Avidyne Corporation
4 Middlesex Green - Suite 221
561 Virginia Road
Concord MA 01742

EASA Approved

Airplane Flight Manual Supplement

For

_____
Make and Model Airplane

with

Avidyne Integrated Flight Displays 700-00182-XXX (IFD5XX), 700-00179-XXX (IFD4XX) and 700-00194-XXX (Atlas)

Registration No. _____

Serial No. _____

This supplement must be attached to the applicable FAA Approved Airplane Flight Manual when Avidyne 700-00182-XXX Integrated Flight Display (IFD), 700-00179-XXX and/or 700-00194-XXX Integrated Flight Display(s) installed in accordance with EASA STC 10058132. The information contained herein supplements or supersedes the basic manual only in those areas listed. For limitations and procedures not contained in this supplement consult the basic Airplane Flight Manual.

FAA Approved on behalf of the European Aviation Safety Agency (EASA): _____

LOG OF REVISIONS

Revision Number	*Revised Pages*	*Description of Revisions*	*EASA Approval*	*Date*
00	*ALL*	*Initial Release*	*Yves Morier*	*17 May 2016*
01	*3, 4, 5, 8, 9, 10, 17, 18, 22*	*Add IFD 410, IFD 510 models. Address new limitations and messages associated with software release 10.2*	*N. Faust manager Boston ACO FAA on behalf of EASA*	*06 April 2017*
02	*1, 2, 3, 5, 6, 8, 9, 12, 17, 23*	*Add IFD 545, IFD 550 models, add new limitations and messages associated*	*W Witzig AIR711 FAA on Behalf of EASA*	*16 August 2017*
03	*5, 24*	*BK pilot guide references*	*W Witzig AIR711 FAA for EASA*	*5/3/2019*
04	*5*	*Add ADS-B out compliance statement*	*W Witzig AIR711 FAA for EASA*	*5 February 2020*
05	*5*	*Add additional Transponders to ADS-B Out Compliance*	*W Witzig AIR 711 FAA for EASA*	*17 February 2021*
06	*All*	*Add s/w rev 10.3 - additional Transponder to ADS-B Out , TAWS-B and ADS-B in TSO C-157b*	*W. Witzig*	*26 Aug 2022*
07	*8- 13,15,20-22,28,29*	*Added RF leg limitations; Add Atlas FMS Only units, add further detail for TAWS-B*	*John M Coffey*	*17 May 2023*

08	***15***	Adjusted GPS/SBAS limitation to reflect the requirements of MMEL (PL)-98		

Section 1 – General

This airplane is equipped with Avidyne p/n 700-00182-XXX (IFD5XX), p/n 700-00179-XXX (IFD4XX) and/or p/n 700-00194-XXX (Atlas) Integrated Flight Display(s). These part numbers may be referred to in this document as simply IFD.

The IFD contains a GPS (SBAS) receiver (all IFD models), VHF Nav/Com transceiver (IFD440, IFD540, IFD550 and Atlas) and processing to accomplish control, display, navigation and input/output to other avionic systems. The IFD 545 and IFD550 include an internal ARS and are capable of displaying attitude information and ego-centric synthetic vision (SVS) display formats. All IFD models can be configured for Bluetooth and WiFi in/out communication (optional).

The information in the supplement is EASA approved material and must be attached to the EASA Approved Airplane Flight Manual, when the airplane has been modified by the installation of an Avidyne Integrated Flight Display (IFD) in accordance with STC 10058132.

GPS/SBAS TSO-C146c Class 3 Operation
The IFD4XX, IFD5XX and Atlas are approved for navigation using GPS and SBAS (Satellite Based Augmentation System complying with ICAO Annex 10) for IFR en route, terminal area, and non-precision approach operations (“GPS”, “or GPS”, and “RNAV (GPS)” approaches). The IFD4XX, IFD5XX and Atlas are approved for approach procedures with vertical guidance including LPV and LNAV/VNAV and approaches without vertical guidance including LP and LNAV.

The Avidyne Integrated Flight Display (IFD) complies with the equipment requirements for P-RNAV and BRNAV/RNAV-5 operations in accordance with AC 90-96A CHG 1. This does not constitute operational approval.

Within Europe, RAIM availability can be determined using the AUGER GPS RAIM Prediction Tool at http://augur.ecacnav.com/augur/app/home.

Avidyne IFD Navigation Capabilities

	Note 5						Note 3	Note 4	Note 2	Note 1		
Spec	**RNP 10**	**RNAV 5 GNSS**	**RNAV5 DME/DME**	**RNAV 5 VOR/DME**	**RNAV 2 GNSS (note 1)**	**RNAV 1 GNSS**	**RNP 4**	**RNP 1 GNSS**	**RNP APCH**	**RNP APCH w/ Baro VNAV**	**RNP AR APCH w/ RF (note3)**	**RNP AR APCH w/o RF (note3)**
IFD4XX/5XX/...	Oceanic	Enroute			Enroute	Terminal	Oceanic	Terminal	Approach			
Procedure Type	N/A	N/A			Arrivals, Departures	Arrivals, Departures, Approaches	N/A	Arrival, Departures, Approaches	LNAV, LNAV/VNAV, LP, LPV			
ICAO Flight Plan Code	A1	B2	B3	B4	C2	D2	L1	O2	S1	S2	T1	T2
IFD4XX/5XX/Atlas Capability	**Yes**	**Yes**	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes** (Note 5)	No	No	No

Note 1 RNAV1 requires total system error of not more than 1NM for 95% of the total flight time
Note 2 RNAV2 requires total system error of not more than 2NM for 95% of the total flight time
Note 3 GNSS sensor complies with AC 20-138. GNSS accuracy better than 36m 95%, SBAS GNSS accuracy is better than 2m 95%
Note 4 This table is intended to show certifications of avionics equipment. Capabilities shown do not constitute operational approval.
Note 5 LP and LPV guidance require SBAS, IFD4XX/5XX/Atlas must be connected to an approved SBAS (e.g. WAAS) antenna.

