

Space Force Doctrine Document 1

THE SPACE FORCE



UNITED STATES
SPACE FORCE

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Space Training and Readiness Command (STARCOM)
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Foreword

Space Force Doctrine Document 1, *The Space Force*, codifies why we exist as a Service, who we are as Guardians, and how we employ spacepower to drive the success of the joint force. To ensure unity of effort, it is essential that each of us fully internalizes these concepts and embodies them as we engage with the entirety of the joint force, our allies, and partners.

At the heart of this publication are six undeniable truths that I believe encapsulate our purpose.


- ▲ ***Space Force capabilities are critical to the joint force and the American way of life.*** Space has never been more vital to our national security or to our prosperity. At least half of the United States' critical infrastructure depends on space, and the joint force is sized with the assumption that military spacepower provides its backbone. In modern warfare, without space, kill chains do not close, operations are less synchronized, indications and warnings are constrained, and we lose.
- ▲ ***The Space Force must defend its capabilities, or the joint force will be unable to project power.*** Space matters, and we must be prepared to defend it. Our adversaries understand the importance of spacepower and are ready and willing to take it from us. Our mission is to secure our Nation's interests in, from, and to space. Space is our responsibility, and Guardians must contest and control the domain to ensure freedom of action.
- ▲ ***The Space Force must protect the joint / combined force from space-enabled targeting, or the joint / combined force will be unable to meet military objectives.*** Because space also matters to our adversaries, we must be ready to deny hostile spacepower. Adversary space capabilities allow them to hold our forces at risk. Our Sister-service airborne, maritime, and land-based capabilities cannot affect the battlefield if they are targeted over the horizon before they even reach theater. The joint force depends on Guardians to break these kill chains.
- ▲ ***Space is a warfighting domain, not a collection of supporting activities.*** In conflict, space will be a contested environment. We are the military Service dedicated to fighting in it. We do not merely provide support functions—we also employ military force to achieve space superiority in order to ensure our freedom of maneuver.
- ▲ ***The Space Force is responsible for organizing, training, and equipping critical space capabilities but is also responsible for performance of warfighting operations as an integral part of the joint force.*** It is our job to organize, train, and equip space forces, but we are also responsible for conducting warfighting operations in space. Space Force units of action align under Service components, where they operate under the authority of combatant commanders using Service-developed tactics and doctrine. Guardians are, and always will be, warfighters.
- ▲ ***Guardians are uniquely and specifically trained, educated, and experienced in warfighting activities in, from, and to the space domain.*** Guardians are the only warfighters with the dedicated career-long training, education, and experience specifically designed to achieve

space superiority. Guardians are preeminent space warfighters with the knowledge and expertise necessary to achieve US military objectives in the domain. If you want to win a war in space, you must have Guardians driving that part of the campaign.

Our ability to adapt to and outpace emerging threats will be instrumental in preserving our superiority in space during this era of strategic competition. We must evolve, take risks, and solve problems with urgency. Space is the linchpin in modern warfare, and the capabilities that the Space Force provides form the backbone of the joint force.

Our success or failure hinges entirely upon the performance of Guardians. At every level in any role, it is our responsibility to sharpen our readiness and to prepare for the challenges before us. Time and again, Guardians have demonstrated the confidence and skills necessary to overcome any obstacle, and it is Guardians who will ensure the Space Force answers our Nation's call.

Your character, commitment, connection, and courage are why I am confident that the Space Force can fight and win against any adversary.

A handwritten signature in black ink, reading "B. Chance Saltzman". The signature is written in a cursive, flowing style.

B. CHANCE SALTZMAN
General, USSF
Chief of Space Operations

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Chapter 1 Why We Fight: The Imperative for Spacepower

National Spacepower

National spacepower *is the totality of a nation's ability to exploit the space domain in pursuit of prosperity and security*. Comparatively, national spacepower is the strength of a nation's ability to leverage the space domain for diplomatic, informational, military, and economic purposes, relative to our adversaries and competitors. As reflected below, access to and exploitation of the space domain multiplies a nation's strength across all instruments of power.

