

# 2021 GLOBAL A GUIDE TO USASMDC

U.S. Army Space and Missile Defense Command





### **Commander's Message**

Lt. Gen. Daniel L. Karbler

elcome to the 2021 issue of the *Global Defender*, your guide to the U.S. Army Space and Missile Defense Command and the Joint Functional Component Command for Integrated Missile Defense.

As the commanding general of both USASMDC and JFCC IMD, I am proud to lead an outstanding team of 3,000 Soldiers, Sailors, Airmen and Civilians in 23 locations worldwide. Day in and day out, the dedicated men and women of these commands execute their no-fail mission as one team of empowered, innovative, ready and resilient professionals. While we ceaselessly pursue mission success, we never forget the People First philosophy: our people are the Army's greatest strength. By continuing to recruit, train and develop the best talent - by putting our people first – we are achieving the intellectual and cognitive overmatch needed to fight and win in today's complex security environment.

Operationally, USASMDC provides the Army and the joint force with satellite communications, space situational awareness, and missile warning and defense as the Army Service Component Command to U.S. Space Command and U.S. Strategic Command, and we protect our homeland 24/7/365 from ballistic missile attack in support of U.S. Northern Command.

Through JFCC IMD, we provide USSTRATCOM with global missile defense expertise that is essential to its strategic deterrence mission.

In force and capability development, USASMDC is responsible for concepts, experimentation, training and integration through our Space and Missile Defense Center of Excellence, as well as developing, testing and evaluating next-generation technologies through our Technical Center.

No one has a better perspective on the convergence of space and missile defense or a more nuanced view of Army air and missile defense forces and capabilities than we do here at USASMDC and JFCC IMD. We occupy strategic key terrain that sits at the integration nexus of three combatant commands, making us truly unique as the nation moves forward in this era of great power competition. The Army and the joint force will be increasingly reliant on our space and missile defense capabilities and expertise as the Army realizes the potential of multi-domain operations and develops the AimPoint Force.

That is why we are laser-focused on integrating Army offensive and defensive capabilities from the tactical to the strategic level, from mud to space, in all domains; and we will execute our missions from competition and crisis, to conflict. Integration will provide commanders with a higherresolution, integrated air picture and empower them to converge capabilities across all domains in a joint kill web. It will allow the joint force to mitigate single points of failure, to address capability and capacity shortfalls, and to avoid exploitable seams and gaps. It will also enable our warfighters to penetrate and disintegrate anti-access and area denial systems and to defeat advanced threats like hypersonic missiles.

I am privileged to lead and serve alongside men and women of the highest caliber at USASMDC and JFCC IMD, some of whom you will read about in these pages. Our team's commitment to protecting and defending this nation, even in the face of a global pandemic, has and always will be unwavering.

Secure the High Ground! Vigilant for the World!

# SMDC BY NUMBERS



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.

A global command with personnel assigned to 11 time zones at 23 worldwide locations



### 800

operational forces deployed worldwide

### 6.2 million

force tracking reports distributed daily by Force Tracking Mission

Management Center

### **0** billion

budget executed in fiscal year 2020, 41 percent supporting customers

Forward-Based Mode AN/TPY-2 Radar **Missile Defense Batteries** 

space and missile defense courses

active duty Army Astronauts

### **TABLE OF CONTENTS**

USASMDC	4		
Global Assets Map6			
Maintaining Readiness	8		
100 <sup>th</sup> Missile Defense Brigade	10		
49 <sup>th</sup> Missile Defense Battalion	12		
Mission Impact	13		
1 <sup>st</sup> Space Brigade	14		
1 <sup>st</sup> Space Battalion	16		
2 <sup>nd</sup> Space Battalion	17		
117 <sup>th</sup> Space Battalion	18		
Mission Impact	19		
U.S. Army Satellite Operations Brigade	20		
53 <sup>rd</sup> Signal Battalion	22		
Satellite Communications Support	23		
Mission Impact	24		
The Faces of USASMDC	25		
Technical Center	26		
Test Directorate	28		
Research Directorate	29		
Space Directorate	30		
Systems Engineering Directorate	31		
Directed Energy Directorate	32		
Ronald Reagan Ballistic Missile Defense Test Site	33		
Mission Impact	34		
USASMDC at Work 2020	35		
Space and Missile Defense Center of Excellence	36		
Capability Development Integration Directorate	38		
U.S. Army Space and Missile Defense School	39		
Air and Missile Defense Integration Division	40		
Army Space Personnel Development Office	41		
Center of Excellence Laboratories	42		
Mission Impact	43		
NASA Detachment	44		
Chief Technology Officer	45		
Office of Small Business	46		
Joint Functional Component Command	-		
tor integrated Missile Detense			
IVISSION IMPACT			



**COMMAND STAFF** LTG Daniel L. Karbler *Commanding General* 

CSM Finis A. Dodson Command Sergeant Major

James B. Johnson Jr. Deputy to the Commander

COL Eric D. Little Deputy Commander for Operations

COL David Baxter Chief of Staff

CW5 Wesley Klees Command Chief Warrant Officer

#### EDITORIAL STAFF

Lira Frye Director of Public Affairs

Carrie David Campbell Command Information/Editor

Contributors

Ronald Bailey Melissa Bullard Jason Cutshaw Staff Sgt. Dennis DePrisco Cecil Longino Mikayla Mast Staff Sgt. Aaron Rognstad 1<sup>st</sup> Sgt. Steve Segin Staff Sgt. Zachary Sheely Dottie White

The *Global Defender* is an authorized publication to inform and educate members and partners of DOD and the U.S. Army Space and Missile Defense Command. The editorial content of this publication is the responsibility of the USASMDC Public Affairs Office.

USASMDC SMDC-PA Building 5220, Martin Road Redstone Arsenal, AL 35898

Dist. A: Approved for public release #1001

37





### **USASMDC**



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

"The commitment to our mission displayed by the men and women of SMDC continues to amaze me. During this global pandemic, our officers, warrant officers and enlisted Soldiers met all challenges and met all objectives. Well done!"



James B. Johnson, Deputy to the Commander

"Our people continue to be our greatest asset. Our civilian workforce responded to the challenges of COVID-19. They met the overabundance of issues head-on and did not falter, which is a testament to their importance to the Army and the nation."



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 multidomain operations. (U.S. Army photo)

he 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.

It 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 2,800 Soldiers and civilians across 11 time zones and 23 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 Bridade (Ground-based Midcourse Defense), the 1<sup>st</sup> Space Brigade and the U.S. Army Satellite Operations Brigade.

The missile defense brigade operates the Ground-based Midcourse Defense 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 and Army National Guard Soldiers in Alaska and California.

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 1<sup>st</sup> Space Brigade. The brigade consists of the 1st Space Battalion and 2nd

Space Battalion, as well as the 117<sup>th</sup> Space Battalion under a direct support relationship.

The 1<sup>st</sup> 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 forwardbased mode conducting ballistic missile search, track and discrimination operations in support of regional and homeland defense. Additionally, the forwardbased mode radar can enable space operations and conduct data collection.

Providing satellite communications for the command is the U.S. Army Satellite Operations Brigade. 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 commands, services, U.S. government agencies and international partners. 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 to enable unit readiness:



#### COL Eric D. Little, **Deputy Commander** for Operations

"The Soldiers and civilians throughout SMDC continue to demonstrate a tremendous amount of resiliency and mission focus throughout 2020. The operational focus and overall readiness of our formation remains intact across all mission areas and is truly impressive."



#### **CW5 Wesley Klees**, **Command Chief** Warrant Officer

"Our warrant officers shepherded our Soldiers at SMDC locations around the world during an especially challenging 2020. They assured critical space and missile defense capabilities through their experienced leadership and unique technical expertise.'



