



2022 GLOBAL DEFENDER

A GUIDE TO USASMDC

U.S. Army Space and
Missile Defense Command





Commander's Message

Lt. Gen. Daniel L. Karbler

Welcome to the 2022 *Global Defender!* The U.S. Army Space and Missile Defense Command (USASMDC) and Joint Functional Component Command for Integrated Missile Defense (JFCC IMD) comprise an amazing team of empowered, innovative, ready, and resilient professionals. They are without a doubt our greatest strength, and as a People First organization, our top priority is ensuring every individual has the opportunity to reach his or her full potential.

Each member of this incredible team is key to executing our truly unique mission set. We provide space, high altitude, and missile defense forces and capabilities to the Army and joint warfighters. We ensure 24/7 missile defense of the homeland, global satellite communications, space domain awareness, and missile warning. We support the current and future warfighter with warfighting concepts, force development, and cutting-edge science and technology. Our key terrain lies at the strategic nexus of three combatant commands: U.S. Space Command and U.S. Strategic Command, to which we are assigned as an Army Service component command, and U.S. Northern Command, to which we provide homeland missile defense forces.

While the Army and joint force already rely heavily on these space and missile defense capabilities, the increasing weaponization of space is rapidly driving demand. We must take the necessary steps today to best support the Army and joint force on the all-domain battlefield of tomorrow – and I am confident we are.

First, we are repositioning our formations to better meet the increasing demand for our expertise and capabilities. We recently reorganized three Army space support teams into new space control planning teams capable of integrating the Army's full breadth of space control

capabilities with those of other Services to contribute a key component to tomorrow's joint kill web. These teams are designed to work in close coordination with another emerging formation, the theater strike effects group, which will use terrestrial-based Army space capabilities to attack adversaries from multiple domains and directions, even in contested environments.

We are also using the Army's Multi-Domain Operations (MDO) AimPoint Force 2035 as our guide as we develop the space and missile defense infrastructure, education, and training needed to build an MDO-ready Army. Our new 163-acre Space and Directed Energy Technology Complex will develop and deliver disruptive and critical technologies in space, hypersonics, and directed energy. Our Space and Missile Defense School has ramped up its efforts to work with the Army Centers of Excellence to provide a continuum of career-long space education across the force.

Finally, we are evolving our current and future ground- and space-based capabilities to more closely align with the concept of integrated deterrence, which combines military and nonmilitary tools in the Nation's security toolbox in new and networked ways across Services, across commands, and with our allies and partners. By working together, we will ensure that any attack on the United States or its allies and partners will have little margin for success – and that any attempt will be met with a deliberate, decisive, and devastating response.

You'll learn more about these and other exciting initiatives in the pages that follow, but for now, let me thank you for your interest in and support of our vital mission in service to the Nation's defense. I could not be prouder of our USASMDC and JFCC IMD team, and I am grateful for this opportunity to share their stories with you.

Secure the High Ground! Vigilant for the World!



**CSM Finis A.
Dodson, Command
Sergeant Major**



**BG Guillaume "Will" Beaurpere,
Deputy Commanding General
for Operations**



**TO BE ANNOUNCED
Deputy to the
Commander**



**CW5 Anson Seebeck,
Command Chief
Warrant Officer**

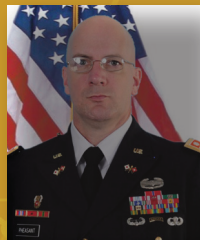
100th Missile Defense Brigade



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GLOBAL DEFENDER:
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USASMDC

The U.S. Army Space and Missile Defense Command is the Army's force modernization proponent and operational integrator for global space, missile defense and high altitude capabilities.

USASMDC provides trained and ready space and missile defense forces and capabilities to the warfighter and nation.

The command builds future space and missile defense forces for tomorrow by researching, testing and integrating space, missile defense, cyber, directed energy, hypersonic and related technologies for the future.

The common link uniting USASMDC's 3,300 Soldiers and civilians across 10 time zones and 22 dispersed locations is a commitment to defending the nation and its allies.

Along with the command's Technical Center and Space and Missile Defense Center of Excellence, it has three major subordinate military elements, the 100th Missile Defense Brigade (Ground-based Midcourse Defense), the 1st Space Brigade and the U.S. Army Satellite Operations Brigade.

The missile defense brigade operates the GMD system and functions as the missile defense component of the missile defense enterprise of the command. The GMD mission is conducted in support of U.S. Northern Command and manned by Army National Guard and active-component Soldiers in Colorado, Alaska and California.



Vanessa L. Kacer, principal engineer, Ronald Reagan Ballistic Missile Defense Test Site Operations Center in Huntsville, Alabama, ensures the Huntsville Mission Control Center is properly configured to support its next mission. (U.S. Army photo by Carrie David Campbell)

Operating under the brigade are Soldiers of the 49th Missile Defense Battalion. These Soldiers not only operate the GMD system but provide security for the Missile Defense Complex at Fort Greely, Alaska.

Leading the command in space operations is the 1st Space Brigade. The brigade consists of the 1st Space Battalion and 2nd Space Battalion, as well as the 117th Space Battalion under a direct support relationship.

The 1st Space Brigade conducts continuous space force enhancement and space control operations in support of combatant commanders, enabling and shaping decisive operations. The brigade also contains five Missile Defense Batteries forward-stationed across U.S. Indo-Pacific Command, U.S. European Command and U.S. Central Command. The batteries operate the AN/TPY-2 radars in forward-based mode conducting ballistic missile search, track and discrimination operations in support of regional and homeland defense. Additionally, the forward-based mode radar can enable space operations and conduct data collection.

The U.S. Army Satellite Operations Brigade, which will transfer to the U.S. Space Force during fiscal year 2022, executes continuous tactical, operational and strategic satellite communications payload management across the full spectrum of operations in support of combatant commands, services, U.S. government agencies and international partners. Established in 2019, the brigade consists of the 53rd Signal Battalion and the SATCOM Directorate.

The Technical Center manages science and technology, research and development, and conducts test programs for space, integrated air and missile defense, directed energy, hypersonic and related technologies. It develops and transitions space and missile defense technology to the warfighter to address current and future capability gaps in persistent communication; intelligence, surveillance and reconnaissance; force protection; and strike. It provides critical technologies that meet today's requirements and addresses future needs enabling warfighter effectiveness in the core competencies of directed energy, space, high altitude systems, cyberspace and missile defense.

The Space and Missile Defense Center of Excellence is the command's architect for future force design. The team is charged to design, build, modernize, train and educate Army space and missile defense forces and is the Army's force modernization proponent responsible for managing Army change to doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy.

It develops and integrates innovative doctrine, concepts and capabilities; trains and educates agile, adaptive and ready Soldiers and leaders; executes life-cycle management for FA40 Army space operations officers; develops the Army

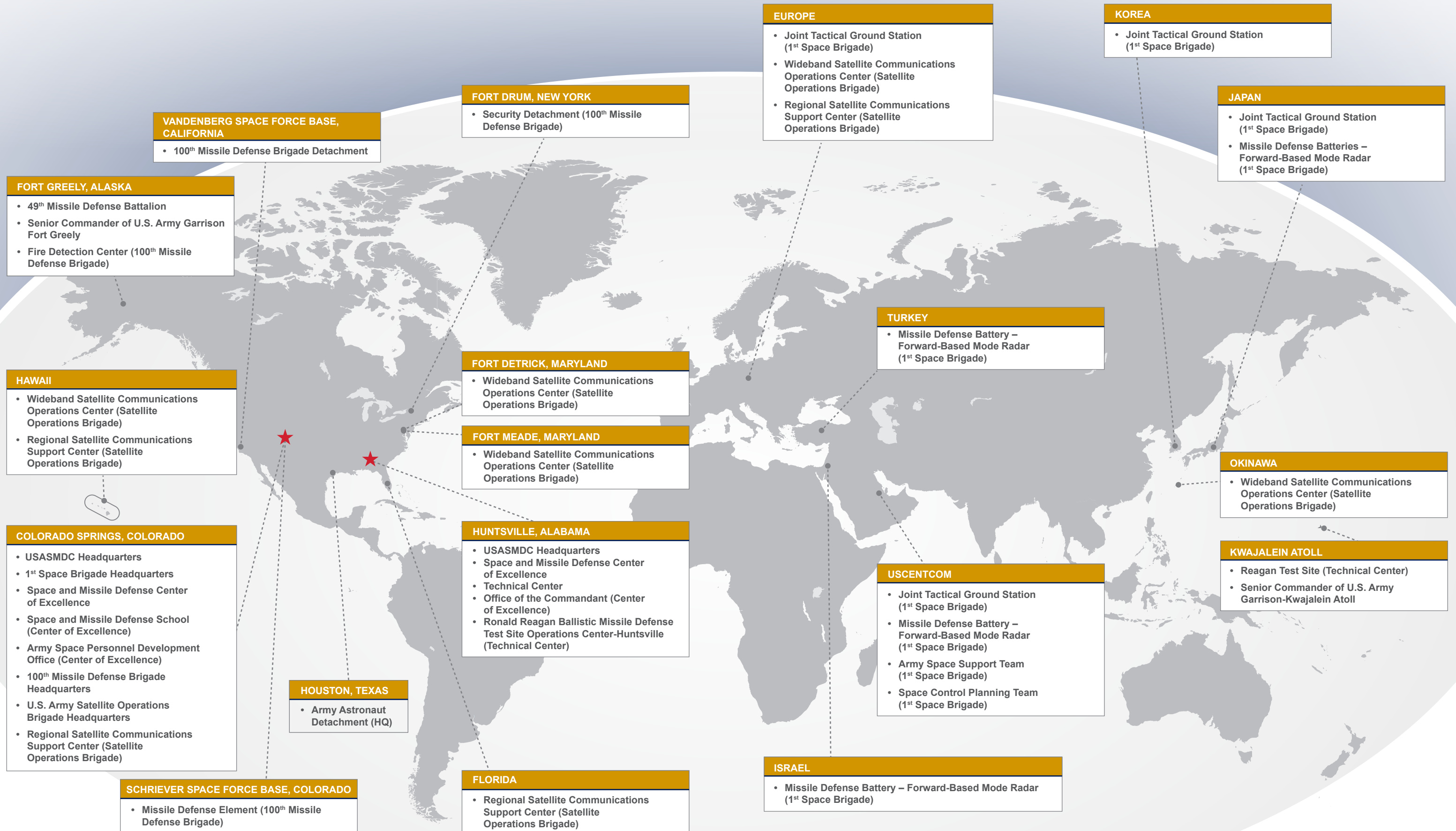
space cadre; and enables informed decision making through studies, analysis, modeling and simulation within the capabilities of Army and joint space, missile defense and high altitude.

USASMDC is also the proponent for the Army astronaut program and provides support to NASA with an Army detachment assigned to Johnson Space Center in Houston, Texas. Army astronauts help the Army define its requirements for the space program and enhance the Army's use of space capabilities.

The USASMDC commanding general also has several other responsibilities: he serves as the senior commander of both Fort Greely and U.S. Army Garrison – Kwajalein Atoll, Republic of the Marshall Islands, where he is responsible for the care of service members, families and civilians, and enabling unit readiness; he is the Army's Air and Missile Defense Enterprise Integrator; and he serves as the commander of U.S. Strategic Command's Joint Functional Component Command for Integrated Missile Defense.



Spc. Brennen Reid and Pfc. Peter Hartman of Company B, 53rd Signal Battalion, conduct satellite communications operations at the Wideband Satellite Communications Operations Center at Fort Meade, Maryland, May 3, 2021. (U.S. Army photo by Staff Sgt. Dennis DePrisco)





Command's people focus shapes its future

The U.S. Army Space and Missile Defense Command's focus on putting "People First" in 2021 confirms what its employees already know: even though the command has been a great place to work, it just keeps getting better.

In April, the command's Office of Personnel Management's Federal Employee Viewpoint Survey results showed the command had an Employee Engagement Index of 80.3%, tying for the U.S. Army's third best score, making it the top ranking participating Army organization on Redstone Arsenal.

"USASMDC cannot carry out our wide-ranging, no-fail, national security missions without the dedication of our greatest asset—our people," said Lt. Gen. Daniel L. Karbler, commanding general, USASMDC. "We place 'People First' as we recruit, train and develop Army space and missile defense professionals. Here, you are part of the SMDC family and SMDC team. I refer to our folks as teammates – not employees or workforce. I believe if you feel you are part of a family or team, it engenders a sense of belonging, purpose and working for the greater good."

Dana Henslee, organizational adviser, USASMDC Civilian Workforce Development, said the annual FEVS uses survey questions to measure the conditions of employees' sense of purpose and overall attachment to their organization and its mission.

"In response to the 2020 FEVS results, we provided employees the opportunity to be heard through monthly brainstorming sessions through which we gained insight and perspective," Henslee said. "We were also able to identify actionable items that ultimately improved our working environment."

"What has made the biggest impact on our employee engagement scores and rankings is our commanding general and his focus on People First," Henslee said.

"He genuinely cares about people and about improving employee engagement."

The command also focused on building and developing new talent. One initiative, the SMDC Underserved Community Cybersecurity and Engineering Education Development program, started in October 2020, now has 24 interns assigned in Huntsville, Alabama, and Colorado Springs, Colorado.

Through partnerships, the program leverages the talent of students attending historically Black colleges and universities, Hispanic-serving institutions and underserved high school communities, to equip and prepare minorities to compete and succeed in science, technology, engineering and mathematics careers with the federal government.

"The SUCCEED program is focused on people, and specifically the young people we need to attract," said Terry Carlson, command chief cyber strategist. "We provide juniors and seniors in high school and college students with opportunities to gain real world experience to enhance their studies and build a resume based upon relevant work experience."

The program has six high school students and 18 college students. Four of those work on-site, with five more about to begin on-site work. The remaining interns conduct research remotely since they are from schools not located near one of the command's dual headquarters.

"The interns are eager to learn and gain experience and this will strengthen our workforce, since the goal is to help them enter the workforce as either Department of the Army civilians or as contractors," Carlson said. "Having a diverse workforce enhances our ability to tackle complex problem sets by leveraging different viewpoints to generate novel approaches and unique solutions."

