

# **DRAB POL** <sup>®</sup> **NEWS**

A V I O N I C S

Quarterly Newsletter no 1 (82) January – February – March 2019

www.drabpol.pl

## **Drabpol Avionics for Business and General Aviation**

„The fundamental principle of transportation is its safety”

SkyHa



## Ladies and Gentlemen! Dear Readers!

The Avionics Department is our youngest but dynamically developing department. The name (AVIONICS) speaks for itself – it is a combination of AViation and electronics – electrONICS.

With the new 2019, we decided to split our quarterly newsletter into two separate parts - a section devoted to automotive topics and a part related to the aviation. We are convinced that such a division will be more transparent for our Readers.

The new Drabpol News formula offers a chance for a brief approximation of our avionics department. It is divided into the PART 21 design office that provides services in the scope of designing changes in avionics equipment on aircraft and the PART 145 service organization that offers all base and line services on aircraft, such as installation, tests, controls and regulations, as well as repairs, installations and updates of avionics systems software and repairs of avionics devices.

We began our adventure with avionics industry in 2007. The first company with which we established cooperation was the American concern - Honeywell. Our company did not stay idle in this field.

For the next 12 years, we have been expanding our actions to cooperate with many major and respected companies and brands, both General and Business Aviation.

We will present all the innovations and our activities related to General and Business Aviation on the columns of our quarterly.

We wish you pleasant reading!

Alicja Drabczyńska



### In this issue you can find:

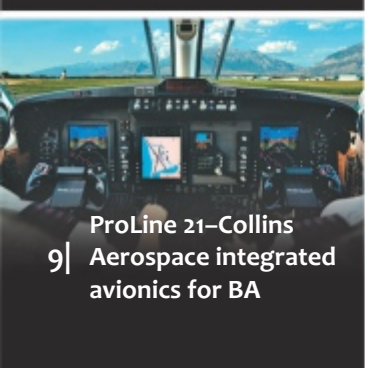
3. AEA Connect Europe
4. AEA under new leadership
9. Rockwell Collins as a part of Collins Aerospace
9. ProLine 21–Collins Aerospace integrated avionics for BA
12. News – GARMIN avionics
  12. New GTX 325 Mode C transponder – a successor to GTX 327
  12. The new G500H TXi display is already on the market!
  13. New GPS 175 and GNX 375 GPS navigation systems
  15. Certification of G3X Touch system for single-engine piston aircraft
16. Top 10 avionics upgrade mistakes
19. A modern instrument panel
21. Universal Avionics – the latest news
  21. Personalization of the UniLink™ customer database
  22. VNAV navigation with temperature compensation
22. Technical and service news



AEA under new  
4 | leadership



New GPS 175  
13 | and GNX 375 GPS  
navigation systems



ProLine 21–Collins  
9 | Aerospace integrated  
avionics for BA



16 | Top 10 avionics  
upgrade mistakes

# The annual AEA Europe Connect Conference in Cologne

January 22-23, 2019

## AEA Europe Connect Conference

AIRCRAFT ELECTRONICS  
ASSOCIATION

This year, two months before the American AEA Convention in the US, its European edition, AEA Europe Connect, took place. A two-day meeting of electronics specialists from the General Aviation industry, including representatives of our company, was held in Cologne, Germany.

Annual conferences, formerly known as the AEA Regional Meetings, give all participants a large dose of knowledge concerning regulatory updates and the latest legal regulations. The symposium was attended by representatives of manufacturers, PART service organizations, as well as FAA / EASA inspectors. Everyone actively participated in the discussion on the most important regulations and at the same time showed an increasing desire to cooperate in favor of the aviation environment.

The AEA Convention means also a presentation of the latest equipment of avionics manufacturers, combined with product trainings conducted by engineers and technicians.

For us, the conference was also an opportunity to meet with our partners, who were present in Cologne as exhibitors – Aspen Avionics, Avidyne Corporation, BendixKing, Garmin, Mid-Continent Instruments, Trig Avionics and Appareo.

Many of them presented their latest products, e.g. Bendix King showed the latest AeroVue Touch display, that can be installed as the main flight display in a new, certified aircraft or as a replacement for obsolete indicators in already flying aircraft. We also participated in a product training organized by Garmin and Avidyne. Garmin discussed issues related to installation, configuration and certification of TXi, G5i, GFC500, GFC600 systems.

Avidyne, on the other hand, shared information on the installation and configuration of the new generation of flight management systems – IFD550 / 540/440.

*On behalf of European members of the association, Mr Gunter Hemmel - the owner of Avionic Straubing company – handed the retiring President Paula Derks a commemorative present.*

We would like to emphasize that this year's AEA Connect was the last European conference attended by the retired President of the AEA Organization - Mrs. Paul Derks.

On behalf of European members of the association, Mr Gunter Hemmel – the owner of Avionic Straubing company - handed the retiring President Paula Derks a commemorative present. We personally said goodbye to Mrs. Paula Derks during the American AEA convention.





**62<sup>nd</sup> American AEA INTERNATIONAL Convention  
in Palm Springs**

**March 25-28, 2019**

# AEA

# AIRCRAFT ELECTRONICS ASSOCIATION

## under new leadership

For the 11th time, as a permanent member of the AEA association, we participated in the convention that took place in sunny Palm Springs, California.

For decades, the AEA Convention has been the most important event devoted to General and Business Aviation. Nearly 2000 representatives of member companies from 43 countries - avionics manufacturers, repair stations, installers, and other general aviation companies - participated in this year's AEA Convention.

### 2019 AEA Member of the Year

This year's edition was special for our company. For the first time, President of Drabpol – Mr. Paweł Drabczyński – was nominated for the prestigious „Member of the Year” award.

This nomination is a very distinct honor in the avionics environment. It is AEA Management Board that annually decides about nominations, analyzing the achievements of the nominees and their impact on the aviation industry, both in terms of offered products and engineering solutions in the field of

avionics equipment upgrades on aircraft.

The other nominees in this category were: Kevin Miesbach from Duncan Aviation, Pahan Ranasingha z from Avionics Installations Inc. and Todd Winter from Mid Continent Instrument

Instruments and Avionics, with which we have been cooperating since 2010. The company has been operating on the market for over 50 years, as it started its activity in 1964 as a small repair station for the growing aviation market.

In 1980, it expanded the scope of its



The list of nominees for this year's „Member of the Year” award was announced by the new President of AEA, Mr. Mike Adamson.

and Avionics – representatives of companies that have been well known in the field of sales and service of avionics components for several or even several dozen years.

This year's „AEA Member of the Year” award went to Mr. Todd Winter – the president and CEO of Mid-Continent

activity to the production of avionics and quickly gained the reputation of a professional supplier of both products and services.

