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Time-Saving CPDLC Departure Clearances Available

Controller-Pilot Data Link Communications (CPDLC) Departure Clearances (DCL) are becoming a hot topic of conversation in the industry. When equipped and properly trained for CPDLC DCL, operators have the ability to obtain initial and revised departure clearances using CPDLC. Operators simply logon to the tower, receive their clearance in seconds and load it into the FMS, and then call ground control for taxi – saving both time and money.

We recently completed live CPDLC DCL testing with our Cessna Citation VII equipped for Future Air Navigation System (FANS) 1/A+. During this testing, it took only 22 seconds to receive a clearance after logging on to the tower, which is unavailable if your departure time is less than 30 minutes away using a traditional Pre-Departure Clearance (PDC). If the wind changes direction and the active runway changes, most aircraft will have to receive a new clearance via voice with the new runway, SID, etc. All of the aircraft in line for departure will be using the same voice clearance delivery frequency which can take quite a bit of time at a busy airport. With CPDLC DCL, operators can receive the new clearance via data link and be ready to go, providing a significant time savings vs voice operations.

Many aircraft that are equipped with CPDLC DCL have been provided with different taxiways in order to move ahead of everyone else when weather is moving in. Aircraft without this capability, can essentially be caught in the back of the line, proving airspace is developing into a "best equipped, best served" environment. Domestic operators who frequent busy airports that offer CPDLC DCL service will desire this capability, regardless of the need for oceanic FANS.

Product News and Company Highlights

Matching Advanced Avionics to Customer Needs

AHS-525 AHRS Receives TSO Authorization

The Federal Aviation Administration (FAA) has granted Technical Standard Order (TSO) authorization for the AHS-525 Attitude Heading Reference System (AHRS). This long-awaited approval allows us to begin manufacturing the product for order and delivery.

The AHS-525 is a low cost, reliable solution for replacing legacy mechanical Vertical Gyroscopes (VG) and Directional Gyroscopes (DG) in Part 23 and Part 25 Fixed Wing aircraft, and Part 27 and Part 29 Rotorcraft. Containing multiple rate gyros, the AHS-525 measures angular aircraft motion in the pitch, roll and yaw axes. There are also several internal accelerometers to measure aircraft linear motion along the longitudinal, lateral and vertical axes of the aircraft.

A single AHS-525 provides an opportunity to replace multiple Line Replaceable Units (LRU) found in a typical aircraft installation. This results in simplified and reduced-cost retrofit installations, and reduced operating costs, weight, wiring and power consumption.

For more information, contact your Universal Avionics Regional Sales Manager or visit www.uasc.com/shop/avionics/ahrs.

ADS–B Failure Messaging Available with New SCN

Software Control Number (SCN) 1001.1/1101.1/1101.1M for the Satellite-Based Augmentation System (SBAS)-Flight Management System (FMS) includes cost-saving messaging to alert the crew to a failure of the Automatic Dependent Surveillance–Broadcast (ADS–B) Out system. Operators with FMS SCN 1001.1/1101.1/1101.1M can save up to $10,000 (USD) vs standalone cockpit panel annunciators and Digital Discrete Adapters (DDA). It also provides a growth path to Localizer Performance with Vertical Guidance (LPV), Required Navigation Performance (RNP), and with the UniLink UL-800/801 CMU, CPDLC DCL, FANS and Link 2000+.

The new SCN adds support for four new ARINC input busses and four new discrete inputs. These inputs are monitored for data indicating the state of ADS–B Out or transponder failure. This improvement adds a monitor with messaging to alert the crew to a failure of the ADS–B Out system. The status labels from an ATC/Mode-S Transponder system are monitored by the FMS and used to detect a failure in the system.

More information can be found in Universal Avionics Service Bulletin (SB) No. SB3633, *Introduction of FMS SCN 1001.1/1101.1/1101.1M and PAS SCN 10.4 for the UNS-1Ew,-1Espw, -1Fw, -1Lw FMS/MMMS and LPV Monitor*. A copy is available for you to download on UniNet at www.uasc.com/UniNet.

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Time-Saving CPDLC Departure Clearances Available (continued)

CPDLC DCL Operational Airports

CPDLC DCL technology is expected to become available to 56 airports throughout 2016. High traffic airports are being added every week.

