



communications

**OPERATING and SERVICE
INSTRUCTIONS**



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

DESCRIPTION

Model S-72 is a portable all-wave super-heterodyne radio receiver which covers the standard broadcast and foreign and domestic shortwave bands. The receiver provides AM and CW reception over its entire frequency range, with continuous coverage from 540 kilocycles (KC) to 30 megacycles (MC). Eight tubes and a selenium rectifier are used in the receiver.

Built-in antenna facilities are provided for normal receiving conditions: a loop antenna for standard broadcast reception (band 1) and a telescoping whip antenna for shortwave reception (bands 2, 3 and 4). A terminal has also been provided for connection to an external single wire antenna for reception in areas of extremely low signal strength where it is difficult to obtain a desired signal using the loop or whip antennas.

The BAND SPREAD control is a fine tuning adjustment provided for electrically spreading out any narrow range of frequencies in the tuning range of the receiver.

The receiver is equipped with a built-in 5 inch PM speaker. The PHONES jack located on the control panel is provided for connection to a pair of headphones.

The VOICE/CODE control permits selection of either AM (VOICE) or CW (CODE) reception. In the CODE position, the control also functions as a RF gain or sensitivity adjustment.

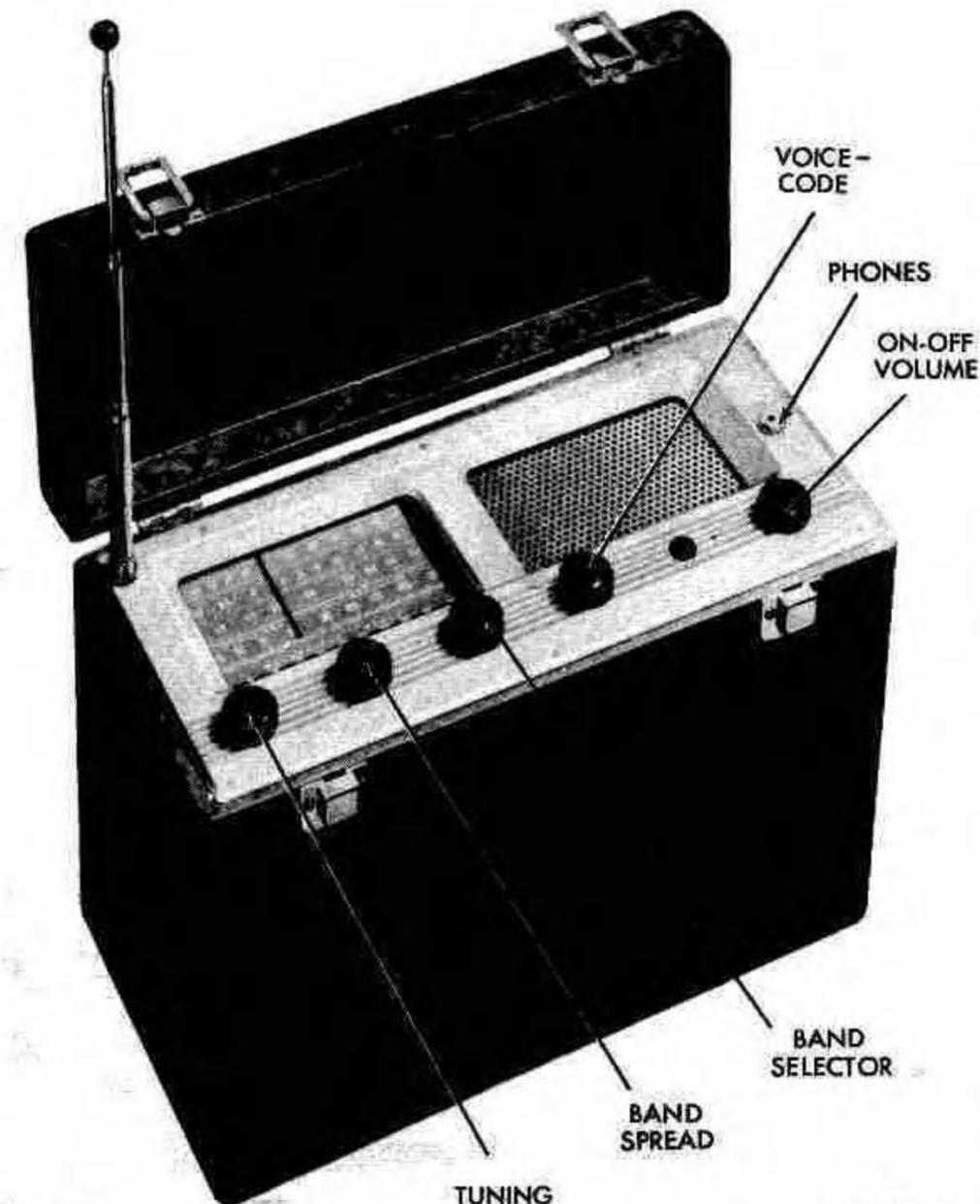


FIG. 1 MODEL S-72

92X75B-B

The receiver is designed both for fixed operation from a 105-125 volt DC or 50-60 cycle AC power source and portable operation from a self-contained 90 volt - 7½ volt battery pack. Before attempting to operate the receiver, carefully read the INSTALLATION and OPERATION sections of this book.

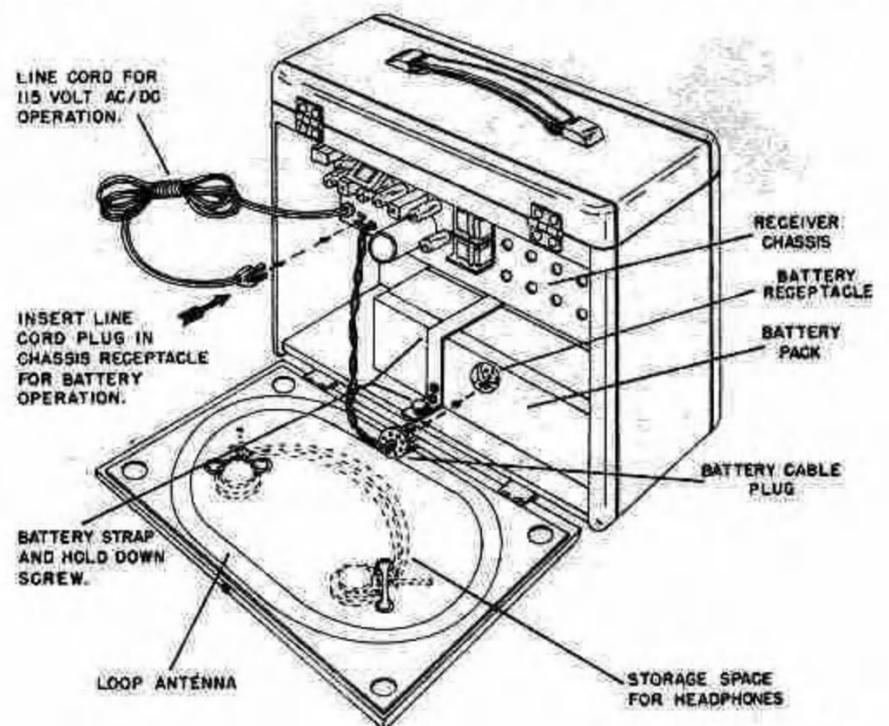
IMPORTANT

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 and tuning controls.

INSTALLATION

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

LOCATION - The receiver is equipped with carrying facilities for portable operation as well as mounting feet for table top or shelf mounting when operating from commercial power sources. Reception of the standard broadcast band does not require the use of the whip antenna; however, for shortwave reception, clearance for the 61 inch whip antenna must be provided as the antenna must be fully extended for maximum performance.