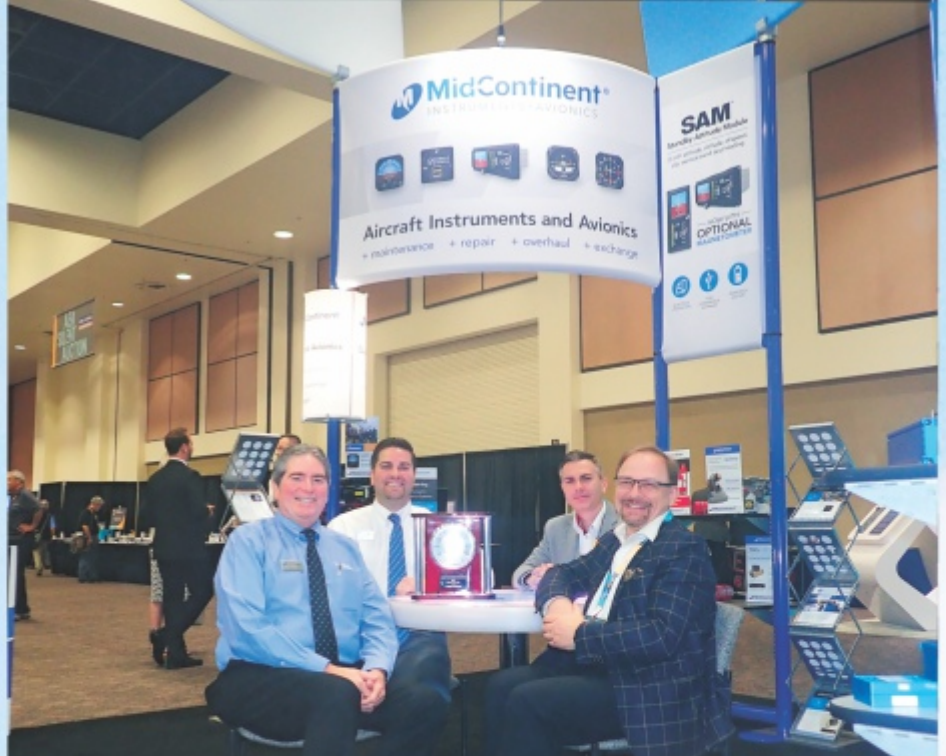
In 1991, Todd Winter took over the leadership of the company; at the same time, the company opened its second headquarters in California. In 2012, the



company added Avionics to its name in order to better illustrate the profile of its operations, mainly for repairs of flight instruments. At present, the scope of qualifications / authorizations includes about 6000 products.

The 28-year activity of President Todd Winter has been appreciated by members of the AEA Committee. We cordially congratulate to the winner and all nominees.

For our company, the nomination of President Paweł Drabczyński is a great reason to be proud. Finding yourself among the selected group of nominees and „competing” with global aviation organizations is a real accomplishment, taking into account the difference in the „aviation practice”.



We were pleased to visit this year's winner of the „Member of the Year”, Todd Winter – the President of MidContinent Instrument and Avionics - at the company's trade fair stand.

## 2019 AEA MEMBER OF THE YEAR NOMINEES

- Paweł Drabczyński – Drabpol Sp. Jawna, Mykanów, Poland
- Kevin Miesbach – Duncan Aviation, Lincoln, Nebraska, USA
- Pahan Ranasingha – Avionics Installations, Port Orange, Florida, USA
- Todd Winter – MidContinent Instrument and Avionics, Wichita, Kansas, USA

The official presentation of nominations and the awarding ceremony took place during the ceremonial Gala that took place on the first day of the Convention.

## MIKE ADAMSON – New AEA President



At this year's AEA Convention, an official presentation of the new AEA President took place. Mr. Mike Adamson had been a member of the AEA board for many years. He was also responsible for incorporation of many improvements in the life of the Organization.

Therefore, no one had the slightest doubt that he would be the right person in the right place as President Paula Derks retired. The changes also took place at the position of the Chairman of the AEA Management Board, to which Garry Joyce was appointed.

Right after the official appointment, we had the pleasure of talking to the new AEA President Mike Adamson. The new AEA President gave a brief interview for readers of our quarterly.

### 1. Can you please introduce yourself?

I have been involved in the aviation industry for over 20 years and my experience in this field includes military, commercial, business and general aviation.

After completing a tour in the U.S. Navy, I earned a bachelor's degree in aviation management from Southern Illinois University and a master's degree in business administration



from Avila University in Kansas City, Mo. I am an active member of several industry and academic advisory committees and I oversee, among others, AEA's training and education initiatives delivered to technicians and small-business owners throughout the world. Since joining the association in 1999, I have developed AEA's extensive offering of online, classroom and regional training courses. Before I took up the position of AEA President, I held the position of the Executive Director of the AEA Educational Foundation that administers the largest scholarship program for aircraft and avionics maintenance technicians in the world.

## **2. What challenges do you see for the AEA?**

Our biggest challenge is recruiting the next generation of aviation professionals. From pilots to technicians this will be the focus for the foreseeable future. When you consider high tech fields, avionics is a clear standout. We should have an advantage when we recruit but we are in competition with so many other high-tech fields. Our challenge will be to find as many ways as possible to share our story with the next generation, create a pipeline of talent and facilitate ways to train technicians to be productive earlier in their employment.

## **3. As a new President of the AEA, do you see the need to introduce any changes?**

AEA has had the right formula for 62 years. My goal is to continue our legacy of success while helping our members stay ahead of the technological advances in the cockpit and cabins of modern aircraft. The future will look different, but our mission will remain the same; enhance the probability of our members, facilitate communications, further education, encourage quality and best practices and influence the regulatory and legislative process with authorities around the world.

## **4. Are there any issues important for the aviation environment that require prompt regulatory action and that could be supported by the AEA?**

With multiple authorities controlling aviation rulemaking around the world there is constant demand on AEA to stay on top of the issues. Almost daily we are responding to regulatory changes or guidance from these authorities. Fortunately we are well positioned with our regulatory leadership and a team of consultants to make sure AEA is responding with our members best interests in mind from a maintenance organization perspective and from an equipment manufacturer perspective.

## **5. How do you see the cooperation with EASA or national civil aviation authorities such as Polish ULC?**

The AEA is very active with the international authorities. We maintain an office in Cologne, Germany and have regular meetings with EASA and other European authorities when appropriate. We participate with other associations in numerous rulemaking activities and we lead international harmonization efforts with the FAA when it impacts our members and their business.



## **6. What values are taken into consideration when individuals and organizations are nominated for the „AEA member of the year” or „Associate member of the year” awards?**

Factors to be considered include regular participation at AEA events and how active the member or the company is with AEA in supporting our mission. These nominations are a very distinct honor and the individuals and companies who are considered represent the best of our industry. It was truly an honor to announce Paweł Drabczyński as an AEA Member of the Year nominee this year at our International Convention and Trade Show. I warmly congratulate on this prestigious nomination.

## **7. What would you like to tell electronics engineers and avionics engineers, both those in Poland and in Europe?**

The AEA is an organization established to serve aviation maintenance organizations and manufacturers. If there is anything we can do to help you from a regulatory, technical, networking or business perspective please let us know. Consider attending our AEA Connect Conferences held each January at various locations throughout Europe. Please visit our website [www.aea.net](http://www.aea.net) and read our digital edition of Avionics News magazine [www.aea.net/avionicsnews](http://www.aea.net/avionicsnews) to stay informed on all that AEA is working on.

**Thank you very much for the interview and we wish you a lot of success!**

## **A farewell of a long-time AEA President and CEO Paula Derks**

One of the most important events for the entire AEA organization was the official farewell to the outgoing AEA President Paula Derks and handing over the reins to the incoming leader Mike Adamson.

Paula Derks retired after 23 years of managing the organization, what was announced during the Las Vegas convention last year. The Association prepared a special, farewell party





## Trainings and new products

Although this year's Convention had its specific, unique character, we should remember that the annual symposiums also include product and service presentations of member companies, as well as a number of trainings on products or current regulations.

