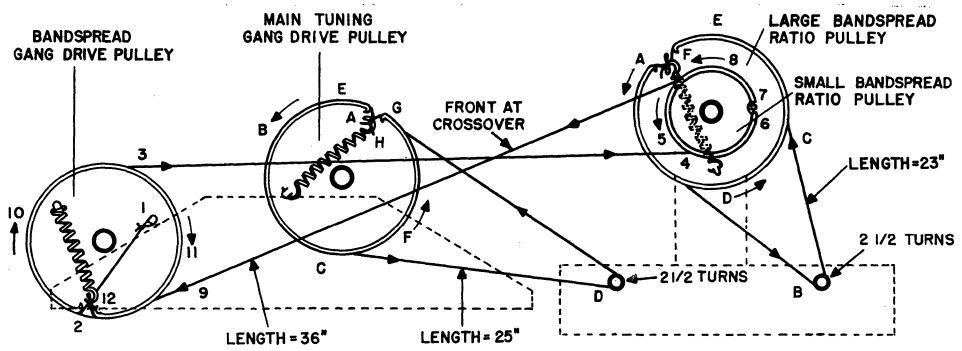


Fig. 8. Dial Cord Stringing Diagram

I-F ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED

1. Vacuum tube voltmeter (VTVM)
2. Signal generator (unmodulated) covering 50 KC and 1650 KC. If a 50 KC signal generator is not available, use two separate generators to provide a 50 KC beat frequency. Set the frequency of one generator to 700 KC and the other to 750 KC.
3. 3.2 or 500 ohm speaker

It is necessary to remove the receiver chassis from the cabinet to make the I-F alignment. The chassis is held in the cabinet by three screws along both the bottom edge of the front panel and the rear of the cabinet and by two screws on each side of the front panel.

The I-F alignment should be made with the main tuning and bandspread tuning capacitors meshed half way, VOLUME, TONE and SENSITIVITY controls fully clockwise, NOISE LIMITER and AVC switches at OFF, RECEIVE/STANDBY switch at RECEIVE, CW/AM switch at AM and the BAND SELECTOR switch at 2. Refer to Figs. 9 and 10 for the location of all adjustments.

Connect the high side of the VTVM to the junction of C-75, R-38, R-43, R-44 and R-59. See Fig. 13. Connect the common side of the VTVM to the chassis. Use just enough signal generator output to give a 1 volt DC indication on the VTVM.

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GEN. FREQUENCY	SELECTIVITY CONTROL SETTING	ADJUST	REMARKS
1	Connect the high side of the generator to terminal 1 of transformer T2 (see Fig. 13) and the ground side to the chassis.	50 KC (No Mod.)	5	1	Maximum output
			5	2	Maximum output
			5	3	Maximum output
			5	4	Maximum output
			5	1	Maximum output
			5	2	Maximum output
			5	3	Maximum output
			5	4	Maximum output
2	Connect the high side of the generator to stator plates of center section of main tuning capacitor. Connect the ground side of the generator to frame of main tuning capacitor.	1650 KC (No Mod.)	5	5	Maximum output. After making adjustment 5 retune the generator for a maximum indication on the VTVM.
			5	6	Maximum output
			5	7	Maximum output
			5	8	Maximum output
			5	9	Maximum output
					Rotate the SELECTIVITY control from position 5 to 1. The VTVM reading should decrease progressively with each position of the SELECTIVITY control. If this does not occur, it is an indication that the 50 KC I-F system is not properly aligned. This indicates that steps 1 and 2 must be repeated.
3	Connect the high side of the generator to terminal 1 of transformer T2 (see Fig. 13) and the ground side to the chassis.	50 KC (No Mod.)	4	10	Disconnect the VTVM. Set the CW/AM switch at CW. Remove the PITCH CONTROL knob. Using a speaker as an indicating device, adjust 10 for a zero beat. After completing this adjustment, replace the knob with the index mark in the top center position.

R-F ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED

1. Output meter. The AC scale of a vacuum tube voltmeter (VTVM) or other suitable meter may be used.
2. Signal generator covering 600 KC to 30 MC. Generator must have amplitude modulated output.
3. Alignment tool made of polystyrene or other similar material.

It is not necessary to remove the chassis from the cabinet for the R-F alignment. All R-F alignment adjustments can be made through the holes in the bottom of the cabinet.

The R-F alignment should be made with the BANDSPREAD, VOLUME, TONE and SENSITIVITY controls fully clockwise, NOISE LIMITER and AVC switches at OFF, RECEIVE/STANDBY switch at RECEIVE, CW/AM switch at AM and the SELECTIVITY control at 3. Refer to Figs. 9 and 10 for the location of all adjustments.

CONNECTING THE TEST EQUIPMENT

1. Connect the output meter between the 500 ohm speaker terminal and the chassis.
2. Connect the high side of the signal generator to antenna terminal A1 through a 330 ohm carbon resistor. Place the jumper between antenna terminals A2 and G. Connect the ground side of the generator to the chassis. Keep the output of the signal generator as low as possible at all times to prevent overloading of the receiver.

