DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE

FOR

10-KW POWER AMPLIFIER TEST SET 006

(RAYTHEON PART NO. 577086-1)

Headquarters, Department of the Army, Washington, DC
13 May 1974

Section I. GENERAL

1. Purpose and Scope. a. This manual contains the information necessary to calibrate the dc voltmeter/ammeter contained in the Servo Drawer Test Panel (Raytheon part number 324725-1) in 10-kW Power Amplifier Test Set 006 (Raytheon part number 577086-1). 10-kW Power Amplifier Test Set 006 (fig. 1) is a portable test set containing two separate test panels, which are used to provide two discrete test capabilities. The upper panel (Servo Drawer Test Set) is used to bench test the servo drawer assembly (part of Amplifier, Radio Frequency AM-4543/TSC38B (10-kW P.A.)) in the AN/TSC-38B van. The lower panel (VSWR Test Set) is used to monitor the output of the 10-kW P.A. in the ANITSC-38B van to simulate various degrees of standing waves to the transmitter antenna circuit during transmitter testing operations.

NOTE

Calibration of the Bird power meter in the VSWR Test Panel is not covered in this procedure. For calibration of the Bird power meter, refer to TB 11-6625-2581-35.

b. Integrated within this bulletin are illustrations showing the location of all operational controls and components used in this calibration procedure, as well as diagrams showing equipment setups.

