TB 9-6625-2094-35

CHANGE 1

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR SIGNAL GENERATOR SG-1170/U (WAVETEK, MODEL 3001)

Headquarters, Department of the Army, Washington, DC
16 July 2001

Approved for public release; distribution is unlimited.

TB 9-6625-2094-35, 24 August 1998, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

Remove pages	Insert Pages
1 and 2	1 and 2
15 and 16	15 and 16

2. File this change sheet in front of the publication for reference purposes.

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REPORTING OF ERRORS

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 FAX 256-842-6546/DSN 788-6546.

CHANGE 1

*This bulletin supersedes TB 9-6625-2094-35, 8 June 1988, including all changes.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Signal Generator SG-1170/U (Wavetek, Model 3001). The manufacturer's manual 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

(1) Wavetek, Model 3001 (unmodified) frequency range is from 1 MHz to 520 MHz.

(2) The SG-1170/U (modified) instruments have a frequency range from 1 kHz to 520 MHz.

(3) SG-1170/U (unmodified) instruments have a frequency range from 450 kHz to 520 MHz.

(4) Frequency ranges for a particular instrument are shown on the front panel, located above the **FREQUENCY** indicator switches.

b. Time and Technique. The time required for this calibration is approximately 4 hours, using the dc and low frequency and microwave techniques.

2. Forms, Records, and Reports. Forms, records, and reports required for calibration personnel at all levels are prescribed by TB 750-25.

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: 0.001 to 520 MHz Accuracy: ± 0.1%, 1 to 100 kHz[1] ± 0.001%, 0.1 to 520 MHz (± 0.001% ± 10 kHz FREQUENCY VENIER in UNCAL position Stability: <0.38 ppm/hr in CAL position ± 500 Hz/10 min in UNCAL position
RF output	Range: -137 to +13 dBm Accuracy: ± 1.25 dB, -7 to 13 dBm ± 1.95 dB, -7 to -77 dBm ± 2.75 dB, -77 to -137 dBm
Flatness	Range: -7 to 13 dBm Accuracy: ± 0.75 dB ref 50 MHz
Meter	Range: 10 dBm Accuracy: ± 0.5 dB at 50 MHz
Attenuators	Range: -130 to +10 dBm Accuracy: ± 0.5 dB to 70 dBm (± 0.2 dB cal error) ± l dB to 130 dBm (± 0.5 dB cal error)

Table 1. Calibration Description - Continued

Test Instrument Parameters	Performance Specifications
Amplitude modulation	Range: 0 to 90% Accuracy: ± (5% +5% of reading) at 1 kHz
Internal frequency	Range: 400 Hz and 1 kHz Accuracy: ± 5%
Distortion	Accuracy: <3% to 70% <5% to 90%
Frequency modulation:	
Frequency	Range: 400 Hz and 1 kHz Accuracy: ± 5%
Deviation	Range: 0 to 10 kHz and 0 to 100 kHz Accuracy: ± 500 Hz on X1 range ± 5 kHz on X10 range
Distortion	Accuracy: <2%, 10 kHz to 100 kHz deviation at 1 kHz <4%, 3 kHz to 10 kHz deviation at 1 kHz

[1]Specification change authorized.

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. 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 is shown in parenthesis.

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	Frequency measurement: Range: 380 to 1050 Hz Accuracy: ±1.25% Distortion capability: <0.5% at 1 kHz	Boonton, Model 1120-S/10 (MIS-35954/2)
FREQUENCY COUNTER	Range: 1 kHz to 520 MHz Accuracy: ±0.00025%	Hewlett-Packard, Model 5345A (MIS-28754/1 Type 1) w/converter, frequency, plug-in, model 5355A (5355A)

Table 2. Minimum Specifications of Equipment Required - Continued

Common name	Minimum use specifications	Manufacturer and model (part number)
MEASURING RECEIVER		Hewlett-Packard, Model 8902A (8902A)
Frequency	Range: 500 kHz to 520 MHz Accuracy: <1 x E-9/day Stability: ±0.05 ppm/hr	
RF Power	Range: 520 MHz (0 dBm to -110 dBm) Accuracy: ±0.1875 dBm	
Flatness	Range: 10 MHz to 500 MHz Accuracy: ±0.125 dBm	
Amplitude modulation	Range: 10% to 90% mod at 520 MHz Accuracy: ±2.65%	
Frequency modulation	Range: 50 MHz at 400 Hz and 1 kHz mod Accuracy: <1.25% from 10 kHz to 100 kHz frequency deviation	
MULTIMETER	Range: 20 V dc Accuracy: ±0.05%	John Fluke, Model 8840A/AF-05/09 (AN/GSM-64D)
SIGNAL GENERATOR	Used in measuring receiver	(SG-1207/U)
SIGNAL GENERATOR	Used in measuring receiver	(SG-1219/U)

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 and item identification number 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 11-6625-3029-14 for this TI.

d. When indications specified in paragraphs **8** through **16** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraphs **8** through **16**. Do not perform power supply check if all other parameters are within tolerance.

