As a child Stan Honey taught himself navigation and he admits he was “always good at math” and “just found navigation interesting.” When he shared his many tales with the crowd in the Oregon Ballroom Tuesday night at the ION GNSS+ during the Plenary Session, the Yale- and Stanford-trained engineer entertained the audience with a wealth of information on early navigation systems, current navigation technologies, and how he and his colleagues developed many of the systems used to enhance the way millions of fans watch sports on television.

While Honey is one of the most successful professional navigators in sailing — he even met his wife through competitive sailing — the electrical engineer also has helped pioneer some of the biggest developments in sports TV including the development of the yellow first-down line now well known by all football fans, the ESPN “K-Zone” for pitch tracking in baseball, and the Race/FX tracking and highlight system used in NASCAR races.

A love for navigating the seas has always been in Honey’s blood, and along the way his accomplishments included winning the Volvo Ocean Race around the world, setting the prestigious Jules Verne record for the fastest non-stop circumnavigation of the world, and many other honors before being named to the National Sailing Hall of Fame in 2012.

But he was not just a star at sea. Honey described his earlier projects in navigation related work in the days prior to GPS. He co-founded ETAK Inc. back in 1983 and the company pioneered vehicle navigation systems with digital map databases, heading-up map display, and map-matching navigation.

With his background at Stanford, Honey said he “knew of GPS,” at that

ION GNSS+ 2017 PLENARY

Honey Shares his Lifetime of Navigation with Boats, Cars and Sports

Stan Goff

GNSS Program Update: Dozens of NavSats Set to Launch in Next 40 months

Dee Ann Divis

If all goes as planned the world’s satellite navigation providers will be launching dozens of satellites between now and the end of the decade.

The activity just this year and next is remarkable, said John Betz of the MITRE Corp., who co-chaired the panel with José-Ángel Ávila-Rodriguez of the European Space Agency.

“If I counted properly,” said Betz, “between 2017 and 2018 we’re going to see more than 30 satnav satellite launches between the systems that are represented here and the two that are not — (India’s) NavIC and (Russia’s) GLONASS. That’s really a phenomenal benefit to the world.”

Of those presenting their plans at the ION GNSS+ Program Status panel China had the most near-term launches planned with four BD-3 satellites scheduled for placement in mid-Earth orbit (MEO) this year, 14 more in 2018 and six more through 2020, said Jiaqing Ma of the China Satellite Navigation Office.

Program Updates continued on page 5

ION GNSS+ 2017 will be in Miami!

September 24–28, 2018

Save the Date!
time, but he and his colleagues were working with these vehicle navigation systems ahead of their time. This technology may have seemed a little futuristic then to some, but this first commercially available computerized navigation system for automobiles sold thousands of units in the early to mid 1980s and was featured in a cover story in *Popular Mechanics* in June of 1985.

Of course, as it often is the case with many of Honey's life experiences, sailing did indeed play a role with this development of the system was backed financially by Atari co-founder Nolan Bushnell, who Honey got to know well while navigating Bushnell's racing yacht Charley through the 1983 Transpacific championship.

This was a common thread as Honey described how his passion at sea often led to friendships and relationships that were carried over to his other love. Working with Disney on sailing projects eventually led to the ESPN “K-Zone,” for example, and the immensely popular yellow first-down line technology first made headlines with ESPN broadcasts. Earlier, selling ETAK to Rupert Murdoch and News Corp. helped pave the way to sports projects like using the technology to track hockey pucks for TV viewers.

Honey explained that many fans didn't watch a lot of hockey on television as it was difficult to follow the puck, especially before high-definition TVs were the norm. With an accelerometer and a lithium battery installed inside the pucks, Honey's team changed the way fans tracked the puck visually during these broadcasts in the 1990s.

But there were some concerns, he admitted. “ Thankfully we never had a puck come apart,” he joked. “One of the greatest fears was, what if half a puck goes into the goal?”

This technology spread to car races and most recently America's Cup, where GNSS equipment has changed not only the way fans watch the sport, but also the way it is officiated. Along the way, Honey and his team have earned Emmy Awards for such broadcast breakthroughs, and brought today's navigation and precise tracking technologies into new industry sectors.