Karbler said he was proud of the command's outreach to bring young talent into USASMDC's mission areas.

"Hopefully they will get attracted to the Huntsville area and will settle here and start a new generation of professionals and experts," Karbler said.

Another talent management initiative, the Assured Functional Area Transfer program started in 2019, focuses on Soldiers. The Space and Missile Defense Center of Excellence's Army Space Personnel Development Office seeks Army officers with STEM degrees who will commission into military service soon. The program offers an assured transfer into FA40 space operations at the four-year point of their military careers. In 2021, 20 cadets were selected for the program.

"We're looking for a talented pool of applicants for the AFAT program," said Col. Will Starr, Space and Missile Defense Center of Excellence commandant. "We need that next generation of space operations officers. We also want to generate an interest and understanding of Army space."

In 2021, the command was focused on supporting the civilians and Soldiers of the U.S. Army Satellite Operations Brigade who have been preparing to transfer to U.S. Space Force in fiscal year 2022.

"Early on, the Army and the Space Force began hammering out a set of conditions for the transfer that address how the transferees would retain their seniority, benefits, etc.," Karbler said. "Our main concern is to 'do no harm' to the Soldiers involved."

Established in 2019, the brigade executes continuous tactical, operational and strategic satellite communications payload management across the full spectrum of operations in support of combatant



Capt. Richard Colvin, executive officer to the U.S. Army Space and Missile Defense Command's deputy commanding general for operations, talks to cadets during the U.S. Military Academy at West Point's Branch Week, Sept. 9, 2021, about an assured transfer into FA40 space operations at the four-year point of their military careers. (U.S. Army photo by Lira Frye)

commands, services, U.S. government agencies and international partners. The brigade's assets, as well as the associated manpower authorizations are slated to transfer once the fiscal year 2022 budget is passed.

"This transfer will be completed methodically and carefully to ensure there is no degradation to the important mission these Soldiers and civilians provide to the nation," Karbler said. "But more importantly, we're going to ensure our people are taken care of throughout this transition."

The USASMDC team, comprising 3,300 Soldiers and civilians, is spread around the world in 22 locations and 10 time zones tackling a variety of critical mission sets for the Army and for the nation.

"They and their families are far and away our greatest strength and most important weapons system – their service and sacrifice are what make winning possible," Karbler said. "That is why, in the Army, we put 'People First.'"



100th Missile Defense Brigade

PURPOSE

The 100th Missile Defense Brigade operates the Ground-based Midcourse Defense System and functions as a component of the missile defense enterprise of the U.S. Army Space and Missile Defense Command. The GMD mission is the ultimate defense of the homeland, conducted in support of the U.S. Northern Command commander and manned by Army National Guard and active-component Soldiers in Colorado, Alaska and California. The 100th Missile Defense Brigade is tasked with conducting the presidentially directed national security mission to defend the United States against the threat of intercontinental ballistic missile attack. It is a role the brigade has fulfilled for nearly two decades.

The brigade, headquartered in Colorado Springs, Colorado, includes brigade staff, Headquarters and Headquarters Battery and five Missile Defense Element crews operating at Schriever Space Force Base. As part of a 2020 Colorado National Guard organizational realignment, the 100th Missile Defense Brigade was assigned administrative and operational control of the 117th Space Battalion. The 49th Missile Defense Battalion, the brigade's major subordinate element, is located at Fort Greely, Alaska.

Missile Defense Element crews from the 100th Missile Defense Brigade man and control the GMD System 24/7/365. These Soldiers are responsible for the strategic-level execution of the GMD mission to protect the homeland. The five-Soldier crews provide both operational and tactical recommendations to the commander of USNORTHCOM while synchronizing operations and conducting fire distribution.

IMPACT

Soldiers of the 100th Missile Defense Brigade are part of a unique multi-component National Guard organization. The brigade headquarters consists

mainly of full-time active guard and reserve Colorado National Guardsmen. The unit also includes a small contingent of active-component Soldiers.

To perform their national security mission, brigade Soldiers, to include the 49th Missile Defense Battalion, automatically transition between Title 10 federal active-duty and Title 32 National Guard status. The brigade and battalion commanders are dual-status commanders and are uniquely authorized by the president to simultaneously command Soldiers in either status.

At Detachment 1 at Vandenberg Space Force Base, California, a small contingent of California National Guard Soldiers perform liaison and asset management of the ground-based interceptors located there. There is also a detachment of Soldiers and Department of the Army civilians located at Fort Drum, New York, that is responsible for the security of the In-Flight Interceptor Communications System Data Terminal.

While GMD Army National Guard Soldiers are able to move between operational crew positions and staff, or between GMD units in the three states, the 100th Missile Defense Brigade does not rotate its forces like active-component Army units. This is because there are no other GMD units in the Army. The brigade and battalion have no sister units because they are truly one of a kind. As such, life-cycle management decisions are determined within the brigade and their respective National Guard states.

Training

To be gunnery-table certified to operate the GMD Fire Control System, a Soldier is required to complete the seven-week GMD Fire Control Qualification Course at Schriever Space Force Base. The Soldier will then undergo positional and crew training directly with their newly assigned crew.



The Soldier will then be gunnery-table certified with the crew by the USASMDC Operational Readiness Evaluation team. This entire process of certification may take anywhere from three months to six months to complete, depending on the Soldier's previous qualifications and school availability dates.

USASMDC oversees the rigorous GMD training and gunnery-table certification program. The minimum passing academic score for any GMD written examination or hands-on practical certification is 90 percent due to the critical no-fail nature of the GMD mission.

System

The GMD System utilizes leap-ahead concepts and technologies through a spiral development acquisition process. The tip of the spear for the system is its ground-based interceptor equipped with an Exoatmospheric Kill Vehicle. Once the ground-based interceptor is outside the atmosphere, the

boost vehicle releases the EKV on an intercept trajectory toward a hostile missile's warhead.

From release, the EKV seeks out the target using multispectral sensors, a cutting-edge onboard computer and a divert and attitude control system used for independent course correction in space. The EKV hones in on its target with pinpoint accuracy and destroys it by direct collision using only kinetic energy.

The GMD enterprise is a system of systems, involving shooters, sensors, and command, control and communication systems. GMD sensors consist of space-based infrared satellites, upgraded early warning radars, Cobra Dane, transportable X-band radars (AN/TPY-2), Aegis weapon system radars on select U.S. Navy warships, and the massive Sea-based X-band radar. These sensors provide information to the GMD Fire Control System to calculate precise intercept points for the ground-based interceptors and EKVs.

49th Missile Defense Battalion

PURPOSE

Soldiers of the 49th Missile Defense Battalion operate and secure the Ground-based Midcourse Defense System at Fort Greely, Alaska, and are an integral piece of the homeland defense mission to protect the U.S. from intercontinental ballistic missiles using ground-based interceptors. The 49th Missile Defense Battalion shares the same presidentially directed national security mission to defend the United States against the threat of an ICBM attack as its higher headquarters, the 100th Missile Defense Brigade.

IMPACT

The primary functions of the 49th Missile Defense Battalion are services of the Fire Direction Center and a military police company.

Fire Direction Center crews operate the GMD System 24/7/365 in conjunction with 100th Missile Defense Brigade personnel at Schriever Space Force Base, Colorado. They are responsible for the tactical-level execution of the GMD mission to protect the homeland – that is to say they “fight the current fight.” These five-Soldier crews provide tactical recommendations to the commander of U.S. Northern Command while synchronizing and coordinating activities on the Missile Defense Complex.

The 49th Missile Defense Battalion’s military police ground-based interceptor security company is a one-of-a-kind MP company and is the only MP company in the U.S. Army Space and Missile Defense Command. The Soldiers of Alpha Company conduct 24/7/365 site security operations at the MDC. The MDC is a national defense

critical site where 40 of the nation’s ground-based interceptors are emplaced.

These MPs perform their duties in some of the most austere conditions in the United States, with winter temperatures plummeting to 50 degrees below zero (60 below with wind chill) and with fewer than four hours of sunlight in the winter months. In this harsh environment, the MP Soldiers also support the U.S. Army Cold Region Test Center by testing the latest cold weather gear and other equipment.

Epitomizing diversity in support of the mission, Alpha Company’s Soldiers hail from all over the nation, including Puerto Rico, New York and South Carolina. This company is where the entire nation comes together to support the defense of the homeland.

The 49th Missile Defense Battalion is manned exclusively by active Guard and reserve Alaska National Guardsmen. All 49th Missile Defense Battalion Army National Guard Soldiers operate in a dual status, Title 10 and Title 32. The battalion consists of the battalion staff, Headquarters and Headquarters Battery, five Fire Direction Center crews and Alpha Company.



The “Fort Greely A Team” consisting of Staff Sgt. Travis Hall, Sgt. Garrett Ryan, Sgt. Luz Sanchez and Spc. Mackay Kim, of the 49th Missile Defense Battalion, wins best overall team out of 25 teams from across the Alaska National Guard in the Alaska National Guard Adjutant General Marksmanship Competition at Joint Base Elmendorf-Richardson, May 15-16, 2021. (U.S. Army National Guard photo by Staff Sgt. Zachary Sheely)



Rotational security force arrives at Fort Greely



California National Guard’s 330th Military Police Company arrives at Fort Greely, Alaska, March 30, 2021. They integrated with the military police of the Ground-based Interceptor Security Company, 49th Missile Defense Battalion, to defend and secure the Missile Defense Complex. (U.S. Army National Guard photo by 1st Lt. Desirae Garcia)

Trading the warm sunshine of Southern California, for the frozen snowscape of the Alaska Interior, a detachment of Soldiers with the California National Guard’s 330th Military Police Company arrived at Fort Greely, Alaska, March 30, 2021.

The added military police Soldiers integrated with the military police of the Ground-based Interceptor Security Company, 49th Missile Defense Battalion, and Alaska National Guard, to defend and secure the Missile Defense Complex.

Col. Mike Hatfield, 100th Missile Defense Brigade commander, said the added MP Soldiers enhanced the mission.

“As the Ground-based Midcourse Defense mission continues to expand and evolve, so must the security of the Missile Defense Complex,” Hatfield said. “We’re happy about the arrival of the 330th and ready to incorporate them into the mission.”

The Missile Defense Complex houses ground-based inceptors, which are designed to be launched on order to intercept and destroy threat warheads inbound to the U.S. and designated areas. The complex is expanding, as construction is underway on another missile field to hold additional interceptors in the future. The 49th Missile Defense Battalion MP

Company, comprising all active Alaska National Guard Soldiers, guards and defends this facility.

The 330th Military Police Company, stationed in Ontario, California, includes Army National Guard Soldiers, who serve in a part-time status. Army military police functions include site security, policing and detention operations.

The integration of the 330th Military Police Company into the mission was a phased approach and included site-specific training, familiarization and ultimately, validation. The Soldiers integrated into the mission and operated autonomously after receiving mission-essential task certification by the 49th Missile Defense Battalion.

This is the first opportunity for many of these Soldiers to mobilize away from their home station and 2nd Lt. Sidonia Vega, 330th Military Police Company detachment commander, said her Soldiers were excited for the opportunity.

“Our first impressions were exceeded with the newly renovated barracks rooms,” Vega said. “And of course, the snow. Many of my Soldiers have not experienced weather like this. We are excited to learn a new mission, explore a new place and make new connections with the other Soldiers here.”



1st Space Brigade



Capt. Gregory Schoon and Sgt. Vernon Salter, 2nd Space Battalion, 1st Space Brigade, conduct space operations training as part of battle assembly at Fort Carson, Colorado, Nov. 6, 2021. (U.S. Army photo by Staff Sgt. Dennis DePrisco)

PURPOSE

The Army's only space brigade manages space warriors and capabilities enabling the joint force to deploy, fight and win decisively against any adversary in a multi-domain, high-intensity conflict. Headquartered in Colorado Springs, Colorado, with a global footprint across 16 locations in 10 countries and six time zones, the 1st Space Brigade, with its many unique mission areas, ensures warfighters' freedom of action in using space capabilities to shoot, move and communicate with unmatched speed and precision. The brigade prides itself on its diverse multi-component force comprising Soldiers and civilians from all branches and backgrounds. They use the tools, training and experiences garnered to integrate space operations during competition, crisis and conflict.

IMPACT

The 1st Space Brigade was activated in 2005 in response to an increased reliance on space-based capabilities to shoot, move and communicate across the battlespace and continues to support Army, joint and coalition warfighters around the world through the activities of two subordinate battalions and one associated unit relationship. Subordinate battalions include the 1st Space Battalion, established in 1999, and the 2nd Space Battalion, which stood up in 2017.

The 1st Space Battalion consists of a Headquarters and Headquarters Company; 2nd Space Company with Space Control Planning Teams; 4th and 18th Space Companies with Space Control Platoons; and 19th, 20th, 21st and 22nd Theater Missile Warning Companies providing missile warning at

four Joint Tactical Ground Stations in Italy, Korea, Japan and Qatar.

The 2nd Space Battalion, a U.S. Army Reserve unit, consists of a Headquarters and Headquarters Company, 3rd, 5th, 6th and 8th Space Companies. These citizen-warriors make up 18 of the brigade's Army Space Support Teams and four Space Control Detachments.

Both battalions integrate and synchronize space technical operations and support to joint forces across the globe as well as contingency activities in support of Army, joint and combined forces, as well as civil authorities.

1st Space Brigade also contains five Missile Defense Batteries forward-stationed across U.S. Indo-Pacific Command, U.S. European Command and U.S. Central Command. These batteries operate the AN/TPY-2 radars in forward-based mode conducting ballistic missile search, track and discrimination operations in support of regional and homeland defense. Additionally, the Forward-Based Mode Radar can enable space operations and conduct data collection.

The brigade has an associated unit relationship with the Colorado National Guard's 117th Space Battalion, which activated in September 2001. The 117th Space

Battalion currently has 12 ARSSTs in the 217th and 1158th Space Companies and has been a steady and reliable presence in support of the U.S. Central Command area of responsibility since inception.

