



FlightMax™ Entegra Primary Flight Display

Field Level Troubleshooting Guide

700-00006-XXX-() PFD

700-00011-XXX-() Magnetometer/OAT

**P/N 600-00103-000
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Revision Table

<i>Date</i>	<i>Revision No.</i>	<i>Description</i>
8/31/03	Draft 00-A	Initial Release
9/13/03	Draft 00-B	Cirrus and Internal Review Comments incorporated
11/20/03	Draft 00-C	KAP 140 addition and Crosscheck Attitude additions
12/03/03	Draft 00-D	Addressed comments from T. D. T. to support Diamond
12/04/03	Draft 00-E	Formatting prior to ECO release
12/04/03	Draft 00-F	Minor corrections

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NOTE

If corrective action calls for the PFD to be removed and replaced, a pitot-static leak check must be performed.

NOTE

The software version of the PFD is displayed on the AHRS Initialization box during alignment for S/W Version 530-00123-000 Rev 04 and beyond. Behavior for Revs 00 through 03 is all considered identical in this document. Revs 00 through 03 can be identified by a lack of S/W Version number being displayed on the AHRS Initialization box.

1. Quick Symptom Reference List

This bulleted list serves as a quick reference list that identifies the applicable section of this troubleshooting guide to find further details. If using an electronic version of this guide, these symptoms are hyperlinked to the applicable sections. Therefore clicking on one will immediately jump to the applicable section.

1.1 Calibration Issues

<i>Issue</i>	<i>Section</i>
Pitch or Roll values remain unchanged from pre-calibration values	2.1.1
Pitch or roll values are different from pre-calibration values but still not correct as determined by level measurement or visual determination	
Fast Erect Page is displayed after attempting/performing an IRU calibration	2.1.2
The IRU Calibration page is removed before the calibration could be completed and replaced with the main PFD page, the Fast Erect page, or a blank display	2.1.3
During post mag cal ground check at cardinals, heading off from truth by more than 4° In flight, heading is noted to be off from truth by more than 6°	2.2.1
One of the intermediate mag cal points (any other than the last one at 330°) returns the message "Failed" in red text after pressing the "Calibrate Heading" line select key	2.2.2
After the final mag cal point is attempted (330°), there is a delay of up to one minute followed by a "Failed" message in red	2.2.3
At the completion of a mag cal or after aborting a mag cal, the Fast Erect page is displayed instead of the normal PFD page	2.2.4
Mag cal page is removed prior to completing cal and replaced with main PFD page, Fast Erect page or blank screen	2.2.5
After attempting an autopilot calibration for Heading mode, the captured offset doesn't get applied to subsequent Heading commands using the Heading Bug (S-TEC models only) Some time after performing a successful autopilot calibration, the heading calibration appears to have been "lost" (S-TEC models only)	2.3.1
After attempting an autopilot calibration, the airplane is still flying a few° off of the Heading Bug in steady state conditions (S-TEC models only)	2.3.2
At the completion of a autopilot calibration or after aborting an autopilot calibration, the Fast Erect page is displayed instead of the normal PFD page	2.3.3
System Setup Page or normal PFD page is displayed prior to completion of autopilot calibration	2.3.4
ADU Temperature Calibration or ADU Altitude Calibration pages are displayed and any labeled line select key other than Back To PFD (L4) is depressed	2.4.1
ADU Temperature Calibration or ADU Altitude Calibration pages are displayed and the Back To PFD is depressed or the PFD power is cycled prior to completing the full calibration protocol	2.4.2

1.2 Alignment Issues

<i>Issue</i>	<i>Section</i>
<p>For Revs 04 and beyond, alignment time takes more than 3 minutes and AHRS Initialization box is held in the "READY FOR FINAL AHRS ALIGNMENT" or "FINAL AHRS ALIGNMENT" phases for more than 5 and 45 seconds respectively (assumption – aircraft experienced no forward motion during the alignment time)</p> <p>For Revs 04 and beyond, alignment time takes more than 3 minutes and AHRS Initialization box is held in the "READY FOR FINAL AHRS ALIGNMENT" or "FINAL AHRS ALIGNMENT" phases for more than 5 and 45 seconds respectively (assumption – aircraft experienced no forward motion during the alignment time)</p>	3.1.1
<p>For Revs 00 – 03, AHRS alignment does not complete in 6 minutes or less (assumption – aircraft experienced no forward motion during the alignment period)</p> <p>For Revs 04 and beyond, at approximately 4 minutes after alignment has began, the AHRS Initialization box displays "AHRS ALIGNMENT INCOMPLETE AHRS CODE XX"</p>	3.1.2
<p>Immediately following the completion of an AHRS alignment during ground ops, the displayed attitude solution is clearly incorrect (e.g. more than 2° error in displayed pitch or roll)</p>	3.1.3
<p>AHRS Initialization Box does not ever get displayed after power is applied to PFD. Display stays covered by Red-Xs</p>	3.1.4
<p>Immediately following the completion of an AHRS alignment during ground ops, the displayed heading solution is clearly incorrect (e.g. more than 4° error in displayed heading)</p>	3.1.5
<p>Heading errors appear to be approximately twice any observed pitch or roll errors</p>	3.1.5

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1.3 In-flight Performance Issues

<i>Issue</i>	<i>Section</i>
<p>Attitude (pitch, roll, skid/slip indications) is erroneous as compared to outside references or backup indicators when in coordinated flight. Acceptable performance criteria when in coordinated flight:</p> <p>Pitch: 2° error or less</p> <p>Roll: 2° error or less (note this may appear very noticeable)</p> <p>Skid/Slip: No visual displacement</p>	4.1.1
<p>Air data (altitude, airspeed, vertical speed) is erroneous as compared to outside ground references (altitude check) or backup indicators when in coordinated flight. Acceptable performance criteria when in coordinated flight:</p> <p>Altitude: ±20' < 1K', ±25' < 5K', ±30' < 8K'</p> <p>Airspeed: ±5 KIAS < 50 KIAS, ±3.5 KIAS < 80 KIAS, ±2 KIAS < 200 KIAS, ±2.5 KIAS < 250 KIAS</p> <p>Vertical Speed: ±45 FPM < 500 FPM, ±50 FPM < 1000 FPM, ±100 FPM < 2000 FPM</p>	4.1.2
<p>Heading off by more than 6° in wings level, steady-state conditions</p>	4.1.3
<p>If, some time after manually increasing the PFD brightness above the wake up brightness, it is noted to be dimmer than last commanded value (typical scenario: Brightness set to full high, subsequently noticed to be seemingly dimmer and then BRT/DIM rocker key adjusted and display gets brighter again.)</p>	4.1.4
<p>Crosscheck Attitude Message Displayed</p>	4.1.5

1.4 In-flight Loss of Function Issues

<i>Issue</i>	<i>Section</i>
Attitude, Airspeed and Heading are all removed from display and replaced by red-Xs	5.1.1
Attitude (ADI-only) is removed from display and replaced by red-Xs	5.1.2
Air Data (Altitude, Airspeed, Vertical Speed or any combination of those three) is removed from display and replaced by red-Xs	5.1.3
Heading Data (Magnetic Heading indication on top of HSI, compass rose markings) is removed from display and replaced by red-Xs	5.1.4
PFD suddenly blanks out in-flight and is non responsive to the BRT/DIM rocker key and line select keys still lit by green LEDs PFD suddenly blanks out in-flight and is non responsive to the BRT/DIM rocker key and line select keys are no longer lit by green LEDs	5.2.1
Bezel BRT/DIM rocker key appears non-functional Labeled bezel knobs appear non-functional Labeled bezel line select keys appear non-functional	5.2.2

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1.5 External Sensor Interface Issues

<i>Issue</i>	<i>Section</i>
Moving map data is not displayed on lower half of PFD (HSI) Datablocks adjacent to Nav (and Bearing, Aux buttons if active) are dashed out Wind Vector is dashed out and winds aloft are greater than 5 knots Ground speed datablock is dashed out and ground speed is greater than 5 knots	6.1.1
HDG mode of the autopilot is non-responsive to PFD Hdg Bug commands (S-TEC Models only) Altitude Capture attempts continue to fly through target altitude (S-TEC Models only) Vertical Speed commands are not followed within 100 FPM of commanded values in non-turbulent air within the aircraft flight dynamics envelope (S-TEC models only)	6.1.2
Hdg Bug on PFD does not turn solid when HDG mode selected on autopilot (S-TEC models only) Alt Bug on PFD does not turn solid when ALT or ALT/VS mode(s) selected on autopilot (S-TEC models only) VS Bug on PFD does not turn solid when VS or ALT/VS mode(s) selected on autopilot (S-TEC models only)	6.1.3
Autopilot Not Responding to PFD Supplied Commands (KAP-140 model only)	6.1.4

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1.6 Miscellaneous

<i>Issue</i>	<i>Section</i>
OAT is not visibly displayed on the PFD and it is expected	7.1.1

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<i>Issue</i>	<i>Section</i>
Vspeed markings on the airspeed tape do not match the aircraft POH The airspeed tape has a wide red band attached to it for its entire scale The AHRS Initialization box displays "N/A" in the top left corner during AHRS alignments The AHRS Initialization box displays an incorrect aircraft type in the top left corner during AHRS alignments	7.1.2
Bezel line select key labels appear to be missing on the main PFD page (VSI Bug, Bearing, Aux, Range/View)	7.1.3
PFD Initial Installation into aircraft	7.2.1
PFD removed from aircraft and same unit re-installed	7.2.2
PFD removed from aircraft and different unit installed	7.2.3
Magnetometer removed from aircraft and different unit installed	7.2.4

2. Calibrations

2.1 IRU Cals

2.1.1 IRU Cal Data Not Accepted

The standard means of conducting an IRU calibration requires the operator to fully align the PFD and note the aircraft pitch and roll. Ideally these values are recorded for subsequent comparison. If the operator elected to perform an IRU calibration and followed the published calibration procedures, then a power cycle has occurred after the IRU Cal reported completion and the operator waited until the post-calibration alignment has completed. It is at this point that the symptoms are noted.

2.1.1.1 Symptom(s)

- Pitch or Roll values remain unchanged from pre-calibration values.
- Pitch or roll values are different from pre-calibration values but still not correct as determined by level measurement or visual determination.

2.1.1.2 Cause

- Incorrect values entered by operator at IRU Cal page.
- PFD power was not cycled after IRU Cal reported complete.
- MPU/IRU not receptive to required message traffic.

2.1.1.3 Workaround (if any)

- None

2.1.1.4 Corrective Action

- Verify MPU and IRU reporting checksums on System Setup page. If not reporting checksums, stop the investigation at field level, record this on the discrepancy sheet and send to Avidyne Service Center/Factory. Otherwise:
- Ensure the proper 10 minute warmup time has been met and then re-perform an IRU calibration being sure to follow published procedures exactly, including the important power cycle after completion.
- If still not successful, ship unit back to Avidyne Service Center/Factory.

