

***TB 9-6625-2020-35**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR DIGITAL MULTIMETER, TEKTRONIX TYPES DM 502 AND DM 502A

Headquarters Department of the Army, Washington, D.C.
25 July 2002

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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*This bulletin supersedes TB 9 6625-2020-35, 24 July 1989.

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**SECTION I
IDENTIFICATION AND DESCRIPTION**

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Digital Multimeter, Tektronix, Types DM 502 and DM 502A. The manufacturer's manuals were used as the prime data sources in compiling these instructions. The equipment being calibrated will be referred to as the TI (test instrument) throughout this bulletin.

a. Model Variations. None.

b. Time and Technique. The time required for this calibration is approximately 2 hours, using the dc and low frequency technique.

2. Forms, Records, and Reports

a. Forms, records, and reports required for calibration personnel at all levels are prescribed by TB 750-25.

b. Adjustments to be reported are designated (R) at the end of the sentence in which they appear. When adjustments are in tables, the (R) follows the designated adjustment. Report only those adjustments made and designated with (R).

3. Calibration Description. TI parameters and performance specifications which pertain to this calibration are listed in table 1.

Table 1. Calibration Description

| Test instrument parameters | Performance specifications |
|----------------------------|--|
| Type DM 502 | |
| Dc volts | Range: 0 to 1000 V in 5 ranges Accuracy: $\pm 0.1\%$ of reading, ± 1 count |
| Ac volts | Range: 0 to 500 V in 5 ranges Accuracy: 40 Hz to 10 kHz, $\pm 0.5\%$ of reading, ± 1 count 20 to 40 Hz and 10 to 20 kHz, $\pm 1.0\%$ of reading, ± 1 count |

Table 1. Calibration Description - Continued.

| Test instrument parameters | Performance specifications |
|----------------------------|---|
| Type DM 502 | |
| Ac decibels | Range: -40 to +40 dB in 4 ranges Accuracy: ±0.5 dB from 0 to +20 dB from 20 Hz to 20 kHz ±0.5 dB from 0 to -10 dB from 20 Hz to 2 kHz ±1.0 dB from 0 to -10 dB from 2 to 20 kHz ±0.5 dB from -10 to -20 dB from 20 Hz to 2 kHz ±1.0 dB from -10 to -20 dB from 2 to 7.5 kHz ±2.0 dB from -10 to -20 dB from 7.5 to 20 kHz |
| Ohms | Range: 0 to 20 MΩ in 6 ranges Accuracy: 200Ω range; ± (0.5% ± 1 count) +0.1Ω 2, 20, 200 kΩ, and 2 MΩ range; ±0.5%, ± 1 count 20 MΩ range; ± 1%, ± 1 count |
| Dc current | Range: 0 to 2000 mA in 5 ranges Accuracy: ± 0.2% of reading, ± 1 count |
| Ac current ¹ | Range: 0 to 2000 mA in 5 ranges Accuracy: ± 0.6% of reading, ± 1 count |
| Type DM 502A | |
| Dc volts | Range: 0 to 1000 V in 5 ranges Accuracy: 200 mV, 2, 20, and 200 V range: ± (0.1% of reading +0.05% of FS) 1000 V range: ±(0.1% of reading +0.1% of FS) |
| Ac volts | Range: 0 to 500 V in 5 ranges Accuracy: 200 mV, 2, 20, and 200 V range: 20 to 40 Hz, ± (1.5% of reading +0.3% of FS) 40 Hz to 20 kHz, ± (0.6% of reading ±0.3% of FS) 500 V range: 20 to 40 Hz, ± (1.5% of reading +1.2% of FS) 40 Hz to 20 kHz, ± (0.6% of reading +1.2% of FS) |
| True rms decibels | Range: -10 dB to +50 dB in 4 ranges with measurement capability to -60 dB Accuracy: ±0.5 dB from +50 dB to -50 dB from 20 Hz to 20 kHz ±0.5 dB from -50 dB to -60 dB from 20 Hz to 2 kHz ±1.5 dB from -50 dB to -60 dB from 2 kHz to 10 kHz |
| Ohms | Range: 0 to 20 MΩ in 6 ranges Accuracy: 200Ω, 2 kΩ, 20kΩ, 200 kΩ, and 2000 kΩ range: ± (0.5% of reading +0.05% of FS +0.2Ω) 20 MΩ range: ± (1% of reading +0.05% of FS) |
| Dc current | Range: 0 to 2000 mA in ranges Accuracy: ± (0.2% of reading, +0.05% of FS) |
| Ac current ¹ | Range: 0 to 2000 mA in 5 ranges Frequency: 40 Hz to 10 kHz Accuracy: ± (0.6% of reading +0.3% of FS) |

