*TB 11-6625-496-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR RADIO TEST SETS, AN/VRM-1 AND AN/VRM-1A

(6625-00-892-5542)

Headquarters, Department of the Army, Washington, D. C.
12 August 1975

Section I. GENERAL

1. Purpose and Scope.

a. This bulletin provides information for the periodic calibration of Radio Test Set AN/VRM-l, AN/VRM-lA (fig. 1) and is used by calibration personnel. Since maintenance calibration personnel are trained and qualified in the usage of test and measuring equipment, detailed instructions concerning the operation and use of these equipments are not contained in this bulletin.

b. Integrated within this bulletin are illustrations delineating the location of all controls and components utilized in this calibration procedure as well as diagrams showing equipment setups. Equipment ground connections are not necessarily shown in the diagrams.

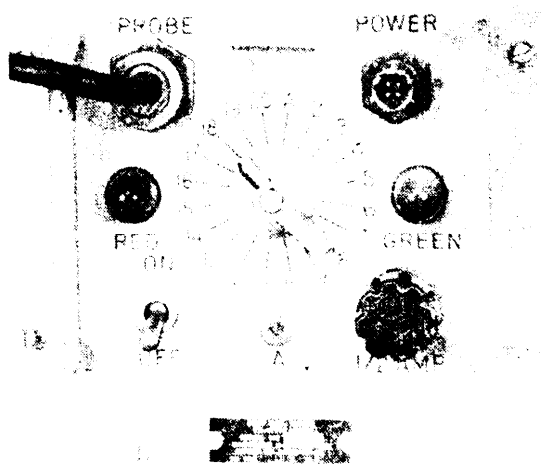

Figure 1. Radio Test Set AN/VRM-1 — front panel view.

***This bulletin supersedes TB 11-6625-496-35/1, 15 May 1969**

2. Reporting of Publication Improvements. Report of errors, omissions, and recommendations for improving this bulletin is encouraged. Submit reports on DA Form 2028 (Recommended Changes to DA Publications and Blank Forms) and forward directly to: Commander, U.S. Army Electronics Command, ATTN: AMSEL-MA-Q, Fort Monmouth, N.J. 07703.

3. Description. Radio Test Set AN/VRM-1 and AN/VRM-1A are special purpose instruments used for testing R-442/VRC Radio Receivers and RT-524/VRC Radio Receiver-Transmitters of the AN/VRC-12 and AN/VRC-43 through 49 series. Additional data is listed in a, b, and c below.

a. Identification.

Nomenclature	RADIO TEST SET AN/VRM-1 and AN/VRM-1A.
National stock number	6625-00-892-5542.
Line item number	V 8 8 0 2 7 .
Size	5.5 x 7.5 x 9.5 in.
Weight	6 lb.
Reference	TM 11-6625-496-45, C2, 4, 5
	TM 11-6625-496-12, C1, 2, 3, 4

b. Specifications.

Input power requirement	26 vdc at 300 ma.
Test indication	Red or green light indication dependent upon signal applied and selector switch position.

c. Program Data.

Time required for calibration	2 hours.
Interval	In accordance with TB 43-180.

4. General Instructions.

a. Calibration Data Card.

(1) 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.

(2) Adjustments to be reported on DA Form 2416 are designated (R) at the end of the sentence in which they appear.

b. Unit Under Test. Radio Test Set AN/VRM-1 and AN/VRM-1A will be referred to as "unit under test".

5. Difference Among Models. Variations among models are described in text.

Section II. CALIBRATION

6. Equipment and Accessories Required. Table 1 lists minimum use specifications of calibration performance checks and adjustments. Table 2 lists the accessories required.

NOTE

Equipment and accessories used in this procedure are referenced within the text by common name and item identification number in tables 1, and 2. For item identification numbers prefixed A see table 1, for item identification numbers prefixed B see table 2.