Honey and partner Ken Milnes were hired in June 2010 by Oracle Team USA to develop the tracking, telemetry, and augmented-reality system for America's Cup races and knew they'd need top-notch equipment to overcome obstacles that included cameras and sensors mounted on helicopters, fast yachts, and varying weather conditions. Honey thanked NovAtel for its work with the projects, noting that the company's NovAtel SPAN GNSS/INS, OEM GNSS receiver and ProPak6 receivers have helped produce a totally enhanced, viewer friendly TV experience for sports fans.

“Sailing used to be hard to track and watch, but these graphics suddenly made it very understanding who's ahead and who's behind,” he said, noting that placing lines on the water for broadcasts gave viewers a feeling of comfort similar to watching football with lines on the field.

So thanks to Honey and his love for both sailing and navigation, sports like yacht racing can be enjoyed by fans who are not on the water at the events or experienced sailing pros. And the next time that “K-Zone” baseball pitch tracking helps prove the umpire made the right call for or against your team, you can thank the electrical engineering background that this lifelong navigator has used to change the way you watch your games.
Based on our next-generation full-constellation real-time GPS Simulator technology, the RSR GNSS Transcoder™ is the world's first fully self-contained GNSS Transcoder/converter (real time GPS Simulator) that can take a baseband PNT/PVT signal from any GNSS receiver or positioning source and convert this to a commercial GPS L1 RF output signal within milliseconds. This allows glue-less retrofitting of all of your legacy GPS receiver products with the following A-PNT capabilities:

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(left to right) Dr. Chris Hegarty, Dr. Kyle Snow, Steve Malkos, Dr. Alex Stratton, Dr. Frank van Diggelen, Dr. Michael Veth, Dr. Gert Trommer, Eric Chatre, Patricia Doherty

ION GNSS+ 2017
Satellite Division Executive Committee
(left to right) Dr. José-Ángel Avila-Rodríguez, Dr. John Betz, Dr. John Raquet, Dr. Frank van Diggelen, Dr. Jiyun Lee, Dr. Chris Hegarty, Dr. Sanjeev Gunawardena
Lockheed Martin’s Second-Generation SBAS Testbed Achieves Another Milestone

Stan Goff

Lockheed Martin announced that its second-generation satellite-based augmentation system (2nd Gen SBAS) testbed started broadcasting in dual frequency, multi-constellation (DFMC) during testing last week that was moved up from originally scheduled dates.

Early in 2017, Geoscience Australia, an agency of the Commonwealth of Australia, and Lockheed Martin announced they had entered into a collaborative research project to show how augmenting signals from multiple GNSS constellations can enhance positioning, navigation, and timing for a range of applications. GNSS signals are critical tools for industries requiring exact precision and high confidence, and this new testbed was designed to demonstrate enhanced navigation performance for nine critical industrial sectors in Australia. Since then Australia has also explored the use of the technology in medical applications, adding a tenth sector.

On the scheduled date of June 1, the program reached an initial milestone by broadcasting the L1 legacy SBAS, which broadcasts similar messages to what Wide Area Augmentation System (WAAS) and EGNOS are broadcasting, said Bob Jackson, Global SBAS Project Lead with Lockheed Martin.

Then came last week’s breakthrough. “The next big milestone was going to be broadcasting for the first time of dual frequency multi-constellation SBAS using GPS L1/L5 and Galileo E1 and E5a,” Jackson told Inside GNSS on Sept. 21. “We actually overachieved and the first broadcast was earlier this week, so we’re pleased.”

Also, for the first time, Lockheed Martin says it’s broadcasting precise point positioning capability off an SBAS satellite, on both L1 and L5.

“Basically, whenever you’re running a program, sooner is better,” Jackson said. “You want to get as much information as you can as soon as you can. So, we’re quite pleased at how the team has worked very well together to accomplish this.”

Back in February, came news that the Australian Government will be collaborating with New Zealand on the project to improve positioning capability in the Australasia region.

Technology companies GMV, Inmarsat, and Lockheed Martin are all involved in the project. The companies have been involved in implementing SBAS technology around the world, and are handling the technical components of the testbed.

Ultimately, the second-generation SBAS testbed will broaden understanding of how this technology can benefit safety, productivity, efficiency and innovation in Australia’s industrial and research sectors. The two-year project has about another 15 months to demonstrate capabilities and provide data that can be used to determine future applications.