Currently, 25 percent of the brigade's forces are globally dispersed at locations throughout U.S. Northern Command, EUCOM, INDOPACOM and CENTCOM areas of responsibility. Significantly, 60 percent of the brigade's strength executes 24/7/365 no-fail missions with the JTAGSSs, MDBs and current deployments.

Over the last fiscal year, the 1st Space Brigade supported more than a dozen Army, joint and multi-national exercises around the world. The brigade supported the perennial warfighter series, quarterly exercises focused on corps and division operations in a large-scale combat operations environment. Overseas, the brigade participated in Defender Pacific and several nested exercises, working with joint and multi-national partners to ensure readiness and interoperability.

The 1st Space Brigade is in constant support of combat operations worldwide, and the capabilities that 1st Space Brigade Soldiers and civilians leverage in space translate to mission success across all domains and warfighting functions.



The 1st Space Brigade conducts continuous space force enhancement and space control operations in support of combatant commanders, enabling and shaping decisive operations. One of these capabilities is warning of missile attacks provided by the four Joint Tactical Ground Stations, like this one at Misawa Air Base, Japan. (U.S. Army photo by Carrie David Campbell)

1st Space Battalion

PURPOSE

The 1st Space Battalion generates and provides space combat power for Army and joint forces to conduct global and continuous multi-domain planning and operations. The battalion supports the nation's strategic land power – to fight in, from and through space. Its purpose is to provide teams of Soldiers who know how to fight, know how to plan, and are experts in Army and space operations. The combat power provided by the 1st Space Battalion is a critical part of the Army's strategy to extend combined arms warfare across all domains. The battalion is headquartered on Fort Carson, Colorado.

IMPACT

The 1st Space Battalion postures to meet operational requirements with trained and ready space forces capable of meeting the demands of modern warfare and leading multi-domain warfighting efforts across all levels of war. The battalion consists of eight companies, each with specific contributions to Army warfighting functions, operating 24/7/365 conducting space operations across 10 locations globally.

The Headquarters Company executes deployments in support of training and operational requirements. It ensures the readiness of forward-stationed units and remains prepared to support multiple, global contingencies.

2nd Space Company supports combatant commanders and joint task force commanders with Space Control Planning Teams. SCPTs remain the Army's only element designed to provide planning for, and integration of, space control. Space control planning teams focus on supporting the commander's intent with subject matter expertise. SCPTs integrate space control capabilities to include coordinating effects, timing and tempo in support of operations.

4th and 18th Space Companies support Army and joint force commanders by deploying platoons and



Soldiers of 4th Space Company, 1st Space Battalion, 1st Space Brigade, assemble a Mobile Integrated Ground Suite at Fort Carson, Colorado, June 17, 2021. (U.S. Army photo by Sgt. 1st Class Aaron Rognstad)

crews into positions of advantage to seize and retain key terrain in the electromagnetic spectrum. These platoons deploy globally on land to monitor friendly satellite communications and report on sources of electromagnetic interference. They can be employed geographically proximate to an adversary capable of expeditionary maneuver and projecting long-range precision fires. This makes the Army uniquely suited for this critical land-based space warfighting operation.

19th, 20th, 21st and 22nd Theater Missile Warning Companies provide warning of missile attacks to Army and joint forces through four globally dispersed Joint Tactical Ground Stations. Each company receives data from satellites used to report missile launches and battlespace events within a hemisphere of the Earth. Soldiers disseminate the warning to forces on the ground and joint force commanders so they can take action to protect their forces and respond as necessary.

In addition to the routine operations of multiple combatant commands, the battalion's Soldiers are currently supporting Operation Inherent Resolve and Operation Spartan Shield.

2nd Space Battalion

Capt. Heather Healy, a personnel officer in Headquarters and Headquarters Company, 2nd Space Battalion, works at the 1st Space Brigade headquarters at Fort Carson, Colorado. (U.S. Army photo by Sgt. 1st Class Aaron Rognstad)



PURPOSE

The 2nd Space Battalion is a U.S. Army Reserve unit based on Fort Carson, Colorado. It is the Army's only Reserve space battalion, comprising citizen-Soldiers representing 32 states. As part of the 1st Space Brigade, the battalion's mission is to plan, integrate, synchronize, and execute space situational awareness, space and technical operations support, and assigned contingency activities in support of the Army, joint and combined forces, and civil authorities.

IMPACT

The 2nd Space Battalion comprises a Headquarters and Headquarters Company, 3rd Space Company, 5th Space Company, 6th Space Company and 8th Space Company.

The 3rd, 5th and 6th Space Companies each consist of six Army Space Support Teams. ARSSTs attach to staff elements at the division, corps and theater Army levels to provide situational awareness of

space capabilities, space assets, space products and the impact of space on operations.

Every year, 2nd Space Battalion units deploy in support of operations in the U.S. Central Command area of operation and participate in numerous Army and joint exercises. Most recently, 2nd Space Battalion ARSSTs provided continual support to V Corps staff as that unit reestablished during fiscal year 2021.

8th Space Company has four deployable Space Control Detachments that provide monitoring and resolution of electromagnetic interference. Using Mobile Integrated Ground Suite capabilities, these detachments ensure space situational awareness while maintaining space and information superiority. These detachments have the ability to conduct emergency communications operations when directed.

117th Space Battalion

PURPOSE

The 117th Space Battalion is the Colorado National Guard's only space battalion and is a premier provider of space knowledge. They provide space support to the warfighter through space planning expertise, capabilities, products and space domain awareness for supported maneuver units both overseas and in the U.S.

The 117th Space Battalion performs the difficult task of training the citizen-Soldiers assigned to the unit. This allows their service members to develop as ordinary citizens working in various occupations throughout Colorado and the United States while simultaneously providing significant contributions toward the sustainable readiness of the 1st Space Brigade.

IMPACT

The battalion's composition includes three companies: Headquarters Company, the 217th Space Company and the 1158th Space Company. Each space company mans, trains and equips six Army Space Support Teams. The Headquarters Company contains two Space Support Element Teams and one space operations officer, who are tasked with supporting 42nd and 35th Infantry Divisions as part of a memorandum of agreement between Colorado, Kansas and New York.

ARSSTs deploy and integrate with the supported unit to provide direct support to Army brigades and higher echelons, special operations forces and Marine Expeditionary Forces. They provide supported commanders and staff with space domain situational understanding, which is used to shape current and future operations. Space Support Elements are part of the division or corps staff, while space operations officers provide space support to field artillery brigades.



The Soldiers of the 117th Space Battalion prepare to support the East Troublesome County wildfires in Colorado during October-November 2020. (U.S. Army photo)

Since 2001, the battalion has mobilized and deployed more than 30 ARSSTs, Commercial Imagery Teams or other task-organized elements to provide space support in the U.S. Central Command theater.

In its ongoing support to exercises, the 117th Space Battalion has provided support to multiple warfighter exercises; and the 29th Infantry Division culminating training event at Fort Hood, Texas. These exercises provide critical space-based technical results and training for numerous units.

The 117th Space Battalion remains a unique hallmark of USASMDC and the Colorado National Guard. The battalion continues to support the Department of Defense, allies and mission partners as the United States deters aggression and is a stabilizing force in the world today. The battalion will continue the advancement of space capabilities for the warfighter far into the future.



1st Space Brigade trains Marines on space capabilities



U.S. Army Space and Missile Defense Command leadership briefs U.S. Marine Corps Maj. Gen. David Furness, assistant deputy commandant for plans, policy and operations, on USASMDC's operations at 1st Space Brigade headquarters at Fort Carson, Colorado, July 1, 2021. The 1st Space Brigade has begun a new initiative to train Marine teams in space-related fields to support joint force warfighters. (U.S. Army photo by Sgt. 1st Class Aaron Rognstad)

U.S. Army Space and Missile Defense Command's 1st Space Brigade is training select Marines on how the Army uses space-based capabilities to assist warfighters.

Marines from the newly activated Marine Corps Forces Space Command at Offutt Air Force Base in Omaha, Nebraska, are training at the Space and Missile Defense School in Colorado Springs and embedding with Army Space Support Teams. Training includes, situational awareness of space capabilities, space assets, space products, and the impact of space on operations.

"We are trying to model ourselves off Army Space Support Teams, as well as Space Control Planning Teams," said Maj. Robert Manuel, officer-in-charge of the Marine Corps Forces Space support team at 1st Space Brigade. "We have integrated with the staff, are taking advantage of training opportunities, and are participating in exercises with the Army, as well as supporting other joint and Marine Corps requirements."

Manuel, who is on three-year orders with USASMDC, said his team is establishing initial operating

capabilities over the course of the next year as more Marines come on board to the team.

The Marines are training on USASMDC's, certification tables to bring their space expertise to the joint force, said Maj. Steven Richards, an ARSST officer-in-charge with 2nd Space Company, 1st Space Battalion, 1st Space Brigade.

As of now, there is no set time limit on how long Marines will remain integrated into 1st Space Brigade companies, but the intention is to establish their own autonomous Marine Space Support Teams in 2023.

"1st Space Brigade and Col. (Donald) Brooks (1st Space Brigade Commander) have been great hosts thus far," said Manuel. "They've made us feel part of the unit and we couldn't ask for anything more. For a Marine in a space role – to be working with the right personnel who have been providing space support in a variety of roles for a while now at the tactical and operational level – this is where you want to be."



U.S. Army Satellite Operations Brigade

PURPOSE

The U.S. Army Satellite Operations Brigade executes continuous tactical, operational and strategic satellite communications payload management through its wideband and narrowband Consolidated SATCOM Systems Experts, Wideband SATCOM Operations Centers, Regional SATCOM Support Centers and an electromagnetic interference mitigation detachment across the full spectrum of operations in support of combatant commands, services, U.S. government agencies and international partners.

IMPACT

In October 2019, the U.S. Army Space and Missile Defense Command SATCOM elements were redesignated as the U.S. Army Satellite Operations Brigade. The brigade consolidated all assigned SATCOM missions under a major subordinate element to align for efficient command and control up to the joint force commander level to include U.S. Space Command through the Combined Forces Space Component Command, the operational supported commander for space. The function of the brigade

will transition from the Army to the Space Force during fiscal year 2022.

The transition will be transparent to the warfighter, who will continue to receive the same level of support through the same processes that will align functions within the command under an operational commander. This transition will improve effectiveness, efficiency and oversight while reducing redundancy and bureaucracy within the SATCOM enterprise. It ensures seamless military SATCOM support globally through continuous 24/7/365 operations at five WSOCs and four RSSCs to all elements of the Department of Defense, U.S. government agencies, and U.S. allies and partners, providing unity of command and establishing a single unit responding to the needs of the warfighter.

As the Army's only Satellite Operations Brigade, it is composed of active duty and reserve-component Soldiers, civilian employees and Australian military members. The brigade has globally stationed forces within the U.S. Northern Command, U.S. European Command and U.S. Indo-Pacific Command areas of responsibility, but supports every combatant command and nine Wideband Global Satellite partners (Australia, Canada, Denmark, Luxembourg, Belgium, Netherlands, New Zealand, Czechoslovakia and Norway).

Subordinate organizations include the 53rd Signal Battalion (Satellite Control) and the SATCOM Directorate.

The 53rd Signal Battalion provides wideband payload control, transmission control, and defensive space control ensuring the DOD wideband constellations' continuous support to peacetime, contingency, surge and crisis action plans supporting DOD, U.S. government agencies and allied partners. The 53rd Signal Battalion sustains, operates and maintains five geographically dispersed WSOCs with two located in Maryland and one each in Hawaii, Germany and Japan. The WSOCs' responsibilities include controlling terminal communications and satellite access, maintaining operational databases, responding to anomalies and alarms, evaluating the quality of

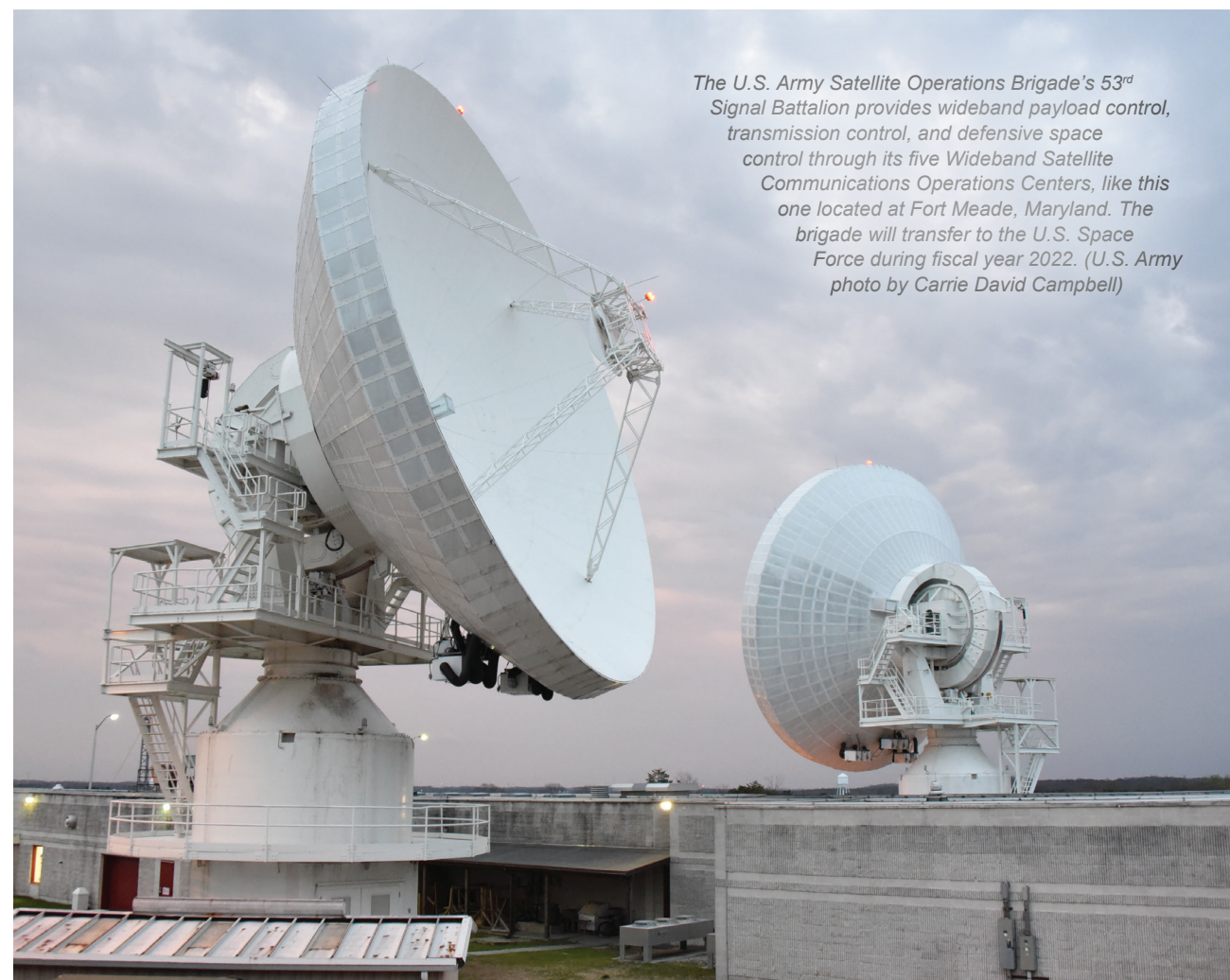


Spc. Orlando Hernandez of Company D, 53rd Signal Battalion, conducts system checks on the Wideband Satellite Communications Operations Center in Wahiawa, Hawaii, July 8, 2021. (U.S. Army photo by Staff Sgt. Dennis DePrisco)

communications links and the implementation of restoral plans. WSOCs stand prepared to support joint operations for the next major conflict, while fighting through a denied, degraded and disrupted space operating environment.

