

# TMC SPECIFICATION

NO. S 1039

REV:  A

COMPILED: **BN**

CHECKED:

APPD: *AMH*

SHEET 1 OF 8

TITLE:

*11/22/65*

typed by vab 11/18/65

TEST PROCEDURE  
FOR  
THE TMC MODEL CSS-3B  
PARTS 1  
&  
PARTS 2

# TMC SPECIFICATION

NO. S 1039

REV:  A

COMPILED: BN

CHECKED:

APPD:

SHEET 2 OF 8

TITLE: TEST PROCEDURE FOR THE TMC MODEL CSS-3B PART 1

typed by vab 11/18/65

## 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 to 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-3B:

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%.

# TMC SPECIFICATION

NO. S 1039

REV:  A

COMPILED: BN

CHECKED:

APPD:

SHEET 3

OF 8

TITLE: TEST PROCEDURE FOR THE CSS-3B

PART 1

typed by vab 11/18/65

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  $\pm 0.1$  VDC.
  - (b) Q601 Pin 2 to ground and Q602 Pin 2 to ground. (Yellow leads). Tolerance  $\pm 0.1$  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-3B 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-3, 3A, 3B. Phase comparator Meter will vary in accordance with phase relationship between CSS under test and the external 1 MC signal.
17. Check that S605, external-internal alarm is in the external position.
18. Connect the CA480-3-12, provided in KIT-270, 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. Connect the VTVM across J602, INT STD Meter should read 1.0 Volt.
22. Turn R1 counter-clockwise.

# TMC SPECIFICATION

NO. S 1039

REV:

A

COMPILED: BN

CHECKED:

APPD:

SHEET 4 OF 8

TITLE: TEST PROCEDURE FOR THE CSS-3B PART 1

23. Connect the multimeter, RX1 scale, across terminals 8 and 9. The meter should read short.
24. Turn R1 slowly clockwise until the multimeter reads open. Check to see that the VTVM still reads 1.0 Volt.
25. Using R617, reduce the level of the 1.0 MC output until the multimeter reads short again. The VTVM must not read below 0.707 Volts.
26. Raise the level of the 1.0 MC output to 1.0 Volt. The multimeter should read open at 1.0 Volt.
27. A slight readjustment of R1 may be necessary to have the multimeter read open at 1.0 Volt. Repeat steps 25 and 26.
28. Set R617 to have the VTVM read 1.0 Volt and lock R617 and R1.
29. Connect the AC VTVM across the load.
30. With 1.0 V applied to J3, 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.
31. Disconnect the cable from J3.
32. 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.
33. Place S605, EXTERNAL-INTERNAL ALARM to the INTERNAL position. The ALARM should sound and the light should light.
34. Replace the cable on J3. The ALARM should cease and the light should go out.
35. The CSS-3B is now ready for the stability test of the 1 MC Frequency Standard.

# TMC SPECIFICATION

NO. S 1039

REV: ØACOMPILED: BN

CHECKED:

APPD:

SHEET 5 OF 8

TITLE: TEST PROCEDURE FOR THE CSS-3B

PART 1

typed by vab 11/18/65

TECHNICAL MATERIEL CORPORATION  
MAMARONECK, N.Y.

CSS-3B TEST DATA SHEET PART

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 \_\_\_\_\_

# TMC SPECIFICATION

NO. S 1039

REV:  A

COMPILED: BN

CHECKED:

APPD:

SHEET 6 OF 8

TITLE: TEST PROCEDURE FOR THE CSS-3B

PART 2

typed by vab 11/18/65

## 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-3 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.

# TMC SPECIFICATION

NO. S 1039

REV:  A

COMPILED: BN

CHECKED:

APPD:

SHEET 7 OF 8

TITLE: TEST PROCEDURE FOR CSS-3B

PART 2

typed by vab 11/18/65

## IV. 1 MEGACYCLE SETTING

1. Remove 47 Ohm load.
2. Turn CSS-3B 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  $10^8$  for this period.
4. Record on chart, the date, time, serial number of CSS-3 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-3B. The final inspection stamp must appear on accepted standard and recorded chart.

# TMC SPECIFICATION

NO. 5 1039

REV: Ø A

COMPILED: BN

CHECKED:

APPD:

SHEET 8 OF 8

TITLE: TEST PROCEDURE FOR THE CSS-3B

PART 2

typed by vab 11/18/65

TECHNICAL MATERIEL CORPORATION  
MAMARONECK, N.Y.

CSS-3B TEST DATA SHEET PART 2

SERIAL NO. \_\_\_\_\_

MODEL NO. \_\_\_\_\_

MFG. NO. \_\_\_\_\_

PRELIMINARY

Date \_\_\_\_\_ Time \_\_\_\_\_ Turned On.  
Output at C612 \_\_\_\_\_ Volts.  
Waveform at C612 \_\_\_\_\_ OK.  
Waveform at J602 or J606 \_\_\_\_\_ OK.  
Output at J602 or J606 \_\_\_\_\_ Volts.

1 MEGACYCLE SETTING AND STABILITY RUN

Warmup 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 \_\_\_\_\_



