

*TB 9-6695-291-40

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR CAPACITANCE STANDARD BARFIELD, MODEL 101-00816

Headquarters, Department of the Army, Washington, DC
24 July 2008

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 or 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 send in your comments electronically to our E-mail address: 2028@redstone.army.mil or by fax 256-842-6546/DSN 788-6546. For the World Wide Web use: <https://amcom2028.redstone.army.mil>. Instructions for sending an electronic 2028 can be found at the back of this manual.

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*This bulletin supersedes TB 9-6695-291-50, dated 30 September 1988.

SECTION I IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Capacitance Standard, Barfield, Model 101-00816. 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

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 parameter	Performance specifications
Capacitance test	Range: 160 pF Accuracy: Test report
Range Test	Range: Balance between R1 and R2 Accuracy: $\pm 3\Omega$

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 Reference Calibration Standards Set, NSN 4931-00-621-7878. 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.

Table 2. Minimum Specifications of Equipment Required

Common name	Minimum use specifications	Manufacturer and model (part number)
CAPACITANCE MEASUREMENT SYSTEM (REFERENCE)	Range: 80 pF at 1 kHz Accuracy: ± 0.25 pF	Andeen-Hagerling, Model 2550A
MULTIMETER	Range: 35 k Ω Resolution: $\pm 1\Omega$	Hewlett Packard, Model 3458A (3458A)

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 manufacturer's manual for this TI.

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

7. Capacitance Test

a. Performance Check

- (1) Connect equipment for 3 term measurement from receptacle **A**.
- (2) Adjust capacitance measurement system to measure 80 pF at 1 kHz and obtain null indication.
- (3) Record indication.
- (4) Disconnect probe from **A** receptacle and insert into **B** receptacle. Repeat technique of (2) and (3) above.
- (5) Add the recorded values of (3) and (4) above. The sum will be within 0.10 pF of manufacturer's initial value or previous test report value. Record value obtained on new test report (see Appendix A).

8. Range Test

a. Performance Check

- (1) Set multimeter to measure 30.100 k Ω .
- (2) Set **RANGE/1 VOLT** switch on TI to **RANGE**.
- (3) Connect multimeter between **-1 V Jack** on TI and pin 13 on multi-pin connector as shown in figure 1. Record value.
- (4) Remove lead from pin 13 and reconnect to pin 17 on multi-pin connector. Record value.
- (5) Values from (3) and (4) above must be within $\pm 3 \Omega$ of each other. If value is not within stated tolerance, perform **b** below.

b. Adjustments. Adjust P1 of figure 1.

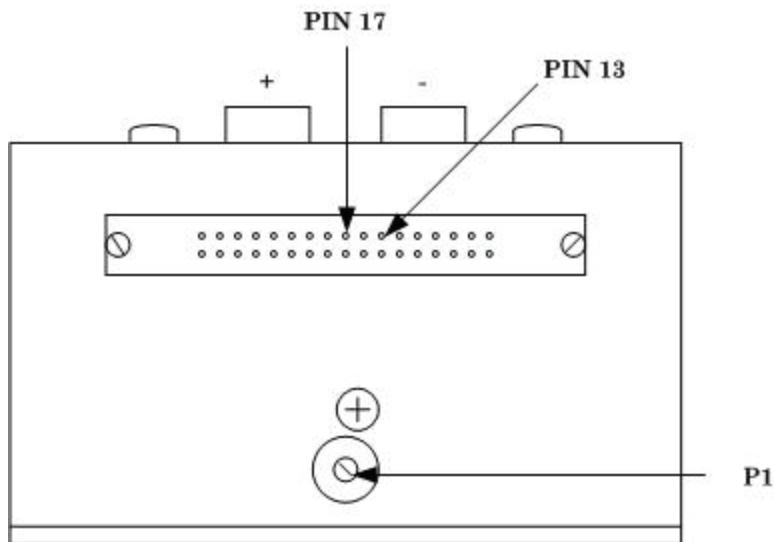


Figure 1. Test instrument (left end view).

9. Final Procedure

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

APPENDIX A
CALIBRATION TEST REPORT

1. Calibration Test Report. A calibration test report is required for Barfield, Capacitance Standard, Model 101-00816. The purpose of the test report is to allow utilization of the following:

a. Instruments whose values have drifted outside manufacturer's specifications when referenced to nominal values, yet the drift rate is sufficiently low to allow use within manufacturer's specified accuracy of the previous test report value.

b. The performance specifications shall be ascertained by referencing present measured values to previous measured values in lieu of nominal values. If present measured values are not within the tolerance guidelines of the initial and/or last test report specification, the TI must be red-tagged. Calibration activities will maintain a case history file of test reports for the TI.

c. The manufacturer states that initial values are approximate and are to be used as guidelines in preparing the initial test report **ONLY**. If in three successive calibrations the measured value drifts as much as three times the manufacturer's accuracy specification, the TI must be red-tagged. An example of calibration data to be annotated on the test report is shown on the sample test report.

SAMPLE CALIBRATION TEST REPORT

(Organization) _____

REPORT OF CALIBRATION FOR

CAPACITANCE STANDARD

(Nomenclature)

BARFIELD

(Manufacturer)

101-00816

(Identification)

(Model and Serial No.)

SUBMITTED BY:

(Activity) _____
and _____
UIC _____

CALIBRATION MEASUREMENT VALUES

_____ pF

_____ Date of Calibration

_____ Calibration Report Number

CALIBRATION TECHNICIAN

FACILITY CHIEF

By Order of the Secretary of the Army:

Official:



Handwritten signature of Joyce E. Morrow in black ink.

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

0816401

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

Distribution:

To be distributed in accordance with STD IDS No. RLC-1500, 2 January 2003, requirements for calibration procedure TB 9-6695-291-40.

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.