The SATCOM Directorate executes U.S. Space Command's assigned Consolidated SATCOM System Expert mission for both wideband and narrowband SATCOM systems and maintains 24/7/365 watch officer support. The wideband C-SSE operationally manages the payloads on the Wideband Global SATCOM, Defense SATCOM System and the Global Broadcast Service, which is a broadband service carried over the WGS. The narrowband C-SSE operationally manages the payloads on the last remaining Fleet SATCOM systems satellite, the Ultra High Frequency Follow-On and the Mobile User Objective System.

The SATCOM Directorate manages the four RSSCs and executes the wideband and narrowband SATCOM international partner agreements that DOD has with international and coalition partners. The SATCOM Directorate manages three memoranda of understanding valued at more than \$2 billion and 20 other international SATCOM exchange arrangements across 13 international partners.



The U.S. Army Satellite Operations Brigade's 53rd Signal Battalion provides wideband payload control, transmission control, and defensive space control through its five Wideband Satellite Communications Operations Centers, like this one located at Fort Meade, Maryland. The brigade will transfer to the U.S. Space Force during fiscal year 2022. (U.S. Army photo by Carrie David Campbell)

53rd Signal Battalion



Sgt. Casey Mastel, Spc. Orlando Hernandez, and Billy Venable of Company D, 53rd Signal Battalion, conduct checks on a Modern Earth Terminal at the Wideband Satellite Communications Operations Center at Wahiawa, Hawaii, July 10, 2021. (U.S. Army photo by Staff Sgt. Dennis DePrisco)

PURPOSE

The 53rd Signal Battalion (Satellite Control), part of the U.S. Army Satellite Operations Brigade, is the only Army satellite control battalion. The battalion is the only unit in the Department of Defense that conducts payload and transmission control of both the Defense Satellite Communications System and the Wideband Global Satellite communication constellations.

The battalion’s management of these constellations provides assured communications connectivity for mission-critical subscribers ranging from the president of the United States, DOD, U.S. government agencies, all branches of the U.S. military, and international partners, all engaged in conducting global operations.

Soldiers of this globally dispersed battalion accomplish their vital missions and provide support 24/7/365 from the Wideband SATCOM Operations Centers located at Fort Detrick and Fort Meade, Maryland; Landstuhl, Germany; Wahiawa, Hawaii; Camp Buckner, Okinawa, Japan; and the Battalion Satellite Operations Center in the battalion headquarters at Fort Carson, Colorado.

IMPACT

The 53rd Signal Battalion supports Operation Inherent Resolve, Operation Freedom’s Sentinel, Operation Resolute Support and more than 75 exercises and operations for U.S. Northern Command, U.S. Africa Command, U.S. Central Command, U.S. European Command, U.S. Southern Command, U.S. Pacific Command and all joint service component commands.

The Soldiers of the 53rd Signal Battalion are uniquely qualified to execute garrison, tactical, strategic and space operations, while remaining a crucial enabler for all joint and military operations within the continental U.S. and in support of global operations. The battalion’s SATCON mission set supports joint and military commands that require well-trained Soldiers and precise technical expertise to manage a multitude of communications systems and networks.

The battalion trains and develops the most technically competent Soldiers, tactically sound in their ability to maneuver equipment and conduct operationally based responsibilities to support any mission, anywhere.

Satellite Communications Support

PURPOSE

The Satellite Communications Directorate within the U.S. Army Satellite Operations Brigade executes U.S. Space Command’s assigned mission for both wideband and narrowband SATCOM systems. The wideband Consolidated SATCOM System Expert operationally manages the payloads on the Wideband Global SATCOM. Other satellite payloads managed include the legacy Defense SATCOM system and the Global Broadcast Service, which is a broadband service carried over the WGS. The narrowband C-SSE operationally manages the payloads on the last remaining Fleet SATCOM systems satellite; the Ultra High Frequency Follow-On systems; and the Mobile User Objective System.

From Peterson Space Force Base, Colorado, the C-SSEs and their 24/7/365 watch officers support wideband and narrowband military satellite communications for the entire Department of Defense, other U.S. government users, and international partners to deliver beyond-line-of-sight communications. The directorate manages the four Regional SATCOM Support Centers and executes the wideband and narrowband SATCOM international partner agreements that the DOD has with international and coalition partners. The directorate manages three memoranda of understanding valued at \$2.16 billion and 20 other international SATCOM exchange arrangements across 13 international partners. The directorate’s team delivers operational management and international agreement expertise to forums for exploratory discussions and negotiations across more than seven SATCOM expansion areas including NATO, arctic SATCOM and medium-Earth orbit opportunities.

IMPACT

The wideband constellation provides flexible and reliable long-haul, high-capacity communications worldwide. Military wideband SATCOM accounts for 70 percent of all DOD beyond-line-of-sight throughput.

The military narrowband constellation provides critical all-weather tactical links to forces on the move using highly mobile radios. Field units are demanding more real and near-real time intelligence, warning and battle damage data to support continuously updated and shared situational awareness. SATCOM enables first-in and last-out communications for hundreds of thousands of warfighters worldwide.

The four geographically dispersed RSSCs provide 24/7/365 SATCOM planning, engineering and satellite payload management for all DOD SATCOM systems. The RSSCs are located at Wheeler Army Airfield, Hawaii; Peterson Space Force Base, Colorado; MacDill Air Force Base, Florida; and Patch Barracks, Stuttgart, Germany. The RSSCs work with regional SATCOM users planning and authorizing critically required connectivity to support the full range of military operations – diplomatic, humanitarian assistance, disaster relief and scientific missions – in zones where the communications infrastructure can be destroyed, degraded or is simply non-existent.



The U.S. Army Satellite Operations Brigade’s Satellite Communications Directorate provides a number of satellite communications capabilities including Regional Satellite Communications Support Centers and serves as the Consolidated Satellite Communication System Expert for Wideband. (U.S. Army photo)



SATOPS Brigade prepares for transfer to Space Force



Spc. Jonathan Beckett, Cpt. Amber Hagy and Spc. Wolmy Louigene, of Company A, 53rd Signal Battalion, work on a Modern Earth Terminal, at the Wideband Satellite Communications Operations Center, Fort Detrick, Maryland, Sept. 18, 2020. (U.S. Army photo by Sgt. 1st Class Aaron Rognstad)

The Department of the Army announced in September 2021, that it will transfer its satellite operations to the U.S. Space Force in fiscal year 2022, consolidating all military wideband satellite functions under one service.

Throughout the transfer, it is vital to ensure that along with assumption of responsibilities in satellite operations, the U.S. Space Force also inherits the knowledge and skills needed to support U.S. Space Command, according to Lt. Col. David Pheasant, commander, U.S. Army Satellite Operations Brigade.

“By bringing in members of each of the other services through the inter-service transfer program, we ensure that the Space Force retains the knowledge and expertise developed by the sister services through decades of providing communications, while also gaining an understanding from the user’s perspective of the operational missions they support,” Pheasant said.

For years, the sister services have had their own proponents for satellite communications and operations, which have supported and provided forces to the U.S. Space Command.

“The transfer will change the way forces are provided to the combatant commander, SPACECOM, to execute

the satellite communication mission outlined in the Unified Command Plan,” Pheasant said.

This transfer includes the five Wideband Satellite Communications Operations Centers, four Regional Satellite Communications Support Centers, the Consolidated Satellite Communication Systems Experts, and the associated 502 manpower authorizations.

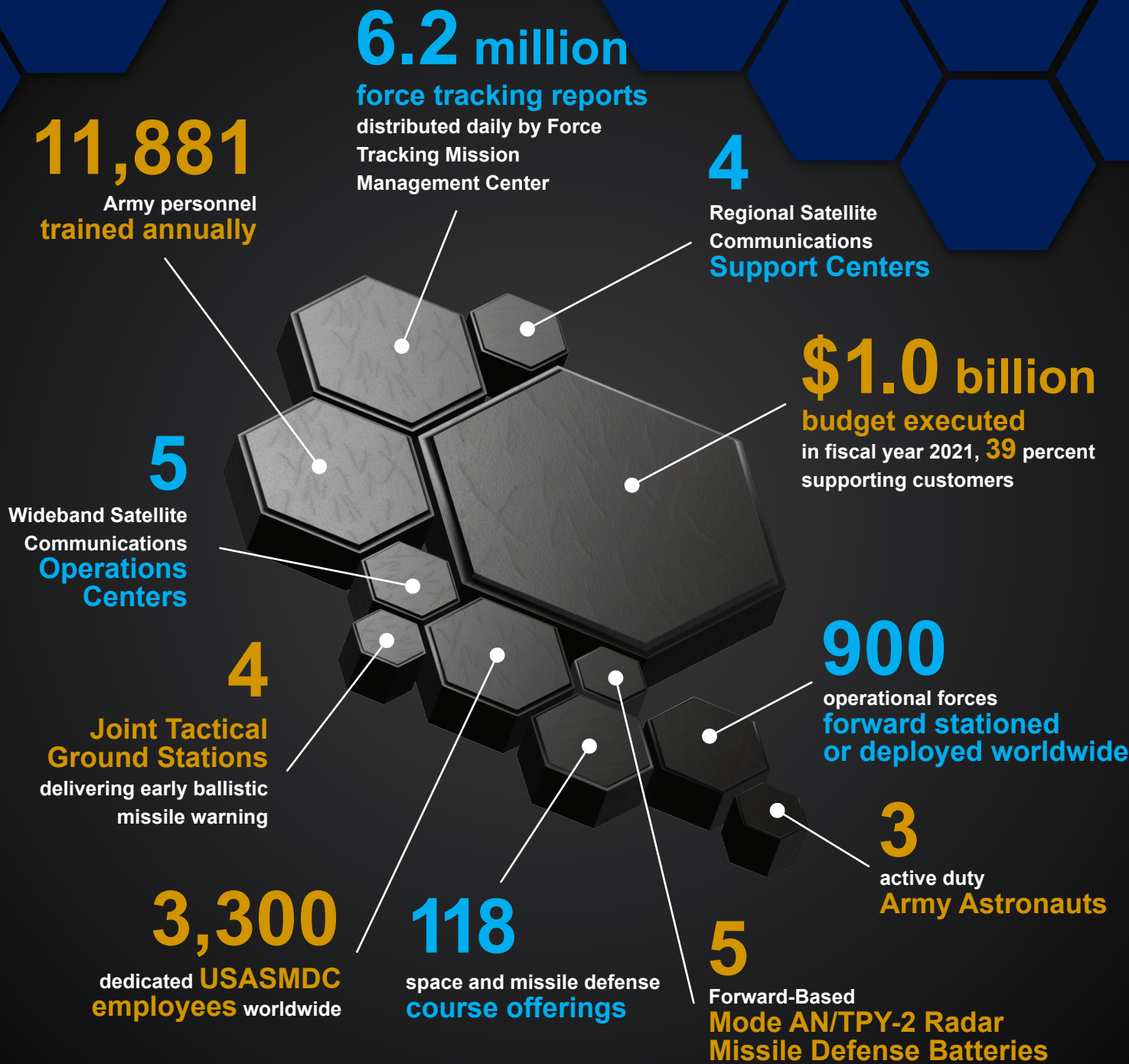
“The transfer will consolidate all of the military SATCOM under one service and one commander,” Pheasant said. “This provides unity of command for a range of SATCOM operations to include: constellation optimization, receipt and planning of access requests, and payload control for 36 communications satellites.”

With Space Force already operating the wideband satellite constellation, assuming responsibility for the communications payload planning and control function will consolidate all wideband satellite functions under one service, enhancing unity of effort and mission effectiveness in the satellite communications mission area.

The transfer will officially take place after the approval of the fiscal year 2022 budget.

SMDC BY THE NUMBERS

A global command with personnel assigned to 10 time zones at 22 worldwide locations



The mission of USASMDC is complex: develop and provide current and future global space, missile defense and high altitude capabilities to the Army, joint force, our allies and partners to enable multi-domain combat effects; enhance deterrence, assurance and detection of strategic attacks; and protect the nation.



Technical Center

PURPOSE

The U.S. Army Space and Missile Defense Command Technical Center supports the joint warfighter by providing science, technology, and test and evaluation expertise to enable warfighter dominance today and in the future. As part of the Army Science and Technology enterprise, the Technical Center contributes to the current fight and enables the next generation to prevail in conflicts to come. The Technical Center focuses on three essential tasks: executing science and technology, research and development, and test and evaluation; managing and operating the Ronald Reagan Ballistic Missile Defense Test Site; and conducting space operations and space domain awareness.