STEP	SIGNAL GENERATOR FREQUENCY (MOD.)	BAND SELECTOR SETTING	MAIN TUNING DIAL SETTING	ADJUST	REMARKS
1	30 MC	4	30 MC	A	Adjust A thru F for maximum output. Oscillator trimmer A should be set so that the oscillator operates on the high side as indicated by an image at 26.7 MC. If the oscillator is operating on the low side, an image will be obtained at 33.3 MC.
	30 MC	4	30 MC	B	
	30 MC	4	30 MC	C	
	14 MC	4	14 MC	D	
	14 MC	4	14 MC	E	
	14 MC	4	14 MC	F	
2	11.5 MC	3	11.5 MC	G	Maximum output
	11.5 MC	3	11.5 MC	H	Maximum output
	11.5 MC	3	11.5 MC	J	Maximum output
	5.1 MC	3	5.1 MC	K	Maximum output
	5.1 MC	3	5.1 MC	L	Maximum output
	5.1 MC	3	5.1 MC	M	Maximum output
3	4.6 MC	2	4.6 MC	N	Maximum output
	4.6 MC	2	4.6 MC	P	Maximum output
	4.6 MC	2	4.6 MC	Q	Maximum output
	1 925 MC	2	1.925 MC	R	Maximum output
4	1400 KC	1	1.4 MC	S	Maximum output
	1400 KC	1	1.4 MC	T	Maximum output
	1400 KC	1	1.4 MC	U	Maximum output
	600 KC	1	.6 MC	V	Maximum output

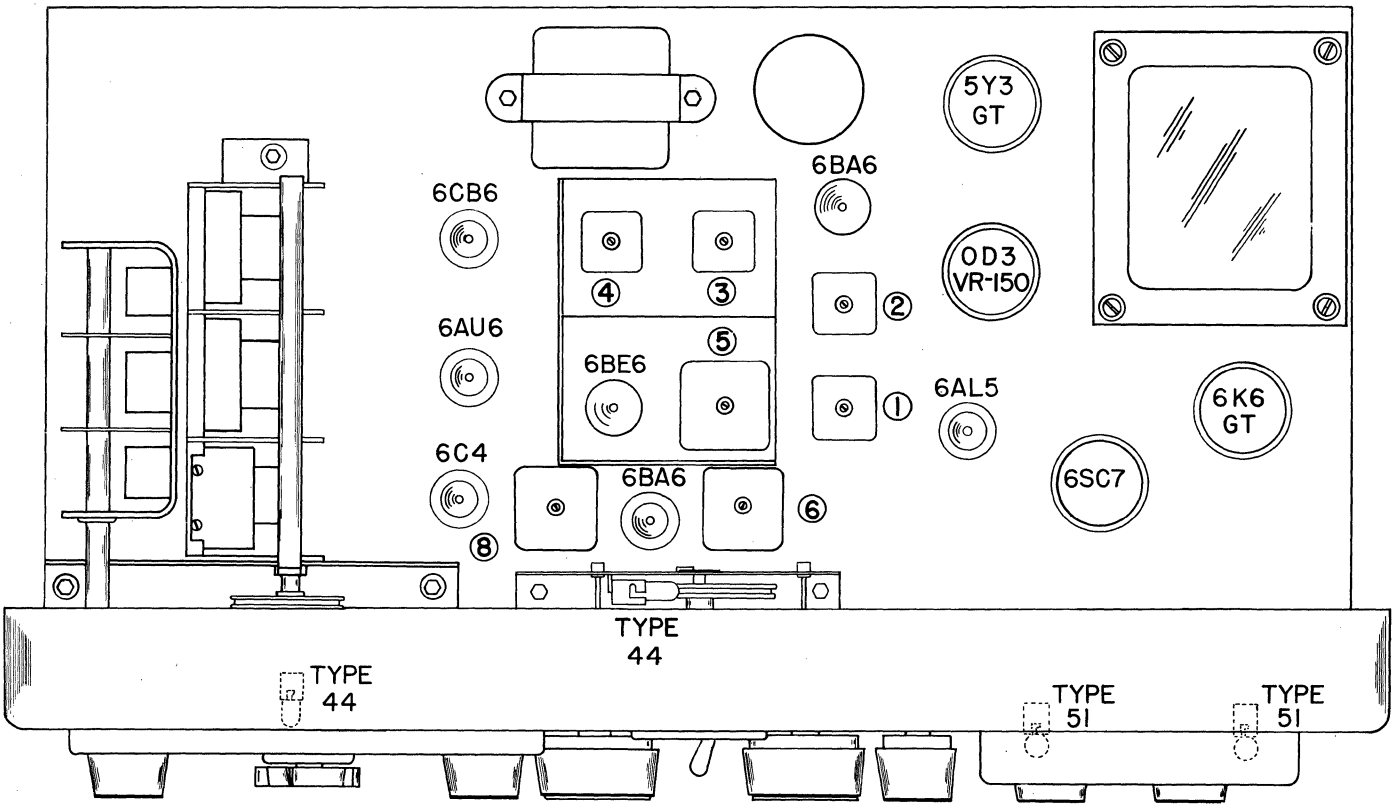


Fig. 9. Top View of Chassis Showing Location of Alignment Adjustments, Tubes and Dial Lamps