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 cover from TI only as necessary to make adjustments. Replace cover upon completion of adjustments.

b. Connect TI to a 115 V ac source.

c. If OUTPUT meter needle does not bisect the dot at the left end of the scale, adjust zero adjust, located below meter face, until meter needle bisects dot.

d. Set **POWER** switch to **ON** and allow at least 2 hours for TI to warm up and stabilize.

8. Frequency Accuracy

a. Performance Check

NOTE

Perform only the frequency checks pertaining to the model being calibrated. See paragraph **1a**(1) through (4) for identification of models.

(1) Connect TI **RF OUTPUT** to frequency counter **CHANNEL A**. Set counter to 50Ω input and gate time to 10 seconds.

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

(a) **FREQUENCY VERNIER** control to **CAL**.

(b) **MODULATION MODE** switch to **CW**.

(c) **OUTPUT** step attenuator control for **0 dBm**.

(d) **OUTPUT VERNIER** control fully cw.

(e) **FREQUENCY** switches to indicate **000.001 MHz**.

(3) If counter does not indicate between 999 and 1001 Hz, perform **b**(1) through (4) below.

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

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

(a) **FREQUENCY VERNIER** control to **0 kHz**.

(b) **FREQUENCY** switches to indicate **001.000 MHz**.

(c) **MODULATION MODE** switch to **FMx1**.

(d) **MODULATION FREQ** switch to **DC**.

(e) **MODULATION FM/AM** switch to **10 kHz**.

(6) If frequency counter does not indicate between 989.99 and 1010.01 kHz, perform **b**(4) through (11) below.

(7) Set **MODULATION MODE** switch to **Fmx10**.

(8) Frequency counter will indicate between 1089.98 and 1110.02 kHz.

Table 3. Frequency

Test instrument **FREQUENCY** switch settings	Frequency counter indications (Hz)	
(MHz)	Min	Max
000.001	0999	1001
000.005	4995	5005
000.009	8991	9009
000.010	9990	10,010
000.050	49,950	50,010
000.090	89,910	90,090
000.100	99,999	100,001
000.500	499,995	500,005
000.900	899,991	900,009
001.000	999,990	1,000,010
005.000	4,999,950	5,000,050
009.000	8,999,910	9,000,090
010.000	9,999,900	10,000,100
050.000	49,999,500	50,000,500
090.000	89,999,100	90,000,900
100.000	99,999,000	100,001,000
500.000	499,995,000	500,005,000

(9) Set **MODE** switch to **CW**, **FREQUENCY** switches to **002.000 MHz**, and **FREQUENCY VENIER** control to +**3 kHz**. After 1 minute, record frequency counter indication.

(10) Set **FREQUENCY VERNIER** control to **0 kHz**. After 1 minute, record frequency counter indication. Subtract from indication recorded in (9) above. Difference will be between 2500 and 3500 Hz.

(11) Set **FREQUENCY VERNIER** control to -3 kHz. After 1 minute, record frequency counter indication. Subtract from indication recorded in (10) above. Difference will be between 2500 and 3500 Hz.

b. Adjustments

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

(a) **FREQUENCY VERNIER** control to **CAL**.

(b) **MODULATION MODE** switch to **CW**.

(c) **OUTPUT** step attenuator control for **0 dBm**.

(d) **OUTPUT VERNIER** control fully cw.

(2) Set **FREQUENCY** switches to indicate **500.000 MHz**.

(3) Adjust FREQ ADJ M30-1 (fig. 1) trimmer ccw for minimum frequency indication on frequency counter, then adjust trimmer cw until frequency counter indicates 500.000 MHz (R).

