



Helicopters have new technologies for operational Safety and Fighting Brushfires

J.F. Taylor's Mission Computer Alternative Products (MCA) Dramatically Reduce Deployment Time and Cost Providing Open Architecture Future Upgrade Paths

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Airmen load a vehicle onto an aircraft during a combat airlift operation in the U.S. Central Command area of responsibility, Oct. 10, 2022.

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The INSIDE TRACK

NASA's Artemis I Mission Sees Successful Completion

Artemis Prime Industry Team Congratulates NASA on the Success of Artemis I

Artemis I mission came to a successful conclusion with the splashdown and recovery of the Orion spacecraft. This mission was an uncrewed, integrated flight test of the hardware and technology that will take humans back to the Moon for the first time in more than five decades.

The Space Launch System (SLS) rocket, Orion spacecraft and Exploration Ground Systems (EGS) at NASA's Kennedy Space Center in Florida performed flawlessly during the Artemis I launch on Nov. 16. During a nearly 26-day mission, Orion traveled more than 1.4 million miles on a path that took it around and beyond the Moon before returning to Earth. The flight testing and data from the mission inform future Artemis missions.

As the foundational elements of NASA's deep space exploration architecture, Orion is the safest human spacecraft ever developed, and the launch and ground systems were designed to deliver greater mass and volume with more Earth-orbit departure energy than any existing system. With planned

upgrades, the architecture will be able to support future missions to destinations beyond the Moon, including Mars.

The next step in NASA's Artemis program is launching the first crewed flight to the Moon and back on the Artemis II mission. All elements for that mission are deep into assembly. Work on Artemis III, which aims to put the first woman and person of color on the Moon, is well underway with many of the systems, such as the propulsion for SLS and Orion, nearly complete.

The Artemis program constitutes an important national capability that leverages more than 3,800 suppliers and 60,000 workers across all 50 states. The program sustains an essential industrial base of large, mid-size, and small companies that provide high-tech, professional jobs across the country.

Industry partners – Aerojet Rocketdyne, Boeing, Jacobs, Lockheed Martin, and Northrop Grumman – applaud NASA and their suppliers across the nation for the successful once-in-a-generation accomplishment of launching SLS and Orion as

humanity looks toward exploring deep space as humans never have before.

- Aerojet Rocketdyne provided the 39 propulsive elements to the mission, including the RS-25 and RL10 engines affixed to the core and upper stage that carried the SLS and Orion into orbit, as well as the jettison motor for the Orion spacecraft's Launch Abort System (LAS).

- Boeing is the prime contractor for the design, development, testing, and production of the launch vehicle core stage and upper stages as well as the development of the flight avionics suite.

- Jacobs was responsible for the rocket's final assembly, integration, testing, launch, and recovery operations support, including the development of the Artemis ground and launch control software used in the NASA Launch Control Center at Kennedy Space Center.

- Lockheed Martin is the prime contractor for the Orion spacecraft, including the LAS, crew module, and crew module adaptor.

- Northrop Grumman contributed the twin solid rocket boosters that supplied more than 75% of the thrust at launch, as well as the abort motor and attitude control motor for the LAS.



The INSIDE TRACK

Cleo Robotics to Develop Tactical Drone for U.S. Army

Cleo Robotics, the developer of the Dronut aerial vehicle platform, has been awarded a contract by the U.S. Army to deliver several prototype Tactical Dronut (TacDronut) systems for Intelligence, Surveillance, and Reconnaissance (ISR) capability.



The contract, valued at \$2.5M, was awarded by the U.S. Army's Rapid Capabilities and Critical Technologies Office (RCCTO) after the technology was selected during an Army Innovation Day competition evaluation of disruptive and innovative technologies to address required critical capabilities.

Army RCCTO specializes in executing rapid prototyping and initial equipping of strategically important capabilities. "Partnering with a company like Cleo Robotics allows the Army RCCTO to bring disruptive capabilities to the warfighter. Working through our Innovation Day process paired this approach to a unit of action," said Mr. Robert Monto, Jr., deputy director of the Critical Technologies Office (CTO) and Advanced Concepts and Experimentation (ACE) of the Army RCCTO.

As Soldiers are required to operate in more congested and contested environments, next-generation small, unmanned aircraft systems (sUAS) that can operate in buildings, tunnels, and other enclosed spaces are critical to mission success on the battlefield. The TacDronut is a compact, lightweight, and rugged sUAS based on Cleo's next-generation Dronut technology.

The Dronut is a ducted aerial vehicle platform capable of withstanding impact without sustaining damage and can operate in GPS-enabled and GPS-denied environments. Its onboard intelligence and sensor payload make it highly capable and reduces

the cognitive burden on the Soldier, allowing commanders to rapidly adapt to the challenges faced on a very fluid battlefield. After a successful demonstration of the prototype with the 82nd Airborne Division, the TacDronut will be transitioned by the Army as an ISR capability for the dismounted Soldier.

"The TacDronut sUAS project was selected as part of the Army RCCTO Advance Concepts and Experimentation (ACE) office's Army mission to rapidly develop, test, and transition advanced technologies to address high-priority items for the Warfighter. This project's goal is to improve air platform kinematics in support of in-

door and outdoor short-range operations in complex environments to help mitigate operational gaps involving the clearing of buildings, potential tunnels, and other enclosed spaces that are incredibly challenging for our Warfighters," said Mr. Nathan Rozea, Army RCCTO ACE office project lead on the TacDronut effort.

"We developed the Dronut specifically to operate in challenging environments and provide lifesaving intelligence and information, so the TacDronut program is a natural progression for this technology," said Omar Eleryan, founder and CEO at Cleo Robotics. "This endorsement by the U.S. Army is a great testament to the groundbreaking technology we're building, and we're thrilled to be working with the Army RCCTO team and Soldiers from an elite group like the 82nd Airborne Division."

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The INSIDE TRACK

First Two O3b mPOWER Satellites Sending, Receiving Signals After Successful Dual-Stack Launch

Milestone sets the stage for service provider SES to deliver global connectivity services with unrivaled flexibility and guaranteed reliability

The first two Boeing-built O3b mPOWER satellites are sending and receiving signals as they continue their journey into Medium Earth Orbit (MEO) following their successful dual-configuration launch. Developed for service provider SES, the satellites lifted off atop a SpaceX Falcon 9 rocket from Florida's Cape Canaveral Space Force Station on Dec. 16 at 5:48 PM ET.

O3b mPOWER is SES's second-generation MEO system designed to transform industries with terabit-level scale, roundtrip latency of fewer than 150 milliseconds, and unmatched service availability.

"Today's launch marks the next milestone of our MEO journey. With O3b mPOWER, we are bringing game-changing technology to deliver a unique combination of high-throughput, guaranteed reliability, and service flexibility that is the first in the industry," said Steve Collar, chief executive officer, of SES. "O3b mPOWER is the

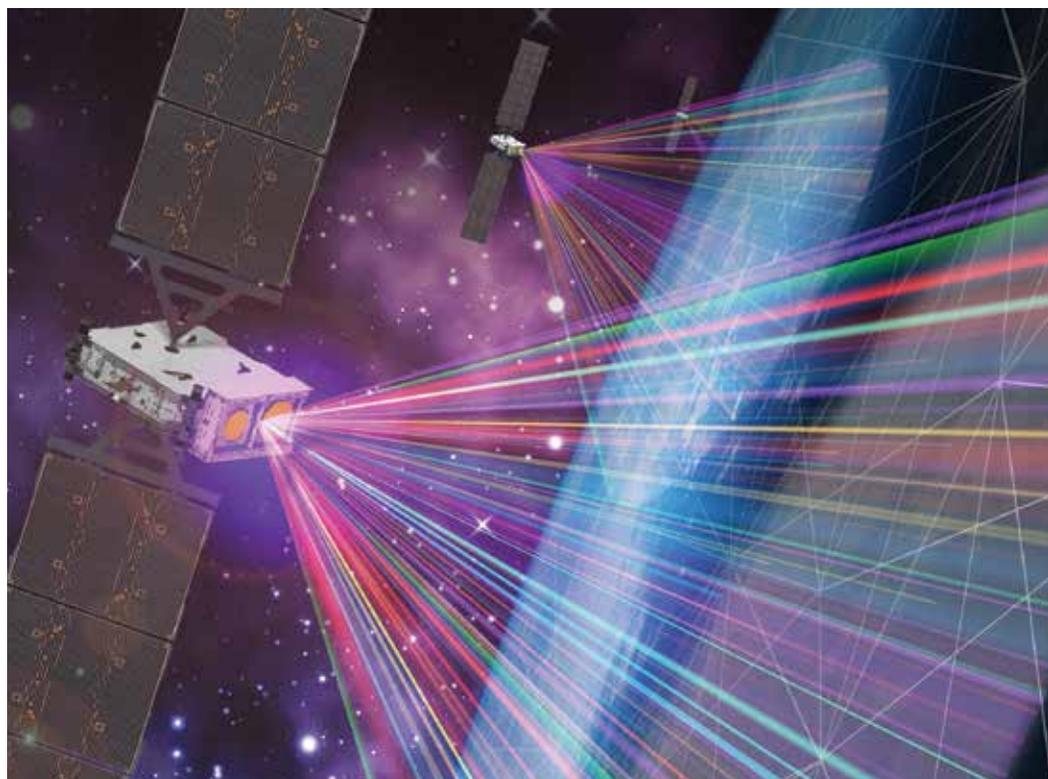
satellite system of choice for applications where performance matters most."

