

# Service Bulletin

from

# hallicrafters

## ANALYSIS & REMEDY

### FOR

#### SUDDEN DECREASE OF SENSITIVITY IN MODEL SX-71 RECEIVERS

Our investigation of this condition, which has been encountered in a few Model SX-71 receivers, discloses that loss of sensitivity may be caused by one or more of the following:

1. Leakage between B<sub>f</sub> and A.V.C. circuits across the terminal boards of IF transformers T-7 or T-8.
2. Gassy RF or IF amplifier tubes.
3. Intermittent 220 mmfd condensers, connected across IF transformer windings.
4. Intermittent short in oscillator coil T-21, resulting in unsatisfactory receiver operation on Bands 3 to 5.

The first receiver performance symptom when transformer leakage is encountered will be a progressive decrease of sensitivity due to grid emission from the AGC controlled tubes. Some sets may have a partial recovery if the AC power is turned off temporarily, but in most cases the grids of these tubes will continue to emit. Replacement of an RF or IF tube may temporarily restore performance but the new tube will fail immediately or in from 1/2 to 8 hours of use.

In order to detect any leakage across the bakelite terminal boards of the IF transformers T-7 and T-8, Part #500416, it should be noted that leakage resistance between the primary and secondary terminals when all leads are disconnected from the circuit must be greater than 15,000 megohms. This corresponds to a 0.2 volt (or less) reading when these terminals are connected in series with a 250 volt DC power supply and an electronic "Voltohmmyst". NOTE: To prevent meter damage, initially set VTVM to 300 volt range; then continue to lower the voltage range until meter deflection is readable. If reading indicates under 0.2 volt replace the IF transformer. In some instances, slightly higher than normal leakage (between 0.2 and 0.4 volt) can be corrected by changing resistor R-41 from 1 megohm to 220,000 ohms.

The 6BA6 tube itself may have grid emission even with no B<sub>f</sub> circuit leakage into the A.V.C. system. Tubes exhibiting this characteristic were manufactured before 1950, and they should be replaced with units of recent manufacture.



Another cause of this sudden loss in set sensitivity may be intermittent internal contact in any of the 220 mmf mica condensers across the IF transformer windings. In this case, however, transformer leakage will obviously not be apparent.

Occasionally an SX-71 may be intermitted on Bands 3 to 5 and perform satisfactorily on Bands 1 and 2. This is an indication that the trouble lies in the first converter assembly and experience has shown that the trouble can often be traced to an intermittent short at the tap on oscillator coil T-21, Part #50C448. In most cases this short can be cleared without replacement of a new unit by carefully removing and resoldering the tap and then well coating the tap and adjacent turns with coil dope.

