

Cessna.  
MODEL 421B

N239SE

Form 337's,  
STC's,  
Equipment List







# AIRCRAFT EXHAUST SYSTEMS

1-800-338-5420

FAX (262) 763-3735

NAME <i>Achievement Aviation</i>		
ADDRESS <i>1400 Leeson Ave</i>		
CITY <i>Van Wert</i>	STATE <i>OH</i>	ZIP <i>45291</i>
MAKE & MODEL <i>Cessna 421B</i>		
MUFFLER	SHROUD	
STACKS <i>5155156-207</i>	CLAMPS	
TAILPIPES	RISERS	
CUSTOMER PHONE NO. <i>260/525-2975</i>	CONTACT <i>Josh</i>	

ALL WORK PERFORMED IN ACCORDANCE WITH DAWLEY AVIATION PROCESS SPEC 1000

AD COMPLIANCE DUE UPON INSTALLATION (as determined by the installer)

*Clean & inspect, weld misc.  
cracks, resurface flanges, resize  
slip joints, check alignment.*

WORK ORDER NO 110082



140 Industrial Drive  
Burlington, WI 53105

FAA Repair Station  
NJ5R069N

INSPECTION	Preliminary	<i>4-14-14</i>
	Date	<i>4-14-14</i>
	Hidden Damage	
	Date In Progress	<i>20</i>
	Date Final	<i>4-14-14</i>
	Date	<i>4-14-14</i>

REPLACEMENTS			
Flame Tubes, Cones, Cans Qty. _____		Inlay Qty. _____	
End Plate Overlay Qty. _____		Outer Shell	
Beaded End Qty. _____		Ring Qty. _____	
End Plates Qty. _____		Cuff	
Ball Joint Qty. _____		Tab	
Slip Joint Qty. _____		Bends _____	
Tailpipe Qty. _____	<i>GJ</i>	Weld	<i>AT</i>
Overlay Qty. _____	<i>N/A</i>	Fab	<i>5m</i>
Flange Qty. _____	<i>AT</i>	Pressure Test	

CLEAN AND INSPECT

REPAIR

FED X

RED

BLUE

NORMAL

## MAINTENANCE RELEASE

The aircraft / component identified hereon was repaired and inspected in accordance with current Federal Aviation Regulations and was found airworthy for return to service. Pertinent details of the repair are on file at this agency.

AUTHORIZED AND CONDITIONS AGREED TO AS STATED ABOVE

BY *[Signature]*

DATE *4-14-14*



U.S. Department  
of Transportation  
Federal Aviation  
Administration

## MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)

Form Approved  
OMB No. 2120-0020  
11/30/2007

Electronic Tracking Number

For FAA Use Only

**INSTRUCTIONS:** Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U. S. C. §46301(a))

<b>1. Aircraft</b>	Nationality and Registration Mark <b>USA N239SE</b>	Serial No. <b>421B0315</b>	
	Make <b>CESSNA</b>	Model <b>421B</b>	Series
<b>2. Owner</b>	Name (As shown on registration certificate) <b>RONALD A PETERSON INC DBA</b>		Address (As shown on registration certificate) <b>5036 PHILLIPS BLVD STE 347 ORLANDO, FLORIDA 32819 USA</b>

**3. For FAA Use Only**

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>AIRFRAME</b>	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	<b>POWERPLANT</b>			
<input type="checkbox"/>	<input type="checkbox"/>	<b>PROPELLER</b>			
<input type="checkbox"/>	<input type="checkbox"/>	<b>APPLIANCE</b>	Type		
			Manufacturer		

**6. Conformity Statement**

<b>A. Agency's Name and Address</b> <b>ORLANDO AIRCRAFT SERVICES</b> <b>601 HUMPHRIES AVE. ORLANDO EXECUTIVE AIR</b> <b>ORLANDO, FL</b> <b>32803 USA</b>	<b>B. Kind of Agency</b> <input type="checkbox"/> U. S. Certificated Mechanic <input type="checkbox"/> Foreign Certificated Mechanic <input checked="" type="checkbox"/> Certificated Repair Station <input type="checkbox"/> Certificated Maintenance Organization  <input type="checkbox"/> Manufacturer <b>C. Certificate No.</b> <b>FAA CRS # TP4R552M</b>
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**D.** I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U. S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual <div style="text-align: center; font-family: cursive; font-size: 1.2em;">T E W</div>	<b>TROY E WEBB</b> <b>30-July-2021</b>
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**7. Approval for Return to Service**

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is  Approved  Rejected

	FAA Fit Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
<b>BY</b>	FAA Designee	<input checked="" type="checkbox"/> Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. <b>TP4R552M</b>	Signature/Date of Authorized Individual <div style="text-align: center; font-family: cursive; font-size: 1.2em;">T E W</div>	<b>TROY E WEBB</b> <b>30-July-2021</b>
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### NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

#### 8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

USA N239SE	Jul-30-2021
Nationality and Registration Mark	Date

Removed Cessna 400A Autopilot System, Bendix/King KT 74 transponder and a Garmin GTX 33 transponder.

Installed a Genesys Aerosystems 3100 Autopilot System with Yaw Damper per STC SA09751DS, a Garmin GTX 345 and a GTX 33ES ADS-B compliant transponders per STC SA01714WI, a Garmin GI 275 CDI per STC SA02658SE and a JP Instruments EDM 760 EGT/CHT indicator per STC SA00729SE. Included Genesys Aerosystems 3100 AFMS p/n ST-966-AFMS-0001 Rev B dated June 2021, Garmin GTX 345 and GTX 33ES AFMS p/n 190-00734-15 Rev 5 dated June 2021, Garmin GI 275 AFMS p/n 190-02246-12 Rev 6 dated July 2021 and JP Instruments EDM 760 AFMS p/n 760- Rev NC dated August 1999 in the Aircraft Flight Manual. Included Genesys Aerosystems 3100 ICA p/n ST-966-ICA-0001 Rev B dated May 2021, Garmin GTX 345 and GTX 33ES ICA p/n 190-00734-11 Rev 8 dated June 2021, Garmin GI 275 ICA p/n 190-02246-11 Rev 4 dated July 2021 and JP Instruments EDM 760 ICA p/n 760 Rev NC dated July 1999 with the aircraft paperwork.

Aircraft is ADS-B compliant IAW 14 CFR91.227.

Connected primary power to circuit breaker and labeled appropriately.

Electrical load computed and found to be within acceptable limits.

Weight and Balance changed and entered in aircraft papers.

Revised equipment list to show alterations.

Equipment installed, checked, and compass compensated in accordance with FAR 23-1301, 1309, 1327, and 1431.

This installation made in accordance with manufacturer's installation manuals and:

- AC-43.13-1B Chapter 7 - Sections 1, 2, 3, 4, 5, and 11
- Chapter 10
- Chapter 11 - Sections 3 Thru 17, 19, and 20
- Chapter 12 - Sections 1, 2, 3, and 4
- AC-43.13-2B Chapter 2, 3

-----END-----

ADDITIONAL SHEETS ARE ATTACHED

**J.P. INSTRUMENTS**  
**FAA APPROVED MODEL LIST (AML) NUMBER SA00729SE**  
**FOR**  
**INSTALLATION OF THE EDM-760 SERIES**  
**TEMPERATURE INDICATING SYSTEM WITH FUEL FLOW**

Issue Date: August 31 1999

IT	AIRCRAFT MAKE	AIRCRAFT MODEL	TYPE CERTIFICATE NUMBER	CERTIFICATE ON BASIS FOR ALTERATION	PART NO. SEE PAGE 3 FOR SERIES	AML REVISION DATE

United States of America

Department of Transportation—Federal Aviation Administration

## Supplemental Type Certificate

Number SA00729SE

*This certificate, issued to*      **J. P. Instruments**  
**P.O. Box 7033**  
**Huntington Beach, CA 92646**

*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 \* of the \* Regulations.*

*Original Product—Type Certificate Number:*      \*See attached FAA Approved Model List (AML)  
*Make:*      No. SA00729SE for a list of approved airplane  
*Model:*      models and applicable airworthiness regulations.

*Description of the Type Design Change:* Installation of twin temperature indicating system with fuel flow in accordance with J.P. Instruments (JPI) Installation manual Report No. 760, Revision -, dated 7/20/99, or later FAA approved revision.

*Limitations and Conditions:* Approval of this change in type design applies to the aircraft models listed on the AML only. This approval should not be extended to other aircraft of these models on which other previously approved modifications are incorporated unless it is determined that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that aircraft. A copy of this certificate, Airplane Flight Manual Supplement No. 760-1 dated August 31, 1999, or later FAA approved revision, and FAA Approved Model List (AML) No. SA00729SE must be maintained as part of the permanent records for the modified aircraft.

Cylinder head, oil, turbine inlet and/or exhaust gas temperature, fuel flow equipment, tachometer instruments, and manifold pressure instruments required by the original type design, or if required by other FAA approval, must remain installed.

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

*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:* June 18, 1999

*Date reissued:*

*Date of issuance:* August 31, 1999

*Date amended:*



*By direction of the Administrator*  
  
 (Signature)

Acting Manager, Seattle Aircraft  
 Certification Office

(Title)

*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.*



**J.P. INSTRUMENTS**  
**FAA APPROVED MODEL LIST (AML) NUMBER SA00729SE**  
**FOR**  
**INSTALLATION OF THE EDM-760 SERIES**  
**TEMPERATURE INDICATING SYSTEM WITH FUEL FLOW**

Issue Date: August 31 1999

IT	AIRCRAFT MAKE	AIRCRAFT MODEL	TYPE CERTIFICATE NUMBER	CERTIFICATE ON BASIS FOR ALTERATION	PART NO. SEE PAGE 3 FOR SERIES	AML REVISION DATE
1.	Aerostar (Piper)	PA-60-600, 601, 601P, PA-60-602P, -700P	A17W E	FAR 23	6	8/31/1999
2.	Aerostar Piper ) Machen Conv.	650, 680 700, A,CR STC SA 1658NM	A17WE	FAR 23	6	8/31/1999
3.	American General Aircraft	GA-7	A17SO	FAR 23	4	6/11/2001
4.	Beech	58, 58A	3A16	CAR3	6	8/31/1999
5.	Beech	58P, 58PA, 58TC, 58TCA	A23CE	FAR 23	6	8/31/1999
6.	Beech	60, A60, B60	A12CE	FAR 23	6	8/31/1999
7.	Beech	65, 65-80,65-A80,65-A80-8800, 65-88,65-B80,A65 A65-8200,70,	3A20	CAR 3	6	8/31/1999
8.	Beech	76	A29CE	Far 23	4	6/11/2001
9.	Beech	95, B95, B95A, D95A, E95,	3A16	CAR 3	4	8/31/1999
10.	Beech	95-55, -A55, -B55, -B55A, -C55, -C55A D55, D55A, E55, E55A	3A16	CAR 3	6	8/31/1999
11.	Beech	95-B55B (T-42A); 95-B55A, B55B with Colemill STC SA432SO	3A16	CAR 3	6	11/30/2005
12.	Cessna	T303	A334CE	FAR 23	6	1/27/2003
13.	Cessna	310C, D, E, F, G, H, E310H, 310I, J, K, L, N, P, Q, R, 310J-1, E310J, T310P T310Q, T310R	3A10	CAR 3	6	8/31/1999
14.	Cessna	320, A, B, C, D, E, F, 320-1, 335, 340, 340A	3A25		6	8/31/1999
15.	Cessna	336	A2CE	CAR 3	6	8/31/1999
16.	Cessna	337, 337A, B, C, D, E, F, G, H T337B, C, D, E, F, G, H, M337B, P337H, T337H-SP	A6CE	CAR 3	6	8/31/1999
17.	Cessna	401, 401A, B, 402, 402A, B, C, 411, 411A, 414, 414A 421, 421A, 421B, 421C	A7CE	CAR 3	6	8/31/1999
18.	Cessna	404	A25CE	FAR 23	6T	11/30/2005
19.	Grumman	G-44, G-44A, Scan 30 with STC SA380WE	A-734	CAR 4a	6	11/30/2005
20.	Piper	PA-23, -23-160	1A10	CAR 3	4	8/31/1999
21.	Piper	PA- E23-250, 23-250	1A10	CAR 3	6T	8/31/1999
22.	Piper	PA-30, PA-39, PA-40	A1EA	CAR 3	4T	8/31/1999
23.	Piper	PA-31	A20S0	CAR 3 FAR 23	6	1/27/2003
24.	Piper	PA-31--325, -31-350	A20SO	CAR 3 FAR 23	6	8/31/1999
25.	Piper	PA-31P	A8EA	CAR 3 FAR 23	6	6/11/2001
26.	Piper	PA-34-200	A7SO	FAR 23	4	8/31/1999
27.	Piper	PA-34-200T, -220T	A7SO	FAR 23	6	8/31/1999
28.	Piper	PA-44-180, -44-180T	A19SO	FAR 23	4	8/31/1999
29.	Twin Commander	500-A,	6A1	CAR 3	6	8/31/1999
30.	Twin Commander	500-B	6A1	CAR 3	6	6/11/2001
31.	Twin Commander	500-S, -U Merlyn STC SA 5969NM	6A1	CAR 3	6	6/11/2001
32.	Twin Commander	500-B, -S, -U Merlyn STC SA01142SE or STC SA01212SE	6A1	CAR 3	6T	11/30/2005
33.	Twin Commander	685	2A4	CAR 3	6	8/31/1999
34.	Siai-Marchetti	F20	A38EU	FAR 23 CAR 10	6	8/31/1999

FIG -9

**Instructions for Continued Airworthiness (ICA)**

There are no field adjustments and or calibration requirements for the EDM-700 series instrument after initial installation. ICA is not required. Maintenance of nonfunctioning or malfunctioning components is limited to removal and replacement of JPI factory supplied new or repaired components as described in the troubleshooting section of the installation instructions



United States of America  
Department of Transportation  
Federal Aviation Administration

# Supplemental Type Certificate

Number: SA02658SE

This certificate issued to: Garmin International, Inc.  
1200 East 151st Street  
Olathe, KS 66062

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

Original Product – Type Certificate Number:

Make:

Model:

Multiple - AML STC

See Approved Model List (AML) SA02658SE for approved aircraft models and applicable airworthiness standards.

Description of Type Design Change:

Installation of Garmin GI 275 Multi-Function Display System. Data required includes Garmin Master Drawing List (MDL) 005-01208-41 Revision 1, dated January 13, 2020 or later FAA-approved revision; Garmin Airplane Flight Manual Supplement (AFMS) 190-02246-12 Revision 1, dated January 13, 2020 or later FAA-approved revision; Garmin Maintenance Manual (Includes Instructions for Continued Airworthiness (ICA)) 190-02246-11 Revision 1, dated January 13, 2020 or later FAA-approved revision.

Limitations and Conditions:

- (1) The installer must determine whether this design change is compatible with previously installed modifications.
- (2) If the holder agrees to permit another person to use this certificate to alter a product, the holder must give the other person written evidence of that permission.
- (3) A copy of this certificate and AML, the approved AFMS, and the approved ICA must be maintained as part of the permanent records for the modified aircraft.

(See Continuation Sheet on Page 3)

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

Date of Application: March 29, 2018

Date Reissued:

Date of Issuance: January 13, 2020

Date Amended: June 14, 2021

By Direction of the Administrator

Signature JR Brownell

Title JR Brownell  
ODA STC Unit Administrator  
ODA-240087-CE

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 or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).

