DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR FLIGHT CONTROL SET TEST SET AN/ASM-330

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

SECTION I

INTRODUCTION AND DESCRIPTION

1-1. Purpose and Scope. This bulletin provides information for the periodic calibration of Flight Control Set Test Set AN/ASM-330. It is to be used by personnel trained and qualified in the use of calibration equipment. Since calibration personnel are trained and qualified in the use of test and measuring equipment, detailed instructions concerning the operation and use of these equipments are not contained in this bulletin.

1-2. Reporting of Technical Bulletin Improvements= The reporting of errors, omissions, and recommendations for improving this bulletin is authorized and encouraged. Submit-reports on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, US Army Electronics Command, ATTN: AMSEL-MA-Q, Fort Monmouth, NJ 07703.

1-3. Descriptive Data. Flight Control Set Test Set AN/ASM-330 provides for in-helicopter testing and troubleshooting of Flight Control Set AN/ASW-29. The AN/ASM-330 is also used as an integral part of the bench test setup in conjunction with Flight Control Set Test Bench Set AN/ASM-329.

a. Identification.

Nomenclature	Test Set, Flight Control Set AN/ASM-330
National stock number	4920-00-087-6644
Manufacturer	United Aircraft Corp. Sikorsky Aircraft Division
Model number	6470-90120-041
Size	12.5 X 21.25 X 13.5 in
Weght	39.625 lbs
Reference	TM 11-4920-293-12 and TM 11-4920-293-45

b. Specifications.

Input voltage:	
AC	1115 ± Vac, single phase, 400 ± 20 Hz
DC	27.5 ± 0.5 Vdc
Output signal	
In-helicopter test	24 mA ± 4%
Bench testing	0 to 0.5 (±0) Vac 0 to 5 (±0) Vac
Meter movement (SERVO MONITOR)	10-0-10 mA ±4% Full scale

c. Calibration.

Time required	2 hours (approx)
Technique	Dc - low frequency
Interval	In accordance with TB 43-180

1-4. General Instructions. a. Calibration Reporting.

(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 33-750 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. When adjustments are in tables, the (R) will follow the designated adjustment. Report only those adjustments made and designated with (R).

b. Test Instrument. Flight Control Set Test Set AN/ASM-330 will be referred to as the Test Instrument.

1-5. Differences Among Models. None.

SECTION II
EQUIPMENT REQUIREMENTS

NOTE

Minimum use specifications are the principal parameters required for performance of the calibration, and are included to assist in the selection of alternate equipment, which may be used at the discretion of the calibrating activity. Satisfactory performance of alternate items shall be verified prior to use. All applicable equipment must bear evidence of current calibration.

2-1. Equipment Required. Equipment required for calibration performance tests is listed below.

Common name	Minimum use specifications	Calibration equipment*
Oscilloscope	Range: horizontal sensitivity 2V/CM; vertical sensitivity 50V/CM Accuracy: ±3%	AN/USM-281 or TEK RM561A (7910655-2)
Voltmeter	Range: 0 to 30 Vdc Accuracy: ±1%	ME-202/U or Dana 5703 (7912606)
Stopwatch	Range: 0-60 seconds	Cleber Watch Co. 382
Variable dc power supply	Range: 0 to 28 Vdc Accuracy: ±4%	TS-656/U or NJE CS36CR30 (7907346-2)

*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

2-2. Accessories Required. Accessories required for calibration performance tests are listed below.

Common Name	Description
Cable Assembly (two required)	24 m. banana plug to banana plug with pm adapter (red)
Cable Assembly (two required)	24 in. banana plug to banana plug with pm adapter (black)

SECTION III

CALIBRATION PROCESS

NOTE

It is recommended that personnel familiarize themselves with the entire procedure before performing calibration.