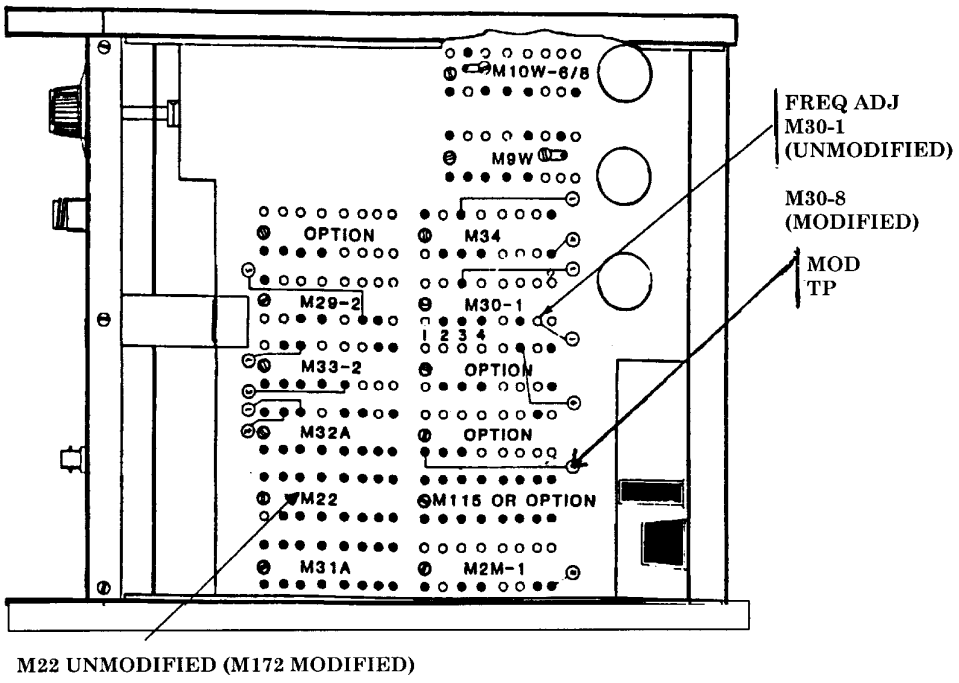

Figure 1. Test instrument - bottom view.

(4) Position controls as listed in (a) through (g) below:

(a) **FREQUENCY VERNIER** control to **0 kHz**.

(b) **FREQUENCY** switches to **002.000 MHz**.

(c) **MODULATION MODE** switches to **FMx10**.

(d) **MODULATION FREQ** to **DC**.

(e) **MODULATION FM/AM** slide control to full up position.

(f) **OUTPUT** step attenuator control **for +10 dBm**.

(g) **OUTPUT VERNIER** control fully cw.

NOTE

Modulation board C316-6 contrains a size ADJ (C) and a balance ADJ (D), which are factory adjustments. DO NOT change the settings of these two controls.

(5) Connect digital multimeter to MOD TP (fig. 1) and ground.

(6) Adjust MODULATION BOARD POT A (fig. 2) for a +5.00 ±01 V dc indication on the digital multimeter (R).

