SBAS FMS UPGRADE: Operator Sales Bulletin

OFFER OVERVIEW

Act fast to take advantage of this highly competitive offer to upgrade Universal Avionics (UA) 60X/70X and 80X/90X software Flight Management System (FMS) to Satellite-Based Augmentation System (SBAS) FMS. For a limited time, buy one FMS and get the second FMS at no charge (BOGO) or buy one FMS at 50% off.

Qualifying FMS models include: UNS-1C, UNS-1Csp, UNS-1D, UNS-1K, UNS-1C+, UNS-1Csp+ UNS-1D+, UNS-1K+, UNS-1E, UNS-1Esp, UNS-1F, and UNS-1L. Part Numbers include: 1017-XX-XXX, 1019-XX-XXX, 1192-XX-XXXXXX, 1116-XX-XXXX, 10172-XX-XXX, 10192—XX-XXX, 11922-XX-XXXXXX, 11162-XX-XXXX, 2017-XX-XXX, 2019-XX-XXX, 2192-XX-XXXXX, 2116-XX-XXXX.

EFFECTIVE DATES

This offer is valid for new orders placed before October 31, 2023, and orders must be shipped by December 31, 2023.

PROGRAM DESCRIPTION

When UA unveiled the 60X/700X software FMS in 1995, it was the most advanced FMS available in the commercial market. Keen operators were quick to adopt this technology. Since then, significant advancements have occurred in technology and aerospace. These remarkable innovations have paved the way for creating more capable FMS models that showcase cutting-edge features. These advanced features reduce pilot workload by enabling flight along any desired flight path with precision and, most importantly, the ability to determine aircraft position with accuracy and integrity. With these capabilities comes an increase in safety and a reduction in operational cost, no more multiple step-down, non-precision, and circling approaches.

Interestingly, the International Civil Aviation Organization (ICAO) acknowledges the effectiveness of utilizing continuous guidance systems such as RNP and LPV approaches in mitigating the risk of Controlled Flight Into Terrain (CFIT) accidents. In fact, ICAO has stated that these operations can reduce the risk of CFIT accidents by a factor of 25 compared to traditional circling approaches. Furthermore, once vertical guidance is incorporated into these approaches, the safety margin increases by an additional factor of 8. This means that with the integration of both lateral and vertical guidance, overall safety is enhanced by 200 times.

The advanced capabilities of the UA SBAS FMS offer pilots a precise and stable alternative to inherently risky circle-to-land operations. By adopting these advanced navigation systems, pilots not only experience heightened safety but also a significant reduction in their workload.

It is important to acknowledge that the number of published procedures and approaches has experienced exponential growth over the past three decades. While the 60X/70X software FMS was designed with ample memory at the time, it is now unable to accommodate the vast volume of navigation data that is available. Consequently, the 60X/70X software FMS navigation database has significant limitations, often offering only a single approach option for many airports.

Discontinuation of Repair Service

In November 2019 UA announced limited repair capabilities for the SCN 60X/70X FMS LRUs due to parts obsolescence.

Reference SL2902, SL2903, SL2904, and SL2906 for more information.

Despite these navigation database limitations brought about by advancements in air traffic management, UA continues to place great importance on earning the loyalty of our customers by continuing to provide 24/7 support for the 60X/70X and 80X/90X software FMS. Nevertheless, the increasing obsolescence of components threatens UA's ability to offer repair services for these aging FMSs. Upgrading to a new SBAS FMS ensures long-term reliability and supports efficient cost management for operators.

As demonstrated by the exceptional performance and longevity of our 60X/70X and 80X/90X software FMS, UA is dedicated to delivering cutting-edge and dependable avionics solutions. Gain what is important to you and save by acting fast to receive exclusive discounts on an upgrade to a UA SBAS FMS. Review some of the benefits of upgrading to an SBAS-capable FMS, including RNP procedures, LPV approaches, coupled RF legs, and database management benefits.

WHAT'S IMPORTANT?