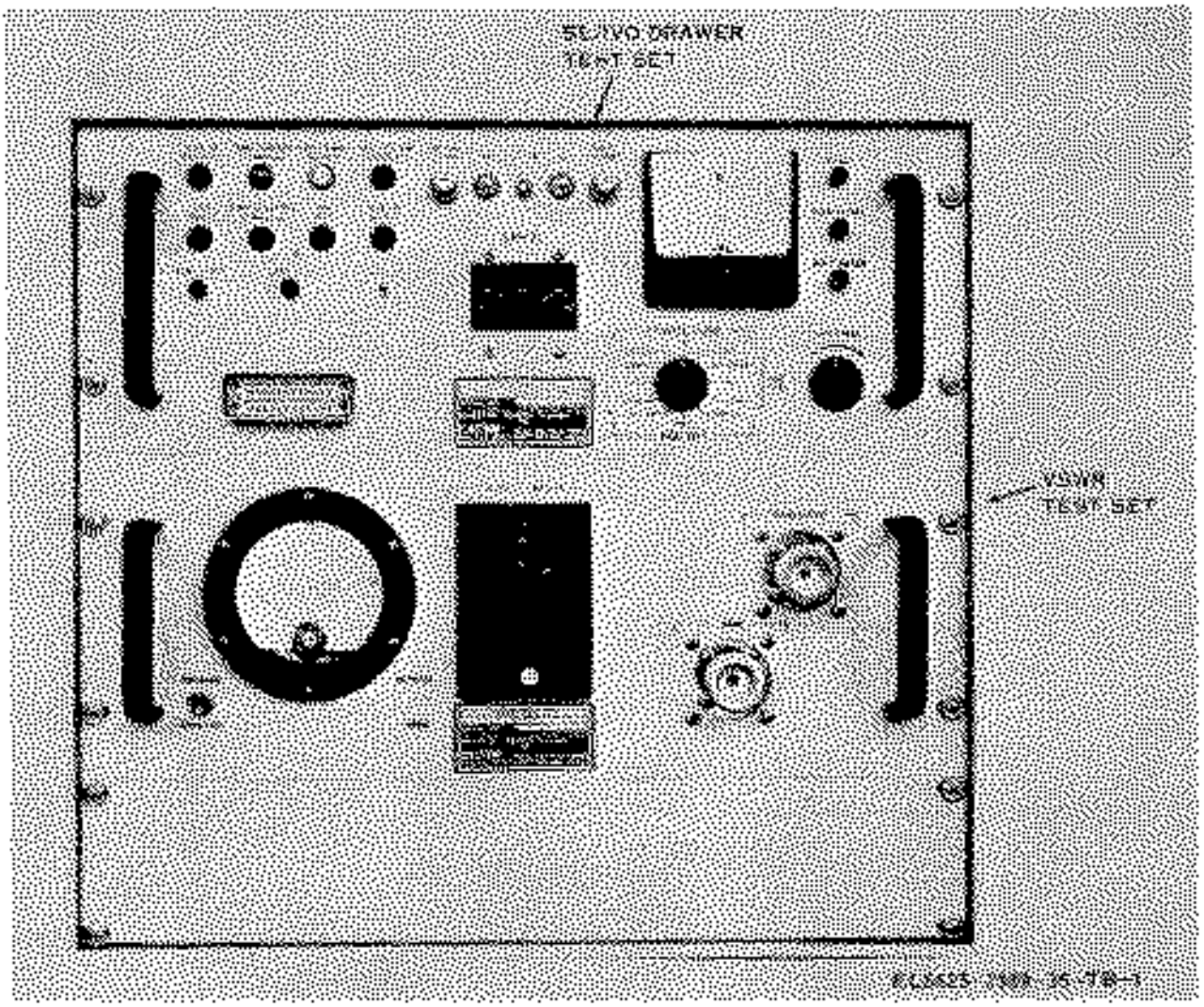

Figure 1. 10-kW Power Amplifier Test Set 006 - front panel view

2. Reporting of Technical Bulletin Improvements. Reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-CRA, Fort Monmouth, New Jersey 07703.

3. General Instructions. *a. Calibration Reporting*. During the performance of this calibration procedure, annotate DA Form 2416 (Calibration Data Card) in accordance with TM 38-750.

b. Calibration Interval. Refer to TB 43-180 for the interval of calibration.

c. Time Requirement. This power amplifier can be calibrated in approximately 1.5 hours.

d. Terms. The Servo Drawer Test Set, Raytheon part number 324725-1, will be referred to as the "Test Instrument" throughout this procedure.

4. Differences Among Models. None.

Section II. CALIBRATION PROCESS

5. Calibration Equipment. The equipment required for calibration of the Test Instrument is listed in the following table, together with the minimum use specifications for each item and the

recommended instruments for each equipment type.

NOTE

Minimum use specifications are the principle parameters required for performance of this calibration procedure, and are included to assist in the selection of alternate equipment which may be used at the discretion of the calibrating activity. Satisfactory performance of alternate items shall be verified prior to use. All applicable equipment must bear evidence of current calibration.

Table of Equipment Required for Calibration

Item	*Minimum use specification*	*Calibration equipment*
Differential voltmeter	a. Dc voltmeter calibration: 0-28 ± 2 volts b. Plate current meter calibration: 0-0.5 ± 0.01 volt c. 050 microamp dc microammeter calibration: 0-0.5 ± 0.01 volt	ME-202/U
30-Vdc power supply	Dc voltage source	PP-2309B/U
Resistor	400 ohm, 5 watt, wire wound Accuracy ± 5%	
Resistor	10 ohm, 1 watt, wire wound Accuracy ± 5%	
Resistor	10 K ohm Accuracy ± 1%	

NOTE

It is recommended that personnel familiarize themselves with the entire procedure prior to performing the calibration.

6. Servo Drawer Test Set Microammeter Calibration.

a. Performance Check.

CAUTION

Insure that the 3 PH AC circuit breakers on the UUT are in the OFF (down) position before continuing.

(1) Connect a 400-ohm, 5-watt, wire-wound resistor in series with a 10-ohm, 1-watt, wire-wound resistor, and connect the combination across the positive (+) and negative (-) terminals of a power supply as shown in figure 2.

(2) Connect one end of a 10-Kohm, 1% resistor to the junction of the 400-ohm and 10-ohm resistors as shown in figure 2.

(3) Connect the other end of the 10-Kohm resistor to pin J1-U of test connector J1 on the UUT front panel.

(4) Connect the negative terminal of the power supply to pin J1-a of the test connector.