- ▲ Space exploration and research strengthens diplomatic power by bolstering national prestige and generating opportunities for peaceful multinational cooperation and the advancement of human knowledge.
- ▲ United States (US) space capabilities are critical to obtaining information for adequate exercise of the instruments of national power.
- ▲ On the modern battlefield, spacepower has become a prerequisite for global deterrence and power projection, critical to our Nation's military power.
- ▲ The US commercial space industry is a rapidly growing segment of the economy with limitless potential to amplify the economic power of the United States.

In this era of sustained strategic competition, maintaining a competitive edge through superior national spacepower is critical to securing our Nation's strategic interests in, from, and to space.

Military Spacepower

Military spacepower *is the ability to accomplish military objectives in, from, and to the space domain*. Securing our national interests in space requires safeguarding and enhancing the ability of US commercial, civil, intelligence, and military entities to safely access, maneuver within, and exploit the space domain without prohibitive interference. Military spacepower supports and reinforces deterrence by demonstrating America's ability and willingness to impose costs and deny an adversary's benefit from hostile actions. The United States shows strength, and support for our allies and partners, through our ability to wield spacepower in, from, and to space. Guardians are the practitioners of military spacepower and are prepared to compete and win against adversaries who threaten our Nation's prosperity, security, or strategic aims.

Guiding Foundations

The Space Force was established on 20 December 2019 for the purpose of securing the Nation's vital interests in space. The Space Force's commitment to the Nation is rooted in the oath every Guardian takes to support and defend the Constitution. Through Title 10 United States Code, Congress directs statutory roles for the military departments and Services. Department of Defense Directive (DoDD) 5100.01, *Functions of the Department of Defense and Its Major*

Components, expands on those roles. Ensuring strategic alignment to our national decision makers also requires conformity to the National Security Strategy, National Defense Strategy, and National Military Strategy.

Statutory Roles of the Space Force

Title 10 United States Code § 9081(c) directs that the Space Force shall be organized, trained, and equipped to:

- ▲ Provide freedom of operation for the United States in, from, and to space.
- ▲ Conduct space operations.
- ▲ Protect the interests of the United States in space.

Subject to the authority, direction, and control of the Secretary of Defense and the Secretary of the Air Force, DoDD 5100.01 directs that in addition to common military functions listed in figure 1, the Space Force shall develop concepts, doctrine, tactics, techniques, and procedures and organize, train, equip, and provide forces to perform the following specific functions:

- ▲ Provide freedom of operation for the United States in, from, and to space.
- ▲ Provide prompt and sustained space operations.
- ▲ Protect the interests of the United States in space.
- ▲ Deter aggression in, from, and to space.
- ▲ Conduct space operations.

DoDD 5100.01 also assigns the Space Force responsibility for military functions common to each Service.

- Develop concepts, doctrine, tactics, techniques, and procedures for space forces.
- Organize, train, and equip (including research and development) forces to contribute unique service capabilities to the joint force across all domains and areas of responsibility, and to conduct support to civil authorities.
- Recommend to the Joint Chiefs of Staff the assignment and deployment of forces to the combatant commands.
- Monitor and assess operational readiness and capabilities of forces for assignment to the combatant commands and plan for the use of intrinsic capabilities of the other Military Services, United States Special Operations Command, and United States Cyber Command.
- Coordinate and consult with other Military Services on all matters of joint concern.
- Determine force requirements and make recommendations concerning requirements to support national security objectives and strategy.
- Provide training for joint operations and joint exercises in support of combatant command and operational requirements.
- Conduct operational testing and evaluation.
- Operate organic capabilities (e.g., spacecraft or space systems) and provide command and control.
- Provide force protection and logistical support for the Service and its forces assigned to joint commands.