“The Australians have outlined a very ambitious and comprehensive set of demonstrations across nine or 10 industrial sectors, looking at the different potential applications for second-generation SBAS,” Jackson said.

“Our objective is to be able to demonstrate the capability and support different industries as they evaluate that capability. All of that will roll into a larger assessment of the benefits.”

Jackson said the signals will become even more robust once additional satellites are added to the GPS and Galileo constellations in the near future. The Air Force will be launching GPS IIIIs beginning in 2018, and several more Galileo launches are scheduled for next year.

“We’re excited to be at the forefront of demonstrating the advantages of dual-frequency multi-constellation, and it’s important to note that we are working with two partial constellations,” Jackson said. “The availability is not as robust as it will be in two or three years.”

Lockheed Martin has a contract to make 10 of those planned GPS III satellites.

By augmenting signals from multiple GNSS constellations – both Galileo and
GPS – second-generation SBAS is not dependent on just one GNSS. They now use signals on two frequencies – the L1 and L5 GPS signals, and their companion E1 and E5a Galileo signals – to provide integrity data and enhanced accuracy.

Lockheed Martin is providing systems integration expertise in addition to the Uralla radio frequency uplink. GMV-Spain provides their “magic-GNSS” processors, while Inmarsat has provided the navigation payload hosted on the 4F1 geostationary satellite.

Both Lockheed Martin (Booth: C) and GMV (Booth: 508) will be at ION GNSS+ in Portland, Sept. 25-29, and Jackson said they will have monitors showcasing the DFMC.

The five planned BD-3 geostationary satellites will require dedicated launchers. Of those five, which will go up in 2019 and 2020, three will be in inclined orbits.

There will be two additional GEO spacecraft launched in support of China’s planned space-based augmentation system BDSBAS. One is set to go up next year and the second by 2020. China is also working on a ground-based augmentation system and has begun research on underwater, indoor and deep space navigation.

Japan will launch just one more satellite in 2017. That satellite is special, however, in that it completes the initial QZSS system. QZSS, which has three spacecraft in quasi-zenith orbit and one GEO satellite compliments GPS, improves availability and deploys a two-way messaging capability that could be especially useful in a natural disaster.

The United States’ GPS program has five GPS III launches planned through 2020, starting with one in 2018, and two in each of the following years.

Col. Steven Whitney, the director of the GPS Directorate, said he was proud to report that a review concluded last week determined that the first GPS III spacecraft met all the criteria to be available for launch. “So, I signed that paperwork on Friday.”

This year, however, all eyes will likely be focused less on the satellites being completed and more on the competition to build the next tranche of GPS III space vehicles. The request for proposals will go out later this year with a decision expected late next year.

Though the GPS Directorate plans to select one contractor for all 22 satellites the spacecraft themselves are expected to change.

“We’ve built a strategy of 22 basic GPS satellites with the ability, at different stages in the build, to be able to add different capabilities as they mature. In order to build those, we’re working hand in glove with our partners at the Air Force Research Lab,” he said, on things like advance antennas and power amplifiers.

Whitney said AFRL’s work is expected to be reflected from the beginning of the new contract.

“We’ve done a lot of work with the various providers already on things like digital payloads and so we expect to see some of that in the basic proposals. The additional items we talked about we expect to on-ramp at a later date,” Whitney said.

Galileo is also buying a set of new spacecraft and has signed a deal for the next eight satellites in June.

The deal will help keep the momentum going. Galileo did its first four-satellite, or quad, launch in November 2016, which was successful. The next launch, again for four spacecraft, is to be on December 12 with another planned for mid 2018.

Though testing is still underway it also appears that Galileo engineers might be able to salvage and integrate two satellites that were launched into highly elliptical orbits, said a representative of the European Commission delegation in response to a question.

“Hopefully we will be able to declare those operational though we are waiting for the last few checks to be sure we are doing the right thing at the right time,” he said from his seat the audience.
Broadcom Releases Dual-Frequency GNSS Receiver with Centimeter Accuracy for Consumer LBS Applications

Broadcom announced on September 21 the world’s first mass-market, dual-frequency GNSS receiver device, the BCM47755, designed to enhance location-based services (LBS) applications for mobile phones, tablets and fitness wearables. Equipped with the latest GNSS innovations, the device is capable of centimeter accuracy with minimal power consumption and footprint, enabling an entirely new suite of high-precision LBS applications including lane-level vehicle navigation and mobile augmented reality (AR).

