



ROTOR ACT EXPANDS ADS-B MANDATE BEYOND 2020 REQUIREMENTS

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SOARING AMBITION

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STORY BY DAVID HUGHES

Modern integrated cockpits already include built-in connectivity, but approximately 10,000 aircraft equipped with legacy federated cockpits and a Universal FMS can now be connected for \$11,000 or less.

No major hardware replacement is required for most recent models while only a software upgrade is needed to enable Wi-Fi capability in the Universal Data Transfer

Unit. In some aircraft, the work can be completed for as little as \$6,000. Repair shop schedulers who suggest this improvement to customers may open the door for broader avionics upgrade opportunities.

In March 2024, the company announced that it had obtained Federal Aviation Administration certification for installation of its Wi-Fi-enabled FMS on Part 25 aircraft. The capability has been available for Part 23 aircraft since 2023,

Universal Avionics InSight flight deck featuring digital displays and mobile tablet apps



“UNIVERSAL FLIGHT MANAGEMENT SYSTEMS ALSO PROVIDE A GROWING ADVANTAGE AS GPS JAMMING AND SPOOFING BECOME INCREASINGLY COMMON.”

Photos courtesy of Universal Avionics

when the connected FMS was first introduced. Universal is an Elbit Systems company, and its avionics business is evenly split between the airlines and business aviation.

When paired with an iPad, the connected FMS provides what the company calls “smart” flight planning across all phases of flight through the UA FlightPartner iPad application. Database updates are also simplified and can be synchronized on the go whenever an update occurs.

Weather-modeling products present a radar forecast and vertical weather profile. Weather can be previewed along the route up to eight days ahead using advisories including AIRMETs and SIGMETs. A pilot digital assistant allows pilots to manage workflow with notepads and checklists

BELOW: UA FlightPartner provides a snapshot of critical data in all phases of flight, including traffic, weather, and navigation.



and provides access to the FlightReview app that provides data reporting for flight and maintenance operations.

Another major time-saving feature is that flight routes (including winds, temperatures aloft, fuel calculations, and takeoff and landing performance) can be entered directly through iPad applications. This eliminates countless minutes of manual data entry by pilots and significantly reduces the potential for errors. The route can also be created graphically on the iPad display, allowing for quick and easy verification that matches the intended flight plan. Pilots can review the flight plan at any time, whether in the air or on the ground, using the iPad display.

Universal Flight Management Systems also provide a growing advantage as GPS jamming and spoofing become increasingly common. These systems were originally developed just before GPS became widespread in business aviation cockpits, and therefore they can use legacy navigation aids such as DME/DME, VOR, and ILS. Although the latest Universal FMS units are equipped with WAAS, if GPS signals are jammed or spoofed and the aircraft is over land, pilots can still navigate using ground-based navaids. Comparing GPS-

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derived positions with radio navigation results can help identify GPS interference. In addition, legacy nav aids can provide the accuracy needed for RNP 0.3 to 1.0 operations without GPS.

In one case, an aircraft headed for the U.S. that was hit by GPS interference in the Middle East was unable to recalibrate to use GPS and entered the North Atlantic without the required RNP performance – to the consternation of air traffic control.

GPS jamming and spoofing interference is not limited to active war zones such as Ukraine or areas near the Gaza Strip, where both sides seek to deny GPS access to the enemy due to drone warfare and other factors. It is also used as a countermeasure against small commercial drones that might be employed for surveillance or attacks on civilian infrastructure far from any conflict zone. Additionally, GPS jamming is reportedly used to obscure the location and travel of high-profile figures such as Vladimir Putin.

According to OpsGroup, reports of GPS jamming and spoofing have increased by 500% in recent years. OpsGroup is an ad hoc organization whose aviation members include flight operations specialists, pilots, dispatchers, schedulers and controllers who track GPS incidents around the world. The European Union Aviation Safety Agency has noted that the GPS interference impacts can include inconsistent navigation position and/or time, loss or corruption of surveillance data (such as ADS-B), loss of ACAS functionality, and misleading alerts from TAWS. Avionics manufacturers and government authorities are actively developing solutions to counter these threats, but effective mitigation may take years to achieve.

“Modern cockpits produced since 2004 do connect to the cloud to upload and download data to an extent,” said Dror Yahav, chief executive officer of Universal Avionics. “It is mostly historical information captured on the flight deck but can also include real-time data like winds and weather being provided by connectivity with the ground. Remember that most business aircraft (jets and turboprops) flying today do not have modern cockpits. They are equipped with avionics in the 1990s. Most of these legacy aircraft are not connected to the cloud.”

Universal had a huge wave of WAAS FMS retrofits in the lead-up to the 2020 ADS-B mandate. There are still about 10,000 legacy aircraft flying today without any connectivity or to receive or store information from a device using cloud-based services.

Yahav became CEO in 2019 after 18 years at the parent company Elbit Systems. He introduced EFVS, HUD and wearable HUD technologies in commercial aviation as well as the use of EFVS in commercial helicopters. He has 22 years of experience as a pilot of fighters, training aircraft and commercial airplanes.

