Juneau “Paves Way” for FAA ADS-B Out Rule

The last of four key sites the FAA has selected to demonstrate Automatic Dependent Surveillance-Broadcast (ADS-B) services has achieved initial operating capability (IOC). The agency’s April 28th announcement declares IOC for the use of ADS-B at Anchorage Center for air traffic separation services in Juneau, Alaska.

The technology is also being used in Philadelphia, Pennsylvania (IOC on April 26th); at the Houston Air Route Traffic Control Center for air traffic in the Gulf of Mexico (IOC on January 12); and in Louisville, Kentucky (IOC on November 19, 2009).

ADS-B allows air traffic controllers to use the satellite-based GPS system to monitor and separate aircraft. Because it uses GPS signals, it expands surveillance services into areas where little or no radar coverage exists, such as in Alaska and the Gulf of Mexico. The precision and accuracy of the information received from the GPS satellites allows for reduced separation between aircraft, which provides substantial benefits—even in areas with existing radar coverage.

With all four sites now declared to be in IOC, the FAA has moved forward with its ADS-B Out Final Rule, which was released May 27th. The document outlines a 2020 deadline for all aircraft flying above 10,000 feet or in Class A, B or C airspace to transmit ADS-B signals.

ADS-B is a cornerstone of the FAA’s transition to satellite-based surveillance and navigation under the Next Generation Air Transportation System plan. National commissioning of ADS-B is slated for September 2010 with rollout of ADS-B ground stations to be complete in 2013. Look for more from Universal Avionics regarding ADS-B compliant equipment in the upcoming months.

New Product News

Introduction of Universal’s Attitude Heading Reference System

Looking to replace those antiquated analog gyros? A new option will soon be available as Universal Avionics presents a new Attitude Heading Reference System (AHRS). The “AHS-525” AHRS is designed as a low-cost solution for next generation flight decks and to seamlessly replace difficult-to-maintain analog gyros.

The stand-alone AHS-525 is a solid-state AHRS providing stable and accurate aircraft analog and digital pitch, roll and heading measurements.

The AHS-525 incorporates Microelectromechanical Systems (MEMS)-based technology, which combines the computational ability of microelectronics with the acuity and control of microsensors and microaccelerometers. This solid-state construction (i.e. no internal movable parts) increases unit reliability over analog gyros.

The AHS-525 features digital, analog, discrete and synchro inputs and outputs (I/O) to support a wide variety of interfaces on Part 23, Part 25, Part 27 and Part 29 aircraft. Federal Aviation Administration Technical Standard Order is expected in October.

AHS-525: In Brief

**Features**
- Magnetic (slaved) heading mode
- Heading control managed through Universal’s EFI-890R (additional heading controls required when not interfaced with the EFI-890R)
- Extensive integration capabilities with a host of avionics systems
- Digital and analog inputs/outputs to support a wide variety of aircraft
- Compact: 8.6” L x 5.0” W x 5.2” H
- Fixed mounting plate allows “box swapping” without repeat of alignment procedures

**System Components**
- Attitude Heading Reference Unit
- Configuration Module
- External Remote Magnetometer
- Mounting Plate
The Technologies of NextGen: An Overview

There is much attention in the media to the FAA’s Next Generation Air Transportation System (NextGen). Diving in to the fine details of the program, you’re likely to find a maze of Enabling Activities, Solution Sets and Transformational Programs. What does it all mean?

Although informative, the NextGen 2009 Implementation Plan released in March does not offer a good translation of what a Solution Set means to an operator, let alone what aircraft equipages will be required in support of it. Given, much of this is unknown as this time.

As such, it is an opportune time to look at the FAA’s portfolio of technologies that make up NextGen. Chances are you’ll be affected by one of these technologies, no matter where in the world you operate.

Satellite-Based Navigation

NextGen features several programs based on the emergence of satellite-based navigation. The majority of these programs take shape in the form of procedures, with a focus on either increasing the use of existing ones or development of new. These procedures include:

- **RNAV and RNP** – routes and procedures that allow pilots to fly more direct and precise paths. Removes the direct link between aircraft navigation and a NAVAID. Enables point-to-point operations. RNP is an RNAV procedure with the addition of onboard navigation performance monitoring and alerting capability.

- **T-route** – an RNAV route around or through busy terminal areas, typically in airspace that is within about 5 miles of an airport. Three T-routes have been developed so far.

- **Q-route** – used in high altitude airspace (18,000-45,000 feet) for direct routing. Allows creation of a parallel route and enables point-to-point operations. There are five Q-routes in existence.

- **Tailored Arrivals (TAs)** – low power continuous descent approaches from cruise altitude to the runway threshold. These provide a smooth path that reduces fuel burn, emissions and noise. There are three in existence.

- **LPV** – a new category of approach that uses satellite-based altitude (lateral and vertical) from the Wide Area Augmentation System (WAAS). Enables landing during periods of reduced visibility due to inclement weather, obstacles or darkness. Improves runway access. Over 2,040 in existence.

- **OPD (Optimized Profile Descent)** – enables continuous glide path on initial descent from high altitude to the runway at low power. Reduces fuel burn, emissions and noise. Four exist today.

