Next Step for WAAS: LP Approaches

The FAA has announced it will begin publishing Localizer Performance (LP) approach procedures in March 2009. These new Wide Area Augmentation system (WAAS) procedures, charted as RNAV (GPS) LP, are lateral-only procedures similar to an Instrument Landing System (ILS) localizer. LP approaches will use SBAS satellite position information for accurate lateral guidance and smaller position errors. They are commonly referred to as WAAS procedures without vertical guidance.

According to the FAA, LP procedures will be published in locations where, due to obstacles or other infrastructure limitations, a vertically guided approach / glidepath (LPV or LNAV/VNAV) is not possible.

An LP procedure chart has yet to be published (to date). However, the following information has been made available by the FAA:

- The protected area for LP approaches is considerably smaller than the area for the present LNAV lateral protection and will provide a lower minimum descent altitude (MDA) in many cases.
- The MDA is expected to be approximately 300 feet above the runway.
- LPV and LP will not be published as part of the same instrument procedure. Integrity limits cannot be changed during an approach. Each procedure will have a different Channel ID.
- Equipage requirements for LP procedures are the same as for LPV, which require TSO-145c/TSO-C146c equipment.

More information on LP approach capability for Universal’s WAAS/ SBAS-FMS will be provided as these procedures become available.

New Product News

Looking Forward to 2009

EFI-890Rs to Use LED Lighting

By the end of the first quarter of 2009, light-emitting diode (LED) technology will replace fluorescent lamps in the MFD-640 and EFI-890R Flat Panel Displays.

The new backlight system will provide an approximate 40% power reduction in the MFD-640 and 25% reduction in the EFI-890R. Reduced power requirements lower the unit operating temperature, thereby putting less load on the aircraft power bus, lowering the amount of heat generated in the cockpit and increasing reliability. Customers will notice brighter, clearer displays, improved color uniformity and performance in low luminance operations.

The LED upgrade will be automatically incorporated into newly manufactured units and be available as a modification upgrade for existing installations.

NTSB’s Most Wanted: Solved

Universal Avionics announces an exciting new line of cockpit voice and digital flight data recorders that will be available 2nd quarter 2009.

The Cockpit Voice and Flight Data Recorder (CVFDR) with internal Recorder Independent Power Supply (RIPS) features backup power and cockpit audio recording capabilities listed by the National Transportation Safety Board (NTSB) on its transportation safety improvements “10 Most Wanted List”. The CVFDR meets the NTSB’s recommendations, as well as the FAA’s final rule mandate for cockpit voice and flight data recording.

CVFDR features will include:

- Record and store 2 hours of cockpit audio, at least 25 hours flight data and 120 minutes data link messaging
- Five CVR, FDR and CVFDR options available
- Internal RIPS option
- Weighs less than 8 lbs (4 lbs lighter than CVR-30B/120)
- Meets TSO-C123b, C124b, C155, C177; and ED-112
Seeing the Value in LPV Approaches
An editor’s perspective by Michelle A. James, Relationship Marketing Manager for Universal Avionics

As I’m placing the final touches on this issue of The Universal Flyer, I can’t help but to glance outside my office window. Here at Universal’s headquarters in sunny Tucson, Arizona, it’s clear, sunny and 72°. Situated in the Sonoran desert in the hot, dry southwestern U.S., Tucson doesn’t get a lot of the snow, ice and fog that other regions do. Those of us who live here don’t take that for granted, given most are “transplants”, including myself.

But what Tucson lacks in weather, it makes up for in landscape. We have impressive local mountain ranges that we often use to demonstrate Universal’s TAWS (some folks are better at handling the forces of the TAWS demo flight than others). And we often use the LPV procedures at Tucson International Airport to demonstrate the benefits of our Satellite-Based Augmentation System (SBAS)-capable Flight Management Systems. Anyone who has flown LPV over and over, as we often do here during testing, can attest to the impressive consistency of descending straight down to the centerline every single time. Yet when it comes to low visibility conditions for which the WAAS/ SBAS-FMS is so very well suited, dry and clear, let’s be honest, we just don’t get the weather here to support that. Darn those clear sunny days.

That’s why we were delighted at the rain and fog on a recent demo trip that included several stops along the U.S. East Coast. Did I say “delighted”? Let me explain. True, the marketing background in me sees nothing but opportunity to show off the capabilities to land centerline without VFR and ILS. But the human (that is, nervous) part of me rests all confidence to land safely each and every time in our trusty WAAS/SBAS-FMS and in the hands of experienced Chief Pilot, Jerry Harkin. Neither let me down.

I was reminded on this demo trip of the considerable value of the equipment we have onboard our King Air and the piece of mind it brings when you’re 354 feet above the runway...

“It’s like an out of body experience.”

It was on this East Coast trip that a potential customer, while viewing our Vision-1® Synthetic Vision System as we descended through fog and clouds perfectly aligned 354 feet above the runway centerline, said: “It’s like an out of body experience.”

Software and Hardware Updates

**EFI-890R**
SCN 1017.1.3 approved 10/2/08. This minor software change adds configuration support for several new aircraft types.

SCN 1017.0.7 expected January. This minor change adds alternate display formats, software updates for Garmin WAAS interface, allows Vision-1® display simultaneously on left and right PFD.

changes MLSA depiction and other improvements.

SCN 1017.1.4 expected February. This minor change supports a change for digital AHRS or IRS interface and removed unused code for EASA certification.

