

*TB 9-6625-2262-35

CALIBRATION PROCEDURE FOR MULTIMETER FLUKE, MODEL 8025A AND APN 13235191 (FLUKE, MODEL 8025B)

Headquarters, Department of the Army, Washington, DC.
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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 or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, US Army Aviation and Missile Command, 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>.

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**SECTION I
IDENTIFICATION AND DESCRIPTION**

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Multimeter Fluke, Model 8025A and APN 13235191 (Fluke, Model 8025B). The manufacturer's manual and specification control drawing No. 13235191 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. Variations among models are described in text.

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

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

b. Adjustments to be recorded are designated (R) at the end of the sentence in which they appear. 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 \pm (% of reading + digits) (3 ¹ / ₂ digit display)			
Dc voltage	Range: 0 to 1000 V Accuracy: 0.2 + 1			
Ac voltage	Range	Accuracy		
		40 Hz to 2 kHz	2 to 10 kHz	10 to 30 kHz
	320.0 mV 3.200 V 32.00 V 320.0 V	0.5 + 3	2.0 + 3	4.0 + 10
	1000 V	1.0 + 3	3.0 + 3	N/A
Resistance	Range	Accuracy		
	320.0 Ω	0.3 + 2		
	3.200 k Ω 32.00 k Ω 320.0 k Ω 3.200 M Ω	0.2 + 1		
	32.00 M Ω	1.0 + 1		
	32.00 nS	2.0 + 10		
Dc current	Range: 0 to 10 A Accuracy: 0.75 + 2			
Ac current	Range: 0 to 10 A Frequency: 40 Hz to 1 kHz Accuracy: 1.5 + 2			

**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. When the four-to-one ratio cannot be met, the actual accuracy of the equipment selected is shown in parenthesis.

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	<p>Dc voltage Range: 300 mV to 1000 V Accuracy: ±0.055%</p> <p>Ac voltage Range: 300 mV to 300 V, 40 Hz and 1.9 kHz Accuracy: ±0.15% Range: 300 mV to 300 V, 9.9 kHz Accuracy: ±0.52% Range: 300 mV to 300 V, 30 kHz Accuracy: ±1.08% Range: 1000 V, 40 Hz and 1.9 kHz Accuracy: ±0.325% Range: 1000 V, 10 kHz Accuracy: ±0.825%</p> <p>Resistance Range: Accuracy: ±(%) 190 Ω 0.105 1.9 kΩ thru 19 MΩ 0.065 19 MΩ 0.262 100 MΩ 0.75</p> <p>Dc current Range: 300 μA to 9.5 A Accuracy: ±0.2%</p> <p>Ac current Range: 300 μA to 9.5 A Frequency: 40 Hz and 1 kHz Accuracy: ±0.392%</p>	Fluke, Model 5720A (5700A/EP) (p/o MIS-35947), w/amplifier, Fluke, 5725A/AR (5725A/AR)

**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. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for this 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 protective cover from TI as necessary to gain access to adjustments.

b. For some checks throughout this procedure, it may be necessary to manually set TI range by pressing **RANGE** pushbutton.

8. Dc Voltage

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **VΩ** and **COM**.

(2) Set function switch to dc mV.

(3) Set TI and calibrator for settings listed in table 3. If TI does not indicate within limits specified, perform **b** below.

Table 3. Dc Voltage

Test instrument range settings	Calibrator output settings	Test instrument indications	
		Min	Max
320 mV	300 mV	299.3	300.7
3.2 V ¹	3 V	2.993	3.007
32 V	30 V	29.93	30.07
320 V	300 V	299.3	300.7
1000 V	1000 V	997	1003

¹Set function switch to dc V.

b. Adjustments.

- (1) Set function switch to dc V.
- (2) Set calibrator for a 2.7 V dc output.
- (3) Press **RANGE** pushbutton for 3.2 V range.
- (4) Adjust R19 (DC VOLTS) (fig. 1) until TI indicates 2.700 V dc (R).

