

TD-3 MICROWAVE RADIO
J68386A AND J68386B TRANSMITTER-RECEIVER BAY
RECEIVER TESTS
NOISE FIGURE

This section describes the procedures for measuring the noise figure of a radio receiver. The noise figure test should be performed in accordance with the Equipment Test List. However, if trouble has been experienced with the receiver modulator and IF preamplifier, such as diode changes, modulator, and/or preamplifier replacement, the noise figure should be measured.

The preliminary checks in Section 411-402-500 must be completed before performing the tests in this section. The recommended maintenance interval for the tests in this section is given in the Equipment Test List.

This issue affects the Equipment Test List.

Caution: *These tests are performed on an out-of-service basis. Obtain a release from the designated control office and remove the channel from service as directed by local practice.*

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CHART 1
RECEIVER NOISE FIGURE TEST
(USING THE J68392A TEST SET NOT EQUIPPED WITH A NOISE LAMP)

In the following procedure the receiver noise figure is measured without the use of a noise lamp. The receiver is set up in conjunction with the IF amplifier, IF bandpass filter, and power meter in the test set so that the inherent noise in the receiver, in the absence of any signal, will give a prescribed reading on the power meter. The gain of the overall test setup is then checked by inserting into the receiver a known RF carrier power and measuring the resulting IF output power. An out-of-limit noise figure is indicated by an out-of-limit power indication when the RF carrier is inserted.

CHART 1 (Cont)

APPARATUS:

1—J68392A Transmitter-Receiver Test Set (not equipped with a noise lamp)

STEP

PROCEDURE

- 1 Remove the KS-19748, L3 flexible waveguide ahead of the 1322-type receiver bandpass filter and install a 24A transducer on the filter. Terminate the drop arm of Z1.
- 2 Connect the test setup as shown in Fig. 1.

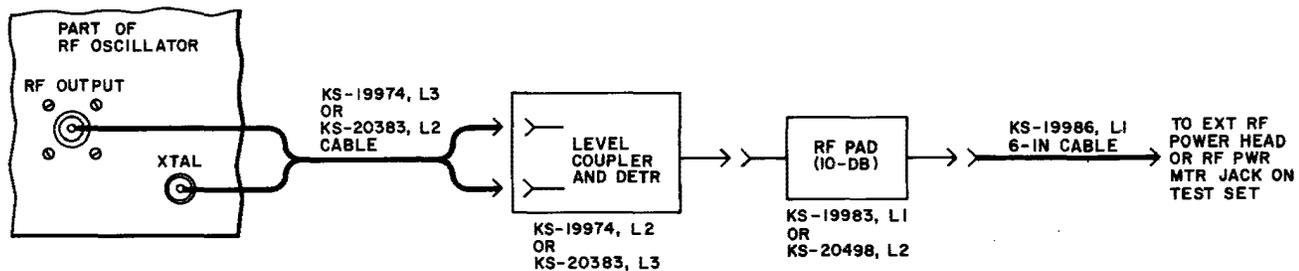


Fig. 1—RF Oscillator Output Power Adjustment

- 3 Set the RF oscillator to the CW mode and set the frequency to the receiver channel frequency (stamped on the front of the control panel door).
- 4 Note the calibrated loss of the 30-dB RF pad at 4 GHz. Add the calibrated loss to -28.0 dBm and adjust the RF output of the oscillator to obtain the resultant power.

Example: If the calibrated loss is 29.6 dB, adjust the output to obtain -28.0 dBm + 29.6 dB = $+1.6$ dBm.
- 5 Remove the RF carrier by turning the RF oscillator line switch to the STANDBY position, if provided, or to the OFF position.
- 6 Connect the test setup in Fig. 2. Make sure that all coaxial connections are tight.
- 7 Set attenuators ATTEN 1 and ATTEN 2 to 0 dB.
- 8 Operate the bay AGC pushbutton to the AGC position (lamp in switch should be extinguished).
- 9 Remove the IF cable from the IF IN jack on the AGC amplifier. (This ensures that the IF main amplifier gain will be at maximum.)

