*TB 9-4920-362-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR TEST BOX ASSY PILOT ASSIST/NULLING SIRKORSKY, MODEL 70700-20678-041

Headquarters, Department of the Army, Washington, DC
11 July 1983

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*This bulletin supersedes TB 55-4920-421-50, 16 May 1980.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Test Box Assy Pilot Assist/Nulling, Sirkorsky, Model 70700-20678-041. TM 55-4920-414-13&P was used as the prime data source in compiling these instructions. The equipment being calibrated will be referred to as the TI (test instrument) throughout this bulletin.

a. Model Variations. None.

b. Time and Technique. The time required for this calibration is approximately 2 hours, using the dc and low frequency technique.

2. DA Form 2416 (Calibration Data Card)

a. Forms, records, and reports required for calibration personnel at all levels are prescribed by TB 750-25-1. DA Form 2416 must be annotated in accordance with TB 750-25-1 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. When adjustments are in tables, the (R) follows the designated adjustment. Report only those adjustments made and designated with (R).

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

Table 1. Calibration Description

Test instrument parameters	Performance specifications
Power requirements	115 V ac, 60 Hz ±10%; 28 V dc ±1%
Dc volts	Range: -15.5 To +28.5 V Accuracy: ±1.8%
Dc current	Range: -10.5 To +10.5 mA Accuracy: ±5%

SECTION II
EQUIPMENT REQUIREMENTS

4. Equipment Required. Table 2 identifies the specific equipment to be used in this calibration procedure. This equipment is issued with Secondary Transfer Calibration Standards Set AN/GSM-286. Alternate items may be used by the calibrating activity when the equipment listed in table 2 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. The accuracies listed in table 2 provide a four-to-one ratio between the standard and TI.

5. Accessories Required. The accessories listed in table 3 are issued as indicated in paragraph 4 above and are used in this calibration procedure. When necessary, these items may be substituted by equivalent items, unless specifically prohibited.

Table 2. Minimum Specifications of Equipment Required

Item	Common name	Minimum use specifications	Manufacturer and model (part number)
A1	AUTOTRANSFORMER	Range: 115 V ac Accuracy: ±1%	General Radio, Model W10MT3AS3 (7910809)
A2	DC POWER SUPPLY	Range: 28 V dc	NJE, Model CS36CR30D2 (7907346-2)
A3	DIGITAL MULTIMETER	Range: -10.5 to +10.5 mA Accuracy: ±1.25%	Tektronix, Type DM501A (DM501A)
A4	DIGITAL VOLTMETER	Range: -15.5 to +28.5 V dc Accuracy: ±0.45%	Hewlett-Packard, Model 349AOPT060 (3490AOPT060)

Table 3. Accessories Required

Item	Common name	Description (part number)
B1	ADAPTER	Single banana jack to pin plug (black) (7907528)
B2	ADAPTER	Single banana jack to pin plug (red) (7907517)
B3	LEAD	24-in., No. 18; single banana plug terminations (black) (7907498)
B4	LEAD	24-in., No. 18; single banana plug terminations (red) (7907497)
B5	LEAD[1]	Miniature pin jack with 12-in., No. 16 wire attached (fabricated locally)
B6	LEAD[2]	Pin jack to single banana plug (7921032)

[1]Two required.
[2]Three required.

SECTION III
CALIBRATION PROCESS

6. Preliminary Instructions

a. The instructions outlined in paragraphs **6** and **7** are preparatory to the calibration process. Personnel should become familiar with the entire bulletin before beginning the calibration.

b. Items of equipment used in this procedure are referenced within the text by common name and item identification number as listed in tables 2 and 3. For the identification of equipment referenced by item numbers prefixed with A, see table 2, and for prefix B, see table 3.

WARNING

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

NOTE

Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in TM 55-4920-414-13&P for this TI.

NOTE

Unless otherwise specified, all controls and control settings refer to the TI.

7. Equipment Setup

a. Position controls as listed in (1) through (6) below:

(1) AC POWER switch to OFF.

(2) DC POWER switch to OFF.

(3) TRIM switch to OFF.

(4) SAS switch to OFF.

(5) BOOST switch to OFF.

(6) POWER AC and DC circuit breakers to IN.

b. Connect autotransformer (A1) to AC POWER connector, using cable supplied with TI.

c. Connect autotransformer to a 115-V ac, 60-Hz power source and adjust for 115-V ac output.

d. Connect dc power supply (A2) positive terminal to DC POWER connector pin B and negative terminal to pin A, using two leads (B5).

e. Connect digital voltmeter (A4) to dc power supply, using leads (B3 and B4).

f. Adjust dc power supply for a 28-V dc indication on digital voltmeter and then disconnect digital voltmeter from equipment setup.

g. Set AC POWER and DC POWER switches to ON and allow at least 20 minutes for equipment to warm-up.

8. Dc Voltage

a. Performance Check

(1) Set AC POWER and DC POWER switches to OFF.

(2) Connect digital voltmeter (A4) to connector J466R pin 1 (+) and pin 2 (-), using two leads (B6).

