TB 9-6625-2074-24

CHANGE 1

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR RF MILLIVOLTMETER ME-526/USM (BOONTON, MODEL 92BD WITH SERIAL NUMBER 2890 AND BELOW) AND BOONTON, MODELS 92B, 92BD WITH SERIAL NUMBER 2891 AND ABOVE, AND 92C

Headquarters, Department of the Army, Washington, DC
28 June 2010

TB 9-6625-2074-24, 24 March 2009, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

Remove Pages	Insert Pages
5 and 6	5 and 6

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

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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR RF MILLIVOLTMETER ME-526/USM (BOONTON, MODEL 92BD WITH SERIAL NUMBER 2890 AND BELOW) AND BOONTON, MODELS 92B, 92BD WITH SERIAL NUMBER 2891 AND ABOVE, AND 92C

Headquarters, Department of the Army, Washington, DC
24 March 2009

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 9-6625-2074-35, dated 7 July 1992.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of RF Millivoltmeter ME-526/USM (Boonton, Model 92BD with Serial Number 2890 and Below), and Boonton, Models 92B, 92BD with Serial Number 2891 and Above, and 92C. 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. ME-526/USM (Boonton, Model 92BD (all serial numbers)) has a digital meter. Boonton, Models 92B and 92C have analog meters. ME-526/USM and Boonton, Model 92BD with serial number 2890 and below have the same specifications.

b. Time and Technique. The time required for this calibration is approximately 4 hours, using the dc and low frequency and microwave techniques.

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 which pertain to this calibration are listed in table 1.

Table 1. Calibration Description

Test instrument parameters	Performance specifications			
ME-526/USM (Boonton, Model 92BD with serial number 2890 and below	Frequency range: 10 kHz to 1.2 GHz Accuracy: ±(% of FS + % of reading)			
	Voltage range	Frequency range	FS (%)	+ Reading (%)
	100 µV to 300 mV	10 to 50 kHz	1	2
	300 to 3000 mV	10 to 50 kHz	1	1
	100 µV to 3000 mV	50 kHz to 150 MHz	1	1
	100 µV to 3000 mV	150 to 700 MHz	1	3
	100 µV to 300 mV	700 to 1200 MHz	1	7
	300 to 3000 mV	700 to 1200 MHz	1	10
Boonton, Model 92BD (serial number 2891 and above)	200 µV to 3000 mV	10 kHz to 150 MHz	1	1
	200 µV to 3000 mV	150 to 700 MHz	1	3
	200 µV to 300 mV	700 to 1200 MHz	1	7
	300 to 3000 mV	700 to 1200 MHz	1	10
Boonton, Model 92B	100 µV to 300 mV	10 to 50 kHz	1	2
	300 to 3000 mV	10 to 50 kHz	1	1
	100 µV to 3000 mV	50 kHz to 150 MHz	1	1
	100 µV to 3000 mV	150 to 700 MHz	1	3
	100 µV to 300 mV	700 to 1200 MHz	1	7
	300 to 3000 mV	700 to 1200 MHz	1	10
Boonton, Model 92C	500 µV to 300 mV	10 to 50 kHz	2	2
	300 to 3000 mV	10 to 50 kHz	2	1
	500 µV to 3000 mV	50 kHz to 150 MHz	2	1
	500 µV to 3000 mV	150 to 700 MHz	2	3
	500 µV to 300 mV	700 to 1200 MHz	2	7
	300 to 3000 mV	700 to 1200 MHz	2	10

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-287 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 ratio 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)
AC DIVIDER	Range input: 1 to 10 V ac at 10 kHz Output voltage: 1 μV to 10 mV ac Combined accuracy with calibrator: ±0.5%	Fluke, Model 7405A-4207 (7405A-4207)
CALIBRATOR	Frequency range: 10 kHz Voltage range: 97 to 3090 mV rms Stand alone accuracy: ±0.5% Accuracy with ac divider: ±0.5%	Fluke, Model 5720A (5700A/EP) (p/o MIS-35947); w amplifier, Fluke 5725A/AR (5725A/AR))
MEASURING RECEIVER	Frequency range: 100 kHz to 1.2 GHz mV range: 100 mV rms Accuracy: ±0.5%	Measuring Receiver system N5530S consisting of: Spectrum Analyzer Agilent, Model E4440A (E4440A), Power Meter Agilent, Model E4419B (E4419B), and Sensor Module Agilent, Model 504 (504)
MULTIMETER	Range: -15.1 to +15.1 V dc Accuracy: ±0.17%	Hewlett-Packard, Model 3458A (3458A)
POWER SPLITTER	Frequency range: 100 kHz to 1.2 GHz Port-to-port tracking accuracy: ±0.15 dB	Weinschel, Model 1870A (7916839)
SIGNAL GENERATOR	Range: 100 kHz to 1.2 GHz Output amplitude: 100 mV	Aeroflex, Model 2023B (2023B) or (SG-1207/U)

Table 3. Accessories Required

Common name	Description (part number)
Adapter	50Ω BNC adapter Boonton, Model 91-8B (p/o TI)
Adapter	Boonton, Model 91-14A (p/o TI)
Probe tip	Boonton, Model 91-13B (p/o TI)
Termination	Boonton, Model 91-15A (p/o TI)

SECTION III
CALIBRATION PROCESS FOR ME-526/USM (BOONTON, MODEL 92BD WITH SERIAL NUMBER 2890 AND BELOW) AND BOONTON, MODEL 92B

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 tables 2 and 3.