**FAA Approved Model List (AML) STC SA02658SE**

<b>Aircraft Make (TCDS Holder) [common name or previous make]</b>	<b>Aircraft Model (alias)</b>	<b>Type Certificate Number</b>	<b>TC Certification Basis [1]</b>	<b>MDL 005-01208-41 Approved Rev. [2]</b>	<b>AML Amended Date</b>	<b>AFMS Part Number</b>	<b>AFMS Revision [2]</b>
<b>Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]</b>	310, 310A (USAF U-3A), 310B, 310C, 310D, 310E (USAF U-3B), 310F, 310G, 310H, E310H, 310I, 310J, 310J-1, E310J, 310K, 310L, 310N, 310P, T310P, 310Q, T310Q, 310R, T310R	3A10	CAR 3, FAR 23	1	Original	190-02246-12	1
<b>Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]</b>	320, 320-1, 320A, 320B, 320C, 320D, 320E, 320F, 335, 340, 340A	3A25	CAR 3, FAR 23	1	Original	190-02246-12	1
<b>Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]</b>	336	A2CE	CAR 3	1	Original	190-02246-12	1
<b>Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]</b>	337, 337A (USAF 02B), 337B, T337B, M337B (USAF 02A), 337C, T337C, 337D, T337D, 337E, T337E, 337F, T337F, 337G, T337G, 337H, P337H, T337H, T337H-SP	A6CE	CAR 3, FAR 23	1	Original	190-02246-12	1
<b>Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]</b>	401, 401A, 401B, 402, 402A, 402B, 402C, 411, 411A, 414, 414A, 421, 421A, 421B, 421C, 425	A7CE	CAR 3, FAR 23	1	Original	190-02246-12	1
<b>Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]</b>	404, 406	A25CE	FAR 23	1	Original	190-02246-12	1

**3 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS**

3.1	Airworthiness Limitations .....	3-2
3.2	Servicing Information .....	3-3
3.2.1	Periodic Maintenance Instructions .....	3-3
3.2.2	Special Tools .....	3-3
3.3	Maintenance Intervals .....	3-4
3.4	Visual Inspection .....	3-6
3.4.1	Aluminum Foil Tape (Non-metallic Aircraft Only).....	3-6
3.5	Electrical Bonding Maintenance Check .....	3-6
3.6	Overhaul Period .....	3-7
3.7	Special Inspection Requirements.....	3-7
3.8	Application of Protective Treatments .....	3-7
3.9	Data Relative to Structural Fasteners.....	3-7
3.10	Additional Instructions .....	3-7

**3.1 Airworthiness Limitations**

There are no new (or additional) airworthiness limitations associated with this equipment and/or installation.

**The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§ 43.16 and 91.403 of Title 14 of the Code of Federal Regulations unless an alternative program has been FAA approved.**

FAA APPROVED

*JR Brownell*

JR Brownell

ODA STC Unit Administrator

ODA-240087-CE

7/22/2021  
Date

## **3.2 Servicing Information**

There are no servicing requirements for the GI 275 system. In the event of a system or LRU failure, troubleshoot the GI 275 system in accordance with Section 4.

### **3.2.1 Periodic Maintenance Instructions**

GI 275 system LRUs are designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units, and built-in tests are continuously executed while the LRUs are operating. Detected errors are indicated on the GI 275 display via failure annunciations, system messages, or a combination of the two. A list of reported errors for the system can be printed in the form of a maintenance log using the instructions provided in Section 4.1.

### **3.2.2 Special Tools**

A milliohm meter with an accuracy of  $\pm 0.1 \text{ m}\Omega$  (or better) is required to measure the electrical bonding between the GI 275 system components and aircraft ground.

A pitot-static ground tester is required for internal ADAHRS and standby instrument checkout procedures and maintenance.

### 3.3 Maintenance Intervals

**Table 3-1 Periodic Maintenance**

Item	Description/ Procedure	Interval
GI 275 System Visual Inspection	All installed system LRUs, switches, knobs, and wiring harnesses must be inspected to ensure continued integrity of the installation. The inspection must be performed in accordance with Section 3.4.	12 calendar months
Backup Battery Check	If installed, perform a Backup Battery Check as described in Section 5.12.5. If the backup battery does not pass the Backup Battery Check, it must be replaced using the procedure found in Section 5.5.	12 calendar months
EIS Annunciator Lamp Check	If an EIS annunciator(s) is installed, perform a check of the annunciator lamps using the following procedure: 1. Power on the GI 275 directly interfaced to the annunciator in Configuration mode. 2. Navigate to <b>Diagnostics</b> → <b>Discrete Outputs</b> . 3. Toggle the state of the Engine Caution and Engine Warning discrete outputs to <i>Active</i> . 4. Verify that the respective engine annunciator lights have illuminated. 5. Toggle the state of the Engine Caution and Engine Warning discrete outputs to <i>Inactive</i> .	12 calendar months
AHRS Magnetic Field Model Update	The GI 275 Integrated ADAHRS utilizes an Earth magnetic field model that is updated once every 5 years as part of the Aviation Database maintained by the owner/operator. If the magnetic model is not up-to-date, the unit will issue an alert upon start-up indicating the model has expired. A Service Bulletin containing the updated magnetic field model and instructions for installation can be obtained from the <u>Dealer Resource Center</u> or by contacting Garmin.	Every 5 years
Electrical Bonding Check	Perform an electrical bonding check of the GI 275 system LRUs in accordance with Section 3.5.	Every 2000 flight hours or 10 years, whichever comes first
Altimeter Checks	Test according to 14 CFR §43 Appendix E. Refer to the pitot-static checkout procedure in Section 5.14.2 for system-specific checkout procedure.	Interval must be in accordance with Title 14 CFR §91.411 and 91.413
Lightning Damage Check	Conduct an inspection of the GI 275 system in accordance with Section 3.7.	After a suspected or actual lightning strike
Equipment Removal and Replacement	Removal and replacement of the GI 275 system LRUs can be accomplished by referring to Section 5 for instructions.	On Condition



### **3.2 Servicing Information**

There are no servicing requirements for the GI 275 system. In the event of a system or LRU failure, troubleshoot the GI 275 system in accordance with Section 4.

#### **3.2.1 Periodic Maintenance Instructions**

GI 275 system LRUs are designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units, and built-in tests are continuously executed while the LRUs are operating. Detected errors are indicated on the GI 275 display via failure annunciations, system messages, or a combination of the two. A list of reported errors for the system can be printed in the form of a maintenance log using the instructions provided in Section 4.1.

#### **3.2.2 Special Tools**

A milliohm meter with an accuracy of  $\pm 0.1 \text{ m}\Omega$  (or better) is required to measure the electrical bonding between the GI 275 system components and aircraft ground.

A pitot-static ground tester is required for internal ADAHRS and standby instrument checkout procedures and maintenance.

Item	Description/ Procedure	Interval
Cleaning GI 275 Touchscreen	The display can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical cleaning agents. Care should be taken to avoid scratching the surface of the display.	On Condition
Display Backlight	Over time, the backlight lamp may dim and the display may not perform as well in direct sunlight conditions. The user must determine by observation when the display brightness is not suitable for its intended use. Contact a Garmin authorized repair station when the backlight lamp requires service.	On Condition

### 3.4 Visual Inspection

Operation of the GI 275 system is not permitted unless an inspection, as described in this section, has been completed within the preceding 12 calendar months. Conduct the following visual inspection of the GI 275 system LRUs and associated wiring harnesses to ensure installation integrity:

1. Inspect all units for security of attachment, including visual inspection of brackets and other supporting structure attaching all units to the airframe.
2. Inspect all switches, annunciators, knobs, and buttons for legibility.
3. Visually inspect each unit's wiring (including electrical bonding straps), overbraid, and connectors for chafing, deterioration, damage, or wear.
4. Visually check for any signs of corrosion.

#### 3.4.1 Aluminum Foil Tape (Non-metallic Aircraft Only)

Any aluminum foil tape used in the GI 275 installation for grounding of a GEA 24 or GEA 110 (refer to Appendix A of this document) must be inspected every 12 calendar months. The inspection must verify that the foil tape is not torn, damaged, or showing signs of corrosion. If any of these conditions are found, the tape must be replaced in accordance with Section 4 of *GI 275 Part 23 AML STC Installation Manual*.

### 3.5 Electrical Bonding Maintenance Check

GI 275 LRU electrical bonding must be checked every 2,000 flight hours or 10 years, whichever occurs first. During the check, any cables normally attached to the LRU must be disconnected from the LRU. Resistance must be measured from a bare metal portion of the LRU to an airframe grounding location. The airframe grounding location should be as close to the LRU as possible, unless otherwise noted in Table 3-2. If the measured resistance is greater than applicable values in the table, bonding must be improved to meet applicable requirements for a new installation in accordance with Section 4 of *GI 275 Part 23 AML STC Installation Manual*.

**Table 3-2 Electrical Bonding Maintenance Requirements**

LRU	Maintenance Requirement
GI 275 Base GI 275 ADAHRS GI 275 ADAHRS+AP	5 mΩ (from unit to instrument panel)
Engine Annunciator(s)	20 mΩ (from unit to instrument panel)
GEA 24 GEA 110	5 mΩ (from unit to local structure)
GTP 59 GMU 44B	5 mΩ (or electrically isolated per Appendix D of the <i>GI 275 installation manuals listed in Table 1-1</i> )
GMU 11	None, except when overbraid is required. Overbraid bond must meet 5 mΩ.
GSB 15	5 mΩ (from unit to instrument panel or local structure)

### 3.6 Overhaul Period

The system does not require overhaul at a specific time period. Power on self-test and continuous BIT will monitor the health of the GI 275 system. If any LRU indicates an internal failure, the unit may be removed and replaced. Refer to Section 4 of this document for fault corrective actions.

### 3.7 Special Inspection Requirements

After a suspected lightning strike, the following actions must be performed for the specified LRU:

#### **GTP 59 OAT Probe**

Inspect the GTP 59 for signs of lightning damage. Check the self-sealing washer (P/N 212-00026-00) used on the probe tip outside of the aircraft for any evidence of melting or lack of seal. Replace the washer if damaged. If there is evidence of lightning strike to the OAT or any lightning damage, replace the GTP 59 OAT Probe.

Tube-and-fabric aircraft must replace the OAT probe bond strap (if installed) in accordance with Section 4 of the GI 275 installation manuals (refer to Table 1-1).

#### **GMU 11/44B**

Aircraft with a GMU mounted in the wingtip of metallic aircraft with non-metallic wingtip covers must inspect the magnetometer installation for the following conditions:

1. Check the GMU magnetometer body and mount for scorching, soot, melting, pitting, denting, or discoloration.
2. Check the GMU connectors for melting or pin damage.
3. Check the cable overbraid for pinching, melting, or evidence of arcing.
4. Check the lug for evidence of arcing and verify that the lug is still secured to the overbraid.
5. Check electrical bonding between the GMU overbraid and adjacent aircraft structure. Resistance should be less than 5 m $\Omega$ .
6. If any of these checks shows evidence of a lightning strike, replace the overbraid assembly and affected components in accordance with Section 4 of *GI 275 Part 23 AML STC Installation Manual*.

Perform the Magnetic Interference Check in accordance with Section 6 of *GI 275 Part 23 AML STC Installation Manual*. The purpose of this check is to ensure the structure around the GMU did not get magnetized by the lightning event to the point of affecting magnetometer performance.

### 3.8 Application of Protective Treatments

None.

### 3.9 Data Relative to Structural Fasteners

Data relative to structural fasteners, such as type, torque, and installation requirements can be found in Section 5 of this manual.

### 3.10 Additional Instructions

None.



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

Number: SA09751DS

*This certificate issued to:*  
 S-TEC Corporation  
 One S-Tec Way  
 Mineral Wells, Texas  
 76067-9236

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

Original Product – Type Certificate Number: A7CE

Make: Textron Aviation Inc.  
 Models: 414, 414A, 421, 421A, 421B, 421C, and 425

Description of Type Design Change:

Installation of an S-TEC 01326 Digital Flight Control System (DFCS), in accordance with Master Data List No. ST-966-MDL-0001, Revision A, dated 9-24-18 or later FAA approved revision.

Limitations and Conditions:

1. Also eligible on model 421C when modified per STC SA1361SO.
2. Airplane Flight Manual Supplement, ST-966-AFMS-0001, Rev. -, dated 9-26-18 or later FAA approved revision is required.
3. Instructions for Continued Airworthiness, ST-966-ICA-0001, Revision -, dated 9-12-18, or later FAA approved revision is required. (See continuation sheet 3)

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

Date of Application: May 4, 2018

Date Reissued:

Date of Issuance: September 26, 2018

Date Amended:

By Direction of the Administrator

Signature Stephen Joseph

Title Stephen Joseph, Lead ODA Administrator ODA-100.5  
 ODA-700096-SW

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 or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).



United States of America  
 Department of Transportation  
 Federal Aviation Administration

# Supplemental Type Certificate

(Continuation Sheet)

Number: SA09751DS

Dated September 26, 2018

*Limitations and Conditions: (cont)*

4. Compatibility of this modification with other previously approved modifications must be determined by the installer.
5. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

*Certification Basis:*

Certification Basis: Compliance determination used for this STC

FAR 23.143 Amdt 23-17	FAR 23.693 Amdt 23-0
FAR 23.301 Amdt 23-0	FAR 23.771(a) Amdt 23-14
FAR 23.303 Amdt 23-0	FAR 23.777(a)(b) Amdt 23-7
FAR 23.305 Amdt 23-0	FAR 23.867(a)(b) Amdt 23-7
FAR 23.307 Amdt 23-0	FAR 23.1301 Amdt 23-20
FAR 23.395(a)(1) Amdt 23-7	FAR 23.1306 Amdt 23-61
FAR 23.397 Amdt 23-17	FAR 23.1308(a)(b)(c) Amdt 23-57
FAR 23.561(b)(e) Amdt 23-7	FAR 23.1309 Amdt 23-62
FAR 23.601 Amdt 23-0	FAR 23.1322 Amdt 23-17
FAR 23.603 Amdt 23-23	FAR 23.1329 Amdt 23-23
FAR 23.605(a) Amdt 23-23	FAR 23.1335 Amdt 23-20
FAR 23.607 Amdt 23-17	FAR 23.1351(a) Amdt 23-20
FAR 23.609 Amdt 23-0	FAR 23.1357(a)(b)(c)(d) Amdt 23-20
FAR 23.611 Amdt 23-7	FAR 23.1365 Amdt 23-14
FAR 23.613 Amdt 23-23	FAR 23.1367 Amdt 23-0
FAR 23.619 Amdt 23-7	FAR 23.1431 Amdt 23-0
FAR 23.625(a) Amdt 23-7	FAR 23.1501 Amdt 23-21
FAR 23.627 Amdt 23-0	FAR 23.1525 Amdt 23-0
FAR 23.671 Amdt 23-0	FAR 23.1529 Amdt 23-26
FAR 23.677 Amdt 23-7	FAR 23.1541(a)(2)(b) Amdt 23-21
FAR 23.685 Amdt 23-17	FAR 23.1581 Amdt 23-21
FAR 23.689 Amdt 23-7	FAR 23.1583 (a)(h) Amdt 23-23
	FAR 23.2540(b) Amdt 23-64

—END—

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 or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).



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Mineral Wells, TX 76067  
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T: (800)872-7832  
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April 21, 2021

### Use of Supplemental Type Certificate Written Permission Statement

Genesys-Aerosystems hereby grants permission Orlando Avionics Services /Orlando Avionics Corp. for use of STC No. SA09751DS and the supporting data associated with it, to modify one aircraft Cessna 421B serial no. 421B0393 registration no. N239SE

modification, as described in the attached supporting data, is specific and applicable to only the Product as described on the face of the STC listed above.

Compatibility of this STC modification, as described in the attached supporting data, with other previously approved modifications and/or a Product other than that listed on the face of the STC listed above must be determined by the installer.

Current Owner of Record Ronald A Peterson Inc DBA  
5036 Phillips Blvd Ste 347  
Orlando FL 32819

Genesys-Aerosystems

Kay Cox

Documentation Administrator

**Note:** *This certificate is provided to person(s) who are modifying an aircraft using an S-TEC STC. A copy of this certificate must be provided to the owner/operator of the modified aircraft and included in the permanent aircraft records.*

86316 Rev B 4/22/2014

# S-TEC

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**Instructions for Continued Airworthiness**  
*for the*  
**S-TEC 01326 Digital Flight Control System**  
*installed in*  
**Textron Aviation Inc. Models 414, 414A,  
421, 421A, 421B, 421C and 425**

Report No: ST-966-ICA-0001

Revision: B  
5-19-21

All reports, analyses, drawings, documents, or other data provided to the FAA by S-TEC are confidential/proprietary and are only to be used by FAA employees in conjunction with S-TEC certification projects, Supplemental Type Certificates (STC), Parts Manufacturing Approvals (PMA), or Technical Standard Orders (TSO). Release of this information or data in any form to any other party without prior written consent of S-TEC Corporation is prohibited.