¹Ac current verified during dc current check since same shunt resistors are utilized for both checks.

**SECTION II
EQUIPMENT REQUIREMENTS**

4. Equipment Required. Table 2 identifies the specific equipment to be used in this calibration procedure. This equipment is issued with Secondary Transfer Calibration Standards Set AN/GSM-286. Alternate items may be used by the calibrating activity. The items selected must be verified to perform satisfactorily prior to use and must bear evidence of current calibration. The equipment must meet or exceed the minimum use specifications listed in table 2.

5. Accessories Required. The accessories required for this calibration are issued as indicated in paragraph 4 above. Common usage accessories are not listed in this calibration procedure. The following peculiar accessories are also required for this calibration: Extender, Tektronix Type 067-0645-02 and Power Module, Tektronix TM515.

Table 2. Minimum Specifications of Equipment Required

| Common name | Minimum use specifications | Manufacturer and model (part number) |
|-------------|---|--|
| CALIBRATOR | Range: 180 mV to 1000 V dc Accuracy: $\pm 0.042\%$ Range: 190 Ω to 19 M Ω Accuracy: 190 Ω $\pm 0.151\%$ 1.9 k Ω to 1.9 M Ω $\pm 0.138\%$ 19 M Ω $\pm 0.263\%$ Range: 180 μ A to 1.8 A dc Accuracy: $\pm 0.069\%$ Range: 0.7746 mV to 500 V ac Frequency: 20 Hz to 20 kHz Accuracy: $\pm 0.264\%$, 20 Hz and 20 kHz $\pm 0.153\%$, 50 Hz $\pm 0.312\%$, 1 kHz | John Fluke, Model 5700A/CT (p/o MIS-35947); w/power amplifier, John Fluke, Model 5725A (5725A) |
| MULTIMETER | Range: 0 to 15.76 V dc Accuracy: $\pm 0.016\%$ | John Fluke, Model 8840A/AF-05/09 (AN/GSM-64D) |

**SECTION III
CALIBRATION PROCESS FOR TYPE DM 502**

6. Preliminary Instructions

a. The instructions outlined in paragraphs 6 and 7 are preparatory to the calibration process. Personnel should become familiar with the entire bulletin before beginning the calibration.

b. Items of equipment used in this procedure are referenced within the text by common name as listed in table 2.

c. Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for this TI.

d. Unless otherwise specified, all controls and control settings refer to the TI.

7. Equipment Setup

WARNING

HIGH VOLTAGE is used or exposed during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions. REDUCE OUTPUT(S) to minimum after each step within the performance check where applicable.

- a.** Remove TI protective cover as required.
- b.** Connect TI to power module using extender.
- c.** Connect power module to 115 V ac power source.
- d.** Release TI **dB/OUT: NORM** pushbutton to **OUT: NORM** and **INPUT INT/OUT: EXT** pushbutton to **OUT: EXT**.
- e.** Pull power module **PWR** switch to on and allow at least 30 minutes for warmup.

8. Dc Volts

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT HI** and **LO**.
 - (2) Set TI range/function switch and calibrator output for settings listed in table
3. If TI indications are not within limits specified, perform **b** below.

Table 3. Dc Volts

| Test instrument range/function switch settings (DC VOLTS) | Calibration output settings | Test instrument indications | |
|--|-----------------------------|-----------------------------|----------|
| | | Min | Max |
| 200 mV | 180 mV | 179.7 mV | 180.3 mV |
| 2 | 1.8 V | 1.797 V | 1.803 V |
| 20 | 18 V | 17.97 V | 18.03 V |
| 200 | 180 V | 179.7 V | 180.3 V |
| 1 k | 1000 V | 998 V | 1002 V |

b. Adjustments

- (1) Set calibrator to **STANDBY** and disconnect from TI.
- (2) Set TI range/function switch to **2 DC VOLTS**.

