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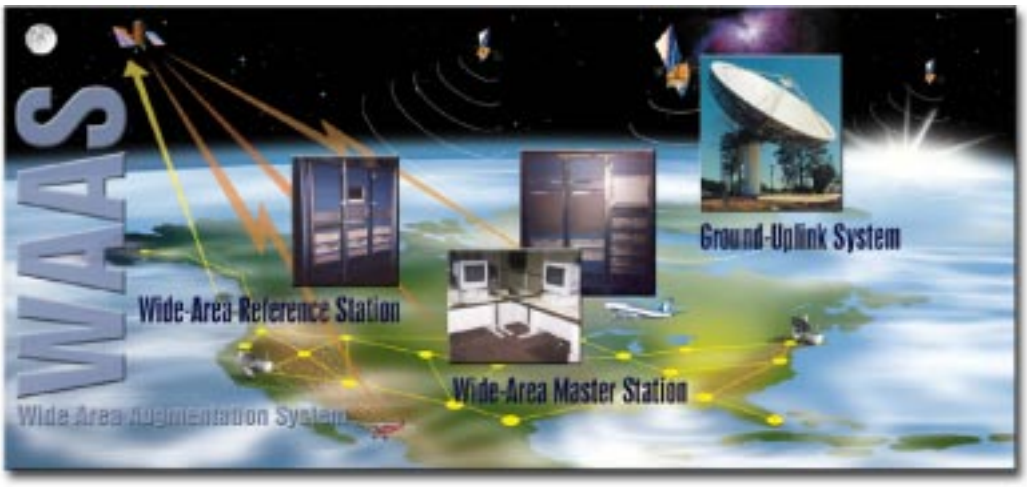
FAA Satellite Navigation Product Teams

SatNav News

WAAS Completes 60-Day Stability Test

By Bill Wanner, FAA/ACT-360



On September 16, 2002, the Wide Area Augmentation System (WAAS) completed its final test before FAA acceptance of the WAAS from the prime contractor, the Raytheon Corporation. This final test, the 60-Day Stability Test, completes the formal test and integration phase of this system that augments GPS for aviation applications. Preliminary results show that the system has met all requirements allocated to the test. A final decision on the status of the test will occur after the FAA reviews the final test report, which is expected sometime in late October. Analysis of test data has shown that accuracy levels have been as low as one meter in the horizontal and vertical dimensions. In addition, over 95 percent of CONUS (Continental United States) receives WAAS service for the Lateral Precision with Vertical Guidance (LPV) service level. LPV has the criteria of a horizontal alert limit of 40 meters and a vertical alert limit of 50 meters.

The requirements associated with the 60-Day Stability Test include the system's integrity, availability, coverage, and accuracy. The system meets those requirements, according to preliminary analysis by Raytheon and the FAA. The FAA and Raytheon worked closely together while preparing for and during the test. Due to this close coordination, the FAA was aware of system performance during the entire test. Raytheon has been comparing test results that were independently generated by the FAA each week of the test. Currently, the FAA is conducting a review of those test results. The successful end of the 60-Day Stability Test marks the completion of a crucial milestone for the WAAS program.

In this issue:

The WAAS has been available for use in non-safety-of-life applications since August 2000. Once WAAS is commissioned next year, aviation users will be able to expand the use of the WAAS to include instrument flight rules (IFR) applications.

New LAAS Product Team Lead-Words of Introduction

by Gary N. Skillicorn, FAA/AND-710
with Christine Cave, GPSTAC and Mary Ann Davis, GPSTAC
This month, Gary Skillicorn took the reins as LAAS Product Team Lead. He anticipates working with the team members who he says are dedicated to bringing the Local Area Augmentation System into focus. He shared an introductory message of hope and excitement with SatNav News.

"As I join the LAAS Integrated Product Team as the team lead, I'd like to offer a few words of self-introduction. It is with great pleasure and excitement that I begin to work with a fine group of team members dedicated to making LAAS a reality. As my wife simply states, our job is to 'make other people's dreams come true'. The dream, in this case, is for a safe reliable terminal approach and landing system that will serve us all for years to come."

Gary has been a government civil servant for more than 30 years. For the last 12 years, he has been with the Federal Aviation Administration (FAA). Before joining the LAAS team, Gary's time at the FAA has largely been dedicated to managing the ground-based navigation program, e.g. ILS, VOR, NDB, DME, etc. "I feel a sense of accomplishment from being involved in the fielding of hundreds of navigation aids in the last decade. I'm now looking forward to contributing to the development and fielding of LAAS as a natural evolution with technology." Gary commented that in many ways, LAAS is not unlike existing ground-based navigation equipment. It is faced with many of the same challenges; e.g. avionics interface standards, multi-path propagation, monitoring, competition for spectrum, flight inspection, certification, and, of course, logistic concerns - including maintenance, supply support, and training. "LAAS and WAAS are truly complex systems with a whole set of unique challenges. I did not fully appreciate that complexity until I started being absorbed into the program." Gary brings to the LAAS program a strong acquisition background from many years of experience, and a strong technical savvy with degrees in electrical engineering and systems management, as well as a personal interest in electronics and aviation. He is an active instrument- rated general aviation pilot and aircraft owner. Before working with the FAA, Gary worked with the Department of Defense in the development and acquisition of air traffic radar, navigation aids, and landing systems

