

EDO-AIRE MITCHELL

**AUTOMATIC
FLIGHT SYSTEMS**

AK514



EDO-AIRE MITCHELL
MINERAL WELLS, TEXAS

FAA APPROVED

FAA APPROVED FOR GRUMMAN AMERICAN MODELS AA-5, AA-5A AND AA-5B
PER STC SA3031SW-D

(14 VOLT SYSTEM)

AK514

NOTICE TO THE INSTALLER

The Approval of the installation of this system is not applicable to specific aircraft having other previously approved modifications, unless it is determined the interrelationship between this change and the other approved modifications will introduce no adverse effect upon the airworthiness of the aircraft.

AUTOPILOT R.F.I. INTERFERENCE

Due to the variety and hi-power of radio equipment often found in today's General Aviation Aircraft, there exists a potential radio transmission interference problem with other equipment in the aircraft. Because of this potential, the autopilot system is designed and constructed with R.F. shielding to prevent interference however, installation combinations can occur wherein minor interference is possible.

R.F.I. interference from radio transmissions usually are manifest in one of two ways, either by interference with the VOR deviation needle display or by causing the autopilot flight path to be displaced during transmissions.

The most common interference causes the VOR deviation needle to jump or swing while the transmitter is being keyed. This type of interference affects the autopilot only in radio coupled modes as the autopilot is coupled to the VOR indicator meter movement and therefore, sees any needle movement as a command. VOR needle interference is sometimes found to be wholly within the NAV - COM set, that is, radiation or conduction of transmission energy from the transmitter to the VOR receiver internally. When this is the case, there is little the installation technician can do to overcome the condition other than contact the field representative of the company involved for advice.

A much less common interference type is one in which radio transmissions affects the roll or pitch axis of the autopilot directly. This occurrence is caused by R.F. energy being radiated into the autopilot system and there being detected and fed as a signal to one or more of the autopilot

command channels. This problem is usually found only in aircraft equipped with high output power transmitters and varies with antenna types and mounting locations. The reflected power or standing waves on the antenna cable is probably the greatest single source of this trouble, however, an antenna located so it radiates into the cabin can also cause the problem. The effect of this interference on the aircraft flight path is usually an initial displacement and then resumption of the programmed flight path. The response is similar in both roll and pitch.

Often, due to the wave form of radio frequency energy and the wave length, (frequency) an interference problem will only be found on one or two isolated frequencies. In these cases simply moving the autopilot component suspected or the radio source by a few inches will correct the problem.

Occasionally a new autopilot installation will cause a deterioration in A.D.F. receiver operation quality. This is reverse of the previous problem wherein "noise" from the autopilot is transmitted to the radio. One source of "noise" in the autopilot is the 5KHZ oscillator in the amplifier. Oscillator noise can get into the A.D.F. system by both induction and radiation. A power buss common to both the autopilot and A.D.F. receiver is a good path for this type interference. If a separate power source corrects the problem then a filter, such as Mitchell part number 1A479, in one or both A+ leads will usually eliminate the interference. Radiation from autopilot cable and terminal ends, although very weak, can sometimes interfere with the A.D.F. receiver by radiation into the sense antenna, or loop, or both. Cable routing providing additional distance bet-

ween these items and additional shielding of the autopilot leads is usually best in these cases. Since the autopilot leads are already shielded, the most productive solution is usually routing.

An important area, often over looked, is the ground and ground path. It has been found in many aircraft that a considerable resistance builds up between adjacent sections of skin paneling and structure due to paint, primer, etc. This increases the resistance in the ground path for some equipment, which lowers the equipment tolerance to R.F.I. Sometimes it is advisable to add a braided ground strap to the equipment to assure a good ground.

Ground loops developing in cable shielding and the aircraft due to the existence of a ground potential difference can also cause problems. In some cases it might be necessary to connect only one end of a shielded cable to ground or even to isolate the autopilot amplifier from ground.

In summary, if an interference between the autopilot system and one or more of the radios is determined to exist, then one or more of the following cures should be tried in an effort to eliminate the interference.

1. Install a filter in one or all involved A+ leads.
2. Re-route antenna leads.
3. Re-route autopilot leads and cabling.
4. Relocate antenna.
5. Relocate autopilot component - Consult GADO office concerning approval of installation deviation.
6. Add ground straps to affected component(s).
7. Eliminate ground from one end of long ground shielded leads.
8. Isolate autopilot amplifier from ground.

FIELD SERVICE RECORD CARD - INSTALLATION

We have endeavored through this installation manual to provide you with complete and accurate installation information. You can help us improve and up-date this manual and the installation kit by reporting any errors, omissions, or discrepancies on this reporting sheet.

Fill out as completely as possible. Fold along the dotted lines and affix a stamp to the pre-addressed side.

Thank you

Director, Flight Engineering
EDO-AIRE MITCHELL
Mineral Wells, Texas

AK Number _____ Date of Manual _____

Aircraft Type and Model _____

Your Name _____

Your Company Name _____

Address _____

Phone Number: Area Code _____ Number _____ Extension _____

Page

Discrepancies - Comments

I consider this manual served its purpose well adequately poorly.