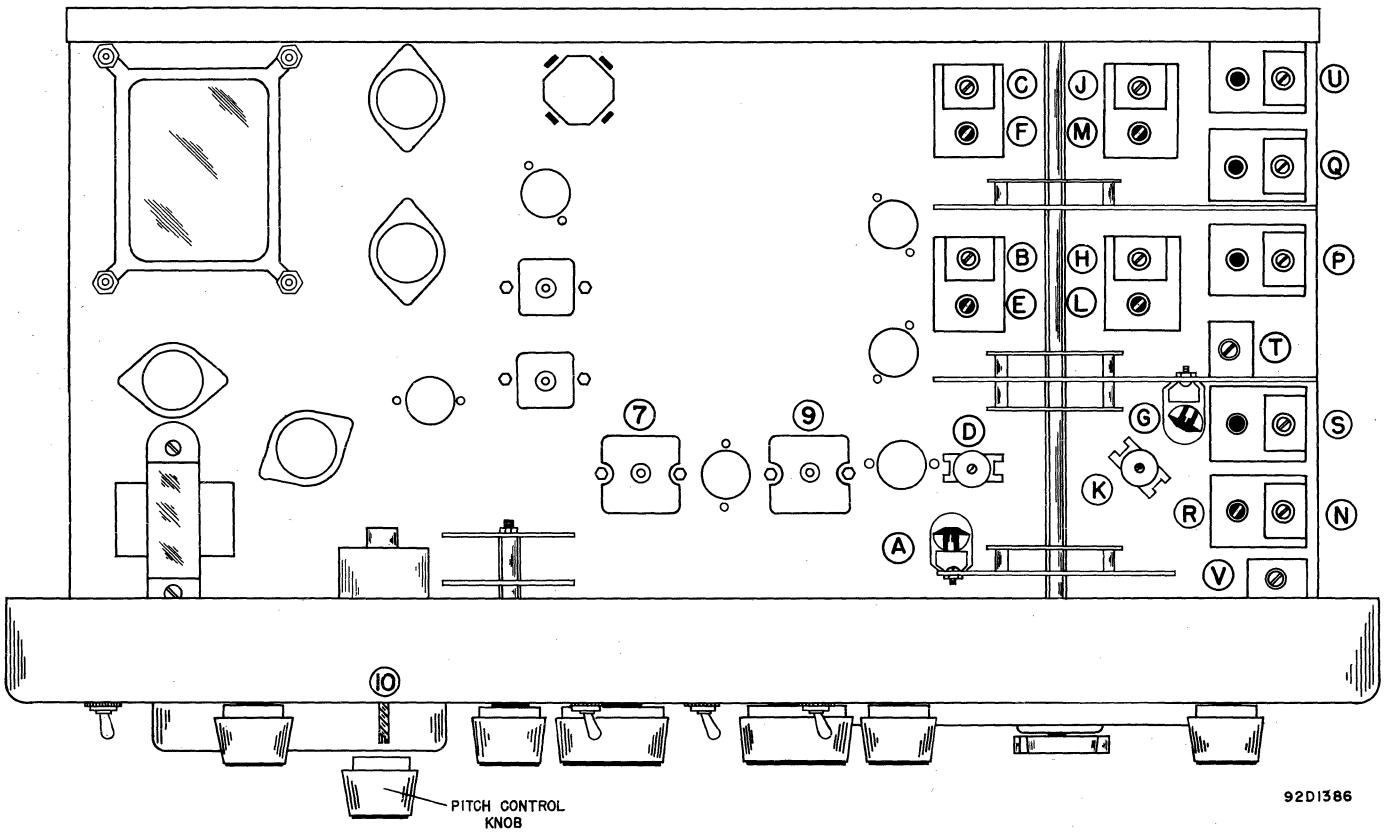


Fig. 10. Bottom View of Chassis Showing Location of Alignment Adjustments

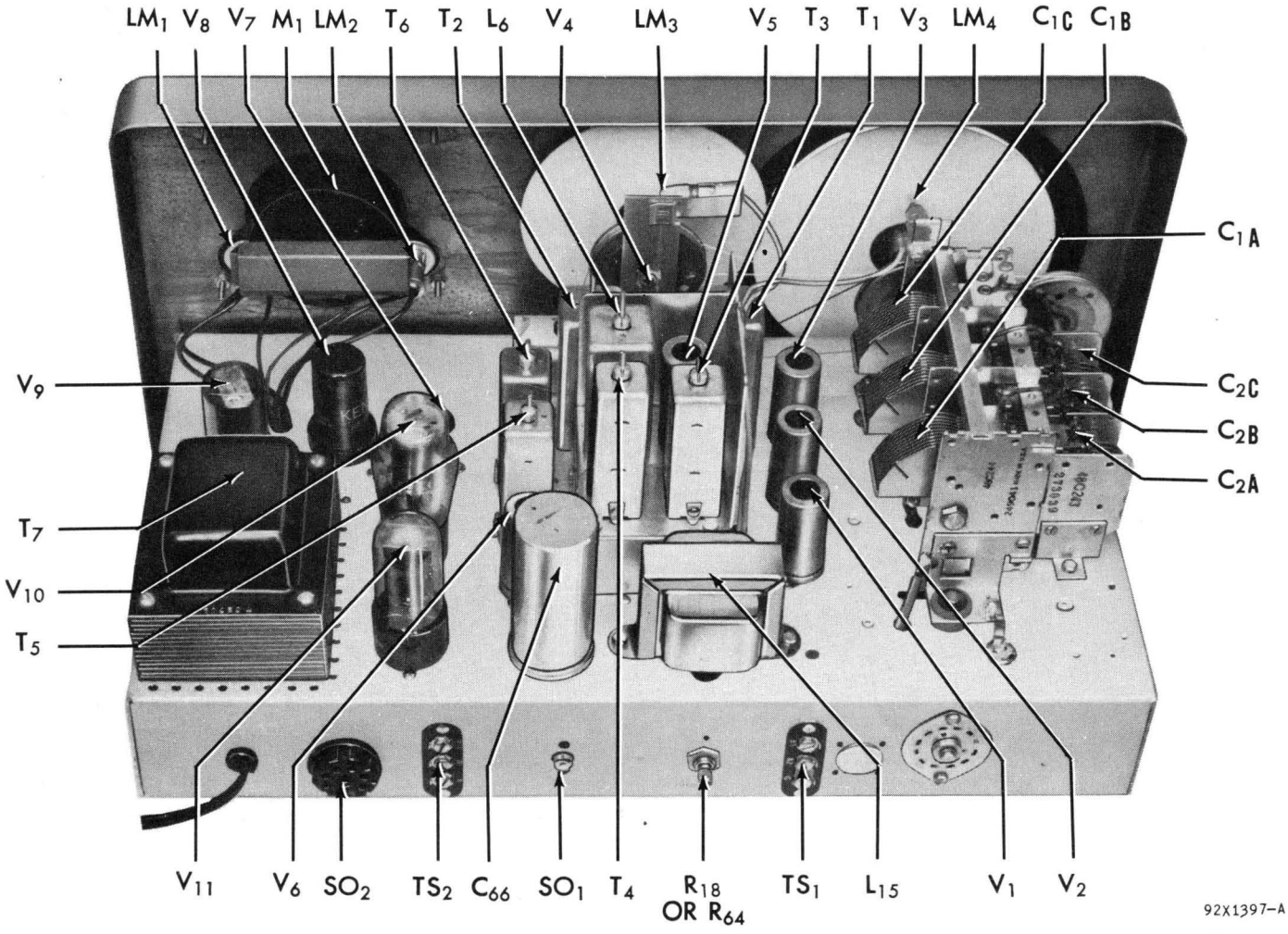


Fig. 11. Top View of Chassis Showing Component Location

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.



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.