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FIG. 2 REAR VIEW, REAR DOOR OPEN

OPERATION

BATTERY OPERATION

1. Select one of the 90 volt - $7\frac{1}{2}$ volt battery packs listed on page 4. Refer to Fig. 2 for an illustration of the battery installation.
2. Open the rear door of the cabinet by pulling out on the finger grip provided.
3. Place the battery pack into the compartment located below the receiver chassis and fasten the BATTERY STRAP securely around the battery.
4. Insert the BATTERY CABLE PLUG into the BATTERY RECEPTACLE.
5. Insert the LINE CORD PLUG into the CHASSIS RECEPTACLE.

CAUTION - Do not store the receiver with the battery in the battery compartment. Damage to the receiver due to possible leakage from a dead battery can be avoided by removing the battery and storing it separately in a cool, dry place.

AC/DC OPERATION

1. The receiver is designed to operate from a 105-125 volt, DC or 50-60 cycle AC power source. The power consumption is 25 watts. If in doubt as to the frequency or voltage rating of your power source, contact the local power company representative.
2. Insert the line cord plug into any convenient power outlet.
3. When operating on DC, reverse the line cord plug if the receiver does not operate after having been turned ON.
4. Operation from a 220 volt, 50-60 cycle AC source is possible by using a special step down transformer available as an accessory. Consult your Hallicrafters dealer regarding this transformer (Hallicrafters part number 52B088).

STANDARD BROADCAST RECEPTION

1. Set the BAND SELECTOR switch at 1 for the standard broadcast band.
2. Turn the VOICE/CODE control clockwise past the point of switch action to the VOICE position.
3. Set the BAND SPREAD dial pointer at 0.
4. Turn the receiver ON by rotating the ON-OFF VOLUME control clockwise. This control will have to be reset for the desired volume level after the station has been tuned in.
5. Tune in the desired station with the TUNING control. Read the frequency from the dial scale marked BAND 1.
6. The built-in loop antenna is used for standard broadcast reception. This type of antenna is directional. If satisfactory reception of a station is not obtained, rotate the entire receiver for the position which will provide the greatest signal.
7. To turn the receiver OFF, turn the ON-OFF VOLUME control counterclockwise until the switch click is heard.

SHORTWAVE RECEPTION

1. Extend the whip antenna to its full length. A short length of wire located in the battery compartment has been provided for connection to a separate external single wire antenna. It is only necessary to use an external antenna in low signal strength areas where it is difficult to receive a desired signal using the whip antenna.
2. Set the BAND SELECTOR switch at 2, 3 or 4 for the desired shortwave band. When tuning, read the dial scale which corresponds to the setting of the BAND SELECTOR.
3. Set the BAND SPREAD dial pointer at 0.
4. **FOR VOICE RECEPTION** - Turn the VOICE/CODE control clockwise past the point of switch action to the VOICE position.

FOR CODE RECEPTION - Set the VOICE/CODE control to CODE. The VOICE/CODE control performs two functions when set at CODE: (1) It places the beat frequency oscillator in operation to make code signals intelligible and (2) It controls the sensitivity of the receiver. When strong code signals block the receiver, reduce the sensitivity slightly by turning the control counterclockwise.

5. Turn the receiver ON by rotating the ON-OFF VOLUME control clockwise. Turn this control to a well advanced position and reset it for the desired volume after the station has been tuned in.
6. Tune in the desired station with the TUNING control. For CODE RECEPTION, adjust the TUNING control for the desired pitch of the code signal.
7. For fine tuning of the shortwave bands, refer to BAND SPREAD TUNING on page 4.

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. Set the BAND SPREAD dial pointer at 0.
3. Set the TUNING DIAL pointer at the high frequency end of the range of frequencies to be covered.
4. Tune through the frequency range with the BAND SPREAD control.
5. Logging of shortwave stations is possible by recording the settings of the TUNING and BAND SPREAD dial scales.

IMPORTANT - The calibration of the TUNING dial scales will be correct ONLY when the BAND SPREAD dial pointer is set at 0.

HEADPHONES

1. Any standard pair of headphones with an impedance of 500 to 2000 ohms can be used with the receiver.
2. To connect the headphones, insert the headphone plug into the PHONES jack located on the control panel. Attaching the headphones automatically disconnects the speaker.
3. Storage space for the headphones is provided on the rear door of the cabinet. See Fig. 2.

SERVICE INSTRUCTIONS

GENERAL SPECIFICATIONS

Tubes and Rectifiers	8 tubes and 1 selenium rectifier
Speaker	5 inch PM
Voice Coil Impedance	3.2 ohms
Headphone Output Impedance	100 ohms
Antenna	Loop for band 1, whip for bands 2, 3 and 4 and terminal for connection to an external antenna.
Intermediate Frequency	455 KC
Power Supply	105-125 volts DC/50-60 cycle AC or 90 - 7½ volt battery pack.
Power Consumption	25 watts on AC/DC

BATTERY REPLACEMENT - Select one of the battery types listed below under REPLACEMENT BATTERIES. For installation instructions, refer to BATTERY OPERATION on page 3.

REPLACEMENT BATTERIES

Manufacturer	Type	Manufacturer	Type
BRIGHT STAR	66-50	OLIN	0615
BURGESS	G6M60		0614
	F6A60	RAY-O-VAC	AB678
DELCO	6760		AB994
EVEREADY	754	RCA	VS018
	753		VS019
GENERAL	60BF65	SEARS	67E605
	60A6F65	USALITE	660
MONT. WARD	62A35M	WEST. WIZARD	
	62A32		60B6F6/6
NAT. UNION	N606		60A6F6/5

TUBE REPLACEMENT - The tube types and their relative location in the receiver are shown in Fig. 4. When installing a replacement tube, line up the seven small pins with the socket holes and then push straight down on the tube until the base of the tube rests on the socket. Handle all tubes with care as they are fragile and will not withstand mechanical abuse.

RESTRINGING DIAL CORD - The dial drive system of the S-72 consists of three separate string drives (1) BAND SPREAD gang and pointer drive (2) TUNING gang drive and (3) TUNING pointer drive. Refer to Fig. 3 for the dial stringing diagrams.

BAND SPREAD GANG AND POINTER DRIVE

1. Set the BAND SPREAD gang in a fully open position (minimum capacity).
2. Tie one end of a 30 inch length of 30 lb. test dial cord to the hook at position 1 on the BAND SPREAD gang drive pulley.
3. Follow the stringing procedure 1 through 10. At position 10, stretch the tension spring and tie the cord securely to the spring.
4. With the BAND SPREAD gang fully opened, attach the dial pointer to the cord and align it with 0 on the BAND SPREAD SCALE.

TUNING GANG DRIVE

1. Set the TUNING gang in a fully meshed position (maximum capacity).
2. Tie one end of a 30 inch length of 30 lb. test dial cord to the hook at position A on the rear TUNING gang drive pulley.
3. Follow the stringing procedure A through J. At position J, stretch the tension spring and tie the cord securely to the spring.

TUNING POINTER DRIVE

1. Set the TUNING gang in a fully meshed position.
2. Tie one end of a 28 inch length of 9 lb. test dial cord to the hook at position 1 on the front TUNING gang drive pulley.
3. Follow the stringing procedure 1 through 11. At position 11, stretch the tension spring and tie the cord securely to the spring.
4. With the TUNING gang fully meshed, attach the dial pointer to the cord and align it with the left hand index marks on the dial.

