

STC GROUP LLC
480 RUDDIMAN DRIVE
MUSKEGON, MICHIGAN 49445

REPORT NO: 1006100 REV B

TRIO AUTO PILOT INSTALLATION INSTRUCTIONS
FOR ELECTRONIC FLIGHT INSTRUMENT SYSTEM CONTROL

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DATE:	6/2/2023
WRITTEN BY:	Ahmed J. Abdulshafi
APPROVED BY:	Jeffrey P. Odum



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REVISIONS

Rev.	Date:	By:	Checked By:
-	02 JUNE 2023	Ahmed J. Abdulshafi	Jeffrey P. Odum
A	12 JULY 2023	Jeffrey Odum	Mark Sullivan
B	24 JUNE 2024	Jeffrey Odum	Mark Sullivan
ER No: 1006			
Revision:	Description		
-	Initial Release		
A	Renamed Document, Edited Trio Autopilot External Controller Functionality Table, Section 2.8 edited for DPDT switch labeling.		
B	Added reference to Dynon SkyView HDX, Section 1.0, 2.0, & Appendix A		



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REFERENCES

The following documents form a part of this report. Unless a specific revision of one of these documents is specified, the revision in effect at the time of original issue of this document shall apply.

DWG 413000XX Trio Pro Pilot System Wiring Diagram

DWG 41500005 External Airdata Input Wiring Diagram

Document 1006001 Trio Auto Pilot Avionics Compatibility List

Industry Specifications and Standards:

1. MMPDS-09 Metallic Materials Properties Development and Standardization
2. AC 43.13-1B ACCEPTABLE METHODS, TECHNIQUES, AND PRACTICES – AIRCRAFT INSPECTION AND REPAIR

Other Data:

ER1006 – STC GROUP LLC Program Engineering Record.



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ACRONYMS, ABBREVIATIONS, AND SYMBOLS

AC	Advisory Circular
AFM	Airplane Flight Manual
ASSY	Assembly
Autopilot	Trio Pro Pilot Autopilot
C.G.	Center of Gravity
CMD	Command
DPDT	Double Pole Double Throw
EFIS	Electronic Flight Indication System
ER	Engineering Record
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
F.S.	Fuselage Station
GPS	Global Positioning System
ICA	Instructions for Continued Airworthiness
INCH	Inches
LH	Left Hand
OEM	Original Equipment Manufacturer
OUTBD	Outboard
PCS	Pilot Controlled Steering
POH	Pilot Operating Handbook
Recover	Recover Button
RH	Right Hand
Servo	Trio Gold Standard Servo
STC	Supplemental Type Certificate
WS	Wing Station



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1.0 GENERAL

Thank you for your purchase of the Trio Pro Pilot Autopilot for your aircraft. This document is written to ensure your installation is simple, safe, and professionally completed. Before you begin: Read All Instructions!

This installation procedure provides information and data necessary to install the Trio Auto Pilot Controller with external control inputs from an EFIS. New external control functions are as follows:

- (1) Automatic barometric altitude data synchronization,
- (2) Selected heading,
- (3) Selected course,
- (4) Selected altitude
- (5) Autosensing and Autoconfiguration for RNAV GPS Approach

TRIO PRO PILOT AUTOPILOT EXTERNAL CONTROLLER FUNCTIONALITY						
(with EFIS / Air Data ARINC 429 bus input)						
	Selected Heading	Selected Course	Corrected Barometric Altitude	Selected Altitude	Horizontal CMD to Autopilot "GPSS"	Vertical Deviation "GPSV"
ASPEN EFD Pro Max (Software up to 2.10.2)	Yes	Yes	Yes	No	No	No
ASPEN EFD ProMax (Software 2.11, or later)	Yes	Yes	Yes	Yes	Yes	Yes
Aspen EFD E5 (Software up to 2.11)	Yes	Yes	Yes	No	No	No
ASPEN EFD E5 (Software 2.12, or later)	Yes	Yes	Yes	Yes	Yes	Yes
Garmin G5 (GAD 29B) (Software 8.26, or later)	Yes	Yes	Yes	Yes	No	No
Dynon SkyView HDX (Software 16.4.6)	Yes	No	Yes	Yes	Yes	Yes

-You may contact The STC Group LLC for installation questions. Contact Trio Avionics, Inc with all autopilot related questions.