Figure 1. DoDD 5100.01 Common Military Service Functions

Mission

From our statutory responsibilities, we have derived our mission statement:



Figure 2. The Space Force Mission

As presented in Joint Publication 3-0, *Joint Campaigns and Operations*, we perform our mission across the competition continuum (figure 3). This includes enabling joint force activities to assure our allies and partners, and to deter, compel, and apply force to our adversaries. Given the importance of military and national spacepower as contributors of the instruments of power (diplomatic, informational, military, economic), space forces enable significant effects in cooperation and competition below armed conflict. Some examples may include offering new avenues of space-related security cooperation to international partners, competing for strategic leadership roles in space, strengthening ties and mutually beneficial relationships with industry partners, or bolstering strategic narratives through widely visible space activities. Military space forces play a key role in armed conflict and war through the application of force in the space domain and enabling the application of force in all other domains and environments.

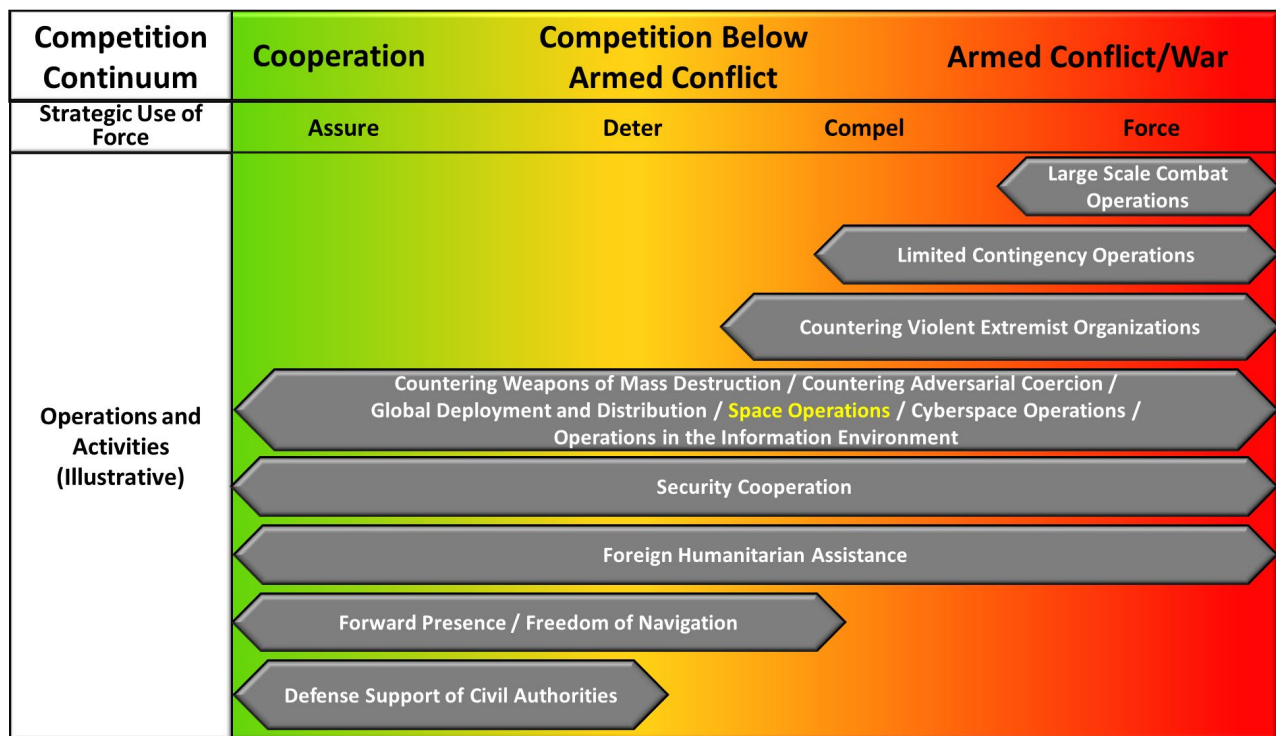


Figure 3. The Competition Continuum

Space Warfare

To achieve our mission, the Space Force must be prepared to conduct warfare to deter or compel adversary behavior, undermine adversary intent, and enable joint all-domain application of force, through force or the threat of force in, from, and to the space domain. These activities may include but are not limited to:

- ▲ Deterring or denying attacks on friendly space capabilities by holding adversary space forces at risk.

