TB 9-6625-2349-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR MULTIMETER MERCER, MODEL 83K

Headquarters, Department of the Army, Washington, DC
23 October 2003

Distribution Statement A: Approved for public release; distribution is unlimited

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax, or the World Wide Web. Our FAX number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is: 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual. For the World Wide Web, use: https://amcom2028.redstone.army.mil.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Multimeter Mercer, Model 83K. The manufacturer's manual was used as the prime data source 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 1 hour, using the dc and low frequency technique.

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

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
Dc voltage	Range: 250 mV to 1000 V in 7 ranges Accuracy: ±3% FS
Dc current	Range: 50 μA to 500 mA in 5 ranges Accuracy: ±3% FS
Ac voltage	Range: 2.5 to 1000 V in 6 ranges at 400 Hz Accuracy: ±4% FS
Resistance	Range: 0 to 20 MΩ in 4 ranges (center scale at 20 Ω, 200 Ω, 20 kΩ, 200 kΩ) Accuracy: ± 3° of arc

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. The accuracies listed in table 2 provide a four-to-one ratio between the standard and TI.

5. Accessories Required. The accessories required for this calibration are common usage accessories issued as indicated in paragraph **4** above and are not listed in this calibration procedure.

Table 2. Minimum Specifications of Equipment Required

Common name	Minimum use specifications	Manufacturer and model (part number)
CALIBRATOR	Dc volts: Range: 242.5 mV to 1030 V Accuracy: ±.75% Dc current: Range: 48.5 μA to 515 mA Accuracy: ±.75% Ac volts: Range: 2.375 to 1050 V Accuracy: ±1.0%	John Fluke, Model 5720A (p/o MIS-35947)
RESISTANCE STANDARD	Range: 17.74 Ω to 225531.9 Ω Accuracy: ±2.83%	Biddle-Gray, Model 71-631(7910328)

SECTION III
CALIBRATION PROCESS

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 results of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. 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.

8. Dc Voltage

a. Performance Check

(1) Connect calibrator output to TI **+** and **COM**.

(2) Set TI function/range switch to **0.25 DCV**.

(3) Set calibrator initial output for 250 mV. Adjust calibrator output controls for a 0.25 V dc TI indication. Calibrator control **Error** display will indicate within ±3 percent.

(4) Repeat technique of (2) and (3) above for TI function/range switch and calibrator output settings listed in table 3. Calibrator control **Error** display will indicate within ±3 percent for each TI indication.

Table 3. Dc Voltage

Test instrument function/range switch settings (**DCV**)	Calibrator initial output settings (V)	Test instrument indications (V dc)
2.5	2.5	2.5
10	10	10
50	50	50
250	250	250
500	500	500
1 k[1]	1000	1000

[1]Connect calibrator output to TI **DC 1k V** and **COM**.

b. Adjustments. No adjustments can be made.

9. Dc Current

a. Performance Check

(1) Connect calibrator output to TI **+** and **COM**.

(2) Set TI function/range switch to **50 μA**.

(3) Set calibrator initial output for 50 μA. Adjust calibrator output controls for a 50 μA indication on TI. Calibrator control **Error** display will indicate within ±3 percent.

(4) Repeat technique of (2) and (3) above for TI function/range switch and calibrator initial output settings listed in table 4. Calibrator control **Error** display will indicate within ±3 percent for each TI indication.

Table 4. Dc Current

Test instrument function/range switch settings (**DC mA**)	Calibrator initial output settings (DC mA)	Test instrument indications (DC mA)
.5	.5	.5
5	5	5
50	50	50
500	500	500

b. Adjustments. No adjustments can be made.

10. Ac Voltage

a. Performance Check

(1) Connect calibrator output to TI **+** and **COM**.

(2) Set TI function/range switch to **2.5 ACV**.

(3) Set calibrator initial output for 2.5 V at 400 Hz. Adjust calibrator output controls for a 2.5 V ac indication on TI. Calibrator control **Error** display will indicate within ±4 percent.

(4) Repeat technique of (2) and (3) above for TI function/range switch and calibrator initial output settings listed in table 5. Calibrator control **Error** display will indicate within ±4 percent for each TI indication.

Table 5. Ac Voltage

Test instrument function/range switch settings (**ACV**)	Calibrator initial output settings		Test instrument indications (V ac)
	Voltage (V)	Frequency (Hz)	
10	10	400	10
50	50	400	50
250	250	400	250
500	500	400	500
1 k[1]	1000	400	1000

[1]Connect calibrator output to TI **AC 1k V** and **COM.**

b. Adjustments. No adjustments can be made.

11. Resistance

a. Performance Check

(1) Disconnect TI inputs.

(2) Set TI function/range switch to **OHM x1**.

(3) Connect leads to TI **+** and **COM.** Short leads together and adjust **0 Ω ADJ** control for 0 indication on Ω scale.

(4) Connect TI **+** and **COM** to resistance standard. Adjust resistance standard for a 20 Ω indication on TI. Resistance standard will indicate between 17.74 Ω and 22.55 Ω.

(5) Repeat technique of (1) through (4) above for TI function/range switch settings and indications listed in table 6. Resistance standard will indicate within limits specified in table 6.

b. Adjustments. No adjustments can be made.

Table 6. Resistance

Test instrument		Resistance standard indications (Ω)	
Function/range switch settings (**OHM**)	Indications	Min	Max
X10	200 Ω	177.36	225.53
Xlk	20 kΩ	17735.85	22553.19
X10k	200 kΩ	177358.5	225531.9

12. Final Procedure

a. Deenergize and disconnect all equipment.

b. Annotate and affix DA Label/Form in accordance with TB 750-25.

By Order of the Secretary of the Army:

Official:

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0323906

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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@redstone.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:** 55-2840-229-23
9. **Pub Title**: TM
10. **Publication Date**: 04-JUL-85
11. Change Number: 7
12. Submitter 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.

PIN: 081025-000