REVISION PAGE

REV	DESCRIPTION	RELEASED BY	DATE
-	Initial Release	S. Joseph	9/12/18
A	Revised to update the configuration setup and leveling procedures. Updated Acronyms.	S. Joseph	10/01/19
B	Revised to update section 2.0, Table 2:LRU parts list, Section 6, IMU Leveling procedure and Section 10.0 Weight and Balance	S. Joseph	5/19/21

## TABLE OF CONTENTS

TITLE PAGE .....	1
REVISION PAGE .....	2
TABLE OF CONTENTS .....	3
1.0 INTRODUCTION .....	5
1.1 PURPOSE .....	5
1.2 EFFECTIVITY .....	5
1.3 REFERENCE DOCUMENTS .....	6
1.4 APPLICABLE REGULATIONS .....	7
2.0 SYSTEM DESCRIPTION .....	7
2.1 ACRONYMS .....	12
3.0 MAINTENANCE INSTRUCTIONS .....	14
3.1 ANNUAL INSPECTION .....	14
3.2 SPECIAL INSPECTION .....	14
3.3 REPAIR .....	14
4.0 TROUBLESHOOTING INFORMATION .....	15
5.0 REMOVAL AND REPLACEMENT INFORMATION .....	20
5.1 GENERAL INSTRUCTIONS (if applicable) .....	20
5.2 REMOVAL – 01326 COMPUTER .....	20
5.3 INSTALLATION – 01326 COMPUTER .....	20
5.4 REMOVAL – ROLL SERVO .....	21
5.5 INSTALLATION – ROLL SERVO .....	21
5.6 REMOVAL – ROLL SERVO .....	21
5.7 INSTALLATION – ROLL SERVO .....	22
5.8 REMOVAL – PITCH SERVO .....	22
5.9 INSTALLATION – PITCH SERVO .....	22
5.10 REMOVAL – YAW SERVO .....	23
5.11 INSTALLATION – YAW SERVO .....	23
5.12 REMOVAL – TRIM SERVO .....	23
5.13 INSTALLATION – TRIM SERVO .....	23
5.14 REMOVAL – TRIM SERVO .....	24
5.15 INSTALLATION – TRIM SERVO .....	24
5.16 WIRING DIAGRAMS .....	24
6.0 IMU LEVELING PROCEDURE .....	25
6.1 ASSUMPTIONS .....	25
6.2 REQUIRED EQUIPMENT .....	25
6.3 ASSIGN COM PORT .....	25
6.4 ESTABLISH PC TO CAN-USB CONNECTION .....	26
6.5 ESTABLISH CAN-USB TO 01326 CONNECTION .....	33
6.6 LEVELING PROCEDURE .....	37
6.7 CONFIGURATION AND VOLUME SETUP .....	41
6.8 VERIFICATION .....	42
7.0 SPECIAL TOOLS NEEDED .....	42
8.0 RECOMMENDED OVERHAUL PERIODS .....	43
9.0 AIRWORTHINESS LIMITATIONS .....	43
10.0 WEIGHT AND BALANCE .....	43
11.0 STRUCTURAL FASTENERS .....	43
12.0 ANNUAL INSPECTIONS .....	43

13.0 STRUCTURAL INSPECTIONS.....	44
14.0 APPLICATION OF PROTECTIVE TREATMENTS.....	44
15.0 COMMUTER CATEGORY (if applicable).....	44
16.0 REVISION AND DISTRIBUTION.....	44
17.0 REFERENCE INSTALLATION DRAWINGS.....	45

## 1.0 INTRODUCTION

**WARNING:** Means a maintenance procedure, practice, condition, etc. that could result in personal injury or loss of life.

**CAUTION:** Means a maintenance procedure, practice, condition, etc. that could result in damage or destruction of equipment.

**NOTE:** Means a maintenance procedure, practice, condition, etc., or a statement which needs to be highlighted.

### GENERAL ADVISORIES

**NOTE:** These instructions are intended for use by personnel familiar with standard aircraft avionics practices and methods of maintenance. If you do not have prior experience with or knowledge of avionics systems, do not attempt the following instructions. S-TEC Corporation will not be held liable for damaged items resulting from improper handling and maintenance.

**WARNING:** Service personnel are to obey standard safety precautions, such as wearing safety glasses, to prevent personal injury while installing or doing maintenance on this unit.

**WARNING:** This autopilot system exhibits a high degree of functional reliability. Nevertheless, users must know that it is not practical to monitor for all conceivable system failures and, however unlikely, it is possible that erroneous operation could occur without a fault indication. The pilot has the responsibility to find such an occurrence by means of cross-checks with redundant or correlated data available in the cockpit.

**CAUTION:** Remove all power to the autopilot unit before disconnecting or removing it. Disconnecting the unit with power connected may cause voltage transients that can damage the unit.

**NOTE:** Superseded Documents: The information, procedures, requirements, and limitations contained in these Instructions for Continued Airworthiness for this type design change supersede the information, procedures, requirements and limitations contained in the aircraft's maintenance manual when the type design change is installed on the Type Certificate Holder's aircraft.

## 1.1 PURPOSE

The purpose of these Instructions for Continued Airworthiness is to provide the line maintenance technician with the information necessary to ensure the continued airworthiness of the S-TEC 01326 Digital Flight Control System (hereafter referred to as System 01326) when installed in Textron Aviation Inc. Models 414, 414A, 421, 421A, 421B, 421C and 425.

## 1.2 EFFECTIVITY

This ICA is effective to all Textron Aviation Inc. Models 414, 414A, 421, 421A, 421B, 421C and 425 aircraft modified by the installation of a System 01326.

**NOTE:** This maintenance plan is designed to meet the required Instructions for Continued Airworthiness (14 CFR 23.1529), for aircraft equipped with the System 01326. This plan must be placed into the aircraft operator's Aircraft Maintenance Manual and incorporated into the operator's scheduled maintenance program.

### 1.3 REFERENCE DOCUMENTS

This document forms a part of the overall aircraft continued airworthiness requirements and is to be used in conjunction with the following documents, as applicable, reference Appendix A.

DOCUMENT NUMBER	TITLE
87325	Pilot's Operating Guide and Reference
ST-966-MDL-0001 (latest revision)	Master Data List
ST-966-II-0001	Installation Instructions
05166 (latest revision)	Procedure, Clutch Torque Adjustment
10243 (latest revision)	W/D 01326 System
10244 (latest revision)	Wiring Interface System 01326
10245 (latest revision)	W/D 01326 System
10246 (latest revision)	Wiring Interface System 01326
10248 (latest revision)	Schematic, 1500/2100 Interface to 01326
7687 (latest revision)	Installation, Control Wheel Switches
7688 (latest revision)	Installation, Control Wheel Switches
76333 (latest revision)	Installation, Roll Servo
76334 (latest revision)	Installation, Pitch Servo
76336 (latest revision)	Installation, Control Wheel Switches
76337 (latest revision)	Installation, Trim Servo
76338 (latest revision)	Installation, Control Wheel Switches
76339 (latest revision)	Installation, Yaw Servo
76341 (latest revision)	Installation, Pressure Bulkhead Fittings
76483 (latest revision)	Installation, Yaw Servo
76610 (latest revision)	Installation, Control Wheel Switches
76652 (latest revision)	Installation, Roll Servo
76723 (latest revision)	Installation, Yaw Servo
761168 (latest revision)	Installation, Yaw Servo
761173 (latest revision)	Installation, Trim Servo
761177 (latest revision)	Installation, Roll Servo
761180 (latest revision)	Installation, Control Wheel Switches
761185 (latest revision)	Installation, Pitch Servo
761190 (latest revision)	Installation, Autopilot Pressure Bulkhead Connector
761418 (latest revision)	Installation, Control Wheel Switches
761475 (latest revision)	Installation, Trim Servo
761476 (latest revision)	Installation, Trim Servo
761507 (latest revision)	Installation, Trim Servo
761527 (latest revision)	Installation, Pitch Servo
761543 (latest revision)	Installation, Go Around Switch
761575 (latest revision)	Installation, 01326 Computer
761609 (latest revision)	Wire routing 01326 DFCS

**Table 1: Reference Documents**

**NOTE**

It is the responsibility of the Maintenance Technician to verify with the Vendor that the Data being used is the latest revision.

## 1.4 APPLICABLE REGULATIONS

- 14 CFR 21.50 Instructions for Continued Airworthiness and manufacturer's maintenance manuals having airworthiness limitations sections.
- 14 CFR 23.1529 Instructions for Continued Airworthiness.
- 14 CFR 43.16 Airworthiness Limitations.
- 14 CFR 91.403 General Maintenance, Preventative Maintenance, and Alterations.

## 2.0 SYSTEM DESCRIPTION

(Including control and operation information)

The System 01326, a digital three-axis attitude-based Digital Flight Control System (DFCS), is designed for installation in aircraft equipped with a dual or single Air Data and Attitude Heading Reference System (ADAHRS) and/or DFCS computer internal sensors. The System provides roll, pitch and yaw modes along with an integral autotrim feature. The System 01326 includes a straight and level recovery feature as well as envelope protection/alerting features. The system utilizes the ADAHRS for attitude reference. The system utilizes sensors internal to the Computer/Programmer to support its monitoring (cross comparison) of the basic attitude information or to provide the attitude data. These sensors provide a continuous comparison of the attitude information to ensure integrity of the attitude source. The DFCS system accepts digital or analog navigation inputs from various sources such as an EFIS or navigation radios and a heading system.

The **Programmer/Computer** provides a means to engage the autopilot, select modes of system operation and to annunciate system modes and status. The Programmer/Computer consists of two sections: roll and pitch. The roll section accepts steering inputs from the navigation radios and the ADAHRS or internal sensors and uses this information to drive the **Roll Servo**. The pitch section receives signal inputs from the Primary Flight Displays and ADAHRS or internal sensors, and uses this information to drive the **Pitch Servo**. Yaw axis stabilization is provided by drive commands to a remote mounted **Yaw Servo**

Elevator Trim is automatically controlled by the **Trim Servo**, which also provides trim annunciation.

### Modes of Operation

#### Roll Axis Control

- **Autopilot (AP) Mode:** Engages roll servo
- **Flight Director (FD) Mode:** Laterally drives steering command bars (if applicable)
- **Roll Attitude (ROLL) Mode:** Holds roll attitude
- **Heading (HDG) Mode:** Turns onto a selected heading and hold it
- **Navigation (NAV) Mode:** Intercepts and tracks a VOR course
- **Approach (APR) Mode:** Intercepts and tracks a LOC front course or GPS approach inbound
- **Reverse (REV) Mode:** Intercepts and tracks a LOC back course (BC) inbound or track a LOC front course outbound
- **Control Wheel Steering (CWS) Mode:** Captures and holds new roll attitude, pitch attitude, indicated airspeed, vertical speed, or altitude
- **GPS Steering (GPSS) Mode:** Laterally steers along a flight plan course defined by GPS/FMS

- **GPS Lateral Navigation (GPSL) Mode:** Laterally steers along an approach course defined by GPS/FMS approach
- **Level (LVL) Mode:** Returns A/C to wings level attitude from any condition
- **Go-Around (GA) Mode:** Disengages AP and/or engages FD in ROLL wings-level mode

#### Pitch Axis Control

- **Autopilot (AP) Mode:** Engages pitch servo
- **Flight Director (FD) Mode:** Vertically drives steering command bars (if applicable)
- **Pitch Attitude (PITCH) Mode:** Holds pitch attitude
- **Indicated Airspeed (IAS) Mode:** Holds indicated airspeed
- **Vertical Speed (VS) Mode:** Holds vertical speed
- **Altitude Hold (ALT HOLD) Mode:** Holds altitude
- **Glideslope (GS) Mode:** Intercepts and tracks glideslope
- **GPS Vertical Navigation (GPSV) Mode:** Vertically steers along a glidepath defined by a GPS/FMS approach
- **Enroute Vertical Navigation (VNAV) Mode:** (Optional) Provides guidance from a top-of-descent (TOD) point to a target altitude specified by an enroute VNAV descent profile on a compatible navigator. This feature differs from that of vertically guided instrument approaches such as LPV and/or LNAV/VNAV.
- **Level (LVL) Mode:** Returns A/C to a fixed pitch up attitude from any condition
- **Go-Around Mode (GA) Mode:** Disengages AP and/or engages FD (if applicable) in PITCH hold mode with a preset nose-up command
- **Automatic Trim Mode:** Automatically drives trim servo(s), as required.

#### Yaw Axis Control

- **Yaw Damper (YD) Mode:** Dampens excessive adverse yaw and coordinates turns (if installed)

#### System 01326 (equipment locations)

- The 01326 computer is installed in the instrument panel, reference Appendix A, Drawing 761575 (latest revision).
- The roll servo is installed in the cabin area beneath the left hand floor panel on the forward side of the rear spar carry through. This area is between F.S. 176.50 and F.S. 186.5 and is approximately 43 1/2" forward of the centerline of the cabin door. Remove the floor panel beneath the number three seat to gain access to this area, reference Appendix A, Drawing 76333 (latest revision).
- Alternate installation, the roll servo is installed in the cabin area beneath the left hand floor panel on the forward side of the rear spar carry through. This area is between F.S. 186.15 and F.S. 200.75 and is approximately 27 inches forward of the centerline of the cabin door. Remove the floor panel beneath the number three seat to gain access to this area, reference Appendix A, Drawing 76652 (latest revisions).
- Or, the roll servo is installed in the fuselage between F.S. 212.87 and F.S. 225.50. Remove the floor panels to gain access to this area, reference Appendix A, Drawing 761177 (latest revisions).

- The pitch servo is installed in the aft fuselage section just aft of F.S. 289.94 on bottom centerline of the aircraft. Remove the access panel on the aft pressure bulkhead to gain entry to this area, reference Appendix A, Drawing 76334 (latest revision).
- Alternate installation, the pitch servo is installed in the aft fuselage directly forward of F.S. 305.94. Remove aft pressure bulkhead door to gain access to this area, reference Appendix A, Drawing 761527 (latest revision).
- Or, the pitch servo is installed in the fuselage between F.S. 225.50 and F.S. 238.13. Remove the floor panels to gain access to this area, reference Appendix A, Drawing 761185 (latest revision).
- The yaw servo is installed on the existing structure approximately 5 inches aft of the aft pressure bulkhead on the centerline of the aircraft. Remove the aft bulkhead access panel to gain access to this area, reference Appendix A, Drawings 76339 and 76723 (latest revisions).
- Alternate installation, the yaw servo is installed aft of F.S. 273.94 or F.S. 277.20 (414A and 421C). Remove center floor section of baggage area to gain entry to this area, reference Appendix A, Drawing 76483 (latest revision).
- Or, the yaw servo is installed in the aft fuselage between F.S. 289.94 and F.S. 305.94. Remove the aft access panel on the right side of the airplane to gain access to this area, reference Appendix A, Drawing 761168 (latest revision).
- The trim servo is installed in the cabin area beneath the floorboard on the centerline of the aircraft between F.S. 212.87 and F.S. 225.50. Remove the center floor panel to gain access to this area, reference Appendix A, Drawings 76337, 761475, 761476 and 761507 (latest revisions).
- Alternate installation, the trim servo is installed in the aft fuselage between F.S. 289.94 and F.S. 305.94. Remove the aft access panel on the right side of the airplane to gain access to this area, reference Appendix A, Drawing 761173 (latest revision).
- The control wheel switches are installed in the pilot's control yoke, reference Appendix A, Drawings 7687, 7688, 76336, 76338, 761180 and 761418 (latest revisions).
- Wiring of the System 01326 is accomplished in accordance with information provided on W/D 01326 DFCS or W/D Interface 01326 System reference Appendix A, Drawings 10243, 10244, 10245, 10246, 10248, 76341 and 761190 (latest revisions).
- Approximate wire routing of the autopilot system is shown on Wire Routing 01326 DFCS, reference Appendix A, Drawing 761609 (latest revision).



## System Line Replaceable Components

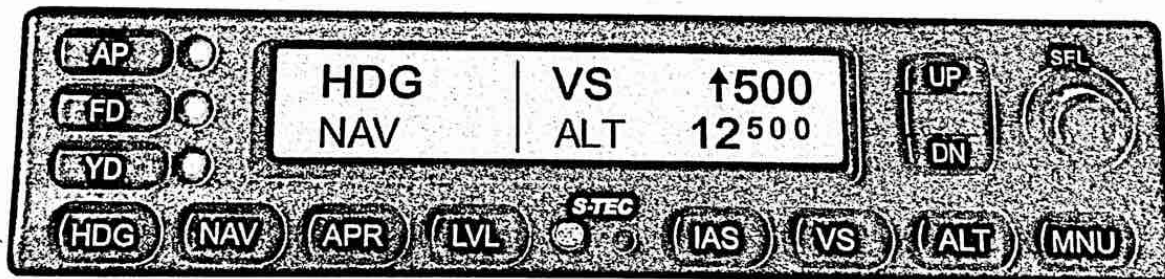
The System 01326 consists of the following components:

<u>P/N</u>	<u>Name</u>	<u>TSO</u>
01326-01-02-000	Digital Flight Control System (with YD)	C198
01326-04-02-000	Digital Flight Control System (without YD)	C198
01326-05-02-000	Digital Flight Control System (with YD)	C198
01326-06-02-000	Digital Flight Control System (without YD)	C198
01326-07-02-000	Digital Flight Control System (with YD)	C198
01326-08-02-000	Digital Flight Control System (without YD)	C198
0106-R9	Roll Servo (28V)	C9c
0108-P4	Pitch Servo (28V)	C9c
0106-Y12	Yaw Servo (28V)	C9c
0106-T9	Trim Servo (28V)	C9c

Table 2: LRU Parts List

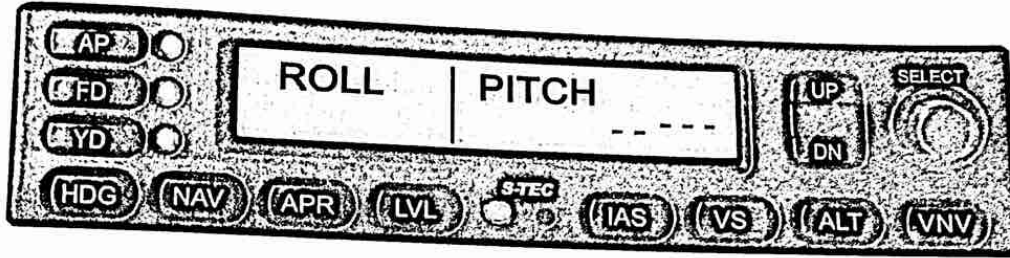
## CONTROL AND OPERATION INFORMATION

All system pilot control functions are from the instrument panel mounted Digital Flight Control System (as shown) and adjacent on-off and half-bank switches.