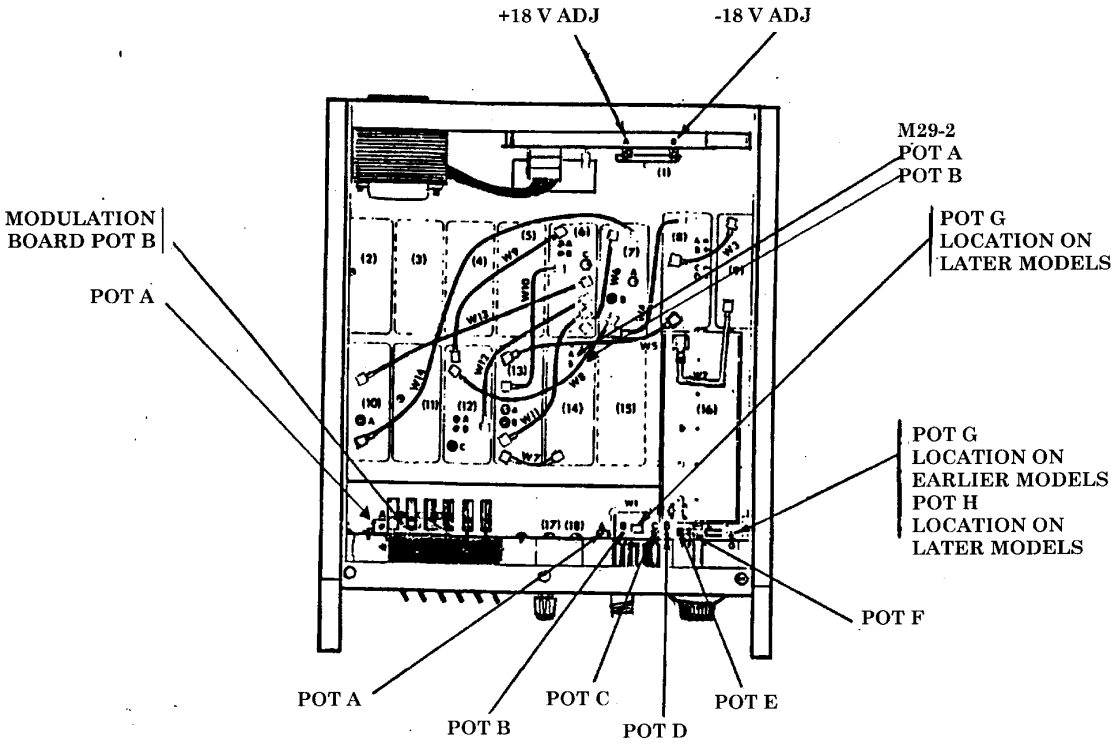

Figure 2. Test instrument - top view.

(7) Set **MODULATION FM/AM** slide control to **0**. The digital multimeter should indicate 0 V ±20 mV dc.

(8) Disconnect the digital multimeter from MOD TP (fig. 1) and ground.

(9) Adjust M29-2 POT B (fig. 2) to produce an indication of 2.000 MHz 100 Hz on frequency counter (R).

(10) Set **MODULATION FM/AM** slide control to full up position and adjust M29-2 POT A (fig. 2) to produce an indication of 2.100 MHz 100 Hz (R) on frequency counter.

(11) Set **MODULATION MODE** switch to **Fmx1** and adjust MODULATION BOARD POT B on left side of board (fig. 2) to produce an indication of 2.010 MHz 100 Hz on frequency counter (R).

9. Frequency Stability

a. Performance Check

(1) Position controls as listed (a) through (e) below:

(a) **FREQUENCY VERNIER** control to **CAL**.

(b) **MODULATION MODE** switch to **CW**.

(c) **OUTPUT** step attenuator control for **0 dBm**.

(d) **OUTPUT VERNIER** control fully cw.

(e) Set **FREQUENCY** switches to indicate **500.000 MHz.**

(2) After frequency counter indication stabilizes, record frequency indication.

(3) Monitor frequency counter indication for 1 hour. The frequency will not drift more than 200 Hz from the value recorded in 2. above.

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

(a) **FREQUENCY VERNIER** control to **0 kHz**.

(b) **MODULATION MODE** switch to **FMx1**.

(c) **MODULATION FM/AM** slide control to **10 kHz**.

(5) After 1 minute stabilization period. Record frequency counter indication.

(6) Monitor frequency counter indication for 10 minutes. The frequency will not drift more than 500 Hz from the value recorded in 5. above.

(7) Disconnect frequency counter **CHANNEL A** from **TI RF OUTPUT**.

b. Adjustments. No adjustments can be made.

10. Output Meter Accuracy

a. Performance Check

(1) Connect measuring receiver sensor module (HP 11722A) to **RF POWER CALIBRATION OUTPUT**.

NOTE

Calibrate measuring receiver for sensor zero and power level cal.

(2) Connect measuring receiver sensor module to TI **RF OUTPUT** and press **LOG/LIN** (**dBm**) pushbutton.

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

(a) **FREQUENCY VERNIER** control to **CAL**.

(b) Set **FREQUENCY** switches to indicate **050.000 MHz**.

(c) **MODULATION MODE** switch to **CW**.

(d) **OUTPUT VERNIER** control for a **-1 dB** indication on **OUTPUT** meter.

(e) **OUTPUT** step attenuator control to **+10 dBm**.

(4) If measuring receiver does not indicate between 8.5 and 9.5 dB, perform **b** below.

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

Table 4. Output Meter

Test Instrument		Power meter (dBm)	
OUTPUT step attenuator settings (dBm)	**OUTPUT** meter settings	Min	Max
0	+3	+2.5	+3.5
0	0	-0.5	+0.5
0	-3	-2.5	-3.5
0	-5	-4.5	-5.5
0	-7	-6.5	-7.5
-10	+3	-6.5	-7.5

b. Adjustments

(1) Temporarily disconnect measuring receiver sensor module from TI.

