*TB 9-6625-2135-24

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR DIGITAL MULTIMETER HEWLETT-PACKARD, MODELS 3465A, 3465B, AND 3466A

Headquarters, Department of the Army, Washington, DC
14 November 2007

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 send in your comments electronically to our E-mail address: 2028@redstone.army.mil or by fax 256-842-6546/DSN 788-6546. For the World Wide Web use: https://amcom2028.redstone.army.mil. Instructions for sending an electronic 2028 can be found at the back of this manual.

*This bulletin supersedes TB 9-6625-2135-35, dated 5 June 2003.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Digital Multimeter, Hewlett-Packard, Models 3465A, 3465B, and 3466A. The manufacturers' manuals were 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. The difference between models 3465A and 3465B is the casing and front panel markings. General terms will be used to identify particular functions and ranges required during performance tests for models 3465A and 3465B.

b. Time and Technique. The time required for this calibration is approximately 1 hour for each item, 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. Report only those adjustments made and designated (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
Models 3465A and 3465B	
Dc Voltage	Range: 0 to 1000 V (in 6 ranges) Range: Accuracy:[1] 20 mV 0.03 + 2 200 mV to 200 V 0.02 + 1 1000 V 0.025 + 1
Ac Voltage	Range: 0 to 500 V (in 5 ranges) Frequency: 40 Hz to 20 kHz Range: Accuracy:[1] 200 mV to 200 V[2] 40 Hz to 10 kHz 0.15 + 5 10 to 20 kHz 0.50 + 15 500 V 40 Hz to 1 kHz 0.15 + 5 1 to 2 kHz 0.50 + 5
Ac current[3]	Range: 0 to 2000 mA (in 5 ranges) Frequency: 40 Hz to 20 kHz Range: Accuracy:[1] 200 μA to 20 mA 40 Hz to 2 kHz 0.4 + 5 2 to 10 kHz 0.25 + 5 10 to 20 kHz 0.6 + 15 200 mA 40 Hz to 1 kHz 0.8 + 5 1 to 2 kHz 0.65 + 4 2000 mA 40 Hz to 1 kHz 0.8 + 5
Dc Current	Range: 0 to 2000 mA (in 5 ranges) Range: Accuracy:[1] 200 μA to 2 mA 0.07 + 1 20 mA 0.11 + 1 200 and 2000 mA 0.6 + 1
Resistance	Range: 0 to 20 MΩ (in 6 ranges) Range: Accuracy:[1] 200Ω 0.02 + 2 2 through 2000 kΩ 0.02 + 1 20 MΩ 0.1 + 1
Model 3466A	
Dc voltage	Range: 0 to 1200 V (in 6 ranges) Range: Accuracy:[1] 20 mV 0.05 + 3 200 mV 0.04 + 2 2 and 20 V 0.03 + 1 200 V 0.035 + 1 1200 V <700 V 0.035 + 1 1200 V >700 V 0.055 + 1

See footnotes at end of table.

Table 1. Calibration Description - Continued

Test instrument parameters	Performance specifications
Ac voltage	Range: 0 to 1200 V (in 5 ranges) Frequency: 20 Hz to 100 kHz[4] Frequency: — Accuracy:[1] 20 to 30 Hz — 2.0 + 50 30 to 50 Hz — 1.0 + 30 50 Hz to 10 kHz — 0.3 + 20 10 to 20 kHz — 1.0 + 40 20 to 100 kHz — 2.0 + 150
Ac Current[3]	Range: 0 to 2000 mA (in 5 ranges) Frequency: 20 Hz to 10 kHz Range: — Accuracy:[1] 200 μA to 200 mA 20 to 30 Hz — 2.0 + 50 30 Hz to 10 kHz — 0.9 + 35 2000 mA 20 to 30 Hz — 2.0 + 50 30 Hz to 10 kHz — 1.2 + 20
Dc current	Range: 0 to 2000 mA (in 5 ranges) Range: — Accuracy:[1] 200 μA to 20 mA — 0.07 + 2 200 mA — 0.15 + 2 2000 mA — 0.5 + 2
Resistance	Range: 0 to 20 MΩ (in 7 ranges) Range: — Accuracy:[1] 20 and 200Ω — 0.08 + 2 2 through 200 kΩ — 0.03 + 1 2000 kΩ — 0.04 + 1 20 MΩ — 0.15 + 1

[1] Accuracy: ±(% of reading + digits) 4 1/2 digits (1999.9 maximum display).
[2] Maximum input: FS to 10 kHz decreasing linearly to 50 percent of FS at 20 kHz.
[3] Ac current verified during dc current check since same shunt resistors are utilized for both checks.
[4] Volts/hertz product not to exceed 10^7.

