EDO-AIRE MITCHELL

MINERAL WELLS, TEXAS

FAA APPROVED FOR GRUMMAN AMERICAN MODELS AA-5, AA-5A AND AA-5B
PER STC SA 3032 SW-D

AK515

FAA APPROVED
BULLETIN NO. 638

EDO-AIRE MITCHELL
P.O. Box 610
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REVISION REFERENCE SHEET

Original Manual, AK515, Century IIB, Bulletin No. 638 dated 11-8-74 for Grumman American Model AA-5B.

Revision (1) dated 5-2-75 (Major Change)
Added Grumman American Model AA-5. Changed limitations placard 13A689-515 to Autopilot Flight Manual. Reference FECO 451.

Revision (2) dated 7-29-75 (Major Change)
Added Grumman American Model AA-5A. Reference FECO No. 518.

MASTER DWG LIST

FOR Century IIB - AK515 S.T.C. SA3032SW-D

DRAWING NO.	DESCRIPTION	REVISIONS	DATE
DRAWINGS REQUIRED FOR THE INSTALLER TO MAKE THE INSTALLATION:			
638	Bulletin	(2)	7-29-75
1C388M	Radio Coupler Outline Drawing S/N 6000 & up	H	
63B149-1	Wiring Interconnect 1C388-2 & NSD 360-( )	A	
63D358	Schematic Interconnect 1C388-3 to PN101, KPI-550, Wilcox 1041A, Sperry RD444-447	-	
69A313	Template	A	
69C835	Vacuum System Plumbing	-	
69C835-1	Pressure System Plumbing	-	
69A911	Century IIB & Autocontrol IIIB Adjustment Drawing	-	
69D932	Roll Servo Installation	A	
69C935	Century IIB Autopilot Pictorial	-	
69C936	Console/Amplifier Installation	B	
DRAWINGS THAT DEFINE THE DESIGN AND ARE NOT NECESSARY FOR THE INSTALLATION:			
1C363-1	Servo Outline Drawing 14 VDC, 7.2 RPM	A	
1C385	Century IIB, 14 Volt, Amplifier Console Outline Drawing	H	
1C388-2	Radio Coupler 1C388-2 Outline Drawing	A	
1C388-3	Radio Coupler Outline Drawing	A	
1B440	Roll Signal Filter Outline Drawing	E	
7B1076	Bracket	A	
7B1077	Bracket	A	
7C1267-1	Bracket, Roll Servo Installation	-	
7B1268-1	Bracket, Roll Servo Installation	A	
12A294	Parts List Specification for Roll Servo 1C363-1 (14 V.)	D	
13A132	Reverse Plate	B	
13A701	Placard, Serial No. Century IIB	A	

MASTER DRAWING LIST REVISION		
A	Removed 13A689-515 and Revised Bul. No. 638	5-2-75
B	Revised Bulletin No. 638	7-29-75

MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

TITLE
CENTURY IIB INSTALLATION

CHECKED Benny L. Barnett

DRAWING NO. 87A749

Date: 11-8-74

SHEET 1 of 2

MASTER DWG LIST

FOR Century IIB - AK515 S.T.C. SA3032SW-D

DRAWING NO.	DESCRIPTION	REVISIONS	DATE
30B180-1-2&-3	Circuit Breaker Assembly	D	
30C198-( )	Cable Assembly	M	
30B200	Cable Assembly	F	
30C211-( )	Cable Assembly	P	
42A173-1	Cable Clamp Assy.	C	
52D54	Directional Gyro Audio Course Selector	M	
52D66	52D66 Gyro Attitude Audio (Roll Only)	R	
79D48	14 VDC, 7.2 RPM Servo Assy. (1C363-1)	AO	

MASTER DRAWING LIST REVISION		

MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

TITLE

CENTURY IIB INSTALLATION

CHECKED Benny P. Barnett

DRAWING NO. 87A749

DATE: 11-8-74

SHEET 2 of 2

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SECTION I

INTRODUCTION

EDO-AIRE MITCHELL CENTURY IIB

This manual is intended to facilitate proper installation of the Edo-Aire Mitchell Century IIB Automatic Pilot; therefore, before proceeding read the manual carefully and study the drawings thoroughly. Inspect the kit parts individually to insure a complete understanding of their purpose and proper location.

The Century IIB Automatic Pilot is an electronic, light weight system incorporating the newest, functional and electronic designs available. The Century IIB incorporates the following automatic features:

1. A Course Selector built into the D. G. for selecting and maintaining automatically, any desired D. G. heading. This Automatic System is mode button controlled.

2. A Toggle Switch Electric Engage.

3. A lateral guidance Radio Coupler is optional equipment.

The Century IIB Automatic pilot is designed for maximum service with minimum installation time. The unit is principally composed of the two gyro instruments which furnish the aircraft Attitude Sensing; the Amplifier which interprets this sensing and the power Servo which transmits them to the aircraft's controls.

Each component is sturdily built for maximum efficiency, but must be handled carefully during unpacking and installation as with all electronic devices.

EDO-AIRE MITCHELL
Mineral Wells, Texas

ATTITUDE GYRO - 52D66

PARTS GROUP I

Drawing No. 69C835
Drawing No. 69C835-1

1. The 52D66 Attitude Gyro is used for roll control sensing.

2. Remove standard Attitude Gyro from instrument panel, and remove vacuum line and vacuum gauge fittings.

3. Install the 52D66 Attitude Gyro in the instrument panel with four mounting screws.

   CAUTION: Do not use mounting screws that extend into the gyro more than 1/2".

4. Using the existing aircraft plumbing and hardware, connect the vacuum and vacuum gauge lines to the proper fittings. Drawing 69C835 or 69C835-1 may be used as a guide to plumb the gyro to the existing aircraft vacuum or pressure system. If aircraft does not have a central filter of .3 micron capability for the Gyro's, Mitchell Filter 1X314 for use with vacuum systems is available through your Edo-Aire Mitchell Distributor.

COURSE SELECTOR DIRECTIONAL GYRO - 52D54

PARTS GROUP II

1. Remove the existing directional gyro and install the 52D54 directional gyro in the instrument panel with three mounting screws.

   CAUTION: Do not use mounting screws that extend into the gyro more than 1/2".

2. Connect vacuum line to proper fitting and to filter. (Ref. Par. 4 of Attitude Gyro).

3. Check to see that proper filtering is available. (Ref. Par. 4 above).

*Refer to Bulletin No. 479 for installation of non-slaved NSD 360-( ) or DG 360-( ) and Bulletin No. 600 for installation of slaved NSD 360-( ) or DG 360-( ), if used in place of standard 52D54 Directional Gyro.

CONSOLE - AMPLIFIER - 1C385

PARTS GROUP III Drawing No. 69C936

1. The Console - Amplifier is contained in one unit. The Console - Amplifier is mounted in the panel as shown on Drawing No. 69C936 or any existing 3 9/16" x 1 7/8" instrument panel cutout that is within reach of the pilot.

2. The face plate of the console can be removed by removing the roll knob and the two flat head screws on the face. The Amplifier can be removed from the cover by removing the spring retaining clip 42A285 on the left side of the console.

3. Make cutout in instrument panel, reference Drawing No. 69C936 then drill six .113 dia. (No. 33 drill) holes in cover as specified in Drawing No. 69C936.

4. Attach (item 2) 7B1076 bracket and two (item 3) 7B1077 brackets on to cover with six (item 4) 3S254 screws and six (item 5) 2S40 nuts. Position cover in instrument panel and using brackets as a guide, mark and drill five .113 dia. (No. 33 drill) holes through instrument panel and countersink 82° to a dia. of .225. Attach cover and brackets to instrument panel with five (item 4) 3S254 screws.

5. Reinstall amplifier in cover. Install retaining clip. Leave face plate off until final adjustments are made. Refer to Section IV of this manual for proper adjustment procedures.

ROLL SERVO - 1C363-1-373R

PARTS GROUP IV

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.

ELECTRICAL CABLE HOOK-UP WITH ROLL FILTER

PARTS GROUP V — Drawing No. 69C935

1. The 30C198 cable is connected to the various components as per Drawing No. 69C935 and according to code numbers on cable ends.

   NOTE: Before connecting autopilot, check the capacity of the power source to determine that the addition of the autopilot will not adversely affect the electrical system. Refer to Advisory Circular 43.13-1 Section II, Paragraph 241. Maximum current flow for the Century IIB during normal operation is 1.5 amps.

2. Connect printed circuit connector to amplifier and attach with two 3S327 thumb screws.

3. Connect the CD-33 lead of the 30C198 cable assembly to the CD-33 plug on the 52D54 Directional Gyro. If a Radio Coupler is installed, connect the CD-33 of 30C198 cable assembly to the CD-33 plug of the Radio Coupler and the CD-33 pigtail lead from the Radio Coupler to the CD-33 plug on the Directional Gyro. (The Radio Coupler, when installed, is connected in series, between the amplifier and directional gyro.)

4. Connect the CD-18 lead of the 30C198 cable assembly to the CD-18 plug on the 1B440 roll filter, and plug the CD-18 pigtail from the 1B440 roll filter to the CD-18 plug on the Attitude Gyro. Ref. Drawing No. 69C935.

5. Roll Filter may be mounted under instrument panel in any area with sufficient space and structure to support it making sure the CD-18 pigtail on filter will reach Attitude Gyro. Drill one .147 dia. (No. 26 drill) hole at the mounting location. After determining mounting area, leave Roll Filter loose from structure until Flight Adjustments are made.

6. Connect CD-47 plug of 30C211-( ) extension cable assembly to the Roll Servo. Connect CD-47 plug of 30C198 to CD-47 receptacle of 30C211-( ).

7. Connect CD-26 lead to the instrument light rheostat.

   NOTE: Before connecting autopilot and/or coupler lights to the instrument light rheostat, measure the total wattage requirements of the lights, both bright and dim, and determine that the rheostat is adequate. A rheostat (Mitchell P/N 18S38) is available upon order the for autopilot and radio coupler lights if necessary.

8. Install circuit breaker and 30B180-1 cable assembly in aircraft breaker panel. Connect the CD-28 circuit breaker "A" lead to the aircraft bus bar. Connect the other lead of the cable assembly CD-27 to the CD-27 lead of the 30C198 cable assembly.

9. Secure all wiring to airframe with cushion AN742 clamps within a maximum spacing of 18" to prevent damage and allow full freedom of controls. Route cables clear of flammable fluid and oxygen lines. All open 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. Advisory Circular 43.13-1, Chapter 11.

