xCruze 100 Autopilot
Installation Manual
8300-086 Rev B

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Table of Contents

1. Document Revision History

Rev	Description	Pages	Date
IR	Initial Release	21	12/18/2013
A	Corrected G3X Pin Numbers		12/16/2014
B	Updated PV4.0		2/15/2021

Warning:

Do no drill any holes in the aircraft or aircraft structure that will result in less than recommended edge or fastener spacing distances. Reference your aircraft's structural repair manual or Advisory Circular 43.13 for more information. If the installation requires less than recommended distances, do not proceed with the installation and contact BendixKing for further instruction.

2. Controller Installation

2.1. Mounting Considerations

The xCruze 100 controller unit is designed to mount in the aircraft instrument panel within view and reach of the pilot. Maximum recommended viewing angle should be no more than 20 deg. The maximum mounting angle the xCruze 100 can accommodate is 10 degrees longitudinal (pitch) axis and 0 degrees lateral (roll or yaw) axis. The location should be such that the controller unit is not blocked by the glare shield on top, or by the throttles, control yoke, etc. on the bottom. Use appropriate aircraft installation standards for mounting and support of the autopilot controller. *After completion of mechanical installation, apply torque seal (Cross Check A498M or equivalent) to all servo and servo linkage fasteners.*

2.2. Wiring Considerations

Use AWG #24 or larger wire for all connections unless otherwise specified. The standard crimp pin contacts supplied in the connector kit are compatible with up to AWG #20 wire. AWG #20 shall be used for all power and ground connections. Do not attach any wires to the outside of the autopilot controller or route high current wires within six (6) inches of the controller. Ensure that routing of the wiring is not exposed to sources of heat, RF or EMI. Check that there is ample space for the cabling and mating connectors. Avoid sharp bends in cabling and routing near aircraft control cables. Do not route the COM antenna coax within twelve (12) inches of any autopilot components.

- Ensure that the autopilot master switch is mounted in a location that is easily accessible to the pilot / crew.

- Ensure that the autopilot circuit breaker is mounted in a location that is easily accessible to the pilot / crew.

- Ensure that the Control Wheel Steering button / emergency autopilot disconnect switch is mounted on the pilot's yoke / stick. This button must be installed, must be red in color, and must be labeled as AP CWS or AP DISCO or AP CUTOFF.

- Ensure that the Emergency Level button is located in a clearly visible and accessible portion of the panel. This button must be accessible to both pilot and copilot.

2.3.Pitot / Static Connection

All xCruze 100 autopilots require connections to the pitot and static systems. The preferred method of this connection would be tee fittings near the aircraft's altimeter. The static line for the autopilot requires due care in its construction, as excessive lag or insufficient static orifices can cause the autopilot to oscillate (hunt) in pitch. Although there is compensation within the autopilot sufficient to handle moderate amounts of lag, the importance of a good static port and line cannot be overstated.
In some cases problems can be caused by having a large number of devices (including the autopilot) connected to a single, insufficient, static port. In other cases, the static line itself is adequate but there are one or more devices connected to the same line, one of which has a large static reservoir. A simple remedy for this problem if it occurs is a tee-fitting near the static port, and a dedicated line to the autopilot only. Obviously, an insufficiently-large orifice coupled with large static reservoirs can aggravate the problems associated with lag.

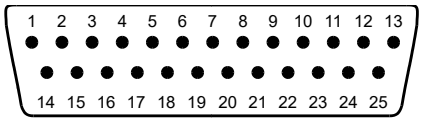
2.4.RFI / EMI Considerations

The autopilot controller is shielded and does not generate any appreciable level of electromagnetic interference. Moreover, the servo lines (except for power and ground) are low-current and cannot contribute to RF interference. The servo power and ground lines do have switching currents through them, but so long as there are no parallel runs of servo power and ground lines with such things as poorly-shielded antenna lines or strobe light power lines, there is no need to shield the servo harnesses.

The autopilot itself has been internally protected from RF interference and has been tested under fairly extreme conditions, such as close proximity to transmitting antennas. However, it is always good practice to ensure that such antennas are properly shielded and not routed directly over or under sensitive panel-mounted electronic equipment. Most problems in this area are the result of improper RF shielding on transmitting antennas, microphone cables, and the like. The most sensitive input to the autopilot is the Control Wheel Steering switch input. This line should not be routed in parallel with transmitting antennas or other sources of known RF interference. If necessary, it can be shielded with the shield connection to pin 13 of the autopilot connector.

2.5.xCruze 100 Electrical Pin Out

The table below provides a brief explanation of each pin function on the main 25-pin connector P101.

