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Headquarters, Department of the Army, Washington, DC
8 December 1978

REPORTING OF ERRORS

You can help improve this manual by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ Fort Monmouth, NJ 07703. A reply will be furnished direct to

Section I. IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Audio Test Set TS-762/TC. Technical manual TM 11-2141 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. None.

b. Time and Technique. The time required for this

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* **This bulletin supersedes TB 9-6625-1352-50, 16 April 1969, and TB 11-6625-217-35/1, 21 April 1966, including all changes**

calibration Is approximately 4 hours, using the dc (direct current) and low frequency technique.

2. Calibration Data Card, DA Form 2416. a Forms, records, and reports required for calibration personnel at all levels are prescribed by TM 38-750. DA Form 2416 must be annotated in accordance with TM 38-750 for each calibration performed.

b. Adjustments to be reported on DA Form 2416 are designated (R) at the end of the sentence m 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
Power input requirements	105 to 125 V ac, 50 to 60 Hz
Test frequency	Range 1 kHz Accuracy +3 Hz
Test frequency distortion	Less than 1%
Send attenuator (test level)	Range -35 to + 10 dBm Accuracy ±0.3 dB per step
Receive attenuator level measure-ments)	Range -70 to + 10 dBm Accuracy ±0.3 dB per step
Audio filters (FIA for noise weight-ing)	1 kHz rejection for distortion

[1]This specification Ls for information only and is not verified in this bulletin

Section II. EQUIPMENT REQUIREMENTS

4. Equipment Required. Table 2 Identifies the specific equipment used m this calibration procedure This equipment Is Issued with Secondary Transfer Standards Calibration Sets NSN 6695-00-621-7877, NSN 669500-525-8175 (AN/GSM-256), NSN 4931-01-019-1829 (AN/GSM-259), Transportable Maintenance Calibration Facility AN/TSM-55, or Electronic Maintenance Shop Set and Is to be used in performing this procedure Alternate items may be used by the calibrating activity when the equipment listed in table 2 is not available 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 m 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 m table 3 are issued as indicated m paragraph 4 above and are to be 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

Item	Common name and/or (official nomenclature)	Minimum use specifications	Manufacturer, model, and part number			
			Level A	AN/GSM-256 and ANIGSM-259	Transportable maintenance shop set AN/IM-55	Electronic maintenance shop set
A1	AC VOLTMETER (TRUE RMS VOLTMETER)	Range 0077 to 345 V Accuracy: ±1%	Singer, Model 3574M (MIS-10299)	Hewlett-Packard, Model 400EL (400EL)	AN/USM-265	ME-30/U
A2	AUTOTRANSFORMER (VARIABLE TRANSFORMER)	Range 105 to 125 V ac POWER (7910809) Accuracy: ±1%	General, Radio, Model WIOMT3AS3-(MOD)	Same as Level A	TF-510/U	CN-16/U
A3	DECADE RESISTOR[1]	Range 600 Ω Accuracy ±10 Ω	Biddle-Gray, Model 6011471 (7910328)	Biddle-Gray, Model 71-631 (7910328)	ZM-58/U	ZM-16/U
A4	DISTORTION ANALYZER (SPECTRUM ANALYZER)	Range 1 kHz (7911957) Capability: ±1% distortion	Hewlett-Packard, Model 334A	Same as Level A	AN/URM-180	TS-723/U
A5	FREQUENCY COUNTER (DIGITAL ELECTRONIC COUNTER)	Range 997 to 1,003 Hz 1037M (7910823) Accuracy ±0.1%	Systron-Donner, Model 5245L (5245L)	Hewlett-Packard, Model	AN/USM-257A	AN/USM-207
A6	OHMMETER (MULTIMETER)	Range 0 to 20 n (7910902) Accuracy ±0.3%	Hewlett-Packard, Model 410C	Same as Level A	ME-338/U	ME-26A/U
A7	TEST OSCILLATOR (AUDIO-RADIO FREQUENCY OSCILLATOR)	Range 0 to 10 dB, 970 to 1,030 Hz 652A (MIS-10224) Accuracy ±0.3%	Preston, Model 134A or Hewlett-Packard, Model	Same as Level A	AN/USM-264	AN/URM-127
A8	VARIABLE ATTENUATOR (ATTENUATOR TEST SET)	Range 0 to 70 dB 350D (7904453) Accuracy ±0.1dB	Hewlett-Packard, Model	Same as Level A	CN-1000/G	TS-402/U

