



**STC GROUP LLC
480 RUDDIMAN DRIVE
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Trio Pro Pilot Autopilot Maintenance TROUBLESHOOTING Guide

**STC SA04230CH
Original Issue Date: October 2nd, 2025**

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Trio Pro Pilot Autopilot
Maintenance TROUBLESHOOTING Guide REV A

Record of Revisions			
Revision:	Date:	Description of Change:	Approved By:
-	02 October 2025	Original Issue	Jeff Odum
A	07 May 2026	Page 4 correction	Jeff Odum



Introduction

Welcome to the **Maintenance Troubleshooting Guide** for the **Trio Pro Pilot Autopilot System**. This guide is designed to assist technicians, installers, and aircraft operators in identifying, diagnosing, and resolving common issues that may arise during the operation or maintenance of the Trio Pro Pilot Autopilot system.

The Trio Pro Pilot Autopilot is a sophisticated, solid-state flight control system designed to enhance pilot workload management and flight precision. While built for reliability and ease of use, like all avionics systems, it may occasionally require troubleshooting to ensure optimal performance and continued airworthiness.

This guide provides a systematic approach to:

- Identifying symptoms of malfunction or degraded performance
- Diagnosing root causes using built-in system diagnostics and field-tested methods
- Performing corrective actions or determining when to seek manufacturer support

Please read this guide thoroughly before performing any maintenance or troubleshooting procedures. Always follow standard safety practices and ensure that any work performed complies with applicable FAA regulations and aircraft maintenance guidelines.



MAINTENANCE TROUBLESHOOTING GUIDE

The following tables list troubleshooting aids that can be performed to mitigate and/or diagnose a system anomaly or malfunction.

Discrepancy	Description	Possible Cause	Corrective Action
Lateral Oscillations (Wandering) (ROLL)	This scenario occurs when the aircraft rolls back and forth across the intended track/course.	1) HNAV gains improperly set.	1) Adjust HNAV gains and/or contact The STC Group LLC for servo gain documents.
		2) Lost motion.	2) Check fasteners in the roll installation for looseness.
		3) Aileron control system.	3) Ensure aileron rigging and cable tension is correct per TCDS & Service Manual. Inspect cables, chains, pulleys, and rod ends for wear and/or binding.
		4) Roll servo direction wrong.	4) See Servo Direction Wrong (ROLL) Section.
Vertical Oscillations (Porpoise) (PITCH)	This scenario occurs when the aircraft pitches up and down across the intended altitude or climb/descent rate.	1) VNAV gains improperly set.	1) Adjust VNAV gains and/or contact The STC Group LLC for servo gain documents.
		2) Lost motion.	2) Check fasteners in the pitch installation for looseness.
		3) Elevator/Stabilator control system.	3) Ensure elevator/stabilator rigging and cable tension is correct per TCDS & Service Manual. Inspect cables, chains, pulleys, and rod ends for wear and/or binding.
		4) Pitot and/or Static system clog or leak.	4) Verify integrity of pitot and/or static systems.
		5) Pitch servo direction wrong.	5) See Servo Direction Wrong (PITCH) Section.
CLH SLIP (ROLL)	This message can appear in the upper LEFT (H NAV) side of the screen accompanied by 2 short audible beeps.	1) Forces in the aileron control system are higher than the clutch setting.	1) Aileron control cable tension and/or friction throughout the system are too high or binding.
		2) Broken gear in the roll servo.	2) Remove roll servo cover & inspect servo – Contact Trio Avionics for an RMA if the servo gears are damaged.
		3) Roll servo clutch torque too low.	3) Contact Trio Avionics or The STC Group LLC for Servo Clutch Procedure or remove and replace the servo.
CLH SLIP (PITCH)	This message can appear in the upper RIGHT (V NAV) side of the screen accompanied by a short audible alert.	1) Forces in the pitch control system are higher than the clutch setting.	1) Elevator/Stabilator control cable tension and/or friction throughout the system are too high or binding.
		2) Broken gear in the pitch servo.	2) Remove pitch servo cover & inspect servo – Contact Trio Avionics for an RMA if the servo gears are damaged.
		3) Pitch servo clutch torque too low.	3) Contact Trio Avionics or The STC Group LLC for Servo Clutch Procedure or remove and replace the servo.