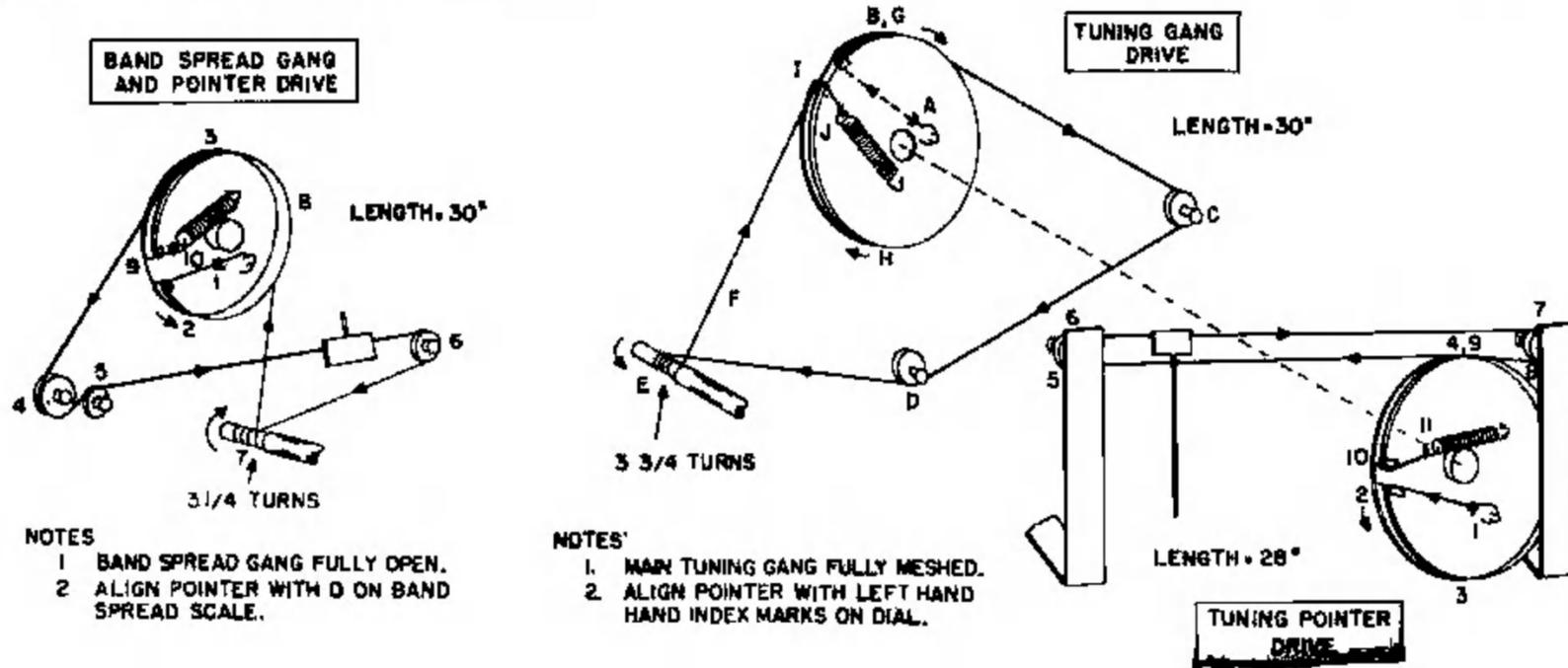


FIG. 3 DIAL CORD STRINGING DIAGRAMS

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SERVICE OR OPERATING QUESTIONS - For further details regarding operation or servicing of the receiver, contact your dealer. Make no 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 at the right.

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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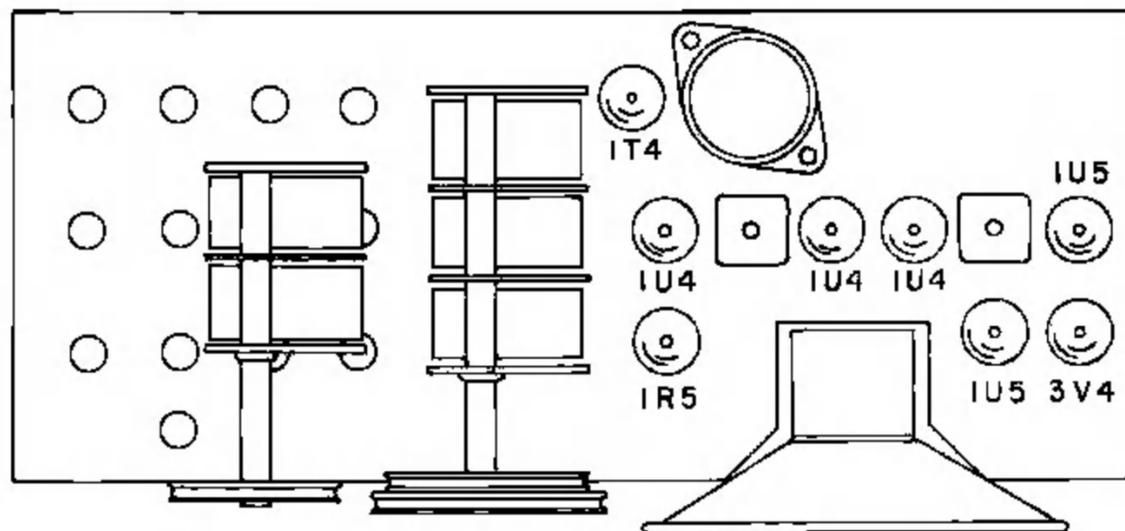


FIG. 4 TUBE LOCATION

92CB90-0

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

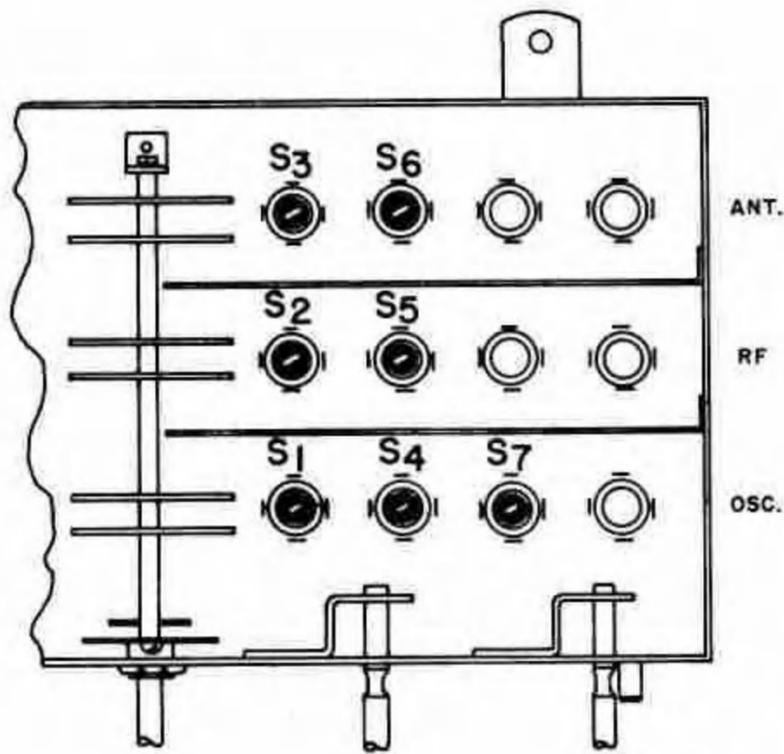
It is necessary to remove the chassis from the cabinet to make the alignment. The procedure for removing the chassis is as follows: (1) Remove the control knobs (2) Remove the knurled mounting nut from the PHONES jack (3) Remove the control panel escutcheon (4) Remove the hex nut from the PHONES jack (5) Disconnect the BATTERY CABLE PLUG and remove the battery from the compartment (6) Unsolder the whip antenna lead and the two loop antenna connections (7) Remove the two mounting screws from the chassis angle brackets and (8) Remove the chassis from the cabinet.

The alignment should be made with the VOLUME control fully clockwise, the VOICE/CODE control at VOICE and the BAND SPREAD dial pointer at 0. Refer to Figs. 5 and 6 for the location of all adjustments.

