*TB 9-6625-2194-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR HIGH IMPEDANCE VOLTMETER NULL DETECTOR, FLUKE MODELS 845AB, 845ABAF AND 845AR

Headquarters, Department of the Army, Washington, DC
9 March 2004

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.

*This bulletin supersedes TB 9-6625-2194-35, dated 25 June 1990.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of High Impedance Voltmeter Null Detector, Fluke, Models 845AB, 845ABAF, and 845AR. The manufacturers' 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
Dc voltage (models 845AB and 845ABAF)	Range: 1 μV to 1000 V (end scale) Accuracy: ± 2% of end scale + 0.1 μV
Dc voltage (model 845AR)	Range: 1 μV to 1000 V (end scale) Accuracy: ± 3% of end scale + 0. l μV

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. 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. Where 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. The following peculiar accessory is also required for this calibration: Shielded pair, No. 18 AWG solid copper conductor, MIS 10312 - 2 each.

Table 2. Minimum Specifications of Equipment Required

Common name	Minimum use specifications	Manufacturer and model (part number)
CALIBRATOR	Range: 0 to 1000 V Accuracy: ± .25%	Fluke, Model 5720A (5700A/EP) (p/o MIS-35947); w/power amplifier, Fluke, 5725A (5725A)
DC VOLTAGE DIVIDER	Range: .0000000 to .0100000 Accuracy: ± .25%	ESI, Model RV722 (RV722)

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 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 manufacturers' manuals 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.

NOTE

Perform **a** and **b** below for models 845AB and 845ABAF only.

a. Set **POWER** switch to **BAT CHK**.

b. If TI meter needle does not indicate within **BATTERY OK** region for at least 10 seconds, set **POWER** switch to **BAT CHG LINE OPR** and allow at least 15 minutes for batteries to charge. Repeat **c** above and this step.

c. Set **POWER** switch to **LINE OPR**, **OPR** switch to **OPR** (**ON** for model 845AR), and allow at least 15 minutes for TI to warm-up and stabilize.

d. Set **RANGE** switch to **1000 VOLTS**.

e. Adjust TI mechanical zero adjustment screw to obtain 0 indication on TI meter.

f. Set **RANGE** switch to **10μ** and **OPR/ZERO** switch to **ZERO**.

g. Adjust **ZERO** control to obtain 0 indication on TI meter.

h. Set **RANGE** switch to **3μ** and repeat **1** above.

i. Set **OPR/ZERO** switch to **OPR**.

j. Repeat **f** through **i** above and **k** below, until no further adjustment is required.

k. Set **RANGE** switch to **1000 VOLTS**.

8. Voltage, Range, and Tracking

a. Performance Check

(1) Connect calibrator **OUTPUT** to dc voltage divider **INPUT** and then connect dc voltage divider **OUTPUT** to TI **INPUT** and **COMMON** terminals.

(2) Set calibrator output to **0 V**.

(3) Set dc voltage divider dials to **.0000000** and repeat **7 f** through **i** and **k** above.

(4) Set dc voltage divider dials to **.0001000**.

(5) Set calibrator output to **0.010000**.

(6) Set **RANGE** switch to **1μ**.

(7) Adjust calibrator output to obtain a full-scale indication on TI meter. If calibrator does not indicate between 0.0088 and 0.0112 V (0.0087 and 0.0113 for model 845AR), perform **b** below.

(8) Repeat technique of (4) through (7) above, using values listed in table 3. Calibrator will indicate within limits specified.

(9) Reverse leads to TI and repeat (2) through (8) above.

b. Adjustments

(1) Set **RANGE** switch to **10μ**.

(2) Connect calibrator to TI **INPUT** and **COMMON** terminals.

(3) Adjust calibrator dials to **10.000000**.

(4) Adjust R151 (R213 for model 845AR) (fig. 1) to obtain full-scale (+10) deflection on TI meter (R).

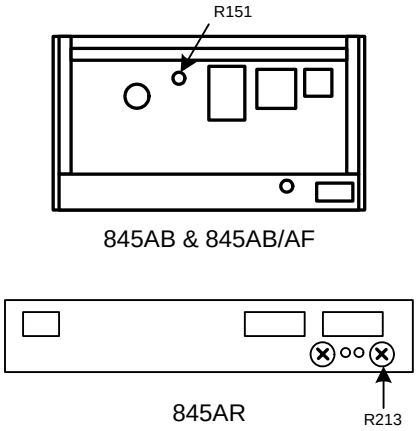

Figure 1. High impedance voltmeter - null detector - rear view.

Table 3. Voltage Check

Test instrument **RANGE** switch settings	DC voltage divider settings	Calibrator Indications (V)			
		Model 845AB and 845ABAF		Model 845AR	
		Min	Max	Min	Max
3 μV	.0001000	0.0284	0.0316	0.0281	0.0319
10 μV	.0001000	0.097	.103	0.096	0.104
30 μV	.0001000	0.293	.307	0.290	0.310
100 μV	.0010000	0.0979	0.1021	0.0969	0.1031
300 μV	.0010000	0.2939	0.3061	0.2909	0.3091
1 mV	.0100000	0.098	0.102	0.097	0.103
3 mV	.010000	0.294	0.306	0.291	0.309
10 mV[1]	- - -	0.0098	0.0102	0.0097	0.0103
30 mV	- - -	0.0294	0.0306	0.0291	0.0309
100 mV	- - -	0.098	0.102	0.097	0.103
300 mV	- - -	0.294	0.306	0.291	0.309
1 V	- - -	0.98	1.02	0.97	1.03
3 V	- - -	2.94	3.06	2.91	3.09
3 V[2]	- - -	1.94	2.06	1.91	2.09
3 V[3]	- - -	0.94	1.06	0.91	1.09
10 V	- - -	9.8	10.2	9.7	10.3
30 V	- - -	29.4	30.6	29.1	30.9
100 V	- - -	98	102	97	103
300 V	- - -	294	306	291	309
1000 V	- - -	980	1020	970	1030

[1]Remove dc voltage divider from equipment setup.
[2]Adjust calibrator output for an indication of 2 on TI lower scale
[3]Adjust calibrator output for an indication of 1 on TI lower scale

9. 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:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

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

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To be distributed in accordance with the initial distribution number (IDN) 343824 requirements TB 9-6625-2194-35.

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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.