In closing, Gary had this to add, "I'd like to mention that when I walk through an airport terminal, I sense the overwhelming importance of what we do. Millions of people I'll never know benefit from our efforts and, in turn, they trust a team of folks they will never know with making their travel as safe as possible. The challenge I give to the LAAS Product Team is to share that same feeling that the work we're doing is truly important and will matter in a countless number of ways in decades to come."

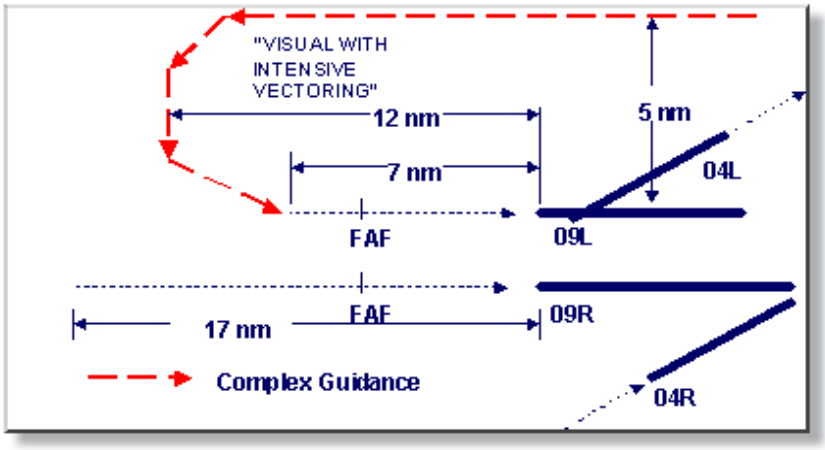
LAAS Acquisition and Implementation Activities

By Dieter Guenter, GPS TAC/AND-710
The FAA LAAS Product Team (AND-710) and the FAA Navigation Systems Implementation Product Team (AND-720) have been leading the effort for the acquisition and implementation of the LAAS program. Many of our SATNAV News readers are familiar with the main areas of focus of the LAAS program. Here is a quick review:

Phase 1 - Establishment of a Government Industry Partnership (GIP) to develop a LAAS CAT I system (private system for public use) to be fielded in the National Airspace System (NAS). Under the GIP, commercial vendors develop the systems, and the FAA provides type-acceptance support. The GIP industry partners are Honeywell, Raytheon, and Thales.)
Phase 2 - Development of a government-procured LAAS CAT I system, which meets all FAA requirements for a public-use system to be operated and maintained by the FAA.
Phase 3 - Research and Development (R&D) leading to a developmental contract for the LAAS CAT II/III system.

As a result of the GIP work completed in Phase 1, some industry partners have established LAAS prototypes (private systems, not FAA type-accepted) at various airports throughout the NAS.

One of these prototypes is installed at Chicago O'Hare Airport and another at Chicago Midway Airport. The Chicago Airport Authority has been very active in the promotion of new technology such as the Automatic Dependent Surveillance-Broadcast (ADS-B), Airborne Information for Lateral Spacing (AILS), and LAAS. Their intent is to implement these capabilities as soon as possible to help solve some of O'Hare's operational problems. Chicago O'Hare (ORD) will also be one of six U.S. airports to receive a "limited rate initial production" (LRIP) LAAS CAT I system as part of the Phase 2 LAAS CAT I Procurement activities.



The user community, which is mainly represented by the Air Transport Association, and air carriers such as FedEx, United Airlines, Delta Airlines and Alaskan Airlines, are very interested in LAAS. Its primary focus is on the benefits that LAAS can provide above and beyond an ILS-like straight-in capability. Specifically, the user community wants "complex procedures" (curved, segmented approaches and guided departures) to solve some of their operational problems. For example, these complex procedures can reduce overall flight time while increasing Visual Flight Rules (VFR) acceptance rates during times of reduced visibility.

The FAA and the user community, along with the Chicago Airport Authority, met this summer to discuss various alternatives for the use of LAAS at Chicago O'Hare. The goal has been to evaluate operational areas where LAAS could provide significant value to their operations in Chicago. A particular runway configuration at ORD (triple conversion, 09L/R and 04) requires visual meteorological conditions (VMC) and close monitoring and guidance from air traffic control (ATC). ATC's main requirement is a precise, repeatable path in space flown by all users. This path can be provided by LAAS with an up-linked complex procedure. The sample graphic below, included for demonstration purposes only, outlines one possible application of LAAS at Chicago O'Hare.