The Director for Research and Technology executes science and technology, and research and development through three subordinate directorates – Space, Directed Energy, and Research. The Director for Engineering and Test serves as the center’s chief engineer, and manages systems engineering and test execution through two subordinate directorates – Systems Engineering and Test. The RTS Directorate manages the RTS located on Kwajalein Atoll in the central Pacific Ocean, which is part of the Department of Defense Major Range and Test Facility Base.

The Technical Center contributes to the success of the warfighter and joint force in four major areas: directed energy, tactical responsive space and high altitude, test and evaluation, and hypersonic and strategic weapons.

IMPACT

Directed Energy

The Technical Center is the Army lead for high energy laser technology development. High energy lasers complement kinetic energy in addressing rocket, artillery and mortar threats;

unmanned aerial systems; and cruise missiles. Additionally, the Technical Center is exploring high-power microwave technology for use in interdicting a multitude of improvised threats. As systems are fielded, the Technical Center will continue to develop new and improved directed energy technologies for insertion into weapon systems to maintain warfighter dominance.

Tactical Space and High Altitude Technologies

As the Army lead for space and high altitude research, development and engineering, the Technical Center identifies, develops, demonstrates and integrates technologies in the areas of responsive space and space superiority and high altitude. Working with other Army, defense and industry partners, the Technical Center focuses on persistent beyond line-of-sight communications for forces in remote areas; functionally effective resolution imagery; solutions for assured position, navigation and timing; ground command and control systems; and direct downlink of tactical data feeds.

Test and Evaluation

As an invaluable part of the Army Test and Evaluation Enterprise, the Technical Center supports developmental and operational air and missile defense testing with a suite of low-cost ballistic missile targets, transportable and configurable launchers, and test execution and evaluation. The RTS provides test support to the Missile Defense Agency, the U.S. Air Force, NASA and others.

Hypersonic and Strategic Weapons

Since completing the nation’s first successful hypersonic weapon test in 2011, the Technical Center has continued to support hypersonic testing for the Army, Navy and Air Force – beginning with test planning and design, through mission execution and post-flight analysis. Additionally, the center is continuing to develop the capability to enable



rapid systems development and fielding through integration and interoperability testing, sensor and command and control design, flight test analysis, verification/validation, and warfighter training within an independent laboratory infrastructure.

The construction of the Technology Complex, which will include laboratory facilities for directed energy, space, hypersonic, and integrated air and missile defense, continues on Redstone Arsenal, Alabama, with several labs becoming operational in early 2022.

Although the Technical Center’s primary location is Redstone Arsenal, the center is geographically distributed in many sites. Other locations are the Reagan Test Site located at U.S. Army Garrison-Kwajalein Atoll in the Republic of the Marshall Islands; the Reagan Test Site Operations Center located in Huntsville; and the Solid State Laser Testbed located at White Sands Missile Range, New Mexico.

It is a lean organization with 190 Department of the Army civilians and seven military personnel and a budget of approximately \$575 million per year, split between about 45 percent direct funding and 55 percent reimbursable funding. Budget, personnel, contract and other recurring management activities are coordinated and executed by the Technical Center

Business Management Office, which works under the oversight of the deputy director.

On a daily basis, the civilians, Soldiers and contractors of the Technical Center focus on achieving their vision of “Innovating and Transforming the Future Army through Revolutionary Research, Development, Test and Evaluation.” This contributes to the command’s ability to support joint warfighting readiness in all domains – wherever and whenever required.



Lt. Col. Juan Santiago assumes responsibility for the Ronald Reagan Ballistic Missile Defense Test Site during a ceremony at the RTS Operations Center in Huntsville, Alabama, July 23, 2021. RTS is part of the U.S. Army Space and Missile Defense Command's Technical Center. (U.S. Army photo by Carrie David Campbell)

Test Directorate

PURPOSE

The Test Directorate provides test execution and mission resource support for advanced hypersonic as well as target development and testing execution for missile defense. This support includes test planning and resource definition needed to provide comprehensive and operationally realistic scenarios to test the effectiveness of advanced warfighter capability.

The Test Directorate consists of two divisions: the Targets Division, and the Mission Execution and Test Resources Division. The directorate represents the command as a member of the Targets Reliance Panel and at other Army and Department of Defense test and evaluation forums, as directed.

IMPACT

The Targets Division designs, fabricates and demonstrates a suite of low-cost, threat-representative targets for use in Army and other government agency flight test programs. These targets utilize excess Army motors that are near the end of their operational life, but can be repurposed for flight testing. To reduce development time and cost, the targets use state-of-the-art, proven flight qualified components. The Targets Division also provides high-fidelity, threat-representative targets and interceptor mass surrogate sled vehicles to support live fire test and evaluation as required by law and provides data and analysis to support the director of Operational Test and Evaluation.

The Mission Execution and Test Resources Division develops and executes plans for data collection, execution, and training for large-scale flight tests. The division provides command, control, and communication and manages sensors, communications, telemetry,

Technical Center's Test Directorate, in support of the Lower Tier Air and Missile Defense Sensor, launches the first Economical Target 2, Aug. 12, 2021, from White Sands Missile Range, New Mexico. (U.S. Army photo)



and data collection assets for execution of flight tests, and is responsible for test architecture design and risk management for responsible tests.

Mission execution support includes execution analysis, document development, mission execution team identification and training, deployment and retrograde actions, and quick-look and post-mission data analysis and reporting. Test resource support includes test range requirements definition and selection, capability augmentation, asset identification and asset schedule de-confliction.

Research Directorate

PURPOSE

The Research Directorate performs in-house basic and early applied research for key enabling technologies with applications across space, integrated air and missile defense, directed energy, strategic weapons and related areas.

The Research Directorate consists of two divisions: the Space and Integrated Air and Missile Defense Technologies Division, and the Concepts Analysis Division. The directorate collaborates across government, industry and academia on innovative research opportunities and also represents the Technical Center as a member of communities of interest, and at other Army and Department of Defense science and technology forums, as directed.

IMPACT

The Space and Integrated Air and Missile Defense Technologies Division provides basic and applied research for key enabling technologies with applications across multiple mission areas. It explores technologies related to reducing size, weight and power; communications; electro-optical/infrared/radio frequency; sensors; material properties; signatures and more.

The division also manages the Small Business Innovation Research program for the command as well as Rapid Innovation Fund opportunities.

The division operates key research laboratories, such as the Aerophysics and Impact Mechanics Laboratory, which enables both experimental analysis, and modeling and simulations supporting aerospace, photonics, quantum, high-power microwave and space research. Through this, the Space and Integrated Air and Missile Defense

Technologies Division develops and refines unique, high-payoff applications and concepts for technologies enabling warfighter dominance.

The Concepts Analysis Division performs research exploration; advances new technologies; performs analysis on conceptual systems and emerging technologies; and develops future science and technology leaders and workforce hired through the Department of Defense Science, Mathematics and Research for Transformation program, and other internship programs.

The division operates the Concepts Analysis Laboratory, which includes a hardware lab area with laboratory benches, multiple 3D printers, a circuit board mill and pick-and-place machine, cleanroom, satellite software-in-the-loop and hardware-in-the-loop testbed, collaborative office area and a large meeting/classroom with a state-of-the-art media wall. With its unique mission and facilities, the laboratory is normally a must-visit location for high-profile visitors to include senior military leaders from across the DOD.

The Concepts Analysis Division Precision Track and Search Radar supports testing at Yuma Proving Ground, Arizona. (U.S. Army photo)



Space Directorate

PURPOSE

The Space Directorate provides a customer-focused approach to develop, integrate, demonstrate and transition space and high altitude tactical systems responsive to user requirements providing current and future relevant warfighter capabilities.

The Space Directorate consists of four divisions: Space Technologies Division; Space Applications Division; Command, Control, Communication and Integration Division; and the Strategic Capability Division. The directorate also represents the U.S. Army Space and Missile Defense Command Technical Center as a voting member on the Department of Defense Space Experiments Review Board.

CAPABILITIES

The Space Technologies Division evaluates and matures applicable evolving technologies for relevant space and high altitude platforms, sensors and technologies for tactical warfighter applications. The Position, Navigation, and Timing Resiliency Laboratory is a world-class position, navigation and timing science and technology center committed to develop and assess innovative technologies, techniques and simulation to advance the competitive technological advantage in the rapidly evolving position, navigation and timing battlespace. The lab can detect, test, characterize and evaluate mitigation techniques that environmental and manmade effects have on assured position, navigation and timing resiliency.

The Space Applications Division demonstrates, integrates, prototypes and transitions relevant space and high altitude technologies aligned with tactical warfighter capability requirements to improve ground force capabilities across joint multi-domain operations. Recent initiatives within this division include demonstrating a small satellite payload capability during a joint capability technology demonstration event and general support to joint multi-domain operations



The Technical Center Space Directorate's Gunsmoke J Space Vehicle 2 launches on a cargo vessel from NASA's Wallops Flight Facility, Virginia, on Feb. 20, 2021. It was the program's first of three 2021 launches. (NASA photo by Patrick Black)

with communications, intelligence, surveillance and reconnaissance; assured position, navigation and timing; and navigation warfare electronic support.

The Command, Control, Communication and Integration Division provides research and development of ground-based enablers, novel concepts and cyber capabilities for space and high altitude data exploitation and integration. The division identifies, develops, demonstrates, integrates and transitions cyberspace, space and high altitude data exploitation and integration technologies aligned with requirements to enhance operational capabilities across joint multi-domain operations in response to critical operational needs. The division provides an operational Payload Demonstration Laboratory, which is a space satellite ground station capability available to support government space payloads to demonstrate advance capabilities. The lab offers a government-owned and -operated ground station for research and development vice using industry proprietary systems.

The Strategic Capability Division provides customers with dependable, unique space- and ground-based technologies to enable warfighter superiority and support tactical warfighter capability requirements across joint multi-domain operations.

Systems Engineering Directorate

PURPOSE

The Systems Engineering Directorate was created under the Director for Engineering and Test as part of a Technical Center reorganization in June 2020. The directorate was given the mission to manage and execute systems engineering efforts on behalf of the Technical Center chief engineer. The directorate consists of two divisions: the Systems Integration Division and the Program Integration and Assurance Division.

IMPACT

The Systems Engineering Directorate provides a virtual and distributed environment for the integration, demonstration and spiral development of technology demonstrations to fielded weapons systems in space, integrated air and missile defense, directed energy, hypersonic and related technologies. The division comprises the Directed Energy Systems Integration Lab, the Small Satellite Systems Integration Lab, the Air and Missile Systems Integration Lab and the Digital Simulation and Analysis Center. The Systems Integration Lab applies state-of-the-art modeling and simulation technologies for research, development, and test and evaluation applications; prototype system development; and programs of record across the Department of Defense to mature technology, reduce risks and lower developmental and testing costs.

Additionally, the Air and Missile Systems Integration Lab hosts one of the most advanced testing facilities for internal measurement units in the country to validate system performance under stressing 3 degrees and 6 degrees of freedom conditions.

The Program Integration and Assurance Division manages the functions of mission assurance and risk management framework for the Technical Center to ensure synchronization and integration across the directorates. Mission assurance ensures the appropriate technical rigor is applied to the independent verification and validation of Technical Center technology efforts, while the risk management framework process provides the required accreditations while managing information system-related security risks.

The Program Integration and Assurance Division also provides the support structure for employees matrixed to external organizations and manages the engineering workforce to ensure workforce development and proper assignment of skills. They also manage technology transfer, intellectual property, data rights, patents, science and technology metrics, cooperative research and development agreements, and educational partnerships. In 2021, the Program Integration and Assurance Division was officially listed as an approved DOD provider for software assurance by the Joint Federated Assurance Center.

The first lab of the Technical Center's 163-acre technology complex, the Directed Energy Systems Integration Lab supports directed energy capabilities for the command and the Army. (U.S. Army photo by Carrie David Campbell)



Directed Energy Directorate

PURPOSE

The Directed Energy Directorate provides directed energy technology to enable warfighter dominance in a variety of mission areas. Research and development of high energy laser weapon technologies is conducted to evaluate and demonstrate the defensive and offensive application of directed energy. Additionally, the director functions as the Technical Center adviser for directed energy science and technology development.

The directorate includes two divisions: the Directed Energy Technologies Division and the Lethality Division. The Directed Energy Technologies Division conducts basic and applied research and early technology development to advance, evaluate, assess and leverage relevant emerging high energy laser weapon technologies. The Lethality Division conducts applied research and develops and evaluates high energy laser and high-power microwave weapon system effectiveness against targets of interest to the Army. It also interfaces with other government agencies for lethality and propagation data collection and analysis to ensure continuity across the Department of Defense.

IMPACT

The Directed Energy Directorate supports the Fires Center of Excellence electric fires capability



Adam Aberle, Directed Energy Directorate, Technical Center, holds an unmanned aerial system displaying the damage caused by a laser weapons system. (U.S. Army photo by Monica K. Guthrie)

needs. The directorate explores the use of high-power microwave technology for use in interdicting unmanned aerial systems. They develop, integrate, demonstrate and transition high energy laser and high-power microwave technology and systems to the Rapid Capabilities and Critical Technologies Office, program executive officers, program managers and users to provide current and future Army and joint warfighter capabilities. Directed energy technologies offer unique performance attributes that contribute to addressing existing operational capability gaps.

The Directed Energy Technologies Division designs, develops and conducts experiments on high energy laser technologies, components and systems to address warfighter needs. The division manages the High Energy Laser Enabling Technologies Lab and has the responsibility to develop the next generation of directed energy scientists and engineers.

The Lethality Division conducts research, experiments and evaluations of high energy laser and high-power microwave weapon system effectiveness against a wide variety of threats. The division manages the Solid State Laser Test Bed at White Sands Missile Range, New Mexico, and collects data and develops vulnerability modules for integration into the fire

control systems, using results from laser/material interaction experiments and effectiveness studies.

Ronald Reagan Ballistic Missile Defense Test Site

PURPOSE

The Ronald Reagan Ballistic Missile Defense Test Site is a vital national asset providing live-fire developmental and operational flight testing of offensive and defensive missile systems, hypersonic systems and space systems; equatorial satellite launch capability; space object tracking and characterization; and atmospheric science research. The unique range and test facility is located 2,300 miles west-southwest of Hawaii in the U.S. Army Garrison-Kwajalein Atoll, Republic of the Marshall Islands.

