

the hallicrafters co.

SERVICE BULLETIN FOR MODEL SX-71

*James # 111
 Kalden 6*

GENERAL

Tubes eleven plus voltage regulator and rectifier
 Speaker Output 3.2/500 ohms
 Headset Output 500 ohms
 Antenna Input For 50 to 600 ohm line or single wire lead-in.
 Phono Input High impedance
 External Power Connector Std. octal socket

TUNING RANGE

Band	*Frequency Range	Type of Reception	Intermediate Frequency
1	560 KC - 1600 KC	AM/NBFM/CW	455 kc
2	1650 KC - 4700 KC	AM/NBFM/CW	455 kc
3	4.7 MC - 13.4 MC	AM/NBFM/CW	2.075 mc and 455 kc
4	12.8 MC - 34 MC	AM/NBFM/CW	2.075 mc and 455 kc
5	46 MC - 56 MC	AM/NBFM/CW	2.075 mc and 455 kc

* First and last dial calibration

Power Supply Standard Model 105-125 V. 60 Cycles AC
 Universal Model 105-250 V. 25/130 Cycles AC
 Power Consumption 90 Watts.

RESTRINGING DIAL CORD

The dial drive system of the SX-71 consists of four separate spring drives. The two drive shaft string systems are identical; the two pointer drive systems are similar but right and left handed.

(1) **DRIVE SHAFT.** - To restring either one, use a 26 inch length of 30 lb. test dial cord. Tie one end of the cord to position "1" on the drum and follow the stringing sequence "1" to "9" as shown. At position "9" stretch the tension spring and tie the cord securely to the spring. Note that the dial cord is wrapped around the drive shaft three and one half times for proper traction.

(2) **POINTER DRIVE** - To restring either one, use a 66 inch length of 30 lb. test dial cord. Tie one end of the dial cord to position "A" and follow the stringing sequence "A" to "U" as shown. At position "U", stretch the tension spring and tie the cord securely to the spring. Two small pieces of spaghetti tubing approximately one half inch long should be threaded on

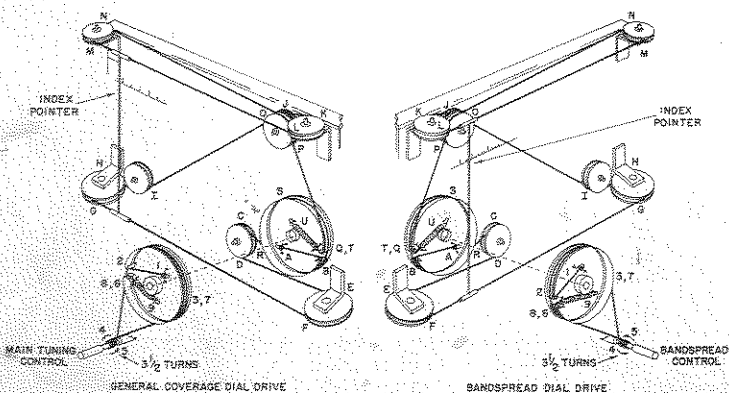
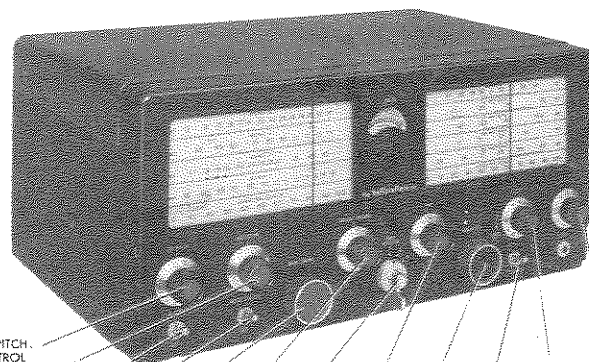


Figure 1. Dial cable stringing procedure



CW PITCH CONTROL
 RECEPTION CONTROL
 B.F.O. SWITCH
 NOISE LIMITER SWITCH
 MAIN TUNING CONTROL
 CRYSTAL PHASING CONTROL
 BAND SELECTOR CONTROL
 TONE CONTROL
 BAND-SPREAD TUNING SWITCH
 RECEIVE-STANDBY CONTROL SWITCH
 VOLUME CONTROL
 SENSITIVITY CONTROL

924981

the cord, as shown, to provide a suitable purchase for the dial pointer. With the pointer drive pulleys positioned as shown on the diagram (Fig. 1.), the tuning capacitor should be entirely closed. The pointer may now be fastened to the cord and aligned with the 0 position on the logging scale and the index marks on the dial scales. The ends of the pointer should be carefully crimped around the spaghetti tubing and cemented fast.

REPLACING LAMPS

Refer to Fig. 8 for the location of the dial lamps in the receiver. To gain access to the defective lamps, remove the chassis from the cabinet by removing the screws on the sides and bottom. The two end lamps are fastened by screws to an angle bracket. Remove the screws and change the lamp using a type Mazda #47 (brown bead) or equivalent. To change the two dial lamps in the center, remove the screws holding the sockets in place and replace the lamps using a type Mazda #44 (blue bead) or equivalent.

"S" METER ADJUSTMENT

MECHANICAL:

Turn off the receiver.

Immediately below the dial face of the "S" meter is a round metal disc. This disc is pivoted so that it may be moved to one side. Doing this discloses the pivot adjustment screw of the "S" meter. Use a screw driver and carefully rotate the screw in either direction until the needle indicates zero.

ELECTRICAL ADJUSTMENT:

Turn the receiver on.

Set the RECEIVE STANDBY switch at RECEIVE.
 Set BFO at OFF
 Set the SENSITIVITY control at maximum.
 Set the NOISE-LIMITER at OFF.
 Short the antenna terminals to ground.