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, AN/GSM-287, and AN/GSM-705. Alternate items may be used by the calibrating activity when the equipment listed in table 2 is not available. 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 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.

Table 2. Minimum Specifications of Equipment Required

<table>
<tr><th>Common name</th><th>Minimum use specifications</th><th>Manufacturer and model (part number)</th></tr>
<tr><td>CALIBRATOR</td><td>
Dc voltage:
Range: 10 mV to 1000 V
<table>
<tr><th rowspan="2">Dc voltage</th><th colspan="2">Accuracy: ± (%)</th></tr>
<tr><th>3565A & B</th><th>3566A</th></tr>
<tr><td>10 mV</td><td>0.0125</td><td>- - -</td></tr>
<tr><td>19 mV</td><td>0.0105</td><td>0.0158</td></tr>
<tr><td>190 mV</td><td>0.0066</td><td>0.0132</td></tr>
<tr><td>1.9 to 190 V</td><td>0.0066</td><td>0.0092</td></tr>
<tr><td>500 V</td><td>- - -</td><td>0.0150</td></tr>
<tr><td>990 V</td><td>0.0076</td><td>- - -</td></tr>
</table>
Ac voltage models 3465A and 3465B:
Range: 100 mV to 490 V
Frequency: 40 Hz to 20 kHz
<table>
<tr><th rowspan="3">Ac voltage</th><th colspan="5">Frequency (kHz)</th></tr>
<tr><th>0.04</th><th>0.9</th><th>2</th><th>9</th><th>20</th></tr>
<tr><th colspan="5">Accuracy: ± (%)</th></tr>
<tr><td>100 mV to 190 V</td><td>0.04</td><td>- - -</td><td>- - -</td><td>0.04</td><td>0.16</td></tr>
<tr><td>490 V</td><td>0.06</td><td>0.06</td><td>0.15</td><td>- - -</td><td>- - -</td></tr>
</table>
Ac voltage model 3466A:
Range: 190 mV to 1000 V
Frequency: 20 Hz to 100 kHz
<table>
<tr><th rowspan="3">Ac voltage</th><th colspan="5">Frequency (kHz)</th></tr>
<tr><th>0.02</th><th>0.04</th><th>5</th><th>15</th><th>100</th></tr>
<tr><th colspan="5">Accuracy: ± (%)</th></tr>
<tr><td>190 mV to 190 V</td><td>0.57</td><td>0.29</td><td>0.10</td><td>0.10</td><td>0.10</td></tr>
<tr><td>100 V</td><td>- - -</td><td>- - -</td><td>- - -</td><td>- - -</td><td>4.25</td></tr>
<tr><td>500 V</td><td>- - -</td><td>- - -</td><td>- - -</td><td>.45</td><td>- - -</td></tr>
<tr><td>1000 V</td><td>- - -</td><td>.32</td><td>.125</td><td>- - -</td><td>- - -</td></tr>
<tr><td>190 mV to 190 V</td><td>0.57</td><td>0.29</td><td>0.10</td><td>0.10</td><td>0.10</td></tr>
</table>
Dc current:
Range: 190 µA to 1.9 A

Resistance:
Range: 100 Ω to 10 MΩ
<table>
<tr><th rowspan="2">Resistance</th><th colspan="2">Accuracy: ± (%)</th></tr>
<tr><th>3465A & B</th><th>3466A</th></tr>
<tr><td>19Ω</td><td>- - -</td><td>0.02275</td></tr>
<tr><td>190Ω</td><td>0.00775</td><td>0.02275</td></tr>
<tr><td>1.0 kΩ</td><td>0.00775</td><td>- - -</td></tr>
<tr><td>1.9 to 190 kΩ</td><td>0.00625</td><td>0.00875</td></tr>
<tr><td>1.9 MΩ</td><td>0.00625</td><td>0.01125</td></tr>
<tr><td>10 MΩ</td><td>0.02750</td><td>0.04000</td></tr>
</table>
</td><td>Fluke, Model 5720A (5720A) (p/o MIS-35947); w amplifier, Fluke 5725A/AR (5725A/AR)</td></tr>
<tr><td>MULTIMETER</td><td>Range: -200 µV to 7.01 V dc</td><td>Fluke, Model 8840A/AF05 (AN/GSM-64D)</td></tr>
</table>

