# *TB 9-6625-2326-35

## DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

# CALIBRATION PROCEDURE FOR DIGITAL MULTIMETER ISAS MODEL DM224

Headquarters, Department of the Army, Washington, DC
5 May 2005



**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 9-6625-2326-35, dated 29 December 2003.

## SECTION I
## IDENTIFICATION AND DESCRIPTION

**1. Test Instrument Identification.** This bulletin provides instructions for the calibration of Digital Multimeter, ISAS, Model DM224. 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 that pertain to this calibration are in table 1.

Table 1. Calibration Description

| Test instrument parameters | Performance specifications |
|---|---|
| Dc voltage | Range: 0.2 to 200 V<br>Accuracy: ± 1% of range |
| Ac voltage | Range: 0.2 to 200 V<br>Frequency: 500 Hz<br>Accuracy: ± 3% of range |
| Resistance | Range: 0 to 20 MΩ<br>Accuracy: ± 1% of 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 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. The accuracies listed in table 2 provide a four-

to-one ratio between the standard and TI. Where the four-to-one ration cannot be met, the actual accuracy of the equipment selected is shown in parenthesis.

**5. Accessories Required.** The accessories listed in table 3 are issued as indicated in paragraph **4** above and are used in this calibration procedure. When necessary, these items may be substituted by equivalent items, unless specifically prohibited.

Table 2. Minimum Specifications of Equipment Required

| Common name | Minimum use specifications | Manufacturer and model (part number) |
|---|---|---|
| CALIBRATOR | Range: 0.2 V dc to 200 V dc<br>Accuracy: ±0.25%<br><br>Range: 0.2 V ac to 200 V ac<br>Accuracy: ±0.75%<br>Frequency: 500 Hz<br><br>Range: 0 to 20 MΩ<br>Accuracy: ±0.25% | Fluke, Model 5720A (5700A/EP) (p/o MIS-35947); w amplifier, Fluke 5725A/AR (5725A/AR) |

Table 3. Accessories Required

| Common name | Description (part number) |
|---|---|
| CONTROLLER | Polywell (MIS-45854) |
| SPORT or MSD<br>(To be provided by customer for calibration of DM224 if Polywell Controller w/preinstalled calibration software not available.) | Miltope, AN/PSM-95<br>Miltope, AN/PSM-95A<br>(Turned in with TI if required) |
| SPORT/MSD DMM Maintenance Disk<br>(Provides calibration software routine for use on SPORT/MSD.) | Calibration software<br>(provided to teams by PM-TMDE) |
| Test Lead Connector[1] | Type 311 cable |

[1]To be supplied with TI.

## SECTION III
## CALIBRATION PROCESS FOR DM224
## (UTILIZING POLYWELL CONTROLLER)

**NOTE**

Use of this section of the TB requires use of the Polywell Controller (MIS-45854) with the DM224 Calibration Software pre-installed. If you do not have access to this controller, you will need to perform Section IV. Be advised that this pre-installed software is unique and not to be confused with the SPORT/MSD DMM Maintenance Disk that is used in **Section IV**.

## 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.

**e.** Unless otherwise specified, on screen controls will be accessed by using the mouse or the trackball controls to move the arrow over the icon, virtual instrument controls, etc. and clicking the left button.

## 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.** Insert TI into controller PCMCIA slot.

**b.** Navigate to and execute DM224 Calibration Software program on controller.

**NOTE**

During Self Test, test lead connector must be disconnected from TI.

**c**. Click on **Self Test** button in display window. Upon successful completion of Self Test, reconnect test lead connector to TI and proceed to paragraph **8**.

## 8. All Parameters Test

### a. Performance Check

(1) Connect TI red (+), black (-), and green (ground) connections to calibrator **OUTPUT** terminals.

(2) Click on **Performance Check** button and follow on-screen instructions.

**b. Adjustments**

The test and calibration utility will give pass/fail indications. If there is an out-of-tolerance finding on any function/range of the Performance Check, you will be given an opportunity to repeat the test. If the out-of-tolerance finding still exists, you will be prompted to run the Alignment Check. Follow on-screen instructions. When the Alignment Check is successfully completed, you must rerun the Performance Check for a successful completion of same.

**9. Final Procedure**

**a**. Deenergize and disconnect all equipment.

**b.** Annotate and affix DA label/form in accordance with TB 750-25.

## SECTION IV
## CALIBRATION PROCESS FOR DM224
## UTILIZING AN/PSM-95 (SPORT) OR AN/PSM-95A (MSD)

**NOTE**

Use this section of TB if calibrating the DM224 utilizing the "SPORT/MSD DMM Maintenance Disk" running from the SPORT (AN/PSM-95) or MSD (AN/PSM-95A) CD drive.

**10. Preliminary Instructions**

**a**. The instructions outlined in paragraphs **10** and **11** 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.

**e.** Unless otherwise specified, on screen controls will be accessed by using the mouse or the trackball controls to move the arrow over the icon, virtual instrument controls, etc., and clicking the left button.

**11. 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**

Ensure that there are no other PC cards installed in PCMCIA slots.

**a.** Insert TI into AN/PSM-95 or AN/PSM-95A PCMCIA slot. Do not connect test lead connector at this time.

**b.** Power up AN/PSM-95 or AN/PSM-95A.

**c**. Once system has completed the boot process, insert "SPORT/MSD DMM Maintenance Disk" into CD drive.

**d**. Software should auto-start and present a menu. If this does not occur, explore the CD and run **SPORT_MSD_CAL.exe**.

**e.** At first menu screen, click on **SPORT** or **MSD**, depending on the default selection that is presented.

**f**. If you are utilizing AN/PSM-95 (SPORT) to run this procedure, proceed to step **g**. If utilizing AN/PSM-95A (MSD), proceed to step **i**.

**g**. On the proceeding menu screens, select **Continue**, then select **ISAS DM224**, then select **Setup & Calibration**.

**h**. Proceed to step **j**.

**i**. On next menu screen, select **ISAS - DM224**.

**j**. At this time you will be executing the software from the CD drive.

**NOTE**

A menu with the buttons "**Install DM224 Driver**" and "**Run DM224 Calibration Software**" will be presented. If "**Install DM224 Driver**" is inactive, the drivers have been previously installed and you can select "**Run DM224 Calibration Software**" and proceed. If the "**Install DM224 Driver**" button is active, you must select it to install the drivers. You will then need to remove the CD and reboot the SPORT or MSD (if CD is not removed, computer will attempt to boot from same CD). Once this is done, reinsert the SPORT/MSD DMM Maintenance Disk. Once inserted, you should then proceed to and select "**Run DM224 Calibration Software**".

**NOTE**

During Self Test, test lead connector must be disconnected from TI.

**k**. Click on the Self Test button. Upon successful completion of Self Test, reconnect test lead connector to TI and proceed to paragraph **12**.

**12. All Parameters Test**

**a**. **Performance Check**

(1) Connect TI red (+), black (-), and green (ground) connections to calibrator **OUTPUT** terminals.

(2) Click on **Performance Check** button and follow on-screen instructions.

**b**. **Adjustments**

The test and calibration utility will give pass/fail indications. If there is an out-of-tolerance finding on any function/range of the Performance Check, you will be given an opportunity to repeat the test. If the out-of-tolerance finding still exists, you will be prompted to run the Alignment Check. Follow on-screen instructions. When the Alignment Check is successfully completed, you must rerun the Performance Check for a successful completion of same.

**13. 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:

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

Official

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0507004

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 344739, requirements for calibration procedure TB 9-6625-2326-35.

## 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.