Reference Materials

Temporary Guidance leaflet (TGL) 10 – Rev 1 Airworthiness and Operational Approval for Precision RNAV Operations in Designated European Airspace.

Acceptable Means of Compliance 20-27 Airworthiness Approval and Operational Criteria for RNP APPROACH (RNP APCH) Operations,

Acceptable Means of Compliance 20-28 Airworthiness Approval and Operational Criteria for RNAV GNSS Approach Operations to LPV Minima using SBAS

Acceptable Means of Compliance 20-4 Airworthiness Approval and Operational Criteria for the use of Navigation Systems in European Airspace Designated for Basic RNAV Operations (BRNAV)

ADS-B OUT Compliance

The IFD4XX, IFD5XX and/or Atlas installed per this STC in conjunction with the following transponders/ UAT transceivers have been shown to meet the equipment requirements of 91.227 for ADS-B OUT:

ACSS NXT-700
Avidyne AXP340, AXP322
Becker BXT6553
Bendix King KT74
Bendix King MST 70B
Collins TDR94(D)
Garmin GTX330ES
Garmin GTX335/345
Garmin GTX3000
L3Harris NGT9000
Trig TT31, TT22
Bendix King KXP80

IFD4XX, IFD5XX and/or Atlas have been approved for ADS-B Out compliance with other transponders under separate installation approvals (STCs). Check the aircraft's transponder or UAT transceiver AFMS for the statement above indicating ADS-B out compliance for the navigator and transmitter combination.

ADS-B In TSO-C157c Class 1 Operation

The IFD4XX, IFD5XX and/or Atlas IFD installed per this STC may be interfaced with an ADS-B UAT or 1090MHz (ADS-B In) TSO C-157b, Class 1 receiver to display ADS-B traffic and FIS-B weather products (available only in specific areas).

If no ADS-B out system is installed, this installation will not be able to receive TIS-B client status, and will not receive ADS-R or TIS-B broadcasts from ATC unless the aircraft is in the same area as a valid TIS-B client broadcasting that it has ADS-B In capability.

FIS-B information may be used for pilot planning decisions focused on updating the pilot's awareness of the dynamic flight environment; including avoiding areas of inclement weather that are beyond visual range and near-term decisions where poor visibility precludes visual acquisition of inclement weather.

FIS-B weather and NAS status information may be used as follows:

(a) To promote pilot awareness of ownship location with respect to reported weather, including hazardous meteorological conditions; NAS status indicators to enhance pilot planning decisions; and pilot near-term decision-making.

(b) To cue the pilot to communicate with Air Traffic Control, Flight Service Station specialist, operator dispatch, or airline operations control center for general and mission critical meteorological information, NAS status conditions, or both. FIS-B information, including weather information, NOTAMs, and TFR areas, are intended for the sole purpose of assisting in long-/near-term planning and decision making.
The system lacks sufficient resolution and updating capability necessary for aerial maneuvering associated with immediate decisions. In particular, in extreme scenarios, the oldest weather radar data on the display can be up to 15 to 20 minutes older than the display's age indication for that weather radar data. Therefore, do not attempt to use FIS-B weather information to maneuver the aircraft at minimum safe distances from hazardous weather. FIS-B information must not be used in lieu of a standard preflight briefing.

(c) FIS-B uplink is an FAA approved source for METAR , TAF, WINDS, PIREPs, NEXRAD, AIRMET, SIGMET, and TFR information subject to the range limits for the broadcast of these products. FIS-B uplink is not an FAA approved source for NOTAMs.

NOTE

When no traffic or datalink receiver is interfaced with the installed IFD series GPS/Nav/Com, a portable (unapproved) ADS-B receiver may be interfaced via WiFi and/or Bluetooth to provide traffic and FIS-B weather products for display on the IFD. Traffic aurals and TAs will not be issued when configured this way.

TAWS-B TSO C-151d Operation

The IFD5XX and/or Atlas IFD installed per this STC meets the minimum requirements of TSO-C151d when IFD software release 10.3 or later approved release, and the TAWS-B Unlock Enablement is installed. Fixed Wing TAWS-B is not available on IFD4xx units.