Director, Flight Engineering
EDO-AIRE MITCHELL
PO Box 610
Mineral Wells, Texas
76067

EDO-AIRE MITCHELL
P.O. Box 610
Mineral Wells, Texas 76067

REVISION REFERENCE SHEET

Original Manual, AK514, Century I Autopilot, Bulletin No. 637 dated 11-8-74
for Grumman American Model AA-5B.

Revision (1) dated 5-2-75. (Major Change)
Added Grumman American Model AA-5 and removed A/P Interrupt Switch.
Reference FECO 452.

Revision (2) dated 7-29-75 (Major Change)
Added Grumman American Model AA-5A.
Reference FECO No. 517.

Revision (3) dated 10-30-75 (Major Change)
Included Autopilot Flight Manuals, P/N 68S296 for models AA-5 and AA-5A
and P/N 68S297 for model AA-5B, in Placards Section of manual.
Reference FECO No. 663.

Revision (4) dated 12-6-76 (Major Change)
Added POH Supplements. Reference FECO #1094.

Revision (5) dated 2-21-78 (Major Change)
Changed POH Supplements to Supplemental Flight Manuals. Reference
FECO # 1667.

MASTER DWG LIST

FOR Century I - AK514

S.T.C. SA3031SW-D

DRAWING NO.	DESCRIPTION	REVISIONS	DATE
DRAWINGS REQUIRED FOR THE INSTALLER TO MAKE THE INSTALLATION:			
637	Bulletin	(5)	2-21-78
69A873	Template for Turn and Bank	-	
69D875-2	Pictorial Century I	B	
69D932	Roll Servo Installation	A	
DRAWINGS WHICH DEFINE THE DESIGN AND ARE NOT NECESSARY FOR THE INSTALLATION:			
1C363-1	Servo Outline Drawing 14VDC, 7.2 RPM	A	
7C1267-1	Bracket Roll Servo Inst'l	-	
7B1268-1	Bracket Roll Servo Inst'l	A	
12A215	30C402-() Assembly Variations Cut Wire Length (Inches) (Century I 52D75-3/4)	G	
13A616	Placard, T & B	A	
13A751	Autopilot Serial Placard	-	
13A629	Placard	-	
13A845	Placard	-	
30B200	Cable Assembly	F	
30C402-()	Cable Assembly for 52D75-3/4 on Century I	B	
42A173-1	Cable Clamp Assy.	D	
52D75-3/4	Outline Drawing Turn and Bank	G	
93A363-1-373R	Servo Assembly Information For 1C363-1-373R 12VDC, 7.2RPM	A	

MASTER DRAWING LIST REVISION

A	Updated Master Drawing List	5-2-75
B	Revised Bulletin No. 637	
	Revised 13A762-514	7-29-75
C	Revised Bulletin No. 637	10-30-75
D	Rev. Bul. No. 637. Removed 12A294, 13A622, 13A630, 13A762-514, 13A762-514-1	
	79D48. Added 13A751, 13A845,	
	93A363-1-373R	12-6-76
E	Rev. 637. Removed 52D75-13/-14.	2-21-78

MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

TITLE

CENTURY I INSTALLATION

CHECKED

Benny L. Baret

DATE: 11-8-74

DRAWING NO.

87A750

SHEET 1 of 1

TABLE OF CONTENTS

SECTION I. CENTURY I INSTALLATION

Introduction	Page 1-1
Turn and Bank Installation	Page 1-2
Roll Servo Installation	Page 1-3
A Word About the Tracker	Page 1-4
Electrical Cable Installation	Page 1-5
Placards Installation	Page 1-6
Component Weights and Current Drain	Page 1-6

SECTION II.

Parts List	Page 2-1
	2-2

SECTION III.

Ground and Flight Checks (68S92)	Page 3-1
	3-2

SECTION IV.

Appendix	Page 4-1
--------------------	----------

SECTION I

INTRODUCTION

This installation manual is intended to facilitate proper installation of the Mitchell Century I. Before proceeding with the installation, read the manual and study the installation drawings carefully.

The Mitchell Century I is a light weight, all electronic stabilization system contained in two compact units, plus interconnecting wiring.

The panel mounted instrument contains the pictorial Turn and Bank, stabilizer electronics, optional tracker electronics, and tracker switching. The operating controls on the face of the instrument consists of two control knobs. The left knob controls the Roll Trim and the knob on the right side is the turn command control. The panel unit is available with either blue or gray mask, with or without internal lighting, and with or without tracker electronics in conjunction with the stabilizer electronics. The Roll Actuator is the other unit and it is mounted in the fuselage or wing as required by the particular aircraft installation. (See Roll Servo Installation.)

The installation hardware is packaged in individual group packages for each component installation. Open the group packages and inspect the parts individually to ensure a complete understanding of their purpose and location prior to beginning each installation.