The exhibition part of the convention gathered as many as 134 exhibitors, including our partners, with whom we have been cooperating for years. Many of them, like BendixKing, Garmin, Universal Avionics, Avidyne, Aspen Avionics, Appareo or Mid Continent, were also sponsors of this year's Convention.

With great interest, we took part in selected trainings and got acquainted with the latest news on the avionics market, and there were a lot of them.



dedicated to Paula Derks. Everyone could personally thank to the President for decades-long service for the AEA, for the great development that AEA achieved under leadership of Paula Derks, and for everyday help and support provided to AEA members on a daily basis. It was a moving moment.

We also personally said goodbye to the outgoing President. We handed Mrs. Paula Derks a specially created album containing a lot of commemorative photos from the conferences and meetings that we jointly participated, as well as photos showing Poland's most attractive places, which may be an incentive to visit our country. The album also contained a small surprise - a special video that will surely be a nice recollection of cooperation with our company and other members of AEA.



President Paweł Drabczyński personally said goodbye to the retired AEA President, Paula Derks.

## GARMIN.

Garmin presented a new series of GPS devices – GNX 375 and GPS 175, referring to the style of known GTN in combination with the ADS-B receiver and transponder, which as far as the size is concerned corresponds to the former GPS 150 / 155XL devices.

Certainly, the new series will be well received by the future users.





# BendixKing

BendixKing presented a new AeroVue Touch™ at its stand – fast, simple and powerful flight display for certified aircraft.

AeroVue Touch can be installed as a primary flight display or as MFD display. Another novelty was an attitude indicator with additional altitude and airspeed information – KI 300. It can be used as a replacement for the traditional attitude indicator or as a complementary device for the AeroVue display with a standby indicator. The new BendixKing offer was completed by the AeroPoint 200 engine monitor, that is very similar in function to the well-known JP Instruments devices and the AeroCruze 100 autopilot.



# Honeywell

Our another partner – Honeywell - focused on presentation of Aspire® satellite communications system that provides in-flight connectivity for business aviation, airlines and helicopters all over the world.

Utilizing the Inmarsat satellite system, Aspire® 400 provides greater reliability, cost savings and efficiency from pole to pole.

The Honeywell Aspire 400 Satellite Communications System delivers high-speed voice and data communications for cockpits and cabins in a compact and lightweight package.



## Dinner in the museum

Gala dinners organized by both AEA and avionics manufacturers for their dealers are already convention tradition. Once again, we had the pleasure to participate in such evenings. The AEA association has invited its guests to the Palm Springs Air Museum, that has one of the world's largest collections of flying

combat aircraft from the World War II, many of which were built in Southern California. For those who are fans of aviation of that period, this evening was a real treat.





# Rockwell Collins as a part of Collins Aerospace



In the aviation environment, mergers of tycoons in the aviation industry recently become more and more popular in the aviation environment. At the end of 2018, the merger of Rockwell Collins and UTC Aerospace Systems took place, resulting in the creation of Collins Aerospace. The company is based on heritage of Rockwell Collins - a leader in aviation and solutions with a high level of integrity - from avionics and cabin systems to simulation and training solutions.

The achievements of the second company that is part of Collins Aerospace are also very significant for aerospace and defense history- ranging from the propeller that powered Amelia

Earhart's nonstop flight across the Atlantic to the spacesuits worn by American's first astronauts during the Mercury program.

At present Collins Aerospace includes six strategic business units throughout the United States, that serve customers across the commercial, regional, business aviation and military sectors.

## Collins Aerospace Pro Line 21™ integrated avionics for BA



For Business Aviation, our partner, Rockwell Collins, that is now a part of Collins Aerospace offers the newest Pro Line 21 integrated avionics system from the King Air family.

The Basic package includes the latest version of AFD 10.4 and the FMS software rel. 4.2 that support the international LPV/RNP and constitute a basic element for the operation of other options, such as ADS-B, IFIS 6 or SVS.

Due to the wide range of possible configurations within the King Air family, packages can vary in price and equipment. The Pro Line 21 series is more than just a synthetic vision. These are also integrated messages of ADS-B Out system as well as co-operation with a satellite support system for Europe, such as:

### ► ADS-B Out (mandatory from 2020)

*Worldwide accepted new aviation standards.*

NextGen moves from a radar-based system to a satellite-based system, which will significantly affect efficiency of the air traffic.

### ► WAAS z GPS

*NextGen airspace with an updated WAAS system.*

WAAS is the technology that enables precision RNAV GPS approaches, LPV and the ADS-B Out mandate.



► **Synthetic vision – the new standard**

Fly with increased confidence at night, or in any weather.

- You always know where you are relative to nearby terrain
- Orientation, clarity and simplicity during approach
- See where your airplane is going with Flight Path Vector

► **SFlight Management**

Taking advantage of the latest routes and terminal procedures requires the latest FMS technology.

- Saves time and money by enabling LPV approaches
- Uses GPS as primary means of navigation
- ddsXYZ approaches

RNP

DME/DME RNP-0.3 NA.

PROV. LITAH	AI-683 (FAA)	15176
WAA5 CH 97307 W13A	APP CRS 134°	Rwy Idg TDZE 4497 Apl Elev 4497

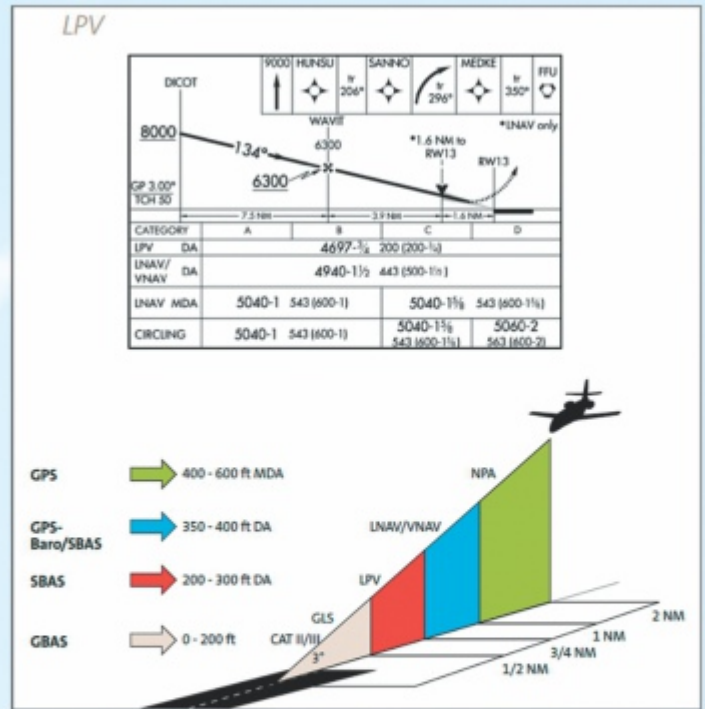
**RNAV (GPS) RWY 13**  
PROVO MUNI (PVU)

For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -23°C (-9°F) or above 40°C (104°F).  
DME/DME RNP-0.3 NA.  
Circling NA east of Rwy 18 and 31.

