TD-3 MICROWAVE RADIO
J68386G AND J68386H TRANSMITTER-RECEIVER BAYS
COMMON EQUIPMENT TESTS
J68387W 40-MHZ OSCILLATOR AND SHIFT MODULATOR

This section contains procedures for further checking the performance of the J68387W 40-MHz oscillator and shift modulator (Fig. 1) when the requirements associated with this unit specified in Section 411-502-500, Common Equipment Tests—Preliminary Checks, cannot be met.

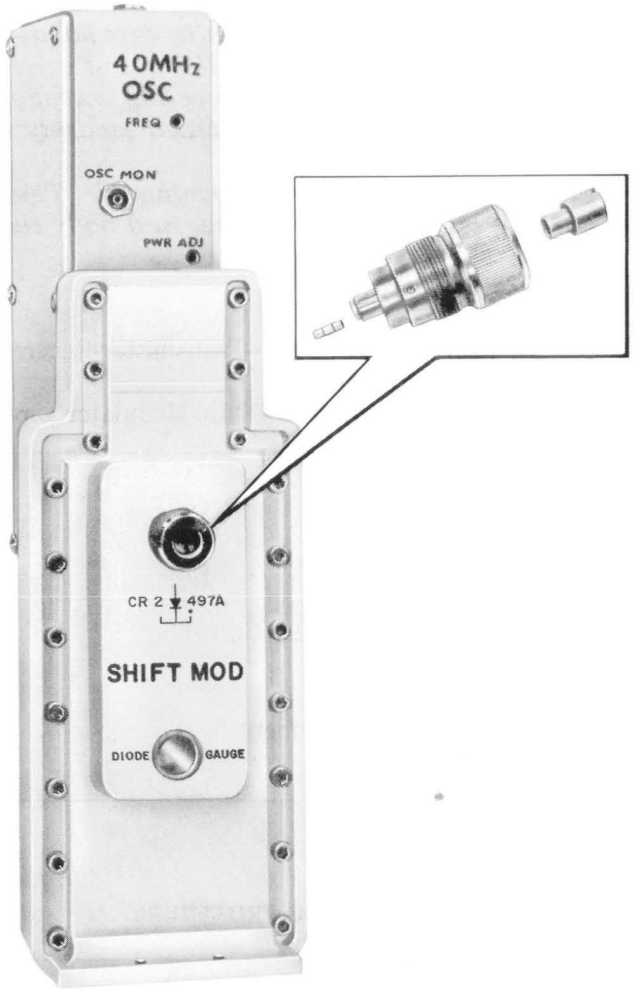

Fig. 1—J68387W 40-MHz Oscillator Shift Modulator

Chart 1 contains a troubleshooting procedure. Charts 2 and 3 give procedures for diode replacement and unit replacement, respectively.

This section is reissued to add a caution to be observed when working on a system equipped with Hot Standby/Space Diversity Switching.

This reissue does not affect the Equipment Test List.

Caution 1: These tests are to be 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.

Caution 2: ◗On Hot Standby/Space Diversity equipped bays, consult Section 411-600-500 for forced switching procedures to remove service from BOTH the transmitter and receiver. Exercise extra caution during the tests since service will be present in some waveguide and IF cabling within this bay.◖

Caution 3: When removing and replacing waveguide units, care should be exercised to prevent foreign matter from entering the waveguide. Handle all types of waveguide carefully in order to prevent damage to the mating surfaces. When connecting waveguide units, flange mating surfaces must be carefully aligned and all screws tightened securely to prevent RF leakage.

Warning: DO NOT leave energized waveguides unterminated. The RF power density that may be encountered is potentially hazardous to the eyes and body tissue.

The following drawings are related to this section:

SD-50583-01	TD-3 Radio—Application Schematic—Transmitter-Receiver Bay
SD-50586-01	TD-3 Radio—40-MHz Oscillator and Shift Modulator Circuit

CHART **PAGE**

CHART 1

TROUBLESHOOTING PROCEDURE

STEP **PROCEDURE**

Note: Perform any Steps, 1 through 4, that are pertinent to the situation.

