*TB 9-6625-2367-24

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR FAULT LOCATION ANALYZER, ECLYPSE INTERNATIONAL, MODEL ESP+ (PART NUMBER 980-ESP-00256)

Headquarters, Department of the Army, Washington, DC
9 July 2008

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 9-6625-2367-35, dated 13 June 2006.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Fault Location Analyzer, Eclypse International, Model ESP+ (Part Number 980-ESP-00256). The manufacturer's performance validation procedure 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 4 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. 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
Frequency	Range: 200-10,000 KHz Accuracy: ± 200 ppm
Amplitude	Frequency Range: 200-10,000 KHz Accuracy: ± 15%

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 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 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)
FREQUENCY COUNTER	Range: 200 kHz to 3 MHz Accuracy: ± 50 ppm	Fluke, Model PM6681/656 (PM6681/656)
TRUE RMS VOLTMETER	Frequency Range: 200-10,000 kHz Range: 1 Vrms Accuracy: (± 5%)	Fluke, Model 8922A/AA (8922A/AA)

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 applicable sections 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. Adjustments required to calibrate the TI are not included in this procedure. 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. Remove protective cover from TI only when necessary to make adjustments.

b. Ensure TI is fully charged before attempting performance checks.

8. Frequency Accuracy

a. Performance Check

(1) Connect frequency counter to TI's BNC connector using cable and 50 Ω feedthrough termination.

(2) Turn on and setup frequency counter to measure a 1 Vp-p, 1 MHz sinusoidal signal.

(3) Turn on TI and wait for display to indicate "**READY FOR TEST**".

(4) Press the "**MENU**" key, and then use the arrow keys to select "**SET IMPEDANCE**". Press the "↵" key, then enter **50**, followed by the "↵" key again.

(5) TI display should read "**READY FOR TEST**", and on the second line should appear "**Z=50**". If not, repeat steps (3) through (5) above.

(6) Press and hold the '**0**' key for at least 3 seconds. TI display will read "**F=0.000 KHz**".

(7) Enter a value of **1000**, followed by the "↵" key.

(8) Frequency counter will indicate 999.800 and 1000.200 kHz.

(9) Repeat step (7) above for a value of **200**.

(10) Frequency counter will indicate 199.960 and 200.040 kHz.

(11) Repeat step (7) above for a value of **10000**.

(12) Frequency counter will indicate 9999.000 and 10001.000 kHz.

(13) Disconnect frequency counter from TI.

b. Adjustments. No adjustments can be made.

9. Amplitude Accuracy

a. Performance Check

(1) Connect true RMS voltmeter to TI's BNC connector using cable and 50 Ω feedthrough termination.

(2) Enter a value of **1000**, followed by the "↵" key.

(3) True RMS voltmeter will indicate 0.295 and 0.398 Vrms.

(4) Repeat step (2) above for a value of **200**.

(5) True RMS voltmeter will indicate 0.291 and 0.394 Vrms.

(6) Repeat step (2) above for a value of **10000**.

(7) True RMS voltmeter will indicate 0.285 and 0.386 Vrms.

(8) Disconnect true RMS voltmeter and termination from TI.

b. Adjustments. No adjustments can be made.

10. A and B Measurement Accuracy

a. Performance Check

(1) Press the "**MENU**" key, and then use the arrow keys to select "**SET IMPEDANCE**". Press the "↵" key, then enter **121**, followed by the "↵" key again.

(2) TI display should read "**READY FOR TEST**", and on the second line should appear "**Z=121**". If not, repeat step (1) above.

(3) Press and hold the '**0**' key for at least 3 seconds. TI display will read "**F=0.000 KHz**".

(4) TI display should indicate values of **A = 0-2988** and **B=4130-8618**.

(5) Enter a value of **1000**, followed by the "↵" key.

(6) TI display will read "**F=1000.000 KHz**".

(7) TI display will indicate values of **A = 40749-65000** and **B=41999-65000**.

(8) Repeat step (5) above for value of **200**.

(9) TI display will indicate values of **A = 40545-65000** and **B=41789-65000**.

(10) Repeat step (5) above for value of **10000**.

(11) TI display will indicate values of **A = 39216-65000** and **B=40419-65000**.

b. Adjustments. No adjustments can be made.

11. Relative A and B Measurement Accuracy

a. Performance Check

(1) Press the "**MENU**" key, and then use the arrow keys to select "**SET IMPEDANCE**". Press the "↵" key, then enter **75**, followed by the "↵" key again.

(2) TI display should read "**READY FOR TEST**", and on the second line should appear "**Z=75**". If not, repeat step (1) above.

(3) Press and hold the '**0**' key for at least 3 seconds. TI display should read "**F=0.000 KHz**".

(4) Enter a value of **1000**, followed by the "↵" key.

(5) TI display will read "**F=1000.000 KHz**".

(6) Record the values of **A** and **B** as the base values.

(7) Repeat technique of steps (1) through (5) above for impedances of **121Ω**, **200Ω**, and **400Ω** and record values of **A** and **B** for each impedance.

(8) Calculate the ratios of each measurement to the base value (ie: A $ratio_{[z=121]}$ = $A_{[z=121]}/A_{[base]}$) for **A** and **B**. Ratios will be in accordance with table 3.

Table 3. Relative A and B Measurement Accuracies

TI impedance	Tolerance relative A	Tolerance relative B
75	base	base
121	0.98-1.02	0.9304-0.9738
200	0.98-1.02	0.8434-0.8926
400	0.98-1.02	0.6241-0.6882

b. Adjustments. No adjustments can be made.

12. 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:

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0813507

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 344850, requirements for calibration procedure TB 9-6625-2367-24.

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.