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 manufacturers' manuals for this TI.

d. When indications specified in paragraph **8** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraph **8**. 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

a. Connect RF probe to **PROBE** jack.

b. The RF probe authorized for use with TI must have serial numbers matching the TI serial numbers. If a new probe is calibrated with TI, annotate new probe with TI serial number. Do not use any probe not calibrated with TI.

c. Remove TI protective cover as required for adjustment.

d. Connect TI to a 115 V ac source.

e. Energize equipment and allow 1 hour for warm-up.

8. RF Millivoltmeter Accuracy

a. Performance Check

(1) Press **30 mV FULL SCALE** pushbutton.

NOTE
Ensure probe is shielded from local fields for (2) below.

(2) Replace probe tip with 50 Ω termination.

(3) Adjust **ZERO** control for zero indication on TI meter.

(4) Connect multimeter (dc mode) to TI **RECORDER OUTPUT** (rear panel). If multimeter does not indicate between -0.01 and +0.01 V dc, perform **b** (1) below.

(5) Replace 50 Ω termination with probe tip.

(6) Press **1000 mV FULL SCALE** pushbutton.

(7) Connect probe to calibrator **OUTPUT VΩA HI** and **LO** terminals.

(8) Adjust calibrator controls for 10 kHz and a full-scale indication on TI. If multimeter does not indicate between 9.9 and 10.1 V dc, perform **b** (2) below.

(9) Set calibrator to standby operation.

(10) Disconnect calibrator and multimeter from TI.

(11) Connect ac divider input to calibrator **OUTPUT VΩA HI** and **LO** terminals.

(12) Set TI pushbuttons as listed in the first row of table 4 and adjust **ZERO** control for zero indication on TI meter.

(13) Connect TI probe to ac divider output.

(14) Adjust calibrator controls for 10 kHz and a full-scale indication on TI. If calibrator does not indicate within limits specified, perform corresponding TI adjustments.

(15) Disconnect TI probe from ac divider.

(16) Repeat technique of (12) through (15) above for remaining settings in table 4.

Table 4. Accuracy

TI pushbutton setting	Calibrator output (Vac)			TI indication (mV)	TI adjustment
	Min	Nominal	Max		
1 mV	0.97	1	1.03	1	**b**(3)
3 mV	2.91	3	3.09	3	**b**(4)
10 mV	9.7	10	10.3	10	**b**(5)

(17) Disconnect TI probe and ac divider from calibrator.

(18) Connect TI probe to calibrator **OUTPUT VΩA HI** and **LO** terminals.

(19) Set TI pushbuttons as listed in the first row of table 5.

(20) Adjust calibrator controls for 10 kHz and a full-scale indication on TI. If calibrator does not indicate within limits specified, perform corresponding TI adjustments.

(21) Repeat technique of (20) above for remaining TI pushbutton settings in table 5.

Table 5. Accuracy

TI pushbutton setting	Calibrator output (V ac)			TI indication (mV)	TI adjustment
	Min	Nominal	Max		
30 mV	0.0291	0.030	0.0309	30	**b**(6)
100 mV	0.097	0.100	0.103	100	**b**(7)
300 mV	0.294	0.300	0.306	300	**b**(8)
1000 mV	0.980	1.0	1.020	1000	**b**(9)
3000 mV	2.940	3.0	3.060	3000	**b**(10)

(22) Set calibrator to standby.

(23) Set TI pushbuttons as listed in table 6.

(24) Adjust calibrator controls for 1MHz and a full-scale indication at each TI pushbutton setting. Calibrator will indicate within limits specified.

Table 6. Accuracy

TI pushbutton setting	Calibrator output (V ac)			TI indication (mV)
	Min	Nominal	Max	
1000 mV	0.98	1.0	1.02	1000
3000 mV	2.94	3.0	3.06	3000

(25) Disconnect TI probe from calibrator.

(26) Connect equipment as shown in figure 1.