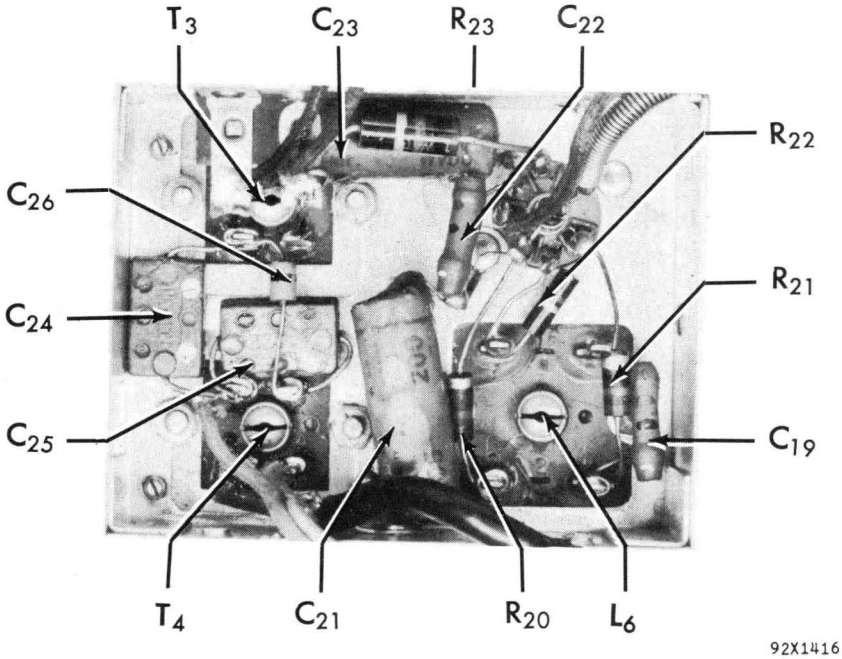


Fig. 12. Bottom View of 2nd Converter Showing Component Location

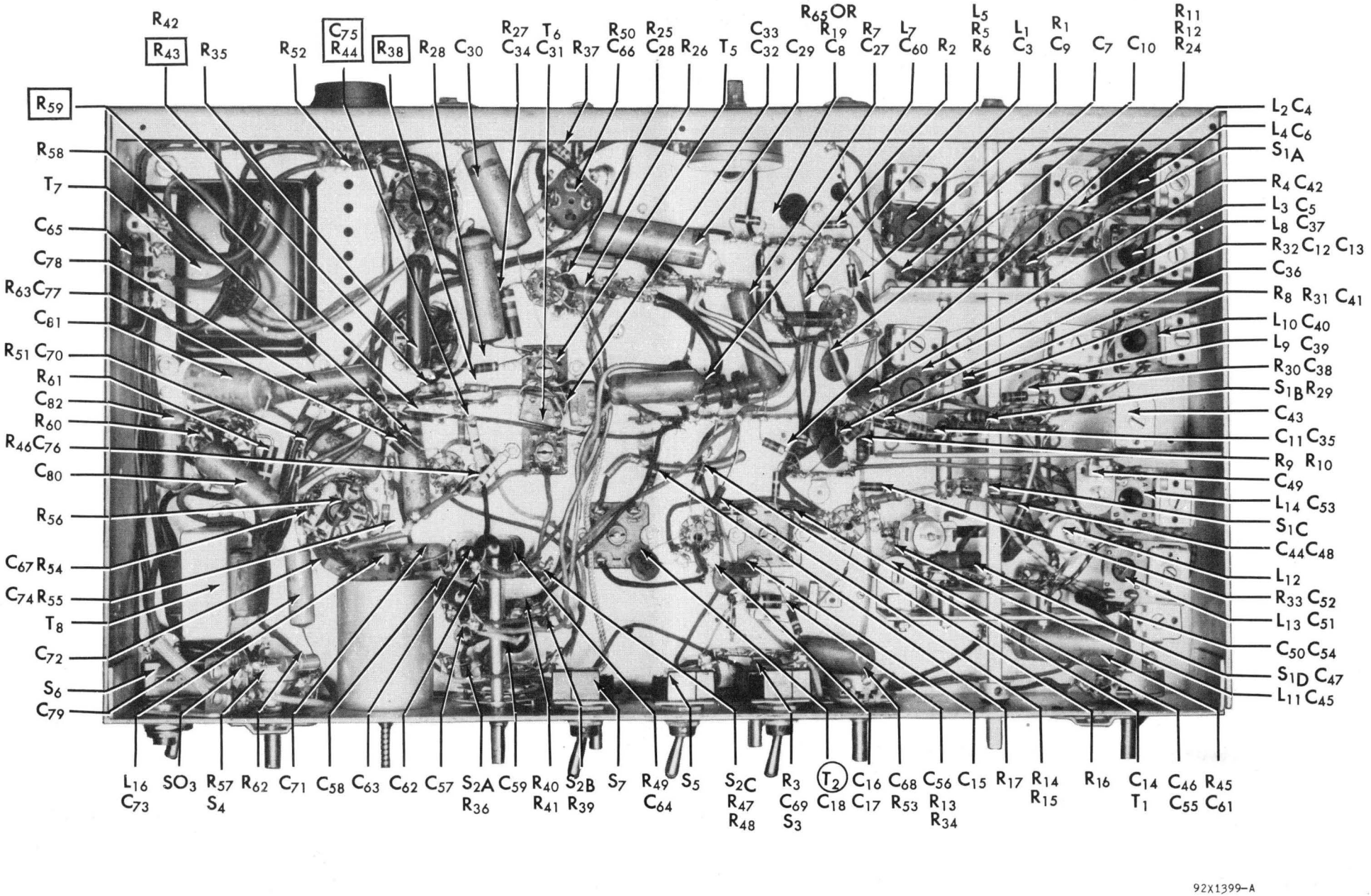
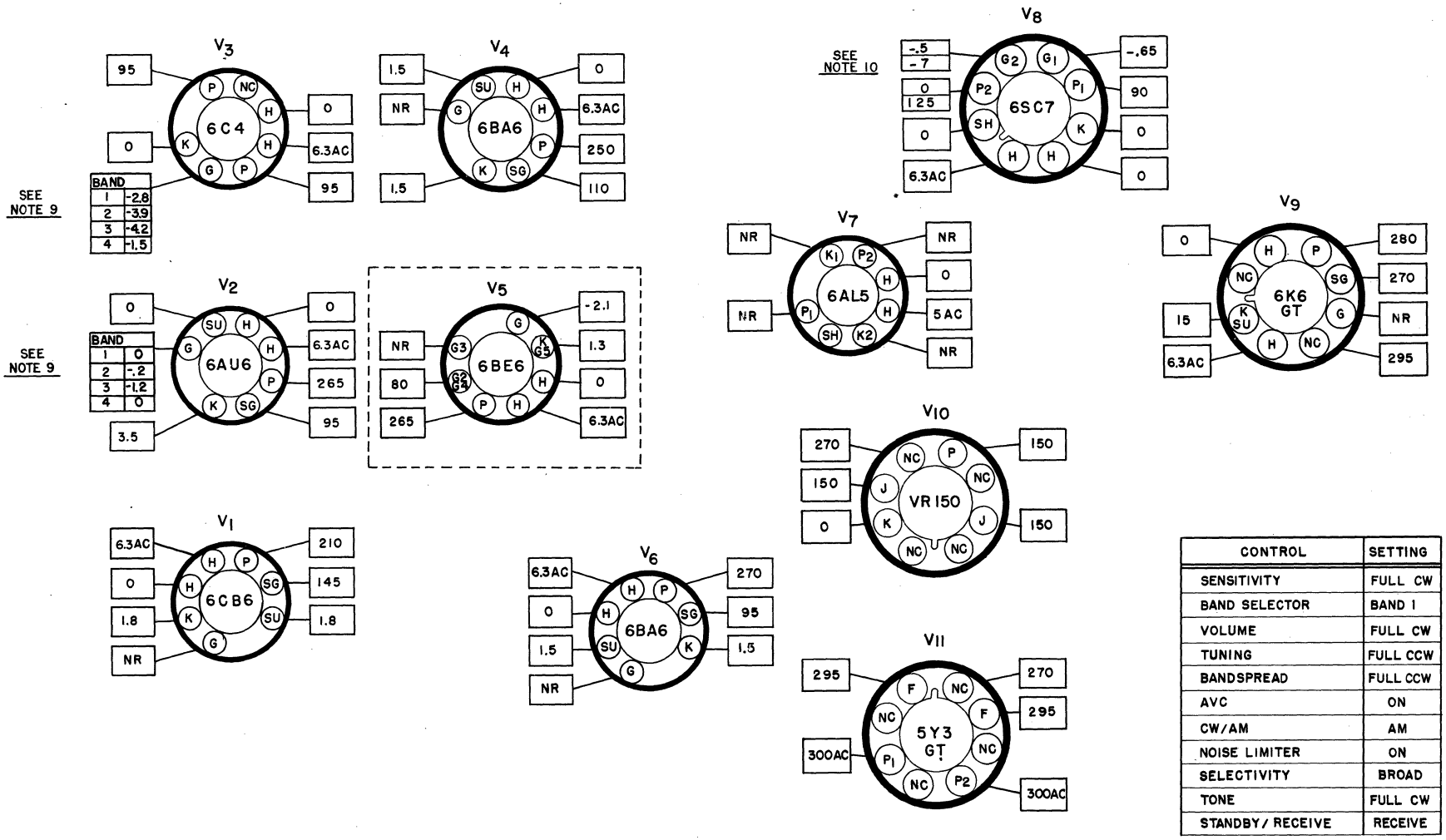


Fig. 13. Bottom View of Chassis Showing Component Location



CONTROL	SETTING
SENSITIVITY	FULL CW
BAND SELECTOR	BAND 1
VOLUME	FULL CW
TUNING	FULL CCW
BANDSPREAD	FULL CCW
AVC	ON
CW/AM	AM
NOISE LIMITER	ON
SELECTIVITY	BROAD
TONE	FULL CW
STANDBY/ RECEIVE	RECEIVE