SCN 1019.0.2 expected February. This minor change removes unused code in support of EASA certification.

**MFD**
SCN 1011.5.1 expected January. This minor change supports RDR-4000 weather radar, RDR-4B Windshear mode and Primus 700A/701A SAR radar interface.

**FMS**
SCN 802.6/902.6 expected late December 2008. Minor change addresses memory corruption issues during crossfill operations.

SCN 1000.2/1100.2 approved 9/16/08. This minor change corrects a software defect affecting crossfill operations during approach operations.

WAAS/SBAS-FMS Mod 2 released 10/28/08. This hardware change corrects a defect with the Ethernet operation when the FMS is interfaced with the SSDTU.

New Central Region Marketing Representative
Universal Avionics is pleased to welcome Robert Randall as its new U.S. Central Region Marketing Manager. Robert will be responsible for the overall growth and development of Universal product sales in the Midwest region. He will be affiliated with Universal’s Wichita, Kansas office although much of his work will be based out of a satellite office in Tulsa, Oklahoma.

With over 30 years of avionics maintenance, testing, sales and management experience, Robert brings a broad range of avionics knowledge to the company. He is a licensed A&P Mechanic and a member of AOPA.

Robert assumes this position from Robert Clare, who recently assumed a new role within Universal as Director of OEM Marketing.

Robert may be contacted at (918) 925-9883 or (800) 321-5253; email: rrandall@uasc.com.
Notes from Product Support
FAQ: Calculated VS Actual Wind Speed

Why do calculated winds not match actual winds?
Universal’s Flight Management Systems (FMS) are not capable of determining actual wind data. However, it calculates a close estimate of wind speed using a variety of data sources and advanced computing methods. Wind speed and direction are displayed on the Navigation pages in the lower left corner.

Incorporated into the FMS is an advanced algorithm called the “Kalman Filter”. This filter determines the aircraft’s true track and ground speed and uses that as the actual aircraft motion through space. The FMS compares this data to the airspeed and heading from the Air Data Computer (ADC) and AHRS/IRS. The difference between these two data sources is attributed to winds.

Any difference between actual winds and FMS-calculated winds is due to the variables involved with the calculation.

How accurate is this wind calculation?
Errors involved with this type of calculation, if any, are considered miniscule compared to errors from the air data sensors.

For example, if an aircraft was flying without an FMS or GPS, the pilot would track a course by tuning a VOR, dialing the desired course and flying that heading. If the aircraft starts to drift off course, the pilot would correct the heading to maintain course and account that to winds. Actually, the crosswind portion of the wind is what causes the drift correction heading.

So, the amount of heading change (drift) from the desired course is based upon aircraft airspeed and amount of crosswind. A realistic drift heading would be a degree or two for a nominal crosswind of 10 to 20 knots at common airspeeds. If a heading is off by as little as a degree or two, the FMS automatically assumes that is due to a wind.

In dual FMS installations, why are the calculated winds different between FMS 1 and FMS 2?
Universal FMSs are independent navigators and do not compare any data other than a gross position check (when crossfill or sync is configured). This applies to air data, headings, winds, position (other than gross position), etc. Therefore, the FMS computes winds independently and will attribute any and all heading/air data errors to winds.

Why does the difference in wind calculation between FMS 1 and FMS 2 affect the fuel at destination calculation?
To compute flight plan leg times and time to destination, the FMS recomputes predicted ground speed over the entire flight plan, rather than applying the current ground speed directly. To prevent wind errors from being propagated throughout the entire flight plan, manually enter flight plan wind estimates into the FMS. This is accomplished on Flight Plan Menu page 2.

Service Bulletins and Letters

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Manual Currency & Updates
The Tech Pubs team offers a reminder that the UniNet portion of our website (www.uasc.com) is a great place to verify the currency of your manuals and download manuals and temporary changes.

A squawk sheet is also provided on the site if you would like to point out errors or make suggestions for our manuals. Registration is simple and quick.

As always you can email Technical Publications directly at techpubs@uasc.com.
SSDTU

Fast, Easy and...Ready to Ship

In the inaugural issue of The Universal Flyer, dated April 1, 2008, Universal announced the introduction of the Solid State Data Transfer Unit (SSDTU). The article stated that the unit would be released 4th quarter 2008. Indeed, Universal received FAA TSO-C109 certification approval for the SSDTU on October 3rd (ETSO is in process). Shipments began shortly thereafter.

The SSDTU features high-speed Universal Serial Bus (USB 2.0) and Secure Digital High Capacity (SDHC) technologies that replace floppy, Zip and CD/DVD disks used by older data transfer devices. Its 2-in-1 functionality eliminates the need for a separate data-loader for FMS, TAWS, Synthetic Vision and UniLink database updates; and another for Jeppesen Charts, EDOCs and checklist updates.

At under 2 ½ lbs, the SSDTU weighs 72% less than a fixed-mount DTU-100 and Accessible Data Unit (ADU) combo installation. It features a multi-port Ethernet network to simultaneously support up to eight Universal products, including FMS, TAWS, Vision-1®, UniLink, ASU and UCD systems. The SSDTU has the same fit as the DTU-100 and in most cases, would be considered a direct replacement with only minor wiring and connector changes. Contact your local dealer or call Universal Avionics at 1-800-321-5253 or 520-295-2300 for more information about switching to the SSDTU.

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