DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR CHARGER BATTERY ANALYZER AN/ASM-137 (NSN 6135-00-788-8481) AND AN/ASM-137A (NSN 6130-00-238-4433)

Headquarters, Department of the Army, Washington, DC
3 May 1977

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***This bulletin supersedes TB 11-6625-678-35/1, 22 June 1966.**

Section I. IDENTIFICATION AND DESCRIPTION

1-1. Test Instrument Identification. This bulletin provides instructions for the calibration of Charger Battery Analyzer AN/ASM-137 and AN/ASM-137A, hereafter referred to as Test Instruments.

a. Model Variations. There are slight differences in physical and electrical components but these differences do not affect the calibration.

b. Time and Technique. The time required for this calibration is approximately four hours, using the dc-low frequency technique.

1-2. 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 in which they appear. Report only those adjustments made and designated with (R).

1-3. Calibration Description. Test Instrument parameters and performance specifications which pertain to this calibration are listed in table 1-1.

Table 1-1. Calibration Description

Test Instrument parameters	Performance specification
Power put requirements	115 volts ac, 60 Hz, single phase
Charging characteristics	
Type	Pulsing constant current
Rate	4 hours (nickle-cadmium batteries)
Voltage range	0 to 40 volts dc ± 2-
Current range	0 to 20 amperes dc ± 2%

*During the performance of this calibration monitor the input voltage. Do not allow this voltage to drift beyond 2%. Do not attempt to vary power transformer to check Test Instrument at 105-125 vac operation.

Section II. EQUIPMENT REQUIREMENTS

2-1. Equipment Required. Table 2-1 identifies the specific equipment used in this calibration procedure. This equipment is issued with secondary transfer Standards Calibration Set AN/GSM-256 and electronic maintenance shop sets and is to be used in performing this procedure. Alternate items may be used by the calibrating activity when the equipment listed in table 2-1 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 in table 2-1.

2-2. Accessories Required. The accessories listed in table 2-2 are issued with secondary transfer Standards Calibration Set AN/GSM-256 and electronic maintenance shop sets and are to be used in this calibration procedure. When necessary, these items may be substituted by equivalent items.

Table 2-1. Minimum Specifications of Equipment Required

Item	Common name	*Minimum we specifications*	[1]Manufacturer, model, National stock number, and military designation
A1	METER CALIBRATOR	Current Range: .03 to 20.50 amperes. Voltage Range: 0 to 50 volts. Accuracy: ±1.25%	[2]John Fluke, Model 760A (TS-2734/U) (6625-00-935-7002).
A2	METER TEST SET.	Current Range: .03 to 20.50 amperes. Voltage Range: 0 to 50 volts Accuracy: ±1.25 %	TS-682/GSM-1 (6625-00-669-0747).

[1]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 of 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.

[2]Issued with AN/GSM-256.

Table 2-2. Accessories Required

Item	Common name	Description or identifying number
B1	Variable power transformer	CN-16/U or W010MT3S3
B2	Storage battery	BB-433/U, Aircraft type (24 volts)[1]
B3	Power supply	PP-3940/G or CS 36CR30 (19 volts dc required)[2]
B4	Cable assembly	CX-9064/ASM-137 (p/o test instrument)
B5	Cable assembly	Alligator clip to single banana plug (red)
B6	Cable assembly	Alligator clip to single banana plug (blk)

[1]Obtain on temporary loan basis from shop that is submitting test instrument or calibration.
[2]Issued with AN/GSM-256.

Section III. PRELIMINARY OPERATIONS

3-1. Preliminary Instruction. *a.* Remove Test Instrument from protective cover.

b. Remove one lead from ammeter rear terminals.

c. Using meter mechanical adjustments, adjust voltmeter and ammeter for zero indication.

NOTE
Do not attempt to adjust hermetically sealed meters having solder sealed zeroing adjustments.

d. Verify that the line voltage and frequency to be used during calibration of this Test Instrument remains at 115 volts ac 60 Hz by monitoring with variable power transformer (B1).

3-2. Equipment Setup. Using test leads supplied with meter test set (A2), connect meter test set dc voltage output to rear terminals of Test Instrument voltmeter observing correct polarity.

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

Section IV. CALIBRATION PROCESS

4-1. Timer Accuracy. *a. Performance Check.*

(1) Set Test Instrument timer control to indicate 4 (hours).

(2) Monitor Test Instrument timer with a clock in known good condition for a period of one hour.

(3) At the end of the one hour period Test Instrument timer should indicate a minimum of 58 minutes.

b. Adjustments. No adjustments can be made.

NOTE
During the performance of the timer accuracy check proceed with the following calibration checks and adjustments.

4-2. Voltmeter Accuracy. *a. Performance Check.* Adjust meter test set (A) output voltage for Test Instrument indications listed in table 4-1. Meter test set output voltage shall be within limited listed in table 4-1.

b. Adjustments. No adjustments can be made.

4-3. Voltmeter Accuracy Using AN/GSM-256 Calibration Facility. *a. Performance Check.*

(1) Connect meter calibrator (A1) output terminals to rear terminals of Test Instrument voltmeter observing correct polarity.

(2) Adjust meter calibrator for output equal to first Test Instrument voltmeter indication listed in table 4-1. The Test Instrument will indicate within the limits specified for meter calibrator listed in table 4-1.