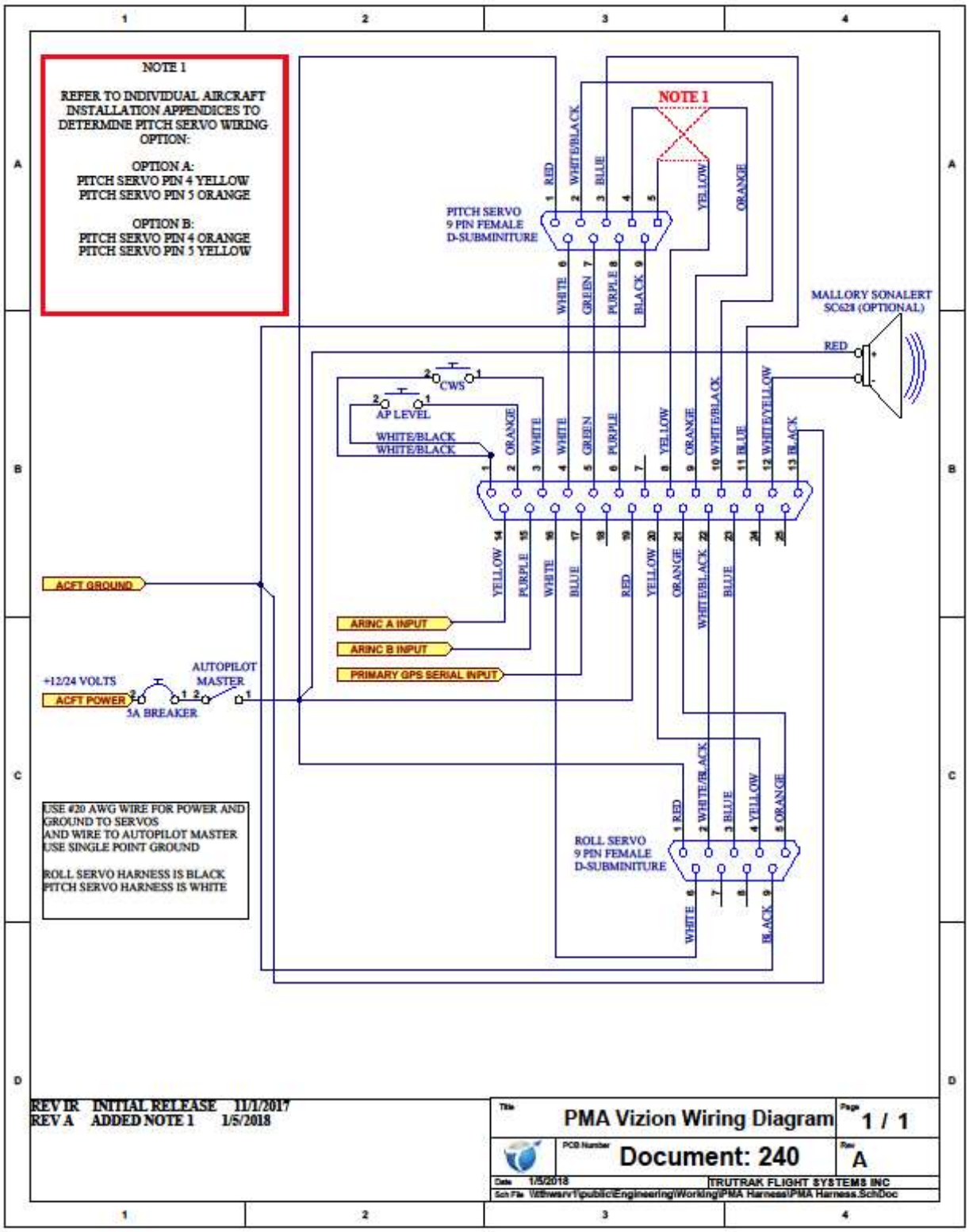


Rear 25-Pin Connector
P101
viewed from rear of unit

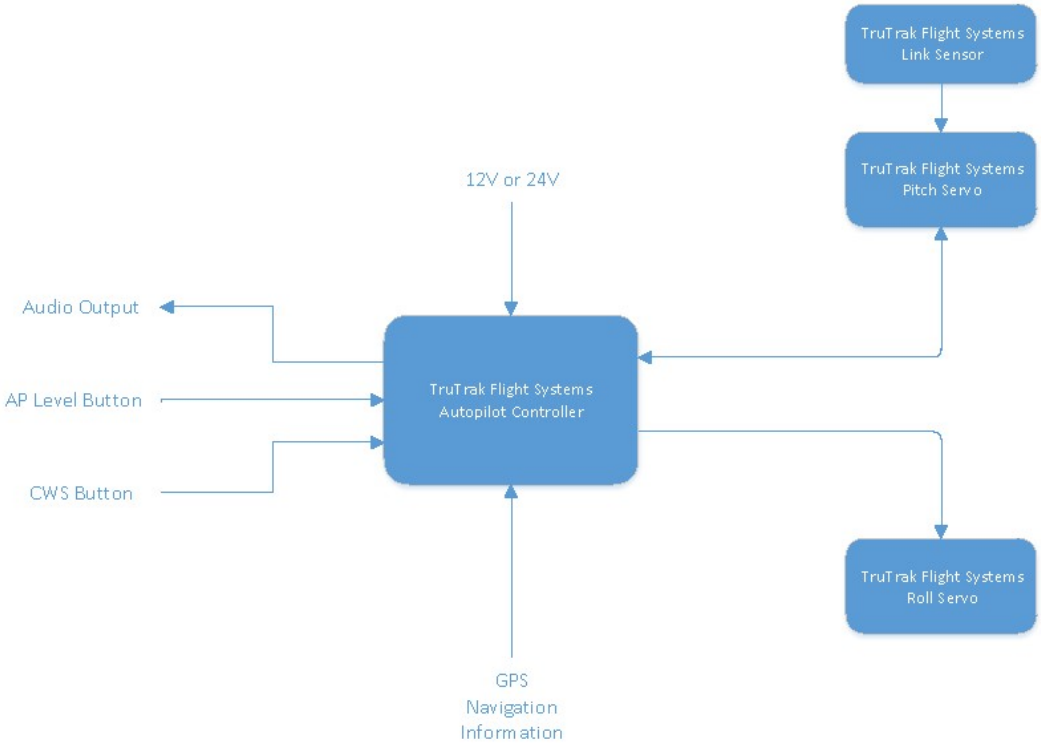
P101 Pin	Function	Notes
1	Used for external Emergency AP Level button connection.	
2	Used for external Emergency AP Level button connection.	
3	**Control Wheel Steering**. Connect as shown in wiring diagram to a RED SPST momentary switch located on the aircraft control yoke or stick to remotely disconnect the autopilot. This is also used for the control wheel steering function.	
4	**Pitch Servo Torque Control**. A signal from the autopilot to the pitch servo, which sets the amount of torque to be delivered by the servo.	
5	**Pitch Servo Trim Sensor**. A signal from the pitch servo to the autopilot, which indicates an out-of-trim condition and its direction.	
6	**Pitch Servo Trim Sensor**. A second signal from the pitch servo to the autopilot, which indicates an out-of-trim condition and its direction.	
7	**RS-232 Output**. Output for communication with G3X or other system to display autopilot mode information.	
8	**Pitch Servo control lines**. These lines cause the stepper motor in the pitch servo to run in the appropriate direction at the desired velocity. They are small-signal lines and do not have any substantial current-carrying capability or require any special shielding. Connect to pitch servo as shown on wiring diagram.	
9		
10		
11		
12	**Audio annunciator output** Connect to optional audio annunciator. Designed to drive Mallory Sonalert SC628 type device.	
13	**Ground Connection**. Provide #20 AWG to common grounding point.	
14	**ARINC 429 Input A**	
15	**ARINC 429 Input B**	
16	**Roll Servo Torque Control**. A signal from the autopilot to the roll (aileron) servo, which sets the amount of torque to be delivered by the servo.	

17	**Primary Serial Input**. Baud rate selectable 1200, 2400, 4800 or 9600 baud. Automatically decodes NMEA-0183, Garmin Aviation Format, or Apollo/UPSAT Moving-Map or GPSS format. Provides directional reference to the autopilot.	
18	**SkyView RS-232 Input**. Input from Dynon SkyView for SkyView mode control	Dynon connection only
19	**Autopilot Master** (+12 OR +24 V DC). The autopilot itself draws less than 0.5 ampere. Most of the current required by the autopilot system is used by the servos (up to 2A per servo at 12 Volts).	
20 21 22 23	**Roll (aileron) Servo control lines.** These lines cause the stepping motor in the roll servo to run in the appropriate direction at the desired velocity. They are small-signal lines and do not have any substantial current-carrying capability or require any special shielding. Connect to roll servo as shown on wiring diagram.	
24	Unused.	
25	Unused.	