3-1 Preliminary Procedure. a. Remove Test Test Intrument case top cover.

b. Set POWER switches to OFF. Position all switches to OFF or center.

c. Connect pins A and B of J235 to the positive test lead of 115 Vac, 400 Hz power source and pin C of J235 to the negative test lead.

d. Connect oscilloscope vertical input and ground test leads to Test Instrument VOLTAGE 0B and PWR GRD test jacks respectively.

e. Connect oscilloscope horizontal input and ground test leads to Test Instrument PITCH DISPL GYRO and PWR GRD test jacks respectively.

f. Turn Test Instrument 115V 400-POWER switch to ON and allow 10 minutes for equipment warmup.

WARNING

HIGH VOLTAGE is used during the performance of this calibration.

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.

3-2. Sensor Simulator Phase Circuit Test. a. Performance Check.

(1) Set oscilloscope horizontal sensitivity control for 2 volts/cm and vertical sensitivity control for 50 volts/cm.

(2) Turn CHANNEL SELECTOR switch to PITCH/ROLL.

(3) Turn PITCH/ROLL switch to PITCH DISPL GYRO.

(4) Set SIGNAL PHASING control to 0 IN.

(5) Turn SIGNAL LEVEL AC VOLTS to +0 maximum. The oscilloscope indicates an in-phase condition. (A line slanting upward to the right.)

NOTE

Some oscilloscopes may indicate 180° out of phase condition.

(6) Set SIGNAL PHASING to to 0 OUT. The oscilloscope shall indicate an out-of-phase condition. (A line slanting upward to the left).

(7) Turn SIGNAL LEVEL AC VOLTS to -0 maximum. The oscilloscope indicates an m-phase condition. (A line slanting upward to the right).

(8) Turn PITCH/ROLL control to OFF.

(9)Turn CHANNEL SELECTOR to ALT/YAW.

(10) Set SIGNAL PH SING to # IN.

(11) Turn ALT/YAW to AUTO PLT ALT CONT.

(12) Remove oscilloscope horizontal input test lead from TEST PITCH DISPL GYRO test jack and connect to TEST AUTO PLT ALT CONT test jack

(13) Repeat 5, 6, and 7 above.

b. Adjustments. No adjustments can be made.

3-3. DC TEST Switch Circuit Test a. Performance Check.

(1) Connect positive lead of variable dc power supply to pin GG of J235 and negative lead to PWR GRD.

(2) Adjust dc power supply for 28 volt output.

(3) Turn DC TEST switch to AN/ASW-29 POWER. DC TEST lamp shall illuminate.

(4) Connect positive lead of dc power supply to pin EE of J235.

(5) Turn DC TEST switch to YAW SYNC B+. DC TEST lamp shall illuminate.

(6) Connect positive lead of dc power supply to pin FF of J235.

(7) Turn DC TEST switch to BAR ALT ENG. DC TEST lamp shall illuminate.

(8) Connect positive lead of dc power supply to pm G of J235.

(9) Turn DC TEST switch to AUX STK ENG. DC TEST lamp shall illuminate.

(10) Connect positive lead of dc power supply to pin BB of J235.

(11) Turn DC TEST switch to NORM STK ENG. DC TEST lamp shall illuminate.

(12) Turn DC TEST switch to OFF.

(13) Connect positive lead of dc power supply to pin HH of J235. AN/ASW-29 ENGAGE lamp shall illuminate.

(14) Turn 28 VDC POWER switch to OFF.

b. Adjustments. No adjustments can be made.

3-4. Sweep Generator Circuit Test, a. Performance Check.

(1) Set stopwatch to zero.

(2) Connect the 28 volt dc source to pm D of connector J235.

(3) Turn voltmeter to 3V scale.

(4) Connect dc probe of voltmeter to pin J of J235 and common probe ot PWR GRD.

(5) Set HARDOVER TEST switches (ALT, PITCH, ROLL, YAW) to center.

(6) Set 27 VDC POWER switch to ON.

(7) Set SIGNAL PHASING switch to 0 IN and simultaneously start stopwatch. Stop stopwatch when voltmeter indicates 2.0 Vdc. Time shall be between 11 and 17 seconds.

(8) Set SIGNAL PHASING to OFF. Voltmeter shall indicate zero volts.

b. Adjustments. No adjustments can be made.

3-5. HARDOVER TEST Switch Circuitry Test. a. Performance Check.