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- (3) Short TI **HI** and **LO**. Adjust C315 (fig. 1) until TI indicates .000.
- (4) Remove short from TI **HI** and **LO**.
- (5) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT HI** and **LO**.
- (6) Set calibrator for a 1.8 V output. Adjust R305 (fig. 1) until TI indicates 1.800 V (R).
- (7) Set calibrator for a 180 mV output.
- (8) Set TI range/function switch to **200mV DC VOLTS**. Adjust R295 (fig. 1) until TI indicates 180.0 mV (R).

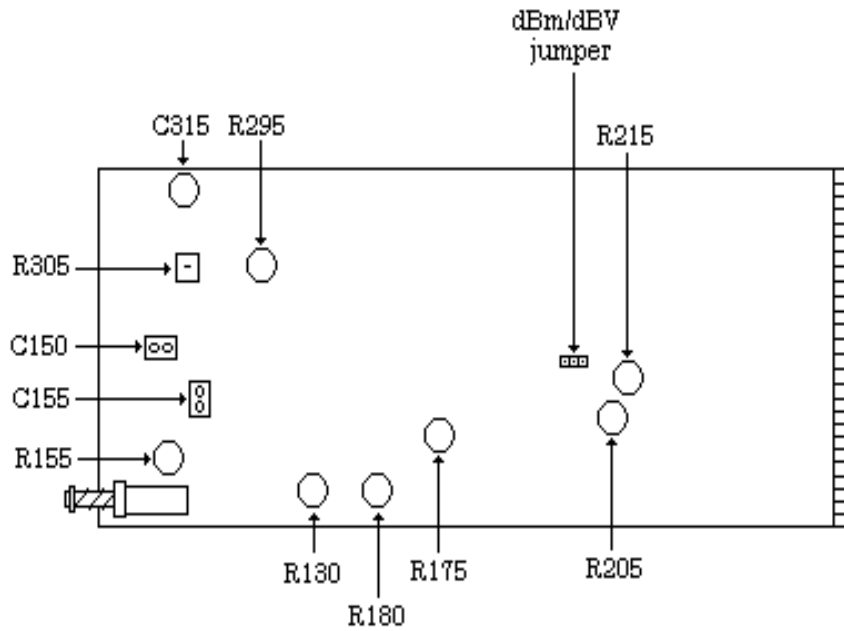


Figure 1. Type DM 502 - right side view.

9. Ohms

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT HI** and **LO**.
- (2) Set TI range/function switch to **200K OHMS**.
- (3) Set calibrator for a 190 kΩ output, **EX SNS** off then, using output adjustment controls, set calibrator control display **Reading** equal to TI indication. If calibrator control display **Error** indication is not within $\pm 0.5526\%$, perform **b** below.
- (4) Repeat technique of (2) and (3) above using settings and indications in table 4.

Table 4. Ohms

| Test instrument range/function switch settings (OHMS) | Calibrator | |
|--|------------------------------|--|
| | Output settings (Ω) | Control display Error indications ($\pm\%$) |
| 200 | 190 ¹ | 0.6053 |
| 2 k | 1.9 k | 0.5526 |
| 20 k | 19 k | 0.5526 |
| 2 M | 1.9 M ² | 0.5526 |
| 20 M | 19 M | 1.0526 |

¹Set calibrator **2 wire Comp** to on.

²Set calibrator **2 wire Comp** to off before setting output to 1.9 M Ω .

b. Adjustments

(1) Adjust R130 (fig. 1) until TI indication is equal to calibrator output display indication rounded to TI digits of resolution (R).

10. Dc Current

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT HI** and **LO**.
- (2) Set TI function/range switch and calibrator output for settings listed in table 5. TI will indicate within limits specified.

