TB 9-6625-2021-24

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR FREQUENCY COUNTER HEWLETT-PACKARD, MODEL 5340A AND MICROWAVE FREQUENCY COUNTER TD-1225A(V)1/U (HEWLETT-PACKARD, MODEL 5342A/H14), TD-1225A(V)2/U (HEWLETT-PACKARD, MODEL 5342A/H16) AND HEWLETT-PACKARD, MODELS 5342A AND 5343A

Headquarters, Department of the Army, Washington, DC
11 March 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@conus.army.mil or by fax 256-842-6546/DSN 788-6546. For the World Wide Web use: https://amcom2028.conus.army.mil. Instructions for sending an electronic 2028 can be found at the back of this manual.

*This bulletin supersedes TB 9-6625-2021-35, dated 26 June 2000.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Frequency Counter, Hewlett-Packard, Model 5340A and Microwave Frequency Counter TD-1225A(V)1/U (Hewlett-Packard, Model 5342A/H14), TD-1225A(V)2/U (Hewlett-Packard, Model 5342A/H16) and Hewlett-Packard, Models 5342A and 5343A. 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. Variations among models are described in text.

b. Time and Technique. The time required for this calibration is approximately 3 hours, using the microwave 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 applications which pertain to this calibration are in table 1.

Table 1. Calibration Description

Test instrument parameters	Performance specifications
HEWLETT-PACKARD, MODEL 5340A	
Time base: Option 001 only	Frequency: 10 MHz Aging rate: <±5 x 10^{-10} per day after 24 hour warm-up Line variation: <±1 x 10^{-10} for 10% line variation
Self-check	Counts and displays 10 MHz for resolution selected Accuracy: ±1 count, ± time base error
Signal input: 50 Ω input 1 MΩ input	Frequency range: 10 Hz to 18 GHz Sensitivity: -30 dBm, 10 Hz to 500 MHz -35 dBm, 500 MHz to 10 GHz -25 dBm, 10 to 18 GHz Frequency range: 10 Hz to 250 MHz Sensitivity: 50 mV rms
TD-1225A(V)1/U (HEWLETT-PACKARD, MODEL 5342A/H14), TD-1225A(V)2/U (HEWLETT-PACKARD, MODEL 5342A/H16) AND HEWLETT-PACKARD, MODELS 5342A AND 5343A	
Time base: Option 001 and time base 10544A, H14 and H16	Frequency: 10 MHz Aging rate: <±5 x10^{-10} per day after 24 hour warm-up Line variation: <±1 x 10^{-10} for 10% line variation
Self-check	Counts and displays 75 MHz for resolution selected Accuracy: ±1 count, ± time base error
Signal input: BNC 50 Ω position BNC 1 MHz position Type N connector TD-1225A(V)1/U and (5342A) 1 MΩ input connector APC-3.5 male with collar (SMA compatible)	 Frequency range: 10 Hz to 520 MHz Sensitivity: 25 mV rms Frequency range: 10 Hz to 25 MHz Sensitivity: 50 mV rms Frequency range: 500 MHz to 18 GHz Sensitivity: -25 dBm, 500 MHz to 12.4 GHz -20 dBm, 12.4 to 18 GHz Frequency range: 500 MHz to 26.5 GHz[1] Sensitivity: -33 dBm, 500 MHz to 12.4 GHz -28 dBm, 12.4 to 18 GHz -23 dBm, 18 to 26.5 GHz[1]

[1]Not checked above 18 GHz.