2.6.xCruze 100 Wiring Diagram

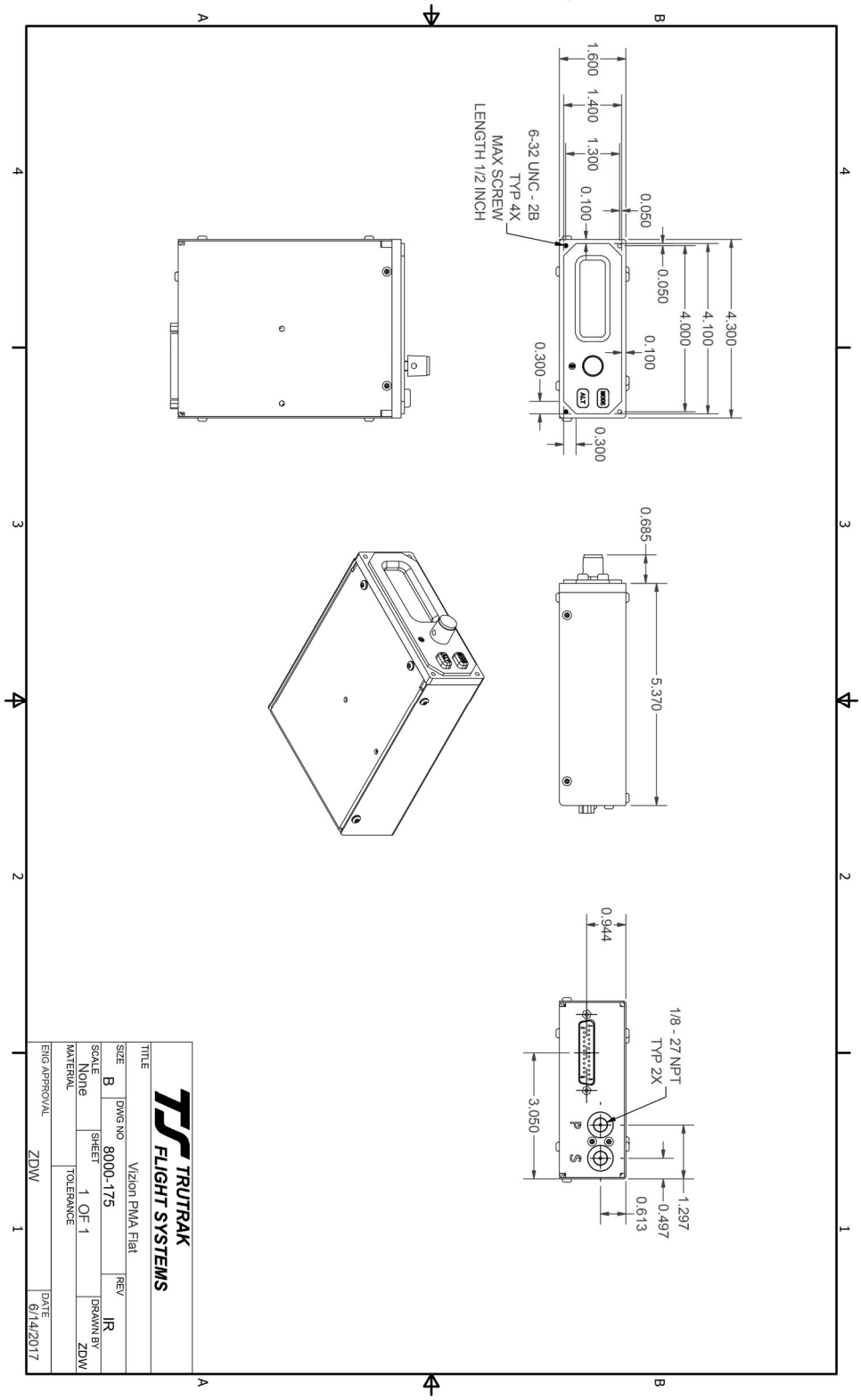


2.7.xCruze 100 Autopilot System Diagram

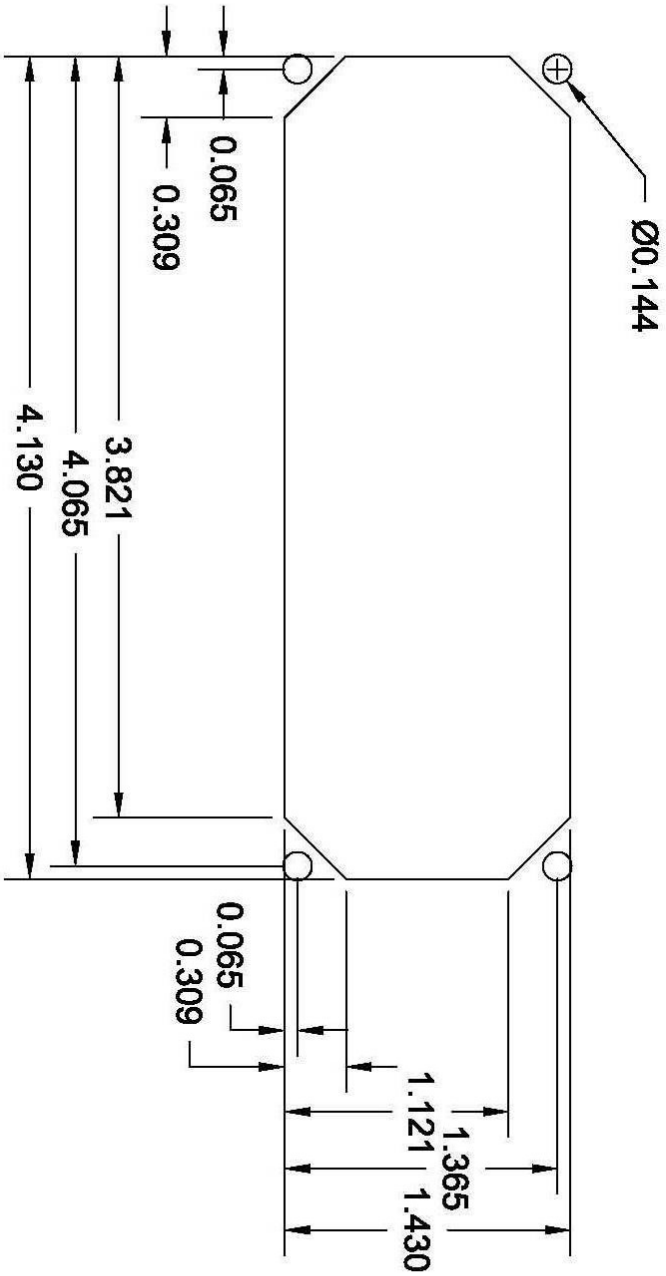


3. Controller Cut-outs and Dimensions

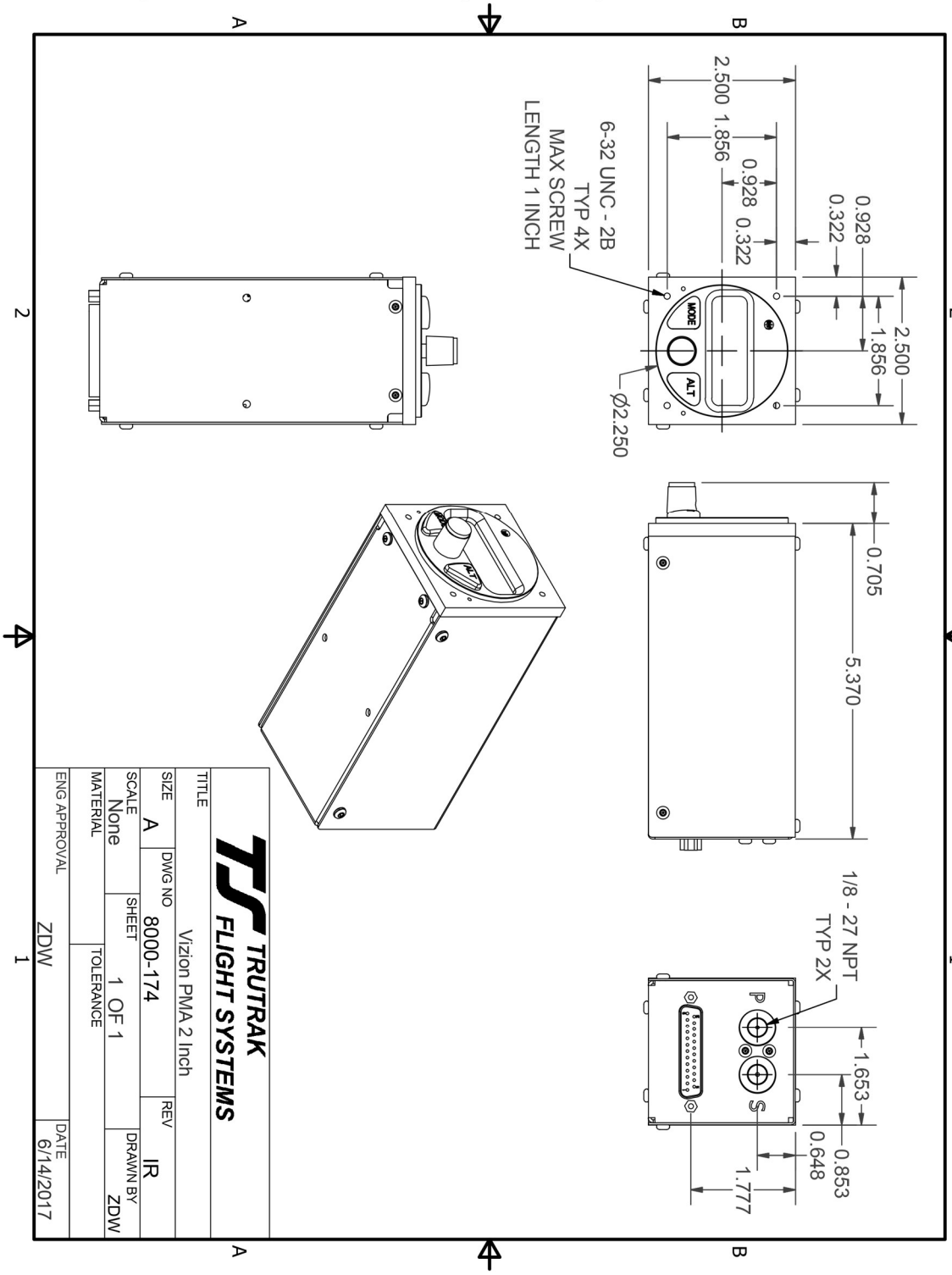
3.1. Flat Pack Dimensions (8000-165)



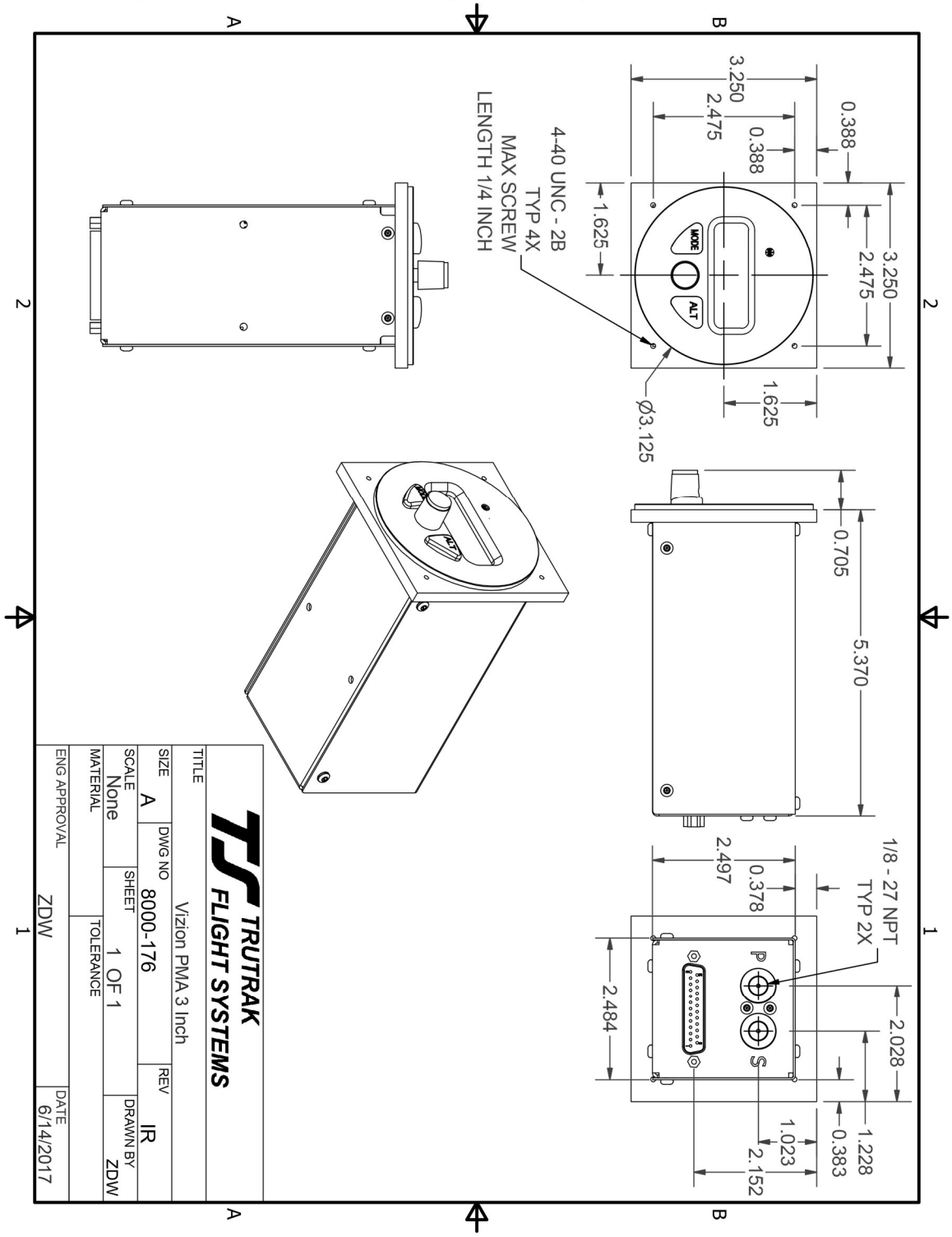
3.2.Flat Pack Panel Cut-out



3.3. 2-1/4” Round Dimensions (8000-164)



3.4. 3-1/8” Round Dimensions (8000-169)



4. GPS Setup

For known setup and cable information to connect GPS units to the xCruze 100 autopilot, see the document "Approved GPS List (186)" on the BendixKing website Downloads & Manuals Page – filter by xCruze 100 System. This document provides setup information for panel mounted and handheld GPS units that have been verified to be compatible with xCruze 100 autopilots.

If your GPS is not included in the Approved GPS List (186), consult your GPS manual for NMEA output setup. The autopilot must have a direct RS-232 connection with the handheld GPS. To allow easy removal of the handheld GPS, a 9 pin D subminiature connector in your panel is recommended, which will also allow the use of the aircraft electrical system to power the handheld GPS.

5. xCruze 100 Setup

Once all wiring is complete, verified, and the GPS setup has been completed, follow the steps below to verify proper autopilot settings.

Refer to Section 9 – Suggest Autopilot Settings for recommended settings for your aircraft.