[1]Two required

Table 3. Accessories Required

	Common name and/or official nomenclature	Description and part number
Item		
BI	ADAPTER I (ELECTRICAL PLUG CONNECTOR)	BNC jack to double banana plug (7907592)
B2	ADAPTER (CONNECTOR ADAFTER)	BNC tee (MS35173-274C)
B3	CABLE I (TEST LEAD)	36 m, RG58/U, double banana plug to BNC plug (7907471)
B4	CABLE I (RF CABLE ASSEMBLY)	36 in, BNC to 2 alligator clips (7909410)
B5	LOAD (ELECTRICAL DUMMY LOAD)	600 l (8898497)

[1]Two required

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 procedure 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 tables 2 and 3 For the identification of equipment referenced by item numbers prefixed with A, see table 2, and for prefix B, see table 3

WARNING

HIGH VOLTAGE is used during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions

NOTE

Unless otherwise specified, verify the results 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 m this procedure Additional maintenance information is contained m TM 11-2141 for this TI.

NOTE

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

7. Equipment Setup. a Remove TI from protective cover as required for adjustments

b. Connect TI to autotransformer (A2).

c. Connect autotransformer to 115-v ac (volt alternating current) source and adjust autotransformer for a 115V ac output.

d. Energize equipment and allow 15 minutes for warm up and stabilization

8. Oscillator Frequency and Stability. *a Performance Check*

(1) Connect equipment as shown in figure 1

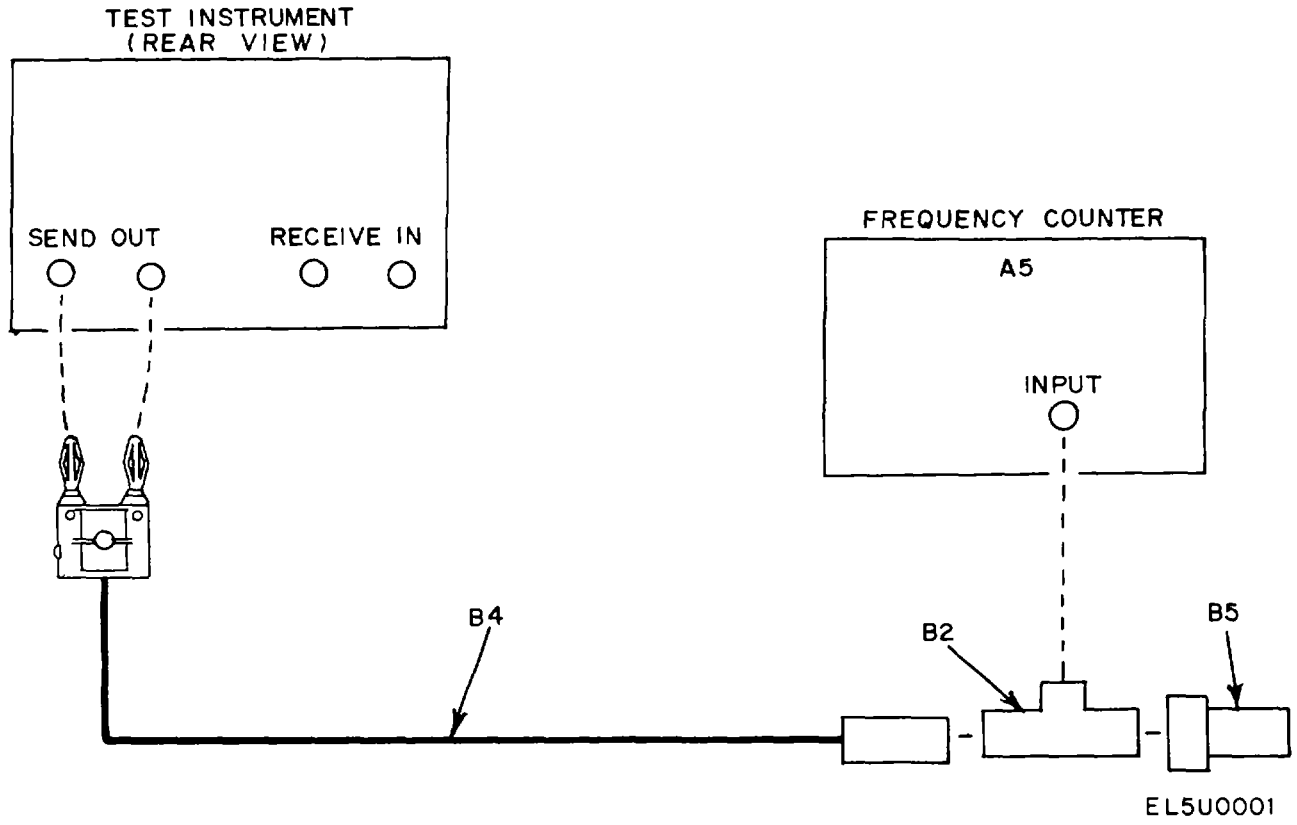

Figure 1. Oscillator frequency check - equipment setup

(2) Press SEND CALIBRATE pushbutton and adjust ADJ SEND control for a red-line (O dB) (decibel) indication on DECIBELS meter

(3) Set RECEIVE-DBM switch to +10 CAL REC position

(4) Press REC CALIBRATE pushbutton and adjust ADJ REC control for a red-line (O dB) indication on DECIBELS meter

(5) Release REC CALIBRATE pushbutton and set SEND-DBM switch to 0 (zero)

(6) Press FIA MEASURE pushbutton If frequency counter (A5) does not indicate between 997 and 1,003 Hz (hertz), perform b below

(7) Adjust autotransformer (A2) output between 105 and 125 V Frequency counter indication will remain between 997 and 1,003 Hz Adjust *autotransformer* for a 115-V ac output

b. Adjustments

(1) Adjust FREQUENCY *control potentiometer* R4 (fig 2) for 1,000 Hz as indicated on frequency counter (R)

