Avidyne Corporation
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FAA Approved

Airplane Flight Manual Supplement

For

_____
Make and Model Airplane

with

Avidyne Integrated Flight Displays p/n 700-00182-XXX and 700-00179-XXX

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) and/or 700-00179-XXX Integrated Flight Display installed in accordance with STC SA00343BO. 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 _____ AIRWORTHIGHT FOR MANAGER

Boston Aircraft Certification Office
Federal Aviation Administration
Burlington, MA

FAA APPROVED
Date: MAR 2 0 2017

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LOG OF REVISIONS

Revision Number	*Revised Pages*	*Description of Revisions*	*FAA Approval*	*Date*
00	ALL	Initial Release	Robert Mann	Jul 24 2014
01	Pages 1,2, 3, 4, 5, 6, 7, 8, 9, 11, 15, 16, 17, 18, 21	Add IFD440 and Software Release 10.1.0.0	-	-
02	Pages 13, 14, 19	AEG comments	Robert Mann	Jun 18 2015
03	Pages 2, 3, 4, 7, 8. 9, 10, 11, 12, 13, 18, 19, 20, 21, 24	Add models IFD410, IFD510, IFD545, IFD550 and software version 10.2	-	-
04	Pages 4 - 24	Added 91.227 compliance statement	-	-
05	Pages 11, 13, 22	Added limitation regarding use of radar display, added EmProc for disabling wireless connectivity.ACO comments incorporated	Anthony Pigott	Mar 06 2017
06	Pages 13	Added note regarding IFD4XX FLTA aural alert conflicts with other sensors	MAR 2 0 2017	

A vertical black line in the margin shows revised portions of affected pages.

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Section 1 – General

This airplane is equipped with an Avidyne p/n 700-00182-000 IFD5XX Integrated Flight Display (IFD) and /or Avidyne p/n 700-00179-000 IFD4XX Integrated Flight Display. Both 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 and IFD550) 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).

GPS/SBAS TSO-C146c Class 3 Operation
The IFD4XX and IFD5XX has airworthiness approval 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 and IFD5XX are approved for approach procedures with vertical guidance including “LPV” and “LNAV/VNAV” and approaches without vertical guidance including “LP” and “LNAV”.

The IFD4XX and IFD5XX comply with the requirements for GPS Class II oceanic and remote navigation (RNP-10) and (RNP-4) without time limitations. A second navigation source may be required for these operations to meet availability requirements.

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.

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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 and IFD5XX 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.

ADS-B OUT Compliance
The installed IFD4XX and/or IFD5XX installed per this STC in conjunction with Garmin GTX330ES or GTX335/345 transponders have been shown to meet the equipment requirements of 14 CFR 91.227 for ADS-B OUT.

IFD4XX and IFD5XX 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.

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Figure 1. Avidyne IFD540 700-00182-XXX Integrated Flight Display (IFD).

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Figure 2. Avidyne IFD440 700-00179-XXX Integrated Flight Display (IFD).

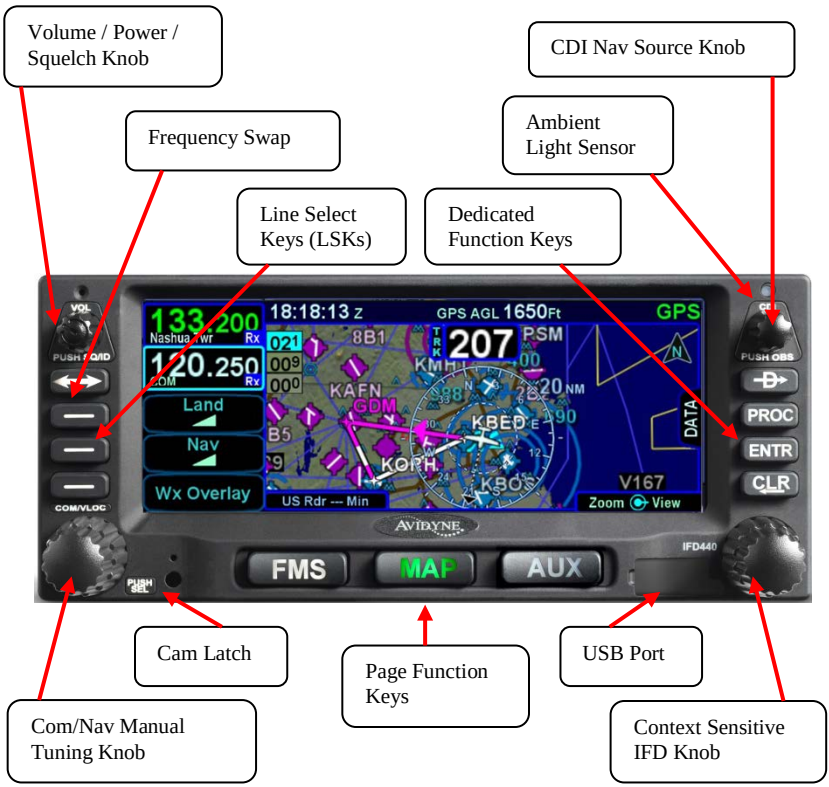

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Figure 3. Avidyne IFD550 700-00182-XXX Integrated Flight Display Ego-centric SVS.

Section 2 – Limitations

1. The Avidyne IFD4XX and IFD5XX Integrated Flight Display Pilot Guides:
   P/N 600-00300-001 for the IFD540
   P/N 600-00304-000 for the IFD440
   P/N 600-00317-000 for the IFD545 and IFD550
   P/N 600-00318-000 for the IFD510
   P/N 600-00319-000 for the IFD410
   must be available to the pilot during all flight operations.