2.1.1.5 Other comments

- Future software release will significantly improve all the calibration GUIs.

2.1.2 Fast Erect message at exit from IRU Cal

A number of reported events of Fast Erect Page being displayed after attempting/performing an IRU Calibration have occurred.

2.1.2.1 Symptom(s)

- Fast Erect Page is displayed after attempting/performing an IRU calibration.

2.1.2.2 Cause

- Operator pressed the Back To PFD button on the IRU Cal page after it reported being complete with IRU Cal instead of following published and displayed directions to cycle PFD power following completion.
- This pressing of Back To PFD button issues a Reset Command Message that gets interpreted as a Request for Fast Erect by the IRU/MPU.

2.1.2.3 Workaround (if any)

- Assuming the aircraft is in a true level attitude, press the Fast Erect Button, watch it count down the 10 seconds and note the displayed pitch and roll when PFD is displayed again. If acceptable values, consider the attitude to be nominal and move on.
- If after pressing Fast Erect and the displayed attitude solution is not correct or satisfactory, re-perform an IRU Calibration using the published procedures, to include the PFD power cycle at completion.

2.1.2.4 Corrective Action

- After completing an IRU Calibration, as indicated by the message “Done” being displayed at the bottom of the PFD IRU Calibration page in yellow, wait 10 seconds and then cycle power to the PFD.
- Let the PFD perform a nominal alignment and carry on with IRU calibration verification procedure.

2.1.2.5 Other comments

- Future software will suppress the Back to PFD button from being displayed at inappropriate times during the IRU calibration. It will also look at stopping the Reset Command from being issued if appropriate.

2.1.3 IRU Cal Aborted

The IRU Cal was aborted before completion either due to pressing the Back To PFD button, intentionally cycling PFD power or an uncommanded power loss to the PFD.

2.1.3.1 Symptom(s)

- The IRU Calibration page is removed before the calibration could be completed and replaced with the main PFD page, the Fast Erect page, or a blank display.

2.1.3.2 Cause

- Operator intentionally or unintentionally cycled power or pressed the Back To PFD button before the calibration could be completed.

2.1.3.3 Workaround (if any)

- None

2.1.3.4 Corrective Action

- Reattempt IRU Calibration per published procedures.

2.1.3.5 Other comments

- None

2.2 Mag Cals

2.2.1 Mag Cal Not Accepted or Calibration Exceeds Specifications

The standard means of conducting a Magnetometer calibration requires the operator to fully align the PFD and note the aircraft heading as displayed on the PFD at each point along a 12 point compass swing. Ideally these values are recorded for subsequent comparison. If the operator elected to perform a magnetometer calibration and followed the published calibration procedures, a power cycle has occurred after the Mag Cal reported completion and the operator waited until the post-calibration alignment has completed and aircraft spun to 4 cardinal headings. It is at this point that the symptoms are noted. The other scenario that symptoms are noted is during subsequent ground and flight operations when comparing displayed heading to other heading sources.

2.2.1.1 Symptom(s)

- During post mag cal ground check at cardinals, heading off from truth by more than 4° .
- In flight, heading is noted to be off from truth by more than 6° .

2.2.1.2 Cause

- Mag cal not performed IAW published procedures (missed a point, double press at a point, 10 minute warm-up time not accomplished, etc).
- Calibration points not taken accurate enough (more than +/- 2 deg from truth during cal procedure – e.g. aircraft really at 065 instead of 060 at time of button press).
- Calibration location may not be considered acceptable due to various types of magnetic disturbances in the immediate vicinity.

2.2.1.3 Workaround (if any)

- None

2.2.1.4 Corrective Action

- Ensure location the mag cal is being performed is considered acceptable. A means of determining acceptability of a given site is to sight on a distant location and then translate the reference compass vertically by 3 feet. If the bearing to the distant reference object changes then the sight is considered not acceptable. If site is considered unacceptable by the stated method, change the location of the physical calibration site and continue with the following steps, otherwise, remain at the same location and then continue with the following steps.
- Repeat the published mag cal procedure.
- If still unsatisfactory, connect a telemetry recording device to the box and repeat.
- If still unsatisfactory, connect mag (while still installed in aircraft) to mag sniffer to determine its health.
- If mag determined to be healthy, remove and replace the PFD and repeat.
- If new unit satisfactory, return original unit to Avidyne Service Center/Factory for repair.

2.2.1.5 Other comments

- Considering a modification of the mag cal procedure, TBD if it makes it into future release.

- Determine if an IRU cal was performed prior to mag cal.

2.2.2 Mag Cal Failed intermediate point

2.2.2.1 Symptom(s)

- One of the intermediate mag cal points (any other than the last one at 330°) returns the message “Failed” in red text after pressing the “Calibrate Heading” line select key.

2.2.2.2 Cause

- Internal communication between the PFD and the mag experienced a problem.

2.2.2.3 Workaround (if any)

- See corrective action.

2.2.2.4 Corrective Action

- Ensure the aircraft is not moved and then press the “Redo Previous” line select key.
- If successful, move on to the remaining calibration points per the published procedure and expect a nominal heading calibration.
- If unsuccessful, repeat attempt one more time.
- If still unsuccessful (this is likely given a known software bug) also move on to the remaining calibration points per the published procedure. At the end of the procedure a four cardinal heading accuracy check is made. If that check is successful, consider the procedure to have been completed and expect a nominal system with respect to heading.
- If the four point cardinal heading check was unsuccessful, Remove and replace the PFD

2.2.2.5 Other comments

- Future software release is expected to address and fix this known problem.

2.2.3 Mag Cal Failed last point

2.2.3.1 Symptom(s)

- After the final mag cal point is attempted (330°), there is a delay of up to one minute followed by a “Failed” message in red.

2.2.3.2 Cause

- Internal communication between the PFD and the mag experienced a problem.

2.2.3.3 Workaround (if any)

- None

2.2.3.4 Corrective Action

- Continue with the 4 point cardinal heading post-calibration verification. If PFD displayed heading matches actual aircraft heading at all four cardinal points within 4° , then expect a nominal aircraft heading system and press on.

- If the four cardinal heading check did not pass the 4° test at anyone of the four points, then reattempt mag cal per published procedures.
- If successful, expect a nominal heading calibration.
- If still unsuccessful, Remove and replace the PFD

2.2.3.5 Other comments

- In most cases, the actual calibration data did get transmitted to the magnetometer and it was simply a problem of the PFD not recognizing that condition due to message timeouts. In these cases, aircraft heading is okay.
- Future software release is expected to correct this problem.

2.2.4 Fast Erect at exit from Mag Cal

2.2.4.1 Symptom(s)

- At the completion of a mag cal or after aborting a mag cal, the Fast Erect page is displayed instead of the normal PFD page.

2.2.4.2 Cause

- An internal message is being sent within the PFD to reset the AHRS which is recognized as a request for Fast Erect.

2.2.4.3 Workaround (if any)

- Press the Fast Erect button and wait until the timeout has occurred. At that point a full-up PFD will be presented.

2.2.4.4 Corrective Action

- Cycle the PFD power upon completing a mag cal or aborting from one instead of pressing the Back To PFD line select key.

2.2.4.5 Other comments (ie plans for future release fixes, etc)

- Future software changes intend to prevent the Back To PFD button from being available after a successful mag cal.

2.2.5 Mag Cal Aborted

2.2.5.1 Symptom(s)

- Mag cal page is removed prior to completing cal and replaced with main PFD page, Fast Erect page or blank screen.

2.2.5.2 Cause

- Operator intentionally pressed the Back To PFD button or cycled PFD power before completion of the mag cal.

2.2.5.3 Workaround (if any)

- None

2.2.5.4 Corrective Action

- Reattempt mag cal if still needed IAW published procedures, otherwise continue with intended course of action.

2.2.5.5 Other comments

- None

2.3 Autopilot Calibrations

2.3.1 Autopilot Calibration Data Not Accepted (S-TEC models only)

2.3.1.1 Symptom(s)

- After attempting an autopilot calibration in accordance with installation manual procedures, the heading is not synchronized to the heading bug and the flight director command bars are not aligned with the aircraft reference symbol.
- Some time after performing a successful autopilot calibration, the heading and flight director command bar calibrations appear to have been “lost”.

2.3.1.2 Cause

- For the first symptom, the cause is typically attributed to the PFD not “seeing” the line select key selection.
- For the second symptom, the cause is a corrupted flash location that stores the heading and flight director bias values.
- Heading Error line (Analog Out 2) inop.
- Pitch Str line (Analog Input 0) inop.
- Roll Str line (Analog Input 1) inop.

2.3.1.3 Workaround (if any)

- For both symptoms, reattempt the autopilot calibration using procedures in the installation manual.

2.3.1.4 Corrective Action

- For both symptoms, reattempt the autopilot calibration using procedures in the installation manual.
- If successful, expect a nominal system.
- If not successful, remove the PFD and connect it to a system capable of running the applicable ATP Port Test Procedure and perform the checkout. This test will quickly indicate if the Heading Error line and Pitch/Roll Str lines are inoperative. If it is, return PFD to the Avidyne Service Center/Factory. If analog inputs and output checks are good, consider returning PFD to Avidyne Service Center/Factory regardless.
- Other Comments
- None

2.3.2 Autopilot Calibration Does Not Meet Specifications (S-TEC models only)

2.3.2.1 Symptom(s)

- After attempting an autopilot calibration in accordance with installation manual procedures, the airplane is still flying a few° off of the Heading Bug in steady state conditions when the autopilot is in HDG mode.
- After attempting an autopilot calibration in accordance with installation manual procedures, the flight director command bars are not aligned with the aircraft reference symbol when the autopilot is in HDG and ALT modes with AP Master switch in the AP/FD position.

2.3.2.2 Cause

- For both symptoms, incorrect bias(es) captured due to conditions at calibration attempt (e.g. not in smooth air at calibration time, nose still hunting/heading oscillating slightly at calibration time, calibration attempted prior to aircraft reaching steady state heading condition).

2.3.2.3 Workaround (if any)

- At pilot discretion, accept the bias values that were stored and manually adjust via heading bug each time a target heading is commanded.
- Don't manually fly the flight director commands. Always fly with autopilot engaged.

2.3.2.4 Corrective Action

- Ensure autopilot calibration is being attempted in smooth air, let the aircraft heading and altitude to stabilize while autopilot HDG and ALT modes are engaged and reattempt the autopilot calibration, concentrating on precision during the published procedure steps.
- Other Comments
- None

2.3.3 Fast Erect At Exit From Autopilot Calibration Page

2.3.3.1 Symptom(s)

- At the completion of an autopilot calibration or after aborting an autopilot calibration, the Fast Erect page is displayed instead of the normal PFD page.

2.3.3.2 Cause

- An internal message is being sent within the PFD to reset the AHRS which is recognized as a request for Fast Erect.

2.3.3.3 Workaround (if any)

- Ensure aircraft is in wings level, stabilized conditions and then press the Fast Erect button and wait until the timeout has occurred. At that point a full-up PFD will be presented.