IMPACT

RTS maintains, operates, improves and modernizes a diverse, world-class instrumentation suite, including radar, telemetry radio frequency systems, electro-optical systems, command and control systems, flight safety command-destruct systems, mission data networks and communication systems. The range and key instrumentation systems can be operated remotely from the RTS Operations Center in Huntsville, Alabama.

The cornerstone of the RTS instrumentation capability is a suite of four of the world's most sophisticated radar systems, spanning the radio frequency spectrum, enabling support of a broad range of missions. Combining long-range tracking radars able to detect objects in all orbits with high-resolution imaging radars, RTS maintains a highly effective balance of tracking and radar imaging capability.



The Ronald Reagan Ballistic Missile Defense Test Site supports the test of an unarmed Minuteman III intercontinental ballistic missile launched from Vandenberg Space Force Base, California, Aug. 11, 2021. The vehicle impacted in a pre-established target zone roughly 4,200 miles away near the Kwajalein Atoll in the Republic of the Marshall Islands. (U.S. Space Force photo by Michael Peterson)

RTS provides strategic and tactical space surveillance support to U.S. Space Command, tracking satellites in all orbits and providing first visibility of new foreign launches from Europe and Asia. In addition, RTS provides unique capabilities to the Space Surveillance Network, such as wideband radar imagery and space object identification data, which is used to identify orbital payloads. Because of the growing concern about U.S. satellite survivability, U.S. Space Command works directly with the U.S. Army Space and Missile Defense Command and RTS to maximize availability of range assets to support this critical mission area.

Geographically located in the middle of the Pacific Ocean, RTS provides unique testing and data collection capabilities. The instrumentation managed and operated at RTS provides weapon system developers accurate data to continue refinement of the world's most accurate strategic and tactical offensive and defensive missile systems to protect and defend Soldiers and the homeland. The unmatched sensitivity and range provide unparalleled space situational awareness support to protect and defend orbiting U.S. and allied space systems.



Gunsmoke provides Tech Center win



Members of the Gunsmoke program team place a Gunsmoke-J, a U.S. Army Space and Missile Defense Command and Assured Position Navigation and Timing/Space Cross Functional Team joint capability technology demonstration satellite, aboard a launch deployment vehicle prior to its June 30 air-launch from the Mojave Desert in California. (U.S. Army photo)

In 2021, the U.S. Army Space and Missile Defense Command's Technical Center oversaw the assembly, integration, delivery and launch of three Gunsmoke-J 3U CubeSat satellites into low-Earth orbit.

The first launch docked on the International Space Station on Feb. 20, 2021, and was deployed into orbit June 30, 2021. The second unit was launched on March 22, 2021 and third unit was launched June 30, 2021.

Gunsmoke-J is a Joint Capability Technology Demonstration designed as a 3U Cubesat that is an Army technology development and demonstration project to develop, prototype and test next generation tactical small satellite technology to perform various data collection functions from low-Earth orbits. The result will be a next-generation tactical small satellite system able to demonstrate an operationally relevant capability in a relevant environment.

The Gunsmoke-J science and technology effort will provide new and advanced capabilities to tactical warfighters in a satellite about the size of a loaf of bread. Its experiments will show how its sensors can provide critical data and information key in multi-domain operations. The effort will also help inform future acquisition decisions.

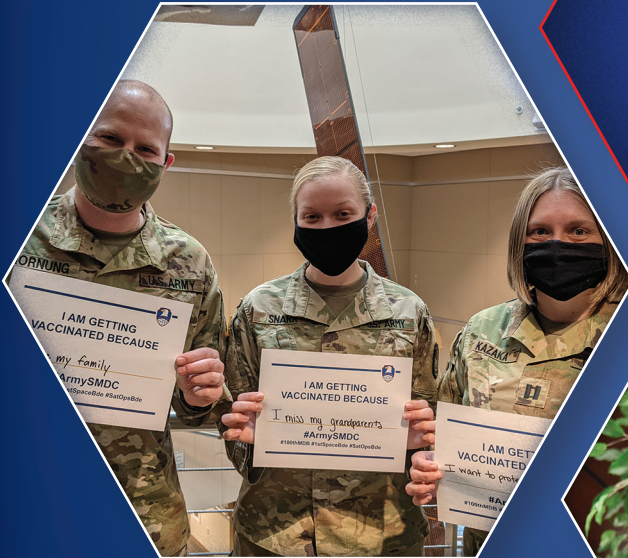
Its objectives will be evaluated through a Joint Military Utility Assessment beginning in early 2022, which will consist of both technical and operational demonstrations.

Gunsmoke and potential follow-on small satellite systems are designed to provide information or sufficient data relative to tactical decision-making that is delivered in a timely manner.

Currently USASMDC is going through the technical demonstration, which started in August. Gunsmoke-J recently participated in Project Convergence 21 as part of the program's Technical Demonstration Plan.

"The command is very excited to have this capability," said Wheeler "Chip" Hardy, chief, Space Applications Division, Space Directorate, Technical Center. "The experiments done on orbit will be the culmination of five years of hard work done by the entire Gunsmoke team in designing, building, integrating and testing these satellites. If successful, Gunsmoke could lead to a follow-on acquisition with a capability that could be a game changer for the tactical warfighter."

THE FACES of USASMDC





Space and Missile Defense Center of Excellence

PURPOSE

The Space and Missile Defense Center of Excellence was established in August 2019 from the U.S. Army Space and Missile Defense Command's former Future Warfare Center. This change in organizational structure, design and designation creates a functional alignment with authority equivalent to other Army proponent organizations and U.S. Army Training and Doctrine Command centers of excellence.

The Space and Missile Defense Center of Excellence is the Army's force modernization proponent, responsible for managing Army change to doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy requirements for space, strategic missile defense and high altitude capabilities.

It represents Army equities across the joint community. Within the capabilities of Army and joint space, missile defense and high altitude, the Space and Missile Defense Center of Excellence trains and educates agile, adaptive and ready Soldiers and leaders; executes life-cycle management for U.S. Army space operations officers; develops the Army space cadre; and enables informed decision-making.

To carry out its mission, it executes TRADOC-established practices to meet force management responsibilities. This includes performing concept development and capabilities determination and integration relative to DOTMLPF-P for materiel development. Additionally, the organization executes the Army's institutional training and education for space and global ballistic missile defense mission



Space and Missile Defense School students participate in the Tactical Space Operations Course. (U.S. Army photo)

areas. It is uniquely organized and geographically well-positioned to meet future Army needs.

IMPACT

The Space and Missile Defense Center of Excellence is USASMDC's architect for future force design. Its specialized and geographically dispersed team designs, builds, modernizes, trains and educates Army space and missile defense forces. The center contributes to developing superior space, missile defense, and high altitude capabilities that enable multi-domain effects to protect the homeland and support tactical-to-strategic success whenever and wherever required.

It is laser-focused on delivering combat-ready forces and capabilities – today and in the future. Through critical analysis of the future operating environment, it prepares and adapts leap-ahead concepts and technologies to provide innovative and effective solutions to the warfighter.

Components include the U.S. Army Space Personnel Development Office, Capability Development and Integration Directorate, the U.S. Army Space and Missile Defense School and the Air and Missile Defense Integration Division. These organizations support the overall mission through steady accomplishment of operations that include:

- Training Army Soldiers, space cadre and missile defense operators through 200 formal course offerings with more than 15,000 students annually;
- Designing and documenting future space and missile defense organizations;
- Designing/performing/executing wargames, experiments and studies;
- Advocating for Army space, missile defense and high altitude capabilities;
- Providing modeling and simulations for Army space, missile defense and cyber technologies from concept to fielding and life-cycle management;
- Providing Functional Area 40 life-cycle management and space cadre sustainment, and serving as the single point of contact for all Army space personnel matters.

The Space and Missile Defense Center of Excellence's 2021 accomplishments and 2022 notable activities include:

Building Coalition within the Space Enterprise: The Space and Missile Defense Center of Excellence built coalition within the space enterprise by contributing value to U.S. Space Command's Joint Concepts for

Space Operations, U.S. Space Force Space Analysis Consortium, and developing an analytical agenda with USSPACECOM J8. Through these efforts, the Space and Missile Defense Center of Excellence is seeking opportunity for the Army to leverage other organizations' space investments (analytically and materially) and ensure the Army's equity in all space-based capability developments by the external stakeholders.

Concept Development: Set the conceptual foundation for Army space contribution for the Army operating as part of the joint force in multi-domain operations with the submission of the Army Futures Command Pamphlet 71-20-10. The concept was developed as the campaign of learning, result of analysis, discussion and decisions amongst Army Futures Command, USASMDC leadership and the Army Modernization Enterprise community of practice. The concept expands on the ideas in the multi-domain operations and echelons above brigade concepts and identifies space and high altitude capabilities required to support multi-domain operations. Additionally, this concept provides a common framework for future Army space and high altitude capability development. Noteworthy, this is the first time Army space will be integrated in an Army and joint concept framework commensurate with the warfighting functional concepts.

Training Soldiers: The Space Operations Training Division trained and educated 2,389 Soldiers across 12 courses. The Missile Defense Training Division trained and educated 220 Soldiers across 10 courses. The Army Space Training Division trained and educated 11,881 Soldiers across the Army including support to combat training center rotations and warfighter exercises for 19 Basic Combat Training, eight divisions and two corps. The Institutional Training Division trained and educated 30 Soldiers and staff as part of the TRADOC-required staff and faculty training and certification program.



1st Space Brigade batteries operate the AN/TPY-2, a missile-defense radar that can detect, classify and track ballistic missiles, in several locations around the world. (U.S. Army photo)

Capability Development Integration Directorate

PURPOSE

The Space and Missile Defense Center of Excellence Capability Development and Integration Directorate conducts concept-to-capability development in support of force modernization efforts for current and emerging mission areas for the U.S. Army Space and Missile Defense Command, approved by U.S. Space Command, U.S. Strategic Command, U.S. Northern Command and the Department of the Army.

The CDID also conducts wargaming, experimentation, studies and analysis; develops or adopts leap-ahead concepts and technology; and integrates doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy solutions for multi-domain operations. It performs these responsibilities in support of Army Futures Command and as part of the Army Modernization Enterprise.

IMPACT

The Army Capability Managers for Space and High Altitude and Strategic Missile Defense, or ACM SHA and ACM SMD, respectively, represent the U.S. Army Training and Doctrine Command commanding general and report to the USASMDC commanding general. The ACM SHA serves as the Army's centralized fielded force integrator for space and high altitude operations. The ACM SHA coordinates and synchronizes all DOTMLF-P solutions to provide space- and high altitude-required capabilities. The ACM SMD serves as the Army's user representative and centralized manager and integrator for all DOTMLPF-P considerations for strategic missile defense, and Army applications of the Command, Control, Battle Management and Communications System.

The Concept Development Division establishes the conceptual foundation for the command's future force development and force modernization and focuses on the USASMDC-assigned mission areas of space, high altitude and global ballistic missile defense. Working with partners, the division conducts concept and



technology exploration and assessment; integrates USASMDC force modernization proponenty equities in wargames, experimentation and studies; and develops and integrates concepts and future force organizational design. This concept-to-capability development, warfighting capabilities determination, and DOTMLPF-P development and integration drives Army institutional decision-making processes such as the Total Army Analysis and program objective memorandums, directly contributing to the Army Modernization Enterprise's operationalization of a multi-domain operations-capable force in 2028 and a multi-domain operations-ready force in 2035.

The Decision Support Division provides the computational and network resources, cyber vulnerability testing, modeling and simulation, and operational analysis required to support major decisions concerning the acquisition of systems and the development of concept of operations that provide the best joint and Army space, missile defense, high energy laser and high altitude capabilities to current and future warfighters. One such modeling and simulation supported by this division is the Extended Air Defense Simulation, a system-level simulation of air, space and missile warfare. EADSIM provides an integrated tool to support joint and combined force operations and analyses to model the performance and predict the effectiveness of ballistic missiles, surface-to-air missiles, and aircraft and cruise missiles in a variety of user-developed scenarios.

Space and Missile Defense School

PURPOSE

The U.S. Army Space and Missile Defense School executes the Army's institutional training and education for space and ground-based midcourse defense mission areas. It develops all individual training tasks and necessary products to conduct Soldier-focused mission qualification training. The school designs, writes, coordinates and publishes Army doctrine for space and GMD. It assists the command's operational units in developing collective tasks for space and GMD training. The school also instructs and integrates space education and training at each Army center of excellence, proponent schools, and operational unit training as part of the Army Space Training Strategy.

IMPACT

The school earned the U.S. Army Training and Doctrine Command's highest accreditation rating of fully accredited in 2020. Every three years, TRADOC reviews all aspects of training management and execution to include how the school analyzes, designs, develops, implements and evaluates space and missile defense training and education against the Army Enterprise Accreditation Standards. Additionally, TRADOC recognized several school-developed initiatives as Army best practices.

In May 2019, the Institutional and Operational training lines of effort of the Army Space Training Strategy formed the Army Space Training Division within the SMD School. The ASTD provides denied, degraded and disrupted space operational environment training across the Army through institutional and operational training venues. These activities educate leaders and Soldiers at all levels to integrate space capabilities throughout the operations process to understand threats to U.S. space capabilities and how space capabilities enable and enhance Army systems.