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 ration cannot be met, the four-to-one 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)
AUTOTRANSFORMER	Range: 105 to 125 V ac	General Radio W10MT3AS3(7910809) or Ridge, Model 9020A (9020A), or Ridge, Model 9020F (9020F)
FREQUENCY COUNTER	Range: 10 Mhz Accuracy: <2 parts in 10^8	Fluke, Model PM6681/656 (PM6681/656)
FREQUENCY DIFFERENCE METER	Accuracy: <±1.25 parts in 10^{10}	Tracor, Model 527E (527E)
FUNCTION GENERATOR	Function: Sinewave, 50 Ω Frequency: 10 Hz to 10 MHz Amplitude: 1 to 200 mVpp Accuracy: ±2%+2mVpp	Agilent, Model 33250A (33250A)
MULTIMETER	Range: -14.95 to +15.05 V dc Accuracy: ±0.08%	Fluke, Model 8840A/AF05 (AN/GSM-64D)
SIGNAL GENERATOR	Frequency: 10 MHz to 18 GHz Amplitude: -50 to -13 dBm	Wiltron, Model 68347M
TIME/FREQUENCY WORKSTATION	Frequency: 1 and 10 MHz Accuracy: <± 1.25 parts in 10^{11}	Datum, Model ET6000-75 (13589305)

SECTION III
CALIBRATION PROCESS FOR
FREQUENCY COUNTER HEWLETT-PACKARD, MODEL 5340A

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 the manufacturer's manual for this TI.

d. When indications specified in paragraphs **8** through **11** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraphs **8** through **11**.

e. 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 covers from TI as necessary to make adjustments.

b. Set line voltage **SELECTOR** switch (rear panel) for 115 V ac and verify that correct fuse (as labeled on rear panel) is installed.

c. Connect TI to autotransformer. Connect autotransformer to 115 V ac power source and adjust to 115 V ac.

d. Position controls as listed in (1) through (4) below:

(1) **RESOLUTION Hz** pushbutton to **1**.

(2) **SAMPLE RATE** control fully ccw.

(3) **INT-EXT** switch (rear panel) to **INT**.

(4) **RANGE** switch to **10 Hz - 250 MHz**.

e. Set **LINE** switch to **ON** and allow TI at least 24 hours for warm-up and stabilization.

8. Time Base Stability - Option 001 Only

a. Performance Check

(1) Connect time/frequency workstation 10 MHz output to frequency counter 10 MHz reference input connector and set frequency counter external reference on.

(2) Connect TI **FREQ STD OUT 10 MHz** output jack (rear panel) to frequency counter **Channel A** input.

(3) Adjust frequency counter for a stable indication. Frequency counter should indicate between 9.999998499 and 10.00000151 MHz (based on one year interval).

NOTE

To determine time base drift limits for TI with other intervals: multiply aging rate per day by the interval (days).

(4) Connect time/frequency workstation 1 MHz output to frequency difference meter **REF INPUT**.

(5) Connect TI **10 MHz OUTPUT** (rear panel) to frequency difference meter **SIG INPUT**.

NOTE

The time base is adjusted during each calibration in order to correct for drift and improve reliability of the TI throughout the interval. If TI is within the limits in step (3) above, then the following FREQ ADJ adjustment will not be annotated as an out-of-tolerance condition.

(6) Adjust FREQ ADJ (fig. 1) for a minimum indication on frequency difference meter 10^{10} range. Record frequency difference meter indication.

(7) Allow at least 24 hours for TI time base oscillator to stabilize. Frequency difference meter indication will be within ±5 parts in 10^{10} of indication recorded in step (6) above. Record frequency difference meter indication.

(8) Adjust autotransformer output to 105 V ac. Allow 1 minute for oscillator to stabilize. Frequency difference meter indication will be within ±1 part in 10^{10} of indication recorded in step (7) above.

(9) Adjust autotransformer output to 125 V ac. Allow 1 minute for oscillator to stabilize. Frequency difference meter indication will be within ±1 part in 10^{10} of indication recorded in step (7) above.

(10) Adjust autotransformer output to 115 V ac.

b. Adjustments. No further adjustments can be made.

