

Communication Receiver Model SX105 Mark 1



Fig. 1. Model SX105

SPECIFICATIONS

Tubes and Rectifiers.....	10 tubes and 1 selenium rectifier
Speaker	5 inch PM
Voice Coil Impedance.....	3.2 ohms
Headphone Output Impedance.....	50-5000 ohms
Antenna Input Impedance	300 ohms
Antenna	Vertically polarized whip or doublet
Intermediate Frequency	10.7 MC
Power Supply	105-125 volts 60 cycle AC
Frequency Coverage	152 to 173 MC
Dimensions (overall).....	7-1/2" x 13" x 8-3/4" deep
Net Weight	12 Lb.
Shipping Weight	14 Lb.

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

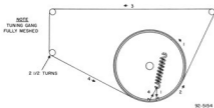


Fig. 2. Dial Cord Stringing Diagram

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 65° farther counterclockwise.

CRYSTAL OPERATION

The Hallicrafters Model SX105 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 auto-former 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:

$$\text{SX105 Crystal Frequency} = \frac{\text{Signal Frequency (MC)} - 10.7 \text{ MC}}{6}$$

3rd Mode Crystal - Low End 150 MC - High End 174 MC
 Range of Crystal = 23.216 MC to 27.216 MC

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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

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.

IF ALIGNMENT

- Use a 10.7 MC signal generator, either amplitude modulated or unmodulated.
 - Connect high side of generator through a 0.1 mfd. capacitor to pin 7 of V-2; connect low side to chassis.
 - Set function switch to tunable position.
1. 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.
- 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.

RF ALIGNMENT

- Use a signal generator either amplitude modulated or unmodulated which covers 156 MC and 170 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.
1. Set generator and receiver dial to 170 MC and adjust G and then H for maximum output. When adjusting H, "rock" tuning capacitor slightly.
 2. Check calibration at low end of receiver by setting generator and receiver dial to 156 MC. A calibration adjustment is usually not necessary and should not be made unless the oscillator coil on the top front of the tuning gang has been damaged or bent. If adjustment is required, the frequency can be increased by compressing the coil or decreased by expanding the coil.
- Connect DC probe of VTVM to pin 2 of V-5; common lead to chassis.
 - 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.

CRYSTAL ALIGNMENT PROCEDURE

After crystal covering the desired frequency (see section on crystal selection) has been inserted in the crystal socket, proceed with alignment as follows:

1. Turn the Function switch to Xtal position.
2. Set tuning dial pointer to approximate frequency of the desired signal.
3. Turn the Receiver on its left side, and insert a 6U5 tube in the socket visible at right hand front of chassis bottom.
4. Turn on Receiver and adjust slugs in "J" and "K" for maximum closing of the tuning eye.

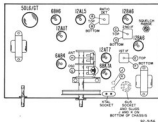


Fig. 3. Tube Location and Alignment Adjustments

SERVICE PARTS LIST

Schematic Symbol	Description	Part Number	Schematic Symbol	Description	Part Number	Schematic Symbol	Description	Part Number
CAPACITORS			RESISTORS (cont)			MISCELLANEOUS (cont)		
C-1, 2, 3	330 mfm. 500V, 10% ...	47CA2531K/D	R-25...	Variable, (sequelch)...	25A1113	Cabinet	.....	65A1480
4, 12	Ceramic tubular		R-26...	10k ohm 10% 1/2w, comp.	23X24X103K	Clip, pilot light mig.	.....	79A090
20, 22			R-27...	22 megohm 10% 1/2w, comp.	23X20X226K	Clip, dial glass	.....	76A390-0
C-5A, B	Variable, (main tuning)	48C302	comp			Cover, cabinet	.....	65A1489
C-5, 33...	2.5-13 mfm. ceramic	46A415	R-28, 31	22k ohm 10% 1/2w, comp.	23X20X226K	Dial glass & calib.	.....	22-544
C-7...	33 mfm. 500V, 9% ...	47X35C230J	comp			Etchutch	.....	7A057
NPD			R-29...	15 ohm 10% 1w, comp.	23X30X150K	Foot, rubber	.....	16A007
C-8, 10...	.01 mfd. 500V	47A224	R-30...	100 ohm 10% 2w, comp.	23X24X101K	Gasket, dial	.....	12A042
13, 18, 21, 23			R-31...	47 ohm 10% 2w, ww.	24B4V70E	Grommet, nylon/plasti.	2B-2432	(spacer cabinet)
C-9, 11...	.005 mfd. 500V, 20% ...	47A168	R-32...	270 ohm 10% 1w, ww	24BW271E	Grommet, plasti	.....	2B244
14, 19,	ceramic disc					Spacer, dial plate	.....
25, 34,						Grommet, elasti	.....	2B2452
40, 35,						(spacer, front panel)	.....
35, 42,						Instruction book	.....	94C1669
43						Insulator strip (rear...)	.....	10-128
C-15...	2 mfd. 50V	45B192				Insulator (sequelch)	.....	8A3092
C-16...	220 mfm. 500V, 10% ...	47X32U4221K				control)	.....
N750						Insulator (volume)	.....	8A3093
C-17, 38...	.001 mfd. 500V GMV	47B230				control)	.....
44, 45	ceramic disc					Insulator (crystal)	.....	8A3094
C-25A, B,	60-40-40 @ 150 - 20 ...	44-091				Insulator, stabilizer	.....	8A3703
C, D	@ 25V, electrolytic					Insulator (foot)	.....	8A3710
C-25, 27...	.55 mfm. 30% gilmnick	47B403-13				Insulator, dial plate	.....	8B3716
C-29...	10 mfd. 130V	44-067				back	.....
C-30, 37...	51 mfm. 500V, 10% ...	47X20UK510K/D				Insulator, cabinet back	8C3730	
ceramic tubular						Knob, main tuning	.....	15B802
C-31...	43 mfm. 500V, 10% ...	47X30U430K				Knob, control, volume	15B816	
N750, ceramic tubular						sequelch crystal/manual	.....	.....
C-32...	.001 mfd. style 325	47A676				tuning	.....	87D4848
standoff						Line cord	.....	.....
C-38...	24 mfm. 500V, 10% ...	47X20UK240K/D				Lock, line cord (male)	76A397-1	
N750, ceramic tubular						Lock, line cord	.....	76A397-2
C-39...	27 mfm. 500V, 10% ...	47X20UK270K/D				(female)	.....	.....
N750, ceramic tubular						Medallion "h" trade-	.....	7A069
C-41...	.047 mfd. 600V	45BR473L5				mark	.....	.....
molded paper						Panel, front	.....	88A547
						Plate, dial mtg.	.....	83A2341
						Pointer, Indicator	.....	82A321
						Pulley-Idler	.....	26A952-7
						Receptacle, AC line	.....	10A375
						Reel	.....	213502
						Ring, retaining	.....	76A1052
						Shaft, tuning	.....	74A1254
						Shield, plate	.....	69D511
						Shield, audio stage	.....	69D594
						Spacer, tuning eye	.....	73A1505
						Spacer, dial clip	.....	16A126
						Speaker, wafer 8 pin	.....	8A401
						Socket, wafer 7 pin	.....	4B462
						Socket, (crystal)	.....	8A417
						Switch, 3PDT slide	.....	60A243
						Switch, rotary (stal	.....	60A823
						Co-GF)	.....	.....
						Terminal strip (phones)	86A510	
						Gasket, cover	.....	12A044
						Pad, felt	.....	14-165
						Screen Vent	.....	14-415
						Strip, sponge rubber	.....	15-047-1