TB 9-6625-2328-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR DIGITAL ELECTRONIC COUNTER AN/USM-459B

Headquarters, Department of the Army, Washington, DC
18 March 2002

Approved for public release, distribution is unlimited.

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedure, please let us know. Mail your letter or DA Form 2028 to: Commander, U. S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5230. 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.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Digital Electronic Counter AN/USM-459B. TM 9-6625-907-12 and TM 9-6625-907-40 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 2 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. Software corrections will be reported by parameter; i.e. time interval, sensitivity, timebase. Report only those software corrections made.

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: Channel 1 and 2: Dc to 225 MHz Channel 3: 100 MHz to 1.3 GHz Accuracy: (± Timebase ± 300 ps/gate time x frequency)
Peak volts	Range: -5.1 to +5.1 V Accuracy: AC signals: (100 Hz to 30 MHz > 100 mV p-p) 25 mV + 10% of V DC signals: 25 mV + 2% of V
Sensitivity	Channel 1 and 2: 20 mV rms (-21 dBm): dc to 100 MHz 30 mV rms (-17.5 dBm): 100 to 200 MHz 40 mV rms (-15 dBm): 200 to 225 MHz Channel 3: -27 dBm: 100 MHz to 1.3 GHz
Timebase	Frequency: 10 MHz Stability: $< 5 \times 10^{-10}$ per day
Time interval	Range: -1 ns to 10^5 s Accuracy: ± (Timebase x time interval) ± trigger level timing error ±1.5 ns
Trigger level	Range: -5.125 to +5.125 V Accuracy: ±15 mV + 1% of trigger level reading

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 Standards Set, AN/GSM-286. 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 specification listed in table 2.

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)
CALIBRATOR	Range: -2 to 5 V dc Accuracy: ±0.75% Frequency: 1 MHz Range: 0.707 V ac Accuracy: ± 3%	John Fluke, Model 5700A/CT (p/o MIS-35947)
FUNCTION GENERATOR	Function: Square wave Frequency: 1 and 10 MHz Output level: 80 mV p-p and 1 V p-p DC offset: -60 to +60 mV	(SG-1288/G)
PULSE GENERATOR	Pulse width: 150 ns Accuracy: ±0.67%	LeCroy, Model 9210 (9210) w/ output module, LeCroy, Model 9211 (9211)
SIGNAL GENERATOR	Frequency: 1 to 1300 MHz Output level: -60 to –7 dBm	(SG-1207/U)
TIME/FREQUENCY WORKSTATION	Range: 1 and 10 MHz Accuracy: ±1.25 parts in 10^{10}	Autek Systems Corp., Model 620 (MIS-38946)

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. Additional maintenance information is contained in TM 9-6625-907-40.

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. Connect TI to a 115 V ac power source.

b. Press TI **POWER ON/STBY** pushbutton to **ON** and allow 30 minutes for warmup.

NOTE

Initialization of TI controls and indicators is accomplished by cycling the **POWER ON/STBY** pushbutton from **STBY** to **ON**.

8. Time Interval

a. Performance Check

(1) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(2) Press TI **POWER ON/STBY** pushbutton to **ON**.

(3) Execute pulse generator and output module **CAL**.

(4) Connect pulse generator output module **OUTPUT** to TI **CHANNEL 1** input.

(5) Press TI keys as listed in (a) through (k) below:

(a) **MEASURE Time & Period** until **TI 1 TO 2** is displayed.

(b) **CHANNEL 1 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(c) **CHANNEL 1 Trigger/Sensitivity** until **LEVEL:** is displayed, use Þ, Ý, Ü, ß to display **LEVEL: .500 V** and then **Enter**.

(d) **CHANNEL 1 Trigger/Sensitivity** until **COMMON 1:** is displayed, use Þ to display **COMMON 1: ON**.

(e) **CHANNEL 1 50**W**/1M**W to **50**W (LED on).

(f) **CHANNEL 1 DC/AC** to **DC** (LED on).

(g) **CHANNEL 2 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(h) **CHANNEL 2 Trigger/Sensitivity** until **LEVEL:** is displayed, use Þ, Ý, Ü, ß to display **LEVEL: .500 V** and then **Enter**.

(i) **CHANNEL 2 Trigger/Sensitivity** until **SLOPE:** is displayed, then Þ to display **SLOPE: NEG**.

(j) **CHANNEL 2 50**W**/1M**W to **50**W (LED on).