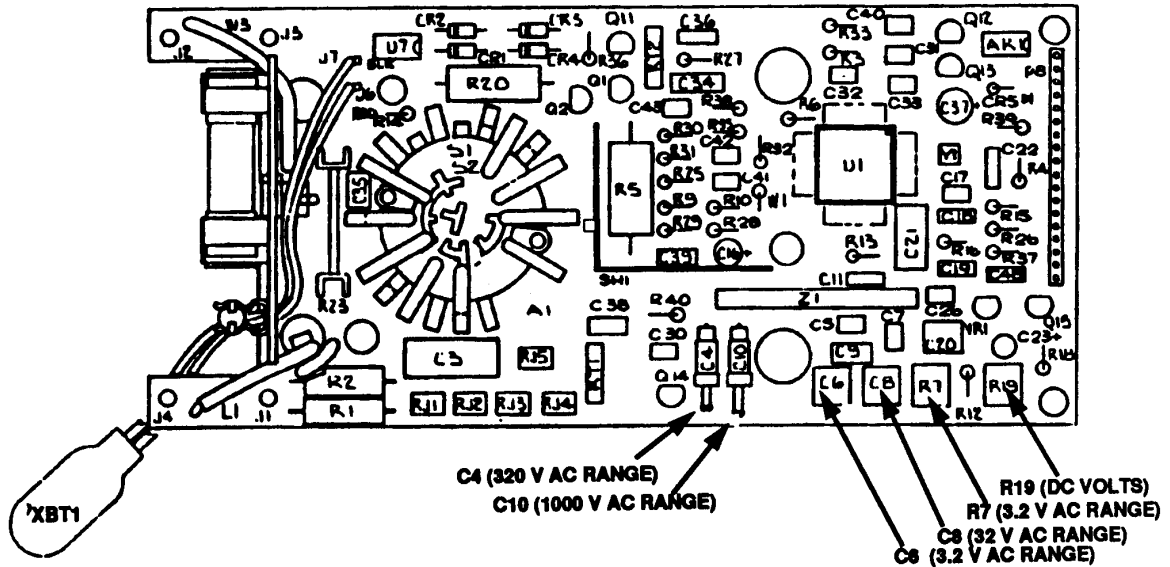


Figure 1. Adjustments locations.

9. Ac Voltage

a. Performance Check

- (1) Set TI function switch to ac mV.
- (2) Set TI and calibrator for settings listed in table 4. If TI indications are not within limits specified, perform **b** below.

Table 4. Ac Voltage

Test instrument range settings	Calibrator output settings		Test instrument indications	
	Voltage	Frequency	Min	Max
320 mV	300 mV	40 Hz	298.2	301.8
320 mV	300 mV	1.9 kHz	298.2	301.8
320 mV	300 mV	9.9 kHz	293.7	306.3
320 mV	300 mV	30 kHz	287	313
3.2 V ¹	3 V	40 Hz	2.982	3.018
3.2 V	3 V	1.9 kHz	2.982	3.018
3.2 V	3 V	9.9 kHz	2.937	3.063
3.2 V	3 V	30 kHz	2.87	3.13

See footnote at end of table.

Table 4. Ac Voltage - Continued

Test instrument range settings	Calibrator output settings		Test instrument indications	
	Voltage	Frequency	Min	Max
32 V	30 V	40 Hz	29.82	30.18
32 V	30 V	1.9 kHz	29.82	30.18
32 V	30 V	9.9 kHz	29.37	30.63
32 V	30 V	30 kHz	28.7	31.3
320 V	300 V	40 Hz	298.2	301.8
320 V	300 V	1.9 kHz	298.2	301.8
320 V	300 V	9.9 kHz	293.7	306.3
320 V	300 V	30 kHz	287	313
1000 V	1000 V	40 Hz	987	1013
1000 V	1000 V	1.9 kHz	987	1013
1000 V	1000 V	10 kHz	967	1033

¹Set function switch to ac V and press **RANGE** pushbutton for remaining range settings.

