GNSS Providers Chart Progress of Programs

Col. Bernard Gruber, the new GPS Wing commander in his first ION GNSS appearance, led off Wednesday’s GNSS program updates panel discussion with optimism fueled with cautions about the prospects for GPS in an era of budgetary constraints. He was joined in the panel by representatives of programs in Russia, Europe, and Japan.

Gruber noted the recent progress with a variety of Wing-led initiatives, including the on-orbit performance of the new-generation Block IIF satellites and the recent critical design review (CDR) for the next-generation Block IIA spacecraft — in which the commander participated within weeks of assuming his post at Los Angeles Air Force Base, California. The successful CDR puts the GPS III program two months ahead of schedule. Looking forward to the near future, Gruber said that a GPS enterprise review will take place in November, a GPS III program two months ahead of schedule. An update on the European Union’s GNSS program, Galileo, was presented by Rene Oosterlinck, who heads the navigation directorate of the European Space Agency (ESA).

Launch of four in-orbit validation (IOV) satellites, which are in most respects identical to the planned FOC Galileo satellites, is now expected to be completed in the course of 2011, beginning with a mid-year launch. A new facility has been established in Korou (French Guiana) from where the IOV SVs will be lifted by a modified Soyuz rocket. Provision of initial FOC Galileo services is expected by 2014, Oosterlinck said, including the civil Open Service, encrypted Public Regulated Service, and a Search and

Civil Interface Committee

CGSIC Urged to Revive More Active Role

A well-attended meeting of the Civil GPS Service Interface Committee (CGSIC), which preceded the ION GNSS 2010 on Monday and Tuesday, underscored the interest of key stakeholders in forging closer ties with the U.S. Air Force stewards of the Global Positioning System.

Jim Doherty, a CGSIC founder and former co-chair now with the Institute for Defense Analysis, led off the Tuesday plenary session with a recap of the origins of the group, which first met in 1986. He challenged session attendees to re-assert the early interactive engagement that enable the civil community to make its needs and wishes known to the Air Force operators.

“Remember, you’re a committee, not an audience,” Doherty said.

There followed a familiar (for CGSIC) agenda of presentations, although perhaps with a bit more vigorous interrogation of some speakers.

Col. Rob Hessin, deputy director of the National Coordination Office (NCO) for Space-Based Positioning, Navigation, and Timing (PNT), reported on the work of the board that facilitates interagency GPS policy efforts. For the first time since the NCO’s formation nearly six years ago, the office is fully staffed with representatives from every member agency of the PNT Executive Committee. That strengthens the NCO’s effectiveness across the interoperability space,” Hessin said.

Lt. Col. Stephen Steiner, the new chief engineer for the GPS Wing, described progress on that organization’s activities, while Lt. Col. Mike Manor, deputy commander for the GPS Operations Center at Schriever Air Force Base, Colorado, briefed the committee on the status of the constellation. This included description of the satellite repositioning effort that comprises development of an “expandable 24” configuration, which will provide increased availability and accuracy for military and civil users in mountainous terrain and urban areas.

Rick Hamilton, U.S. Coast Guard, briefed CGSIC members on GPS interference detection and mitigation (IDM) initiatives mandated under the 2004 national security directive on PNT. He described the first document case of a portable GNSS jammer in the United States — a motorist driving in the New York City area, whose jamming device was located and confiscated by local law enforcement. Hamilton also discussed the Patriot Watch program designed to lead to a “system of systems” in which data collected from a variety of sensors will be fused to provide a shield around key resources and critical infrastructure.

So-called “command post” exercises that simulate jammer events are planned in the near future. Hamilton also discussed restrictions under the Federal Communications Commission regulations that outlaw the importation or operation of unlicensed radio devices, which covers GNSS jammers.