Until now, mobile location-based applications have been powered by single-frequency GNSS receivers operating under stringent battery power and footprint constraints, according to Broadcom. The expanded availability of L1/E1 and L5/E5 frequencies in satellite constellations enables the use of two frequencies to compute position much more accurately in both urban and open area environments.

“The beauty of this is of course you have more constellations for your computations,” Manuel del Castillo, Broadcom’s associate director, GNSS product marketing, told Inside GNSS. “So, you can be potentially be in an urban area with a small, narrow corridor where you have limited visibility of the sky and the more satellites you have the better. Multi constellations is something that we started at Broadcom and we never dropped.”

del Castillo said the BCM47755 receiver supports GPS, GLONASS, BeiDou, Galileo and QZSS, but what also makes this a breakthrough is its dual-frequency capabilities and its mass market availability.

“This is the first time that we bring the dual-frequency feature to the mass market. This is pretty revolutionary in the sense that this centimeter accuracy can now be achieved on a smartphone with the mass market components of the smartphone and the price of the smartphone,” he said.

The BCM47755 delivers this higher level of location accuracy while meeting the rigorous battery power and footprint needs in mobile phones. According to the company, this new receiver uses half the power used by the previous generation chip. Its accuracy allows location-based applications to offer a richer consumer experience. For example, lane-level knowledge of the vehicle’s location vastly improves the turn-by-turn navigation performance. Further, combining this accurate location with the lane’s traffic pattern gives consumers a significantly better estimate of arrival times. In the same vein, ride hailing applications can be enhanced to more precisely pinpoint driver and client location.

“Our focus is on smartphones and watches,” del Castillo added. “This is a high-end GNSS chip and initially it should go in flagship smartphones. Eventually it will move itself down to other smartphones, and we’ll open our focus to other industries like automotive, and maybe other smart devices like IoT (Internet of Things).”

“We optimized the design of Galileo for dual frequency services,” said Javier Benedicto, Galileo project manager at the European Space Agency. “The availability of mass-market chips processing Galileo E1/E5 will allow users to experience Galileo at its best.”

“We are glad to see the industry recognizing the advantages of dual-frequency GNSS receivers, including Galileo E1 and E5,” said Carlo des Dorides, executive director of European GNSS Agency, Galileo market development. “We believe Galileo’s contribution is instrumental to reach mass market GNSS centimeter level accuracy.”

Availability The company said it planned this launch leading up to ION GNSS+. Broadcom is currently sampling the BCM47755...
dual frequency GNSS receiver to its early access partners and customers. Additionally, Broadcom was to present further information on the BCM47755 in the Ubiquitous Navigation panel at the ION GNSS+ 2017.

CAST Navigation Showcasing CAST 5000 GPS Wavefront Generator
CAST Navigation, a Massachusetts-based provider of simulation systems for Global Navigation Satellite and Inertial Navigation Systems, announced the showcasing of their CAST 5000 GPS Wavefront Generator. The CAST-5000 is the only Controlled Reception Pattern Antenna (CRPA) tester currently on the market that allows a full end-to-end test of the antenna system, according to the company.

“As a company that has dedicated itself to the provision of top-quality GNSS test equipment and complete follow-through services, our team could not be more proud of what we’ve created. Producing a single coherent wavefront of GPS RF signals to provide repeatable testing in the laboratory environment or anechoic chamber. The system is capable of generating up to seven independent, coherent simulations that reference a single point. With an intercard carrier phase error of less than one centimeter, the CAST-5000 is extremely accurate and represents what we believe is the best offering on the market,” said Lou Pelosi of CAST Navigation.

In addition to generating single coherent wavefront of GPS, the CAST 5000 has a host of other features. These features include 6-DOF motion generation capability, post mission processing, multipath modeling, time-tagged satellite events, and a modifiable navigation message among many others. Buyers have the option of upgrading their CAST configuration to add anti-jam testing capability that enables the user to specify jamming levels and signal transmission characteristics for broadband and narrowband jammers.