(k) **CHANNEL 2 DC/AC** to **DC** (LED on).

(6) Set pulse generator output as listed in (a) through (k) below:

(a) **Period** to **10.00**m**s**.

(b) **Width** to **150.0ns**.

(c) **Vhigh** to **1.000V**.

(d) **Vlow** to **0mV**.

(e) **Delay** to **0.00ns**.

(f) **Lead** to **1.00ns**.

(g) **Trail** to **1.00ns**.

(h) **2 Pulse** to **OFF**.

(i) **Loadcomp** to **OFF**.

(j) **Trigger Mode** to **Normal**.

(k) Enable output.

(7) Press TI **Stop/Single** key. If TI does not indicate between 0.146 and 0.154 µs, perform **b** below.

(8) Disconnect pulse generator from TI.

b. Adjustments

(1) Disconnect pulse generator from TI.

(2) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(3) Press and hold **MATH Scale & Offset** key while pressing **POWER ON/STBY** pushbutton to **ON** until **CAL SECURE** is displayed.

(4) Press **MATH Scale & Offset** key until **CODE: 0** is displayed.

(5) Press Ü key until **CODE: 00000** is displayed.

(6) Press Þ, ß, Ü, Ý keys until **CODE: 53131** is displayed then press **Enter** key and verify **CAL UNSECURE** is displayed.

(7) Connect function generator **Function Outputs Unbalanced** to TI **CHANNEL 1** input.

(8) Set function generator for a square wave, 10 MHz, 1 V p-p, 50Ω output.

(9) Press **MATH Scale & Offset** key until **CAL:OFFS 1 ?** is displayed.

(10) Press Þ key until **CAL: TI QUIK ?** is displayed.

(11) Press **Enter** key. When **THEN ENTER** is displayed, press **Enter** key.

(12) Verify **CALIBRATING** is displayed followed by **TI CAL PASS**.

(13) Press **MATH Scale & Offset** key until **CODE: 0** is displayed.

(14) Press Ü key until **CODE: 00000** is displayed.

(15) Press Þ, ß, Ü, Ý keys until **CODE: 53131** is displayed then press **Enter** key and verify **CAL SECURE** is displayed.

(16) Disconnect function generator from TI.

9. Trigger Level

a. Performance Check

(1) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(2) Press TI **POWER ON/STBY** pushbutton to **ON**.

(3) Connect function generator **Function Outputs Unbalanced** to TI **CHANNEL 1** input.

(4) Press TI keys as listed in (a) through (h) below:

(a) **CHANNEL 1 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(b) **CHANNEL 1 Trigger/Sensitivity** until **LEVEL:** is displayed, if necessary, use Þ, Ý, Ü, ß to display **LEVEL: 0.000 V** and then **Enter**.

(c) **CHANNEL 1 50**W**/1M**W to **50**W (LED on).

(d) **CHANNEL 1 DC/AC** to **DC** (LED on).

(e) **CHANNEL 2 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(f) **CHANNEL 2 Trigger/Sensitivity** until **LEVEL:** is displayed, if necessary, use Þ, Ý, Ü, ß to display **LEVEL: 0.000 V** and then **Enter**.

(g) **CHANNEL 2 50**W**/1M**W to **50**W (LED on).

(h) **CHANNEL 2 DC/AC** to **DC** (LED on).

(5) Set function generator for a square wave, 1 MHz, 80 mV p-p, -60 mV dc offset, 50Ω output.

(6) Press TI **RUN** key.

(7) Increase function generator dc offset in 1 mV increments until TI **Gate** indicator flashes and frequency indication is stable at approximately 1 MHz. Add 40 mV to function generator dc offset indication and record results. Example: -29 mV + 40 mV = 11 mV.

(8) Set function generator dc offset to +60 mV.

(9) Press TI **CHANNEL 1 Trigger/Sensitivity** key until **SLOPE:** is displayed then press Þ key to display **SLOPE: NEG**.

(10) Press TI **RUN** key.

(11) Decrease function generator dc offset in 1 mV increments until TI **Gate** indicator flashes and frequency indication is stable at approximately 1 MHz. Subtract 40 mV from function generator dc offset indication and record results. Example: 28 mV – 40 mV = -12 mV.

(12) Calculate trigger level by adding results recorded in (7) and (11) above. Example: 11 mV + -12 mV = -1 mV. Calculated trigger level will be between -15 and +15 mV.