- ▲ Compelling an adversary to cease aggressive action in any domain by disrupting, denying, degrading, or destroying the space capabilities they rely on to achieve their military objectives.
- ▲ Undermining an adversary's strategy and their intent to attrit friendly space capabilities through forcible action in, from, and to the space domain.
- ▲ Enabling the application of force in all domains by providing a space-enabled combat edge to terrestrial forces.

The strategic and operational appropriateness of these approaches is highly contextual, and their effectiveness is dependent on how friendly and adversary actors perceive the relative value of their space capabilities as they weigh potential costs and benefits.

Although Guardians are the primary practitioners of space warfare, other Services also contribute effects in, from, and to the space domain. For maximum impact, the military conducts these operations in concert with other instruments of power to achieve our Nation's strategic goals.

Space Superiority

Space superiority is the degree of control that allows forces to operate at a time and place of their choosing without prohibitive interference from space or counterspace threats, while also denying the same to an adversary. In this context, space threats should be considered any adversary space capabilities that enable all-domain attacks on the joint force. Counterspace threats are adversary capabilities that hold friendly space capabilities at risk. The requisite degree of control to and from the domain may include control of key links, nodes, and forces across the air, land, maritime domains, cyberspace, and the electromagnetic environment.

Space superiority's requisite quality and scope are highly contextual and may be bound functionally, temporally, and spatially—e.g., establishing a relative communication advantage in a specific joint operational area at a specific time. The ability to establish space superiority at the time and place of our choosing is critical to joint lethality in all domains.

Competitive Endurance

Since the emergence of nuclear weapons, most competition between rival great powers has occurred below the threshold of direct hostilities. It is in this gray space where the adversary tests our commitment, where we demonstrate our resolve, and establish our credibility. An enduring part of strategic competition is conducting low-intensity operations without compromising high-intensity readiness.

Joint Publication 3-0, *Joint Campaigns and Operations*, delineates how the joint force integrates and balances actions across time and areas of responsibility (AORs) to achieve the objectives of military strategy within acceptable risk. This prevents operational fatigue through strategic competitions which are, by their very definition, protracted. Campaigning space forces should shift the competition into areas of relative advantage for the United States, thereby raising the net

risk and cost to adversaries engaging in irresponsible or threatening behaviors. These areas of competition may revolve around military or technological superiority, but also legitimacy, credibility, influence, and political will.

Competitive Endurance is the Space Force's approach to achieving space superiority, when necessary, in crisis or conflict, while maintaining the safety, security, stability, and long-term sustainability of space. Establishing the capabilities, culture, and commitment of combat-credible forces is essential for success against a peer adversary. This approach has three core tenets:

- ▲ **Avoid Operational Surprise.** Space forces must be able to detect and preempt any perturbations in the operational environment that could compromise the ability of the joint force to achieve space superiority. This requires the full breadth of space domain awareness data including intelligence, environmental monitoring, and cooperative reporting to support timely and actionable decision making.
- ▲ **Deny First-Mover Advantage.** Space forces must have the capability and resiliency to deter or overcome an adversary's first strike in space, making it impractical and self-defeating.
- ▲ **Conduct Responsible Counterspace Operations.** Space forces must be able to conduct a sequence of military activities that enable protection of the Nation and the joint force from space-enabled attack without generating long-lived hazardous debris.

Competitive Endurance sets the necessary conditions in peacetime to endure in a long-term state of competition and postures US forces to prevail in conflict. This allows the joint force to effectively engage strategic rivals in a way that favors US national interests.

