

1ST QUARTER | 2023



CRITICAL TECHNOLOGIES NEWSLETTER

OUR WHY

The creation of the Office of the Deputy Chief Technology Officer for Critical Technologies (DCTO(CT)) was informed by the 2022 and 2019 National Defense Strategies, which initially established the previous modernization priority areas.

Expanding on the original priorities, there are now 14 Critical Technology Areas (CTAs) that are vital to maintaining the United States' national security.

Our mission is to drive the *critical technological vision* for the Department of Defense (DoD), to accelerate the *transition of key capabilities*, and to maximize our *technological advantage* for the future fight.

OFFICE OF THE DEPUTY CHIEF TECHNOLOGY
OFFICER FOR CRITICAL TECHNOLOGIES



TECHNOLOGY VISION FOR AN ERA OF COMPETITION



We exist to maximize the technological advantage of our service men and women to ensure they are never in a fair fight, today and in the future.



ADVANCING THE CT PORTFOLIO

From the desk of Mr. Maynard Holliday, DCTO(CT)

I am proud to report that the first quarter of 2023 has been a very successful period for us. In January, I attended the AI Fusion Workshop at the Software Engineering Institute at Carnegie Mellon University with Dr. Kimberly Sablon, the Principal Director for Trusted Artificial Intelligence and Autonomy. It was an excellent workshop focused on accelerating the development of distributed AI capabilities to enable edge intelligence.

In February, I joined other African American Appointees from across the Biden-Harris Administration for a celebration of Black History Month at The White House. It was an honor to be a part of the event, and a photo from the occasion is attached above. I also visited Sairdrones Inc. in Alameda, California, where I was given a tour of their facilities by CEO & Founder, Richard Jenkins. Sairdrones Inc. is the world leader in providing ocean data and persistent maritime domain awareness with autonomous surface vehicles.

While attending the Pacific Operational Science and Technology (POST) Conference in Hawaii in March, in addition to moderating two Critical Technology Panels, I had many important sidebar meetings with our allies and partners in the region. I also had the pleasure of meeting Dr. Zachary Krevor, CEO and President of Stratolaunch. Stratolaunch is a company that designs and launches aerospace vehicles and technologies. I then had the opportunity to co-lead with Dr. Dev Shenoy, the Principal Director for Microelectronics, a workshop on the transition of Northpole; IBM's Neuromorphic AI Inference chip. We heard about its breakthrough capabilities and many compelling use cases from the Services and DOE labs in attendance.

I am incredibly proud of our team and all that we have accomplished in the first quarter of 2023. Let's continue to strive for excellence in all that we do.



Army RQ-11C Small UAS

AGILE ENCRYPTED COMMUNICATIONS FOR ARMY SMALL UNMANNED AIRCRAFT SYSTEMS (UAS)

INTEGRATED SENSING & CYBER

Under The Spectrum Access Research and Development Program (SARDP), the prime vendor, MaXentric Technologies, has developed a next generation secure radio that is a fully integrated System-on-Chip (SOC) – a transceiver module integrated with an advanced digital processor and custom cores on a single silicon chip, enabling a secure software defined radio with greatly reduced size, weight, power requirements, and cost in comparison to current radios.

The Reconfigurable Communications for Small Unmanned Systems (RCSUS) cutting-edge design supports the Army's new UAS Advanced Digital Datalink (ADDL) waveform by adding Dynamic Spectrum Access (DSA), Anti-Jam, and Type 1 Encryption security. Notably, the National Security Agency (NSA) adopted RCSUS standards for electrical and logical interfaces for their new pico-crypto module – an example of SARDP impact.

Recent testing of the fabricated SoC is on track to deliver the chip by 3QFY23, a major project milestone.

MICROELECTRONICS COMMONS HOSTS CAPABILITY PITCH DAYS

MICROELECTRONICS

The Microelectronics Commons (Commons) Capability Pitch Days were hosted to shape solution responses for the six key technical areas of the Commons, January 9 – 23, 2023. More than 600 registrants from across over 400 unique organizations participated. There were more than 240 questions from the offeror community addressed before closing the request for solutions on February 28.

"MICROELECTRONICS COMMONS WILL BOLSTER THE LOCAL SEMICONDUCTOR ECONOMIES AND SUPPORT A ROBUST WORKFORCE FOR A STRONG, RESILIENT MICROELECTRONICS SUPPLY CHAIN IN THE U.S."