Table l. Minimum Specifications of Equipment Required

Item Number	Common Name	Minimum Use Specifications	Calibration Equipment*
A1	AUDIO GENERATOR	Range: 1 kHz @ 0 to 15 Vac Accuracy: ±2.75%	TS-421/U
A2	MULTIMETER	Range: 0.012 to 0.810 Vac Accuracy: ±5%	AN/URM-145
A3	ELECTRONIC VOLTMETER	Range: 9.90 to 22.0 Vdc Accuracy: ±0.1%	AN/USM-98
A4	ELECTRONIC VOLTMETER	Range: .200 to 14.90 Vac Accuracy: ±2.75%	ME-30/U
A5	ELECTRONIC COUNTER	Range: 5.65 to 47.0 MHz Accuracy: ±0.5%	AN/USM-207
A6	POWER SUPPLY	Range: 0 to 26 Vdc @ 300 mA	PP-2309/U
A7	POWER SUPPLY	Range: 0 to 15 Vdc @ 150 mA	PP-3514/U
A8	SIGNAL GENERATOR	Range: 5.65 to 47.0 MHz Accuracy: ±0.5%	AN/URM-25

*The calibration equipment utilized in this procedure was selected from those known to be available at Department of Defense facilities, and the listing by make or model number carries no implication of preference, recommendation or approval by the Department of Defense for use by other agencies. It is recognized that equivalent equipment produced by other manufacturers may be capable of equally satisfactory performance in the procedure.

Table 2. Accessories Required

Item Number	Common Name	Type and Description
B1	RF CABLE ASSEMBLY	36 in., RG-58/U; BNC plug and double banana plug terminations
B2	RF CABLE ASSEMBLY	30 in., RG-58/U; double banana plug termination
B3	TEST LEAD SET	CX-1331/U

Note. It is recommended that personnel familiarize themselves with the entire procedure prior to performing calibration.

7. Preliminary Procedure.

a. Remove protective cover from unit under test.

b. Set unit under test power switch to ON.

Note. The following paragraphs are divided into subparagraph *a*, performance check and subparagraph *b*, adjustments. When the performance check is within tolerance, do not perform the corresponding adjustment. When the performance check is not within tolerance, perform the corresponding adjustment before continuing with the calibration procedure. When the performance check is not within tolerance and no adjustment is specified, the deficiency must be corrected before continuing with the procedure.

8. Power Test.

a. Performance Check.

(1) Connect equipment as shown in figure 3.

(2) With unit under test power switch set to ON, vary DC POWER SUPPLY (A6) from 0 to 26 volts, RED indicator on unit under test should glow when Electronic Voltmeter (A3) indicates between 21.0 and 22.0 volts dc.

b. Adjustments. Adjust R7816 (fig. 2) so that RED indicator glows when electronic voltmeter indicates 21.5 volts dc as dc power supply is varied from 0 to 26 volts. (R)

9. Voltage Sensing Circuit.

a. Performance Check.

(1) Connect equipment as shown in figure 4.

(2) Turn unit under test selector switch to position 8.

(3) Vary dc output of Power Supply (A7) from 0 to 15 volts.

(4) RED indicator on unit under test should cease to glow and GREEN indicator should glow when electronic voltmeter indicates between 9.9 and 11.2 volts. RED indicator should glow when electronic voltmeter indicates between 12.7 and 14.2 volts.

b. Adjustments.

(1) Adjust R7803 (fig. 2) so that GREEN indicator on unit under test glows when electronic voltmeter indicates 10.5 volts. (R)

