

TMC SPECIFICATION

NO. S 1194

REV:

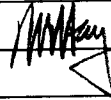
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RRH

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SHEET

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OF

8

TITLE:

typed vy vab

5/19/67

TEST PROCEDURE

FOR

TMC MODEL CSS-4

PARTS 1

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PARTS 2

TMC SPECIFICATION

NO. S 1194

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SHEET 2 OF 8

TITLE: TEST PROCEDURE FOR TMC MODEL CSS-4 PARTS 1 AND PARTS 2

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I. Test Equipment Required:

- A. Ballantine model 314 AC VTVM or equivalent.
- B. 47 ohm non-inductive resistor 1/2 watt.
- C. Simpson model 260 multi-meter or equivalent.

II. Preliminary:

1. Inspect unit for obvious mechanical imperfections.
2. Inspect unit for obvious wiring errors.
3. Check for proper orientation of transistors. The index tab on the transistor should match the keyway on the socket. All transistor sockets should be mounted with the keyway toward the rear of the unit.
4. Make sure that the terminal board is screwed down securely; if not, the unit will not operate properly.
5. Alarm switch, S605, to external position.
6. Connect unit 115VAC power source. Check operation of I601 and I602.
 - a. STANDBY position, I601 should be ON.
 - b. POWER-ON position, I602 should be ON.
7. Check voltage across CR601. A value of 27 VDC $\pm 10\%$ should be obtained.
8. Disconnect 115VAC power source from J605.

III. Testing of the CSS-4:

1. Install Frequency Test Std. into socket Z602.
2. Connect unit to 115VAC power source.
3. Set switch S601 to ON position.
4. Allow unit to warm up. (Approximately 30 minutes.)
5. Check voltage at CR601. A minimum value of 24.3VDC shall be obtained.
6. Check the output of the Frequency Test Std. at C612 with an AC VTVM. Voltage should be 1.4 VAC, $\pm 10\%$.

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TITLE: TEST PROCEDURE FOR THE CSS-4

PART 1

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7. Connect 47 ohm load at J602.
8. Connect AC VTVM to arm of R617. Adjust R617 for 1 volt AC.
9. Check the following DC voltages with the Multi-meter
 - (a) Q601 Pin 1 to ground and Q602 Pin 1 to ground. (Green leads). Tolerance ± 0.1 VDC.
 - (b) Q601 Pin 2 to ground and Q602 Pin 2 to ground. (Yellow leads). Tolerance ± 0.1 VDC.
10. Connect the AC VTVM to J602. Tune T603 for Maximum peak. Start with slug all the way out to avoid wrong peak.
11. The output of the CSS-4 should be at least .8 VAC at this point.
12. Readjust R617 for 1.0 VAC at J602.
13. Place the AC VTVM probe on the yellow dot terminal of Z601. Tune Z601 for maximum. (Start with slug all the way out to avoid wrong peak).
14. Place R616 sensitivity control to maximum. Adjust R614 phase detector Bal. for a 0 center scale reading of M601. When this has been accomplished the modulators are balanced.
15. If step #14 is performed correctly, then with R616 at minimum sensitivity, M601 should still read 0.
16. To check phase comparator circuit connect a stable external 1mc signal (1 volt max.) to J604 connector on CSS-4. Phase comparator Meter will vary in accordance with phase relationship between CSS under test and the external 1 MC signal.
17. Check that S604, external-intertnal alarm is in the external position.
18. Connect the CA480-3-12, provided in KIT-215A from J602, Int. Std., to J3, Int. In.
19. Connect the external 1 MC 1.0 V source to J1, Ext. In.
20. Connect the 47 ohm load to J2, Out.
21. Test automatic changeover operation as indicated in S1192 Part VI.

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TITLE:

TEST PROCEDURE FOR THE CSS-4

22. Connect the AC VTVM across the load.
23. With 1.0 V applied to J1, the AC VTVM should read 1.0 V. On TB1, terminal 9 and 10 should be shorted, Terminal 8 and 9 should be open. On TB601, terminal 1 and 2 should be open.
24. Disconnect the cable from J1.
25. The AC VTVM should still read 1.0 V. On TB1, terminal 8 and 9 should be shorted, terminal 1 and 2 should be open. On TB601, terminal 1 and 2 should be shorted.
26. Place S605, EXTERNAL-INTERNAL ALARM to the INTERNAL position. The ALARM should sound and the light should light.
27. Replace the cable on J1. The ALARM should cease and the light should go out.
28. The CSS-4 is now ready for the stability test of the / MC Frequency Standard.