#### 2,800 DEDICATED EMPLOYEES WORLDWIDE WITH MORE THAN 800 OPERATIONAL FORCES FORWARD STATIONED OR DEPLOYED

VANDENBERG AIR FORCE BASE, CALIFORNIA

• 100th Missile Defense Brigade Detachment

#### FORT GREELY, ALASKA

- 49th Missile Defense Battalion
- Senior Commander of U.S. Army Garrison Fort Greely

#### HAWAII

- Wideband Satellite Communications Operations Center (Satellite Operations Brigade)
- Regional Satellite Communications Support Center (Satellite Operations Brigade)

#### COLORADO SPRINGS, COLORADO

- USASMDC Headquarters
- 1st Space Brigade Headquarters
- Space and Missile Defense Center of Excellence
- Space and Missile Defense School (Center of Excellence)
- Army Space Personnel Development Office (Center of Excellence)
- 100th Missile Defense Brigade Headquarters
- U.S. Army Satellite Operations
  Brigade Headquarters
- Regional Satellite Communications Support Center (Satellite Operations Brigade)

#### SCHRIEVER AIR FORCE BASE, COLORADO

HOUSTON, TEXAS

Army Astronaut

Detachment (HQ)

100th Missile Defense Brigade
 Detachment

FORT DRUM, NEW YORK

 Security Detachment (100th Missile Defense Brigade)

#### EUROPE

- Joint Tactical Ground Station (1st Space Brigade)
- Wideband Satellite Communications Operations Center (Satellite Operations Brigade)
- Regional Satellite Communications Support Center (Satellite Operations Brigade)

#### TURKEY

Missile Defense Battery – Forward-Based Mode Radar (1st Space Brigade)

#### FORT DETRICK, MARYLAND

 Wideband Satellite Communications Operations Center (Satellite Operations Brigade)

#### FORT MEADE, MARYLAND

 Wideband Satellite Communications Operations Center (Satellite Operations Brigade)

#### HUNTSVILLE, ALABAMA

- USASMDC Headquarters
- Space and Missile Defense Center
- of Excellence
- Technical Center
- Office of the Commandant (Center of Excellence)
- Ronald Reagan Ballistic Missile Defense Test Site Operations Center-Huntsville (Technical Center)

FLORIDA

 Regional Satellite Communications Support Center (Satellite Operations Brigade)

#### US CENTRAL COMMAND

- Joint Tactical Ground Station (1st Space Brigade)
- Missile Defense Battery Forward-Based Mode Radar (1st Space Brigade)
- Army Space Support Team (1st Space Brigade)
- Space Control Planning Team
  (1st Space Brigade)

#### ISRAEL

 Missile Defense Battery – Forward-Based Mode Radar (1st Space Brigade)

#### KOREA

• Joint Tactical Ground Station (1st Space Brigade)

#### JAPAN

- Joint Tactical Ground Station (1st Space Brigade)
- Missile Defense Batteries Forward-Based Mode Radar (1st Space Brigade)

#### OKINAWA

 Wideband Satellite Communications Operations Center (Satellite Operations Brigade)

•

#### **KWAJALEIN ATOLL**

- Reagan Test Site (Technical Center)
- Senior Commander of U.S. Army Garrison-Kwajalein Atoll



### **USASMDC** maintains readiness, capabilities amid pandemic challenges

espite the many challenges created by 2020's coronavirus pandemic including learning new ways to operate and accomplish the mission, the U.S. Army Space and Missile Defense Command remained focused on providing space, missile defense and high altitude capabilities that enable multi-domain operations so combatant commanders can effectively maneuver and win.

"It has been a tremendous honor and a privilege to be able to serve as the commander especially at a time where missile defense and Army space are as relevant as I've ever seen them," said Lt. Gen. Daniel L. Karbler, USASMDC commanding general. "Combine that with the COVID environment that we have been operating under for the last nine months, it has given me an opportunity to see how well we do as an organization and how well we pull together as a team when the circumstances are tough and the environment is changing. It really emphasizes to me that we are a well-trained organization, and we really embrace the ability to be flexible, adaptable and agile to our circumstances."

Karbler said the command took extra precautions to be able to maintain readiness while protecting the health and safety of Army personnel, their families and the civilian workforce.

"I am glad to say that COVID really didn't affect our readiness," Karbler said. "We knew we had to stay ready 24/7. We do the most critical strategic missions within the Department of Defense, whether that's missile warning or to be able to respond to an intercontinental ballistic missile attack from our adversaries. We can't afford to take a day off, or take a week off, or take a month off, or allow COVID to impact our readiness."

One of the command's 2020 highlights was a flag unfurling ceremony to solidify its Army Service Component Command relationship with U.S. Space Command. This formalizes the supporting role USASMDC had already been serving and underscores that space is now a contested warfighting domain.

"The Army's space forces that we provide to Space Command, whether it's from the Satellite Operations Brigade or the 1<sup>st</sup> Space Brigade – we are the owner of those Army forces, and my duty is to make sure they're trained and ready for warfighting operations to support Space Command. We move, shoot and communicate based on space-enabled capabilities," Karbler said during the ceremony. "Today we formalized our relationship by unfurling our colors and recognizing the Army's contributions to U.S. Space Command."

Karbler said USASMDC will support USSPACECOM's warfighting mindset.

"I will provide today, and in the future, trained and ready Army space forces," Karbler said. "Tied closely



U.S. Army Space and Missile Defense Command Technical Center's Test Directorate supports the test of a hypersonic glide body launched from Pacific Missile Range Facility, Kauai, Hawaii, March 19, 2020. (U.S. Navy Photo)

to warfighting culture is warfighting readiness. My commitment to you is to make sure our operational brigades and the developmental work we do is at the forefront of that warfighting readiness. Winning matters. But I will tell you that in space, winning first really matters."

USASMDC had many significant successes in 2020:

- Joint Tactical Ground Stations provided early warning for American Soldiers and international partners during an Iranian theater ballistic missile attack on U.S. and allied forces in Iraq in January.
- The Technical Center broke ground in March for a 5,800-square-foot Technology Complex facility on Redstone Arsenal, Alabama, that will enable the Army to stay on the forefront of technology.
- · Army Astronaut Col. Andrew Morgan departed the International Space Station to return to earth April 17 following his 272-day mission in space.
- U.S. Army Satellite Operations Brigade provided satellite communication to U.S. Navy hospital ships during the COVID-19 outbreak.
- · Regional Satellite Communications Support Center-West processed the first U.S. Space Command satellite access request for ultra high frequency SATCOM and supported a mission launching NASA astronauts on a Falcon 9 SpaceX Crew Dragon spacecraft.
- The Space and Missile Defense School earned the U.S. Army Training and Doctrine Command's fully accredited status.
- The Ronald Reagan Ballistic Missile Defense Test Site participated in joint Department of Defense missions including an ICBM Glory Trip, a hypersonic vehicle test, missile defense tests and others.

"It's been a great year with a lot of great accomplishments," Karbler said.

In the coming year, SMDC will continue as the integration nexus where U.S. Strategic Command, U.S. Northern Karbler said that in 2021 and beyond, the Soldiers, civilians Command and USSPACECOM meet to accomplish the and family members will drive the success of the command. command's critical strategic missions.

The Technical Center's research and development of leap-ahead technologies is positioned to meet and defeat tomorrow's challenges, exploring ways to ensure Soldiers have unprecedented access to space and space-enabled capabilities.



Gen. James H. Dickinson, U.S. Space Command commander, left, and Lt. Gen. Daniel L. Karbler, U.S. Army Space and Missile Defense Command commanding general, unfurl USASMDC's colors to officially recognize the command as the Army Service Component Command to USSPACECOM during a ceremony at Schriever Air Force Base, Colorado, Aug. 21, 2020. (U.S. Army photo by Dottie K. White)

The Space and Missile Defense Center of Excellence is meeting the growing need to provide trained and ready space and missile defense Soldiers for the Army through the Space and Missile Defense School.

The command's SMDC Underserved Community Cybersecurity and Engineering Education Development program will engage with students in Alabama, offering development opportunities in science, technology, engineering and mathematics careers fields.

"I wish I had a good crystal ball because no one told me that a month into my command we were going to be responding to Iranian missile attacks into Irag, or we were going to be dealing with a COVID environment that was going to totally turn things on their head with respect to readiness and training and teleworking and you name it," Karbler said. "What I do know for the next year is that the talented team we have at SMDC will continue to respond to the call, and they will continue to respond to the needs of the nation to provide Army space capabilities as well as provide missile defense."

"When I took command I talked about trying to avoid using the terms workforce and employee, and instead I tell them they are part of the SMDC family," Karbler said. "I want to make sure when they come to work every day they are recognized and they understand they are appreciated and valued as members of the team."



### **100<sup>th</sup> Missile Defense Brigade**



COL Michael S. Hatfield Commander, 100<sup>th</sup> Missile Defense Brigade



CSM John Robinson Command Sergeant Major, 100<sup>th</sup> Missile Defense Brigade

#### PURPOSE

he 100<sup>th</sup> 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 U.S. Army National Guard and active-component Soldiers in Colorado, Alaska and California. The 100<sup>th</sup> 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 Air Force Base. As part of a 2020 Colorado National Guard organizational realignment, the 100<sup>th</sup> Missile Defense Brigade was assigned administrative and operational control of the 117<sup>th</sup> Space Battalion. The 49<sup>th</sup> Missile Defense Battalion, the brigade's major subordinate element, is located at Fort Greely, Alaska.

Missile Defense Element crews from the 100<sup>th</sup> Missile Defense Brigade man and control the GMD System 24/7/365. These Soldiers are responsible for the strategiclevel 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 100<sup>th</sup> Missile Defense Brigade are part of a unique multicomponent 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 49<sup>th</sup> 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 Air 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 100<sup>th</sup> 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.