The "S" meter adjustment control is located on the left rear apron of the chassis. Turn this control slowly until the needle in the "S" meter indicates zero.

ALIGNMENT PROCEDURE

It will be necessary to remove the receiver chassis from the cabinet to make all alignment adjustments. The chassis is held in the cabinet by two screws on the bottom rear and by the flanges on the side and bottom. The following control settings are to be set before alignment: TONE control at maximum. SENSITIVITY control at maximum. VOLUME control at maximum. NOISE LIMITER switch at OFF. RECEIVE/STANDBY switch at RECEIVE.

I-F ALIGNMENT

Step	Signal Gen. Coupling	Signal Gen. Frequency	Receiver Control Settings	Receiver Dial Set	Adjust	Remarks
1	Connect gen. to stator of gang, mixer sect.	455 KC Unmodulated	BAND SELECTOR at 2. RECEPTION switch at BROAD CRYSTAL. BFO switch at BFO.	Both dials set at 50 on the logging scale		Remove CW PITCH control knob and set shaft for zero beat. Replace knob with the zero at the index line.
2	Same as step 1.	Same as step 1.	Adjust CW-PITCH for a 1000 cycle note. Other controls same as step 1.	Same as step 1.	U	While turning the slug very slowly in one direction, "rock" the signal generator. As the adjustment passes thru the response of the crystal filter, the output goes thru a maximum, dips down, and starts going up again. The correct setting of this slug is in the center of the observed dip. A swishing note, in contrast to the sharp crystal tone will be apparent when the correct adjustment has been reached.
3	Same as step 1.	Same as step 1.	RECEPTION switch at SHARP CRYSTAL. Other controls same as step 1.	Same as step 1.		Set the generator frequency for maximum output on the crystal frequency.
4	Same as step 1.	Same as step 3. Modulated	RECEPTION switch at NORMAL I.F. BFO switch at OFF. Other controls same as step 1.	Same as step 1.	V W X Y Z (1) (2)	Maximum output Maximum output Maximum output Maximum output Maximum output Maximum output Repeat above until maximum gain is obtained.

F-M ALIGNMENT

5	Same as step 1.	Same as step 3. Increase output to approx. 1000 microvolts.	RECEPTION switch at NBFM. Other controls same as step 1.	Same as step 1.	(3)	Set up circuit shown in Fig. 2. Until vacuum tube voltmeter shows zero voltage.
---	-----------------	---	--	-----------------	-----	---

I-F ALIGNMENT

6	Same as step 1.	2.075 MC Modulated	RECEPTION switch at NORMAL I.F. BAND SELECTOR at 4.	Same as step 1.	(4) (5) (6)	Until a signal is heard. For maximum output. For maximum output. Repeat until the maximum output is obtained.
---	-----------------	--------------------	---	-----------------	-------------------	--

R-F ALIGNMENT

Leave BANDSPREAD dial at 100 for all steps. The following adjustments can be made without removing the chassis from the cabinet.

1	Connect the high side of the gen. thru a 300 ohm resistor to term. A1 of the ant. term. strip. Connect a jumper between A2 & G. Use just enough gain to obtain a 500 milliwatt audio output level.	1500 KC 600 KC 1500 KC	BAND SELECTOR at 1. RECEPTION switch at NORMAL I.F. BFO switch at BFO	1500 KC 600 KC 1500 KC	A(osc.trim) B C D(osc.pad) A B Repeat	Until a signal is heard. For maximum output. For maximum output. Until a signal is heard. For maximum output. For maximum output Until maximum output is obtained.
2	Same as step 1	4 MC	BAND SELECTOR at 2. Other controls as in step 1.	4 MC	E(osc.trim) F G E F G	Until a signal is heard. For maximum output For maximum output For maximum output For maximum output For maximum output Repeat until maximum output is obtained
3	Same as step 1.	12 MC 5.2 MC 12 MC	BAND SELECTOR at 3. Other controls as in step 1.	12 MC 5.2 MC 12 MC	H(osc.trim) I H J K	Until a signal is heard Until a signal is heard For maximum output. ("Rock" the gang) For maximum output. ("Rock" the gang) For maximum output. ("Rock" the gang) Repeat until maximum results are obtained.
4	Same as step 1	30 MC 14 MC	BAND SELECTOR at 4. Other controls as in step 1.	30 MC 14 MC	L(osc.trim) M (slug) N O L P Q	Until a signal is heard. Until a signal is heard. For maximum output. ("Rock" the gang) For maximum output. ("Rock" the gang) For maximum output. ("Rock" the gang) For maximum output. ("Rock" the gang) For maximum output. ("Rock" the gang) Repeat until maximum results are obtained.
5	Same as step 1.	54 MC	BAND SELECTOR at 5. Other controls as in step 1.	100 on logging scale.	R(osc.trim) S T	Until a signal is heard. For maximum output. ("Rock" the gang) For maximum output. ("Rock" the gang) Repeat until maximum results are obtained.

