Communication Receiver Model SX104

Mark 1



Fig. 1. Model SX104

SPECIFICATIONS

Tubes and Rectifiers...8 tubes and 1 selenium rectifier Speaker 5 inch PM Voice Coil Impedance 3.2 ohms Headphone Output Impedance......50-5000 ohms Antenna...........Vertically polarized whip or doublet Frequency Coverage30 to 50 MC Dimensions (overall)..... 7-1/2" High x 13" Wide x 8-3/4" Deep

SQUELCH RANGE CONTROL ADJUSTMENT

The Squelch Range control (Figure 3) adjusts the operating point of the output section of the 12AU7 squelch tube (V-8). This control has been carefully adjusted at the factory for proper operation and will normally not

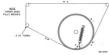


Fig. 2. Dial Cord Stringing Diagram

require readjustment unless the squelch tube, relay, or components in the squelch circuit have been replaced. If adjustment is necessary, proceed as follows:

- 1. Connect a DC milliammeter (0-15 ma) in series with the squelch relay, RY-1, in the plate circuit of the squelch tube, V-8.
- 2. Set the Volume control at maximum, the Squelch Range control fully clockwise (minimum resistance) and the Squelch control on the front panel fully counterclockwise (maximum resistance) but not at "Off".
- 3. Tune the receiver to noisy part of the band where no signal is present.
- 4. With no signal tuned in, slowly rotate the Squelch Range control counterclockwise until the noise is just squelched (disappears). At this point the relay contacts are closed and the grid of the audio output tube is shorted to ground. Note the plate current reading of the squelch tube (should be anywhere from 6.5 to 10.25 ma), and then continue to advance the Squelch Range control until the plate current drops 2 ma from that obtained at the point of squelch. This is the proper setting of the Squelch Range control.

If a milliammeter is not available, the Squelch Range control can be "roughly" set by adjusting the Squelch Range control to the point of squelch as outlined above and then advancing the control 650 farther counterclockwise.

CRYSTAL OPERATION

The Hallicrafter Model SX104 is designed for crystal use, although crystals are not supplied with the receiver. It is advantageous to use this feature if considerable use of some particular frequency is expected. By selecting the proper crystal to cover the desired frequency, more stable reception of this frequency will be attained. Select the crystal you want, according to the formulas which follow, and insert it in the crystal socket located on the chassis base, just to the left of the autoformer near the front panel. Set the operation switch to the crystal position and tune in the frequency desired. The following formulas should be used for selecting the proper crystal:

SX104 Crystal Frequency = Signal frequency desired (MC) + 10.7 MC 3rd Mode Crystal - Low End 29 MC - High End 51 MC Range of Crystal = 39.7 MC to 61.7 MC

ALARM CONNECTIONS

On the back of your receiver are two terminals marked ALARM. Connecting a bell on light alarm circuit to these terminals will permit visual or audible notification when a signal is on the air. Whatever alarm circuit

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- Use a 10.7 MC signal generator, either amplitude modulated or unmodulated.

 Adjust generator output to maintain a one volt readmodulated.

 Adjust generator output to maintain a one volt readmodulated.
- modulated or unmodulated. ing on YTVM.

 Connect high side of generator through a .01 mfd.
 capacitor to pin 7 of V-2; connect low side to troi at "Off".
- Set function switch to tunable position
 See Figure 3 for location of alignment adjustments.
- Connect DC probe of VTVM to pin 2 of V-5; common lead to chassis. Adjust B, C, D, E, and F for maximum output.
- 2. Connect two 470,000 ohm resistors in series between pin 2 of V-5 and the chassis. Connect DC probe of VTVM to junction of R-10 and C-16; common lead to center tap of the two 470,000 ohm resistors. Adjust A for zero reading between a positive and negative peak. The two peaks should have approximately the same amplitude. If not, readjust B slightly and then touch up A.

RF ALIGNMENT

- Use a signal generator either amplitude modulated or unmodulated which covers 33 MC and 49 MC.
- Connect high side of generator through a 270 ohm resistor to terminal "A" on antenna terminal strip on rear of chassis; low side to terminal "G".
- Use a non-metallic alignment tool.
 Set function switch to tunable position.

 Connect DC probe of VTVM to pin 2 of V-5; common lead to chassis.

is used must be self-powered as the receiver provides

only the necessary switching to actuate the alarm. The

alarm circuit should be of low voltage (24 volts or less).