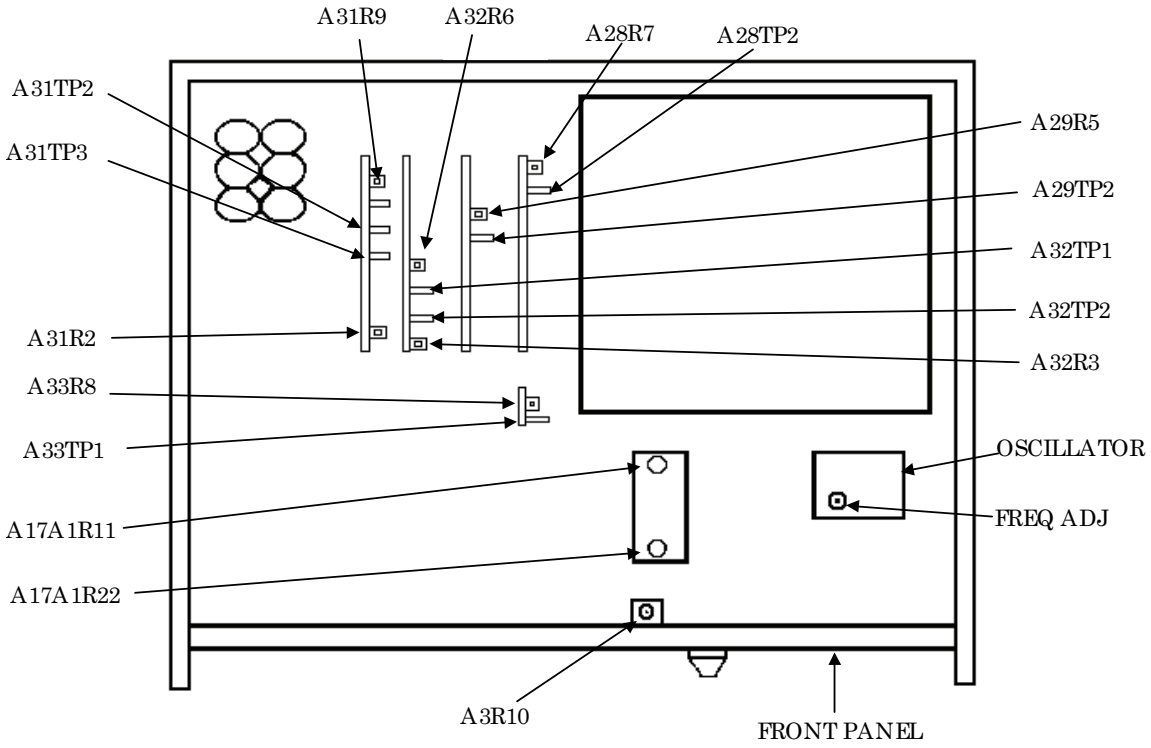

Figure 1. Test instrument - top view.

9. Self-Check

a. Performance Check

(1) Set **RANGE** switch to **CHK** and press and release **RESET** switch. TI display will initially be all zeros and then 10.000000 MHz ±1 count; the **DIR** (direct) annunciator will light and the **GATE** annunciator should be flashing.

(2) Press **RESOLUTION Hz** pushbutton to positions listed in table 3. TI display will be as specified.

Table 3. Self-Check

RESOLUTION Hz pushbutton positions	Display ±1 count
10 Hz	10.00000 MHz
100 Hz	10.0000 MHz
1 kHz	10.000 MHz
10 kHz	10.00 MHz
100 kHz	10.0 MHz
1 MHz	.010 GHz

b. Adjustments. No adjustments can be made.

10. 10 Hz to 250 MHz Frequency and 1 MΩ Input Sensitivity Check

a. Performance Check

(1) Press **RESOLUTION Hz** pushbutton to **10,** adjust **SAMPLE RATE** control to midposition, and set **RANGE** switch to **10 Hz-250 MHz**.

NOTE

Throughout the remainder of this check, press **RESOLUTION Hz** pushbuttons as necessary.

(2) Connect function generator output to TI **INPUT 1 MΩ** using a 50 Ω feedthrough termination.

(3) Set function generator for a sinewave, 10 Hz, 1 mVp-p, 50 Ω output. Slowly increase function generator amplitude until TI displays a stable indication of applied frequency. If function generator amplitude exceeds 141 mVp-p, perform **b** below.

(4) Set function generator amplitude to 141 mVp-p.