CHART 1 (Cont)	
STEP	PROCEDURE
10	<p>Adjust the test set AMPL GAIN control to obtain -10.0 dBm.</p> <p>Note: If this power is varying, check the coaxial connections and waveguide joints for tightness in the receiver front end section.</p>
11	<p>Set ATTEN 1 to 15 dB and ATTEN 2 to 40 dB and turn the RF oscillator line switch to ON.</p>
12	<p>Remove the P2BJ cord from the IF PWR MTR jack and plug it into the CTR jack. Operate the CTR switch to EXT.</p>
13	<p>Adjust the RF oscillator frequency control to obtain 70 ± 0.5 MHz on the counter.</p>
14	<p>Remove the P2BJ cord from the CTR jack and plug it into the IF PWR MTR jack.</p>
15	<p>Measure the power.</p> <p>Requirement: Between -1.4 dBm and $+2.6$ dBm for bays equipped with the J68387P receiver modulator. Between -5.4 and $+2.6$ dBm for bays equipped with the J68387C receiver modulator.</p> <p>Note: These powers correspond to maximum and minimum noise figures of 9 dB and 5 dB for bays equipped with the J68387P receiver modulators and 13 dB and 5 dB for bays equipped with the J68387C receiver modulators.</p> <p>If the requirement is met, proceed with Step 16. If the requirement is not met, refer to Section 411-404-503 (J68387P) or 411-404-504 (J68387C).</p>
16	<p>Restore all connections to normal.</p>