PLACARDS

PARTS GROUP VI

1. Placard autopilot circuit breaker with placard 13A132.

2. Install 13A701 placard inside glove box door for reference.

3. Remove the appropriate Autopilot Flight Manual from the back of this installation bulletin and fill in the blanks and place it with the aircraft records.

COMPONENT WEIGHTS AND CURRENT DRAIN

1. COMPONENT WEIGHTS

COMPONENT	WEIGHT	ARM	MOMENT
Course Selector D.G. - 52D54	2.9 lbs.		
Attitude Gyro - 52D66	2.7 lbs.		
Console-Amplifier - 1C385	1.0 lb.		
Roll Servo - 1C363-1-373R	2.5 lbs.		
Cables	.5 lb.		
Roll Signal Filter - 1B440	.25 lb.		

2. CURRENT DRAIN

Maximum Continuous Action	1.5 Amps.

SECTION II.

1C388-( )

RADIO COUPLER OPTION

INTRODUCTION

The 1C388-( ) Radio Coupler provides the autopilot with VOR and ILS localizer signal inputs, which cause the autopilot to intercept and track a selected radio course. The basic concept of coupling the autopilot to a radio course consist of setting the autopilot to a heading which corresponds to the desired course. A radio deviation signal is then introduced which causes the heading to deviate an amount proportional to the radio deviation. By the incorporation of additional circuitry, the capabilities of interception and automatic crosswind correction are added to the basic tracking ability.

The 1C388-( ) Coupler is controlled by the use of a mode selection knob that provides for a selection of the following modes:

Heading, OMNI, Localizer, Localizer Reverse and Navigation Modes.

The 1C388-( ) Radio Coupler is available in three models; 1C388-M for operation with standard VOR converters, the 1C388-3 for operation with ARINC integrated indicators such as the Collins PN101 and King KPI-550, etc., and the 1C388-2 for operation with the EDO-AIRE MITCHELL NSD-360 and DG 360. The radio gain on all coupler models is factory adjusted for use with 150mv=10° (ARINC) output Converters. For connection to other than standard ARINC, consult the EDO-AIRE MITCHELL Service Manual for gain adjustment procedures.

The following section of this manual is intended to facilitate proper installation of appropriate model of the 1C388-( ) Radio Coupler. Before proceeding, read the following instructions carefully and study the drawings thoroughly. Inspect the kit parts individually to insure complete understanding of their purpose and proper location.

PARTS GROUP I

Drawing No. 1C388-M
Drawing No. 69A313

COUPLER INSTALLATION

The Radio Coupler is to be installed in the instrument panel in any existing 2 1/4" hole that is accessible to the pilot. If an existing cutout is not available, use template Drawing No. 69A313 for proper cutout size. Use four 3S376 screws 6-32 x 5/8 F.H. for mounting. Do not use mounting screws that extend into the Radio Coupler more than 5/8".

CABLES

1. The 1C388-M Radio Coupler is placed in series with the D. G. signal by connecting the CD-33 plug from the autopilot amplifier to the CD-33 plug connector on the Radio Coupler. The CD-33 pigtail, with receptacle, from the Radio Coupler is routed to the D.G. and connected to the CD-33 connector, thereby placing the Radio Coupler in between the Amplifier and Directional Gyro. CD-33 extension number 30A246-24 is available if necessary.

2. Using the 9S73 (9 pin) connector furnished, construct a wiring harness to connect the CD-34 connection on Radio Coupler to the OMNI course deviation indicator. Use MIL-W-5086A, No. 20 wire in the construction of this harness. Refer to Drawing No. 1C388 for wiring diagram of the CD-34 mating connector. Notice that different wiring diagrams are provided for 14 volt or 28 volt systems.

3. Terminals A & B of CD-34 plug on the Radio Coupler are connected directly to the OMNI course deviation indicator. For correct wiring information pertaining to the type indicator being used, refer to the appropriate radio equipment handbook. If the OMNI Receiver being used has no external connection for wiring to the deviation indicator, the internal modification of the receiver necessary in connecting the Coupler must be made by an approved radio facility. After all connections are complete, an OMNI needle deflection to the right should cause aileron deflection for a right bank.

4. The Coupler lights (terminal E or F) should be connected to the instrument light rheostat or the same rheostat the autopilot lights are connected to.

   NOTE: Use MIL-W-5086A wire for connecting the coupler lights. Before connecting Autopilot and/or Coupler lights to the instrument light rheostat measure the total wattage requirement of the lights both bright and dim and determine that the rheostat is adequate. A rheostat (Mitchell part number 18S38) is available upon order for Autopilot and Radio Coupler lights if necessary.

5. Secure all wiring to the airframe with cushion AN742 clamps within a maximum spacing of 18" to prevent damage and allow full freedom of controls. Route cables clear of flammable fluid and oxygen lines. All open connections and interconnections such as wrist lock 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. Advisory Circular 43.13-1, Chapter 11.

COMPONENT WEIGHTS AND CURRENT DRAIN

1. Radio Coupler 1.0 lb.

2. Current Drain
   Maximum 1.0 Amp.

1C388-2 RADIO COUPLER

PARTS GROUP II

Drawing No. 63B149-1
Drawing No. 69A313

COUPLER INSTALLATION

The Radio Coupler is to be installed in the instrument panel in any existing 2 1/4" hole that is accessible to the pilot. If an existing cutout is not available, use template Drawing No. 69A313 for proper cutout size. Use four 3S376 screws 6-32 x 5/8 F.H. for mounting. Do not use mounting screws that extend into the Radio Coupler more than 5/8".

CABLES

1. The 1C388-2 Radio Coupler is placed in series between the Autopilot Amplifier and the NSD-360 indicator. The CD-33 cable from the Autopilot Amplifier is connected to the CD-33 plug on the 1C388-2 Radio Coupler. Cable "A" (reference 63B149-1) is constructed to connect the CD-33 pigtail from the Radio Coupler to the NSD-360 indicator. Cable Assembly "B" is fabricated to connect CD-34 of the Coupler to the converter indicator and to the appropriate A+ sources for lighting and relay operation.

2. Using the 9S73 (9 pin) connector furnished, construct Harness Assembly "B" as shown on Drawing No. 63B149-1 to connect the CD-34 connection on the Radio Coupler to the indicator. Note that pin "K" on CD-34 is used only with the EDO-AIRE MITCHELL Glide Slope Coupler. See Glide Slope Coupler Section for further instructions. Harness "B" should be constructed with MIL-W-5086A, Wire No. 22 GA. Min.

3. When wiring Cable Harness "B" note that the CD-34 receptacle wiring varies slightly with 14 volt or 28 volt system. Also, note that for NSD-360, CD-34-A and CD-34-B are connected to pins 17 and 18 of the CD106 plug on the NSD-360.

4. Using the 28S52 plug furnished fabricate Cable Harness "A" to connect the CD-33 pigtail from the coupler to the indicator. Cable Harness "A" should be fabricated, using four single conductor, shielded, wires as shown on 63B149-1. Wire to be MIL-W-5086A, No. 22 GA. Min.

5. The Coupler lights (terminal E or F) should be connected to the instrument light rheostat or the same rheostat the autopilot lights are connected to.

   NOTE: Use MIL-W-5086A wire for connecting the coupler lights. Before connecting Autopilot and/or Coupler lights to the instrument light rheostat measure the total wattage requirement of the lights, both bright and dim, and determine that the rheostat is adequate. A rheostat (Mitchell Part Number 18S38) is available upon order for Autopilot and Radio Coupler lights if necessary.

6. Pin H to be connected to the 14/28 VDC A/P Master Switch or A/P Circuit Breaker with MIL-W-5086A No. 22 gauge minimum.

7. Secure all wiring to the airframe with cushion AN742 clamps within a maximum spacing of 18" to prevent damage and allow full freedom of controls. Route cables clear of flammable fluid and oxygen lines. All open connections and interconnections such as wrist lock 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. Advisory Circular 43.13-1, Chapter II.

COMPONENT WEIGHTS AND CURRENT DRAIN

1.	Radio Coupler	1.0 lb.
2.	Current Drain Maximum	1.03 Amp.

PARTS GROUP III

Drawing No. 63D358
Drawing No. 69A313

COUPLER INSTALLATION

The Radio Coupler is to be installed in the instrument panel in any existing 2 1/4 inch hole that is accessible to the pilot. If an existing cutout is not available, use template Drawing No. 69A313 for proper cutout size. Use four 3S376 screws 6-32 x 5/8 F.H. for mounting. Do not use mounting screws that extend into the Radio Coupler more than 5/8 inch.

CABLES

1. The 1C388-3 Radio Coupler is placed in series between the Autopilot Amplifier and the Heading System indicator. The CD-33 cable from the Autopilot Amplifier is connected to the CD-33 plug on the 1C388-3 Radio Coupler. Cable "A" (reference 63D358) is constructed to connect the CD-33 pigtail from the Radio Coupler to the indicator. Cable Assembly "B" is fabricated to connect CD-34 of the Coupler to the converter indicator and to the appropriate A + sources for lighting and relay operation.

2. Using the 9S73 (9 pin) connector furnished, construct Harness Assembly "B" as shown on Drawing No. 63D358 to connect the CD-34 connection on the Radio Coupler to the indicator. Note that pin "K" on CD-34 is used only with the EDO-AIRE MITCHELL Glide Slope Coupler. Harness "B" should be constructed with MIL-W-5086A, Wire No. 22 gauge minimum.

3. When wiring Cable Harness "B" note that the CD-34 receptacle wiring varies slightly with 14 volt or 28 volt system. Refer to Drawing No. 63D358 for pin connections to PN101, King KPI 550, Wilcox 1041A and Sperry RD444 thru RD447.

4. Using the 28A87 plug furnished fabricate Cable Harness "A" to connect the CD-33 pigtail from the coupler to the indicator. Cable Harness "A" should be fabricated, using eight single conductor, shielded, wires as shown on 63D358 Wire to be MIL-W-5086A, No. 22 gauge minimum.

5. The Coupler lights (terminal E or F) should be connected to the instrument light rheostat or the same rheostat used for the autopilot lights.

   NOTE: Use MIL-W-5086A wire for connecting the coupler lights. Before connecting Autopilot and/or Coupler lights to the instrument light rheostat measure the total wattage requirement of the lights, both bright and dim, and determine that the rheostat is adequate. A rheostat (Mitchell Part Number 18S38) is available upon order for Autopilot and Radio Coupler lights if necessary.

6. Pin H of CD-34 to be connected to the 14/28 VDC A/P Master Switch or A/P Circuit Breaker with MIL-W-5086A No. 22 gauge minimum.

