*TB 9-6625-1997-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR SIGNAL GENERATOR AN/URM-103 (SG-297/U)

Headquarters, Department of the Army, Washington, DC
18 March 2003

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, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028, 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.

*This bulletin supersedes TB 9-6625-1997-35, 25 February 1987, including all changes.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Signal Generator AN/URM-103 (SG-297/U). TM's 11-6625-586-12 and 11-6625-586-45 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. Slight internal differences occur but they do not affect calibration. All models are constructed per military specifications.

b. Time and Technique. The time required for this calibration is approximately 6 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
RF frequency	Range: 18 to 80 MHz Accuracy: ±0.5% at any point on frequency dial, ±0.00375% at 1 MHz increments using calibrator
RF voltage	Range: 0.05 µV to 10 mVrms, continuously variable switch selectable fixed output levels of 62.5, 125, 250, and 500 mVrms Accuracy: ±15% from 0.1 µV to 10 mVrms ±25% from 62.5 to 500 mVrms
Internal modulation	Switch selectable internal modulating frequencies of 150 ±1 Hz, 400 Hz ±5 Hz, and 1 kHz ±50 Hz

Table 1. Calibration Description - Continued

Test instrument parameters	Performance specifications
IF output	Frequency range: 4.3, 5.6, 5.625, 5.65, 10.0, and 115 MHz 11.5 MHz Accuracy: ±0.10% Level: 2 µVrms to 1 Vrms Accuracy: ±2.5%
Distortion	<4%
Modulation deviation	Range: 10 to 40 kHz Accuracy: ±2 kHz on 10 kHz range ±3 kHz on 20 kHz range ±5 kHz on 40 kHz range

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. 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 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)
AUDIO ANALYZER	Range: 150 Hz to 1 kHz Accuracy: <1%	Boonton, Model 1120-S/10 (MIS-35954/2)
FREQUENCY COUNTER	Range: 950 Hz to 80 MHz Accuracy: ±0.00094%	John Fluke, Model PM6681/656 (PM6681/656)
MEASURING RECEIVER	Range: 8 to 45 kHz Accuracy: ±1% Range: 7.5 mV to 1.25 V (at 10 MHz) Accuracy: 6.25%	Hewlett-Packard, Model 8902A w/sensors, Hewlett-Packard, Model 11722A (11722A) and 11792A (11792A), and microwave converter, model 11793A (11793A)
MULTIMETER	Range: 8 to 26 V dc Accuracy: 0.1%	John Fluke, Model 8840A/AF-05/09 (AN/GSM-64D)

Table 3. Accessories Required

Common name	Description (part number)
CABLE No. 1[1]	36-in., RG-223/U, BNC PLUG TERMINATION
CABLE No. 2[1]	36-in., RG-62/U, BNC PLUG TERMINATION
IMPEDANCE MATCHING ADAPTER No. 1	BNC plug to jack (50 to 25Ω) TERMINATIONS (CN 900/CU)
IMPEDANCE MATCHING ADAPTER No. 2	BNC plug to jack (100 to 50Ω) terminations CN-901/U)
IMPEDANCE MATCHING ADAPTER No. 3	BNC plug (100 to 50Ω) to jack terminations (CN-9f02/U

[1] Furnished with TI.

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. Additional maintenance information is contained in TMs 11-6625-586-12 and 11-6625-586-45.

d. When indications specified in paragraphs **8** through **15** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraphs **8** through **15**. Do not perform power supply check if all other parameters are within tolerance.

e. 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.

a. Load connectors as listed in (1) through (3) below:

(1) Connect impedance matching adapter No. 2 to **LO-RF**, using cable No. 1.

(2) Connect impedance matching adapter No. 3 to **HI-RF**, using cable No. 2.

(3) Connect impedance matching adapter No. 1 to **IF**, using a 50Ω coaxial cable.

NOTE

Do not remove impedance matching adapters until instructed to do so.

b. Connect frequency counter **A** input to impedance matching adapter No. 3 located on **HI-RF** connector, using cable No. 1.

c. Set power switch to **OPERATE** and allow sufficient time for equipment to warm up and stabilize.

8. RF Frequency Range and Dial Accuracy

a. Performance Check

(1) Position TI controls as listed in (a) through (d) below:

(a) **FUNCTION** switch to **MOD OFF**.