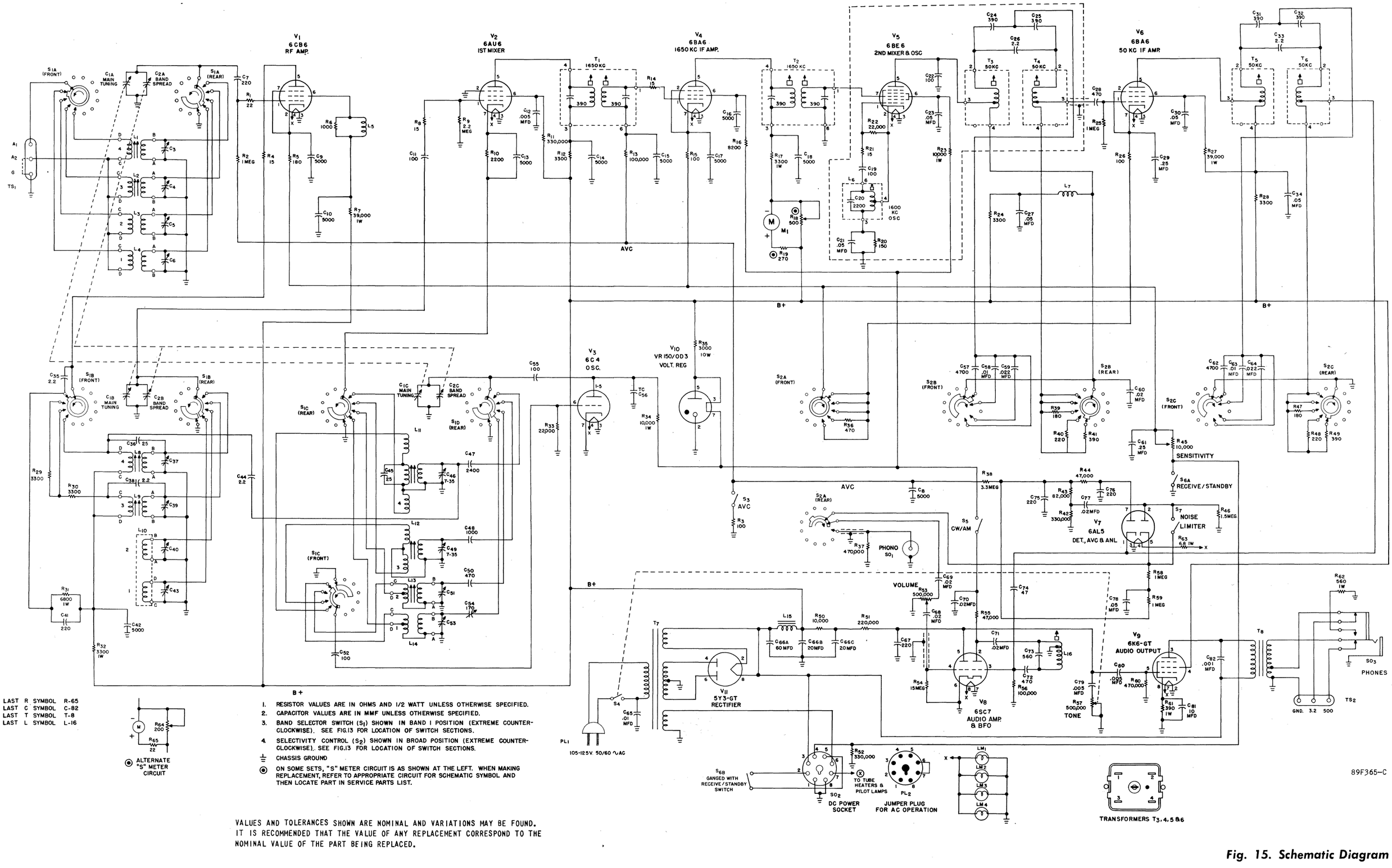
NOTES

92D1389-A

1. SOCKET VIEWS ARE BOTTOM VIEWS.
2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS AND THE CHASSIS WITH ZERO SIGNAL INPUT.
3. LINE VOLTAGE - 117 VOLTS, 60 CYCLES AC.
4. ALL VOLTAGES SHOWN ARE DC AND POSITIVE UNLESS OTHERWISE SPECIFIED
5. DC VOLTAGES WERE MEASURED WITH A VACUUM TUBE VOLTMETER (VTVM).
6. "NC" - NO CONNECTION. VOLTAGE SHOWN FOR THIS TERMINAL ONLY WHEN TERMINAL IS USED AS A TIE LUG.
7. "NR" - NOT READABLE. VOLTAGES MEASURED AT THESE TERMINALS GENERALLY MEANINGLESS.
8. "CW" - CLOCKWISE. "CCW" - COUNTERCLOCKWISE
9. VOLTAGE AT THIS TERMINAL VARIES WITH SETTING OF BAND SELECTOR SWITCH.
10. AM / CW WHERE TUBE SOCKET VOLTAGES CHANGE FROM AM TO CW OPERATION, TWO READINGS ARE SHOWN. THE UPPER READING IS WITH THE AM/CW SWITCH IN THE AM POSITION WHILE THE LOWER READING IS WITH THE SWITCH IN THE CW POSITION.

Fig. 14. Tube Socket Voltage Chart

MODELS S-76 & S-76U
RUN 3



LAST R SYMBOL R-65
LAST C SYMBOL C-82
LAST T SYMBOL T-8
LAST L SYMBOL L-16

ALTERNATE "S" METER CIRCUIT

1. RESISTOR VALUES ARE IN OHMS AND 1/2 WATT UNLESS OTHERWISE SPECIFIED.
2. CAPACITOR VALUES ARE IN MMF UNLESS OTHERWISE SPECIFIED.
3. BAND SELECTOR SWITCH (S_1) SHOWN IN BAND 1 POSITION (EXTREME COUNTER-CLOCKWISE). SEE FIG.13 FOR LOCATION OF SWITCH SECTIONS.
4. SELECTIVITY CONTROL (S_2) SHOWN IN BROAD POSITION (EXTREME COUNTER-CLOCKWISE). SEE FIG.13 FOR LOCATION OF SWITCH SECTIONS.