7. Secure all wiring to the airframe with cushion AN742 clamps within a maximum spacing of 18" to prevent damage and allow full freedom of controls. Route cable clear of flammable fluid and oxygen lines. All open connections and interconnections such as wrist lock 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. Advisory Circular 43.13-1, Chapter II.

COMPONENT WEIGHTS AND CURRENT DRAIN

1.	Radio Coupler	1.0 lb.
2.	Current Drain Maximum	1.03 Amp.

EDO-AIRE MITCHELL CENTURY IIB MODEL AK515 PARTS LIST FOR INSTALLATION IN GRUMMAN AMERICAN MODELS AA-5, AA-5A AND AA-5B

SECTION I. CENTURY IIB INSTALLATION

GROUP I
ATTITUDE GYRO

Item No.	Part No.	Description	Spec. No.	Qnty.
1.	52D66	Attitude Gyro	PMA	1 _____

GROUP II
COURSE SELECTOR DIRECTIONAL GYRO

Item No.	Part No.	Description	Spec. No.	Qnty.
1.	52D54	Course Selector D. G.	PMA	1 _____

GROUP III
CONSOLE/AMPLIFIER

Item No.	Part No.	Description	Spec. No.	Qnty.
1.	1C385	Console/Amplifier	PMA	1 _____
2.	7B1076	Bracket	PMA	1 _____
3.	7B1077	Bracket	PMA	2 _____
4.	3S254	Screw	AN505-4-6	11 _____
5.	2S40	Nut	AN365-440	6 _____

GROUP IV
ROLL SERVO

Item No.	Part No.	Description	Spec. No.	Qnty.
1.	1C363-1-373R	Roll Servo	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 _____

Item No.	Part No.	Description	Spec. No.	Qnty
		GROUP V		
		ELECTRICAL CABLE HOOK-UP		
1.	30C198	Cable Assembly	PMA	1 _____
2.	30B180-1	Cable Assembly	PMA	1 _____
3.	3S327	Thumb Screws	PMA	2 _____
4.	30C211-36R	Cable Assembly	PMA	1 _____
5.	1B440	Roll Signal Filter	PMA	1 _____
		GROUP VI		
		PLACARDS		
1.	13A132	Placard	PMA	1 _____
2.	13A701	Placard	PMA	1 _____
3.	68S240-1	Autopilot Flight Manual	PMA	1 _____
4.	68S241	Autopilot Flight Manual	PMA	1 _____

_____

PMA INSPECTOR

Item No.	Part No.	Description	Spec. No.	Qnty.

SECTION II. RADIO COUPLER INSTALLATION (OPTIONAL)

GROUP I
RADIO COUPLER 1C388M

1.	1C388-M	Radio Coupler	PMA	1 _____
2.	3S376	Screw, 6-32 x 5/8 F. H.	PMA	4 _____
3.	9S102	Receptacle (9S73)	Amp 126-222	1 _____
4.	15S159			
5.	42S234			

GROUP II
RADIO COUPLER 1C388-2

1.	1C388-2	Radio Coupler	PMA	1 _____
2.	3S376	Screw 6-32 x 5/8 F. H.	PMA	4 _____
3.	9S102	Receptacle (9S73)	Amp 126-222	1 _____
4.	15S159			
5.	42S234			
6.	28S79	Plug (28S52)	Amp 126-216	1 _____
7.	2S95			
8.	41S121			
9.	15S159	Hood	Amp 126-1063	1 _____

GROUP III
RADIO COUPLER - 1C388-3

1.	1C388-3	Radio Coupler	PMA	1 _____
2.	3S376	Screw 6-32 x 5/8 F. H.	PMA	4 _____
3.	9S102	Receptacle (9S73)	Amp 126-222	1 _____
4.	15S159			
5.	42S234			
6.	28S78	Plug (28A87)	Amp 126-195-1002	1 _____
7.	15S159			
8.	41S121			

_____
PMA INSPECTOR

SECTION IV.

GROUND CHECKS AND FLIGHT ADJUSTMENT PROCEDURES

CENTURY IIB AUTOPILOTS

Drawing No. 69A911

The Century IIB Autopilot is an "Open Loop" system which responds only to the dynamics of the aircraft in flight, thus the only ground checks that can be accomplished are functional checks as described in this bulletin.

GROUND CHECKS:

1. Remove console face plate by removing the roll knob and the two face plate mounting screws that are exposed. After removing the face plate, reinstall the roll knob.

2. Start aircraft engine to obtain Gyro stability. Adjust vacuum regulator to obtain 4.5 to 5.0" vacuum.

3. Center roll knob.

4. Rotate aircraft control wheel to level flight (neutral) position. Push A/P ON/OFF switch ON. Move control wheel right and left to check Servo engagement and that Servo can be overridden.

5. Rotate roll knob right and left and observe that aircraft control wheel is moving the correct direction.

   NOTE: Aircraft control wheel will not necessarily be in any particular position when the roll knob is centered, but will remain stationary at the position it is in at the time the roll knob is rotated to its zero electrical output position.

6. Center Course Selector of Directional Gyro and push HDG switch ON. If Radio Coupler is installed, place Coupler Selector Switch in HDG mode. With the HDG switch ON, turns to selected headings are commanded by the HDG knob of the Directional Gyro. The D.G. HDG knob functions by being pushed in and rotated. With the HDG switch ON, the roll knob on the console is inoperative.

7. Rotate D.G. Course Selector right and left from center, and observe that control wheel rotates in correct direction. Return D.G. Course Selector to center.

8. If Radio Coupler is installed, proceed as follows: If coupler is not installed, skip to paragraph 10. Turn on radio and tune receiver to any available omni signal. Center Omni Indicator Needle.

9. Place Radio Coupler in OMNI mode. Swing omni needle right and left slowly and observe that control wheel rotates in correct direction.

10. Turn ON/OFF switch OFF. Rotate control wheel right and left and observe that Servo disengages.

FLIGHT CHECKS AND ADJUSTMENTS:

The Flight Adjustments required by the Century IIB Automatic Flight Control System vary slightly depending upon whether rate filtering is utilized and the options employed.

If Roll Filter is installed, disconnect and leave out of electrical system until Step 15 of Section "C". (Connect CD-18 from console amplifier directly into Attitude Gyro.)

Reference Drawing 69A911

A. ROLL THRESHOLD ADJUSTMENT - The Roll Threshold potentiometer is attached to the circuit board of the 1C385 amplifier and is accessible from the front of the amplifier with the face plate removed. (Ref: Ground Checks, Note 1).

1. With the aircraft in smooth air and trimmed for level flight and the A/P ON/OFF switch ON, center the HDG Indice, push HDG switch ON.

2. Adjust the roll threshold potentiometer, ("D", Ref: Drawing No. 69A911), clockwise until a noticeable roll oscillation develops, (clockwise rotation increases the sensitivity).

3. Rotate potentiometer counterclockwise until lateral oscillation is eliminated.

   NOTE: Counterclockwise rotation past the desired adjustment will cause long term lateral oscillation and possible wandering on established headings.

4. Grasp control wheel and displace aircraft in roll. If no oscillation develops, this completes the threshold adjustment. If roll oscillation develops, turn roll pot counterclockwise until oscillation stops. Repeat until no oscillation is detectable.

B. ROLL CENTER AND BANK LIMIT ADJUSTMENTS - NO RADIO COUPLER:

1. Fly aircraft to smooth air and trim for level flight using 75% power.

   NOTE: Check for correct rudder trim. If rudder is incorrectly trimmed, the Century IIB will fly the aircraft with a wing low to compensate for the rudder out of trim condition.

2. Center Roll Knob, push ON/OFF switch ON. Set D.G. Course Selector to D.G. heading (aircraft heading).

3. Turn HDG switch ON. If aircraft does not maintain selected heading, adjust as necessary to center D.G. Course Selector using center adjustment screw (B) on Console (Ref. Drawing No. 69A911).

4. Rotate D.G. Course Selector 90° to 150° left and observe aircraft bank angle. Adjust left bank screw (A) of Console to obtain 20° bank. (Ref. Drawing No. 69A911). Rotate adjustment screw clockwise to increase bank angle.

   NOTE: Keep D.G. Course Selector at least 25° left of D.G. heading until adjustment is completed.

5. Rotate D.G. Course Selector 90° to 150° right and observe aircraft bank angle. Adjust right bank screw (C) of Console to obtain 20° bank (Ref. Drawing No. 69A911). Rotate adjustment screw clockwise to increase bank angle.

   NOTE: Keep D.G. Course Selector at least 25° right of D.G. heading until adjustment is completed.

6. Allow aircraft to return to selected heading and level flight. Observe that Autopilot maintains selected heading $\pm 2^{o}$. If not, repeat steps 2 and 3 until selected HDG is maintained.

7. Push HDG switch OFF and with roll knob centered, observe that aircraft flies wings level $\pm 2^{o}$. (With A/C level, roll knob will not necessarily be centered.)

8. Turn roll knob full left and observe that aircraft banks left $30^{o} \pm 2^{o}$.

9. Repeat step 8 to the right, using the right bank screw (C) of Console.

C. ROLL CENTER AND BANK LIMIT ADJUSTMENTS - WITH RADIO COUPLER:

1. Fly aircraft to smooth air and trim for level flight using 75% power.

   NOTE: Check for correct rudder trim. If rudder is incorrectly trimmed, the Century IIB will fly the aircraft with a wing low to compensate for the rudder out of trim condition.

2. Push ON/OFF switch ON.

3. Set D.G. Course Selector to match D.G. heading (centered), for drift reference.

4. Push HDG switch ON. Set Coupler Selector Switch to OMNI mode, and push red button on rear of coupler IN. Hold button IN until the centering adjustment is complete.

5. Allow aircraft Roll Attitude to stabilize and if necessary adjust for straight and level flight (wings level and ball centered), with center adjustment screw (B) in Console (Ref. Drawing No. 69A911). After each adjustment allow aircraft attitude to stabilize and observe it for two minutes to insure aircraft is maintaining straight flight. Observe heading drift at HDG indice, maintain red button IN until no drift is detectable during a 30 second period.

6. Place Coupler Selector Switch in the HDG mode, release red button (coupler isolation button), and observe that aircraft maintains selected heading $\pm 2^{o}$.

7. Rotate D.G. Course Selector 90° to 150° left and observe aircraft bank angle. Adjust left bank screw (A) of console (Ref. Drawing No. 69A911) to obtain 20° bank. Rotate adjustment screw clockwise to increase bank angle.

   NOTE: Keep D.G. Course Selector at least 25° left of D.G. heading until adjustment is complete.