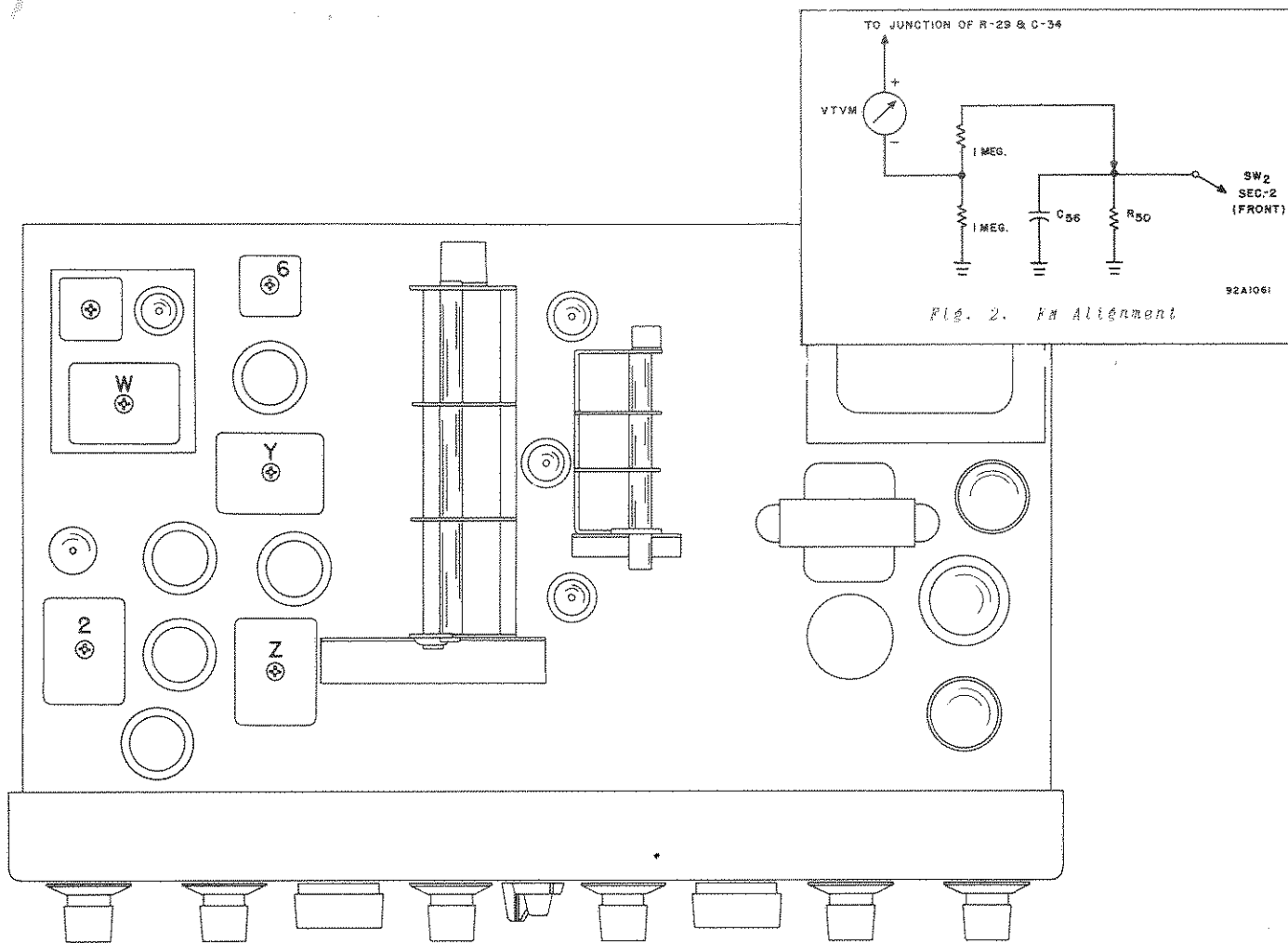


Fig. 3. Alignment adjustments, top view

920964

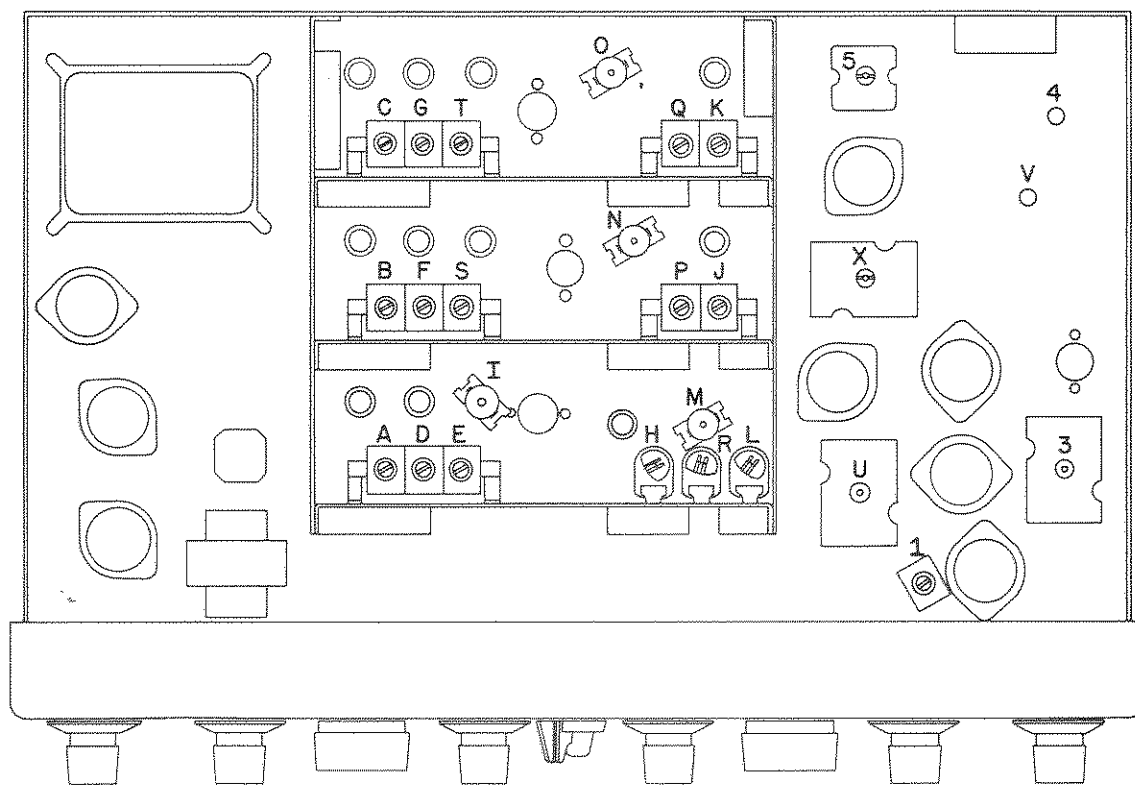


Fig. 4. Alignment adjustments, bottom view

920965

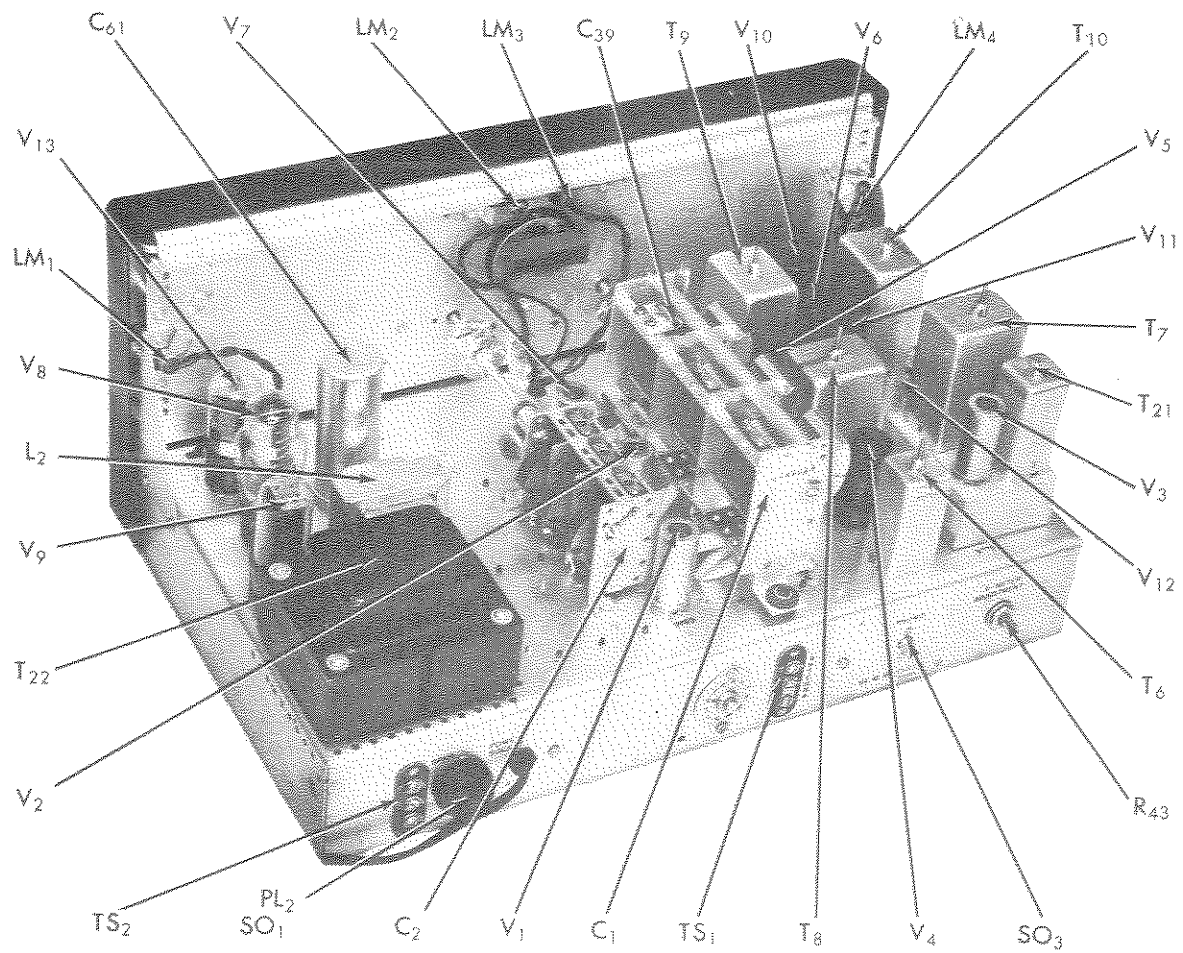


Fig. 5. Component locations, top view

92X966

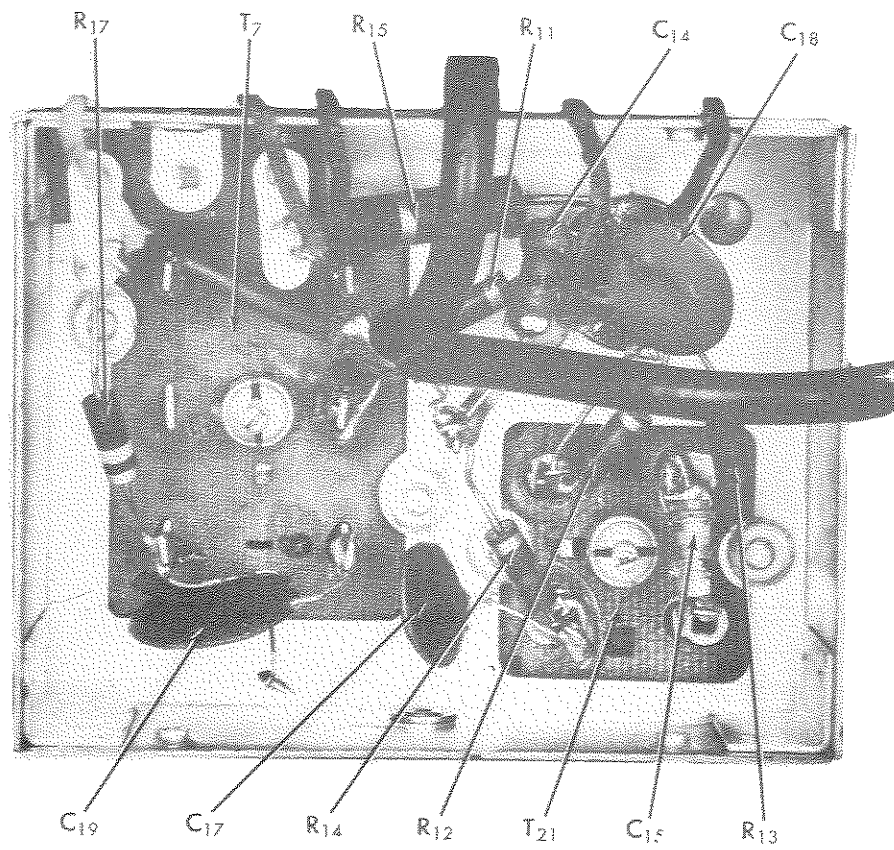


Fig. 6. Component locations, bottom view second converter unit

92X1075

PERFORMANCE DATA FOR SERVICE ENGINEERS

If this receiver is to continue giving the fine performance of which it is capable, only experienced service engineers should repair and realign it. It is essential that the equipment and methods used be comparable with those set forth by the Institute of Radio Engineers in their "Standards of Radio Receivers". The necessary data on receiver performance is given below:

Measurement conditions are as follows unless otherwise specified:

- Modulation - 30% at 400 cycles - - - Output - 50 milliwatts into 500 ohms.
- Dummy antenna - Standard IRE on bands 1 & 2, 300 ohms on bands 3,4, and 5.

FREQUENCY LIMITS ON EACH BAND

- Band - 1 - .538 mc to 1.65 mc
- Band - 2 - 1.6 mc to 4.8 mc
- Band - 3 - 4.6 mc to 13.5 mc
- Band - 4 - 12.5 mc to 35 mc
- Band - 5 - 46.0 mc to 56 mc

OVERALL BANDWIDTHS

- At the IF frequency of 2075 kc. bandwidth at 6 DB down is 3.5 kc, at 60 DB - 14 kc.
- At the IF frequency of 2075 kc. (Broad Xtal) 6 DB down is .7 kc, at 60 DB - 11 kc.
- At the RF frequency of 1000 kc. (Reception Normal) bandwidth at 6 DB down is 3.2 kc and at 60 DB down is 13 kc.

AUDIO RESPONSE

Plus or minus 5 DB from 100 to 3000 cycles.

IF AMPLIFIER GAIN (455 kc) AND BANDWIDTH

Modulator Stage (Osc working: set tuned to 3 mc)	1st IF Amplr.	2nd IF Amplr.	3rd IF Amplr.
Gain	15 X	29 X	4.5 X