(b) **BAND SWITCH** to **A**.

(c) **DIAL IND SET** control until cursor is centered on band select mask.

NOTE

DIAL IND SET control should not be moved during test except when changing bands.

(d) **RF OUTPUT** switch to **250 KUV**.

(2) Adjust **RF TUNING** control for 18.5 MHz.

(3) Adjust **LO-HI RF SET TO LINE** control to red line on **RF SET TO LINE** meter. If frequency counter does not indicate within limits specified in first row of table 4, perform **b** below.

(4) Repeat technique of (1) through (3) above for switch settings listed in table 4. If frequency counter does not indicate within limits specified, perform **b** below.

Table 4. RF Frequency Range and Dial Accuracy

Test instrument		Frequency counter indications (MHz)	
BAND SWITCH settings[1]	Frequency dial settings (MHz)	Min	Max
A	18.5	18.4075	18.5925
	20.0	19.9000	20.1000
	24.4	24.2780	24.5220
	26.0	25.8700	26.1300
B	37.6	37.4120	37.7880
	34.0	33.8300	34.1700
	30.4	30.2480	30.5520
	26.6	26.4670	26.7330
C	37.6	37.4120	37.7880
	43.0	42.7850	43.2150
	47.0	46.7650	47.2350
	53.6	53.3320	53.8680
D	79.6	79.2020	79.9980
	73.0	72.6350	73.3650
	60.0	59.7000	60.3000
	54.0	53.7300	54.2700

[1]Adjust **DIAL IND SET** control as necessary when changing bands.

(5) Position controls as listed in (a) through (d) below:

(a) **BAND SWITCH** to **A**.

(b) **RF TUNING** control for frequency of 20 MHz.

(c) **FUNCTION** switch to **FREQ CAL**.

(d) **LO-HI RF SET TO LINE** control for a red line indication on **IF UV RF SET TO LINE** meter.

(6) Adjust **RF TUNING** control for a zero beat. Frequency counter will indicate between 19.999250 and 20.000750 MHz.

NOTE

Adjust **AUDIO/CAL VOL** control as required.

b. Adjustments

(1) Connect frequency counter to TP1 on TI harmonic generator (at right rear top corner of. chassis), using probe.

(2) Adjust C3 in end of oven (A6A1A1) for a 1 MHz indication on frequency counter (R).

(3) Adjust capacitor A1A1C10 (on board A1A1) until plates are fully meshed

(4) Set **BAND SWITCH** to **D**.

(5) Connect multimeter to test point A1A1TP1 (E31) using probe.

(6) Adjust potentiometer R26 for a 10.00-V dc indication on multimeter(R).

(7) Adjust **RF TUNING** control for frequency of 80 MHz.

(8) Adjust capacitor A1A1C21 for an 80 MHz indication on frequency counter. If frequency counter indication cannot be obtained, adjust band D coil A1A2L6 for an 80 MHz indication on frequency counter (R).

(9) Adjust **RF TUNING** control for frequency of 53.5 MHz. If frequency counter does not indicate 53.5 MHz, adjust band D coil A1A2L6 for 515 MHz (R).

(10) Adjust **RF TUNING** control for frequency of 80 MHz. If frequency counter does not indicate 80 MHz, adjust capacitor A1A1C21 for 80 MHz (R).

(11) Check tracking over entire band. if proper reading cannot be obtained, readjust capacitor A1A1C21 and band D coil A1A2L6 (R).

(12) Set **BAND SWITCH** to **C**.

(13) Adjust potentiometer R27 for a 100.0-V dc indication on multimeter (R).

(14) Adjust **RF TUNING** control for frequency of 54 MHz. If frequency counter does not indicate 54 MHz, adjust band C coil A1A2L 5 for 54 MHz (R).

(15) Check tracking over entire band. If proper reading cannot be obtained, readjust band C coil A1A2L5 (R).

(16) Set **BAND SWITCH** to **B**.

(17) Adjust potentiometer R28 for a 10.70 V dc indication on multimeter (R).

(18) Adjust **RF TUNING** control for frequency of 38 MHz. If frequency counter does not indicate 38 MHz, adjust band B coil A1A2L4 for 38 MHz (R).