⏚ CHASSIS GROUND

◉ ON SOME SETS, "S" METER CIRCUIT IS AS SHOWN AT THE LEFT. WHEN MAKING REPLACEMENT, REFER TO APPROPRIATE CIRCUIT FOR SCHEMATIC SYMBOL AND THEN LOCATE PART IN SERVICE PARTS LIST.

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

Fig. 15. Schematic Diagram

SERVICE PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C-1A,B,C	Capacitor, MAIN TUNING; 3 section	48C244
C-2A,B,C	Capacitor, BANDSPREAD; 3 section	48C243
C-3,4,5,6	Trimmers (part of antenna coils L-1,2,3, and 4)	----------
C-7,41,67, 75,76	220 mmf. 500 V., ceramic	47B20221K5
C-8,9,10,12, 13,14,15, 16,17,18, 42	5000 mmf. 450 V., ceramic	47A168
C-11,19,22, 52,55	100 mmf. 500 V., ceramic	47X20UJ101K
C-20	2200 mmf. 500 V., mica (part of osc. coil, L-6)	----------
C-21,23,78	.05 mfd. 200 V., tubular paper	46AU503J
C-24,25,31, 32	390 mmf. 500 V., mica	47X20D391J
C-26,33,35, 38,44	2.2 mmf. 450 V., ceramic	47A160-4
C-27,30,34	.05 mfd. 600 V., tubular paper	46AY503J
C-28,72	470 mmf. 500 V., mica	47X20B471K
C-29,61	.25 mfd. 200 V., tubular paper	46AT254J
C-36,45	25 mmf. 500 V., ceramic	47X20UK250K
C-37,39,40	Trimmers (part of RF coils L-8,9 and 10)	----------
C-43	Trimmer (for RF coil L-10, band 1)	44A399
C-46	Trimmer, 7-35 mmf. (for osc. coil L-11)	44A378
C-47	2400 mmf. 500 V., mica	47X30D242J
C-48	1000 mmf. 500 V., mica	47X25D102J
C-49	Trimmer, 7-35 mmf. (for osc. coil L-12)	44A378
C-50	470 mmf. 500 V., mica	47X20C471G
C-51,53	Trimmers (part of osc. coils L-13 and 14)	----------
C-54	Padder, 170 mmf. (for osc. coil L-14)	44B398
C-56	Capacitor, temperature compensated	44A158
C-57,62	4700 mmf. 600 V., molded tubular paper	46A181
C-58,63	.01 mfd. 600 V., molded tubular paper	46A179
C-59,64	.022 mfd. 600 V., molded tubular paper	46A180
C-60,68,69, 70,71,77	.02 mfd. 600 V., tubular paper	46AY203J
C-65	.01 mfd. 600 V., molded paper	46X35X103M
C-66A,B,C	60-20-20 mfd. 450 V., electrolytic	45B113
C-73	560 mmf. 500 V., mica	47X20D561J
C-74	47 mmf. 500 V., ceramic	47X20UK470K
C-79,80	.005 mfd. 600 V., tubular paper	46AY502J
C-81	10 mfd. 25V., electrolytic	45A121
C-82	.001 mfd. 600 V., tubular paper	46AZ102J

Schematic Symbol	Description	Hallicrafters Part Number
	RESISTORS	
R-1	22 ohms 1/2 watt, carbon	23X20X220K
R-2,25,58,59	1 megohm 1/2 watt, carbon	23X20X105K
R-3,15,26	100 ohms 1/2 watt, carbon	23X20X101K
R-4,8,14,21	15 ohms 1/2 watt, carbon	23X20X150K
R-5,39,47	180 ohms 1/2 watt, carbon	23X20X181K
R-6	1000 ohms 1/2 watt, carbon (part of L-5)	----------
R-7,27	39,000 ohms 1 watt, carbon	23X30X393K
R-9	2.2 megohms 1/2 watt, carbon	23X20X225K
R-10	2200 ohms 1/2 watt, carbon	23X20X222K
R-11,42,52	330,000 ohms 1/2 watt, carbon	23X20X334K
R-12,24,28, 29,30	3300 ohms 1/2 watt, carbon	23X20X332K
R-13,56	100,000 ohms 1/2 watt, carbon	23X20X104K
R-16	8200 ohms 1/2 watt, carbon	23X20X822K
R-17,32	3300 ohms 1 watt, carbon	23X30X332K
R-18	Resistor; variable; 500 ohms ("S" METER ADJUSTMENT)	25C022
R-19	270 ohms 1/2 watt, carbon	23X20X271K
R-20	150 ohms 1/2 watt, carbon	23X20X151K
R-22,33	22,000 ohms 1/2 watt, carbon	23X20X223K
R-23,34	10,000 ohms 1 watt, carbon	23X30X103K
R-31	6800 ohms 1 watt, carbon	23X30X682K
R-35	3000 ohms 10 watts, WW	24BG302E
R-36	470 ohms 1/2 watt, carbon	23X20X471K
R-37,60	470,000 ohms 1/2 watt, carbon	23X20X474K
R-38	3.3 megohms 1/2 watt, carbon	23X20X335K
R-40,48	220 ohms 1/2 watt, carbon	23X20X221K
R-41,49	390 ohms 1/2 watt, carbon	23X20X391K
R-43	82,000 ohms 1/2 watt, carbon	23X20X823K
R-44,55	47,000 ohms 1/2 watt, carbon	23X20X473K
R-45	Resistor, variable; 10,000 ohms (SENSITIVITY control)	25B590
R-46	1.5 megohms 1/2 watt, carbon	23X20X155K
R-50	10,000 ohms 1/2 watt, carbon	23X20X103K
R-51	220,000 ohms 1/2 watt, carbon	23X20X224K
R-53	Resistor, variable; 500,000 ohms (VOLUME control)	25B534
R-54	15 megohms 1/2 watt, carbon	23X20X156K
R-57	Resistor, variable; 500,000 ohms (TONE control)	25B605
R-61	390 ohms 1 watt, carbon	23X30X391K
R-62	560 ohms 1 watt carbon	23X30X561K
R-63	6.8 ohms 1 watt, carbon	23X30X068K
R-64	Resistor, variable; 200 ohms ("S" METER ADJUSTMENT)	25B714
R-65	22 ohms 1/2 watt, carbon	23X20X220K

SERVICE PARTS LIST (Cont.)