CHART 1 (Cont)

STEP	PROCEDURE
1	If unable to meet the frequency requirement, replace the 40-MHz oscillator and shift modulator as directed in Chart 3 of this section and repeat the tests in Section 411-502-500.
2	If unable to meet the output power requirement (SHIFT MOD OUT indication), replace the diode as directed in Chart 2 of this section and repeat the tests in Section 411-502-500.
3	If still unable to meet the output power requirement after replacing the diode, replace the 40-MHz oscillator and shift modulator unit as directed in Chart 3 of this section and repeat the tests in Section 411-502-500.
4	If still unable to meet the requirements in Section 411-502-500 after performing Steps 1 through 3, the problem is probably not in the 40-MHz oscillator and shift modulator. Possible sources of trouble that could cause the 40-MHz oscillator and shift modulator to miss its requirements are listed below. **Frequency Requirement Not Met** (a) Defective counter in test set. (b) FREQ control in 40-MHz oscillator improperly adjusted. (See Section 411-502-500 for proper adjustment procedure.) (c) The −19 volt dc supply voltage requirement not met. (See Section 411-502-500.) **Output Power Requirement Not Met (SHIFT MOD OUT Indication)** (d) Controls in the 40-MHz oscillator improperly adjusted. (See Section 411-502-500 for proper adjustment procedure.) (e) P48N180 cable that connects the OSC MON jack on the 40-MHz oscillator to the CTR jack on the test set not removed from OSC MON jack. (The counter may load down the 40-MHz oscillator and reduce its output power.) (f) The −19 volt dc supply voltage requirement not met. (See Section 411-502-500.) (g) The MWV GEN OUT requirement not met. (See Section 411-502-500.) If this requirement is not met, the RF input power to the shift modulator will not be correct. (h) The detector in the 27A integrated circuit and the meter circuit may be defective. This circuit provides the MWV GEN OUT indication that monitors the RF input power to the shift modulator. See Section 411-502-505. This section provides procedures for checking the performance of this detection circuit. (i) The 70A detector and associated meter circuit may be defective. This circuit provides the SHIFT MOD OUT indication that monitors the output power from the 40-MHz

CHART 1 (Cont)

STEP	PROCEDURE
	oscillator and shift modulator. See Section 411-502-505 which provides procedures for checking the performance of the detection circuit.

CHART 2

DIODE REPLACEMENT

APPARATUS:

1—AT-7825 Screwdriver

STEP	PROCEDURE
1	Turn the RCVR PWR switch on the bay to the OFF position.
	Caution: The 497A diode is a fragile device, susceptible to damage from static discharge or mechanical shock. Extreme care should be exercised in handling the diode and diode mount while removed from the modulator assembly.
2	Unscrew the collet assembly by hand and remove the collet assembly from the modulator housing.
3	Turn the recessed slotted-head nut counterclockwise to loosen the collet that holds the diode.
4	Remove the diode from the collet.
5	Insert the replacement diode, the end with the colored dot first, into the collet leaving as much as possible of the diode exposed. Lightly tighten the collet to the diode by turning the recessed slotted nut clockwise.
6	Touch the collet assembly to the modulator housing to remove any static charge.
7	Insert the diode and collet assembly into the diode gauge machined into the front face of the modulator, and seat the assembly so that the gauge exerts pressure to seat the diode at the correct position in the collet.
8	Turning the slotted nut clockwise, tighten the collet so that the diode is held securely in the collet.

CHART 2 (Cont)

STEP	PROCEDURE
9	Remove the diode and collet assembly from the gauge.
10	Recheck the position of the diode by reinserting the diode and collet assembly into the diode gauge and checking that the diode is inserted far enough into the collet. If not inserted far enough, loosen the collet and repeat the procedure.
11	Remove the diode and collet assembly from the gauge.
12	Touch the collet assembly to the modulator housing to remove any static charge.
13	Insert the diode and collet assembly into the modulator housing and hand tighten.
14	Turn the RCVR PWR switch on the bay to the ON position.

CHART 3

40-MHZ OSCILLATOR AND SHIFT MODULATOR REPLACEMENT

APPARATUS:

1—0X1-8 Wrench (Waveguide Wrench)

STEP	PROCEDURE
	Note: This procedure describes the replacement of the entire 40-MHz oscillator and shift modulator assembly. No provision is made for replacement of the 40-MHz oscillator unit alone.
1	Turn the RCVR PWR switch on the bay to the OFF position. This will remove RF power from the waveguide port to which the unit is connected.
2	Remove the dc power plug from the unit.
3	Remove the eight waveguide screws that connect the shift modulator to the 27A integrated circuit; then remove the unit from the integrated circuit. ***Caution: Be careful not to damage the probe in the 27A integrated circuit that is exposed by the removal of the modulator unit.***
4	Reverse the procedure to install the new unit.

CHART 3(Cont)

STEP	PROCEDURE
5	Return the defective unit to the maintenance center.