(19) Check tracking over entire band. If proper reading cannot be obtained, readjust band B coil A1A2L4 (R).

(20) Set **BAND SWITCH** to **A**.

(21) Adjust potentiometer R29 for an 8.30 V dc indication on multimeter (R).

(22) Adjust **RF TUNING** control for frequency of 205 MHz. If frequency counter does not indicate 26.5 MHz, adjust band A coil A1A2L3 for 260 MHz (R).

(23) Check tracking over entire band. If proper reading cannot be obtained, readjust band A coil A1A12L3 (R).

(24) Repeat technique of paragraph **8** above.

9. Low RF Voltage Range

a. Performance Check

(1) Connect measuring receiver to impedance matching adapter No. 2 located on **LO-RF** connector, using cable No. 1.

(2) Position controls as listed in (a) through (e) below:

(a) **FUNCTION** switch to **MOD OFF**.
(b) **RF OUTPUT** switch to **0-10 KUV**.
(c) **LO RF UV** dial to **10 KUV**.
(d) **BAND SWITCH** to **A**.
(e) **RF TUNING** control to **20**.

(3) Adjust **LO-HI RF SET TO LINE** control for a red-line indication on **IF UV RF SET TO LINE** meter. If measuring receiver does not indicate within limits shown in first row of table 5, perform **b** below.

(4) Repeat technique of (2) and (3) above for switch settings listed in table 5. If measuring receiver does not indicate within limits specified, perform **b** below.

Table 5. Low RF Voltage Range Accuracy

Test instrument			Measuring receiver	
BAND SWITCH setting	**RF TUNING** control for frequency (MHz)	**LO RF UV** dial for output (KUV)	Min (mV)	Max (mV)
A	20	10	16.97	22.98
		3	5.09	6.93
B	30	10	16.97	22.98
		3	5.09	6.93
C	45	10	16.97	22.98
		3	5.09	6.93
D	65	10	16.97	22.98
		3	5.09	6.93

b. Adjustments

(1) Turn **LO RF UV** dial to **10 KUV** and adjust **LO-HI RF SET TO LINE** control for a 20.00 mV indication on measuring receiver.

(2) Adjust R61 (LO RF METER CAL) for a red-line indication on **IF MV RF SET TO LINE** meter (adjustment is located on right end on bottom chassis) (R).

10. High RF Voltage Range

a. Performance Check

(1) Connect measuring receiver to impedance matching adapter No. 3 located on TI **HI-RF**, using cable No. 2.

NOTE

At each of the following tests, adjust **LO-HI RF SET TO LINE** control to maintain red line indication on **IF MV RF SET TO LINE** meter.

(2) Set **RF OUTPUT** switch to **62.5 KUV** and **BAND SWITCH** to **B** and 30 MHz. If measuring receiver does not indicate within the limits shown in first row of table 6, perform **b** below.

Table 6. High RF Voltage Range Accuracy

Test Instrument			Measuring Receiver	
BAND SWITCH setting	**RF TUNING** control for frequency (MHz)	**RF OUTPUT** switch setting (KUV)	Min (mV)	Max (mV)
B	30	62.5	94	155.5
		125	187	312
		250	375	624
		500	749	1249
A	20	62.5	94	155.5
		125	187	312
		250	375	624
		500	749	1249
C	45	62.5	94	155.5
		125	187	312
		250	375	624
		500	749	1249
D	65	62.5	94	155.5
		125	187	312
		250	375	624
		500	749	1249

(3) Repeat technique of (2) above for switch settings listed in table 6. If measuring receiver does not indicate within limits specified, perform **b** below.

b. Adjustments

(1) Set **RF OUTPUT** switch to **250 KUV** and adjust **LO-HI RF SET TO LINE** control for a 498 mV indication on measuring receiver.

NOTE

When TI protective cover is removed to make adjustments, do not change setting of **115-230 LINE VOLTAGE SELECTOR** switch (located on bottom front center).

(2) Adjust R1 ((HI-RF METER CAL) located on lower right side) for a 0.55 or a red-line indication on **IF UV RF SET TO LINE** meter (R).

11. IF Output Level

a. Performance Check

(1) Connect measuring receiver to impedance matching adapter No. 1 located on TI **IF** output.