2.3.3.4 Corrective Action

- Ensure the changes made on the autopilot calibration page have taken effect, and if so, expect nominal operations. If not, reenter the autopilot calibration page and accomplish the changes per published procedures.

2.3.3.5 Other comments

- None

2.3.4 Aborted Autopilot Calibration (S-TEC models only)

2.3.4.1 Symptom(s)

- System Setup Page or normal PFD page is displayed prior to completion of autopilot calibration.

2.3.4.2 Cause

- Back To PFD (L4) or Back To Setup (L3) line select keys were depressed prior to pressing the Sync HDG line select key.

2.3.4.3 Workaround (if any)

- None

2.3.4.4 Corrective Action

- If autopilot calibration is still desired/required, reattempt the autopilot calibration per published procedures.

2.3.4.5 Other Comments

- None

2.4 Air Data Unit (ADU) Calibrations

The air data unit is not intended to be calibrated using the interface provided on the PFD. Using this interface without the proper calibration equipment (e.g. ability to send pressure points ranging from -3000' to 50,000' and at two different temperatures, 25° and 50° C) will have the undesirable effect of invalidating the existing ADU cal if run through to completion. Bottom line, do not perform an ADU calibration using the available user interface on the PFD. The following data is provided in the event the "Do not perform" guidance is not heeded and an ADU calibration is attempted.

2.4.1 ADU Calibration Attempted

2.4.1.1 Symptom(s)

- ADU Temperature Calibration or ADU Altitude Calibration pages are displayed and any labeled line select key other than Back To PFD (L4) is depressed.

2.4.1.2 Cause

- Operator mistakenly entered the ADU Calibration pages.

2.4.1.3 Workaround (if any)

- None

2.4.1.4 Corrective Action

- If the Back To PFD line select key is still displayed, press it to discontinue the ADU Calibration.
- If the Back To PFD line select key is not displayed, DO NOT cycle PFD power but instead, continue with the ADU cal to the best of the operators ability and upon completion, red tag the PFD unit for being out of air data calibration and contact a service center for further guidance if the calibration was not able to be performed exactly as stated on the display. If no further guidance is available, contact Avidyne Customer Service at 1-877-723-7592 or at www.avidyne.com.

2.4.1.5 Other Comments

- ADU calibration interfaces are intended to be fully revamped under a future software release.

2.4.2 ADU Calibration Aborted Prior to Completion

2.4.2.1 Symptom(s)

- ADU Temperature Calibration or ADU Altitude Calibration pages are displayed and the Back To PFD is depressed or the PFD power is cycled prior to completing the full calibration protocol.

2.4.2.2 Cause

- Operator intentionally or unintentionally exited the ADU Calibration pages prior to calibration completion.

2.4.2.3 Workaround (if any)

- None

2.4.2.4 Corrective Action

- Recommend contacting the Avidyne Customer Service at 1-877-723-7592 or at www.avidyne.com.

2.4.2.5 Other Comments

- ADU calibration is not overwritten until the last step is completed in the Altitude Calibration page. Aborting the calibration at any time up until that stage will result in no corruption to the ADU calibration and an automatic reversion back to the pre-existing cal data.
- ADU calibration interfaces are intended to be fully revamped under a future software release.

3. Alignments

3.1 AHRS Alignments

NOTE

The software version of the PFD is displayed on the AHRS Initialization box during alignment for S/W Version 530-00123-000 Rev 04 and beyond. Behavior for Revs 00 through 03 is all considered identical in this document.

3.1.1 AHRS Alignment Takes Excessive Amount of Time

3.1.1.1 Symptom(s)

- For Revs 00 – 03, alignment time takes more than 3 minutes but does eventually complete (assumption – aircraft experienced no forward motion or no excessive rotational/rocking motion in the yaw or roll axis during the alignment period).
- For Revs 04 and beyond, alignment time takes more than 3 minutes and AHRS Initialization box is held in the “READY FOR FINAL AHRS ALIGNMENT” or “FINAL AHRS ALIGNMENT” phases for more than 5 and 45 seconds respectively (assumption – aircraft experienced no forward motion or no excessive rotational/rocking motion in the yaw or roll axis during the alignment time).

3.1.1.2 Cause

- Communication with the magnetometer in the wing is intermittent.
- A significant magnetic disturbance is experienced by wing mounted magnetometer (e.g. right wing parked over ferrous material).
- Aircraft is subjected to moderate yawing action (due to excessive crosswind conditions) during AHRS alignment.
- Aircraft is subjected to substantial rolling or pitching action during AHRS alignment.
- Aircraft is subjected to forward motion during AHRS alignment.

3.1.1.3 Workaround (if any)

- Cycle power to the PFD to reattempt alignment (note, if excessive alignment time was due to environmental conditions, then this action is likely to have little impact).

3.1.1.4 Corrective Action

- Ensure right wing is clear of any iron-containing material during AHRS alignment.
- Reposition orientation of aircraft as required, if subjected to substantial rolling or pitching action due to environmental conditions.
- Reposition aircraft as required, to reduce/eliminate any yawing action during AHRS alignment.
- Ensure aircraft is not subjected to forward motion during alignment.

3.1.1.5 Other Comments

- None

3.1.2 AHRS Alignment Never Completed

3.1.2.1 Symptom(s)

- For Revs 00 – 03, AHRS alignment does not complete in 6 minutes or less (assumption – aircraft experienced no forward motion during the alignment period).
- For Revs 04 and beyond, at approximately 4 minutes after alignment has began, the AHRS Initialization box displays “AHRS ALIGNMENT INCOMPLETE AHRS CODE XX” .

3.1.2.2 Cause

- Communication with the magnetometer in the wing is failed.
- Communication within the AHRS is failed (comm. with IRU)
- A significant magnetic disturbance is experienced by wing mounted magnetometer (e.g. right wing parked over ferrous material).
- Aircraft is subjected to continuous moderate yawing action (due to excessive crosswind conditions) during AHRS alignment.
- Aircraft is subjected to continuous substantial rolling or pitching action during AHRS alignment.
- Aircraft is subjected to extended forward motion during AHRS alignment.

3.1.2.3 Workaround (if any)

- None

3.1.2.4 Corrective Action

- Verify all checksums report a value and not “FAILED” on the PFD System Setup page.
- Ensure right wing is clear of any iron-containing material during AHRS alignment.
- Reposition orientation of aircraft as required, if subjected to substantial rolling or pitching action due to environmental conditions.
- Reposition aircraft as required, to reduce/eliminate any yawing action during AHRS alignment.
- Ensure aircraft is not subjected to forward motion during alignment.
- For Rev 04 and beyond, upon display of the “AHRS ALIGNMENT INCOMPLETE” message, ensure the aircraft is stationary for approximately 2 more minutes. If the display does not clear itself, note the AHRS CODE that is displayed and compare against the table below:

<i>AHRS Code</i>	<i>Explanation</i>	<i>Recommended Action</i>
2	Heading is not valid – Most likely cause is non-communication with magnetometer. Next most likely cause is a disturbance of the magnetic field in the immediate vicinity of the airplane.	Wait 5 minutes in the existing location/state. If the code clears itself, expect a nominal system. If the code does not clear itself, check connectivity/continuity with magnetometer using mag sniffer tool. If no communication with magnetometer, remove and replace mag unit. If good communication with magnetometer, reposition aircraft to another location and reattempt alignment. If still no success, remove and replace the PFD

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<i>AHRS Code</i>	<i>Explanation</i>	<i>Recommended Action</i>
4	Attitude is not valid – Most likely cause is an internal AHRS failure.	Remove and replace the PFD
8	Heading rate is not valid – Most likely cause in an internal AHRS failure.	Remove and replace the PFD
10	Lateral Acceleration is not valid – Most likely cause in an internal AHRS failure.	Remove and replace the PFD
20	Synthetic Rate Miscompare – Most likely cause is a miscompare between measured AHRS outputs and predicted AHRS outputs as computed by the PFD.	Wait an additional 5 minutes while stationary in the same location. If the code clears itself, expect a nominal system. If the code does not clear itself within those 5 minutes, remove and replace the PFD
40	Excessive Gyro Drifting Detected – Most likely cause is an internal failure of AHRS components	Remove and replace the PFD
69	Software Exception – Most likely cause is a failed self test of the main PFD software.	Power cycle the PFD. If a successful alignment is achieved, expect nominal behavior from the PFD. If subsequent alignment is still unsuccessful, remove and replace the PFD
80	Cessation of AHRS Self Checking – Most likely cause is an extended series (2 or more minutes) of highly dynamic maneuvering such as aggressive wing rocking.	Cease any highly dynamic maneuvering if in-flight and maintain stabilized flight conditions for several minutes. If on the ground during AHRS Initialization, terminate alignment and remove and replace the PFD
F2	Timeout in the OK to Taxi Phase – This is due to a timeout of a timer that gets internally set during the OK to Taxi Phase of the AHRS alignment. The most likely cause is an extended taxi duration (more than 3 minutes) during that phase.	Bring aircraft to a stop as soon as it is practical and the alignment should resume within 1 to 4 minutes. If the alignment does not resume within that time period, cycle PFD power when reaching a position where it is practical to remain stationary for the nominal 3 minute alignment time.
F4	Timeout in the Final AHRS Alignment Phase – This is due to a timeout of a timer that gets internally set during the Ready For Final AHRS Alignment or the Final AHRS Alignment phase of the AHRS alignment. The most likely cause is motion during the final alignment phase.	Bring aircraft to a stop as soon as it is practical and the alignment should resume within 1 to 4 minutes. If the alignment does not resume within that time period, cycle PFD power when reaching a position where it is practical to remain stationary for the nominal 3 minute alignment time.

Table 1 AHRS Alignment Incomplete Codes

3.1.2.5 Other Comments

- None

3.1.3 Inaccurate Attitude Depiction Following AHRS Alignment

3.1.3.1 Symptom(s)

- Immediately following the completion of an AHRS alignment during ground ops, the displayed attitude solution is clearly incorrect (e.g. more than 2° error in displayed pitch or roll).

3.1.3.2 Cause

- IRU or Mag calibrations not performed at the airplane level (i.e. Tail Cals not performed).
- Improper IRU or Mag Calibration.
- Failure of an internal component of the AHRS that was not detected by self test.

3.1.3.3 Workaround (if any)

- None

3.1.3.4 Corrective Action

- Ensure proper calibrations were performed IAW published procedures.
- Perform as-published IRU calibration
- Ensure post-cal IRU performance on flat surface looks nominal (pitch and roll within 1° of level attitude)
- Perform as-published magnetometer calibration
- Ensure post-cal Mag and IRU performance on flat surface looks nominal (pitch and roll within 1° of level attitude and heading within 4° of actual heading)
- If performance of PFD after alignment is still unacceptable, Remove and replace the PFD

3.1.3.5 Other Comments

- Future release of software will be able to provide a history log file of all calibration work performed. This will help to distinguish if a bad cal was the cause.

