TB 11-5841-259-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR ELECTRONIC EQUIPMENT MAINTENANCE KIT MK-774/APN-158

Headquarters, Department of the Army, Washington, D.C.
21 July 1975

SECTION I
GENERAL

1. Purpose and Scope. This bulletin provides information for the periodic calibration of Electronic Equipment Maintenance Kit MK-774/APN-158. It is to be used by personnel trained and qualified in the use of calibration equipment.

2. Report of Equipment Publication Improvements. Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications and Blank Forms) and forwarded direct to: Commander, U.S. Army Electronics Command, ATTN: AMSEL-MA-Q, Fort Monmouth, N.J. 07703.

3. Descriptive Data

a. Identification

Nomenclature	Electronic Equipment Maintenance Kit
Military designation	MK-774/APN-158
Reference	TM 11-5841-259-12 and TM 11-5841-259-45

b. Specifications

Power input requirements	115 ±6 vac, 400 ±20 Hz, 400 va, single phase
Internal power supplies	+27.5 ± 0.1 vdc, -27 ±1.5 vdc, +15 ±2 vdc
Meter:	
Range[1]	10 μa full scale
Accuracy[1]	±2%

c. Calibration

Interval	In accordance with TB 43-180
Time required	1 hour (approx)
Technique	Dc-low frequency

[1]These specifications are for information only and are not necessarily verified in this bulletin.

4. General Instructions.

a. DA Form 2416 (Calibration Data Card). During the use of this bulletin, annotate DA Form 2416 in accordance with TM 38-750. Reportable adjustments are followed by (R) in this procedure.

b. **Unit Under Test**. Electronic Equipment Maintenance Kit, MK-774/APN-158 will be referred to as the UUT (unit under test) throughout this bulletin.

c. **Equipment and Accessory Identification**. The equipment and accessories referred to throughout this bulletin are identified in tables 1 and 2.

d. Equipment Setup. Disconnect instructions are not contained in this bulletin.

SECTION II
EQUIPMENT REQUIRED

5. Equipment Required. Table 1 lists equipment required for calibration performance checks and adjustments. Minimum use specifications are provided to assist in the selection of alternate equipments which may be used at the discretion of the calibration activity provided they bear evidence of certification prior to use.

6. Accessories required. Table 2 lists accessories required to connect the UUT to the calibration equipment. Substitution of these accessories may be necessary depending upon the calibration equipment used.

Table 1. Equipment Required

Item number	Common name	Minimum use specifications	Calibration equipment (identifying number)
A1	OSCILLOSCOPE	Range: 415 to 2150 Microseconds Accuracy: ± 3%	AN/USM-281 or Tektronix model 561 RM (7910655-2)
A2	VOLTMETER	Range: 0 to 30 Volts DC Accuracy: ± 0.5%	ME-202/U or J.Fluke model 887ABAN (MIS-10216)

*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	Common name	Description
B1	Electrical Lead	Single banana plug terminations, 36 inches in length, red (7907497)
B2	Electrical Lead	Single banana plug terminations, 36 inches in length, black (7907498)
B3	Adapter (2 required)	Banana plug to pin jack (8899486)
B4	Adapter	Double banana to BNC connector (7909400)
B5	Adapter *	BNC plug to “N” Type connector (10519458)

*May not be required for connection to some oscilloscopes.

SECTION III
PRELIMINARY INSTRUCTIONS

7. Preliminary Procedure

NOTE

Personnel should familiarize themselves with the entire bulletin prior to performing calibration.

a. Remove UUT Electronic Plug-in Test Set TS-2160/APN-158 from protective case.

b. Set UUT **POWER** and **METER FUNCTION** switches to **OFF**.

CAUTION

Excessive adjustment of the meter zero screw may impair meter accuracy.

c. Adjust mechanical zero-adjustment screw on meter face for zero indication.

8. Equipment Setup

a. Connect UUT power cord to 115 volt 400 Hertz power source.

b. Set UUT **POWER** switch to **ON**, and allow sufficient time for equipment to warm up and stabilize.

c. Make connections to the calibration equipment when instructed throughout the procedure.

NOTE

When the UUT is not within tolerance, perform the specified adjustment and continue the performance check When the UUT is not within tolerance and no adjustment is specified, the deficiency must be corrected before continuing with the procedure.

WARNING

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

SECTION IV
CALIBRATION

9. Voltage Calibrator

a. Performance Check

(1) Turn UUT **TEST FUNCTION SELECTOR** switch to **CAL**.

(2) Connect dc voltmeter (A1) to UUT **CAL VOLT +** and **–** (located on the right side of UUT chassis). Dc voltmeter will indicate between 3.996 and 4.004 volts. If not, perform b below.

b. Adjustments. Adjust R14 (fig. 1) until dc voltmeter indicates +4 volts. (R)

10. Phase-Detector Simulator

a. Performance Check.

(1) Turn UUT **SWEEP GENERATOR TEST SELECTOR** switch to **X1**, **TEST RANGE SELECTOR** switch to **150**, and **TEST FUNCTION SELECTOR** switch to **SWEEP GEN**.