Cordially yours,

N. J. Cooper  
General Service Manager

NJC:bv

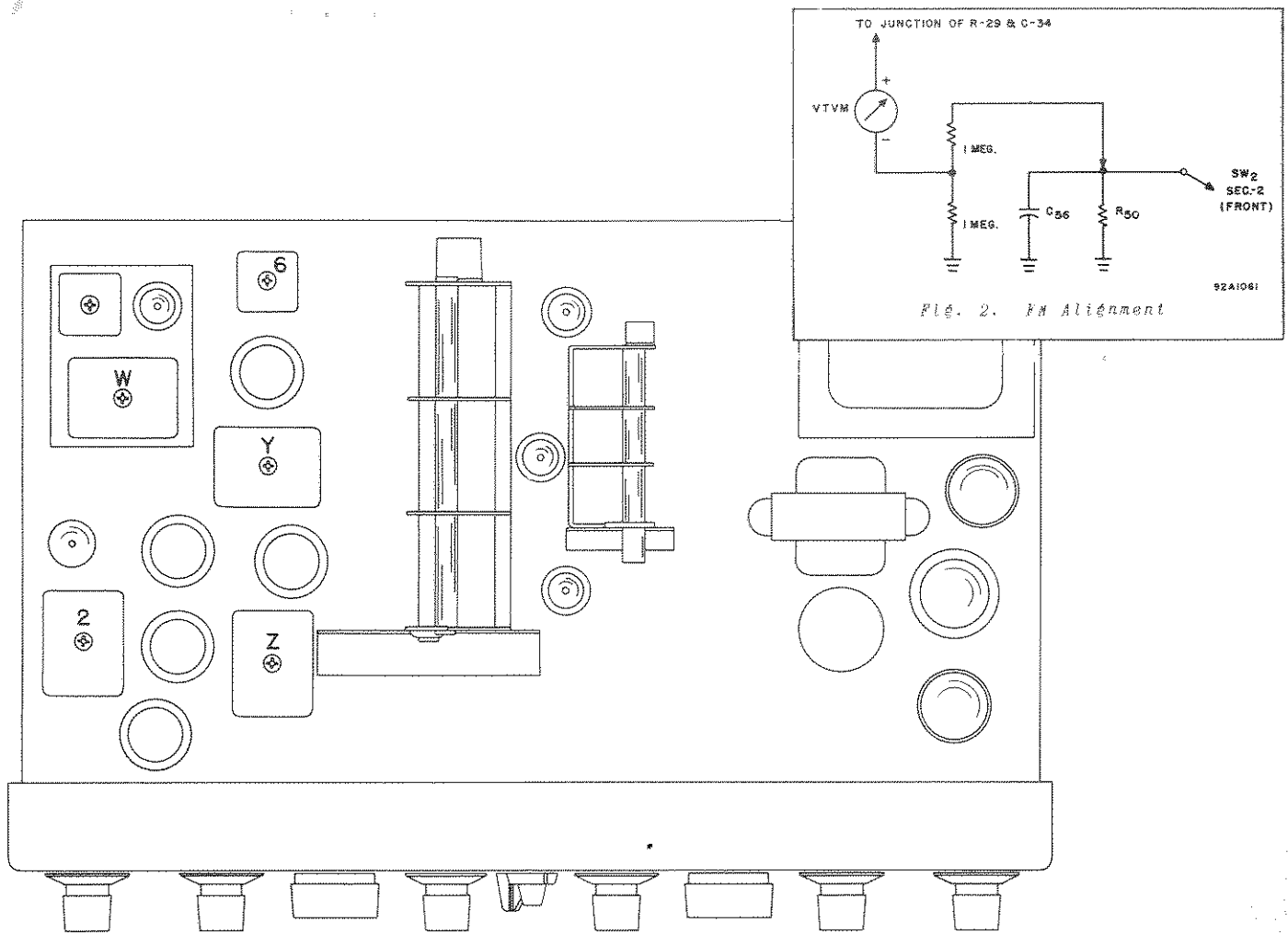


Fig. 3. Alignment adjustments, top view

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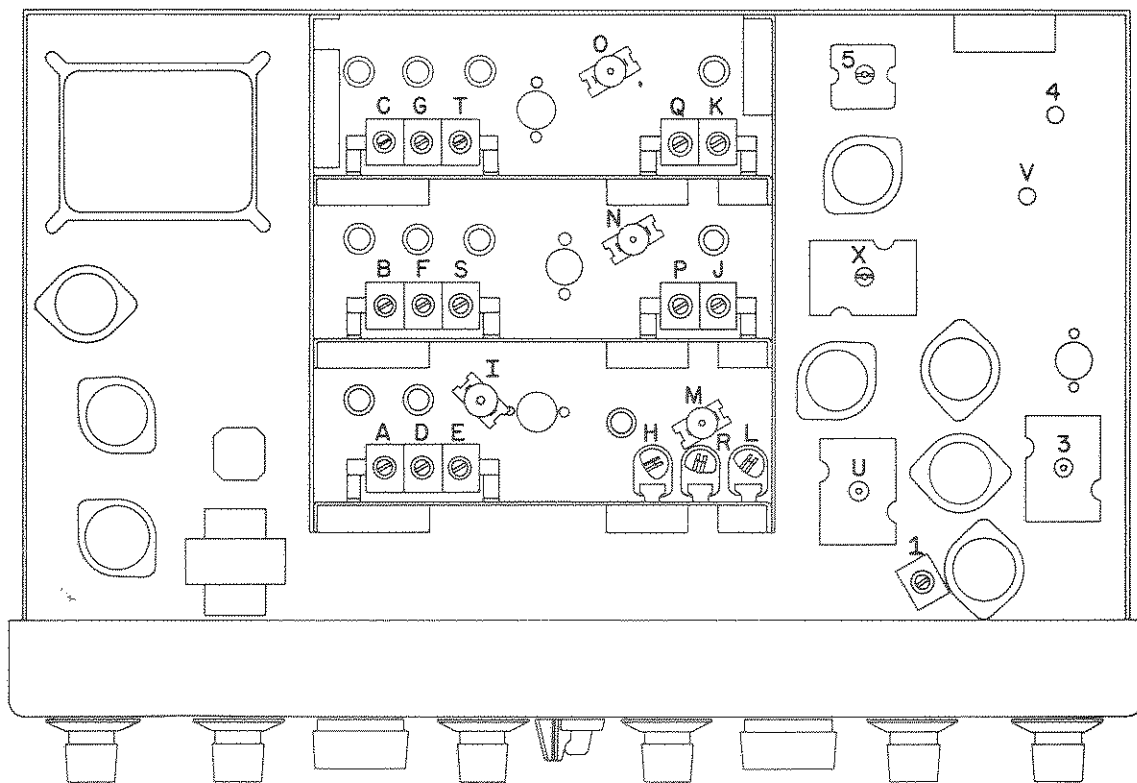