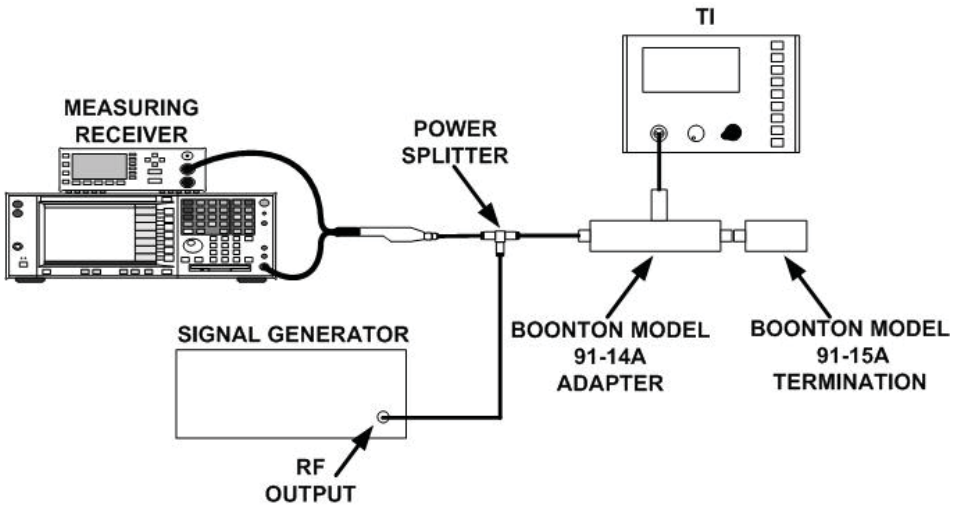

Figure 1. Frequency response - equipment setup.

NOTE

Verify that the proper CAL FACTORS are loaded for the measuring receiver power sensor module.

(27) Zero and calibrate the measuring receiver power sensor module.

(28) Set measuring receiver to measure RF power in mV.

(29) Adjust signal generator frequency controls to the first frequency setting listed in table 7.

Table 7. Frequency Response

Signal generator frequency control settings (MHz)	Test instrument indications[1]				
	No. 1 (mV)	No. 2 (mV)	Average (mV)	Min (mV)	Max (mV)
10.00				98	102
30.00				98	102
60.00				98	102
80.00				98	102
100.00				98	102
140.00				98	102
200.00				96	104
400.00				96	104
800.00				92	108
1000.00				92	108
1200.00				92	108

[1]If TI indicates beyond 100 mV range, go to next higher range.

(30) Adjust signal generator amplitude controls for a 100.0 mV indication on measuring receiver. Record TI indication under TI instrument indications No. 1 column in table 7.

(31) Repeat technique of (29) through (30) above for remaining signal generator frequency settings listed in table 7.

(32) Reverse the output ports connections of the power splitter.

(33) Repeat technique of (29) through (30) above and record TI indication under TI indications No. 2 column in table 7.

NOTE

Refer to table 7 for (34) below.

(34) Add TI indications No. 1 value to TI indications No. 2 value and divide the sum by two. Record results in TI indications average column. Results recorded in TI indications average column will be within the limits specified in the minimum-maximum columns of table 7.

(35) Repeat (34) above for each row listed in table 7.

b. Adjustments

(1) Adjust R233 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a multimeter indication between -0.01 and +0.01 V dc (ideal 0.00 V dc) (R).

(2) Adjust R353 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a multimeter indication between 9.9 and 10.1 V dc (ideal 10.0 V dc) (R).

(3) Adjust calibrator controls for an output of 1.0 V ac and adjust R303 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a TI indication between 0.97 and 1.03 mV (ideal 1.00 mV) (R).

(4) Adjust calibrator controls for an output of 3.0 V ac and adjust R308 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2980 and below) (fig. 3 for Boonton, Model 92B) for a TI indication between 2.91 and 3.09 mV (ideal 3.00 mV) (R).

(5) Adjust calibrator controls for an output of 10.0 V ac and adjust R318 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a TI indication between 9.7 and 10.3 mV (ideal 10.0 mV) (R).

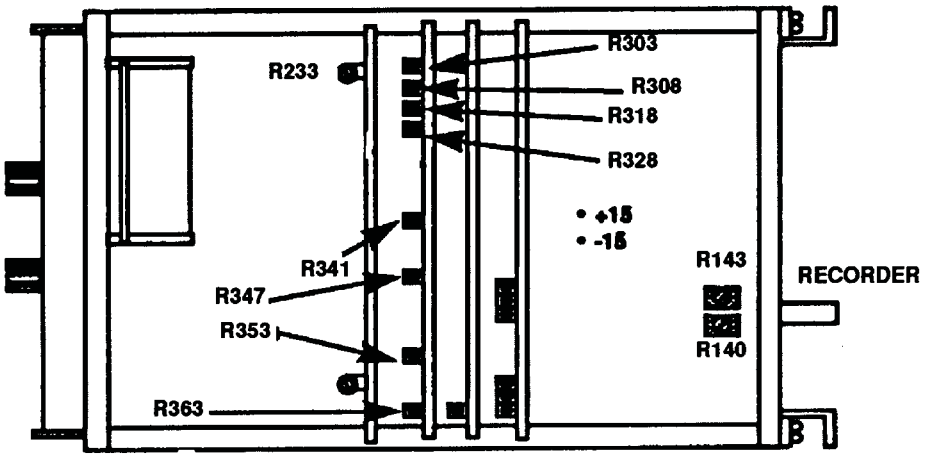

Figure 2. ME-526/USM (Boonton, Model 92BD) with serial number 2890 and below).