At 6 DB down	6 kc	6 kc	24 X
At 20 DB down	15 kc	15 kc	20 kc
			125 kc

NOISE

For 2 microvolts input, the signal to noise ratio is not less than 10 DB.

GENERAL PERFORMANCE				SINGLE STAGE CHARACTERISTICS			GENERAL PERFORMANCE				SINGLE STAGE CHARACTERISTICS		
Band	MC	uv	Image Ratio	Antenna Gain	RF Gain	Osc (Conv) Gain	Band	MC	uv	Image Ratio	Antenna Gain	RF Gain	Osc (Conv) Gain
1	.600	13	24,000 X	3.4 X	2.9 X	14 X	4	14.0	*	1,500 X	1.3 X	8.0 X	12 X
	1.000	6.5	7,000 X	3.5 X	3.5 X	13 X		24.0	*	180 X	1.7 X	8.5 X	14 X
	1.500	5.3	1,800 X	3.6 X	3.5 X	12 X		30.0	1	100 X	1.7 X	8.1 X	9 X
2	1.8	1.5	28,000 X	4.7 X	3.2 X	18 X	5	48.0	1	36 X	1.8 X	6.6 X	13 X
	3.2	*	1,000 X	4.9 X	6.1 X	18 X		54.0	*	20 X	1.8 X	7.7 X	18 X
	4.0	*	300 X	4.7 X	7.2 X	16 X							
3	5.2	2.4	8,800 X	1.9 X	7.1 X	10 X							
	9.0	1.4	2,500 X	2.9 X	7.6 X	12 X							
	12.0	*	570 X	3.3 X	7.7 X	12 X							