Table 5. Dc Current

| Test Instrument range/function switch settings (DC mA) | Calibrator output settings | Test instrument indications | |
|---|----------------------------|-----------------------------|---------------|
| | | Min | Max |
| 200 μ A | 180 μ A | 179.5 μ A | 180.5 μ A |
| 2 | 1.8 mA | 1.795 mA | 1.805 mA |
| 20 | 18 mA | 17.95 mA | 18.05 mA |
| 200 | 180 mA | 179.5 mA | 180.5 mA |
| 2 A | 1.8 A | 1.795 A | 1.805 A |

b. Adjustments. No adjustments can be made.

11. Ac Volts

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT HI** and **LO**.
- (2) Set TI range/function switch and calibrator output for settings listed in table 6. If TI indications are not within limits specified, perform **b** below.

Table 6. Ac Voltage

| Test Instrument range/function switch settings (AC VOLTS) | Calibrator output settings | | Test instrument indications | |
|--|----------------------------|-----------|-----------------------------|----------|
| | Voltage | Frequency | Min | Max |
| 200 mV | 180 mV | 20 Hz | 178.1 mV | 181.9 mV |
| 200 mV | 180 mV | 1 kHz | 179.0 mV | 181.0 mV |
| 200 mV | 180 mV | 20 kHz | 178.1 mV | 181.9 mV |
| 2 | 1.8 V | 20 Hz | 1.781 V | 1.819 V |
| 2 | 1.8 V | 1 kHz | 1.790 V | 1.810 V |
| 2 | 1.8 V | 20 kHz | 1.781 V | 1.819 V |
| 20 | 18 V | 20 Hz | 17.81 V | 18.19 V |
| 20 | 18 V | 1 kHz | 17.90 V | 18.10 V |
| 20 | 18 V | 20 kHz | 17.81 V | 18.19 V |
| 200 | 180 V | 20 Hz | 178.1 V | 181.9 V |
| 200 | 180 V | 1 kHz | 179.00 V | 181.0 V |
| 200 | 180 V | 20 kHz | 178.10 V | 181.9 V |
| 500 | 490 V | 50 Hz | 487 V | 493 V |
| 500 | 490 V | 20 kHz | 484 V | 496 V |

b. Adjustments

- (1) Set calibrator to **STANDBY**.
- (2) Set TI range/function switch to **2 AC VOLTS**.
- (3) Set calibrator for a 1.8 V, 1 kHz output. Adjust R180 (fig. 1) until TI indicates 1.800 V (R).
- (4) Set calibrator for a 180 mV, 1 kHz output.
- (5) Set TI range/function switch to **200mV AC VOLTS**. Adjust R175 (fig. 1) until TI indicates 180.0 mV (R).
- (6) Set TI range/function switch to **20 AC VOLTS**.
- (7) Set calibrator for a 18 V, 1 kHz output. Adjust C150 (fig. 1) until TI indicates 18.00 V (R).
- (8) Set TI range/function switch to **500 AC VOLTS**.
- (9) Set calibrator for a 500 V, 100 Hz output. Adjust R155 (fig. 1) until TI indicates 500 V (R).
- (10) Set calibrator for a 500 V, 10 kHz output. Adjust C155 (fig. 1) until TI indicates 500 V (R).
- (11) Repeat (1) through (10) above as necessary for best overall in-tolerance frequency response.

12. Ac Decibels

a. Performance Check

- (1) Position **dBm/dBV** jumper (fig. 1) in **dBm** position.

- (2) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT HI** and **LO**.
- (3) Set TI range/function switch to **AC VOLTS - 20 dB** and press **dB/OUT: NORM** pushbutton in to **dB**.
- (4) Set calibrator for a 77.46 mV, 1 kHz output. If TI does not indicate between -0.5 and +0.5, perform **b(1)** below.
- (5) Set calibrator for a 8.69 mV, 1 kHz output. If TI does not indicate between -18.5 and -19.5, perform **b(2)** below.
- (6) Set calibrator for a 690.36 mV, 1 kHz output. TI will indicate between +18.5 and +19.5.
- (7) Position TI **dBm/dBV** jumper (fig. 1) in **dBV** position.
- (8) Set TI range/function switch and calibrator output for settings listed in table 7. TI indications will be within limits specified.