SECTION III
CALIBRATION PROCESS FOR
HEWLETT-PACKARD MODELS 3465A AND 3465B

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. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturers' manuals for this TI.

d. When indications specified in paragraphs **8** through **11** are not within tolerance, perform power supply check prior to making adjustments. If power supply adjustments are made, repeat paragraphs **8** through **11**. Do not perform power supply check if all other parameters are within tolerance.

e. 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. Remove protective cover from TI only to make adjustments and replace upon completion.

b. If necessary, set **~ LINE SELECTOR** switch (rear panel) to **86-127 V** position.

c. Connect TI to a 115 V ac power source. Press **POWER** pushbutton to **ON** and allow at least 10 minutes for stabilization.

d. Press TI ⎓ **V** and **20 m** pushbuttons.

e. Short TI **VΩ** and **COM**. If necessary, adjust **ZERO ADJ** (rear panel) for **0.000** indication. Remove short.

8. Dc Voltage

a. Performance Check

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

(2) Set calibrator for a 10 mV dc output. If TI does not indicate between 9.995 and 10.005 mV, perform **b** below.

(3) Press TI pushbuttons and set calibrator output for settings listed in table 3. TI will indicate within limits specified.

Table 3. Dc Voltage

Test instrument pushbuttons	Calibrator output	Test instrument indications	
		Min	Max
20 m	19 mV	18.992 mV	19.008 mV
200 m	190 mV	189.95 mV	190.05 mV
2	1.9 V	1.8995 V	1.9005 V
20	19 V	18.995 V	19.005 V
200	190 V	189.95 V	190.05 V
2000	990 V	989.7 V	990.3 V

b. Adjustments. Adjust GAIN ADJ R76 (fig. 1) for a TI indication of 10.000 (±3 digits) (R).

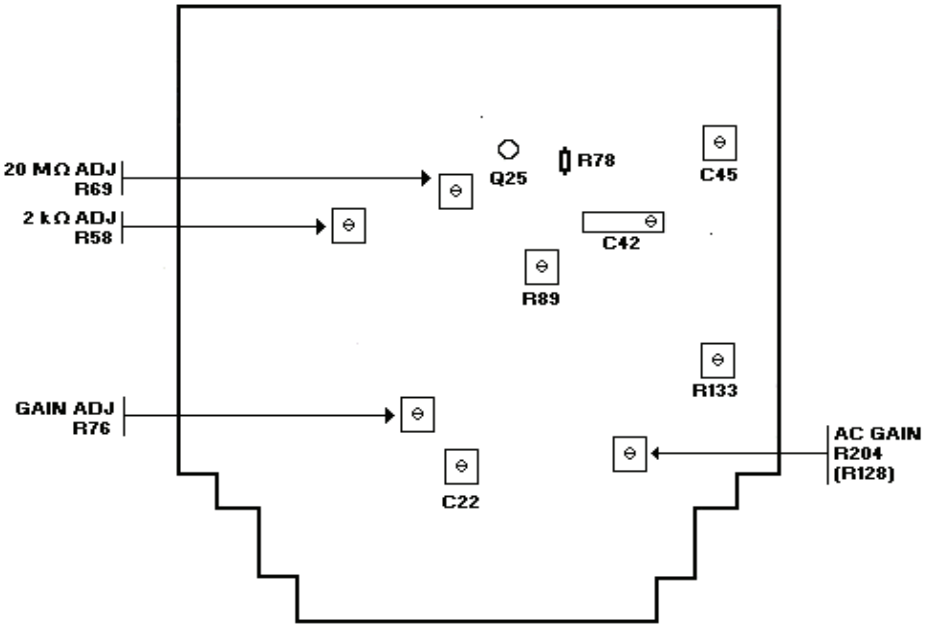


Figure 1. Adjustment locations bottom view (models 3465A and 3465B).

9. Resistance

a. Performance Check

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

(2) Press TI **Ω** pushbutton.