Missile defense courses include:

- Ground-Based Midcourse Defense Fire Control Qualification Course
- Army GMD Staff Course; GMD Missile Defense Officer Course; GMD North American Aerospace



Defense Command/U.S. Northern Command and Control Course; GMD Master Gunner/Top Gun Program; GMD System Trainer Course

- AN/TPY-2 Forward-Based Mode Sensor Manager Qualification Course; Leader Development Course
- Command, Control, Battle Management and Communications Planner Course

Space institutional training courses include:

- Space Operations Officer Qualification Course
- Space Senior Leader Course
- Army Space Cadre Basic Course, Phase 1 and 2
- Army Space Control Fundamentals Course
- Mobile Integrated Ground Suite Initial Qualification Training
- Advanced Space Control Systems Courses
- Fundamentals in Space Control Planning; Space Control Planners Course
- Tactical Space Operations Courses Initial Qualifications Training
- Joint Tactical Ground Station Initial Qualification; JTAGS Leader Development Course

Army-wide space training includes:

- Army Professional Military Education – Noncommissioned Officer Academy, Basic Officer Leader Course, Captain's Career Course, Intermediate Level Education for the Command and General Staff College, Pre-Command Course
- Home Station Training
- Combat Training Center rotations
- Mission Command Training Program
- Army Warfighter exercises

Air and Missile Defense Integration Division



U.S. Army Cpl. Rogelio Argueta, Patriot launching station enhanced operator-maintainer, assigned with Task Force Talon, 94th Army Air and Missile Defense Command, gives commands during practice missile reload and unload drills on a Terminal High Altitude Area Defense system trainer at Andersen Air Force Base, Guam. (Army photo by Capt. Adan Cazarez)

PURPOSE

The Space and Missile Defense Center of Excellence Air and Missile Defense Integration Division is responsible for synchronizing the implementation of Army AMD modernization efforts for the U.S. Army Space and Missile Defense Command commanding general, who serves as the Army's AMD Enterprise Integrator.

These efforts include force planning and sourcing requirements, combat and materiel development, AMD acquisition and lifecycle management, and the orchestration of consistent strategic communication messaging themes among the AMD enterprise consisting of those agencies and organizations that develop, maintain, sustain, train and employ Army AMD assets.

IMPACT

Army AMD is in the midst of great change, undergoing significant transformation, and is one of the top five modernization priorities for the chief of staff of the Army. As such, the CSA routinely requests USASMDC's commanding general's opinion and recommendations on Army AMD modernization issues to shape the

direction of critical ballistic missile defense capabilities.

The AMD Integration Division was initially established under the G-3, then later moved directly under the commanding general to increase direct reporting responsiveness. In 2019, the Space and Missile Defense Center of Excellence was established within USASMDC, and the AMD division was reorganized under the CoE to increase the synchronization and synergy with the Army AMD enterprise.

The AMD Integration Division now has the ability to execute in-depth coordination with the Strategic Missile Defense U.S. Army Training and Doctrine Command Capability Manager, as well as the missile defense doctrine writers in the Capability Development and Integration Division.

To balance today's operational requirements, while shaping the future force and modernization efforts to counter future challenges, the AMD Integration Division led efforts across the AMD enterprise to develop and publish AMD 2028. This is a comprehensive strategy articulating the Army's vision to provide combatant commanders with "a flexible, agile and integrated AMD force capable of executing multi-domain operations and defending the homeland, regional, joint and coalition forces, and critical assets in support of unified land operations."

The AMD Integration Division provides a comprehensive analytical perspective to keep the commanding general informed on Army AMD equities so he can make better recommendations to senior Army leaders.

Army Space Personnel Development Office/Space Officers

PURPOSE

The Army Space Personnel Development Office executes the life-cycle management functions of Functional Area 40 space operations. It ensures officers' knowledge, skills, behaviors, experience and education meet operational requirements and ensures career growth aligns training and education requirements to operational needs and career professional development.

The ASPDO conducts strategic planning, ensuring FA40 and non-FA40 Army space cadre billets are identified and tracked to support space-related missions and functions. ASPDO manages the processing and awarding of the Space Badge and 3Y, Q4 skill identifiers/additional skill identifiers, and S1A personnel development skill identifier, and manages allocations for attendance to the Space Operations Officer Qualification Course, Space 200, and Space 300.

IMPACT

FA40 and non-FA40 Army space cadre have documented training and experience in the space domain. They conduct daily missions in the eight codified joint space capabilities supporting all Army warfighting functions.

FA40s provide in-depth expertise and experience to leverage space-related assets that deliver space capabilities to the warfighter today, as well as develop and integrate space capabilities for the future.

ASPDO manages the Training with Industry and Advanced Civil Schooling programs for FA40s that help develop space officers' experience and skills that augment Army space initiatives. ASPDO also performs FA40 Force Management to ensure the right skill sets

and expertise are efficiently applied to Army advantage, recruitment procedures with the Voluntary Incentive Transfer Program for personnel wanting to become space operators, and communication for consideration of the officer's desired career path.

ASPDO is piloting two talent management initiatives for the Army. First is the Assured Functional Area Transfer initiative. This program gives 10-20 U.S. Military Academy and ROTC cadets with space-oriented science, technology, engineering and mathematics degrees the opportunity to "branch detail" to FA40. The second initiative is the direct commissioning program. This allows for the direct commissioning of individuals from the civil sector up to the grade of colonel based on constructive credit. These talent initiatives allow FA40 to continue to acquire the necessary talent to maintain a human capital advantage.

In the future, ASPDO will play a key role in establishing an Army space branch and, once established, execute the life-cycle management functions for all three cohorts (officer, warrant officer and enlisted).



Capt. Nicholas Miller, deputy of Home Station Training, Army Space Training Division, talks to cadets at the U.S. Military Academy at West Point, New York, during its Branch Week, Sept. 8-10, 2021. (U.S. Army photo by Lira B. Frye)

Center of Excellence Laboratories

PURPOSE

The Space and Missile Defense Center of Excellence operates three major laboratories that support mission accomplishment and provide a test bed for future operations. They are the Simulation Center, the Cyber Hardening Integration Lab and the Joint Air Defense Operations Center Developmental Laboratory.

IMPACT

The SimCenter serves as one of the U.S. Army Space and Missile Defense Command's major research and development facilities for space and missile defense research, design and analysis of complex missile defense systems with state-of-the-art computational, modeling and simulation resources. The center provides services to the Missile Defense Agency and its program elements, the High Performance Computing Modernization Program and other joint activities. The SimCenter also offers local and remote organizations large-scale computational assets and access to high-performance Department of Defense networks to meet customer mission requirements. The SimCenter provides the most appropriate hardware, software, network and communications tools, and environments

for each user program; the engineering services required to acquire and integrate cost- and mission-effective computer architectures for user programs; and a secure, cost-effective computing environment that optimizes resources for analysis tasks common to the USASMDC community.

The Cyber Hardening Integration Lab provides an environment in which systems can be replicated in a secure enclave and assessed against a comprehensive suite of cyber threats to determine mission resiliency against such threats. The CHIL team can determine if vulnerabilities exist; how those vulnerabilities impact a system's mission; and what can be done to mitigate, or even negate, the impact. Accordingly, the process provides for fixes of vulnerabilities before they ever show up in the "real" system. Although systems under assessment in the CHIL are operating in a virtual environment, the system components are not virtual but replicated hardware versions of the operational systems. As such, they are mirror images and respond exactly the same. This has the advantage over simulations, in that vulnerabilities in the assessments are the same as would happen in the operational systems, and, most importantly, fixes in the CHIL work exactly the same in the actual systems.

The Joint Air Defense Operations Center Developmental Laboratory provides a live-test environment for the battle-management systems employed by the National Capital Region Integrated Air Defense System. The purpose is to enable effective integration of U.S. Army ground-based air defense capabilities into the North American Aerospace Defense Command air sovereignty systems that control the air defense of the homeland mission. The lab communications systems enable connectivity with distributed test assets across the continental U.S. so that Army and Air Force system program offices can assess the capabilities of all new systems or component upgrades to operate effectively as a systems of systems.



Jorge Aladino, security specialist, and Jonathan McGlade, network engineer, work in the Cyber Hardening Integration Lab on Redstone Arsenal, Alabama, Dec. 7, 2021. (U.S. Army photo by Carrie David Campbell)



CDID operationalizes high altitude capability



The U.S. Army Space and Missile Defense Command, as the Army proponent for high altitude, identifies, demonstrates and assesses high altitude capabilities in support of the Army's needs and in the context of multi-domain operations. (U.S. Army photo)

As the world, technology and warfare continue to change, the Army must continually modernize to ensure readiness at all times. A part of the Army's modernization strategy is to create plans and doctrine preparing for conflicts across all domains including land, air, sea, space and cyberspace.

This year, the Army took this concept of multi-domain operations and began the process of creating doctrine for MDO and operationalizing it. The Capabilities Development Integration Directorate former director Tse-Horng "Richard" Yu said this transition to operationalizing MDO means the high altitude capability his team has been working on for over a decade will finally be operationalized in an Army formation.

"For the first time ever, a high altitude formation is actually coming online," Yu said. "Now we're going to stop talking about high altitude capabilities and start actually doing, equipping, training and organizing the (multi-domain task force) multi-domain effects battalion's high altitude formation, so the Army will actually have that capability in action, along with the doctrine being developed for high altitude."

Yu said the process is moving rapidly. While the normal acquisition process in the Army is a long-

term, sequential proceeding where first one step must occur before moving to the next, Yu said acquisition for high altitude capability must move faster by completing these in tandem.

"In this extreme environment being strategic competition with our near peers, we don't have the time sequential processing takes," Yu said. "So, while we continue to work with the Program Executive Office-Aviation on program of record efforts, we're also working to organize, train and equip the high altitude formation with MDEB that's coming next."

While the technology for the high altitude capability is mature after more than a decade of research and experimentation, Yu said being able to field it now also enables his team to continue learning about the capability.

"We have the opportunity to learn from actually doing," Yu said. "We're equipping the MDEB high altitude formation so they can start fighting with the high altitude capability, but the MDTF is also a task force or experimental force, which can help us continue to learn about this capability and how it can best support our Soldiers."

NASA Detachment

PURPOSE

The U.S. Army Space and Missile Defense Command NASA Detachment provides support to NASA with Army astronauts and space operations officers detailed to the Lyndon B. Johnson Space Center in Houston, Texas.

There are currently three active duty Army astronauts. Col. Andrew Morgan, detachment commander, served aboard the International Space Station, June 2019 – April 2020, as part of Expedition 60, 61 and 62. Lt. Col. Anne McClain served aboard the ISS, December 2018 – June 2019, as part of Expeditions 58 and 59. Both were selected for the astronaut program in 2013. Lt. Col. Frank Rubio, selected in 2017, and McClain were selected for NASA's Artemis Team to help pave the way for the next astronaut missions on and around the moon.

USASMDC astronauts train to fly as flight crew on NASA space missions providing engineering expertise for human interface with spacecraft. Army astronauts and space operations officers bring fundamental Soldier skills such as leadership, operational experience and technical expertise to NASA and the space profession. They help the Army define its requirements for the space program and enhance the Army's use of space capabilities.

An astronaut's primary responsibility is to train for spaceflight. Their training includes flying as T-38 crewmembers, learning the Russian language, and maintaining proficiency in robotics, spacewalking and ISS emergency procedures. Each astronaut is assigned a number of additional duties including:



The U.S. Army Space and Missile Defense Command NASA Detachment's current astronauts are from left: Lt. Col. Frank Rubio; Lt. Col. Anne McClain; and Col. Andrew Morgan, detachment commander. (NASA photo)

providing their technical expertise in spacecraft design and habitability, conducting on-board scientific and technical research, and functioning as members of the flight control room in the Mission Control Center.

Assigned as assistant program managers, the detachment's space operations officers serve as capsule communicator in the flight control center, integrate with government and commercial space mission partners, and serve on problem-solving teams/committees.

Space operations officers use their understanding of the space program and operations management; science, technology, engineering and mathematics disciplines; and NASA culture to enhance the Army's space capabilities in multi-domain operations.

Since the Army's first astronaut, retired Brig. Gen. Bob Stewart, was first selected into the 1978 astronaut class, 18 Army astronauts and one payload specialist have passed through the detachment. Several retired Army astronauts continue to serve as astronauts and in NASA leadership positions.

Chief Technology Office

PURPOSE

The chief technology officer serves as the scout for the U.S. Army Space and Missile Defense Command's leadership to uncover potentially game-changing innovations, concepts and technologies to support the command's missions and enable multi-domain operations.

The CTO, as the principal adviser to the commanding general and the deputy to the commander for science and technology matters, provides timely and relevant near-, mid- and long-term information, planning and resourcing recommendations on science and technology matters.

The CTO accomplishes this by focusing outwardly to the science and technology elements of the Army, other services, combatant commands, joint organizations, other government agencies, industry and academia, looking for the most promising conceptual and technological breakthroughs.

In addition to maintaining awareness of the latest scientific and technological advances from U.S. and ally organizations, the CTO is the primary investigator within the command, gaining insight and awareness of adversary and potential adversary science and technology efforts.

The CTO assesses technology for operational support to the warfighter and emerging technologies that could enhance combat and force development efforts within the command.

IMPACT

The CTO's efforts saw a string of successes within the COVID-19 restrictions that demonstrated a commitment by dedicated professionals in executing requirements to meet the CG's guidance, both specified and implied. Their successes centered on key areas of CG interest: operations, oversight, security, resourcing and integration:



The chief technology officer serves as the U.S. Army Space and Missile Defense Command principal adviser for science and technology matters.

- Effectively managed telework and return to onsite work requirements.
- Coordinated with the Academic Research Council to prepare for the U.S. Military Academy 2021 academic year; worked with the Physics Department to ensure the CG interacted meaningfully with the cadets; and supported the deputy to the commander's hosting of the USMA Department of Physics and Nuclear Engineering members. Discussions centered on cooperative opportunities between the organizations, and USASMDC support of the space curriculum and the Space and Missile Defense Research and Analysis Center.
- Represented the command at the Army Futures Command Science and Technology community of interest sessions. Presentations focused on rapidly identifying, developing and transitioning capabilities to front line operators; National Reconnaissance Office Mission Integration Directorate and Operational Integration Office on their current programs; and supporting large caliber armaments.
- The CTO met with members of Sandia National Laboratory and their support contractor to receive a presentation on the X-Bow Bolt Launch system. The lab shared a novel rail-launch system that may prove useful to reconstitute, replenish and refresh Department of Defense orbital assets.
- Coordinated with the Office of Naval Research to draw on talents from across industry and academia to focus on innovative efforts in developing dual-use solutions to meet national defense needs and to enhance the region's economic strength with innovative commercial products.



