TD-3 MICROWAVE RADIO

TRANSMITTER-RECEIVER BAY

COMMON EQUIPMENT TESTS

USING KRUSE 52011 IF/RF TEST SET

J68387D 40-MHz OSCILLATOR-SHIFT MODULATOR

This appendix contains procedures used to check the performance of the J68387D 40-MHz oscillator-shift modulator (Fig. 1 in the main section) when the requirements specified in Section 411-404-501 are met.

The purpose of this appendix 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 the appendix are not met; the cover of the shift modulator should be removed (refer to Fig. 2 in the main section) 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 appendix:

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

CHART A

40-MHz FREQUENCY AND POWER OUTPUT TEST

APPARATUS:

1—Kruse 52011 IF/RF 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.

CHART A (Contd)

STEP	PROCEDURE
3	Measure the output frequency of the 40-MHz oscillator at the OSC MON jack using the test setup in Exhibit 1, option (A). *Requirement:* 40 MHz ±400 Hz
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 FREQ ADJ control for a frequency of 40 MHz ±20 Hz.
5	Make the connection in accordance with Exhibit 1, option (B).
6	Observe 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 (refer to Fig. 1 in the main section).
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 B

OSCILLATOR OUTPUT MONITORING AND DIODE BIAS VOLTAGE TEST

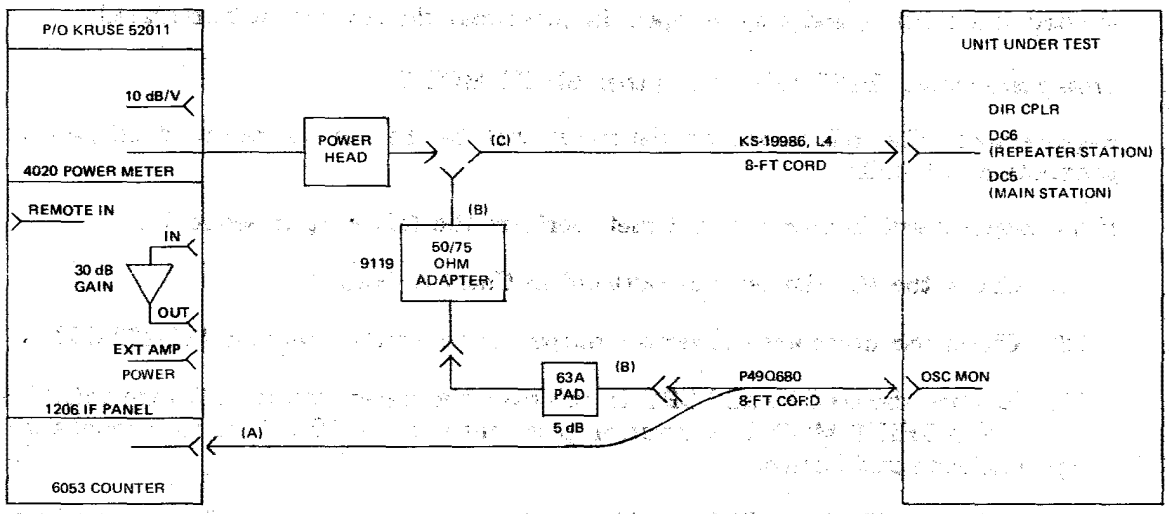
APPARATUS:

1—Kruse 52011 IF/RF Test Set

STEP	PROCEDURE
1	Press pushbutton SHIFT OSC 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 A, 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.

CHART B (Contd)

STEP	PROCEDURE
	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 A, 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.*
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 mid-range. *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 Exhibit 1, 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 position). Depress DBM 50 OHM key on power meter.
9	Observe 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).



PREPARATION FOR TEST

1. Allowing 5 minutes warm-up, operate controls on test set as follows:

4020 POWER METER	LEVEL	10 DB/V
	GROUNDING	INT
	OFFSET	MID-SCALE
COUNTER	ATTENUATOR	X1
	RESOLUTION	1K
	EXT/INT (REAR)	INT

2. Connect power meter head to CAL OUT jack. Depress DBM CAL key and adjust its control for +10.00 dBm reading. Depress ZERO key and adjust its control for 00.00 ± 0.01 reading. Depress DBM 75 OHM key.

Frequency and Power Test Setup
Exhibit 1