Universal Avionics Solution

Our FANS 1/A+ and CPDLC solution includes a SBAS-FMS, UniLink® UL-800/801 Communications Management Unit (CMU) and data link capable Cockpit Voice Recorder (CVR). For more information, visit www.uasc.com/fans.

Limited-Time Incentive Programs Available

FMS Upgrade Incentive for Learjet 40/45/40XR/45XR and Citation Excel/XLS

Available to Learjet 40/45/40XR/45XR and Citation Excel/XLS operators – trade in your non-SBAS (legacy) Universal Avionics FMS for a significant credit toward the purchase of a new, advanced capability SBAS-FMS. This offer is valid for new orders placed January 1, 2016 through December 31, 2016.

ADS–B Out Pricing Incentive

This package program includes a Universal Avionics SBAS-FMS upgrade and Rockwell Collins TDR-94(D) Mode S Transponder, together providing equipage requirements to meet the upcoming NextGen ADS-B Out mandate. This offer is valid for new orders placed April 20, 2015 through December 31, 2016.

NextGen SBAS-FMS Upgrade Incentive

Non-Universal Avionics operators may trade in their aircraft's legacy FMS/GPS system for a new, SBAS-capable FMS. Qualified FMS/GPS systems will be accepted for a trade-in credit allowance toward the new system. Offer valid for new orders placed May 1, 2016 through December 31, 2019. Please feel free to share this with associates not currently operating Universal FMSs.

Dealer Spotlight: Heli-One

Heli-One, a Universal Avionics Authorized Dealer since 2010, is a leader in rotor wing maintenance, repair, and overhaul (MRO) services with decades of expertise supporting a wide range of helicopter platforms from Airbus, Leonardo-Finmeccanica (AgustaWestland), Sikorsky and Bell. The company also supports a wide range of mission types including: Search and Rescue (SAR), law enforcement, utility, VIP, oil and gas, Emergency Medical Service (EMS) and military. Customer-focused solutions are aimed at ensuring safety, minimizing aircraft downtime and maximizing operational capability, while decreasing the cost of ownership.

The services offered by Heli-One span the range from nose-to-tail, including avionics and design solutions. They have a rich design history with over 40 years of experience in developing custom modifications and upgrades for operators. The team in Stavanger, Norway is a European Aviation Safety Agency (EASA) 21J Design Approval Organization.

The team in Delta, Canada is a Transport Canada Approval Organization.

Between these groups and satellite design teams, Heli-One holds over 145 Supplemental Type Certificates (STC) and can design and certify a wide array of modifications certifiable in practically any Airworthiness Jurisdiction in the world.

Heli-One's upgrade and modifications solutions allow for operators to extend the lifespan of aircraft and expand operational capability.

Heli-One's Headquarters in Delta, BC, Canada

About

The Universal Flyer is a quarterly publication produced by Universal Avionics Systems Corporation. This newsletter provides information about Universal Avionics as a company, its products and services as well as regulatory and educational information relevant to the owners and operators of business, regional and air transport aircraft.

Feedback

Your feedback is appreciated. Email your comments to: universalflyer@uasc.com.

Update

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From the Flight Deck

Discussing ARINC Procedural Leg Types with Universal Avionics Pilot Instructor – Customer Training

Mike Michalski, Pilot Instructor – Customer Training

Various questions from FMS operators over the years suggest that the 23 different ARINC Procedural Leg Types (22 types prior to SCN 801) are misunderstood or not recognized at all when appearing in the Flight Plan or on the Navigation pages.

These legs are the "building blocks" of terminal procedures, specifically designed to allow a charted procedure to be converted into a digital sequence of instructions for the FMS computer to follow. Most consist of a path and a terminator and are understood intuitively, such as Procedure Turn {to Intercept} (PI), Direct to Fix (DF), Heading to Altitude (VA), DME Arc to a Fix (AF), and so forth.

For a complete listing of the types and their two letter codes, please reference the Flight Planning Section of the FMS Reference Guide for SCN's 803/903 and later (Report No. 2423sv80X/90X.01), or Section IV Database in other software version Operator's Manuals. To see examples of how the leg types work, consult the respective Operator's Training Manual, which can be downloaded from UniNet at www.uasc.com/uninet. While it is not imperative that you memorize all of the leg types, it is important to recognize their existence in a procedure and the effect they may have on the subsequent flight path.