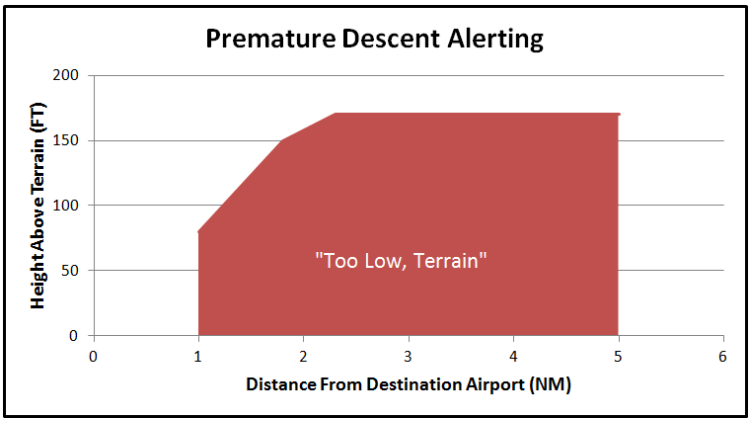
In addition to the FLTA Terrain Awareness features, TAWS-B contains the following sub-functions:

Premature Descent Alert (PDA) – this function is designed to alert when the aircraft is hazardously below the normal approach path for the nearest runway at either the origin or destination airport

The PDA function is operational only in the vicinity of the origin or the destination airport contained in the FMS flight plan. Specifically, considering all the runways at the origin and destination airports, the aircraft must be between 1 and 5 nautical miles from the runway nearest to the aircraft position.

Using the threshold elevation of the nearest runway and the current aircraft altitude, the PDA function determines whether the aircraft is hazardously below the normal approach path for that runway, based on the criteria in the table below.

Range from nearest runway	AGL Altitude Range in Which a PDA Caution Alert is Generated
1 – 1.8 NM	80 to 150 feet (Linear)
1.8 – 2.3 NM	150 to 170 feet (Linear)
2.3 – 5 NM	170 feet

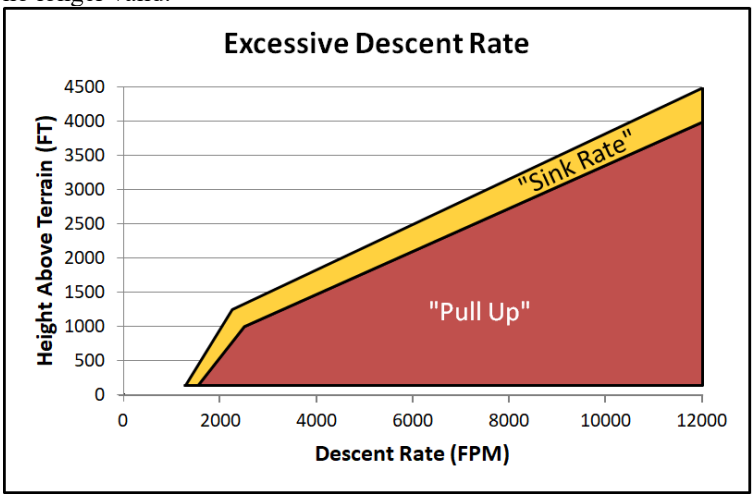


If a PDA alert has been triggered, a CAS message and aural alert "Too Low Terrain" will be issued and repeat every 6 seconds until it is acknowledged, or the condition is no longer true. For the condition to no longer be true, the aircraft must clear the alerting altitude by 100 feet. So, for example, if the aircraft is 4 NM away from the airport and descended to 150 feet AGL, a climb to 270 feet AGL must be completed to clear the condition.

Excessive Rates of Descent (EDR) – this function is designed to alert when the aircraft is experiencing excessive rates of descent given the current AGL altitude. The alert can be generated during any phase of flight

The function that monitors for excessive rates of descent is always active, not just in the vicinity of an airport. There is a caution area for high rates of descent and a warning area for even higher rates of descent. The figure below depicts the yellow caution area in which a "Sink Rate" aural alert and associated yellow caution CAS message is issued and then a red warning area in which a "Pull Up" aural alert and associated red warning CAS message is issued.

The excessive rate of descent aural will continuously repeat every 6 seconds until either the message is acknowledged or the condition is no longer valid.



The "Pull Up" warning will provide up to 24 seconds of protection, while the "Sink Rate" caution will provide up to 33 seconds of protection, based on aircraft altitude. Aircraft vertical speed and current terrain elevation below the aircraft are used to compute the alerting altitude thresholds. As a result, these protection times may not apply in rising terrain or when the aircraft's rate of descent is increasing.

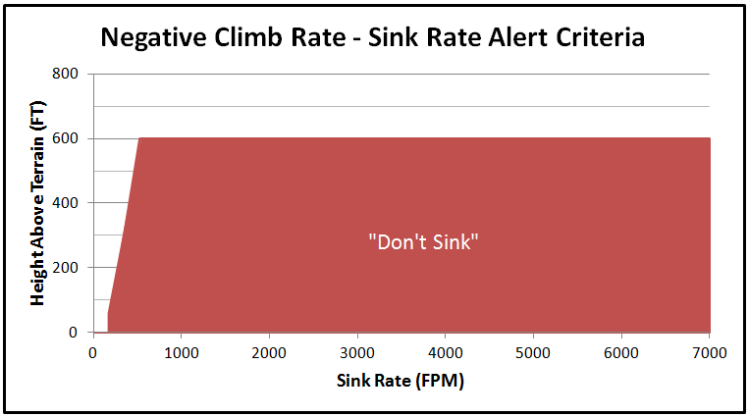
The EDR "Sink Rate" alert can trigger as low as -1250 fpm, while the "Pull Up" alert can trigger as low as -1500 fpm. EDR "Pull Up"