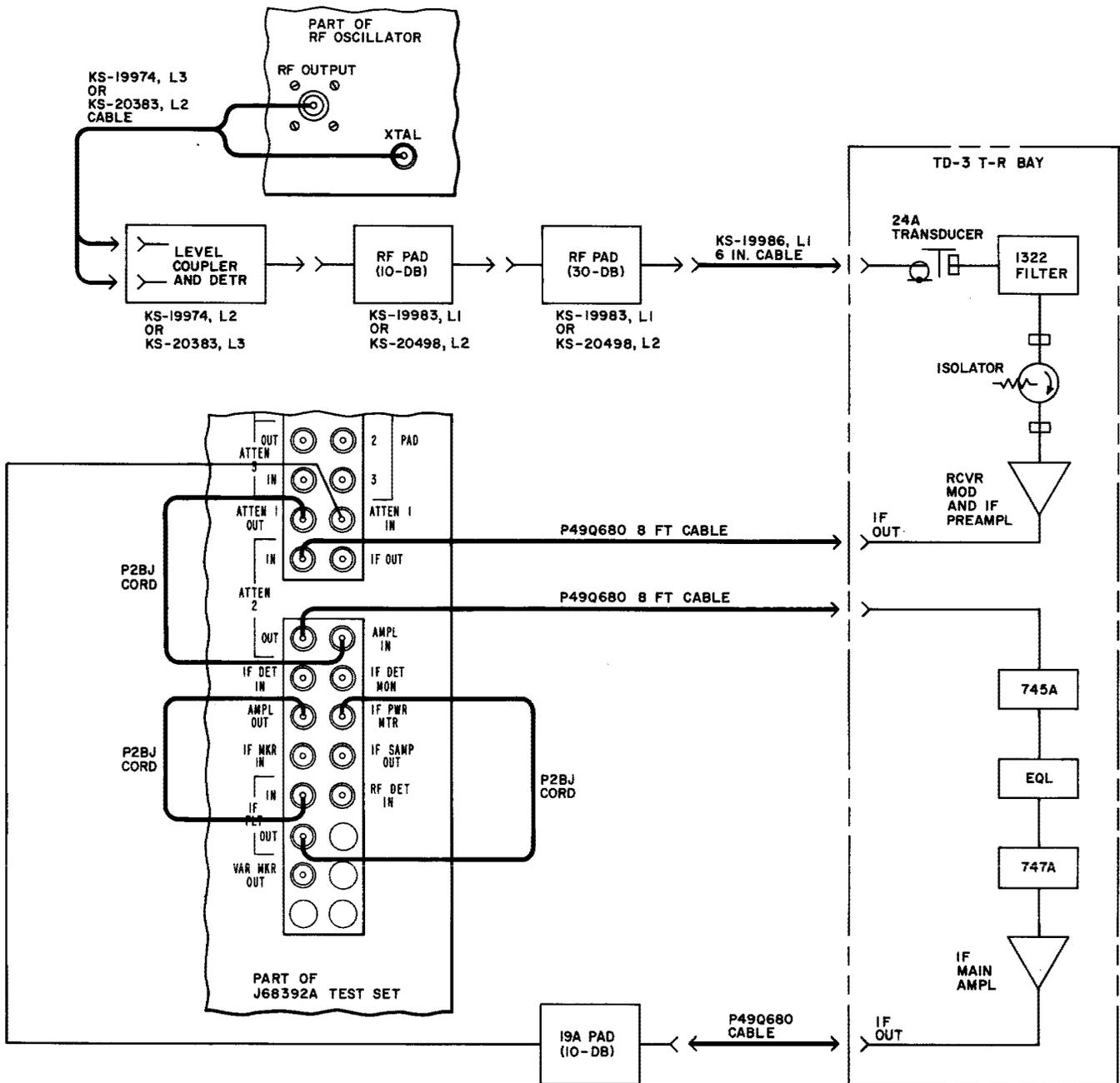
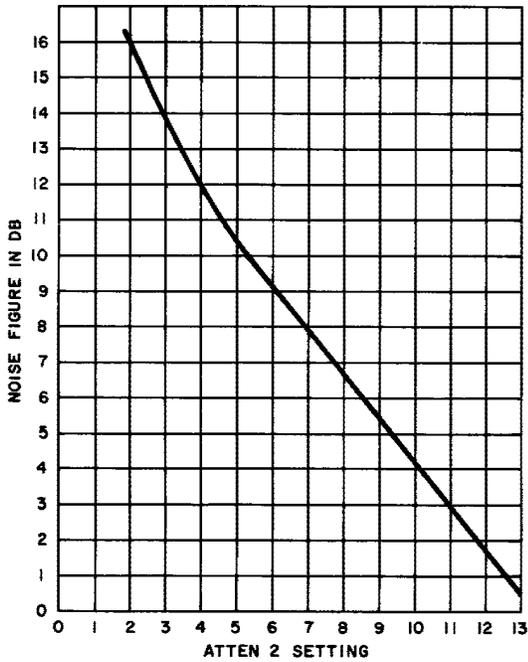
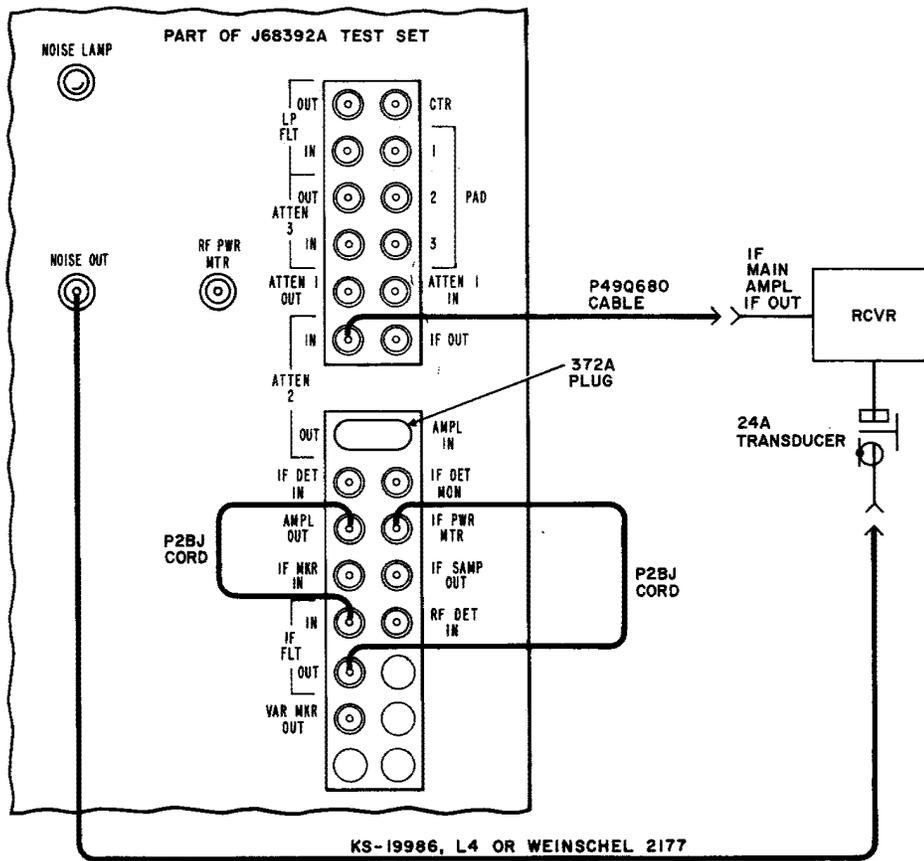