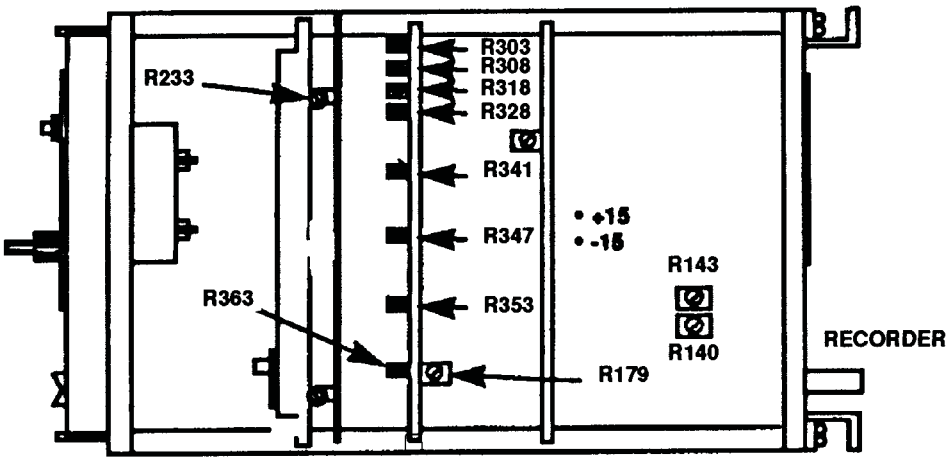

Figure 3. Boonton, Model 92B.

(6) Adjust calibrator controls for an output of 30.0 mV ac and adjust R328 for ME526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a TI indication between 29.1 and 30.9 mV (ideal 30.0 mV) (R).

(7) Adjust calibrator controls for an output of 100 mV ac and adjust R341 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a TI indication between 97 and 103 mV (ideal 100 mV) (R).

(8) Adjust calibrator controls for an output of 0.3 V ac and adjust R347 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a TI indication between 294 and 306 mV (ideal 300 mV) (R).

(9) Adjust calibrator controls for an output of 1.0 V ac and adjust R353 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below), or R179 (fig. 3 for Boonton, Model 92B) for a TI indication between 980 and 1020 mV (ideal 1000 mV) (R).

(10) Adjust calibrator controls for an output of 3.0 V ac and adjust R363 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a TI indication between 2940 and 3060 mV (ideal 3000 mV) (R).

9. Power Supply

NOTE

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

a. Performance Check

(1) Connect multimeter to -15 V dc test point located on main amplifier board (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B). If multimeter does not indicate between -14.9 and - 15.1 V dc, perform **b** (1) below.

(2) Connect multimeter to +15 V dc test point located on main amplifier board (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B). If multimeter does not indicate between +14.9 and +15.1 V dc, perform **b** (2) below.

b. Adjustments

(1) Adjust R143 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a -15.0 V dc multimeter indication (R).

(2) Adjust R140 (fig. 2) for ME-526/USM (Boonton, Model 92BD with serial number 2890 and below) (fig. 3 for Boonton, Model 92B) for a +15.0 V dc multimeter indication (R).

10. 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
BOONTON, MODEL 92BD WITH SERIAL NUMBER 2891 AND ABOVE

11. Preliminary Instructions

a. The instructions outlined in paragraphs **11** and **12** 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.

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. When indications specified in paragraph **13** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraph **13**. 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.

12. Equipment Setup

a. Connect RF probe to **PROBE** jack.

b. The RF probe authorized for use with TI must have serial numbers matching the TI serial numbers. If a new probe is calibrated with TI, annotate new probe with TI serial number. Do not use any probe not calibrated with TI.

c. Remove TI protective cover as required for adjustment.

d. Connect TI to a 115 V ac source.

e. Energize TI and allow TI to warm up for 1 hour.

13. RF Millivoltmeter Accuracy

a. Performance Check

(1) Press **30 mV FULL SCALE** pushbutton.

NOTE
Ensure probe is shielded from local fields for (2) below.

(2) Replace probe tip with 50 Ω termination.

(3) Adjust **ZERO** control for zero indication on TI meter.

(4) Connect multimeter (dc mode) to TI **RECORDER OUTPUT** (rear panel). If multimeter does not indicate between -0.01 and +0.01 V dc, perform **b** (1) below.

(5) Replace 50 Ω termination with probe tip.

(6) Press **1000 mV FULL SCALE** pushbutton.

(7) Connect probe tip to calibrator **OUTPUT VΩA HI** and **LO** terminals.

(8) Adjust calibrator controls for a 1000 mV full-scale indication at 10 kHz on TI. If multimeter does not indicate between 9.9 and 10.1 V dc, perform **b** (2) below.

(9) Set calibrator to standby.

(10) Disconnect calibrator and multimeter from TI.