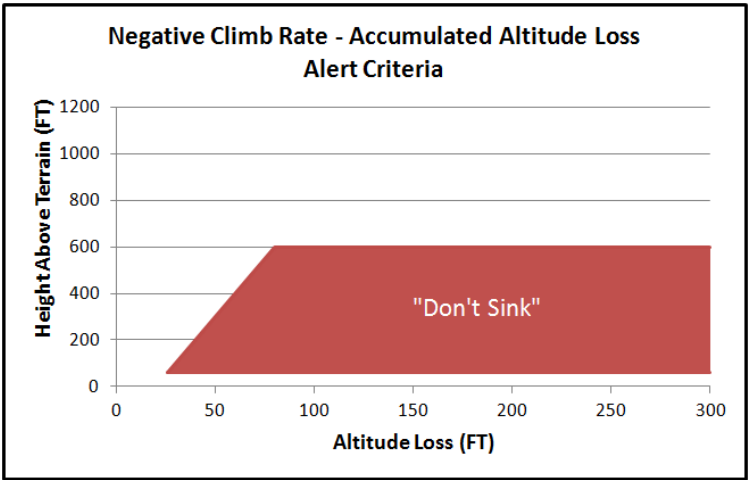
warnings are the highest priority of all TAWS alerts, even higher than FLTA warnings.

Negative Climb Rate (NCR) or Altitude Loss After Takeoff/Go-Around – this function is designed to alert when the aircraft develops a negative climb rate immediately after takeoff or go-around or when an altitude loss is detected in that phase

The final function of the TAWS system is the alert for a negative climb rate (NCR) or excessive altitude lost after takeoff/go-around. Therefore, NCR is enabled only between 50 and 600 feet AGL.

When enabled, this function triggers a “Don’t Sink” caution with an associated aural message if there is excessive negative vertical speed or if there is excessive altitude loss (approximately 10% of altitude). The alerts will clear if the CAS message is acknowledged, the aircraft AGL altitude increases past the previous highest value, or the aircraft reaches 600 feet AGL.





TAWS-B has several associated aural alerts. With the exception of altitude callouts, the aural alerts are associated with CAS messages. The priority of TAWS-B alerts is illustrated below, prioritized from highest to lowest.

Function	CAS Alert	Aural Alert
EDR	Pull Up	Pull Up, Pull Up
FLTA	Terrain Pull Up	Per Setup Option
FLTA	Warning Obstacle	Warning, Obstacle
FLTA	Caution Terrain	Per Setup Option
FLTA	Caution Obstacle	Caution, Obstacle
PDA	Too Low, Terrain	Too Low Terrain
Altitude Callout	n/a	Five Hundred (others per configuration and setup option)
EDR	Sink Rate	Sink Rate
NCR	Don't Sink	Don't Sink

Database Accuracy and Completeness

The operator is responsible to ensure that the navigation data used in the unit has the accuracy, resolution, and timeliness appropriate for

the purpose of the flight operation being conducted. Using navigation data from an Avidyne authorized supplier will ensure that the navigation data has the same accuracy and resolution provided by official sources, in a format compatible with the intended function of the unit.

Avidyne requests that any observed database discrepancies are reported. These discrepancies may be in the form of an incorrect procedure, incorrectly identified terrain, obstacles, navigation fixes, or any other displayed item used for navigation or communication in the air or on the ground. Use the Service Hotline listed on the back cover of the IFD4XX, IFD5XX and/or Atlas IFD Pilot Guides.

Avidyne accurately processes and validates the database data, but cannot guarantee the accuracy and completeness of the data provided by various state sources and their suppliers.

Avidyne Corporation holds a FAA Type 2 Letter of Acceptance (LOA) in accordance with AC 20-153 for database integrity, quality, and database management practices for the navigation database. Flight crew and operators can view the LOA at www.avidyne.com.

Section 2 – Limitations

1. The Avidyne IFD4XX, IFD5XX and/or Atlas Integrated Flight Display Pilot Guides must be available to the pilot during all flight operations:
   P/N 600-00300-001 for the IFD5XX Series
   P/N 600-00304-000 for the IFD4XX Series
   P/N 600-00300-002 for the Atlas Series
   P/N 890-00039-010 Bendix King AeroNav 900 and 910
   P/N 890-00041-008 Bendix King AeroNav 800

2. For Class I airplanes (single engine, piston, under 6,000# GTOW), a single IFD4XX, IFD5XX and/or Atlas IFD is required for flight under instrument flight rules (IFR). IFR is prohibited when the GPS or VHF navigation receiver is inoperable unless the airplane has an additional approved GPS and/or VHF receiver.

   For all other Airplanes (Class II, III and IV), dual VHF communications transceivers and dual GPS or VHF

Navigation receivers are required for flight under instrument flight rules (IFR). One communication transceiver, or one GPS receiver, or one VHF navigation receiver may be inoperable for IFR flight.

In all airplanes, an approved navigation display (external CDI, HSI, or EHSI) is required for flight under instrument flight rules (IFR).

3. WiFi and Bluetooth wireless features may not be used during critical phases of flight to include takeoff, approaches, landing. WiFi and Bluetooth must be selected off on the user setup tab (SYS/Setup) during these phases of flight.

4. Any portable electronic device (PED) that transmits data to IFD4XX/IFD5XX units must be checked and approved prior to use in flight.