MISSED APPROACH: Climb to 9000 direct HUNSU and on track 206° to SANNO and right turn on track 299° to MEDKE and on track 350° to FFU VORTAC and hold.

- Automatically shares takeoff and arrival data with IFIS and SVS
- More precision approaches available at more airports
- More than 4,000 LPV approaches available in the United States

Without SBAS, the user is restricted to the NPA approach minimums



# Capabilities

► **Aircraft Information Manager (AIM)**

No more worries - from now on databases can be sent directly to the aircraft.

With the IMS-3500 and AIM, Collins will deliver the database directly to the aircraft, send you a text message when the database is ready and, with a couple of keystrokes, transfer it to the FMS or IFIS systems (if required).





► 10Data link (VHF)

Sends your flight plan directly to the aircraft.

► Second MS/GPS

Essential in critical situations.

► High-frequency (HF) RADIO

Collins Aerospace is the industry leader in HF radios.

- A cost-effective solution that provides aircraft with worldwide communication capabilities
- Full-frequency HF system permits direct tuning of any of 280,000 frequencies between 2.0 and 29.9999 MHz in 100 Hz steps when operated in the discrete frequency mode
- Discrete frequency mode provides USB, UD, AM equivalent, CW, LSB and LD operation. The users can program 99 channels operate in any of these modes.
- Tuned directly from CDU

► Integrated EFB (IFIS)

Pro Line 21 IFIS has a positive effect on operators' concentration. The series includes standard EFB functions (such as charts, weather and updated maps), thanks to which the FMS system automatically transmits flight plan data do IFIS.

This enables automated chart selection, presenting aircraft position and flight plan on chart. Pilots have better situational awareness while simultaneously reducing their workload, in comparison to federated EFB.

- Position of your own aircraft on the card
- SIDS, STARs, approaches, airport charts
- XM WX Satellite Weather
- Enhanced maps with airways and intersections
- Geopolitical boundaries
- Chart link



Pilots now have the perfect opportunity to upgrade avionics and improve their performance with Rockwell Collins flight instruments - ARINCDirect

- A comprehensive flight planning tool
- Smooth connections inside the cabin
- Award-winning support team
- Flexible FOS (ARINCDirect Flight Operations System).

Cabin solutions

Every flight is more enjoyable with options such as Airshow moving maps. So you can discover new destinations and points of interest and just be up to dateduring the whole journey. The Airshow application is available for iPad and Android tablets.





## Garmin Introduces GTX™ 325 Mode C Transponder GTX 327 Succeeded by GTX 325

We are pleased to announce that our partner - Garmin company has introduced to the market the GTX 325, a new digital Mode C transponder that will replace the GTX 327.



Garmin is pleased to introduce the GTX 325, a new digital Mode C transponder based on the popular GTX 335 and GTX 345. Offering a simple, affordable replacement for standard Mode C transponder units in aircraft that don't fly in ADS-B or Mode S mandated airspace — or that will be equipped with a separate UAT ADS-B transceiver solution — the GTX 325 transponder is a



reliable, TSO-certified problem solver.

Featuring an easy-to-read LCD display designed for optimal viewing in all lighting conditions, GTX 325 offers a number of useful timing and display functions. Dedicated push buttons numbered 0 through 9 make for quick and easy squawk code entry, while a dedicated VFR button pulls up the VFR code with a single keystroke. Compatibility with the GTN 750/650 series of integrated GPS/Nav/Comm systems also enables transponder code selection and control from the navigator's touchscreen display. GTX 325 is also compatible with the Garmin altitude encoder — which conveniently mounts to the transponder backplate for easy installation and service, precluding the need for a static leak check after removal of the transponder for maintenance.

Effective immediately, GTX 327 is discontinued. Though new GTX 327 transponders will no longer be available from Garmin, they will continue to be fully supported by the Garmin aviation support team.

## Garmin Begins G500H TXi Shipments



Deliveries of the new G500H TXi flight displays dedicated to helicopters started at the beginning of this year.

### New GTN™ 650/750 Series Software Approved for Helicopters

Garmin is pleased to announce that initial shipments of the G500H TXi flight displays have begun. The Federal Aviation Administration (FAA) has granted supplemental type certification (STC) for the installation of the G500H TXi system with an approved model list (AML) that includes select models of Bell 206/407/427, Airbus AS350/EC130,

Robinson R44 and MD Helicopters MD500/530. Garmin is continuing the efforts with EASA to validate this STC and we hope to announce the approval shortly. The G500H TXi offers a vastly expanded feature set with an array of



panel possibilities and a streamlined upgrade path for helicopters already equipped with the original G500H flight display. Additionally, GTN™ 650/750 Series software version 6.51 has also been approved for helicopters from both the FAA and EASA. Together, G500H TXi and GTN offer seamless touchscreen continuity in the cockpit, bringing a new level of reliability, adaptability and affordability to helicopter operations.

### Optimized for Helicopter Operations

Designed specifically for FAR Part 27 VFR helicopters, G500H TXi boasts a bright LCD design — including a large 10.6" display and 2 versions of 7" displays, available in portrait or landscape orientation — and features traditional concentric knobs for added versatility and convenience. G500H TXi can be equipped with a five-color Helicopter Terrain Awareness and Warning System<sup>1</sup> (HTAWS), WireAware wire-strike avoidance technology and Garmin HSVT 3-D synthetic vision. G500H TXi also supports multiple video input options, night vision goggle (NVG) compatibility and a graphical map overlay within the horizontal situation indicator (HSI) for most display formats. The system includes a 2-year warranty, supported by our award-winning avionics product support team. Please contact your regional sales manager with any questions.

# Garmin Introduces GPS 175 and GNX 375 GPS Navigators



The new GPS 175 and GNX 375 GPS navigators with Localizer Performance with Vertical guidance (LPV) approach capability were introduced to the market in spring.

Pilots receive the benefits of high-integrity WAAS/SBAS GPS guidance in a compact, (6.25-inches wide by 2-inches tall) minimally intrusive design that is both cost-effective and easy to incorporate into an existing avionics stack.

GPS 175 is a stand-alone certified IFR navigator and GNX 375 adds 1090 ES ADS-B „Out” as well as dual-link ADS-B „In” via a built-in transponder. Intended for Class 1/II aircraft that weigh 6,000 lbs/2,721 kg or less as well as experimental/amateur-built (EAB) aircraft, GPS 175/GNX 375 have received STC with an approved model list of more than 700 aircraft makes/models.

button offer added versatility when interfacing with the touchscreen. The user interface has been optimized for the size of the display while also retaining a familiar menu structure similar to other Garmin products. Dedicated pages within GPS 175 include a moving map, flight plan, nearest, procedures, waypoint information and terrain pages, and GNX 375 adds traffic and weather pages. The addition of a Direct-to button on the touchscreen offers quick access to direct airport or waypoint navigation. Customizable data fields and shortcuts on the moving map to pilot-selectable pages such as the nearest airport allow for quick, one-touch access to important information in-flight.

### Intuitive Navigation

Slim and unobtrusive, the GPS 175/GNX 375 serve as an economical WAAS/SBAS GPS that are both IFR approach-capable.

A vibrant, colorful touchscreen display enables quick and intuitive entry of flight plan information, while a dual concentric knob and dedicated home





## Advanced Approach to IFR



Fully WAAS IFR-approach-capable, the GPS 175 and GNX 375 navigators give pilots the benefit of accessing newer LPV, Lateral Performance (LP), as well as all Area Navigation (RNAV) approaches. Many approaches can offer vertical approach guidance as low as 200-feet above ground level (AGL).