-The STC Group Technical Support is available 0800 to 1700 Monday through Friday Pacific Time: +1 (231) 220-9296 or +1 (888) 350-2998

-Trio Avionics may be reached Monday through Saturday at +1 (619) 448-4619

-The STC Group LLC Documents can be found at The STC Group LLC website:

www.thestcgroupllc.com/documents



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2.0 INSTALLATION PROCEDURES

2.1 Pitot and static system leak checks are recommended to be performed on the aircraft before any work begins. {i.e. FAR §43 Appendix E, Paragraph (a)}.

2.2 If this is a **new** installation, then skip to step 2.6.

2.3 If this is an **upgrade** installation, then record all previous Trio Pro Pilot Autopilot settings.

VNAV GAIN SETS		
AH	VS	AS

SET SERVO GAINS	
HNAV=	VNAV=

AS/VS SELECT

SET H NAV GAINS		
TRK=	CRS=	PI=

2.4 Record all GPS and EFIS settings.

GPS	
ARINC 429 <u>OUTPUT</u> CHANNEL =	SPEED=
	FORMAT=

EFIS	
ARINC 429 <u>INPUT</u> CHANNEL =	SPEED=
	FORMAT=
ARINC 429 <u>OUTPUT</u> CHANNEL =	SPEED=
	FORMAT=

2.5 Remove Trio Pro Pilot Autopilot control head.

2.6 Modify the ARINC 429 wiring in accordance with External Airdata Input Wiring Diagram shown in Appendix A.

2.7 All ARINC 429 wires should be 22 AWG (minimum) twisted shielded pairs and shielding should be terminated at least one end.

2.8 DPDT switch must be installed in reach of the pilot in command. (Mountain 10TC260, TE MTA206N, or equivalent DPDT)

2.9 The DPDT switch is labeled **A/P Source Select**, GPS navigator model, and EFIS model installed in the aircraft. Example 1 - Aspen/430W. Example 2 – G5/440. Refer to Figure 2-1. Example 3 – Dynon/175



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FIGURE 2-1 A/P SOURCE SELECT SWITCH PLACARDS

- 2.10** Install the Trio Pro Pilot Autopilot control head with software version 220322E, or later. Refer to The STC Group model specific installation instructions for new installations.
- 2.11** Connect and secure the DB37 plug and pitot & static tubing.



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2.12 Configure GPS and EFIS output speeds and formats:

GPS	
ARINC 429 OUTPUT =	SPEED = LOW or HIGH
	FORMAT = GAMA 429*
RS-232 OUTPUT =	Avidyne 4XX/5XX - Aviation
	Garmin 4XX/5XX – Avtn no alt
	Garmin 175/355/375/650/750 – Aviation Format 1 or 2

EFIS	
ARINC 429 OUTPUT =	SPEED = LOW** or HIGH***
	FORMAT = EFIS / AIRDATA*+

NOTE:

*Other acceptable formats: GAMA 429 Graphics, GAMA 429 Graphics w/Int, GAMA Format 1, GAMA Format 3

**Dynon & Aspen model EFIS's require HIGH Speed ARINC 429 output.

***Aspen installations that contain ACU PN: 910-00004-001 must remain on LOW Speed ARINC 429. In this case GPSV (Glidepath) will not pass through the Aspen. Aspen ARINC Output Format is not configurable.

*+Use Dynon Output Format GAMA 429, GAMA 2, or GAMA 3. For applicability of specific GPS and EFIS configurations see Avionics Compatibility List STC Document # 1006001, current revision.