5. All IFD models are prohibited from use of Bluetooth and WiFi communications features in Class IV airplanes. These features, if not disabled by installation configuration, must be selected off in user setup by the pilot.

6. The IFD4XX, IFD5XX and/or Atlas IFD installed with an SBAS approved antenna, provides pilot and automatic flight control guidance for the following operations conducted under instrument flight rules (IFR):

   Note: That models IFD410, IFD510, IFD545 and Atlas FMS Only units do not include VHF capabilities and VHF navigation and approaches are not applicable to these models.

   - VOR, LOC, ILS instrument approach procedures (procedures using VHF radio guidance)
   - Instrument approach procedures using the following lines of minima:
     - LNAV minima (including when using advisory vertical guidance from the system);
     - LNAV/VNAV minima;
     - LPV minima;

    - LP minima
  - B-RNAV/ RNP-5/RNAV-5, RNP-10, RNP-APCH [titled RNAV (GPS) or RNAV(GNSS)] terminal procedures, including arrival and departure procedures.
  - RNP-1/RNAV-1, RNP-2/RNAV-2, RNAV terminal procedures, including RNAV arrival and RNAV departure procedures. P-RNAV, RNAV Routes (DPs, STARS, Q and T Routes)
  - Oceanic and Remote Areas of Operation

7. The IFD4XX, IFD5XX and/or Atlas w/VHF IFD when installed with a non-SBAS antenna, provide pilot and automatic flight control guidance for the following operations conducted under instrument flight rules (IFR):
   - VOR, LOC, ILS instrument approach procedures (procedures using VHF radio guidance)
   - Instrument approach procedures using the following lines of minima:
     - LNAV minima
   - B-RNAV/ RNP-5/RNAV-5, RNP-10, RNP-APCH [titled RNAV (GPS) or RNAV(GNSS)] terminal procedures, including arrival and departure procedures.
   - RNP-1/RNAV-1, RNP-2/RNAV-2, RNAV terminal procedures, including RNAV arrival and RNAV departure procedures. P-RNAV, RNAV Routes (DPs, STARS, Q and T Routes)
   - Oceanic and Remote Areas of Operation
8. GPS/SBAS based IFR enroute, oceanic, and terminal navigation is prohibited unless the flight crew verifies and uses a valid, compatible, and current navigation database **or** verifies each waypoint for accuracy by reference to current approved data.
9. The Avidyne moving map display provides visual depiction of the aircraft's own-ship, GPS position on a moving map for situation awareness (SA) purposes only. The pilot shall not use the moving map display as a sole means of navigation. The external CDI, HSI, or EHSI display must be used as the primary navigation instrument.

10. The Avidyne electronic checklists are not EASA approved and may not be loaded or used. Use of this feature will require further certification and operational approval.

11. The IFD integrates with separately approved system installations such navigation indicators, remote annunciators, weather, traffic and terrain alerting systems. Adherence to limitations in installation AFM supplements for those systems is mandatory.

12. The use of datalink, traffic and lightning sensor information displayed on the IFD must be in compliance with the approved AFM supplements for those systems.

13. Gloves may not be used to operate the IFD touch functions unless the Glove Qualification Procedure located in the respective IFD Pilot's Guides, has been successfully completed.

14. For flight planning purposes, in areas where SBAS coverage is not available, the flight crew must check RAIM availability.

    In the event of a predicted continuous loss of RAIM of more than five minutes for any part of the intended route of flight, the flight shall be delayed, canceled, or rerouted on a track where RAIM requirements can be met. The flight may also be re-planned using non-GPS based navigational capabilities.

    For flight planning purposes for operations within European B-RNAV/RNAV-5 and P-RNAV airspace, if more than one satellite is scheduled to be out of service, then the availability of GPS RAIM shall be confirmed for the intended flight (route and time). In the event of a predicted continuous loss of RAIM of more than five minutes for any part of the intended flight, the flight shall be delayed, canceled, or rerouted on a track where RAIM requirements can be met.

NOTE

Within Europe, RAIM availability can be determined using Europe's AUGER GPS RAIM Prediction Tool at http://augur.ecacnav.com/augur/app/home.

15. Coupling to an installed autopilot that is not identified as an approved, compatible autopilot in the approved installation manual for AML STC 10058132 is not authorized.

CAUTION

Terrain information shown on the MAP page display is provided to the pilot as an aid to situational awareness. The MAP page terrain color representations should not be used as a sole basis for terrain avoidance.

CAUTION

Traffic information shown on the Map page display is provided to the pilot as an aid to visually acquiring traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive visual acquisition of the conflicting traffic. Avoidance maneuvers should not be made based only on a Traffic Advisory.

16. For CS23 Class IV airplanes the IFD545 and IFD550 may not be used for primary attitude information or standby attitude information (If required by type design). The IFD545 and/or IFD550 may only be used as a secondary (non-required) source for attitude information.

NOTE

The IFD545 and/or IFD550 may be used in conjunction with air data and turn rate indicators in determining if a primary or standby attitude source has failed e.g. in the case of primary/standby attitude indicator mis-compare.

17. The IFD545 and/or IFD550 may not be used for primary navigation deviation information (horizontal of vertical).

The IFD545 and/or IFD550 may only be used as a secondary (non-required) source for this information.