(3) Press TI pushbuttons and set calibrator output for settings listed in table 4. At each output setting, use calibrator output adjustment controls to set calibrator control display **Reading** equal to TI indication. If calibrator control display **ERROR** indications are not within limits specified, perform **b** below.

Table 4. Resistance

Test instrument pushbuttons	Calibrator	
	Output	**ERROR** display indication ±(%)
200	190 Ω[1]	.031
2 k	1.9 kΩ	.025
20 k	19 kΩ	.025
200 k	190 kΩ[2]	.025
2000 k	1.9 MΩ	.025
20 M	10 MΩ	.110

[1]Set calibrator **2 wire Comp** on.
[2]Set calibrator **2 wire Comp** off before setting output.

b. Adjustments

(1) Press TI **2 k** pushbutton and disconnect calibrator from TI.

(2) Short TI **VΩ** and **COM**.

(3) Connect multimeter to junction of R78 and Q25 (fig. 1). Adjust 20 MΩ ADJ R69 (fig. 1) for a multimeter indication of < 500 μV (R).

(4) Remove short from TI **VΩ** and **COM** and disconnect multimeter.

(5) Connect calibrator **OUTPUT HI** and **LO** to TI **VΩ** and **COM**.

(6) Set calibrator for a 1 kΩ output and **2 wire Comp** on. Adjust 2 kΩ ADJ R58 (fig. 1) for a TI indication equal to calibrator output display rounded to TI digits of resolution (±2 digits) (R).

(7) Press TI **20 M** pushbutton.

(8) Set calibrator **2 wire Comp** off and output to 10 MΩ. Adjust 20 MΩ ADJ R69 (fig. 1) for a TI indication equal to calibrator output display rounded to TI digits of resolution (±1 digit) (R).

(9) Press TI **2 k** pushbutton.

(10) Repeat (6) through (9) above for best compromise.

10. Ac Voltage

a. Performance Check

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

(2) Press TI **~V** pushbutton.

(3) Press TI pushbuttons and set calibrator output for settings listed in table 5. If TI indications are not within limits specified, perform **b** below.

Table 5. Ac Voltage

Test instrument pushbuttons	Calibrator output settings		Test instrument indications	
	Voltage	Frequency	Min	Max
200 m	190 mV	40 Hz	189.67 mV	190.33 mV
200 m	190 mV	9 kHz	189.67 mV	190.33 mV
200 m	100 mV	20 kHz	99.35 mV	100.65 mV
2	1.9 V	40 Hz	1.8967 V	1.9033 V
2	1.9 V	9 kHz	1.8967 V	1.9033 V
2	1.0 V	20 kHz	0.9935 V	1.0065 V
20	19 V	40 Hz	18.967 V	19.033 V
20	19 V	9 kHz	18.967 V	19.033 V
20	10 V	20 kHz	9.935 V	10.065 V
200	190 V	40 Hz	189.67 V	190.33 V
200	190 V	9 kHz	189.67 V	190.33 V
200	100 V	20 kHz	99.35 V	100.65 V
2000	490 V	40 Hz	488.8 V	491.2 V
2000	490 V	900 Hz	488.8 V	491.2 V
2000	490 V	2 kHz	487.1 V	492.9 V

b. Adjustments

(1) Set calibrator to **STANDBY**.

(2) Press TI **2** pushbutton.

(3) Set calibrator for a 1 V, 200 Hz output. Adjust AC GAIN R204 (R128) (fig. 1) for a 1.0000 TI indication (R).

(4) Set calibrator for a 100 mV, 200 Hz output.

(5) Press TI **200 m** pushbutton. Adjust R133 (fig. 1) for a 100.00 TI indication (R).

(6) Press TI **2** pushbutton.

(7) Set calibrator for a 100 mV, 20 kHz output. Adjust C45 (fig. 1) for a .1000 (±1 digit) TI indication (R).

(8) Press TI **200 m** pushbutton. Adjust C42 (fig. 1) for a 100.04 (±1 digit) TI indication (R).

(9) Press TI **20** pushbutton.

(10) Set calibrator for a 10 V, 20 kHz output. Adjust C22 (fig. 1) for a 10.008 (±1 digit) TI indication (R).

11. Dc Current

a. Performance Check

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

(2) Press TI ⎓ **A** pushbutton.

(3) Press TI pushbuttons and set calibrator output for settings listed in table 6. TI will indicate within limits specified.

