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|-----------------------------|--|----------|
| DATE <u>3/23/62</u>         | <b>TMC SPECIFICATION NO. S-658</b>             | <b>B</b> |
| SHEET <u>1</u> OF <u>7</u>  |  |          |
| COMPILED <i>[Signature]</i> | TITLE: TEST PROCEDURE FOR THE TMC MODEL CSS-1A |          |
| APPROVED <i>[Signature]</i> | PARTS 1 & 2                                    |          |

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

DATE 2/13/62

SHEET 2 OF 7

TMC SPECIFICATION NO. S-658

B

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CHECKED

TITLE: CSS-1A TEST PROCEDURE PART I

APPROVED

I. Test Equipment Required:

- A. Ballantine model 314 AC VTVM or equivalent.
- B. 68 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. 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.
- 6. Check voltage across CR601. A value of 26 VDC,  $\pm 10\%$  should be obtained.
- 7. Disconnect 115VAC power source from J605.

III. Testing of the CSS-1A:

- 1. Install frequency standard 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 across CR601. A minimum value of 25VDC should be obtained.
- 6. Check the output of the frequency standard at C612 with AC VTVM. Voltage should be 1.4 VAC,  $\pm 10\%$ .
- 7. Connect AC V.T.V.M. to arm of R617. Adjust R617 for 1 volt AC.

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TITLE: CSS-1A TEST PROCEDURE PART 1

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8. Check the following points with the Multi-meter. Voltage readings should be the same for each group within 0.1 VDC readings to be taken by placing meter from Q601 pin 1 to Q602 pin 1 and also from Q601 pin 2 to Q602 pin 2.
  - a. Q601 pin 1 (green wire) 0.1 VDC tolerance
  - b. Q602 pin 1 (green wire)
  - c. Q601 pin 2 (yellow wire) 0.1 VDC tolerance
  - d. Q602 pin 2 (yellow wire)
9. Connect the AC VTVM to J606. Tune T603 for maximum.
10. Connect the 68 ohm load to J602.
11. The output of the CSS-1A should be at least .8 volt AC.
12. Adjust R617 for 1 volt AC output at J606
13. Place the AC VTVM probe on the yellow dot terminal of Z601. Tune Z601 for maximum.
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. The CSS-1A is now ready for the stability test of the 1MC frequency standard.

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SHEET 4 OF 7

TMC SPECIFICATION NO. S-658

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TITLE: CSS-1A TEST PROCEDURE, PART I

APPROVED \_\_\_\_\_

TECHNICAL MATERIEL CORPORATION  
MAMARONECK, N.Y.

CSS-1A TEST DATA SHEET PART I

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

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

| SECTION |                                    | READINGS       |
|---------|------------------------------------|----------------|
| II 6    |                                    | _____          |
| III 8   | Q601-pin 1 }<br>to<br>Q602-pin 1 } | _____<br>_____ |
|         | Q601-pin 2 }<br>to<br>Q602-pin 2 } | _____<br>_____ |
| III 12  |                                    | _____          |

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TESTER \_\_\_\_\_

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TMC SPECIFICATION NO. S-658

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*C.V.P.*  
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TITLE: CSS-1A TEST PROCEDURE PART 2

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I. TEST EQUIPMENT REQUIRED

- A. Ballantine MO. 314 AC VTVM or equivalent.
- B. 68 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-105-2 or NF-109 into Z602
- 3. Record serial number of CSS-1A that the XTAL standard was installed in.
- 4. Connect 68 ohm load to J602 or J606.
- 5. Turn unit on.
- 6. Record date and time that unit was turned on.
- 7. Allow unit to warm up for one hour.
- 8. Check output of 1MC standard at C612 with Ballantine meter, the voltage should be 1.4V. +10%.
- 9. Connect oscilloscope to C612, the sine wave output should not have more than 20% distortion.
- 10. Connect oscilloscope to J602 or J606, the output should be an undistorted sine wave.
- 11. Connect Ballantine meter to the same point and adjust R617 for 1V. output.

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| <i>MP</i><br>COMPILED      | CHECKED | TITLE: <u>CSS-1A TEST PROCEDURE PART 2</u> |   |
| APPROVED                   |         |  |   |

III. 1 MEGACYCLE SETTING AND STABILITY RUN

1. Remove 68 ohm load.
2. Leave CSS-1 on for 24 hours to stabilize.
3. Connect J602 or J606 to TEST INPUT of frequency error multiplier (FEM-1) with a cable using a "T" connector on the TEST INPUT jack.
4. Connect 68 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-105-2 or NF-109 unit.
7. Using screwdriver end of JFD adjustment tool 5484, adjust NF-105-2 or NF-109 standard so that the RUSTRAK recorder needle is at zero.
8. Turn SCALE FACTOR switch to 15 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.
12. Allow RUSTRAK chart to record for 24 hours.
13. The unit should maintain a stability of one part in 10<sup>-8</sup> for this period.
14. Record on chart, the date, time, serial number of CSS-1A and NF-105-2 or NF-109.
15. Record in book whether the unit was accepted or rejected.
16. Accepted XTAL standards remain in the CSS-1A. The final inspection stamp must appear on accepted standard and recorded chart.

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SHEET 7 OF 7

TMC SPECIFICATION NO. S-658

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*C.M.P.*  
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TITLE: CSS-1A TEST PROCEDURE PART 2

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TECHNICAL MATERIEL CORPORATION  
MAMARONECK, N.Y.

CSS-1A TEST DATA SHEET PART 2

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

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

II. PRELIMINARY

- Step 6. Date \_\_\_\_\_ Time \_\_\_\_\_ Turned on.  
Step 8. Output at C612 \_\_\_\_\_ Volts.  
Step 9. Waveform at C612 \_\_\_\_\_ OK  
Step 10. Waveform at J602 or J606 \_\_\_\_\_ OK  
Step 11. Output at J602 or J606 \_\_\_\_\_ Volts

III. 1 MEGACYCLE SETTING AND STABILITY RUN

- Step 2. Warmup period 24 hours \_\_\_\_\_ OK  
Step 7. Adjustment \_\_\_\_\_ OK  
Step 8. Adjustment \_\_\_\_\_ OK  
Step 9. Adjustment \_\_\_\_\_ OK  
Step 10. Adjustment \_\_\_\_\_ OK  
Step 11. Adjustment \_\_\_\_\_ OK  
Step 12. Chart recorded 24 hours \_\_\_\_\_ OK  
Step 13. Stability in 24 hours \_\_\_\_\_ OK  
Step 16. Serial number of accepted standard \_\_\_\_\_

DATE \_\_\_\_\_

TESTER \_\_\_\_\_