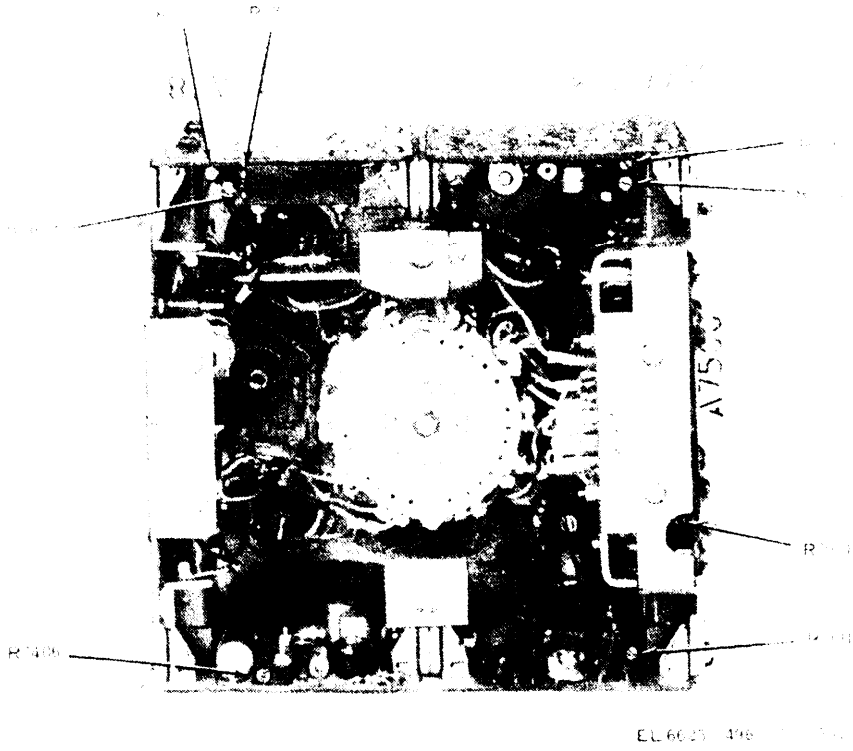

Figure 2. Radio Test Set AN/VRM-1 — rear view.