Table 7. Ac Decibels

| Test Instrument range/function switch settings (AC VOLTS dB) | Calibrator output settings | | Test instrument indications | |
|---|----------------------------|-----------|-----------------------------|--------|
| | Voltage | Frequency | Min | Max |
| -40 | 10 mV | 1 kHz | -0.5 | +0.5 |
| -20 | 100 mV | 50 Hz | -0.5 | +0.5 |
| 0 | 200 mV | 7 kHz | -12.98 | -14.98 |
| 0 | 200 mV | 20 kHz | -11.98 | -15.98 |
| 0 | 1 V | 1 kHz | -0.5 | +0.5 |
| 0 | 1.05925 V | 20 kHz | 0.0 | +1.0 |
| 0 | 3 V | 15 kHz | +9.04 | +10.04 |
| 0 | 9 V | 50 Hz | +18.58 | +19.58 |
| 20 | 90 V | 7 kHz | +18.58 | +19.58 |
| 40 | 90 V | 20 kHz | -1.91 | +0.09 |
| 40 | 472.029 V | 20 kHz | +12.98 | +13.98 |

- (9) Release TI **dB/OUT: NORM** pushbutton to **OUT: NORM**.

b. Adjustments

- (1) Adjust R205 (fig. 1) until TI indicates 0.00 (R).
- (2) Adjust R215 (fig. 1) until TI indicates -19.00 (R).

13. Final Procedure

- a.** Deenergize and disconnect all equipment
- b.** Annotate and affix DA Label/Form in accordance with TB 750-25.

**SECTION IV
CALIBRATION PROCESS FOR TYPE DM 502A**

14. Preliminary Instructions

a. The instructions outlined in paragraphs **14** and **15** are preparatory to the calibration process. Personnel should become familiar with the entire bulletin before beginning the calibration.

b. Items of equipment used in this procedure are referenced within the text by common name as listed in table 2.

c. Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for this TI.

d. When indications specified in paragraphs **16** through **20** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraphs **16** through **20**. Do not perform power supply check if all other parameters are within tolerance.

15. Equipment Setup

WARNING

HIGH VOLTAGE is used or exposed during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions. REDUCE OUTPUT(S) to minimum after each step within the performance check where applicable.

- a.** Remove TI protective cover as required.
- b.** Connect TI to power module using extender.
- c.** Connect power module to a 115 V ac source.
- d.** Release TI **INPUT INT/EXT** pushbutton to **EXT**.
- e.** Pull power module **PWR** switch to on and allow at least 30 minutes for warmup.

16. Dc Volts

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **VOLTS/W** and **LOW**.
- (2) Press TI **VOLTS DC** pushbutton.
- (3) Press TI range pushbuttons and set calibrator output to settings listed in table 8. If TI does not indicate within limits specified, perform **b** below.

Table 8. Dc Volts

| Test instrument range pushbuttons | Calibrator output settings | Test instrument indications | | | |
|---|-------------------------------|--------------------------------|--|----------|--|
| | | Min | | Max | |
| 200 mV | 180 mV | 179.7 mV | | 180.3 mV | |
| 2 V | 1.8 V | 1.797 V | | 1.803 V | |
| 20 V | 18 V | 17.97 V | | 18.03 V | |
| 200 V | 180 V | 179.7 V | | 180.3 V | |
| 1000 VDC | 1000 V | 998 V | | 1002 V | |

b. Adjustments

- (1) Set calibrator to **STANDBY** and disconnect from TI.
- (2) Short TI **VOLTS/W** and **LOW**.
- (3) Press TI **200 mV** pushbutton. Adjust R1542 (fig. 2) until TI indicates 000.0.
- (4) Remove short from **VOLTS/W** and **LOW**.
- (5) Connect calibrator **OUTPUT HI** and **LO** to TI **VOLTS/W** and **LOW**.
- (6) Press TI **2 V** pushbutton.
- (7) Set calibrator for a 1.8 V dc output. Adjust R1443 (fig. 2) until TI indicates 1.800 V (R).
- (8) Set calibrator for a 180 mV dc output.
- (9) Press TI **200 mV** pushbutton. Adjust R1531 (fig. 2) until TI indicates 180.0 mV (R).
- (10) Set calibrator to **STANDBY** and disconnect from TI.
- (11) Short TI **VOLTS/W** and **LOW**.
- (12) Connect multimeter **INPUT HI** to TP1013 (fig. 2) and **LO** to TI **LOW**. Adjust R1011 (fig. 2) until multimeter indicates 0.000 V dc.
- (13) Disconnect multimeter and short from TI.