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3.0 CLOSEUP

- 3.1** It is required that pitot and static system leak tests and inspections be performed after autopilot installation per 14 CFR 91.411 or to your local authorities' regulations. {i.e. FAR §43 Appendix E, Paragraph (a)}.
- 3.2** No change to Weight & Balance.
- 3.3** Install current FAA Approved Aircraft Flight Manual Supplement for the Trio Pro Pilot Autopilot into the AFM, POH, or applicable flight manual for the aircraft.
- 3.4** Complete all logbook entries as required to return the aircraft to service.
- 3.5** Submit applicable paperwork in accordance with local authority regulations. (i.e. FAA Form 337, if applicable)

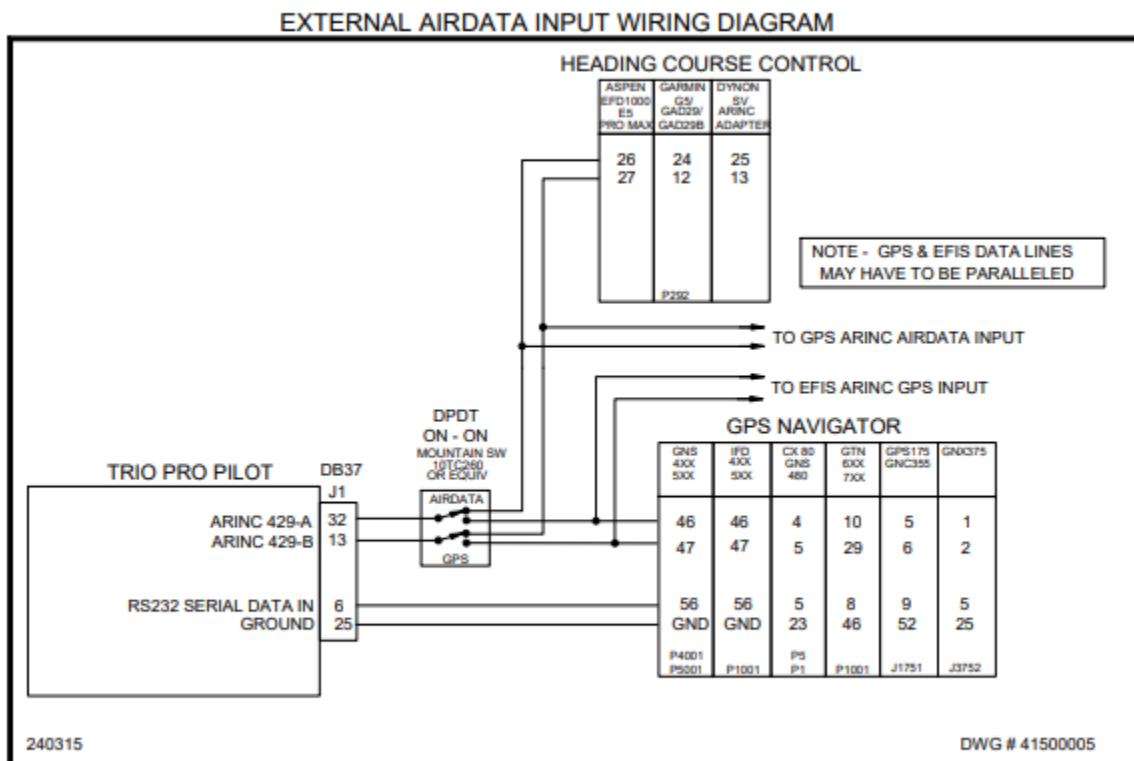


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APPENDIX A EXTERNAL AIRDATA INPUT WIRING DIAGRAM



NOTE:

In most installations:

The GPS ARINC 429 output bus from the GPS will be paralleled to the A/P Source Select DPDT switch and the EFIS system input.

The EFIS/AIRDATA ARINC 429 output bus from the EFIS will be paralleled to the A/P Source Select switch and the GPS input.



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APPENDIX B RECOMMENDED INSTALLATION TOOLS



Solder Station



Wire Strippers



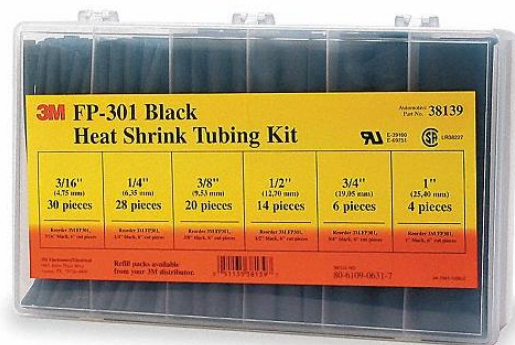
Heat Gun



Pin Crimpers



1.5mm & 3/16" Allen Wrenches



Heat Shrink