3.1.4 AHRS Initialization Box Never Displayed

3.1.4.1 Symptom(s)

- AHRS Initialization Box does not ever get displayed after power is applied to PFD. Display stays covered by Red-Xs.

3.1.4.2 Cause

- An internal communication failure within the PFD.
- Failure or non communication with the on-board magnetometer.

3.1.4.3 Workaround (if any)

- None

3.1.4.4 Corrective Action

- If this is a one-time event, power cycle the PFD and reattempt a proper AHRS alignment. If successful, expect a nominal PFD. If unsuccessful, Remove and replace the PFD
- If this happens on a more frequent basis, remove and replace the PFD and if contacting Avidyne Customer Service (1-888-723-7592, www.avidyne.com), provide the Mod number as marked on the TSO sticker, the unit serial number and the software version number, if known.

3.1.4.5 Other Comments

- None

3.1.5 Inaccurate Heading Depiction Following AHRS Alignment

3.1.5.1 Symptom(s)

- Immediately following the completion of an AHRS alignment during ground ops, the displayed heading solution is clearly incorrect (e.g. more than 4° error in displayed heading).
- Heading errors appear to be approximately twice any observed pitch or roll errors.

3.1.5.2 Cause

- IRU or Mag calibrations not performed at the airplane level (i.e. Tail Cals not performed). Note that a mag cal is required after any IRU cal.
- Improper IRU or Mag Calibration.
- Magnetic anomalies in the immediate vicinity of the magnetometer (right wing).
- Failure of an internal component of the AHRS that was not detected by self test.

3.1.5.3 Workaround (if any)

- None

3.1.5.4 Corrective Action

- Ensure proper calibrations were performed IAW published procedures.
- Perform as-published IRU calibration
- Ensure post-cal IRU performance on flat surface looks nominal (pitch and roll within 1° of level attitude)
- Perform as-published magnetometer calibration
- Ensure post-cal Mag and IRU performance on flat surface looks nominal (pitch and roll within 1° of level attitude and heading within 4° of actual heading)
- If performance of PFD after alignment is still unacceptable, ensure there are no magnetic anomalies in the immediate vicinity by either moving the airplane to a known good location or perform the location suitability test as described in section 2.2.1.4.
- If performance of PFD after alignment is still unacceptable, Remove and replace the PFD

3.1.5.5 Other Comments

- Future release of software will be able to provide a history log file of all calibration work performed. This will help to distinguish if a bad cal was the cause.

4. In-flight Performance Problems

4.1 ADAHRS Performance Problems

4.1.1 Attitude Drifting In-flight

4.1.1.1 Symptom(s)

- Attitude (pitch, roll, skid/slip indications) is erroneous as compared to outside references or backup indicators when in coordinated flight. Acceptable performance criteria when in coordinated flight:
 - Pitch: 2° error or less;
 - Roll: 2° error or less (note this may appear very noticeable);
 - Skid/Slip: No visual displacement

4.1.1.2 Cause

- An internal failure of components within the AHRS.
- Inaccurate IRU or Magnetometer calibrations.

4.1.1.3 Workaround (if any)

- None

4.1.1.4 Corrective Action

- Remove and replace the PFD

4.1.1.5 Other Comments

- None

4.1.2 Air Data Drifting In-flight

4.1.2.1 Symptom(s)

- Air data (altitude, airspeed, vertical speed) is erroneous as compared to outside ground references (altitude check) or backup indicators when in coordinated flight. Acceptable performance criteria when in coordinated flight:
 - Altitude: $\pm 20' < 1K'$, $\pm 25' < 5K'$, $\pm 30' < 8K'$
 - Airspeed: $\pm 5 \text{ KIAS} < 50 \text{ KIAS}$, $\pm 3.5 \text{ KIAS} < 80 \text{ KIAS}$, $\pm 2 \text{ KIAS} < 200 \text{ KIAS}$, $\pm 2.5 \text{ KIAS} < 250 \text{ KIAS}$
 - Vertical Speed: $\pm 45 \text{ FPM} < 500 \text{ FPM}$, $\pm 50 \text{ FPM} < 1000 \text{ FPM}$, $\pm 100 \text{ FPM} < 2000 \text{ FPM}$

4.1.2.2 Cause

- An internal failure of components within the ADAHRS.
- Inaccurate ADU calibrations.

4.1.2.3 Workaround (if any)

- None

4.1.2.4 Corrective Action

- Remove and replace the PFD

4.1.2.5 Other Comments

- None

4.1.3 Magnetic Heading Indications Inaccurate

4.1.3.1 Symptom(s)

- Heading off by more than 6° in wings level, steady-state conditions.

4.1.3.2 Cause

- An internal failure of components within the magnetometer.
- Inaccurate magnetometer calibrations.
- Flight in geographic areas of significant magnetic disturbances (typically indicated on sectional charts or their equivalents).

4.1.3.3 Workaround (if any)

- None

4.1.3.4 Corrective Action

- Ensure an accurate magnetometer calibration was performed on the aircraft. If it hasn't, perform mag cal per published procedures.
- If an accurate mag cal was verified to have been performed, connect the mag sniffer and observe results.
- If mag sniffer results look nominal, connect PFD unit to the Magnetometer Calibration Diagnostic Tool and determine the input calibration to determine if bad calibration was the cause.
- If the magnetometer is still suspect after these actions, remove and replace the magnetometer from the wing.

4.1.3.5 Other Comments

- None

4.1.4 PFD Display Dimming In-flight

4.1.4.1 Symptom(s)

- If, some time after manually increasing the PFD brightness above the wake up brightness, it is noted to be dimmer than last commanded value (typical scenario: Brightness set to full high, subsequently noticed to be seemingly dimmer and then BRT/DIM rocker key adjusted and display gets brighter again.).

4.1.4.2 Cause

- An internal failure of the brightness circuitry within the PFD. Note, if this is the case, the dimmest level the PFD would automatically step to is the 75% power-on brightness level.

- One of the two tubes used for internal lighting has burned out (Note: if this is the case, the PFD will not get brighter when manually adjusted via the BRT/DIM rocker key).

4.1.4.3 Workaround (if any)

- Manually adjust the brightness to desired levels when the dimmer setting is noticed.

4.1.4.4 Corrective Action

- If this is a one time event, manually readjust the PFD display brightness to desired level.
- If this occurs on a more frequent basis, contact Avidyne Customer Service (1-888-723-7592, www.avidyne.com) and expect to remove and replace the unit.

4.1.4.5 Other Comments

- None

4.1.5 Crosscheck Attitude Message Displayed

4.1.5.1 Symptom(s)

- A yellow boxed “Crosscheck Attitude” message is displayed on the PFD. Note that it will always display a number in the bottom right corner of the boxed message.

4.1.5.2 Cause

- If a “1” is displayed as the numeric code, internal monitoring of the AHRS performance has detected that the bias values internal to the AHRS have drifted past a threshold value over time as compared to the factory calibration. This doesn’t necessarily result in a degraded or inaccurate AHRS however.
- If a “2” is displayed as the numeric code, internal monitoring of the AHRS performance has detected a period of excessive highly dynamic maneuvering and has temporarily loosened up its self checking tolerances.
- If a “3” is displayed as the numeric code, internal monitoring of the AHRS performance has detected what it believes to be a roll-over condition of the displayed attitude.

4.1.5.3 Workaround (if any)

- None

4.1.5.4 Corrective Action

- If in flight, scan all backup instruments and auxiliary instruments (backup attitude indicator, backup airspeed indicator, backup altimeter as a minimum) to crosscheck aircraft attitude.
- If engaged in highly dynamic maneuvering such as continuous full stick deflection wing rocks, cease such maneuvering, establish stable flight and wait a maximum of 2 minutes for the fault to clear itself.
- If a “Crosscheck Attitude 1” is displayed, contact Avidyne Customer Service (1-888-723-7592, www.avidyne.com) and expect to remove and replace the unit.

4.1.5.5 Other Comments

- The Crosscheck Attitude message is automatically removed when the self-check monitor confirms the PFD attitude is valid.
- The Crosscheck Attitude message will not be displayed if air data is invalid

5. In-flight Loss of Function

5.1 In-flight Loss of ADAHRS Function

5.1.1 In-flight Loss of ADI (Attitude, Air Data, Heading)

5.1.1.1 Symptom(s)

- Attitude, Airspeed and Heading are all removed from display and replaced by red-Xs.

5.1.1.2 Cause

- An internal failure of the ADAHRS.

5.1.1.3 Workaround (if any)

- None - refer to backup instruments.

5.1.1.4 Corrective Action

- If in-flight, refer to backups for remainder of flight and do not attempt to regain ADAHRS data by power cycling the PFD.
- If power was cycled for whatever reason to the PFD, air data may come back. Due to the unlikelihood of this occurring however, it is still recommended that the PFD not be power cycled in-flight.
- Remove and replace the PFD and if contacting Avidyne Customer Service (1-888-723-7592, www.avidyne.com), provide the modification number as marked on the TSO sticker, the unit serial number and the software version number, if known.

5.1.1.5 Other Comments

- If this event only occurs once in flight and cannot be duplicated on the ground, consider a subsequent flight test in VMC conditions to attempt to replicate.

5.1.2 Loss of Attitude In-flight

5.1.2.1 Symptom(s)

- Attitude (ADI-only) is removed from display and replaced by red-Xs.

5.1.2.2 Cause

- An internal failure of the ADAHRS.

5.1.2.3 Workaround (if any)

- None - refer to backup instruments.

5.1.2.4 Corrective Action

- If in-flight, refer to backups for remainder of flight and do not attempt to regain ADAHRS data by power cycling the PFD.
- Remove and replace the PFD and if contacting Avidyne Customer Service (contact info here), provide the modification number as marked on the TSO sticker, the unit serial number and the software version number, if known.

5.1.2.5 Other Comments

- None

5.1.3 Loss of Air Data In-flight

5.1.3.1 Symptom(s)

- Air Data (Altitude, Airspeed, Vertical Speed or any combination of those three) is removed from display and replaced by red-Xs.

5.1.3.2 Cause

- An internal failure of the ADAHRS.
- A failure of the aircraft level pitot-static system.

5.1.3.3 Workaround (if any)

- None – refer to backup instruments.

5.1.3.4 Corrective Action

- If in-flight, refer to backups for remainder of flight and do not attempt to regain ADAHRS data by power cycling the PFD.
- Run an aircraft-level pitot static test and consider purging the pitot-static lines.
- If still failed, remove and replace the PFD and if contacting Avidyne Customer Service (1-888-723-7592, www.avidyne.com), provide the modification number as marked on the TSO sticker, the unit serial number and the software version number, if known.

5.1.3.5 Other Comments

- None

5.1.4 Loss of Heading Data In-flight

- Symptom(s)
- Heading Data (Magnetic Heading indication on top of HSI, compass rose markings) is removed from display and replaced by red-Xs.