LAAS can support complex procedures in different ways. First, LAAS can provide input to the onboard area navigation (RNAV) systems for an RNAV approach. Second, LAAS can provide the approach procedure as part of the system's uplink message. In the first case, the database resides in the aircraft; in the second case the database for the approach resides in the LAAS ground system. The different implementation philosophies are part of the LAAS Concept of Operations and are being discussed within the FAA and the user community.

The team has established the basic requirements and is now assessing the implementation activities required to complete the integration efforts. These efforts include establishing or modifying existing avionics standards, LAAS ground system requirements, and rule-making activities (Flight Standards). Ongoing close coordination with the user community and ATC has been a critical requirement for successful LAAS implementation.

Over the next few months, the team will continue similar activities at the remaining five airports selected to receive the first LRIP LAAS CAT I systems. The team's strategy for these implementation activities will be the same: Identify user and ATS requirements at the local airport level and then determine where LAAS can provide the best overall benefits.

WAAS Completes First Maintainer Training Course

By Christine Cave, GPSTAC – with inputs from John Otey, GPSTAC and Steve Mason, FAA/AMA-430

On September 25, the Wide Area Augmentation System (WAAS) completed its first prototype course on maintainer training for wide area ground reference stations (WRS) and wide area master stations (WMS). This is the first course that would train FAA airway facilities technicians to maintain WAAS equipment. The prototype training development began September 4 and subjects included the removal and replacement of line replaceable units (LRU), configurations, and troubleshooting. Seven students gathered in Oklahoma City, OK, to assist with this training development. The students were a group from the field that included three operators; two from the National Operations Control Center (NOCC), and one from the Pacific Operations Control Center (POCC). With the students' assistance, instructors in Oklahoma City were able to make changes in the training materials as needed. The first class of eight students begin WRS maintainer training on October 16, 2002.

Enhanced GEO Services for WAAS

by Pamela Gomez, FAA, AND-730

The FAA intends to award a contract for the Geostationary Satellite and Control Segment (GCCS) Acquisition by December 2003. The FAA is currently definitizing a contract with the team of Lockheed Martin Air Traffic Management, Inmarsat, Boeing, and Raytheon Company.

On June 5, 2002, the FAA issued a competitive Screening Information Request/Request For Offer (SIR/RFO) to acquire on a competitive basis, a third GEO for WAAS. Offeror responses from Industry were received on August 2, 2002. The GCCS Contract will provide the FAA the flexibility to procure up to three satellites through the WAAS Initial Operating Capability and up through Final Operating Capability. This acquisition will allow the FAA flexibility for procuring leased services that take into account changes in the constellation due to satellite relocations, satellite failure, unplanned outages, as well as maintaining Geostationary diversity and security. It also provides the FAA the flexibility to improve WAAS performance for availability and continuity of service over time. The FAA currently has communications transponders on two INMARSAT-III satellites providing single coverage over most of the United States and hopes to have the first additional communications link, operating on a GEO satellite by 2004.

SatNav at Oshkosh

By Dean Alexander, GPS TAC/AFS-420

It is considered a bonus for the FAA when the administration uses forums such as the Experimental Aircraft Association's (EAA) AirVenture to publicly discuss its major programs and directly answer pilots' questions. The FAA provided such a forum on July 25th in the FAA Pavilion at this Oshkosh event. The information session entitled, "Transition to Satellite Navigation" was provided to a full house of as many as 200 pilot participants. The objective of this presentation was to convey the FAA's satellite navigation mission, present an overview of the operational integration aspects of transitioning to satellite navigation, and provide the current status of the various operational integration projects. As always, the WAAS/LAAS briefings generated interest, and questions came from an enthusiastic audience. Two of the hottest items on pilots' minds were the possibility of a new and improved Notice to Airmen (NOTAM) system, and the low-cost database promised by the Administrator. Interested pilots asked so many questions that the follow-on question and answer period was moved outside the pavilion to make way for the next briefing. Team members Dave Peterson, FAA Lead for Satellite Navigation Operational Integration, and Dean Alexander, GPS Technical Assistant Contract (TAC) support, co-briefed and answered questions an hour beyond the official end of the session. The event was viewed as a success, and one can expect more of these types of presentations to take place in the coming year.

VFR Waypoints Used On Phoenix Terminal Area Chart

by Bob Brekke, GPS TAC/AWP-520.6

Western-Pacific Region on October 31, 2002, will start using Visual Flight Rules (VFR) Waypoints on the Phoenix Terminal Area Chart (TAC). The VFR Waypoints Chart Program gives navigation guidance to pilots who are unfamiliar with an area in or near Class B, Class C, and Special Use Airspace. The program was established to assist pilots with position awareness while they are visually navigating in aircraft equipped with Area Navigation (RNAV) receivers.

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