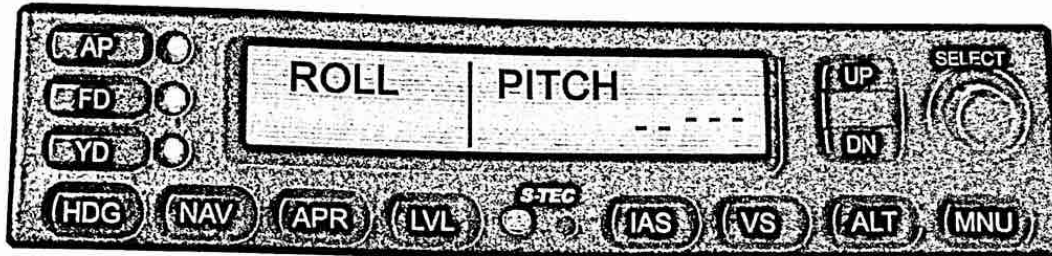


Programmer/Computer -01/-04

**NOTE:** For detail controls, annunciation, operation refer to the Pilot's Operating Guide and Reference P/N 87325.



Programmer/Computer -05/-06



Programmer/Computer -07/-08

**NOTE:** For detail controls, annunciation, operation refer to the Pilot's Operating Guide and Reference P/N 87325.

## 2.1 ACRONYMS

a.	AC	Advisory Circular
b.	ADI	Attitude Director Indicator
c.	AFMS	Airplane Flight Manual Supplement
d.	ALT	Altitude
e.	ADAHRS	Air Data Attitude Heading Reference System
f.	ADC	Air Data Computer
g.	AHRS	Attitude Heading Reference System
h.	A/P	Autopilot
i.	APR	Approach
j.	ALT HOLD	Altitude Hold
k.	ATC	Air Traffic Control
l.	ATT	Attitude
m.	BC	Back Course
n.	CAN	Controller Area Network
o.	CFR	Code of Federal Regulations
p.	COM	Communications Port
q.	COMP. POT.	Compensator Potentiometer
r.	CRC	Cyclic Redundancy Code
s.	CWS	Control Wheel Steering
t.	DISC	Disconnect
u.	DN	Down
v.	DFCS	Digital Flight Control System
w.	EFIS	Electronic Flight Instrument System
x.	F.S.	Fuselage Station
y.	FAA	Federal Aviation Administration
z.	FAR	Federal Aviation Regulations
aa.	FD	Flight Director
bb.	FGC	Flight Guidance Computer
cc.	GA	Go-Around
dd.	GS	Glideslope
ee.	GPS	Global Positioning System
ff.	GPS/FMS	Global Positioning System/Flight Management System
gg.	GPSV	GPS Vertical Navigation Mode
hh.	GPSS	GPS Steering Mode
ii.	GPSL	GPS Lateral Navigation Mode
jj.	G.P.U.	Ground Power Unit
kk.	HDG	Heading
ll.	HIRF	High Intensity Radiated Fields
mm.	HR	Hour
nn.	HSI	Horizontal Situation Indicator
oo.	IAS	Indicated Air Speed
pp.	IAW	In Accordance With
qq.	ICA	Instructions for Continued Airworthiness
rr.	IMU	Inertial Measurement Unit
ss.	IN	Inches
tt.	LBS	Pounds
uu.	LOC	Localizer
vv.	LRU	Line Replaceable Unit
ww.	LVL	Level
xx.	NAV	Navigation
yy.	PC	Personal Computer
zz.	P/N	Part number
aaa.	PFD	Primary Flight Display
bbb.	REF	Reference

ccc.	REV	Reverse
ddd.	SEC	Second(s)
eee.	STC	Supplemental Type Certificate
fff.	TRIM INTR	Trim Interrupt
ggg.	USB	Universal Serial Bus
hhh.	V	Volt
iii.	VDC	Volts Direct Current
jjj.	VOR	Very High Frequency Omni-directional Radio Range
kkk.	VS	Vertical Speed
lll.	W/D	Wiring Diagram
mmm.	YD	Yaw Damper

### 3.0 MAINTENANCE INSTRUCTIONS

Servicing of the System 01326 is "On-Condition" but should be checked during any Continuous Inspection Program.

#### 3.1 ANNUAL INSPECTION

Refer to Section 3.3.

#### 3.2 SPECIAL INSPECTION

This section is not applicable.

#### 3.3 REPAIR

Servicing of the System 01326 is "On-Condition" but should be checked during any Continuous Inspection Program (100 hr inspection / annual inspection) at a minimum.

Requirements under 91.411 and 91.413 are unchanged by the System 01326 installation reference FAR Part 43, Appendix E, Altimeter System Test and Inspection, FAR Part 43, Appendix F, ATC Transponder Tests and Inspections.

Autopilot servicing and/or maintenance are on-condition; however, the following inspections shall occur during the 100 Hr Inspection or Annual Inspection Program at a minimum. These inspections include:

- a. Checking component installations against this document Appendix A, 7687, 7688, 76333, 76334, 76336, 76337, 76338, 76339, 76341, 76483, 76610, 76652, 76723, 761168, 761173, 761177, 761180, 761185, 761190, 761418, 761475, 761476, 761507, 761527, 761543, and 761575 (latest revisions).
- b. Unless otherwise specified, mechanical fasteners shall be inspected for proper installation in accordance with AC 43.13-1B, Change 1, Chapter 7, Paragraphs 7-37, 7-41, 7-50, 7-64, 7-66, 7-87, 7-102, 7-103, 7-104 and 7-124, as applicable.
- c. Inspect servo bridle cables and their attachments to the control cables for proper tension, frayed cables, proper runoff on the pulleys and corrosion.
- d. **Pitch Servo** - Inspect the installation of the mounting brackets, associated hardware and support structures for wear, cracking, corrosion and security. Verify bridle cable tension is  $15 \pm 2$  lbs and cable clamp nuts and bolts are set at 55 in-lbs of torque. If the cable tension needs to be increased, loosen one end of the bridle cable at the cable clamps and tension the cable to within the above noted range. Torque the cable clamps to 55 in-lbs. Pull back on the yoke to run the controls throughout their full range of travel and verify there is no chaffing or binding caused by this installation, reference Appendix A, Drawings 76334, 761185 and 761527 (latest revisions).
- e. **Roll Servo** - Inspect the installation of the mounting brackets, associated hardware and support structures for wear, cracking, corrosion and security. Verify bridle cable tension is  $15 \pm 2$  lbs. and cable clamp nuts and bolts are set at 55 in-lbs. of torque. If the cable tension needs to be increased, loosen one end of the bridle cable at the cable clamps and tension the cable to within the above noted range. Torque the cable clamps to 55 in-lbs. For installations with turnbuckle connections, adjust the cable to within the above noted range with the turnbarrel. Operate the yoke left and right to run the controls throughout their full range of travel and verify there is no

- chaffing or binding caused by this installation, reference Appendix A, Drawing 76333, 76652 and 761177 (latest revisions).
- f. **Yaw Servo** - Inspect the installation of the mounting brackets, associated hardware and support structures for wear, cracking, corrosion and security. Verify bridle cable tension is  $15 \pm 2$  lbs. and cable clamp nuts and bolts are set at 55 in-lbs. of torque. If the cable tension needs to be increased, loosen one end of the bridle cable at the cable clamps and tension the cable to within the above noted range. Torque the cable clamps to 55 in-lbs. Operate the rudder controls throughout their full range of travel and verify there is no chaffing or binding caused by this installation, reference Appendix A, Drawing 76339, 76483, 76723 and 761168 (latest revisions).
  - g. **Trim Servo** - Inspect the installation of the mounting brackets, associated hardware and support structures for wear, cracking, corrosion and security. Verify bridle cable tension is within the specifications as called out by the aircraft manufacturer and turnbarrel locking clips installed. If the cable tension needs to be increased, tension the cable to within the above noted range with the turnbarrel. Install locking clips after tightening. Operate elevator trim controls through its full range of travel and there is no chaffing or binding caused by this installation, reference Appendix A, Drawing 76337, 761173, 761475, 761476 and 761507 (latest revisions).
  - h. Verify control surface rigging is in accordance with aircraft manufacturer's maintenance manual.
  - i. Inspect wiring and connectors for corrosion, damage, loose pins, broken shielding, frayed wiring, cracking.

**NOTE:** For replacement of any of the autopilot wiring, cables or associated components, reference the documents in Appendix A associated with the action performed.

**4.0 TROUBLESHOOTING INFORMATION**

After maintenance tests and basic troubleshooting guidelines are listed below.

**SYSTEM OPERATIONAL CHECKOUT AFTER MAINTENANCE**

**NOTE**

Full system voltage is required for this test, either by running the aircraft engine or by using a suitable G.P.U.

**NOTE**

During the ADAHRS initialization period the aircraft must not be moved for three minutes, minimum.

- 1. AVIONICS MASTER SWITCH..... ON
- 2. A/P MASTER SWITCH----- ON
- 3. TRIM MASTER SWITCH----- ON

**NOTE**

For proper manual electric trim function, both the A/P Master Switch and Trim Master Switch must be on during the autopilot self test.

- 4. Autopilot Self Test-----COMPLETE
- 5. ADAHRS INITIALIZATION-----COMPLETE  
("A/P READY" is displayed)

**NOTE**  
If the autopilot system fails to initialize it will annunciate "A/P FAIL" and not allow any mode to function.

**NOTE**  
The below tests should be conducted with the control yoke held neutral to prevent the weight of the elevator from making a constant command for pitch trim while the ground test is being performed. As the tests are conducted, allow the autopilot to move the yoke while supporting it in the pitch axis.

6. A/P BUTTON -----PRESS  
(A/P, FD indicators illuminate and servos engage. Roll and Pitch annunciate. Steering bars appear on PFD or ADI with Flight Director bars)
7. PFD/HSI HDG BUG -----CENTER HDG BUG
8. PRESS HDG (on AP) -----ENGAGE
9. HDG BUG -----MOVE HDG BUG LEFT AND RIGHT  
(Aileron control and Steering bars should follow HDG bug)
10. IAS BUTTON -----PRESS  
(IAS indicates "115", Steering bar moves down and pitch control moves slowly in (forward))
11. ROCKER SWITCH -----PRESS AND HOLD UP  
(IAS number increases)
12. ROCKER SWITCH -----PRESS AND HOLD DN BUTTON  
(IAS number decreases)
13. VS BUTTON ----- Press-VS  
(Indicates "0")
14. ROCKER SWITCH -----PRESS UP BUTTON UNTIL +500 IS DISPLAYED  
(Steering Bar moves up and pitch control moves slowly aft- pilot may have to assist a heavy yoke)
15. ROCKER SWITCH -----PRESS DN BUTTON UNTIL -500 IS DISPLAYED  
(Steering bar moves down and pitch control moves slowly in (forward))
16. ALT BUTTON -----PRESS  
(ALT HOLD is displayed)
17. PITCH CONTROL -----SLOWLY PULL AFT  
(Autotrim runs nose down after 3 sec. and "Trim" is displayed. After 8 seconds "Trim-In-Motion" voice annunciated)
18. PITCH CONTROL -----SLOWLY PUSH FORWARD  
(Autotrim runs nose up after 3 sec. and "Trim" is displayed. After 8 seconds "Trim-In-Motion" voice annunciated)
19. PFD ALTIMETER ----- SET ALTITUDE TO FIELD ELEVATION
20. VS MODE ----- SELECT

21. ALTITUDE SELECTOR KNOBS (on AP) --SELECT AN ALTITUDE 200' BELOW FIELD ELEVATION
22. BARO KNOB (on PFD)-----SLOWLY REDUCE ALTITUDE  
(Match altitude that selected on the A/P altitude selector. A/P should display "Altitude Hold" when the two altitudes match.)
23. CWS BUTTON-----PRESS AND HOLD  
(Pitch and Roll servos disengage and controls are free. CWS annunciator is displayed)
24. CWS BUTTON-----RELEASE CWS BUTTON  
(Servos reengage)
25. AP DISC/TRIM INTR button-----PRESS/HOLD  
(All A/P modes and FD disconnect followed by aural tone and voice annunciation)
26. GO AROUND BUTTON-----PRESS  
(FD mode illuminates. Roll and Pitch annunciate and pitch steering bar moves to 8° up position)

**NOTE**

It is difficult to test the autopilot NAV and APR functions during a preflight test without a NAV signal generator; therefore, these modes may be left for in-flight evaluation.

**MANUAL ELECTRIC TRIM TEST**

1. TRIM MASTER SWITCH-----VERIFY ON
2. PITCH TRIM SWITCH-----MOVE FORWARD  
(Trim should run nose down)
3. PITCH TRIM SWITCH-----MOVE AFT  
(Trim should run nose up)
4. AP DISC/TRIM INTR button-----PRESS AND HOLD WHILE TRIM IS RUNNING  
(Trim motion should stop)
5. AP DISC/TRIM INTR button-----RELEASE  
(Trim motion should resume)

**NOTE**

If either the manual electric trim or Autotrim fails any portion of the preflight test, turn the Trim Master switch off. **DO NOT USE THE ELECTRIC TRIM UNTIL THE FAULT IS CORRECTED.** With Trim Master switch off, the autopilot trim UP/DN or TRIM indicators and audio warning are activated. If the electric trim fails, or has an in-flight power failure, the system automatically reverts to an out-of-trim annunciation and audio warning. Should this occur, turn the Trim Master switch off, and revert to manual aircraft trim until the fault is corrected.



## AUTOPILOT OVERRIDE TEST

With the autopilot engaged, grasp the control yoke and slowly overpower the roll and pitch servos to ensure proper clutch action. Also, overpower the rudder servo. Control movements should be smooth. If any unusual noise or feel occurs, inspect the servo installation and repair as needed.

Press the control yoke mounted A/P disconnect switch. The A/P will disconnect immediately and an audible warning tone will be heard for approximately six seconds.

### **CAUTION:**

**DO NOT OPERATE THE AIRCRAFT UNTIL ANY ABNORMAL OR UNUSUAL CONDITIONS ARE RESOLVED.**

### **NOTE**

**BEFORE FLIGHT, VERIFY THAT THE AUTOPILOT IS DISENGAGED AND ALL TRIM SYSTEMS ARE SET FOR TAKEOFF.**

### **NOTE**

**This completes pre-flight procedures. Before flight, verify that the autopilot, including yaw damper, is disengaged and that all trim systems are set for take-off.**

**Operation of the autopilot is described in FAA Approved Flight Manual Supplement ST-966-AFMS-0001. Specialized controls, annunciators, operation and interpretation are covered in the AFMS and in S-TEC Pilot's Operating Guide and Reference P/N 87325, which supplements the approved AFMS.**

Only approved S-TEC dealers holding the appropriate FAA certification and using S-TEC Dealer Maintenance Manuals and S-TEC Special Tools may service the items in the System 01326. The System 01326 has Failure Annunciators to identify the system and/or sub-system that has failed.

