DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR INDICATOR TEST SET AN/ASM-111 INCLUDING INDICATOR TEST SET TS-1626/ASM-111 AND GYRO SIMULATOR SM-253/ASM

Headquarters, Department of the Army, Washington, D. C.

31 October 1974

SECTION I

GENERAL

1. Purpose and Scope. a. This bulletin provides information for the periodic maintenance calibration of Indicator Test Set AN/ASM-111 including TS-1626/ASM and Gyro Simulator SM-253/ASM and is used by maintenance calibration personnel. Since maintenance calibration personnel are trained and qualified in the use of calibration test and measuring equipment, detailed instructions concerning the operation and use of these equipments are not contained in this bulletin.

*This bulletin supersedes TB 11-6625-480-35/1, 31 July 1967.

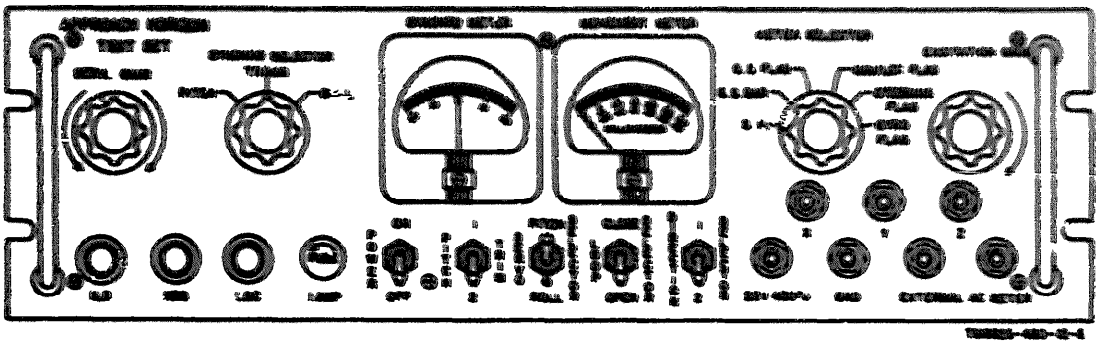

Figure 1. Indicator Test Set TS-1625/asm-111, front panel view

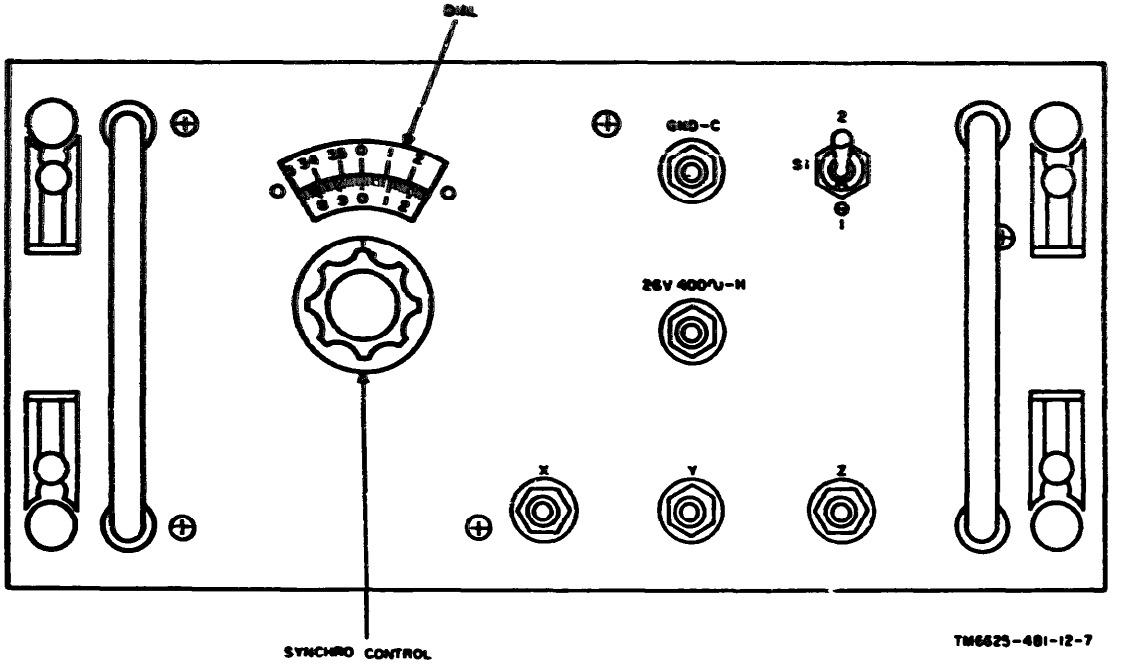

Figure 2. GYRO Simulator SM-253/ASM, front panel view

b. Integrated within this bulletin are illustrations showing 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.