Pilots can also leverage the touchscreen and moving map to easily generate customized holding patterns over an existing fix in the navigation database or a user-defined waypoint and easily insert it into a flight plan. Visual approaches are also available within GPS 175/GNX 375 and provide lateral and vertical approach guidance in visual flight conditions. Visual approaches offer added assurance at unfamiliar airports or in challenging environments to ensure the aircraft is aligned properly with the correct runway while also taking into consideration terrain and obstacle avoidance.

## Cockpit Integration

Intentionally designed to replace earlier-generation products such as the iconic GPS 150/155 series, GX 50/55, as well as the KLN 89/90/94 series, aircraft owners won't have to make significant panel modifications to accommodate GPS 175/GNX 375. Aircraft owners can also retain many of their existing flight instruments, audio panels and many legacy composite CDI indicators such as the KI 209, or easily pair it with a new or existing flight display such as the G5 electronic flight instrument. Additional interface options include the G3X Touch™ flight displays for experimental and certificated aircraft, the TXi series, G500/G600, the GFC™ 500 and GFC 600 autopilots as well as select third-party autopilots. Additionally, precise course deviation and roll steering outputs can be coupled to the GFC autopilots and select third-party autopilots so procedures such as holds, radius-to-fix (RF) legs and missed approaches may be flown automatically.



## Connex<sup>®</sup> and Optional ADS-B "In"/"Out"

Built-in Connex cockpit connectivity gives pilots the benefits and efficiencies of a wireless cockpit, enabling wireless flight plan transfer via BLUETOOTH® technology to and from compatible portables and mobile devices running the Garmin Pilot™ and FltPlan Go applications. GPS position information and back-up attitude can also be used by compatible products. Because GNX 375 has an integrated ADS-B transponder and dual link ADS-B "In," pilots can also view ADS-B traffic and weather on compatible mobile devices and portables. Offering a faster, more intuitive method of judging target trajectories and closure rates, ADS-B enabled TargetTrend™ relative motion technology aids in the identification of real traffic threats, while TerminalTraffic™

technology displays a comprehensive picture of ADS-B equipped aircraft and ground vehicles. Patented TargetTrend and TerminalTraffic are exclusively available within Garmin products, including the Garmin Pilot app. For customers who are already equipped for ADS-B, the GTX™ 345 transponder or GDL® 88 datalink can interface to GPS 175 to display ADS-B "In." wireless benefits include Database Concierge, which is available as an option by pairing the Flight Stream 510 with these navigators.

## Perfect Touch

The GPS 175 and GNX 375 navigators offer unique benefits that only a touchscreen can provide, such as graphical flight plan editing, which allows pilots to more easily edit their flight plan based on an ATC amendment or weather.



Features such as FastFind simplifies flight plan entry by applying predictive logic to suggest airports and waypoints using current GPS location, while the Smart Airspace™ feature makes it easier to identify pertinent airspace on the moving map. Additionally, SafeTaxi® airport diagrams display runways, taxiways, fixed-based operators (FBOs), hangars and more relative to the aircraft's location on the airport surface.

## Ready for Installation

The GNX 375 is included on Garmin Installation Policy. However, the GPS 175 is excluded from the Garmin Installation Policy, allowing independent installers to complete installations. Using the included STC product registration card, an STC permission letter will be granted for each aircraft in which GPS 175 is installed, and installation documents will be included within the STC permission letter retrieval process. To retrieve these documents, installers will need to redeem the single-use registration code via the website listed on the STC product registration card. Please note that Garmin dealers are required to offer support for the installations of any GPS 175 navigators they sell but do not install.



# Garmin Certifies G3X Touch™ for Single-engine Piston Aircraft

G3X Touch flight displays for nearly 500 certified aircraft will be available in early April.

Garmin is pleased to announce the certification of G3X Touch™ flight displays for hundreds of certificated aircraft. G3X Touch offers a variety of scalable panel configurations and a superior feature set that includes wireless connectivity and synthetic vision as standard, as well as options such as display redundancy, advanced autopilot compatibility, engine monitoring and more.

Touchscreen displays offer an intuitive user interface and through any combination of the touchscreen or dual-concentric knobs, pilots can efficiently perform common in-flight functions such as Direct-to navigation, setting altitude pre-select or radio tuning. Pilots will also appreciate the seamless in-flight experience behind G3X Touch as the user interface is harmonious with multiple Garmin products, such as the GTN™ 650/750 and new GPS 175/GNX™ 375 navigators. The FAA has granted installation approval of G3X Touch via an AMLSTC that features nearly 500 certified single-engine piston aircraft. Garmin has also begun working with EASA on an STC specifically for European Aircraft. Breaking new ground to validate a non-TSO's product is an ongoing project and Garmin remains focused to deliver this to the market.

## Multifaceted Screen Formats

Multiple panel configurations and display options allow pilots and aircraft owners to better leverage their current and future avionics investments. For space-limited panels, a single 10.6" or 7" display can accommodate both PFD and MFD windows within the same unit.

The 10.6" display can also include an EIS strip for additional versatility. Another option allows two 7" screens to be installed side by side and accommodate PFD, MFD and optional EIS functionality. Or pair a 10.6" split-screen unit with a 7" format to provide even more flexibility to lay out the preferred arrangement of PFD, MFD and optional EIS displays. In configurations where multiple displays are installed, the G3X

Touch system offers redundancy and reversionary mode as a single display is capable of showing all primary flight information, including engine information when installed. For aircraft owners that have already installed a G5 electronic flight instrument in their aircraft, they can easily add a G3X Touch display to take advantage of the redundancy benefits associated with this configuration. The building-block design of these four approved cockpit configurations give aircraft owners scalable upgrade options that suit a variety of panels.

## Dynamic Maps, SVX™ and Wireless Connectivity

The G3X Touch suite offers an impressive array of standard features that gives pilots greater situational awareness throughout every phase of flight. Synthetic vision (SVX) comes



standard on all G3X Touch displays and provides a rich, three-dimensional depiction of terrain, obstacles, water features, the runway environment, and more. Capable of serving as a standalone VFR navigator, G3X Touch provides benefits that help further situational awareness in visual conditions with features such as vertical navigation (VNAV), which allows pilots to generate a vertical descent profile by setting an altitude constraint in the flight plan. VFR sectionals and IFR enroute charts display pertinent information pertaining to VFR/IFR flights, and geo-referenced instrument approaches improve situational awareness by overlaying own-ship position information on the instrument approach chart. Modern tools such as wireless connectivity are also available as standard. Wireless flight plan transfer, the sharing of traffic, weather, backup attitude information and more with a compatible tablet or smartphone are all available via Connex™.





*“An expert is a man who has made all the mistakes which can be made, in a narrow field.”*

*”*  
*Niels Bohr, Danish physicist*

# TOP 10 AVIONICS UPGRADE MISTAKES

...AND HOW AIRCRAFT OWNERS CAN AVOID THEM

STORY BY DALE SMITH

Source: Avionics News, March 2018.

Nobody wants to be that customer. You know, the aircraft owners whose wallets are much thicker than their logbooks and who know more about an avionics upgrade than an avionics shop.

