TD-3 MICROWAVE RADIO
TRANSMITTER-RECEIVER BAY
COMMON EQUIPMENT TESTS
J68387D 40-MHz OSCILLATOR-SHIFT MODULATOR

This section contains the procedures to be used in checking the performance of the J68387D 40-MHz oscillator-shift modulator (Fig. 1) when the requirements specified in Section 411-404-501 are not met.

This section is reissued to add additional information to Step 4, Chart 2, to change the requirement of Step 6, Chart 2, and to correct the SD number for the TD-3 Radio—Application Schematic—Transmitter-Receiver Bay.

The purpose of this section is to outline the method of isolating and locating malfunctions which might occur and the adjustments that may be necessary to achieve the desired frequency, power output, and voltage indications on the control panel.

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

If the requirements in this section are not met; the cover of the shift modulator should be removed (Fig. 2) and replaced with an operating unit which has met the requirements. The shift modulator block should be replaced only in case of physical damage, such as a broken or bent finger of the connectors (P46Q172), or broken chuck leads (P46Q170).

The following drawings are related to this section.

SD-50549-01	TD-3 Radio—40-MHz Oscillator-Shift Modulator
SD-50564-01	Transmitter-Receiver Test Set
♦SD-50544-01	TD-3 Radio—Application Schematic—Transmitter-Receiver Bay♦