* - Less than one microvolt

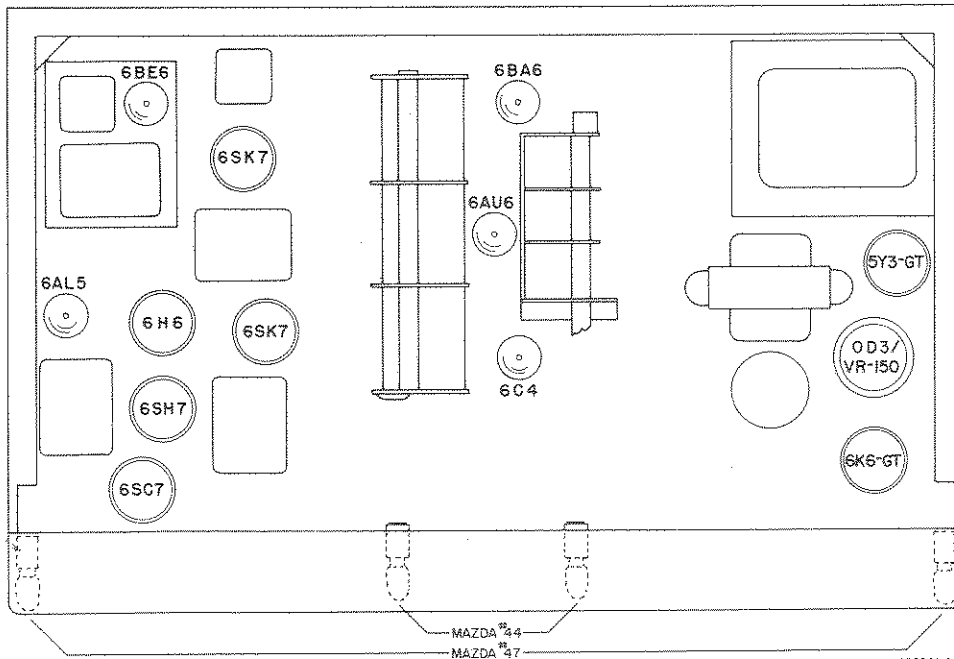


Fig. 8. Top view, location of tubes and dial lamps

SERVICE PARTS LIST

Ref. No.	Description	Manufacturer's Part Number	Ref. No.	Description	Manufacturer's Part Number
CONDENSERS			RESISTORS (Cont.)		
C-1	Capacitor, MAIN TUNING (3 section)	48D209	R-10, 24, 28,42	3300 ohms 1/2 watt, carbon	23X20X332K
C-2	Capacitor, BANDSPREAD (3 section)	48C210	R-11	220 ohms 1/2 watt, carbon	23X20X221K
C-3	Trimmer Ass'y, antenna stage (Bands 1, 2 & 5)	44B381	R-12,45	22,000 ohms 1/2 watt, carbon	23X20X223K
C-4	Trimmer Ass'y, antenna stage (Bands 3 & 4)	44B379	R-14,48	150 ohms 1/2 watt, carbon	23X20X151K
C-5,33,34, 52,57, 63,68	220 mmf. 500 V., ceramic	47B20221K5	R-15,46,60	10,000 ohms 1 watt, carbon	23X30X103K
C-6,10,19, 67	2 x 4,000 mmf. 450 V., ceramic	47A218	R-17,21,25, 49,52,55	100,000 ohms 1/2 watt, carbon	23X20X104K
C-7	.25 mfd. 200 V., tubular	46AT254J	R-18,26	270 ohms 1/2 watt, carbon	23X20X271K
C-8,14,38, 41,58	100 mmf. 500 V., ceramic	47X20UJ101K	R-19,27	33,000 ohms 1/2 watt, carbon	23X20X333K
C-9,12,17, 18,21,22, 23,25,26, 31,64,65,	5,000 mmf. 450 V., ceramic	47A168	R-20	47,000 ohms 1 watt, carbon	23X30X473K
**C-11,13	300 mmf. 500 V., mica	47X20B301J	R-22	1000 ohms 1/2 watt, carbon	23X20X102M
C-15	47 mmf. 500 V., ceramic	47X20UK470K	R-23	6800 ohms 1/2 watt, carbon	23X20X682K
C-16,20,24, 30,50	.05 mfd. 600 V., tubular	46AY503J	R-29	56,000 ohms 1/2 watt, carbon	23X20X563K
C-27	Trimmer, adjustable	44A047	R-31	680 ohms 1/2 watt, carbon	23X20X681K
C-28	Capacitor, variable CRYSTAL PHASING	48A182	R-32,33	2700 ohms 1/2 watt, carbon	23X20X272K
C-29	33 mmf. 500 V., mica	47X20A330K	R-34,35,40	470,000 ohms 1/2 watt, carbon	23X20X474K
C-32	.25 mfd. 600 V., tubular	46AX254J	R-36	180,000 ohms 1/2 watt, carbon	23X20X184K
C-35	Trimmer Ass'y, mixer stage (Bands 1, 2 & 5)	44B382	R-37	82,000 ohms 1/2 watt, carbon	23X20X823K
C-36	Trimmer Ass'y, mixer stage (Bands 3 & 4)	44B380	R-38,50,59	220,000 ohms 1/2 watt, carbon	23X20X224K
C-37	15 mmf. 500 V., ceramic	47X20UJ150K	R-43	Resistor, variable, 500 ohms, S-METER ADJUSTMENT	25C022
C-39	2.2 mmf. 450 V., ceramic	47A160-4	R-47	Resistor, 2500 ohms 10 watts, wirewound	24BG252D
C-40,49	25 mmf. 500 V., ceramic	47X20UK250K	R-51	39,000 ohms 1/2 watt, carbon	23X20X393K
C-42	Trimmer Ass'y, oscillator stage (Bands 1 & 2)	44B383	R-53	Resistor, variable, 500,000 ohms, VOLUME control	25B604
C-43,44,45	Trimmer Ass'y, oscillator stage (Bands 3, 4, & 5)	44A378	R-54	15 megohms 1/2 watt, carbon	23X20X156K
**C-46	2200 mmf. 500 V., mica	47X30D222J	R-56	Resistor, variable, 500,000 ohms, TONE control	25B589
**C-47	910 mmf. 500 V., mica	47X30D911J	R-57,58	560 ohms 1 watt, carbon	23X30X561K
**C-48	1500 mmf. 500 V., mica	47X30D152G	R-61,62	6.8 ohms 1 watt, carbon	23X30X068K
C-51	.1 mfd. 200 V., tubular	46AU104J	R-63	27,000 ohms 1/2 watt, carbon	23X20X273K
C-54	.02 mfd. 200 V., tubular	46AU203J	R-65	47,000 ohms 2 watts, carbon	23X40X473K
C-55	10 mmf. 500 V., ceramic	47X20UK100K	R-67	100 ohms 1/2 watt, carbon	23X20X101K
C-56	1 mfd. 50 V., electrolytic	45A163	TRANSFORMERS AND COILS		
**C-59	Capacitor, temperature compensator	44A158	T-1	Transformer, antenna stage, band 1	51B1088
**C-60	.01 mfd. 600 V., moulded	46X35X103M	T-2	Transformer, antenna stage, band 2	51B1089
C-61	60-20 mfd. 450 V., & 20 mfd. 400 V., electrolytic	45B113	T-3	Transformer, antenna stage, band 3	51B1090
C-62,70	.01 mfd. 600 V., tubular	46AY103J	T-4	Transformer, antenna stage, band 4	51B1091
C-66	1 mmf. 450 V., ceramic	47A160-2	T-5	Transformer, antenna stage, band 5	51B1092
C-69	470 mmf. 500 V., mica	47X20B471J	T-6	Transformer, 1st IF (2.075 MC)	50C414
RESISTORS			T-7,8	Transformer, 1st and 2nd IF (455 KC)	50C416
R-1,30	10 ohms 1/2 watt, carbon	23X20X100K	T-9	Transformer, 3rd IF (455 KC)	50C415
R-2,13	15 ohms 1/2 watt, carbon	23X20X150K	T-10	Transformer, FM detector	50C418
R-3,41	1 megohm 1/2 watt, carbon	23X20X105K	T-11	Transformer, mixer stage, band 1	51B1093
R-4,44	82 ohms 1/2 watt, carbon	23X20X820K	T-12	Transformer, mixer stage, band 2	51B1094
R-5	Resistor, variable, 10,000 ohms, SENSITIVITY control	25B582	T-13	Transformer, mixer stage, band 3	51B1095
R-6	8200 ohms 1/2 watt, carbon	23X20X822K	T-14	Transformer, mixer stage, band 4	51B1096
R-7,39,66	2.2 megohms 1/2 watt, carbon	23X20X225K	T-15	Transformer, mixer stage, band 5	51B1097
R-8	2200 ohms 1/2 watt, carbon	23X20X222K	T-16	Transformer, osc. stage, band 5	51B1160
R-9	330,000 ohms 1/2 watt, carbon	23X20X334K	T-17	Transformer, osc. stage, band 4	51B1101

