TB 9-6625-2315-35

CHANGE 2

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR MULTIMETER HEWLETT-PACKARD, MODEL 34401A

Headquarters, Department of the Army, Washington, DC
6 October 2005

Distribution Statement A: Approved for public release; distribution is unlimited.

TB 9-6625-2315-35, 2 October 2003, is changed as follows:

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2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

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

Official:

SANDRA R. RILEY
Administrative Assistant to the Secretary of the Army

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Distribution:

To be distributed in accordance with IDN 344604 requirements for calibration procedure TB 9-6625-2315-35.

TB 9-6625-2315-35

CHANGE 1

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR MULTIMETER HEWLETT-PACKARD, MODEL 34401A

Headquarters, Department of the Army, Washington, DC
19 April 2005

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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR MULTIMETER HEWLETT-PACKARD, MODEL 34401A

Headquarters, Department of the Army, Washington, DC
2 October 2003

Distribution Statement A: Approved for public release; distribution is unlimited

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, U.S. Army Aviation and Missile Command, ATTN: 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.

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*This bulletin supersedes TB 9-6625-2315-35 dated 7 April 1997.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Multimeter, Hewlett-Packard, Model 34401A. 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 2 hours, 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. TI uses closed-box electronic adjustments; no hardware adjustments are used. Report adjustments performed in Section IV using range and parameter failing performance test; i.e. 10 V dc, 100 ohms, etc.

3. Calibration Description. TI parameters and performance applications which pertain to this calibration are in table 1.

Table 1. Calibration Description

Test instrument parameters	Performance specifications
Dc voltage	Range: 100 mV to 1000 V Accuracy: ±(% of reading + % of range) 6½ digits, 1 hour warm-up Range — Accuracy 100.0000 mV — 0.0050 + 0.0035 1.000000 V — 0.0040 + 0.0007 10.00000 V — 0.0035 + 0.0005 100.0000 V — 0.0045 + 0.0006 1000.000 V — 0.0045 + 0.0010
Resistance	Range: 100 Ω to 100 MΩ Accuracy: ±(% of reading + % of range) 6½ digits, 1 hour warm-up Range — Accuracy[1] 100.0000 Ω — 0.010 + 0.004 1.000000 kΩ — 0.010 + 0.001 10.00000 kΩ — 0.010 + 0.001 100.0000 kΩ — 0.010 + 0.001 1.000000 MΩ — 0.010 + 0.001 10.00000 MΩ — 0.040 + 0.001 100.0000 MΩ — 0.800 + 0.010

See footnotes at end of table.

Table 1. Calibration Description - Continued

Test instrument parameters	Performance specifications
Dc Current	Range: 10 mA to 3 A Accuracy: ±(% of reading + % of range) 6½ digits, 1 hour warm-up Range — Accuracy 10.00000 mA — 0.050 + 0.020 100.0000 mA — 0.050 + 0.005 1.000000 A — 0.100 + 0.010 3.000000 A — 0.120 + 0.020
Ac Voltage	Range: 100 mV to 750 V Accuracy: ±(% of reading + % of range) 6½ digits, 1 hour warm-up, slow ac filter, sinewave inputs > 5 % of range Range — Frequency — Accuracy 100.0000 mV — 3 Hz - 5 Hz — 1.00 + 0.04 5 Hz - 10 Hz — 0.35 + 0.04 10 Hz - 20 kHz — 0.06 + 0.04 20 kHz - 50 kHz — 0.12 + 0.05 50 kHz - 100 kHz — 0.60 + 0.08 100 kHz - 300 kHz — 4.00 + 0.50 1.000000 V to 750.000 V — 3 Hz - 5 Hz — 1.00 + 0.03 5 Hz - 10 Hz — 0.35 + 0.03 10 Hz - 20 kHz — 0.06 + 0.03 20 kHz - 50 kHz — 0.12 + 0.05 50 kHz - 100 kHz — 0.60+ 0.08 100 kHz - 300 kHz — 4.00 + 0.50
Ac Current	Range: 1 A and 3 A Frequency: 3 Hz to 300 kHz Accuracy: ±(% of reading + % of range) 6½ digits, 1 hour warm-up, slow ac filter, sinewave inputs > 5 % of range Range — Frequency — Accuracy 1.000000 A — 3 Hz - 5 Hz — 1.00 + 0.04 5 Hz - 10 Hz — 0.30 + 0.04 10 Hz - 5 Hz — 0.10 + 0.04 3.000000 A — 3 Hz - 5 Hz — 1.10 + 0.06 5 Hz - 10 Hz — 0.35 + 0.06 10 Hz - 5 kHz — 0.15 + 0.06
Frequency	Range: 100 mV to 750 V Frequency: 3.0 Hz to 300 kHz Accuracy: ± (% of reading) 6½ digits, 1 hour warm-up 3 Hz - 5 Hz 0.10 5 Hz - 10 Hz 0.05 10 Hz - 40 Hz 0.03 40 Hz - 300 kHz 0.01