(13) Connect function generator **Function Outputs Unbalanced** to TI **CHANNEL 2** input.

(14) Press TI **MEASURE Freq & Ratio** key until **FREQUENCY 2** is displayed.

(15) Set function generator for a square wave, 1 MHz, 80 mV p-p, -60 mV dc offset, 50Ω output.

(16) Press TI **RUN** key.

(17) Increase function generator dc offset in 1 mV increments until TI **Gate** indicator flashes and frequency indication is stable at approximately 1 MHz. Add 40 mV to function generator dc offset indication and record results. Example: -28 mV + 40 mV = 12 mV.

(18) Set function generator dc offset to +60 mV.

(19) Press TI **CHANNEL 2 Trigger/Sensitivity** key until **SLOPE:** is displayed then press Þ key to display **SLOPE: NEG**.

(20) Press TI **RUN** key.

(21) Decrease function generator dc offset in 1 mV increments until TI **Gate** indicator flashes and frequency indication is stable at approximately 1 MHz. Subtract 40 mV from function generator dc offset indication and record results. Example: 33 mV – 40 mV = -7 mV.

(22) Calculate trigger level by adding results recorded in (17) and (21) above. Example: 12 mV + -7 mV = 5 mV. Calculated trigger level will be between -15 and +15 mV.

(23) Disconnect function generator from TI.

b. Adjustments. No adjustments can be made.

10. Sensitivity

a. Performance Check

(1) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(2) Press TI **POWER ON/STBY** pushbutton to **ON**.

(3) Connect equipment as shown in figure 1.

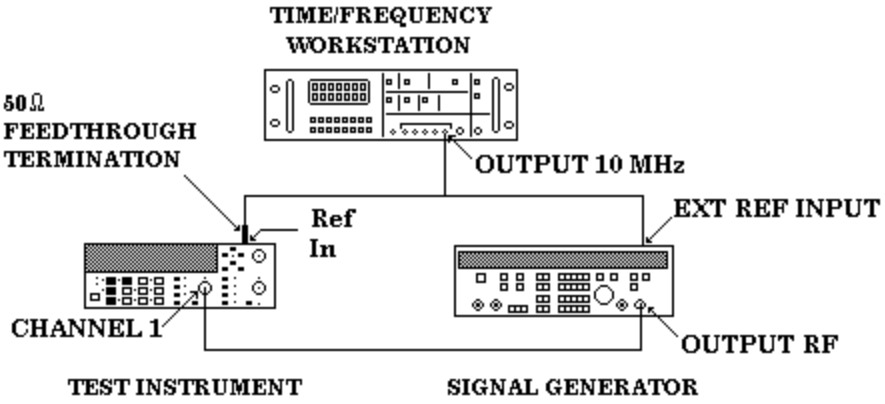

Figure 1. Equipment setup

(4) Press TI keys as listed in (a) through (h) below:

(a) **CHANNEL 1 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(b) **CHANNEL 1 Trigger/Sensitivity** until **LEVEL:** is displayed; if necessary, use Þ , Ý, Ü , ß to display **LEVEL: 0.000 V** and then **Enter**.

(c) **CHANNEL 1 50**W**/1M**W to **50**W (LED on).

(d) **CHANNEL 1 DC/AC** to **DC** (LED on).

(e) **CHANNEL 2 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(f) **CHANNEL 2 Trigger/Sensitivity** until **LEVEL:** is displayed; if necessary, use Þ , Ý, Ü , ß to display **LEVEL: 0.000 V** and then **Enter**.

(g) **CHANNEL 2 50**W**/1M**W to **50**W (LED on).

(h) **CHANNEL 2 DC/AC** to **DC** (LED on).

(5) Set signal generator for a 1 MHz, -35 dBm output.

(6) Press TI **Run** key.

NOTE

Disregard unstable TI display digits to the right of decimal point for 1 MHz in (7) below.

(7) Slowly increase signal generator amplitude until TI **Gate** indicator flashes and **Freq** display indication is stable at applied frequency. If signal generator amplitude is not ≤ -21 dBm, perform **b** below.

(8) Repeat (5) through (7) above at 99 MHz.

(9) Set signal generator for a 101 MHz, -30 dBm output.

(10) Press TI **Run** key.