(11) Connect ac divider input to calibrator **OUTPUT VΩ A HI** and **LO** terminals.

(12) Set TI pushbuttons as listed in the first row of table 8 and adjust **ZERO** control for zero indication on TI meter.

(13) Connect TI probe to ac divider output.

(14) Adjust calibrator controls for 10 kHz and a full-scale indication on TI. If calibrator does not indicate within limits specified, perform corresponding TI adjustments.

(15) Disconnect TI probe from ac divider.

Table 8. Accuracy

TI pushbutton setting	Calibrator output (Vac)			TI indication (mV)	TI adjustment
	Min	Nominal	Max		
1 mV	0.98	1	1.02	1	**b**(3)
3 mV	2.94	3	3.06	3	**b**(4)
10 mV	9.8	10	10.2	10	**b**(5)

(16) Repeat technique of (12) through (16) above for remaining settings in table 8.

(17) Set calibrator to standby operation and disconnect TI probe and ac divider from calibrator.

(18) Connect TI probe to calibrator **OUTPUT VΩA HI** and **LO** terminals.

(19) Set TI pushbuttons as listed in the first row of table 9.

(20) Adjust calibrator controls for 10 kHz and a full-scale indication on TI. If calibrator does not indicate within limits specified, perform corresponding TI adjustments.

(21) Repeat technique of (20) above for remaining settings in table 9.

Table 9. Accuracy

TI pushbutton setting	Calibrator output (V ac)			TI indication (mV)	TI adjustment
	Min	Nominal	Max		
30 mV	0.0294	0.030	0.0306	30	**b**(6)
100 mV	0.098	0.100	0.102	100	**b**(7)
300 mV	0.294	0.300	0.306	300	**b**(8)
1000 mV	0.980	1.0	1.020	1000	**b**(9)
3000 mV	2.940	3.0	3.060	3000	**b**(10)

(22) Set calibrator to standby.

(23) Set TI pushbuttons as listed in table 10.

(24) Adjust calibrator controls for 1MHz and a full-scale indication at each TI pushbutton setting. Calibrator will indicate within limits specified.

Table 10. Accuracy

TI pushbutton setting	Calibrator output (V ac)			TI indication (mV)
	Min	Nominal	Max	
1000 mV	0.98	1.0	1.02	1000
3000 mV	2.94	3.0	3.06	3000

(25) Disconnect TI probe from calibrator.

(26) Connect equipment as shown in figure 4.

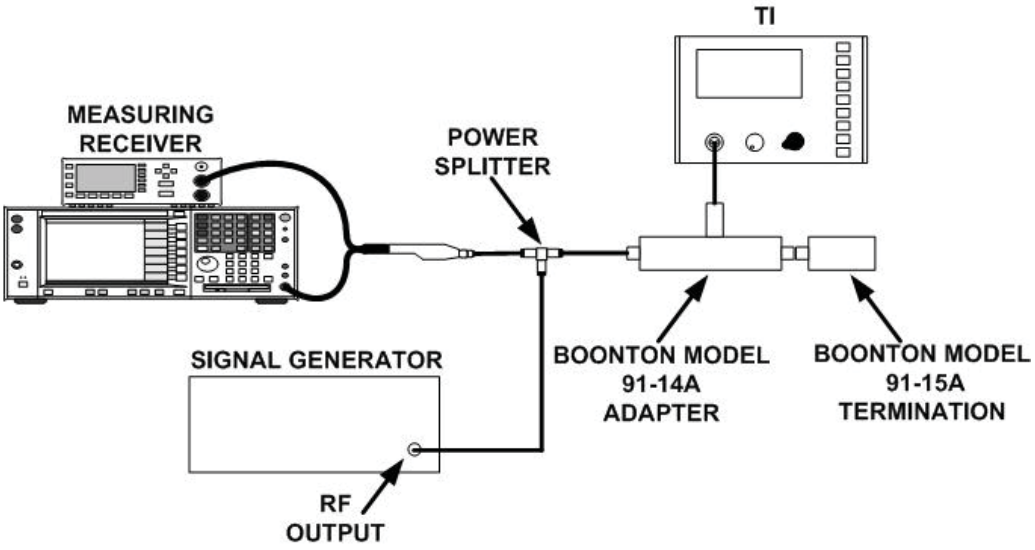

Figure 4. Frequency response - equipment setup.

NOTE

Verify that the proper CAL FACTORS are loaded for the measuring receiver power sensor module.

(27) Zero and calibrate the measuring receiver power sensor module.

(28) Set measuring receiver to measure RF power in mV.

(29) Adjust signal generator frequency controls to frequency setting listed in table 11.

(30) Adjust signal generator amplitude controls for a 100.0 mV indication on measuring receiver. Record TI indication under TI instrument indications No. 1 column in table 11.

(31) Repeat technique of (29) through (30) above for remaining signal generator frequency settings listed in table 11.