(5) Connect a differential voltmeter across the 10-Kohm resistor as shown in the figure, observing the polarities shown.

(6) Set the COARSE TUNE/AGC DET rotary switch on the UUT front panel to the + 15V position.

(7) Activate the power supply.

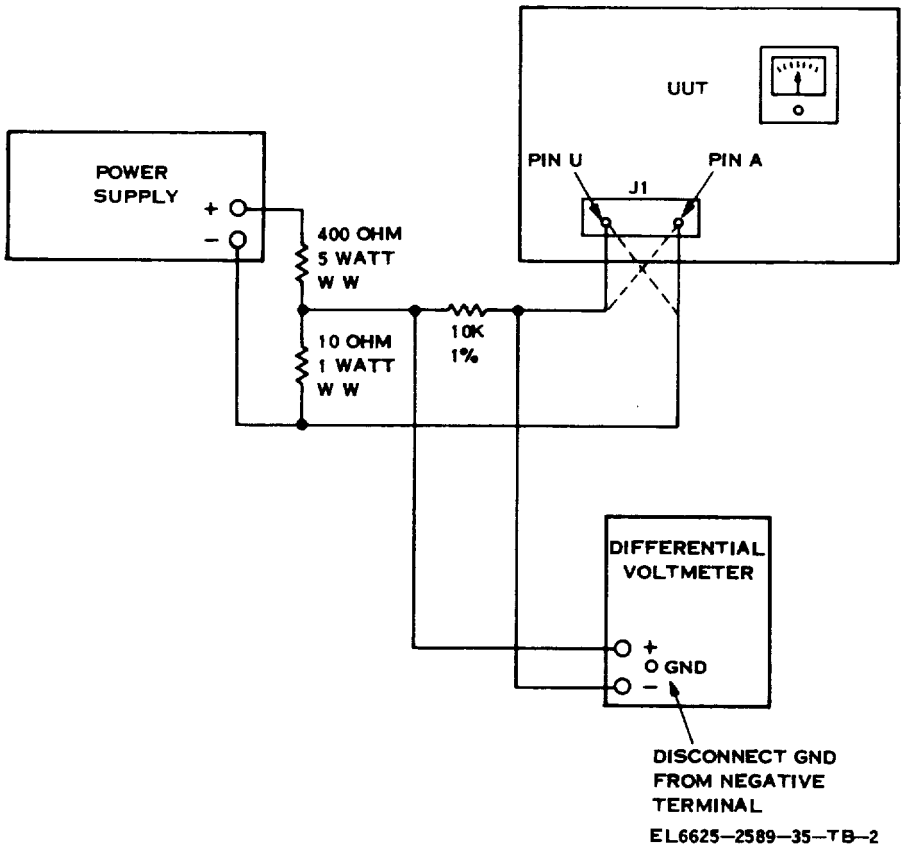

Figure 2. Servo Drawer Test Set microammeter calibration - test equipment setup.

(8) Using the VOLTAGE CONTROL and VOLTAGE VERNIER knobs on the power supply, vary the voltage so that the voltage (as measured on the differential voltmeter) varies between 0 and 0.5 Vdc, stopping to calibrate the voltmeter when the voltage reaches 0.1, 0.2, 0.3, 0.4, and 0.5 Vdc.

(9) Observe and certify that the 10, 20, 30, 40, and 50 microampere settings on the microammeter on the UUT are indicated upscale (± 2.0 microamp) when the input voltage to the panel is stopped at the 0.1, 0.2, 0.3, 0.4, and 0.5 Vdc voltage levels, respectively.

(10) Reverse test connections J1-U and J1-a at test connector J1.

(11) Repeat step (1) above.

(12) Observe and certify the test results of step (2) above for downscale deflections on the front panel meter.

(13) Deenergize and disconnect all test equipment.

b. Adjustment. No adjustments can be made.

7. Servo Drawer Test Set Plate Current Meter Calibration. ***a. Performance Check.***

CAUTION
Insure that the 3 PH AC circuit breakers on the UUT are in the OFF (down) position before continuing.