(2) Set **OUTPUT VERNIER** control fully ccw and adjust meter board POT B (fig. 2) until meter needle bisects dot at left end of meter scale (R).

(3) Adjust **OUTPUT VERNIER** control fully cw and adjustmeter board POT A (fig. 2) for a +3-dBm **OUTPUT** meter reading (R).

(4) Set **OUTPUT** step attenuator to **+10 dBm**.

(5) Connect measuring receiver sensor module to TI **RF OUTPUT**.

(6) Alternately adjust **OUTPUT VERNIER** control for a **0** and **-7 dBm** reading on TI **OUTPUT** meter while adjusting meter board POT F (fig. 2) for +10 dBm and POT E (fig. 2) for +3 dBm indications on the measuring receiver. Repeat the above until no further adjustments are required (R).

(7) Adjust **OUTPUT** step attenuator to **0 dBm**.

(8) Alternately adjust **OUTPUT VERNIER** control for a **+3** and **-6 dBm** reading on TI **OUTPUT** meter while adjusting meter board POT C (fig. 2) for +3 dBm and POT D for -6 dBm indications on the measuring receiver. Repeat the above until no further adjustments are required (R).

11. Output Level Flatness

a. Performance Check

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

(a) **FREQUENCY VERNIER** control to **CAL.**

(b) **Set FREQUENCY** switches to indicate **050.000 MHz.**

(c) **MODULATION MODE** switch to **CW.**

(d) **OUTPUT** step attenuator control to **-10 dBm.**

(e) **OUTPUT VERNIER** control for a **-7 dB** indication on measuring receiver.

NOTE

Do not change **OUTPUT VERNIER** control setting after this point.

(2) Press **RATIO** (lit) on the measuring receiver and adjust **FREQUENCY** switches from 010.000 MHz to 500.000 MHz. Measuring receiver indication will stay between -.75 and +.75 dB over the entire range.

(3) Press **RATIO** (not lit) on the measuring receiver.

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

(a) **FREQUENCY VERNIER** control to **CAL**.

(b) Set **FREQUENCY** switches to indicate **050.000 MHz**.

(c) **MODULATION MODE** switch to **CW**.

(d) **OUTPUT** step attenuator control to **0 dBm**.

(e) **OUTPUT VERNIER** control for a **-1 dB** indication on measuring receiver.

NOTE

Do not change **OUTPUT VERNIER** control setting after this point.

(5) Press **RATIO** (lit) on the measuring receiver and adjust **FREQUENCY** switches from **010.00 MHz** to **500.00 MHz.** Measuring receiver indication will stay between -.75 to +.75 dB over the entire range.

(6) Press **RATIO** (not lit) on the measuring receiver.

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

(a) **FREQUENCY VERNIER** control to **CAL**.

(b) Set **FREQUENCY** switches to indicate **050.000 MHz**.

(c) **MODULATION MODE** switch to **CW**.

(d) **OUTPUT** step attenuator control to **10 dBm**.

(e) **OUTPUT VERNIER** control for a **+9 dB** indication on measuring receiver.

NOTE

Do not change **OUTPUT VERNIER** control setting after this point.

(8) Press **RATIO** (lit) on the measuring receiver and adjust **FREQUENCY** switches from **010.00 MHz to 500.00 MHz.** Measuring receiver indication will stay between -.75 to +.75 dB over the entire range.

(9) Press **RATIO** (not lit) on the measuring receiver.

b. Adjustments. No adjustments can be made.

12. Attenuator Accuracy

a. Performance Check

(1) Position controls as listed in (a) through (c) below.

(a) **FREQUENCY** switches to indicate **520.000 MHz**.

(b) **OUTPUT** step attenuator switch to **0 dBm**.

(c) **OUTPUT VERNIER** control for **0 dBm** on TI **OUTPUT** meter.

(2) Press **FREQ** on the measuring receiver and wait for frequency indication.

(3) Press **RF POWER**, **TUNED RF LEVEL** and **CALIBRATE** pushbutton on the measuring receiver, then press **RATIO** (lit).

(4) Set **TI OUTPUT** attenuator switch to **-10 dBm.** Measuring receiver will indicate between -9.3 and -10.7 dB.

(5) Repeat technique of (4) above for **TI OUTPUT** step attenuator settings listed in table 5. Measuring receiver will indicate within limits specified.

