Approved GPS and Software List
For
Vizion PMA Autopilot
And
Procedure for Approving Additional GPS or Software

Prepared by

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1. Document Revision History

Rev	Description	Pages	Date
Init	Preliminary manual created	13	7-5-17
A	Added Aera 660, GPS connection and configuration to flight check report, added KLN 89B, and 696.	13	2-14-18

2. Table of Approved GPS Units

2.1.Vizion Hardware and Software Covered

Vizion Hardware	Vizion Software
Rev A	PV.30

2.2.Approved TSO GPS Units and Software Versions

GPS	GPS Software Version
GNS 430/430W	5.20
GTN 650	4.10
GNC 250XL	2.09
IFD 550	10.2.0.0
KLN 89B	00880-0007

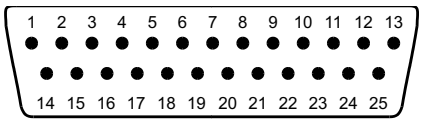
2.3.Approved non-TSO (Portable) GPS Units and Software Versions

GPS	GPS Software Version
Garmin 496	3.50, 4.80
Garmin Aera 500/510/550/560	5.60
Garmin Aera 660	2.30, 3.20
Garmin 696	6.90

2.4.GPS Approval Requirements

The Vizion (P/N 8000-174 or 8000-175 or 8000-176) autopilot can be interfaced to multiple different types of GPS units for navigation input. The STC requires that the GPS and GPS software be on the approved list before connection to the Vizion is allowed. If the GPS is listed but the software to be used is not, refer to section 5 of this document for the procedure for approving a new software version.

3. Connection Pinouts



Vizion 25-Pin Connector viewed from rear of unit

3.1.TSO GPS Pin Connections to Vizion

GPS Connector/Pin	Vizion Pin
GNS 430/430W	
P4001/56	17
P4001/46	14
P4001/47	15
GNS 530/530W	
P5001/56	17
P5001/46	14
P5001/47	15
GTN 650/750	
P1001/8	17
P1001/10	14
P1001/29	15
GNS 480	
P1/22	17
P5/4	14
P5/24	15
GNC 155XL/250XL/300XL	
J1/19	17
J1/16	14
J1/15	15

3.2.Non-TSO GPS Connection to Vizion

For connection to the Vizion (P/N 8000-174 or 8000-175 or 8000-176), most non-TSO (portable) GPS units will require a specific cable purchased from either the manufacturer or an authorized dealer. The wire colors in this section assume that specific cable is being used in the installation.

GPS Connector/Pin	Vizion Pin
Garmin 695/696/795/796	
Blue Wire	17
Garmin Aera 500/510/550/560/660	
Blue Wire	17
Garmin 396/496	
Blue Wire	17

4. GPS Configuration

4.1.TSO GPS Configuration Procedures

4.1.1. GNS 430/430W/530/530W

1. Press and hold the ENT button while powering up.
2. Release the ENT button once GARMIN is shown on the display.
3. Cycle through the Instrument Panel Self-Test Page like normal, this will bring up the MAIN ARINC 429 CONFIG page.
4. Cycle the cursor down to OUT, select GAMA 429 as the format.
5. Cycle the cursor down to SPEED, select LOW.
6. Cycle the cursor down to VNAV LABEL (430W/530W only), select ENABLE.
7. Rotate the large knob to access the RS232 SETUP page.
8. Cycle the cursor to the OUTPUT column of the CHNL 1 row.
9. Select Aviation.
10. Autopilot baud rate must be 9600, refer to Vizion PMA Installation Guide (166) Appendix corresponding to aircraft type.

4.1.2. GTN 650/750

1. Press and hold the HOME button while powering up.
2. Release the HOME button when GARMIN is shown on the display.
3. From the CONFIG MODE screen, touch GTN SETUP.
4. Touch RS232.
5. On channel 1 output, select Aviation, then touch the back arrow.
6. Touch ARINC 429.
7. On channel 1 output, select GAMA 1, Speed LOW, then touch the back arrow.
8. Touch Update Config Module.
9. Autopilot baud rate must be 9600, refer to Vizion PMA Installation Guide (166) Appendix corresponding to aircraft type.

4.1.3. GNC 155XL/250XL/300XL

1. Press and hold the MSG button.
2. Rotate the outer knob until the I/O Setup page is displayed.
3. Press the CRSR button twice and rotate the inner knob to select Plotting
4. Rotate the outer knob to advance the cursor to the baud rate selection, choose 9600
5. Press CRSR.