Table 11. Frequency Response

Signal generator frequency control settings (MHz)	Test instrument indications[1]				
	No. 1 (mV)	No. 2 (mV)	Average (mV)	Min (mV)	Max (mV)
10.00				98	102
30.00				98	102
60.00				98	102
80.00				98	102
100.00				98	102
140.00				98	102

See footnote at end of table.

Table 11. Frequency Response - Continued

Signal generator frequency control settings (MHz)	Test instrument indications[1]				
	No. 1 (mV)	No. 2 (mV)	Average (mV)	Min (mV)	Max (mV)
200.00				96	104
400.00				96	104
800.00				92	108
1000.00				92	108
1200.00				92	108

[1]If TI indicates beyond 100 mV range, go to next higher range.

(32) Reverse the output ports connections of the power splitter.

(33) Repeat technique of (29) through (30) above and record TI indication under TI indications No. 2 column in table 11.

NOTE

Refer to table 11 for (34) below.

(34) Add TI indications No. 1 value to TI indications No. 2 value and divide the sum by two. Record results in TI indications average column. Results recorded in TI indications average column will be within the limits specified in the minimum-maximum columns of table 11.

(35) Repeat (34) above for each row listed in table 11.

b. Adjustments

(1) Adjust R40 (fig. 5) for a multimeter indication between -0.01 and +0.01 V dc (ideal 0.00 V dc) (R).

(2) Adjust R353 (fig. 5) for a multimeter indication between 9.9 and 1 0. 1 V dc (ideal 10.0 V dc) (R).

(3) Adjust calibrator controls for an output of 1.0 V ac and adjust R303 (fig. 5) for a TI indication between 0.98 and 1.02 mV (ideal 1.0 mV) (R).

(4) Adjust calibrator controls for an output of 3.0 V ac and adjust R308 (fig. 5) for a TI indication between 2.94 and 3.06 mV (ideal 3.0 mV) (R).

(5) Adjust calibrator controls for an output of 10.0 V ac and adjust R318 (fig. 5) for a TI indication between 9.8 and 10.2 mV (ideal 10.0 mV) (R).

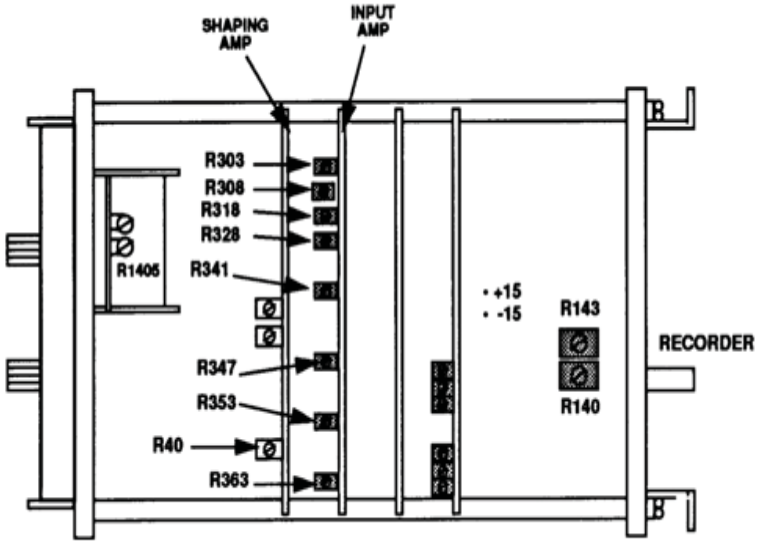

Figure 5. Boonton, Model 92BD with serial number 2891 and above.

(6) Adjust calibrator controls for an output of 30 mV ac and adjust R328 (fig. 5) for a TI indication between 29.4 and 30.6 mV (ideal 30 mV) (R).

(7) Adjust calibrator controls for an output of 100 mV ac and adjust R341 (fig. 5) for a TI indication between 98 and 102 mV (ideal 100 mV) (R).

(8) Adjust calibrator controls for an output of 0.3 V ac and adjust R347 (fig. 5) for a TI indication between 294 and 306 mV (ideal 300 mV) (R).

(9) Adjust calibrator controls for an output of 1.0 V ac and adjust R353 (fig. 5) for a TI indication between 980 and 1020 mV (ideal 1000 mV) (R).

(10) Adjust calibrator controls for an output of 3.0 V ac and adjust R1405 (fig. 5) for a TI indication between 2940 and 3060 mV (ideal 3000 mV) (R).

14. Power Supply

NOTE

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

a. Performance Check

(1) Connect multimeter to -15 V dc test point located on main amplifier board (fig. 5). If multimeter does not indicate between -14.9 and -15.1 V dc, perform **b** (1) below.

(2) Connect multimeter to +15 V dc test point located on main amplifier board (fig. 5). If multimeter does not indicate between +14.9 and +15.1 V dc, perform **b** (2) below.

b. Adjustments

(1) Adjust R143 (fig. 5) for a -15.0 V dc multimeter indication (R).

(2) Adjust R140 (fig. 5) for a +15.0 V dc multimeter indication (R).