EDO-AIRE MITCHELL
Mineral Wells, Texas

TURN AND BANK 52D75-()

PARTS GROUP I

Drawing No. 69A873

1. The Century I, Turn and Bank unit is mounted in the instrument panel in any available standard 3" instrument hole cutout in clear view of the pilot that provides adequate clearance behind the panel. The ideal location would be one that offers a minimum of parallax as viewed from the pilot seat. If the instrument replaces the original turn and bank instrument, it should be mounted in the same location.
2. Using the cutout modification detail on Drawing No. 69A873 as a guide, modify the existing 3" dia. instrument cutout.
3. Remove the two control knobs from the front of the instrument and mount the instrument in the instrument panel. Use four 3S226 screws. Use care not to jar or bump the instrument during installation as all gyroscopic instruments are delicate. Replace the control knobs.

CAUTION: Do not use mounting screws that extend into Turn and Bank more than 1/2".

PARTS GROUP II

Drawing No. 69D932

1. The (item 1) 1C363-1-373R Roll Servo is mounted on lower end of the yoke support bracket directly below the fuel selector valve. Refer to Drawing No. 69D932.
2. To gain access to this area remove the royalite pedestal side panels.
3. Temporarily attach (item 3) 7B1268-1 bracket and (item 2) 7C1267-1 bracket to the (item 1) roll servo using four (item 8) 3S92 bolts, four (item 10) 4S134 washers and four (item 9) 2S38 nuts. Use Drawing No. 69D932 as reference for mounting the brackets to the servo.
4. Place the servo assembly near the lower end of yoke support bracket as shown on Drawing No. 69D932. Position the assembly so that the servo capstan is centered over the aileron cable. The left (outboard) edges of the brackets should be nearly flush with the edges of the yoke support bracket as shown on Drawing No. 69D932.
5. Using the five holes in the (item 2) and (item 3) brackets as a guide, mark and drill five .166 dia. (No. 19) holes in the yoke support bracket. It will be necessary to disassemble the brackets from the servo to mark all of the hole locations.
6. Attach (item 2) and (item 3) brackets to the yoke support bracket using five (item 5) 3S464 screws, five (item 6) 2S34 nuts and five (item 7) 4S205 washers.
7. Mount the servo to the brackets using four (item 8) 3S92 bolts, four (item 9) 2S38 nuts and four (item 10) 4S134 washers. (Hardware removed in Par. 5)
8. Loosen the cable guards on the servo. Rotate the capstan so the bridle cable pin hole is just fwd of bottom cable guard, approximately 160° from top cable guard, as shown on Drawing No. 69D932. Position the (item 4) 30B200 bridle cable so that the long end of cable (from pin) is aft and parallel to the aileron cable. Insert the bridle cable pin into the capstan hole and tighten set screw.
- *9. With the aileron control in neutral position, wrap the short end of the (item 4) 30B200 bridle cable around the capstan 330°. This will bring the cable fwd. Attach the bridle cable to the aileron cable with one (item 11) 42A173-1 cable clamp.
 *NOTE: Aileron cable should be clean and free from excessive oil or grease at points where cable clamp attachment is made.
10. Wrap the long end of the bridle cable approximately 390° aft around the capstan. Attach bridle cable to aileron cable using one (item 11) 42A173-1 cable clamp.
 NOTE: Move aileron control to the left stop (full travel). In this position the aft end of the forward cable clamp should clear the forward lower servo mount bolt by 1/8" to 1/4". If this clearance is not provided, reposition cable clamps as necessary to provide clearance. Exercise aileron control, check for binding or other interference.
11. Torque cable clamp bolts to 55 ± 5 inch pounds with a minimum of .005" measured between clamp halves after torquing. Cable tension should be the same as the aileron primary cable tension.
12. Position the cable guards within 1/32" of the capstan O.D. and tighten.
13. Rotate aileron thru full travel and check for any binding or restriction of bridle cable or clamps that may contribute to unsafe conditions.

A WORD ABOUT THE TRACKER

If the Tracker option is installed in the Century I 52D75-4, consideration must be given to the Navigation Converters. The Century I Tracker is designed to operate with all Navigation Converters having an ARINC 1000 ohm meter movements. That is, full scale deflection of the left/right meter requires 150 microamps through a 1000 ohm load + left or + right (floating). The Tracker has a high impedance input of greater than 10 K ohms. Therefore, it's loading is negligible and need not be considered in selecting correct loading for the Navigation Converter.

NOTE: Before connecting autopilot check the capacity of the power source to determine the addition of autopilot will not adversely affect the electrical system. Refer to Advisory Circular 43.13-1A, Chapter 11, Section 2, Paragraph 428.

ELECTRICAL CABLE HOOK-UP

PARTS GROUP III

Drawing No. 69D875-2

The Century I is connected as shown on Drawing No. 69D875-2 and according to the code numbers on the cable ends.

