

# \*TB 9-6625-2310-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

## CALIBRATION PROCEDURE FOR AVA CALIBRATION TEST SET SCIENTIFIC-ATLANTA INC., PART NUMBER 29085800

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

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\*This bulletin supersedes TB 9-6625-2310-35, 8 November 1994.

**SECTION I  
IDENTIFICATION AND DESCRIPTION**

**1. Test Instrument Identification.** This bulletin provides instructions for the calibration of AVA Calibration Test Set, Scientific-Atlanta, Inc., Part Number 29085800. The manufacturer's manual was 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 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. Appendix A is a duplicate copy of table 3, located within the text, which requires annotation. This table may be conveniently reproduced locally.

**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                         |                       |                 |
|----------------------------|--|-----------------------|-----------------|
| Signal output level        | Gain range   | (High/low difference) | Accuracy (±)    |
|                            | 1:1  | (0.983V)              | 2.0%            |
|                            | 1:4  | (0.245 V)             | 2.0%            |
|                            | 1:16   | (0.060 V)             | 2 digits (2 mV) |
|                            | 1:64   | (0.016 V)             | 2 digits (2 mV) |
| Output frequency           | Range: 4.7683 Hz (209.7183 ms)<br>Accuracy: ±0.01% |                       |                 |

**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 item 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: Dc power supply, HDL, Inc., Model LR-10.

Table 2. Minimum Specifications of Equipment Required

| Common name                                       | Minimum use specifications                      | Manufacturer and model (part number)                |
|---|---|---|
| AVIATION VIBRATION ANALYZER TEST SET <sup>1</sup> | Range: N/A<br>Accuracy: N/A                     | Scientific-Atlanta, Inc., Model 29313102 (29313102) |
| FREQUENCY COUNTER                                 | Range: 209.7183 mS<br>Accuracy: ± 0.0025%       | Fluke, Model PM6681/656 (PM6681/656)                |
| FUNCTION GENERATOR                                | Range: 5.0 V pk-pk, 50 kHz<br>Accuracy: Nominal | (SG-1288/G)   |
| MULTIMETER  | Range: 3 to 6 V dc<br>Accuracy: ±0.5%           | Fluke, Model 8840A/AF-05/09 (AN/GSM-64D)            |

<sup>1</sup>Limited deployed. Components required consist of: Data Acquisition Unit (DAU), Part No. 29328201 and AVA Test Set Cable, (MULTI-CH), Part No. 29283200. Evidence of current calibration is not required.

### 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 OUTPUTS(s) to minimum after each step within the performance check where applicable.

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- a. Connect data acquisition unit (DAU) **MULTI-CH** connector to TI **MULTI-CH** connector using the AVA test set cable.
- b. Connect dc power supply to DAU **28VDC** connector; + to pin B and - to pin A (fig. 1).

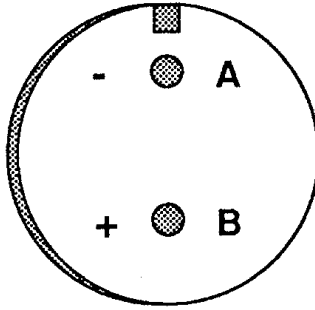


Figure 1. DAU 28 VDC connector.

- c. Set dc power supply for a +28 V output. Set DAU **POWER** switch to **ON** and allow approximately 15 minutes for equipment warm-up.

**8. Signal Output Level**

**a. Performance Check**

- (1) Set **ACC 1** through **ACC 4** channel switches to **100 mV/g**.
- (2) Connect equipment as shown in fig. 2.

**NOTE**

The output of the TI should alternate between two levels. At this point (with the **ACC SIGNAL SELECT** dial set to **(1:1)**) the output to the multimeter should stabilize on about 5 Vdc for approximately 6 seconds then stabilize on approximately 4 Vdc for 6 seconds. If the multimeter does not have sufficient time to stabilize, reduce the input frequency on the external clock input. Due to the design of the TI, the absolute value of the output signals is not critical (within a few tenths of a volt) but the difference between them is important.

- (3) Set function generator for a 5 V pk-pk, 50 kHz output and multimeter for dc voltage measurements, autorange.
- (4) Set **ACC SIGNAL SELECT** dial to **1:1**.
- (5) Record multimeter indication high and low indications in table 3, **ACC 1** row.

Table 3. Signal Output Difference

| Test instrument                    |                                  | Multimeter indications |   |         |                | Tolerance |         |
|------------------------------------|----------------------------------|------------------------|---|---------|----------------|-----------|---------|
| Accelerometer channel connection   | ACC SIGNAL SELECT dial positions | High (V)               |   | Low (V) | Difference (V) | Min (V)   | Max (V) |
| ACC (1-4) 100 mV/g switch position |                                  |                        |   |         |                |           |         |
| ACC 1                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 2                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 3                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC4                               | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC (1-4) 54 mV/g switch position  |                                  |                        |   |         |                |           |         |
| ACC 1                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 2                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 3                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC4                               | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |



## 9. Output Frequency

### a. Performance Check

(1) Disconnect multimeter and function generator connections from TI and DAC which were made in fig. 2.

#### CAUTION

Ensure that the connection from **EXT ACC** to signal ground on function generator is removed.

(2) Set **TACHO CONTROL TACH 2** switch to **MONO PULSE**.

(3) Connect frequency counter **A** input to **TACH 2** connector, using a 50  $\Omega$  feed-through termination.

(4) Measure output period. Frequency counter will indicate between 209.6973 ms and 209.7393 ms.

**b. Adjustments.** No adjustments can be made.

## 10. Final Procedure

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

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





APPENDIX A

Signal Output Difference (Duplicate Table)

| Test instrument                    |                                  | Multimeter indications |   |         |                | Tolerance |         |
|------------------------------------|----------------------------------|------------------------|---|---------|----------------|-----------|---------|
| Accelerometer channel connection   | ACC SIGNAL SELECT dial positions | High (V)               |   | Low (V) | Difference (V) | Min (V)   | Max (V) |
| ACC (1-4) 100 mV/g switch position |                                  |                        |   |         |                |           |         |
| ACC 1                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 2                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 3                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC4                               | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC (1-4) 54 mV/g switch position  |                                  |                        |   |         |                |           |         |
| ACC 1                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 2                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC 3                              | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |
| ACC4                               | 1:1                              | _____                  | - | _____   | = _____        | 0.96334   | 1.00266 |
|                                    | 1:4                              | _____                  | - | _____   | = _____        | 0.24010   | 0.24990 |
|                                    | 1:16                             | _____                  | - | _____   | = _____        | 0.05800   | 0.06200 |
|                                    | 1:64                             | _____                  | - | _____   | = _____        | 0.01400   | 0.01800 |



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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
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12. **Submitter Rank:** MSG
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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**

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