18. The Avidyne IFD4XX and IFD5XX may only be operated in IMC conditions as a radar display when used in conjunction with an independent lightning detection and display system (Approved Thunderstorm Detection Equipment).

19. IFD Series Navigators are capable of providing guidance for procedures and approaches containing RF legs. This STC does not grant operational approval for RF leg navigation for those operations requiring approval (AR). FAA approval may be required for operators intending to use the IFD Series navigator for RNP-1 Procedures. For Procedures containing RF legs that are not AR (approval required) or RNP<1, the IFD Series Navigators provide approved guidance (hand-flown or coupled) with the following limitations:

    - Navigation guidance must be displayed on the Primary Navigation Instrument with Course Pointer Auto-Slew functioning.
    - RF legs must be flown at less than 180 KIAS
    - Distance to Waypoint or Moving Map information must be available to the Pilot when hand-flying RF legs without Flight Director Guidance

CAUTION

Terrain information shown on the MAP page display is provided to the pilot as an aid to situational awareness. The MAP page terrain color representations should not be used as a sole basis for terrain avoidance.

CAUTION

Traffic information shown on the Map page display is provided to the pilot as an aid to visually acquiring traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive visual acquisition of the conflicting

traffic. Avoidance maneuvers should not be made based only on a Traffic Advisory.

CAUTION

In IFD545 and IFD550 units the inertial reference accelerometers may be irreparably damaged by exposure to temperatures below -40°C. The units are capable of operating at -40°C, but exposure to temperatures below this, even when powered off, can stress the parts internally causing a detectable and annunciated failure of the sensors.

Section 3 – Emergency Procedures

Loss of GPS
In the event of the loss of the IFD4XX, IFD5XX and/or Atlas GPS receiver, the FMS will enter dead reckoning mode for 5 minutes, after 5 minutes all FMS functions are lost and the ownship is removed from map depictions. The pilot should revert to remaining navigation receiver (required for IFR operations).

Loss of VHF Nav/Com
In the event of the loss of VHF Navigation on the IFD4XX, IFD5XX and/or Atlas w/VHF , the pilot should revert to remaining navigation receiver (required for IFR operations).

Warning Messages
Caution and warning messages provided by the IFD4XX, IFD5XX and/or Atlas are related to functions performed by the IFDs and are additional to the caution and warning annunciation system provided by the aircraft.

NOTE

The original caution and warning annunciator panel remains as the primary indication. POH/AFM Emergency procedures are not affected by this installation.

To Disable WiFi/Bluetooth Connectivity on IFD4XX/IFD5XX:

1. Press and hold the IFD4XX, IFD5XX and/or Atlas power button/knob for 1 second (upper left bezel)
2. ALLOW/IGNORE WiFi Bluetooth dropdown is presented. Press IGNORE Dropdown is removed
3. Verify the WiFi and Bluetooth icons on the upper right of the display are removed

Caution and Warning Messages

The Caution and Warning panel is not altered as part of this modification and remains the primary means of providing Caution and Warning messages. Caution and Warning messages are provided in the following table:

EXCEEDANCES | WARNINGS RED

Short Text	Long Text	Comments
Pull Up	Excessive Descent Rate	The TAWS Excessive Descent Rate algorithm has detected a CFIT potential – initiate an immediate recovery maneuver.
Terrain Pull-Up*	Terrain Pull-Up	The FLTA algorithm has detected an imminent ground collision - Initiate an immediate recovery maneuver.
Warning Obstacle*	Warning Obstacle	The FLTA algorithm has detected an imminent obstacle collision. Initiate an immediate recovery maneuver.
Unit Overtemp – Unit Unreliable	Unit Overtemp: <internal component name> Unit reliability in question – Get IFD serviced	One or more of the internal components has exceeded its maximum design temperature and reliability cannot be ensured until the unit is tested by the Avidyne Service Center. Contact the Avidyne Service Center or a local dealer for service. This message will be present on every subsequent power cycle until reset by the Avidyne Service Center.
Low Volts – off in <countdown from 60> sec	Low Volts – IFD powers down in <countdown from 60> sec	Main supply voltage has fallen below 9 VDC. Contact a local dealer for service.

Terrain Alert Warning Maneuver

When a terrain alert warning occurs, immediately initiate, and continue a climb that will provide maximum terrain clearance, or any similar approved vertical terrain escape maneuver, until all alerts cease. Only vertical maneuvers are recommended, unless operating in visual meteorological conditions (VMC) and/or the pilot

determines, based on all available information, that turning in addition to the vertical escape maneuver is the safest course of action.

EXCEEDANCES | CAUTIONS YELLOW

Short Text	Long Text	Comments
ADS-B Traffic Sensor Fault	No communication with traffic sensor	The IFD is not receiving messages from the ADS-B traffic sensor. Contact a local dealer for service. This message is local if independent traffic sensors are installed.
ADS-B Traffic Sensor Fault	Traffic sensor has failed	The ADS-B traffic sensor is reporting a failure or the IFD is receiving invalid messages from the sensor. Contact a local dealer for service. This message is local if independent traffic sensors are installed.
No ADS-B Position	AXP322 Lost GPS Position Data	ADS-B position data had previously been valid and then transitions to invalid. Check the ADS-B position source device.
Caution Terrain*	Caution Terrain	The FLTA algorithm is predicting a likely ground collision within approximately 60 seconds – initiate a proper recovery maneuver.
Caution Obstacle*	Caution Obstacle	The FLTA algorithm is predicting a likely obstacle collision with approximately 60 seconds – initiate a proper recovery maneuver.
No Position	No position available	The IFD cannot compute a navigation solution. IFD operation will be degraded (e.g. no map, no FMS guidance, etc.) Transition to alternative navigation sources.
GPS Integrity Lost	GPS Integrity Lost – Crosscheck Nav	This is alerting about imminent exceedence of horizontal fault detection limits or protection levels. Crosscheck the nav solution and determine the best course of action. If on a GPS based approach, Missed Approach is required.