System 01326 Troubleshooting Guide	
Symptom	Action
<p>Failure to initialize: AP FAIL: (system does not allow any mode to function).</p> <p>NOTE: <u>Primary System Failure</u> If a primary system fails, the system will disconnect and annunciate all failures and disallow all modes.</p>	<ul style="list-style-type: none"> <li>a) Reset Autopilot Computer Circuit Breaker.</li> <li>b) Check Autopilot wiring harness IAW Drawing 10243, 10244, 10245, 10246 or 10248. Repair if required.</li> <li>c) Replace Autopilot Computer/Programmer.</li> <li>d) Reset A/P Master and Trim Master, allow system to initialize and perform self-test.</li> <li>e) Verify Servo connectors are connected and secure.</li> </ul>
<p>Failure to initialize: ATT FAIL: NOTE: <u>Sub-System Failure</u> The system will annunciate a failed input <u>Attitude Reference Failure</u> If, during the normal operation of the autopilot, the ADAHRS reverts to initialization mode, the system will disconnect all modes and annunciate the disconnect, then annunciate "ADAHRS INITIALIZING" as well. If the ADAHRS fails, the system will annunciate "ATT FAIL" and will not allow any mode of the autopilot to function.</p>	<ul style="list-style-type: none"> <li>a) Reset PFD/ADC/AHRS Circuit Breakers (Allow to initialize).</li> <li>b) Turn OFF then ON Autopilot Computer.</li> <li>c) Check PFD, ADC and AHRS wiring IAW Drawing 10243, 10244, 10245, 10246 or 10248. Repair if required.</li> <li>d) Ensure that all PFD, ADC and AHRS connectors are securely fastened.</li> <li>e) Check PFD, ADC and AHRS circuit breakers.</li> <li>f) Check AHRS alignment.</li> <li>g) Replace PFD/AHRS unit if found bad.</li> <li>h) Check Autopilot wiring harness IAW Drawing 10243, 10244, 10245, 10246 or 10248. Repair if required.</li> <li>i) Ensure that all Autopilot connectors are securely fastened.</li> <li>j) Replace Autopilot Computer.</li> </ul>
<p>A/P Pitch Axis Problems: Aircraft porpoising.</p>	<ul style="list-style-type: none"> <li>a) Check cable system friction.</li> <li>b) Check Cable tension, Aircraft and Bridle cables.</li> <li>c) Verify clutch settings.</li> <li>d) Check start-up voltage.</li> <li>e) Test pitot-static system for leaks.</li> </ul>
<p>A/P Roll Axis Problems:</p> <ul style="list-style-type: none"> <li>a) Aircraft wing rock</li> <li>b) Heading offset</li> </ul>	<ul style="list-style-type: none"> <li>a) Check cable system friction.</li> <li>b) Check Cable tension, Aircraft and Bridle cables.</li> <li>c) Verify clutch settings.</li> <li>d) Check start-up voltage.</li> <li>e) Check AHRS Alignment.</li> <li>f) Check heading system wiring.</li> </ul>
<p>A/P Trim Problems</p> <ul style="list-style-type: none"> <li>a) Trim does not drive from trim switch.</li> </ul>	<ul style="list-style-type: none"> <li>a) Check circuit breaker and trim master on.</li> <li>b) Check A/P Disconnect/Trim Interrupt wiring. Verify power 28 VDC at P1 34 at A/P Computer.</li> <li>c) Check Autopilot wiring harness IAW Drawing 10243, 10244, 10245, 10246 or 10248. Repair if required.</li> <li>d) Check Servo startup voltage.</li> <li>e) Verify servo clutch settings.</li> <li>f) Inspect Pitch Trim servo chain and verify tension.</li> <li>g) Check trim switch at control yoke.</li> <li>h) Replace A/P Computer.</li> </ul>

Table 3: System 01326 Troubleshooting Guide

## 5.0 REMOVAL AND REPLACEMENT INFORMATION

### 5.1 GENERAL INSTRUCTIONS (if applicable)

#### Wire Separation

Whenever it becomes necessary to repair or replace a wire or group of wires, maintain the same wire separation that was used to install the system. Any wire added to or removed from the aircraft should satisfy separation requirements and wiring standards, in accordance with FAA Advisory Circular AC 43.13-1B, Chapter 11, Section 8, Paragraphs 11-96 (w), (z) and (dd).

#### Wire Routing

Whenever it becomes necessary to repair or replace a wire or group of wires, maintain the same wire routing that was used to install the system. Wires should be routed using proper bend radii, drip loops and slack to allow for easy access for maintenance repairs and inspection. Route wires in such a manner that it does not violate any regulatory safety requirements. (Ref: AC 43.13-1B, Chapter 11, Sections 8, Paragraphs 11-96 (b), (q-y) and (aa-gg) and Section 9).

#### Securing Wire Bundles

Whenever it becomes necessary to repair or replace a wire or group of wires, clamps of the proper size, type, and material should be used. Secure repaired or replaced wiring in the same manner that it was installed in the aircraft. (Ref: AC 43.13-1B, Chapter 11, Section 8, Paragraphs 11-96 (a-p) and Sections 9 and 11).

#### Wire Termination

Whenever it becomes necessary to terminate wires, care should be taken to ensure enough slack in wiring for proper servicing, repair, and fit. When stripping wires for termination, be sure not to nick or cut strands of wire. Check that proper crimping tools are used, and insure they are set to the proper setting for a correct crimp. Utilize the correct size terminals and/or splices according to wire gauge when crimping. If soldering is necessary, be sure a cold solder joint does not exist and that shrink tube of the proper size is installed over the wire and connection point.

**NOTE:** It is expected that the skilled technicians performing the inspections, tests, and troubleshooting of the System 01326 will adhere to the safety practices and operational procedures given in the basic aircraft manufacturers Maintenance Manuals.

All components can be removed with common tools and practices. Installation of components required for this alteration must be in accordance with the approved data for the System 01326. **Ensure aircraft power, and AVIONICS master switches are in the off position.**

### 5.2 REMOVAL – 01326 COMPUTER

- Reference Appendix A, Drawing 761575 (latest revision) to remove the Programmer/Computer.
- Using a 3/32 Allen wrench, loosen the Allen screw in the bottom center of the Programmer/Computer faceplate.
- Carefully pull the Programmer/Computer straight out of the tray.

### 5.3 INSTALLATION – 01326 COMPUTER

- Reference Appendix A, Drawing 761573 (latest revision) to install the Programmer/Computer.
- Carefully slide the Programmer/Computer straight into the tray.

- Using a 3/32 Allen wrench, tighten the Allen screw in the bottom center of the Programmer/Computer faceplate.
- Verify electrical bonding – The Programmer/Computer Tray must be electrically bonded to the airframe for Electromagnetic compatibility, HIRF and Lightning protection. Electrical bonding is accomplished through the mechanical mounting points of the equipment. Clean and alodine the bonding surface of the equipment and the airframe no more than 6 hours prior to installation. After installing the Programmer/Computer Tray, measure the resistance in milliohms between the equipment chassis and adjacent airframe structure. Verify that the resistance is 2.5 milliohms or less. If the resistance is greater than 2.5 milliohms, clean and re-alodine the bonding surfaces, re-install the equipment and repeat the milliohm resistance measurement.
- See Section 4 for after maintenance checkout procedures.
- See Section 6 for IMU leveling process.

#### 5.4 REMOVAL – ROLL SERVO

- Reference Appendix A, Drawing 76333 or 76652 (latest revision) to remove the roll servo.
- Remove the electrical connector.
- Install protective caps over the electrical connectors.
- For drawing 76333, remove and retain the two cable clamps used to secure the bridle cable to the existing aileron cables.
- For drawing 76652, remove and retain the cable clamp and disconnect the other end of the bridle cable by removing and retaining the hardware called out on the drawing in Detail A.
- Remove and retain the required nuts, washers and bolts per the drawing used to secure the roll servo to the brackets.
- Remove and retain roll servo and attached bridle cable.
- Removal complete.

#### 5.5 INSTALLATION – ROLL SERVO

- Reference Appendix A, Drawing 76333 or 76652 (latest revision) to install the roll servo.
- Position roll servo (with attached bridle cable) on brackets and attach with retained nuts, washers and bolts required per the drawing.
- Route bridle cable approximately as shown in the drawing and install the retained hardware to mount servo to brackets.
- With aileron controls in neutral position, check the position of the bridle cable center ball and wrap bridle cable around capstan.
- For Drawing 76333 attach ends of bridle cable to the aileron cable with the two retained cable clamps as stated in the drawing. Adjust bridle cable tension to  $15\pm 2$  lbs. and torque cable clamps to  $55\pm 5$  in. lbs.
- For drawing 76552, attach eye end of bridle cable to the existing bellcrank using retained hardware as shown in detail A. Attach other end of bridle cable using retained cable clamp and adjust tension of bridle cable to  $15\pm 2$  lbs. and torque cable clamp bolts to  $55\pm 5$  in. lbs.
- Remove the protective caps from the electrical connectors.
- Install the electrical connector.
- See Section 4 for after maintenance checkout procedures.

#### 5.6 REMOVAL – ROLL SERVO

- Reference Appendix A, Drawing 761177 (latest revision) to remove the roll servo.
- Remove the electrical connector.
- Install protective caps over the electrical connectors.

- Loosen the tension on the bridle cable using the turnbuckle.
- Remove and retain the required hardware used to secure the bridle cable ends to the existing aileron bellcrank.
- Remove and discard the four (item 22) cotter pins used as cable clamps to secure the bridle cable around the left and right pulleys.
- Remove and retain the required nuts, washers and bolts per the drawing used to secure the roll servo to the brackets.
- Remove and retain roll servo and attached bridle cable.
- Removal complete.

#### 5.7 INSTALLATION – ROLL SERVO

- Reference Appendix A, Drawing 761177 (latest revision) to install the roll servo.
- Position roll servo (with attached bridle cable) on brackets and attach with retained nuts, washers and bolts required per the drawing.
- Route bridle cable approximately as shown in the drawing and install four MS24665-142 cotter pins to be used as cable guards.
- With aileron controls in neutral position, check the position of the bridle cable center ball and wrap bridle cable around capstan and attach ends of bridle cable to the existing bellcrank with the retained bolts, washers and nuts as stated in the drawing. Using the turnbuckle, adjust bridle cable tension to the specifications called out per the aircraft manufacturer and install turnbuckle locking clip.
- Remove the protective caps from the electrical connectors.
- Install the electrical connector.
- See Section 4 for after maintenance checkout procedures.

#### 5.8 REMOVAL – PITCH SERVO

- Reference Appendix A, Drawings 76374, 761185 or 761527 (latest revision) to remove the pitch servo.
- Remove the electrical connector.
- Install protective caps over the electrical connectors.
- Remove and retain the two cable clamps used to secure the bridle cable to the existing elevator cables.
- Remove and retain the required washers, nuts and bolts per the drawing used to secure the pitch servo to the brackets.
- Remove and retain pitch servo and attached bridle cable.
- Removal complete

#### 5.9 INSTALLATION – PITCH SERVO

- Reference Appendix A, Drawings 76374, 761185 or 761527 (latest revision) to install the pitch servo.
- Position pitch servo (with attached bridle cable) on the brackets and attach with retained washers, nuts and bolts per the drawing.
- With elevator controls in neutral position, check the position of the bridle cable center ball and wrap bridle cable around capstan and attach ends of bridle cable to the elevator cable with the two retained cable clamps as stated in the drawing. Adjust bridle cable tension to  $15 \pm 2$  lbs. and torque cable clamp bolts to  $55 \pm 5$  in. lbs.
- Remove the protective caps from the electrical connectors.
- Install the electrical connector.
- See Section 4 for after maintenance checkout procedures.

### 5.10 REMOVAL – YAW SERVO

- Reference Appendix A, Drawings 76339, 76483, 76723 or 761168 (latest revision) to remove the yaw servo.
- Remove the electrical connector.
- Install protective caps over the electrical connectors.
- Remove and retain the two cable clamps used to secure the bridle cable to the existing rudder cables.
- Remove and discard the cotter pin used as a cable guard in the idler pulley assembly.
- Remove and retain the required washers, nuts and bolts per the drawing used to secure the yaw servo to the brackets.
- Remove and retain yaw servo and attached bridle cable.
- Removal complete

### 5.11 INSTALLATION – YAW SERVO

- Reference Appendix A, Drawings 76339, 76483, 76723 or 761168 (latest revision) to install the yaw servo.
- Position yaw servo (with attached bridle cable) on the brackets and attach with retained washers, nuts and bolts per the drawing.
- With rudder controls in neutral position, check the position of the bridle cable center ball and wrap bridle cable around capstan and attach ends of bridle cable to the rudder cable with the two retained cable clamps as stated in the drawing. Adjust bridle cable tension to  $15\pm 2$  lbs. and torque cable clamp bolts to  $55\pm 5$  in. lbs.
- Install new MS-24665 cotter pin (with length determined by the drawing) into idler pulley bracket as shown in the drawing.
- Remove the protective caps from the electrical connectors.
- Install the electrical connector.
- See Section 4 for after maintenance checkout procedures.

### 5.12 REMOVAL – TRIM SERVO

- Reference Appendix A, Drawings 76337 and 761476 (latest revisions) to remove the trim servo.
- Remove the electrical connector.
- Install protective caps over the electrical connectors.
- Remove and retain the required screws and standoffs from the idler pulley mounting plate.
- Loosen turnbuckles in the trim cable and remove bridle cable extension from around the idler pulley.
- Remove and retain the bolt, nut, washers used to secure the idler pulley buildup to bracket and servo. Remove and retain the idler pulley buildup hardware.
- Remove and discard cotter pin as called out in the 761476 drawing.
- Remove bridle cable by unscrewing the turnbuckle end of the bridle cable from the assembly and disconnect the connecting link from the chain end of the existing chain.
- Remove and retain the washers, bolts and nuts required per the drawing used to secure the trim servo to the brackets.
- Remove and retain the trim servo with bridle cable attached.
- Removal complete.

### 5.13 INSTALLATION – TRIM SERVO

- Reference Appendix A, Drawing 76337 and 761476 (latest revision) to install the Trim Servo.
- Position trim servo (with bridle cable extension attached) onto brackets and attach using retained nuts, bolts and washers required per the drawing.

- Install hardware for idler pulley buildup and secure using retained bolt, nut and washers.
- Attach bridle cable extension to existing trim cable by connecting the turnbuckle and chain connecting link to the right hand elevator trim cable.
- Route bridle cable extension around idler pulley.
- Adjust trim system cable tension and trim tab travels to within the tolerance specified by the aircraft manufacturer and safety wire turnbuckles.
- Install the retained standoffs and screws onto the idler pulley buildup.
- Install new MS24665-289 cotter pin as shown on 761476 drawing.
- Remove the protective caps from the electrical connectors.
- Install the electrical connector.
- See Section 4 for after maintenance checkout procedures.

#### **5.14 REMOVAL – TRIM SERVO**

- Reference Appendix A, Drawings 761173 (latest revision) to remove the trim servo.
- Remove the electrical connector.
- Install protective caps over the electrical connectors.
- Remove and retain the required screws, cable guards and capstan cover from the servo.
- Loosen existing trim cable tension per the aircraft manufacturer specifications, loosen the setscrew on the servo capstan and remove bridle cable extension from around the servo capstan.
- Remove and retain the washers, bolts and nuts required per the drawing used to secure the trim servo to the bracket.
- Remove and retain the trim servo.
- Removal complete.

#### **5.15 INSTALLATION – TRIM SERVO**

- Reference Appendix A, Drawing 761173 (latest revision) to install the Trim Servo.
- Position trim servo onto bracket and attach using retained nuts, bolts and washers required per the drawing.
- With elevator trim tab in neutral position, orient the servo capstan and depress the existing cable center ball into the bottom of hole on servo capstan and wrap existing trim cable around the servo capstan as called out in Detail A. Tighten down the setscrew to keep center ball in place.
- Adjust trim system cable tension and trim tab travels to within the tolerance specified by the aircraft manufacturer.
- Install the retained cable guards, capstan cover and screws onto the servo.
- Remove the protective caps from the electrical connectors.
- Install the electrical connector.
- See Section 4 for after maintenance checkout procedures.

#### **5.16 WIRING DIAGRAMS**

Reference Appendix A, Drawings 10243, 10244, 10245, 10246 and 10248 (latest revisions) for system integration and wiring information.

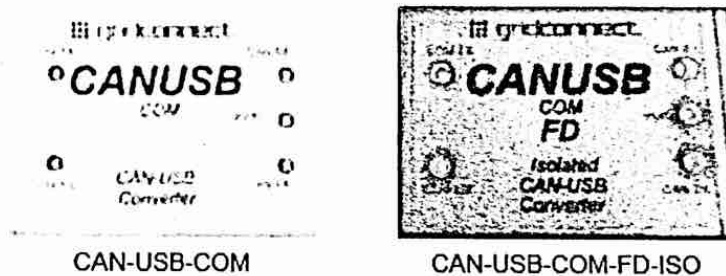
## 6.0 IMU LEVELING PROCEDURE

### 6.1 ASSUMPTIONS

The FGC is loaded with main processor application software version 1.3 or later, configuration file and calibration file.