2021 GLOBAL DEFENDER | A GUIDE TO USASMDC

Navy Rear Adm. William W. "Trey" Wheeler III, U.S. Strategic Command chief of staff, right, and retired Vice Adm. Walter "Ted" Carter, president, University of Nebraska, present the Omaha Trophy to Col. Michael Hatfield, commander, 100th Missile Defense Brigade, during a ceremony at U.S. Army Space and Missile Defense Command headquarters at Peterson Air Force Base, Colorado, Nov. 19, 2020. This is the first time an Army unit or an Army National Guard unit has been selected for this prestigious honor, which recognizes outstanding support to the USSTRATCOM mission of strategic deterrence. (U.S. Army National Guard photo by Staff Sgt. Zach Sheely)



The 100<sup>th</sup> Missile Defense Brigade enacted a Mission Assurance Program throughout 2020 to ensure there were no interruptions to the mission due to COVID-19. These efforts included sequestering crew members while they were on shift and certifying additional staff and non-battle rostered Soldiers to provide additional GMD operator depth.

#### Training

To be gunnery-table certified to operate the GMD Fire From release, the EKV seeks out the target using Control System, a Soldier is required to complete the multispectral sensors, a cutting-edge onboard computer and a divert and attitude control system used for seven-week GMD Fire Control Qualification Course at Schriever Air Force Base. The Soldier will then independent course correction in space. The EKV hones in on its target with pinpoint accuracy and undergo positional and crew training directly with their newly assigned crew. The Soldier will then be destroys it by direct collision using only kinetic energy. gunnery-table certified with the crew by the USASMDC Operational Readiness Evaluation team. This entire The GMD enterprise is a system of systems, involving process of certification may take anywhere from three shooters, sensors, and command, control and to six months to complete, depending on the Soldier's communication systems. GMD sensors consist of

Operational Readiness Evaluation team. This entire process of certification may take anywhere from three 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. Descent and the control and the ground-based interceptors and EKVs. 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.

#### System

The GMDS utilizes leap-ahead concepts and technologies through a spiral development acquisition process. The tip of the spear for the system is its groundbased 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.

### 49<sup>th</sup> Missile Defense Battalion

From left, Sgt. Gerardo Rodriguez, Spc. Jesib Mogin and Sgt. Michael Santiago Ortiz, military police Soldiers with the 49th Missile Defense Battalion, Alaska National Guard, patrol the Missile Defense Complex at Fort Greely, Alaska, Nov. 3, 2020. (U.S. Army National Guard photo by Staff Sgt. Zach Sheely)

#### PURPOSE

Soldiers of the 49<sup>th</sup> 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 49<sup>th</sup> 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 100<sup>th</sup> Missile Defense Brigade.

#### IMPACT

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

Fire Direction Center crews operate the GMDS 24/7/365 in conjunction with 100<sup>th</sup> Missile Defense Brigade personnel at Schriever Air 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 49<sup>th</sup> 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 and is the location 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 49<sup>th</sup> Missile Defense Battalion is manned exclusively by active Guard and reserve Alaska National Guardsmen. All 49<sup>th</sup> 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.



Members of a 100<sup>th</sup> Missile Defense Brigade crew exit the secure area at Schriever Air Force Base, Colorado, following their shift April 30, 2020. Since the onset of the pandemic, the brigade has implemented measures to ensure the continued execution of its mission including sequestering crew members away from their homes and families. (U.S. Armv National Guard photo by Staff Sqt. Zachary Sheely)

s the stranglehold of the COVID-19 pandemic tightened its grip on America in 2020, the focu for the Soldiers of the 100<sup>th</sup> Missile Defense Brigade (Ground-based Midcourse Defense) was singular - maintain the mission, no matter what.

That mission is the federally mandated defense of the United States homeland from intercontinental ballisti missile attack. A limited number of U.S. Army Soldier Alaska, California and Colorado operate a sophistica fire control system that can, on order, launch groundbased interceptor missiles to destroy incoming warhe in outer space. This is a task that cannot be done fro home, as missile defense crews operate together wit the walls of secured facilities.

Throughout 2020, the 100th Missile Defense Brigade crews at the Missile Defense Element at Schriever A Force Base, Colorado, and 49th Missile Defense Batt crews at Fort Greely, Alaska, have enacted measures to ensure the uninterrupted continuation of the missi during the global pandemic environment.

This was formalized with the establishment of a Miss Assurance Program that included sequestering crew members while they are on shift and certifying additional and non-battle rostered Soldiers to provide operator d

"I deployed to Afghanistan with an infantry platoon, so I know what it's like to be truly deployed to a



### **Proactive measures ensure** mission continuity

c us	mountainous combat outpost in a war zone," said Staff Sgt. Hayden Murray, a 100 <sup>th</sup> Missile Defense Brigade readiness operations officer. "This is different but not completely. We are 'deployed in place,' and our job is the defense of the homeland. At any time, we could go into a war posture and
e C	we must be able to engage threats 24/7/365."
s in ted eads m hin	The brigade has operated on that around-the- clock continuum since 2004, its war posture predicated on the steadily increasing nuclear missile capabilities of near-peer nations and rogue states. Two redundant crews work in concert under the command and control of U.S. Northern Command.
ir alion s	These Soldiers are the human interface to the highly automated GMD Fire Control System. Any degradation to crew readiness could leave America vulnerable to a nuclear detonation on U.S. soil.
ion	Staff Sgt. Joseph Harris, a readiness operations officer in Colorado Springs, said he feels especially fortunate to serve in the 100 <sup>th</sup> Missile Defense Brigade during this time of uncertainty.
staff epth.	"It's an honor to be part of something that means so much more than oneself," Harris said. "To our adversaries, we are always ready. There is no fighting force in the world as prepared and ready as the United States military."



### **1**<sup>st</sup> Space Brigade



COL Donald K. Brooks Commander, 1<sup>st</sup> Space Brigade



CSM Kelly Hart Command Sergeant Major, 1<sup>st</sup> Space Brigade

#### PURPOSE

he Army's only space brigade manages the world's best space warriors and capabilities to enable 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 17 locations in 11 countries and six time zones, the 1<sup>st</sup> 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 background. They use the tools learned and experiences garnered to integrate space operations into the warfight unlike any other unit of its kind.

#### IMPACT

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

The 1<sup>st</sup> Space Battalion consists of a Headquarters and Headquarters Company; 1<sup>st</sup> Space Company with four Joint Tactical Ground Stations in Europe, Korea, Japan and Qatar; 2<sup>nd</sup> Space Company with six Army Space Support Teams; and 4<sup>th</sup> Space Company with six Space Control Detachments.

The 2<sup>nd</sup> Space Battalion, a U.S. Army Reserve unit, consists of a Headquarters and Headquarters Company, 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> Space Companies, and the newly formed 6<sup>th</sup> Space Company. These citizen-warriors make up 12 of the brigade's ARSSTs and three 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, and civil authorities.

1<sup>st</sup> Space Brigade also contains five Missile Defense Batteries forwardstationed 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 brigade has an associated unit relationship with the Colorado National Guard's 117<sup>th</sup> Space Battalion, which stood up in September 2001. The 117<sup>th</sup> Space Battalion currently has 12 ARSSTs in the 217<sup>th</sup> and 1158<sup>th</sup> Space Companies and has been a steady and reliable presence in support of the U.S. Central Command area of responsibility since inception.



Sgt. Colin Crutchfield, Joint Tactical Ground Station-Italy, 1<sup>st</sup> Space Company, 1<sup>st</sup> Space Battalion, conducts routine preventive maintenance checks and services at Naval Air Station Sigonella, Italy, Feb. 5, 2020. (U.S. Army photo)

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 execute 24/7/365 no-fail missions with the JTAGs, MDBs and current deployments.

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

2021 GLOBAL DEFENDER | A GUIDE TO USASMDC



Soldiers of 4<sup>th</sup> Space Company, 1<sup>st</sup> Space Battalion, disassemble a tactical multiband antenna at Fort Carson, Colorado, Aug. 1, 2020. (U.S. Army photo by Staff Sgt. Aaron Rognstad)

### 1<sup>st</sup> Space **Battalion**

#### **PURPOSE**

The 1<sup>st</sup> Space Battalion generates and provides space combat power for Army and joint forces to conduct global and continuous multidomain 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 1<sup>st</sup> Space Battalion is a critical part of the Army's strategy to



Sgt. Deamonte Galloway, left, Sgt. Nick Gavira and Staff Sgt. Ronald Gilbert, 2<sup>nd</sup> Space Company, 1<sup>st</sup> Space Battalion, analyze a satellite's movement as part of their roles on Army Space Control Planning Team 1 at Fort Carson, Colorado. (U.S. Army photo by Staff Sgt. Aaron Rognstad)

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 four 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.

1<sup>st</sup> Space Company provides warning of missile attacks to Army and joint forces through four Joint Tactical Ground Stations. Each detachment 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.

2<sup>nd</sup> Space Company supports Army divisions, corps and joint task force commanders with Army Space Support Teams. ARSSTs are the Army's only element designed to provide direct space support to Army formations and increase lethality across the intelligence, fires, mission command and protection warfighting functions. They are experts in all space mission areas and provide a surge capability to integrate space and special technical operations into joint task forces.

4<sup>th</sup> Space Company supports Army and joint force commanders by maneuvering into positions of advantage to seize and retain key terrain in the electromagnetic spectrum. 4<sup>th</sup> Space Company detachments deploy globally on land to monitor friendly satellite communications and report on sources of 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.