[1]Specifications are for 4-wire ohms function, or 2-wire ohms using Math Null.

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 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.

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: Range: 100 mV to 1000 V Accuracy: ± 0.001% Resistance: Range — Accuracy 0 Ω — ≤0.001 Ω 100 Ω to 1 MΩ — ±0.002 % 10 MΩ — ±0.010 % 100 MΩ — ±0.200 % Dc current: Range — Accuracy 0 mA — ± 0.5 μA 10 mA — ± 0.017 % 100 mA — ± 0.013 % 1 A — ± 0.027 % 2 A — ± 0.037 % Ac voltage: Range: 100 mV to 750 V Frequency — Accuracy 10 Hz to 20 kHz — ±0.022 % 20 to 50 kHz — ±0.042 % 100 kHz — ±0.17 % 300 kHz — ±1.12 % Ac Current: Range — Frequency — Accuracy 1 A — 1 kHz — ±.035 % 2 A — 1 kHz — ±.052 %	John Fluke, Model 5720A (p/o MIS-35947); w/power amplifier, John Fluke, Model 5725A (5725A)
FUNCTION/ARITRARY WAVEFORM GENERATOR	Function: Sinewave Amplitude: 1 Vrms Frequency: 100 Hz to 100 kHz Accuracy: ±0.0025 %	Agilent, Model 33250A (MIS-45853)

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 result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Section IV contains the adjustments required to calibrate the TI. 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.

a. Connect TI to a 115 V ac power source.

b. Press and hold down **Shift** key for more than 5 seconds after pressing **POWER ON/OFF** pushbutton to **ON** then release **Shift** key to start self-test. Self-test will complete in approximately 20 seconds. If self-test is successful TI will briefly display **PASS** then go into dc voltage measurement mode.

c. Release **Terminals Front/Rear** pushbutton to **Front** and allow 1 hour for warm-up.

8. Dc Voltage

a. Performance Check

(1) Press **FUNCTION DC V** key.

(2) Press **Shift** key then **RANGE/DIGITS Auto/Man** key to select 6½ digits resolution.

(3) Short TI front and rear input terminals as shown in figure 1 using copper wire and allow 5 minutes for thermal offset voltage settling after handling input connections.

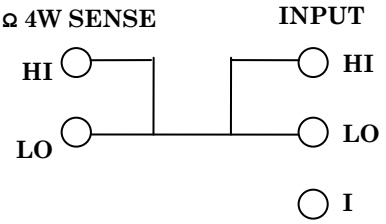

Figure 1. 4-wire short.

(3) Press **RANGE/DIGITS** ∧ or ∨ key to select ranges listed in table 3. If TI does not indicate within limits specified, perform **b** below.

Table 3. DC V Zero Offset

Test instrument					
Ranges		Indications			
		Min		Max	
100	mV	-000.0035	mV	+000.0035	mV
1	V	-0.000007	V	+0.000007	V
10	V	-00.00005	V	+00.00005	V
100	V	-000.0006	V	+000.0006	V
1000	V	-0000.010	V	+0000.010	V

(4) Press **Terminals Front/Rear** pushbutton to **Rear** and repeat (3) above for rear terminals.