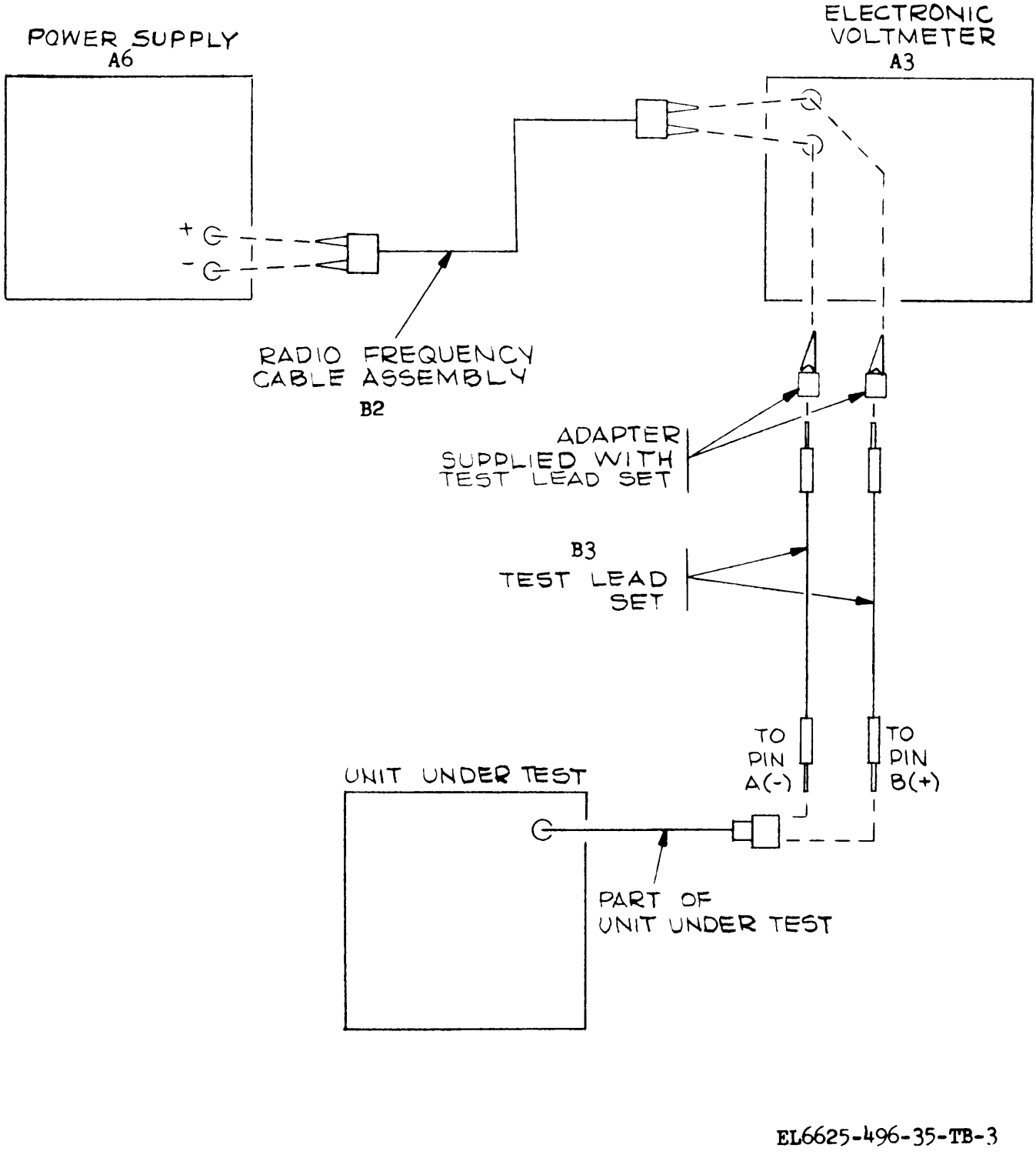

Figure 3. Radio Test Set AN/VRM-1 — power test, equipment setup.

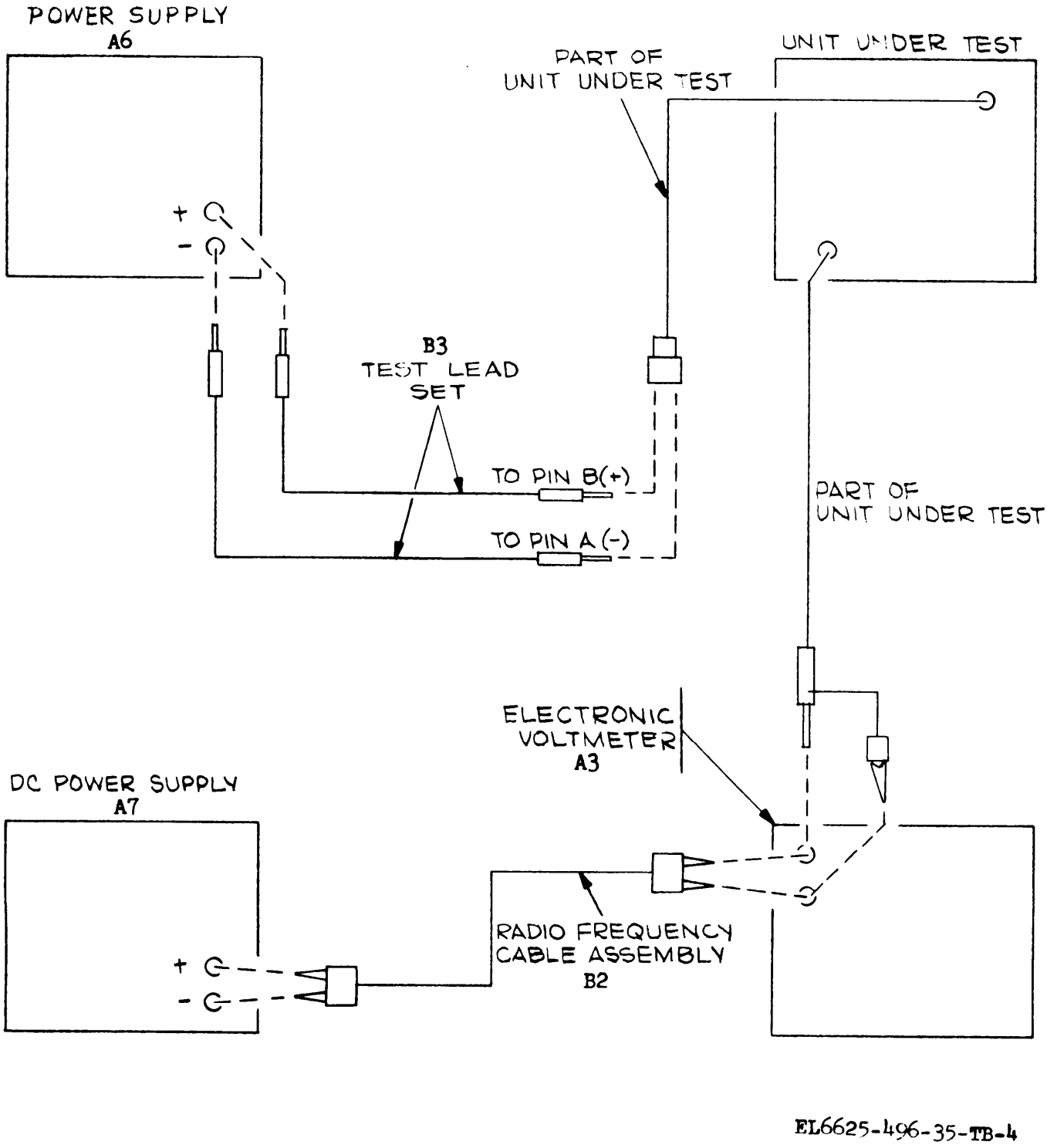

Figure 4. Radio Test Set AN/VRM-1 — dc circuits, equipment setup.