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

### **2<sup>nd</sup> Space Battalion**



capabilities, space assets, space products and the impact of space operations. (U.S. Army photo by Staff Sgt. Dennis Deprisco)

#### **PURPOSE**

The 2<sup>nd</sup> Space Battalion is a U.S. Army Reserve unit based on Fort Carson, Colorado. 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 2<sup>nd</sup> Space Battalion comprises a Headquarters and Headquarters Company, 3rd Space Company, 5<sup>th</sup> Space Company and 8<sup>th</sup> Space Company.

The 3<sup>rd</sup> and 5<sup>th</sup> Space Companies each consist of five Army Space Support Teams. ARSSTs provide situational awareness of space capabilities, space assets, space products and the impact of space on operations.

Sgt. John P. Holland briefs Cpt. William B. Simpson of 5th Space Company, 2nd Space Battalion, during an equipment inspection at Fort Carson, Colorado, Oct. 26, 2020. The 5th Space Company comprises five Army Space Support Teams that provide situation awareness of space

8<sup>th</sup> Space Company has three deployable Space Situational Awareness 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.

As the Army Reserve's only space battalion, the citizen-Soldiers of 3<sup>rd</sup>, 5<sup>th</sup> and 8<sup>th</sup> Space Companies are an integral part of the Army's warfighting capability and are part of the Ready Force X, a special group of reserve component units tasked with being ready to deploy on shorter notice than traditional reserve units.

### **117<sup>th</sup> Space Battalion**

#### **PURPOSE**

The 117<sup>th</sup> 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 117<sup>th</sup> 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 1<sup>st</sup> Space Brigade.

#### IMPACT

The battalion's composition includes three companies: Headquarters Company, the 217<sup>th</sup> Space Company and the 1158<sup>th</sup> 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 42<sup>nd</sup> 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. The ARSST provides 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.

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. Over the course of 2020, the 117<sup>th</sup> Space Battalion has provided



Col. Mike Hatfield, commander, 100<sup>th</sup> Missile Defense Brigade, right, and Lt. Col. Michael Lane, commander, 117th Space Battalion, unfurl the colors of the 117th Space Battalion during a ceremony at Fort Carson, Colorado, to signify a command relationship change as the battalion is now assigned to the brigade for administrative and operational command and control. This change was a part of a larger Colorado National Guard realignment to optimize the mission. (U.S. Army National Guard photo by Staff Sgt. Zach Sheely)

multiple elements for Operation Spartan Shield, as well as supported two domestic operations, COVID-19 and wildfires, in support of the governor of Colorado.

In its ongoing support to exercises, the 117<sup>th</sup> Space Battalion has provided support to multiple warfighter exercises; Yama Sakura, Japan; and the 42<sup>nd</sup> Infantry Division culminating training event at Fort Hood, Texas. These exercises provide critical space-based technical results and training for numerous units.

In 2020, the battalion realigned from the 89<sup>th</sup> Troop Command to the 100<sup>th</sup> Missile Defense Brigade to better align with the overall U.S. Army Space and Missile Defense Command mission. The battalion also moved into its new readiness center on Fort Carson, Colorado. This new \$18 million state-of-the-art facility provides space for the battalion to train its teams in preparation for its global and domestic missions.

The 117<sup>th</sup> 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.



### **20-year rotations complete** with final **ARSST** redeployment

Army Space Support Team 5 forward deploys to Afghanistan summer 2020. From left: Cpt. Ian McQuillan, deputy officer in charge; Sgt. Jeffrey Farr, satellite communications controller; Staff Sgt. Michael Cheek, geospatial intelligence noncommissioned officer; Maj. David Maddaford, officer in charge; Staff Sqt. Hady Saleh, noncommissioned officer in charge; and Spc. Dennis Geoffroy, information technology specialist. The team belongs to 1<sup>st</sup> Space Battalion. (Courtesy photo by Maj. David Maddaford)



rmy Space Support Team 5 returned in August 2020 from a deployment to Kabul, Afghanistan, as part of the ongoing NATO-led Operation Resolute Support – a train, advise and assist mission in the country that began in 2015.

As the mission in Afghanistan winds down and more service personnel are gradually being withdrawn from the country, ARSST 5 also happened to be the final ARRST team to deploy there after almost two decades of support from rotating teams.

"As we closed down the theater, we had to train people to learn pieces of our job," said Maj. David Maddaford, ARRST 5 officer in charge. "We had to identify those people, educate them, and then watch them be successful as we were exiting, because we were the last of our kind."

Maddaford said one of the team's biggest initial challenges was to get the newly formed Information Warfare Task Force-Afghanistan, led by Army Special Operations Command, to utilize the team's resources. Once they did, ARSST 5 planned and coordinated operations for Afghanistan district and provincial centers, police and army checkpoints, convoy operations and vehicle recovery operations.

Additionally, the six-man team, from 1<sup>st</sup> Space Battalion, 1<sup>st</sup> Space Brigade, did everything from



advising their higher command on all-things space to construction projects like the building of a sensitive compartmented information facility used to process classified information.

Col. Brian Bolio, commander, 1st Space Brigade, said ARRSTs have been utilized in Afghanistan since 2001 and praised their importance for the tenure of their time in theater.

"To me their biggest accomplishment is taking highly classified and technical capabilities and integrating them into the warfight," he said. "While other brigade units specialize in a particular mission area, this diverse and extremely talented team is on the hook to know it all and be able to integrate it into maneuver and fires at the tactical level. Spacebased missile warning, GPS optimization for precision fires, navigation, satellite communications, electronic warfare, navigational warfare, you name it."

With the final ARRST having completed their mission, Bolio hopes they will be remembered not necessarily as "space Soldiers," but as Soldiers who filled an important role just like any others in the fight. "I want them to be remembered as bold and ready Soldiers," he said. "They were reliable teammates who had a tangible impact on the success of our operations."



### **U.S. Army Satellite Operations Brigade**



COL Stephen M. Parrish Sr. Commander, U.S. Army Satellite Operations Brigade



CSM Christopher Mann Command Sergeant Major, 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

On May 1, 2019, the U.S. Army Space and Missile Defense Command reorganized its elements to form Task Force Eagle. In October the Task Force was redesignated as the U.S. Army Satellite Operations Brigade. The brigade consolidates all assigned SATCOM missions under a new 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 reorganization is transparent to the warfighter, who continues to receive the same outstanding level of support through the same processes and will better align functions within the command under an operational commander. This reorganization improves 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- 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 support every combatant command and nine Wideband Global Satellite partners (Australia, Canada, Denmark, Luxembourg, Belgium, Netherlands, New Zealand, Czechoslovakia and Norway).



Sgt. 1<sup>st</sup> Class Kevin Dick, Sgt. Kendrick Leinwebber, Sgt. Christopher Morris, Sgt. Christopher Parsons and Master Sgt. Christopher Knoth serve at the Regional Satellite Communications Support Center-Europe at Patch Barracks, Stuttgart, Germany. (U.S. Army photo)



Sgt. Benjamin Ponsano, Staff Sgt. David Jungblut and Pfc. Erick Sarabia, Company D, 53<sup>rd</sup> Signal Battalion of Wahiawa, Hawaii, troubleshoot an inter-facility phone line in the Wideband Satellite Communications Operations Center's Modern Earth Terminal in early 2020 in preparation for installation of service. (U.S. Army photo by Staff Sgt. Justin Hand)

Subordinate organizations include the 53<sup>rd</sup> Signal Battalion (Satellite Control), formerly assigned to 1<sup>st</sup> Space Brigade, and the SATCOM Directorate, formerly a part of the USASMDC G-6 staff.

The 53<sup>rd</sup> Signal Battalion provides wideband payload control, transmission control, and defensive space control ensuring the DOD wideband constellations' continuous support to peacetime, contingency, surge crisis action plans supporting DOD, U.S. government agencies and allied partners. The 53rd Signal Battalior 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 communications links and the implementation of restoral plans. WSOCs sta prepared to support joint operations for the next major conflict, while fighting through a denied, degraded and disrupted space operating environment.

and	The SATCOM Directorate executes U.S. Space Command's assigned Consolidated SATCOM System Expert, or C-SSE, 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 and Defense SATCOM systems 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
s nd r	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 11 international partners.

### **53rd Signal Battalion**

#### PURPOSE

The 53<sup>rd</sup> 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, "Fight SATCOM," 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 53<sup>rd</sup> Signal Battalion supports Operation Inherent Resolve, Operation Freedom's Sentinel and Operation Resolute Support and more than 75 exercises and operations for U.S. Northern Command, U.S. Africa



Spc. Jonathan Beckett, Cpt. Amber Hagy, and Spc. Wolmy Louigene, of Company A, 53<sup>rd</sup> 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 Staff Sgt. Aaron Rognstad)

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 53<sup>rd</sup> 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, or C-SSE, operationally manages the payloads on the Wideband Global SATCOM System. Other satellite payloads managed include the legacy Defense SATCOM Syste and the Global Broadcast Service, which is a broadba service carried over the WGS. The Narrowband C-SSE operationally manages the payloads on the las remaining Fleet SATCOM systems satellite; the Ultra High Frequency Follow-On systems; and the Mobile U Objective System.