* Used on universal model SX-71U only.

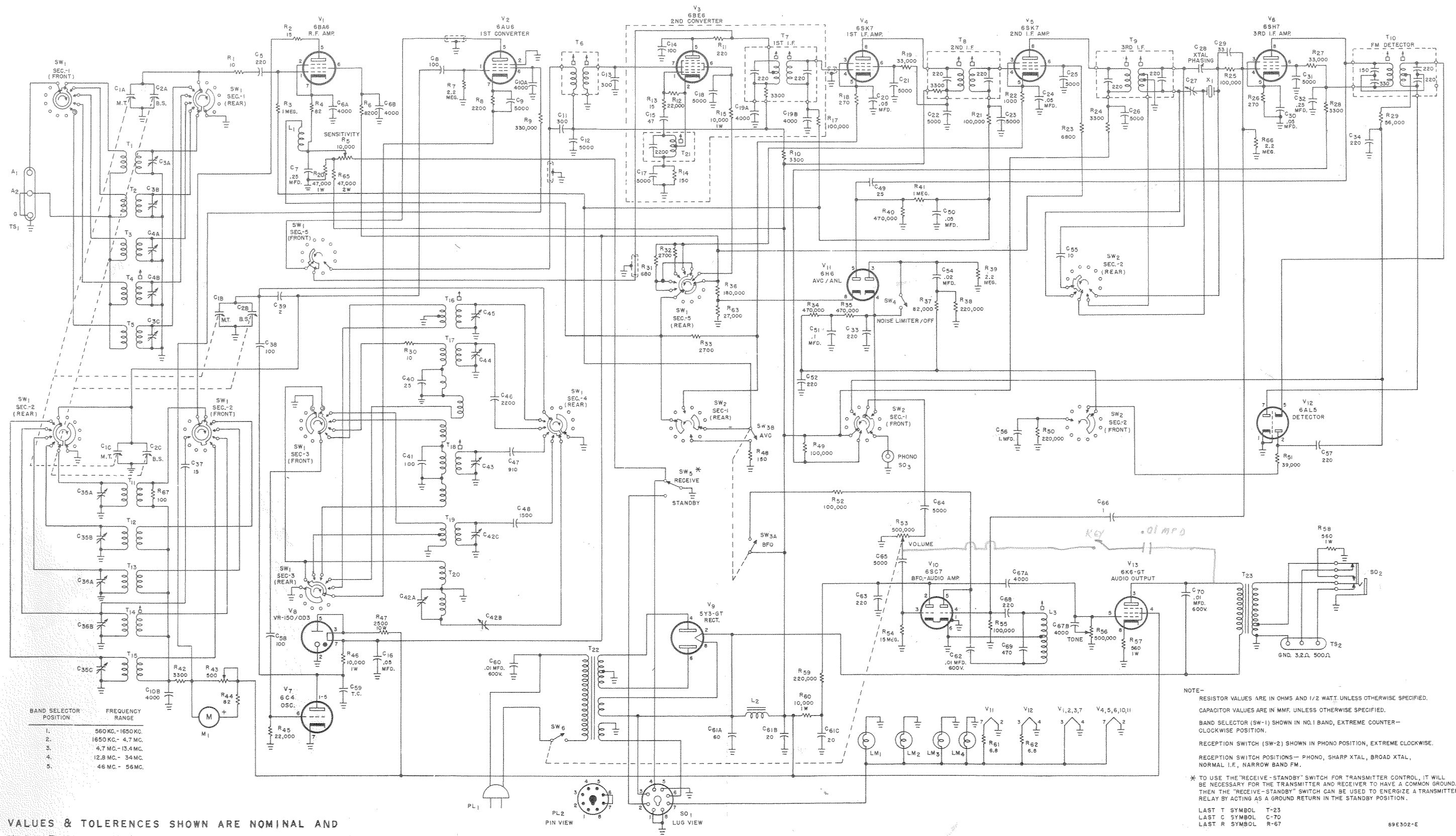
** Use exact replacement part only.