The O3b mPOWER ecosystem comprises an initial 11 satellites each equipped with more than 5,000 digitally formed beams. Coupled with an extensive ground infrastructure, the software-driven system enables SES to address current and future connectivity needs for governments, mobile network operators, energy companies, cruise lines, and enterprises across the globe.

Boeing will oversee the satellites' orbit raising and in-orbit testing before handover to SES in approximately 5 months.

"From concept to reality, the partnership with SES while developing the first-of-its-kind technology has been remarkable," said Jim Chilton, senior vice president of Boeing Space and Launch. "The next few months will be another critical collaboration period as we prepare the next nine satellites for launch and enable these first satellites to fulfill their mission to connect people around the world."

The O3b mPOWER satellite constellation will kick off commercial service in the third quarter of 2023.



The INSIDE TRACK

Concurrent Technologies Enhance Solutions Capability with Launch of New Partnership Agreement with EIZO Rugged Solutions Inc.

Concurrent Technologies, a world-leading specialist in the design and manufacture of high-end embedded computer boards for critical applications, has entered into a partnership agreement to offer a range of General Purpose Graphical Processing Units (GPGPU), AI-enabled, capture and video processing boards from EIZO Rugged Solutions.

EIZO provides a wide range of rugged COTS XMC and VPX form factor graphics and video solutions for both compute and I/O intensive systems. These GPGPU modules can provide graphi-

cal input/output channels and are widely utilized to accelerate processing tasks in electronic warfare (EW), intelligence, surveillance, and reconnaissance (ISR), 360° situational awareness, and artificial intelligence applications.

Concurrent Technologies' plug-in processor cards have an onboard expansion mezzanine site (XMC) or PCI Express lanes to adjacent cards (or both) to allow high bandwidth connections to these GPGPU cards from EIZO. EIZO's line of Condor video graphics and GPGPU solutions are based on the popular NVIDIA® GPU chipsets which are widely deployed in high-definition video and image analysis while utilizing the adjacent processor card to provide up to a 100G Ethernet for system-level connectivity. In addition, Concurrent Technologies' plug-in processor cards and EIZO Rugged Solution's OpenVPX modules

integrate to make a complete CPU + GPU solution in SOSA™ aligned systems

Brent Salgat, President of Concurrent Technologies, commented: "We have a great relationship with the EIZO Rugged team, having successfully worked together on many high-profile programs in the USA and worldwide. This moves our relationship up a level, providing Concurrent Technologies with additional payloads that we can utilize within our evolving systems portfolio."

Selwyn Henriques, President, and CEO of EIZO Rugged commented: "Our video, capture, encoding, and GPGPU product offerings are complementary with Concurrent Technologies' processor plug-in cards. Through this partnership, customers will receive complete, tested solutions to accelerate system designs and win programs."

OET Announces Conditional Approval for 6 GHz Band Automated Frequency Coordination Systems

ET Docket No. 21-352 - By the Acting Chief, Office of Engineering and Technology:

The Office of Engineering and Technology (OET) conditionally approves thirteen

entities to operate automated frequency coordination (AFC) systems to manage access to 6 GHz band spectrum by standard-power unlicensed devices: Broadcom, Google, Comsearch, Sony Group, Kyrio, Key Bridge Wireless, Nokia Innovations, Federated Wireless, Wireless Broadband Alliance, Wi-Fi Alliance (WFA), Qualcomm, Plume Design, and RED Technologies. This conditional approval begins the next phase of the process toward full

commercial operations. As these thirteen entities continue to develop their AFC systems, the next step in the approval process will entail testing to verify that they operate following the Commission's rules. Testing protocols are still under development and more information will be provided in future releases. OET will approve for commercial operations those AFC systems that successfully complete testing.

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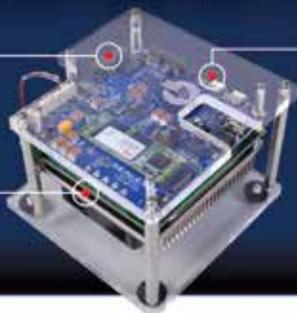
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New US Army RFI Signals Growing Acceptance of Digital IF Standard

The SATACOM industry passed a milestone recently when the US Army specified the Digital IF Interoperability (DIFI) Consortium's standard as a requirement in two recent Requests for Information (RFIs). The US Army Wideband Enterprise Satellite Systems (PdM WESS) RFIs inquired about DIFI standard compliance in Digital IF Converters (IFC) and Digital IF Combiner-Dividers. Through these RFIs, the US Army is seeking to find a way to modernize their existing DOD SATCOM Gateways and address growth in DoD SATCOM user demand through the migration to digital IF ground segment architecture to address growth and resilience.

Compliance with the DIFI 1.1 standard offers many benefits in government, military, and commercial satellite communications. By insisting on technology based on an open standard, buyers eliminate the threat of lock-in to proprietary systems, ensure that they can incorporate best-of-breed technology at competitive prices from multiple vendors in the future, and preserve the flexibility to innovate.

"There is growing interest and investment in digital transformation by the U.S. military," commented Stuart Daughtridge, Chairman of DIFI. "The specification of open interoperable standards such as DIFI helps the U.S. DoD achieve its stated modernization goals of reducing vendor lock, supporting adaptive dynamic space operations, while also reducing life-cycle costs."

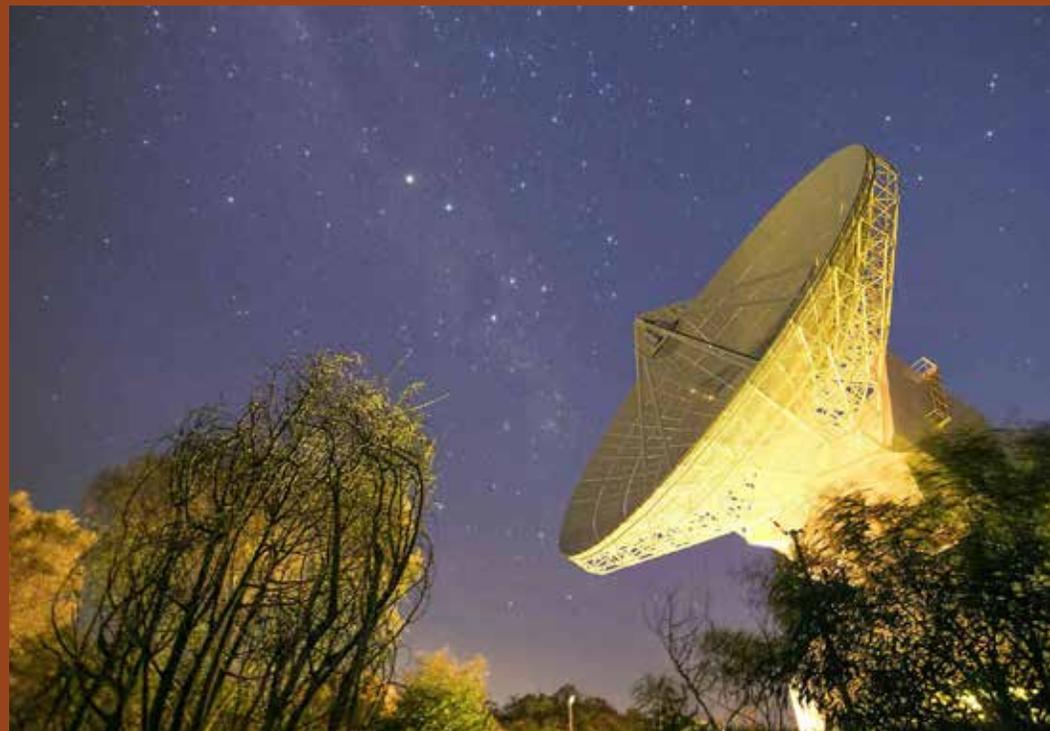
DIFI membership includes US govern-

ment representatives from the US Army, US Navy, US Space Command, DISA, and the DoD CIO's office, along with about 50 commercial and foreign government members. Their decision to join the DIFI Consortium reflects a strong preference for acquiring standards-based technology.

About DIFI IF Interoperability Consortium

The Digital IF Interoperability Consortium (DIFI) is an independent, international group of companies, organizations, and government agencies that have an interest in the interoperability of networks and ground systems supporting space-based operations. Launched in

coordination with the IEEE-ISTO, DIFI's mission is to enable the digital transformation of space, satellite, and related industries through a simple, interoperable Digital IF/RF standard that accelerates industry transformation from L-Band IF to Digital IF while discouraging vendor lock-in. DIFI's current membership is comprised of over 50 companies and government organizations from across space industry sectors. The founding members of DIFI include Hawkeye 360, Intelsat Corp., Kongsberg Satellite Services AS (KSAT), Kratos Defense & Security Solutions, Inc. (NASDAQ: KTOS), Microsoft, and the U.S. Navy.



Elma Updates Product Selection for Quick-Turn Delivery of Embedded Systems Platforms

More types of quick-turn units are available to help speed development time

Elma Electronic has increased the selection of popular chassis and development platforms available for quick shipment through the company's Express List offering. A broader range of chassis platforms that support the new SOSA™ standard and Open-

VPX is now part of the program.

Each unit in Elma's Express Products program comes wired, assembled, and tested. The program enables delivery of up to two units within two weeks of ordering, and four to six weeks for additional small quantities.