(5) Increment function generator frequency from 10 Hz to 10 MHz, allowing sufficient time for TI to stabilize between increments. If TI does not display a stable indication for each applied frequency, perform **b** below.

(6) Disconnect function generator and 50 Ω feedthrough termination from TI.

(7) Connect signal generator output to TI **INPUT 1 MΩ** using a 50 Ω feedthrough termination.

(8) Set signal generator frequency to 10 MHz and output level to –50 dBm. Slowly increase signal generator output level until. TI displays a stable indication of applied frequency. If signal generator output level exceeds –13 dBm, perform **b** below.

(9) Set signal generator output level to –13 dBm.

(10) Increment signal generator frequency from 10 to 250 MHz, allowing sufficient time between increments for TI to stabilize. If TI does not display a stable indication for each applied frequency, perform **b** below.

b. Adjustments

(1) Connect signal generator output to TI **INPUT 1 MΩ** using a 50 Ω feedthrough termination.

(2) Set signal generator frequency to 100 MHz and level output to –13 dBm.

(3) Press **RESOLUTION Hz** pushbutton to **100** and adjust A3R10 (fig. 1) until a stable count is displayed (R).

11. 10 Hz to 18 GHz Frequency and 50 Ω Input Sensitivity Check

a. Performance Check

CAUTION

Do not exceed 1 W of power to 50 Ω input, otherwise extensive damage will occur to the test instrument.

(1) Connect function generator output to TI **INPUT 50Ω**.

(2) Set **RANGE** switch to **10 Hz - 18 GHz** and press **RESOLUTION Hz** pushbutton to **10**.

NOTE

Throughout the remainder of this check, press **RESOLUTION Hz** pushbuttons as necessary.

(3) Set function generator for a sinewave, 10 Hz, 20 mVp-p, 50 Ω output. If TI does not display a stable indication of applied frequency, perform **b** below.

NOTE

Allow sufficient time for TI to stabilize between each increment throughout the following frequency ranges.

(4) Increment function generator frequency from 10 Hz to 10 MHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(5) Disconnect function generator from TI.

(6) Connect signal generator output to TI **INPUT 50Ω**.

(7) Set signal generator frequency to 10 MHz and level output to -30 dBm. If TI does not display a stable indication of applied frequency, perform **b** below.

(8) Increment signal generator frequency from 10 to 500 MHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(9) Set signal generator frequency to 500 MHz and level output to -35 dBm. If TI does not display a stable indication of applied frequency, perform **b** below.

(10) Increment signal generator frequency from 500 MHz to 10 GHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(11) Set signal generator frequency to 10 GHz and level output to -25 dBm. If TI does not display a stable indication of applied frequency, perform **b** below.

(12) Increment signal generator frequency from 10 to 18 GHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(13) Set **RANGE** switch to **250 MHz - 18 GHz**.

(14) Set signal generator frequency to 250 MHz and level output to -30 dBm. TI will display a stable indication of applied frequency.

(15) Increment signal generator frequency from 250 to 500 MHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(16) Set signal generator frequency to 500 MHz and level output to -35 dBm. TI will display a stable indication of applied frequency.

(17) Increment signal generator frequency from 500 MHz to 10 GHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(18) Set signal generator frequency to 10 GHz and level output to -25 dBm. TI will display a stable indication of applied frequency.

(19) Increment signal generator frequency from 10 GHz to 18 GHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

b. Adjustments

(1) Connect signal generator output to TI **INPUT 50Ω**.

(2) Set signal generator frequency to 100 MHz and level output to -25 dBm.

(3) Adjust A17A1R22 (fig. 1) fully ccw.

(4) Adjust A17A1R11 (fig. 1) for a stable indication on TI.

(5) Decrease signal generator level output and adjust A17A1R11 (fig. 1) until maximum sensitivity is obtained (R).

(6) Increase signal generator level output for a stable indication. Record signal generator level output indication.

(7) Adjust A17A1R22 (fig. 1) fully cw. TI will display all zeros.

(8) Increase signal generator level output by 1 dB from level recorded in (6) above and adjust A17A1R22 (fig. 1) ccw until TI display indicates 100 MHz (R).