Discrepancy	Description	Possible Cause	Corrective Action
I/O ERROR (ROLL)	This message displays on the LEFT side of the screen when communication between the control head and the roll servo is interrupted. Power is removed from the servo and H NAV LED will flash until the H NAV button is pressed.	1) Wiring.	1) Verify correct wiring and/or contact The STC Group LLC for I/O Error document to check wiring.
		2) Faulty pitch servo or control head.	2) Contact Trio Avionics for an RMA of the faulty unit.
I/O ERROR (PITCH)	This message displays on the RIGHT side of the screen when communication between the control head and the pitch servo is interrupted. Power is removed from the servo and V NAV LED will flash until the V NAV button is pressed.	1) Wiring.	1) Verify correct wiring and/or contact The STC Group LLC for I/O Error document to check wiring.
		2) Faulty pitch servo or control head.	2) Contact Trio Avionics for an RMA of the faulty unit.
L SERVO CKSM ERR (ROLL)	This checksum message occurs when data between the control head and roll servo is corrupted.	1) Interference in data wires.	1) Inspect the shielding ground continuity, data wire continuity, shorts between or short to ground of data wires. Check routing of roll wire to avoid noisy components (i.e. radio antennas, lighting power supplies, AC circuits).
V SERVO CKSM ERR (PITCH)	This checksum message occurs when data between the control head and pitch servo is corrupted.	1) Interference in data wires.	1) Inspect the shielding ground continuity, data wire continuity, shorts between or short to ground of data wires. Check routing of pitch wire to avoid noisy components (i.e. radio antennas, lighting power supplies, AC circuits).
NO GPS	This message occurs when the autopilot is not receiving valid GPS data.	1) GPS has not acquired a signal.	1) Wait for GPS to acquire a signal or use the instrument panel self-test page for verification of data (NOTE: GPS signals cannot pass through metal)
		2) Wiring.	2) Verify proper data connections/formats (RS-232 and ARINC 429) or contact The STC Group LLC for GPS data test document.
One or both servos fail to disconnect via the yoke mounted disconnect button.	Momentarily pressing the yoke mounted servo disconnect button should release both servos from the control system.	1) Wiring.	1) Verify integrity of wire from the autopilot to the switch and from the switch to ground.
		2) Failed button.	2) Replace disconnect button.
Servo does not activate when the H NAV or V NAV buttons are activated.	Momentarily pressing the H NAV and/or V NAV button should turn the servos ON/OFF.	1) The disconnect circuit is grounding (this will also be indicated by flashing H NAV or V NAV LED's)	1) Verify integrity of wire from the autopilot to the switch and from the switch to ground or replace disconnect button.
		2) Faulty servo (if no other messages appear)	2) Contact Trio Avionics for an RMA of the faulty unit.



