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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR VOLT-OHM-MILLIAMMETER SOLTEC, MODEL HM-102S

Headquarters, Department of the Army, Washington, DC
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♦REPORTING OF ERRORS♦

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SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Volt-Ohm-Milliammeter, Soltec, Model HM-102S. 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. Forms, records, and reports required for calibration personnel at all levels are prescribed by TB 750-25.

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: 250 mV to 1000 V in 7 ranges Accuracy: ±3% FS
Dc current	Range: 50 μA to 500 mA in 5 ranges Accuracy: ±3% FS
Ac voltage	Range: 2.5 to 1000 V in 6 ranges at 400 Hz Accuracy: ±5% FS
Resistance	Range: 0 to 20 MΩ in 4 ranges (center scale at 20Ω, 200Ω, 20kΩ, 200 kΩ) Accuracy: ± 3° of arc

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.

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 volts: Range: 242.5 mV to 1030 V Accuracy: ±.75% Dc current: Range: 48.5µA to 515 mA Accuracy: ±.75% Ac volts: Range: 2.375 to 1050 V Accuracy: ±1.25%	John Fluke, Model 5700A/CT (p/o MIS-35947)
RESISTANCE STANDARD	Range: 17.74Ω to 225531.9Ω Accuracy: ±2.83%	Biddle-Gray, Model 71-631(7910328)

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. 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.

8. Dc Voltage

a. Performance Check

(1) Connect calibrator output to TI **+** and **COM**.

(2) Set TI function/range switch to **0.25 DCV**.

(3) Set calibrator initial output for 250 mV. Adjust calibrator output controls for a .25 V dc TI indication. Calibrator control **Error** display will indicate between -3% and +3%.

(4) Repeat technique of (2) and (3) above for TI function/range switch and calibrator output settings listed in table 3. Calibrator control **Error** display will indicate between -3% and +3% for each TI indication.

Table 3. Dc Voltage

Test instrument function/range switch settings (**DCV**)	Calibrator initial output settings (V)	Test instrument indications (V dc)
2.5	2.5	2.5
10	10	10
50	50	50
250	250	250
500	500	500
1 k[1]	1000	1000

[1]Connect calibrator output to TI **DC 1k V** and **COM**.

b. Adjustments. No adjustments can be made.

9. DC Current

a. Performance Check

(1) Connect calibrator output to TI **+** and **COM**.

(2) Set TI function/range switch to **50 µA**.

(3) Set calibrator initial output for 50 µA. Adjust calibrator output controls for a 50 µA indication on TI. Calibrator control **Error** display will indicate between -3% and +3%.

(4) Repeat technique of (2) and (3) above for TI function/range switch and calibrator initial output settings listed in table 4. Calibrator control **Error** display will indicate between -3% and +3% for each TI indication.

Table 4. Dc Current

Test instrument function/range switch settings (**DC mA**)	Calibrator initial output settings (mA)	Test instrument indications (dc mA)
.5	.5	.5
5	5	5
50	50	50
500	500	500

b. Adjustments. No adjustments can be made.

10. AC Voltage

a. Performance Check

(1) Connect calibrator output to TI **+** and **COM**.

(2) Set TI function/range switch to **2.5 ACV**.

(3) Set calibrator initial output for 2.5 V at 400 Hz. Adjust calibrator output controls for a 2.5 V ac indication on TI. Calibrator control **Error** display will indicate between -5% and +5%.

(4) Repeat technique of (2) and (3) above for TI function/range switch and calibrator initial output settings listed in table 5. Calibrator control **Error** display will indicate between -5% and +5% for each TI indication.

Table 5. Ac Voltage

Test instrument function/range switch settings (**ACV**)	Calibrator initial output settings		Test instrument indications (V ac)
	Voltage (V)	Frequency (Hz)	
10	10	400	10
50	50	400	50
250	250	400	250
500	500	400	500
1 k[1]	1000	400	1000

[1]Connect calibrator output to TI **AC 1k V** and **COM.**

b. Adjustments. No adjustments can be made.

11. Resistance

a. Performance Check

(1) Disconnect TI inputs.

(2) Set TI function/range switch to **OHM x1**.

(3) Connect leads to TI **+** and **COM.** Short leads together and adjust **0Ω ADJ** control for 0 indication on Ω scale.

(4) Connect TI **+** and **COM** to resistance standard. Adjust resistance standard for a 20Ω indication on TI. Resistance standard will indicate between 17.74Ω and 22.55Ω.

(5) Repeat technique of (1) through (4) above for TI function/range switch settings and indications listed in table 6. Resistance standard will indicate within limits specified in table 6.

b. Adjustments. No adjustments can be made.

Table 6. Resistance

Test instrument		Resistance standard indications (Ω)	
Function/range switch settings (**OHM**)	Indications	Min	Max
X10	200 Ω	177.36	225.53
Xlk	20 kΩ	17735.85	22553.19
X10k	200 kΩ	177358.5	225531.9

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:

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Distribution:

To be distributed in accordance with DA Form 12-34-E, Block No. 3453, requirements for calibration procedure TB 9-6625-2279-35.