(9) Verify that sensitivity is at least -32 dBm.

12. Power Supply

NOTE

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

a. Performance Check. Connect multimeter between test points listed in table 4 and chassis ground. If multimeter does not indicate within limits specified, perform corresponding adjustments in table 4.

Table 4. Power Supply Voltages

Test instrument test points (fig. 1)	Multimeter indications (V)		Adjustments (R) (fig. 1)
	Min	Max	
A28TP2	–14.95	–15.05	A28R7
A29TP2	+14.95	+15.05	A29R5
A31TP2	–4.95	–5.05	A31R9
A31TP3	–4.95	–5.05	A31R2
A32TP1	+4.95	+5.05	A32R6
A32TP2	+4.95	+5.05	A32R3
A33TP1[1]	+10.95	+11.05	A33R8

[1]Option 001 only.

b. Adjustments. No further adjustments can be made.

13. 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 MICROWAVE FREQUENCY COUNTER TD-1225A(V)1/U (HEWLETT-PACKARD, MODEL 5342A/H14), TD-1225A(V)2/U (HEWLETT-PACKARD, MODEL 5342A/H16), AND HEWLETT-PACKARD, MODELS 5342A AND 5343A

14. Preliminary Instructions

a. The instructions outlined in paragraphs **14** and **15** 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 the manufacturer's manual for this TI.

d. When indications specified in paragraphs **16** through **19** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraphs **16** through **19.**

e. Unless otherwise specified, all controls and control settings refer to the TI.

15. 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 for access to adjustments or test points.

b. Assure that **LINE VOLTAGE SELECTOR** switch (rear panel) is set for 115 V ac and verify that correct fuse (as labeled on rear panel) is installed.

c. Connect TI to autotransformer and connect autotransformer to a 115 V ac source and adjust for 115 V ac output.

d. Connect 50 Ω feedthrough termination supplied with TI to **FREQ STD OUT** on rear of TI.

NOTE

When **FREQ STD OUT** on rear of TI is not being used, the connector must be terminated with 50 Ω feedthrough termination supplied with TI.

e. Position controls as listed in (1) through (6) below.

(1) **INT/EXT** switch (rear panel) to **INT**.

(2) **CW/FM** switch (rear panel) to **CW** (model 5342A only).

(3) **ACQ TIME/FAST, MED, SLOW** switch (rear panel) to **MED** (model 5343A only).

(4) **SAMPLE RATE** control fully ccw.

(5) Frequency range switch **10 Hz - 500 MHz/500 MHz - 18 GHz** (**10 Hz - 500 MHz/500 MHz - 26.5 GHz** for model 5343A) to **10 Hz - 500 MHz**.

(6) **50Ω - 1 MΩ** switch to **50Ω**.

f. Set **STBY/LINE/ON** switch to **ON** and allow TI at least 24 hours for warm-up and stabilization.

16. Time Base Stability (Option 001, H14, H16, Time Base 10544A and Model 5343A)

a. Performance Check

(1) Connect time/frequency workstation 10 MHz output to frequency counter 10 MHz reference input connector and set frequency counter external reference on.

(2) Connect TI 10 MHz Ref output to frequency counter **Channel A** input.

(3) Adjust frequency counter for a stable indication. Frequency counter should indicate between 9.999998499 and 10.00000151 MHz (for TI with one year interval).

NOTE

To determine time base drift limits for TI with other intervals: multiply aging rate per day by the interval (days).

(4) Connect time/frequency workstation **OUTPUT 1 MHz** to frequency difference meter **REF INPUT**.

(5) Connect TI **10 MHz OUTPUT** (rear panel) to frequency difference meter **SIG INPUT**.

NOTE

The time base is adjusted during each calibration in order to correct for drift and improve reliability of the TI throughout the interval. If TI is within the limits in step (3), then the following FREQ ADJ adjustment will not be annotated as an out-of-tolerance condition.

