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The McHale Report, by mil-embedded.com Editorial Director John McHale, covers technology and procurement trends in the defense and aerospace electronics community.

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TOP STORY

Wave motion may provide novel way to protect warfighters



The wave-motion work of a Worcester Polytechnic Institute (WPI ? Worcester, Massachusetts) researcher may lead to bulletproof

vests and helmets that can sense the speed, angle of approach, and size of an incoming bullet ? allowing the granular materials inside the protective gear to morph their properties to provide greater shock protection at the precise point of impact.

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INDUSTRY SPOTLIGHT

Virtualization improves efficiency of legacy military embedded systems



Virtualizing legacy embedded systems improves their performance, efficiency, and security, as well as helping to

meet size, weight, and power requirements for military aircraft and ground vehicles.

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[3U VPX Software Radio FPGA with Backplane Optical & RF I/O](#)

With the Xilinx Kintex Ultrascale FPGA, data converters and optical or RF I/O, the [Model 54821](#) becomes an excellent high performance interface to HF or IF ports of a communications or radar system. The Model 54821 can be populated with a range of Kintex UltraScale FPGAs to match specific requirements of the processing task. The Model 54821 also includes a complete multi-board clock and sync engine and a large DDR4 memory. In addition to supporting PCI Express Gen. 3 as a native interface, the Model 54821 includes optional high-bandwidth connections to the Kintex UltraScale FPGA for custom digital I/O.

SPECIAL REPORT

The benefits and challenges of using GaN technology in AESA radar systems

TOP STORY

Solar-powered UAS introduced by Leonardo

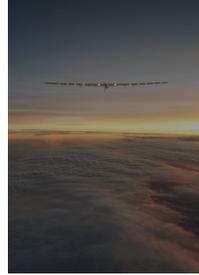
Leonardo has invested in Skydweller Aero Inc., a start-up specializing in large-scale solar-powered unmanned



As the trend in the development of new radar systems shifts away from dish antennas and towards active electronically steered arrays (AESA), there is a growing need

for high-power signal amplification distributed across the array. Whereas mechanically steered dish radars can use a single high-power amplifier to drive the antenna, AESA systems require multiple, compact power amplifiers. Achieving this level of high output power in a small space requires a solution with high power density and wide bandwidth ? an ideal use case for gallium nitride (GaN) semiconductor technology.

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aerial systems (UAS), including a solar-powered unmanned aerial system (UAS) that the company claims is capable of perpetual flight with heavy payloads.

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TOP STORY

Glide munition launched from Gray Eagle UAS in GA-ASI demo



A U.S. Army MQ-1C ER Gray Eagle Extended Range (GE-ER) Unmanned Aircraft System (UAS)

manufactured by General Atomics Aeronautical Systems, Inc. (GA-ASI) performed a flight demonstration using a Dynetics GBU-69B Small Glide Munition (SGM). The SGM is a lightweight munition with increased effective range.

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First 100Gb-Capable COTS FPGA Board, for High-Bandwidth Applications



For the most challenging real-time data digitization, processing, and storage applications, there is a new, higher-performing 6U OpenVPX board – the **WILDSTAR 6XB2**. RT3 backplane connectors deliver 100Gb per Fat Pipe.

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TOP STORY

Secure satellite systems contract worth up to \$3.3 billion inked between Lockheed Martin, USAF



This is my first job out of journalism school, sans a bar gig here and there. But as far as pantsuit-wearing, desk-sitting, degree-utilizing jobs go ?

Associate Editor for Military Embedded Systems is the first title I've ever held.

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TOP STORY

EW suite prototype introduced for F-16 fighter



Northrop Grumman Corporation has been selected by the U.S. Air Force for a prototype project to demonstrate an internally mounted electronic warfare (EW) suite and

digital radar warning receiver for the F-16 fighter aircraft. The agreement was issued under SOSSEC Consortium's Air Force Open System Acquisition Initiative (OSAI) Other Transaction Agreement (OTA) for prototyping.

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TOP STORY

Raytheon's Pit Boss equipped with autonomous mission management

Raytheon is designing Pit Boss, an autonomous mission management system for DARPA's Blackjack

MARKETS/BUSINESS DEALS

Biometrics to drive growth in military advanced authentication market, study shows



satellite constellation, with prime Scientific Systems Company, Inc.

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Biometrics will likely drive the advanced authentication market in the defense sector, as armies around the world increasingly use biometrics as a way to intensify battlefield awareness and handle encounters with bad actors who may be hidden in civilian populations, according to a recent market study by Mordor Intelligence, "Advanced Authentication Market in Defense Industry -- Growth, Trends, and Forecast (2019-2024)."