(5) Release **Terminals Front/Rear** pushbutton to **Front**.

(6) Disconnect short from TI front and rear input terminals.

(7) Connect calibrator **OUTPUT HI** and **LO** to TI front **Input HI** and **LO**.

(8) Press **RANGE/DIGITS** ∧ or ∨ key to select TI ranges and set calibrator output for settings listed in table 4. If TI does not indicate within limits specified, perform **b** below.

Table 4. Dc Voltage

Test instrument ranges		Calibrator output settings (V dc)	Test instrument indications			
			Min		Max	
100	mV	0.1	99.9915	mV	100.0085	mV
1	V	1.0	0.999953	V	1.000047	V
10	V	10	9.9996	V	10.0004	V
10	V	-10	-9.9996	V	-10.0004	V
100	V	100	99.9949	V	100.0051	V
1000	V	1000	999.945	V	1000.055	V

b. Adjustments. Perform paragraphs **14** and **15** below.

9. Resistance

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI front **Input HI** and **LO**.

(2) Connect calibrator **SENSE HI** and **LO** to TI front **Ω4W Sense/Ratio Ref HI** and **LO**.

(3) Press **Shift** key then **FUNCTION Ω 2W/Ω 4W** key.

(4) Press **Shift** key then **RANGE/DIGITS Auto/Man** key to select 6½ digits resolution.

(5) Set calibrator for a 0 Ω output, **EX SNS** on, and **2 wire Comp** off.

(6) Press **RANGE/DIGITS** ∧ or ∨ key to select ranges listed in table 5. If TI does not indicate within limits specified, perform **b** below.

Table 5. Ω 4W Zero Offset

Test instrument	
Ranges	Indications (≤)
100 Ω	000.004 Ω
1 kΩ	0.00001 kΩ
10 kΩ	00.0001 kΩ
100 kΩ	000.001 kΩ
1 MΩ	0.00001 MΩ
10 MΩ	00.0001 MΩ
100 MΩ	000.01 MΩ

(7) Press **RANGE/DIGITS** ∧ or ∨ key to select 100 Ω range.

(8) Set calibrator for a 100 Ω output. Using output adjustment controls set calibrator control display **Reading** equal to TI indication. If calibrator control display **Error** indication is not within ±0.014%, perform **b** below.

(9) Repeat technique of (7) and (8) above using TI ranges and calibrator output settings listed in table 6. If calibrator control display **Error** indications are not within limits specified, perform **b** below.

Table 6. Resistance

Test instrument ranges	Calibrator	
	Output settings	Control display **Error** indications (±%)
1 kΩ	1 kΩ	0.011
10 kΩ	10 kΩ	0.011
100 kΩ	100 kΩ	0.011
1 MΩ	1 MΩ	0.011
10 MΩ	10 MΩ	0.041

(10) Press **FUNCTION Ω 2W** key.

(11) Press **Shift** key then **RANGE/DIGITS Auto/Man** key to select 6½ digits resolution.

(12) Press **RANGE/DIGITS** ∧ or ∨ key to select 100 MΩ range.

(13) Set calibrator **EX SNS** off and output to 100 MΩ. Using output adjustment controls set calibrator control display **Reading** equal to TI indication. Calibrator control display **Error** will indicate within ±0.81 percent.

b. Adjustments. Perform paragraphs **14** and **15** below.

10. Dc Current

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI front **Input I** and **LO**.

(2) Press **Shift** key then **FUNCTION DC V/DC I** key.

(3) Press **Shift** key then **RANGE/DIGITS Auto/Man** key to select 6½ digits resolution.

(4) Set calibrator for a 0 mA dc output.

(5) Press **RANGE/DIGITS** ∧ or ∨ key to select ranges listed in table 7. If TI does not indicate within limits specified, perform **b** below.