From Peterson Air Force Base, Colorado, the C-SSEs and their 24/7/365 watch officers support wideband ar narrowband military satellite communications for the entire Department of Defense, other U.S. government users, and international partners to deliver beyond-linof-sight communications. The directorate manages the four Regional SATCOM Support Centers and execute 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 11 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, highcapacity communications worldwide.



Staff Sgt. Brett Cater, Spc. Joseph Delacruz, Staff Sgt. Cassandra Irby, Staff Sgt. Ethan Wilkinson and Spc. Jared Joyner serve at the Regional Satellite Communications Support Center-East at MacDill Air Force Base, Florida. (U.S. Army photo)

	Military wideband SATCOW accounts for 70 percent
	of all DOD beyond-line-of-sight throughput. The
	military narrowband constellation provides critical
nd	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
d	and battle damage data to support continuously
	updated and shared situational awareness. SATCOM
em;	enables first-in and last-out communications for
and	hundreds of thousands of warfighters worldwide.
st	The four geographically dispersed RSSCs provide
	24/7/365 SATCOM planning, engineering and
Jser	satellite payload management for all DOD SATCOM
	systems. The RSSCs are located at Wheeler Army
	Airfield, Hawaii; Peterson Air Force Base, Colorado;
S	MacDill Air Force Base, Florida; and Patch Barracks,
nd	Stuttgart, Germany. The RSSCs work with regional
	SATCOM users planning and authorizing critically
t	required connectivity to support the full range of military
e-	operations – diplomatic, humanitarian assistance,
е	disaster relief and scientific missions – in zones
es	where the communications infrastructure can be
I	destroyed, degraded or is simply non-existent.

Militam unidaband CATCOM accounts for 70 percent

### Pandemic does not hinder national SATCOM support

Spc. Jordan Forsha and Spc. Tristan Youdal, Company B. 53rd Signal Battalion at Fort Meade, Maryland, conduct maintenance on the Wideband Satellite Communications Operations Center's small fixed Modernized Earth Terminal as part of routine maintenance. (U.S. Army photo by Sgt. 1<sup>st</sup> Class William R. Steiner)



he U.S. Army Satellite Operations Brigade provides 24/7/365 satellite communications support to the warfighter across the globe.

The Soldiers, civilians and contractors within the Satellite Operations Brigade execute a global mission that impacts Department of Defense operations worldwide.

"The year 2020 has been unique for the brigade due to support that we've been able to provide within the continental United States' footprint," said Maj. David Peterson, brigade plans officer in charge. "Leaders at the dispersed companies of the 53rd Signal Battalion and Regional Satellite Communications Support Centers execute the challenging job of ensuring their teams are in sync with brigade and battalion directives while also providing the necessary training, care and support to those they lead.

"These company commanders and civilian RSSC directors are some of the real heroes within the brigade who are always quietly working behind the scenes to ensure their teams are taken care of and that the mission is successful," Peterson added. "The Soldiers and civilians who work within the brigade are the best and brightest in the business and are truly passionate about the mission."

The brigade has continued to accomplish all assigned missions and tasks despite the many challenges caused by the COVID pandemic, exacerbated by the brigade's global footprint. Consistent guidance and a People First mandate from brigade leadership has helped to null the potentially devastating impacts that COVID-19 could have on the brigade's 24/7/365 operations centers.

In September 2020 the brigade hosted the first **Combined Forces Space Component Command** SATCOM Electromagnetic Interference Resolution table top exercise. The event was the culmination of seven months of planning that encompassed all key SATCOM functions within the DOD and included all relevant stakeholders.

"The SATOPS Brigade provides critical satellite communications links to all DOD services, multiple government agencies, and to several international partner nations, including NATO," Peterson said. "Critical national assets such as presidential communications, command and control infrastructure, and special operations communications rely on the satellite constellations that the brigade manages. The men and women of the SATOPS Brigade continue to seek selfimprovement and to execute our mission flawlessly."







### **Technical Center**



**Thomas Webber** Director, Technical Center



**COL Christopher M** Williams

Deputy Director, Technical Center

#### **PURPOSE**

he 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

U.S. Military Academy cadets and instructors learn the value of live demonstrations of emerging technologies during a visit from the Technical Center's High Energy Laser Mobile Test Truck, March 2-5, 2020. (U.S. Army photo by Mikayla Mast)

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 hypersonics and strategic weapons.

#### **IMPACT**

#### **Directed Energy**

The Technical Center is the Army lead for high-energy laser technology development. This technology offers unique performance attributes that contribute directly to addressing operational capability gaps. High-energy lasers are a low-cost, effective complement to kinetic energy to address rocket, artillery and mortar threats; unmanned aerial systems; and cruise missiles. Additionally, the Technical Center is exploring highpower microwave technology for use in interdicting unmanned aerial systems and defeating improvised explosive devices and other improvised threats.

> **Tactical Space and High Altitude Technologies** As the Army lead for space and high altitude research, development and demonstrates and integrates technologies in the areas of responsive space and space superiority, and high altitude. needs using small satellites

The Ronald Reagan Ballistic Missile Defense Test Site successfully supports Flight Test Unit-2, Feb. 5, 2020, in the second of four tests scheduled to validate replacement components in the Minuteman III intercontinental ballistic missile fleet. (U.S. Air Force photo by Senior Airman Clayton Wear)

and high altitude platforms, focus areas include persistent beyond-line-of-sight communications for forces deployed 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**

The Technical Center is an invaluable part of the Army Test and Evaluation Enterprise and provides a suite o low-cost ballistic missile targets for use in development and operational air and missile defense testing, transportable and configurable launchers, and test support. The RTS provides test support to the Missile Defense Agency, the U.S. Air Force, NASA and other

#### Hypersonics and Strategic Weapons

The Technical Center also provides hypersonic test support for the Army, Navy and Air Force - from test planning and design, through mission execution and p flight analysis. Additionally, the center is developing th capability to enable rapid weapon systems developme and fielding through integration and interoperability testing, sensor and command and control design, fligh test analysis, verification/validation, and warfighter training within an independent laboratory infrastructur

The Technical Center broke ground in 2020 on a world-class Technology Complex on Redstone

engineering, the Technical Center identifies, develops, To meet Army operational



е	Arsenal, Alabama, which will include laboratory facilities for directed energy, space, hypersonic, and integrated air and missile defense.
y of ental	The Technical Center is geographically distributed in many sites, with its primary offices located at Redstone Arsenal. Other locations are the RTS located at U.S. Army Garrison-Kwajalein Atoll in the Republic of the Marshall Islands; the RTS Operations Center located in Huntsville; and the Solid State Laser Testbed located at White Sands Missile Range, New Mexico.
e s. post- ie	It is a lean organization with 160 Department of the Army civilians and seven military personnel and a budget of approximately \$400 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.
ent	On a daily basis, the civilians, Soldiers and contractors
nt	of the Technical Center focus on achieving their vision of "Innovating and Transforming the Future Army
e.	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.

### 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 operational 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. They also provide 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 and



A Black Dagger target missile launches from Fort Wingate, New Mexico, Oct. 1, 2020. (Courtesy photo by Lou Rosales)

data collection assets for execution of flight tests. It is also 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 with 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 through the Department of Defense Science. Technologies Division provides basic and applied Mathematics and Research for Transformation research for key enabling technologies with applications program, and other internship programs. across multiple areas. It explores technologies related to reducing size, weight and power, communications, The division operates the Concepts Analysis Laboratory, which include a hardware lab area with laboratory electro-optical/Infrared, sensors, material properties and more. The division also manages the Small Business benches, multiple 3D printers, a circuit board mill and



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 enable 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

> 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 Laboratory Precision Track and Search Radar supports testing at Yuma Proving Ground, Arizona. (U.S. Army photo)

### Space Directorate

#### PURPOSE

The Space Directorate develops, integrates, and demonstrates space and high altitude systems. The directorate transitions those systems to the Rapid Capabilities and Critical Technologies Office, program executive officers, program managers, and users to provide for current and future Army and joint warfighter capabilities.

The directorate consists of four divisions: the Space Technologies Division; the

Space Applications Division; the Command, Control, Communication and Integration Division; and the Strategic Capability Division. The directorate also represents the command as a voting member on the Department of Defense Space Experiments Review Board.

#### CAPABILITIES

The Space Technologies Division assesses and matures relevant space and high-altitude platforms, sensors and technologies for tactical warfighter applications. The Position, Navigation and Timing Resiliency Laboratory is an innovative test center with the capability to rapidly assess and develop new technologies, techniques and prototypes to maintain a competitive technological advantage in the rapidly evolving position, navigation and timing battlespace.