(1) Connect a 400-ohm, 5-watt, wire-wound resistor in series with a 10-ohm, 1-watt, wire-wound resistor, and connect the combination across the positive (+) and negative (-) terminals of a power supply as shown in figure 3.

(2) Connect the junction of the 400-ohm and 10ohm resistors to pin J1-BB of test connector J1 on the UUT front panel as shown in figure 3.

(3) Connect the negative terminal of the power supply to test connector pin J1-a.

(4) Connect a differential voltmeter across the terminals of the 10-ohm resistor as shown in figure 3, observing the polarities shown.

(5) Set the COARSE TUNE/AGC DET rotary switch on the UUT front panel to the P CUR position.

(6) Activate the power supply.

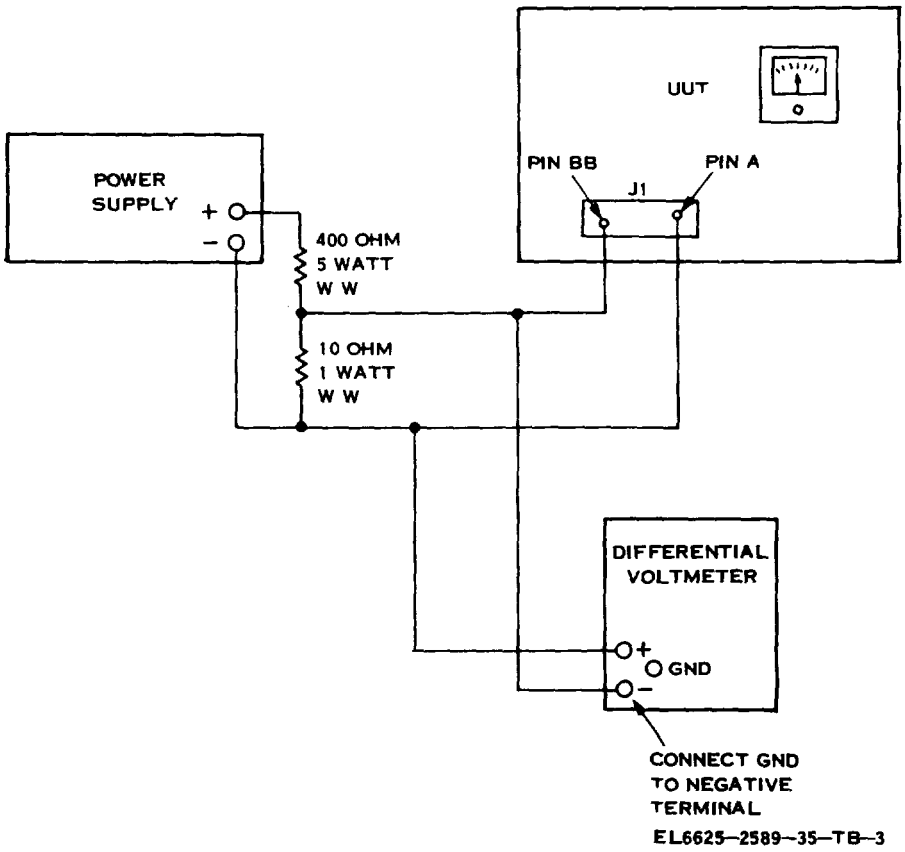

Figure 3. Servo Drawer Test Set plate current meter calibration - test equipment setup.

(7) Using the VOLTAGE CONTROL and VOLTAGE VERNIER knobs on the power supply, set the power supply output voltage for 0.5 Vdc across the 10-ohm resistor, as measured by the differential voltmeter.

(8) Depress the INPUT METER pushbutton switch on the UUT front panel; observe and certify that at the 0.5-Vdc voltage output level, the meter on the front panel indicates 50 microamperes dc (± 2 microamperes) upscale.

(9) Deenergize and disconnect all test equipment.

b. Adjustments. No adjustments can be made.