8. Repeat step 7 to the right, using the right bank screw (C) of Console, (Ref. Drawing No. 69A911).

9. Set omni Bearing Selector to obtain full <u>left needle</u> deflection.

   NOTE: Full left needle deflection must be maintained until adjustment is complete. This can best be accomplished by being at least 20 miles from the omni station and flying approximately to or from the station.

10. Push HDG switch OFF and set D.G. Course Selector 45° right of center indice.

11. Push HDG switch ON and allow aircraft heading to stabilize.

12. Adjust left intercept screw on side of Radio Coupler as necessary to stabilize Course Selector 45° right of center indice. Turn adjustment screw clockwise to increase intercept angle.

13. To adjust right intercept angle, repeat steps 9 through 12 with omni needle deflected full right and Course Selector 45° to left of center indice. Adjust right intercept pot.

14. Center omni needle on a "TO" bearing, and set Course Selector to match omni bearing. Allow aircraft to fly to the omni station and observe that omni needle stays "centered". If omni needle does not maintain center, adjust ROLL center potentiometer (B) CW for a needle displaced to the right of center, and CCW for a needle displaced to the left of center. (Ref. Drawing No. 69A911). This adjustment needs to be made in ONE TURN increments or less, for a "FINE" adjustment.

15. If Roll Filter is installed reconnect into system as called out in Electrical Section. Mount the Roll Filter at the location determined in the Electrical Section.

16. Slow aircraft back to best angle to climb airspeed and turn roll rate adjustment potentiometer on end of Roll Filter counterclockwise until slow lateral oscillation is apparent. Then rotate potentiometer clockwise until no oscillation is detected.

17. Command left and right turns at various airspeeds. A noticeable softening in roll rate should be apparent. Bank limits should be the same, if not adjust as in Step 7 of Section "C".

18. This completes the Ground and Flight Checks and Adjustments. Reinstall the Radio Coupler and Console/Amplifier face plate. Check coupler and console wiring for security and clearance.

SECTION V.

APPENDIX

1. Drawing Package (Refer to Master Drawing List for contents)

2. S.T.C. Certificate

3. A.F.M. Supplement, Autopilot Flight Manual or Placard

4. R.F.I. Instructions

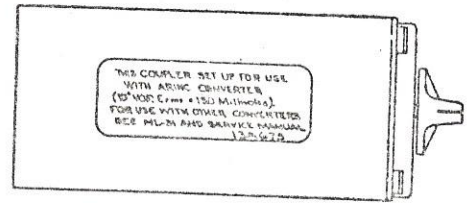
[ ] If A.F.M. Supplement is required, remove and place in the Aircraft Flight Manual.

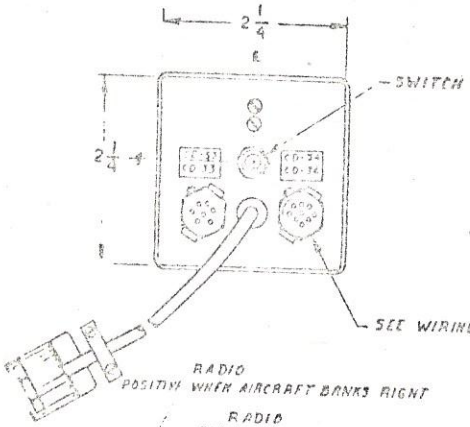
[X] If Autopilot Flight Manual is required, remove and place with aircraft records.

[ ] If Placard is required, place on instrument panel in full view of the Pilot.

MOD CKS.	SERIAL NO	E.O. NUMBER	DATE
G	6,000	6204	12-23-71

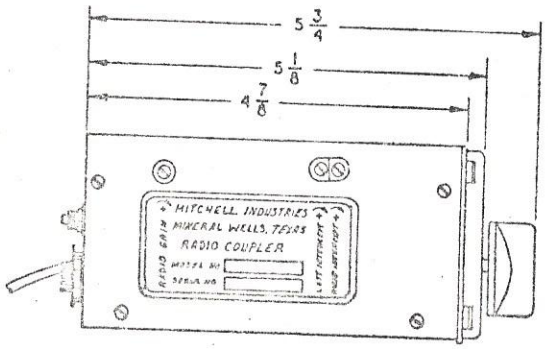
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
—	RELEASED PER E.O.		
G	ADD [illegible]	[illegible]	[illegible]
H	ADD TARGETS PLACARD E.O. # 6307	2-12-72	E. [illegible]





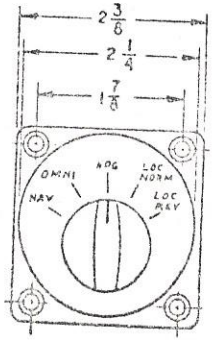
CD-34 14 VOLT HOOK-UP

7 SOCKET MATING CONNECTOR P/N 9573



CD-34 28 VOLT HOOK-UP

7 SOCKET MATING CONNECTOR P/N 9573



CAUTION
DO NOT USE MOUNTING SCREWS LONGER THAN 5/8

PLACARD 13A289
INSTALL CENTERED ON RIGHT SIDE OF COUPLER

NOTES:

1. WEIGHT: 1.0 LBS.
2. REFER TO SPEC. NO. 12A213 FOR ENGINEERING SPECIFICATIONS.

REFER TO 79C189 FOR FINAL ASSEMBLY

QTY	ITEM	PART NUMBER	DESCRIPTION

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

MATERIAL N/A

FINISH N/A

DRAWN C. WILTON 7-16-70
CHECKED SM 8-3-70
ENGINEER [illegible] 12-9-71
APPROVED [illegible] 12/9/71

MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

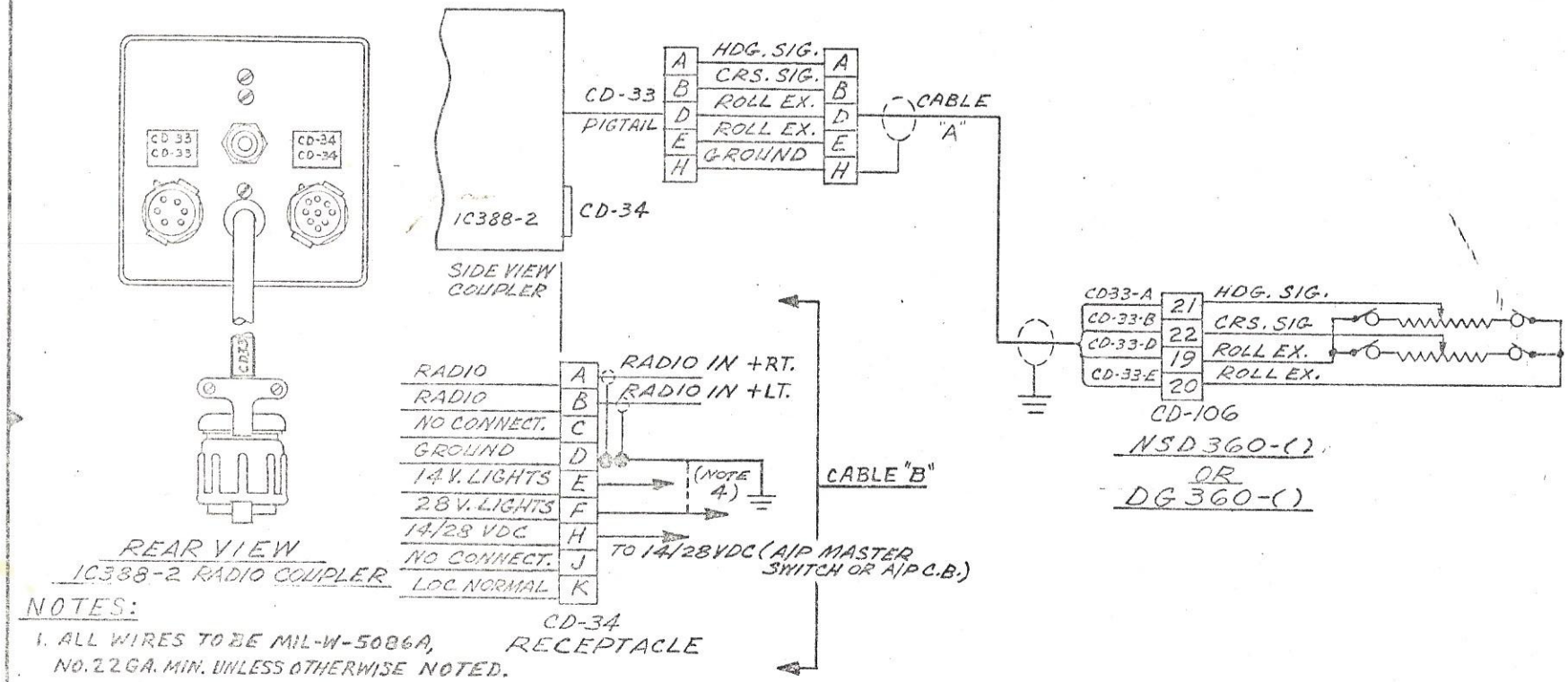
TITLE
RADIO COUPLER
OUTLINE DRAWING
SERIAL NUMBER 6000 AND ABOVE

SIZE
DWG NO. 1C 388 M
REV
SCALE FULL
SHEET

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 THERSON.

OCT 5 1973

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
–	RELEASED PER E.O. 7201	4-25-73	C. WILTON
A	CHG. NOTE 2 PER E.O. 7725	3-7-74	



NOTES:

1. ALL WIRES TO BE MIL-W-5086A, NO. 22 GA. MIN. UNLESS OTHERWISE NOTED.
2. TO REVERSE HEADING PHASE: REVERSE LEADS TO PINS 19 AND 20 AT CD 106 OF NSD 360.
3. PIN "K" OF CD-34 USED ONLY WITH MITCHELL GLIDE SLOPE COUPLER.
4. FOR 28VDC SYSTEMS, PIN "F", CD-34, IS CONNECTED TO PANEL LIGHT RHEOSTAT AND PIN "E" IS OPEN. FOR 14VDC SYSTEMS, PIN "E" IS CONNECTED TO RHEOSTAT, AND PIN "F" JUMPERED TO PIN "D".