Safety

RNP procedures:

- ✓ Contribute to enhanced safety by providing clear and precise navigation guidance, reducing the risk of navigational errors and deviations from intended flight paths.
- ✓ Are designed to maintain safe separation from obstacles, terrain, and other aircraft, helping to mitigate the risk of controlled flight into terrain (CFIT) and improving situational awareness
- ✓ Enable optimized flight paths, taking advantage of direct routing, shorter distances, and efficient climb and descent profiles

LPV approaches:

- ✓ Enhance safety by providing vertical guidance to the runway, even in areas where traditional ground-based navigation aids are limited or unavailable
- ✓ Enables pilots to maintain a stabilized descent profile and approach the runway more precisely, reducing the risk of controlled flight into terrain (CFIT) and improving overall situational awareness
- ✓ Enhance operational capability by providing vertical guidance to lower decision altitudes or minimum descent altitudes compared to non-precision approaches, which enables pilots to descend closer to the runway while maintaining obstacle clearance, potentially reducing the likelihood of missed approaches and diversions due to weather conditions.

Coupled RF legs:

- ✓ Enhance safety by providing more predictable and standardized flight paths, reducing the risk of navigation errors and deviations from the intended track, promoting better situational awareness.

On-time Arrival

RNP procedures:

- ✓ Enable more efficient use of airspace and airport resources, facilitating improved traffic flow management, supporting on-time arrivals
- ✓ Enable aircraft to follow predictable and precise paths, contributing to smoother traffic flow, reduced delays, and increased capacity.

Coupled RF legs:

- ✓ Enable aircraft to follow precise curved paths, so air traffic controllers can optimize routes and reduce conflicts between aircraft operating in congested airspace, improving traffic flow, reducing delays, and increasing airspace capacity.

Efficient Flight Operations

RNP procedures:

- ✓ Enable pilots to navigate along precise paths with exceptional accuracy
- ✓ Expand operational flexibility when designed to navigate through challenging terrain, congested airspace, or noise-sensitive areas providing more precise navigation capability, enabling aircraft to fly in airspace that would otherwise be limited or restricted
- ✓ Minimize unnecessary turns, distance, and altitude changes, reducing flight time, fuel consumption, and emissions, leading to cost savings for airlines and a positive environmental impact.

LPV approaches:

- ✓ Utilize onboard navigation systems, providing pilots with enhanced situational awareness, enabling real-time adjustments, resulting in smoother descents, stabilized approaches, and reduced fuel consumption
- ✓ Allow for more direct routing options, efficient flight planning, and considerable time and fuel savings by improving accessibility to airports without traditional ILS infrastructure
- ✓ Reduce pilot dependence on ground-based navigation aids, further enhancing operational flexibility and efficiency
- ✓ Offer lower decision altitudes and descent altitudes, reducing the chances of missed approaches and costly diversions due to weather conditions
- ✓ Can serve as cost-effective alternatives to RNAV approaches with less stringent RNP requirements, streamlining operations and reducing costs.

Coupled RF legs:

- ✓ Enable smoother and more efficient turns, optimizing routes and reducing track miles.

In the U.S., as of 04/20/2023, there are:

4119 LPVs | **1998** Airports

734 LPs | **537** Airports

1550 Cat I | **762** Airports

Database Management

Single world coverage database includes:

- ✓ Public use airports with plain-language references for locations having one hard-surfaced runway at least 2,000, 4,000, or 5,000 feet long, depending on the coverage selected
- ✓ Navaids with plan-language references for VHF navaids and NDB navaids
- ✓ All high and low enroute airway routes published by government agencies
- ✓ All enroute waypoints (intersections) published by government agencies for on-airway and off-airway navigation
- ✓ All terminal waypoints (intersections) associated with SID, STAR, or approach procedures
- ✓ VFR reporting points
- ✓ For included airports, SIDs, STARs, and approaches, including transitions and missed approach procedures
- ✓ ILS, LOC, BC, GPS, RNAV, VOR, VOR/DME, NDB, and TACAN approaches
- ✓ Multiple approaches of the same type to the same runway
- ✓ Some private and some special permission required SID, STAR, and approach procedures
- ✓ Runways at included airports with a minimum length of 2000, 4000, or 5000 feet, as applicable.
- ✓ Some private runways and some soft-surfaced and gravel runways.