2. Reporting of Technical Bulletin Improvements.

The reporting of errors, omissions, and recommendations for improving this bulletin by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-DS, Fort Monmouth, NJ 07703.

3. Description. **Indicator Test Set AN/ASM-111 including TS-1626/ASM-111 is a special purpose instrument used in testing flight navigational system altitude indicators. Gyro Simulator SM-253/ASM is a special purpose instrument for use in tests where simulator gyro signals are required to test attitude indicators. Additional data is listed in *a*, *b*, and *c* below.**

a. Identification.

(1) Indicator Test Set AN/ASM-111.

Nomenclature	Indicator Test Set AN/ASM-111 including TS-1628/ASM-111.
Federal stock number	6625-863-3400, 6625-973-3408
Line item number	685927
Size	11 3/4% by 22 1/2 by 9 1/4 in
Weight	13 lb.
Reference	TM 11-625-480-12 C1, 2 TM 11-6625-480-45.

(2) Gyro Simulator SM-253/ASM

Nomenclature	Gyro Simulator SM-253/ASM
Federal stock number	6625-860-9290
Line item number	T56813
Size	6 3/4 by 10 1/2 by 6 3/4 in
Weight	4 3/4 lb
Reference	TM 11-6625-480-12 TM 11-6625-480-45

b. Specifications.

(1) Indicator Test Set AN/ASM-111.

Input requirements:[1]	
Voltage	**115 volts, 400 cps, single phase, ac.**
Current	**300 milliamperes**
Simulated gyro signal	**Three 11.2 volt 400 cps, ac simulated synchro signals**
Outputs:[1]	
Gyro simulator excitation and attitude indicator excitation and switch test voltages	**26 volts, 400 cps, single phase, ac.**
Attitude indicator illuminating lamp voltage	**5 volts, 400 cps, single phase, ac.**
Simulated gyro signal	**Three 11.2 volt, 400 cps, ac simulated synchro signals**
Servo drive signal	**0 to 7 volts, 400 cps, single phase, ac.**
Meter movement test currents:	
With METER SELECTOR switch set to G. S. BAR G. S. FLAG, or GYRO FLAG	**0 to 3.0 milliaperes, dc.**
With METER SELECTOR swetch set to NAV/LOC FLAG, S. N. or STEERING FLAG	0 TO 3.0 milliaperes, dc
MOVEMENT METER:	
Type	Dc microammeter
Sensitivity	0 to 100 microamperes, ± 2percent.
Scales	0 to 3.0 milliamperes, and 0 to 0.3 milliampere.
SYNCHRO METER:	
Typel	Dc microammeter
Sensitivity 1	100 microamperes, ± 2 percent.
Resistancel	--1,000 ohms, + percent.
Scale	-20 to 0 to + 20 scale. divisions.

(2) Gyro Simulator SM-253/ASM.

Input requirements 1	
Voltage	-26 volts ac. 400 cps.
Output signals	Three 112 volt, 400 cps simulated synchro signals
Dial.	
Range	- 0° to 360°
Accuracy	±01°

c Program Data.

Time required for calibration	- 2 hours (approx)
Technique	-------Dc-low frequency.

1 These specifications are for information only and are not necessarily verified in this procedure

4. General Instructions. a. Calibration Reporting. During the performance of this procedure, annotate DA Form 2416 in accordance with TM 38-750. Adjustments to be reported are designated (R) at the end of the sentance in which they appear.

b. Unit Under Test.

(1) Indicator Test Set TS-1626/ASM-111 will be referred to as *unit under test.*

(2) Gyro Simulator SM-253/ASM will be referred to as *unit under test.*

c. Frequency of Calibration. The maximum time permitted between calibration of the TS-1626/ASM-111 and the SM-253/ASM will be in accordance with instructions given in TB 43-180.

d. Removal. Do not remove the unit under test from its protective case unless necessitated by equipment connections and/or components to be adjusted which are not accessible from external ports provided on the unit under test.