(2) Adjust R7801 (figure 2) so that RED indicator glows when electronic voltmeter indicates 13.5 volts. (R)

Note. Repeat steps (1) and (2) until both GREEN and RED indicators operate properly.

10. Dc Circuits.

a. Performance Check.

(1) Turn unit under test selector switch to position A.

(2) Vary dc output voltage of Power Supply (A7) from 0 to 21 volts.

(3) GREEN indicator on unit under test should glow when electronic voltmeter indicates between 13.40 and 15.00 volts.

(4) Reduce dc output voltage of power supply to 0 (zero).

(5) Repeat steps (1) through (4) using values listed in table 3.

Table 3. Dc Circuit Values

Unit under test		(A3) Electronic voltmeter indication	
Selector switch position	Indicator (glows)	Min	Max
A	Red	17.30	19.50
2	Green	19.00	21.80
8	Green	9.90	11.20
19'	Green	13.00	14.70

Earlier models of AN/VRM-1, position 19 is not used.

b. Adjustments.

(1) Adjust R7501 (fig. 2) for the A selector indication listed in table 3. (R)

(2) No adjustment for correction of indication received at switch positions 2, 8, 19 can be made.

11. Audio Circuits.

a. Performance Check.

(1) Connect equipment as shown in figure 5.

(2) Turn selector switch of unit under test to 3 position.

(3) Adjust Audio Level Test Generator (A1) for 1 kHz output.

(4) increase voltage output of test generator. GREEN indicator on unit under test should glow when Electronic Voltmeter (A4) indicates between 2.60 and 3.30 volts.

(5) Reduce output voltage of test generator to 0 (zero).

(6) Repeat steps (2) through (5) using values listed in table 4.

Table 4. Audio Circuit Values

Unit under test selector position	(A4) electronic multimeter indication (volts)	
	Min	Max
4	12.50	14.90
5	.450	.520
6	.8000	1.00
10	.200	.250
11	6.00	7.30

b. Adjustments.

(1) Adjust R7406 (fig. 2) for indications listed in table 4. (R)

(2) If R7406 is adjusted for the 4, 5, 6, 10, or 11 position, the previous voltage checks in this table must be rechecked until all indications are within the prescribed tolerances.

12. RF Circuits.

a. Performance Check.

(1) Connect equipment as shown in figure 6.

(2) Turn selector switch of unit under test to position 12.

(3) Adjust frequency output of Signal Generator (A8) for an indication of 5.65 MHz ± 1 kHz as determined by Electronic Counter (A5).

(4) Increase voltage output of signal generator. GREEN indicator on unit under test should glow when Electronic Multimeter (A2) indicates between 0.125 and 0.250 volt ac.

(5) Reduce output voltage of signal generator,

(6) Repeat steps (2) through (5) using values listed in table 5.