6. Power down the GPS.
7. Remove the database card.
8. Power the unit on.
9. Press the ENT button when asked “Select operating mode Normal?”.
10. Press the ENT button again when asked “user wpts ok?”
11. After the satellite status page is displayed for five seconds, turn the unit off.
12. Press and hold the ENT button then turn the power on. Release the ENT button when the display activates.
13. Press the CRSR button, then rotate the outer knob to select ARINC 429 CHANNEL.
14. Press the CRSR button, then rotate the inner knob to cycle the cursor to OUTPUT, select w/o GAMA labels.
15. Autopilot baud rate must be 9600, refer to Vizion PMA Installation Guide (166) Appendix corresponding to aircraft type.

4.1.4. GNS 480/ CNX 80

1. Immediately after power up of GPS, press the 1, 4, and MENU/ENTER buttons together.
2. After the unit reboots, it will be in the SETUP page.
3. Press the button next to SERIAL PORTS.
4. Press the small knob and move the cursor to the TX column for channel 2.
5. Select MAPCOM and 9600. Press the small knob to save.
6. Press BACK to return to the setup page.
7. Press the button next to ARINC PORTS SETUP.
8. Move the cursor to Channel 1 OUT.
9. For DATA, select ARINC 429.
10. For SPEED, select LOW.
11. Autopilot baud rate must be 9600, refer to Vizion PMA Installation Guide (166) Appendix corresponding to aircraft type.

4.2.Non-TSO (Portable) GPS Configuration Procedures

4.2.1. Garmin GPSMAP 395/396/495/496

1. Press the MENU button twice.
2. Scroll down to SETUP.
3. Scroll right to the Interface tab.
4. Scroll down to select the Serial Data Format field.
5. Press ENTER, a window will popup.
6. Scroll to NMEA IN/NMEA OUT
7. Press the MENU button.
8. Select Advanced NMEA Setup and press ENTER.
9. Select FAST OUTPUT, then press ENTER.
10. Autopilot baud rate must be 4800, refer to Vizion PMA Installation Guide (166) Appendix corresponding to aircraft type.

4.2.2. Garmin Aera 500/510/550/560/660

1. Select Tools from the home menu.
2. Select Setup.
3. Select Interface.
4. Select the drop down menu for Serial Data Format.
5. Choose NMEA OUT.
6. Autopilot baud rate must be 4800, refer to Vizion PMA Installation Guide (166) Appendix corresponding to aircraft type.

5. Procedure for GPS Software Version Approval

All GPS units interfaced to the TruTrak Vizion (P/N 8000-174 or 8000-175 or 8000-176) autopilot require their software to be on the approved list in section 2.2 and 2.3 of this document. This section outlines the procedure to follow to add a software version to the approved list. For GPS units with multiple different softwares, this document refers only to the Main Software of the unit.

5.1.Ground Check Procedure for GPS Units with Self-Test Feature

This section will apply mostly to TSO GPS units that have a self-test page. However, any GPS that has a mode to output signals on the ground can use this procedure. Refer to the manual for the specific GPS unit for instructions on how to access the self-test/demo mode of the GPS.

5.1.1. RS232 Communication Verification

1. Verify that wiring connections are correct for the GPS model interfaced.
2. If GPS unit has a test page, instrument panel self-test, or demo page, leave the GPS at this page for the duration of the ground check.
3. Check upper left corner of autopilot display.
4. GPS OK indicates proper RS232 communication.
5. NO GPS indicates no or improper communication. Refer to Vizion PMA Installation Guide (166) to troubleshoot wiring. Refer to GPS Configuration (section 4 of this document) to verify GPS settings.

5.1.2. ARINC 429 Communication Verification

1. Verify that wiring connections are correct for the GPS model interfaced.
2. If GPS has a test page, instrument panel self-test page, or demo page, leave the GPS at this page for the duration of the ground check.
3. Engage the autopilot by pressing the KNOB on the autopilot controller.
4. Press the MODE button on the autopilot.
5. Check the lower left area of the display.
6. GPSS indicates good ARINC 429 communication.
7. No change or response indicates no or improper communication. Refer to Vizion PMA Installation Guide (166) to troubleshoot wiring. Refer to GPS Configuration (section 4 of this document) to verify GPS settings.

5.2.Taxi Check Procedure for GPS Units without Self-Test Feature

This section will apply mostly to Non-TSO GPS and some older TSO GPS units that do not have a self-test page. This check will require two crew members, a pilot-in-command and an auxiliary crew member to verify proper autopilot interface to the GPS unit.

5.2.1. RS232 Communication Verification

1. Verify that wiring connections are correct for the GPS model interfaced.
2. Power up the GPS and autopilot.
3. Check upper left corner of autopilot display.
4. GPS OK indicates proper RS232 communication.
5. NO GPS indicates no or improper communication. Refer to Vizion PMA Installation Guide (166) to troubleshoot wiring. Refer to GPS Configuration (section 4 of this document) to verify GPS settings.