Table 6. Dc Current

Test instrument pushbuttons	Calibrator output	Test instrument indications	
		Min	Max
200 μ	190 μA	189.86 μA	190.14 μA
2 m	1.9 mA	1.8986 mA	1.9014 mA
20 m	19 mA	18.978 mA	19.022 mA
200 m	190 mA	188.85 mA	191.5 mA
2000 m	1.9 A	1888.5 mA	1911.5 mA

b. Adjustments. No adjustments can be made.

12. Power Supply

NOTE

Do not perform power supply check if all other parameters are within tolerance.

a. Press TI ⎓ **V** and **2** pushbuttons.

b. Connect calibrator **OUTPUT HI** and **LO** to TI **VΩ** and **COM**.

c. Set calibrator for a 1 V dc output. If TI does not indicate 1.0000, adjust R89 (fig. 1) for a 1.0000 TI indication (R).

13. 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 HEWLETT-PACKARD, MODEL 3466A

14. Preliminary Instructions

a. The instructions outlined in paragraphs **14** and **15** 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. 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. When indications specified in paragraphs **16** through **19** are not within tolerance, perform power supply check prior to making adjustments. If power supply adjustments are made, repeat paragraphs **16** through **19.** Do not perform power supply check if all other parameters are within tolerance.

e. Unless otherwise specified, all controls and control settings refer to the TI.

15. 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. Remove protective cover from TI only to make adjustments and replace upon completion.

b. Connect TI to a 115 V ac source. Press **POWER ON/OFF** pushbutton to **ON** and allow at least 15 minutes for stabilization.

c. Press **FUNCTION ⎓ V** and **RANGE 20 mV** pushbuttons.

d. Short TI **INPUT VΩ** and **COM**. If necessary, adjust **ZERO ADJ** (rear panel) for a TI 00.000 indication. Remove short.

16. Dc Voltage

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT VΩ** and **COM**.

(2) Press TI **RANGE** pushbuttons and set calibrator output for settings in table 7. If TI does not indicate within limits specified, perform **b** below.

Table 7. Dc Voltage

Test instrument **RANGE** pushbuttons	Calibrator output (V dc)	Test instrument indications	
		Min	Max
20 mV	0.019	18.988 mV	19.012 mV
200 mV	0.19	189.9 mV	190.1 mV
2	1.9	1.8993 V	1.9007 V
20	19	18.993 V	19.007 V
200	190	189.92 V	190.08 V
1200 V	500	499.7 V	500.3 V
1200 V	1000	999.3 V	1000.7 V

b. Adjustments

(1) Set calibrator to **STANDBY**.

(2) Press TI **RANGE 20** pushbutton.

(3) Set calibrator for a 19 V dc output. Adjust R602 19 VDC ADJ (fig. 2) for a 19.000 V TI indication (R).

