SERVICE INSTRUCTIONS

94X1667
1156

Communication Receiver Model SX105
Mark 1

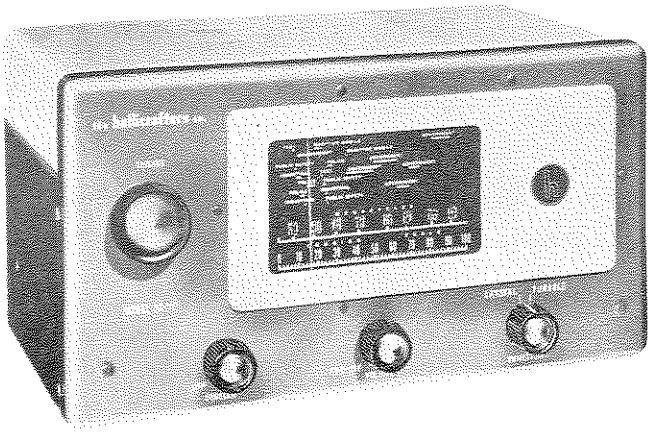

Fig. 1. Model SX105

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 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.

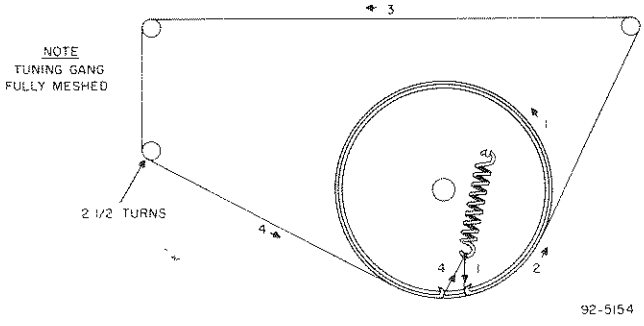

Fig. 2. Dial Cord Stringing Diagram

CRYSTAL OPERATION

The Hallicrafter 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 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:

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

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

the hallicrafters co.
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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.
- 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.

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.

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.
- 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.

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.

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.