Table 5. Attenuator Accuracy

Test instrument	Receiver system indications (dB)	
step attenuator settings	Min	Max
-20	-19.3	-20.7
-30[1]	-29.3	-30.7
-40	-39.3	-40.7
-50	-49.3	-50.7
-60	-59.3	-60.7
-70[1]	-68.5	-71.5
-80	-78.5	-81.5
-90	-88.5	-91.5
-100	-98.5	-101.5
-110	-108.5	-111.5

[1]If **RCAL** annunciator is illuminated, press the **CAL** key on the measuring receiver.

b. Adjustments. No adjustments can be made.

13. Amplitude Modulation Accuracy

a. Performance Check

NOTE

Measuring receiver (AM) should be calibrated prior to running this test.

(1) Connect measuring receiver sensor module to TI **RF OUTPUT** and connect measuring receiver **MODULATION OUTPUT AUDIO INPUT** to audio analyzer **INPUT HI**.

(2) Set measuring receiver to measure AM, and set audio analyzer to measure frequency.

(3) Position controls as listed in (a) through (f) below:

(a) **FREQUENCY** switches to indicate **520.000 MHz**.

(b) **MODULATION MODE** switch to **AM**.

(c) **MODULATION FREQ** switch to **400 Hz**.

(d) **MODULATION FM/AM** slide control to **90%**.

(e) **OUTPUT** step attenuator switch for **0 dBm**.

(f) **OUTPUT VERNIER** control for **-3 dB**.

(4) The audio analyzer will indicate between 380 and 420 Hz modulation.

(5) Set **MODULATION FREQ** switch to **1 kHz**.

(6) The audio analyzer will indicate between 950 and 1050 Hz modulation.

(7) If measuring receiver does not indicate between 81 and 99% AM, perform **b** below.

(8) Repeat technique of (7) above for TI **OUTPUT** percent settings listed in table 6. Measuring receiver will indicate within limits specified.

Table 6. Amplitude Modulation

Test instrument (**MODULATION FM/AM**) percent slide	Measuring receiver percent modulation (AM)	
settings	Min	Max
80%	71.5	88.5
70%	62.0	67.5
60%	52.5	67.5
50%	43.0	57.0
40%	33.5	46.5
30%	24.0	36.0
20%	14.5	25.5
10%	5.00	15.0

b. Adjustments

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

(a) **FREQUENCY** switches to **520.000 MHz**.

(b) **MODULATION MODE** switch to **AM**.

(c) **MODULATION FREQ** switch to **DC**.

(d) **OUTPUT** step attenuator switch for **0 dBm**.

(e) **OUTPUT VERNIER** control for **+3 dB**.

(2) Connect audio analyzer **INPUT HI** to **MOD TP** (fig. 1) and chassis ground.

NOTE
Set audio analyzer to read V dc.

(3) Adjust **MODULATION FM/AM** slide control until audio analyzer indicates 4.5 V dc.

(4) Set **MOD FREQ** to **1000 Hz.**

(5) Connect measuring receiver to **TI RF OUTPUT.**

(6) Adjust **METER BOARD POT G** (fig. 2) for 90% AM indication on the measuring receiver modulation display (R).

(7) Set **OUTPUT VERNIER** control for **-7 dBm** indication on **OUTPUT** meter.

(8) Adjust **METER BOARD POT H** (fig. 2) for 90% AM indication on the measuring receiver modulation display (R).

(9) Repeat technique above until no further adjustment is required.

(10) Disconnect audio analyzer **INPUT HI** from **MOD TP** (fig. 1) and chassis ground.

(11) Connect measuring receiver **MODULATION OUTPUT AUDIO INPUT** to audio analyzer **INPUT HI**.

14. AM Distortion

a. Performance Check

(1) Set audio analyzer to measure distortion.

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

(a) **FREQUENCY** switches to indicate **520.000 MHz**.

(b) **MODULATION MODE** switch to **AM**.

(c) **MODULATION FREQ** switch to **1 KHz**.

(d) **MODULATION FM/AM** slide control to **0%.**

(e) **OUTPUT** step attenuator switch for **0 dBm**.

(f) **OUTPUT VERNIER** control for **-7 dB**.

(4) Adjust TI **MODULATION FM/AM** slide control to indicate **70% AM** on measuring receiver.

(5) The audio analyzer will indicate less than 3% AM distortion.