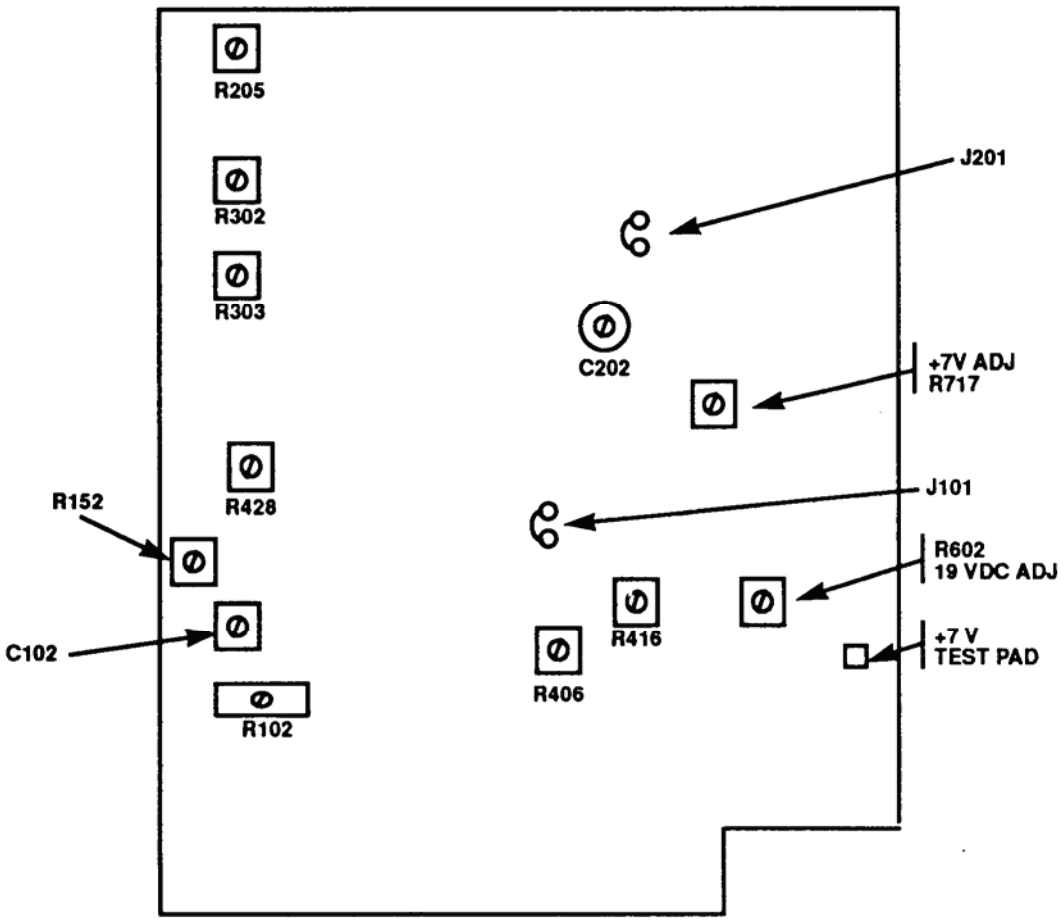


Figure 2. Adjustment locations, model 3466A - top view.

17. Resistance

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT VΩ** and **COM**.

(2) Press TI **FUNCTION kΩ** and **RANGE 20 Ω** pushbuttons.

(3) Set calibrator for a 0 Ω output and **2 wire Comp** on. Adjust front panel **Ω ZERO** for a zero indication on TI.

(4) Press TI **RANGE** pushbuttons and set calibrator output for settings listed in table 8. At each output, use calibrator output adjustment controls to set control display **Reading** equal to TI indication. If calibrator control **ERROR** display indications are not within limits specified, perform corresponding adjustments.

Table 8. Resistance

Test instrument **RANGE** pushbuttons	Calibrator		Adjustments
	Output	**ERROR** display indication ±(%)	
20	19 kΩ	0.035	**b**(1)
20 Ω	19 Ω	0.091	**b**(2)
20 MΩ	10 MΩ[1]	0.16	**b**(3)
200 Ω[2]	190 Ω	0.091	---
2	1.9 kΩ	0.035	---
200	190 kΩ[1]	0.035	---
2000	1.9 MΩ	0.045	---

[1]Set calibrator **2 wire Comp** off before setting output.
[2]Repeat (3) above.

b. Adjustments.

(1) Adjust R416 (fig. 2) for a TI indication equal to calibrator output display rounded to TI digits of resolution.

(2) Adjust R406 (fig. 2) for a TI indication equal to calibrator output display rounded to TI digits of resolution.

(3) Adjust R428 (fig. 2) for a TI indication equal to calibrator output display rounded to TI digits of resolution.

18. Ac Voltage

a. Performance Check

(1) Connect calibrator **OUTPUT HI** and **LO** to TI **INPUT VΩ** and **COM**.

(2) Press **FUNCTION ~V** and **RANGE 200 mV** pushbuttons.

(3) Press TI **RANGE** pushbuttons and set calibrator for output settings listed in table 9. If TI does not indicate within limits specified, perform **b** below.

Table 9. Ac Voltage

Test instrument **RANGE** pushbuttons	Calibrator output		Test instrument indications	
	Voltage	Frequency	Min	Max
200 Mv	190 mV	20 Hz	185.7 mV	194.3 mV
200 mV	190 mV	40 Hz	187.8 mV	192.2 mV
200 mV	190 mV	5 kHz	189.23 mV	190.77 mV
200 mV	190 mV	15 kHz	187.7 mV	192.3 mV
200 mV	190 mV	100 kHz	184.7 mV	195.3 mV
2	1.9 V	20 Hz	1.857 V	1.943 V
2	1.9 V	40 Hz	1.878 V	1.922 V