“With automatic data processing and analytics, we are reconstructing the flight so you can see where you flew graphically,” Yahav said. “We are also monitoring unique events like an unstable approach, a suboptimal bank that is too steep and over-speeds. We can also calculate fuel consumption and compare it to reference information.”

In 2022, an International Air Transport Association report found that unstable approaches in airline service rose substantially during the COVID-19 pandemic with the drop in air transport activity and was a contributing factor in three of the

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10 accidents that year. Unstable approaches are often a factor in runway excursions, CFIT, hard landings, loss of control and tail strikes.

I asked how pilots will feel about being monitored by computers, and Yahav said that today, especially for Part 135 charter operators and the requirement to implement a safety management system, “how would an aircraft operator know there is a potential safety issue without this information?”

“Our FMS is used in federated systems, unlike the integrated solutions that took over new production aircraft 20 years ago,” Yahav said. “That distinction is now our advantage for nearly 10,000 customers flying with our FMS. Because the system is modular, we can bring them up to the latest standards by introducing modern capabilities like an iPad to receive information from the cloud and transfer data seamlessly without requiring a completely new cockpit, provided the aircraft is operating within the Universal ecosystem.”

Recently, Universal certified the link between the iPad and the FMS and the cloud with the FAA. The FMS upgrade uses secure, FAA-compliant encryption for transmission between devices.

“So now it’s secure and cyber protected and it is protected against penetration according to the FAA,” Yahav said. “In a sense, we can fully control the FMS through the iPad with various applications. You can send information from the ground like winds, NOTAMs, takeoff and landing speeds such as Vref and flight profiles to the FMS while also receiving data from the FMS as things happen throughout the flight such as fuel consumption, waypoints, keystrokes, etc.”

Universal connects to major cloud providers, including Google Cloud, Azure and Amazon’s AWS. Yahav said the consensus in the aviation industry is that the major cloud providers are more secure than other points of connection because of their active vulnerability testing.

“We have evolved with several new applications for the iPad because once the link was certified we can introduce any application that adds value by using the available data,” Yahav said. Universal already offers links to Aviobook and APG on its connected FMS network.

Aviobook is a smart EFB that covers airline flight operations. It connects to digital capabilities for cabin crew, the flight operations center, dispatch, mechanics and engineers. APG provides capability for flight planning, runway analysis, charts and instrument procedure plates, day-of-flight tracking and flight planning.

Gogo reports that many customers now want multiple cabin connections for in-flight office capability and entertainment. Gogo can provide air-to-ground, LEO and other types of connections including GEO satellite links. Some customers want all three. Yahav said that cockpit connectivity is separate and secure

and the cabin systems do not interface or interfere with Universal’s FMS connectivity.

In October 2025, Universal moved to integrate FreeFlight Systems’ dual-band ADS-B solution into its connected avionics ecosystem and InSight Flight Deck. The partnership was announced at NBAA’s Business Aviation Convention and Exhibition to benefit business aviation and rotorcraft operators. The capability will provide improved cockpit connectivity, situational awareness and operational efficiency tools.

“This is one of the few solutions for business aviation and rotorcraft operators that provides cockpit ADS-B In to pilots, making every flight safer and more efficient,” said Anthony Rios, president of FreeFlight Systems.

The company’s dual-band ADS-B capability provides hybrid surveillance with integrated TCAS II including real-time traffic, altitude, heading, speed and distance of aircraft nearby. Its flight software unifies flight dispatch and pilots in business aviation operations. It also has mobile flight operations applications for general aviation pilots.

The Universal/FreeFlight partnership comes as Congress is moving ahead with ADS-B In adoption requirements for aircraft. Universal’s WAAS-enabled FMS can access its UA FlightPartner app using ADS-B In traffic and weather data.

Universal plans to continue to provide artificial intelligence and automation enhancements to its connected FMS and to add more third-party applications.

The InSight flight deck is for both retrofit and forward-fit and it is customizable. UA FlightPartner also augments InSight’s embedded 3D synthetic vision system as well as interactive mapping and electronic charts displayed on glass cockpit screens. Universal has supplemental type certificates for InSight cockpit upgrades for the Hawker 800XP, Falcon 2000/EX, Falcon 50, Falcon 900B, Falcon 20 and Citation VII.

On a Falcon 900B retrofit with four InSight displays, the weight savings provide an additional 250 pounds for payload by replacing legacy Honeywell avionics. On that aircraft it provides capability for FANS 1/A+, CPDLC and ATN B1. On a Hawker 800A/B/XP with three InSight displays and dual Universal FMS (UNS-1Fw) with LPV approach capability, it also saves 250 pounds.

Universal has obtained connected FMS STCs for Bombardier CL-601-1A/3A/3R; Cessna 500, 550 (V/Ultra/Encore/Bravo), 560 (Excel, XLS Series), 650 (Citation III/VI/VII); Dassault Falcon 10/20/200/50/900A/900B/2000/2000EX; Gulfstream G200/GIII/GIV/V; Learjet 31/31A/35/35A/36/36A/40/45/55/60; ATR 42-300/320/500 and ATR 72-200/500; De Havilland Dash 8 100/200/300, Dash 8-400 (Q400); Embraer 145/145ER/14m5LR/135ER/135LR/135KL/145XR/145MP/145EP; and the Saab 340A/B. □

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