Table 7. Dc Current Zero Offset

Test instrument		
	Indications	
Ranges	Min	Max
10 mA	-00.002 mA	+00.002 mA
100 mA	-000.005 mA	+000.005 mA
1 A	-0.0001 A	+0.0001 A
3 A	-0.0006 A	+0.0006 A

(6) Press **RANGE/DIGITS** ∧ or ∨ key to select TI ranges and set calibrator output for settings listed in table 8. If TI does not indicate within limits specified, perform **b** below.

Table 8. Dc Current

Test instrument ranges	Calibrator output settings	Test instrument indications	
		Min	Max
10 mA	10 mA	9.993 mA	10.007 mA
100 mA	100 mA	99.945 mA	100.055 mA
1 A	1 A	0.9989 A	1.0011 A
3 A	2 A	1.997 A	2.003 A

b. Adjustments. Perform paragraphs **14** and **15** below.

11. Ac voltage

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **Input HI** and **LO**.

(2) Press keys as listed in (a) through (e) below:

(a) **FUNCTION AC V**.

(b) **Shift** then **MENU <**.

(c) **RANGE/DIGITS** ∨ until **AC FILTER** is displayed.

(d) **MENU <** or > until **SLOW 3 HZ** is displayed.

(e) **RANGE/DIGITS Auto/Man**.

(3) Press **Shift** key then **RANGE/DIGITS Auto/Man** key to select 6½ digits resolution.

(4) Press **RANGE/DIGITS** ∧ or ∨ key to select TI ranges and set calibrator output for settings listed in table 9. If TI does not indicate within limits specified, perform **b** below.

Table 9. Ac Voltage

Test instrument ranges	Calibrator output settings		Test instrument indications	
	Voltage	Frequency	Min	Max
100 mV	100 mV	20 Hz	99.9 mV	100.1 mV
100 mV	100 mV	15 kHz	99.9 mV	100.1 mV
100 mV	100 mV	40 kHz	99.83 mV	100.17 mV
100 mV	100 mV	90 kHz	99.32 mV	100.68 mV
100 mV	100 mV	300 kHz	95.5 mV	104.5 V
1 V	1 V	20 Hz	0.9991 V	1.0009 V
1 V	1 V	15 kHz	0.9991 V	1.0009 V
1 V	1 V	40 kHz	0.9983 V	1.0017 V
1 V	1 V	90 kHz	0.9932 V	1.0068 V
1 V	1 V	300 kHz	0.955 V	1.045 V
10 V	10 V	10 Hz	9.991 V	10.009 V
10 V	10 V	15 kHz	9.991 V	10.009 V
10 V	10 V	40 kHz	9.983 V	10.017 V
10 V	10 V	90 kHz	9.932 V	10.068 V
10 V	10 V	300 kHz	9.55 V	10.45 V
100 V	100 V	20 Hz	99.91 V	100.09 V
100 V	100 V	15 kHz	99.91 V	100.09 V
100 V	100 V	40 kHz	99.83 V	100.17 V
100 V	100 V	90 kHz	99.32 V	100.68 V
100 V	100 V	200 kHz	95.5 V	104.5 V
750 V	750 V	40 Hz	749.325 V	750.675 V
750 V	750 V	90 kHz	744.9 V	755.1 V

b. Adjustments. Perform paragraphs **14** and **15** below.

12. Ac Current

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **Input I** and **LO**.

(2) Press **Shift** key then **FUNCTION AC V/AC I** key.

(3) Press **Shift** key then **RANGE/DIGITS Auto/Man** key to select 6½ digits resolution.

(4) Press **RANGE/DIGITS** ∧ or ∨ key to select 1 A range.

(5) Set calibrator for a 1 A, 1 kHz output. If TI does not indicate between 0.9986 and 1.0014 A, perform **b** below.

(6) Press **RANGE/DIGITS** ∧ or ∨ key to select 3 A range.

(7) Set calibrator for a 2 A, 1 kHz output. If TI does not indicate between 1.9952 and 2.0048 A, perform **b** below.

b. Adjustments. Perform paragraphs **14** and **15** below.