(1) Check to see that the 27 VDC POWER switch is set to ON.

(2) Set HARDOVER TEST ALT switch to UP.

(3) Turn METER CHAN SELECT switch to OFF/CAL.

(4) Turn voltmeter to 30V scale.

(5) Connect dc probe of voltmeter to pin N of J235 and common probe to PWR GRD. Voltmeter shall indicate between 25 and 29 Vdc.

(6) Set HARDOVER TEST ALT to DOWN and connect de probe of voltmeter to pm P of J235. The voltmeter shall indicate between 25 and 29 Vdc.

(7) Set HARDOVER TEST ALT to center and set HARDOVER TEST PITCH to FWD. Connect dc probe of voltmeter to pin U of J235. Voltmeter shall indicate between 25 and 29 Vdc.

(8) Set HARDOVER TEST PITCH to AFT and connect dc probe of voltmeter to pm T of J235. The voltmeter shall indicate between 25 and 29 Vdc.

(9) Set HARDOVER TEST PITCH to center and set HARDOVER TEST ROLL to LEFT. Connect dc probe of voltmeter to pin S of J235. Voltmeter shall indicate between 25 and 29 Vdc.

(10) Set HARDOVER TEST ROLL to RIGHT and connect dc probe of voltmeter to pin R of J235. The voltmeter shall indicate between 25 and 29 Vdc.

(11) Set HARDOVER TEST ROLL to center and set HARDOVER TEST YAW to LEFT. Connect dc probe of voltmeter to pin L of J235. Voltmeter shall indicate between 25 and 29 Vdc.

(12) Set HARDOVER TEST YAW to RIGHT and connect dc probe of voltmeter to pm M of J235. The voltmeter shall indicate between 25 and 29 Vdc.

b. Adjustments. No adjustments can be made.

B-6. SERVO MONITOR Network Test

NOTE

Upon completion of each SERVO MONITOR power application step, return power to zero.

a. Performance Check.

(1) Set 115 VAC 400-and 27 VDC POWER witches to OFF.

(2) Set HARDOVER TEST switches (ALT, PITVH, ROLL, and YAW) to center.

(3) Turn METER CHAN SELECT switch to OFF/CAL.

(4) Turn voltmeter to 10V scale.

(5) Connect dc probe of voltmeter to METER CAL VDC red test jack and common probe to black test jack.

(6) Connect positive lead of dc power supply to METER CAL VDC red test jack and negative lead to black test jack.

(7) Turn variable dc power supply on and adjust the power supply until left deflection of 5.0 milliamperes is observed on SERVO MONITOR METER. The voltmeter shall indicate between 4.8 and 5.2 Vdc. (See Note above.)

(8) Turn METER CHAN SELECT switch to PITCH.

(9) Connect dc probe of voltmeter to TEST PITCH ELECTRONIC CONT AMPL A test jack and common probe to TEST PITCH ELECTRONIC CONT AMPL F test jack.

(10) Connect positive lead of dc power supply to pin T of J235 and negative lead to pin U of J235.

(11) Adjust dc power supply until right deflection of 5.0 milliamperes is observed on SERVO MONITOR METER. Voltmeter shall indicate between 4.8 and 5.2 Vdc. (See Note above.)

(12) Turn METER CHAN SELECT switch to ROLL.

(13) Connect dc probe of voltmeter to TEST ROLL ELECTRONIC CONT AMPL R test jack and common probe to TEST ROLL ELECTRONIC L test jack.

(14) Connect positive lead of dc power supply to pm R of J235 and negative lead to pin S of J235.

(15)Adjust dc power supply until right deflection of 5.0 milliamperes IS observed on SERVO MONITOR METER. The voltmeter shall indicate between 4.8 and 5.2 Vdc. (See Note above.)

(16) Turn METER CHAN SELECT switch to ALT.

(17) Connect dc probe of voltmeter to TEST ALT ELECTRONIC CONT AMPL D test jack and common probe to TEST ALT ELECTRONIC CONT AMPL U test jack.

(18) Connect positive lead of dc power supply to pm P of J235 and negative lead to pin N of J235.