QTY	ITEM	PART NUMBER	DESCRIPTION
LIST OF MATERIALS			

NEXT ASSY	USED ON
	NSD360-( )
	IC388-2

APPLICATION

TOLERANCES UNLESS OTHERWISE SPECIFIED.
DECIMAL: XXX: ± .005
DECIMAL: XX: ± .010
FRACTIONS: ± 1/64
ANGLES: ± 0° 30'
REMOVE BURRS
BREAK SHARP EDGES .010
DO NOT SCALE DRAWING

MATERIAL NOTED

FINISH ~

DRAWN 4-25-73
CHECKED R. Bennett 4-25-73
ENGINEER
APPROVED

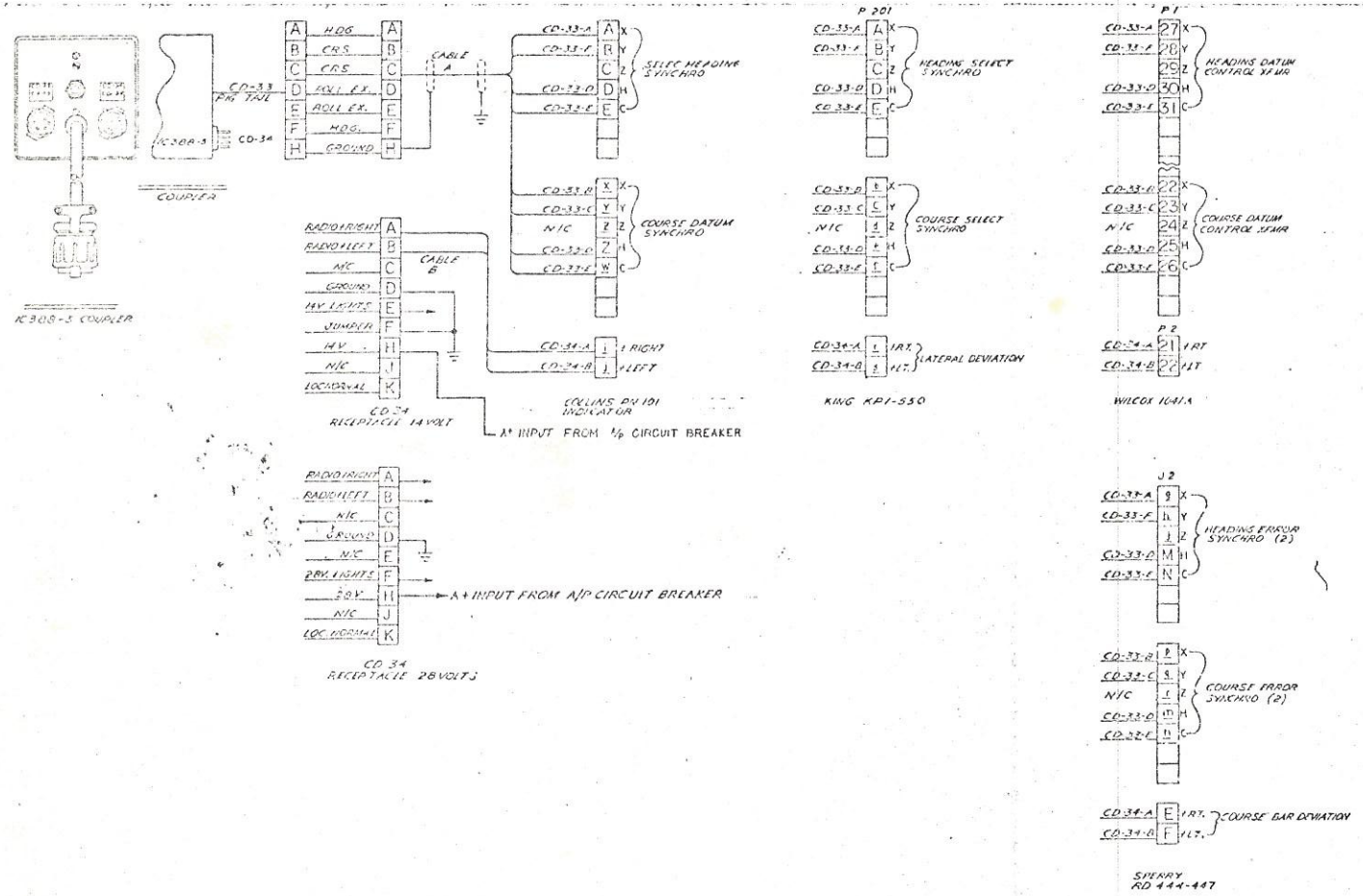
MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

TITLE WIRING INTERCONNECT IC388-2 & NSD360-( )

SIZE | DRAWING NO. 63B149-1 | REV.

SCALE ~ | SHEET 1 OF 1

REVISIONS			
LTR	DESCRIPTION	DATE	APPRO.
—	RELEASED PER E.O. 1-50	[illegible]	[illegible]
A	ADDED TO CD34 AT E.O. E364	[illegible]	[illegible]



NOTES:

1. DESIGNATED LETTERS IN CONNECTORS DENOTE LOWER CASE LETTERS. W
2. [illegible] LEADS (CD-33 & E) MAY BE EXCHANGED TO REVERSE PHASE.
3. [illegible] WITH HEADING SYNCHRO AND COURSE DATUM SYNCHRO.
4. [illegible] HEADING AND COURSE DATUM SYNCHRO LEADS SHOULD BE SHIELDED.

QTY	ITEM	PART NUMBER	DESCRIPTION
			LIST OF MATERIALS

NEXT ASSY	USED ON	MATERIAL N/A	DRAWN F. TORRES 3-19-74
APPLICATION		FINISH N/A	CHECKED [illegible] 4-19-74
			ISSUED [illegible]
			APPROVED [illegible]

EDO-AIRE MITCHELL
MINERAL WELLS, TEXAS

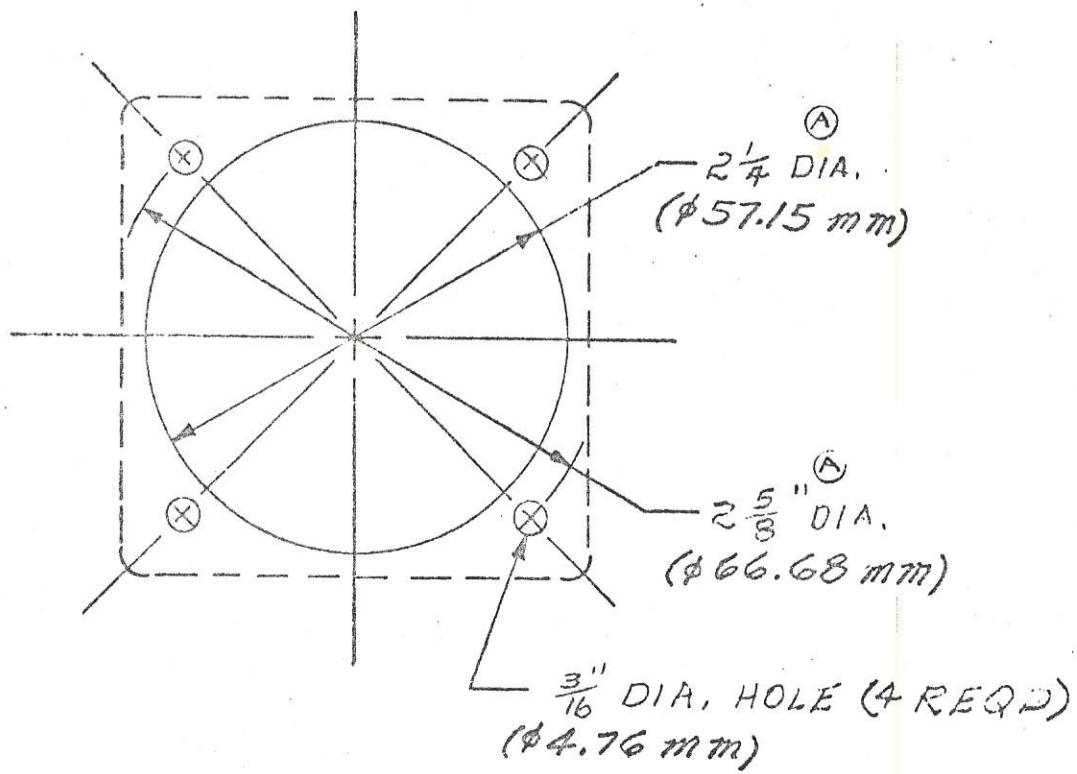
TITLE SCHEMATIC INTERCONNECT K388-3 TO PN101, KPI-550, WILCOX 1041A, SPERRY RD444-447

SIZE D | DWG. NO. 630358 | REV.

SCALE | SHEET

MITCHELL INDUSTRIES, INC. MINERAL WELLS, TEXAS	PART NAME TEMPLATE "MICRO-FILM" JUN 20 1966		PART NO. 69A313
DRAWN BY: JFR DATE: 7/24/63	USED ON RADIO COUPLER 1D292	SCALE 1/1	
MFG. APP.: DATE: 5-8-74	MATERIAL	FINISH	
APPROVED: DATE: 5-9-74			