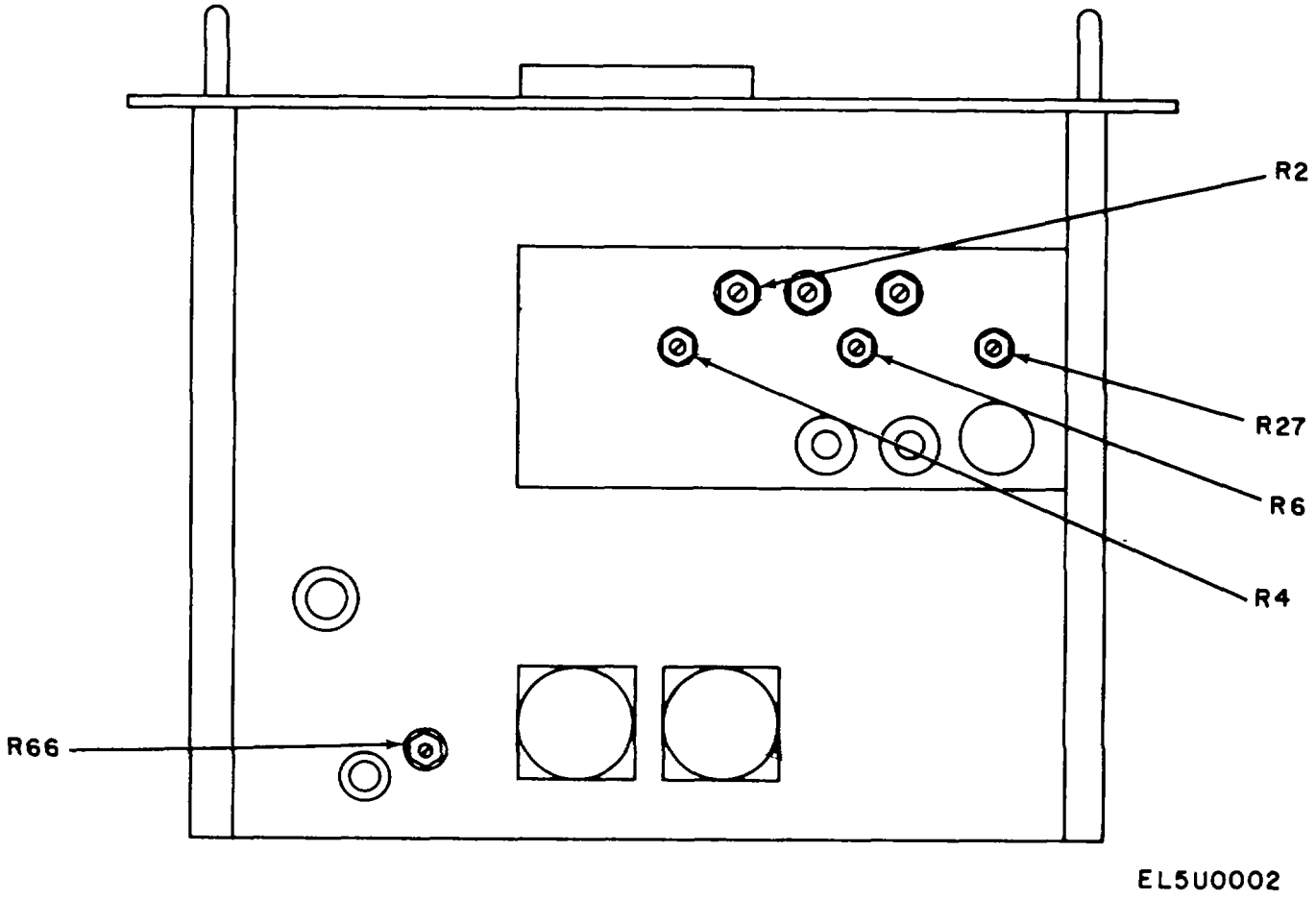

Figure 2. Audio test set component location - top

(2) Set ON-OFF switch to OFF

(3) Connect ohmmeter (A6) test leads across FREQUENCY potentiometer R4 (top half) (fig 2) Record ohmmeter resistance indication.

(4) Connect ohmmeter test leads across FREQUENCY potentiometer R4 (bottom half) (fig 2)

(5) adjust BRIDGE BALANCE potentiometer R2 (fig 2) for ohmmeter indication recorded in (3) above (R) Remove ohmmeter

(6) Set ON-OFF switch to ON Repeat a(1l) through (7) above

9. Distortion. *a Performance Check*

(1) Connect equipment as shown in figure 3, connection A.

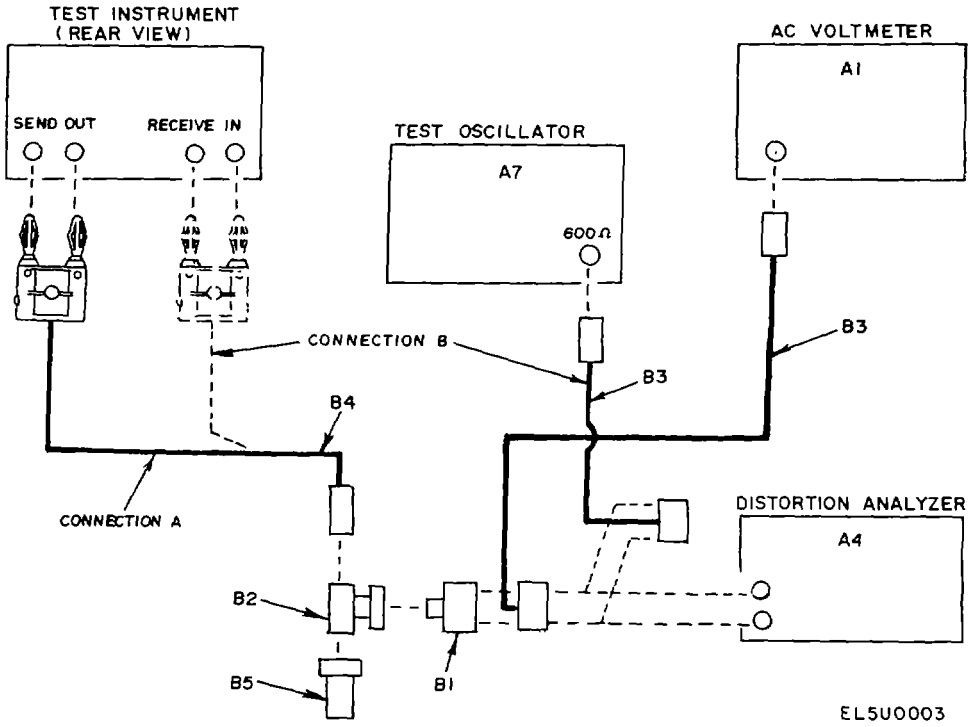

Figure 3. Distortion check and meter accuracy - equipment setup

(2) Adjust ADJ SEND control fully cw (clockwise) and set SEND-DBM switch to + 10 Ac voltmeter (Al) will indicate at least 3 46 V

(3) Adjust ADJ SEND control for a 2 45-V Indication on ac voltmeter If distortion, as indicated by distortion analyzer (A4), is not 1 percent or less, perform *(b)* below

b. Adjustments

(1) Repeat a(2) above

(2) adjust OUTPUT BALANCE control R27 (fig 2)for minimum distortion as indicated by distortion analyzer

(3) Repeat a(3) above

(4) Adjust DISTORTION control R6 (fig. 2) for minimum distortion as indicated by distortion analyzer (R)

10. Meter Accuracy. *a. Performance Check*

(1) Connect equipment as shown m figure 3, connection B

(2) Set RECEIVE-DBM switch to 0 (zero).

