

SECTION 7

PERFORMANCE TESTS

7-1. GENERAL

7-2. The purpose of this section is to enable the user to verify that the counter meets specifications over the entire frequency range.

7-3. VARIABLE LINE VOLTAGE

7-4. During the performance tests the counter should be connected to the power source through a variable voltage device so that line voltage may be varied $\pm 10\%$ from nominal (115 or 230 Vac) to assure proper operation of the counter under various supply conditions.

7-5. RECOMMENDED TEST EQUIPMENT

7-6. See Table 5-1 for recommended test equipment. Other equipment may be used provided that performance is equal to, or better than, that listed in the table.

7-7. PERFORMANCE TESTS

7-8. RANGE AND SENSITIVITY — BAND IA (20 Hz to 135 MHz)

a. Set controls as follows:

(1) SAMPLE RATE: Fully counter-clockwise.

(2) BAND SELECT: 20 Hz - 135 MHz range.

(3) TIME BASE switch: Set to INT.

b. Connect signal source output to Band I input via 50 ohm shunt feedthru resistor (to terminate source).

c. Set signal level to 25 mV rms (-19 dBm into 50 ohms).

d. Vary signal from 20 Hz to 135 MHz (changing signal source as required). Counter should display correct input frequency.

7-9. RANGE AND SENSITIVITY — BAND IB (10 MHz to 300 MHz)

a. Set controls as follows:

(1) SAMPLE RATE: Fully counter-clockwise.

(2) BAND SELECT: 10 MHz - 300 MHz range.

(3) TIME BASE switch: Set to INT.

b. Connect signal source output to Band I input.

c. Vary signal frequency from 10 MHz to 300 MHz at -20 dBm (22 mV rms) power level. Counter should display correct input frequency.

7-10. RANGE AND SENSITIVITY — BAND II (100 MHz to 850 MHz)

a. Set controls as follows:

(1) SAMPLE RATE: Fully counter-clockwise.

(2) BAND SELECT: 100 MHz - 850 MHz range.

(3) TIME BASE switch: Set to INT.

b. Connect signal source output to Band II input.

c. Vary signal frequency from 100 MHz to 150 MHz at -15 dBm (40 mV rms) power level. Counter should display correct input frequency.

d. Change level to -20 dBm (22 mV rms). Vary frequency from 150 MHz to 850 MHz. Counter should display correct frequency.

7-11. RANGE AND SENSITIVITY — BAND III (825 MHz to 18 GHz)

a. Set controls as follows:

(1) SAMPLE RATE: Fully counter-clockwise.

(2) BAND SELECT: 825 MHz - 18 GHz range.

(3) TIME BASE switch: Set to INT.

b. Connect leveled source output to Band III input.

c. Vary signal frequency from 825 MHz to 18 GHz at the following levels:

825 MHz - 1.1 GHz	-25 dBm (12 mV rms)
1.1 GHz - 12.4 GHz	-30 dBm (7 mV rms)
12.4 GHz - 18.0 GHz	-25 dBm (12 mV rms)

Counter should display correct input frequency.

7-12. YIG PRESET — BAND III

- a. Connect microwave source to Band III input,
- b. Program the YIG preset frequency as shown in Table 7-1. Verify that counter locks on the desired frequency but not on an undesired frequency.

YIG PRESET FREQUENCY	DESIRED LOCK FREQUENCY	UNDESIRED LOCK FREQUENCY
0.8 GHz	1.1 GHz	0.5 GHz
1.0	1.3	0.7
1.2	1.5	0.9
1.4	1.7	1.1
1.8	2.1	1.5
2.0	2.3	1.7
4.0	4.3	3.7
8.0	8.3	7.7
10.0	10.3	9.7

TABLE 7-1
YIG PRESET VERIFICATION

7-13. FREQUENCY PROGRAMMING

- a. Adjust 10 - 300 MHz source for -10 dBm output.
- b. Set counter to the 10 - 300 MHz range. Connect source output to the Band I input.
- c. Tune source to within the capture range of the following MHz frequencies, and lock source to each frequency in turn: 10.0, 10.2, 10.4, 10.8, 11.0, 12, 14, 18, 20, 40, 80, 100, and 200 MHz.

7-14. LOCK-UP RANGE — BAND I

- a. Set source and counter as in steps 7-13a and b. Set source to 280 MHz.
- b. Program counter Auxiliary Display for 300 MHz and press LOCK button. Counter should lock within 1/2 second.
- c. Press CLEAR button. Tune source to 30 MHz.
- d. Repeat step b with 10 MHz programmed.

7-15. LOCK UP RANGE — BAND II

- a. Set counter to 100 - 850 MHz range. Connect source to the Band II input.

- b. Set source to 830 MHz at -10 dBm.
- c. Program Aux Display for 850 MHz. Press LOCK button. Counter should lock within 1/2 second.
- d. Press CLEAR button. Tune source to 120 MHz.
- e. Repeat step c with 100 MHz programmed.

7-16. LOCK UP RANGE — BAND III

- a. Set counter to 825 MHz - 18 GHz range. Connect source to the Band III input.
- b. Set source to 850 MHz at -10 dBm.
- c. Program Aux Display for 825 MHz. Press LOCK button. Counter should lock within 1/2 second without searching (SEARCH light should not flash).
- d. Press CLEAR button. Tune source to 1050 MHz.
- e. Repeat step c with 1070 MHz programmed.

7-17. TIME BASE AGING RATE

(For Options 03, 04, and 05 only)

- a. Place counter in constant temperature environment.
- b. Allow counter to warm up for 72 hours if the unit has been disconnected from AC power.
- c. Connect 10 MHz rear panel output to input of VLF comparator. (If VLF comparator is not equipped to accept 10 MHz inputs, a divider must be provided.)
- d. Determine average frequency over a six-hour interval.

NOTE: Time interval selected should be during periods of maximum stability of received VLF signal. Avoid periods near sunrise or sunset.

- e. Determine average frequency over the same six-hour interval 24 hours later. Counter should remain plugged into the power line during this period to keep time base oven temperature constant.
- f. The daily aging rate is the difference between the two readings. This should be within the specifications noted for the particular ovenized oscillator (Option 03, 04, or 05).