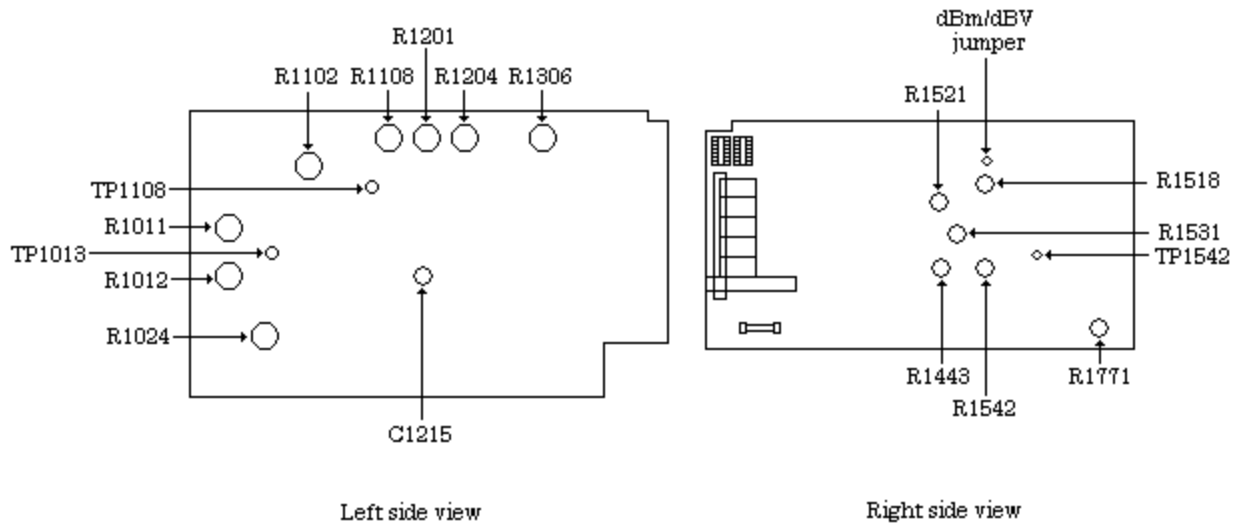


Figure 2. Type DM 502A – left and right side views.

17. Ohms

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **VOLTS/W** and **LOW**.
- (2) Press TI **kW** pushbutton.
- (3) Press TI **20 kW** range pushbutton.
- (4) Release TI **HI/LO** pushbutton to **HI**.
- (5) Set calibrator for a 19 kΩ output, **EX SNS** off, and **2 wire Comp** on then, using output adjustment controls, set calibrator control display **Reading** equal to TI indication. If calibrator control display **Error** indication is not within ±0.5526%, perform **b** below.
- (6) Press TI **HI/LO** pushbutton to **LO** and repeat (5) above.
- (7) Repeat technique of (3) through (6) above using settings and indications in table 9.

Table 9. Ohms

| Test instrument range pushbuttons | Calibrator | |
|-----------------------------------|---------------------|---|
| | Output settings (Ω) | Control display Error indications (±%) |
| 200Ω | 190 | 0.6579 |
| 2 kΩ | 1.9 k | 0.5526 |
| 200 kΩ | 190 k ¹ | 0.5526 |
| 2000 kΩ | 1.9 M | 0.5526 |
| AUTO 20 M | 19 M | 1.0526 |

¹Set calibrator **2 wire Comp** to off before setting output to 190 kΩ.

b. Adjustments

(1) Adjust R1306 (fig. 2) until TI indication equals calibrator output display indication rounded to TI digits of resolution (R).