(11) Slowly increase signal generator amplitude until TI **Gate** indicator flashes and **Freq** display indication is stable at applied frequency. If signal generator amplitude is not ≤ -17.5 dBm, perform **b** below.

(12) Repeat (9) through (11) above at 199 MHz.

(13) Set signal generator for a 201 MHz, -30 dBm output.

(14) Press TI **Run** key.

(15) Slowly increase signal generator amplitude until TI **Gate** indicator flashes and **Freq** display indication is stable at applied frequency. If signal generator amplitude is not ≤ -15 dBm, perform **b** below.

(16) Repeat (13) through (15) above at 225 MHz.

(17) Connect signal generator **OUTPUT RF** to TI **CHANNEL 2** input.

(18) Press TI **MEASURE Freq & Ratio** key until **FREQUENCY 2** is displayed.

(19) Repeat (5) through (16) above.

(20) Connect signal generator **OUTPUT RF** to TI **CHANNEL 3** input.

(21) Press TI **MEASURE Freq & Ratio** key until **FREQUENCY 3** is displayed.

(22) Set signal generator for a 100 MHz, -60 dBm output.

(23) Press TI **Run** key.

(24) Slowly increase signal generator amplitude until TI **Gate** indicator flashes and **Freq** display indication is stable at applied frequency. Signal generator amplitude will be ≤-27 dBm.

(25) Repeat (22) through (24) above at 1300 MHz.

b. Adjustments

(1) Disconnect all equipment from TI.

(2) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(3) Press and hold **MATH Scale & Offset** key while pressing **POWER ON/STBY** pushbutton to **ON** until **CAL SECURE** is displayed.

(4) Press **MATH Scale & Offset** key until **CODE: 0** is displayed.

(5) Press Ü key until **CODE: 00000** is displayed.

(6) Press Þ, ß, Ü, Ý keys until **CODE: 53131** is displayed then press **Enter** key and verify **CAL UNSECURE** is displayed.

(7) Press **MATH Scale & Offset** key until **CAL: OFFS 1 ?** is displayed.

(8) Press **Enter** key. When **THEN ENTER** is displayed press **Enter** key.

(9) Verify **CALIBRATING** is displayed followed by **OFFS 1 PASS**.

(10) Press Þ key until **CAL: OFFS 2 ?** is displayed.

(11) Press **Enter** key. When **THEN ENTER** is displayed press **Enter** key.

(12) Verify **CALIBRATING** is displayed followed by **OFFS 2 PASS**.

(13) Connect calibrator **OUTPUT HI** and **LO** to TI **CHANNEL 1** input.

(14) Set calibrator for a 5 V dc output.

(15) Press Þ key until **CAL: GAIN 1 ?** is displayed.

(16) Press **Enter** key. When **THEN ENTER** is displayed, press **Enter** key.

(17) Verify **CALIBRATING** is displayed followed by **GAIN 1 PASS**.

(18) Connect calibrator **OUTPUT HI** and **LO** to TI **CHANNEL 2** input.

(19) Set calibrator for a 5 V dc output.

(20) Press Þ key until **CAL: GAIN 2 ?** is displayed.

(21) Press **Enter** key. When **THEN ENTER** is displayed, press **Enter** key.

(22) Verify **CALIBRATING** is displayed followed by **GAIN 2 PASS**.

(23) Press **MATH Scale & Offset** key until **CODE: 0** is displayed.

(24) Press Ü key until **CODE: 00000** is displayed.

(25) Press Þ, ß, Ü, Ý keys until **CODE: 53131** is displayed then press **Enter** key and verify **CAL SECURE** is displayed.

(26) Disconnect calibrator from TI.

11. Frequency Accuracy

a. Performance Check

(1) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(2) Press TI **POWER ON/STBY** pushbutton to **ON**.

(3) Connect equipment as shown in figure 2.