- Dr. Dev Shenoy, Principal Director for Microelectronics

Since the December 2022 Industry Day, Dr. Dev Shenoy, the Principal Director for Microelectronics, has led continued outreach of the Commons opportunity including engagement with the Association of American Universities. OSD (R&E) also continues to coordinate with the Department of Commerce, the National Science Foundation, the Department of State, and the Department of Energy to ensure synergy across U.S. Government investments in the Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act for America. Commons awards are planned for August 2023.

The Commons will establish a network of domestic prototyping facilities to demonstrate, at-scale, the system-level benefits of innovations in microelectronics materials, processes, devices, and architectural designs across six key technical areas - Secure Edge/IoT Computing, 5G/6G Technology, Artificial Intelligence Hardware, Quantum Technology, Electromagnetic Warfare, and Commercial Leap Ahead Technologies. This national network will reduce barriers to innovation, mature emerging microelectronics technologies, enhance existing microelectronics infrastructure, and foster a pipeline of domestic talent and innovative ideas.

TRUSTED AI AND AUTONOMY STAFF VISIT INDIA AND SINGAPORE

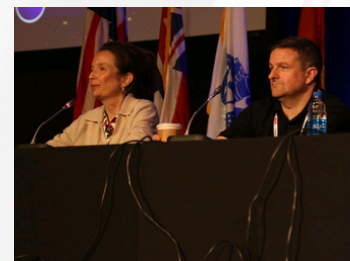
TAIA

Representatives from the Trusted Artificial Intelligence and Autonomy (TAIA) team and OUSD (International Outreach and Policy) recently visited the Defense Research & Development Office (DRDO) in Delhi, India and the Ministry of Defense (MinDef) in Singapore. Both countries seek to promote a resilient, rules-based international order that safeguards sovereignty and territorial integrity.

Planned joint projects will benefit India and Singapore-U.S. relations and cooperation in the region. OUSD delegates attended the Joint Technical Group-Plenary in-person discussion related to ongoing project agreements and planning for further joint cooperative projects and demonstration. During the visit, delegates visited several locations in Delhi including the DRDO and Innovations for Defense Excellence (iDEX) where India's Defense Ministry receives project/ capability requests from its Services and requests proposals from startups and industry.

In Singapore, delegates met with Singapore MinDef to design a co-development project related to Humanitarian Aid/Disaster Relief using intelligent autonomous systems and sensors. They conducted site visits to MinDef as well as industry and academic research sites including Singapore University of Technology and Design (SUTD), National University of Singapore (NUS) and a drone manufacturer, Performance Rotors Pte, Ltd., and Singapore Tech. Land Systems Ltd. (STELS).

The TAIA team will continue to work with the DRDO and the MinDef scientists and defense contacts that they connected with during the trip to advance joint co-development proposals for AI & Autonomous system projects. Together they are working to plan a demonstration for an upcoming joint exercise or table-top experiment (TTX).



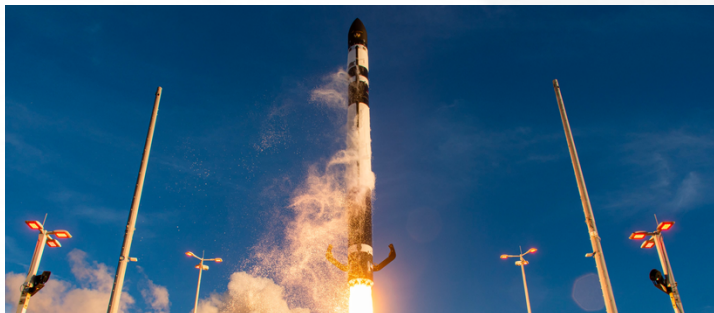
PACIFIC OPERATIONAL SCIENCE AND TECHNOLOGY 2023 CONFERENCE

DCTO (CT)

Mr. Maynard Holliday, Deputy Chief Technology Officer for Critical Technologies, moderated two Critical Technologies Panels at the at the National Defense Industrial Association and U.S. Indo-Pacific Command (INDOPACOM)'s Pacific Operational Science and Technology (POST) 2023 Conference in Honolulu, Hawaii, March 7, 2023. Panel participants included the Principal Directors for Space Technology, Trusted Artificial Intelligence and Autonomy, Integrated Sensing and Cyber, Integrated Network Systems-of-Systems and Directed Energy.