ALIGNMENT CHART

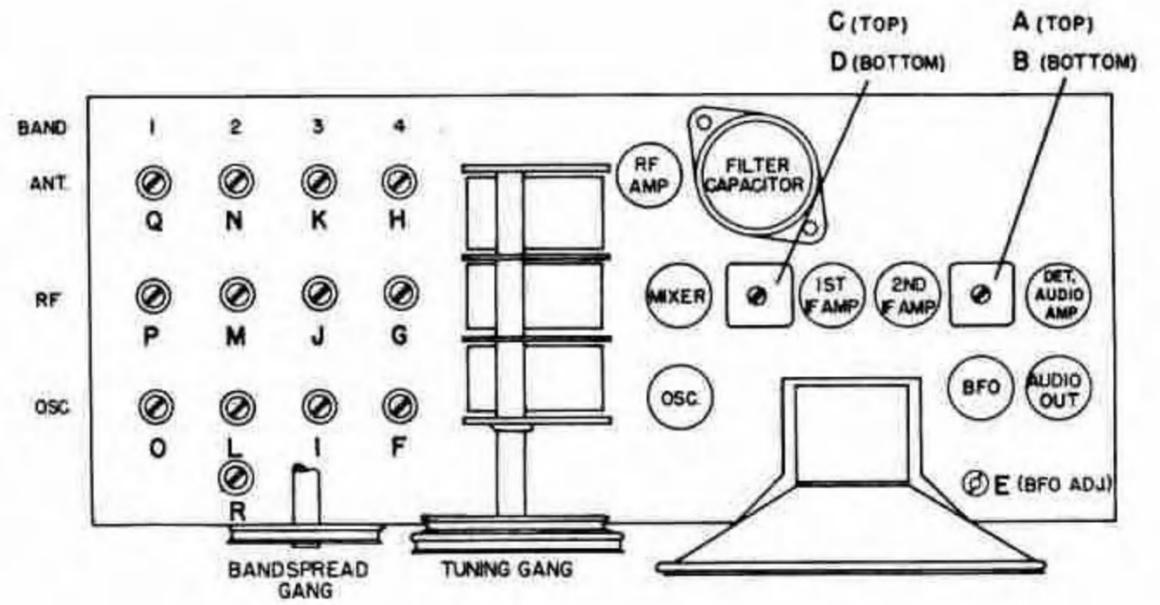
STEP	SIGNAL GENERATOR CONNECTIONS	SIGNAL GEN. FREQUENCY	BAND SELECTOR SETTING	TUNING DIAL SETTING	ADJUST	REMARKS
1	Connect the high side of the generator to stator plates of center section of TUNING gang. Connect the ground side of the generator to the chassis.	455 KC	1	1000 KC	A, B, C, D	Adjust for 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	1000 KC	E	Set the VOICE/CODE control at CODE. Adjust E for a 1000 cycle note.
3	Connect a 10 mmf. capacitor from the external antenna lead (located in battery compartment) to the chassis. Connect the high side of the generator to the ext. ant. lead through a 15 mmf. capacitor and the ground side to the chassis.	30 MC	4	30 MC	F, G, H	Maximum output as in STEP 1.
		12 MC	4	12 MC	S1, S2, S3	
4	Same as STEP 3.	11.5 MC	3	11.5 MC	I, J, K	Maximum output as in STEP 1.
		5 MC	3	5 MC	S4, S5, S6	
5	Same as STEP 3.	4.4 MC	2	4.4 MC	L, M, N	Maximum output as in STEP 1.
		1800 KC	2	1.8 MC	S7	
6	Same as STEP 3. The loop antenna should be connected for this step.	1500 KC	1	1.5 MC	O, P, Q	Maximum output as in STEP 1.
		600 KC	1	.6 MC	R	

* Reset the VOICE/CODE control at VOICE when STEP 2 is completed.



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FIG. 5 BOTTOM VIEW - ALIGNMENT POINTS



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FIG. 6 TOP VIEW - ALIGNMENT POINTS