Chapter 2 Who We Are: Guardians and Military Space Professionals

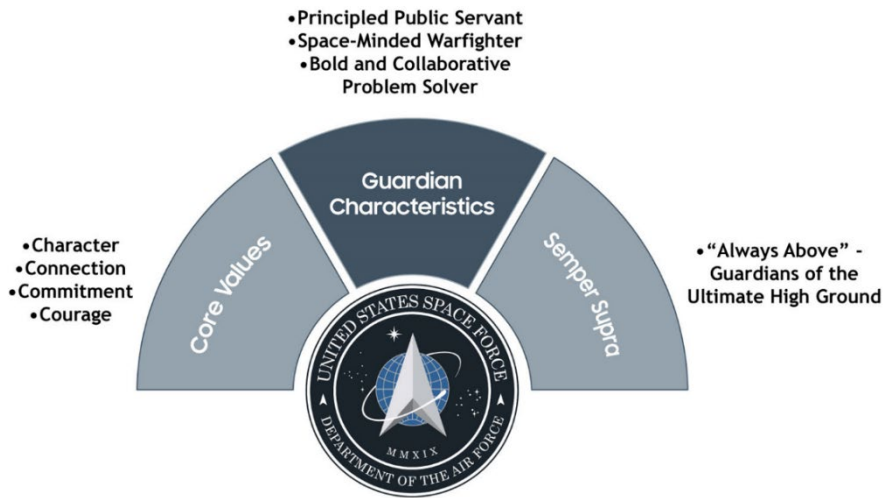


Figure 4. The Space Force – Our People

Our Values

Our greatest assets are the Space Force Guardians who develop, employ, and advance military spacepower for the Nation. These space-minded warfighters have internalized the Service’s mission to *secure our Nation’s interests in, from, and to space*. Our people are consummate space professionals with the trust of the American people, who abide by the core values of our Service. Every Guardian is a warfighter, developed with the foundational skills and experiences to lead and win in a highly contested, lethal, and uncertain security environment. The Space Force’s philosophy of Guardian development focuses on building multi-disciplinary Guardians with a common foundational baseline to synchronize efforts across the range of Space Force missions.



Figure 5. Space Force Core Values

As Guardians we value character, connection, commitment, and courage. These values unite Guardians, make us stronger, and sustain us as a ready force of combat-credible warfighters.

The Guardian Spirit embodies the personal and professional characteristics of what it means to be a member of the Space Force.

- ▲ **Principled Public Servant.** Guardians who embody the values of character, connection, commitment, and courage. Selfless public service is foundational to the Space Force and the source of trust the American people place in the US military.
- ▲ **Space-minded Warfighter.** Guardians who are deeply committed to defending our Nation, protecting our interests, and defeating our adversaries. Guardians have a deep understanding of space operations, understand their role as a participant in joint unified action, and are experts in fielding and employing space capabilities against a thinking adversary.
- ▲ **Bold and Collaborative Problem Solver.** Guardians who engage with, analyze, and debate new ideas and perpetually challenge the status quo. When presented with a problem, we have the courage and persistence to experiment, fail, learn, adapt, and innovate. As Guardians we are ready to seize and exploit the initiative and are comfortable empowering subordinates to act.

The Space Force motto, “Semper Supra,” which is Latin for “Always Above,” captures the *esprit de corps* of current and future Guardians. Securing the ultimate high ground is our duty and promise to the American people. The values we instill in our people, the characteristics we seek and inculcate in our force, and the Service motto we internalize are critical to the vitality of the Space Force.

Officers, Enlisted, and Civilian Guardians

The Space Force defines clear roles, responsibilities, and duties for our officers, enlisted, and civilian members. In defining and delineating Guardian roles and responsibilities the Space Force provides a clear professional development path for Guardians to meet the high-tech demands of our Service and build a combat-credible force.

- ▲ **Officers.** Officers are principally leaders and planners. These Guardians undergo extensive education and training across the core functions, the Space Planning Process, the Joint Planning Process, joint operations and warfare, and command. Through intentional development, officers learn to lead through mission command at all levels (tactical, operational, and strategic), direct staff functions, and execute planning and operations to integrate space into the joint all-domain fight.
- ▲ **Enlisted.** Enlisted personnel are the Service’s warfighters. They train as frontline operators, developing technical expertise. Enlisted Guardians possess extensive operational experience and execute orders through mission command to achieve commander’s intent. With their mission area and weapon system expertise, enlisted Guardians are the Service’s primary source of instructors and innovators. Select senior

enlisted Guardians fill leadership roles at every level of command advising their officer and civilian counterparts.