(2) Connect dc voltmeter (A2) to UUT **PHASE DET +** and **–** observing polarity. Dc voltmeter indication will be between 1.99 and 2.01 volts. If not, perform b below.

b. Adjustments. Adjust R15 (fig. 1) until dc voltmeter indicates 2.0 volts. (R)

11. Sweep Current Meter Balance

a. Performance Check

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

(a) **TEST FUNCTION SELECTOR** switch to **SWEEP GEN**.

(b) **METER FUNCTION** selector switch to **TEST (X10)**.

(c) **SWEEP GENERATOR TEST SELECTOR** switch to **X BAL**.

(2) Observe that **TEST METER** indicates in green area and **X10** light blinks.

(3) Turn **METER FUNCTION** switch to **TEST (X1**). **TEST METER** will indicate **NULL** (center scale plus one-half minor division). If not, perform **b** below.

b. Adjustments. Adjust R5 (fig. 1) until **TEST METER** indicates **NULL** (R).

12. Meter Function

a. Performance Check

(1) Set UUT METER FUNCTION switch to (500 VAC) 115 VAC position.

(2) Observe that the UUT meter indicates between 11 and 13.

(3) Set UUT METER FUNCTION switch to (+50V) +27.5 V position.

(4) Observe that the UUT meter indicates between 26 and 28.

(5) Set UUT METER FUNCTION switch to (-50) -27 V position.

(6) Observe that the UUT meter indicates between 26 and 28.

(7) Set UUT METER FUNCTION switch to (+50V) +15 position.

(8) Observe that the UUT meter indicates between 14 and 16.

b. Adjustments. No adjustments can be made.

13. Gate Generator Module

a. Performance Check

(1) Remove the UUT GATE GENERATOR card from UUT rear chassis (inner card of two) and insert into front panel SIGNAL GENERATOR receptacle.

(2) Set UUT TEST FUNCTION SELECTOR switch to GATE GEN.

(3) Set UUT TEST RANGE SELECTOR switch to 30.

(4) Set UUT METER FUNCTION switch to TEST (X1).

(5) Connect oscilloscope (Al) to UUT OSCILLOSCOPE CHANNEL A BNC jack.

(6) Observe that oscilloscope displays a positive gate pulse with a width at the 50% amplitude point between 415 and 445 microseconds. If not, perform b below.

(7) Set UUT TEST RANGE SELECTOR switch to 60.

(8) Observe that the oscilloscope pulse width at the 50% amplitude point is between 830 and 890 microseconds.

(9) Set UUT TEST RANGE SELECTOR switch to 150.

(10) Observe that the oscilloscope pulse width at the 50% amplitude point is between 2050 and 2150 microseconds.

b. Adjustments. Adjust R31 on the Gate Generator Module for the best possible compromise of three indications above. (R)

14. Power Supply

a. Performance Check

(1) Connect the voltmeter between +27.5 ADJUST (red) jack and GRD (black) jack.

(2) Observe that the voltmeter indicates between 26 and 28 volts.

(3) Connect voltmeter positive lead to UUT + 15 V(orange) jack.

(4) Observe that the voltmeter indicates between 14.5 and 15.5 volts.

(5) Connect voltmeter positive lead to UUT -27 V (green) jack.

(6) Observe that the voltmeter indicates between -26 and -28 volts.

b. Adjustments. Adjust +27.5 V ADJUST (R8) for voltmeter indication of +27.5 volts. (R)

15. Final Procedure

a. Reinstall UUT **TEST GENERATOR** card in holder on rear of UUT.

b. Deenergize and disconnect all equipment and reinstall Electronic Plug-in Test Set TS-2160/APN158 in protective case.

c. In accordance with TM 38-750, annotate and affix DA Label (80 U.S. Army Calibration System). When the UUT cannot be adjusted within tolerance, annotate and affix DA Form 2417 (Unserviceable Test Instrument or Standard) (red tag).

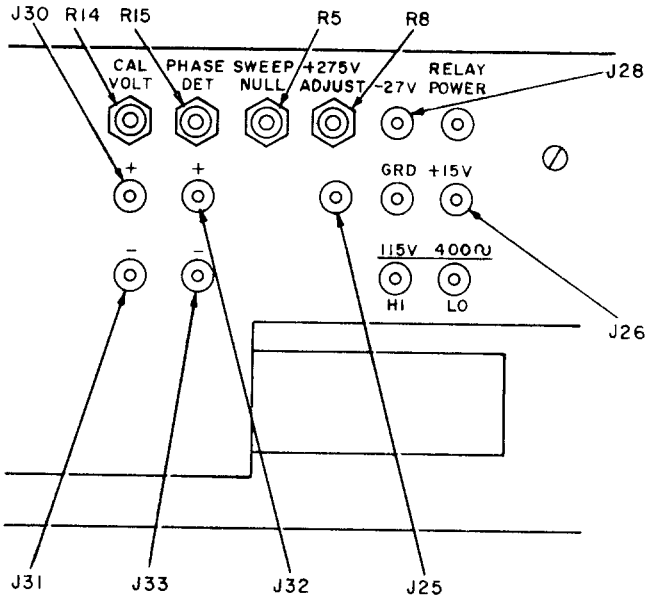

Figure 1. Electronic equipment maintenance kit MK-744/APN-158 - test point and adjustment locations

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Distribution:

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