To turn the receiver off, rotate the Volume control fully

counterclockwise, until a click is heard.

- Adjust generator output to maintain a one volt reading on VTVM.
- Set Volume control at maximum and Squelch control at "Off".
 See Figure 3 for location of alignment adjustments.
- Set generator and receiver dial to 49 MC and adjust G, then H, and then I for maximum output. When adjusting I, "rock" tuning capacitor slightly.
- 2. Check calibration at low end of receiver by setting generator and receiver dial to 33 MC. A calibration adjustment its usually not necessary and should not be made unless the oscillator coil on the top front of the tuning gang has been replaced. If adjustment is required, the oscillator coil lead connected to the chassis should be ussoldered and its length varied until maximum output is obtained at 33 mc.

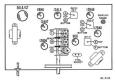
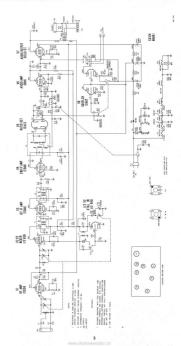


Fig. 3. Tube Location and Alignment Adjustments



SERVICE PARTS LIST

chematic Symbol	Description	Part Number	Schematic Symbol	Description Part 2	Number Symbol	Description Part Nu
	CAPACITORS			RESISTORS (cont)		MISCELLANEOUS (cost)
1 2	330 mmf. 10% N750 4	7CA25331K/D	8.21	12K ohm 10% 1/2w, 233203	K125K	Cover, cabinet 66A1489
12 19	500V, fixed ceramic,					Dial glass & 22-543
21	Durez dip		9.22	Variable, squelch 258111	14	calibration
1A 1	M. in Tuning Gang 4	18P/391		control		Escutcheon 7A657
B.C	at in running Gang 4	and an	n 22	1200 chm 10% 1/2w, 2532203	v1999	Foot, rubber 16A007
B, C	.001 mid. GMV 4	70310	W-44	fixed comp	N. F. S. SEC.	Gasket, dial 12A042
17	fixed ceramic disc	18440	0.05	470 ohm 10% 1/2w, 253203	NATIN'	Gasket, cover 12A044
	51 mmf. 10% NT50, 4	THE PARTY OF THE P	R-40	410 dilli 105 1/44, someon	04119	Grommet, nylon plasti, 2B2432
0,20	fixed ceramic	1 AZOUKSTUBŲ D		fixed comp Variable, Squelchadj. 25A111		(spacer, cabinet)
- 1	lixes ceramoc		R-20	variable, Squeschies). 2004111	1.0	Grommet, nylon plasti, 23:2462
7	33 mmf. 5% 500V, 4 fixed ceramic	1X25CG3300	H-27	10K ohm 10% 2w 23X42X fixed comp	KIUSK.	(spacer, front panel)
						Grommet, mylon plasti, 2212464
8,9,	.005 mtd. 20% 4	TA168	R-28	15 ohm 10% 1w 233(30)	K130K	(spacer, dial plate)
11, 13,	fixed ceramic disc			fixed comp		Instruction book 94X1669
15, 24,			R-29	220 ohm 10% 2w, 25 X423	K221 K	Insulator, switch 8A1206
29, 32,				fixed comp		Insulator strip 8C1628
33, 34			R-30	470 ohm 10% lw, 233(303	KATIK	(chassis rear)
10, 18,	.01 mid. GMV, 4	7A224		fixed comp		
20, 22,	fixed ceramic disc		R-31	270 ohm 10% lw, 24BWZ	712	Insulator, mounting \$A3592
27				fixed wirewound		board (squeich control)
14	2 mfd. 50VDC, 4	5B192				Insulator, mounting 8A3593
						board (volume control)
16	220 mmf. 5% N750 4	7332UK221J				Insulator feet \$A3710
				TRANSFORMERS AND COILS		Insulator, dial plate 823718
234	60-40-40 mid. @ 4	(5B091				back
