TB 9-4931-413-50

Change 1

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR SOUND-LEVEL METER, GENERAL RADIO MODELS 1551-C, 1565-A, AND 1565B

Headquarters, Department of the Army, Washington, DC
31 March 1981

TB 9-4931-413-50, 25 February 1972, is changed as follows:

Page 1. Change title to read as shown above.

Paragraph 1. In line 4, change "1551-C and 1565-A" to read "1551-C, 1565-A, and 1565-B."

Page 2, table 1. After "Model 1565-A" add "and -B."

NOTE following paragraph 7d: In line 1, change "1565-A" to read "1565-A and -B."

NOTE following paragraph 7g. In line 2, change "1565-A" to read "1565-A and -B."

Page 3, paragraph 8b(2). In line 2, change "1565-A" to read "1565-A and -B."

Paragraph 9a(1)a. In line 2, change "1565-A" to read "1565-A and -B."

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

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CALIBRATION PROCEDURE FOR SOUND-LEVEL METER, GENERAL RADIO MODELS 1551-C AND 1565-A

Headquarters, Department of the Army, Washington, DC
25 February 1972

REPORTING OF ERRORS

You can help improve this publication by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028, Recommended Changes to Publications, should be mailed directly to Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-TMD-EP, Redstone Arsenal, AL 35898-5000. FAX to DSN 788-2313 (commercial 256-842-2313). A reply will be furnished directly to you.

*This bulletin supersedes TB 9-4931-413-50, 8 July 1970.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of sound-level meter, General Radio Models 1551-C and 1565-A. The manufacturer's instruction manual was used as the prime data source in compiling these instructions. The sound level meter will be referred to as the "test instrument" throughout this bulletin.

a. Model Variations. Variations among models are described in text.

b. Time and Technique. The time required for this calibration is approximately 2 hours, using the physical technique.

2. Calibration Data Card (DA Form 2416). Maintenance forms, records, and reports which are to be used by calibration personnel at all calibration levels are listed in and prescribed by TM 38-750.

3. Calibration Description. Test instrument parameters and performance specifications which pertain to this calibration are listed in table 1.

Table 1. Calibration Description

Test instrument parameters	Performance specifications
Sound-level range	Model 1551-C: 24 to 150 db above 0.0002 μ bar at 1000 Hz Model 1565-A: 44 to 144 db above 0.0002 μbar at 1000 Hz

SECTION II
EQUIPMENT REQUIREMENTS

4. Equipment Required. Table 2 identifies the specific equipment used in this calibration procedure. This equipment is issued with secondary reference calibration standards set 4931-621-7878 and is to be used in performing this procedure.

5. Accessories Required. The accessories furnished with the test instrument are the only items required to perform this procedure.

Table 2. Minimum Specifications of Equipment Required

Common Name	Minimum Use Specification	Manufacturer, Model, and Part Number
SOUND-LEVEL CALIBRATOR	No substitute	General Radio, Model 1562-A (MIS-10219)

SECTION III
CALIBRATION PROCESS

6. Preliminary Instructions

a. Personnel should become familiar with the entire bulletin before beginning the calibration.

b. Remove protective cover from test instrument only when necessary for adjustment.

NOTE

Steps **c** and **d** below pertain only to model 1551-C with ac power supply.

c. Connect test instrument to 115-volt ac source.

d. Set test instrument power supply POWER switch to on (up) position.

NOTE

Step **e** below is for model 1565-A only; steps **f** and **g** below are for battery-powered model 1551-C only.

e. Turn test instrument left-hand knob to BAT. Meter pointer will indicate in region marked BAT. If not, replace batteries.

f. Energize test instrument by lifting microphone holder to vertical position.

g. Turn METER BATTERIES switch to FIL 1, FIL 2 and PL, respectively. Meter pointer will indicate in region marked BAT. If not, replace appropriate batteries.

NOTE

Throughout this bulletin, references to model 1565-A panel markings and values are enclosed in parenthesis.