(3) Adjust test oscillator (A7) for 1,000 Hz and output amplitude for a 775-V indication on ac voltmeter (Al)

(4) Adjust ADJ REC control for a red-line (0 dB) indication on DECIBELS meter

(5) Adjust test oscillator output amplitude to obtain DECIBELS meter indications listed In table 4 Ac voltmeter will indicate within limits specified.

Table 4. Meter Accuracy

Test instrument DECIBELS meter indications (dB)	Ac voltmeter indications (V rms)	
	Min	Max
-1	.68	.70
-2	.60	.63
-3	.52	.58
-4	.46	.52
-5	.40	.48
-7	.30	.39
-10	.21	.29
-20	.054	.11

b. Adjustments. No adjustments can be made

11. Send Attenuator. *a Performance Check*

(1) Connect equipment as shown *in figure* 4, *con*nection A

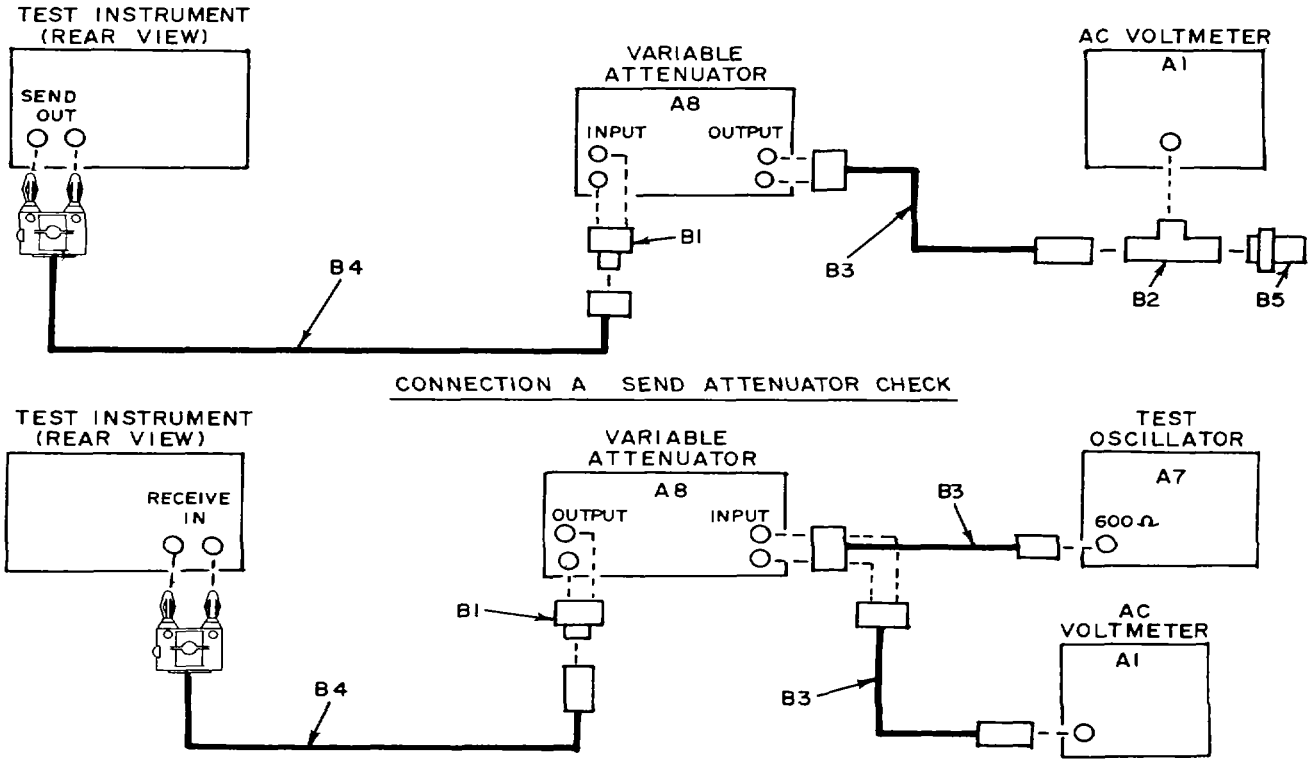

Figure 4. Attenuation check - equipment setup

(2) Set variable attenuator (A8) for 50 dB

(3) Turn SEND-DBM switch on TI to + 10

(4) Adjust ADJ SEND control for 0077-V indication on ac voltmeter

(5) Set SEND-DBM switch and variable attenuator to positions listed in table 5 Ac voltmeter will indicate between 0075 and 008 V at each combination of settings.

b. Adjustments No adjustments can be made

Table 5. Send Attenuator

Test instrument SEND-DBM switch positions	Variable attenuator switch positions (dB)
0	40
-10	30
-20	20
-30	10
-35	5

12. Receive Attenuator. *a. Performance Check*

(1) Connect equipment as shown in figure 4, connection B.

(2) Set variable attenuator (A8) to 0 dB and RECEIVE-DBM switch to + 10

(3) adjust test oscillator (A7) frequency to ,1,000 Hz and amplitude for a 2.45-V indication on ac voltmeter (Al)

(4) Adjust ADJ REC control for a red-line (O dB) indication on DECIBELS meter.

(5) Set variable attenuator switch and RECEIVEDBM switch to settings listed m table 6 At each listed setting, adjust output amplitude of test oscillator for a redline indication on TI DECIBELS meter. Ac voltmeter indication will be between 2 35 and 2 55 V at each combination of settings

b. Adjustments No adjustments can be made

Table 6. Receive Attenuator

Test instrument Variable attenuator switch settings (DB)	RECEIVE-DBM switch settings
10	0
20	-10
30	-20
40	-30
50	-40
60[1]	-50
70[1]	-60

[1]At this setting there may be a noticeable "zero" (1,000 Hz) beat with the TI internal oscillator If there Is, slightly change frequency of test oscillator (A7)