(2) Position controls as listed in (a) through (c) below:

(a) **FUNCTION** switch to **IF**.
(b) **IF OUTPUT** switch to **1.0 VOLT**.
(c) **IF MHZ** switch to **10.00**.

(3) Adjust **IF UV** control for a 1.0 V indication on **IF UV RF SET TO LINE** meter. If measuring receiver does not indicate within the limits shown in first row of table 7, perform **b** below.

(4) Repeat technique of (2) and (3) above for switch settings listed in table 7. If measuring receiver does not indicate within limits specified, perform **b** below.

Table 7. IF Output Level Accuracy

Test instrument		Measuring receiver	
IF MHZ switch	**IF OUTPUT** switch	Min	Max
10.00	1.0 VOLT	750 mV	1.25 V
	100 KUV	75 mV	125 mV
	10 KUV	7.5 mV	12.5 mV

b. Adjustments

(1) Adjust **IF UV** control for a 1.000 V indication on measuring receiver.

(2) Adjust R69 ((IF METER CAL) located on lower right side) for a 1.0 indication on **IF UV RF SET TO LINE** meter (R).

12. IF Output Frequency Accuracy

a. Performance Check

(1) Connect frequency counter to impedance matching adapter No. 1 located on **IF** output.

(2) Set **IF MHZ** switch to **4.300** and **IF OUTPUT** switch to **1.0 VOLT**.

(3) Adjust **IF UV** control for 1.0 indication on **IF UV RF SET TO LINE** meter. Frequency counter will indicate within limits specified in first row of table 8.

(4) Repeat technique of (2) and (3) above for switch settings listed in table 8. Frequency counter will indicate within limits specified.

Table 8. IF Output Frequency Accuracy

Test instrument **IF MHZ** switch settings	Frequency counter indications (MHz)	
	Min	Max
4.300	4.29957	4.30043
5.600	5.59944	5.60056
5.625	5.62443	5.62556
5.650	5.64943	5.65056
10.00	9.99900	10.00100
11.50	11.49885	11.50115

b. Adjustments. No adjustments can be made.

13. Internal Modulation Frequency

a. Performance Check

(1) Remove impedance matching adapter No. 2 from TI and connect frequency counter to **INT MOD OUT**.

(2) Position controls as listed in (a) through (d) below:

(a) **RF OUTPUT** switch to **250 KUV**.

(b) **FUNCTION** switch to **1000 HZ**.

(c) **LO-HI RF SET TO LINE** control for a red-line indication on **IF UV RF SET TO LINE** meter.

(d) **DEVIATION RANGE - KHZ** switch to **40**.

(3) Adjust **DEVIATION** control for a full-scale deflection on **DEVIATION KHZ** meter. If frequency counter does not indicate within limits specified in first row of table 9, perform adjustments listed in table 9.

(4) Repeat technique of (2) and (3) above for switch settings listed in table 9. If frequency counter does not indicate within limits specified, perform adjustments listed in table 9.

Table 9. Modulating Frequency Accuracy

Test instrument **FUNCTION** switch settings (HZ)	Frequency counter indications (kHz)		Adjustments (located on test instrument lower left side)
	Min	Max	
1000	0.950	1.050	
150	0.149	0.151	R16 INT MOD CALBR 150 Hz FREQ (R)
400	0.395	0.405	R18 INT MOD CALBR 400 HZ FREQ (R)

b. Adjustments. No further adjustments can be made.

14. Distortion

a. Performance Check

(1) Connect audio analyzer to **INT MOD-OUT**.

(2) Set **FUNCTION** switch to **150 HZ** and adjust **DEVIATION** control for a full-scale indication on **DEVIATION KHZ** meter at each setting. If audio analyzer does not indicate within the limits shown in first row of table 10, perform **b** below.

(3) Repeat technique of (2) above for switch settings listed in table 10. If analyzer does not indicate within limits specified, perform **b** below.

Table 10. Distortion

Test instrument **FUNCTION** switch setting (Hz)	Audio analyzer distortion displayed
150	<4%
400	<4%
1000	<4%

b. Adjustments

(1) Set **FUNCTION** switch to **150 HZ**.

(2) Connect audio analyzer to E29 on audio board (located left rear on bottom of chassis), using probe.

(3) Adjust R15 (located on left end of chassis) for minimum distortion (R).