THIS STEP MUST BE COMPLETED PRIOR TO GROUND CHECK AND FLIGHT CHECK!!!

5.1. xCruze 100 Software Version PV.30 setup

Lateral settings:

1) PRESS and HOLD KNOB
2) Apply power to autopilot and GPS
3) Release KNOB.
4) PRESS KNOB to advance to min backlight
5) PRESS KNOB to advance to SETUP ENABLE.
6) ROTATE KNOB to select a value of **10**.
7) PRESS KNOB to exit.
8) PRESS and HOLD MODE button until LAT ACTIVITY is shown.
9) ROTATE KNOB to select a LAT ACTIVITY of **3**
10) PRESS ALT button to advance to next setup screen.
11) ROTATE KNOB to select a BAUD that matches the baud rate of the GPS (this will be either **4800** or **9600**, refer to Approved GPS List (Doc 186) for information about approved GPS units).
12) PRESS ALT button to advance to next setup screen.
13) ROTATE KNOB to select a BANK ANGLE of **MED**.
14) PRESS ALT button to advance to next setup screen.
15) ROTATE KNOB to select a MICROACTIVITY of **0**.

16)PRESS ALT button to advance to next setup screen.
17)ROTATE KNOB to select a GPSS GAIN of **16**.
18)PRESS ALT button to advance to next setup screen.
19)ROTATE KNOB to set ROLL REV to **N**.
20)PRESS KNOB to exit lateral setup and return to the home screen.
21)PRESS ALT AND HOLD alt button until VRT AVTIVITY is shown.
22)WHILE CONTINUING TO HOLD ALT, PRESS MODE.
23)RELEASE MODE AND ALT.
24)PRESS MODE until MAC is displayed.
25)ROTATE KNOB to set MAC to **0**.
26)PRESS KNOB to exit menu and return to home screen.
27)Do not remove power from autopilot.

Vertical Settings:

1) PRESS and HOLD ALT button until VRT ACTIVITY is shown.
2) ROTATE KNOB to select a VRT ACTIVITY of **3**.
3) PRESS ALT button to advance to next setup screen.
4) ROTATE KNOB to select a MIN AIRSPD of (Refer to aircraft POH and set a value equal to 1.3 V_S in knots).
5) PRESS ALT button to advance to next setup screen.
6) ROTATE KNOB to select a MAX AIRSPD of (Refer to aircraft POH and set a value equal to 0.9 V_{NE} in knots).
7) PRESS ALT button to advance to next setup screen.
8) ROTATE KNOB to select a PITCH REV of **N**.
9) PRESS ALT button to advance to next setup screen.
10)ROTATE KNOB to select a STATIC LAG of **0**.
11)PRESS ALT button to advance to next setup screen.
12)ROTATE KNOB to select a MICROACTIVITY of **0**.
13)PRESS ALT button to advance to next setup screen.
14)ROTATE KNOB to select a HALF STEP of **N**.
15)PRESS KNOB to exit vertical setup and return to the home screen.
16)Cycle power on the autopilot.

5.2. xCruze 100 Software Version PV.40 setup

Lateral Settings:

1) PRESS and HOLD KNOB
2) Apply power to autopilot and GPS
3) Release KNOB.
4) PRESS ALT button to advance to min backlight
5) PRESS ALT button to advance to SETUP ENABLE.
6) ROTATE KNOB to select a value of **10**.
7) PRESS ALT button to exit.
8) PRESS and HOLD MODE button until LAT ACTIVITY is shown.
9) ROTATE KNOB to select a LAT ACTIVITY of **3**

10) PRESS ALT button to advance to next setup screen.
11) ROTATE KNOB to select a BAUD that matches the baud rate of the GPS (this will be either **4800** or **9600**, refer to Approved GPS List (Doc 186) for information about approved GPS units).
12) PRESS ALT button to advance to next setup screen.
13) ROTATE KNOB to select a BANK ANGLE of **MED**.
14) PRESS ALT button to advance to next setup screen.
15) ROTATE KNOB to select a MICROACTIVITY of **0**.
16) PRESS ALT button to advance to next setup screen.
17) ROTATE KNOB to select a GPSS GAIN of **16**.
18) PRESS ALT button to advance to next setup screen.
19) ROTATE KNOB to set ROLL REV to **N**.
20) PRESS KNOB to exit lateral setup and return to the home screen.
21) PRESS ALT AND HOLD alt button until VRT AVTIVITY is shown.
22) WHILE CONTINUING TO HOLD ALT, PRESS MODE.
23) RELEASE MODE AND ALT.
24) PRESS MODE until MAC is displayed.
25) ROTATE KNOB to set MAC to **0**.
26) Repeatedly PRESS ALT button until EFIS TYPE is displayed
27) ROTATE KNOB to set EFIS TYPE to:
    1 – if the autopilot is connected to an ASPEN,
    2 – if the autopilot is connected to a G5,
    0 – if the autopilot is connected to any other GPS
28) PRESS KNOB to exit menu and return to home screen.
29) Do not remove power from autopilot.

Vertical Settings:

1) PRESS and HOLD ALT button until VRT ACTIVITY is shown.
2) ROTATE KNOB to select a VRT ACTIVITY of **3**.
3) PRESS ALT button to advance to next setup screen.
4) ROTATE KNOB to select a MIN AIRSPD of (Refer to aircraft POH and set a value equal to 1.3 V_S in knots).
5) PRESS ALT button to advance to next setup screen.
6) ROTATE KNOB to select a MAX AIRSPD of (Refer to aircraft POH and set a value equal to 0.9 V_{NE} in knots).
7) PRESS ALT button to advance to next setup screen.
8) ROTATE KNOB to select a PITCH REV of **N**.
9) PRESS ALT button to advance to next setup screen.
10) ROTATE KNOB to select a STATIC LAG of **0**.
11) PRESS ALT button to advance to next setup screen.
12) ROTATE KNOB to select a MICROACTIVITY of **0**
13) PRESS ALT button to advance to next setup screen.
14) ROTATE KNOB to select desired DEFAULT VS (this is the vertical speed setting that the autopilot will use as the value to determine whether or not to synchronize to current vertical speed or synchronize to zero vertical speed, as

well as the default vertical speed for altitude pre-select). For example, if the DEFAULT VS is set to 300 fpm, if the aircraft is climbing at 200 fpm, the autopilot select zero VS upon engagement. If the aircraft is climbing at 400 fpm, the autopilot will select 400 fpm upon engagement.
We suggest using 500-600 feet per minute.
CAUTION! Do not select a DEFAULT VS that is too high, or autopilot performance may be adversely affected.

15) PRESS KNOB to exit vertical setup and return to the home screen.
16) Cycle power on the autopilot.

6. xCruze 100 Ground Checkout

Once installation and setup of the autopilot are complete, (see xCruze 100 Setup section) a ground checkout is required before the first flight of the system. This procedure will verify correct servo direction and pitot / static system connection.

The following steps should be used to do a ground checkout prior to powering or engaging autopilot in flight.