13. Distortion Network Response. *a. Performance Check*

(1) Set RECEIVE-DBM switch to +10

(2) Set variable attenuator (A8) to 0 dB

(3) adjust test oscillator (A7) *frequency to* 1,000 Hz and output amplitude for a 2 45-V ac voltmeter indication.

(4) adjust ADJ REC control for a red-line (0-dB) indication on DECIBELS meter

(5) Press DIST AT 1000 - MEASURE pushbutton

(6) Set RECEIVE-DBM switch for an on-scale DECIBELS meter indication The sum of RECEIVEDBM switch setting plus DECIBELS meter indication will be greater than - 40 dBm (more negative)

(7) Press FIA MEASURE pushbutton

(8) Repeat (1) and (3) through (7) above with test oscillator frequency adjusted to 970 and 1,030 Hz

b. Adjustments No adjustments can be made

14. Noise and Hum Output. *a Performance Check*

(1) Connect RECEIVE-IN jack (rear) to decade resistor (A3), using adapter and cable (B1 and B4)

(2) Connect SEND OUT jack (rear) to second decade resistor, using adapter and cable (B1 and B4)

(3) Set each decade resistor to 600 ohms By Order of the Secretary of the Army:

(4) Press SEND CALIBRATE pushbutton and adjust ADJ SEND control for a red-line (O dB) indication on DECIBELS meter

(5) Set RECEIVE-DBM switch to + 10 CAL REC *Press REC CALIBRATE pushbutton and adjust ADJ* REC control for a red-line (O dB) indication on DECIBELS meter

(6) Set SEND-DBM switch to + 10 (7) Press FIA MEASURE pushbutton and set RECEIVE-DBM switch for a readable indication on DECIBELS meter If the sum of DECIBELS meter indication plus RECEIVE-DBM switch setting does not equal - 70 dBm or more (more negative), perform *b* below

b. Adjustments Adjust potentiometer R66 (fig 2) for indication specified In *a(7)* above

15. Final Procedure. *a* Deenergize and disconnect all equipment and reinstall TI protective cover

b. In accordance with TM 38-750, annotate and affix DA Label 80 (US Army Calibrated Instrument). When the TI receives limited or special calibration, annotate and affix DA Label 163 (US Army Limited or Special Calibration) When the TI cannot be adjusted within tolerance, annotate and affix DA Form 2417 (US Army Calibration System Rejected Instrument).

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