NOTE

Unless otherwise specified, verify the results of each test and take corrective action whenever the test requirement is not met before continuing with the calibration.

7. Sound-Level Meter Sensitivity

a. Performance Check

NOTE

Test instrument must be calibrated in an area where ambient noise is less than 70 db.

(1) Position sound-level calibrator (table 2) securely over test instrument microphone, making sure that microphone is seated properly over lip of coupler.

NOTE

Step (2) below is for model 1551-C only.

(2) Set test instrument attenuator switch to 130 CAL and WEIGHTING switch to CAL. Test instrument meter will indicate in center of white area marked CAL. If not, perform **b**(1) below.

(3) Set attenuator switch to 110.

(4) Energize sound-level calibrator and adjust frequency to 500 Hz. Test instrument will indicate between 112.8 and 114.8 db. If not, perform **b**(2) below

(5) Repeat (2) through (4) above, as applicable, several times until correct indications are obtained on meter.

NOTE

Throughout this procedure, pressure corrections should be made to sound-pressure-level readings, using pressure correction chart (fig. 1), according to the nearest 1000-foot elevation above sea level of the calibration site.

b. Adjustments

(1) Adjust microphone sensitivity adjustment (fig. 2) until meter pointer indicates in center of white area marked CAL.

(2) Adjust CAL control (screwdriver adjustment on front panel of model 1565-A) until meter indicates 113.8 db.

8. Frequency Response

a. Performance Check

(1) Position test instrument controls as indicated in (a) through (c) below:

(a) METER BATTERIES switch to FAST (not applicable to model 1565-A).

(b) WEIGHTING switch to C (C_F).

(c) Attenuator switch to 110 db.

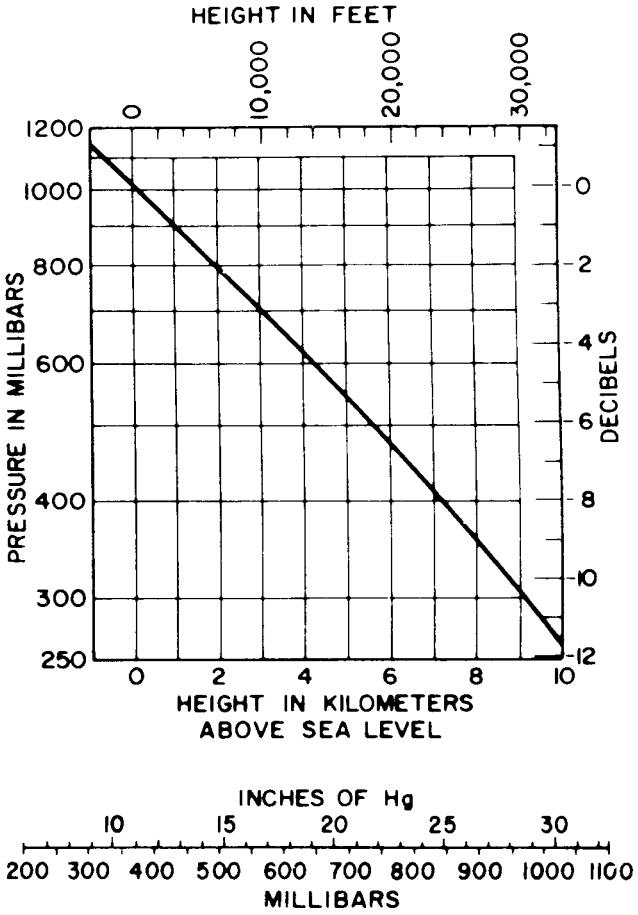

Figure 1. Pressure correction chart.