All cables should be routed clear of flammable fluid and oxygen lines. Secure cables to airframe with AN742 cushion clamps within a maximum spacing of 18 inches to prevent damage and allow full freedom of controls. All open cable connections and interconnections, such as wristlock connectors and knife disconnect type connectors, shall be protected with a suitable insulating sleeve which shall be secured in accordance with good aviation wiring practices. Polyvinyl chloride sleeving material is an acceptable insulator. Ref. AC 43.13-1A, Chapter 11.

1. Route CD-47 of 30C402-5 cable harness with other aircraft wiring to the roll servo. Observe wiring practice as outlined in AC 43.13-1A. Connect CD-47 to the roll servo.
2. Connect large connector CD-92 to rear of the panel mounted 52D75-().
3. Connect CD-97 and CD-98 of 30C402-5 to + left and + right terminations of navigation converter when 52D75-4 is installed. Tie back and cover these leads when the 52D75-3 is installed.
4. Connect ground lead of 30C402-5 to airframe ground.
5. Mount the ON/OFF Switch (40S35) in the instrument panel in location accessible to pilot. A 1/4" hole is required for mounting. Placard 13A845 (Group IV) should also be installed under switch ring nut at this time.
- *6. Install the circuit breaker provided, in the aircraft circuit breaker panel.
7. Connect CD-51 from cable assembly 30C402-5 to load side of circuit breaker.
8. Connect other side of circuit breaker to aircraft buss bar with No. 20, MIL-W-5086A wire not to exceed 6 inches in length.
9. Connect wire from ON/OFF switch (40S35) to load side of circuit breaker. This wire should also be No. 20, MIL-W-5086A.
10. Connect CD-50 to other side of ON/OFF Switch.
11. This completes the wiring, make sure all wiring is routed, insulated, and tied as outlined in Advisory Circular 43.13-1A.

*NOTE: Mechanical Products Circuit Breaker Part No. 1600-019-050 may be used as an alternate for the Autopilot Circuit Breaker.

PLACARDS

PARTS GROUP IV

1. Apply placards 13A616 and 13A629 by the circuit breaker.
2. Placard 13A845 should have been installed in Step 5 (Electrical Cable Installation).
3. Install placard 13A751 "S/N" in the aircraft log book. This placard is used for autopilot warranty and service identification.
4. Remove the appropriate Supplemental Flight Manual from the back of this installation bulletin, fill in the blanks and place with the aircraft records or in the supplement section of the Pilot's Operating Handbook.

NOTE: The FAA Type Certificate Data Sheet for any particular aircraft will list the appropriate document and/or placards required for that aircraft.

WHEN: Placards are required use Supplemental Flight Manual.

COMPONENT WEIGHTS AND CURRENT DRAIN

*1. COMPONENT WEIGHTS

COMPONENT	WEIGHT	ARM	MOMENT
Turn & Bank - 52D75-()	2.4 lbs.		
Roll Servo - 1C363-1-373R	2.3 lbs.		
Cables	.5 lb.		

2. CURRENT DRAIN

Maximum Servo Action	2.0 Amps
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*Does not include weight of brackets, attaching hardware, etc.

SECTION II.

PARTS LIST

EDO-AIRE MITCHELL CENTURY I MODEL AK514 PARTS LIST FOR
GRUMMAN AMERICAN MODEL AA-5, AA-5A AND AA-5B
(14 VOLT SYSTEM)

11-8-74
5-02-75 Rev.
7-29-75 Rev.
10-30-75 Rev.
12-06-76 Rev.
2-21-78 Rev.

Item No.	Part No.	Description	Spec. No.	Qty.
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SECTION I. CENTURY I INSTALLATION

GROUP I
TURN AND BANK

1.	52D75-3/-4	Turn and Bank	12A73 & 12A145 (TSO)	1
2.	3S226	Screw	AN505B6R8	4

GROUP II
ROLL SERVO

1.	1C363-1-373R	Roll Servo	12A94 (PMA)	1
2.	7C1267-1	Bracket	PMA	1
3.	7B1268-1	Bracket	PMA	1
4.	30B200	Bridle Cable	PMA	1
5.	3S464	Screw	AN525-832-R8	5
6.	2S34	Nut	AN365-832	5
7.	4S205	Washer	AN960-8	5
8.	3S92	Bolt	AN3-4A	4
9.	2S38	Nut	AN365-1032	4
10.	4S134	Washer	AN960-C10	4
11.	42A173-1	Cable Clamp	PMA	2

THIS (AK514) HARDWARE KIT CONSIST OF GROUPS

IN ACCORDANCE WITH HARDWARE PARTS LIST DATED

REV.