Table 9. Ac Voltage - Continued

Test instrument **RANGE** pushbuttons	Calibrator output		Test instrument indications	
	Voltage	Frequency	Min	Max
2	1.9 V	5 kHz	1.8923 V	1.9077 V
2	1.9 V	15 kHz	1.877 V	1.923 V
2	1.9 V	100 kHz	1.847 V	1.953 V
20	19 V	20 Hz	18.57 V	19.43 V
20	19 V	40 Hz	18.78 V	19.22 V
20	19 V	5 kHz	18.923 V	19.077 V
20	19 V	15 kHz	18.77 V	19.23 V
20	19 V	100 kHz	18.47 V	19.53 V
200	190 V	20 Hz	185.7 V	194.3 V
200	190 V	40 Hz	187.8 V	192.2 V
200	190 V	5 kHz	189.23 V	190.77 V
200	190 V	15 kHz	187.7 V	192.3 V
200	100 V	100 kHz	96.5 V	103.5 V
1200 V	1000 V	40 Hz	987 V	1013 V
1200 V	1000 V	5 kHz	995 V	1005 V
1200 V	500 V	15 kHz	491 V	509 V
1200 V	100 V	100 kHz	83 V	117 V

b. Adjustments

(1) Set calibrator to **STANDBY**.

(2) Press TI **RANGE 20** pushbutton.

(3) Set calibrator for a 19 V, 200 Hz output. Adjust R303 (fig. 2) for a 19.000 TI indication (R).

(4) Set calibrator for a 1.9 V, 200 Hz output. Adjust R302 (fig. 2) for a 1.900 TI indication (R).

(5) Repeat (3) and (4) above for best compromise.

(6) Set calibrator for a 19 V, 10 kHz output. Adjust R102 (fig. 2) for a 19.000 TI indication (R).

(7) Set calibrator for a 1.9 V, 10 kHz output.

(8) Press TI **RANGE 2** pushbutton. Adjust C102 (fig. 2) for a 1.9000 TI indication (R).

(9) Set calibrator for a 1.9 V, 100 kHz output. Record TI indication.

(10) Press TI **RANGE 20** pushbutton.

(11) Set calibrator for a 19 V, 100 kHz output. Adjust C202 (fig. 2) for a TI indication numerically the same as recorded in (9) above (R).

(12) Set calibrator for a 1.9 V, 100 kHz output.

(13) Press TI **RANGE 2** pushbutton and record TI indication.

(14) Repeat (10) through (13) above until numerical indications are the same, or best compromise.

19. Dc Current

a. Performance Check

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

(2) Press TI **FUNCTION ⎓ mA** pushbutton.

(3) Press TI **RANGE** pushbuttons and set calibrator output for settings listed in table 10. TI will indicate within limits specified.

Table 10. Dc Current

Test instrument **RANGE** pushbuttons	Calibrator output	Test instrument indications	
		Min	Max
200 μA	190 μA	189.85 μA	190.15 μA
2	1.9 mA	1.8985 mA	1.9015 mA
20	19 mA	18.985 mA	19.015 mA
200	190 mA	189.7 mA	190.3 mA
2000	1.9 A	1890.3 mA	1909.7 mA

b. Adjustments. No adjustments can be made.

20. Power Supply

NOTE

Do not perform power supply check if all other parameters are within tolerance.

a. Measure voltage at +7V TEST PAD (fig. 2) with multimeter. If required, adjust +7V ADJ R717 (fig. 2) for a multimeter indication between 6.99 and 7.01 V dc (R).

b. Press TI **FUNCTION ⎓V** and **~V** pushbuttons simultaneously.

c. Press TI **RANGE 20** pushbutton.

d. Short TI **VΩ** and **COM**.

e. Connect multimeter to J101 (fig. 2). Adjust R152 (fig. 2) for a multimeter indication of 0 ±100 μV (R).

f. Connect multimeter to J201 (fig. 2). Adjust R205 (fig. 2) for a multimeter indication of 0 ±200 μV (R).

21. Final Procedure

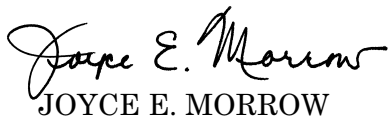
a. Deenergize and disconnect all equipment.

b. Annotate and affix DA Label/Form in accordance with TB 750-25.

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:



JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army

0725602

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 343069, requirements for calibration procedure TB 9-6625-2135-24.

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.