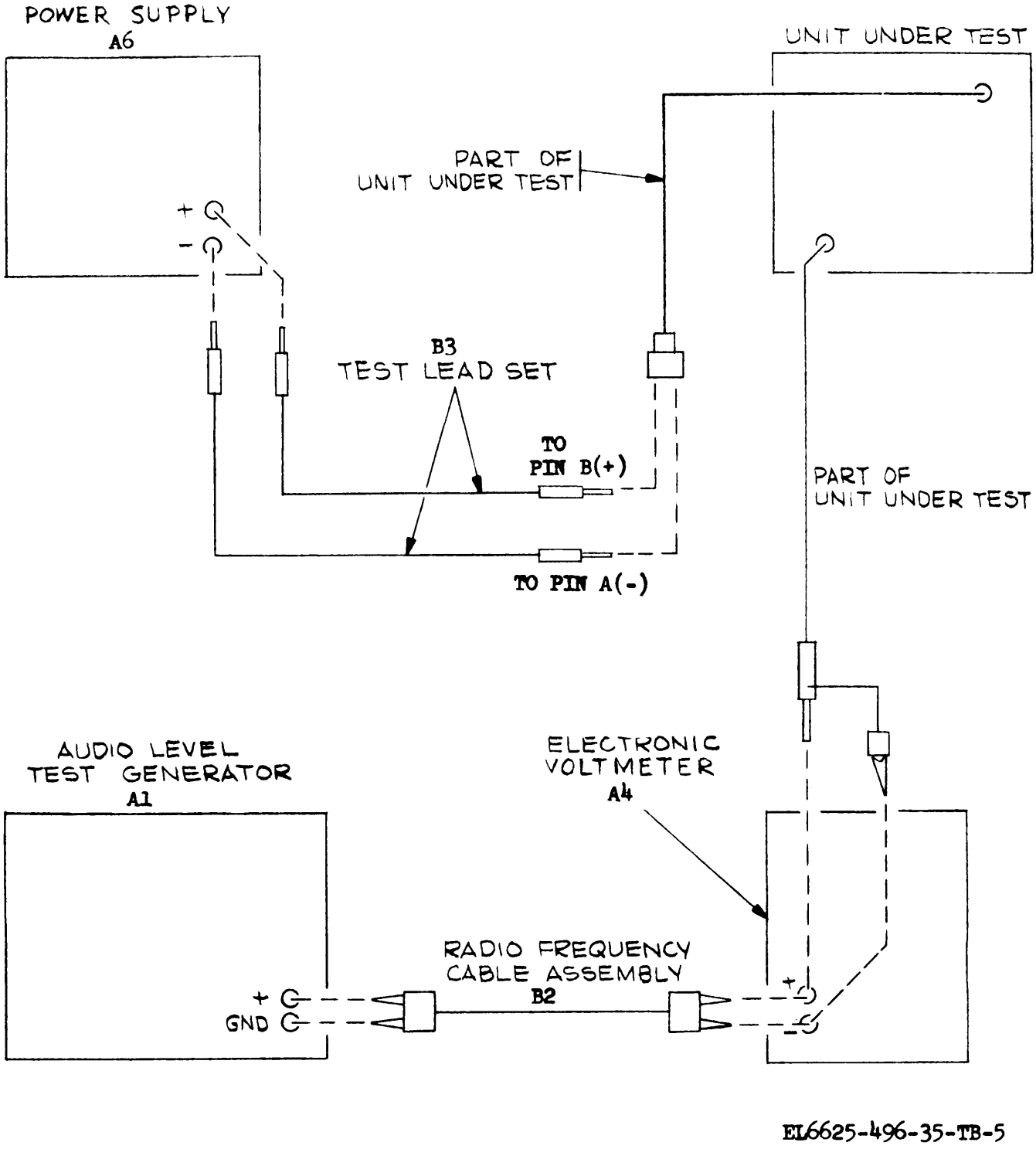

Figure 5. Radio Test Set AN/VRM-1 — audio circuits, equipment setup.

Table 5. Rf Circuit Values

Unit under test selector position	(A5) electronic counter	(A2) multimeter (vac)	(R) Adjust (fig. 3)
15	5.65 MHz ± 20 kHz	.200—.250	R7708
16	5.65 MHz ± 20 kHz	.170—.210	R7708
17	5.65 MHz ± 20 kHz	.650—.810	R7708
7	11.5 MHz ± 40 kHz	.230—.330	R7611
9	11.5 MHz ± 40 kHz	.100—.140	R7611
13	11.5 MHz ± 40 kHz	.180—.250	R7611
14	11.5 MHz ± 4 kHz	.012—.016 *	R7611
18	47.0 MHz ± 100 kHz	.100—.135	R7718

*Use calibrated rf output of Signal Generator AN/URM-25( ) terminated into 50 ohms.

b. Adjustments.

(1) Make adjustments as listed in table 5. Adjust each potentiometer for best results at each group of settings.