18. Dc Current

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **mA** and **LOW**.
- (2) Press TI **mA DC** pushbutton.
- (3) Press TI range pushbuttons and set calibrator output to settings listed in table 10. TI will indicate within limits specified.

Table 10. Dc Current

| Test instrument range pushbuttons | Calibrator output settings | Test instrument indications | |
|-----------------------------------|----------------------------|-----------------------------|---------------|
| | | Min | Max |
| 200 μ A | 180 μ A | 179.5 μ A | 180.5 μ A |
| 2 mA | 1.8 mA | 1.795 mA | 1.805 mA |
| 20 mA | 18 mA | 17.95 mA | 18.05 mA |
| 200 mA | 180 mA | 179.5 mA | 180.5 mA |
| 2000 mA | 1.8 A | 1795 mA | 1805 mA |

b. Adjustments. No adjustments can be made.

19. Ac Volts

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **HI** and **LOW**.
- (2) Press TI **VOLTS AC TRUE RMS** pushbutton and release all other pushbuttons to out.
- (3) Press TI range pushbuttons and set calibrator for settings listed in table 11. If TI does not indicate within limits specified, perform **b** below.

Table 11. Ac Voltage

| Test instrument range pushbuttons | Calibrator output settings | | Test instrument indications (V) | |
|-----------------------------------|----------------------------|-----------|---------------------------------|----------|
| | Voltage | Frequency | Min | Max |
| 200 mV | 180 mV | 20 Hz | 176.7 mV | 183.3 mV |
| 200 mV | 180 mV | 50 Hz | 178.3 mV | 181.7 mV |
| 200 mV | 180 mV | 20 kHz | 178.3 mV | 181.7 mV |
| 2 V | 1.8 V | 20 Hz | 1.767 V | 1.833 V |
| 2 V | 1.8 V | 50 Hz | 1.783 V | 1.817 V |
| 2 V | 1.8 V | 20 kHz | 1.783 V | 1.817 V |
| 20 V | 18 V | 20 Hz | 17.67 V | 18.33 V |

Table 11. Ac Voltage - Continued

| Test instrument range pushbuttons | Calibrator output settings | | Test instrument indications (V) | |
|-----------------------------------|----------------------------|-----------|---------------------------------|---------|
| | Voltage | Frequency | Min | Max |
| 20 V | 18 V | 50 Hz | 17.83 V | 18.17 V |
| 20 V | 18 V | 20 kHz | 17.83 V | 18.17 V |
| 200 V | 180 V | 20 Hz | 176.7 V | 183.3 V |
| 200 V | 180 V | 50 Hz | 178.3 V | 181.7 V |
| 200 V | 180 V | 20 kHz | 178.3 V | 181.7 V |
| 500 VAC | 500 V | 50 Hz | 491 V | 509 V |
| 500 VAC | 500 V | 20 kHz | 491 V | 509 V |

b. Adjustments

- (1) Set calibrator to **STANDBY** and disconnect from TI.
- (2) Short TI **VOLTS/W** and **LOW**.
- (3) Press TI **200 mV** range pushbutton. Adjust R1204 (fig. 2) until TI indicates 00.0.
- (4) Remove short from **VOLTS/W** and **LOW**.
- (5) Connect calibrator **OUTPUT HI** and **LO** to TI **VOLTS/W** and **LOW**.
- (6) Press TI **2 V** range pushbutton.
- (7) Set calibrator for a 1.8 V, 100 Hz output. Adjust R1108 (fig. 2) until TI indicates 1.800 V (R).
- (8) Press TI **20 V** range pushbutton.
- (9) Set calibrator for a 18 V, 10 kHz output. Adjust C1215 (fig. 2) until TI indicates 18.00 V (R).