Two leg types that are easily confused are the CF, or Course to Fix leg, and the TF, Track between Fixes leg. The CF is most often encountered in an approach, typically as the first waypoint inside the Approach Label. An example is shown to the right using the KMDW RNAV RWY 04L approach with EON transition. Note: the CRS047° directly above JERNU in line 5 (top), whereas a track of 047° between TASUE and JERNU appears above line 3. The logical question at this point might be, "What is the difference?"

CRS047° directly above JERNU in line 5

The answer lies in how the crew programs the FMS to comply with an approach clearance that may exclude parts of the transition. For instance, if approach control clears the aircraft from EON to JERNU, and the crew deleted both lines 2 and 3, resulting in EON followed by the CF version of JERNU as shown in the top right, the FMS will see the new active leg as a course of 047°

and automatically set up to a maximum 45° intercept angle to join that course (heading 002° in this case which would intercept inside HADGI) as illustrated below.
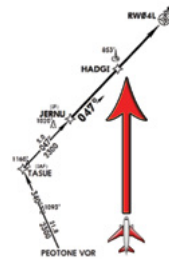
To prevent this, the correct action would have been to only delete TASUE from the flight plan, leaving the TF leg between EON and JARNU as a track of 351° (right).

EON followed by the CF version of JERNU

TF leg between EON and JARNU as a track of 351°

While the above situation is not too alarming, a situation in which the CF leg to the Intermediate Fix can create big problems is when a *NO LINK* is deleted between last waypoint in the flight plan (possibly a STAR waypoint) and the approach without the transition loaded. Using KSTL RIVERS 4 arrival and RNAV 29 approach without the FORUM transition (right), and *NO LINK* deleted, we see that following MELVY (end of STAR) is the approach label and the CF leg to JIGIM.

KSTL RIVERS 4 arrival and RNAV 29 approach without the FORUM transition

When within 2 minutes of MELVY, the FMS would commence a turn to the right to set up a 45° intercept angle to join the extended course of 302°, far to the northwest of the airport. The screen captures of the FMS and MFD illustrate this (right and below).
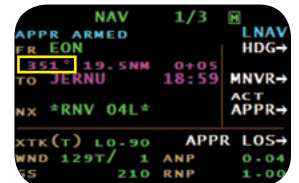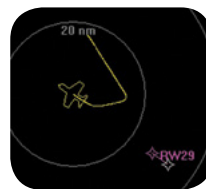
45° intercept angle to join the extended course of 302°

45° intercept angle to join the extended course of 302° on MFD
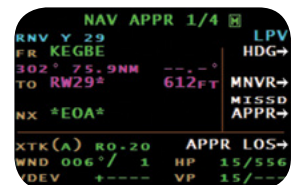
45° intercept angle to join the extended course of 302°

Recent Service Bulletins and Letters

Visit UniNet today at www.uasc.com/UniNet to download any of our Service Bulletins (SB) or Service Letters (SL), including the recently released ones listed to the right, from the Tech Pubs tab.

SB / SL No.	Release Date	Title
SB3452	6/9/16	Installation of Mod 9 into the MFD-640
SB3633	4/7/16	Introduction of FMS SCN 1001.1/1101.1/1101.1M and PAS SCN 10.4 for the UNS-1Ew, -1Espw, -1Fw, -1Lw FMS/MMMS and LPV Monitor
SB3617	1/26/16	Introduction of the AHS-525 Attitude Heading Reference System (AHRS)

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Dealer Spotlight: Heli-One (continued)

They also allow a more cost-effective and less disruptive option than purchasing new helicopters.

A couple of collaborative projects currently underway demonstrate the universality of this solution: flight display and avionics upgrades for the German Federal Police (AS332 platform), His Majesty the Sultan of Johor (S-76 platform), and the Royal Malaysian Air Force (S-61 platform).

The relationship between Heli-One and Universal Avionics goes beyond the traditional manufacturer-dealer relationship; the two companies work closely together to provide customized solutions for operators. We undertake a key support role from the first implementation discussion with an operator all the way to supporting the training of flight crew and pilots. As an example, Heli-One recently completed the first flight test for an AS332 flight display upgrade installation, and our representatives were on-site to provide live support to the crew, technicians, regulatory representatives and the customer.

Inside This Issue