The Space Applications Division demonstrates, integrates and transitions tactically responsive space and high-altitude technologies aligned with Army and joint warfighter requirements to enhance ground force capabilities across the spectrum of operations. The division manages a small satellite joint capability technology demonstration and



Soldiers from the 25<sup>th</sup> Infantry Division learn about tasking and downloading from a U.S. Army Space and Missile Defense Command satellite during an operational demonstration at the Space and Naval Warfare Systems Center Pacific facility, Pearl City, Hawaii. (U.S. Army photo by Christian Reyes)

several classified projects to support multi-domain operations with tactical communications; intelligence, surveillance and reconnaissance; assured position, navigation and timing; and navigation warfare.

The Command, Control, Communication and Integration Division identifies, develops, demonstrates, integrates and transitions cyberspace, space and high-altitude data exploitation and integration technologies to enhance operational capabilities across the entire spectrum of operations. C3I is currently deploying the Analytical Space Data Exploitation Environment, a cloud-based data dissemination approach with advanced artificial intelligence/machine learning tools to reduce the sensorto-shooter timeline. Additionally, the division manages the Payload Demonstration Laboratory, a space satellite ground station capability available to support Army space payloads to demonstrate advance capabilities.

The Strategic Capability Division provides customers with dependable novel, space and ground-based technologies to enable warfighter superiority, and directly and indirectly support warfighter operational capability requirements allowing full spectrum dominance during multi-domain operations.

### Systems Engineering Directorate

#### PURPOSE

The Systems Engineering Directorate was established as part of the Technical Center's reorganization in June 2020 as part of the center's transition into a fully mature Science and Technology Reinvention Laboratory. The directorate is leading the Technical Center's efforts to intensify the focus on in-house research and expand laboratory capability. Additionally, the directorate manages and executes systems engineering efforts on behalf of the Technical Center chief engineer.

The directorate consists of two divisions:Constructionthe Systems Integration Division, which<br/>operates and manages innovativeArsenal, A<br/>systems, w<br/>photo by Plabs and provides oversight of the<br/>center's Technology Complex, and the<br/>Program Integration and Assurance Division, which<br/>manages multiple functions to ensure synchronization<br/>and integration internally and externally.

#### IMPACT

The Systems Integration Division 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 use state-of-the-art modeling and simulation capabilities to support research and development, test and evaluation prototype system development, and programs of reco These capabilities allow developers and testers to mature technologies, while reducing risks and costs.

The Systems Integration Division manages the Direct Energy Systems Integration Lab, Small Satellite Syste Integration Lab, Air and Missile System Integration La and the Hypersonic Aerothermal Integration Lab. The Air and Missile System Integration Lab hosts one of the



Construction continues on the Air and Missile Systems Integration Lab on Redstone Arsenal, Alabama. It will provide hardware/software verification testing for air and missile systems, with the first customer being the Long Range Hypersonic Weapon. (U.S. Army photo by Keith Nicholson)

٦	most advanced testing facilities for internal measurement units in the country to validate system performance under stressing three and six degree-of-freedom conditions.
3	The Program Integration and Assurance Division manages mission assurance and the risk management framework across the Technical Center. Mission assurance confirms the application of appropriate technical rigor to the independent verification and validation of technology efforts, while the risk management framework provides
es	the required accreditations and manages
o on,	information system-related security risks.
ord.	Additionally, the Program Integration and Assurance Division provides the support structure for employees who are matrixed to external organizations and manages the engineering workforce to ensure professional
ed	development and proper assignment of skills. The
ems	division also manages technology transfer, intellectual
ab	property, data rights, patents, science and technology
	metrics, cooperative research and development
he	agreements, and educational partnerships.

31

### **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 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.

### **Reagan BMD 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 commanddestruct 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 radsystems, spanning the radio frequency spectrum, enabling support of a broad range of missions. Combining long-range tracking radars able to detect track multiple objects in all orbits with high-resolution imaging radars, RTS maintains a highly effective balance of tracking and radar imaging capability.

RTS provides strategic and tactical space surveillance support to U.S. Space Command, tracking satellites i orbits and providing first visibility of new foreign launc from Europe and Asia. In addition, RTS provides uniq capabilities to the Space Surveillance Network, such wideband radar imagery and space object identification data, which is used to identify and characterize orbita



The Ronald Reagan Ballistic Missile Defense Test Site's ARPA Long-Range Tracking and Instrumentation Radar serves as a tracking radar and is part of their space surveillance mission. (U.S. Army photo)

	payloads. Because of the growing concern about
у	U.S. satellite survivability, U.S. Space Command
lar	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.
and	
	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
е	developers accurate data to continue refinement
n all	of the world's most accurate strategic and tactical
ches	offensive and defensive missile systems to protect
lue	and defend Soldiers and the homeland. The
as	unmatched sensitivity and range provide unparalleled
on	space situational awareness support to protect and
l	defend orbiting U.S. and allied space systems.

## New lab complex to focus on critical technology development

The Technical Center breaks ground in March 2020 on a world-class Technology Complex on Redstone Arsenal, Alabama, which will include laboratory facilities for directed energy, space, hypersonic, and integrated air and missile defense. (U.S. Army photo)



he U.S. Army Space and Missile Defense Command's Technical Center broke ground at the site of the future Technical Center Complex in March 2020, which will include the Directed Energy Systems Integration Lab, a research, development, test and evaluation facility.

Technical Center director Thomas Webber believes that the new facility will play a vital role in the Technical Center team putting new technology, including directed energy, into warfighters' hands.

"This is the first time in the Army's history that it is fielding a high energy laser weapon system and organic space-enabled capabilities," Webber said. "So our technology campus complex will provide the facilities and equipment that's necessary to enable the scientists and engineers to continue to drive technological discovery for the Army modernization priorities in space, directed energy and hypersonic."

The SMDC Technical Center supports the joint warfighter by providing disruptive and critical technologies that meet today's requirements and address future needs, enabling warfighter dominance in multi-domain operations.

"Our goal is to ensure we continue to deliver the relevant technologies our Army needs to maintain superiority now and in the future," Webber said. "The goal of every science and technology effort is to transition new capability to the warfighter that provides technical superiority enabling their mission and giving them the advantage."

The new lab will also provide opportunities for early warfighter involvement, which is needed to mature the technologies. Webber said this is vital to both the warfighter and the Technical Center and will help his team deliver new technologies as rapidly as possible.

The lab will be equipped with specialized equipment enabling the Technical Center team to continue researching and testing new technologies. The facility will also be capable of housing the Army's soon-tobe-fielded directed energy weapon systems – the Directed Energy Mobile Short-Range Air Defense System and the Indirect Fire Protection Capability-High Energy Laser System – simultaneously.

"I truly believe in the work we are doing and know what we are doing now will have tremendous impact for our warfighters in the future," Webber said. "I am very excited about our future and all the new efforts we have underway to expand our laboratory capabilities. Our goal is to ensure we continue to build and retain a quality workforce capable of delivering the relevant technologies our Army needs to maintain superiority now and in the future."





### **Space and Missile Defense Center of Excellence**

#### **PURPOSE**



**Richard De Fatta** Director, Space and Missile Defense **Center of Excellence** 



**COL Brian Moore Deputy Director**, Space and Missile **Defense Center of** Excellence

he 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 areas. It is uniquely

organized and geographically wellpositioned 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 multidomain effects to protect the homeland and support tactical-to-strategic success whenever and wherever required.

It is laser-focused on delivering combatready 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;

2021 GLOBAL DEFENDER | A GUIDE TO USASMDC

The Space and Missile Defense School uses Home Station Trainers, acquired March 2020, to support Army Space Control Fundamentals and Army Space Control courses. The trainers allowed the school to instruct two five-Soldier crews at a time, whereas before they had to rotate Soldiers in and out. Despite the restrictions and altered environment of the 2020 pandemic. the school continued to train Soldiers to provide space capabilities to all combatant commands. (U.S. Army photo)

- 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' 2020 accomplishments and 2021 notable activities incl

The Office of the Commandant: In 2020, the Space and Missile Defense Center of Excellence established the Office of the Commandant to provide a single point of focus for the education and training of skilled military and civilian space personnel. They also provide doctr support for space and missile defense operations to enable Army forces to support the full range of multidomain operations. As the proponent for Army space training and Army space doctrine, the commandant's office manages the eight personnel life-cycle management functions for all Army space personnel i both the active and reserve components.

U.S. Army Training and Doctrine Command Accredita The Space and Missile Defense School earned TRADOC's highest rating of fully accredited in 2020, several school-developed initiatives were recognized Army best practices.