**DENOTES PART OR COMPONENT PACKED SEPARATELY

ASSEMBLED BY

DATE

Q.C. INSPECTED BY

DATE

SHIPPING DEPT. INSP. BY

DATE

Item No.	Part No.	Description	Spec. No.	Qty.
----------	----------	-------------	-----------	------

GROUP III
ELECTRICAL CABLES

1.	30C402-5	Cable Assembly	PMA	1
2.	40S35	Switch	PMA	1
3.	65S67	Circuit Breaker (3 Amp)	PMA	1

GROUP IV
PLACARDS

1.	13A616	Placard, Turn & Bank	PMA	1
2.	13A751	Placard, S/N	PMA	1
3.	13A629	Placard, Century I	PMA	1
4.	13A845	Placard, ON/OFF	PMA	1
5.	68S296-1	Supplemental Flight Manual		1
6.	68S297-1	Supplemental Flight Manual		1
7.	68S491-1-S	Supplemental Flight Manual		1
8.	68S492-1-S	Supplemental Flight Manual		1

THIS (AK514) HARDWARE KIT CONSIST OF GROUPS _____
 IN ACCORDANCE WITH HARDWARE PARTS LIST DATED _____ REV. _____
 **DENOTES PART OR COMPONENT PACKED SEPARATELY
 ASSEMBLED BY _____ DATE _____
 Q.C. INSPECTED BY _____ DATE _____
 SHIPPING DEPT. INSP. BY _____ DATE _____

SECTION III
GROUND AND FLIGHT CHECKS
CENTURY I AND TRACKER

Revision 12-06-71
Revision 2-21-74
Revision 5-18-76
Revision 11-5-76

The Century I Automatic Flight System has only two adjustments other than the normal controls. One is a trim centering adjustment potentiometer that is located on the rear of the panel mounted instrument unit. This potentiometer is used to center the trim knob during the initial ground check. The other adjustment is a roll servo threshold adjustment that should be made only in flight as necessary to match the amplifier threshold to the threshold of the servo motor.

PRE-FLIGHT

1. Check Century I Circuit Breaker - IN.
2. Turn on aircraft master switch and listen for Gyro motor start in Turn and Bank instrument.
3. Turn Century I master ON/OFF switch - ON.
4. Pull turn control knob (right side) out and rotate left and right. Observe the control wheel rotates left and right. Center turn control knob.
5. Rotate trim control knob (left side) left and then right and observe the control wheel turns left and right slowly. Place the trim control knob in the center of its travel. If the aircraft control wheel continues to slowly move left or right, then adjust the trim centering potentiometer on the rear of the instrument as necessary to stop all wheel movement.
6. Turn on the VOR receiver and tune a local station whose signal can be received on the aircraft. Rotate the OMNI Bearing Selector (O.B.S.) until the deviation needle centers. Push IN the turn control knob to actuate the electric tracker. Slowly rotate the O.B.S. to cause a full scale needle deflection left and then right. Observe that the aircraft control wheel follows the VOR deviation needle left and then right. Turn tracker - OFF.
7. Override servo in both directions with aircraft control wheel manually.
8. Press "Autopilot Interrupt" switch on pilot's control wheel and rotate control wheel to check for servo disengagement. Release switch - servo should re-engage. (This item not applicable to all installations, refer to installation data for applicability.)
9. Begin taxi with Century I ON- Century I should cause a control wheel deflection opposite to the direction of turn.

This completes the ground check portion. There are no specific initial in-flight checks required, other than normal operation. If at all possible the initial Flight Test should be conducted in calm air, as this makes an evaluation of performance much easier and more accurate. Some aircraft models might require that a servo threshold voltage adjustment be made to the 52D75 in order to match the servo amplifier electronic threshold to the starting voltage requirements of the individual servo motor used in the installation. A mismatched threshold is usually manifest by "Wing Rock" or control wheel "Jitter" if the threshold is too high or by roll overshoot or long term, slow, roll oscillations if the threshold is too low. Generally, no adjustment is required and an adjustment should not be attempted unless a threshold mismatch is known to exist, i.e. unless the test flight is conducted in perfectly smooth air it is almost impossible to determine in most cases, also some degree of roll overshoot is always present depending on the airspeed used.

If a threshold adjustment is deemed necessary, proceed as follows:

52D75 Units with serial numbers ending in the letter "D" or later.

1. The roll threshold potentiometer is located directly in line with the top left instrument mounting screw, inside the instrument. Access to the potentiometer is made by removing the top left mounting screw and inserting a small, narrow blade, screw driver into the screw hole approximately (1) inch.
2. The potentiometer is a small, 20 turn trim pot, that is manufactured without stops. It should turn very easy throughout it's full range with the only indication of full travel being a slightly audible "click" each revolution once at full travel. If the pot is not easy to turn Do Not Apply Force To Turn It. Pull out the screw driver and re-insert in a different position. The screw hole is provided with a guide tube, however, it might be possible to get the screw driver blade wedged between the "pot" screw head and the guide tube. Forcing while in this position might result in damage to the pot. The pot is affixed to the amplifier circuit board.
3. The factory threshold adjustment procedures usually result in the "Pot" being within 3 turns of center. Adjust the pot in 1 turn increments until proper adjustment is obtained. If the roll oscillation is long term, the threshold pot should be tightened, (C.W.). If the roll oscillation is short term or if the control wheel jitters or is over active then the threshold must be reduced, turn the pot C.C.W. After adjustment replace the mounting screw removed in Step No. 1.