5. Differences Among Models. None.

SECTION II

CALIBRATION

6. Equipment Required. Equipment required for calibration performance checks and adjustments is listed in table 1. When any of the equipment listed in table is not available, an equivalent calibrated item may be used.

Table 1. Equipment Required for Calibration Performance Checks and Adjustments

A-Authorized Equipment

Item	Minimum use specifications	Calibration equipment [1]
A1 Voltmeter, Electronic	Range: 0.001 to 30 Vac Accuracy: ±2%	ME-30( )/U or Singer model 316
A2 Voltmeter, Electronic	Range: 0 to 10 Vdc Accuracy: ±0.05%	ME-202/U or Dana model 5703-S-2127

[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 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.

B-Authorized Accessories

Item	Federal stock No.	Description
B1 Adapter	4931-739-4420	Single banana jack to alligator clip (blk)
B2 Lead, electrical[2]	6625-957-9299	24 in.No.18 (red) single banana plug terminations
B3 Lead, electrical[2]	6625-957-9300	24 in.No.18 (black)single banana plug terminations
B4 Jumper wire	NSN	Used in paragraph 10b (3).

[2] Two Required.

Note. **Personnel must familiarize themselves with the entire procedure prior to performing calibration.**

7. Preliminary Procedure. ***a.*** **Observe that the SYNCHRO METER and MOVEMENT METER indicate zero. If they do not, adjust the mechanical zero controls for zero indications.**

b. **Set the unit under test POWER switch to OFF, and connect the power input cable to a 115-volt, 400-cps source. Refer to figure 1 for location of all controls; position controls as indicated in (1), (2), and (3) below.**

(1) Set the LOOP SELECTOR switch to OPEN.

(2) Adjust the EXCITATION GAIN control fully counterclockwise.

(3) Set the POWER switch to ON.

Note. **Paragraphs 8 through 10 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 correrponding 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. Test Set SYNCHRO METER. a. Performance Check.

(1) On the unit under test, connect electrical lead 6625-957-9299 between jack X and the red EXTERNAL AC METER jack, and electrical lead 6625-957-9300 between jack Y and and black EXTERNAL AC METER jack.

(2) **Turn the SYNCHRO SELECTOR switch to TRANS.**

(3) Turn the SERVO GAIN control fully clockwise.

(4) Observe that the SYNCHRO METER indicates between 10 and 18, and deflects right.

(5) **Turn the SERVO GAIN control fully counterclockwise.**

(6) Observe that the SYNCHRO METER indicates between 10 and 18, and deflects left.

(7) Turn the SYNCHRO SELECTOR Switch to ROLL,

(8) **Observe that the SYNCHRO METER indicates zero.**

b. Adjustments.

(1) Repeat the procedures given in (7) and (8) above, and adjust the ZERO ADJUST control, located on rear of unit under test, for a zero indication on the SYNCHRO METER.

(2) Repeat the procedures given in *a* (2) through (8) above. (R)

9. Test Set MOVEMENT METER. a. Performance Check.

(1) Connect electronic voltmeter (A2) to either end of R12 (fig. 3) with electrical lead 6625-957-9299 and adapter 4931-739-4422, and to EXTERNAL AC METER (black) terminal with electrical lead 6625-957-9300.