Concept-to-Capability Development: The Concept Development Division establishes the conceptual foundation for USASMDC's future force development



	command's mission areas of space, high altitude
	and strategic missile defense. Concept-to-capability
	development in 2021 will define future warfighting
	capabilities, DOTMLPF-P development and
	integration, and drive the Army institutional decision-
s	making processes directly contributing to the Army
ude:	Modernization Enterprise's realization of multi-domain
ado.	operations-capable forces in 2028 and multi-domain
nd	operations-ready forces in 2025
F	Talent Management Initiatives: In fiscal year 2020, the
	Army Space Personnel Development Office piloted two
inal	Talent Management Task Force initiatives for the Army
IIIai	The Accurate Europianal Area Transfer initiative gives
	10.20 LLS Military Academy and DOTC addets with
	10-20 0.5. Military Academy and ROTC cadels with
	space-oriented science, technology, engineering and
	mathematics degrees the opportunity to "branch detail"
	to FA40. After commissioning, the officers will serve four
n	years in their basic branch, then they are guaranteed
	the ability to transfer to FA40. The second initiative,
	the direct commissioning program allows for the direct
tion:	commissioning of individuals from the civil sector up
	to the grade of colonel, based on constructive credit.
and	These initiatives will allow FA40 to continue to acquire
as	necessary talent to maintain a human capital advantage
	into the future.

and force modernization activities focusing on the

Army Studies and Analysis Campaign Plan: Completed 18 major operational analyses in fiscal year 2020; and will execute a similar number in fiscal year 2021.

### **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 proponency equities in wargames, experimentation and studies; and



U.S. Training and Doctrine Command Capability Manager for Space and High Altitude serves as the capability developer for the 1<sup>st</sup> Space Brigade's Joint Tactical Ground Station units' theater missile warning systems as part of the U.S. Army Space and Missile Defense Command's force modernization proponency for space. (U.S. Army photo by Carrie David Campbell)

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. The division conducts decision support across USASMDC, Joint Functional Component Command for Integrated Missile Defense, and at the Army and joint levels. One such modeling and simulation supported by this division is the Extended Air Defense Simulation, a systemlevel 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, two lines of effort, Institutional and Operational training, 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.

The current and future 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



Pvt. Eliiah L. Davis and Pvt. Edward Hernandez-Herrera. students a the Space and Missile Defense School, study a Joint Tactical Ground Station antenna, May 28, 2020, during the JTAGS Qualification Course in Colorado Springs, Colorado. (U.S. Army photo by Dottie K. White)

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

The current and future 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

The current and future 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 & Missile Defense Integration Division**

#### **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 who 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



A Patriot missile, an air and missile defense asset, launches. The U.S. Army Space and Missile Defense Command commanding general serves as the Army's Air and Missile Defense Enterprise Integrator. (U.S. Army photo)

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 multidomain 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.

#### 2021 GLOBAL DEFENDER | A GUIDE TO USASMDC

### **Army Space Personnel Development Office**/ **Space Officers**

#### **PURPOSE**

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

The U.S. Army, the largest user of space-based capabilities in the military, formalized an Army space cadre consisting of officers, enlisted and civilian personnel in 2006. The ASPDO conducts strategic planning, ensuring space cadre billets are identified, created and tracked to support space-related missions. Cadre functions include planning, developing, acquiring, integrating and operating space forces, applications and capabilities. ASPDO manages the processing and awarding of the Space Badge and 3Y, Q4 skill identifiers/additional skill identifiers, and S1A personnel development skill identifiers.

#### IMPACT

The Army's space cadre, which spans all Army warfighting functions, has documented training and experience in the space domain and conducts daily missions. It is a diverse group with various areas of concentration, including military occupational special and occupational series with a common mission to develop, plan, acquire and operate space capabilities to fulfill mission requirements in the eight codified joint space capabilities: space situational awareness; position, navigation and timing; space control; satellite communications; satellite operations; missile warning environmental monitoring; and space-based intelligen surveillance and reconnaissance.

As the core of the Army space cadre, FA40s provide in-depth expertise and experience to leverage spacerelated assets that deliver space capabilities to the warfighter today, as well as develop and integrate space allow FA40 to continue to acquire necessary talent to capabilities for the future. ASPDO also manages the maintain a human capital advantage into the future. Initial Training with Industry and Advanced Civil Schooling indications show strong interest in this program. Within programs for FA40s that help develop space officers' the first few days of the www.GoArmy.com website experience and skills that augment Army space initiatives. rollout, ASPDO received more than 35 applicants.



Capt. Holly Cross, commander, Detachment 1, 4th Space Company, and Capt. Michael D Masty, Army liaison and deputy dean of the National Security and Space Institute's Space Warfare College, speak with cadets at the U.S. Military Academy at West Point, New York, about the Assured Functional Area Transfer pilot program. AFAT offers USMA and ROTC cadets with space-oriented science, technology, engineering and mathematics degrees the opportunity to "branch detail" into the Functional Area 40 space operations officer military occupational specialty after serving four years in their basic branch. (U.S. Army photo)

ASPDO performs FA40 force management to ensure the right skill sets and experience are efficiently applied to Army advantage as well as in consideration of the officer's desired career path.

	ASPDO is piloting two Talent Management Task Force
	initiatives for the Army. First is the Assured Functional
ties	Area Transfer initiative. This program gives 10-20 U.S.
	Military Academy and ROTC cadets, with space-oriented
6	science, technology, engineering and mathematics
	degrees the opportunity to "branch detail" to FA40. After
	commissioning, the officers will serve four years in their
е	basic branch, then they are guaranteed to transfer to
<b>]</b> ;	FA40. Twenty cadets from both ROTC and West Point
nce,	were selected as the first AFAT class in February 2020.
	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 will

### 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



Bob Hill, left, and Charlie Wilcox discuss a sever in the Space and Missile Defense Center of Excellence Simulation Center, one of the CoE's three major labs that support mission accomplishment and provide a test bed for future operations. (U.S. Army photo by Carrie David Campbell)

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 battlemanagement systems employed by the National Capital Region Integrated Air Defense System. The purpose is to enable effective integration of U.S. Army groundbased 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.



# New position builds synergy with schoolhouse, ASPDO

Col. William Starr, commandant, Space and Missile Defense Center of Excellence, addresses students in the Army Space Cadre Basic Course at Peterson Air Force Base, Colorado, Oct. 8, 2020. (U.S. Army photo by Master Sgt. Andrew Brown)



he Space and Missile Defense Center of Excellence established an office of the commandant in February 2020 in an effort to integrate the Army Space Personnel Development Office, the personnel proponent for the Army's Functional Area 40, and the Space and Missile Defense School.

Col. William Starr, commandant of the Space and Missile Defense Center of Excellence, serves as the bridge between the school house and ASPDO to ensure effective communication between the two components.

"The addition of the commandant office is building synergy between ASPDO and the school," Starr said. "As they work more closely together we can get out in front of changes that are coming throughout the force for FA40s (space operations officers) and space overall to create a better product in support of the warfighter."

The SMD School trains the Army's space and missile defense forces of tomorrow to plan and integrate space and missile defense capabilities to support warfighting readiness within all formation echelons and across all warfighting domains. To prepare the SMD School students, Starr believes it is important to take what is learned in the field and put those lessons into the classroom.

"As the commandant, I am the single point of contact for the training side of the house with the school, and also the personnel side of the house for our FA40s," Starr said. "To the tactical users of space, it means that we can more quickly adapt to things we are seeing in the field by transitioning those lessons learned throughout the rest of the Army, making it a faster process, especially as space continues to integrate into our tactical formations."

To Starr, the commandant's office means providing support to ASPDO and the school house so they can continue to do the tremendous work they are already performing.

"I am here to let them focus more on their mission and to provide more integration on their behalf to get things done for them," Starr said.

43



### **NASA Detachment**

### **Chief Technology** Office

he 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



U.S. Army astronaut Col. Andrew Morgan poses for a photo during extravehicular activity at the International Space Station's Alpha Magnetic Spectrometer worksite Jan. 25, 2020. Morgan and European Space Agency Italian Air Force Col. Luca Parmitano completed repairs on the AMS. a state-of-the-art particle physics detector. (Photo by ESA Astronaut Col. Luca Parmitano)

2013. Lt. Col. Frank Rubio, selected in 2017, completed the Astronaut Candidate Program in January 2020.

USASMDC astronauts train to fly as flight crew on NASA space missions and provide engineering expertise for human interfaces with spacecraft. Army astronauts and space operations officers are ambassadors to both NASA and the public and bring fundamental Soldier skills such as leadership, operational experience and technical expertise to 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 crew members, learning the Russian language, and maintaining proficiency in robotics, spacewalking and ISS emergency procedures. Each astronaut is assigned a number of additional duties including: provide their technical expertise in spacecraft design and habitability, perform on-board payload

activities, and function 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 room, integrate with government and commercial space mission partners, and serve as program management and 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 officers have passed through the detachment. Several retired Army astronauts continue to serve in NASA leadership positions.

2021 GLOBAL DEFENDER | A GUIDE TO USASMDC

#### PURPOSE

he chief technology officer serves as the scout for the U.S. Army Space and Missile Defense Command's leadership to uncover potentially gamechanging 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-, midand 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.

#### IMPACT

Despite the impacts of COVID-19, in 2020 the CTO maintained a two-way information highway linking the command to military, industrial and academic science and technology organizations. By moving into the virtual world, the CTO initiated and participated in events online that brought new and promising technology into the command.