2. For Class I airplanes (single engine, piston, under 6,000# GTOW), a single IFD5XX or IFD4XX is sufficient 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. The IFD4XX and/or IFD5XX installed with an SBAS approved antenna, provides 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) – IFD440, IFD540, IFD550 only
   - RNP 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; and
- LP minima.

Note: The U.S. titles RNP instrument approach procedures "RNAV (GPS) Rwy XX". Other States may use similar titling or may title these procedures "RNAV (GNSS) Rwy XX".

- RNP terminal procedures, including RNP arrival procedures and RNP departure procedures.
- RNAV terminal procedures, including RNAV arrival procedures and RNAV departure procedures.

The IFD4XX and/or IFD5XX 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 procedures (procedures using VHF radio guidance) – IFD440, IFD540, IFD550 only;
- RNP instrument approach procedures using the following lines of minima:
  - LNAV minima.
- RNP terminal procedures, including RNP arrival procedures and RNP departure procedures.
- RNAV terminal procedures, including RNAV arrival procedures and RNAV departure procedures.

4. When GPS is available, the IFD440 and/or IFD540/550 , may serve as an RNAV alternate or substitute means of navigation for ground-based navigation aids that are out-of-service or unavailable.

5. GPS/SBAS based IFR enroute, oceanic, and terminal navigation is prohibited unless current Navigation and Procedure databases are installed.

6. Use of RNP terminal operations and RNP instrument approach procedures containing RF leg segments (identified on the approach plate) is prohibited.
7. In areas where SBAS coverage is not available, the pilot must check RAIM availability.
8. The Avidyne moving map display provides visual depiction of the aircraft's own-ship, GPS position on a moving map for situational 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.
9. The Avidyne electronic checklists display supplements the Pilot Operating Handbook checklists and are advisory only. The pilot shall not use the electronic checklists as the primary set of on-board aircraft checklists. FAA Approved Flight Manual paper checklist must be available to the pilot as the primary reference.
10. The IFD integrates with separately approved system installations such navigation indicators, remote annunciators. Adherence to limitations in installation AFM supplements for those systems is mandatory.
11. The use of datalink, traffic and lightning sensor information displayed on the IFD4XX and IFD5XX must be in compliance with the approved AFM supplements for those systems.
12. Gloves may not be used to operate the IFD4XX and IFD5XX touch functions unless the Glove Qualification Procedure located in the IFD4XX/IFD5XX Pilot's Guides has been successfully completed.

13. 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.

14. 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.

15. 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).

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 IFD440 or IFD540 GPS receiver, the FMS will enter dead reckoning mode for 5 minutes, after that 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 IFD440, IFD540 or IFD550 VHF navigation, the pilot should revert to remaining navigation receiver (required for IFR operations).

Warning Messages

Caution and warning messages provided by the IFD4XX and IFD5XX are related to functions performed by the IFD4XX and IFD5XX 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.

CAUTION

IFD4XX units lack an audio inhibit output to preclude other sensors aural alerts from sounding while IFD4XX forward looking terrain awareness (FLTA) aural alerts are issued. Simultaneous alerts are possible. Example; a TIS-B aural traffic alert could be issued at the same time as an FLTA terrain or obstacle aural caution or warning.

To Disable WiFi/Bluetooth Connectivity on IFD4XX/IFD5XX:

1. Press and hold the IFD4xx/IFD5XX 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---------- Extinguish

Caution 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
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.
Pull Up	Excessive Descent Rate	The TAWS Excessive Descent Rate algorithm has detected a CFIT potential – initiate an immediate recovery maneuver.

EXCEEDANCES | CAUTIONS YELLOW

Short Text	Long Text	Comments
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.
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.
GPS Fault Dead Reckoning	Position updated via dead reckoning	The system will use the last known position and groundspeed (and heading if available) to estimate the aircraft position following loss of GPS for up to 5 minutes. Since Dead Reckoning assumes no directional or groundspeed change, it will not be reliable even during those first 5 minutes if either or both of these factors have changed. Execute a missed approach if this occurs while performing a GPS based approach. Use an alternate GPS or VHF navigation receiver.

Short Text	Long Text	Comments
GPS Fault No Position	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.
VNAV Lost Use LNAV MDA	Excessive XTK or Low GPS Integrity for Vertical Guidance	Transition to LNAV 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.

Short Text	Long Text	Comments
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.
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.

Short Text	Long Text	Comments
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.
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.

Short Text	**Long** Text	Comments
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.
Xpndr Fault	AXP322 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: Echos Ahead	Radar: Heavy Echos Ahead	Generated when a number of red and/or magenta echos 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 t aken immediately.
TAWS Fail	Invalid GPS Positon/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.

Section 4 – Normal Procedures

To Activate the IFD4XX/IFD5XX :

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 :

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

IMC Operations with Weather Radar

1. While operating in IMC conditions with weather radar active, activate lightning detection system and monitor. Correlate lightning strike information with painted radar information to confirm proper system operation.
2. In the event that radar data and lightning do not coincide, contact ATC for the latest severe weather information.

Also see Avidyne IFD4XX/IFD5XX Pilot's Guides for Normal operation procedures.

Section 5 – Performance

No change from basic Handbook.

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Section 6 – Weight and Balance

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

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Section 7 – Systems Description

See Avidyne IFD4XX and IFD5XX FMS/GPS/Nav/Com Pilot Guides

P/N 600-00300-001 for the IFD540
P/N 600-00304-000 for the IFD440
P/N 600-00317-000 for the IFD545 and IFD550
P/N 600-00318-000 for the IFD510
P/N 600-00319-000 for the IFD410