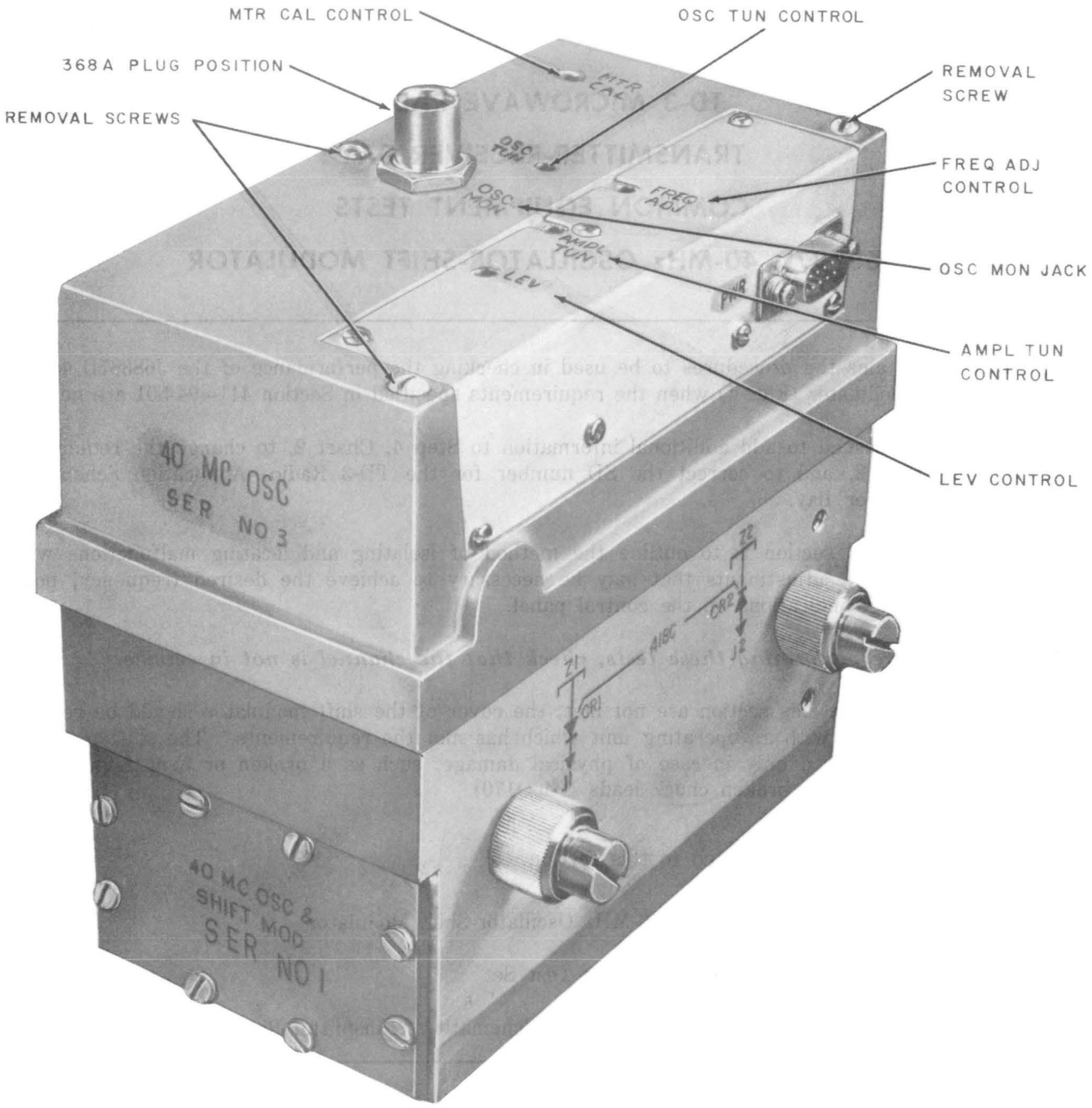


Fig. 1—40-MHz Oscillator-Shift Modulator

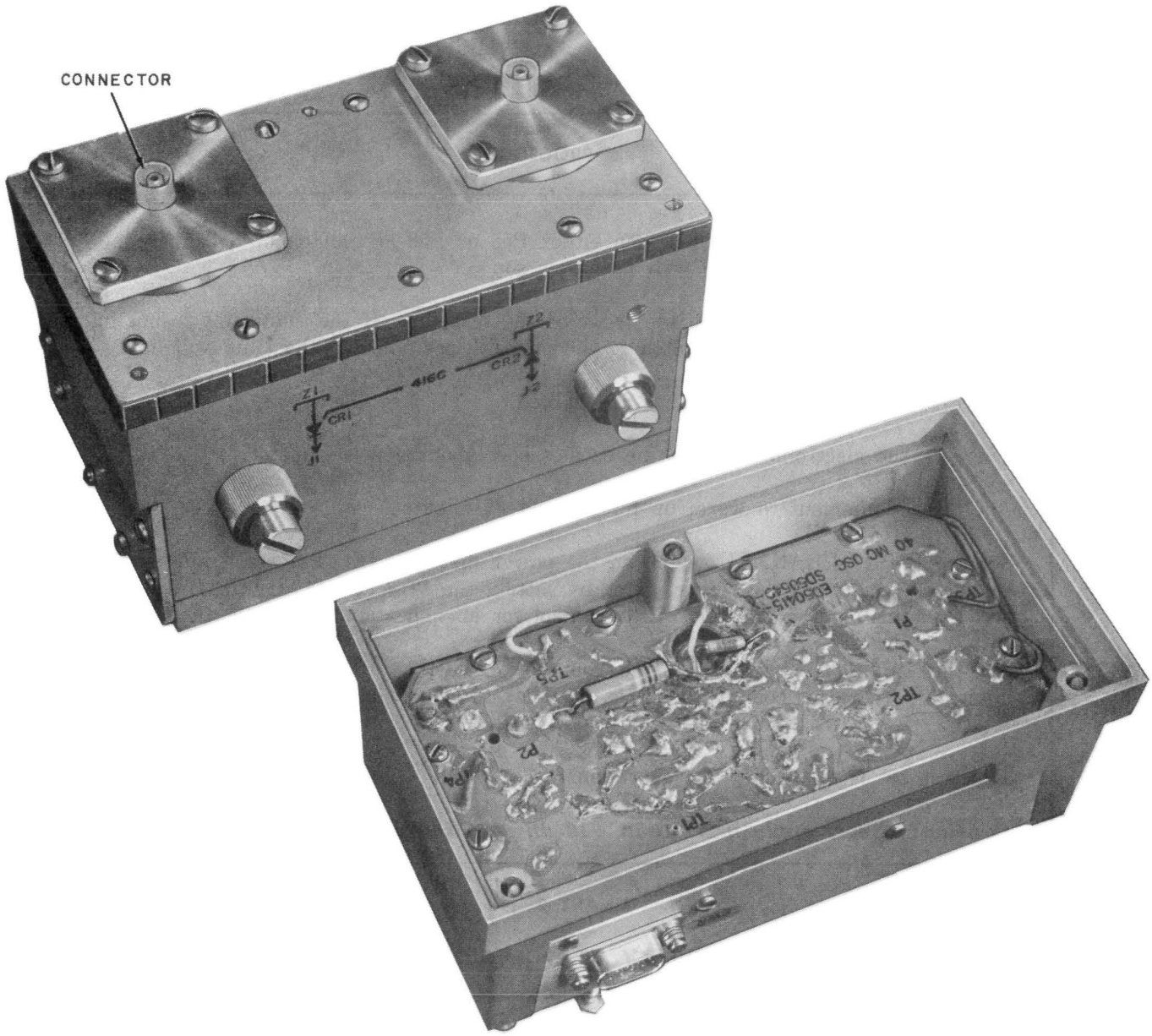


Fig. 2—40-MHz Oscillator-Shift Modulator—Cover Removed

CHART 1

INITIAL SETUP OF TEST SET

STEP	PROCEDURE
1	Connect the AC power cord between either P55 or P56 at the top or bottom rear of the test set and a convenient 117-volt ac power source.
2	Observe the pilot lamp at the top front of the test set. If the pilot lamp is not lighted, operate the adjacent toggle switch to the opposite position and the lamp will light.
3	Observe that no fuse alarm lamps are lighted.
4	Energize the electronic counter, the oscilloscope, and the power meter.
5	Allow the equipment to warm up for at least 30 minutes.
6	Set the INPUT CHANNEL switch on the power meter to IF. Determine that no input is connected, then zero the power meter by setting the POWER RANGE DBM switch to -25 and by adjusting the METER ZERO control for an indication of zero on the meter.
7	Set the FUNCTION switch on the counter to TEST. Press the RESET button, and determine that the counter indicates 1 MHz ±1 count on the last digit; then set the FUNCTION switch to the FREQ position. The test set is now ready for operation. ***Caution: Never apply more than +10 dBm to the power meter.***

CHART 2

40-MHz FREQUENCY AND POWER OUTPUT TEST

APPARATUS:

1—J68392A Transmitter-Receiver Test Set

STEP	PROCEDURE
1	Remove the shift modulator from service as outlined in Section 411-400-301.
2	Remove the 368A plug from the OSC MON jack on the 40-MHz oscillator.
3	Measure the output frequency of the 40-MHz oscillator at the OSC MON jack using the test setup in Fig. 3, option (A). ***Requirement:*** 40 MHz ±400 Hz

CHART 2 (Cont)