Boris Micha, vice president of customer service & marketing for Elma Electronic Inc., noted, "By offering quick shipment of many standard architecture-based chassis, we're helping to facilitate system development for

our customers. The need to immediately begin testing and development to rapidly deploy larger-scale rugged embedded systems is a key driver in our industry. Our Express Program supports that model."

In addition to the SOSA and OpenVPX versions, chassis for VME and CompactPCI architectures are still available via the program. All units can be ordered, shipped, and delivered with a very quick turnaround to meet tight design schedules, enabling system engineers to begin development immediately, rather than waiting on a full order delivery.

The INSIDE TRACK

Bell Delivers Subaru Bell 412EPX to Guatemala Ait Force

In a joint ceremony to mark the 101st anniversary of the Guatemalan Air Force, Bell Textron Inc., a Textron Inc. (NYSE: TXT) company, delivered two SUBARU BELL 412EPX aircraft during an acceptance ceremony at La Aurora International Airport. The aircraft are part of an Indefinite Delivery / Indefinite Quantity (IDIQ) contract signed between Bell and the U.S. Army Multinational Aviation Special Programs Office (MASPO) earlier this year.

“We are honored to bring the most modern version of the Bell 412 to Guatemala,” said Carl Coffman, Bell vice president, of Advanced Vertical Lift Systems sales and strategy. “Turn-around from signature to delivery is a statement to the men and women supporting this aircraft at every level of the business, and a testament to the efficiency of the IDIQ contract between Bell and MASPO.”

Multi-mission capabilities make the SUBARU BELL 412EPX a popular choice for customers with more than 54 percent of the Bell 412 global fleet deployed in military and para-public missions worldwide. The Guatemalan

Air Force currently operates versions of the Bell 206, 212, 407, 412, and UH-1. The SUBARU BELL 412EPX is the latest version of the 412 aircraft, whose legacy spans more than 6.5 million flight hours.

“We are excited to introduce the SUBARU BELL 412EPX into the Guatemalan Air Force,” said Major General Henry Yovani Reyes, Minister of National Defence. “The aircraft will support missions including disaster response,

humanitarian relief, and other utility needs.”

The SUBARU BELL 412EPX robust main rotor gearbox improves horsepower and maximum weight capacity, enabling the aircraft to transport more supplies and perform operations more efficiently. The SUBARU Bell 412EPX has a maximum internal weight of 12,200 lbs, an external weight of 13,000 lbs, and up to 5,000 lbs of goods with a cargo hook.



Viasat Awarded \$99 Million Lot Buy Order for Military Tactical Radios

MIDS is among the most widely used Link 16 terminals by the US military and global allies

Viasat Inc. announced it was awarded a \$99 million order for Multifunctional Information Distribution System (MIDS) Joint Tactical Radio System (JTRS) terminals from U.S. Naval Information Warfare Systems Command (NAVWAR) on behalf of the MIDS Program Office. This order falls under a U.S. Navy Indefinite Delivery, Indefinite Quantity (IDIQ) contract awarded to Viasat in 2020 with a maximum value of \$998 million for the production, retrofits, development, and sustainment of MIDS JTRS terminals. This order was received during Viasat’s Q2 FY23.

MIDS is among the most widely used Link 16 terminals by the US military and global allies, acting as the foundational communications datalink on the modern battlefield and providing a secure communications

capability for operations in any environment. Viasat’s MIDS JTRS terminals provide access to the secure Link 16 line-of-sight network enabling tactical communications and data transport to ground, maritime and airborne platforms to provide greater situational awareness on the battlefield.

“This award further indicates Viasat’s commitment and expertise in providing Link 16 tactical communications solutions supporting US and Allied armed services,” said Craig Miller, president of Viasat Government Systems. “MIDS JTRS radios are a critically important tool that enables warfighters to maintain communications superiority and secure data transport on

the battlefield, as well as securely communicate with allied forces. Viasat is proud to be a trusted supplier of this capability for today’s allied warfighting force.”

The order demonstrates the strength of Viasat’s Tactical Data Link (TDL) business and recognition of its production capability to deliver large quantities of MIDS terminals in a variety of configurations to meet mission and customer requirements.



The INSIDE TRACK

OSS Wins Multi-Million-Dollar AI Transportable Program with Leading 5G Cellular Provider

One Stop Systems, Inc. a leader in AI Transportable solutions on the edge, has won a multi-year, multi-million-dollar program with a Fortune 50 cellular provider to supply OSS transportable compute and storage hardware for a mobile 5G AI application.

The deployment will involve installing OSS SDS rugged servers in service vehicles operating in more than 100 cities nationwide. The vehicles will use onboard 5G antennas to gather and characterize data in real-time in the field, and then transport the data back to a service hub where it is uploaded to the cloud and combined with other data sets.

“This leading 5G cellular provider chose OSS because of our technology leadership and long history of delivering rugged compute and storage solutions for transportable applications, particu-

larly those involving high-speed data recording,” stated OSS CEO, David Raun. “We anticipate a long-term relationship developing under this commercial program win and it leading to other opportunities with this marquee customer.”

The planned deployment will leverage OSS’s unique AI transportable edge technology consisting of an OSS Gen 4 PCIe® SDS-3U GPU-accelerated server mounted in a vehicle equipment rack. The SDS will be powered by the latest AMD EPYC™ 7003 Series Processors and 16 NVMe drives—an ideal configuration for high-speed NVMe data acquisition and recording.

The system features the first server class, dual socket AMD EPYC platform ruggedized for harsh edge environments and will be air-cooled inside the vehicle.

Each SDS-3U system will be capable of ingesting, recording, and storing up to 256 terabytes of raw 5G RF data signals onto high-speed NVMe SSDs encased in two easily re-



movable, encrypted drive packs.

OSS’s proprietary high-speed PCIe Gen 4 switched interconnect will transport the data to the compute processors for real-time, in-vehicle signal analysis using the latest AI deep learning frameworks. For uploading the massive amount of collected data to the cloud, the drive packs can be easily removed and transported to OSS SDS servers installed in-ground stations with high-bandwidth Internet connections.

“This 5G cellular signal capture and analysis application is a perfect example of our strength in the AI Transportable segment of edge computing which requires the highest performance in challenging mobile environments,” added Raun. “Our rugged SDS server demonstrates how we continue to push the boundaries of high-performance edge computing, where speed, security, and reliability are the most critical factors for AI transportable applications.”

OSS SDS-3U gives users the flexibility to choose to encrypt data on the move using optional OSS Ion Accelerator 6.x SAN and NAS software or encrypting data at rest using NVMe self-encrypting drives. The servers are ideally suited for field applications, where they can be housed in highly ruggedized mobile containers, shelters, or vehicles. These mobile or field locations can then support end-to-end AI workflows and on-the-spot decision-making without the need to access a remote centralized data center for processing.

SDS options include up to sixteen PCIe 4.0, FIPS 140-2 encryption compliant U.2 NVMe™ SSD drives, up to four of the latest Gen 4 GPUs, and high-speed Network Adapters or SmartNICs. These components enable the system to deliver unprecedented acceleration, security, and flexibility for AI, data analytics, and high-performance edge computing. Altogether, the system represents the highest performance, most secure FIPS 140-2 solution required by today’s government and enterprise AI edge applications.

OSS expects initial deliveries of the mobile 5G AI system to begin before the end of this year, with deployments continuing through 2026.

OSS is focused on the fastest-growing segment of the edge computing market, AI Transportables. According to MarketsandMarkets, the global edge computing market is projected to grow at a compound annual growth rate of 17.8% to reach \$101.3 billion by 2027.

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The INSIDE TRACK

Space Systems MOSA Interface Standards Alliance Announces Formation for Standards Development

IEEE Industry Standards and Technology Organization (ISTO), an international federation of leading groups and consortia dedicated to the advancement of standardized technologies for the benefit of industry, today announces its newest member program, Space Systems MOSA Interface Standards Alliance.

Sponsored by the Space Systems Command (SSC) under the United States Space Force (USSF), the Space Systems MOSA Interface Standards Alliance is a Government-guided collaboration with IEEE-ISTO for the development of Modular Open System Approach (MOSA) interface standards that enable interoperability at key space system interfaces. Standardization of key space system interfaces will provide the warfighter with resilient systems that enable rapid technology insertion and refreshments.

According to the DoD Defense Standardization Program (DSP) website, "MOSA enabling standards can best be described as widely accepted, supported and consensus-based standards set by recognized standards organizations or the marketplace." A recent message from the SSC Commander stated, "We must look across our entire space enterprise as an integrated system of many systems and missions – and consider interoperability and resilience a critical part of delivering any space capability."

"SSC is pleased to collaborate with IEEE-ISTO to develop industry consensus-based standards. Collaboration with industry on interface standards is essential to ensure the standards meet both industry and mission needs," said Dr. Claire Leon, SSC's Space Systems Integration Office director. "Establishing robust interface standards will improve interoperability between systems and enhance our U.S. space systems resiliency."

"IEEE-ISTO welcomes the Space Systems MOSA Interface Standards Alliance as a new member program of IEEE-ISTO Federation of Programs. IEEE-ISTO looks forward to collaborating on this important step in achieving space system interoperability and the Alliance's mission to develop industry consensus-based standards to effectively advance U.S. Space Programs," said Adam Newman, IEEE-ISTO president.

The Space Systems MOSA Interface Standards Alliance brings together committees of specialized technical skill sets from industry and spacefaring Government partners whose combined expertise will inform consensus-developed, immediately implementable standards that enable Government-driven objectives. Furthermore, Government-guided interface standardization will increase opportunities for new entrants to better compete in the established market.