8. Servo Drawer Test Set DC Voltmeter Calibration

a. Performance Check.

(1) Set the power supply level for 28 Vdc and turn the power supply off without altering the level adjustment.

(2) Connect a differential voltmeter and power supply to pins J1-a and J1-B of test connector J1 on the UUT front panel as shown in figure 4.

(3) Set the COARSE TUNE/AGC DET rotary switch on the UUT front panel to the + 28V position.

(4) Remove fuse F2 (28VDC 1.5 AMP) from the UUT front panel.

(5) Activate the 28-Vdc power supply.

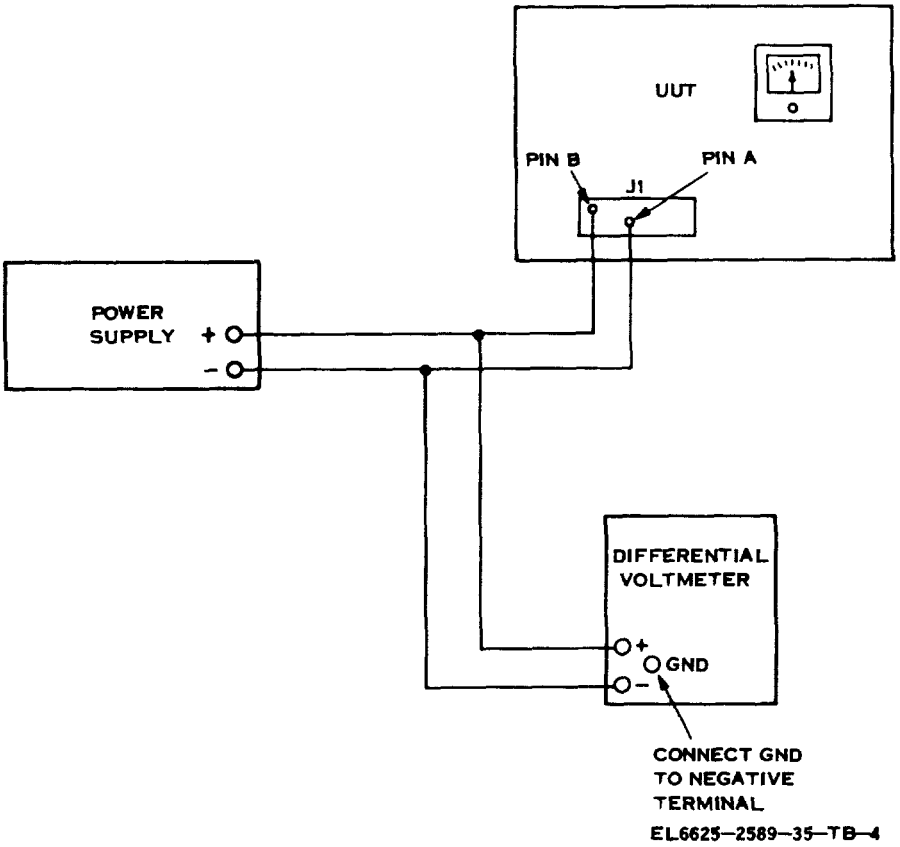

Figure d. Servo Damper Test Set voltmeter calibration-test equipment setup.

(6) Observe and certify that the meter reading on the front panel of the OUT (in dc microamperes) is numerically equal to the voltage readout indicated in dc volts by the differential voltmeter ($\pm$ 2 microamperes).

b. Adjustment. No adjustments can be made.

NOTE

The power supply may be readjusted for a readout of 28 Vdc on the differential voltmeter.

9. Final Procedure. a. Deenergize and disconnect all test equipment.

b. Install the fuse removed in paragraph &(4).

c. In accordance with TM 38-750, annotate and affix calibration DA Label 80 (US Army Calibration System). When the panel being tested cannot be certified within the specified tolerances, annotate and affix DA Form 2417 (Unserviceable or Limited Use Tag) (red tag).

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