Time after time, they will tell you, in no uncertain circumstances, the right way to put their avionics upgrade together. They want “this box there” and “that display over here” and “yes, you can integrate this with that because someone on the internet said they did it.”

As an avionics shop owner or technician, you know this project has rework written all over it. But as they say in retail, “The customer is always right.”

Thankfully, this type of situation is rare – at least we hope. But there still are those times when even the most well-intentioned aircraft owner makes a critical error that will turn what could have been a simple avionics upgrade into the type of project that generates bad Facebook reviews.

To help everyone concerned avoid these recurring issues,

Avionics News contacted a cross-section of avionics shops to learn what the most-common customer “mistakes” are and, hopefully, how to avoid them.

## Mistake No. 1:

### Not having a realistic budget for the project

“We run into it all the time – a prospect wants a quote on an avionics upgrade and they either don’t have a budget, or worse, don’t have a realistic budget,” said Monica Gualandri, repair station coordinator for Sarasota Avionics. “The avionics OEMs are fantastic at marketing – they put prices in their ads starting at \$X, and owners figure their budget using those types of numbers, which is a big mistake.

Aircraft owners don’t understand that the total cost of the installation can be up to twice the cost of the equipment. You have labor, accessories and other components to figure in there, also.”

“One thing we run into a lot is a customer who has a budget, but won’t share it with us,” stated Gary Brown, service manager at Stevens Aviation. “In a lot of cases, they are shopping around and think if they tell the shop what they are willing to spend, the price will go up to meet that number.

“It’s a lot easier to architect an upgrade if you know the budget in advance. More than once, I’ve given a customer a bottom-line price only to have them

Not having a realistic budget for an avionics upgrade can lead to confusion and disappointment.





say they can actually spend \$30,000 more.

So I have to do the work all over again. Trying to trick someone is no way to approach a project like an avionics upgrade.”

### Mistake No. 2:

## Selecting the shop that quotes the lowest price

“Be suspicious of a price that seems too good to be true, especially if that quote is much lower than the others you have secured,” stated Mark Lee, owner of Carpenter Avionics.

“It isn’t likely that the low-cost shop has figured out a way to do the work so much more efficiently than all the other shops.

“Have you confirmed the shop is truly an authorized sales and service affiliate for the brand of avionics that interest you? The affiliation matters because, should you have an issue in the future, the manufacturer could possibly not honor the warranty claim if the equipment was sold and installed by someone other than an authorized shop.”

“Shops make mistakes with their quotes, too,” stated Kirk Fryar, president of Sarasota Avionics. “Owners show us other quotes, and there are times when they’ve missed something they’re not familiar with. Once your airplane is disassembled in their hangar, it’s too late to catch these kinds of mistakes.

You can put a price tag on experience, and it’s not usually the lowest one you will find.” According to Lee, “You should consider doing business with shops that extend fair and reasonable pricing because you want them to be around in a year or two in case you have any issues.”

“Owners also make the mistake of assuming their avionics will be installed legally,” Brown added. “There are shops that don’t exactly do the installation correctly, and the certification path they are using is questionable. Down the road when the owner wants to sell the airplane and it goes through a pre-buy inspection, they find it’s illegal. That’s a big problem.”

### Mistake No. 3:

## Not allowing enough time for the project

“To do justice to any avionics upgrade, especially one of any magnitude, you must have a lot of time on the front end for all the necessary research and planning,” explained Don Milum, director of technical sales for Standard Aero Business Aviation. “You have things like engineering reviews, electrical load distribution analysis, and equipment lead times to consider.

And the more complex the upgrade, the more you have to deal with. “Some extensive upgrades like a Rockwell Collins Pro Line 4 to Pro Line 21 can take a year to get completed. It takes that long to get all the quotes and make the decision on which shop to use. Then you must get into the details of the installation for that particular aircraft. Once everything is vetted, those types of well-planned projects go smoothly.

When you rush, you make mistakes. It’s too important of a project for that way of thinking.”



### Mistake No. 4:

## Choosing the wrong avionics shop

Selecting the right shop for the upgrade is probably the most-difficult decision aircraft owners will make. How do you know which shop is right?

Start with shops that already have experience with your aircraft type and avionics selection. Not every shop has experience with every aircraft, and you don’t want to be the one the technicians go to school on. Somebody has to pay for his or her education.

“Take the new Garmin TXi displays for example,” Gualandri said. “There are more than 30 possible combinations with those systems alone. The typical aircraft owner has no idea what will work in their aircraft, and even a less-experienced technician can spend a lot of time figuring it out.”

“My advice is for owners to talk to pilots who have similar aircraft and find out who they work with,” Brown said. “And it’s not about the lowest price. The cheapest price means nothing if the shop cannot do the work to your satisfaction. Talking to other owners may tell you which shops to avoid.

“We get aircraft in here all the time that have come from other shops. They can’t fix the problem, so the owner comes to us for our expertise with their aircraft or avionics. It would have saved them a lot of time and money if they would have researched it better in the beginning.”

“Ask to see their incoming aircraft checklist,” Milum said. “Look at it to see how complete and comprehensive it is. If you don’t think they’re taking the time to check much upfront, chances are you’re going to get a nasty surprise somewhere in the project. You want a shop that’s very thorough in everything it does.”

“If you are doing an ADS-B installation, obtain an ADS-B Performance Report from the FAA,” Lee said. “According to the FAA, as of July 2017, the error rate of all general aviation ADS-B installations (not counting experimental and LSAs) was 12 percent. As a prospective customer, ask the shop what percentage of their installations had to be corrected during the past year. Quality shops with great processes, people and tools produce higher-quality outcomes and have error rates of zero or close to it.





Selecting the right shop for the upgrade is probably the most-difficult decision aircraft owners will make.  
**HOW DO YOU KNOW WHICH SHOP IS RIGHT?**

“Another thing is to ask if the facility is an FAA Part 145 repair shop. Overall, the biggest difference to the customer will be FAA oversight. Part 145 shops are required to have a more-rigorous set of procedural standards, including a drug testing program in place for anyone who touches the aircraft. The outcome of a project is directly related to the people working on the aircraft. It’s something owners should be aware of.”

### **Mistake No. 5:**

#### **Not flying the equipment before it’s purchased**

“This is a more-frequent mistake than you might think,” Gualandri said. “Pilots see something at a show or a video on YouTube and they immediately think it’s what they want and need. You can’t know if it’s right for you and your type of flying until you physically use the unit in the air.

“We are strong believers in trying before you buy, so we have all of the latest avionics installed in various single- and twin-engine aircraft. We want customers to have the chance to get hands-on with it. Many times, the unit they want doesn’t fit their needs.”

“There are some shops that are pigeonholed into selling only one brand of avionics, and I don’t think owners take the time to look at other options,” Brown said. “It’s refreshing when an owner comes in here and has done his homework. That makes the whole process a lot easier and more successful for everyone involved.”

### **Mistake No. 6:**

#### **Not doing your preplanning homework**

“Take time to assess your goals and clarify what you truly want and need,” Lee said. “Avoid getting fixated on any one particular piece of equipment just because you’ve seen a positive article about it. Ladder up and think about how that gear could make your flying safer, more automated, more enjoyable. How will it benefit you?

“Maybe there are other solutions that can accomplish these same goals that you don’t know about. That’s what your avionics shop can do to help. See options from reputable shops. While there can be many solutions that are common among many customers and aircraft, one size does not fit all.”