5.2.2. ARINC 429 Communication Verification

1. Verify that wiring connections are correct for the GPS model interfaced.
2. Program a waypoint into the GPS.
3. Taxi the aircraft at a speed greater than 10 knots.
4. Engage the autopilot by pressing the KNOB on the Vizion controller.
5. Press the MODE button on the autopilot.
6. Check the lower left area of the display.
7. GPSS indicates good ARINC 429 communication.
8. No change or response indicates no or improper communication. Refer to Vizion PMA Installation Guide (166) to troubleshoot wiring. Refer to GPS Configuration (section 4 of this document) to verify GPS settings.

6. Procedure for GPS Model Approval

All GPS units interfaced to the TruTrak Vizion autopilot (P/N 8000-174 or 8000-175 or 8000-176) are required to be on the approved list along with their software. Refer to sections 2.2 and 2.3 of this document for approved GPS units and softwares. Follow the procedure in this section to gain approval for a GPS model that is not on the approved list. New GPS models will require a verified flight check to ensure proper interface to the Vizion autopilot (P/N 8000-174 or 8000-175 or 8000-176).

6.1. Wiring Verification

Using GPS installation manuals and Vizion PMA Installation Guide (166), verify proper connections to autopilot inputs.

6.2. RS232 Communication Verification

1. Verify that wiring connections are correct for the GPS model interfaced.
2. If GPS unit has a test page, instrument panel self-test, or demo page, leave the GPS at this page for the duration of the ground check.
3. Check upper left corner of Vizion display.
4. GPS OK indicates proper RS232 communication.
5. NO GPS indicates no or improper communication. Refer to Vizion PMA Installation Guide (166) to troubleshoot wiring. Refer to GPS Configuration (section 4 of this document) or GPS installation manual to verify GPS settings.

6.3. ARINC 429 Communication Verification (Ground Check)

1. Verify that wiring connections are correct for the GPS model interfaced.
2. If GPS has a test page, instrument panel self-test page, or demo page, leave the GPS at this page for the duration of the ground check.
3. Engage the autopilot by pressing the KNOB on the Vizion controller.
4. Press the MODE button on the autopilot.
5. Check the lower left area of the display.
6. GPSS indicates good ARINC 429 communication.
7. No change or response indicates no or improper communication. Refer to Vizion PMA Installation Guide (166) to troubleshoot wiring. Refer to GPS Configuration (section 4 of this document) or GPS installation manual to verify GPS settings.

8. If wiring and settings are verified with no correct response received, proceed to section 6.4 for the ARINC 429 Communication Verification Taxi Check

6.4.ARINC 429 Communication Verification (Taxi Check)

1. Verify that wiring connections are correct for the GPS model interfaced.
2. Program a waypoint into the GPS.
3. Taxi the aircraft at a speed greater than 10 knots.
4. Engage the autopilot by pressing the KNOB on the Vizion controller.
5. Press the MODE button on the autopilot.
6. Check the lower left area of the display.
7. GPSS indicates good ARINC 429 communication.
8. No change or response indicates no or improper communication. Refer to Vizion PMA Installation Guide (166) to troubleshoot wiring. Refer to GPS Configuration (section 4 of this document) to verify GPS settings.

6.5.GPS Flight Check

After ground check verifications, currently unapproved GPS units must be flown to verify correct interface to the autopilot. A report must be sent to Trutrak verifying a successful check flight. The following points must be covered in the check flight. Fill out the table on page 13 of this document and return

1. Verify autopilot displays TRK and the current ground track in the upper left corner of the display.
2. Verify autopilot follows current track when engaged.
3. Make several left and right turns of greater than 90°, verify autopilot rolls out at correct track.
4. Program a waypoint in the GPS
5. Press the MODE button on the autopilot, verify the autopilot enters GPS NAV mode and tracks to the currently set course and waypoint. (NOTE: If ARINC 429 steering is present, GPS NAV mode will not be accessible.)
6. Verify the autopilot enters GPSS mode on the lower left of the display and tracks to the currently set course (ARINC 429 interface only).
7. Send copy of page 13 flight report to TruTrak.

7. Check Flight Report

GPS Model		
GPS Software Version		
RS232 Pin Connection	Connector	Pin
RS232 Configuration Setting		
ARINC 429 A Pin Connection	Connector	Pin
ARINC 429 B Connection	Connector	Pin
ARINC 429 Configuration Setting		

Check Flight Parameter	**Pass / Fail / N/A**
TRK and current ground track displayed in top left	
Autopilot follows current track when engaged	
Autopilot turns and rolls out correctly	
Autopilot enters GPS NAV mode and correctly tracks course	
Autopilot enters GPSS mode and correctly tracks course	

Authorized Signature _____

Company Name (if applicable) _____

Date of flight _____