Discrepancy	Description	Possible Cause	Corrective Action
Display flashes all pixels when power is applied & controller does not sequence past this display.	This malfunction indicates the control head display unit is not operating properly.	1) Control head has failed.	1) Contact Trio Avionics for an RMA of the faulty unit.
The autopilot controller display is blank when power is applied.	The autopilot controller should always sequence to the ELEVATION SET display on power up.	1) Wiring.	1) Press the ENCODER knob and observe the TRK LED. If the TRK LED does not illuminate the power and ground wiring to the autopilot system should be verified for proper voltages and connections.
		2) Failed display.	2) If the display is blank on power up, press the ENCODER knob and observe the TRK LED. If this LED illuminates for seven seconds, then extinguishes, the display has failed. Contact Trio Avionics for an RMA of the faulty unit.
Either servo fails to disengage when the power is removed from the system.	This type of malfunction indicates a mechanical failure in the servo.	1) Failed servo.	1) Contact Trio Avionics for an RMA of the faulty unit.
Autopilot performance suddenly degrades in the roll axis.	This type of malfunction may indicate a problem with the aileron control system, bridle cable tensions (if applicable), or an internal EEPROM malfunction.	1) Mechanical installation.	1) Check for fod or binding in the aileron control system. Clean the control yoke shafts with alcohol.
		2) Loose bridle cable or slipped cable clamp. (if applicable)	2) Check roll servo bridle cable tension and cable clamp bolts torque (if applicable)
		3) Roll servo internal failure.	3) Contact Trio Avionics for an RMA of the faulty unit.
Autopilot performance suddenly degrades in the pitch axis.	This type of malfunction may indicate a problem with the pitot or static system, bridle cable tensions (if applicable), or an internal EEPROM malfunction.	1) Pitot and/or static system leak/blockage.	1) Inspect and perform leak checks on the pitot and/or static systems.
		2) Mechanical installation.	2) Check for fod or binding in the aileron control system. Clean the control yoke shafts with alcohol.
		3) Loose bridle cable or slipped cable clamp. (if applicable)	3) Check pitch servo bridle cable tension and cable clamp bolts torque (if applicable)
		4) Pitch servo internal failure.	4) Contact Trio Avionics for an RMA of the faulty unit.
Roll Servo cannot drive the ailerons during ground testing	When driving the roll servo manually with the servo engaged the LNAV SERVO SET number does not change.	1) Manual drive not selected.	1) Ensure there is an arrow on the bottom right side of the screen that it reads DIR>XX. If no arrow is showing (DIR=XX) then momentarily press the H MODE button.
		2) Roll servo clutch slip.	2) See CLH SLIP (ROLL) Section.
		3) Servo not engaging.	3) Ensure sufficient power and ground.
		4) Roll servo arm clocked wrong.	4) Verify servo arm is installed correctly.
		5) Servo failed.	5) Contact Trio Avionics for an RMA of the faulty unit.



Discrepancy	Description	Possible Cause	Corrective Action
Pitch Servo cannot drive the elevator/stabilator during ground testing	When driving the pitch servo manually with the servo engaged the VNAV SERVO SET number does not change.	1) Manual drive not selected.	1) Ensure there is an arrow on the bottom right side of the screen that it reads DIR>XX. If no arrow is showing (DIR=XX) then momentarily press the H MODE button.
		2) Pitch servo clutch slip.	2) See CLH SLIP (PITCH) Section.
		3) Servo not engaging.	3) Ensure sufficient power and ground.
		4) Pitch servo arm clocked wrong.	4) Verify servo arm is installed correctly.
		5) Servo failed.	5) Contact Trio Avionics for an RMA of the faulty unit.
Servo Direction Wrong (ROLL)	When driving the roll servo manually with the servo engaged the ailerons turn the wrong direction.	1) The wrong servo was installed or the servo jumper configuration is wrong. Clockwise encoder = right turn (clockwise yoke).	1) Contact Trio Avionics or The STC Group LLC for Servo Jumper Procedure or remove and replace the servo with the correct servo.
Servo Direction Wrong (PITCH)	When driving the pitch servo manually with the servo engaged the elevator/stabilator goes the wrong direction.	1) The wrong servo was installed or the servo jumper configuration is wrong. Clockwise encoder = pitch up (yoke aft)	1) Contact Trio Avionics or The STC Group LLC for Servo Jumper Procedure or remove and replace the servo with the correct servo.
RECOVER button does not work	When the RECOVER button is pressed and held in for 3 seconds the servos do not engage.	1) No GPS.	1) Move the aircraft to acquire a GPS signal or see NO GPS Section.
		2) Failed wiring or button.	2) Verify recover circuit wiring/button or replace the recover button.