52D75 Units with serial numbers ending with no code letter or code letters A through C.

1. These units have the same trim potentiometer as the later units, however it is located in a different position on the circuit board, thereby making in-flight adjustment much more difficult. Shop adjustment can be made by reference to the 52D75 Overhaul Manual Paragraph 4.2.5.17 or an in-flight adjustment can be made as follows:
2. Remove the instrument from the instrument panel and place it in a suitable holding fixture that will allow operation in flight.
3. Remove the cover from the instrument by removing the tape around the bezel and the single screw at the rear adjacent to the main connector.
4. Locate the Trim Pot (R25) located on the left circuit board about midway between the instrument face and the connector end. The pot is located at the top of the board and is oriented vertically, with the adjustment screw at the top. Note that there is another pot at the front of the circuit board, nearest the face plate. This is Not The Threshold Pot, Do Not Adjust.
5. Adjust the threshold as discussed in Paragraph 3 for units serial number "D" and later.
6. Replace sealing tape and cover and reinstall instrument in instrument panel after flight.

SECTION IV

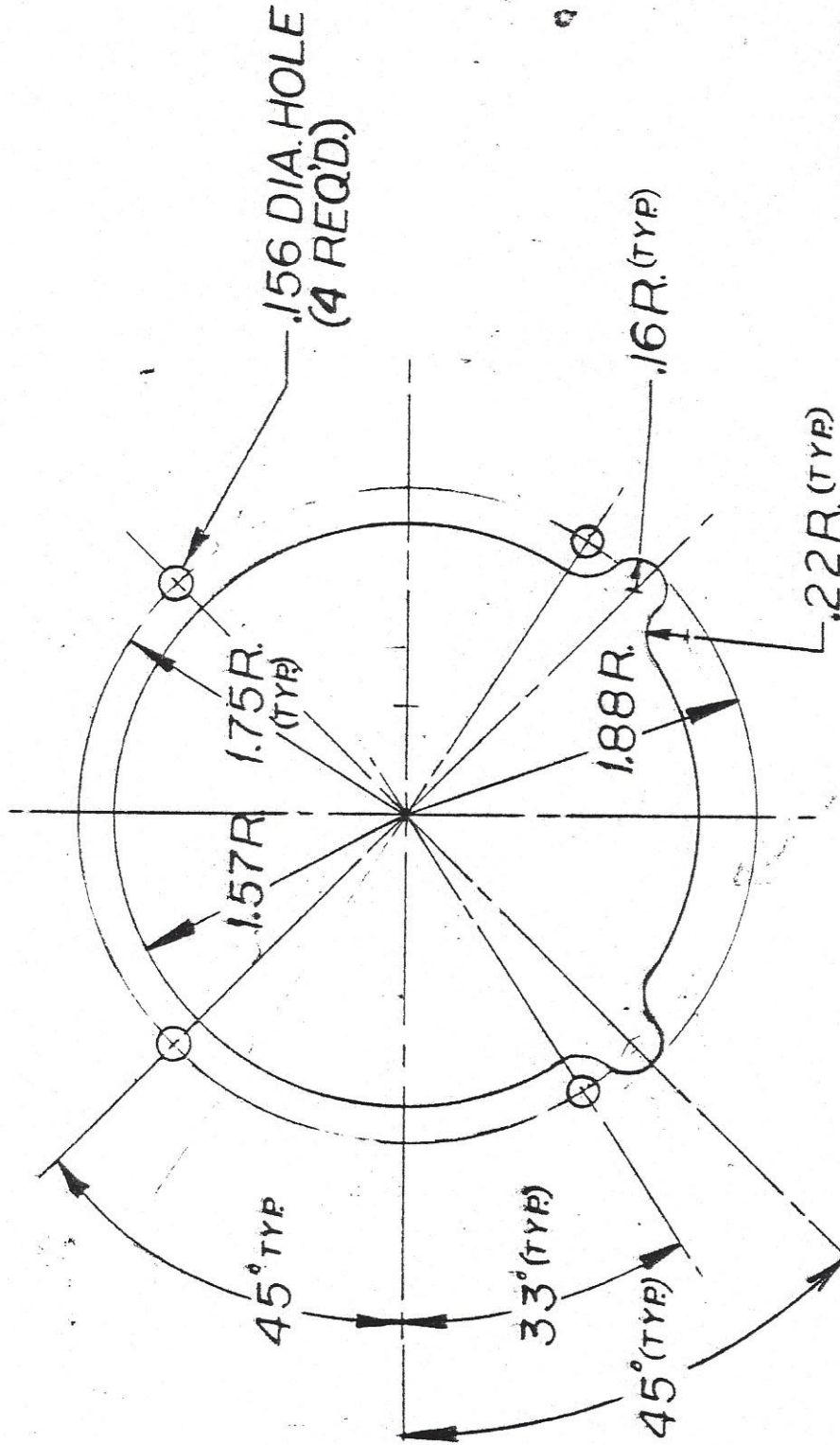
APPENDIX

1. Drawing Package (Refer to Master Drawing List for contents)
2. S.T.C. Certificate
3. A.F.M. Supplement, Supplemental Flight Manual, Placard, or Pilot's Operating Handbook Supplement
4. R.F.I. Instructions

- ☐ If A.F.M. Supplement is required, remove and place in the Airplane Flight Manual.
- ☒ If Supplemental Flight Manual is required, remove and place with aircraft records.
- ☐ If Placard is required, place on instrument panel in full view of the pilot.
- ☐ If Pilot's Operating Handbook Supplement is required, remove and place with Pilot's Operating Handbook.