20. Ac Decibels

a. Performance Check

- (1) Position **dBm/dBV** jumper (fig. 2) in **dBm** position.
- (2) Press TI **VOLTS AC TRUE RMS, dB**, and **200 V** pushbuttons.
- (3) Connect calibrator **OUTPUT HI** and **LO** to TI **VOLTS/W** and **LOW**.
- (4) Set calibrator for a 77.46 V, 100 Hz output. If TI does not indicate between +39.5 and +40.5, perform **b** below.
- (5) Set calibrator for a 77.46 mV, 100 Hz output.
- (6) Press TI **200 mV** pushbutton. If TI does not indicate between -19.5 and -20.5, perform **b** below.
- (7) Set calibrator for a 0.7746 mV, 100 Hz output. If TI does not indicate between -59.5 and -60.5, perform **b** below.

- (8) Position **dBm/dBV** jumper (fig. 2) in **dBV** position.
- (9) Press TI **MAX dB** pushbuttons and set calibrator output for settings listed in table 12. TI will indicate within limits specified.

Table 12. dBV

| Test instrument MAX dB pushbuttons | Calibrator output settings | | Test instrument indications | |
|---|----------------------------|-----------|-----------------------------|-------|
| | Voltage | Frequency | Min | Max |
| -10 | 1 mV | 20 Hz | -59.5 | -60.5 |
| -10 | 1 mV | 2 kHz | -59.5 | -60.5 |
| -10 | 1 mV | 10 kHz | -58.5 | -61.5 |
| -10 | 100 mV | 10 kHz | -19.5 | -20.5 |
| +10 | 1 V | 20 Hz | -0.5 | +0.5 |
| +30 | 10 V | 10 kHz | +19.5 | +20.5 |
| +50 | 100 V | 10 kHz | +39.5 | +40.5 |

b. Adjustments

- (1) Press TI **200 V** pushbutton.
- (2) Connect multimeter **INPUT HI** to TP1108 (fig. 2) and **LO** to TI **LOW**.
- (3) Set calibrator for a 77.46 V, 100 Hz output. Adjust R1201 (fig. 2) until multimeter indicates 00.0 mV dc.
- (4) Disconnect multimeter from TI.
- (5) Adjust R1518 (fig. 2) until TI indicates +40.0 (R).
- (6) Set calibrator for a 77.46 mV, 100 Hz output.
- (7) Press TI **200 mV** pushbutton. Adjust R1521 (fig. 2) until TI indicates -20.0 (R).
- (8) Set calibrator for a 0.7746 mV, 100 Hz output. Adjust R1102 (fig. 2) until TI indicates -60.0 (R).
- (9) Press TI **2 V** pushbutton.
- (10) Set calibrator for a 3.0984 V, 100 Hz output. Adjust R1024 (fig. 2) until TI indication just begins to flash (starts to blink).
- (11) Set calibrator for a 23.238 mV, 100 Hz output. Adjust R1012 (fig. 2) until TI indication just begins to flash (starts to blink).

21. Power Supply

a. Performance Check

NOTE

Do not perform power supply check if all other parameters are within tolerance.

- (1) Short TI **VOLTS/W** and **LOW**.

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(2) Connect multimeter **INPUT HI** to TP1542 (fig. 2) and **LO** to TI chassis ground. If multimeter does not indicate between +15.74 and +15.76 V dc, perform **b** below.

b. Adjustments. Adjust R1771 (fig. 2) until multimeter indicates +15.75 V dc. (R)

22. Final Procedure

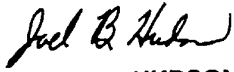
- a.** Deenergize and disconnect all equipment
- b.** Annotate and affix DA label/form in accordance with TB 750-25.

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By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

OFFICIAL:



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army

0215705

Distribution:

To be distributed in accordance with IDN 342183, requirements for calibration procedure TB 9-6625-2020-35.

TB 9-6625-2282-35

THESE ARE THE INSTRUCTIONS FOR SENDING AN ELECTRONIC 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" whomever@avma27.army.mil

To: 2028@redstone.army.mil

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** Home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-Oct-93
8. **Pub No:** TB 9-6625-xxxx-35
9. **Pub Title:** Calibration Procedure for ...
10. **Publication Date:**
11. **Change Number:**
12. **Submitted Rank:** MSG
13. **Submitter Fname:** Joe
14. **Submitter Mname:** T
15. **Submitter Lname:** Smith
16. **Submitter Phone:** (123) 123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure :** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.