(19) Adjust dc power supply until right deflection of 5.0 milliamperes IS observed on SERVO MONITOR METER. The voltmeter shall indicate between 4.8 and 5.2 Vdc. (See Note above.)

(20) Turn METER CHAN SELECT switch to YAW.

(21) Connect dc probe of voltmeter to TEST YAW SERVO AMPL R test jack and common probe to TEST YAW SERVO AMPL (ELECTRONIC CONT

AMPL) L test jack.

(22) Connect positive lead of dc power supply to pin M of J235 and negative lead to pin L of J235.

(22)Adjust dc power supply until right deflection of 5.0 milliamperes is observed on SERVO MONITOR METER. The voltmeter shall indicate between 4.8 and 5.2 Vdc. (See Note above.)

b. Adjustments. No adjustments can be made.

3-7. Final Procedure. a. Deenergize and disconnect all equipment.

b. Replace the Test Instrument protective cover.

a In accordance with TM 38-750, annotate and affix DA Label 80 US Army Calibration System). When the Test Instrument cannot be adjusted within tolerance, annotate and affix red tag, DA Form 2417 (Unserviceable or Limited Use Tag).

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-36A (qty rqr block no. 947), calibration requirements for AN/ASM-330.

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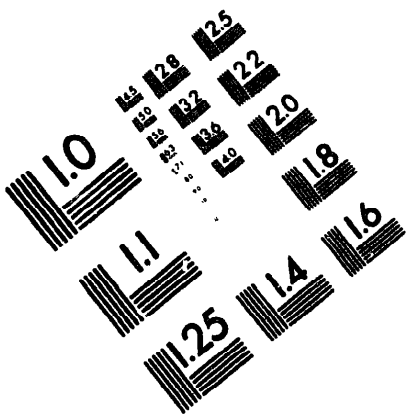

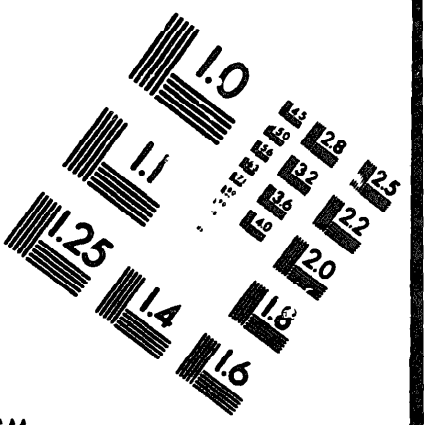

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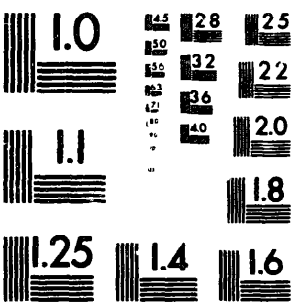

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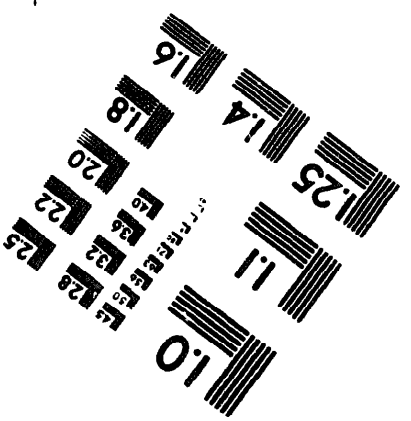

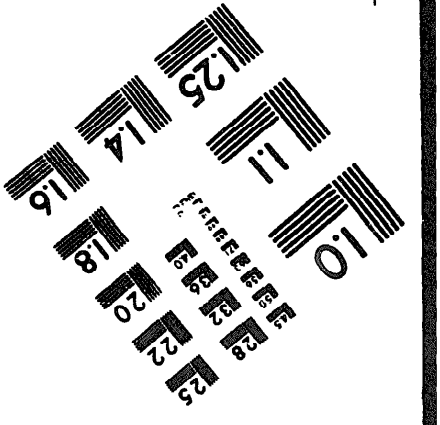

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