**ADS-B**

As noted on Page 1, the Automatic Dependent Surveillance - Broadcast (ADS-B) system is moving forward as a cornerstone of NextGen. In addition to surveillance capabilities, the system also gives pilots access to weather services, terrain maps and flight information services.

Enabling Technologies

Enabling technologies are platform programs used to integrate NextGen programs into the NAS. They include En Route Automation Modernization (ERAM), a new computer system and backup system used at 20 FAA air route traffic control centers around the country; and the Traffic Management Advisor (TMA), a comprehensive automated tool for planning efficient flight trajectories from cruise altitude to the runway threshold. Also of note is the Airport Surface Ground Detection Equipment - Model X (ASDE-X) program, a ground surveillance tool that collects data from a variety of sources (such as aircraft transponders and surface movement radars) to track vehicles and aircraft on airport surfaces in order to detect potential conflicts. The system is operational at 27 of the nation’s largest airports with 8 more planned.

Wake Turbulence Mitigation

Wake Turbulence Mitigation for Departures and Arrivals refers to the ability to increase access to and manage the separation of aircraft in the terminal environment. It is in place today at St. Louis and Seattle airports. Both airports have parallel runways spaced less than 2,500 feet apart that can accommodate concurrent arrivals (1.5 nm separation) on both runways, which boosts arrival capacity.
Notes from Product Support

The Navigation Reference System
By Bob LaBerge, Manager of Customer Training

Many pilots attending our FMS training courses aren’t familiar with the “NRS.” The NRS (Navigation Reference System) is a system of waypoints developed in 2003 for use within the United States for flight planning and navigation without reference to ground-based navigational aids. While a detailed explanation of how the system works requires more space than allowed here, my intention in writing about this subject is to generate awareness of the capabilities in your FMS.

The NRS is intended for use by area navigation (RNAV)-capable aircraft. All aircraft operating with IFR-approved GPS installations are capable of RNAV, which includes most aircraft using Universal’s FMS.

Use of the NRS is conducted in the high altitude environment where waypoints are located in a grid pattern along defined latitude and longitude lines. These waypoints are depicted on high altitude enroute charts. Universal Avionics navigation database for FMS operating SCN 304 and later contain NRS waypoints.

The waypoint naming convention uses five characters, but consists of both letters and numbers. Each name consists of two letters, followed by two numbers, followed by a single letter. The first character identifies the International Civil Aviation Organization (ICAO) Flight Information Region designator. For the contiguous U.S. that character is “K”.

The second character represents the Air Route Traffic Control Center airspace in which the fix is located (as shown in table, below left).

The third and fourth characters represent the latitude increment. Although waypoints can be spaced every ten minutes of latitude, the current implementation uses thirty minute spacing. The scheme can be a little confusing. For example, “KA36Y” is located at N36° latitude. It would be easy, then, to assume that waypoint “KD48Y” would be located on N48° latitude. But, it is actually located at N38°. Since the characters represent units of tens of minutes, it takes a change of six units to equal one degree of latitude (6 X 10 = 60 minutes, or one degree of change). So “KD48Y” is actually 120 minutes (two degrees) north of “KA36Y.”

The fifth character is the longitude identifier. The NRS longitude identifiers circle the globe from west to east beginning with the letter “A” at the prime meridian (0°). The letters repeat every 26°, each representing one degree of longitude. Current implementation is one waypoint every two degrees of longitude. Note the figure above. For complete information, consult AC 90-99, High Altitude Airspace Redesign Phase I, and the current A.I.M.

Fix Location Identifier

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Software and Hardware Updates

RTU
SCN 8.0 expected 4th quarter.
Minor change addresses potential RTU fail when tuning cross-side radios in dual FMS installations.

FMS
SCN 1000.4/1100.4 released 4/27/10. Minor change includes support for UniLink FANS and for Learjet 31A interface.

AHS-525
SCN 1022.0.0 expected 4th quarter. Major TSO/STC submittal in support of new AHRS.

ASU
SCN 32.2 expected 4th quarter. Minor software change adjusts chart filtering logic, adds SSDTU USB support and several other feature enhancements.

UniLink 700/701
SCN 22.3 expected 3rd quarter. Minor software change addresses several known functional issues.

EFI-890R/MFD-640
TSO data package in support of elevating the existing vibration qualification testing for helicopter platforms is expected to be submitted 3rd quarter.

Service Bulletins are published for all software releases and hardware modifications. Visit www.uasc.com to view the Service Bulletin for the software and hardware updates listed here, in addition to associated Service Letters and archived Bulletins.
Customer Highlight Series

Presenting the Dash 8 (Q-Series) Modernization Program

A new flight deck modernization program for the Bombardier Dash 8 (Q-Series 100, 200 and 300) aircraft has been introduced that enhances the operational value of this reliable aircraft. The program, designed and integrated by Universal dealer Field Aviation of Canada, features a 5-panel suite of EFI-890R Flat Panel Display Systems with Primary Flight, Navigation and Engine Displays, dual Vision-1® Synthetic Vision Systems, Radio Control Units and WAAS/ SBAS-FMSs.

This advanced flight deck is similar in arrangement to current-production Q400 aircraft. Combined with Bombardier Commercial Aircraft’s Extended Service Program (ESP) that extends the economic life of the Dash 8-100 turboprop to 120,000 flight cycles from the original 80,000 flight cycles, it results in an exceptional value.

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