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Engineering Survey

Enter to Win a \$100 Amazon Gift Card in time for Christmas!

SPECIAL REPORT

Next-generation military communications challenges



Military communications (MILCOM) has been the backbone for deployed soldiers since the Vietnam War. While these units have proven their capability and

security for decades, the next generation of MILCOM platforms will need to leverage more modern communication technologies that have been developed to enable commercial platforms such as cellphones and Wi-Fi.

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TOP STORY

Kobra heavy UGV chosen by U.S. Army



The U.S. Army announced it has chosen the Kobra robot made by FLIR Systems Inc. for the heavy version of its Common Robotic System. The track-mounted

vehicles are used for explosive ordnance disposal and other heavy-lifting duties. The contract is valued at up to \$109 million for the five-year production run.

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TOP STORY

ATHENA laser weapon system defends UAS threat



Lockheed Martin demonstrated their laser weapon system for the U.S. Air Force at a government test range at Fort Sill, Oklahoma, where the system engaged and

shot down multiple fixed wing and rotary unmanned aerial systems (UAS). The Advanced Test High Energy Asset (ATHENA) operated in a fully-netted engagement environment with a government command and control (C2) system and radar sensor.

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MARKETS/BUSINESS DEALS

TT Electronics acquires aerospace and defense power supplier



TT Electronics, a global provider of engineered electronics for performance critical applications, announced it has acquired Excelitas Technologies Corp., a California-based business that designs and manufactures power electronics for defense and aerospace markets.

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TOP STORY

DARPA Spectrum Collaboration Challenge won by U of Florida team



After three years of competition, the "GatorWings" team from the University of Florida prevailed in the final head-to-head competition of the Spectrum Collaboration Challenge (SC2) -- a long-term challenge run by the Defense Advanced Research Projects Agency (DARPA) to find the team whose artificial intelligence (AI)-managed radio system collaborated best when matched up with the diverse lineup of systems other teams had built and brought to the finale.

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TOP STORY

SDR from Rohde & Schwarz chosen by Saab for integration into Gripen fighter aircraft



The Rohde & Schwarz SOVERON software-defined airborne radio has been selected by Saab for integration into the Saab Gripen E/F fighter aircraft for several export countries.

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MARKETS/BUSINESS DEALS

Military cybersecurity market will grow to \$16 billion by 2023, study says



The global military cybersecurity market will increase at a compound annual growth rate (CAGR) of 3.6% to reach \$16.01 billion by 2023, according to a study from Frost & Sullivan, "Global Military Cybersecurity Market, Forecast to 2023."

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TOP STORY

Missile-warning equipment from BAE Systems purchased by U.S. allies



Military Sales.

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BAE Systems has won contracts worth \$71 million to deliver aircraft survivability equipment to several U.S. allies via U.S. Army Foreign

GIVING BACK

Military Child Education Coalition



Each issue, the editorial staff of Military Embedded Systems will highlight a different charitable organization that benefits the military, veterans, and their families. This time we are highlighting the Military Child Education Coalition (MCEC), a nationwide nonprofit organization that aims to ensure inclusive, quality educational opportunities for all U.S. military-connected children affected by mobility, transition, deployments, and family separation. The MCEC ? founded by Dr. Mary M. Keller, who also acts as president and CEO of the organization ? conducts research, develops resources, sponsors professional institutes, conducts conferences, and publishes information in the pursuit of meeting the educational challenges faced by military-connected children.

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TOP STORY

Secure neural network developed for Secretary of Defense



Charles River Analytics Inc., developer of intelligent systems solutions, has received funding from the Strategic Capabilities Office of the Secretary of Defense (OSD) to develop a Secure Private Neural Network (SPNN) that hardens deep neural networks against adversary attacks.

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Microscopic bomb detector to be developed by Raytheon

Raytheon

Raytheon is using synthetic biology science to create a new method for detecting buried explosives, using bacteria as sensors. Under a contract from the U.S. Defense Advanced Research Projects Agency (DARPA), Raytheon and partner Worcester Polytechnic Institute will program two bacterial strains to monitor ground surfaces for explosive materials.

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Satellites and the kill web



In August 1990, Saddam Hussein invaded Kuwait. At that time, the U.S. Defense Satellite Communications System (DSCS) had one communications satellite

in geostationary orbit (GEO) operating over the Indian Ocean, covering the Middle East. Within the next few weeks, a satellite over the Atlantic Ocean was tilted to access the Persian Gulf. Another satellite in polar orbit was moved to 65 degrees East, and a reserve satellite over the Indian Ocean was activated. Some British satellites were linked-in, and these measures created the first space-based military communications network in history.

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