"As the Space Systems MOSA Interface Standards lead, I'm looking forward to collaborating with the IEEE-ISTO, industry, and National Security Space partners in the development of a synergistic set of space system interoperability standards that will help move SSC into a future of new technological capabilities for a strong Space Force," said Eric Mattessich, SSC's Space System Integration Office. "Standardized interfaces will foster a wider Space industrial base and increase potential opportunities for us to benefit from

a broader range of innovations by new entrants and our current industrial base."



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The INSIDE TRACK

Arabian Development & Marketing Company Inks Deal with Sabrewing Aircraft to Purchase 53 “Rhaegal-A” VTOL Air Cargo Drones

This marks the third contract with ADMC totaling over €1 billion in orders

Oxnard, CA – In a joint announcement between Arabian Development and Marketing Corporation (ADMC) and Sabrewing Aircraft Company, Inc., the two companies stated that ADMC had ordered 53 of the record-breaking heavy-lift cargo uncrewed aerial vehicle (UAV). This event comes on the heels of Sabrewing’s Rhaegal-A “Alpha” aircraft’s first world record-breaking flight.

“We had a phenomenal response to our first flight announcement,” said Ed De Reyes, CEO of Sabrewing. “We are meeting our customers’ requests of carrying large volumes of cargo while lifting heavy payloads of weight.”

This September, Sabrewing announced that it had flown its first flight with a record-breaking 829 pound/374 kg payload – the most for any commercial cargo UAV. According to De Reyes, the Rhaegal-A has continued to fly and lift heavy payloads as part of its final development program.



ADMC currently has 128 orders for Sabrewing’s Rhaegal-B “Bravo” aircraft, which is capable of lifting 5,400 pounds/2,450 kg vertically and up to 10,000 pounds/4,535 kg conventionally. Both the “Alpha” and “Bravo” models are capable of taking off vertically. They are the only cargo UAV capable of taking off both vertically and conventionally (as a fixed-wing aircraft).

De Reyes continued, “Because we already have the molds, hardware, software, and avionics from our first aircraft, we’ve completed the majority of the development work on the Alpha model aircraft. We were looking for a launch customer to start production. ADMC found customers who were interested in buying and leasing the cargo UAV. We had an overwhelming response to our first flight, and interest skyrocketed from day one of the announcement.”

De Reyes added, “On our very first flight, we carried a payload that beat the highest planned payload capacity of the closest competitor by almost 500 pounds, and with over four times more volume than the closest competitors. Since our first payload was only about one-third of what we

can carry, we knew it was going to attract a lot of customers who need to carry a ton or more of cargo in a large cargo bay.”

Ayman Zeibak, General Manager of ADMC, noted, “We are the first launch customer for the Bravo aircraft, ordering 128 of Sabrewing’s Rhaegal-B “Bravo” aircraft valued at over €768 million. We now have a mix of highly versatile aircraft to lease to our African and Middle Eastern customers.”

Zeibak noted, “The Sabrewing Alpha is just the right size for some of the smaller air cargo companies who don’t have contracts with FedEx, DHL or another major carrier, but have the need to carry 1000 kilos of bulk cargo to remote locations regularly.”

This launch order represents an additional €260 million in revenue for Sabrewing, as well as the launch of an additional product line. De Reyes also said that they expect to begin delivering the first Alpha models for type certification testing by the beginning of the 3rd quarter of 2023.

Polish National Police Add To Its Black Hawk Fleet To Support National Security Efforts

PZL Mielec, a Lockheed Martin company, finalized a contract with the Polish National Police for two S-70i Black Hawk helicopters, which will increase its fleet of Black Hawks to five by the end of 2024. The expanded Sikorsky Black Hawk fleet will fulfill important missions including counter-terrorism activities, search and rescue, and firefighting.

“The Black Hawk’s multi-role mission flexibility is key to meeting the needs of the Polish National Police. We bring a deep understanding of our customers’ missions to deliver the best solution for their needs,” said Janusz Zakrecski, PZL Mielec President and General Director. “This contract is another important milestone, given that this valued customer is growing its fleet of Black Hawks, which demonstrates the police’s trust in our helicopters.”

The contract includes a logistical support package that will cover spare parts, pilot and

maintenance specialist training, and ground support equipment.

“We were very keen on a multi-role helicopter because, in 2016, Polish police were entrusted with tasks in the field of counter-terrorism activities, which is why the purchase of Black Hawks was an absolute necessity,” Police Commander-in-Chief Gen. Insp. Jarosław Szymczyk said during the ceremony. “The (Black Hawks) we use are very reliable. I am convinced that the employees of PZL Mielec put their hearts into them, thanks to which they serve us so well.”

Currently, the Police Aviation Authority operates three S-70i helicopters delivered by PZL Mielec in 2018 and 2019. They are deployed for a range of activities, including search and rescue missions, border

patrol activities, and, in cooperation with the Headquarters of the State Fire Service, actions to combat fires and natural disasters.

Built to robust military specifications, the Black Hawk family of helicopters is renowned for its proven combat performance and multi-mission capability. The latest generation of Black Hawks features digital avionics, powerful GE engines, high-strength airframe structures, and composite wide-chord rotor blades that yield increased situational awareness, survivability, and performance.



The INSIDE TRACK

Sweden, Germany, and the United Kingdom have reached an agreement with BAE Systems to purchase 436 BvS10 all-terrain vehicles.

The joint procurement, worth \$760 million, is in support of Arctic operations for the Collaborative All-Terrain Vehicle (CATV) program.

BAE Systems' military all-terrain vehicles are designed for operations in the harshest and most remote environments and this agreement signals the Company's position as the defense industry's leader in these capabilities.

"We're seeing increased interest from numerous countries for the extreme mobility capabilities offered by the BvS10 and its unarmored sister vehicle, Beowulf," said Tommy Gustafsson-Rask, managing director of BAE Systems Hägglunds, which manufactures the vehicles in Örnsköldsvik, Sweden. "Sweden, Germany, and the United Kingdom will be getting an excellent return on their

investment in these highly capable vehicles for decades to come. This further demonstrates the strong relationship between BAE Systems and our customers to deliver these critical capabilities."

The three-nation acquisition will deliver the 436 vehicles beginning in 2024, with 236 BvS10s going to the Swedish Defense Materiel Administration (FMV), 140 to the German Federal Ministry of Defence (BAAINBw), and 60 to the United Kingdom Ministry of Defence (MoD). The vehicles are based on the latest version of the BvS10 currently operated by Sweden and will include variants for

troop transport, logistics, medical evacuation, recovery, and command and control.

The CATV program includes a framework agreement that could lead to the purchase of more vehicles by the three nations, keeping the BvS10, the world's leading all-terrain vehicle, in production for many years to come. Sweden is the lead nation and has established a joint procurement office to lead the effort with representatives from all three nations.

This acquisition follows Sweden's order last year for an additional 127 BvS10 all-terrain vehicles for its existing fleet. In parallel with this agreement, Sweden is also procuring an additional 40 BvS10s in a separate contract valued at approximately \$50 million.

The BvS10 and Beowulf are the world leaders when it comes to all-terrain solutions. Their articulated mobility systems provide optimal maneuverability across varying terrains so they can traverse snow, ice, rock, sand, mud, or swamps, as well as steep mountain environments. The vehicles' amphibious features also allow them to swim in flooded areas or coastal waters. The vehicles can deliver personnel and supplies to sustain strategic, tactical, and operational mobility.

BvS10's unprecedented mobility is based on terrain-accessible North Atlantic Treaty Organization (NATO) standards. Its modular design allows it to be reconfigured for varying missions and can be delivered in multiple variants that include carrying personnel, command, and control, ambulance, vehicle repair and recovery, logistics support situational awareness and a weapons carrier with additional mortar capability.

BvS10 is currently operated by Austria, France, the Netherlands, Sweden, and the United Kingdom. BAE Systems' Beowulf, the unarmored variant of the BvS10, won the U.S. Army's competition for its Cold Weather All-Terrain Vehicle (CATV) program in August. The U.S. Army will receive 110 vehicles over five years.



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Helicopters have new technologies for operational safety and fighting brushfires

By Alan Lowne, CEO, Saelig Co. Inc.

Helicopters are designed to lift heavy loads externally and drop them, often in areas that are hard to reach by other means. Safety is a key to successful missions and new technologies can help.

Helicopter pilots face one of their biggest challenges when picking up, carrying, and discharging an underslung load. Additional extensive training and skill is required for these

external load operations. Typical underslung loads, including vehicles, boats, supplies, fire extinguishing liquids or spray chemicals, are lifted by rotary aircraft to assist military and civilian operations in tough situations. Most often in forest fires, the extinguishing water is dropped in a largely unguided manner, hoping that it will find a target and have a significant result. Pilots have only a limited field of downward view, so they can often only operate by guesswork. Other crew members may have a better view and be able to guide the pilot, use a periscope, or a downward pointing camera. Ground personnel in radio contact with the pilot may be able to direct the aircraft into position but they may not be close to the fire or able to determine relevant hot spots. They will have difficulty gauging the speed of approach, particularly if the

helicopter is approaching at an oblique angle.

This type of load carrying presents challenges for both the ground and airborne crew. The ground crew are responsible for carefully preparing an appropriate load and hooking it onto the belly of the helicopter using straps and nets. The Chinook helicopter, for instance, is able to lift around 10,000kg of equipment and supplies. Loads such as artillery pieces, vehicles, and other bulky items can be lifted with 'leg slings' by attaching them to hard points on the equipment. Loose items like rations, ammunition, and soldiers' backpacks can simply be placed inside an under-cargo net.