13. Frequency

a. Performance Check

(1) Connect function/arbitrary waveform generator **Output** to TI **Input HI** and **LO** using 50 Ω feedthrough termination.

(2) Press **FUNCTION Freq** key.

(3) Press **Shift** key then **RANGE/DIGITS Auto/Man** key to select 6½ digits resolution.

(4) Press **RANGE/DIGITS** ∧ or ∨ to select 1 V range.

(5) Set function/arbitrary waveform generator for a sine wave 100 Hz, 1 Vrms output. If TI does not indicate between 99.99 and 100.01 Hz, perform **b** below.

(6) Set function/arbitrary waveform generator frequency to 100 kHz. If TI does not indicate between 99.99 and 100.01 kHz, perform **b** below.

b. Adjustments. Perform paragraphs **14** and **15** below.

SECTION IV
ADJUSTMENT PROCESS

14. Preliminary Instructions

a. Disconnect TI input terminals from external equipment.

b. Press **FUNCTION DCV** key and **RANGE/DIGITS** ∧ or ∨ key to select 100 mV range.

c. Press **Terminals Front/Rear** pushbutton to **Rear**.

d. Short TI front and rear input terminals as shown in figure 1 using copper wire and allow 5 minutes for thermal offset voltage settling after handling input connections.

e. Press **Shift** key then **MENU <** key to display **A: MEAS MENU**.

f. Press **MENU <** or **>** key until **F: CAL MENU** is displayed.

g. Press **RANGE/DIGITS** ∨ until **1: SECURED** is displayed.

h. Press **RANGE/DIGITS** ∨ key until **^000000 CODE** is displayed.

i. Press **MENU <** or **>** and **RANGE/DIGITS** ∧ or ∨ keys until **034401** is displayed.

j. Press **RANGE/DIGITS Auto/Man** key. TI is now in unsecure mode.

CAUTION

Never turn off the TI during adjustments. This may cause ALL calibration memory to be lost.

15. Zero Offset and Gain

a. Perform zero offset adjustment as listed in (1) through (9) below:

(1) Press **Shift** key then **MENU <** key.

(2) Press **MENU <** or **>** key until **F: CAL MENU** is displayed.

(3) Press **RANGE/DIGITS** ∨ until **1: UNSECURED** is displayed.

(4) Press **MENU >** until **2: CALIBRATE** is displayed.

(5) Press **RANGE/DIGITS** ∨ until **PARAMETERS** is displayed.

(6) Press **MENU <** or **>** and **RANGE/DIGITS** ∧ or ∨ keys until **000.0000 mV DC** is displayed**.**

(7) Press **RANGE/DIGITS Auto/Man** key. Zero adjustment takes approximately 5 minutes to complete then TI will return to measurement mode.

(8) Release **Terminals Front/Rear** pushbutton to **Front** and repeat (1) through (7) above.

(9) Remove short from TI front and rear input terminals.

b. Perform dc volt gain adjustments as listed in (1) through (11) below:

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **Input HI** and **LO**.

(2) Set calibrator for a 0.10 V dc output.

(3) Press **Shift** key then **MENU <** key.

(4) Press **MENU <** or **>** key until **F: CAL MENU** is displayed.

(5) Press **RANGE/DIGITS** ∨ until **1: UNSECURED** is displayed.

(6) Press **MENU >** until **2: CALIBRATE** is displayed.

(7) Press **RANGE/DIGITS** ∨ until **PARAMETERS** is displayed.

(8) Press **MENU** < or > and **RANGE/DIGITS** ∧ or ∨ keys until **+100.000 mV DC** is displayed.

(9) Press **RANGE/DIGITS Auto/Man** key. Gain adjustment takes approximately 20 seconds to complete then TI will return to measurement mode.

(10) Press **RANGE/DIGITS** ∧ or ∨ key to select TI ranges and repeat technique of (2) through (9) above for remaining dc volt gain adjustments listed in table 10.