b. Adjustments

- (1) Set function switch to ac V.
- (2) Set calibrator for a 2.7 V, 100 Hz output.
- (3) Press **RANGE** pushbutton for 3.2 V range.
- (4) Adjust R7 (3.2 V AC RANGE) (fig. 1) for a 2.700 V ac ± 0.001 V ac TI indication (R).
- (5) Press **RANGE** pushbutton for 320 V range.
- (6) Set calibrator for a 270 V, 10 kHz output.
- (7) Adjust C4 (320 V AC RANGE) (fig. 1) for a 270.0 V ac ± 0.1 V ac TI indication (R).
- (8) Press **RANGE** pushbutton for 1000 V range.
- (9) Set calibrator for a 1000 V, 10 kHz output.
- (10) Adjust C10 (1000 V AC RANGE) (fig. 1) for a 1000 V ac ± 1.0 V ac TI indication (R).
- (11) Set calibrator for a 27 V, 10 kHz output.
- (12) Press **RANGE** pushbutton for 32 V range.
- (13) Adjust C8 (32 V AC RANGE) (fig. 1) for a 27.00 V ac ± 0.01 V ac TI indication (R).
- (14) Set calibrator for a 2.7 V, 10 kHz output.
- (15) Press **RANGE** pushbutton for 3.2 V range.
- (16) Adjust C6 (3.2 V AC RANGE) (fig. 1) for a 2.700 V ac ± 0.001 V ac TI indication (R).
- (17) Set calibrator for a 2.7 V, 100 Hz output. Verify that TI indicates 2.700 V ac ± 0.017 V ac.

10. Dc Current

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **mA/ μ A** and **COM**.
- (2) Set function switch to dc μ A.

(3) Set calibrator output for settings listed in table 5. TI will indicate within limits specified.

Table 5. Dc Current

Calibrator output settings	Test instrument indications	
	Min	Max
300 μ A	297.6 μ A	302.4 μ A
3 mA	2976 μ A	3024 μ A
30 mA ¹	29.76 mA	30.24 mA
300 mA	297.6 mA	302.4 mA
9.5 A ²	9.41 A	9.59 A

¹Set function switch to dc mA/A.

²Connect amplifier **CURRENT OUTPUT HI** and **LO** to **TI A** and **COM**.

b. Adjustments. No adjustments can be made.

11. Ac Current

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to **TI mA/ μ A** and **COM**.

(2) Set function switch to ac μ A.

(3) Set calibrator output for settings listed in table 6. TI will indicate within limits specified.

Table 6. Ac Current

Calibrator output settings		Test instrument indications	
Current	Frequency	Min	Max
300 μ A	40 Hz	295.3 μ A	304.7 μ A
300 μ A	1 kHz	295.3 μ A	304.7 μ A
3 mA	40 Hz	2953 μ A	3047 μ A
3 mA	1 kHz	2953 μ A	3047 μ A
30 mA ¹	40 Hz	29.53 mA	30.47 mA
30 mA	1 kHz	29.53 mA	30.47 mA
300 mA	40 Hz	295.3 mA	304.7 mA
300 mA	1 kHz	295.3 mA	304.7 mA
9.5 A ²	40 Hz	9.34 A	9.66 A
9.5 A	1 kHz	9.34 A	9.66 A

¹Set function switch to ac mA/A.

²Connect amplifier **CURRENT OUTPUT HI** and **LO** to **TI A** and **COM**.

b. Adjustments. No adjustments can be made.

12. Resistance

a. Performance Check

- (1) Connect calibrator **OUTPUT HI** and **LO** to TI **VΩ** and **COM**.
- (2) Set function switch to **Ω**.

(3) Set TI and calibrator for settings listed in table 7. At each setting, use calibrator output adjustment controls to set calibrator control display **Reading** equal to TI indication. Calibrator control display **Error** indications will be within limits specified in table 7.

Table 7. Resistance

Test instrument range settings	Calibrator		Error indications ±(%)
	Output settings		
320 Ω	190	Ω ¹	0.42
3.2 kΩ	1.9	kΩ	0.26
32 kΩ	19	kΩ	0.26
320 kΩ	190	kΩ ²	0.26
3.2 MΩ	1.9	MΩ	0.26
32 MΩ	19	MΩ	1.05

¹Set calibrator **2 wire Comp** to **ON**.
²Set calibrator **2 wire Comp** to **OFF**.

- (4) Press **RANGE** pushbutton until nS is displayed.
- (5) Set calibrator for a 100 MΩ output. TI will indicate between 9.7 and 10.3 nS.

b. Adjustments. No adjustments will be made.

13. 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:

PETER J. SCHOOMAKER

*General, United States Army
Chief of Staff*

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Secretary of the Army*

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Instructions for Submitting 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@redstone.army.milT
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.