The POST Conference is the premier international event and leading forum that brings together the Indo-Pacific region's foremost experts in science, technology and security to better understand and successfully address operational issues and recommend near-term solutions to such challenges.

With the theme of "Seizing the Initiative via Decision Superiority, Innovation and Collaborative Partnerships," this conference showcased prototyping and experimentation in support of joint fires, information advantage, contested logistics, and other joint warfighting challenges.



MATURING HYPERSONICS COLLABORATION WITH OUR ALLIES

HYPERSONICS

The Principal Director for Hypersonics, the Associate Director for Hypersonics, members of their team, and U.S. Indo-Pacific Command (INDOPACOM)'s Science and Technology (S&T) Advisor visited the Australian Government, March 14 - 21, 2023. The purpose of their visit was to mature Hypersonics Working Group (HWG) and AUKUS collaborations.

The visit included meetings with the Royal Australian Air Force, the Defence Intelligence Organization, HWG, AUKUS, and Guided Weapons and Explosive Ordnance (GWEO) leaders, the Defence Science and Technology Group, the Air Warfare Center, Hypersonix, Rocket Lab, and the Universities of New South Wales and Queensland.

Australia has significant hypersonics expertise and a long history in the research and development of hypersonic offensive and defensive S&T. The U.S. and Australia are well aligned to accelerate the development and transition of transformational warfighting capabilities based on hypersonic systems. The visit spurred many areas of pursuit for future collaboration.

READYING HYPERSONIC WEAPONS PRODUCTION FACILITIES

HYPERSONICS

As the portfolio of hypersonic offensive programs moves from weapon prototype development toward production for early operational capability, significant progress has been made by industry to build-up production facilities for these new weapon systems.

Mr. Michael White, the Principal Director for Hypersonics, joined by his Senior Technical Advisor, Dr. Walter Rutledge, and the Acting Director for the Joint Hypersonics Transition Office (JHTO), Mr. Mark Glenn, visited key hypersonics industry production facilities, January 23 - 25, 2023.

The visit included Dynetics in Huntsville, Ala. – where the Common Hypersonics Glide Body (CHGB) is produced for both the Army Long Range Hypersonic Weapon (LRHW) and the Navy Conventional Prompt Strike (CPS) weapon system – and Lockheed Martin in Courtland, Ala. – where the CHGB and booster stack for LRHW and CPS is assembled, and the Air Force's Air-launched Rapid Response Weapon (ARRW) glide body is produced and All-Up-Round is assembled.

The visit concluded in Oak Ridge, Tenn. where Oak Ridge National Laboratories (ORNL) showcased new innovative manufacturing technologies for hypersonic vehicle components.



The Principal Director for Hypersonics, his Senior Technical Advisor and the JHTO Director visit the Dynetics' Hypersonics Team in Huntsville, Ala.



HYPERSONICS TEAM WELCOMES DR. JAMES WEBER AS ASSOCIATE DIRECTOR

HYPERSONICS

Dr. James Weber joined the Office of the Deputy Chief Technology Officer for Critical Technologies as Associate Director for Hypersonics on March 13, 2023. Dr. Weber previously served as the Senior Scientist for Hypersonics for Aerospace Systems Directorate, Air Force Research Laboratory, and has over 30 years of experience in the research and development of Hypersonic Systems. Dr. Weber will transition into the role of Principal Director for Hypersonics when Mr. Mike White retires in June.



IBM NorthPole Transition Workshop participants.



Mr. Maynard Holliday and Dr. Kimberly Sablon, the Principal Director for Trusted AI and Autonomy, at the AI Fusion Workshop at Carnegie Mellon University.



Mr. Maynard Holliday with Sairldrone Inc. CEO Richard Jenkins during a tour of their facilities in Alameda, California.

TECHNOLOGY ROADMAPS

More detailed information can be found at DoDTechipedia. DoD CAC holders can access CTA Technology Roadmaps or CTA Plans & Reports [here](#).

Those without a CAC can e-mail a request to the address below. Please provide your full name, organization, phone number and CTA of interest.

CONTACT US

 osd.pentagon.ousd-r-e.mbx.ct@mail.mil

 www.cto.mil/ct

 [@DoDCTO](https://twitter.com/DoDCTO)

 www.linkedin.com/company/ousdre/