Short Text	Long Text	Comments
GPS Fault	Position updated via dead reckoning	The GPS has stopped providing a navigation solution. If GPS is the only navigation solution source available, then expect degraded IFD operation (e.g. no map, no FMS guidance, etc.)
GPS Fault	No position available	The navigation solution cannot compute a position, typically after dead reckoning has expired. Execute a missed approach if this occurs while performing a GPS based approach. Use an alternate GPS or VHF navigation receiver.
Configuration Error	Configuration Error – IFD Requires Service	The configuration of the IFD or the devices to which it is communicating with has changed or experienced an error. Contact the Avidyne Service Center or a local dealer for service.
LPV Unavailable Use L/VNAV DA	GPS integrity is insufficient for LPV Approach	Transition to a non-LPV approach and the appropriate minima if possible. Otherwise execute a missed approach.
LPV Unavailable Use LNAV MDA	GPS integrity is insufficient for LPV Approach	Transition to a non-LPV approach and the appropriate minima if possible. Otherwise execute a missed approach.
LP Unavailable Use LNAV MDA	GPS integrity is insufficient for LP Approach	Transition to a non-LP approach and the appropriate minima.
L/VNAV Unavail. Use LNAV MDA	GPS integrity is insufficient for L/VNAV Approach	Transition to a non-L/VNAV approach and the appropriate minima.

Short Text	Long Text	Comments
Check Altitude Too Low	Aircraft is below the glide slope altitude at FAF	Correct aircraft altitude as required to safely conduct the approach or initiate a climb to a published safe altitude and abort the approach.
Traffic Sensor Fault*	No communication with traffic sensor (local) OR Traffic sensor has failed (global)	Contact a local dealer for service.
Traffic <Low | High> <Bearing in clock direction> <Distance in NM>*	Traffic [Brg (e.g. 1:00)] [dist (e.g. 2 NM)] [alt (e.g. 200 ft)]	Traffic advisories - Alert to be used to facilitate visual acquisition of traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive visual acquisition of the conflicting traffic.
Traffic <Low | High> <Distance in NM>*	Traffic <Distance in NM> <Signed relative altitude in feet> FT	Traffic advisories with no bearing information – Alert to be used to facilitate visual acquisition of traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive visual acquisition of the conflicting traffic.
Traffic <Bearing in clock direction> <distance in NM>*	Traffic <bearing in clock direction> <distance in NM>	Traffic advisories with no relative altitude information – Alert to be used to facilitate visual acquisition of traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive visual acquisition of the conflicting traffic.
Traffic <distance in NM>*	Traffic <distance in NM>	Traffic advisories with no relative altitude information and no bearing – Alert to be used to facilitate visual acquisition of traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive visual acquisition of the conflicting traffic.

Short Text	Long Text	Comments
COM TX Fault	Transmitter Fault, No TX Ability	Transition to a backup VHF com radio (if available) or initiate lost communication procedures. Contact the Avidyne Service Center or a dealer for service.
COM Stuck TX	Stuck Mic Timeout, Transmitter Disabled	Requires 35 seconds of continuous transmission. Verify the PTT is stuck and contact a dealer for service as required.
No Comm with VHF	No communication with the VHF radio	Transition to a backup VHF com radio (if available) or initiate lost communication procedures. Contact the Avidyne Service Center or a dealer for service.
Unit Overtemp – Check cooling	Unit Overtemp: <internal component identification>	One or more of the internal components has exceeded 80°C. Contact the Avidyne Service Center or a dealer for service – consider adding a source of cooling and/or improving air flow in/around the IFD.
Low Volts	Backlight reduced to 25%	Main supply voltage has fallen to approximately 11VDC. Check the aircraft alternators are on and functional. Consider load shedding the power bus that is powering the IFD.
Manual Sequence Req'd	Altitude invalid – leg will not auto sequence	In basic E-M aircraft where the IFD does not have altitude input, this message will appear when the FMS active leg is a Heading→Altitude leg. In this case, the FMS flight plan will need to be manually sequenced to the next leg. Failure to do so will keep the FMS flying the heading indefinitely.