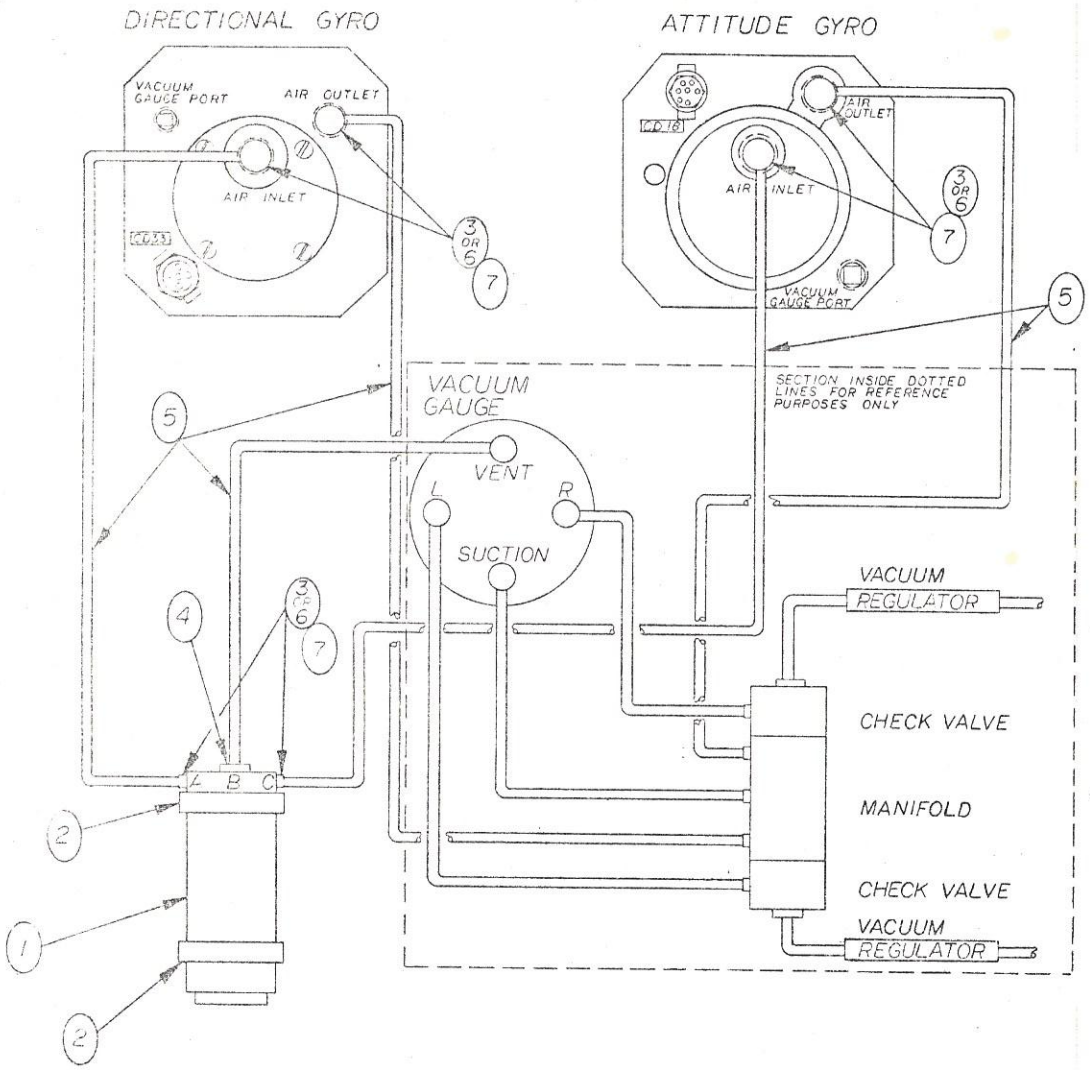
ISSUE	CHANGES	MEMO.
A	DIA. WAS R ARC	3/9/66



TOLERANCES UNLESS OTHERWISE SPECIFIED		
DECIMAL DIMENSIONS		
FRACTIONAL DIMENSIONS	+ −	.015
ANGULAR DIMENSIONS		

A SAMPLE OF THE FINISHED PART MUST BE SUBMITTED TO MITCHELL INDUSTRIES ENGINEERING DEPARTMENT FOR APPROVAL BEFORE PROCEEDING WITH PRODUCTION ON INITIAL

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
—	RELEASED PER E.O. 5388	11-18-70	C. WILTON



NOTES:

1. DO NOT PLUMB AIR DRIVEN INSTRUMENTS IN SERIES.
2. ON PRESSURIZED AIRCRAFT THE FILTER MUST BE OUTSIDE THE PRESSURE VESSEL.
3. PARTS IDENTIFIED WITH AN ASTERISK MUST BE USED ON PRESSURIZED AIRCRAFT OR PARTS SUPPLIED AND/OR RECOMMENDED BY AIRCRAFT MANUFACTURER.
4. ONLY ONE SOURCE OF POWER REQUIRED FOR SINGLE ENGINE AIRCRAFT.

QTY	ITEM	DESCRIPTION	PART NO. OR SPEC. NO.
	7	FITTING	*AN773-6D
	6	NIPPLE	AN840-6D OR *AN816-6D
	5	HOSE	MIL-H-5593A OR EQUIVALENT
	4	NIPPLE	AN840-4D OR *AN816-4D
	3	ELBOW	AN842-6D OR *AN822-6D
	2	CLAMP	AN742D20C
	1	FILTER	(1X3/4) MITCHELL OR EQUAL

LIST OF MATERIALS

USED ON: CENT. II & III, AUTOCONTROL III & ALT. III

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES UNLESS OTHERWISE SPECIFIED:
DECIMALS .XX ± .025
DECIMALS .XX ± .010
FRACTIONS ± 1/64
ANGLES ± 0°30'
REMOVE BURRS AND BREAK SHARP EDGES .005
DO NOT SCALE DRAWING

MATERIAL: NOTED

FINISH

DRAWN: DCT 12-8-69
CHECKED: B. Barrett 3-7-70
ENGINEER: E. Campbell 3-7-70
APPROVED: [illegible] 10-23-70

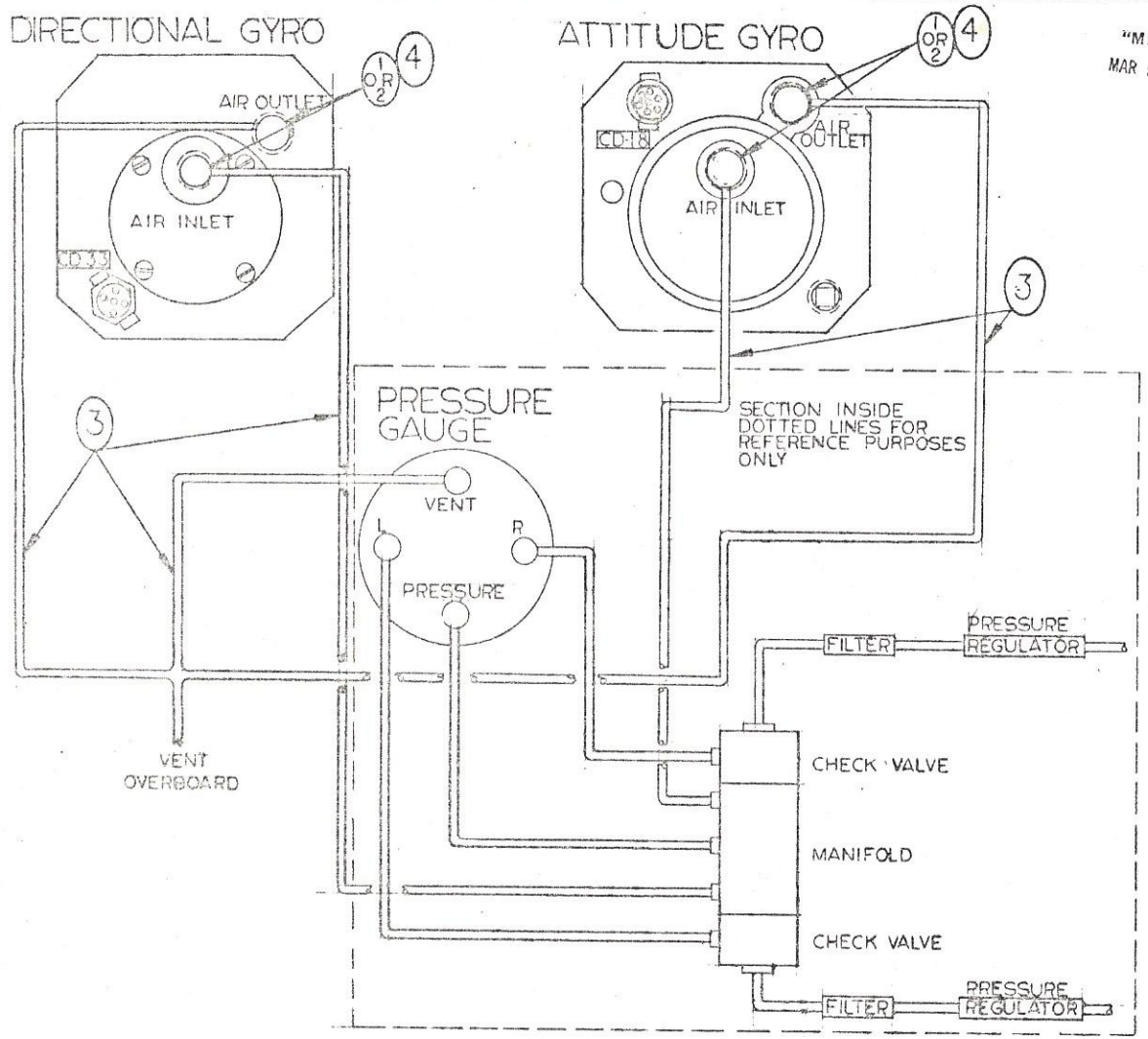
MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

TITLE: VACUUM SYSTEM PLUMBING

SIZE		DWG NO.	REV
C	3-7-70	69C835	

SCALE | SHEET

D.A.B. 4-12-70



"MICRO-FILM"
MAR 9 1973

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
-	RELEASED PER E.O. # 6579	6-30-72	E ELLIS

NOTES:

1. DO NOT PLUMB AIR DRIVEN INSTRUMENTS IN SERIES.
2. ON PRESSURIZED AIRCRAFT THE OVERBOARD VENT MUST BE OUTSIDE THE PRESSURE VESSEL.
3. PARTS IDENTIFIED WITH AN ASTERISK MUST BE USED ON PRESSURIED AIRCRAFT OR PARTS SUPPLIED AND/OR RECOMMENDED BY AIRCRAFT MANUFACTURER.
4. ONLY ONE SOURCE OF POWER REQUIRED FOR SINGLE ENGINE AIRCRAFT.