MICRO-FILM JUN 20 1973

MITCHELL INDUSTRIES, INC. MINERAL WELLS, TEXAS		TITLE TEMPLATE FOR TURNBANK		DWG. NO. 69A873	
DRAWN E. ELLIS	DATE 7-23-70	USED ON AUTO FLITE II AND CENTURY I	SCALE 1X	REV. -	DESCRIPTION RELEASED PER E.O. 5211
CHECKED B. BARRETT	DATE 7-24-70			BY RS	DATE 9-19-72
ENGINEER E. CAMERON	DATE 8-10-70				
APPROVAL TRW	DATE 9-14-70				
		FINISH NONE			



NOTE:
DIMENSIONS GIVEN FOR INFORMATION ONLY.
DRAWING TO BE INCLUDED IN INSTALLATION
MANUAL AND KIT LIST.

THIS DRAWING IS THE PROPERTY OF MITCHELL INDUSTRIES, INC. AND ITS POSSESSION BY UNAUTHORIZED PERSONS SHALL NOT BE CONSTRUED AS PERMISSION TO REPRODUCE FOR SALE, IN WHOLE OR IN PART, ANY DEVICES SHOWN THEREON.

TOLERANCES UNLESS OTHERWISE SPECIFIED:

DECIMALS	XXX: ± .005
DECIMALS	XX: ± .010
FRACTIONS	± 1/64
ANGLES	± 0° 30'

REMOVE BURRS AND BREAK SHARP EDGES .010
DO NOT SCALE DRAWING

MITCHELL INDUSTRIES
CHECK SHEET & PACKING LIST

M8888

Type Cent I
Sold To Gulfstream
Ship To Same

Kit No. AK514
H. O. No. 44796
Date 4-23-79

PACKING LIST

II AXIS

A. H. 52D66 S/N _____
D. G. 52D54 S/N _____
Cons. Amp. 1C385 S/N _____
Roll Servo _____ S/N _____
Filter 1B440 S/N _____

III AXIS

A. H. 52D67 S/N _____
D. G. 52D54 S/N _____
Console 1C404 S/N _____
Amplifier _____ S/N _____
Alt. Hold 1C407 S/N _____
Roll Servo _____ S/N _____
Pitch Servo _____ S/N _____
Filter 1B440 S/N _____

TRIM

Trim Sensor _____ S/N _____
Trim Servo _____ S/N _____
Relay 1A526 S/N _____
Amp. _____ S/N _____

Coupler 1C388M S/N _____
Glide Slope 1C493 S/N _____
Trim Adpt. Box 1B552 S/N _____
Back-up Sys. _____ S/N _____
Tracker _____ S/N _____

CENTURY I

T & B 52D75 S/N _____
Roll Servo _____ S/N _____

CENTURY GROUP

Warehouse & Shipping Initial

1. _____	7. _____
2. _____	8. _____
3. _____	9. _____
4. _____	10. _____
5. _____	11. _____
6. _____	12. _____

CHECK

ROLL

Roll Center _____
Horiz. at 2° R _____ L _____
Roll Knob Center _____
D. G. R _____ L _____
Man Bank R _____ L _____
Horiz. Output R _____ L _____
Right Command = _____ Capstan Rotation

PITCH

Horiz. Center _____
Pitch Limits UP _____ DN _____
Alt. Hold _____
Up Command = _____ Capstan Rotation

COUPLER

TRIM

Center Adj. _____ Manual R _____ L _____
Omni Center _____ Delay R _____ L _____
Nav Center _____ Sensor Pos. _____
LOC Center _____ = _____ Capstan Rotation
Intercept Omni R _____ L _____
Intercept LOC R _____ L _____
Intercept NAVR _____ L _____
Radio Output _____

COUPLER GROUP

TRIM GROUP

1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

BACK UP SYS. GROUP

G/S GROUP

Warehouse & Shipping Initial

1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

Warranty Pkg. TF
Owners Manual _____
Installation Manual _____

92A342

Page 1 of 1

EDO-AIRE MITCHELL Mineral Wells, Texas		OEM PARTS/PACKING LIST		Spec. No. 92A342	
Drawn By <u>R.A.</u>	Date <u>12-13-77</u>	Grumman	Documentation	Issue	Change
Apvd. By <u>E. Compton</u>	Date <u>12-14-77</u>	O.E.M. <u>American</u>	Type <u>Set</u>	Release	FECO 1592
Apvd. By <u>J. Allen</u>	Date <u>12-14-77</u>	AK 514			12-14-77
Kit Assy. Spec. No. <u>92B339</u>					
Apvd. For Aircraft Models : <u>AA-5B</u>					
PMA Inspection Stamp : 					