B,C,	150V. 20 mfd. @		L-1	Coll, antenna 512223	32	Insulator, cabinet EC3720
D	25V, electrolytic		1-2	CHL R.F 51B222	33	back
	5 mmf. NT50 ±120 4	17,681	L-3	Coil, oscillator 51B221	12	Knob, main tuning 15B802
6911111	PPM, fixed ceramic		T-1	Transformer, 1st I.F. 50C515	9	Knob, control, volume 15B816
99	330 mmf. 5% 300V, 4	F7Y20C331.1	T-2	Transformer, 2nd I.F. 50C517		squeich, crystal/
	fixed silver mica		T-3	Transformer, Ratio 50C518		manual
203	4-20 mmf., variable	64A115		det.		Line cord 87B4948
	ceramic trimmer	PARTITO	T-4	Transformer, output., 55A127	7	Lock, Line Cord 76A397-1
21	.047 mid. 600V, 4	16004771 G	T.5	Autoformer		(male)
34	fixed tubular plastic	PUBLISHO				Lock, Line Cord 76A397-1
	more caputar peasure					
						Medallion, "h" 7A669
				TUBES AND RECTIFIERS		trademark
						Panel, front 68A546
			SR-1	Rectifier, Selenium 27A156	8	Plate, dial 63A2341
				150 MA		Pointer, indicator 82B321
			PI-1.2.	Lamp, pilot 39A003	3	Pulley 28A052-1
	RESISTORS		W-1	Tube, Electron, 90X128	RD6	Receptacle AC line 10A975
				type 12BDtr 1	mer s	Relay, D.C. (squelch) . 21B302
1	68 ohm 10% 1/2w, 2	3X20X680K	V-9	Tube, Electron, 90X5U	9 21-1	Ring, retaining 76A1052
	fixed comp			type 608		Shaft, extension 74A1288
2	33K ohm 10% 1/2w, 2	.3X20X333K	V-3.4	Tube, Electron, 90X129	PAS	Shaft, tuning 74A1254
	fixed comp			type 128A6		Shaft, funing 14A1254
	10K ohm 10% 1/2w, 2	JXZ0X1G3K	V-5	Tube, Electron, 90X12/	A1.5	Shield, tube
	fixed comp			type 12AL5		Shield, audio stage 69B694
i	3300 ohm 10% 1/2w, 2	23X20X332K	V-6	Tube, Electron, 903EE	and.	ocieto, austo stage toBto4
	fixed comp			Type Grand		Socket, pilot lamp 86B299 Socket, 9 ptn. wafer 6A401
5,6,	1000 ohm 10% 1/2w, 2	23 X 20 X 10 2 K	V-7	Tube, Electron, 90X501		
			*	type 50L6/GT		Socket, 7 pin, water 6B402
T. 10 .	100 ohm 10% 1/2w, 2	23X20X101K		Tube, Electron, 90X12s	4.177	Socket, crystal 6A417
18 19	fixed comp		V-0	type 12AUT	AUI	Socket, octal 6A296
9 15	1 megohm 10% 1/2w, . 3	23 X20 X 10 6 K		type IZAUI		Spacer, dial clip 16A126
						Spring, dial cord 75A012
12	47K ohm 10% 1/2w 1	23 X20 X473K				Strip, sponge rubber 16A047-1
	fixed comp			MISCELLANEOUS		(adhesive)
12	Variable, volume	55A1425			TS-1	Strip, antenna88A809
	control			Baffle, Speaker 31B974	4 TS-3	Strip, alarm88A809
	2.2 meg 10% 1/2w, 2	23 X20 X225 K		Bracket, Dial plate 67A420		Strip, phone terminal. 88A510
	fixed comp			Bracket, switch 67A430		
14		12 V20 V274 V		mounting	8-2	Part of R-22 squelch,
14	270% shee 100 1/2m 1			Bushing, tuning shaft , 77A133		
14	270K ohm 10% 1/2w 2					Switch, crystal/ 60A823
14	270K ohm 10% 1/2w, 1					
14	2TOK ohm 10% 1/2w, 1 fixed comp 4TOK ohm 10% 1/2w,			Cabinet		manual tuning
14 16, 24. 17	2TOK ohm 10% 1/2w, i fixed comp 4TOK ohm 10% 1/2w, i fixed comp	23X20X474K		Clip, dial glass 76A390	0	
14 16, 24. 17	2TOK ohm 10% 1/2w, 1 fixed comp 4TOK ohm 10% 1/2w,	23X20X474K		Cabinet	0 18-1	manual tuning Speaker 5" PM85-196 Plate, cabinet back63-2616