QTY	ITEM	DESCRIPTION	PART NO OR SPEC NO.
A/R	4	FITTING	*AN773-6D
A/R	3	HOSE	*MIL-H-5593A OR EQUIVALENT
A/R	2	NIPPLE	AN840-6D OR *AN816-6D
A/R	1	ELBOW	AN842-6D OR *AN822-6D

LIST OF MATERIALS

STATUS	INITL	DATE
DOS		
Rel		
Eng		
Eng		
Prod		
Qual		
Eng		
Eng		
Prod		
Qual		

USED ON	CENT. II, III, AUTOCONTROL III, ALT III.
NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS .XX ± .031
DECIMALS .XXX ± .010
FRACTIONS ± 1/64
ANGLES ± 0°30'
REMOVE BURRS AND SHARP EDGES
DO NOT SCALE DRAWING

MATERIAL: NOTED

FINISH: ~

DRAWN: DRT 12-6-69
CHECKED: B. BARRETT 6-8-72
ENGINEER: E CAMERON 6-8-72
APPROVED: J IRWIN 6-8-72

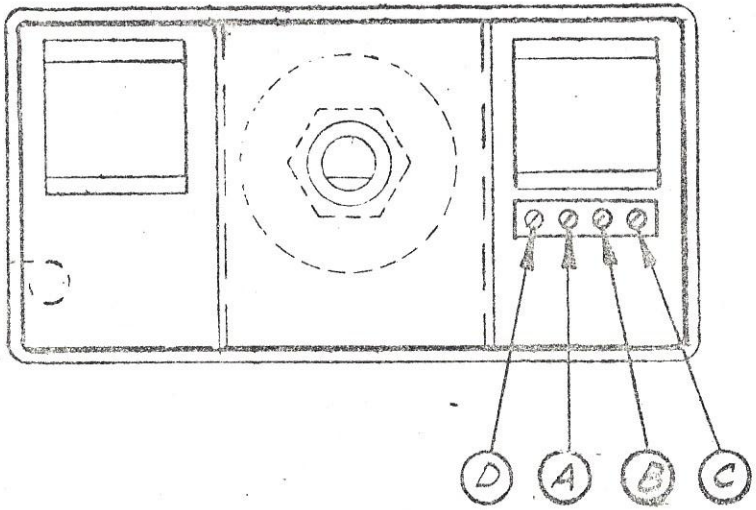
MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

TITLE: PRESSURE SYSTEM PLUMBING

SIZE: C | DWG NO. 69C835-1 | REV

SCALE: ~ | SHEET 1 OF 1

EDO-AIRE MITCHELL MINERAL WELLS TEXAS		TITLE CENTURY IIB & AUTOCONTROL IIIB ADJUSTMENT DRAWING		DWG NO 69A911		
DRAWN J. SWINSON	DATE 1-20-72	USED ON AK362, 363, 364 & 365	SCALE ~	REV	DESCRIPTION	BY	DATE
CHECKED E. CAMPBELL	DATE 1-20-72			-	RELEASED PER EO 62262		
ENGINEER Hugh Coleman	DATE 1-20-72	MATERIAL ~	FINISH ~				
APPROVAL J. Irwin	DATE 1-20-72						



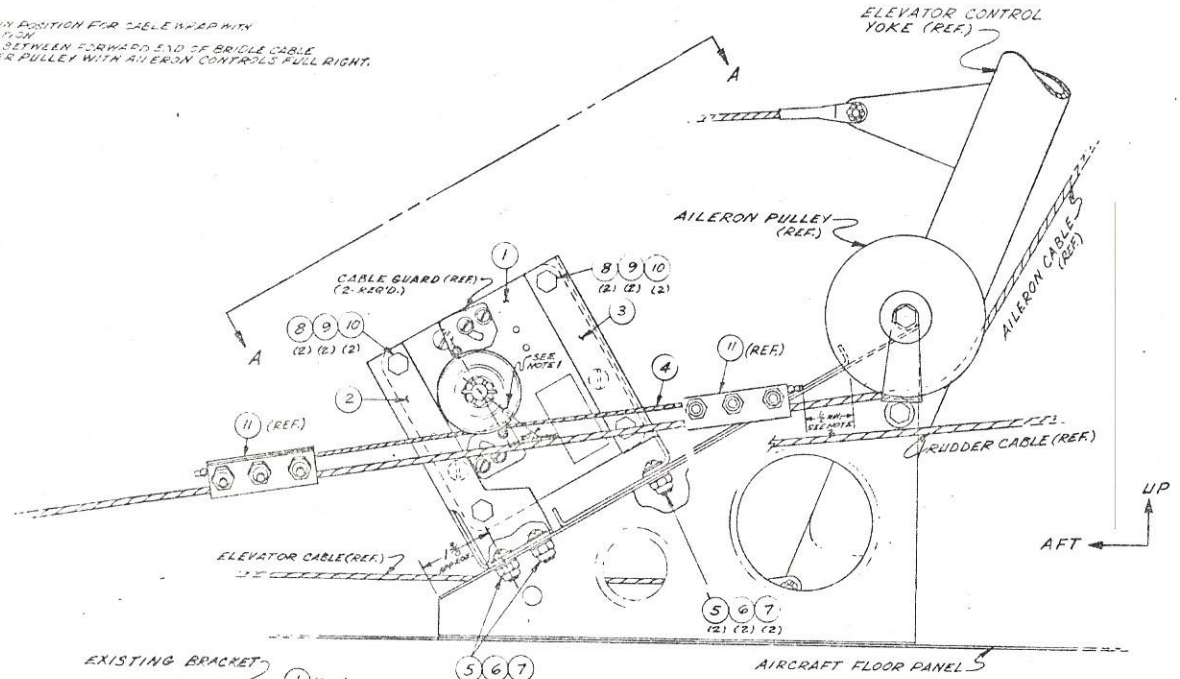
(A) - LEFT BANK ADJUSTMENT
(B) - CENTERING ADJUSTMENT
(C) - RIGHT BANK ADJUSTMENT
(D) - THREASHOLD ADJUSTMENT

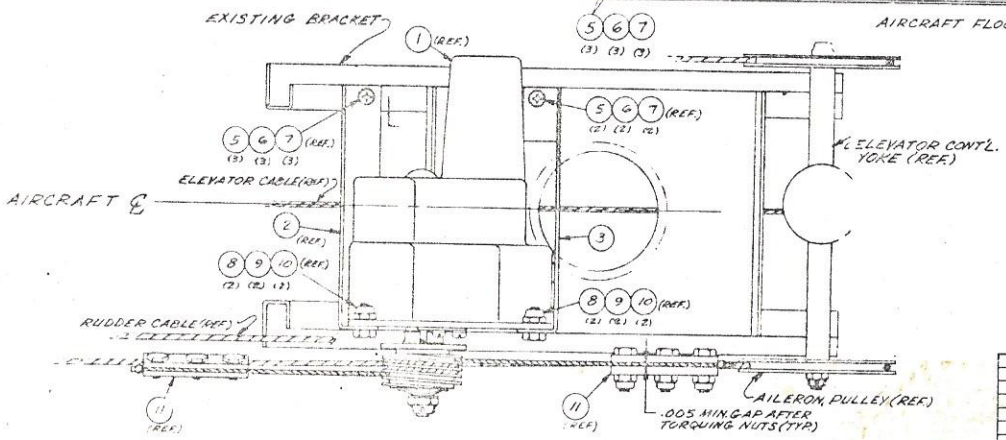
THIS DRAWING IS THE PROPERTY OF EDO-AIRE MITCHELL AND ITS POSSESSION BY UNAUTHORIZED PERSONS SHALL NOT BE CONSTRUED AS PERMISSION TO REPRODUCE FOR SALE, IN WHOLE OR IN PART, ANY DEVICES SHOWN THEREON

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		

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
-	RELEASED PER E.O.		
A	ADD ITEM NOTE & ADJUSTABLE	8-25-72	

NOTES:
1. BRIDLE CABLE PIN SHOWN IN POSITION FOR CABLE WRAP WITH AILERON IN NEUTRAL POSITION.
2. MAINTAIN 1/8" - 1/4" CLEARANCE BETWEEN FORWARD END OF BRIDLE CABLE AND AILERON CABLE IDLER PULLEY WITH AILERON CONTROLS FULL RIGHT.





VIEW A-A

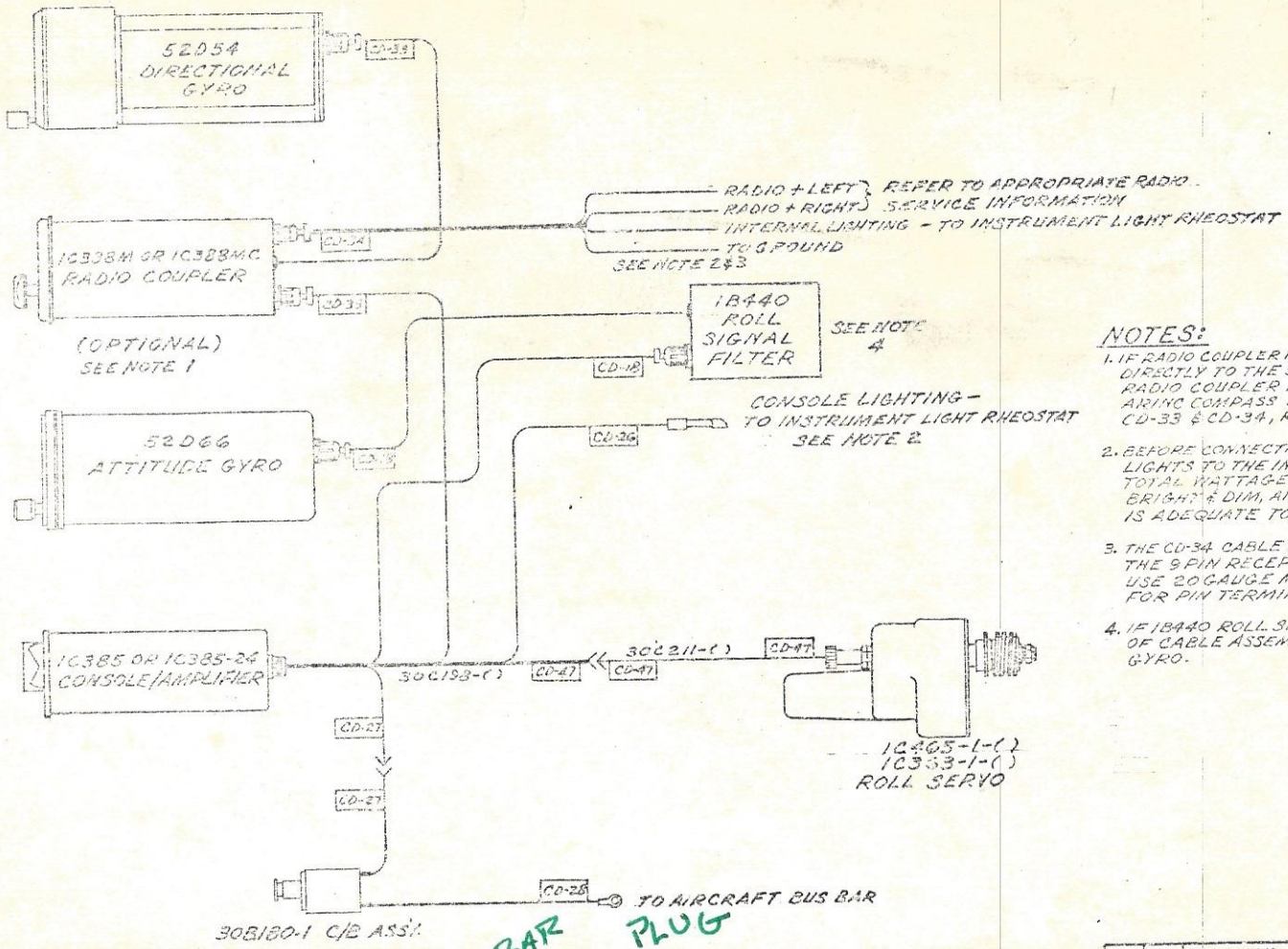
QTY	ITEM	PART NUMBER	DESCRIPTION
2	11	42A173-1	CABLE CLAMP
4	10	43134	WASHER, AN960-C10
4	9	2538	NUT, AN365-1032
4	8	3392	BOLT, AN3-4A
5	7	43205	WASHER, AN960-8
5	6	2534	NUT, AN365-832
5	5	35464	SCREW, AN525-832R8
1	4	308200	BRIDLE CABLE
1	3	73126B-1	BRACKET
1	2	70126B-1	BRACKET
1	1	10[illegible]	ROLL SERVO