(6) Adjust TI **MODULATION FM/AM** slide control to indicate **90% AM** on measuring receiver.

(7) The audio analyzer will indicate less than 5% AM distortion.

b. **Adjustments**. No adjustments can be made.

15. Frequency Modulation Accuracy

a. Performance Check

NOTE

Measuring receiver (FM) should be calibrated prior to running this test.

(1) Connect measuring receiver sensor module to the TI **RF OUTPUT**.

(2) Set measuring receiver to measure FM.

(3) Press measuring receiver high-pass filter pushbutton to 50 Hz and low-pass fileter pushbutton to 15 kHz.

(4) Position controls as listed in (a) through (g) below:

(a) **FREQUENCY VERNIER** control to **0 kHz**.

(b) **FREQUENCY** switches to indicate **050.000 MHz**.

(c) **MODULATION MODE** switch to **FMx1**.

(d) **MODULATION FREQ** switch to **400 Hz**.

(e) **MODULATION FM/AM** switch to **10 kHz FM**.

(f) **OUTPUT** step attenuator switch to **+10 dBm**.

(g) **OUTPUT VERNIER** control fully cw.

(5) If measuring receiver does not indicate between 9.5 and 10.5 kHz FM, perform **b** below.

(6) Set **MODULATION FM/AM** slide control to **5 kHz FM.**

(7) The measuring receiver will indicate between 4.5 kHz and 5.5 kHz.

(8) Set **MODULATION MODE** switch to **FMx10** and **MODULATION FM/AM** slide control to **2 kHz FM**.

(9) Repeat technique of (7) above for TI **OUTPUT FM KHz** settings listed in table 7. Measuring receiver will indicate within limits specified.

Table 7. Frequency Modulation

Test instrument (**MODULATION FM/AM**) **FM KHz** slide settings	Measuring receiver frequency modulation (FM)	
	Min	Max
2 kHz FM	15.0 kHz	25.0 kHz
4 kHz FM	35.0 kHz	45.0 kHz
6 kHz FM	55.0 kHz	65.0 kHz
8 kHz FM	75.0 kHz	85.0 kHz
10 kHz FM	95.0 kHz	105.0 kHz

b. Adjustments

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

(a) **FREQUENCY VERNIER** control to **0 kHz**.

(b) **FREQUENCY** switches to indicate **050.000 MHz**.

(c) **MODULATION MODE** switch to **FMx1**.

(d) **MODULATION FREQ** switch to **1 kHz**.

(e) **MODULATION FM/AM** slide control to **3 kHz FM**.

(f) **OUTPUT** step attenuator switch for **+10 dBm.**

(g) **OUTPUT VERNIER** control fully cw.

(2) The audio analyzer will indicate less than 4% distorion.

(3) Set **TI MODULATION MODE** switch to **FMx10.**

(4) The audio analyzer will indicate less than 2% distortion.

b. Adjustments. No adjustments can be made.

16. FM Distortion

a. Performance Check

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

(a) **FREQUENCY VERNIER** control to **0 kHz**.

(b) **FREQUENCY** switches to indicate **050.000 MHz**.

(c) **MODULATION MODE** switch to **FMx1**.

(d) **MODULATION FREQ** switch to **1 kHz**.

(e) **MODULATION FM/AM** slide control to **3 kHz FM**.

(f) **OUTPUT** step attenuator switch for **+10 dBm.**

(g) **OUTPUT VERNIER** control fully cw.

(2) The audio analyzer will indicate less than 4% distorion.

(3) Set **TI MODULATION MODE** switch to **FMx10.**

(4) The audio analyzer will indicate less than 2% distortion.

b. Adjustments. No adjustments can be made.

17. Power Supply

a. Performance Check

NOTE

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

(1) Connect audio analyzer to pin 3 of M30-1 (fig. 1) and chassis ground. If audio analyzer does not indicate +18.00 V dc, perform b(**1**) below.

(2) Move audio analyzer connection to pin 4 of M30-1 (fig. 1). If audio analyzer does not indicate -18.00 V dc, perform b(**2**) below.

b. Adjustments.

(1) Adjust +18 V ADJ (fig. 2) for +18.00 V dc indication on audio analyzer (R).

(2) Adjust -18 V ADJ (fig. 2) for -18.00 V dc indication on audio analyzer (R).

18. Final Procedure

a. Deenergize and disconnect all equipment.

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

TB 9-6625-2094-35

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:
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