Table 10. Dc Volt Gain Adjustments

Test instrument ranges	Calibrator output	Value displayed in (8) above
1 V	1.0 V	+1.00000 V DC
10 V	10 V	+10.0000 V DC
100 V	100 V	+100.000 V DC
1000 V	1000 V	+1000.00 V DC

(11) Press calibrator **RESET** key.

c. Perform resistance gain adjustments as listed in (1) through (14) below:

(1) Connect calibrator **OUTPUT HI** and **LO** to TI front **Input HI** and **LO**.

(2) Connect calibrator **SENSE HI** and **LO** to TI front **Ω 4W Sense/Ratio Ref HI** and **LO**.

(3) Press **Shift** key then **FUNCTION Ω 2W/Ω 4W** key.

(4) Press **RANGE/DIGITS** ∧ or ∨ key to select 100 Ω range.

(5) Set calibrator for a 100 Ω output, **EX SNS** on, and **2 wire Comp** off.

(6) Press **Shift** key then **MENU** < key.

(7) Press **MENU** < or > key until **F: CAL MENU** is displayed.

(8) Press **RANGE/DIGITS** ∨ key until **1: UNSECURE** is displayed.

(9) Press **MENU** > key until **2: CALIBRATE** is displayed.

(10) Press **RANGE/DIGITS** ∨ key until **PARAMETERS** is displayed.

(11) Press **MENU** < or > and **RANGE/DIGITS** ∧ or ∨ keys until TI display equals calibrator output display rounded to TI digits of resolution.

(12) Press **RANGE/DIGITS Auto/Man** key. Adjustment takes approximately 20 seconds to complete then TI will return to measurement mode.

(13) Repeat technique of (4) through (12) above for remaining resistance gain adjustments listed in table 11.

Table 11. Resistance Gain Adjustments

Test instrument ranges	Calibrator output
1 kΩ	1 kΩ
10 kΩ	10 kΩ
100 kΩ	100 kΩ
1 MΩ	1 MΩ
10 MΩ	10 MΩ

(14) Press calibrator **RESET** key.

d. Perform dc current gain adjustments as listed in (1) through (18) below:

(1) Connect calibrator **OUTPUT HI** and **LO** to TI front **Input I** and **LO**.

(2) Press **Shift** key then **FUNCTION DC V/DC I** key.

(3) Press **RANGE/DIGITS** ∧ or ∨ key to select 100 mA range.

(4) Set calibrator for a 100 mA output.

(5) Press **Shift** key then **MENU** < key.

(6) Press **MENU** < or > key until **F: CAL MENU** is displayed.

(7) Press **RANGE/DIGITS** ∨ key until **1: UNSECURED** is displayed.

(8) Press **MENU** > key until **2: CALIBRATE** is displayed.

(9) Press **RANGE/DIGITS** ∨ key until **PARAMETERS** is displayed.

(10) Press **MENU** < or > and **RANGE/DIGITS** ∧ or ∨ keys until **+100.000 mA DC** is displayed.

(11) Press **RANGE/DIGITS Auto/Man** key. Adjustment takes approximately 20 seconds to complete then TI will return to measurement mode.

(12) Press **RANGE/DIGITS** ∧ or ∨ key to select 1 A range.

(13) Set calibrator for a 1 A output and repeat (5) through (9) above.

(14) Press **MENU** < or > and **RANGE/DIGITS** ∧ or ∨ keys until **+1.00000 A DC** is displayed. Repeat (11) above.

(15) Press **RANGE/DIGITS** ∧ or ∨ key to select 3 A range.

(16) Set calibrator for a 2 A output and repeat (5) through (9) above.

(17) Press **MENU** < or > and **RANGE/DIGITS** ∧ or ∨ keys until **+2.00000 A DC** is displayed. Repeat (11) above.

(18) Press calibrator **RESET** key.

e. Perform ac volt gain adjustments as listed in (1) through (13) below:

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **Input HI** and **LO**.

(2) Press keys as listed in (a) through (e) below:

(a) **FUNCTION AC V**.

(b) **Shift** then **MENU <**.