Office of Small Business

DOING BUSINESS WITH THE COMMAND

The U.S. Army Space and Missile Defense Command has a robust Small Business Program utilizing small businesses of all types in its acquisitions that include small business, small disadvantaged business, service-disabled veteran-owned small business, women-owned small business, and historically underutilized business zone small business concerns.

The USASMDC Office of Small Business Programs ensures small businesses are provided the maximum opportunity to be included in USASMDC's complex procurements in the areas of space, missile defense, directed energy, hypersonic, high altitude, cyber and other related research and development technologies. Support of the small business program is good for the nation and helps build a strong industrial base necessary to provide warfighters the defense products and services they need. Supporting the Department of the Army's commitment to small business is a team effort throughout the command.

DOING BUSINESS WITH THE FEDERAL GOVERNMENT

A newly formed business can access the Small Business Administration and various U.S. Army websites for information about the basic requirements that must be in place before competing for government contracts. Another valuable resource for new and existing small businesses is the Procurement Technical Assistance Center: www.aptac-us.org.

The following information can be used as a guide to doing business with USASMDC:

Research USASMDC before making contact. The command, like many Army activities, maintains its own website: www.smdc.army.mil. Information for the USASMDC Small Business Program can be

found under the Resources tab. Additionally, the Command's Virtual Industry Exchange Forecast Industry Report containing the most recent information on upcoming USASMDC opportunities can be found under the same Resources tab.

Ensure profile information is current and accurate in the System for Award Management www.sam.gov and verify registration has not expired. Verify all relevant North American Industry Classification System, commonly referred to as NAICS, codes; business size/revenue representation; and socioeconomic status are correct.

Review the business profile in the Small Business Administration Dynamic Small Business Search: https://web.sba.gov/pro-net/search/dsp_dsbs.cfm. Ensure this information is consistent with what is in the System for Award Management www.sam.gov. Fields in this database that assist in market research include keywords, capabilities narrative, special equipment/materials and performance history.

Confirm the business website for public access is accessible and consistent with information posted in System for Award Management www.sam.gov and Dynamic Small Business Search https://web.sba.gov/pro-net/search/dsp_dsbs.cfm.

Prepare to meet with the USASMDC Small Business Office. Meetings can be either in person (subject to current conditions) or by phone. Have business capabilities that are in line with USASMDC requirements ready for discussion. Be prepared with business history, prime or subcontractor interests, and any unique capabilities. Ask about current contracting vehicles and how to locate upcoming opportunities.

Monitor federal business opportunities. Use the website <https://sam.gov/content/opportunities> to monitor sources sought, request for information, and



The U.S. Army Space and Missile Defense Command utilizes small business concerns in key mission areas, such as developing high energy laser assets. The Army is leveraging the progress made with USASMDC science and technology programs to develop the High Energy Laser Tactical Vehicle Demonstrator, and eventually to field Indirect Fire Protection Capability-High Energy Laser prototypes. (U.S. Army graphic)

synopsis for upcoming requirements and solicitations notices. This is the single point of entry for the federal government and should be monitored daily. This website is used to publish other events, such as industry day briefings, Advance Planning Briefings to Industry and Procurement Technical Assistance Center events.

Seek additional assistance in the defense marketplace. Procurement Technical Assistance Centers: <https://www.aptac-us.org/> are located in most states and are partially funded by the Department of Defense to provide small businesses with information on how to do business with DOD. They provide in-depth counseling on marketing, financial and contracting issues to small business concerns at minimal cost.

The Small Business Administration offers assistance through their Small Business Development Centers: www.sba.gov/tools/local-assistance/sbdc, which can provide aspiring and current small business owners a variety of free business consulting and low-cost training services including: business plan development, manufacturing assistance, financial packaging and lending assistance, exporting and importing support, disaster recovery assistance, procurement and contracting aid, market research help, 8(a) program support and healthcare guidance. Also, get to know

the local SBA Procurement Center Representative. He or she can be a valuable resource for staying on top of regulatory updates/changes, such as limitations on subcontracting, and program guidance, such as the SBA All Small Mentor-Protégé Program.

Prepare a proposal. Read the solicitation and the performance statement of work carefully. Pay particular attention to sections L and M of the solicitation. Section L provides instructions, conditions and notices to offerors or respondents. Section M lists the evaluation factors for award. Ensure the submitted proposal meets all of the requirements of the solicitation.

Lastly, win a contract....PERFORM.... and earn excellent experience.

For more information, contact the USASMDC Office of Small Business Programs

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Joint Functional Component Command for Integrated Missile Defense

PURPOSE

In addition to his U.S. Army Space and Missile Defense Command service component role, Lt. Gen. Daniel Karbler is also the commander of U.S. Strategic Command's Joint Functional Component Command for Integrated Missile Defense.

The president has assigned USSTRATCOM with primary responsibility for global missile defense; operational-level responsibilities have been delegated to JFCC IMD.

JFCC IMD began operations in January 2005 and includes Army, Navy, Marine Corps, Space Force and Air Force personnel, as well as U.S. government civilians and contractors. The headquarters is located at the Missile Defense Agency's Missile Defense Integration and Operations Center at Schriever Space Force Base, Colorado. The command's location allows JFCC IMD to leverage MDA's existing infrastructure and ensures a strong partnership with the materiel developer in the execution of the command's assigned responsibilities.

JFCC IMD synchronizes planning in support of USSTRATCOM's global missile defense responsibility. JFCC IMD conducts global missile defense operations support in coordination with other combatant commands, the services, and as directed, appropriate U.S. government agencies. JFCC IMD also advocates for and recommends acceptance of missile defense capabilities, and executes joint and combined global missile defense training and education for the USSTRATCOM commander. Objectives for these efforts are to deter adversaries, assure allies and defend U.S. deployed forces, allies and partners against missile attacks.

JFCC IMD translates this responsibility into several lines of effort, to include:

- Synchronize global missile defense planning, global force management and missile defense security cooperation activities.
- Conduct global missile defense operations support, to include asset management, alternate execution authority, federated intelligence support and network monitoring and protection.
- Execute above element joint and combined global missile defense training, exercises and experimentation.
- Advocate for and recommend acceptance of global missile defense capabilities, conduct analysis and assessments of current and future capabilities, and support tests.

IMPACT

Missile defense is a key part of America's national defense strategy to deter threats; assure allies and partners of its commitment to established security frameworks; and to defend the homeland, deployed forces, friends and allies. It becomes even more important in an environment in which missile threats from both state and non-state actors continue to proliferate and expand in capacity, range and lethality.

As a critical mission area, global missile defense encompasses missile defense operations, activities and investments that affect more than one combatant commander. This requires synchronization of the affected commands to coordinate effective allocation, deployment and employment of the capabilities necessary to deter, prevent or respond to attacks and to nullify or reduce the effectiveness of a threat.

Combatant commands designated with responsibility for an adversary problem set must approach



Patrick McNelis, lead Joint Ballistic Missile Defense Training and Education Center instructor; Master Sgt. Son In Hee, Patriot operator, Republic of Korea Air Force Air and Missile Defense Command; Capt. Lee Gun Kee, operations officer, ROK AMDC; Col. Tyler Oxley, deputy commander, 94th Army Air and Missile Defense Command; and Col. Cary Belmear, deputy chief of staff, Joint Functional Component Command for Integrated Missile Defense participate in integrated air and missile defense training, on Sept. 2, 2021, at Hickam Air Force Base, Hawaii. (Courtesy photo)

missile defense from a global perspective given the transregional nature of the threat; the low-density, high-demand nature of missile defense platforms; and complex architecture of sensors, shooters, and command and control nodes spanning multiple geographic areas of responsibility. JFCC IMD provides direct support to these efforts.

JFCC IMD is the recognized subject matter expert across the missile defense enterprise in matters of operational support, policy, strategy, training and education. It anticipates and adamantly advocates for the warfighter's global missile defense requirements through engagement and partnering with MDA, other

governmental agencies, the services, combatant commands, and U.S. allies and partners.

A strong partnership with the services and the materiel developers ensures advocacy for future requirements, delivery of tested capabilities and informs decision makers during operational acceptance of those capabilities into the enterprise. In partnership with combatant commands, JFCC IMD provides expertise to support planning, joint and combined training, resource allocation recommendations and asset management. All of these key functions are essential to ensure U.S. global missile defenses are postured to support U.S. national defense objectives.



Collaboration Essential to JFCC IMD Success



Senior Leaders from 18 nations and three international organizations convene for a Nimble Titan senior leader seminar at the Marine Establishment Amsterdam, Nov. 10-11, 2021 to discuss policy and military operational concepts for multinational missile defense. (U.S. Army photo by Dottie White)

Nimble Titan, the Joint Functional Component Command for Integrated Missile Defense’s recurring two-year wargame campaign brings together nations from across the globe. The Nimble Titan 20 conflict event was the culminating wargame event, designed to stress regional defense designs and explore multinational policy developed at earlier events.

This year’s event was unique with 104 virtual participants from different time zones and 57 in-person participants. The outcomes of Nimble Titan 20 campaign were briefed to the senior leaders from ministries of defense and foreign affairs in November in the Netherlands to solicit feedback and shape the upcoming two-year campaign.

“The time and effort invested in Nimble Titan will support the development of the upcoming Missile Defense Review,” said Col. Geoff Adams, JFCC IMD deputy commander.

Working with the Pacific Integrated Air and Missile Defense Center, Joint Ballistic Missile Defense Training and Education Center instructors provided extensive integrated air and missile defense training, both face to face at Hickam Air Force Base, Hawaii, and virtually, to

64 Republic of Korea Air Force Air and Missile Defense Command service members.

“This was an innovative training event developed by the JBTEC to satisfy critical allied training and is another step in JBTEC’s continued evolution of utilizing live and virtual training to meet warfighter demands for joint training,” said Patrick McNelis, Joint Ballistic Missile Defense Training and Education Center instructor.

Col. Cary Belmear, JFCC IMD deputy chief of staff said it is always exciting to build relationships with military professionals from other nations “especially when those relationships help pave the way for greater understanding of a common problem set.”

“As our foreign engagement efforts continue, hopefully we’ll be able to simultaneously incorporate other nations into our training and education events, not just in INDOPACOM, but in every applicable combatant command,” Belmear said.

JFCC IMD has been able to maintain its positive effect on the global missile defense community, adapting to changing environmental requirements while working with allies, services and combatant commands.



U.S. Army Space and Missile Defense Command

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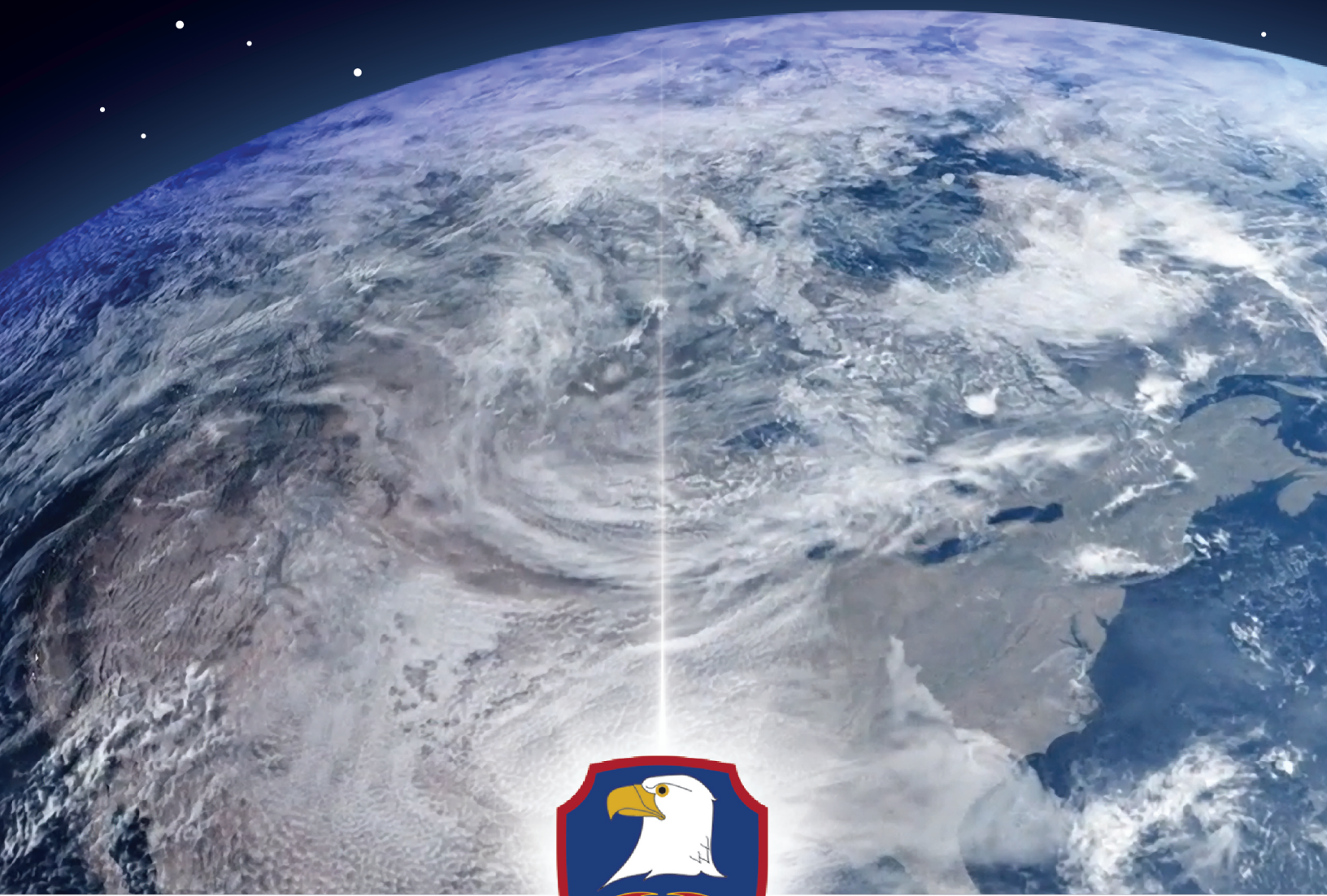


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