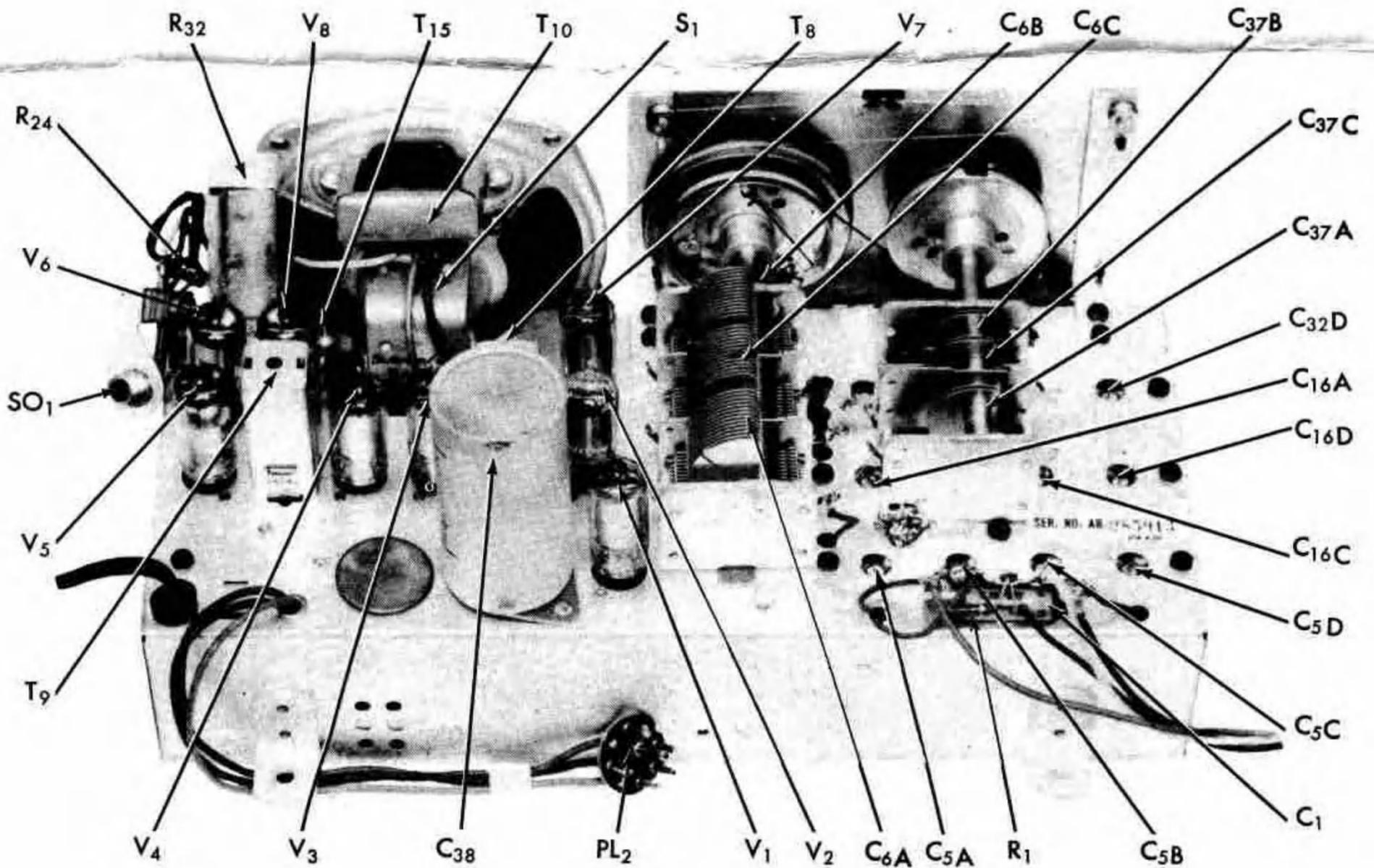


FIG. 7 TOP VIEW - COMPONENT LOCATION

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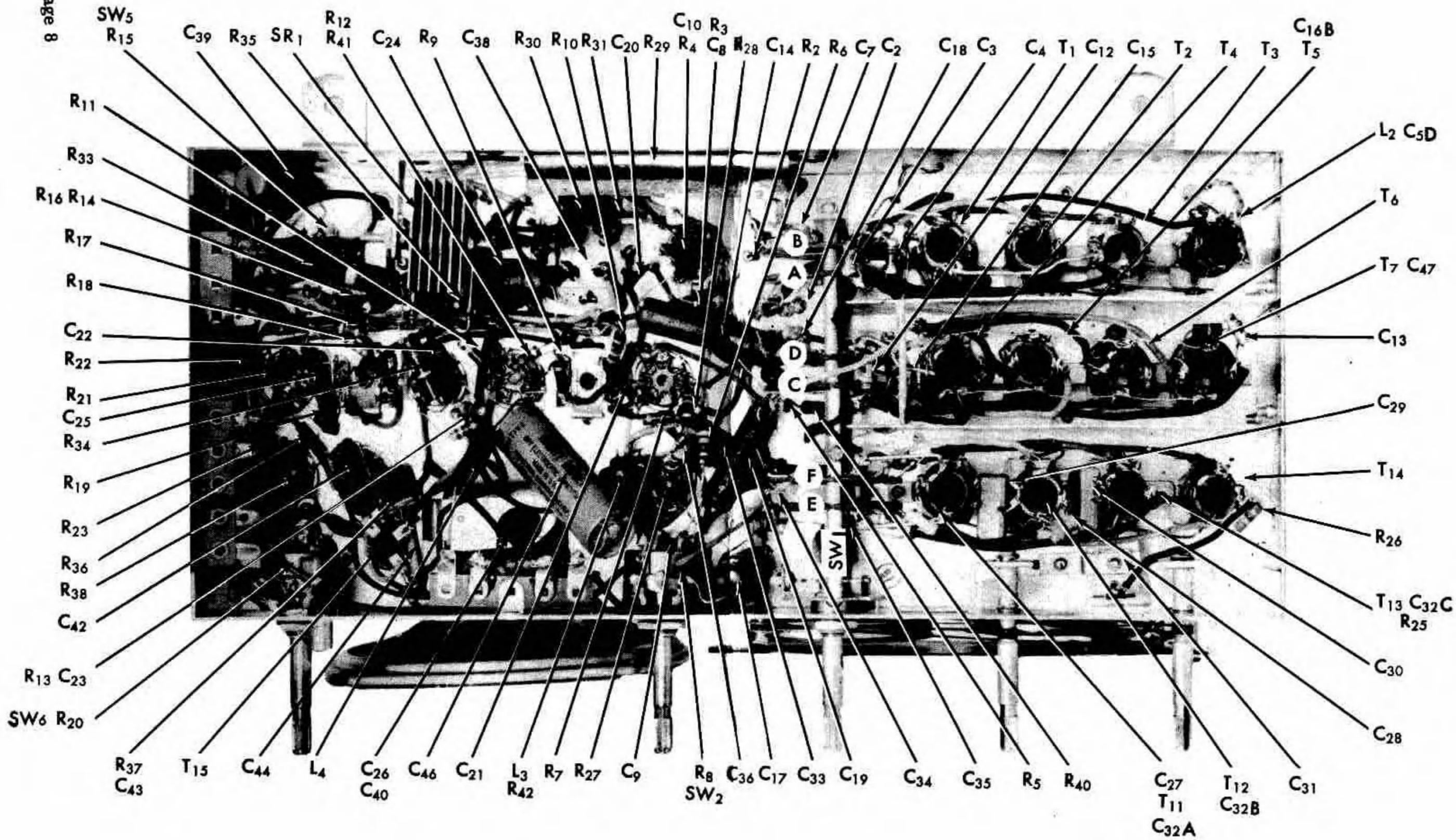
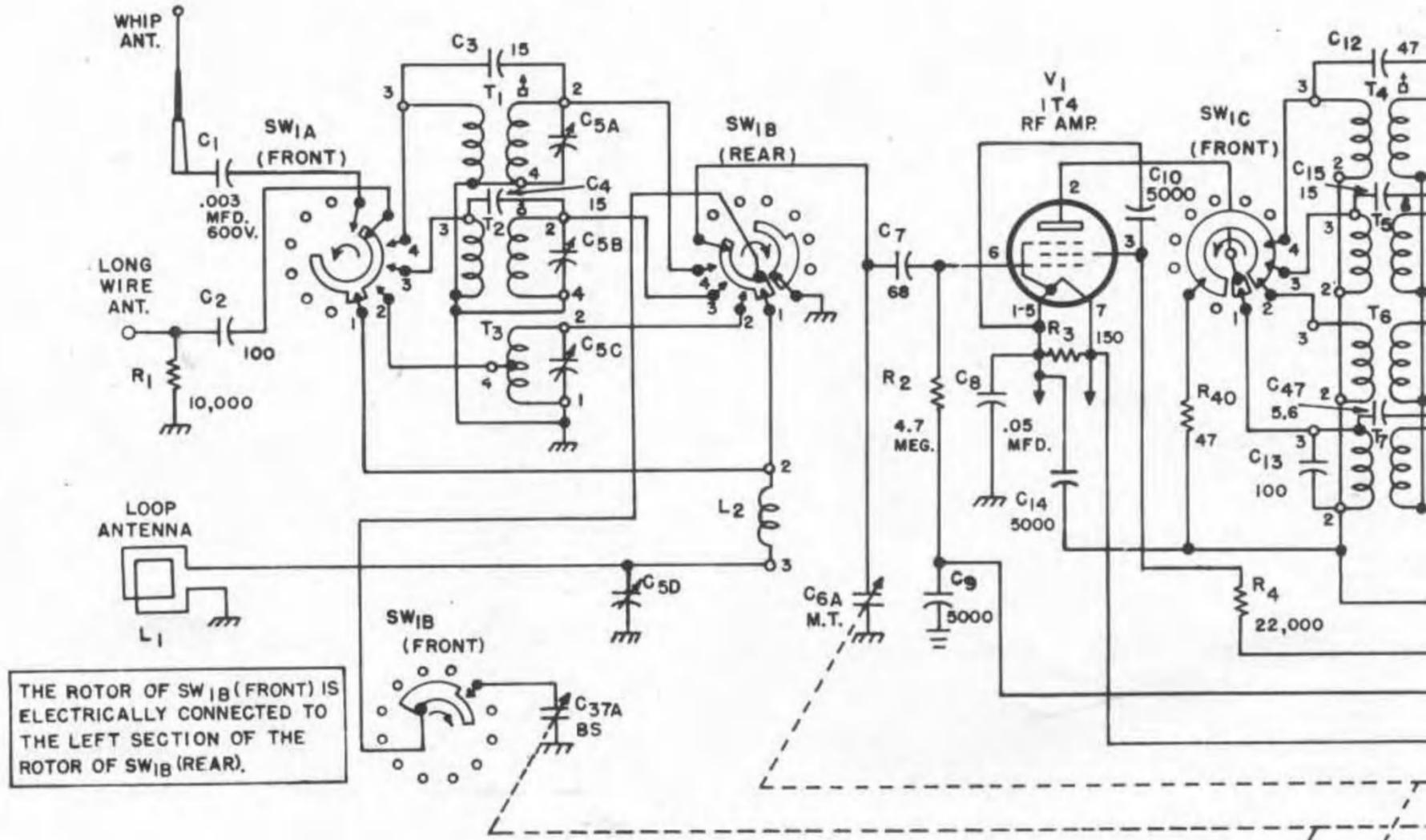
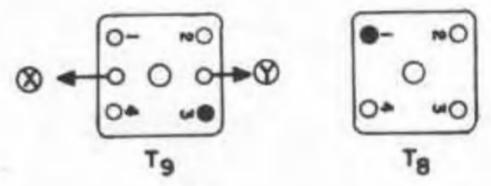
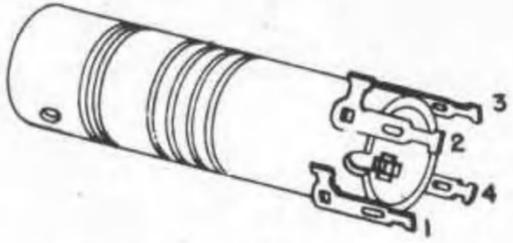
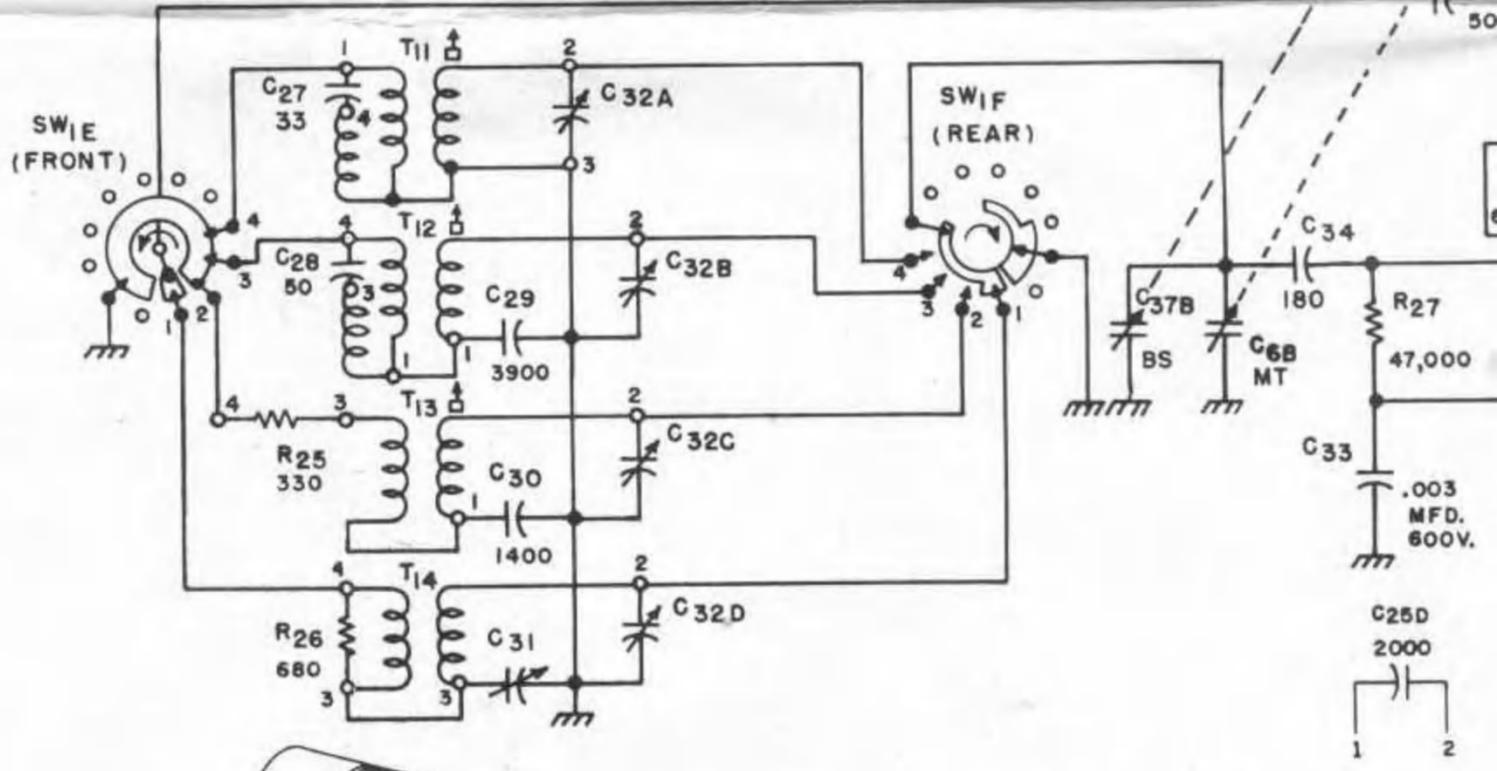