5.1.4.1 Cause

- An internal failure of the ADAHRS.
- A failure of the wing-mounted magnetometer or its communication path to the PFD.
- A cessation of AHRS self checking typically due to excessive highly dynamic maneuvering.

5.1.4.2 Workaround (if any)

- None – refer to backup instruments.

5.1.4.3 Corrective Action

- If in-flight, refer to backups for remainder of flight and do not attempt to regain ADAHRS data by power cycling the PFD.

- Maintain stabilized flight conditions for several minutes. If the condition clears itself and presents a displayed heading again, expect a nominal heading system.
- If the condition did not clear itself in flight, once accessible on the ground, connect the mag sniffer to the wing-mounted magnetometer to attempt to determine its health.
- If magnetometer fails the sniffer test, remove and replace the magnetometer.

5.1.4.4 Other Comments

- None

5.2 Box Level Loss of Function In-Flight

5.2.1 Display Goes Blank In-flight

5.2.1.1 Symptom(s)

- PFD suddenly blanks out in-flight and is non responsive to the BRT/DIM rocker key but line select keys still lit by green LEDs.
- PFD suddenly blanks out in-flight and is non responsive to the BRT/DIM rocker key and line select keys are no longer lit by green LEDs.

5.2.1.2 Cause

- For the first symptom, an internal failure of the display or its back lighting.
- For the second symptom, a power failure to the PFD unit.

5.2.1.3 Workaround (if any)

- None

5.2.1.4 Corrective Action

- Ensure PFD brightness controls are not set to dimmest positions.
- Attempt to change the position of the aircraft dimming rheostat(s) to ensure they are not set to a excessively dimmed value.
- Once on the ground, cycle PFD power and note unit behavior.
- If still unacceptable, Remove and replace the PFD

5.2.1.5 Other Comments

- A future software release will record brightness and power settings to be used in diagnosis of the problem.

5.2.2 Bezel Knobs or Buttons Inoperative

5.2.2.1 Symptom(s)

- Bezel BRT/DIM rocker key appears non-functional.
- Labeled bezel knobs appear non-functional.
- Labeled bezel line select keys appear non-functional.

5.2.2.2 Cause

- An internal failure of the keystroke recognition circuitry.

5.2.2.3 Workaround (if any)

- None

5.2.2.4 Corrective Action

- Ensure activated line select key or knob is labeled as to its functionality (non-labeled buttons or knobs have no function)
- Ensure PFD brightness controls are not set to dimmest positions.
- Attempt to change the position of the aircraft dimming rheostat(s) to ensure they are not set to a excessively dimmed value.
- Once on the ground, cycle PFD power and note unit behavior.
- If still unacceptable, Remove and replace the PFD

5.2.2.5 Other Comments

- A future software release will record brightness and power settings to be used in diagnosis of the problem.

6. Interface with External Sensors

6.1 External Navigator Interfaces

6.1.1 Loss of Communication with the Navigator(s) (Garmins)

6.1.1.1 Symptom(s)

- Moving map data is not displayed on lower half of PFD (HSI).
- Datablocks adjacent to Nav (and Bearing, Aux buttons if active) are dashed out.
- Wind Vector is dashed out and winds aloft are greater than 5 knots.
- Ground speed datablock is dashed out and ground speed is greater than 5 knots.

6.1.1.2 Cause

- Navigators are not powered up or transmitting data.
- PFD was not configured to communicate with installed navigator(s) at install time.
- Aircraft type selected on PFD System Setup page does not support display of navigator-supplied moving map data.
- Wiring connection to navigator(s) not installed or failed.
- Failure of the input/output circuitry of the PFD.

6.1.1.3 Workaround (if any)

- Switch active navigator unit(s).

6.1.1.4 Corrective Action

- Ensure navigator(s) on and properly configured. See PFD Installation Manual for proper navigator configurations.
- Ensure PFD System Setup page is properly configured. See PFD Installation Manual for proper navigator configurations.
- Ensure external cabling is securely fastened to proper port on the rear of the PFD.
- If all of the above checks out valid, Remove and replace the PFD

6.1.1.5 Other Comments

- None

6.1.2 Autopilot Not Responding to PFD Commands (S-TEC models only)

6.1.2.1 Symptom(s)

- HDG mode of the autopilot is non-responsive to PFD Hdg Bug commands.
- Altitude Capture attempts continue to fly through target altitude.
- Vertical Speed commands are not followed within 100 FPM of commanded values in non-turbulent air within the aircraft flight dynamics envelope.

6.1.2.2 Cause

- For the first symptom, the PFD has experienced a corruption of the flash array that stores the heading offset bias values or, the communication between the PFD and Autopilot may have been compromised.
- For the second and third symptoms, the communication between the PFD and Autopilot may have been compromised.
- Autopilot type selected on PFD System Setup page does not match the installed autopilot.
- Wiring connection to autopilot not installed or failed.
- Failure of the input/output circuitry of the PFD.

6.1.2.3 Workaround (if any)

- Reattempt autopilot commands.

6.1.2.4 Corrective Action

- Ensure PFD System Setup page is properly configured. See PFD Installation Manual for proper autopilot configurations.
- Ensure external cabling is securely fastened to proper port on the rear of the PFD.
- If all of the above checks out valid, remove and replace the autopilot.
- If the previous step did not resolve the problem, Remove and replace the PFD

6.1.2.5 Other Comments

- None

6.1.3 Improper Behavior of PFD Bug Indicators (S-TEC models only)

6.1.3.1 Symptom(s)

- Hdg Bug on PFD does not turn solid when HDG mode selected on autopilot.
- Alt Bug on PFD does not turn solid when ALT or ALT/VS mode(s) selected on autopilot.
- VS Bug on PFD does not turn solid when VS or ALT/VS mode(s) selected on autopilot.

6.1.3.2 Cause

- PFD is unable to read the Annunciator line being output from the autopilot.
- Autopilot type selected on PFD System Setup page does not match the installed autopilot.
- Wiring connection to autopilot not installed or failed.
- Failure of the input/output circuitry of the PFD.

6.1.3.3 Workaround (if any)

- Reattempt autopilot commands.

6.1.3.4 Corrective Action

- Ensure PFD System Setup page is properly configured. See PFD Installation Manual for proper autopilot configurations.

- Ensure external cabling is securely fastened to proper port on the rear of the PFD.
- If all of the above checks out valid, remove and replace the autopilot.
- If the previous step did not resolve the problem, Remove and replace the PFD

6.1.3.5 Other Comments

- None

6.1.4 Autopilot Not Responding to PFD Commands (KAP-140 model only)

6.1.4.1 Symptom(s)

- HDG mode of the autopilot is non-responsive to PFD Hdg Bug commands.

6.1.4.2 Cause

- The communication between the PFD and Autopilot may have been compromised.
- Autopilot type selected on PFD System Setup page does not match the installed autopilot.
- Wiring connection to autopilot not installed or failed.
- Failure of the input/output circuitry of the PFD.

6.1.4.3 Workaround (if any)

- Reattempt autopilot commands.

6.1.4.4 Corrective Action

- Ensure PFD System Setup page is properly configured. See PFD Installation Manual for proper autopilot configurations.
- Ensure external cabling is securely fastened to proper port on the rear of the PFD.
- If all of the above checks out valid, remove and replace the autopilot.
- If the previous step did not resolve the problem, Remove and replace the PFD

6.1.4.5 Other Comments

- None

7. Miscellaneous

7.1 Apparent Missing or Incorrect Data

7.1.1 Display of OAT is Missing

7.1.1.1 Symptom(s)

- OAT is not visibly displayed on the PFD and it is expected.

7.1.1.2 Cause

- Improper selection made on PFD System Setup page.

7.1.1.3 Workaround (if any)

- Refer to OAT on the MFD Engine Page.

7.1.1.4 Corrective Action

- Ensure PFD System Setup page is properly configured. See PFD Installation Manual for proper autopilot configurations.

7.1.1.5 Other Comments

- None

7.1.2 Airspeed Tape Vspeed Markings Incorrect

7.1.2.1 Symptom(s)

- Vspeed markings on the airspeed tape do not match the aircraft POH.
- The airspeed tape has a wide red band attached to it for its entire scale.
- The AHRS Initialization box displays "N/A" in the top left corner during AHRS alignments.
- The AHRS Initialization box displays an incorrect aircraft type in the top left corner during AHRS alignments.

7.1.2.2 Cause

- Improper selection made on PFD System Setup page.

7.1.2.3 Workaround (if any)

- None

7.1.2.4 Corrective Action

- Ensure PFD System Setup page is properly configured. See PFD Installation Manual for proper aircraft type configurations.

7.1.2.5 Other Comments

- None

7.1.3 Bezel Line Select Key Labels Appear to be Missing

7.1.3.1 Symptom(s)

- Bezel line select key labels appear to be missing on the main PFD page (VSI Bug, Bearing, Aux, Range/View).

7.1.3.2 Cause

- Improper selection(s) made on PFD System Setup page.
 - Aircraft type selected or associated avionics does not match the installed or actual configuration.
- Proper selections made on PFD System Setup page but the selected aircraft/ avionics configuration intentionally does not support the missing functionality.

7.1.3.3 Workaround (if any)

- None

7.1.3.4 Corrective Action

- Ensure PFD System Setup page is properly configured. See PFD Installation Manual for proper aircraft type configurations.

7.1.3.5 Other Comments

- None

7.2 Actions Required After Performing Maintenance on PFD-related Systems

7.2.1 Actions Required After Initial PFD Installation

7.2.1.1 Symptom(s)

- PFD Initial Installation into aircraft.

7.2.1.2 Cause

- N/A

7.2.1.3 Workaround (if any)

- N/A

7.2.1.4 Corrective Action

- Magnetometer installed per published procedures.
- PFD installed per published procedures.
- Pitot-static leak check performed.
- MFD installed per published procedures.
- IRU Cal performed per published procedures.
- Mag Cal performed per published procedures.
- Lighting check performed.
- PFD-level Navigator and Autopilot type setups performed on PFD.
- Aircraft type setup performed on PFD.

- Navigator setup and check performed.
- EMI check performed.
- Autopilot cal performed.
- Performance flight check performed.

7.2.1.5 Other Comments

- None

7.2.2 Actions Required After PFD Unit Removed and Same Unit Replaced

7.2.2.1 Symptom(s)

- PFD removed from aircraft and same unit re-installed.

7.2.2.2 Cause

- N/A

7.2.2.3 Workaround (if any)

- N/A

7.2.2.4 Corrective Action

- PFD re-installed per published procedures.
- Pitot-static leak check performed.
- Performance flight check performed.

7.2.2.5 Other Comments

- None

7.2.3 Actions Required After PFD Unit Removed and Different Unit Replaced

7.2.3.1 Symptom(s)

- PFD removed from aircraft and different unit installed.

7.2.3.2 Cause

- N/A

7.2.3.3 Workaround (if any)

- N/A

7.2.3.4 Corrective Action

- PFD re-installed per published procedures.
- Pitot-static leak check performed.
- IRU Cal performed per published procedures.
- Mag Cal performed per published procedures.
- Lighting check performed.
- PFD-level Navigator and Autopilot type setups performed on PFD.
- Aircraft type setup performed on PFD.

