

# **\*TB 9-4935-365-35**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

## **CALIBRATION PROCEDURE FOR DIGITAL MULTIMETER FLUKE, MODELS 8120A AND 8125A**

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\*This bulletin supersedes TB 9-4935-365-35, dated 7 July 1988, including all changes.

## SECTION I IDENTIFICATION AND DESCRIPTION

**1. Test Instrument Identification.** This bulletin provides instructions for the calibration of Digital Multimeter, Fluke, Models 8120A and 8125A. The manufacturers' manuals and or technical 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.** Variations among models are described in text, tables and figures.

**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. 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<br>Model 8120A         | Range: 0 to 1000 V in 5 ranges<br>Accuracy: $\pm 0.02\%$ of Input + 0.01% of range for 1, 10, 100, and 1000 V ranges; $\pm 0.05\%$ of input + 0.02% of range for 100 mV range                      |
| Model 8125A                       | Range: 0 to 1000 V in 4 ranges<br>Accuracy: $\pm 0.01$ of input + 0.01% of range                                                                                                                   |
| Ac voltage and frequency response | Range: 0 to 1000 V in 4 (5 for model 8120A) ranges<br>Accuracy: $\pm 0.2\%$ of input + 0.05% of range from 50 Hz to 10 kHz; $\pm 0.5\%$ of input, +0.1% of range from 30 to 50 Hz and 10 to 20 kHz |
| Dc current<br>(model 8120A only)  | Range: 0 to 1000 mA in 5 ranges<br>Accuracy: $\pm 0.1\%$ of input + 0.02% of range                                                                                                                 |
| Resistance<br>Model 8120A         | Range: 0 to 10 M $\Omega$ in 5 ranges<br>Accuracy: $\pm 0.02\%$ of input + 0.01% of range on 1 to 1000 k $\Omega$ ranges; $\pm 0.05\%$ of input + 0.01% of range on 10 M $\Omega$ range            |
| Model 8125A                       | Accuracy: 0.05% of input + 0.01% of range on 1 to 1000 k $\Omega$ ranges; 0.1% of input + 0.01 of range on 10 M $\Omega$ range                                                                     |

## 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, AN/GSM-287 and 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. 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)                                                    |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| CALIBRATOR  | Dc voltage:<br>Range: 0 to 1000 V<br>Accuracy: $\pm 0.005\%$<br><br>Ac voltage:<br>Range: 0 to 1000 V<br>Frequency: 30 Hz to 20 kHz<br>Accuracy: $\pm 0.0625\%$<br><br>Dc current:<br>Range: 100 $\mu\text{A}$ to 1 A<br>Accuracy: $\pm 0.03\%$<br><br>Resistance:<br>Range: 1 k $\Omega$ to 10 M $\Omega$<br>Accuracy: $\pm .0075\%$ | 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.