Fig. 4. Alignment adjustments, bottom view

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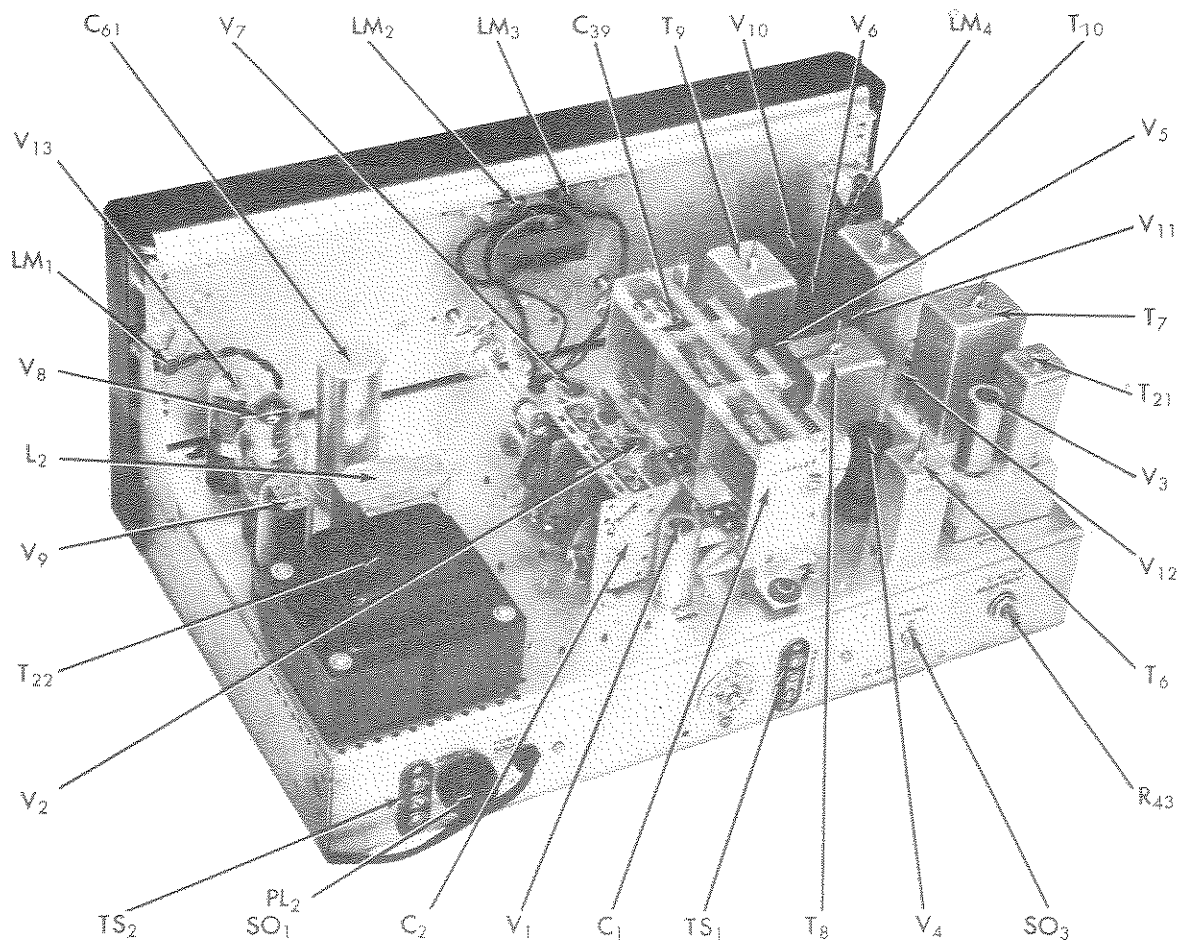