Fig. 2—Receiver Noise Figure Measurement—Using J68392A Test Set Not Equipped With a Noise Lamp

CHART 2 RECEIVER NOISE FIGURE TEST (USING THE J68392A TEST SET EQUIPPED WITH A NOISE LAMP)	
APPARATUS: 1—J68392A Transmitter-Receiver Test Set (equipped with a noise lamp)	
STEP	PROCEDURE
1	Press the AGC pushbutton on the receiver control panel to light the pushbutton indicating MANUAL gain.
2	Remove the flexible waveguide section (KS-19748, L3), located between the channel dropping network and the 1322-type bandpass filter FL1, and connect a 24A transducer to FL1. Terminate the drop arm on Z1 with a shorting plate supplied with the test set.
3	Remove the cable from the IF OUT jack of the IF main amplifier.
4	Prepare the test set in accordance with Fig. 3.
5	On the test set control panel, adjust the AMPL GAIN control for a power meter indication of -10 dBm.
6	Press the NOISE LAMP pushbutton (it lights to indicate ON).
7	Increase the setting of ATTEN 2 until the power meter again indicates -10 dBm.
8	Note the setting of ATTEN 2. Requirement: J68387P, L1 unit: 6.2 dB minimum J68387C, L1, L2 unit: 3.5 dB minimum Note: These minimums correspond to maximum noise figures of 9 dB for the J68387P modulator and 13 dB for the J68387C modulator. The actual noise figure can be found using the curve on Fig. 3, if desired. If the requirement is met, proceed with Step 9. If the requirement is not met, refer to Section 411-404-503 (J68387P) or 411-404-504 (J68387C).
9	Disconnect the test set cables from the transducer and IF OUT jack. Reconnect the bay coaxial cable to the IF OUT jack of the IF main amplifier.
10	Remove the 24A transducer and reinstall the flexible waveguide.
11	On the receiver control panel, press the AGC pushbutton and it will extinguish.
12	On the common alarm panel, clear the visual alarm by pressing the ALARM RESET button.



PREPARATION FOR TEST

1. Establish test connections as shown.
2. Set ATTEN 2 to 0.
3. Operate the controls on the test set to the following positions:

UNIT	CONTROL	POSITION
RF oscillator	LINE	OFF
Control panel	NOISE LAMP	Off (unlighted)
	AMPL GAIN	Midrange
Power meter	INPUT CHANNEL POWER RANGE DBM	IF -10

Fig. 3—Receiver Noise Figure Measurement—Using J68392A Test Set Equipped With a Noise Lamp