### 6.2 REQUIRED EQUIPMENT

- 1) Laptop with available USB port running Windows 7 (32 or 64 bit) or later OS installed.
  - Administrator rights may be required
- 2) V1\_3 ApCfgBuilder.exe Utility downloaded from the dealer section of the web page
  - <https://genesys-aerosystems.com/dealer-section/autopilot-documents>
- 3) CAN-USB adapter.



**Note:** To purchase the latest model of the CAN-USB adapter, please contact Genesys Aerosystems Sales at [Sales@genesys-aerosystems.com](mailto:Sales@genesys-aerosystems.com) or by calling toll free 1-800-872-7832.

- 4) Digital protractor
- 5) Aircraft External Power Supply

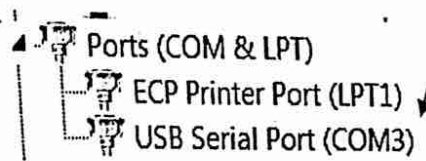
### 6.3 ASSIGN COM PORT

It is important to know which PC COM port has been assigned to the USB-CAN device in order to point the software utilities to the correct port.

- Connect the USB-CAN converter to the computer. You may need to wait for the computer to install the new device.
- Use the PC Device Manager to find out which COM port has been assigned to the USB-CAN device
- Navigate to START->CONTROL PANEL->DEVICE MANAGER



- Expand "Ports (COM & LPT)" and note the USB Serial Port COM# number assigned



- Download and Install the Tera Term utility from an available website source



## 6.4 ESTABLISH PC TO CAN-USB CONNECTION

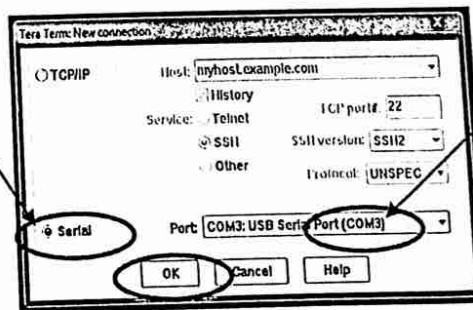
If this is a new USB-CAN converter unit and has not been previously used on a 01326 installation/setup, then you will need to carry out the following steps. Otherwise, skip to section 6.5 to establish the CAN-USB to 01326 connection.

### NOTE

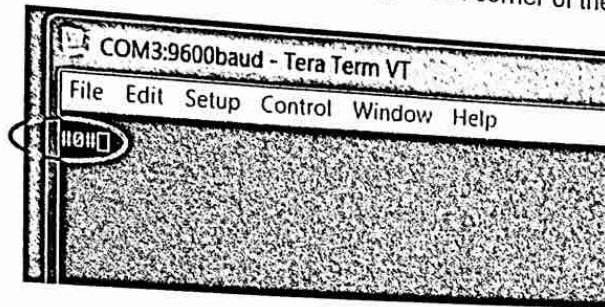
This section only needs to be done once with a new USB-CAN Converter.

#### 6.4.1 PC TO CONVERTER CONNECTION (P/N CAN-USB-COM ONLY)

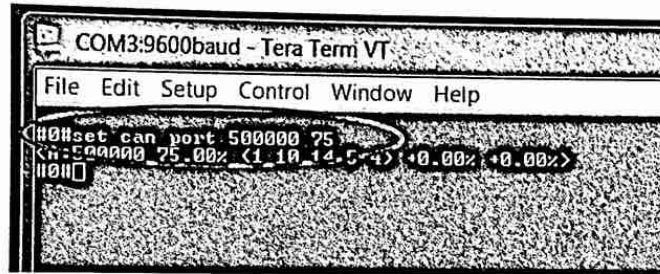
- 1) Connect the USB-CAN converter to the PC
  - a. The PWR light should illuminate.
- 2) Launch the Teraterm utility
- 3) Select the Serial option in the "New Connection" window and select the USB port recorded in Step-3 and press OK



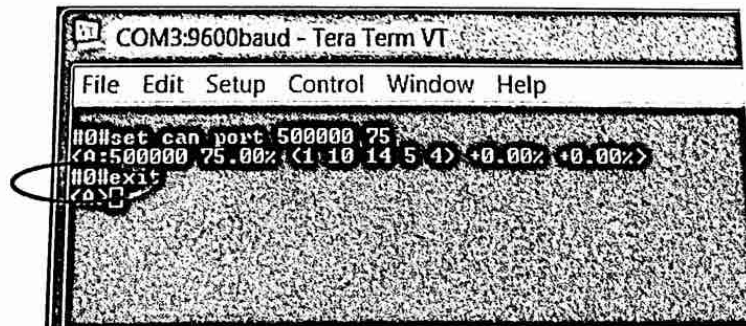
- 4) Press and **hold ~3 seconds** the programming button on the USB-CAN device (located next to the cable) until "#0#" is displayed in the upper LH corner of the command prompt.



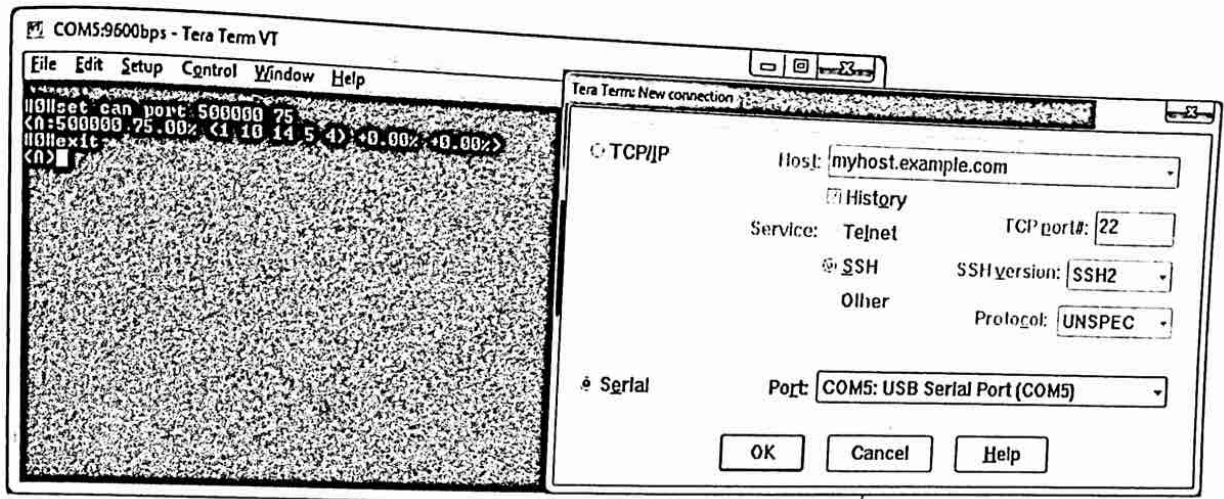
- 5) Enter the command "set can port 500000 75" and press enter on the PC Keyboard.
- a. Some text should be displayed to verify the baud rate has been setup successfully.



- 6) Enter the command "exit" and press enter on the PC Keyboard

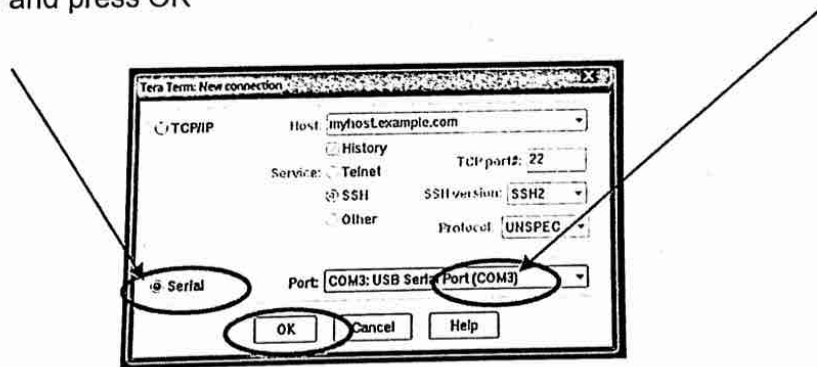


7) Close Teraterm

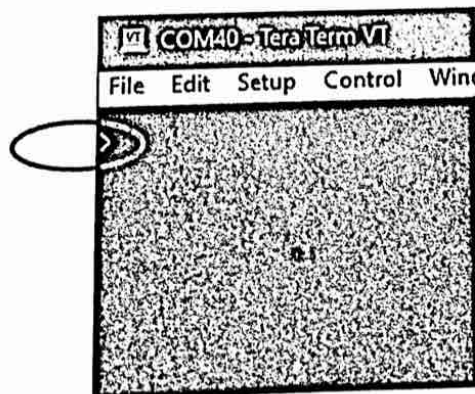


6.4.2 PC TO CONVERTER CONNECTION (P/N CAN-USB-COM-FD-ISO ONLY)

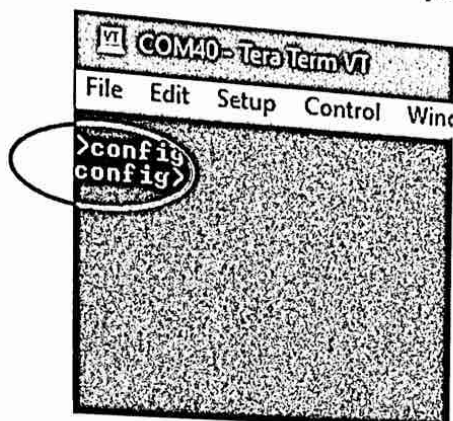
- 1) Connect the USB-CAN converter to the PC
  - a. The PWR light should illuminate.
- 2) Launch the Teraterm utility
- 3) Select the Serial option in the "New Connection" window and select the USB port recorded in Step-3 and press OK



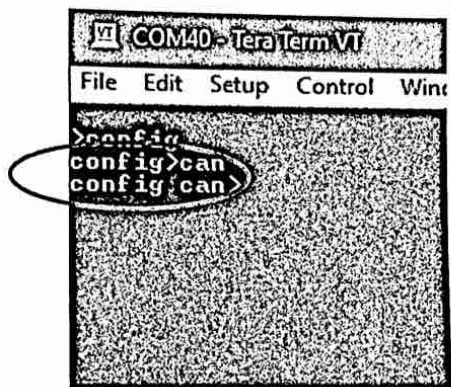
- 4) Press and release the programming button on the USB-CAN device (located next to the cable) to obtain the programming prompt



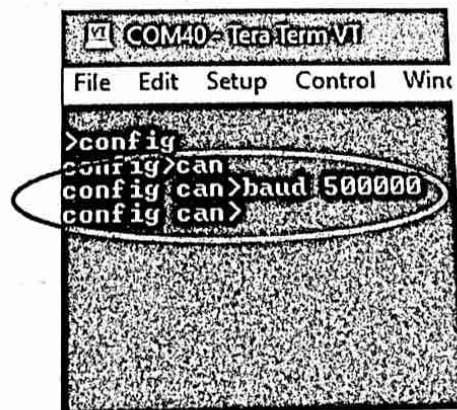
- 5) Type the command "config" and press Enter on the PC keyboard



- 6) Type the command "can" and press Enter on the PC keyboard



- 7) Type the command "baud 500000" and press Enter on the PC keyboard



- 8) Type the command "exit" and press Enter on the PC keyboard

```
VI COM40-TeraTermVI
File Edit Setup Control Window
>config
config>can
config can>baud 500000
config can>exit
config>
```

- 9) Type the command "save" and press Enter on the PC keyboard

```
VI COM40-TeraTermVI
File Edit Setup Control Window
>config
config>can
config can>baud 500000
config can>exit
config>save
config>
```

**Note:** To confirm the baud rate setting, from the config> prompt, type "can" and press Enter then type "show" and press Enter on the PC keyboard. Type "exit" and press Enter on the PC keyboard to return to the config> prompt.

```
VI COM40-TeraTermVI
File Edit Setup Control Window
config can>show
baud : 500000
sample point : 75
timeout : 10
FD : disable
FDbaud : 2000000
config can>
```

The CAN-USB-COM-FD-ISO Converter is now ready for use.

### 6.4.3 Changing the CAN Transition MODE in the converter

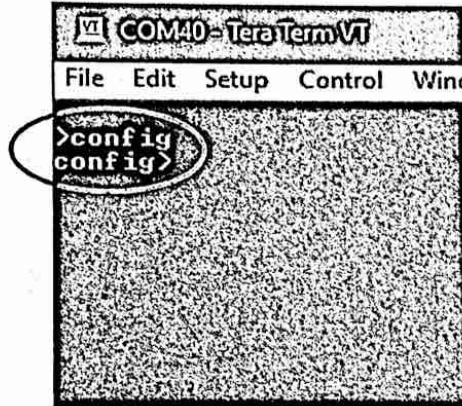
**Note:** This CAN-USB converter's transmission mode must be set to correctly operate with the S-TEC utility in use.

- For the S-TEC ApCfgBuiler & TSOVista utilities, the transmission mode must be set to "normal"
- For the S-TEC FieldAppLoader software load utility, the transmission mode must be set to "one-shot"

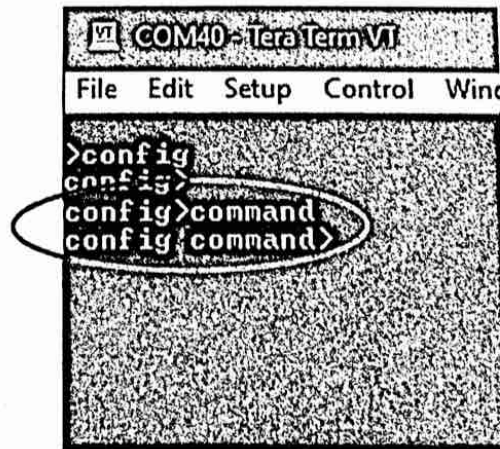
It is anticipated the converter will have the transmission mode established to "normal" as received from S-TEC or GridConnect. The transmission mode can be confirmed or changed via the following procedure.

**Note:** It is not necessary to reset the converter's baud rate when alternating between normal and one-shot transmission modes.