(c) **RANGE/DIGITS** ∨ until **AC FILTER** is displayed.

(d) **MENU <** or **>** until **SLOW 3 HZ** is displayed.

(e) **RANGE/DIGITS Auto/Man**.

(3) Press **RANGE/DIGITS** ∧ or ∨ key to select 100 mV range.

(4) Set calibrator for a 100 mV, 1 kHz output.

(5) Press **Shift** key then **MENU <** key.

(6) Press **MENU <** or **>** key until **F: CAL MENU** is displayed.

(7) Press **RANGE/DIGITS** ∨ key until **1: UNSECURED** is displayed.

(8) Press **MENU >** key until **2: CALIBRATE** is displayed.

(9) Press **RANGE/DIGITS** ∨ key until **PARAMETERS** is displayed.

(10) Press **MENU <** or **>** and **RANGE/DIGITS** ∧ or ∨ keys until **100.000 mV AC** is displayed.

(11) Press **RANGE/DIGITS Auto/Man** key. Adjustment takes approximately 20 seconds to complete then TI will return to measurement mode.

(12) Repeat technique of (3) through (11) above for remaining ac volt adjustments listed in table 12.

Table 12. Ac Volt Gain Adjustments

Test instrument ranges	Calibrator output		Value displayed in (10) above
	Voltage	Frequency	
100 mV	100 mV	50 kHz	100.000 mV AC
1 V	1 V	1 kHz	1.00000 V AC
10 V	10 V	1 kHz	10.0000 V AC
10 V	10 V	50 kHz	10.0000 V AC
10 V	10 V	10 Hz	10.0000 V AC
100 V	100 V	1 kHz	100.000 V AC
100 V	100 V	50 kHz	100.000 V AC
750 V	750 V	1 kHz	750.00 V AC
750 V	200 V	50 kHz	200.00 V AC

(13) Press calibrator **RESET** key and disconnect from TI.

f. Perform frequency adjustments as listed in (1) through (12) below:

(1) Connect function/arbitrary waveform generator **Output** to TI **Input HI** and **LO** using 50 Ω feedthrough termination.

(2) Press **FUNCTION Freq** key.

(3) Press **RANGE/DIGITS** ∧ or ∨ to select 1 V range.

(4) Set function/arbitrary waveform generator for a sine wave 50 kHz, 1 Vrms output.

(5) Press **Shift** key then **MENU <** key.

(6) Press **MENU** < or > key until **F: CAL MENU** is displayed.

(7) Press **RANGE/DIGITS** ∨ key until **1: UNSECURED** is displayed.

(8) Press **MENU** > key until **2: CALIBRATE** is displayed.

(9) Press **RANGE/DIGITS** ∨ key until **PARAMETERS** is displayed.

NOTE

The calibration parameter initial display will be 0.000,000 HZ. HZ will have to be changed to 00.000,00 kHz in order to enter 50.000,00 kHz in (10) below.

(10) Press **MENU** < or > and **RANGE/DIGITS** ∧ or ∨ keys until **50.000,00 kHz** is displayed.

(11) Press **RANGE/DIGITS Auto/Man** key. Adjustment takes approximately 20 seconds to complete then TI will return to measurement mode.

(12) Press function/arbitrary waveform generator **Output** key to off and disconnect from TI.

g. Press TI keys as listed in (1) through (6) below:

(1) **Shift** then **MENU** < to display **A: MEAS MENU**.

(2) **MENU** > until **F: CAL MENU** is displayed.

(3) **RANGE/DIGITS** ∨ until **1: UNSECURED** is displayed.

(4) **RANGE/DIGITS** ∨ until **^000000 CODE** is displayed.

(5) **MENU** < or > and **RANGE** ∧ and ∨ until **034401** is displayed.

(6) **RANGE/DIGITS Auto/ Man**. TI is now in secure mode.

h. Perform paragraphs **8** through **13** above.

16. 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:

Official:

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

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army

0321103

Distribution:
To be distributed in accordance with IDN 344604, requirements for calibration procedure TB 9-6625-2315-35.

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.