



THE STC GROUP, LLC



Project Number STC SA04230CH

Post Installation Test Flight Cards

**Document Number: F-1006-43
Revision E**

Date:

Aircraft Make

Aircraft Model

Serial Number

N Number



TEST 1 – Aircraft Control System Checks – Systems Check Utilizing Ground Power

Pilot:	Date:	Time:
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- Objectives:**
- **Enter Initial Gain Settings.**
 - **Verify proper servo operation.**
 - **Verify aircraft control system rigging.**
 - **Verify servo arm positions.**

Check	Action
	Lock ailerons and elevators in Neutral position with blocks
	Remove any pitot / static covers
	Power up the AP system
	Enter ATIS Information _____ Record the current Altimeter Setting _____ Enter the field elevation into the autopilot.
	Enter the maintenance settings
	Select HNAV VNAV servo gains screens
	Set and record HNAV gain
	Set and record VNAV gain
	Advance to LNAV Servo Set Screen
	Record Neutral servo arm position
	Unblock ailerons
	Record Full Right aileron servo arm position
	Record Full Left aileron servo arm position
	Press HMode button to enter LNAV Servo Set test mode
	Verify arrow is observed
	Press HNAV to activate roll servo
	Rotate Encoder clockwise until right aileron is full up
	Verify that aileron displacement matches full right aileron reading & record
	Return the Encoder to the Neutral position
	Verify that ailerons return to Neutral



	Rotate Encoder counterclockwise until left the aileron is full up
	Verify that aileron displacement matches full left aileron reading & record
	Return the Encoder to the Neutral position
	Verify that ailerons return to Neutral
	Press HMode button to exit LNAV Servo Set test mode
	Verify arrow changes to =
	Rotate Encoder counter clockwise to VNAV Servo Set screen
	Record Neutral servo arm position
	Unblock elevators
	Move control yoke / stick full aft
	Record full UP pitch servo arm position
	Move control yoke / stick full forward
	Record full DOWN pitch servo arm position
	Verify that the controls are free and correct through the entire range of motion. Full forward – full right – full aft – full left – full forward - neutral
	Record any binding in controls and perform visual check of autopilot installation.



TEST 2 - Initial System Checks – Systems Check Utilizing Ground Power		
Pilot:	Date:	Time:
Objectives: <ul style="list-style-type: none"> • Validate BARO screen setup. • Verify proper servo slip clutch operation. • Verify visual servo indications and aural warnings. • Assure operation of yoke disconnect. 		
Check	Action	
	Power up the AP system	
	Enter ATIS Information _____ Record the current Altimeter Setting _____ Enter the field elevation into the autopilot.	
	Center flight controls and engage servos by pressing the HNAV and VNAV Buttons	
	Verify HNAV and VNAV servo LEDs are ON	
	Override HNAV servo to left and release	
	Verify roll control returns to neutral	
	Override HNAV servo to right and release	
	Verify roll control returns to neutral	
	Override VNAV servo to pitch up and release	
	Verify pitch control returns to neutral	
	Override VNAV servo to pitch down and release	
	Verify pitch control returns to neutral	
	Press the VNAV button to release the VNAV servo	
	Observe 3 audible beeps when the servo disconnects	
	Observe the pitch axis controls are free and clear	
	Press the HNAV button to release the HNAV servo	
	Observe 3 audible beeps when the servo disconnects	
	Verify roll axis controls free and clear	



TEST 3 – Initial System Checks – Systems Check Utilizing Ground Power		
Mechanic / Pilot:	Date:	Time:
Objectives: <ul style="list-style-type: none"> • Verify the servos fully release using manual disconnect • Verify servos fully release when power is removed from the autopilot. 		
Check	Action	
	Engage both the HNAV and VNAV servos	
	Place the controls in a full up and down / full right and left positions overriding servo slip clutches.	
	Press the autopilot disconnect button LH <i>red</i> button on pilot yoke	
	Verify aural disconnect tone indicating servos have been disconnected	
	Verify roll and pitch controls free and clear	
	Engage both the HNAV and VNAV servos	
	Place the controls in the full up and full down positions then full right and left positions overriding the servo slip clutches	
	Place the power switch to OFF	
	Verify roll and pitch controls free and clear	
	Power ON autopilot, enter current BARO ALT (Field elevation)	
	Engage HNAV and VNAV servos	
	Pull autopilot circuit breaker	
	Verify roll and pitch controls free and clear	
	Reset the circuit breaker	
	Power ON autopilot, enter current BARO ALT	
	Engage HNAV and VNAV servos	



TEST 4 – Aircraft Dynamics without Autopilot	
Pilot:	Date:
Time:	
<p>Objectives:</p> <ul style="list-style-type: none"> • Check aircraft rigging • Demonstrate the damping of normal aircraft short period and Dutch roll oscillations • Perform flight tests at or above 3500 feet or an appropriate safe VFR altitude. • Record VFR altitude _____ 	
Check	Action
	Carefully trim the aircraft in level flight at a normal cruise airspeed for the selected altitude. Record altitude _____ Observe that the aircraft will fly “hands off”.
	Record whether “roll off” is consistently left or right.
	From the stable cruise condition, excite the short period with a positive elevator pulse. Observe & Record the response. If phugoid motion is started, it must be manually damped, and the short period test reinitiated.
	From the stable cruise condition, excite the Dutch roll with a rudder pulse. Observe and record the response.

