TB 9-6625-2269-24

CHANGE 1

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR DIGITAL MULTIMETER FLUKE, MODELS 8021B, 8022A AND 8022B

Headquarters, Department of the Army, Washington, DC
3 January 2008

TB 9-6625-2269-24, 7 August 2007, is changed as follows:

1. Remove old page and insert new page as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

Remove Page	**Insert Page**
5 and 6	5 and 6

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official

JOYCE E. MORROW
Administrative Assistant to the Secretary of the Army

0730408

Distribution:

To be distributed in accordance with initial distribution number (IDN) 344420 requirements for calibration procedure TB 9-6625-2269-24.

*TB 9-6625-2269-24

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CALIBRATION PROCEDURE FOR DIGITAL MULTIMETER FLUKE, MODELS 8021B, 8022A AND 8022B

Headquarters, Department of the Army, Washington, DC
7 August 2007

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, 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.

*This bulletin supersedes TB 9-6625-2269-35, dated 31 October 1991.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Digital Multimeter, Fluke, Models 8021B, 8022A and 8022B. 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. Model 8021B contains an audible continuity feature; otherwise, all models are alike.

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 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
Dc voltage	Range: 0 to 1000 V (in 5 ranges) Accuracy: ±(0.25% of reading + 1 digit)
Ac voltage	Range: 0 to 750 V (in 5 ranges) Frequency: 45 to 450 Hz Accuracy: ±(1.0% of reading + 3 digits)
Ac current[1]	
Model 8021B	Range: 0 to 2000 mA (in 4 ranges) from 45 Hz to 450 Hz Accuracy: ±(3% of reading + 3 digits) for 2 mA range ±(2% of reading + 3 digits) for other 3 ranges
Model 8022A	Accuracy: ±(2% of reading + 3 digits) for all ranges
Model 8022B	Accuracy: ±(3% of reading + 3 digits) for 2 mA range ±(2% of reading + 3 digits) for other 3 ranges
Dc current	Range: 0 to 2000 mA (in 4 ranges) Accuracy: ±(0.75% of reading + 1 digit)
Resistance	Range: 0 to 20 MΩ (in 6 ranges) Accuracy: ±(0.3% of reading + 3 digits) for 200 Ω range ±(0.2% of reading + 1 digit) for 2 kΩ through 2000 kΩ ranges ±(2% of reading + 1 digit) for 20 MΩ range

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

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-287 or AN/GSM-705. 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. Where the four-to-one ratio cannot be met, the actual accuracy of the equipment selected is shown in parenthesis. 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 voltage: Range: .19 to 1000 V Accuracy: ±(0.075%) Ac Voltage: Range: 190 mV to 750 V Frequency: 45 to 450 Hz Accuracy: ±(0.289%) Resistance: Range: 190 Ω to 19 MΩ Accuracy: ±(%) Resistance: 190 Ω..... (0.115%) 1.9 through 190 kΩ..... (0.063%) 1.9 and 19 MΩ ..... (0.513%) Dc current: Range: 1.9 mA to 1.9 A Accuracy: ±(0.197%)	Fluke, Model 5720A (5700A), (p/o MIS-35947);w amplifier, Fluke, Model 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.

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 protective cover from TI only to make adjustments and replace upon completion.

b. Set **ON - OFF** switch to **ON**.

c. Set **DC/AC** pushbutton to **DC** (out) position.

d. Set function pushbutton to **V** (out) position.

e. Press **200 mV** range pushbutton.

8. DC Voltage

a. Performance Check

(1) Connect calibrator **OUTPUT** terminals to TI **V** and **COMMON** terminals.

(2) Press TI range pushbutton and set calibrator output as specified in table 3. If TI does not indicate within the specified limits, perform **b** below.

b. Adjustments. Set TI range to **200 mV** and calibrator for a 190 mV dc output. Adjust DC CAL R5 (fig. 1) for a TI indication of 190.0 (R)

Table 3. Dc Voltage

Test instrument range pushbutton settings	Calibrator output (V dc)	Test instrument indications	
		Min	Max
200 mV	.19	189.4	190.6
200 mV	-.19	-189.4	-190.6
2	1.9	1.894	1.906
20	19	18.94	19.06
200	190	189.4	190.6
1000 DC	1000	997	1003

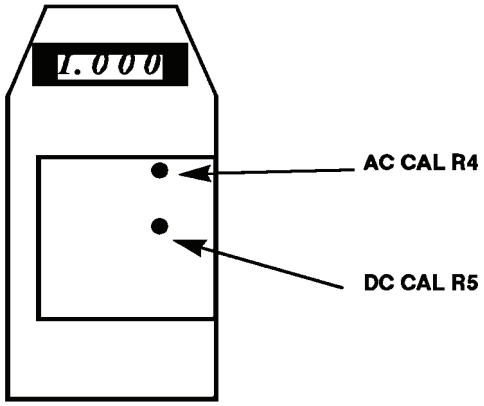

Figure 1. Adjustment locations.

9. AC Voltage

a. Performance Check

(1) Press **DC/AC** pushbutton to **AC** (in) and press the **200 mV** range pushbutton.

(2) Set TI range and calibrator for voltages and frequencies listed in table 4. TI will indicate within the specified limits; if not, perform **b** below.

b. Adjustments. Set TI range to **200 mV** and calibrator for a 190 mV, 45 Hz output. Adjust AC CAL R4 (fig. 1) for a TI indication of 190.0 (R).

Table 4. Ac Voltage

Test instrument range pushbutton settings	Calibration output		Test instrument indications	
	Voltage	Frequency (Hz)	Min	Max
200 mV	190 mV	45	187.8	192.2
200 mV	190 mV	450	187.8	192.2
2	1.9 V	45	1.878	1.922
2	1.9 V	450	1.878	1.922
20	19 V	45	18.78	19.22
20	19 V	450	18.78	19.22
200	190 V	45	187.8	192.2
200	190 V	450	187.8	192.2
750 AC	750 V	45	740	760
750 AC	750 V	450	740	760

10. DC Current

a. Performance Check

(1) Connect calibrator **OUTPUT** terminals to TI **mA** and **COMMON** terminals, set TI range to **2 mA**, and set **DC/AC** pushbutton to **DC** (out).

(2) Set TI range and calibrator output as specified in table 5. TI will indicate within the specified limits.

b. Adjustments. No adjustments can be made.

Table 5. Dc Current

Test instrument range pushbutton settings	Calibrator output (dc current)	Test instrument indications	
		Min	Max
2 mA	1.9 mA	1.885	1.915
20 mA	19 mA	18.85	19.15
200 mA	190 mA	188.5	191.5
2000 mA	1.9 A	1885	1915

11. Resistance

a. Performance Check

(1) Connect calibrator **OUTPUT** terminals to TI **Ω** and **COMMON** terminals. Set TI range to **200Ω** and function pushbutton to **Ω**.

(2) Set TI range pushbutton and calibrator output to the settings listed in table 6. The TI will indicate within the limits specified.

Table 6. Resistance

Test instrument range pushbutton settings	Calibrator output (resistance)	Test instrument indications	
		Min	Max
200 Ω	190 Ω	189.1	190.9
2 kΩ	1.9 kΩ	1.895	19.05
20 kΩ	19 kΩ	18.95	19.05
200 kΩ	190 kΩ	189.5	190.5
2000 kΩ	1.9 MΩ	1895	1905
20 MΩ	10 MΩ	9.80	10.20

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:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0715504

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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.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.