### **Mistake No. 7:**

#### **Not telling the installers about existing avionics squawks**

“This is something we see too often, and it can cause a lot of problems,” Milum said: “If you have a known problem with a piece of equipment, give the shop as much detail about it as you can. If we have to interface the new avionics with a unit that has a squawk, even if it doesn’t bother you, it can be super critical in terms of your new equipment being able to function properly.

“Even if the owner/pilot doesn’t know for sure if it’s a problem, make a note and tell the shop technician. Even if we only suspect that there may be a problem, we can look into it early on. Sometimes, we have the owner sit in the cockpit and show us what’s happening during the incoming checkout.”

### **Mistake No. 8:**

#### **Not taking the time to give the shop a detailed tour of the panel**

“The owner/operator needs to dedicate the time necessary to go through their aircraft’s systems with the installingshop’s technician when they drop it off,” Milum said. “Just leaving the keys on the counter doesn’t work. We can save a lot of time and trouble if the owner/pilot is involved at the beginning.”

If for some reason you can’t be there when the aircraft is delivered, then take the time to write a detailed description of each box in the panel. Even if everything is working as it should, your insight will greatly benefit the folks doing the work.

### **Mistake No. 9:**

#### **Not thinking beyond the panel itself**

“Owners get caught up on the avionics upgrade and don’t think about how the little things can be beneficial to their flying,” Fryar said. “Maybe it’s a simple thing like a new digital



clock or hard-wired Bose jacks or a couple of extra USB ports – they seem simple, until you don't think of adding them until after the panel is done.

"That's why we like to sit down with a prospective customer and discuss how they use or will use their airplane. That way, we can help them list what they truly need. For example, if they fly a lot outside the U.S., then satellite weather doesn't work. They'll do better with a Stormscope. That's often the stuff owners don't think about."

## Mistake No. 10:

### Forgetting to pay for the installation

"Remember, when you pick up your airplane, you have to pay for the work before you can leave," Fryar said. "That's a mistake that owners frequently make. We can't bill them for the work. You have to settle the account before we give you the keys."

# THE MODERN EFIS PANEL

Standby power and backup instruments provide total redundancy

STORY BY DAVE HIDGON

Source: *Avionics News*, August 2018.



When aircraft manufacturers began to equip their panels with flight instrumentation, pilots needed little in the way of alternative instruments or power sources. Instruments of the day, such as they were, predominantly used air pressure via the pitot-static system; when gyroscopic instruments came along, the power to spin the gyro wheels also came from air. In this case, the airflow came via suction power, initially created directly by venturis mounted on the cowl and later from engine-driven air pumps – either vacuum sources or pressure pumps. Second, it wasn't until flying moved into the night-and-instrument world that standby redundant instrumentation became important. Day, visual-flight-rules flight needed little in the way of flight instruments beyond the basic airspeed, altitude and compass.

Of course, that meant staying clear of clouds – until after Sept. 24, 1929, the day that U.S. Army Lt. James Doolittle made the first blind takeoff, flight and landing in a Consolidated NY-2 biplane outfitted with specially designed radio and aeronautical instrumentation.

The step into the instrument flight realm came about thanks to the combined efforts of multiple organizations: the Guggenheim Fund's Full Flight Laboratory; the U.S. Army Air Corps; the U.S. Department of Commerce; and early avionics firms Sperry Gyroscope Co., Kollsman Instrument Co. and Radio Frequency Laboratories.

**WHILE SOME RESEARCH SUGGESTS THAT PILOTS FLYING BEHIND GLASS PANELS SUFFER SLIGHTLY FEWER ACCIDENTS THAN THOSE PILOTING TRADITIONAL SIX-PACK PANELS, SOME RESEARCH ALSO SUGGESTS THAT THE IMPROVEMENT STEMS MORE FROM THE LACK OF AIR-POWERED GYROS AND THE ASSOCIATED PUMP. NO PUMP, NO AIR-DRIVEN GYRO FAILURES.**

Over the ensuing years, instruments powered by electricity and air evolved into the familiar six pack of three air-data instruments, driven by the pitot-static system, and three spinning-mass gyroscopic instruments – two of which used a vacuum (or pressure) pump, and one powered by the aircraft's electrical system. This split power arrangement automatically provides a level of power redundancy, albeit in a somewhat cumbersome, complicated, partial-panel form of redundancy. The standard standby capabilities depend

on the pilot's ability to interpolate what inoperable instruments would indicate, if functioning, from the indications of the remaining operable instruments. Hence the name, "partial panel." Ask any instrument-rated pilot about



the amount of training time they spent flying under a vision-restricting hood or glasses, practicing “partial-panel” flying. The instructor covered one or more of the six and made the instrument student maneuver the aircraft, staying within limits, on command, using only the remaining instruments to fill in the blanks created by covered instruments. While these factors still apply for operators flying traditional analog six-pack, steam-gauge stacks, that population continues to decline with operators taking advantage of the many options available to convert to glass-panel technologies. While some research suggests that pilots flying behind glass panels suffer slightly fewer accidents than those piloting traditional six-pack panels, some research also suggests that the improvement stems more from the lack of air-powered gyros and the associated pump. No pump, no air-driven gyro failures. While not completely true – glass primary flight displays have been known to fail – a body of belief has developed that standby electrical power and modern standby instrument packs helped drive the improvements. Consider the options available for meeting Federal Aviation Administration requirements for standby instruments to back up digital PFDs.

## Backup instruments of all stripes

With the recent-years transition to digital glass cockpit panels from the traditional three-power-sources analog panels, new redundancy options emerged – and are required. FAA Advisory Circular No. 23.1311-1C provides the guidance for installations of electronic displays in Part 23 aircraft. In the past two decades, we’ve seen standby instruments evolve. First, we saw an air-powered-and-analog trio of an altimeter, an airspeed indicator and an attitude indicator, a package often crafted out of repositioning existing instruments after installing a glass PFD.

The benefits include costs – the airspeed indicator, altimeter and attitude indicator already exist; it’s simply a matter of moving them out of the way of the new PFD while keeping them within the pilot’s line of sight. Simple, though the analog gyros – the attitude indicator and gyro compass – still retained the shortcomings the digital PFD eliminate because most aircraft still depend on the fragile vacuum pump. This solution began to give way to more reliable alternatives the instant the first digital standby packs appeared – packages more closely resembling the main digital instruments they back up. Main instruments today – the modern incarnation of the old analog six pack – fit within the confines of the primary flight display. The digital-electronic versions of that old analog six pack still include an altimeter, an airspeed indicator, a vertical speed indicator, attitude indicator, gyroscopic compass and turn coordinator with its slip/skid ball.

## Standby instrument: Mimicking the PFD has benefits

While using old analog airspeed, altimeter and attitude indicator has appeal – reduced costs and already in-hand – safety experts encourage the use of standby instrument packs that present similarly to the main PFD. Plenty of options exist to meet that suggestion. Self-contained backup instrument packages provide a pathway to a complete glass cockpit for Part 23 fixed-wing aircraft or a Part 27/29 rotorcraft, in a form

similar to the PFDs they back up. For some pilots, adding a second, matching PFD fulfills the need. That’s particularly true of many users of Aspen Avionics Millennium series of compact glass instruments. Three – two PFDs and an MFD – can fit into the same space as most analog panels’ six-pack of instruments. Redundancy is assured and standby power is built in.