Learn more about CAST Navigation and get a glimpse of the CAST 5000 GPS Wavefront Generator and a full list of

Exhibitor Demonstration
GNSS raw measurements in consumer devices
Join this Thursday session for an interactive discussion with Frank van Diggelen (Google), Mark Dumville (NSL), Moises Navarro (Astrium) and Lukasz Bonenberg (University of Nottingham) and preview the GSA Raw Measurements Task Force White Paper — Thursday, September 28, 2:00 p.m. – 2:45 p.m. Room C120–122.

With a smartphone featuring Android 7.0 (i.e., Nougat), users now have access to raw GNSS measurements. This feature opens the door to higher-accuracy and the development of algorithms once restricted to more advanced GNSS receivers. This new capability will allow users to fully benefit from the special features offered by Galileo, and to combine it with other constellations in the most efficient way.

Although Nougat makes accessing raw data easier, using it remains a challenge. In fact, its use remains largely limited to research centres, universities and GNSS experts – which raises the question: is there real market opportunity in GNSS raw measurements or is it simply a playground for scientists and experts?

To answer this question, the European GNSS Agency (GSA) launched the Raw Measurements Task Force. Comprised of GNSS experts, scientists and market players, the Task Force aims to foster a wider use of these raw measurements. Their White Paper, set to be published soon, will provide application developers with a range of tools, including practical tips and innovative ideas on how to take full advantage of GNSS raw measurements.

A sneak peek at ION
This exclusive session will include:
• First-hand tips and innovative ideas on using GNSS raw measurements
• Results from tests using raw measurements conducted by different experts
• Advice on how to ensure the use of Galileo in smartphone applications
• Expert insights on the challenges and opportunities of GNSS raw measurements

The session will be moderated by Fiammetta Diani, Deputy Head of Market Development at GSA.
its features at castnav.com or visit them at Booth: 215 at ION GNSS+ 2017.

**Rockwell Collins Working with Spirent Federal to Develop M-Code (MNSA) Capability**

Spirent Federal Systems, a leading provider of GPS/GNSS simulators, recently announced that they are working with Rockwell Collins to develop software that will support M-Code using the Modernized Navstar Security Algorithm (MNSA).

Earlier this year Spirent Federal received approval from the GPS Directorate to begin development of software capable of supporting M-Code using the MNSA. Spirent is one of the first companies to receive approval from the GPS Directorate to begin developing this kind of software.

“We are excited to team with Rockwell Collins in developing our newest M-Code capability that can be added to the Spirent GSS9000 series simulator,” said Ellen Hall, President of Spirent Federal Systems. “We have a rich history of working with Rockwell Collins, and they expressed interest in this important project.

We know that this product will be a valuable asset to the M-Code community.”

Until now, AES and SDS have been the only methods authorized to be used within a GNSS simulator to produce M-Code. Spirent Federal Systems has provided AES M-code and SDS M-Code capable simulators for many years, and as the long awaited MNSA M-Code signals become available, Spirent Federal Systems is planning to make this option available to authorized users on its GSS9000 series simulator.

Spirent Federal is exhibiting at ION GNSS+ 2017 and is located at Booth: A.

**Hemisphere GNSS Announces New Crescent Vector H220 OEM Positioning and Heading Board**

At INTERGEO 2017, Hemisphere GNSS, Inc., announced the Crescent Vector H220, the next offering in a line of new and refreshed, low-power, high-precision, positioning and heading OEM boards. The single-frequency, multi-GNSS H220 provides added benefits over the prior generation H200 with a more robust positioning and heading solution and integrates Atlas GNSS Global Correction Service.

Designed with a new hardware platform, it offers true scalability with centimeter-level accuracy in either single-frequency mode or Atlas-capable mode that supports fast RTK initialization times over long distances. The H220 offers fast accuracy heading of better than 0.30 degrees at 0.5 meters antenna separation in ideal conditions and aiding gyroscope and tilt sensors for temporary GNSS outages, according to the company. The 109 mm x 71 mm module with 34-pin header is a drop-in upgrade for existing designs using the H200.

The latest technology platform enables simultaneous tracking of all L1 constellations including GPS, GLONASS, BeiDou, Galileo, and QZSS, designed to make it robust and reliable. The updated power management system efficiently governs the...
processor, memory, and ASIC, making it ideal for multiple integration applications. The H220 offers flexible and reliable connectivity by supporting Serial, USB, and CAN for ease-of-use and integration. Optional output rates of up to 50 hertz are also supported.