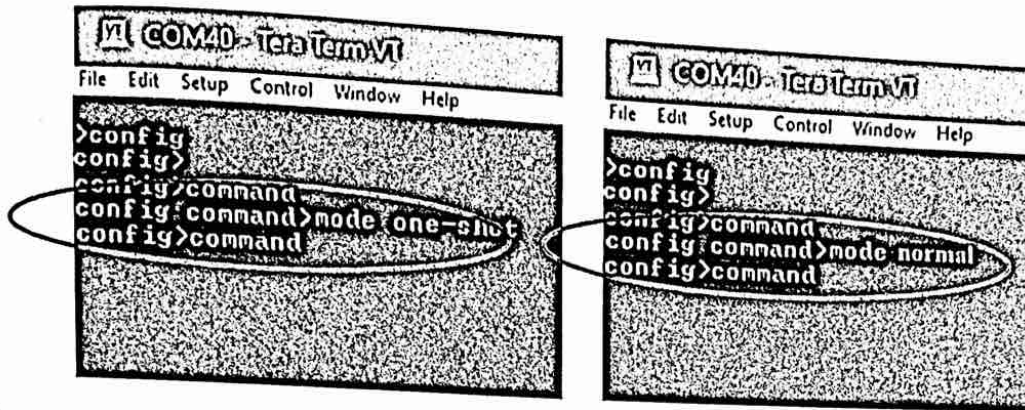
- 1) Follow steps 1 thru 5 of section 6.4.2 to get to the `config>` prompt of the Tera Term utility,



- 2) Type the command "command" and press Enter on the PC keyboard



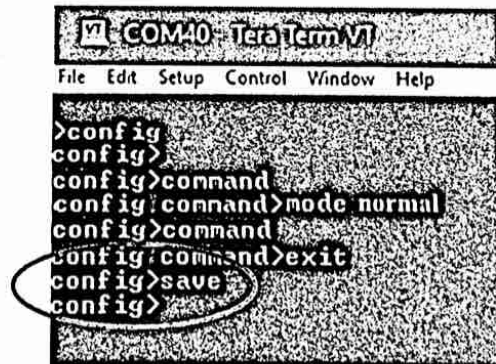
- 3) Type the command "mode one-shot" OR "mode normal" as required and press Enter on the PC keyboard



- 4) Type the command "exit" and press Enter on the PC keyboard

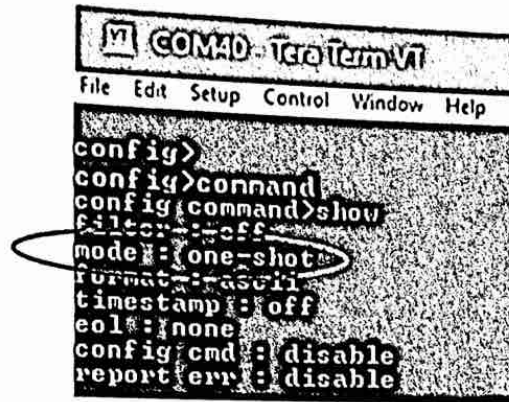


- 5) Type the command "save" and press Enter on the PC keyboard



- 6) Close the Tera Term utility

**Note:** To confirm the transmission mode setting, from the `config>` prompt, type "command" and press Enter then type "show" and press Enter on the PC keyboard; reference Figure 20 for current transmission mode setting. Type "exit" and press Enter on the PC keyboard to return to the `config>` prompt.



```
COM40 - TeraTerm V1
File Edit Setup Control Window Help
config>
config>command
config>command>show
filter : off
mode : one-shot
format : ascii
timestamp : off
eol : none
config cmd : disable
report err : disable
```

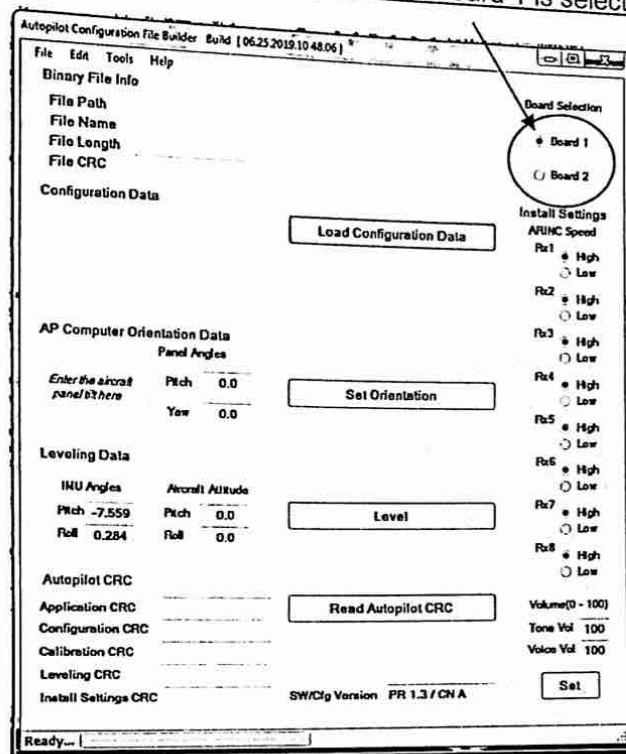
## 6.5 ESTABLISH CAN-USB TO 01326 CONNECTION

### NORMAL PROCEDURE:

- 1) If this is a new USB-CAN adapter unit and has not been used previously with a 01326 installation/setup, then the PC to CAN-USB connection will need to be setup first. Refer to section 6.4 "Establish PC to CAN-USB Connection" and go to the section applicable for the adapter you are currently using.
- 2) With the laptop on, plug the CAN-USB adapter into an available USB port.
  - a. The adapter must be connected directly to the laptop. A USB extension cable should not be used and will cause difficulty establishing communication with the 3100
  - b. The CAN-USB adapter must be plugged in to the USB port on the laptop and initialized prior to connecting to the 3100 Maintenance port. Failure to do so will result in abnormal behavior of the laptop
- 3) Connect the 9 pin D-Sub connector of the CAN-USB adapter to the Internal Maintenance port (CAN 2) of the 3100.
  - a. If needed, use a 9 circuit "pin-to-pin" extension cable. The cable must not be a crossover or null modem type.



- 4) Open the V1\_3ApCfgBuilder.exe utility. Ensure board 1 is selected



- 5) Ensure the 3100 Maintenance Switch is set to ON
- 6) Power on the 3100 system with both the AP Master and TRIM Master switches and wait several seconds

- a. The Pitch & Roll values in the IMU Angles and the SW/Cfg Version box should populate

Autopilot Configuration File Builder Build [07-29-2019,11:02:04]

File Edit Tools Help

Binary File Info

File Path  
File Name  
File Length  
File CRC

Configuration Data

Load Configuration Data

AP Computer Orientation Data

Pand Angles

Enter the aircraft panel at here

Pitch 0.0  
Roll 0.0

Set Orientation

Leveling Data

IMU Angles Aircraft Altitude

Pitch -10.368 Pitch 0.0  
Roll 0.301 Roll 0.0

Level

Autopilot CRC

Application CRC  
Configuration CRC  
Calibration CRC  
Leveling CRC  
Install Settings CRC

Read Autopilot CRC

SW/Cfg Version PR 1.3 / CAN A

Set

Board Selection

Board  
Board 2

Install Settings

AFIX Speed

Rx1 High  
Low  
Rx2 High  
Low  
Rx3 High  
Low  
Rx4 High  
Low  
Rx5 High  
Low  
Rx6 High  
Low  
Rx7 High  
Low  
Rx8 High  
Low

Volume (0 - 100)

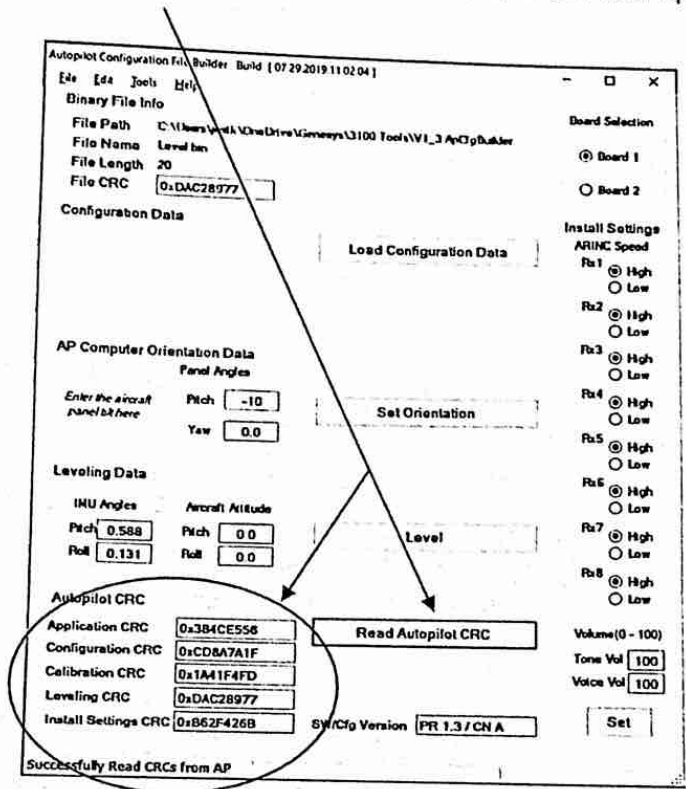
Tone Vol 100  
Voice Vol 100

Ready...

- b. If the IMU angles remain 0.0 but the SW/Cfg Version box populates, ensure the CAN-USB adapter is connected to the Internal (CAN 2) maintenance port.

7) Click the Read Autopilot CRC button

a. The bottom of the window should display the message "Successfully Read CRCs from AP", and the Autopilot CRC boxes should populate. Allow up to 30 seconds to process.



b. If the message "Failed to Read Autopilot CRCs" is displayed, troubleshoot the laptop to CAN-USB to 3100 CAN port connections and ensure the Maintenance Switch is in the ON position

The installation setup must be completed, and the 3100 status at AP READY prior to continuing with the leveling procedure. Refer to Section 6.6 and Report No: 87338 for Install Settings and configuration.

If AP FAIL or ATTITUDE FAIL are displayed, identify and correct any installation issues prior to proceeding. If it is determined that a faulty servo is root cause of an AP FAIL, it is safe to proceed with the IMU calibration procedure.

**NOTE:** Ensure the pitot and static systems are vented to ambient air pressure during the leveling and calibration process. Failure to do so may result in a bad calibration data.

**NOTE:** For a 3100 systems with yaw damper (IE "Dual Board"), the calibration must be completed on one board at a time. Selecting the alternate board during the process may result in a bad calibration data.

## 6.6 LEVELING PROCEDURE

### PREPARATION:

It is not necessary to level the aircraft to accomplish this procedure.

**Note:** Some non-US versions of Microsoft Windows O.S. change the decimal (.) character to a comma (,) which corrupts the leveling calibration. In these cases, the aircraft must be leveled to perform this procedure. Refer to the AMM or equivalent for aircraft levelling procedures. Use whole numbers (no decimals) for the normal procedure steps below.

- 1) Using the digital protractor or equivalent, obtain and record the aircraft's current PITCH and ROLL angles. Refer to the appropriate AMM for leveling reference points on the aircraft

**Note:** Use a positive value for nose up, a negative value for nose down; Use a positive value for right wing down, a negative value for left wing down

- 2) If applicable, measure and record the instrument panel PITCH angle

**Note:** If the top of the instrument panel is tilted further from the pilot than the bottom, the value will be negative

- 3) If applicable, measure and record the instrument panel YAW angle

**Note:** If the radio stack is tilted toward the pilot, the value is positive.

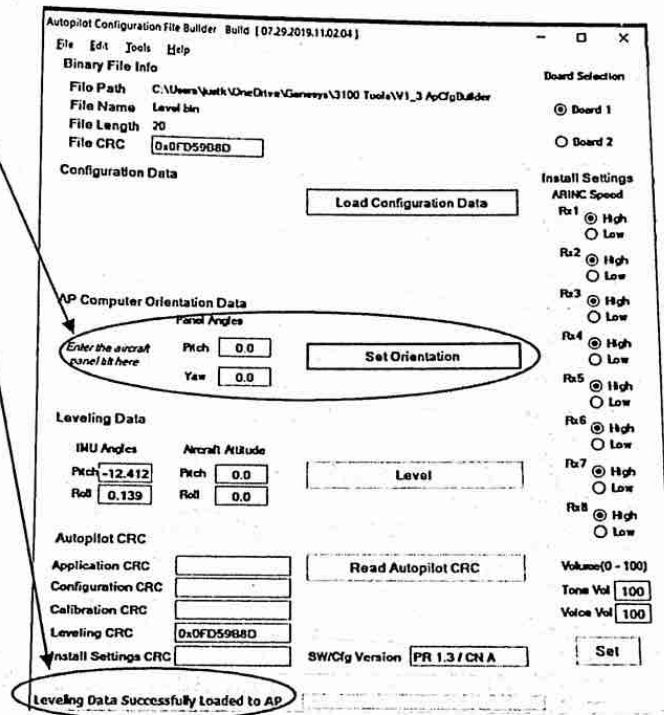
### NORMAL PROCEDURE:

- 4) Enter a value of "0" into Panel Angles Pitch and Yaw boxes
- 5) Click the Set Orientation button. This nulls out any previous data stored in the 3100.
  - a. The bottom of the window should display the message "Leveling Data Successfully Loaded to AP". Refer to figure in step 18a.
- 6) Enter the values determined during the preparation steps 2 & 3 into Panel Angles Pitch and Yaw boxes.

7) Click the Set Orientation button.

**WAIT** a minimum of 3 minutes to allow the 3100 to initialize and the IMU values to average out

a. The bottom of the window should display the message "Leveling Data Successfully Loaded to AP".



b. If the message "Failed to Load Leveling Data to AP" is displayed, steps 7 thru 7 must be re-accomplished

8) Enter the aircraft's attitude values obtained in preparation step 1 into the Aircraft Attitude Pitch and Roll boxes.

9) Click the Level button once

**DO NOT** click the Level button more than one time. Doing so may result in a failed calibration, and the 3100 entering an AP FAIL state

a. The bottom of the window should display the message "Leveling Data Successfully Loaded to AP"

**WAIT** a minimum of 3 minutes to allow the 3100 to initialize and the IMU values to average out.

b. The IMU Angles should match the Aircraft Attitude Pitch and Roll values within 1 degree

c. If the message "Failed to Load Leveling Data to AP" is displayed, steps 8 & 9 must be re-accomplished

If the IMU Angles are not within the  $\leq 1$  tolerance, repeat step 4 thru 9. If the second attempt is unsuccessful, refer to the **Alternate Leveling Procedure**.

If the 3100 system has a Yaw Damper installed, select Board 2 in the top right corner of the tool and repeat steps 8 through 13 to calibrate the 2nd board.

Compare the IMU Angles for Pitch and Roll between Board 1 and Board 2 to ensure the values are within 1 degree of each other. If the values are not within the  $\leq 1$  tolerance, perform steps 10 through 15 on the Board with IMU Angles furthest away from current Aircraft Attitude.

## ALTERNATE LEVELING PROCEDURE:

Based on the original factory IMU calibration of a board, the field calibration may not be within the  $\leq 1$  degree tolerance desired for optimum system performance. In such cases, an alternate levelling procedure may be more suitable. Use this alternate leveling procedure only for a board that won't calibrate within desired tolerance using the normal procedure.

- 1) Enter a value of "0" into Panel Angles Pitch box, and the Yaw value obtained in step 3 of the normal leveling procedure above.
- 2) Click the Set Orientation button
  - a. The bottom of the window should display the message "Leveling Data Successfully Loaded to AP"

**WAIT** a minimum of **3 minutes** to allow the 3100 to initialize and the IMU values to average out

- 3) Calculate a PITCH Panel Angle value based on the following:
  - a. PITCH panel orientation equals the IMU Angle less the Aircraft Attitude

Example: If the current IMU angle equals -9 degrees and actual aircraft attitude is +2 degrees (nose up), the calculated Pitch Panel Angle value will be -11 (IE.  $-9-2 = -11$ ).

- 4) Enter the calculated Pitch Panel Angle value from Step 3 into the Panel Angles Pitch field
- 5) Click the Set Orientation button
  - a. The bottom of the window should display the message "Leveling Data Successfully Loaded to AP"

**WAIT** a minimum of **3 minutes** to allow the 3100 to initialize and the IMU values to average out

- 6) Enter the actual aircraft attitude values obtained in step 1 of the standard levelling procedure into the Aircraft Attitude Pitch and Roll fields
- 7) Click the Level button **once**

**DO NOT** click the Level button more than one time. Doing so may result in a failed calibration, and the 3100 entering an AP FAIL state

- a. The bottom of the window should display the message "Leveling Data Successfully Loaded to AP"

**WAIT** a minimum of **3 minutes** to allow the 3100 to initialize and the IMU values to average out

- b. The IMU angles should now match the values entered into the Aircraft Attitude Pitch and Roll fields within 1 degree.

## 6.7 CONFIGURATION AND VOLUME SETUP

The 01326 Rx ARINC port speeds MUST be setup correctly and match the speed of the ARINC transmitting device in order for the 01326 to pass the self-test. For guidance on the correct settings please refer to the relevant STC electrical wiring diagram notes.

- 1) Select the relevant ARINC speeds for each RX port. For unused ports the speed selection does not matter.
- 2) Set the Tone Volume between 0 – 100
- 3) Set the Voice Volume between 0 – 100
- 4) Click on the "Set" button to upload the configuration settings
- 5) If the autopilot is a dual board unit, these settings MUST be Set on the second board also. Select "Board 2" on the "Board Selection" tab and repeat steps 1 to 4

### Install Settings

#### ARINC Speed

Rx1  High

Low

Rx2  High

Low

Rx3  High

Low

Rx4  High

Low

Rx5  High

Low

Rx6  High

Low

Rx7  High

Low

Rx8  High

Low

Volume(0 - 100)

Tone Vol 100

Voice Vol 100

**Set**



## 6.8 VERIFICATION

- 1) Ensure the Board Selection is set to Board 1
- 2) Click on "Read Autopilot CRC" and verify that the CRC fields populate.
- 3) If any fields are blank, repeat the applicable setup procedure and verify again.
- 4) For dual board systems:
  - a. select Board 2 and repeat steps 1 – 3
  - b. Verify the Application CRC, Configuration CRC and Install settings CRC values are identical for both boards.

### NOTE

The Calibration and leveling CRC's may differ since they are unique values to each board.

- 5) It is necessary to record all the CRC values for both boards.
- 6) Exit the V1\_3ApCfgBuilder utility and power OFF the autopilot.
- 7) Place the Maintenance Switch back to the OFF position to ready the 01326 for flight use.