L3 and Mid-Continent Instruments and Avionics both make and market standby instrument packs designed to look and function the same as the glass PFD. Mid-Continent Instruments and Avionics’ SAM – Standby Attitude Module – splits the AI from the air-data indicators, with the multicolored attitude instrument in the left half while the airspeed and altimeter (along with its barometric pressure readout) occupy the right half. That’s in the horizontally-oriented SAM. The company also offers the SAM package to mount vertically in the panel, with the AI on top. An integral standby battery is included, resolving the question about redundant power for the SAM. L3 Aviation Products offers a similar package in a smaller form factor – one that will fit in a single-instrument opening. Called the Trilogy Electronic Standby Instrument, or ESI, the solid-state Trilogy ESI delivers attitude, altitude and airspeed information on a compact and easy-to-read 4-inch by 3-inch display and easily replaces traditional electro-mechanical standby instruments while presenting the needed information on a single screen.

An internal battery is available in the ESI-2000 model, providing a minimum of one hour of power in the event of an electrical-system failure. Aspen Avionics offers its backup package in two versions, basic and advanced. Both offer the necessary capabilities to serve as a backup package to a glass PFD; the advanced adds several worth-considering features, including synthetic vision system, an angle-of-attack capability, and an emergency GPS navigator. Both also sport their own standby battery for power redundancy. Some pilots migrating to glass panels turn to Dynon for one of its approved PFD packages, one of which is battery powered, the other with a standby battery capability.



Standby Attitude Module (SAM) from Mid-Continent Instruments and Avionics is available in horizontal and vertical orientation. In both versions with MD32 Magnetometer included.



# UNIVERSAL AVIONICS

## – latest news

### UniLink™ Customer Database Customization

Did you know the UniLink UL-800/801 Communications Management Unit's (CMU) customer database driven user-interface and message set can be customized to match your operational requirements? The UniLink Customer Databases can be engineered to:

- ▶ Tailor the UniLink Control Display Unit (CDU) page layouts so you may choose what the pages look like (i.e. moving functions around to eliminate key presses)
- ▶ Hide and unhide (enable/disable) functionalities (i.e. removing the ability to enter the COMM CONTROL MENU from the COMM STATUS page)
- ▶ Modify the content of downlinked and uplinked message formats (i.e. coordinates, altitude, aircraft identifiers, etc. for military and special mission operations)



Helpful in streamlining operations, customizing your UniLink Customer Database can also keep you updated and remaining current with changing industry requirements and mandates.

### VNAV Guiding to Temperature Compensated Altitudes

We have identified an inaccuracy when flying Area Navigation (RNAV) (GPS) and RNAV (GNSS) approaches with SBAS-FMS in the following conditions:



- ▶ Lateral Navigation (LNAV)/Vertical Navigation (VNAV) Level of Service (LOS)
- ▶ No Localizer Performance with Vertical Guidance (LPV) LOS for that runway/approach<sup>1)</sup>
- ▶ Temperature compensation is active

<sup>1)</sup> this can be identified by the absence of LPV minima at the bottom of the approach chart and no published Channel ID in the upper left corner of the approach chart.

Affected SBAS-FMS models include the UNS-1Ew, -1Espw, -1Fw, and -1Lw with Software Control Number (SCN) 1000/1100.8, 1001/1101.0/1/2/3, and 1002/1102.0/1.

Beginning at the Final Approach Fix (FAF) and continuing to the End of Approach (EOA), the FMS approach VNAV incorrectly guides to the temperature compensated vertical approach path with the system altitude set equal to the GNSS altitude (as opposed to barometric altitude). This results in the aircraft flying above the procedural glidepath by an offset altitude equal to the temperature compensated altitude, and thereby flying a path steeper than the designed glidepath.

The FMS is incorrectly using temperature compensated barometric altitude to calculate the glidepath instead of using uncompensated GNSS altitude.

#### Solution

We recommend operators who have a requirement to Temperature Compensate RNAV (GPS) or RNAV (GNSS) procedures with LNAV/VNAS LOS as described above to mitigate this error by manually selecting the LNAV LOS, if available, for the approach. In this case, the FMS approach VNAV will be based on temperature compensated barometric altitude.



# ! CPDLC Departure Clearances

As the operational use of data link communications continues to evolve, it is essential that pilots keep up with changing procedures.

Aircraft with Universal Avionics UniLink UL-800/801 Communication Management Units (CMUs) that are Future Air Navigation System (FANS) 1 / A + equipped can use the Controller-Pilot Data Link Communications Departure Clearances (CPDLC-DCL). CPDLC-DCL allows pilots to request and receive initial and revised Air Traffic Control (ATC) Clearances digitally using CPDLC over VHF Data Link (VDL) Mode 0 / A and Mode 2 data link. These services are available at various airports in U.S. domestic airspace as indicated on the airport diagram and on the Universal Avionics website.

CPDLC-DCL messages can include departure procedures, flight plan route, assigned altitudes, transponder code, departure frequency and other non-route information. Successful receipt of these services depends on proper use of the system. The following information is intended to address common mistakes made by pilots when attempting to take advantage of CPDLC-DCL services.

## Filling the Flight Plan

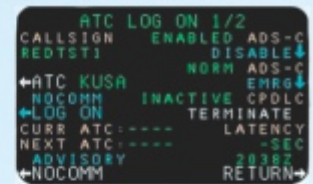
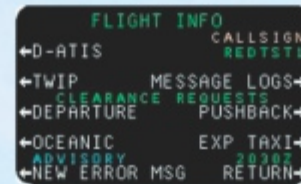
The pilot must ensure that the flight-specific information entered into the on-board data link system and associated equipment matches exactly the corresponding details filed in the flight plan in order to avoid a rejection of the log on request. An ATC-filed flight plan must be filed indicating that the aircraft is CPDLC-DCL capable.

This is indicated by selecting the following options in the International Civil Aviation Organization (ICAO):

- ADS Equipment Code  
-D1 ADS-C with FANS 1 / A capabilities
- CPDLC Codes  
- J3 CPDLC FANS 1/A VDL Mode A  
- J4 CPDLC FANS 1/A VDL Mode 2  
- DAT/1FANSP2PDC lub DAT/1FANSP

Onboard the aircraft, the UniLink aircraft identification or flight number, depending on configuration, will automatically be entered into the CALLSIGN field. This information should be modified to match exactly the corresponding aircraft identification included in the filed flight plan. Callsign for a Part 91 departure should be the aircraft registration number. If departing under an air carrier dispatch (Part 91K/135/121), then the appropriate callsign for the dispatched flight should be in the field to match the dispatch paperwork.

It is also important to note that the Mode S transponder Flight Identification (FID) must match the filed flight plan and the identification entered into the CALLSIGN field of the UniLink CMU. The pilot must also enter the destination airport into the Flight Management System (FMS), as filed in the flight plan, prior to attempting to log on to receive a CPDLC-DCL. The departure and destination airports should be included in the filed flight plan.



# Invitation to AIR FAIR

We cordially invite you to our stand  
No. 9, hall no 3 during the 12th International  
AIR FAIR Exhibition, which will take place  
in Bydgoszcz on May 17-18!

We look forward to seeing you!