Fig. 5. Component locations, top view

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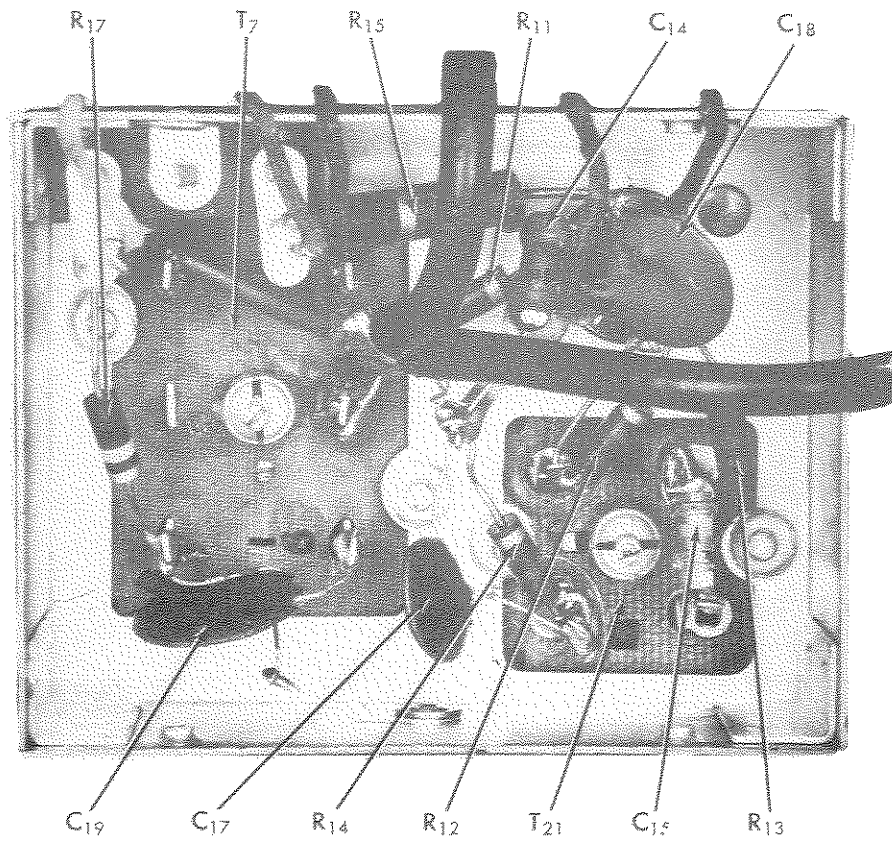


Fig. 6. Component locations, bottom view second converter unit

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 - 4	12.5 mc to 35 mc
Band - 2	1.6 mc to 4.8 mc	Band - 5	46.0 mc to 56 mc
Band - 3	4.6 mc to 13.5 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	24 X
At 6 DB down	6 kc	6 kc	6 kc	20 kc
At 20 DB down	15 kc	16 kc	15 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

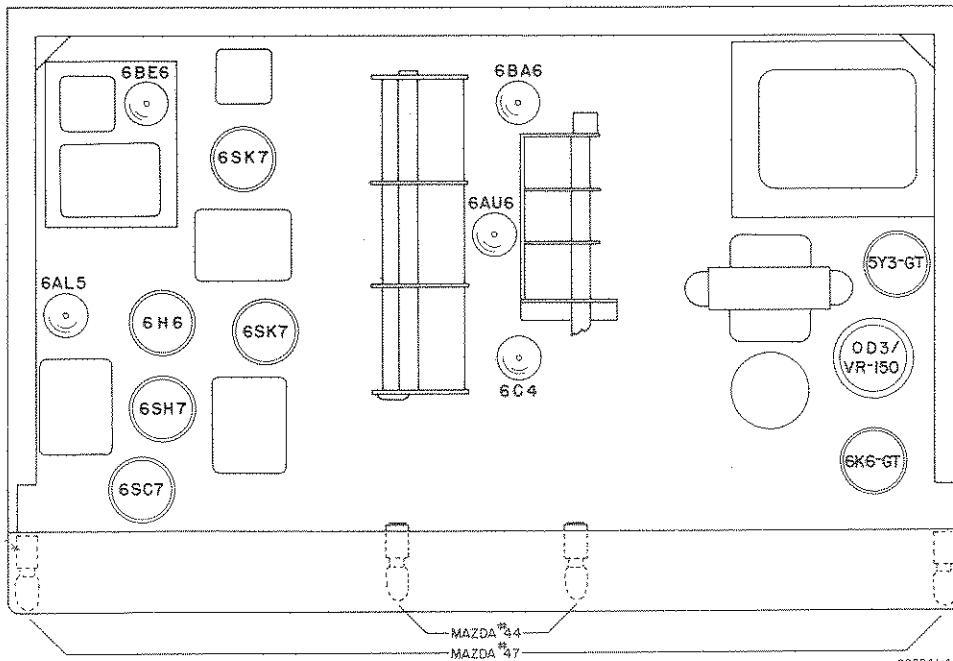


Fig. 8. Top view. Location of tubes and dial lamps