1. Apply power to autopilot and servos and GPS (if equipped). If GPS equipped ensure a GPS has a position fix.
2. Verify autopilot display shows either NO FIX or GPS OK in the upper left.
3. Center both aileron and elevator control surfaces.
4. Using a calibrated PITOT / STATIC test box, connected to both PITOT and STATIC ports of the aircraft, apply an airspeed to the system within above MINIMUM AIRSPEED but below MAXIMUM AIRSPEED (These values are given in the appropriate appendix for the aircraft make / model).
5. Engage the autopilot with a PRESS of the KNOB on the face of the autopilot.
6. Verify that both roll and pitch servos have engaged and are holding aircraft controls.
7. Adjust PITOT pressure to lower the airspeed to below MINIMUM AIRSPEED.
8. Verify that autopilot display shows MIN AS within approximately 3 knots of calibrated airspeed indicator on test box.
9. Adjust PITOT pressure to increase the airspeed to above MAXIMUM AIRSPEED.
10. Verify that autopilot display shows MAX AS within approximately 3 knots of calibrated airspeed indicator on test box.
11. Return PITOT pressure to normal range between MINIMUM and MAXIMUM AIRSPEED.
12. Adjust STATIC pressure to lower altitude at a few hundred feet per minute.
13. Verify that stick or yoke moves aft.
14. Adjust STATIC pressure to increase altitude at a few hundred feet per minute.

15. Verify that stick or yoke moves forward.
16. ROTATE KNOB clockwise to command a turn to the right.
17. Verify that stick or yoke moves to roll the aircraft to the right.
18. ROTATE KNOB counter-clockwise to command a turn the left, make sure to rotate far enough to actually command a left turn.
19. Verify that the stick or yoke moves to roll the aircraft to the left.
20. Disengage autopilot with a PRESS of the CWS button.
21. Verify that servos have disconnected, autopilot display shows AP OFF, and controls are again free.
22. Center both aileron and elevator control surfaces.
23. Engage autopilot with a PRESS of the AP LEVEL button.
24. Verify that both roll and pitch servos have engaged and are holding aircraft controls.
25. PRESS KNOB to move cursor to SVS and ROTATE KNOB clockwise to select a 300 fpm VS climb.
26. Verify that stick or yoke moves aft.
27. Apply a force to the stick or yoke to resist the aft movement
28. Verify that the center of the autopilot display shows the letters UP with an arrow pointing up above them. (this is the indication to trim the aircraft for nose up).
29. PRESS KNOB to move cursor to SVS and ROTATE KNOB counter-clockwise to select a -300 fpm VS climb.
30. Verify that stick or yoke moves forward.
31. Apply a force to the stick or yoke to resist the forward movement
32. Verify that the center of the autopilot display shows the letters DN with an arrow pointing down below them (this is the indication to trim the aircraft for nose down).
33. Disengage the autopilot with a PUSH and HOLD of the knob, release when the display shows AP OFF.
34. Verify that both servos have disconnected and controls are again free.

If steps 1-34 are all verified then the autopilot is ready for a confirmation flight.

7. xCruze 100 First Flight Checkout

Prior to performing xCruze 100 first flight, it is strongly recommended that the pilot be familiar with the operation of the xCruze 100 system. Reading though AeroCruze / xCruze 100 Operating Manual (Doc 167) is recommended. It would also be beneficial to spend some time operating the xCruze 100 autopilot system on the ground to ensure familiarity with modes and controls.

1. Apply power to autopilot and servos and GPS (if equipped). If GPS equipped ensure GPS has a position fix.
2. If GPS equipped, verify autopilot display shows TRK (if aircraft is moving at greater than 15 knots ground speed) and the current track in the upper left.

3. Synchronize autopilot altimeter to aircraft altimeter, CLICK ALT button two times and ROTATE KNOB until displayed altitude matches that of the aircraft altimeter.
4. Engage the autopilot with a CLICK of the KNOB on the face of the autopilot.
5. Verify that both roll and pitch servos have engaged and are holding aircraft controls. The autopilot should synchronize to the current track and vertical speed being flown at the time.
6. ROTATE KNOB clockwise to command a turn of about 60 degrees to the right. (If not GPS equipped, then command a 10-15 degree bank angle)
7. Verify that the aircraft follows the commands and rolls out within a few degrees of the selected track. (If not GPS equipped, the turn must be manually stopped by rotating the KNOB to zero bank)
8. ROTATE KNOB counter-clockwise to command a turn of about 60 degrees the left.
9. Verify that the aircraft follows the commands and rolls out within a few degrees of the selected track. (If not GPS equipped, the turn must be manually stopped by rotating the KNOB to zero bank)
10. If GPS equipped, enter a flight plan or direct to into the GPS.
11. CLICK MODE button to engage either GPS NAV or GPSS.
12. Ensure that autopilot follows GPS flight plan / direct to.
13. If Aspen / G5 equipped, select Aspen / G5 ARINC source.
14. CLICK MODE button to engage ASPEN / EXT HDG, EXT ALT mode.
15. Ensure that autopilot follows heading bug and / or altitude bug.
16. Disengage autopilot with a CLICK of the CWS button.
17. Verify that servos have disconnected, autopilot display shows AP OFF, and controls are again free.
18. Engage autopilot with a CLICK of the AP LEVEL button.
19. Verify that both roll and pitch servos have engaged and are holding aircraft controls. (Display will show BANK mode for several seconds and then will transition to TRK mode if GPS equipped)
20. CLICK ALT button to enter altitude select mode.
21. ROTATE KNOB to select an altitude approximately 300 feet lower, CLICK KNOB to move cursor to VS field, ROTATE KNOB to select a climb rate of approximately -300 fpm. CLICK KNOB to enter altitude select mode.
22. Verify that aircraft descends to and levels off within 20 feet of selected altitude (If trim indication appears, trim aircraft accordingly).
23. Disengage the autopilot with a PRESS and HOLD of the knob, release when the display shows AP OFF.
24. Ensure that AEP is in STBY mode. Display should show AEP STBY, if display does not show AEP STBY, CLICK MODE button to toggle AEP mode from AEP OFF to AEP STBY.
25. Manually fly aircraft to bank angle of approximately 45 degrees, verify that AEP engages (Display shows AEP ACTIVE) and roll servo puts force into the control system moving controls in a direction to lower the bank angle.

26. Verify that AEP goes back to STBY when bank angle decreases to approximately 35 degrees.

8. Troubleshooting Guide

Autopilot System Fault	Possible cause	Possible remedy
Autopilot does not power up when circuit breaker / autopilot master is engaged	Circuit breaker malfunction	Inspect and replace circuit breaker if necessary.
	Autopilot not wired to ground	Verify and fix any wiring errors.
Roll servo does not engage when autopilot system is engaged	Roll servo wiring is faulty	Install servo harness tester in place of roll servo, and / or verify correct wiring.
Pitch servo does not engage when autopilot system is engaged	Pitch servo wiring is faulty	Install servo harness tester in place of pitch servo, and / or verify correct wiring.
Roll servo moves in the wrong direction during ground test	Servo wiring incorrect or servo direction not correct in setup.	Verify correct wiring and / or change roll servo direction in autopilot setup.
Pitch servo moves the wrong direction during ground test; trim indicates incorrect direction.	Servo wiring incorrect or servo direction not correct in setup.	Verify correct wiring and / or change pitch servo direction in autopilot setup.
Pitch servo moves the wrong direction during ground test; trim indicates correct direction.	Servo wiring incorrect.	Verify correct wiring
Autopilot controller displays NO GPS	GPS is not configured correctly	Configure RS232 output on GPS.
	Autopilot controller baud rate is set incorrectly	Enter lateral setup menu of autopilot controller, set baud rate to match that of GPS
	GPS wiring is faulty	Check continuity of RS232 transmit wire from GPS to pin 17 of autopilot controller

9. Suggest Autopilot Settings

The following section will give suggested starting points for the settings of the Vizion based on several popular Experimental-Amateur Built aircraft.