- Navigator setup and check performed.
- EMI check performed.
- Autopilot cal performed.
- Performance flight check performed.

7.2.3.5 Other Comments

- None

7.2.4 Actions Required After Mag Unit Removed and Different Unit Replaced

7.2.4.1 Symptom(s)

- Magnetometer removed from aircraft and different unit installed.

7.2.4.2 Cause

- N/A

7.2.4.3 Workaround (if any)

- N/A

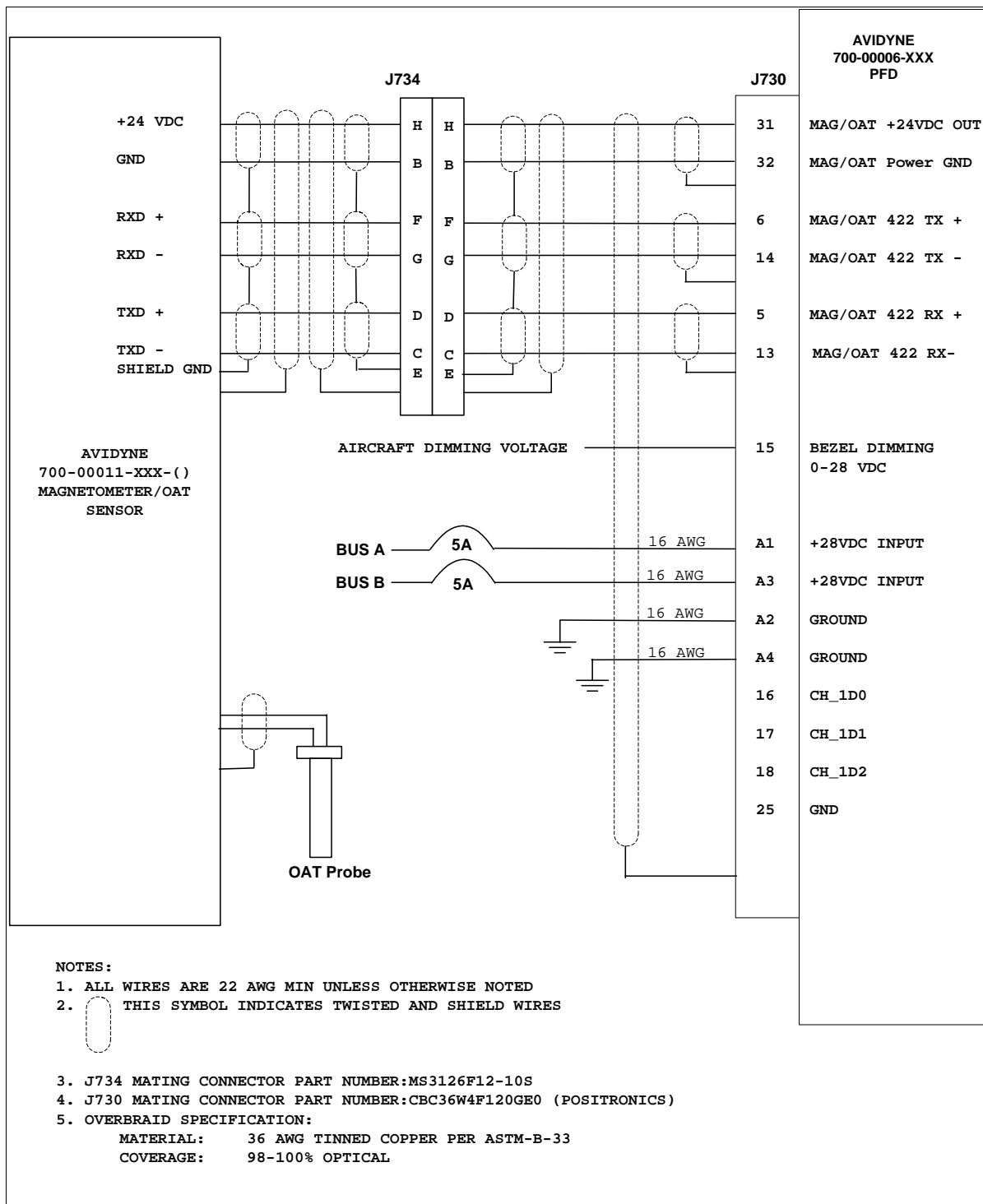
7.2.4.4 Corrective Action

- Magnetometer installed per published procedures.
- IRU Cal performed per published procedures.
- Mag Cal performed per published procedures.
- Performance flight check performed.

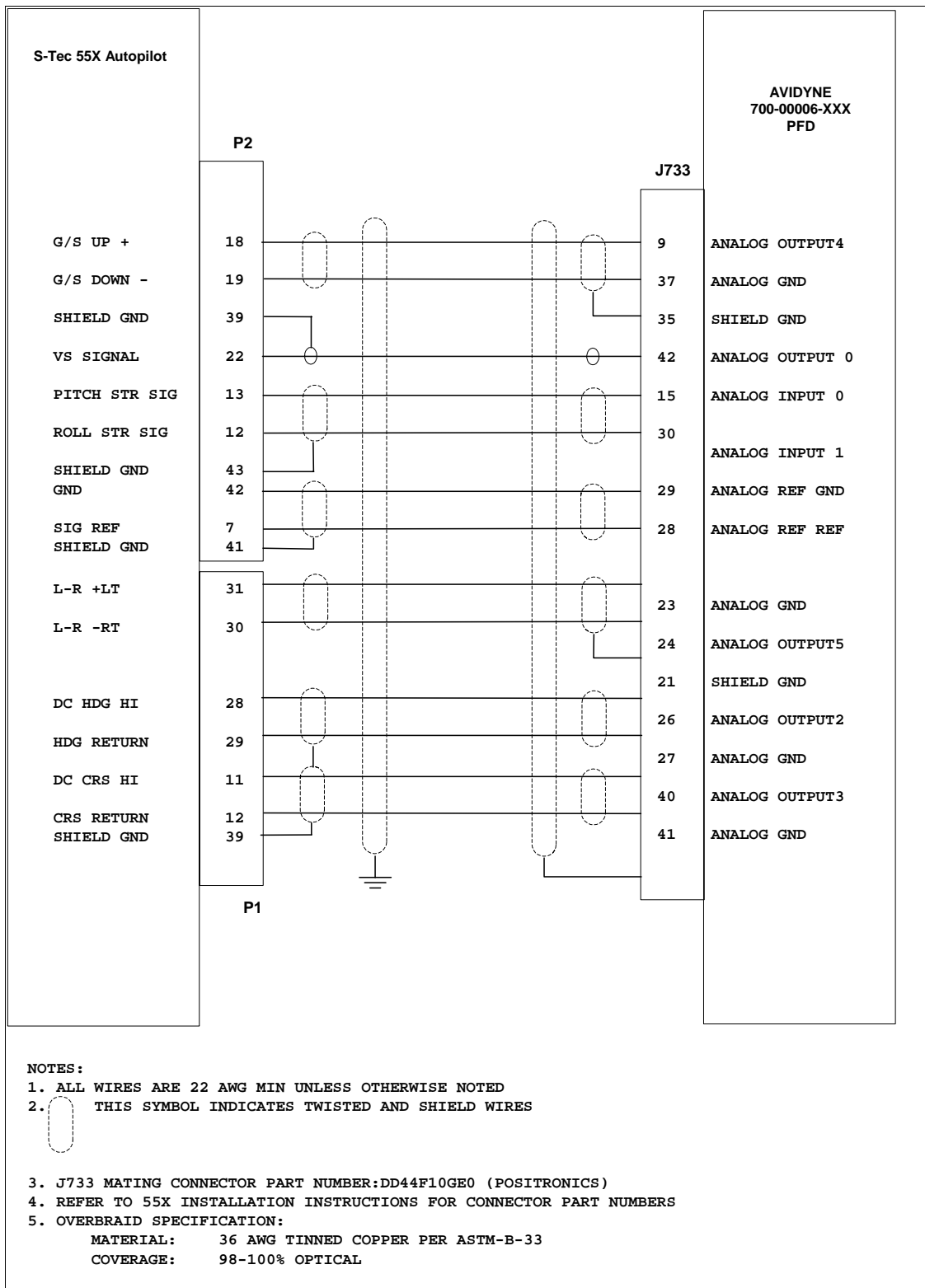
7.2.4.5 Other Comments

- None

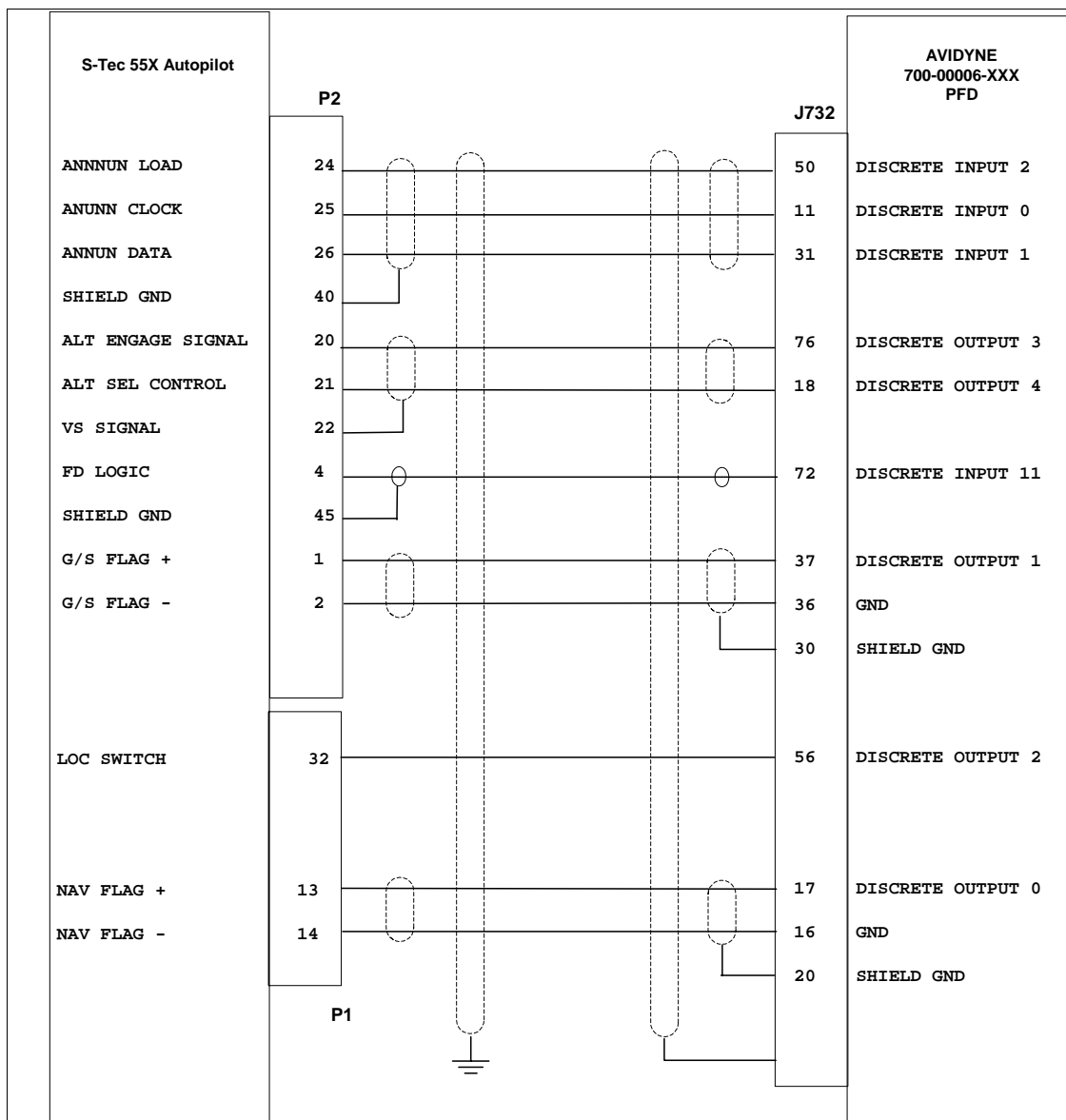
Appendix A – Wiring Diagram (S-TEC 55X AP configuration)