A key contributor to the flow of technical information in 2020 was the Chief Technology Officer Redstone Arsenal Roundup. The USASMDC CTO leads the roundup quarterly for the exploration and collaboration of mutual science and technology interests across



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

all organizations on Redstone Arsenal. By gathering the senior science and technology directors, the CTO Roundup provides a forum for better situational awareness of science and technology efforts across diverse organizations. In 2020, the CTO Roundup was hosted for the first time at a non-governmental facility off post. The University of Alabama in Huntsville shared their latest academic research.

> Assessments conducted in 2020 for the commanding general played a major role in understanding the role and security of foreign-made capabilities in the defense of the nation and its allies. USASMDC CTO supported the Program Executive Office for Missiles and Space in the acquisition of the Israeli Iron Dome force protection system.

CTO efforts in 2020 included documenting science and technology thoughts and advances, as well as scouting them. The Redstone Scientific Center was scheduled to close in 2020, thereby possibly losing potentially important historical information. CTO identified critical data to SMDC missions located at the RSIC and developed a plan to preserve it.

As the command's science and technology scout, the CTO will continue to work closely with internal and external organizations to ensure that U.S. warfighters have the game-changing technologies needed to accomplish any mission quickly and return home safely.



### 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 veteranowned 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 source of information for new 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 requirements can be found under the same Resources tab.

- 2. 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.
- 3. 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.
- 5. Prepare to meet with the USASMDC Small Business Office. Meetings can be either in person 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://www.beta.sam. gov to monitor sources sought, request for information, and 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.



The U.S. Army Space and Missile Defense Command utilizes small business concerns in key mission areas, such as technical support at the Ronald Reagan Ballistic Missile Defense Test Site. RTS is an activity of the Department of Defense Major Range and Test Facility Base; Its purpose is to execute and report on theater and strategic offensive and defensive ballistic missile testing and support space operations and experiments from the Kwajalein Atoll in the Republic of the Marshall Islands. (U.S. Army photo by Carrie David Campbell)

- 7. Seek additional assistance in the defense marketpl Procurement Technical Assistance Centers: 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 t business with DOD. They provide in-depth counsel on marketing, financial and contracting issues to sr business concerns at minimal cost.
- 8. The Small Business Administration offers assistant through their Small Business Development Center www.sba.gov/tools/local-assistance/sbdc, whi 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 guidar Also, get to know the local SBA Procurement Center Representative. He or she can be a valua resource for staying on top of regulatory updates/ changes, such as limitations on subcontracting,

lace.		and program guidance, such as the SBA All Small Mentor-Protégé Program.
to do ling mall	9.	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
nce ers: ich		submitted proposal meets all of the requirements of the solicitation.
	10.	Lastly, win a contractPERFORMand earn excellent experience.
n I	For of S	more information contact the USASMDC Office mall Business Programs
h nce. Ible /	ATT P.O. Hun Pho Ema	N: SMDC-SB . Box 1500 tsville, AL 35807-3801 ne: (256) 955-3412 ail:
	usa	rmy.reastone.smac.mbx.smaii-business-office@ mail.mil



### **Joint Functional Component Command for Integrated Missile Defense**



**COL Geoffrey Adams** Deputy Commander, Joint Functional Component Command for Integrated Missile Defense



#### SGSgt Michael List

Senior Enlisted Leader, Joint **Functional Component** Command for Integrated Missile Defense

#### PURPOSE

n 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.

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 Air 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 the USSTRATCOM responsibility as the global missile defense coordinating authority. JFCC IMD conducts global missile defense operations support, advocates for and recommends acceptance of missile defense capabilities, and executes joint and combined global missile defense training and education for the USSTRATCOM commander in support of combatant commands, the services and appropriate U.S. government agencies. These efforts deter adversaries, assure allies and defend U.S. deployed forces, allies and partners against missile attacks.

#### **IMPACT**

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 forcefully 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.

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 continue to proliferate and expand in range and lethality.

As a critical mission area, global missile defense encompasses missile defense operations, actions and activities 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.

Given the transregional nature of the threat and the low-density, high-demand nature of missile defense platforms and complex architecture of sensors, shooters, and command and control nodes spanning multiple areas of responsibility, combatant commands designated with responsibility for an adversary problem set must approach missile defense from a global perspective. JFCC IMD provides direct support to these efforts.



A Standard Missile-3 Block IIA launches from an Aegis Ballistic Missile Defense System-equipped destroyer as part of Flight Test Aegis Weapons System-44, Nov. 17, 2020. During FTM-44, members of the Joint Functional Component Command for Integrated Missile Defense and the U.S. Army Space and Missile Defense Command's Ronald Reagan Ballistic Missile Defense Test Site, Kwajalein Atoll, Republic of the Marshall Islands, worked alongside American ballistic missile defense forces as they intercepted and destroyed a threat-representative intercontinental ballistic missile target. (Courtesy photo)

The president has assigned USSTRATCOM with primary responsibility for global missile defense operational support, which has been delegated to JFCC IMD.

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

- A strong partnership with the services and the materiel Synchronize global missile defense planning, global developers ensures advocacy for future requirements, force management and missile defense security delivery of tested capabilities and informs decision cooperation activities. makers during operational acceptance of those · Conduct global missile defense operations support, capabilities into the architecture. In partnership with to include asset management, alternate execution combatant commands, JFCC IMD provides expertise to authority, federated intelligence support and network support planning, joint and combined training, resource monitoring and protection. allocation recommendations and asset management. All · Execute above element joint and combined of these key functions are essential to ensure U.S. global global missile defense training, exercises and missile defenses are postured to support U.S. national experimentation. defense objectives.

· Advocate for and recommend acceptance of global missile defense capabilities, conduct analysis and assessments of current and future capabilities, and support tests.

### **JBTEC** develops courseware during pandemic to continue critical training

The Joint Ballistic Missile Defense Training and Education Center is the Department of Defense's only certified Joint Center of Excellence.



he Joint Functional Component Command for Integrated Missile Defense J-7 provides world-class integrated air and missile defense training and education through classroom instruction, distance learning, exercises and practical application of modeling and simulation.

The Joint Ballistic Missile Defense Training and Education Center, or JBTEC, is the execution agent for JFCC IMD J-7, advancing the combat capability of missile defense joint warfighters.

"The JBTEC provides joint IAMD operators, planners and staff personnel with the joint competencies and skills to serve in combatant commands, their service components, and with coalition and allied partners," said John Kaufman, chief, JFCC IMD J-7 Missile Defense Training, Exercises and Education.

Even with COVID-19 creating obstacles during 2020, the JBTEC team still provided joint missile defense training and education in many countries, with more than 85 percent of the courseware being delivered via mobile training teams. When COVID hit, the JBTEC team meticulously declassified the courseware to enable learning from home.

John M. Griffiths III, a security operations specialist with the Defense Threat Reduction Agency, said he thoroughly enjoyed JBTEC's online training.

"It's comprehensive, well thought out and delivered professionally," Griffiths said. "I have learned so much more about our military and the education has definitely expanded my breadth of knowledge and appreciation for all that the Department of Defense does."

The training team, consisting of 26 contractors and two government civilians, produced more than 1,500 pages of material, providing more than 800 hours of instruction, and taught more than 6.500 students between March and October.

JBTEC is also the DOD's only certified Joint Center of Excellence. This was accomplished by the JBTEC team in September 2018, Kaufman said.

"The JBTEC Joint Center of Excellence took on a major task to maintain and provide worldclass training across the globe," Kaufman said. "The ability for this team to provide the level of training it has provided during this pandemic is nothing short of extraordinary. The hours spent not just providing the training, but developing the training, coordinating schedules, registering students, and maintaining the material to keep it current, is incredible, especially since the vast majority of this feat was accomplished with 90 percent of the team working from home."



### **U.S. Army Space and Missile Defense Command**

#### **REDSTONE ARSENAL**

USASMDC P.O. Box 1500 Huntsville, AL 35807-3801 Phone: (256) 955-3887

Office of Small Business Programs ATTN: USASMDC-SB P.O. Box 1500 Huntsville, AL 35807-3801 Phone: (256) 955-3412 Toll Free: (866) 260-8428

#### PETERSON AIR FORCE BASE

USASMDC 350 Vandenberg Drive Peterson Air Force Base, CO 80914-4912 Phone: (719) 554-1982

Office of Small Business Programs ATTN: Directorate C 350 Vandenberg Drive Peterson Air Force Base, CO 80914-4912 Phone: (719) 554-1969



#### www.smdc.army.mil



- www.twitter.com/armysmdc
- •• www.flickr.com/armysmdc
- www.youtube.com/armysmdc
- www.linkedin.com/company/armysmdc

Public Affairs email: usarmy.redstone.smdc.mbx.public-affairs@mail.mil



SPACE

### MISSILE DEFENSE

### HIGH ALTITUDE

WWW.SMDC.ARMY.MIL