(6) Adjust FREQ ADJ (fig. 1) for a minimum indication on frequency difference meter 10^{10} range. Record frequency difference meter indication.

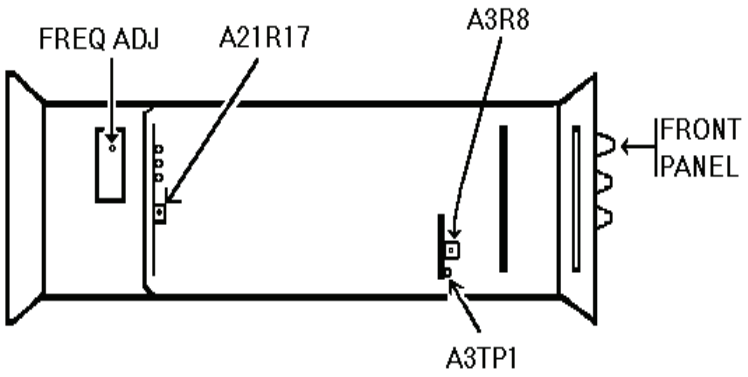

Figure 2. TD-1225A(V)1/U (Hewlett-Packard, Model 5342A/H14), TD-1225A(V)2/U (Hewlett-Packard, Model 5342A/H16), and Hewlett-Packard, Model 5343A - top view.

(7) Allow at least 24 hours for TI time base oscillator to stabilize. Frequency difference meter indication will be within ±5 parts in 10^{10} of indication recorded in step (6) above. Record frequency difference meter indication.

(8) Adjust autotransformer output to 105 V ac. Allow 1 minute for oscillator to stabilize. Frequency difference meter indication will be within ±1 part in 10^{10} of indication recorded in step (7) above.

(9) Adjust autotransformer output to 125 V ac. Allow 1 minute for oscillator to stabilize. Frequency difference meter indication will be within ±1 part in 10^{10} of indication action recorded in step (7) above.

(10) Adjust autotransformer output to 115 V ac.

b. Adjustments. No further adjustments can be made.

17. Self-Check

a. Performance Check

(1) Press **FREQ SHIFT** (blue) and **RESOLUTION CHECK** pushbuttons. Verify that TI displays 75.000000 MHz ±1 count.

(2) Press **RESET** pushbutton.

(3) Remove 50 Ω termination from **FREQ STD OUT** (rear panel) and connect **FREQ STD OUT** to TI front panel BNC input connector.

(4) Press **FREQ SHIFT** (blue) and **RESOLUTION 1 Hz** pushbuttons. Verify that TI displays 10.000000 MHz ±1 count.

(5) Press **RESET** pushbutton and reconnect 50 Ω termination to **FREQ STD OUT** connector (rear panel).

b. Adjustments. No adjustments can be made.

18. Frequency and Sensitivity Check - 10 Hz to 520 MHz

a. Performance Check

CAUTION

The 10 Hz to 500 MHz direct count input BNC connector is fuse-protected for a maximum input level of 3.5 V rms (+24 dBm).

(1) Press **FREQ, SHIFT** (blue) and **RESOLUTION 1 Hz** pushbutton.

(2) Connect function generator output to TI front panel BNC input.

(3) Set function generator for a sinewave, 10 Hz, 1 mVp-p, 50 Ω output. Slowly increase function generator amplitude until TI displays a stable indication of applied frequency. If function generator amplitude exceeds 71 mVp-p, perform **b** below.

(4) Set function generator amplitude to 71 mVp-p.

NOTE

Allow sufficient time for TI to stabilize between each increment throughout the following frequency ranges.

(5) Increment function generator frequency from 10 Hz to 10 MHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(6) Disconnect function generator from TI.

(7) Connect signal generator output to TI front panel BNC input.

(8) Set signal generator frequency to 10 MHz and level output to -19 dBm. TI will indicate a stable indication of applied frequency.

(9) Increment signal generator frequency from 10 MHz to 520 MHz. TI will display a stable indication at each frequency increment.

(10) Disconnect signal generator from TI.