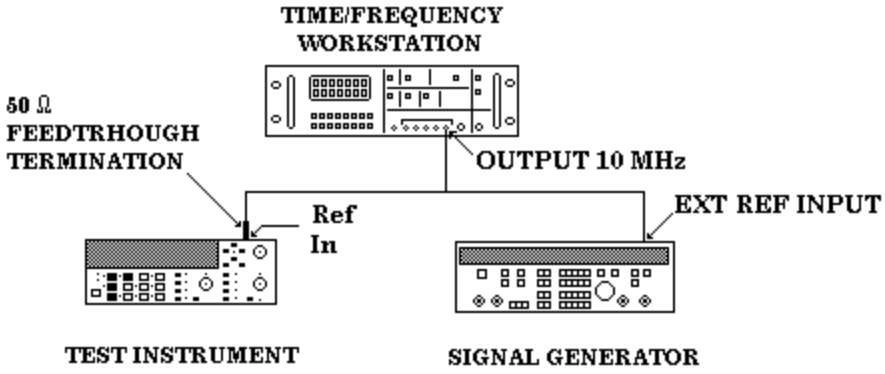

Figure 2. Equipment setup

(4) Press TI keys as listed in (a) through (j) below:

(a) **MEASURE Gate & ExtArm** until **GATE:** is displayed; if necessary, press Þ until **GATE: TIME** is displayed.

(b) **MEASURE Gate & ExtArm** until **TIME:** is displayed; use Þ, Ý, Ü, ß to display **TIME: 1.000 s** and then **Enter**.

(c) **CHANNEL 1 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(d) **CHANNEL 1 Trigger/Sensitivity** until **LEVEL:** is displayed, if necessary, use Þ, Ý, Ü, ß to display **LEVEL: 0.000 V** and then **Enter**.

(e) **CHANNEL 1 50**W**/1M**W to **50**W (LED on).

(f) **CHANNEL 1 DC/AC** to **DC** (LED on).

(g) **CHANNEL 2 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Þ to display **AUTO TRG: OFF**.

(h) **CHANNEL 2 Trigger/Sensitivity** until **LEVEL:** is displayed; if necessary, use Þ, Ý, Ü, ß to display **LEVEL: 0.000 V** and then **Enter**.

(i) **CHANNEL 2 50**W**/1M**W to **50**W (LED on).

(j) **CHANNEL 2 DC/AC** to **DC** (LED on).

(5) Connect time/frequency workstation **OUTPUT 1 MHz** to TI **CHANNEL 1** input.

(6) Press TI **Stop/Single** key. TI will indicate between 999,999.999 and 1,000,000.001 Hz.

(7) Disconnect time/frequency workstation **OUTPUT 1 MHz** from TI **CHANNEL 1** input.

(8) Connect signal generator **OUTPUT RF** to TI **CHANNEL 1** input.

(9) Set signal generator for a 100 MHz, -7 dBm output.

(10) Press TI **Stop/Single** key. TI will indicate between 99.999,999,97 and 100.000,000,03 MHz.

(11) Set signal generator for a 200 MHz, -7 dBm output.

(12) Press TI **Stop/Single** key. TI will indicate between 199.999,999,94 and 200.000,000,06 MHz.

(13) Set signal generator for a 225 MHz, -7 dBm output.

(14) Press TI **Stop/Single** key. TI will indicate between 224.999,999,93 and 225.000,000,07 MHz.

(15) Disconnect signal generator **OUTPUT RF** from TI **CHANNEL 1** input.

(16) Connect time/frequency workstation **OUTPUT 1 MHz** to TI **CHANNEL 2** input.

(17) Press TI **MEASURE Freq & Ratio** key until TI displays **FREQUENCY 2**. Repeat (6) through (15) above for **CHANNEL 2**.

(18) Connect signal generator **OUTPUT RF** to TI **CHANNEL 3** input.

(19) Press TI **MEASURE Freq & Ratio** key until **FREQUENCY 3** is displayed.

(20) Set signal generator for a 100 MHz, -17 dBm output.

(21) Press TI **Stop/Single** key. TI will indicate between 99.999,999,97 and 100.000,000,03 MHz.

(22) Set signal generator for a 1300 MHz, -17 dBm output.

(23) Press TI **Stop/Single** key. TI will indicate between 1,299.999,999,5 and 1,300.000,000,5 MHz.

(24) Disconnect equipment from TI.

b. Adjustments. No adjustments can be made.

12. Peak Volts

a. Performance Check

(1) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(2) Press TI **POWER ON/STBY** pushbutton to **ON**.

(3) Connect calibrator **OUTPUT HI** and **LO** to TI **CHANNEL 1** input.

(4) Press TI keys as listed in (a) through (c) below:

(a) **MEASURE Other Meas** until **VOLT PEAKS 1** is displayed.

(b) **CHANNEL 1 DC/AC** to **DC** (LED on).

(c) **CHANNEL 1 100kHz Filter** to on (LED on).