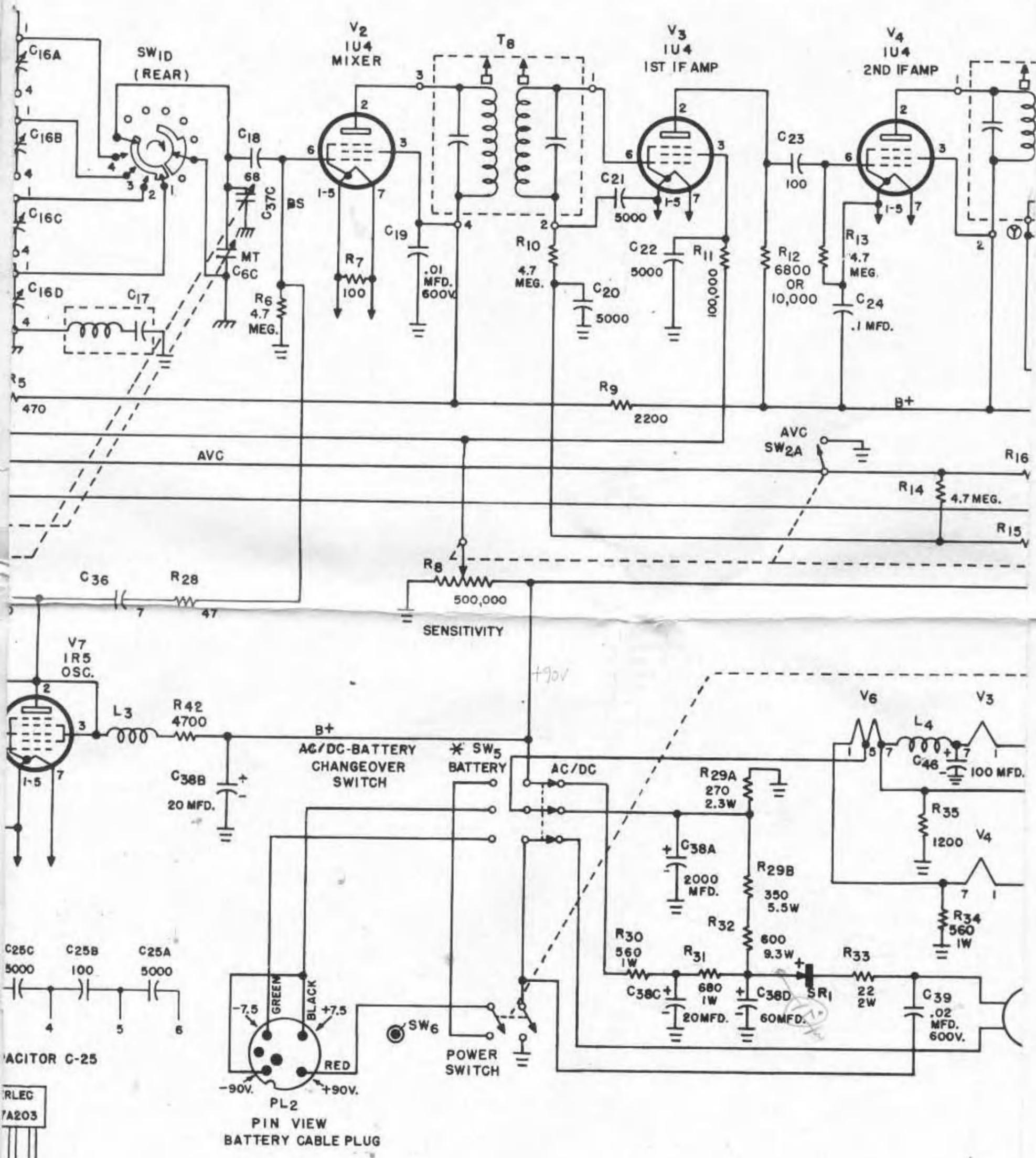
FIG. 8 BOTTOM VIEW - COMPONENT LOCATION



THE ROTOR OF SW_{1B} (FRONT) IS ELECTRICALLY CONNECTED TO THE LEFT SECTION OF THE ROTOR OF SW_{1B} (REAR).