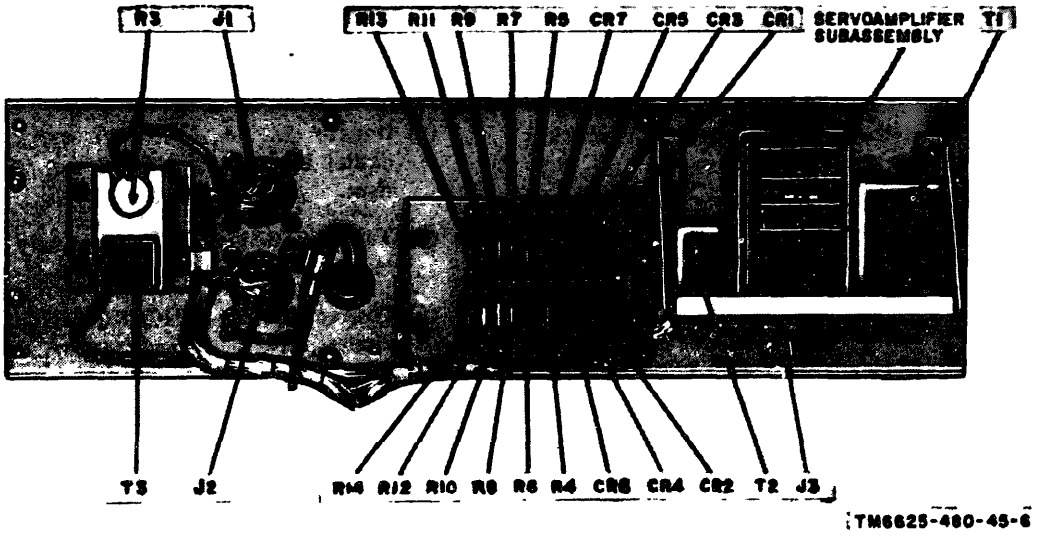

Figure 3. Test Set AN/ASM-111 rear panel assembly, parts locations.

(2) Set the DIRECTION SELECTOR switch to 1.

(3) Adjust the EXCITATION GAIN control and the METER SELECTOR switch as shown in table 2 and observe that the voltmeter (A2) indicates within the limits specified.

b. Adjustments. No adjustments can be made.

Table 2. MOVEMENT METER Check

METER SELECTOR switch position	Adjust EXCITATION GAIN control for MOVEMENT METER indication	Electronic Voltmeter (A2) indication (volts dc)	
		minimum	maximum
S. N.	3.0	6.10	6.48
S N.	2 5	5.05	5.43
S. N.	2 0	4.0	4.38
S N	1.5	2.96	3 33
S. N.	1 0	1.91	2.28
S N	0.5	0.86	1.24
G S BAR	0 30	0 592	0 630

10. Simulator Synchro Transmitter. *a. Performance Check.*

(1) Connect the GND-C and 26V 400Ω connectors on the unit under test to the GND and 26V 400Ω connectors of the TS-1626/ASM-111 with electrical leads 6625-957-9299 sad 6625-957-9300. Allow equipment to warmup for approximately 15 minutes.

(2) Connect the X jack on the unit under test to the electronic voltmeter (A1) INPUT jack, and the Y jack on the unit under test to the electronic voltmeter

GND with electrical leads 6625-957-9299 and 6625-957-9300.

(3) Rotate the synchro control knob on the unit under test toward 0° until a null indication is obtained on the electronic voltmeter. As the null is approached, continuously decrease the ranges on the voltmeter until an absolute minimum indication is obtained. The dial on the unit under test should indicate between 359.9° and 0.1°.

(4) Rotate the synchro control knob on the unit under test toward a 90° indication on the dial scale. A maximum voltage should be obtained on the voltmeter when the dial indicates between 89.9° and 90.1°.

(5) Rotate the synchro control knob on the unit under test to 180°. A null indication should be obtained when the dial indicates between 179.9° and 180.1°.

(6) Rotate the synchro control knob on the unit under teat to 270°. A maximum voltage should be obtained on the voltmeter when the dial indicates between 269.9° and 270.1°.

6. Adjustments.

(1) Remove the rear panel on the unit under test.

(2) Rotate the synchro control knob on the unit under test to get a dial scale indication of exactly 0°.

(3) Connect the voltmeter between the X and 26V 400(U -H jacks on the unit under test. Connect a jumper wire between the GND-C and Z jacks.

(4) Loosen the three screws which hold the synchro transmitter and rotate the body of the synchro transmitter until a maximum voltage indication is obtained on the voltmeter (approx. 37.8 volts).

(5) Disconnect thee jumper wire and the voltmeter and connect the voltmeter the voltmeter between jacks X and Y.

(6) Rotate the body of the synchro transmitter (approx 30°) until a null indication is obtained on the voltmeter.

(7) Tighten the three screws that hold the synch. Be sure the voltmeter still indicates null when the screws are tightened.(R)

(8) Replace the rear panel.

11. Anal Procedure. a. Deenergize and disconnect all test equipment, and install the unit under test in protective cover.

b. In accordance with instructions given in 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 red tag, DA Form 2417 (Unserviceable or Limited Use Tag).

By Order of the Secretary of the Army:

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MICROFORM
TEST TARGET

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