On board the helicopter, a crewman will be responsible for monitoring the load throughout



its journey from pick-up to drop off. With their ability to hover, helicopters can drop supplies and lift equipment in inaccessible places like mountainous terrain or areas with heavy forestation, or where roadways have been destroyed by some catastrophe. This is often the case in disaster relief and humanitarian work, when equipment needs to be dropped and recovered in areas with no easy ground access.

Safety Device For Accurate Load Handling

An innovative design of helicopter load hook called HeliNav LoadMaster is now available, which combines GPS (Global Positioning System) with load sensing and other intelligent functions to automatically optimize complex load handling. This intelligent, removable cargo hook senses underslung load weights and uses GPS signals to identify the exact position of its host helicopter over an area of land to within an accuracy of 2-3 meters. The hook is wirelessly connected to a cockpit display and is completely autonomous with its own on-board sensors, computers, and batteries. This makes it independent of the host helicopter's systems and therefore exempt

from the need for CAA or any other approval. It also means it can be swapped from one craft to another in seconds, allowing this smart hook to be shared around a fleet of aircraft.

Challenges like lifting rubble from a quarry to a hillside to lay an accurate path is currently very difficult, assessing the exact weight of each load, its placement, and the total distance flown during the day. But the HeliNav LoadMaster keeps exact records, accurate to the kilogram and meter. Crop spraying and water bombing can now be more accurate, safe, and accurately targeted. When multiple flights are needed, this new load hook can ensure that the second drop starts exactly where the first finished. This guarantees even coverage and efficient use of sprays, fire retardant, etc.

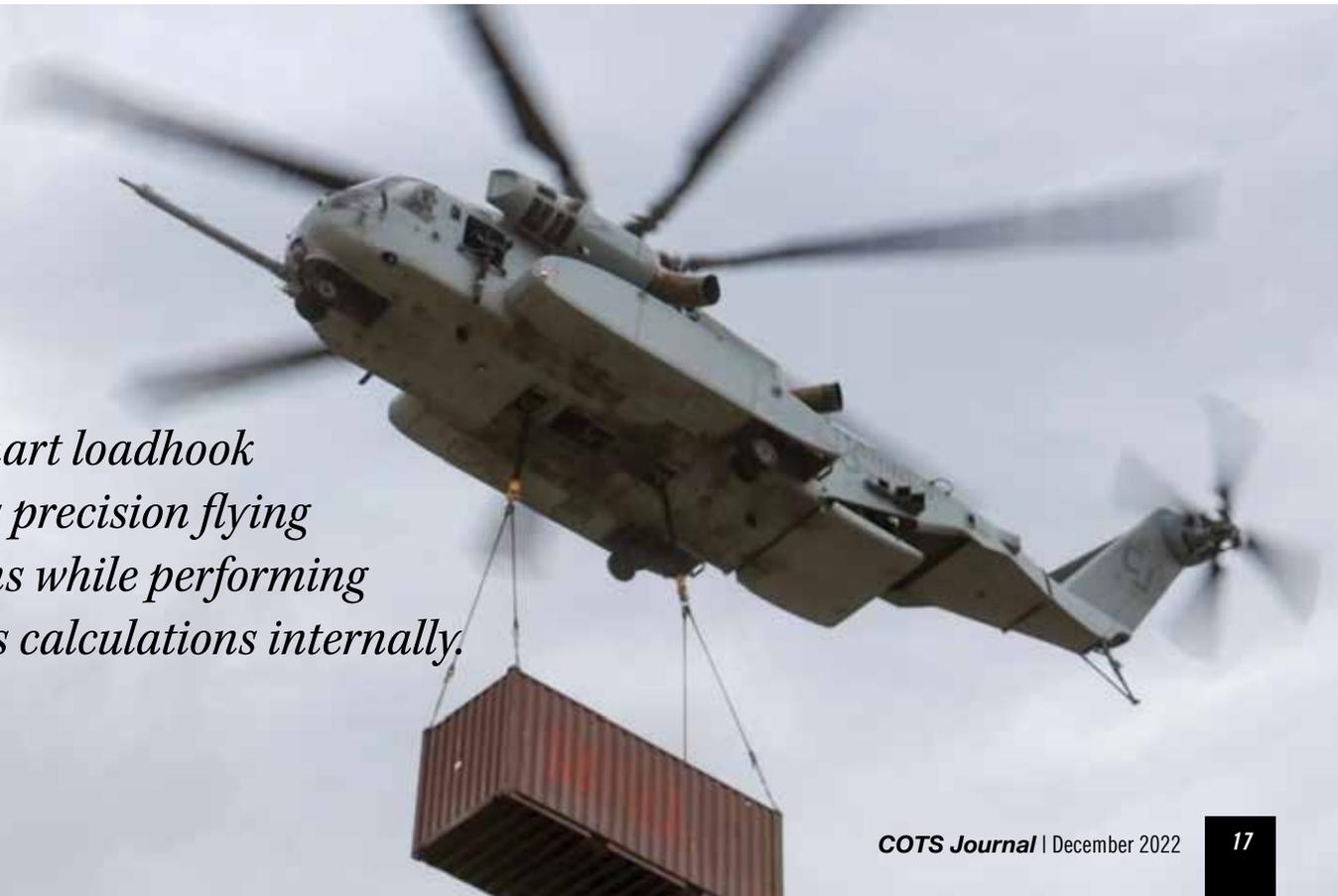
As an extinguishing bucket empties, flow will naturally slow; HeliNav LoadMaster can compensate for this by gradually opening the release valve in proportion to the weight of remaining liquid. The GPS feature can also be used to avoid houses, streams, lakes and roads. It represents an efficiency saving for the actual helicopter flight path, while – perhaps more importantly – also allowing the ground personnel or fire crews to be confident that a whole fire risk area has been addressed.

This smart loadhook enables precision flying missions while performing all of its calculations internally. It communicates information to the helicopter pilot's display via a radio link working on an unrestricted waveband. A full-color touch screen is mounted in the cockpit allowing the pilot to monitor, interrogate, and activate the hook's computer. Operation is simple and training is unnecessary, with both Windows and LabView software embedded in the unit. This patented device transmits load data signals via radio signals to the cockpit and/or to a ground station, so there is no need to drill holes for signal wires in the aircraft body, which could mean requiring recertification for airworthiness. A separate handheld remote monitor can be used by ground crew to accurately check loads, to prevent overloading the aircraft or even to ensure that returning buckets are empty.

This new load cell can tell the pilot the exact underslung weight he is carrying for safety and flight purposes. Because the unit is simply slung under the aircraft, it is possible to have a single unit in use with a fleet of three, four, or more operational helicopters. This represents a step change in the way in which helicopter-based operations function. Flights can now be absolutely accurate and free from overloads, with digital records made available for record-keeping.



This smart loadhook enables precision flying missions while performing all of its calculations internally.



J.F. Taylor's Mission Computer Alternative Products (MCA) Dramatically Reduce Deployment Time and Cost While Providing Open Architecture Future Upgrade Paths

By Rick Schuh, Alta Data Technologies

Open Standards Platform with Alta Data Technologies 1553 & ARINC COTS Products

Alta Data Technologies, LLC (Alta) is excited to announce that it has been selected as the MIL-STD-1553 vendor for J.F. Taylor's (JFTI) next-generation, open systems Mission Computer Alternative (MCA) products. These VPX-based systems offer the latest processing capabilities for mission solutions that desire clear upgrade paths that are not tied to a single vendor. The products are designed to be scalable, meet the highest environmental and se-

curity requirements, and importantly, provide full Government Rights to interface modules.

Matt Campbell, Vice President and Program Manager of MCA Products for JFTI, explains "Our new MCA product line is the culmination of 35 years of experience in electronic design, systems engineering, software development and production of high-fidelity avionics computer systems, and maintenance kits. This unique experience has shown that defense programs have a strategic need to quickly and cost-effectively upgrade mission systems to meet rapidly changing processing and security requirements. One hindrance is working with single prime contractors that naturally want to lock in their systems designs, and control future upgrades, which slows down implementa-

tion and drives up cost. This problem is solved with MCA products."

"The MCA products are based on open hardware and software standards (VITA Hardware Open System Technology - HOST, and Future Airborne Capability Environment - FACE, software) and are built with modular COTS components to the latest technologies. This approach maximizes affordable future growth for tech refreshes. A crucial advantage is the use of non-proprietary interfaces with full Government ownership rights - the Government can control and compete with future contractors to manage upgrades while taking advantage of the latest technologies."

The current MCA product was designed and



built for the U.S. Navy (USN) T-45 trainer aircraft. The T-45 aircraft is a tandem-seat, carrier-capable jet trainer with a digital “glass cockpit” designed for Navy and Marine Corps pilot training. Due to obsolescence and reliability issues, and the need for expanded processing capabilities, the USN initiated a replacement program for the T-45C Mission Display Processor (MDP). In 2017 the JFTI MCA product was selected as the replacement, and JFTI was contracted for the design, test and initial computer builds. Before developing the T-45 MCA variant, JFTI also developed an MCA prototype using HOST and FACE standards for the MH-60R/S rotary wing aircraft. In February 2022 JFTI was contracted to design, build and test a variant of the MCA computer to meet the constraints of the E-2D aircraft. This MCA variant will be called the E-2D Mission Computer Adjunct Processor (MCAP). Throughout all of these mission computing experiences, JFTI has demonstrated its highly-relevant experience in mission computing hardware, software, documentation, logistics, and sustainment, making JFTI the perfect candidate to perform this work.