Note: Baud, Roll Servo Direction, and Pitch Servo Direction are not listed in this section.

9.1. Van's RV Settings

RV-4
Lat Activity - 2
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 1
Min Airspeed - 60
Max Airspeed - 180
Static Lag - 0
Microactivity - 0

RV-6
Lat Activity - 3
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 2
Min Airspeed - 65
Max Airspeed - 180
Static Lag - 0
Microactivity - 0

RV-7
Lat Activity - 3
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 2
Min Airspeed - 65
Max Airspeed - 180
Static Lag - 0
Microactivity - 0

RV-9
Lat Activity - 3
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 2
Min Airspeed - 60
Max Airspeed - 170
Static Lag - 0
Microactivity - 0

RV-10
Lat Activity - 3
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 9
Min Airspeed - 70
Max Airspeed - 180
Static Lag - 0
Microactivity - 0

9.2. Lanciar Settings

Lancair 235/320/360

Lat Activity - 4
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 2
Min Airspeed - 70
Max Airspeed - 190
Static Lag - 0
Microactivity - 0

Lancair Legacy

Lat Activity - 5
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 4
Min Airspeed - 75
Max Airspeed - 195
Static Lag - 0
Microactivity - 0

Lancair IV-P Piston

Lat Activity - 6
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 5
Min Airspeed - 80
Max Airspeed - 200
Static Lag - 0
Microactivity - 0

Lancair IV-P Turbine

Lat Activity - 15
Bank Angle - MED
Microactivity - 4
GPSS Gain - 16
Vrt Activity - 6
Min Airspeed - 80
Max Airspeed - 200
Static Lag - 0
Microactivity - 0

Lancair ES

Lat Activity - 5
Bank Angle - MED
Microactivity - 0
GPSS Gain - 16
Vrt Activity - 4
Min Airspeed - 80
Max Airspeed - 190
Static Lag - 0
Microactivity - 0

9.3. Glasair Settings

Sportsman 2+2

Lat Activity - 7
Bank Angle - MED
Microactivity - 4
GPSS Gain - 16
Vrt Activity - 7
Min Airspeed - 55
Max Airspeed - 150
Static Lag - 0
Microactivity - 4

10. Dynon Skyview Interface Supplement

10.1. Interface Setup

Interface with the Dynon SkyView is relatively simple. It requires an additional RS-232 serial connection to the autopilot from the Dynon D1000 or D700. Each SkyView screen contains five (5) serial ports. This interface will require an unused serial port to be available on the SkyView display. Which serial port is used doesn't matter. The settings required for the serial port are shown below.

1) Set output device to DYNON ADAHRS + SYSTEM
2) Set In/Out Baud Rate to 9600
3) Input device can be set to OFF as this is unused for this interface
4) Autopilot baud rate MUST be set to 9600 as well. NOTE: This will also affect the primary serial input of the autopilot, which is connected to the GPS. If using a portable GPS, be sure to reset the GPS output baud rate to be 9600 as well.

10.2. Mode Operation

Operation of the autopilot in SkyView mode is also very simple. Pressing the MODE button on the autopilot will put it in the SkyView mode, as long as the signal is present. Once in the SkyView mode, all commands are driven from the SkyView and not the autopilot. SkyView mode operation is outlined below.
BE SURE TO SYNC THE ALTIMETER ON THE AUTOPILOT TO THE SKYVIEW ALTIMETER!!!!!!

1) Press MODE on the autopilot to enter SkyView mode. (Fig 1) Note: The autopilot will enter the SkyView mode from the AP OFF screen (powered but not engaged) or with the Vizion engaged.
2) SkyView CDI SRC determines lateral actions of autopilot.
    a. No selection will have the autopilot follow the heading bug of the SkyView. (Fig 2)
    b. Selecting SKYVIEW or the external device (EXAMPLE: GNS430) will follow the flight plan programmed either internally or on the external device. (Fig 3)
    c. Selecting LOC/VOR/ILS will have the autopilot follow the heading bug.
3) For vertical mode control, an altitude bug AND a vertical speed bug must be set on the SkyView. Be sure to
4) select an appropriate vertical speed for the selected altitude. Once the autopilot gets to the selected altitude the display will display ALT HOLD. (Fig 4) If an altitude bug is not set on the SkyView, the autopilot will follow any changes to the vertical speed bug. Note: The autopilot will follow the vertical speed bug any time the altitude bug is adjusted from the current altitude!
5) Press MODE on the autopilot to exit SkyView mode and synchronize to both current track and vertical speed. (Fig 5)

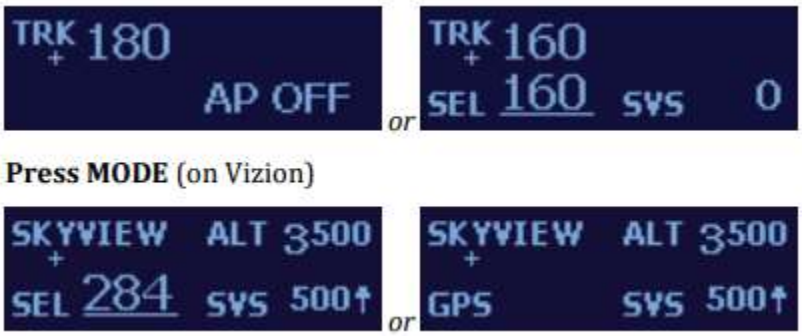


Figure 1

Note: Upon entering the SkyView mode, the Vizion will automatically grab the current heading bug, altitude bug, and vertical speed bug being output by the SkyView. If the SkyView is showing a flight plan on the CDI, the Vizion will enter GPS mode.

Figure 2

Figure 3

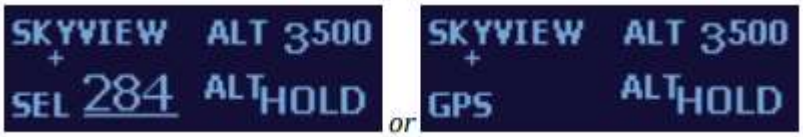


Figure 4

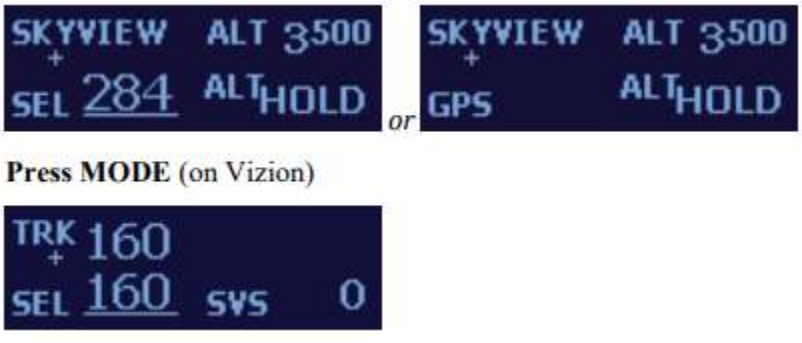
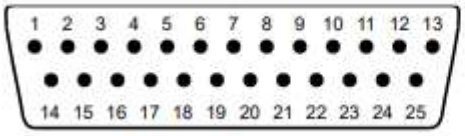