Airport Access

LPV approaches:

- ✓ Expand airport access by allowing instrument approaches in areas where installing traditional ILS infrastructure might not be feasible due to cost or physical constraints
- ✓ Utilizes satellite-based navigation systems which are accessible in a wider range of locations, including remote areas or regions with challenging terrain.

The worldwide **SBAS FMS** navigation database can contain up to **35,000 approaches,** depending on aircraft configuration.

As of April 13, 2023 **ICAO NOTAM A1977/23** permanently requires specific approaches to use Nice Cote D'Azur Airport. These approaches are not in the 604 navigation database. Operators not equipped with an SBAS FMS may be unable to fly into **LFMN**.

Flexibility & Autonomy

LPV approaches:

- ✓ Provide pilots with more flexibility and autonomy during the approach phase, reducing reliance on ground-based navigation aids or air traffic control
- ✓ Enable pilots to fly LPV approaches independently, utilizing onboard navigation systems reducing dependence on external guidance.

Passenger Experience

Coupled RF legs:

- ✓ Minimize abrupt maneuvers and provide a more consistent flight path, reducing sensations of banking or changes in direction, resulting in a smoother and more comfortable flying experience.

Precision & Accuracy

RNP procedures, LPV approaches, and coupled RF legs:

- ✓ Offer pilots enhanced navigation capabilities, ensuring precise lateral and vertical guidance throughout all phases of flight
- ✓ Allow pilots to easily adhere to predefined flight paths with exceptional accuracy, maintain safe separation from obstacles and other aircraft, and execute approaches with unparalleled precision
- ✓ Support Confident navigation through complex airspace, challenging terrain, and adverse weather conditions with precision.

RNP procedures provide:

- ✓ Pilots with an advanced level of navigation precision, surpassing the capabilities of traditional ground-based navigation aids
- ✓ Enable aircraft to navigate along highly precise paths, both laterally and vertically, resulting in superior navigational accuracy and reliability.

LPV approaches:

- ✓ Offer pilots vertical guidance that rivals the accuracy of Instrument Landing System (ILS) approaches
- ✓ Provide pilots with precise altitude and glide slope information throughout the entire approach, ensuring a smooth and accurate descent to the runway.

Coupled RF legs:

- ✓ Enable pilots to navigate smoothly along predefined curved flight paths with precision.

WARRANTY

UA warrants all new equipment for two years from the date of installation as part of our new equipment warranty.

UA offers an extended warranty through our FlightAssure™ Extended Warranty plan.

For more information on UA warranty services, please visit our website.

FlightAssure Plans	Essential	Premier	Fleet
Max Flight Hours	300	300	N/A
Contract Term	3-Year contract, billed annually, fixed-price	3-Year contract, billed annually, fixed-price	Annual Contract; billed monthly based on flight hours
Promotions & Discounts	Early enrollment discount	Early enrollment discount	
No Charge Exchange / Rental / Repairs	✓	✓	✓
Shipping: Free International Priority; Free Domestic Overnight	✓	✓	✓
Fully Transferable Contract	✓	✓	✓
R&R Labor	✓	✓	N/A
Fleet Discounts	✓	✓	N/A
NFF Allowance	5	Unlimited	Unlimited
Counter-to-Counter Shipments		✓	✓
Tech Publications – Pilot Guides		✓	✓
25% Discount for Major FMS Software Upgrades* *does not include upgrades in which the P/N changes (e.g. UniLink™ ATN Module)		✓	N/A

TRAINING

As a company who provides groundbreaking and innovative solutions, UA recognizes the importance of providing state-of-the-art training and is committed to ensuring it provides measurable results that enhance safety and efficiency. UA offers a premiere on-demand online training option through UA Academy in addition to Instructor-Led Training (ILT) in a formal classroom setting at our facility in Tucson, Arizona USA.

