TD-3 MICROWAVE RADIO
TRANSMITTER-RECEIVER BAY
RECEIVER TESTS
J68387P RECEIVER MODULATOR—IF PREAMPLIFIER

This section contains the procedures to be followed in checking the J68387P receiver modulator—IF preamplifier when the requirements specified in Section 411-404-501 for diode current, return loss, gain, amplitude response, or noise figure are not met.

Caution: Before performing these tests, check that the receiver is not in service.

The following sections may be used as additional information if required:

General Test Information—411-400-500

Transmitter-Receiver Bay Level Diagram—411-400-502

Receiver Tests, Gain, and Amplitude Response—411-404-501.

CHART **PAGE**

CHART 1

DIODE CURRENT AND DIODE REPLACEMENT

APPARATUS:

1—J68392A Transmitter-Receiver Test Set

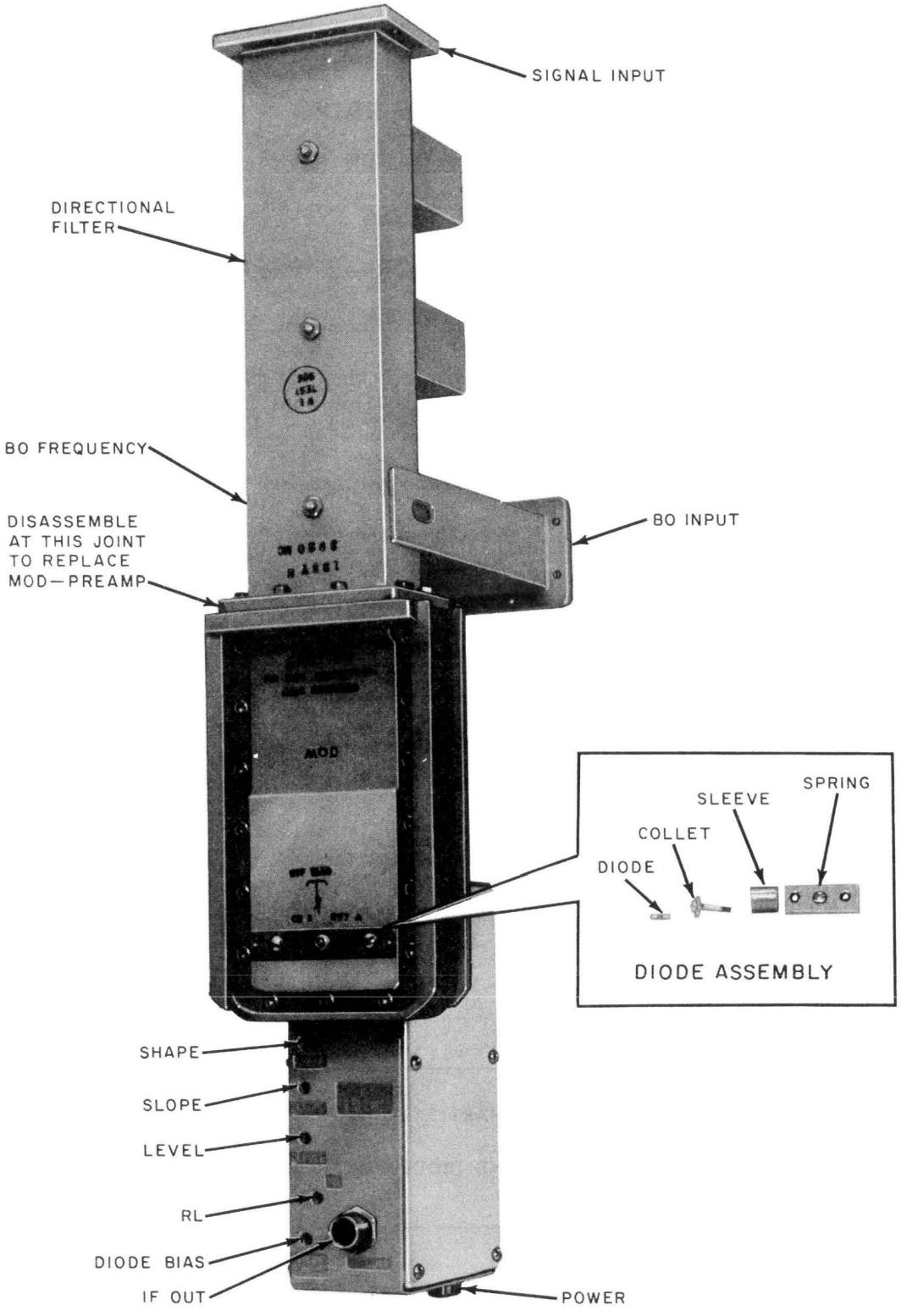

Fig. 1—J68387P, L1 Receiver Modulator—IF Preamplifier

CHART 1 (Cont)