Autopilot CRC

Application CRC

Configuration CRC

Calibration CRC

Leveling CRC

Install Settings CRC

0x2957A181

0xA2C784BE

0xCCDCFFAB

0xDEF057FF

0x3E62CB24

Read Autopilot CRC

SW/Cfg Version

PR 1.4 / CNA

## 7.0 SPECIAL TOOLS NEEDED

A crimp tool and positioner/locator meeting MIL Specification M22520/1-01 is required to ensure consistent, reliable crimp contact connections for the rear d-sub connectors. These tools are available from ITT Cannon or other vendors:

ITT Cannon  
666 E. Dyer Road  
Santa Ana, CA 92705-5612

Phone (800) 854-3028  
Fax (714) 557-4700

Insertion Tool:	ITT part#274-7048-000 (Desc. CIET-22D-KJ)
Crimp Tool (HD):	ITT part#995-0001-584 (Desc. M22520/2-01)
Locator Tool:	ITT part#995-0001-244 (Desc. TH25 TURRET HEAD)
Locator Tool (HD):	ITT part#995-0001-739 (Desc. M22520-2-06)
Locator Tool (HD):	ITT part#995-0001-734 (Desc. M22520-2-09)

### S-TEC Special Tools (Reference Appendix A, Drawing 05166 (latest revision))

Clutch Adjustment Spanner	Part Number 6622-1	Drawing No. 6622 & 1
Clutch Adjustment Spanner	Part Number 66228-1	Drawing No. 66228 & 1

## 8.0 RECOMMENDED OVERHAUL PERIODS

No additional overhaul time limitations. Remove and repair on-condition.

## 9.0 AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations Section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of Title 14 of the Code of Federal Regulations unless an alternative program has been FAA approved.

There are no Airworthiness Limitations associated with this installation.

## 10.0 WEIGHT AND BALANCE

Component weights for the autopilot system are:

P/N	Name	Location	Station	Weight
01326-01-02-000	3100 DFCS	Instrument Panel	70.02	2.70 lbs.
01326-04-02-000	3100 DFCS	Instrument Panel	70.02	2.70 lbs.
01326-05-02-000	3100 DFCS	Instrument Panel	70.02	2.70 lbs.
01326-06-02-000	3100 DFCS	Instrument Panel	70.02	2.70 lbs.
01326-07-02-000	3100 DFCS	Instrument Panel	70.02	2.70 lbs.
01326-08-02-000	3100 DFCS	Instrument Panel	70.02	2.70 lbs.
0106-R9	Roll Servo (28V)	Refer to drawing & Section 2.0		2.90 lbs.
0108-P4	Pitch Servo (28V)	Refer to drawing & Section 2.0		2.90 lbs.
0106-Y12	Yaw Servo (28V)	Refer to drawing & Section 2.0		2.90 lbs.
0106-15-Y12	Yaw Servo (28V)	Refer to drawing & Section 2.0		2.90 lbs.
0106-6-T9	Trim Servo (28V)	Refer to drawing & Section 2.0		2.90 lbs.
0106-T9	Trim Servo (28V)	Refer to drawing & Section 2.0		2.90 lbs.

## 11.0 STRUCTURAL FASTENERS

Refer to Appendix A, Drawings 7687, 7688, 76333, 76334, 76336, 76337, 76338, 76339, 76341, 76483, 76610, 76652, 76723, 761168, 761173, 761177, 761180, 761185, 761190, 761418, 761475, 761476, 761507, 761527, 761543 and 761575 (latest revisions).

## 12.0 ANNUAL INSPECTIONS

Refer to Section 3.3.

**13.0 STRUCTURAL INSPECTIONS**

No structural inspections are required.

**14.0 APPLICATION OF PROTECTIVE TREATMENTS**

This section is not applicable.

**15.0 COMMUTER CATEGORY (if applicable)**

This section is not applicable.

**16.0 REVISION AND DISTRIBUTION**

The S-TEC Service Letter/Bulletin program will be utilized to inform aircraft operators of any changes to this ICA. Aircraft operators may contact S-TEC Corporation at 1-800-USA-STECC to verify that they have the latest revision of any of the documents included in this STC.

United States of America  
Department of Transportation -- Federal Aviation Administration

# Supplemental Type Certificate

Number SA01714WI

This certificate issued to  
Garmin International, Inc.  
1200 East 151<sup>st</sup> Street  
Olathe, KS 66062

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

Original Product--Type Certificate

Number:

\* See attached Approved Model List (AML) No.

Make:

SA01714WI dated May 1, 2013 or later FAA-approved revision for list of approved aircraft models and applicable airworthiness regulations.

Model:

Description of Type Design Change:

Installation of Garmin transponders: (a) GTX 330/330D/33/33D or GTX 335/335R/335D/335DR with ADS-B Out functionality; (b) GTX 345/345R/345D/345DR with ADS-B Out and In functionality; (c) GTX 335R/335DR with ADS-B Out functionality in select airplanes installed with G950/G1000 systems; or (d) GTX 345R/345DR with ADS-B Out and In functionality in select airplanes installed with G950/G1000 systems.

Data Required:

- (1) Garmin Master Drawing List (MDL) 005-00734-04, Revision 1, dated May 1, 2013 or later FAA-approved revision.
- (2) Garmin Airplane Flight Manual Supplement or Supplemental Airplane Flight Manual (AFMS), 190-00734-15, Revision 1, dated May 1, 2013 or later FAA-approved revision.

Limitations and Conditions:

- (1) Compatibility of this design change with previously approved modifications must be determined by the installer.
- (2) Aircraft installations involving the Garmin transponder models without an internal GPS require the previous installation of an approved ADS-B position source. Refer to the design data specified in the Master Drawing List (MDL) listed above for specific hardware and software requirements.

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: August 7, 2012

Date reissued:

Date of issuance: May 1, 2013

Date amended: April 29, 2014; March 8, 2016;  
September 9, 2019



By direction of the Administrator

JR Brownell  
(Signature)

JR Brownell  
ODA STC Unit Administrator  
ODA-240087-CE  
Garmin International, Inc.

(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 Approved Model List (AML) STC SA01714WI**

Airplane Make (TCDS Holder) [common name or previous make]	Airplane Model Designation	Type Certificate Number	TC Certification Basis <sup>(1)</sup>	Master Drawing List Revision (005-00734-04)	AML Amendment/Date
Textron Aviation Inc. (Textron Aviation Inc.) [Cessna Aircraft Company]	337, 337A (USAF 02B), 337B, T337B, 337C, 337E, T337E, T337C, 337D, T337D, M337B (USAF 02A), 337F, T337F, 337G, T337G, 337H, P337H, T337H, T337H-SP	A6CE	CAR 3 FAR 23	1	Original 5/1/2013
	401, 401A, 401B, 402, 402A, 402B, 402C, 411, 411A, 414, 414A, 421, 421A, 421B, 421C, 425	A7CE	CAR 3	1	Original 5/1/2013
	177, 177A, 177B	A13CE	FAR 23	1	Original 5/1/2013
	207, 207A, T207, T207A	A16CE	FAR 23	1	Original 5/1/2013
	177RG	A20CE	FAR 23	1	Original 5/1/2013
	404, 406	A25CE	FAR 23	1	Original 5/1/2013
	501, 551	A27CE	FAR 23	1	Original 5/1/2013
	441	A28CE	FAR 23	1	Original 5/1/2013
T303	A34CE	FAR 23	1	Original 5/1/2013	

**4 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS**

4.1 Applicability .....4-2  
4.2 Airworthiness Limitations .....4-2  
4.3 Servicing Information .....4-3  
    4.3.1 On Condition Servicing.....4-3  
    4.3.2 Special Tools .....4-3  
4.4 Maintenance Intervals.....4-4  
4.5 Visual Inspection .....4-5  
4.6 Electrical Bonding Test .....4-7  
4.7 Additional Instructions .....4-7

This section provides Instructions for Continued Airworthiness for the GTX 33X and GTX 3X5 with ADS-B installation. This section satisfies the requirements for continued airworthiness as defined by 14 CFR Part 23.1529 and Part 23 appendix G. Information in this section is required to maintain the continued airworthiness of the GTX 33X and GTX 3X5 as installed under this AML STC.

**4.1 Applicability**

This document applies to all aircraft equipped with GTX 33X and GTX 3X5 units with ADS-B per STC SA01714W1.

Modification of an aircraft by this STC obligates the aircraft operator to include the maintenance information provided by this document in the operator's Aircraft Maintenance Manual and the operator's Aircraft Scheduled Maintenance Program.

**4.2 Airworthiness Limitations**

There are no new (or additional) airworthiness limitations associated with this equipment and/or installation.

The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of Title 14 of the Code of Federal Regulations unless an alternative program has been FAA approved.

FAA APPROVED

*JR Brownell*

6/16/2021

JR Brownell  
ODA STC Unit Administrator  
ODA-240087-CE

Date

### 4.3 Servicing Information

GTX 33X and GTX 3X5 LRU maintenance is “on condition” only. Component-level overhaul is not required for the GTX 33X and GTX 3X5 with ADS-B installation.

#### 4.3.1 On Condition Servicing

On Condition replacement and/or servicing should occur when an item exhibits conditions, symptoms, and/or abnormalities as defined in Section 5 of this manual. Replacement and/or servicing should be made only after the technician troubleshoots the system by using the guidance in this manual along with common avionics maintenance practices.

#### 4.3.2 Special Tools

The following tools are needed to perform maintenance tasks.

- Calibrated milliohm meter with an accuracy of  $\pm 0.1$  milliohm or better
- Calibrated transponder ramp tester
- Calibrated Pitot/static ramp tester
- GTX 3X5 Install Tool (remote units only)
- 50  $\Omega$  5 watt antenna load



#### 4.4 Maintenance Intervals

Table 4-1 shows systems and components, installed by this STC, which must undergo tests or checks at specific intervals. The inspections based on calendar elapsed time have specifically stated intervals.



#### NOTE

*The maintenance intervals listed in the table below must be adhered to for each installed GTX.*

**Table 4-1 Maintenance Intervals**

Item	Description/Procedure	Section	Interval
Equipment Removal and Reinstallation	Removal and reinstallation of GTX LRUs.	6	On Condition
Cleaning	The GTX 330 and GTX 335/335D/345/345D display and bezel may be cleaned periodically. Cleaning is accomplished using a soft cotton cloth dampened with clean water. <b>DO NOT</b> use any chemical cleaning agents. Avoid scratching the surface of the display.	N/A	On Condition
Antenna Visual Inspection	Removal and replacement.	4.5	On Condition
Lightning Strike - Actual or Suspected	Inspect the coaxial cable connections, GTX bonding hardware (including bonding straps and tape), antenna, and surrounding areas.	4.5	On Condition
	The GTX 33/330 and GTX 3X5 receiver sensitivity must be tested and shown to comply with Title 14 CFR Part 43 Appendix F.	4.	On Condition
Testing	The GTX 33/330 and GTX 3X5 must be tested and shown to comply with Title 14 CFR Part 91.227.	8.7	Replacement of GPS Position source(s).
Equipment Visual Inspection	A visual inspection of the equipment installed by this STC must be performed.	4.5	12 Calendar Months
Testing	The GTX 33/330 and GTX 3X5 must be tested and shown to comply with Title 14 CFR Part 91.411, 91.413, and Part 43 Appendix E and F.	4.	Refer to Title 14 CFR Part 91.411, 91.413, and Part 43 Appendix E and F.
Electrical Bonding Test	An electrical bonding test must be performed on equipment installed by this STC.	4.6	10 Years or 2000 hours

#### **4.5 Visual Inspection**

Perform a visual inspection in accordance with requirements in this section. Check for corrosion, damage, or other defects for each of the installed items. Replace any damaged parts as required. Inspection may require the temporary removal of a unit or units to gain access to connectors. Follow guidance in Section 6 for equipment removal and replacement. Refer to Appendix A of this manual for equipment locations. Refer to the specific Aircraft Maintenance Manual for instructions on removing any access panels.

##### ***GTX 330/330D/335/335D/345/345D Visual Inspection***

During normal aircraft inspections not to exceed 12 calendar month intervals, conduct a visual inspection of the GTX 330/330D/335/335D/345/345D installation in the following locations.

##### ***Instrument Panel***

1. Inspect all GTX 330/330D/335/335D/345/345D keys for legibility of labels and markings.
2. Inspect GTX 330/330D/335/335D/345/345D units for security of attachment.
3. Inspect mounting rack and hardware for integrity.
  - a. Verify the racks, fasteners, and support structure are in good condition and securely fastened.
  - b. Inspect for signs of corrosion.
  - c. For composite aircraft, inspect any aluminum foil tape used to ground the GTX and verify that it is not torn, damaged, or showing signs of corrosion. If any of these occur then the tape must be replaced. Refer to Appendix B for details.
4. Inspect any bonding straps for corrosion, loose connections, or signs of damage. Refer to Appendix B for details.
5. Inspect the condition of the wiring harnesses and coaxial cables.
  - a. Inspect all instrument panel wiring and coax for chafing, damage, proper routing of wire bundles and security of attachment in accordance with AC 43.13-1B, chapter 11, section 8, paragraph 11-96. Pay particular attention to possible areas of chafing.
  - b. Verify that the harness shows no signs of cracking, chafing, abrasion, melting, or any other form of damage.
  - c. Inspect the GTX 330/330D/335/335D/345/345D connectors for corrosion or other defects. Check the integrity of the shield block ground attachments to the harness connector assembly as well as the integrity of the individual shields and their attachment.

### ***GTX 33/33D/335R/335DR/345R/345DR Visual Inspection***

During normal aircraft inspections not to exceed 12 calendar month intervals, conduct a visual inspection of the GTX 33/33D/335R/335DR/345R/345DR installation in the following locations.

#### ***Remote Mount Rack***

1. Inspect GTX 33/33D/335R/335DR/345R/345DR units for security of attachment.
2. Inspect mounting rack and hardware for integrity.
  - a. Verify the racks, fasteners, and support structure are in good condition and are securely fastened.
  - b. Inspect for signs of corrosion.
  - c. For composite aircraft, inspect any aluminum foil tape used to ground the GTX and verify that it is not torn, damaged, or showing signs of corrosion. If any of these occur then the tape must be replaced. Refer to Appendix B for details.
3. Inspect any bonding straps for corrosion, loose connections, or signs of damage. Refer to Appendix B for details.
4. Inspect the condition of the wiring harnesses and coaxial cables.
  - a. Verify that all wiring and cables are securely fastened.
  - b. Verify that the harness shows no signs of cracking, chaffing, abrasion, melting, or any other form of damage.
  - c. Inspect the GTX 33/33D/335R/335DR/345R/345DR connectors for corrosion or other defects. Check the integrity of the shield block ground attachments to the harness connector assembly as well as the integrity of the individual shields and their attachment.

#### ***Antenna Visual Inspection***

During normal aircraft inspections not to exceed 12 calendar month intervals, conduct a visual inspection of the transponder antennas for the following.

1. Erosion, cracks, dents, or broken antenna. If these conditions are present, antenna must be replaced. Refer to antenna manufacturer's replacement instructions for details.
2. If the attachment is not secure, re-work the installation and complete electrical bonding test specified in Section 4.6.
3. Condition of base seals. In the event the antenna seal shows sign of damage or decomposition, re-seal and complete the electrical bonding test specified in Section 4.6.

#### ***Post Lightning Strike Inspection***

A post lightning strike inspection must be performed for a suspected or actual lightning strike to antennas or any temperature sensor connected to the GTX unit. Inspect antenna or sensor and surrounding installation to verify that structural damage has not occurred around the areas where lightning may have attached. If there is visible sign of damage to the antenna or sensor, then it should be replaced.

Inspect the antenna coax connection to GTX unit, grounding hardware, bonding straps or tape, and surrounding areas of the remotely mounted GTX to verify damage has not occurred. Repair any damaged areas and components, then complete the electrical bonding test specified in Section 4.6.

#### **4.6 Electrical Bonding Test**

1. Disconnect the antenna coaxial cable from the GTX 33X or GTX 3X5.
2. Disconnect all connectors from the GTX 33X or GTX 3X5.
3. Measure the DC resistance between each of the following test points and the aircraft ground reference as defined in Table B-1 and verify the resistance is less than or equal to the appropriate periodic test resistance value.
  - Top metal case of GTX 330/330D/335/335D/345/345D #1 (if installed)
  - Top metal case of GTX 330/330D/335/335D/345/345D #2 (if installed)
  - GTX 33/33D/335R/335DR/345R/345DR #1 chassis (if installed)
  - GTX 33/33D/335R/335DR/345R/345DR #2 chassis (if installed)
4. If the resistance is more than the periodic test resistance value in Table B-1, the bond must be improved enough to meet the reconditioned resistance value.

#### **4.7 Additional Instructions**

Electrical load information for the GTX is provided in Section 2.6.