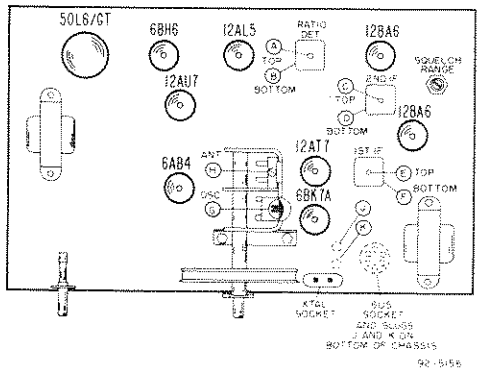
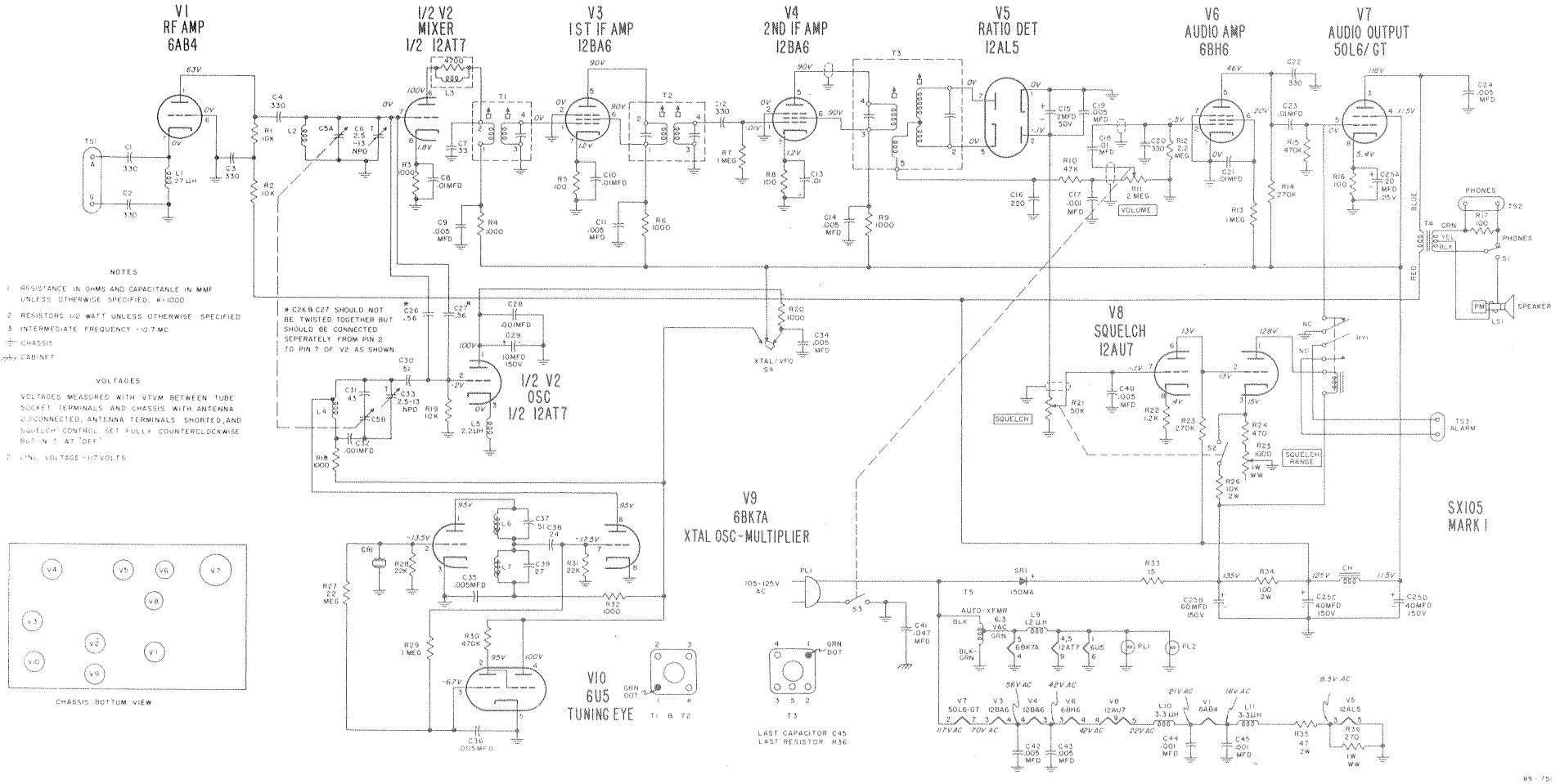


Fig. 3. Tube Location and Alignment Adjustments


V1
RF AMP
6AB4
1/2 V2
MIXER
1/2 12AT7
V3
1ST IF AMP
12BA6
V4
2ND IF AMP
12BA6
V5
RATIO DET
12AL5
V6
AUDIO AMP
6BH6
V7
AUDIO OUTPUT
50L6/GT
V8
SQUELCH
12AU7
V9
6BK7A
XTAL OSC-MULTIPLIER
V10
6U5
TUNING EYE
1/2 V2
OSC
1/2 12AT7
VOLUME
SQUELCH
SQUELCH RANGE
PHONES
SPEAKER
XTAL/VFO
S4
SX105
MARK I
NOTES
1 RESISTANCE IN OHMS AND CAPACITANCE IN MMF UNLESS OTHERWISE SPECIFIED. K=1000
2 RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED
3 INTERMEDIATE FREQUENCY = 10.7 MC
CHASSIS
CABINET
* C26 & C27 SHOULD NOT BE TWISTED TOGETHER BUT SHOULD BE CONNECTED SEPERATELY FROM PIN 2 TO PIN 7 OF V2 AS SHOWN
VOLTAGES
VOLTAGES MEASURED WITH VTVM BETWEEN TUBE SOCKET TERMINALS AND CHASSIS WITH ANTENNA DISCONNECTED, ANTENNA TERMINALS SHORTED, AND SQUELCH CONTROL SET FULLY COUNTERCLOCKWISE BUT IN S-1 AT "OFF"
LINE VOLTAGE = 117 VOLTS
CHASSIS BOTTOM VIEW
LAST CAPACITOR C45
LAST RESISTOR R36