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TITLE:

TEST PROCEDURE FOR THE CSS-4

PART 1

TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y.

CSS-4 TEST DATA SHEET PART I

SERIAL NO. _____

MODEL NO. _____

MFG. NO. _____

READINGS

Voltage at CR601, unloaded. _____ VOLTS

Voltage at CR601, loaded. _____ VOLTS

Q601 pin 1--Q602 pin 1 _____ VOLTS

Q601 pin 2--Q602 pin 2. _____ VOLTS

Output at J602. _____ VOLTS

ALARM Circuit _____ OK

Switchover Voltage, Low point _____ VOLTS

DATE _____

TESTER _____

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TITLE:

TEST PROCEDURE FOR THE CSS-4

PART 2

I. TEST EQUIPMENT REQUIRED:

- A. Ballantine MO. 314 AC VTVM or equivalent.
- B. 47 Ohm carbon 1/2 watt resistor.
- C. Dumont MO. 304 oscilloscope or equivalent.
- D. Montronics Frequency Error Multiplier FEM-1 or equivalent.
- E. Rustrak MO. A recorder.
- F. Hewlett Packard reference Frequency Standard MO. 103AR.

II. PRELIMINARY:

1. Record the dates and serial numbers of the XTAL standards as they are received.
2. Plug NF-105 or NF-109 into Z602.
3. Record serial number of CSS-4 that the XTAL standard was installed in.
4. Connect 47 Ohm load to J602.
5. Turn unit on.
6. Record Date and time that unit was turned on.
7. Allow unit to warm up for one hour.

III. PRELIMINARY TEST:

1. Check output of 1 MC standard at C612 with Ballantine meter, the voltage should be $1.4V \pm 10\%$.
2. Connect oscilloscope to C612, the sine wave output should not have more than 20% distortion.
3. Connect oscilloscope to J602, the output should be an undistorted sine wave.
4. Connect Ballantine meter to the same point and adjust R617 for 1 V output.

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TITLE:

TEST PROCEDURE FOR CSS-4

PART 2

IV. 1 MEGACYCLE SETTING

1. Remote 47 Ohm load.
2. Turn CSS-4 on for 24 hours to stabilize. (Do not record)
3. Connect J602 to TEST INPUT of frequency error multiplier (FEM-1) with a cable using a "T" connector on the TEST INPUT jack.
4. Connect 47 Ohm load to open side of "T" connector.
5. Turn MULTIPLIER switch to position 10 and SCALE FACTOR switch to position 1, on FEM-1.
6. Remove cap from NF-105 or NF-109 unit.
7. Using screwdriver end of JFD adjustment tool 5484, adjust NF-105 or NF-109 standard so that the RUSTRAK recorder needle is at zero.
8. Turn SCALE FACTOR switch to .5 position and repeat step 7.
9. Turn MULTIPLIER switch to position 100 and repeat step 7.
10. Turn MULTIPLIER switch to 1K position and repeat step 7.
11. Turn MULTIPLIER switch to 10K position and repeat step 7.

V. STABILITY RUN

1. Turn on Recorder.
2. Allow RUSTRAK chart to record for 24 hours.
3. The unit should maintain a stability of one part in 108 for this period.
4. Record on chart, the date, time, serial number of CSS-4 and NF-105 or NF-109.
5. Record in book whether the unit was accepted or rejected.
6. Accepted CRYSTAL STANDARDS remain in the CSS-4. The final inspection stamp must appear on accepted standard and recorded chart.

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TITLE: TEST PROCEDURE FOR THE CSS-4 PART 2

TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y.

CSS-4 TEST DATA SHEET PART 2

SERIAL NO. _____

MODEL NO. _____

MFG. NO. _____

PRELIMINARYDate _____ Time _____ Turned On.
Output at C612 _____ Volts.
Waveform at C612 _____ O.K.
Waveform at J602 or J606 _____ O.K.
Output at J602 or J606 _____ Volts.1 MEGACYCLE SETTING AND STABILITY RUNWarmup period 24 hours _____ OK
Chart Recorder/ _____ OK
Standard initial adjustments
Chart Recorder 24 hours _____ OK
Stability in 24 hours _____ OK
Serial number of accepted standard _____

DATE _____

TESTER _____

