

# TMC SPECIFICATION

NO. S -445

REV:

C

COMPILED: REB

CHECKED: RBY

APPD:

*[Handwritten signature]*  
*4/27/66*

SHEET

1

OF

7

TITLE:

TEST PROCEDURE  
FOR

DIRECTIONAL COUPLER  
CU-2 (50-70)

PART OF  
ANTENNA TUNING SYSTEM

ATS-2  
ATS-2A

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SHEET 2 OF 7

TITLE: CU-2 TEST PROCEDURE

## I. PURPOSE:

- A. This procedure specifies the method of performing electrical tests for the CU-2, which is a component of the Antenna Tuning System, ATS-2.
- B. This procedure is equally applicable for 50 ohm and 70 ohm calibration, by using the appropriate load and RF cables.

## II. TEST EQUIPMENT REQUIRED:

- A. Monitor Control Unit, TMC Model MCU-2, or MCU-2A.
- B. RF Wattmeter, Bird Thruline Model 43, or equivalent.
- C. Plug-in elements for the above wattmeter:
  - 1. 2-32 MC, 1KW
  - 2. 2-32 MC, 100W
- D. General Purpose Transmitter, TMC Model GPT-750, or an equivalent transmitter with a continuous rating of 1KW (CW) output.
- E. Antenna, RF Dissipator, 50 ohm unbalanced, 1KW average, Bird Model 8833 (with associated RG-8/U, 50 ohm cables), or equivalent.
- F. Antenna, RF Dissipator, 70 ohm, unbalanced, 1750 watts average, TMC Model TER-3500-70-U (with associated RG-11/U, 70 ohm cables), or equivalent.
- G. ATS-2 interconnecting cable, CA-499
- H. Alignment tool, TMC TP-119-1.

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### III. TEST PROCEDURE:

#### WARNING

This procedure requires the use of RF energy from the transmitter. Failure to follow safety precautions may result in serious injury, shock, or death. Use extreme caution around uncovered RF leads in the coupler unit. Follow instructions carefully. Each time the procedure calls for transmitter power to be off, use the Final Plates switch and turn Drive Control fully counter-clockwise. Ensure that the transmitter and all components in the test set-up are well grounded.

#### A. NULLING AND EQUALIZING:

1. Connect the dummy load to J302 of the CU. Insert the wattmeter in the coaxial line between the dummy load and the CU-2.
2. Connect the GPT-750 to J301 of the CU.
3. Connect the MCU-2 to the CU-2 using ATS-2 interconnecting cable CA-499.
4. Turn all pots located on the MCU-2 chassis fully counter-clockwise.
5. Turn the MCU-2 Power switch to the X10 position. Power light on MCU-2 shall energize.
6. Tune the transmitter for a CW output frequency of 15MC.
7. With the transmitter output level at minimum, slowly increase the drive until the wattmeter indicates 1000W. The FORWARD power (black scale) needle shall indicate approximately half scale; the REFLECTED power (red scale) needle shall indicate near zero.

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8. Slowly turn R104 clockwise until the red needle reads in the upper quarter of the red scale.
- \*9. Utilizing the TMC alignment tool TP-119-1, adjust the NULL capacitor, C302, until the reflected power (red needle) indicates minimum. Rotate R104 clockwise for increased sensitivity and continue adjusting C302 until a minimum indication has been obtained for the reflected power scale.
10. This completes the NULL adjustment. Turn R104 completely counter-clockwise.
- \*11. With the transmitter output at 1KW, and R103 fully CCW, the black needle shall be indicating less than full scale. Slowly rotate R103 clockwise, taking care not to peg the needle. Before the fully CW setting of R103 is reached, the black needle shall exceed the full scale reading. Return R103 to fully CCW.
- \*12. Decrease the transmitter power output to minimum. Turn MCU Power switch to X1 position. Slowly increase the drive until the wattmeter indicates 100 watts. With R102 fully CCW, the black needle shall be indicating less than full scale. Slowly rotate R102 clockwise, taking care not to peg the needle. Before the fully CW setting of R102 is reached, the black needle shall exceed the full scale reading. Return R102 to fully CCW.

NOTE: Indicate completion and acceptance of portions of this test preceded by (\*) by recording required observed value or by check (✓) mark as required on attached test Data Sheet.

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13. Turn the transmitter FINAL PLATES switch to OFF. Reverse the RF cables on the CU-2, by re-connecting the dummy load to J301, and the transmitter to J302.
14. Turn the transmitter FINAL PLATES ON. Increase power until the wattmeter indicates 1000 watts. The REFLECTED power needle shall indicate approximately half scale, and the FORWARD power needle shall indicate near zero.
15. Slowly turn R103 clockwise until the black needle reads in the upper quarter of the scale.
- \*16. Utilizing the TMC alignment tool TP-119-1, adjust the EQUALIZER capacitor, C305, until the FORWARD power needle indicates minimum. Rotate R103 clockwise for increased sensitivity and continue adjusting C305 until a minimum indication has been obtained for the forward power scale.
17. This completes the EQUALIZER adjustment. Turn R103 completely counter-clockwise.
- \*18. With the transmitter output at 1KW, and R104 fully CCW, the red needle shall be indicating less than full scale. Slowly rotate R104 clockwise, taking care not to peg the needle. Before the fully CW setting of R104 is reached, the red needle shall exceed the full scale reading. Return R104 to fully CCW.
- \*19. Decrease the transmitter power output to minimum. Turn MCU Power switch to X1 position. Slowly increase the drive until the wattmeter indicates 100 watts. With R105 fully CW, the red needle shall be indicating less than full scale. Slowly rotate R105 clockwise, taking care not to peg the needle. Before the fully CW setting of R105 is reached, the red needle shall exceed the full scale reading. Return R105 to fully CCW.

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20. Turn the transmitter FINAL PLATES switch to OFF.

B. RF POWER TEST:

1. With the transmitter FINAL PLATES switch OFF, reverse the RF cables on the CU-2, by re-connecting the dummy load to J302, and the transmitter to J301.
- \*2. Turn the transmitter FINAL PLATES ON. Increase the drive until the wattmeter indicates 1000W. Leave the power output at 1000W for 15 minutes.
3. Turn the power OFF, and inspect the CU-2 for any component overheating or discoloration.
4. Check both RF connectors on the CU-2 (J301 and J302) for evidence of arcing or discoloration.

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TITLE: TEST DATA SHEET

## DIRECTIONAL COUPLER CU-2

### TEST DATA SHEET

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

III. A.9. \_\_\_\_\_ NULL \_\_\_\_\_ OHM

A.11. \_\_\_\_\_ X10 FORWARD RANGE

A.12. \_\_\_\_\_ X1 FORWARD RANGE

A.16. \_\_\_\_\_ EQUALIZE \_\_\_\_\_ OHM

A.18. \_\_\_\_\_ X10 REVERSE RANGE

A.19. \_\_\_\_\_ X1 REVERSE RANGE

B. 2. \_\_\_\_\_ RF POWER TEST

TESTED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