STEP	PROCEDURE
1	If the RCVR MOD 1 requirements cannot be met, the most probable cause is the 497A diode in the modulator assembly. However, before replacing the diode, recheck both the beat oscillator (BO) level at the directional coupler and the adjustment of the DIODE BIAS control as specified in Section 411-404-501.
2	If the RCVR MOD 1 requirements still cannot be met, remove the 497A diode in accordance with the procedure in (a) through (j). Refer to Fig. 1 for identification of the parts. ***Caution: The 497A diode is a fragile device, susceptible to damage from static discharge or mechanical shock. No attempt should be made to remove the diode from the housing unless it is absolutely necessary to do so. Extreme care should be exercised in handling the diode and diode mount when removed from the modulator assembly.*** (a) Remove the two screws which attach the spring to the modulator housing. (b) Lift the spring, sleeve, and collet assembly straight out of the modulator housing. The diode should still be held by the collet. (c) Hold the sleeve, with the diode upwards, and turn the spring just enough to loosen the diode in the collet. Do not completely remove the spring from the collet. (d) Remove the diode from the collet and insert the new diode. The end ***without*** the white dot goes into the collet. (e) Seat the diode in the collet. The white dot should still be visible on the external end of the diode. (f) With the diode upwards, hold the sleeve and turn the spring to tighten the collet onto the diode. Tighten firmly ***without*** using tools. (g) Touch the spring to the modulator assembly to remove any static charge. (h) Reinsert the spring, sleeve, and collet assembly (diode first) straight into the hole in the modulator housing. ***Note:*** The screw holes of the spring should be aligned with the mounting holes before insertion of the spring assembly into the modulator housing. Rotation of the spring after the diode has been seated in the modulator may damage the internal mounting disc and/or the 497A diode. (i) Push lightly on the center of the spring assembly to seat the diode into the modulator. Note that the shoulder of the clinch nut is on the outside of the spring.

CHART 1 (Cont)

STEP	PROCEDURE
	(j) Reinsert the two mounting screws and tighten with a screwdriver. ***Note:*** A loose joint will radiate rf energy; therefore, the screws should be tightened ***firmly*** but not excessively.
3	Recheck the RCVR MOD 1 requirements in Section 411-404-501. ***Note:*** The reference bias level stamped on the modulator assembly is determined from the original diode supplied with the modulator. This level generally will not be optimum for another diode. If the replacement diode does not correct the difficulty which prompted the substitution, the original diode should be reinstalled in the modulator and the entire modulator—IF preamplifier assembly should be replaced according to the procedures given in Chart 2. The defective assembly should be returned to the maintenance center.

CHART 2

RECEIVER MODULATOR—IF PREAMPLIFIER REPLACEMENT

No provisions are made to permit replacement of the IF preamplifier unit alone. The 1337-type filter remains in the bay and a new modulator—IF preamplifier assembly is connected to it.

STEP	PROCEDURE
1	To change the modulator—IF preamplifier assembly, remove the eight waveguide screws which attach the 1337-type filter to the modulator (refer to Fig. 1).
2	Disconnect the PWR plug and remove the cable from the IF OUT jack.
3	Remove the two mounting screws from the bottom of the preamplifier housing and remove the modulator—IF preamplifier unit.
4	Reverse the procedure to install the new modulator—IF preamplifier unit.
5	Repeat the receiver modulator—IF preamplifier tests given in Section 411-404-501.
6	Return the defective modulator—IF preamplifier unit to the maintenance center.

CHART 3

GAIN AND AMPLITUDE RESPONSE

APPARATUS:

1—J68392A Transmitter-Receiver Test Set

STEP	PROCEDURE
1	If the receiver modulator—IF preamplifier unit fails to meet the gain and amplitude response requirements, one cause may be the 497A diode.
2	Replace the diode in accordance with the procedure outlined in Chart 1. Observe the notes and cautions listed there.
3	If the requirements still cannot be met, reinstall the original diode in the modulator housing and replace the modulator—IF preamplifier assembly in accordance with the instructions in Chart 2.
4	Repeat the receiver modulator—IF preamplifier tests given in Section 411-404-501.
5	Return the defective unit to the maintenance center.

CHART 4

NOISE FIGURE TESTS

APPARATUS:

1—J68392A Transmitter-Receiver Test Set

STEP	PROCEDURE
1	If the receiver modulator—IF preamplifier fails to meet the noise figure requirements, determine that the shorting plate is on the drop arm of the Z1 channel dropping network and that the microwave sweeper in the test set is turned off.

CHART 4 (Cont)

STEP	PROCEDURE
2	Inspect for and tighten any loose waveguide joints in the beat oscillator and signal paths and recheck the noise figure. *Note:* Leakage often can be detected by observing the power meter while moving a hand across waveguide flange connections and other joints.
3	If the noise figure requirement still is not met, adjust the DIODE BIAS control in each direction in increments of 1 meter division, as indicated on the control panel meter in the RCVR MOD 1 position. Measure the noise figure after each step and continue until a minimum is found.
4	If the requirement is now met, leave the control at this position and mark the new meter reading on the front panel.
5	If Step 3 does not meet the requirement, replace the diode as described in Chart 1. Retest the receiver modulator—IF preamplifier, and measure the receiver noise figure as described in Section 411-404-501.
6	Repeat Step 3 for the new diode if the noise figure requirement is not met at the original bias setting.
7	If Step 6 did not improve the noise figure, reinsert the original diode, and then replace the entire receiver modulator—IF preamplifier as described in Chart 2. Repeat the receiver modulator—IF preamplifier tests given in Section 411-404-501.
8	Return the defective unit to the maintenance center.