Schematic Symbol	Description	Hallicrafters Part Number
	TRANSFORMERS AND COILS	
T-1,2	Transformer, 1st and 2nd IF (1650 KC)	50B488
T-3,4,5,6	Transformer, IF (50 KC)	50B489
T-7	Transformer, power (model S-76)	52C221
T-7	Transformer, power (model S-76U)	52C222
T-8	Transformer, output	55B120
L-1	Coil, antenna (band 4)	51B1325
L-2	Coil, antenna (band 3)	51B1324
L-3	Coil, antenna (band 2)	51B1323
L-4	Coil, antenna (band 1)	51B1322
L-5	Choke, RF	53A215
L-6	Coil, 1600 KC oscillator	50B490
L-7	Choke, RF	53A107
L-8	Coil, RF (band 4)	51B1327
L-9	Coil, RF (band 3)	51B1326
L-10	Coil, RF (bands 1 and 2)	51B1319
L-11	Coil, oscillator (band 4)	51B1321
L-12	Coil, oscillator (band 3)	51B1320
L-13	Coil, oscillator (band 2)	51B1329
L-14	Coil, oscillator (band 1)	51B1328
L-15	Choke, filter	56B107
L-16	Coil, BFO	54B045
	SWITCHES	
S-1A	Wafer, BAND SELECTOR switch; antenna section	62B053
S-1B	Wafer, BAND SELECTOR switch; RF section	62B053
S-1C	Wafer, BAND SELECTOR switch; osc. grid section	62B054
S-1D	Wafer, BAND SELECTOR switch; osc. plate section	62B055
S-2	Switch, rotary wafer; SELECTIVITY control	60B399
S-3,5,7	Switch, toggle; spst (AVC, CW/AM & NOISE LIMITER	60A138
S-4	Switch, power (part of TONE control, R-57)	
S-6	Switch, toggle; dpst RECEIVE/STANDBY)	60A192
	PLUGS AND SOCKETS	
PL-1	Line cord and plug	87A1669
PL-2	Plug, octal; JUMPER PLUG	35A003
SO-1	Jack, PHONO	36A041
SO-2	Socket, octal; DC POWER SOCKET	6B296
SO-3	Jack, PHONES	36B048
	Socket assembly, band-spread dial lamp	86A109
	Socket assembly, main tuning dial lamp	86B108
	Socket assembly, "S" meter pilot lamp	86B107
	Socket, miniature 7 pin tube; molded mica filled	6A347
	Socket, octal tube	6B296

Schematic Symbol	Description	Hallicrafters Part Number
	TUBES, RECTIFIERS AND LAMPS	
V-1	6CB6: RF amplifier	90X6CB6
V-2	6AU6: 1st mixer	90X6AU6
V-3	6C4: oscillator	90X6C4
V-4,6	6BA6: 1650 KC IF amplifier and 50 KC IF amplifier	90X6BA6
V-5	6BE6: 2nd mixer and oscillator	90X6BE6
V-7	6AL5: detector AVC and ANL	90X6AL5
V-8	6SC7: audio amplifier and BFO	90X6SC7
V-9	6K6GT: audio output	90X6K6GT
V-10	VR150: voltage regulator	90XVR150
V-11	5Y3GT: rectifier	90X5Y3GT
LM-1,2	Lamp, "S" meter; Mazda #51	39A030
LM-3,4	Lamp, main tuning and band-spread dial; Mazda #44	39A003
	MISCELLANEOUS	
	Bottom cover, cabinet	63B352
	Cabinet	66D652
	Cabinet front panel	68E159
	Cabinet top cover	66D616
	Cord, dial (specify length)	38A026
	Dial scale, bandspread	83D427
	Dial scale, main tuning	83B387
	Escutcheon, main tuning dial	7C033
	Foot, rubber	16A007
	Gasket, main tuning dial glass	12A040
	Glass, bandspread dial	22A383
	Glass, main tuning dial	22A315
	Grommet, rubber; main tuning gang	16A180
	Insulator, "S" meter	8A1289
	Iron core, RF (for coils L-1,2,8,9 and 13)	77A068
	Iron core, RF (for osc. coils L-11 and 12)	3A1543
	Knob, BAND SELECTOR	15B053
	Knob, TUNING and BAND-SPREAD	15A047
	Knob, PITCH CONTROL	15A334
	Knob, SENSITIVITY, VOLUME, TONE and SELECTIVITY	15A475
	Lock, line cord	76A397
	Pulley, bandspread ratio; 2 1/8" O.D.	28A093
	Pulley, bandspread ratio; 1.14" O.D.	28A094
	Shaft and index plate, BAND SELECTOR switch	74B172
	Shield, miniature tube	69A306
M-1	"S" meter	82C183
	Spring, dial cord	75A163
TS-1	Terminal strip, antenna	88A032
TS-2	Terminal strip, speaker	88A578

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. 94X1034
1052 - RUN 3