**Advanced Technology Features** The H220 offers integrated L-band support for Atlas corrections providing global sub-meter position accuracy while Hemisphere’s Tracer technology helps maintain position during correction signal outages.

**Topcon announces upgrade to SmoothRide data collection software**

Topcon Positioning Group just announced an update to its data collection software for the SmoothRide resurfacing workflow solution. RD-M1 Collect 2.0 includes updates designed to facilitate and optimize mapping of road conditions.

The improvements feature an improved interface that is designed to simplify setup and automatically detect the position of the wheel sensor during data collection.

“Operators can now take advantage of the RD-M1 Collect 2.0 graphical interface status bar that indicates the optimum speed for collecting road information based on the project requirements,” said Kris Maas, director of construction product management. “Capturing at proper speed helps enable SmoothRide to deliver the best possible results for the project.”

Memos is a new feature designed to allow operators to easily create balloons with messages onto the map while collecting data that also can be made visible in the processing software — enabling specific site conditions to be noted for future reference.

The new Manage Runs feature is designed to enable operation without necessitating Windows explorer to be open.

“The large buttons make using a tablet or laptop with touch screen very easy,” said Maas. “Operators can copy data collections to a USB drive, delete them from the hard drive, and add or remove them from the manager.”
Septentrio Unveils New Altus NR3

Septentrio announces the arrival of the Altus NR3: a multi-frequency, quad-constellation (GPS, GLONASS, BeiDou and Galileo) RTK receiver for survey and GIS applications. The Altus NR3 features the company’s AIM+ interference mitigation and monitoring system allowing continued operation in the presence of both intentional and non-intentional interference. The Altus NR3 combines advanced GNSS features with a robust communications suite together in one compact, low-power and easy-to-use unit, according to the company.

The Altus NR3 is a versatile survey receiver, configurable as either a rover or a base station. Ease-of-use is realized by one-touch logging and a unique, on-board web interface so users can monitor and configure the unit as well as collect data using any WiFi capable device. Data collection is made simple using either SurvCE or Septentrio’s own PinPoint Data Collector with overlaps can be managed by creating areas where predefined overlaps are required for the project,” said Maas.

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“We’ve built on the flexibility, reliability and ease-of-use that our Altus line is famous for, and we’ve added all-in-view RTK and the most the most advanced interference mitigation system on the market today” said Gustavo Lopez, Product Manager at Septentrio. “Locations with bad visibility or at risk of interference that were previously off limits, can now benefit from high-precision GNSS positioning, saving both time and cost.”

Microsemi Releases BlueSky GPS Firewall to Provide Security Against GPS Spoofing and Jamming Threats

Microsemi Corporation, a provider of semiconductor solutions differentiated by power, security, reliability and performance, Tuesday announced the recent development of a breakthrough approach to protecting critical infrastructure against GPS spoofing and jamming threats with the introduction of its BlueSky GPS Firewall.

Designed to provide security protection for GPS delivered position, navigation and timing (PNT) data, the BlueSky GPS Firewall solution can be deployed in-line between any standard GPS antenna and stationary GPS receiver to provide protection against GPS signal incidents, both intentional or accidental, before they enter a GPS receiver system. In response to the growing number of GPS incidents and their potential threat to critical infrastructure, and to assist customers in rapid adoption, Microsemi is making BlueSky GPS Firewall Evaluation kits available in advance of the full production release of the solution.

The dependency on PNT is increasingly important to critical infrastructure sectors such as telecommunications, energy, transportation, emergency services, financial services and enterprise infrastructure, and is mainly provided through GPS. Published best practice documents by the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) describe steps that can be taken to mitigate outages and disruptions with GPS reception. In alignment with these documents, the new BlueSky GPS Firewall provides critical infrastructure sectors with a first line of defense against GPS threats to help build out a secure, robust and resilient PNT platform for their infrastructures, according to the company.

Microsemi’s BlueSky GPS Firewall filters the GPS signal in real time, removing anomalies from the GPS signal before it is consumed by the downstream GPS receiver. This creates an intelligent and secure barrier against jamming and spoofing, and prevents the GPS receiver from being impacted by such incidents. Deployment of the BlueSky GPS Firewall does not require any new cabling or alteration of the pre-existing antenna installation and is interoperable with standard GPS receivers.