(11) Set TI **50Ω - 1 MΩ** switch to **1 MΩ.**

(12) Connect function generator output to TI front panel BNC input using a 50 Ω feedthrough termination.

(13) Set function generator frequency to 10 Hz and amplitude to 1 mVp-p. Slowly increase function generator amplitude until TI displays a stable indication of applied frequency. Function generator amplitude will not exceed 141 mVp-p.

(14) Set function generator amplitude to 141 mVp-p.

(15) Increment function generator frequency from 10 Hz to 10 MHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(16) Disconnect function generator and 50 Ω feedthrough termination from TI.

(17) Connect signal generator output to TI front panel BNC input using a 50 Ω feedthrough termination.

(18) Set signal generator frequency to 10 MHz and level output to -13 dBm. TI will display a stable indication of applied frequency.

(19) Increment signal generator frequency from 10 to 25 MHz. TI will display a stable indication at each frequency increment.

b. Adjustments

(1) Set function generator frequency to 1 MHz and amplitude to 200 mVp-p.

(2) Decrease function generator amplitude while adjusting A3R8 (fig. 2) to a point where TI no longer counts (R).

(3) Verify that sensitivity is at least 35 mVp-p.

19. Frequency and Sensitivity Check - 500 MHz to 18 GHz

a. Performance Check

CAUTION

Do not exceed +25 dBm peak of input power at the N type connector (500 MHz to 18 GHz), SMA connector for model 5343A. Damage to the internal sampler may result.

NOTE

When the input signal level to the high frequency input connector exceeds approximately +5 dBm, each digit in the display becomes a minus sign (-) to indicate overload.

(1) Connect signal generator output to TI N type input. (Use APC 3.5 male connector with collar for model 5343A).

(2) Set **10 Hz - 500 MHz/500 MHz - 18 GHz** (**10 Hz - 500 MHz/500 MHz - 26.5 GHz** for model 5343A) switch to **500 MHz - 18 GHz (500 MHz - 26.5 GHz** for model 5343A).

(3) Press **FREQ SHIFT** (blue) and **RESOLUTION 1 Hz** pushbuttons.

(4) Set signal generator frequency to 500 MHz and level output to -25 dBm (-33 dBm for model 5343A). TI will display a stable indication of applied frequency.

(5) Increment signal generator frequency from 500 MHz to 12.4 GHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

(6) Set signal generator frequency to 12.4 GHz and level output to -20 dBm (-28 dBm for model 5343A). TI will display a stable indication of the applied frequency.

(7) Increment signal generator frequency from 12.4 to 18 GHz. If TI does not display a stable indication at each frequency increment, perform **b** below.

b. Adjustments. No adjustments can be made.

20. Power Supply

NOTE

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

a. Performance Check. Connect multimeter HI to -5.2 V TEST POINT (fig. 3) and LO to chassis ground. If multimeter does not indicate between -5.1 and -5.25 V dc, perform **b** below.

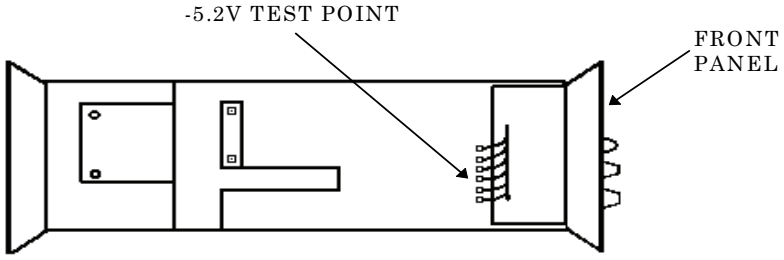

Figure 3. TD-1225A(V)1/U (Hewlett-Packard, Model 5342A/H14), TD-1225A(V)2/U (Hewlett-Packard, Model 5342A/H16) and Hewlett-Packard, Model 5343A - bottom view.

b. Adjustments. Adjust A21R17 (fig. 2) for -5.2 V dc indication on multimeter (R).

21. 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:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army

0802811

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 342184, requirements for calibration procedure TB 9-6625-2021-24.

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.