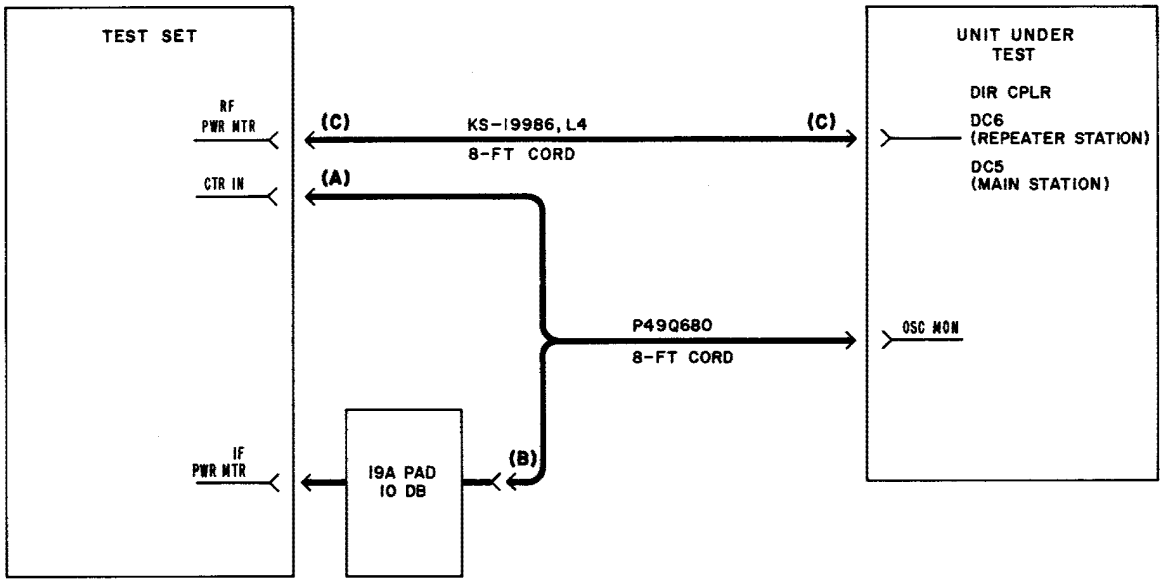
STEP	PROCEDURE
	
	Fig. 3—Frequency and Power Test Setup
4	If the requirement in Step 3 is not met, adjust the FREQ ADJ control for a frequency of 40 MHz ±20 Hz. ▶If the requirement still cannot be met, center the FREQ ADJ control and adjust the OSC TUN control slightly toward the correct frequency. Readjust the FREQ ADJ control for a frequency of 40 MHz ±20 Hz.◀
5	Make the connection in accordance with Fig. 3, option (B).
6	Observe the power meter indication. ***Requirement:*** −12.5 dBm ±0.4 dB. (This corresponds to ▶−2.5 dBm at the OSC MON jack.)◀
7	If the requirement in Step 6 is not met, turn the LEV control fully clockwise. Adjust the AMPL TUN controls for maximum power output; then adjust the LEV control for −12.5 dBm output. Recheck the output frequency per Step 3.
8	If the requirements in Steps 3 and 7 are not met, the 40-MHz oscillator must be replaced and the new unit must be tested, beginning with Step 1. The 40-MHz oscillator is removed by disconnecting the power plug and removing the three mounting screws (see Fig. 1).
9	If the requirements in Steps 4 and 6 are met, remove the test set connection and insert the 368A plug into the OSC MON jack.

CHART 3

OSCILLATOR OUTPUT MONITORING AND DIODE BIAS VOLTAGE TEST

APPARATUS:

1—J68392A Transmitter-Receiver Test Set

STEP	PROCEDURE
1	Press the SHIFT OSC pushbutton on the receiver control panel. ***Caution: The meter will not indicate with the SHIFT OSC pushbutton depressed unless the OSC MON jack is terminated with the 368A plug (see Chart 2, Step 9).***
2	Observe the indication of the meter on the control panel. ***Requirement:*** 50 ±5 divisions
3	If the requirement is not met, adjust the MTR CAL control on the 40-MHz oscillator cover for an indication of 50 divisions on the meter. ***Note:*** If the control panel meter reads full scale or greater with the SHIFT OSC pushbutton depressed, this is an indication of an open MTR CAL potentiometer within the cover and the cover must be replaced. If the meter indicates 0, the MTR CAL potentiometer may be shorted or a monitor lead may be open. In either case the cover must be replaced.
4	Press pushbutton SHIFT MOD 1 and then SHIFT MOD 2. ***Requirement:*** The indications on the meter shall be the same as recorded adjacent to the pushbuttons ±3 units.
5	If the requirement in Step 4 is not met, perform the following in sequence. (1) Check the 40-MHz level as outlined in Chart 2, Step 7. (2) Check the microwave generator output as outlined in Section 411-402-501. (3) Replace diodes CR1 and CR2. In this case, the meter indication for the SHIFT MOD 1 and SHIFT MOD 2 pushbutton positions shall be 80 ±20 units. Record the value opposite each pushbutton. ***Caution: Diodes CR1 and CR2 must be replaced as a pair. Observe the polarity marking stamped adjacent to the diode holders.***

CHART 3 (Cont)

STEP	PROCEDURE
6	For bays equipped with the J68387C receiver modulator-IF preamplifier, perform Steps 6, 7, and 11. Check the shift modulator RF output by observing the meter indication recorded adjacent to the REC MOD 1 and REC MOD 2 pushbuttons. Set the attenuator (AT2 at the repeater station and AT3 at the main station), at the output of the shift modulator, to midrange. ***Requirement:*** The REC MOD 1 and REC MOD 2 readings shall be greater than 34 units. If this requirement is not met, check the receiver modulator in accordance with Section 411-404-504. If the requirement is met, proceed to Step 7.
7	After completing Step 6, reset the AT2 or AT3 attenuator to obtain the previous REC MOD diode readings.
8	For bays equipped with the J68387P receiver modulator-IF preamplifier perform Steps 8, 9, 10, and 11. Make the connection in accordance with Fig. 3, option (C), and set attenuator (AT2 at repeater station and AT3 at main station) at the output of the shift modulator to zero loss (maximum counterclockwise postion).
9	Observe the power meter indication. ***Requirement:*** The power meter shall indicate a power level of at least -6.6 dBm.
10	Reset the AT2 or AT3 attenuator to obtain a power meter indication of -7.1 dBm.
11	Remove the test connections and restore the cap to DIR CPLR DC6 (repeater station) or DC5 (main station).