SERVICE PARTS LIST

Schematic Symbol	Description	Part Number
	CAPACITORS	
C-1,2,3, 4,12, 20,22	330 mmf. 500V, 10% Ceramic tubular	47CA25331K/D
C-5A,B.	Variable, (main tuning)	48C392
C-6,33.	2.5 - 13 mmf. ceramic	44A415
C-7.	33 mmf. 500V, 5% NPO	47X25CJ330J
C-8,10, 13,18, 21,23	.01 mfd. 500V	47A224
C-9,11, 14,19, 24,34, 40,35, 39,42, 43	.005 mfd. 500V, 20% ceramic disc	47A168
C-15.	2 mfd. 50V	45B192
C-16.	220 mmf. 500V, 10% N750	47X32UK221K
C-17,28; 44,45	.001 mfd. 500V GMV ceramic disc	47B230
C-25A,B, C,D	60-40-40 @ 150 - 20 @ 25V, electrolytic	45-091
C-26,27.	.56 mmf. 20%, gimmick	47B403-13
C-29.	10 mfd. 150V	45-097
C-30,37.	51 mmf. 500V, 10% ceramic tubular	47X20UK510K/D
C-31.	43 mmf. 500V, 10% N750, ceramic tubular	47X20UJ430K
C-32.	.001 mfd. style 325 standoff	47A676
C-38.	24 mmf. 500V, 10% N750, ceramic tubular	47X20UK240K/D
C-39.	27 mmf. 500V, 10% N750, ceramic tubular	47X20UK270K/D
C-41.	.047 mfd. 500V molded paper	43BR473L6
	RESISTORS	
R-1,2,	10k ohm 10% 1/2w comp.	23X20X103K
R-3,4,6, 9,18, 20,32	1000 ohm 10% 1/2w, comp	23X20X102K
R-5,8,16, 17	100 ohm 10% 1/2w comp	23X20X101K
R-7,13, 29	1 megohm 10% 1/2w comp	23X20X105K
R-10.	47k ohm 10% 1/2w. comp	23X20X473K
R-11.	Variable (volume)	25A1425
R-12.	2.2 megohm 10% 1/2w, comp	23X20X225K
R-14,23.	270k ohm 10% 1/2w. comp	23X20X274K
R-15,30.	470k ohm 10% 1/2w. comp	23X20X474K
R-21.	Variable, (squelch & On-Off)	25B1114
R-22.	1.2k ohm 1/2w 10% comp	23X20X122K
R-24.	470 ohm 10% 1/2w. comp	23X20X471K