(2) If R7708 or R7611 is adjusted, recheck previous switch positions in that group until all indications are within the prescribed tolerances. (R)

13. Final Procedure.

a. Deenergize and disconnect all test equipment, and install unit under test in protective cover.

b. In accordance with TM 38-750, annotate and affix calibration DA label 80 (U.S. Army Calibration System), When the unit under test cannot be adjusted to within tolerance, annotate and affix DA form 2417 (Unserviceable or Limited Use Tag).

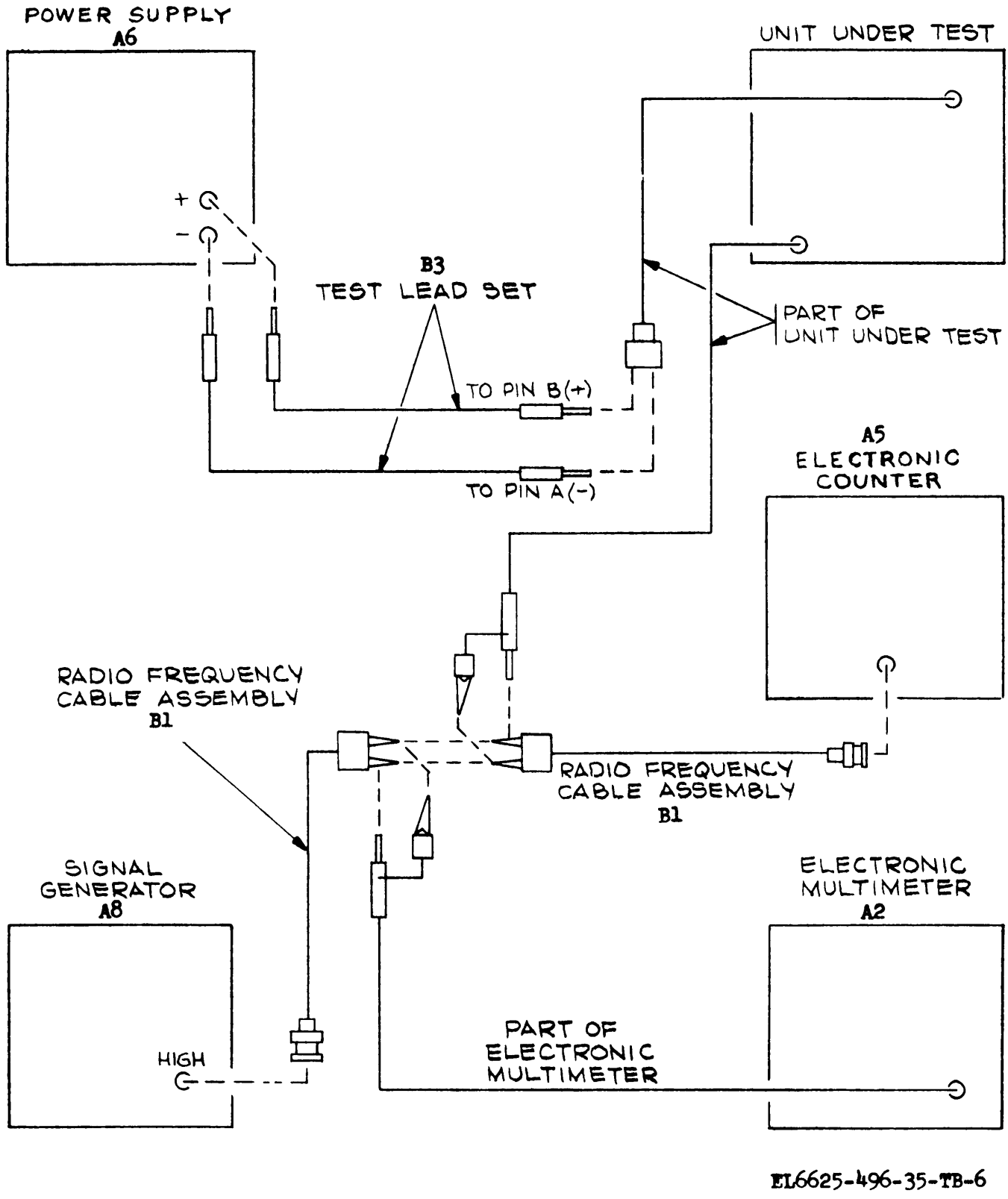

Figure 6. Radio Test Set AN/VRM-1 — RF circuits, equipment setup.

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