Figure 5

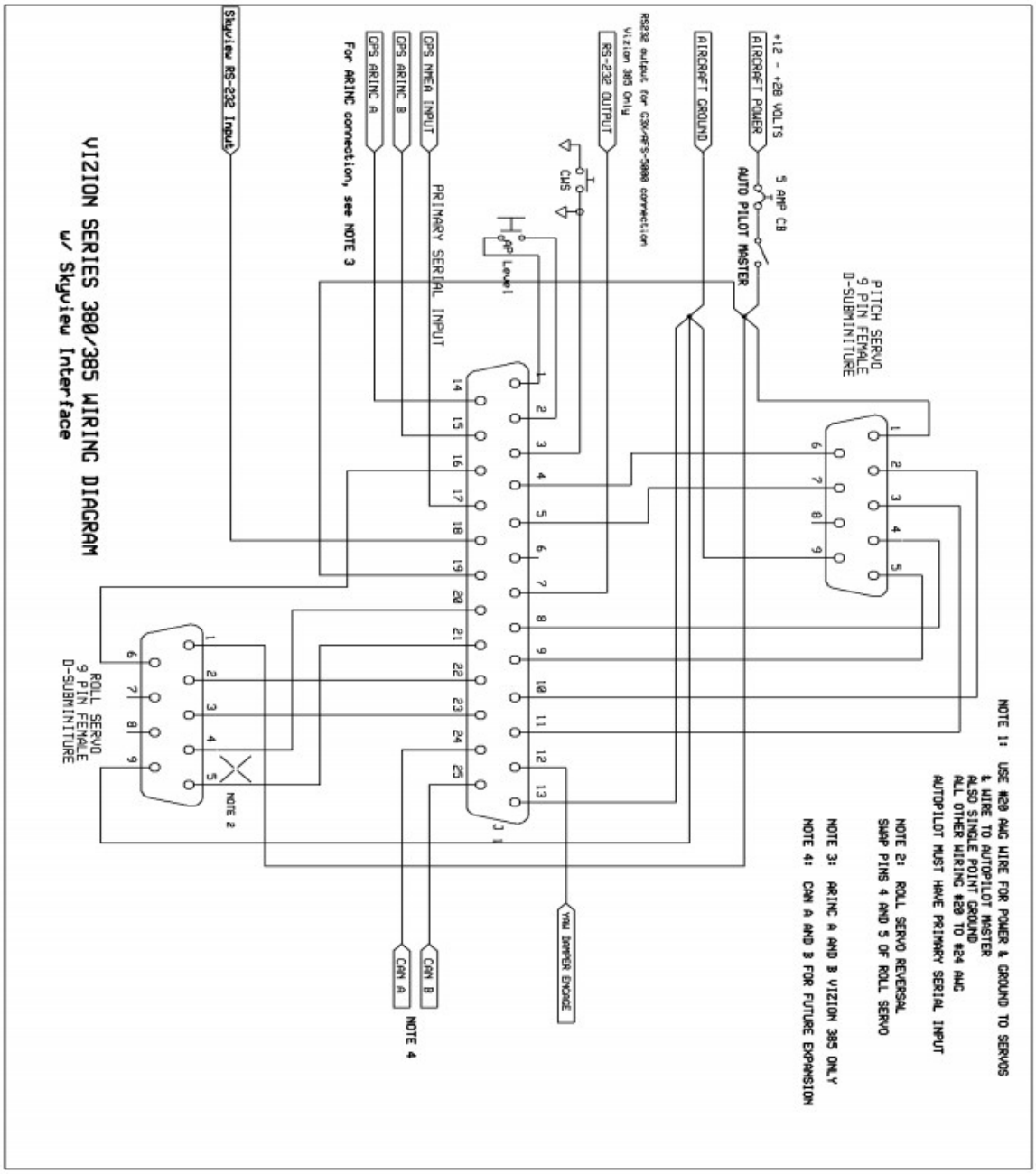
10.3. Electrical Pinout



Rear 25-Pin Connector P101
viewed from rear of unit

P101 Pin	Function	Notes
1	Used for external Emergency AP Level button connection.	
2	Used for external Emergency AP Level button connection.	
3	**Control Wheel Switch**. Connect as shown in wiring diagram to a SPST momentary switch located remotely to the autopilot for convenient engage/disengage function.	
4	**Pitch Servo Torque Control**. A signal from the autopilot to the pitch servo which sets the amount of torque to be delivered by the servo.	
5	**Pitch Servo Trim Sensor**. A signal from the pitch servo to the autopilot which indicates an out-of-trim condition and its direction.	
6	Unused.	
7	**Auxiliary RS-232 Output**. Output to G3X/AFS-5000 series	(G3X) P3701 p 47
8 9 10 11	**Pitch Servo control lines**. These lines cause the stepper motor in the pitch servo to run in the appropriate direction at the desired velocity. They are small-signal lines and do not have any substantial current-carrying capability or require any special shielding. Connect to pitch servo as shown on wiring diagram.	
12	Yaw Damper option.	
13	**Ground Connection**. Provide #20 AWG to common grounding point.	
14 15	**ARINC-A** **ARINC-B** Digital differential signals from Garmin, Sierra, or other panel-mount receiver which provide directional steering commands (GPSS, GPSV) to autopilot	Vizion 385 Only
16	**Roll Servo Torque Control**. A signal from the autopilot to the roll (aileron) servo which sets the amount of torque to be delivered by the servo.	
17	**Primary Serial Input**. Baud rate selectable 1200, 2400, 4800 or 9600 baud. Automatically decodes NMEA-0183, Garmin Aviation Format, or Apollo/UPSAT Moving-Map or GPSS format. Provides directional reference to the autopilot.	
18	**SkyView RS-232 Input**. Input from Dynon SkyView for SkyView mode control.	Dynon SkyView connection only
19	**Autopilot Master** (+12 to +28 V DC). The autopilot itself draws less than 0.5 ampere. Most of the current required by the autopilot system is used by the servos (up to 2A per servo).	
20 21 22 23	**Roll (aileron) Servo control lines.** These lines cause the stepping motor in the roll servo to run in the appropriate direction at the desired velocity. They are small-signal lines and do not have any substantial current-carrying capability or require any special shielding. Connect to roll servo as shown on wiring diagram.	Reverse servo direction if necessary by swapping wires on pins 20 and 21. See note 2 on wiring diagram.
	Wiring to roll servo J201 / Direction of servo arm / capstan rotation (as viewed from face of the servo body) for **RIGHT** aileron	
	J101 / Pin 20 / Pin 21	
	Standard / J201-4 / J201-5 / Servo CCW (counter-clockwise) ➔ RIGHT	
	Reversed / J201-5 / J201-4 / Servo CW (clockwise) ➔ RIGHT	
24	No Connection. Reserved for future expansion.	
25	No Connection. Reserved for future expansion.	

10.4. Wiring Diagram




BendixKing