(5) Set calibrator for a 2 V dc output. TI will indicate +2.00 V ±0.06 V and +2.00 V ±0.06 V.

(6) Set calibrator for a -2 V dc output. TI will indicate -2.00 V ±0.06 V and -2.00 V ±0.06 V.

(7) Press TI **CHANNEL 1 DC/AC** key to select **AC** (LED off) and **CHANNEL 1 100kHz Filter** key to off (LED off).

(8) Set calibrator for a 0.707 V, 1 MHz output. TI will indicate –1.00 V ±0.12 V and +1.00 V ±0.12 V.

(9) Connect calibrator **OUTPUT HI** and **LO** to TI **CHANNEL 2** input.

(10) Press TI keys as listed in (a) through (c) below:

(a) **MEASURE Other Meas** until **VOLT PEAKS 2** is displayed.

(b) **CHANNEL 2 DC/AC** to **DC** (LED on).

(c) **CHANNEL 2 100kHz Filter** to on (LED on).

(11) Set calibrator for a 2 V dc output. TI will indicate +2.00 V ±0.06 V and +2.00 V ±0.06 V.

(12) Set calibrator for a -2 V dc output. TI will indicate -2.00 V ±0.06 V and -2.00 V ±0.06 V.

(13) Press TI **CHANNEL 2 DC/AC** key to select **AC** (LED off) and **CHANNEL 2 100kHz Filter** key to off (LED off).

(14) Set calibrator for a 0.707 V, 1 MHz output. TI will indicate –1.00 V ±0.12 V and +1.00 V ±0.12 V.

(15) Disconnect calibrator from TI.

b. Adjustments. No adjustments can be made.

13. Timebase

a. Performance Check

(1) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(2) Press TI **POWER ON/STBY** pushbutton to **ON**.

(3) Connect time/frequency workstation **OUTPUT 10 MHz** to TI **CHANNEL 1** input.

(4) Press TI keys as listed in (a) through (f) below:

(a) **MEASURE Gate & ExtArm** until **GATE:** is displayed, if necessary, press Þ until **GATE: TIME** is displayed.

(b) **MEASURE Gate & ExtArm** until **TIME:** is displayed, use Þ, Ý, Ü, ß to display **TIME: 1.000 s** and then **Enter**.

(c) **CHANNEL 1 Trigger/Sensitivity** until **AUTO TRG:** is displayed, then Ý to display **AUTO TRG: OFF**.

(d) **CHANNEL 1 Trigger/Sensitivity** until **LEVEL:** is displayed, if necessary, use Þ , Ý, Ü , ß to display **LEVEL: 0.000 V** and then **Enter**.

(e) **CHANNEL 1 50**W**/1M**W to **50**W (LED on).

(f) **CHANNEL 1 DC/AC** to **DC** (LED on).

(5) Press TI **Stop/Single** key. If TI does not indicate between 9.999,999,8 and 10.000,000,2 MHz, perform **b** below.

b. Adjustments

(1) Press and release TI **POWER ON/STBY** pushbutton to **STBY**.

(2) Press and hold **MATH Scale & Offset** key while pressing **POWER ON/STBY** pushbutton to **ON** until **CAL SECURE** is displayed.

(3) Press **MATH Scale & Offset** key until **CODE: 0** is displayed.

(4) Press Ü key until **CODE: 00000** is displayed.

(5) Press Þ , ß, Ü , Ý keys until **CODE: 53131** is displayed then press **Enter** key and verify **CAL UNSECURE** is displayed.

(6) Press **MATH Scale & Offset** key until **CAL: OFFS 1 ?** is displayed.

(7) Press Þ key until **CAL: TIMEBAS ?** is displayed.

(8) Press **Enter** key. When **THEN ENTER** is displayed press **Enter** key.

(9) Verify **CALIBRATING** is displayed followed by **TB CAL PASS** (can take up to 5 minutes to complete).

(10) Press **MATH Scale & Offset** key until **CODE: 0** is displayed.

(11) Press Ü key until **CODE: 00000** is displayed.

(12) Press Þ , ß, Ü , Ý keys until **CODE: 53131** is displayed then press **Enter** key and verify **CAL SECURE** is displayed.

14. Final Procedure

a. Deenergize and disconnect all equipment.

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

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.

TB 9-6625-2328-35

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

0202821

Distribution:

To be distributed in accordance with IDN 344730, requirements for TB 9-6625-2328-35.

PIN: 079837-000