Field Level Troubleshooting Guide



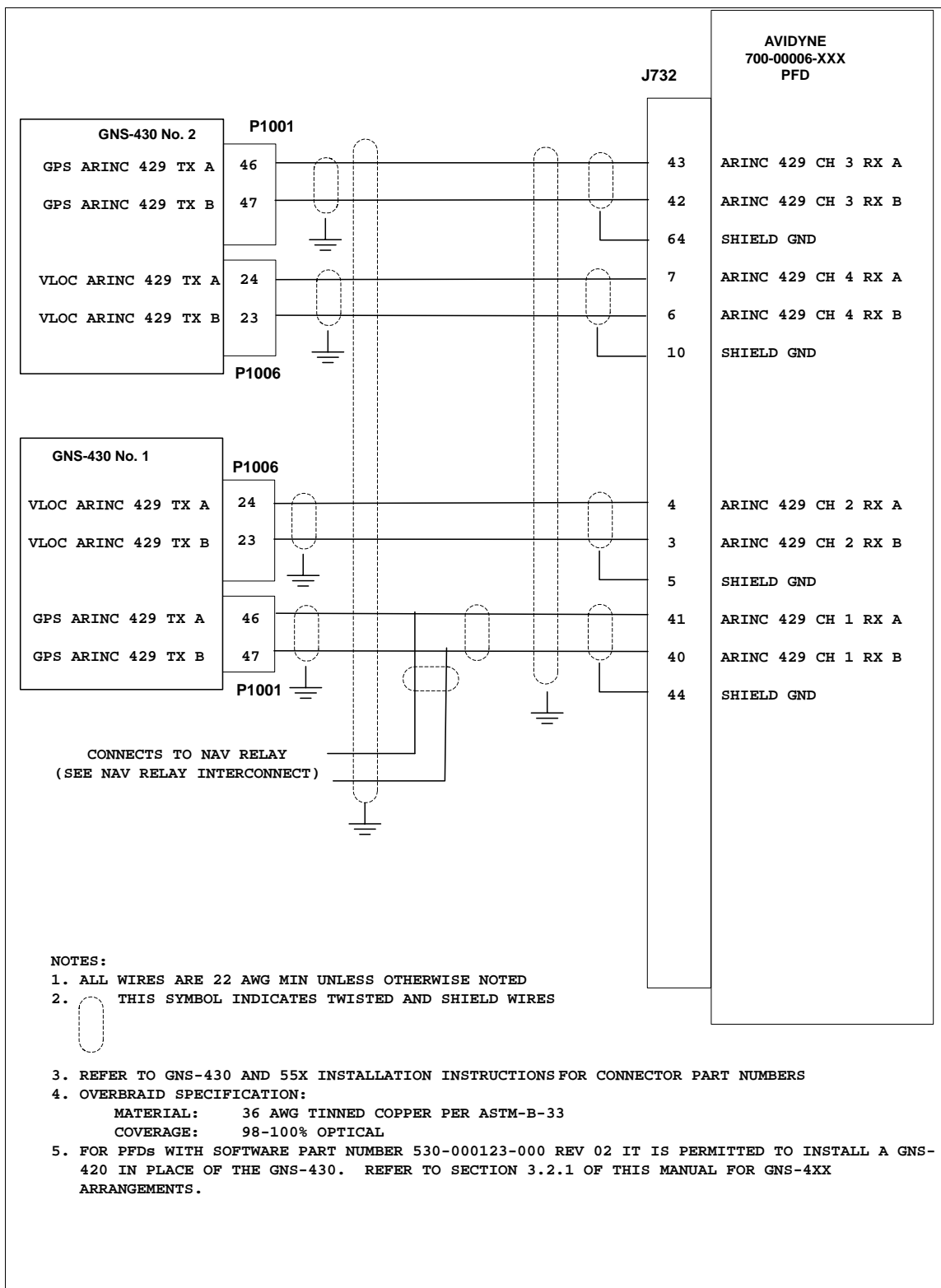
Field Level Troubleshooting Guide



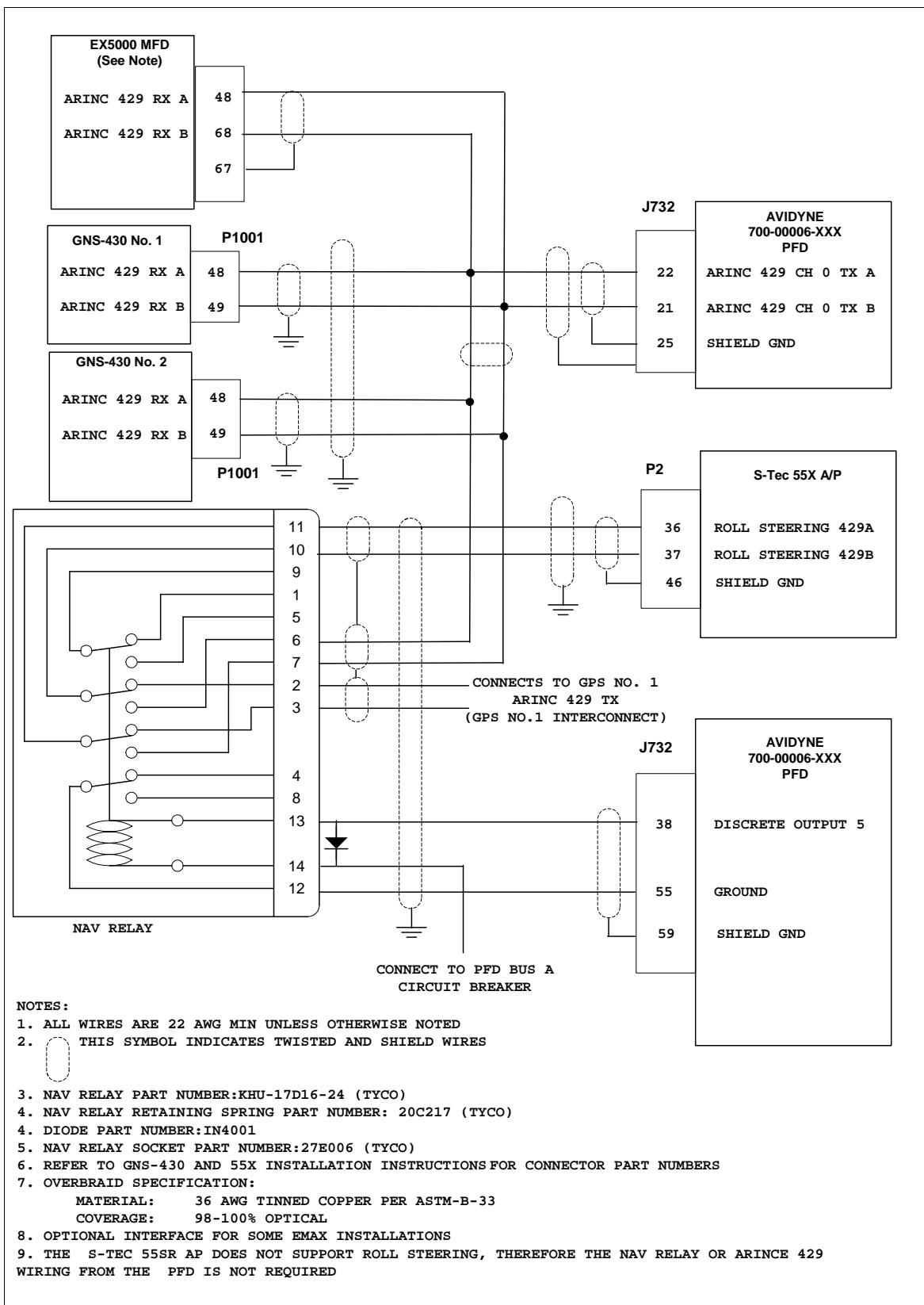
NOTES:

1. ALL WIRES ARE 22 AWG MIN UNLESS OTHERWISE NOTED
2.  THIS SYMBOL INDICATES TWISTED AND SHIELD WIRES
3. J732 MATING CONNECTOR PART NUMBER:DD78F10GE0 (POSITRONICS)
4. REFER TO 55X INSTALLATION INSTRUCTIONS FOR CONNECTOR PART NUMBERS
5. OVERBRAID SPECIFICATION:
 - MATERIAL: 36 AWG TINNED COPPER PER ASTM-B-33
 - COVERAGE: 98-100% OPTICAL