REPRESENTS TRANSFORMERS T-1 TO T-7, T-11 TO T-14 & L-2

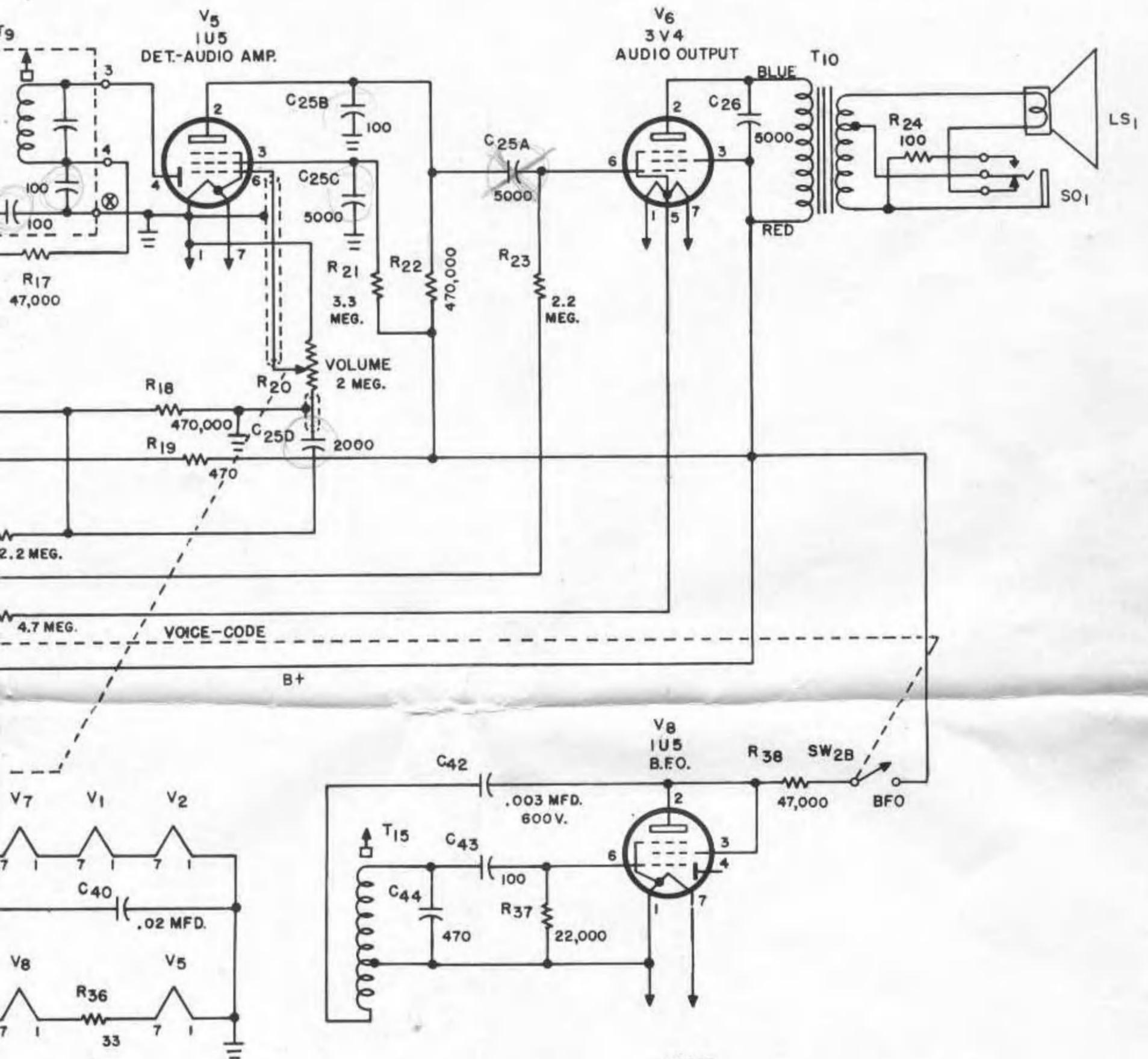


VALUES AND TOLERANCES SHOWN ARE NOMINAL AND VARIATIONS MAY BE FOUND. IT IS RECOMMENDED THAT THE VALUE OF ANY REPLACEMENT CORRESPOND TO THE NOMINAL VALUE OF THE PART BEING REPLACED.

TRLEC
7A203
3456

MODEL S-72

RUN 4



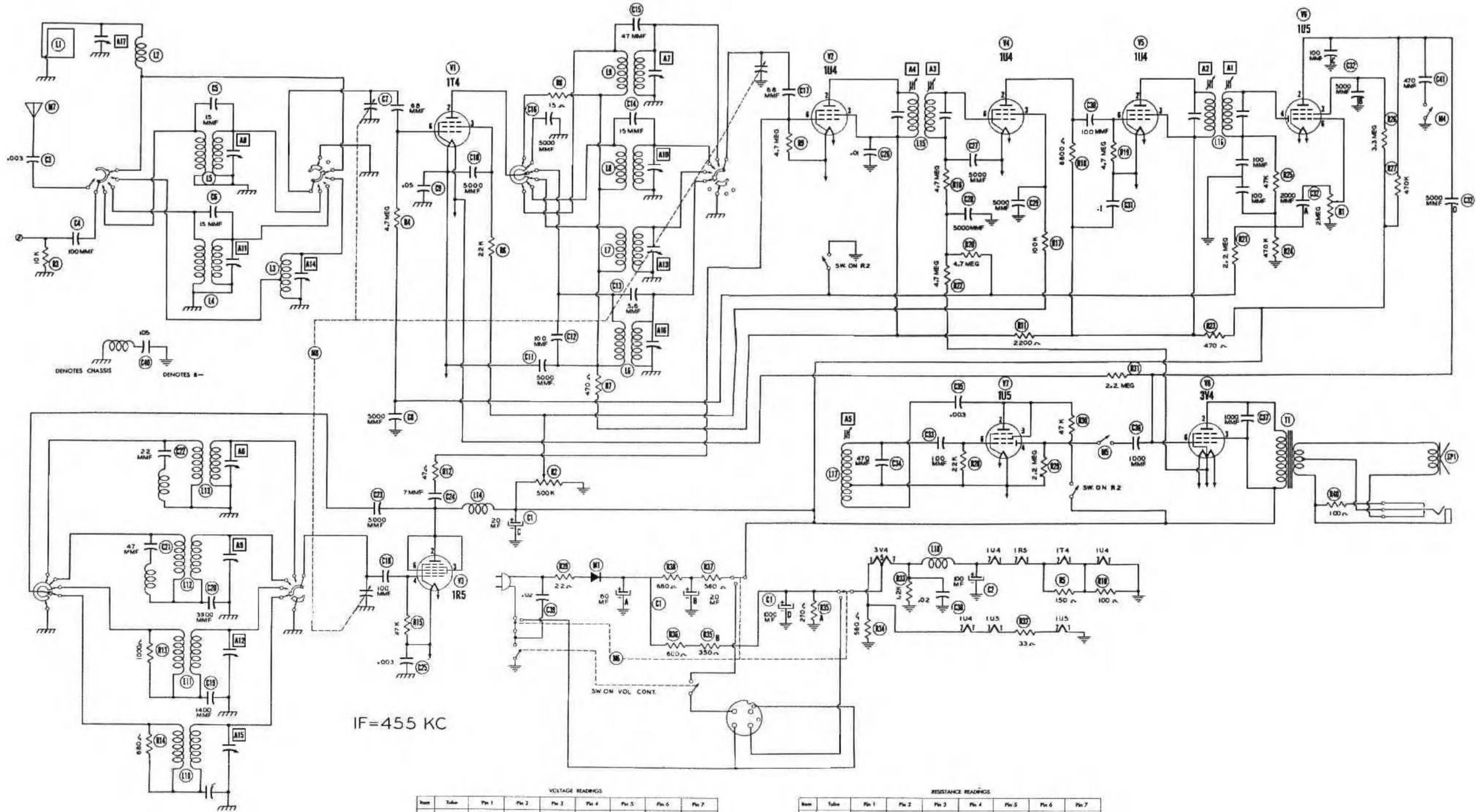
NOTES

1. ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.
2. CAPACITOR VALUES ARE IN MMF. UNLESS OTHERWISE SPECIFIED.
- ⊥ - INDICATES ELECTRICAL GROUND BUS (B-).
- ⏏ - INDICATES CHASSIS GROUND.
3. BAND SELECTOR SWITCH SW₁ SHOWN IN BAND I POSITION (FULLY CLOCKWISE).
4. RESISTOR VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
- * OPERATION SWITCH (SW₅) SHOWN IN AC/DC POSITION. INSERTING AC POWER PLUG (PL₁) IN THE RECEPTACLE ON THE CHASSIS PLACES SWITCH SW₅ IN THE BATTERY POSITION.
- ⊙ SWITCH SW₆ GANGED WITH VOLUME CONTROL.
5. SEE FIG. 8 FOR LOCATION OF SWITCH SECTIONS OF SW₁.