SERVICE PARTS LIST (Cont.)

Ref. No.	Description	Manufacturer's Part Number	Ref. No.	Description	Manufacturer's Part Number
TRANSFORMERS AND COILS (Cont.)			TUBES, RECTIFIERS AND LAMPS (Cont.)		
T-18	Transformer, osc. stage, band 3	51B1100	V-10	Type 6SC7, 1st audio amplifier and beat frequency oscillator	90X6SC7
T-19	Transformer, osc. stage, band 2	51B1099	V-11	Type 6H6, automatic volume control and automatic noise limiter	90X6H6
T-20	Transformer, osc. stage, band 1	51B1098	V-12	Type 6AL5, detector	90X6AL5
T-21	Transformer, 2.53 MC osc. stage, bands 3, 4 and 5	50C448	V-13	Type 6K6GT, audio output	90X6K6GT
T-22	Transformer, power	52C174	LM-2,3	Lamp, carrier level meter light GE #44	39A003
*T-22	Transformer, power (Universal)	52C175	LM-1,4	Lamp, main dial scale light GE #47	39A004
T-23	Transformer, output	55B120-C	MISCELLANEOUS		
L-1	Choke, RF	53A107	TS-1	Terminal strip, antenna	88A032
L-2	Choke, filter	56B107-B	TS-2	Terminal strip, speaker	88B578
L-3	Coil, BFO	54B039	M-1	Escutcheon, meter	7B124-D
SWITCHES				Meter, carrier level (5 ma)	82B166
SW-1	Switch, BAND SELECTOR			Plate, dial drive mounting	63D415
	Section 1 (Antenna stage) and Section 2 (Mixer stage)	62B051		Bracket, pulley mounting	67A1140
	Section 3 (Osc. grid)	62B049		Pulley, small idler	28A078
	Section 4 (Osc. plate)	62B050		Pulley, large idler	28A079
	Section 5 (Converter plate and bias)	62B048		Cord, dial	38A019
SW-2	Switch, RECEPTION	60B343		Spring, dial cord	75A173
SW-3	Switch, BFO-OFF	60A285		Pointer, bandspread and main tuning	82A169
SW-4	Switch, NOISE LIMITER-OFF	60A138		Scale, dial	83D358-E
SW-5	Switch, RECEIVE-STANDBY	60A139		Window, dial	22B305-A
PLUGS AND SOCKETS				Plate, window support	63A450
PL-1	Line Cord	87B1573		Flywheel, bandspread and main tuning	71A178
PL-2	Plug, AC shorting	35A003		Drum, bandspread and main tuning gang drives	28A080
SO-1	Socket, POWER (DC operation)	6B296		Shaft, bandspread and main tuning pulley drives	74A298
SO-2	Jack, PHONES	36A036		Shaft, bandspread and main tuning gang drives	74A299
SO-3	Jack, PHONO	36B048		Ring, retainer, tuning assembly drive shafts	76A552
	Socket, octal (tube)	6B296		Ring, retainer, tuning assembly pulley shafts	76A551
	Socket, octal (tube) with center shield	6A315		Washer, spring	4A043
	Socket, miniature	6A347		Coupling, bandspread gang shaft	29A126
	Socket, tuning dial scale lamps	86B092		Coupling, main tuning gang shaft	29A123
	Socket, carrier lever meter dial lamps	86B091		Shaft and index plate, band switch	74B267
TUBES, RECTIFIERS AND LAMPS				Collar, band switch	77A055
V-1	Type 6BA6, RF amplifier	90X6BA6		Lock, line cord	76A397
V-2	Type 6AU6, 1st converter	90X6AU6		Knob, BANDSPREAD and MAIN TUNING	15A047
V-3	Type 6BE6, 2nd converter	90X6BE6		Knob, CRYSTAL PHASING	15A087
V-4,5	Type 6SK7, 1st and 2nd IF amplifiers	90X6SK7		Knob, CW PITCH	15A089
V-6	Type 6SH7, 3rd IF amplifier	90X6SH7		Knob, POWER-VOLUME, TONE and SENSITIVITY	15A097
Y-7	Type 6C4, oscillator	90X6C4		Knob, BAND SELECTOR	15B209
V-8	Type VR-150/OD3, voltage regulator	90XVR-150/OD3		Knob, RECEPTION	15A212
V-9	Type 5Y3GT, rectifier	90X5Y3GT		Foot, rubber	16A007
			X-1	Crystal, 455 KC	19A123

* Used on universal model SX-71U Only.

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.



VALUES & 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. 10. Schematic diagram