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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR OSCILLOSCOPE OS-303/G

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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.

			Paragraph	Page
SECTION	I.	IDENTIFICATION AND DESCRIPTION		
		Test instrument identification	1	2
		Forms, records, and reports	2	2
		Calibration description	3	2
	II.	EQUIPMENT REQUIREMENTS		
		Equipment required	4	3
		Accessories required	5	3
	III.	CALIBRATION PROCESS		
		Preliminary instructions	6	3
		Equipment setup	7	4
		Vertical gain accuracy	8	5
		Vertical offset	9	6
		Bandwidth accuracy	10	8
		Equivalent time measurement	11	9
		Real time measurement	12	12
		Trigger sensitivity	13	15
		DC calibrator	14	17
		Power supply	15	18
		Final procedure	16	19
	IV.	ALIGNMENT PROCESS		
		Self calibration	17	19
		Final procedure	18	20

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Oscilloscope OS-303/G. The manufacturers service manual and TM 43-6625-915-40 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. None.

b. Time and Technique. The time required for this calibration is approximately 3 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
Vertical gain	Dual cursor measurement: ±(gain accuracy + resolution) Resolution: 0.4% full scale without averaging, 0.024% full scale with 32 averages Accuracy: ±1.00% of full scale at full resolution channel scale
Vertical offset	Accuracy: ±1.25% of channel offset + 2% of full scale
Bandwidth	Dc to □600 MHz
Time measurements	Equivalent time: (≥16 averages) ±[(0.005% x Δt) + (full scale/(2 x memory depth)) + 60ps] Real time: ±[(0.005% x Δt) + (0.2 x sample period)]
Trigger sensitivity	Internal: dc to 100 MHz; 0.5 div 100 MHz to 500 MHz; 1.0 div >500 MHz; 1.5 div Auxiliary: dc to 500 MHz; 300 mV p-p
Dc calibrator	Amplitude: −2.4 V to +2.4 V Accuracy: ±0.2% of ΔV output

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.

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)
OSCILLOSCOPE CALIBRATOR	Voltage output: Range: 49 mV to 35 V Accuracy: ±0.25% Leveled sine wave: Range: 10 mV to 600 mV p-p Frequency: 50 kHz to 600 MHz Accuracy: ±0.25%	(MIS38938) John Fluke, Model 5820A (5820A-5C-GHz)
FUNCTION/ ARBITRARY WAVEFORM GENERATOR	Square wave: Range: 0 to 2.5 V Frequency: 1 MHz to 40 MHz Accuracy: ±0.014%	Agilent, Model 33250A (33250A)
MULTIMETER	Range: 2.4V to -2.4V Accuracy: ±0.05%	John Fluke, Model 8840A/AF-05/09 (AN/GSM-64D)

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. Adjustments required to calibrate the TI are included in this procedure.

d. Unless otherwise specified, all control 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 OUPUT(S) to minimum after each step within the performance check where applicable.

NOTE

Throughout this bulletin, the term "button" denotes a front panel pushbutton which must be physically pressed. The term "key" denotes a button which must be activated by using the TI mouse.

a. Connect TI mouse to mouse input port on TI rear panel.

b. Connect TI keyboard to keyboard input port on TI rear panel.

c. Connect TI to appropriate power source.

d. Press TI ⏻ button and allow 30 minute warm-up time.

NOTE

Warm up must be preceded by a 2 hour non-operating temperature stabilization period (if applicable).

e. Using TI mouse, click key to enable graphical interface.

f. Click **UTILITIES** menu on top of TI display.

g. From displayed roll down menu, click **SELF TEST**.

h. In **SELF TEST WINDOW**, click **SELF TEST** ∇ key.

i. Click **SCOPE SELF TESTS** from **SELF TEST** drop-down list box.

j. Click **START TEST** key.

NOTE

If one or more self-tests fail, refer to TM 43-6625-915-40 Chapter 2, Troubleshooting Procedures.

k. Once TI has passed self-tests, in **SELF TEST** window, click **CLOSE** key.

NOTE

Self-calibration should be performed if TI fails any parameter.