(3) Set AC POWER, DC POWER, and TRIM switches to ON. Digital voltmeter will indicate between 27.5 and 28.5 V dc.

(4) Set DC POWER and TRIM switches to OFF.

(5) Disconnect leads from J466R and connect to J468R pin 1 (+) and pin 2 (-).

(6) Set DC POWER switch to ON. Digital voltmeter will indicate between 27.5 and 28.5 V dc.

(7) Set DC POWER switch to OFF.

(8) Disconnect leads from J468R and connect to J469R pin 1 (+) and pin 2.

(9) Repeat (6) and (7) above.

(10) Disconnect digital voltmeter from equipment setup.

(11) Set AC POWER switch to OFF.

(12) Connect digital voltmeter positive side to +15VDC and negative side to SIG GRD (front panel), using adapters and leads (B1, B2, B3, and B4).

(13) Set AC POWER switch to ON. Digital voltmeter will indicate between 14.5 and 15.5 V dc.

(14) Set AC POWER switch to OFF.

(15) Disconnect adapter and lead from +15VDC and connect to -15VDC.

(16) Set AC POWER switch to ON. Digital voltmeter will indicate between -14.5 and -15.5 V dc.

(17) Set AC POWER switch to OFF.

(18) Connect cable WI (supplied with TI) to connector J3 (rear of TI).

(19) Connect digital voltmeter positive side to pin 4 at other end of cable W1 marked TO PITCH TRIM ACTUATOR, using lead (B6). Connect digital voltmeter negative side to SIG GRD, using lead and adapter (B2 and B3).

(20) Set AC POWER switch to ON. Digital voltmeter will indicate between 14.5 and 15.5 V dc.

(21) Repeat technique of (17), (19), and (20) above at connections listed in table 4. Digital voltmeter will indicate within limits specified.

Table 4. Dc Voltage

Test instrument		Digital multimeter indications (V dc)	
TO PITCH TRIM ACTUATORR connector	Test points position XDCR	Min	Max
Pin 7	---	+14.5	+15.5
Pin 8	---	-14.5	-15.5
Pin 5	---	-14.5	-15.5
Jumper pins 5 and 9[1]	Trim position[2]	-14.5	-15.5
Jumper pins 5 and 6[1]	Stick input[2]	-14.5	-15.5

[1]Use two leads (B6).
[2]Use adapter and lead (B1 and B4).

(22) Set AC POWER switch to OFF and disconnect cable W1 from TI.

b. Adjustments. No adjustments can be made.

9. Valve Current Meter

a. Performance Check

(1) Connect cable W2 (supplied with TI) to connector J3 on TI.

(2) Connect digital multimeter (A3) mA terminal to pin 2 of SAS ACTUATOR end of cable W2, and LOW terminal to pin 1, using two leads (B6).

(3) Set TRIM COIL SELECT switch to BOTH.

(4) Set AC POWER switch to ON.

(5) Adjust CURRENT CONTROL cw toward INCR until valve current meter indicates -10.00 mA. If digital multimeter does not indicate between -9.50 and -10.50 mA, perform **b** below.

(6) Set AC POWER switch to OFF.

(7) Repeat technique of (2) through (6) above at connection and switch positions listed in table 5. Digital multimeter will indicate within limits specified.

Table 5. Valve Current Meter

Digital multimeter connections to SAS ACTUATOR end of cable W2		TRIM COIL SELECT switch positions	Digital multimeter indications (mA)	
mA	LOW		Min	Max
Pin 2	Pin 1	1	-9.50	-10.50
Pin 2	Pin 1	2	0.0	0.0
Pin 2	Pin 1	BOTH[1]	+9.50	+10.50
Pin **4**	Pin 3	BOTH[2]	-9.50	-10.50
Pin **4**	Pin 3	BOTH[1]	+9.50	+10.50

[1]Adjust **CURRENT CONTROL** toward DECR until valve current meter indicates +10.00 mA.
[2]Adjust CURRENT CONTROL toward **INCR** until valve current meter indicates -10.00 mA.

b. Adjustments

(1) Set AC POWER switch to OFF.

(2) Remove TI from protective case.

(3) Set AC POWER switch to ON.

(4) Adjust CURRENT CONTROL until digital multimeter indicates 0.000.

(5) Adjust R15 (under circuit board, right front) until valve current meter indicates 00.00 with flashing polarity (R).

10. Final Procedure

a. Deenergize and disconnect all equipment and if required reinstall protective cover on TI.

b. When all parameters are within tolerance, annotate and affix DA Label 80 (US Army Calibrated Instrument). When the TI receives limited or special calibration, annotate and affix DA Label 163 (US Army Limited or Special Calibration). When the TI cannot be adjusted within tolerance, repair the TI in accordance with the maintenance manual. When repair is delayed for any reason or the TI cannot be repaired with local resources, annotate and affix DA Form 2417 (US Army Calibration System Rejected Instrument) and inform the owner/user accordingly in accordance with TB 750-25-1.

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By Order of the Secretary of the Army:

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