A critical component of these systems is the avionics interfaces provided by Alta. “We have been quite impressed by Alta’s expertise in providing efficient and innovative aviation solu-

tions,” says JFTI’s Matt Campbell. Alta Data Technologies was founded in 2007 to provide the industry with the most advanced and modular MIL-STD-1553 and ARINC COTS products, and their open approach with portable-layered software and independent channel cores provides maximum flexibility for avionics system designs. This approach worked well as Alta is now one of the largest 1553 and ARINC COTS suppliers with over \$175M in total sales and 60,000+ items shipped in their short history, and their products are deployed on 1000s of various mission systems. Just recently Alta has been recognized for the third year in a row as a Top 10 Aerospace Solutions Provider by Aerospace & Defense Review.

“This recognition is such a privilege and demonstrates our entire team’s commitment to providing the very best product and services in the 1553 and ARINC markets. Even though we have grown to be one of the largest suppliers in our market, we’ve never forgotten our first customers that believed in our goal to bring fresh, innovative products and services to the industry. By offering the only 3rd generation, packet off-loading protocol engines, along with our leading manufacturing practices, we’ve been able to grow and keep a personal support promise for all customers – backed up with an industry-leading 5-year warranty,” states Harry

Wild, VP of Sales and Co-Owner.

Wild continues, “We have some exciting new products in the pipeline that will soon release, including a new, advanced cryptographic capability for the Ethernet host interface of our ENET product line. For the first time in our industry, customers will be able to seamlessly have AES256-level hardware encryption for the host control to 1553 and ARINC networks. This will be ideal for embedded, deployed, and even lab 1553 and ARINC requirements.”

About J.F. Taylor

J.F. Taylor, Inc. (JFTI) is a privately owned, mature small business located in Lexington Park, MD, with approximately 500 employees, 10 purpose-built facilities, a Defense Contract Audit Agency (DCAA) certified accounting system, and an ISO 9001:2015 and AS9100D:2016 certified Quality Management System. Since 1983, JFTI has provided prime contractor engineering and manufacturing support for Navy, Marine Corps, Air Force, Army, and Coast Guard programs.

About Alta Data Technologies

Alta is a rapidly growing, private company that provides industry-leading MIL-STD-1553 and ARINC COTS avionics interface products. Alta’s products are offered in high-density channel counts and Ethernet configurations. Products include 1553 and ARINC interfaces for PCI Express, PMC, and XMC for various computer systems such as VPX, VME, cPCI/PXI, PXIe, and Mini PCI Express.



“This recognition is such a privilege and demonstrates our entire team’s commitment to providing the very best product and services in the 1553 and ARINC markets....”

December 2022 COT'S PICKS

Varjo Releases XR-3 Focal Edition Mixed Reality Headset for Advanced Training Operations

Varjo, the maker of professional-grade VR/XR hardware and software, announced its newest headset, XR-3 Focal Edition, which provides superior visual quality for mixed-reality implementations where real-world objects such as cockpits, car dashboards, cell phones, and kneeboards are used. The XR-3 Focal Edition offers the ultimate visual precision for advanced use cases where visualizing small text and illustrations on physical instruments in mixed reality is mission-critical.

The XR-3 Focal Edition is best used for interacting with real instruments, gauges, panels, and meters in mixed-reality scenarios where the trainee is fully immersed in computer-generated content yet needs to interact with the physical world immediately adjacent to the viewer. The headset provides dual high-resolution, 12-megapixel cameras that are calibrated to provide improved image clarity for the range of 30 centimeters to 80 centimeters (12" to 31") from the headset in comparison to a standard XR-3. Seeing crucial dials and knobs in proper focus with content close to the video sensor requires a closer focusing point. The optimized components in the mixed reality camera system change the distance of the focus so the lens brings a sharper depth of field, closer to the user.

Varjo XR-3 Focal Edition is fully TAA/BAA-compliant (the Trade Agreements Act and the Buy America Act) meaning that at least 50% of its overall manufacture cost originates from the US or designated countries and that the product has undergone substantial transformation in the US or designated countries. Trade Agreements Act (TAA) compliance is becoming an ever-increasing

requirement enabling HMD-based solutions to be used for secure and classified operations. Sold with a perpetual, offline license that enables operations in non-internet connected environments that do not require users to create accounts, the XR-3 Focal Edition can support the most demanding security needed for the United States Department of Defense, intelligence, and security-critical infrastructure customers. Furthermore, for customers looking for the highest level of security, the XR-3 Focal Edition can be delivered with radio frequency capability removed as required to operate in some classified environments.

"The use of XR-based devices across the training and simulation segment has grown exponentially over the past year, and we're pleased to be working with the world's leading simulation and training companies across both civilian and defense sectors. We heard from our customers the need for more precise visuals at a closer distance, specifically when looking at dashboards, cockpits, and cell phones and we responded with the XR-3 Focal Edition to address the need," said Seppo Aaltonen, Chief Commercial Officer of Varjo.

"Our engineering team has noticed a clear difference in the ability to read instruments on the avionics panel thanks to Varjo's all-new XR-3 Focal Edition," said Chad Schmitz, Product Manager for Mixed Reality Flight at FlightSafety International. "Our customers have already undergone installations with the XR-3 Focal Edition headsets and test pilots have given positive feedback on the resolution and high fidelity of the device. We can now offer our customers a fully TAA-compliant solution for the most demanding mixed reality training scenarios and deployments."

Varjo
varjo.com



Increasing Need for Locking, High-Retention USB Solutions

In recent years, RS-232 ports have largely been displaced from computers as USB ports emerge as the preferred serial interface for industrial environments. Data rate speed and durability are the two primary factors influencing this migration. With the introduction of USB 3.2 in 2017, data rates that are up to 100,000 faster than RS-232 have been achieved. Additionally, the small pins on traditional serial ports can be easily bent, minimizing their reliable operation in extreme environments where shock, vibration, and other physical disturbances are present. However, one of the primary features of USB can also be its downfall: the USB mechanical connector was intentionally designed to be quickly connected and disconnected. As a result, accidental cable disconnection is a common failure for industrial USB devices.

About SeaLATCH Locking USB Connectors

Sealevel's patent-pending SeaLATCH® locking USB connectors feature a thumbscrew that provides a secure, metal-to-metal connection to avoid interrupted operations for critical communications. SeaLATCH locking USB ports are integrated into Sealevel:

- SuperSpeed USB 3.1 Hubs
- USB 2.0 Hubs
- SeaI/O USB Expansion and Data Acquisition Devices
- SeaDAC Lite USB Digital I/O Modules
- SeaLINK® USB Serial Adapters
- Embedded Computers

"We're excited about the increasing applications that benefit from locking connectors. Originally, this was a driver primarily for our military and aerospace customers but now we are seeing a drone and UAV use increase across industries – and the inherent vibration makes a solution like SeaLATCH highly desirable," said Earle Foster, Sr VP of Sales for Sealevel.

Sealevel
sealevel.com



December 2022 COT'S PICKS



Rich I/O with Flexible Expansion

Cincoze Rugged Embedded Computer Facilitates Internet of Energy

Many countries are facing serious energy shortages, and to counter this problem, many are already actively utilizing renewable energy, but they also urgently need the layout of the internet of energy (IoE) to harness this new power. IoE connects equipment, machines, and systems used in energy production, transmission, and consumption through sensors, controls, and software. IoE delivers power where and when it's needed through smart power storage and distribution and enables forecasting through big data analysis and machine learning. The DV-1000 high-performance and essential rugged embedded computer in the Cincoze Rugged Computing - DIAMOND product line offers high-performance computing in a compact chassis with flexible expansion and industrial-wide temperature support, making it the best choice for IoE applications.

Compact and High Performance

Maximum efficiency for renewable energy requires a network for collecting, storing, and distrib-

uting energy power. The DV-1000 is compact, about the size of A5 paper (224 x 162 x 64 mm), making it easy to install in any small outdoor electrical cabinet. The DV-1000 supports a 9th/8th generation Intel® Core™ i7/i5/i3 (Coffee Lake-R S series) processor and up to 32 GB of DDR4 2666 MHz memory, providing the high-efficiency computing power for the real-time processing and analysis of large amounts of data, and meeting the high computing requirements required for IoE.

Rich I/O with Flexible Expansion

The foundation of IoE lies in distributed energy management. Renewable energy sites need many sensors to collect on-site data from power switches, smart meters, thermostats, and other devices. That data must then be analyzed and transmitted over a network to the control center to determine power distribution. The DV-1000 has the most commonly used I/O interfaces needed for IoE applications, including 2x GbE LAN, 2x COM, and 6x USB, which can be connected to various types of sensors and other devices. For further expansion, COM and DIO ports can be added using Cincoze's exclusive CMI modularization technology, and USB 3.0 and GbE LAN can

be added using MEC modules. The DV-1000 can fully meet the requirements of various sensor interfaces and networking in IoE.