“The United States is not going to stand by as these devices are imported into the country,” he said. •

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KVH Highlights FOG-based Inertial Systems

KVH Industries, Inc. (Booth 204) will demonstrate its fiber optic gyro (FOG)-based inertial measurement units and navigation systems, designed to offer cost-effective solutions for applications such as dynamic surveying and mapping, autonomous vehicle guidance and tracking, unmanned aerial vehicles, underwater remotely operated vehicles and more. Included will be demonstrations of the following: CNS-5000, featuring IMU/GNSS technology, incorporating KVH’s precision FOGs and NovAtel’s precision OEM-5 GPS receiver; Geo2XM100 incorporating FOGs coupled with MEMS accelerometers; precision FOGs designed to deliver high performance in bias stability, low noise and high bandwidth for precision pointing, stabilization and navigation in optical equipment, cameras, antennas, unmanned vehicles and remote weapons.

Receiver Manufacturer Picks IFEN’s GNSS RF Constellation Simulator

IFEN GmbH (Island Booth II) has announced that Ashtech (Booth 721-725) has selected IFEN’s NaX-NXS Professional, a multi-constellation and multiphase GNSS RF navigation constellation simulator as the new GPS, Galileo, and GLONASS reference simulator for its professional receiver development and testing of high-precision professional receivers. “IFEN’s product offering is a perfect match for our high demanding testing needs, as the NaX-NXS Professional simulator has proven to be very logical. The indefinite-delivery, indefinite-quantity contract was competitively awarded and has a five-year ordering period with a $3.9 million ceiling.”

USAF Awards Locata Contract for Terrestrial Positioning System

The U.S. Air Force 746th test squadron (Island Booth M) recently awarded a contract to Locata Corporation to upgrade the Locata high-accuracy terrestrial positioning system to cover almost 2,500 square miles (6,500 square kilometers) of the White Sands Missile Range (WSMR) in New Mexico. The upgrade is designed to help the 746 TS to provide sub-meter accurate positioning on the WSMR when GPS is jammed. The contract focuses on the redesign and upgrade of the USAF’s current Locata Non-GPS Based Positioning System (NGBPS), which Locata sells commercially under the “LocataNet” trademark. The NGBPS will provide the 746 TS’s Ultra High Accuracy Reference System (UHARS) with sub-meter position accuracies in a GPS-denied environment. The 746 TS requires UHARS to evaluate performance accuracies of next-generation weapon and aircraft navigation systems. The 746 TS leads the U.S. Department of Defense’s effort to integrate GPS equipment into existing Locata NGBPS at Holloman Air Force Base for more than three years.

DW International Debuts as Exhibitor

DW International (Booth 218) makes its debut appearance at the ION GNSS show this year, demonstrating its GNSS RAIM/KNP (receiver autonomous integrity monitoring/required navigation performance) Prediction Service and its GNSS Performance Monitoring System. DW CEO John Wilde, chair of the international information committee for the Civil GPS Service Interface committee, will be on hand to demonstrate the company’s range of GNSS solutions.

USGS Contract

Javad GNSS (Island Booth I) has received a contract for various configurations of GPS/GNSS receivers and antennas from the Department of Interior, U.S. Geo-

Last Chance to Win a Navigation Receiver!

Visit our Booth 206 and drop off your business card and join us for the lottery drawing on Thursday during the Afternoon Coffee Break. Good Luck Folks!

ION GNSS 2010 STUDENT PAPER AWARDS

Students Sponsored to Attend GNSS Meeting

As part of the ION GNSS 2010 technical program, the Satellite Division awarded eight students ION GNSS STUDENT PAPER AWARDS. These award recipients, who will be recognized during the Friday Awards Luncheon, were selected by recognized industry and academic experts in their field. Only those papers of superior technical quality for acceptance as a primary paper in the session were included in the program. To qualify, students must have been full-time undergraduate or graduate students in engineering, science, mathematics, or other related fields at the time their papers were written. Groups of student authors were accepted, but the submitted paper could not be co-authored by a working professional or a faculty member. Only the primary author making the presentation was eligible for the award. Student award winners received a full complimentary conference registration and a travel stipend. The following students received an ION GNSS Student Paper Award this year:

Simon Bavisille, The University of New Brunswick, Canada: Antenna Rotation and Its Effects on Kinematic Precise Point Positioning

Voi Chen, The University of Science and Technology of China, China: A Novel EMG-Based Stride Length Estimation Method for Pedestrian Dead Reckoning


Philip Jiles, Surrey Space Centre, University of Surrey, U.K.: GNSS-Based Reflectometry: Techniques for Scattered Remote Sensing

Yu Hua Li, National Cheng Kung University, Taiwan: The Calibration Methodology of a Low Cost Land Vehicle Mobile Mapping System

Ahmed Morsen Mohamed Kamal, Sacred, University of Calgary, Canada: Design and Testing of an Intelligent GPS Tracking Loop for Noise Reduction and High Dynamics Applications

Shashank Satyanarayana, University of Calgary, Canada: Stationary, Cyclostationary and Nonstationary Analysis of GNSS Signal Propagation Channel

Yong Shing Tam, University of New South Wales, Australia: Positioning Techniques with Two GNSS Satellites Over Time

ION GNSS 2010 Program Committee: L to R: Dr. John Betz, The MTEC Corporation; Dr. Alexander Moussine, Cambridge Silicon Radio, Sweden; Dr. Andrea Corneli, MIT Haystack Observatory; Prof. Naser El-Shamy, University of Calgary; Patricia Dishawery, Boston College; Deborah Lawrence, Federal Aviation Administration; Dr. Bashir El-Assal, European Space Agency; France Martin Lopez, Otekke Systems. Not pictured: Dr. Mark Petrosillo, The University of Calgary, Canada.
**NEW PRODUCT ANNOUNCEMENTS**

**NovAtel Introduces Next-Generation OEM6 GNSS RECEIVERS**

On Wednesday NovAtel Inc., (Booth 318) has launched its next-generation OEM6 GNSS receiver platform. According to the company, the powerful OEM6 platform offers comprehensive support for all current and upcoming GNSS constellations and satellite signals including GPS, GLONASS, Galileo, and Compass. The OEM628 board, the first in the new receiver line, expands positioning capabilities with the inclusion of such features as RAIM (Receiver Autonomous Integrity Monitoring) for safety critical applications, integrated LAN Ethernet port with NTRIP Client, and server capabilities designed for seamless integration into reference network applications, and 64-Hertz measurements for high dynamic positioning. The OEM628 board is form, fit and function compatible with NovAtel’s OEM5/MTM receiver and supports all NovAtel OEM firmware options, including AdveX RTK for centimeter-level positioning, ALIGN for precise heading determination, GLIDE for consistent pass-to-pass accuracy, and L-band positioning for autonomous decimeter-level positioning. The OEM628 will be available to order in November 2010, with first shipments occurring in December 2010.

**Hemisphere GPS Introduces miniEclipse Dual-Frequency GPS OEM**

On Wednesday, Hemisphere GPS (Booth 617/619) announced the release of the miniEclipse II, a compact dual-frequency, high-performance GPS OEM board that incorporates the same digital and analog ASIC design as the recently released Eclipse II OEM board. According to the company, the miniEclipse is the highest precision dual-frequency (L1/L2) OEM module available in the market today and is available in two form factors, P200 and P201. The miniEclipse P200 is a drop-in board replacement for Hemisphere GPS’ Crescent board, while miniEclipse P201 is configured as a drop-in replacement for another industry standard interface. The miniEclipse is scalable, functioning in L1-only SBAS and RTK modes that can be upgraded to dual-frequency RTK solutions. Also, raw data is available for post-processing in any configuration. P200 and P201 also feature Hemisphere’s patented SureTrack and COAST technology. The P200 and P201 OEM boards will be available in the fourth quarter of 2010 through the company’s global network of Hemisphere GPS dealers.