Note: List SN Items First

<u>QNTY.</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>S/N</u>
1 <u>1</u>	Bulletin No. 637	AK514 Installation Bulletin	
1 <u>1</u>	13A751	Placard, S/N	
1 <u>1</u>	68S72	Century I Operator's Manual	
1 <u>1</u>	68S78	Final Inspection Check Out-Sheet	
1 <u>1</u>	91S225	Warranty Validation Form	

Customer P.O. No. 78H54139Mitchell H.O. No. 44796Serial No. 178888Date Filled: 4-23-79

United States of America
Department of Transportation—Federal Aviation Administration
Supplemental Type Certificate

Number SA3031SW-D

This certificate, issued to

Mitchell Industries, Inc., dba
EDO-AIRE MITCHELL
P.O. Box 610
Mineral Wells, Texas 76067

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 23 of the Federal Aviation Regulations.

Original Product — Type Certificate Number: A16EA
Make: GRUMMAN AMERICAN
Model: AA-5, AA-5A, AA-5B

Description of Type Design Change:

Installation of Mitchell Automatic Flight System Model AK514 consisting of a Century I Autopilot with Optional Omni Tracker System according to Bulletin No. 637, Revision 5, dated 2-21-78 and Master Drawing List No. 87A750, Revision E, dated 2-21-78 (14 Volt System) and/or later FAA Approved revisions of the above data.

Limitations and Conditions: The following FAA/DAS Approved Supplemental Flight Manuals are required: P/N 68S296-1, dated 12-30-76 for Grumman American Models AA-5 and AA-5A, S/N 282 and below; P/N 68S297-1, dated 12-30-76 for Grumman American Model AA-5B, S/N 399 and below; P/N 68S491-1-S, dated 2-21-78 for Grumman American Model AA-5A, S/N 283 and Up, P/N 68S492-1-S, dated 2-21-78 for Grumman American Model AA-5B, S/N 400 and Up and/or later FAA Approved revisions of the above supplements.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: 11-11-74

Date of issuance: 11-27-74

Date issued: 5-19-75; 8-4-75; 11-25-75;
12-30-76; 2-21-78 Revision 5

Date amended:

By direction of the Administrator

Harold W. Holdeman

(Signature)

HAROLD W. HOLDEMAN
DAS STAFF COORDINATOR, DAS 2 SW

(Title)



Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA/DAS APPROVED
SUPPLEMENTAL FLIGHT MANUAL
FOR

GRUMMAN AMERICAN MODELS AA-5
AND AA-5A, S/N 282 AND BELOW

Reg. No. _____

Ser. No. _____

The information in this manual is FAA Approved material which along with other documents is applicable to the operation of the airplane when modified by the installation of Edo-Aire Mitchell Century I Autopilot, Model AK514 installed in accordance with STC SA3031SW-D.

LIMITATIONS

1. Autopilot use prohibited above 150 MPH CAS.
2. Autopilot OFF during take-off and landing.

PROCEDURES

NORMAL OPERATION

1. Engagement
 - a. Toggle switch on instrument panel - ON.
2. Disengagement
 - a. Toggle switch on instrument panel - OFF.
3. Heading Changes
 - a. Move trim knob on instrument for drift correction from a constant heading.
 - b. Move turn command knob on instrument for right or left banked turns.
4. OMNI Tracker
 - a. Center turn command knob and push IN to engage tracker.

FAA/DAS APPROVED EDO-AIRE MITCHELL
DATE: 12-30-76 P. O. Box 610
P/N 68S296-1 Mineral Wells, Texas 76067
Page 1 of 2

- b. Trim knob - push IN for high sensitivity. (For Localizer Tracking)

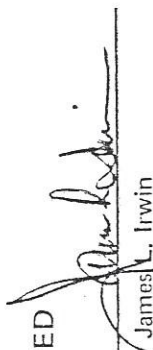
EMERGENCY OPERATION

1. In case of malfunction, initially overpower manually to maintain aircraft control.
2. Toggle switch on instrument panel - OFF.
3. Check Century I circuit breaker - reset, if necessary, to restore turn and bank instrument operation.
4. In climb, cruise or descent configuration a malfunction with a 3 second delay in recovery initiation results in 50° bank and 355' altitude loss. Maximum altitude loss measured at 150 MPH CAS in a descent.
5. In approach configuration a malfunction with a 1 second delay in recovery initiation results in 18° bank and 40' altitude loss.

PERFORMANCE

No change.

APPROVED


James L. Irwin

EDO-AIRE MITCHELL
DAS 2 SW
DATE: 12-30-76
P/N 68S296-1