15. Final Procedure

a. Disconnect and deenergize all equipment.

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

SECTION V
CALIBRATION PROCESS FOR
BOONTON, MODEL 92C

16. Preliminary Instructions

a. The instructions outlined in paragraphs **16** and **17** 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. When indications specified in paragraph **18** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraph **18**. 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.

17. Equipment Setup

a. Connect RF probe to **PROBE** jack.

b. The RF probe authorized for use with TI must have serial numbers matching the TI serial numbers. If a new probe is calibrated with TI, annotate new probe with TI serial number. Do not use any probe not calibrated with TI.

c. Remove TI protective cover as required for adjustment.

d. Connect TI to a 115 V ac source.

e. Energize TI and allow 1 hour for warm-up.

18. RF Millivoltmeter Accuracy

a. Performance Check

(1) Connect ac divider input to calibrator **OUTPUT VΩ A HI** and **LO** terminals.

(2) Set TI pushbuttons as listed in the first row of table 12 and adjust **ZERO** control for zero indication on TI meter.

(3) Connect TI probe to ac divider output.

(4) Adjust calibrator controls for 10 kHz and a full-scale indication on TI. If calibrator does not indicate within limits specified, perform corresponding TI adjustments.

(5) Disconnect TI probe from ac divider.

(6) Repeat technique of (2) through (5) above for remaining TI pushbutton settings in table 12.

Table 12. Accuracy

TI pushbutton setting	Calibrator output (Vac)			TI indication (mV)	TI adjustment
	Min	Nominal	Max		
3 mV	2.88	3	3.12	3	**b**(1)
10 mV	9.6	10	10.4	10	**b**(2)

(7) Disconnect TI probe and calibrator from ac divider.

(8) Connect TI probe to calibrator **OUTPUT VΩA HI** and **LO** terminals.

(9) Set TI pushbuttons as listed in the first row of table 13.

(10) Adjust calibrator controls for 10 kHz and a full-scale indication on TI. If calibrator does not indicate within limits specified, perform corresponding TI adjustments.

(11) Repeat technique of (10) above for remaining TI pushbutton settings in table 13.

Table 13. Accuracy

TI pushbutton setting	Calibrator output (V ac)			TI indication (mV)	TI adjustment
	Min	Nominal	Max		
30 mV	0.0288	0.030	0.0312	30	**b**(3)
100 mV	0.096	0.100	0.104	100	**b**(4)
300 mV	0.291	0.300	0.309	300	**b**(5)
1000 mV	0.970	1.0	1.030	1000	**b**(6)
3000 mV	2.910	3.0	3.090	3000	**b**(7)

(12) Set calibrator to standby.

(13) Set TI pushbuttons as listed in table 14.

(14) Adjust calibrator controls for 1MHz and a full-scale indication at each TI pushbutton setting. Calibrator will indicate within limits specified.

Table 14. Accuracy

TI pushbutton setting	Calibrator output (V ac)			TI indication (mV)
	Min	Nominal	Max	
1000mV	0.97	1.0	1.03	1000
3000mV	2.91	3.0	3.09	3000

(15) Disconnect TI probe from calibrator.

(16) Connect equipment as shown in figure 6.

(17) Zero and calibrate the measuring receiver power sensor module.

(18) Set measuring receiver to measure RF power in mV.

(19) Adjust signal generator frequency controls to frequency setting listed in table 15.

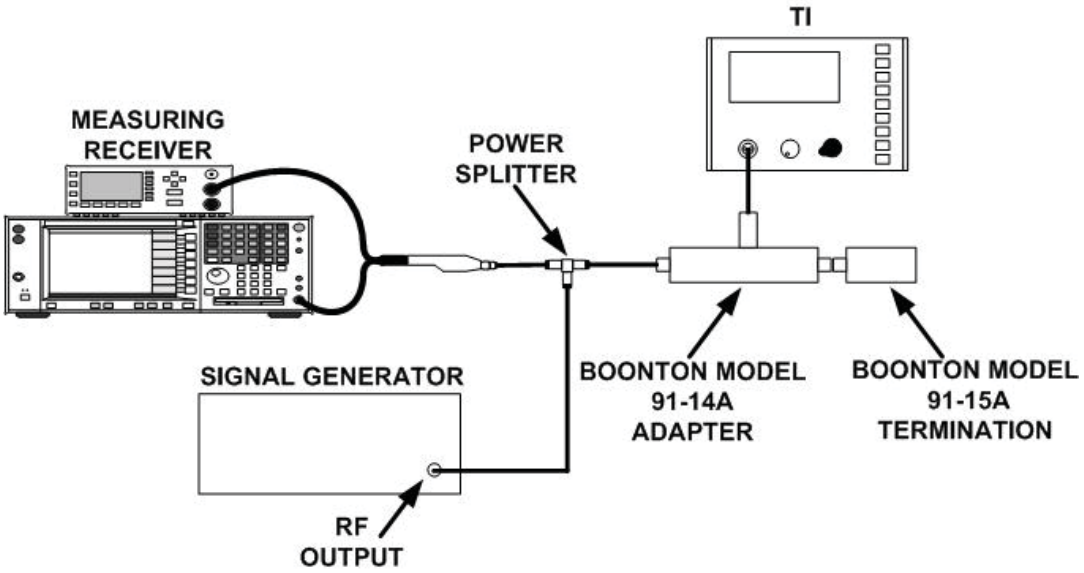

Figure 6. Frequency response - equipment setup.