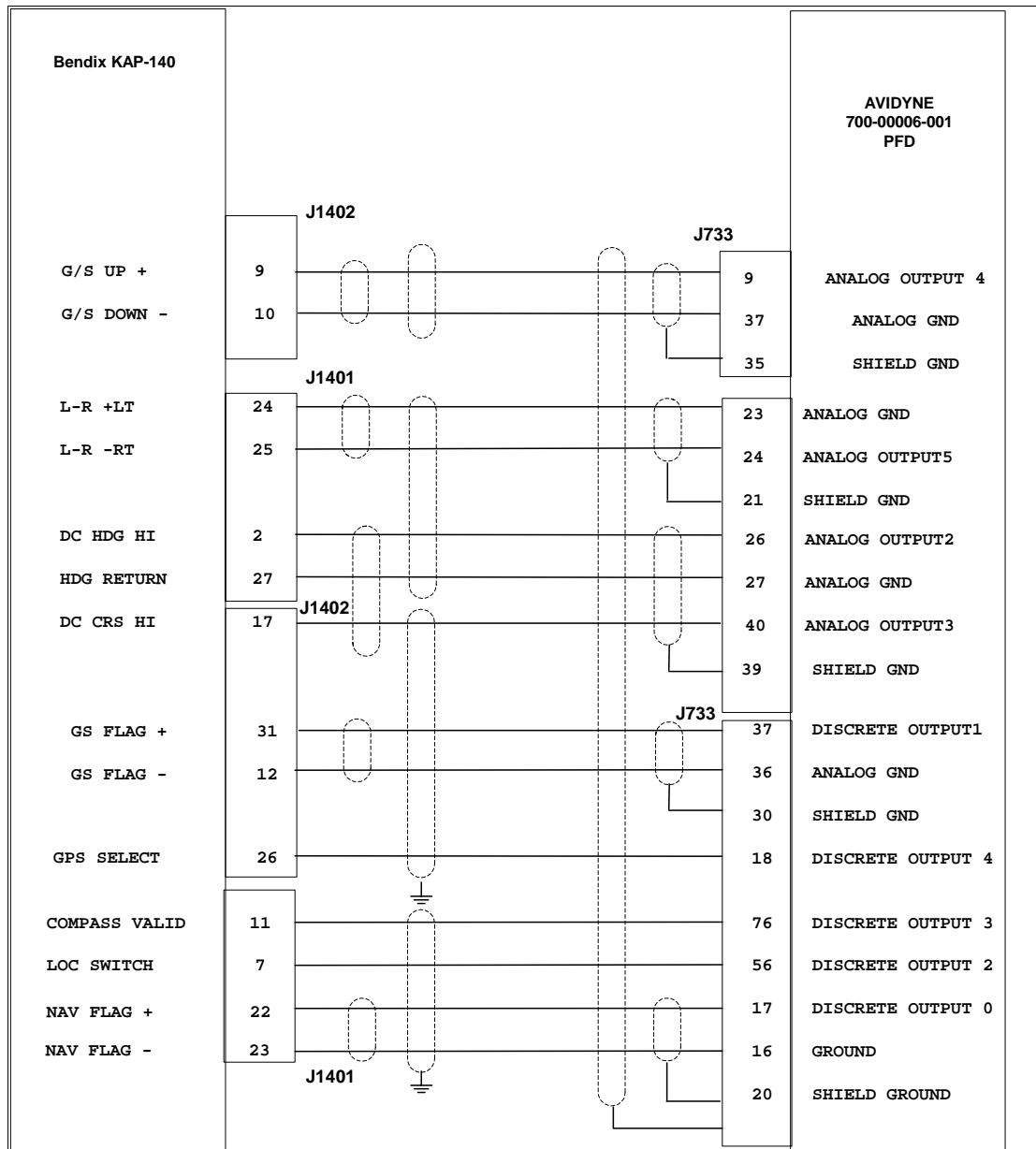
Field Level Troubleshooting Guide



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Appendix B – Wiring Diagram (Bendix KAP-140 AP configuration)

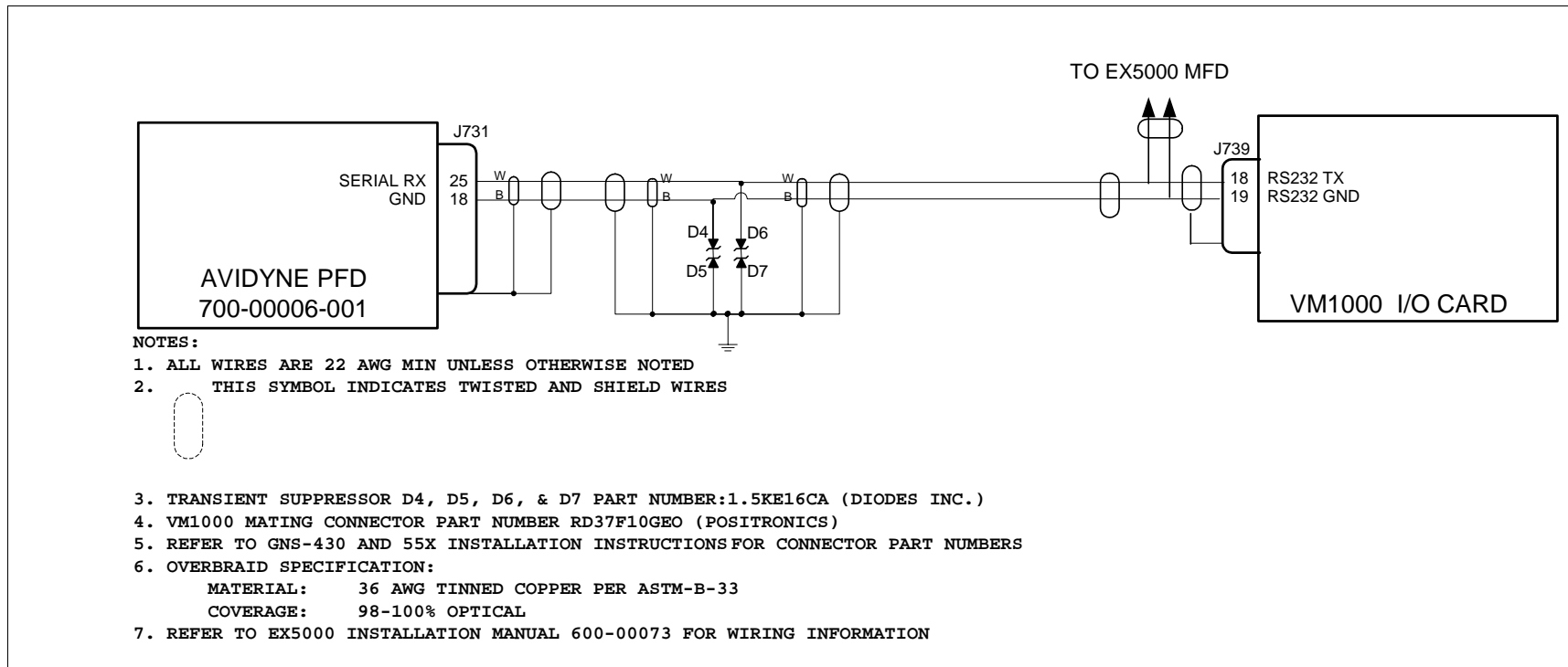


NOTES:

1. ALL WIRES ARE 22 AWG MIN UNLESS OTHERWISE NOTED
2. THIS SYMBOL INDICATES TWISTED AND SHIELD WIRES
3. J733 MATING CONNECTOR PART NUMBER:DD44F10GE0 (POSITRONICS)
4. J732 MATING CONNECTOR PART NUMBER DD78F10GE0 (POSITRONICS)
5. REFER TO KAP-140 INSTALLATION INSTRUCTIONS FOR CONNECTOR PART NUMBERS
6. OVERBRAID SPECIFICATION:
 - MATERIAL: 36 AWG TINNED COPPER PER ASTM-B-33
 - COVERAGE: 98-100% OPTICAL

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Appendix C – Wiring Diagram (VM1000 Interface Option)



Appendix D – Top Level PFD Specification

Revisions				
Rev	ECO	Description	Date	Approved
00	02-340	Release Per ECO	01/02/03	MM
01	03-046	Revised Per ECO	2/3/03	MM

NOTES:

1. WEIGHT: 12.40 LBS. MAX.
2. POWER INPUT: 18 TO 32 VDC
3. POWER CONSUMPTION: 70 WATTS MAX.
4. OPERATING ALTITUDE: 25,000 FEET ABOVE SEA LEVEL
5. OPERATING TEMPERATURE: -20 ° C TO +55 ° C
6. COMPLIES WITH DO-160D STRING: B1WBABSMXXXXXXZBABZWQMZZZZXXA
7. SOFTWARE IS DEVELOPED TO DO-178B, LEVEL C
8. APPLICABLE TSO'S: C2d, C3d, C4c, C6d, C8d, C10b, C106, C113
9. REFER TO INSTALL MANUAL 600-00080-000 FOR ELECTRICAL AND MECHANICAL INSTALLATION INSTRUCTIONS
10. ALLOWABLE DISPLAY RANGE
 - HEADING: 001 – 360 DEGREES
 - PITCH: ±90°
 - ROLL: ±180°
 - AIRSPEED: 20 KIAS TO 300 KIAS
 - PRESSURE ALTITUDE: -1000' TO 25000'
 - VERTICAL SPEED: ±2000 FPM WITH NEEDLE, ±4000 PFM WITH DIGITAL READOUT
11. ACCURACY UNDER WINGS LEVEL STEADY STATE CONDITIONS
 - HEADING: 6 DEGREES
 - PITCH: 2 DEGREES
 - ROLL: 2 DEGREES
 - AIRSPEED: ±5 KIAS < 50 KIAS, ±3.5 KIAS < 80 KIAS, ±2 KIAS < 200 KIAS, ±2.5 KIAS < 250 KIAS
 - ALTITUDE: ±20' < 1K', ±25' < 5K, ±30' < 8K, ±40' < 14K, ±50' < 20K
 - VERTICAL SPEED: ±45 FPM < 500 FPM, ±50 FPM < 1000 FPM, ±100 FPM < 2000 FPM, ±200 FPM < 4000 FPM
12. ACCURACY UNDER DYNAMIC MANEUVERING CONDITIONS
 - PITCH: 2.5 DEGREES WITHIN RANGE OF ±30° LEFT/RIGHT BANK AND ±15° UP/DOWN PITCH. MAXIMUM PITCH RATES = 90° PER SECOND.
 - ROLL: 2.5 DEGREES WITHIN RANGE OF ±30° LEFT/RIGHT BANK AND ±15° UP/DOWN PITCH. MAXIMUM ROLL RATES = 90° PER SECOND.
 - AIRSPEED: : ±5 KIAS < 50 KIAS, ±3.5 KIAS < 80 KIAS, ±2 KIAS < 200 KIAS, ±2.5 KIAS < 250 KIAS (2 KTS DISPLAY LATENCY DURING TAKEOFF ACCLERATION)
 - PRESSURE ALTITUDE: ±20' < 1K', ±25' < 5K, ±30' < 8K, ±40' < 14K, ±50' < 20K
 - VERTICAL SPEED: ±45 FPM < 500 FPM, ±50 FPM < 1000 FPM, ±100 FPM < 2000 FPM, ±200 FPM < 4000 FPM
13. ACCURACY DURING TAXI CONDITIONS
 - PITCH: 3 DEGREES
 - ROLL: 3 DEGREES

CONFIGURATION LIST					
DASH NUMBER	FORMAT	GPS	NAV	A/P	LIGHTING
- 000	LANDSCAPE	GNS-430 GNS-530	GNS-430 GNS-530	S-TEC 55X	0-28 VDC

Avidyne Corporation 55 Old Bedford Road, Lincoln MA 01773 Proprietary Information			
700-00006-XXX-() AVIDYNE FLIGHTMAX ENTEGRA PFD SPECIFICATION CONTROL DRAWING			
Size	Drawing Number	Rev	Sheet
B	880-00001-000	01	1 of 3

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