**Septentrio Announces PolaRxS GNSS Receiver for Scintillation Monitoring**

Septentrio (Booth 516/518) has introduced the PolaRxS, an ultra low noise multi-frequency multi-constellation receiver dedicated to ionosphere monitoring and space weather applications. The receiver offers 136 channels capable of tracking simultaneously GPS, GLONASS, Galileo and SBAS signals in L1, L2, L5 and E1/E5b/Al5BOC bands. Coupled with an on-board controlled crystal oscillator (OCXO), the PolaRxS provides an extensive set of specific measurements for ionosphere monitoring, including signal phase and intensity up to ±100 Hz, a phase noise standard deviation (psb) as low as 0.03 rad. Proprietary LOCK+ tracking technology is designed to provide robust tracking of rapid signal dynamics such as are encountered during high scintillation events, while the integrated interference analysis and mitigation module enables installation in difficult radio environments. A graphical user interface – RxControl – is provided for data logging and remote control and is extended for continuous TEC and scintillation indices, specifically for space weather and ionosphere monitoring applications. Septentrio will start shipping PolaRxS in the first quarter of 2010.

**CSR/SIRF Launches SIRFAtlasV Aimed at Consumer Devices**

CSR (SIRF Technology, Booth 319) has introduced the SIRFAtlasV multiglitch GNSS system processor, a system-on-chip (SoC) device designed for integration into high-volume consumer navigation and location-aware products. Available now in production quantities, the SIRFAtlasV processor combines on a single chip a 500- or 664-MHz ARM11 processor core with vector floating-point unit; advanced autonomous GPS/Galileo baseline DSP core with available SIRFAtlasV fix, DMR, DDM, SD/MMC/MMC+ and NAND Flash memory controllers; audio DAC, LCD touch panel controller, video processing accelerator, USB 2.0 and other connectivity interface, and a complete power management unit. CSR is working with Microchip Technology to optimize the SIRFAtlasV’s integration with Windows Embedded CE 6.0 real-time operating system on a wide range of small footprint consumer and enterprise devices.

**GNSS SYSTEM UPDATES PANEL,**

continued from page 1

Rescue Service. It will include 14 SVs now being built by OHB and Surrey Satellite Technology Ltd.In addition to the 4 IOVs. Meanwhile, the European Geostationary Navigation Overlay Service (EGNOS), a satellite-based augmentation system similar to the U.S. Wide Area Augmentation System (WAAS), will be certified for use by civil aviation before the end of this year.

**QZSS**

Hiroaki Maeda, lead system engineer for Japan’s Quasi-Zenith Satellite System (QZSS), brought the audience up to date on the program, which on September 11 successfully launched its first satellite — nicknamed Michibiki.

Developed by the Japan Aerospace Exploration Agency (JAXA), QZSS will provide a regional augmentation service to the western Pacific/east Asia area. It will broadcast six signals: GPS L1/C/A, L1C, L1C/2 and L1/L2 SAAF (L1-Sub-meter-class Augmentation with Integrity Function), and LEX, an experimental signal with a higher data rate message (2kbps) that is designed to be compatible and interoperable with the Galileo E6 signal.

Designed to provide a satellite at near zenith in the region, QZSS will increase coverage and availability of PVT services even in urban canyons and mountainous areas. It can also enhance GPS performance by transmitting error correction and integrity information.

The first satellite is undergoing a three-month On-Orbit-Checkout (OOC) period, following which JAXA will carry out a technical demonstration phase and then an application demonstration in which 101 companies will participate.

**Record and Playback 3200 to validate, test and verify Professional GNSS devices.**

Averna representatives will be available on the Show Floor to demonstrate solutions, designed to empower RF device manufacturers to generate, record and play back all common radio, video, and navigation signals in use today. Averna representatives will demonstrate the Best-In-Class award-winning URT RF test platform, including the URT Record and Playback 3200 to validate, test and verify Professional GNSS devices.

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For information on sponsorship opportunities please contact Lisa Beatty, Executive Director.

**EXHIBITORS — Information for the Show Daily:** You may drop off press releases, new product announcements and other information for the Show Daily at the ION Membership Booth B20 in the Exhibit Hall or at the Registration Desk in the foyer.
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