Hobbs Out _____

Hobbs In _____

Time Out _____

Time In _____

Total Time _____

Note any aircraft operational discrepancies before starting test:



TEST 5 - Confirmation of Servo Override and Determine Gain Settings	
Pilot:	Date:
Time:	
Objectives: <ul style="list-style-type: none"> • Confirm that the roll and pitch servos can be easily overridden by the pilot • Establish pitch gain settings that result in less than a 40-foot altitude loss • Perform flight tests at or above 3500 feet or an appropriate safe VFR altitude. • Record VFR altitude _____ 	
Check	Action
	Carefully trim the aircraft in level flight at a normal cruise airspeed at _____ MSL or appropriate safe altitude.
	Engage H NAV in CRS and V NAV in Altitude Hold.
	Ensure that the force necessary to override the H NAV and V NAV servos feels normal (3.5 lbs. approx.). If <i>inappropriate</i> force required, terminate the test.
	Initiate the left 180 degree turn function and record the altitude loss.
	Adjust pitch gains as required to achieve the desired altitude loss.
	Record the gain settings and altitude loss

Note:

The Avionics Addendum Document provides specific instructions to set aircraft Gains.
 This document is available at www.thestcgroupllc.com.

Initial VNAV Gain _____

Final VNAV Gain _____

Initial HNAV _____

Final HNAV _____



TEST 6 – Aircraft Dynamics with Autopilot		
Pilot:	Date:	Time:
Objectives: <ul style="list-style-type: none"> • Demonstrate the damping of normal aircraft short period and Dutch roll oscillations with autopilot engaged • Perform flight tests at or above 3500 feet or an appropriate safe VFR altitude. 		
Check	Action	
	Carefully trim the aircraft in level flight at a normal cruise airspeed at _____ feet MSL.	
	From the stable cruise condition, engage the H NAV and V NAV servos to hold the heading and altitude.	
	<ul style="list-style-type: none"> • From a stable cruise condition, and the autopilot engaged, excite the short period with a positive elevator pulse. • Observe and record the aircraft response. • If phugoid motion is observed, manually arrest the motion and reinitiate the short period test. • If damping is less than observed in the airplane with the autopilot disengaged, stop the testing. 	
	<ul style="list-style-type: none"> • From a stable cruise condition and the autopilot engaged, excite the Dutch roll with a rudder pulse. • Observe and record the response. • If damping is less than observed in the airplane with the autopilot disengaged, terminate the test. 	
	If the damping has not changed or has improved, slow the aircraft to slow flight speed with appropriate trim and power changes.	
	<ul style="list-style-type: none"> • When established in level slow flight engage the autopilot. • Excite the short period with an elevator pulse. • Observe and record the response. • If damping is not adequate, terminate the test. 	
	<ul style="list-style-type: none"> • When established in level slow flight engage the autopilot • Excite the Dutch roll with a rudder pulse. • Observe and record the response. • If damping is not adequate, terminate the test. 	
	Slow the aircraft further by using a flap setting appropriate for level flight with appropriate trim and power settings.	
	Repeat the short period and Dutch roll observations above.	



TEST 7 – WAAS Enabled GPS Confirmation		
Pilot:	Date:	Time:
Objectives: <i>NOTE: The Trio autopilot is not approved for coupled approaches below 500 feet</i> <ul style="list-style-type: none"> • Demonstrate the functionality of the autopilot when using data from a WAAS enabled panel mount GPS to fly an LPV approach and missed approach with holding pattern. 		
Check	Action	
	Fly the aircraft a safe distance from an airport in controlled airspace.	
	Set a course on the GPS to return to the airport.	
	Engage the autopilot HNAV servo and place the A/P in CRS Mode.	
	Engage the autopilot VNAV servo and place the A/P in AH Mode.	
	Use the Encoder knob in CRS mode to control flight toward the airport.	
	Use VNAV to execute any required descents.	
	Request a practice RNAV LPV approach.	
	Load the RNAV LPV approach.	
	Practice the approach using the autopilot.	
	When the Glideslope is captured use power to control the descent rate.	
	<ul style="list-style-type: none"> • Observe and record the ability of the autopilot to capture and hold both vertical and horizontal guidance. • Performance should be within 1/2 dot. 	
	Disconnect the autopilot at Placarded altitude – 500 feet AGL.	
	Execute missed approach procedure utilizing the vertical and horizontal navigational capability of the autopilot with appropriate trim and power settings.	
	<ul style="list-style-type: none"> • Observe and record the autopilot guidance. • Performance should be within .25 nautical mile horizontally and 50 feet vertical. 	
	<ul style="list-style-type: none"> • Allow the A/P to enter the published hold per published hold entry. • Observe and record the autopilot guidance. 	
	Allow the A/P to fly published hold.	
	Configure the airplane for landing, and land safely	



Attachment 1 Flight Test Observations