Short Text	Long Text	Comments
Heading Lost	Using ground track for SVS	Indicates loss of the TVV and the aircraft reference symbol ("wedge") now points at ground track, not aircraft heading. "TRK" will also be displayed below the digital compass on the SVS page.
Xpdr Fault	Transponder Fault	Any fault other than loss of ADS-B GPS position. Contact the Avidyne Service Center if this persists across power cycles.
No Comm With Xpdr	No Communication with Remote Transponder	No data has been received from the remote transponder for greater than 2 seconds. Contact the Avidyne Service Center if this persists across power cycles.
Radar: Echoes Ahead	Radar: Heavy Echoes Ahead	Generated when a number of red and/or magenta echoes are present within the area ±22° off the nose of the aircraft at the current displayed radar range.
Radar: Target Alert	Radar: Target Alert Detected	Alerts the pilot to the presence of a significant weather cell that exists beyond the currently selected display range.
Radar Sensor Fault	No Communication with Radar Sensor, or; Radar Data is Invalid, or; Sensor mode is [selected] Selected mode is [reported], or; Radar fault code: any active fault codes.	No data is received from the sensor for at least 2 seconds, or; The data stream from the radar contains information that the data stream should not be used, or; If the requested mode and the reported mode do not match, or; Any specific fault code is active from the sensor.

Short Text	Long Text	Comments
TIS Removed	TIS Traffic Removed	TIS traffic communications have ceased for >12 seconds
TIS Unavailable	TIS Traffic Unavailable	No TIS ground station is available or communications have ceased for >60 seconds
Too Low, Terrain	Premature Descent, below glide path	TAWS PDA algorithm has determined the aircraft is below glide path.
Sink Rate	Excessive Descent Rate	TAWS EDR algorithm has determined a potential CFIT scenario is developing – recover the aircraft
Don't Sink	Negative climb rate or altitude loss	TAWS NCR algorithm has determined corrective action should be taken immediately.
TAWS Fail	Invalid GPS Position/Velocity	The GPS solution is lost or the GPS velocity quality parameters drop below required accuracy limits. A "bing-bong" chime is played if this condition occurs. Contact the Avidyne Service Center if this persists across power cycles.
TAWS System Failure	TAWS Failed Self-Test [reason why]	TAWS failed self-test for the reason provided and TAWS will be degraded or not available for the power cycle. Contact the Avidyne Service Center if this persists across power cycles.

The pilot should utilize available instruments/data displays to verify message(s) and take appropriate action(s) (ref POH/AFM) by selection of alternate systems or settings. Invalid messages generally indicate a failed sensor and that other messages associated with that system will be unavailable. Caution messages indicate the possibility of a pilot action.

Terrain Alert Caution Maneuver

When a terrain alert caution occurs, verify the aircraft flight path and correct it, if required. If in doubt, perform a climb until the caution alert ceases.

Section 4 – Normal Procedures

To Activate the IFD4XX/IFD5XX/Atlas:

1. Verify IFD circuit breakers (2) ---------- IN
2. Verify Battery Master Switch ----------ON
3. Avionics or Radio Master (if equipped) ---------- ON

To Deactivate the IFD4XX/IFD5XX/Atlas :

4. Avionics or Radio Master (if equipped) ---------- OFF
   or
5. Press and hold the Power Knob---------- OFF

Autopilots

Reference autopilot Pilots Guide and AFMS.

The IFD4XX, IFD5XX and/or Atlas may be coupled to an autopilot. Autopilots coupled to the IFD in (NAV) mode will follow GPS or VHF navigation guidance as they would with any VOR/LOC receiver. Autopilots providing GPSS (GPS Roll Steering) course guidance will lead course changes (curved transition), fly arcs, holds and procedure turn/reversals.

IFD 5XX and Atlas with TAWS Enabled

When the Terrain Awareness and Warning System (TAWS) option is enabled and the HELO option is not enabled, the IFD provides a TAWS-B function. TAWS-B does not require any external equipment, with the exception of external annunciators when the IFD/Atlas installation location does not meet annunciation field of view requirements, and alert audio must be wired to the appropriate unswitched input to an audio panel.

When enabled, TAWS is always running in the background, and does not have a dedicated display page, although the Synthetic Vision tab will be relabeled “TAWS.”

TAWS Inhibit Control

The FLTA and PDA functions of TAWS can be inhibited by several means including the Setup Page, an external switch, and the TAWS page. Inhibiting these two functions can be useful in some scenarios like VFR flight in an area of significant terrain, VFR low altitude flight, and during operations at airfields that are not in the nav database or to user waypoints that have been designated as an airport.

TAWS Self-Test

TAWS self-test is conducted automatically at power up. While the self-test is running, external TAWS related annunciators are illuminated and the TAWS page will show “TAWS Self-Test In Progress”. Whether the self-test passed or failed will be annunciated using an aural message.

If TAWS had passed self-test and then fails at some point later in the power cycle, a “bing-bong” chime is issued along with a CAS message.

Degraded Or No TAWS Conditions

TAWS is degraded or not available when any of the following conditions exists:

GPS is unavailable or in Dead Reckoning mode

GPS position accuracy is excessively low

Terrain database is invalid or not available

Obstacle database is invalid or not available

Nav database is invalid or not available

Aircraft is on the ground

The system is configured for an external TAWS system

The TAWS option is not enabled

Section 5 – Performance

No change from basic Handbook.

Section 6 – Weight and Balance

No change from basic Handbook. See POH for current weight and balance for this aircraft.

Section 7 – Systems Description

See Avidyne IFD4XX, IFD5XX and/or Atlas FMS/GPS/Nav/Com Pilot Guides:

P/N 600-00300-001 for the IFD5XX Series
P/N 600-00304-000 for the IFD4XX Series
P/N 600-00300-002 for the Atlas Series
P/N 890-00039-010 Bendix King AeroNav 900 and 910
P/N 890-00041-008 Bendix King AeroNav 800