Schematic Symbol	Description	Part Number
	RESISTORS (cont)	
R-25.	Variable, (squelch)	25A1113
R-26.	10k ohm 10% 2w, comp	23X42X103K
R-27.	22 megohm 10% 1/2w, comp	23X20X226K
R-28,31.	22k ohm 10% 1/2w, comp	23X20X223K
R-33.	15 ohm 10% 1w, comp	23X30X150K
R-34.	100 ohm 10% 2w, comp	23X42X101K
R-35.	47 ohm 10% 2w, ww	24BV470E
R-36.	270 ohm 10% 1w, ww	24BW271E
	TRANSFORMERS AND COILS	
CH-1	Choke, (power)	56A263
L-1.	Coil, Antenna	51A1894
L-2.	Coil, RF Mixer	51A1472
L-3.	Choke, RF	53A239
L-4.	Coil, RF Oscillator	51B2246
L-5.	Choke, RF (2.2 Microhenries)	53A238
L-6.	Coil, Crystal oscillator	51B2245
L-7.	Coil, Crystal oscillator doubler	51B2244
L-9.	Choke, Filament (1.2 Microhenries)	53-412
L-10,11.	Choke, Filament (3.3. Microhenries)	53A240
T-1.	Transformer, 1st IF.	50C519
T-2.	Transformer, 2nd IF.	50C517
T-3.	Transformer, Ratio Detector	50C518
T-4.	Transformer, Output.	55B127
T-5.	Transformer, Autotransformer	52C479
	RECTIFIERS AND TUBES	
V-1.	Tube, Electron, Type 6AB4	90X6AB4
V-2.	Tube, Electron, Type 12AT7	90X12AT7
V-3,4.	Tube, Electron, Type 12BA6	90X12BA6
V-5.	Tube, Electron, Type 12AL5	90X12AL5
V-6.	Tube, Electron, Type 6BH6	90X6BH6
V-7.	Tube, Electron, Type 50L6	90X50L6
V-8.	Tube, Electron, Type 12AU7	90X12AU7
V-9.	Tube, Electron, Type 6BK7A	90X6BK7A
	Lamp, Pilot	39A003
SR-1.	Rectifier, Selenium	27A158
	MISCELLANEOUS	
	Baffle, speaker	31B974
TS-1.	Strip, terminal ant.	88A809
TS-3.	Strip, terminal alarm	88A809
	Bracket, dial plate	67A4205
	Bushing, tuning shaft	77A1338

Schematic Symbol	Description	Part Number
	MISCELLANEOUS (cont)	
	Cabinet	41X50234
	Clip, pilot light mtg	76A660
	Clip, dial glass	76A390-0
	Cover, cabinet	41X40019
	Dial glass & calib	22-544
	Escutcheon	7A657
	Foot, rubber	16A007
	Gasket, dial	12A042
	Grommet, nylon plasti (spacer cabinet)	2B-2432
	Grommet, plasti (spacer, dial plate)	2B2464
	Grommet, plasti (spacer, front panel)	2B2462
	Instruction book	94X1669
	Insulator strip (rear chassis flange)	8-1628
	Insulator (squelch control)	8A3692
	Insulator (volume control)	8A3693
	Insulator (crystal switch)	8A3694
	Insulator, stabilizer	8A3703
	Insulator (foot)	8A3710
	Insulator, dial plate back	8B3718
	Insulator, cabinet back	8C3720
	Knob, main tuning	15B802
	Knob, control, volume squelch crystal/manual tuning	15B816
	Line cord	87B1668-1
	Lock, line cord (male)	76A397-1
	Lock, line cord (female)	76A397-2
	Medallion "h" trade-mark	7A669
	Panel, front	68A547
	Plate, dial mtg.	63A2341
	Pointer, Indicator	82A321
	Pulley-Idler	28A052-7
	Receptacle, AC line	10A975
RY-1	Relay	21B302
	Ring, retaining	76A1052
	Shaft, tuning	74A1254
	Shield, plate	69B611
	Shield, audio stage	69B694
	Spacer, Tuning eye	73A1505
	Spacer, dial clip	16A126
LS-1.	Speaker, 5" PM	85C196
	Spring, dial cord	75A912
	Socket, pilot lamp	86B299
	Socket, (5 pin)	6A054
	Socket, octal	6A296
	Socket, wafer 9 pin	6A401
	Socket, wafer 7 pin	6B462
	Socket, (crystal)	6A417
S-1.	Switch, SPDT slide	60A243
S-4.	Switch, rotary (xtal On-Off)	60A823
TS-2.	Terminal strip (phones)	88A510
	Gasket, cover	12A044
	Pad, felt	14-166
	Screen Vent	14-415
	Strip, sponge rubber	16-047-1
	Wire, Antenna	87-767