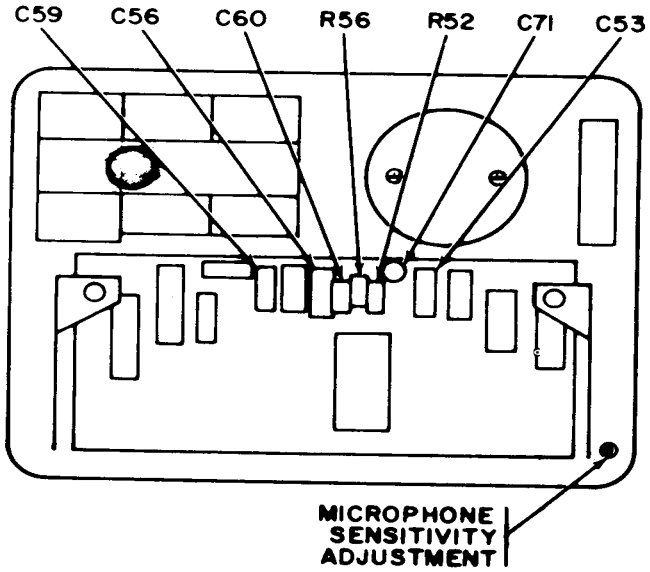

Figure 2.. Sound-level meter (model 1551-C) - internal view.

(2) Turn function switch of sound-level calibrator (table 2) to 2000, 1000, 500, 250, and 125 Hz, respectively. Record test instrument meter indication for each position of function switch of sound level calibrator. Collectively, meter indication will not deviate more than ±3.5 db.

b. Adjustments. No adjustments can be made.

9. Weighting Network Response

a. Performance Check

NOTE

The following values shown in parenthesis apply to units with $1^{1}/_{8}$-inch microphones. Values not enclosed in parenthesis apply to units with $^{15}/_{16}$ inch microphones.

(1) Turn function switch of sound-level calibrator (table 2) to 125 Hz. Test instrument meter will indicate between 112.5 and 115.1, (112.3 and 115.3) db.

(2) Turn test instrument WEIGHTING switch to A. Meter indication will be between 96.5 and 99.1 (96.3 and 99.3) db.

(3) Turn WEIGHTING switch to B. Meter indication will be between 108.4 and 111.0 (108.2 and 111.2) db.

(4) Repeat technique of (1) through (3) above for frequencies and WEIGHTING switch positions listed in table 3. Meter will indicate within limits specified. If not, record actual deviation, and prepare chart of correction factors applicable to test instrument.

Table 3. Weighting Network Response Check

Sound-Level Calibrator Output Frequency (Hz)	Test Instrument		
	Weighting Switch Position	Meter Indications (db)[1]	
		Min	Max
250	C	112.6(112.5)	115.2(115.5)
500	C	112.7(112.5)	115.3(115.5)
1000	C	112.6(112.3)	115.2(115.3)
2000	C	111.7(111.6)	115.3(115.6)
250	B	111.1(111.0)	113.7(114.0)
500	B	112.4(112.2)	115.0(115.2)
1000	B	112.6(112.3)	115.2(115.3)
2000	B	111.7(111.6)	115.3(115.6)
250	A	104.0(103.9)	106.6(106.9)
500	A	109.4(109.2)	112.0(112.2)
1000	A	112.6(112.3)	115.2(115.3)
2000	A	113.1(113.0)	116.7(117.0)

[1]Values in parentheses are for test instruments using microphones 1 1/8 inches in diameter. Values not enclosed in parenthesis are for test instruments using microphones 15/16 inch in diameter.

b. Adjustments. No adjustments can be made.

10. Final Procedure

a. Deenergize and disconnect all equipment.

b. In accordance with TM 38-750, annotate and affix DA Label 80 (U.S. Army Calibration System). When the test instrument cannot be adjusted within tolerance, annotate and affix DA Form 2417 (Unserviceable or Limited Use tag).

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By Order of the Secretary of the Army:

W. C. WESTMORELAND
General, United States Army
Chief of Staff

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VERNE L. BOWERS
Major General, United States Army
The Adjutant General

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