(3) Repeat technique of (2) above for each Test Instrument voltmeter indication. Test Instrument will indicate within limits specified for meter calibrator listed in table 4-1.

b. Adjustments. No adjustments can be made.

Table 4-1. Voltmeter Accuracy

Test Instrument voltmeter indication	Meter calibrator dc output voltage	
	minimum	maximum
40	39.2	40.8
30	29.2	30.8
20	19.2	20.8
10	9.2	10.8

4-4. Ammeter Accuracy. *a. Performance Check.*

(1) Using the test leads supplied with meter test set (A2), connect meter test set dc current output to rear terminals of ammeter on Test Instrument, observing correct polarity.

(2) Adjust meter test set output current for Test Instrument ammeter indications listed in table 4-2. Meter test set output current shall be within limits listed in table 4-2.

b. Adjustments. No adjustments can be made.

4-5. Ammeter Accuracy Using AN/GSM-256 Calibration Facility. *a. Performance Check.*

(1) Connect meter calibrator (A1) output terminals to rear terminals of Test Instrument ammeter observing
correct polarity.

(2) Using meter calibrator controls in current mode, check the percent of error for the Test Instrument indication of + 10. The Test Instrument error will be within ± 2 percent.

(3) Repeat technique of (2) above for Test Instrument indications of +5, -5, and -10. The Test Instrument error will be within ±2 percent.

b. Adjustments. No adjustments can be made.

Table 4-2. Ammeter Accuracy

Test Instrument ammeter indication (amps)	Meter test set output current (amps dc)	
	minimum	maximum
+20	19.6	20.4
+ 15	14.6	15.4
+10	9.6	10.4
+ 5	4.6	5.4
-5[1]	4.6	5.4
-10	9.6	10.4
-15	14.6	15.4
-20[2]	19.6	20.4

[1]Reverse meter test set leads to unit under test ammeter
[2]Reconnect ammeter rear terminal lead upon completion of this check

4-6. Charge Current. *a. Performance Check.*

(1) Set the Test Instrument AC POWER ON-OFF switch to OFF.

(2) Connect cable assembly (B4) to Test Instrument BATTERY CABLE connector and terminals of storage battery (B2).

NOTE

For proper calibration of Test Instrument charge current parameter, storage battery (B2) should be a partly discharged known good battery.

(3) Set Test Instrument controls as follows:

(*a*) SELECTOR switch to MA-5

(*b*) AUTOMATIC CYCLE-MANUAL DISCHARGE switch to AUTOMATIC CYCLE.

(4) Connect the Test Instrument power cable to the 115 volt 60 Hz power source.

(5) Set Test Instrument AC POWER ON-OFF switch to ON.

(6) Set Test Instrument TIMER switch to 2 MAIN CHARGE.

(7) Observe that Test Instrument AMPERES meter indicates approximately 15 amperes. If not, perform *b* (1) below.

(8) Set Test Instrument TIMER switch to 4 TOPPING and observe that Test Instrument AMPERES meter indicates approximately 8.5 amperes. If not, perform *b* (2) below. Set the TIMER switch to (6) OFF, set AC POWER ON-OFF to OFF and disconnect the battery.

b. Adjustments.

(1) Adjust R32 for Test Instrument indication of 15 amperes. (R)

(2) Adjust R33 for Test Instrument indication of 8.5 amperes (R)

4-7. Discharge Current. *a. Performance Check.*

(1) Set Test Instrument AUTOMATIC CYCLE-MANUAL DISCHARGE switch (S3) to MANUAL DISCHARGE.

(2) Connect the negative lead of power supply (B3) to Test Instrument chassis ground and the positive lead to pin 2 of AUTOMATIC CYCLE-MANUAL DISCHARGE (S3-c) switch using cable assemblies B5 and B6. (Pin 2 is the pin connected to adjustable resistor R31.)

(3) Unlock and set variable resistor R31 fully clockwise (maximum resistance).

(4) Adjust power supply (B3) for an output of exactly 19 volts.

(5) Adjust R31 until relay K4 energizes. (Non-reportable adjustment)

(6) Lock R31 at this setting, turnoff and disconnect the power supply.

b. Adjustments. No further adjustment can be made.

4-8. Battery Low.

WARNING

Discharge capacitor C1 before performing this adjustment. DO NOT connect the ac input power cable and Cable Assembly, Electrical CX-9064/ASM-137.

a. Performance Check.

(1) Connect power supply (B3) negative lead to Test Instrument chassis ground and positive lead to positive terminal of Test Instrument capacitor C1. (C1 is the large capacitor located on the top rear of the main chassis.)

(2) Unlock and set variable resistor R30 fully clockwise (minimum resistance).

(3) Adjust power supply (B3) for an output of exactly 19 volts to energize Test Instrument relay K1.

(4) Adjust R30 clockwise until relay K1 deenergizes. (non-reportable adjustment).

(5) Lock R30 for this setting, turn off and disconnect the power supply.

b. Adjustments. No further adjustments can be made.

4-9. Final Procedure. *a.* Deenergize and disconnect all test equipment and install Test Instrument in protective cover.

b. In accordance with TM 38-750, annotate and affix calibration DA Label 80. When the Test Instrument cannot be adjusted to within tolerance, annotate and affix DA Form 2417 (Unserviceable or Limited Use Tag).

By Order of the Secretary of the Army:

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Distribution:
To be distributed in accordance with DA Form 12-36A, calibration literature requirements for AN/ASM-137.

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