Robust, Wide Temperature Design

Renewable energy sites are usually outdoors, so the harsh installation environment and sudden temperature changes must be considered. The DV-1000 works in a wide temperature range (-40 to 70°C), supports a wide input voltage (9 to 48VDC), and has passed the military standard MIL-STD-810G shock and vibration tests, proving it can withstand the shock and vibration of harsh environments. If a higher-wattage processor is used for high-speed operation, the DV-1000 can be fitted with a dedicated external fan. Finally, to avoid electromagnetic interference in the chassis, the DV-1000 has passed EMC certification, including CE, UKCA, FCC, ICES-003 Class A, and other multinational EMC standards. The reliable quality of the DV-1000 makes it the ideal high-performance choice for edge computing and energy interconnection.

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December 2022 COT'S PICKS

The Mini Form Factor for Maximum Performance

congatec is pleased to announce that the PICMG COM-HPC technical subcommittee has approved the pinout and footprint of the new credit-card-sized (95x60mm) high-performance Computer-on-Module specification COM-HPC Mini. The new COM-HPC Mini standard is now entering the home stretch toward final ratification, which is scheduled for the first half of 2023. Designed for small yet extremely performance-hungry applications the new COM-HPC Mini specification will open up the prospect of developing ultra-powerful microcomputers the size of a 4- or 8-port Ethernet switch, for example. Such small system sizes are needed in many segments of embedded and edge computing. Target markets include box PCs and control cabinet / DIN-rail PCs, adaptive IoT gateways for the brownfield, cyber-secure edge computers for critical IT/OT infrastructures, rugged tablets, and even ultra-rugged robots and in-vehicle computers wanting to take advantage of

the soldered RAM which is a standard feature of these modules. Processors predestined for this new form factor are the 12th Gen Intel Core processor series – for which congatec already offers a ready-to-deploy design study for initial lab tests and customer feedback loops – and its future successors.

“The pinout approval is an essential milestone as carrier board designers and Computer-on-Module manufacturers such as congatec who are active in the COM-HPC working group can now embark on first compliant small form factor sized embedded and edge computing solutions based on this pre-approved data. The goal is to bring modules to market at the same time as Intel and other application processor vendors launch their new high-end processor generations, which is expected to happen next year,” explains Christian Eder, director of product marketing congatec, and chairman of the



COM-HPC working group.

Providing 400 pins, as compared to COM Express Mini's 220 pins, the new COM-HPC Mini standard is designed to satisfy the rising interface needs of heterogeneous and multi-functional edge computers. Extensions include up to 4x USB 4.0 with full functionality including Thunderbolt and DisplayPort alternate mode, PCIe Gen 4/5 with up to 16 lanes, 2x 10 Gbit/s Ethernet port, and much more. Add to that the fact that the COM-HPC Mini connector is qualified for bandwidths of more than 32 Gbit/s – enough to support PCIe Gen 5 or even Gen 6 – it is clear that its capabilities go well beyond those of all other credit-card-sized module standards.

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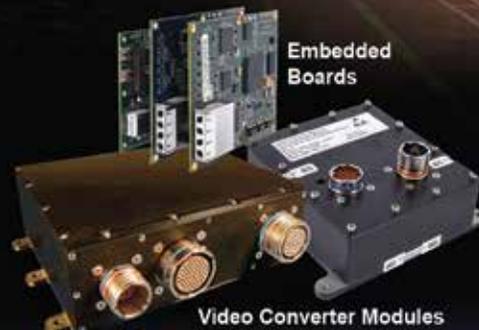
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December 2022 COT'S PICKS

TI expands space-grade product portfolio with radiation-hardened and radiation-tolerant plastic packages for missions from new space to deep space

Texas Instruments announced an expansion in its portfolio of space-grade analog semiconductor products in highly reliable plastic packages for a diverse range of missions. TI developed a new device screening specification called space high-grade in plastic (SHP) for radiation-hardened products and introduced new analog-to-digital converters (ADCs) that meet the SHP qualification. TI also introduced new product families to the radiation-tolerant Space Enhanced Plastic (Space EP) portfolio. Compared to traditional ceramic packages, plastic packages offer a smaller footprint that enables designers to reduce the system-level size, weight, and power, and thus help reduce launch costs.

In the past, space applications and programs used hermetically sealed, ceramic Qualified Manufacturers List (QML) Class V devices to ensure reliability. Today, applications like those in new space, designed to increase commercial access to space programs through

short-term missions in low Earth orbit (LEO), are helping expand communication and connectivity. For new space applications, there is a growing need for smaller components that help reduce system size and weight – and therefore lower the cost required to launch an application into space. Plastic substrate ball-grid array (PBGA) and plastic-encapsulated devices offer an alternative to traditional space semiconductor packages.

New SHP ADCs improve thermal efficiency and increase bandwidth in a smaller size

TI's SHP specification indicates integrated circuits (ICs) that meet the rigorous design requirements of deep space missions with extremely harsh environmental conditions. The SHP specification includes both PBGA and plastic-encapsulated packages for radiation-hardened semiconductors. The 10-mm-by-10-mm-by-1.9-mm ADC12DJ5200-SP and ADC12QJ1600-SP ADCs in flip-chip BGA SHP packages are the first products from TI that meet the SHP specification. These ADCs help enable designs as much as seven times smaller than those using equivalent ceramic-packaged devices, maximize data communication speeds with SerDes rates up to 17.1 Gbps, and reduce thermal resistance. Learn more about TI's SHP

specification by reading "How SHP in Plastic Packaging Addresses 3 Key Space Application Design Challenges."

Space EP product families increase power efficiency and save board space for new space missions

TI's Space EP portfolio is the industry's largest plastic, radiation-tolerant power management, and signal-chain portfolio, with devices specifically designed for smaller, high-volume LEO satellite applications. Space EP devices can help save as much as 50% board space compared to traditional ceramic packages, and deliver high-performance power supplies with rail-to-rail input/output operation. The TPS7H5005-SEP family of pulse-width modulation (PWM) controllers are the newest products in TI's Space EP portfolio and support multiple power-supply topologies and field-effect transistor (FET) architectures. TPS7H5005-SEP PWM controllers minimize power loss through synchronous rectification, enabling at least 5% higher power efficiency compared to equivalent devices. Learn more about TI's Space EP products by reading the application note, "Reduce the Risk in Low-Earth Orbit Missions with Space Enhanced Plastic Products."

*Texas Instruments
ti.com*

Meet radiation and reliability requirements with space-grade plastic packages

TEXAS INSTRUMENTS

December 2022 COT'S PICKS

SynQor® Releases an Advanced Military Grade Compact 4 kW, 270 Vdc Input Inverter (MINV-4000-1U-270)

Converts 270 Vdc Input to Single Phase AC (115 or 230 Vrms at 50, 60, or 400 Hz). Multi-Unit Capabilities allow Parallel, Redundant and 3-Phase Systems. Sealed, Shock, and Weather-Proof Construction. 1U Rack Unit, Ultra-Low Weight (33 lbs.).

SynQor, Inc. announces the new rugged, 270 Vdc input, high power, compact, military-grade



inverter (MINV-4000-1U-270). The new 4000 W 115/230 AC output inverter is low-weight with an easy-to-use design for military, airborne, naval, and mobile high-reliability applications. This inverter is designed to withstand extreme electrical, shock, vibration, and environmental conditions. The inverter draws power from a standard 270 Vdc power supply and delivers a fully isolated, well-conditioned, pure-sinusoidal AC output. Compliant with a wide range of military standards, this inverter is designed for applications where output power, space, weight, and reliability in harsh environments are a major concern.

The MINV inverter is also exceptionally flexible. It supports parallel and N+M redundant configurations of up to 32 units for high power and/or high-reliability requirements. Multiple MINV units can be arranged to deliver complex multi-phase power schemes like 3-Phase and split-phase (doubling line-to-line output voltage and total output power).

The new MINV-4000-1U-270 has an SNMP Ethernet base module that allows configuration via a user-friendly web interface and real-time remote monitoring with trap/email features that

warn users and monitor consoles of important system events. Other options include a wide range of AC output characteristics (115 or 230 Vrms at 50, 60, or 400 Hz); a floating ground option for aerospace and naval applications; and an electronic AC output breaker that allows users to build fault-tolerant, dependable, redundant, high-output power solutions.

Features

- 160-330 Vdc to single-phase AC (4 kW 115 or 230 Vrms at 50, 60 or 400 Hz)
- Pure sinusoidal, well-formed AC output for 0.0-1.0 power factor linear/non-linear loads
- Parallel and N+M redundant power solutions of up to 32 units
- Rugged, sealed, weather and shock-proof, wide temperature range -40 to +55 °C
- Compact, ultra-low weight, 1U high rack-mount unit (17" x 22.42" x 1.73"; 33 lbs.)

Specification Compliance

- MIL-STD-704
- MIL-STD-461F
- MIL-STD-810G

SynQor
synqor.com

Acrosser AIV-TGH7Bx Series: the latest wide operation temperature fan-less computer for in-vehicle application and edge computing fields

Acrosser Technology Co., Ltd. is pleased to announce that AIV-TGH7Bx Series is the latest wide operation temperature fan-less computer for in-vehicle application and edge computing fields. Powered by the latest 11th Gen Intel® Core™ i7/i5/i3 Processor, AIV-TGH7Bx Series delivers high-performance computing needs, and the newest Intel® Iris® Xe Graphics and TSN technology provide real-time graphic rendering. With a wide range of operating temperatures from -40C to 70C, AIV-TGH7Bx is a powerful solution for passenger information computers, digital signage players outside, people counting, power charging equipment controllers, AGV, and AMR applications.