LIST OF MATERIALS

DRAWN	J. Swinson 4-17-72	EDO-AIRE MITCHELL MINERAL WELLS, TEXAS
CHECKED		
ENGINEER		ROLL SERVO INSTALLATION
APPROVED		
MATERIAL	NOTED	SIZE: A — NO. 30932
NEXT ASSY		SCALE: NONE — SHEET 1 OF 1
APPLICATION		

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
—	RELEASE PER E.O. 6593	7-8-72	[illegible]

MICROFILMED
MAR 9 1973



NOTES:

1. IF RADIO COUPLER IS NOT INSTALLED, CD-33 IS TO BE CONNECTED DIRECTLY TO THE 52D54 DIRECTIONAL GYRO. THE 1C338MC RADIO COUPLER IS TO BE USED IN CONJUNCTION WITH STANDARD ARINC COMPASS SYSTEMS. FOR PIN TERMINATIONS AT CD-33 & CD-34, REFER TO DWG. 63B149.
2. BEFORE CONNECTING AUTOPILOT AND/OR RADIO COUPLER LIGHTS TO THE INSTRUMENT LIGHT RHEOSTAT, MEASURE THE TOTAL WATTAGE REQUIREMENTS OF THE LIGHTS, BOTH BRIGHT & DIM, AND DETERMINE THAT THE EXISTING RHEOSTAT IS ADEQUATE TO HANDLE THE ADDITIONAL LOAD.
3. THE CD-34 CABLE IS TO BE FABRICATED IN THE FIELD USING THE 9 PIN RECEPTACLE SUPPLIED WITH RADIO COUPLER. USE 20 GAUGE MIL-W-5086 A WIRE FOR ALL CONNECTIONS. FOR PIN TERMINATIONS REFER TO DWG. 1C388A1.
4. IF 1B440 ROLL SIGNAL FILTER IS NOT USED, PLUG CD-18 OF CABLE ASSEMBLY 30C198-() DIRECTLY TO 52D66 ATTITUDE GYRO.

BAR PLUG

C47 white 4 Th from R - D - D
Black 5 Th " R - E C
Red 2 from Black A
Black lead -0 - B

QTY	ITEM	PART NUMBER	DESCRIPTION
			LIST OF MATERIALS

DRAWN E.S. WINASCH 4-17-72
CHECKED [illegible] 5-2-72
ENGINEER E. CAMERON 5-2-72
APPROVED [illegible] 5-2-72

MITCHELL INDUSTRIES, INC.
MINERAL WELLS, TEXAS

TITLE CENTURY IIB AUTOPILOT PICTORIAL

SIZE | DWG NO. 69C935 | REV

SCALE | SHEET 1 OF 1

MATERIAL

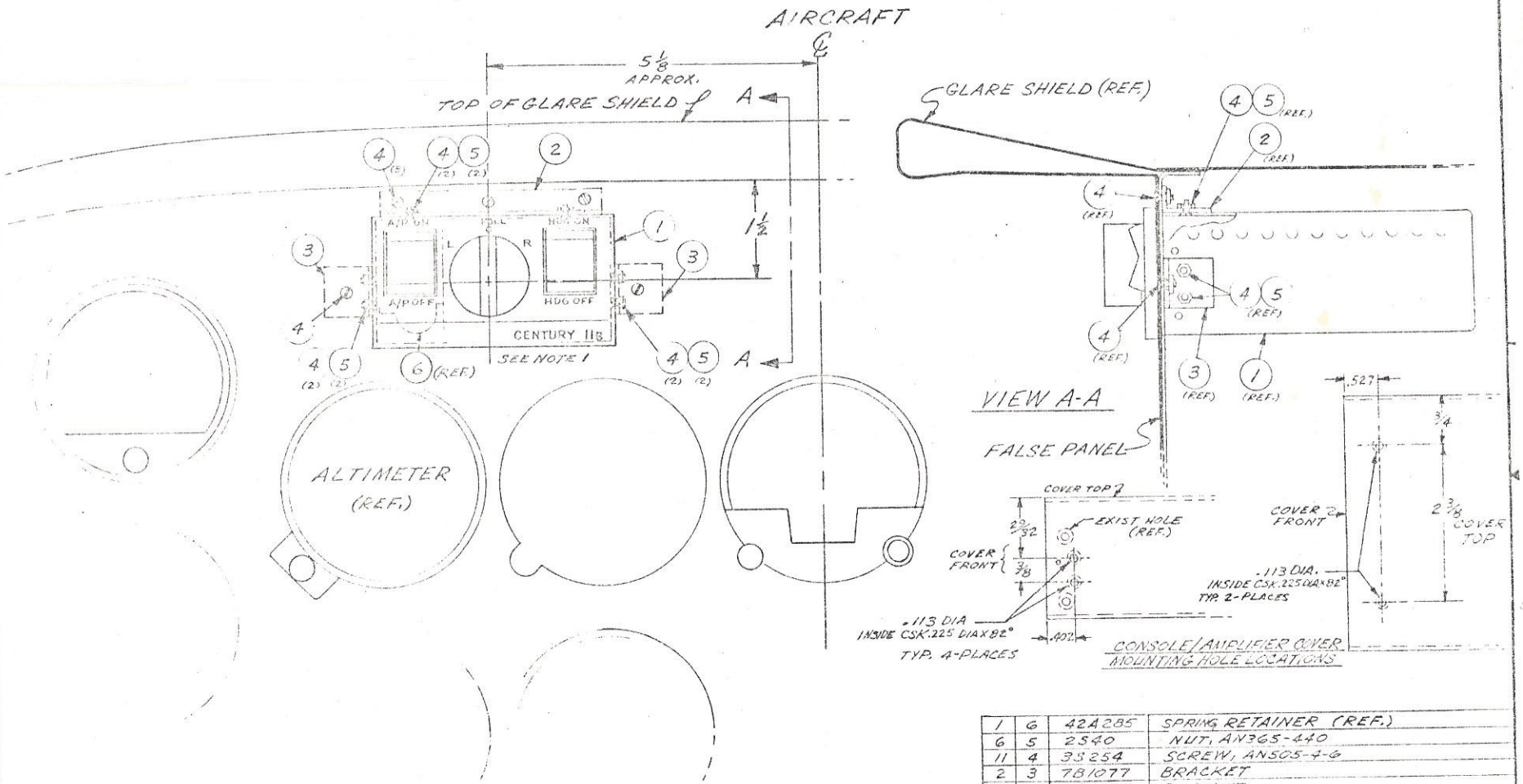
FINISH

NEXT ASSY | USED ON
CENTURY IIB
APPLICATION

"MICRO-FILM"

MAR 9 1973

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
—	RELEASED PER E.O. 6870	12-14-72	[illegible]
A	REV. RETAINER CLIP PER E.O. 3036	5-9-74	[illegible]
B	REVISED PER FECO # 350	1-7-74	[illegible]



PART. VIEW LOOKING FORWARD AT INSTRUMENT PANEL

QTY	ITEM	PART NUMBER	DESCRIPTION
1	6	42A285	SPRING RETAINER (REF.)
6	5	2540	NUT, AN365-440
11	4	33254	SCREW, AN505-4-6
2	3	781077	BRACKET
1	2	781076	BRACKET
1	1	10385	CONSOLE/AMPLIFIER

LIST OF MATERIALS

NOTES:

1. PANEL CUT-OUT TO BE 3 9/16" X 1 7/8". LOCATE PANEL CUT-OUT CENTER 1 1/2" DOWN FROM BOTTOM OF GLARE SHIELD APPROX. 5 1/8" OVER FROM AIRCRAFT ℄

NEXT ASSY	USED ON
	AK515
	AK374

APPLICATION

THIS DRAWING & THE PROPERTY OF MITCHELL INDUSTRIES INC AND ITS PURPOSE MAY ON AUTHORIZED PERSONS SHALL NOT BE LOANED OR REPRODUCED OR REPRODUCE FOR SALE IN WHOLE OR IN PART, ANY DEVICES SHOWN THEREON

TOLERANCES UNLESS OTHERWISE SPECIFIED
DIA HOLES ± .003
DIA PINS ± .010
FRACTIONS ± 1/64
ANGLES ± 0°30'
SCRIBE LINES AND FIELD WORK DIMS. ETC.
DO NOT SCALE DRAWING

MATERIAL: NOTED

FINISH

DRAWN: J. Swinson 4-17-72
CHECKED: V. Bowen 5-2-72
ENGINEER: F. Cameron 5-2-72
APPROVED: J. Irwin 5-2-72

EDO-AIRE MITCHELL
MINERAL WELLS, TEXAS

TITLE: CONSOLE/AMPLIFIER INSTALLATION

SIZE | DWG NO. 69C936 | REV

SCALE FULL | SHEET 1 OF 1

United States of America

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA3032SW-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 Aviatic *Regulations.*

Original Product — Type Certificate Number: A16EA
Make: Grumman American
Model: AA-5, AA-5A, and AA-5B

Description of Type Design Change:

Installation of Mitchell Automatic Flight System Model AK515 consisting of Century II B Autopilot with Optional Radio Coupler according to Bulletin No. 638, Revision (2), dated 7-29-75 and Master Drawing List No. 87A749, Revision B, dated 7-29-75.

Limitations and Conditions:

FAA-DAS Approved Autopilot Flight Manual, P/N 68S240-1, dated 8-4-75 for Grumman American Models AA-5 and AA-5A
FAA-DAS Approved Autopilot Flight Manual, P/N 68S241, dated 5-19-75 for Grumman American Model AA-5B

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 reissued: 6-23-75; 8-4-75 Revision 2
Date amended:

By direction of the Administrator

(Signature)
Harold W. Holdeman
DAS Staff Coordinator, DAS 2 SW
(Title)

FEDERAL AVIATION ADMINISTRATION

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

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2 (10-68)

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 of 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 of pitch axis of the autopilot directly. This occurence 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-

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.