SBAS FMS courses offered at no cost through UA Academy include:

- SBAS Flight Management System (FMS) Operations
- FMS End User Maintenance
- FMS Return to Service
- Vertical Navigation (VNAV) Made Easy
- SBAS FMS Integration and Installation (UA Authorized Dealers only)

Pilots can also use the FMS Trainer Desktop Software Program, which provides interactive training for the SBAS FMS. This Windows® PC-based software loads right on their personal computer, with no other hardware required. It features a fully interactive FPCDU, and depicts Electronic Flight Instrument System (EFIS), Primary Flight Display (PFD), and Navigation Display (ND).

For more information on the training services and software offered by UA visit our website or contact training@uasc.com.

All operators who upgrade from a 60X/70X or 80X/90X software FMS to an SBAS FMS within the effective dates of this promotion are eligible for SBAS FMS Operations familiarization training at our facility in Tucson, Arizona at no cost, a $967 value per pilot. Limit 2 pilots per upgraded aircraft. Pilots must attend training by December 31, 2024. Scheduling is subject to instructor availability—for more information and to reserve a seat, contact training@uasc.com.

EXCLUSIVE PRICING FOR A LIMITED TIME!

Act fast to take advantage of this highly competitive offer to upgrade UA 60X/70X or 80X/90X software FMS to SBAS FMS. For a limited time, buy one FMS and get the second FMS at no charge (BOGO) or buy one at 50% off.

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- Part Numbers include: 1017-XX-XXX, 1019-XX-XXX, 1192-XX-XXXXXX, 1116-XX-XXXX, 10172-XX-XXX, 10192—XX-XXX, 11922-XX-XXXXXX, 11162-XX-XXXX, 2017-XX-XXX, 2019-XX-XXX, 2192-XX-XXXXX, 2116-XX-XXXX.
- Purchase Orders (PO) must include aircraft information: aircraft make, aircraft model, registration number, and serial number.
- All removed FMS components must be returned to UA within 90 days of aircraft delivery, or a core charge of $10,000 per missing FMS component will be invoiced.

Product specifications and complete standard pricing information is available on UniNet.

For additional information, please contact your UA Regional Sales Representative.

NAVIGATION DATABASE

A navigation database subscription service is offered to provide current, accurate navigation information for your Flight Management System (FMS). Subscriptions for SBAS FMS are available in worldwide coverage areas. These databases are available directly from UA, updates are distributed on a 28-day cycle, and are available to either be shipped directly to your location or conveniently downloaded from UniNet 14-days prior to the effective date. Each update completely refreshes the entire database.

Navigation database order forms are available on our website.

INSTALLATION CONSIDERATIONS

Visit UniNet to download Service Letter No. 2815 Installation Considerations for Universal's WAAS/SBAS Flight Management System, which identifies the differences and requirements necessary to replace a 60X/70X and 80X/90X software FMS with an SBAS FMS. Additionally, it compares UA WAAS/SBAS FMS system's individual features and requirements and defines ancillary equipment, power requirements, and equipment specifications.

Visit our website to download brochures and white papers, including Doc No.: WHTP-2013-17-10 Operating in Satellite-Based Augmentation System (SBAS) Airspace, Doc No.: WHTP-2013-16-10 Understanding Required Navigation Performance (RNP) and Area Navigation (RNAV) Operations, and much more.

TO PLACE AN ORDER

For availability, order scheduling and navigation database subscription service, please contact your UA Regional Sales Representative.

TRAINING SERVICES

To obtain training services, including access to UA Academy, scheduling Instructor-Led Training, and purchasing the FMS Trainer software, please contact Training:
Phone: +1 520 573 7627 · 800 595 5906
Email: training@uasc.com

WARRANTY SERVICES

To obtain a quote for FlightAssure™ Extended Warranty, please contact UA Warranty Department:
Phone: +1 520 573 7627 · 800 595 5906
Email: warranty@uasc.com

REPAIR SERVICES

To obtain a quote for upgrades, including turn times, please contact UA Repair Station:
Phone: +1 520 573 7627 · 800 595 5906
Email: repairs@uasc.com