Acrosser's AIV-TGH7Bx Series comes with Intel® 11th Gen Core™ i7-11850HE Processor (Tiger Lake H) with up to 45W TDP which delivers up to 20% faster CPU performance than the previous generation and features advanced In-

tel® Iris® Xe graphics, enabling dual DisplayPort displays with 8K Resolution and one HDMI ports to meet the performance demand of multimedia display applications.

Acrosser's AIV-TGH7Bx Series features rich I/O interfaces including 1 GiGE LAN, 1 2.5GiGE LAN, and 4 USB 3.2 for high-speed data transmission use or high-resolution camera uses. AIV-TGH7Bx Series comes with 2 latch-able SATA III easy-access storage bays from the front panel to speed up installation time and data backup intended for the rugged environment. In addition, AIV-TGH7Bx Series provides 1 mini PCIe and 2 M.2 slots to support Wi-Fi/4G/LTE/5G/WiFi6 wireless networks and 3rd party I/O expansion modules enabling users to have flexible expansion.

Acrosser's
AIV-TGH7Bx

Series is not only providing high-performance computing but also provides an easy maintenance mechanism design for users to install or upgrade their RAM, M.2 expansion modules. With dual external lockable easy access storage bay, it could make users easily maintain their storage data," said Alan Chou, Manager of the Product Strategy Department.

Acrosser Technology Co., Ltd.
acrosser.com



December 2022 COT'S PICKS

Fully integrated, intelligent TFT display module

Display solutions and embedded systems provider, Review Display Systems (RDS) has announced the availability of a fully integrated, intelligent display module. The DMG10600T101-33WTC uses a Rockchip RK3288 ARM-based System on Chip (SoC), featuring a 32-bit Cortex A-17 core running an Android operating system.

The DMG10600T101-33WTC intelligent display module features a 10.1-inch IPS TFT

LCD with WSVGA resolution (1024 x 600 pixels) and a brightness specification of 310cd/m². 24-bit RGB data supports a color palette of up to 16.7M colors. A fully integrated PCap (projected capacitive) touchscreen enables ease of use when implementing a graphical user interface.

A host of integrated interfaces and peripheral connections include two RS232 serial ports, one RS485 serial port to connect and communicate with external devices, an ethernet 10/100Mbps interface, three USB interfaces, a SIM card slot, and a 4G module slot. On board, the memory includes 8GB of flash memory and 2GB DDR3 RAM with an SD card expansion slot supporting up to 64GBytes (maximum).

Justin Coleman, display business manager, at RDS said, "The intelligent display module provides a highly versatile, configurable module that offers a wealth of standard integrated features and functionality. These features coupled with the ability to uniquely configure and customize with standard 'off-the-shelf' Android apps or user-developed APK

files enable an application or user-specific hardware to be simply and easily created."

Additional on-board functionality includes Wi-Fi IEEE 802.11Bb/g/n 2.4Ghz, Bluetooth connectivity, an HDMI interface, a MIPI/USB camera interface, a microphone interface, a 3.5mm headphone socket, and a dual left/right speaker interface.

The intelligent display module currently supports the Android 8.1 operating system. Additional Android apps and APK files can be downloaded to enhance functionality and configure the intelligent display module for application-specific tasks. This enables the device to be uniquely configured and customized for specialized customer requirements.

The intelligent display module has mechanical outline dimensions of 257.0mm (l) x 148.1mm (w) x 23.2mm (h), with the 10.1-inch display providing an active display area of 222.72mm (w) x 125.28mm (h). A Linux-based operating system version of the intelligent display module is also available.

*Review Display Systems
review-displays.co.uk*



Space Edge Computing Boosted by Teledyne e2v's new 8 GB DDR4 Memory

Teledyne e2v today announces the introduction of an 8 GB Space DDR4 memory as part of its edge computing solutions for space. This announcement follows the successful conclusion of all internal de-risking activities, including Radiation/Latch-Up tests and preliminary Industrialization checks. As demand for compact, high-density memories surge, Teledyne e2v stresses that its latest memory chip is compatible with all contemporary high-end space processing components. The list includes processors from AMD/Xilinx VERSAL™ ACAP, space FPGAs, MPSOCs, Microchip RT PolarFire™, together with many proprietary ASICs.

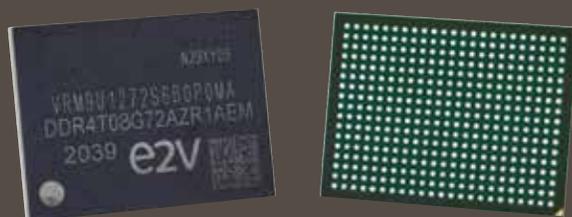
Ultra-fast, high-density 8 GB space DDR4 memory offers the same form factor and pin-to-pin compatibility to the earlier 4 GB option – making it the ideal enhancement for next generation spaceborne developments.

Modern satellite payloads store and shift vast amounts of data minute by minute, hour by hour; many missions, such as Earth observa-

tion, require tens of GB of storage. Consequently, these missions stress existing memory solutions regarding their bandwidth, access time, power consumption, physical size, and storage capacity. Furthermore, Micro- and Cube-Sats have specific size and power constraints, yet OEMs seek increasingly high memory bandwidths for real-time processing.

'Fast DDR4 memory is a critical resource in modern data-intensive satellite systems. Complementing the 4 GB space DDR4, the new 8 GB version with FMs scheduled for 2024 doubles storage density in the same compact, pin-compatible form factor. Furthermore, with the specific temperature grades proposed and the qualification variants up to NASA level 1, Teledyne e2v offers the most ruggedized and versatile space memory product.' Thomas Guillemain, Marketing & Business Development Manager, Data processing products.

The new 8 GB DDR4 memory is single-event latch-up (SEL) immune beyond 60 MeV.cm²/mg. Moreover, the device targets



100 krad total ionizing dose (TID) and SEU/SEE characterization beyond 60 MeV.cm²/mg. Physically, the 8 GB size matches the previous 4 GB version (i.e., 15mm x 20mm x 1.92mm) - doubling storage density yet maintaining pin-out compatibility. In addition, the memory supports a transfer rate of 2400 MT/s.

What is de-risking?

De-risking describes the internal engineering performed on new silicon products to validate their suitability for resilient space operations. In addition, space-grade components must pass a barrage of performance tests that stretch the target product's operating envelope.

*Teledyne e2v
Teledyne e2v.com*

December 2022 COT'S PICKS

Antenova introduces three high-efficiency antennas for small Wi-Fi6 and Wi-Fi6E devices

Antenova Ltd is announcing three antennas for Wi-Fi6 and Wi-Fi6E. They are a surface-mounted antenna, a flexible antenna, and an external antenna for Wi-Fi6 and Wi-Fi6E. All three antennas use the 2.4GHz, 5GHz, and 6GHz bands and support IEEE standards 802.11a/b/g/j/n/ac/ax.

The SMD antenna, named Billi, part number SR43W078, measures 15 mm x 6 mm x 1mm and requires only 1 mm of clearance on the PCB. This makes it an exceptionally low-profile antenna solution for slim devices with a small space for the antenna. In tests, this antenna showed very high efficiency across all three bands. It is suitable for pick-and-place manufacturing processes.

The FPC antenna named Lotti, part number SRF3W077 is a flexible antenna measuring 30.0 x 8.0 x 0.15mm. It has a self-adhesive mounting for easy integration into small designs. This antenna does not require a ground plane on the PCB and also showed very high efficiency in tests.

The third new antenna is Nitida, part number SRE3W084, an antenna for external mounting. It is supplied with an SMA connector and offers a waterproof variant. This antenna is simple to add to a design because it does not require a matching network.

Wi-Fi6E brings faster networks with greater capacity that will deliver better online experiences and support simultaneous communications to many endpoints with increased security. Wi-Fi6E will make wireless networks in the office and smart home feel as fast as Ethernet.

Wi-Fi6E adds the additional channels of the less congested 6GHz radio band to carry even more data. It provides the speeds required to support 4K and 8K video, networked gaming, smart TV, and video calling, and can support many connected IoT devices at a large scale. Wi-Fi6E will complement 5G cellular services and is expected to become the standard in health, education, sports, and entertainment markets where networks have large numbers of simultaneous users.

Antenova Ltd
Antenova.com



Anritsu Expands Accredited Calibration Services to Support 5G FR2

Calibrations Meeting Highest Industry Standards Ensure Test Equipment Delivers Accurate Results to Ensure 5G System Compliance

Anritsu Company announces it has expanded its accredited calibration services to include calibration of 5G Frequency Range 2 (FR2) to ensure customer equipment is compliant with industry standards, including 3GPP. The new 5G FR2 calibrations apply to the Anritsu New Radio RF Conformance Test System ME7834NR and 5G NR Mobile Device Test Platform ME7873NR test systems and provide test houses, certification laboratories, and other facilities with high confidence that the test equipment they use to certify the performance of 5G systems meets industry standards.

Anritsu offers complete wireless system accredited calibration services to ensure measurement accuracy of test equipment used to verify wireless systems. In addition to 5G FR2, Anritsu provides accredited calibrations for 5G Frequency Range 1 (FR1) and legacy test systems. The calibration services can be performed on a wide variety of test equipment.

Calibration of 5G and legacy test equipment is performed on-site at customer locations. Additionally, all Anritsu U.S. facilities are accredited and offer other calibration services on many Anritsu solutions. All Anritsu calibration services are performed by experienced, factory-trained ser-

vice technicians equipped with industry-leading resources and meet the requirements of the highest standards, including ISO/IEC 17025 and ANSI/NCSL Z540-1/Z540-3.

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