(4) Lock adjustment in place. Voltage indication at E29 will be approximately 2.5 V rms, as indicated on audio analyzer.

(5) Repeat paragraph **13** if (3) above was performed.

15. Modulation Deviation

a. Performance Check

(1) Connect measuring receiver to **HI-RF**, using impedance matching adapter No. 3 and cable No. 2.

(2) Position controls as listed in (a) through (e) below.

(a) **FUNCTION** switch to **150 HZ**.
(b) **RF TUNING** control for frequency of 22 MHz.
(c) **RF OUTPUT** switch to **500 KUV**.
(d) **DEVIATION RANGE-kHz** switch to **10**.
(e) **LO HI RF SET TO LINE** control for red line on **RF SET TO LINE** meter.

(3) Adjust **DEVIATION** control for 10 on **DEVIATION KHZ** meter. If measuring receiver does not indicate within limits specified in first row of table 11, perform adjustment for band A in table 11.

(4) Repeat technique of (2) and (3) above for switch settings listed in table 11. If measuring receiver does not indicate within limits specified, perform adjustments listed in table 11.

Table 11. Internal Modulation Deviation Check

	Test Instrument				Modulation analyzer deviation indications (kHz)		
BAND SWITCH settings	**RF TUNING** control for frequency (MHz)	**DEVIATION RANGE – kHz** switch settings	**DEVIATION KHZ** meter indications	**FUNCTION** switch settings (Hz)	Min	Max	Adjustments[1] (located on test instrument lower left side
A	22	10	10	150 400 1000	8	12	R37 DEVIATION CALIBRATION BAND A (R)
		20	20	150 400 1000	17	23	
		40	30	150 400 1000	25	35	
		40	40	150 400 1000	35	45	
B	32	10	10	150 400 1000	8	12	R38 DEVIATION CALIBRATION BAND B (R)
		20	20	150 400 1000	17	23	
		40	30	150 400 1000	25	35	
		40	40	150 400 1000	35	45	
C	32	10	10	150 400 1000	8	12	R39 DEVIATION CALIBRATION BAND C (R)
		20	20	150 400 1000	17	23	
		40	30	150 400 1000	25	35	
		40	40	150 400 1000	35	45	

[1]See footnote at end of table.

Table 11. Internal Modulation Deviation Check - Continued

BAND SWITCH settings	Test Instrument: RF TUNING control for frequency (MHz)	Test Instrument: DEVIATION RANGE – kHz switch settings	Test Instrument: DEVIATION KHZ meter indications	Test Instrument: FUNCTION switch settings (Hz)	Modulation analyzer deviation indications (kHz) Min	Modulation analyzer deviation indications (kHz) Max	Adjustments[1] (located on test instrument lower left side
D	32	10	10	150	8	12	R40 DEVIATION CALIBRATION BAND D (R)
				400			
				1000			
		20	20	150	17	23	
				400			
				1000			
		40	30	150	25	35	
				400			
				1000			
		40	40	150	35	45	
				400			
				1000			

[1]Note position of adjustment screw and use a gyptol solvent before making adjustment. Adjust until indication is within limits specified. If out-of-tolerance condition is not corrected within approximately one turn of adjustment screw, refer to paragraph **17b**. Reseal adjustment screw upon completion of adjustment.

b. Adjustments. No further adjustments can be made.

16. Power Supply

NOTE

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

a. Performance Check

(1) Connect multimeter between +25 V test point (TP2 located on rear of TI chassis) and chassis ground, using probes.

(2) Set power switch to **OPERATE** and **FUNCTION** switch to **MOD OFF**.

(3) Set **RF OUTPUT** switch to **0-10 KUV**. If multimeter does not indicate between 24.25 and 25.75 V, perform **b** below.

b. Adjustments. Adjust R55 MAIN SUPPLY +25 V for a 25-V indication on multimeter (R).

17. Final Procedure

a. Deenergize and disconnect all equipment.

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

THESE ARE THE INSTRUCTIONS FOR SENDING 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@avma27.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**: TB 9-6625-xxxx-35
9. **Pub Title**: Calibration Procedure for …
10. **Publication Date**:
11. Change Number:
12. **Submitted Rank**: MSG
13. **Sumitter 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.

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

OFFICIAL:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0302103

Distribution:

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