LAST CAPACITOR SYMBOL C-47
LAST RESISTOR SYMBOL R-42

89E319-I

FIG. 10 SCHEMATIC DIAGRAM



IF=455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V.1	1T4	1.4VDC	75VDC	60VDC	0V	1.4VDC	.1VDC	2.8VDC
V.2	1U4	0V	75VDC	75VDC	0V	0V	-.1VDC	1.4VDC
V.3	1R5	2.8VDC	87VDC	87VDC	3-6.5VDC	2.8VDC	87VDC	4.4VDC
V.4	1U4	4.4VDC	80VDC	65VDC	0V	4.4VDC	0V	5.8VDC
V.5	1U4	4.4VDC	85VDC	85VDC	0V	4.4VDC	0V	5.8VDC
V.6	1U5	0V	40VDC	15VDC	0V	0V	0V	1.4VDC
V.7	1U5	3VDC	50VDC	50VDC	-.1VDC	0V	12.8VDC	4.4VDC
V.8	3V4	5.8VDC	80VDC	87VDC	0V	7.2VDC	0V	8VDC

TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V.1	1T4	*	14.6KΩ	122KΩ	Inf.	*	7.5Meg.	*
V.2	1U4	*	14KΩ	14KΩ	Inf.	*	7.5Meg.	*
V.3	1R5	*	11.2KΩ	11.2KΩ	47KΩ	*	11.2KΩ	*
V.4	1U4	*	16.5KΩ	1100KΩ	Inf.	*	8 Meg.	*
V.5	1U4	*	11.7KΩ	11.7KΩ	Inf.	*	4.7Meg.	*
V.6	1U5	*	1470KΩ	13.3KΩ	500KΩ	500KΩ	2 Meg.	*
V.7	1U5	*	147KΩ	147KΩ	2.2Meg.	Inf.	22KΩ	*
V.8	3V4	*	12KΩ	11.2KΩ	Inf.	*	2.2Meg.	*

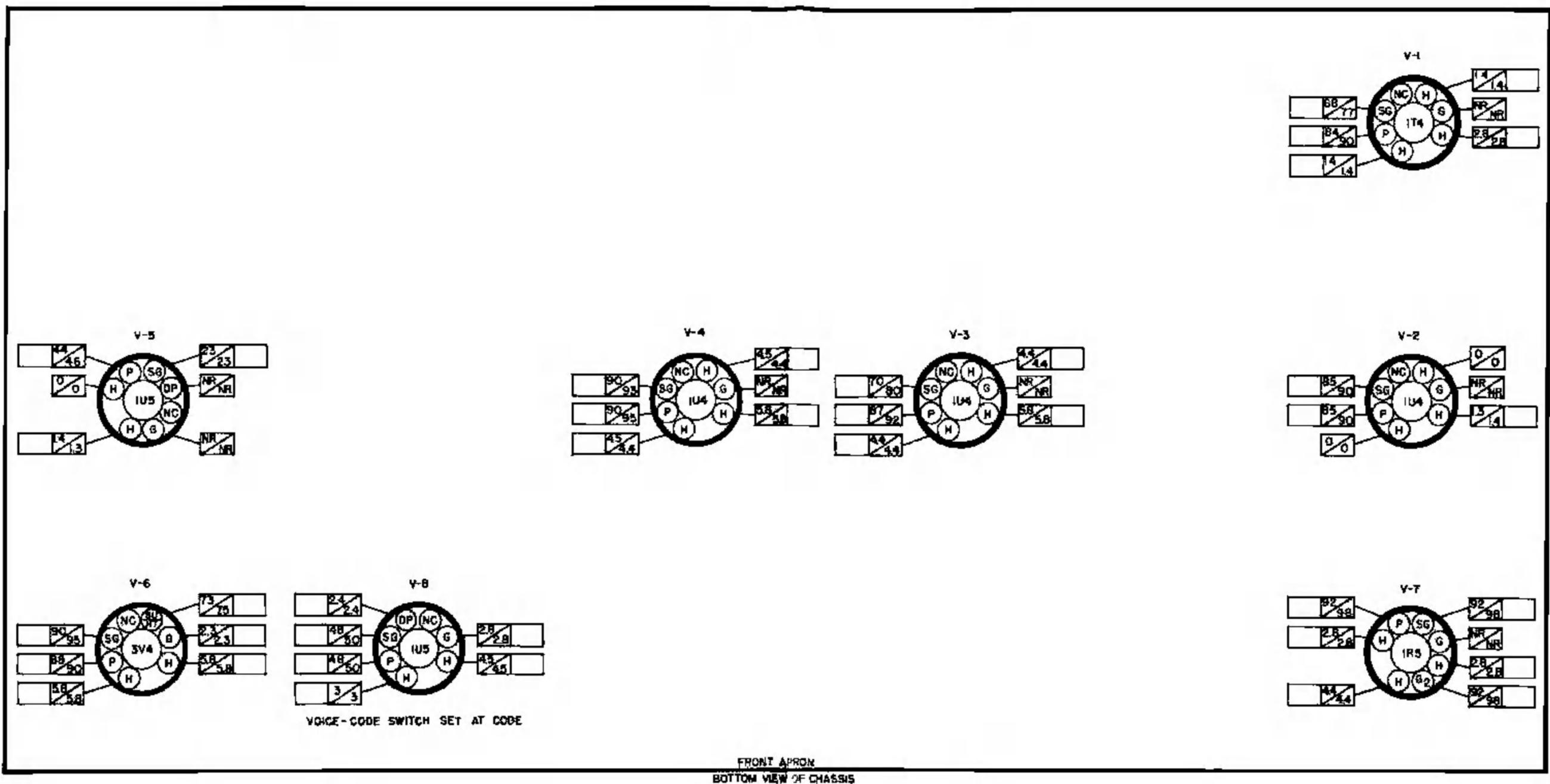
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

† Voice - Code switch in "Code" position.

‡ Measured from output of R1.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



- NOTES -
1. SOCKET VIEWS ARE BOTTOM VIEWS
 2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS & B-, THE ELECTRICAL GROUND BUS (NOT CHASSIS) WITH ZERO SIGNAL INPUT
 3. LINE VOLTAGE --117V AC BATTERY VOLTAGES TAKEN WITH FRESH BATTERY PACK
 4. ALL VOLTAGES SHOWN ARE DC UNLESS OTHERWISE SPECIFIED
 5. DC VOLTAGES SHOWN WERE MEASURED WITH A VACUUM TUBE VOLTMETER
 6. "NC" - NO CONNECTION
 7. "NR" - NOT READABLE (READING GENERALLY MEANINGLESS)
 8. SPACE PROVIDED FOR SERVICE METER READINGS
 9. UPPER VOLTAGE READINGS IN INDICATOR SPACE SHOW BATTERY OPERATION
 10. VOLTAGES FOR TUBE V-8, ARE SHOWN WITH VOICE-CODE SWITCH IN CODE POSITION
 11. ALL READINGS TAKEN WITH LINE PLUG POLARIZED SO THAT GROUND BUS & CHASSIS ARE AT SAME POTENTIAL AS THE CHASSIS GROUND

92D777-A

FIG. 9 TUBE SOCKET VOLTAGE CHART

Warranty

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

This warranty does not extend to ~~any~~ 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 removed 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. 943622

the Hallicrafters co.