“Worldwide critical infrastructure dependency on unprotected GPS receivers is a serious security risk. These receivers are susceptible to jamming and spoofing incidents and the industry recognizes this as an increasing threat,” said Randy Brudzinski, vice president and business unit manager of Microsemi’s Frequency and Time division. “The vast number of GPS systems already in operation means a significant investment would be required if every system was to be replaced. Microsemi’s BlueSky GPS Firewall is a cost-effective and easy-to-deploy solution to protect GPS without requiring replacement of deployed GPS systems.”

Microsemi’s technical experts will be showcasing the BlueSky GPS Firewall, along with its full range of timing and synchro-
nization solutions including the latest advancements in atomic clocks, timescale solutions, and PTP and NTP server systems in Booth: 116.

New High-End GNSS Simulator from Rohde & Schwarz Generates Highly Realistic Test Scenarios

Today, an increasing number of GNSS receivers are able to process signals from diverse navigation systems such as GPS, GLONASS, Galileo or BeiDou in several frequency bands — and in some cases with several antennas in parallel — in order to improve positioning accuracy. Accuracy can be further improved with differential GNSS (DGNSS) techniques.

These techniques are used in applications such as autonomous driving, and they are indispensable for precise and reliable positioning of aircraft during landing approaches. The GNSS receivers used in these applications must undergo extensive tests before deployment in vehicles or aircraft.

The new R&S SMW200A GNSS simulator from Rohde & Schwarz now offers an innovative test solution for easy generation of complex and highly realistic test scenarios for a wide variety of GNSS applications. To test multi-frequency and multi-antenna systems, users now have access to 72 GNSS channels that can be assigned to up to four RF outputs. The R&S SMW200A can generate QZSS and SBAS signals as well as GPS, GLONASS, Galileo and BeiDou signals. This solution is designed to enable users to quickly and easily verify the position accuracy of their receivers under realistic conditions.

The R&S SMW200A is the first and only high-end GNSS simulator on the market that has an internal noise generator and can generate complex interference scenarios with multiple interferers, according to the company. All signals (GNSS, noise and interference) are generated directly in the instrument. Additional signal sources for external generation of interference signals are not necessary, considerably simplifying test setups.

User-friendly and Future-proof

No external computer is needed to configure and operate the R&S SMW200A. The integrated, intuitive GUI allows users to generate GNSS scenarios quickly and easily, according to the company. Thanks to the multitude of instrument options, the solution can be optimally adapted to individual user requirements. The R&S SMW200A is an extendible, future-proof platform that is ready to implement future test requirements such as testing new GNSS signals.

The R&S SMW200A with the new GNSS options is now available from Rohde & Schwarz. The instrument is officially being unveiled at the ION GNSS+ 2017 trade show in Portland, Oregon this week.

NavtechGPS Offers Solutions for High Accuracy Positioning

Stop by NavtechGPS (Booth: 318) where CTO Franck Boynton will be available to answer questions and offer advice. Franck will demonstrate how LabSat WB and LabSat Real Time can save you plenty of money by enabling you to quickly and easily debug your system from the lab. NavtechGPS will also have a host of high accuracy, compact receivers from NovAtel, OxTS, Septentrio, and VectorNav, and antennas especially for UAVs from Tallyman Wireless, Antcom and NovAtel.

But that’s only the beginning. Carolyn McDonald, recipient of the ION 2015 Norman P Hays Award for developing and producing over 30 years of GPS and GNSS engineering tutorials, will be on hand to tell you about recently developed training courses NavtechGPS is offering this fall, including courses like Inertial Systems, Kalman Filtering and GPS/INS Integration, which have become incredibly important to anyone interested in reliable, high-precision GNSS operation and accuracy.
GPS Networking Inc. is the first company to specialize in providing GPS (Global Positioning System) products and solutions to enable you to effectively distribute the GPS/GNSS (Global Navigation Satellite System) signal in your facility. With over 20 years experience, GPS Networking Inc. has been the world leader and your GPS source for providing GPS/GNSS products such as:

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- Rack Mount Splitters
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