NOTE

Verify that the proper CAL FACTORS are loaded for the measuring receiver power sensor module.

(20) Adjust signal generator amplitude controls for a 100.0 mV indication on measuring receiver. Record TI indication under TI instrument indications No. 1 column in table 15.

Table 15. Frequency Response

Signal generator frequency control settings (MHz)	Test instrument indications[1]				
	No. 1 (mV)	No. 2 (mV)	Average (mV)	Min (mV)	Max (mV)
10.00				97	103
30.00				97	103
60.00				97	103
80.00				97	103
100.00				97	103
140.00				97	103
200.00				95	105
400.00				95	105
600.00				95	105
800.00				91	109
1000.00				91	109
1200.00				91	109

'If TI indicates beyond 100 mV range, go to next higher range.

(21) Repeat technique of (19) through (20) above for remaining signal generator frequency settings listed in table 15.

(22) Reverse the output ports connections of the power splitter.

(23) Repeat technique of (19) through (20) above and record TI indication under TI indications No. 2 column in table 15.

NOTE

Refer to table 15 for (24) below.

(24) Add TI indications No. 1 value to TI indication No. 2 value and divide the sum by two. Record results in TI indications average column. Results recorded in TI indications average column will be within the limits specified in the minimum-maximum columns of table 15.

(25) Repeat (24) above for each row listed in table 15.

b. Adjustments

(1) Adjust calibrator controls for an output of 3.0 V ac and adjust R208 (fig. 7) for a TI indication between 2.88 and 3.12 mV (ideal 3.0 mV) (R).

(2) Adjust calibrator controls for an output of 10.0 V ac and adjust R220 (fig. 7) for a TI indication between 9.6 and 10.4 mV (ideal 10.0 mV) (R).

(3) Adjust calibrator controls for an output of 30.0 mV ac and adjust R228 (fig. 7) for a TI indication between 28.8 and 31.2 mV (ideal 30 mV) (R).

(4) Adjust calibrator controls for an output of 100 mV ac and adjust R236 (fig. 7) for a TI indication between 96 and 104 mV (ideal 100 mV) (R).

(5) Adjust calibrator controls for an output of 0.3 V ac and adjust R255 (fig. 7) for a TI indication between 291 and 309 mV (ideal 300 mV) (R).

(6) Adjust calibrator controls for an output of 1.0 V ac and adjust R268 (fig. 7) for a TI indication between 970 and 1030 mV (ideal 1000 mV) (R).

(7) Adjust calibrator controls for an output of 3.0 V ac and adjust R281 (fig. 7) for a TI indication between 291 0 and 3090 mV (ideal 3000 mV) (R).

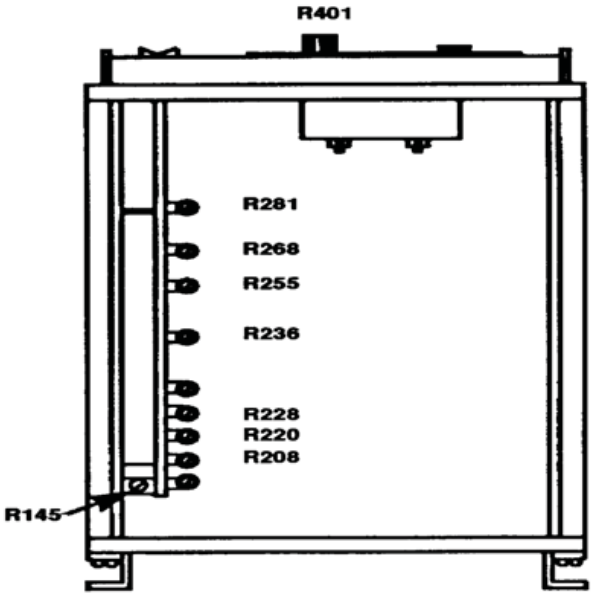

Figure 7 Boonton, Model 92C

19. Power Supply

NOTE

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

a. Performance Check. Connect multimeter to -15 V dc test point located on main amplifier board near R145 (fig. 7). If multimeter does not indicate between 14.9 and - 15.1 V dc, perform **b** below.

b. **Adjustments.** Adjust R145 (fig. 7) for 15.0 V dc multimeter indication (R).

20. Final Procedure

a. Disconnect and deenergize 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
0719015

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 342218 requirements for calibration procedure TB 9-6625-2074-24.

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.

PIN: 085082-000