- ▲ **Civilians.** Civilians bring specialization, operational stability, and the potential for continuity critical to every Space Force function and area of operations. They provide corporate knowledge, supervision, and management at the tactical, operational, and strategic levels. Civilians fill functional areas that exist outside of Space Force’s officer and enlisted career fields. They lead, plan, and manage essential functions through mission command at every level of the Service.

Full-time and Part-time Service Options

The Space Force allows its military force to leverage full- and part-time service options, allowing for more flexibility in the management of our military force, improving available military personnel readiness, improving quality of life and retention, and enabling the Space Force to attract and retain attract talent to deliver unmatched space capabilities for future challenges not yet revealed. Guardians in part-time work roles enhance the innovation of the Space Force personnel resource management. These roles support space operations in predictable windows of time, varying part-time durations and compatible with part-time employment. Eliminating the traditional component structure, which separates members serving on active duty from those in Reserve units, provides the Space Force with more flexibility to attract, train, employ, and retain skilled Guardians inspired to serve their country.

The Space Force Functional Structure

The Space Force uses a streamlined organizational structure supporting the globally dispersed employment of Guardians. The Space Force organizes its forces to:

- ▲ Remain agile, lean, and mission focused.
- ▲ Effectively and efficiently develop, sustain, and employ Space Force capabilities for the joint fight.
- ▲ Enable mission command with clear lines of responsibility and authority.
- ▲ Standardize where appropriate and remain flexible where needed.

The Space Force includes two types of forces: institutional and operational.

- ▲ **Institutional Forces.** Our institutional forces consist of Guardians fulfilling Space Force statutory roles to our organize, train, and equip forces (as outlined in chapter 1). These are non-operational forces that are always under Service control.
- ▲ **Operational Forces.** These forces, when in the appropriate phase of the Space Force Generation (SPAFORGEN) process, support operations for the combatant commander whether employed-in-place (EiP), deployed, or Service retained (discussed further in chapter 4).

- ▲ **EiP Forces.** EiP space forces execute their mission from a home station. EiP forces have global reach, delivering effects to enable multiple combatant commands simultaneously. EiP Guardians may also execute their mission from an overseas home station, operating as forces presented to a single combatant commander as part of a Component Field Command (C-FLDCOM).
- ▲ **Deployable Space Forces.** Deployable space forces are those units that physically relocate to support a joint force commander. Typically, these forces provide regional operational effects localized to an assigned AOR for a specific mission or rotation.
- ▲ **Service Retained Forces.** Service retained forces are operational forces that remained assigned to the Service, as reflected in the “Forces For” memorandum. This includes Guardians in the Prepare and Ready SPAFORGEN phases. This enables the Space Force to rapidly attach forces to any combatant commander requesting deployable space capabilities.

Institutional Forces

Institutional forces are responsible for force design and force development. Force design focuses on “advancing the force,” and identifying the capabilities, capacity, and force structure required for Guardians to accomplish their roles and missions in the forecasted operational environment. Force development focuses on “preparing the force,” adapting and improving our processes, equipment, and thinking to account for projected operational challenges. This includes talent management, education, training, tactics development, test and evaluation, acquisition, and resourcing.

- ▲ **Office of the Chief of Space Operations.** The Chief of Space Operations (CSO) is responsible to the Secretary of the Air Force for fulfilling statutory Service roles and is also a member of the Joint Chiefs of Staff. Positioned at Headquarters, United States Space Force, the Vice Chief of Space Operations and Chief Master Sergeant of the Space Force support the CSO. Per Secretary of Defense direction, the CSO is the designated Force Design Architect for Space of the Armed Forces. The CSO, under authority, direction, and control of the Secretary of the Air Force, is responsible for presenting coordinated recommendations to the Secretary of Defense regarding space-mission force designs to satisfy the requirements of the joint force. The Joint Requirements Oversight Council has also designated the Space Force as the integrator for Department of Defense’s Joint Space Requirements.

On behalf of the CSO, the headquarters staff oversees resourcing and programming; develops strategy, policy, and guidance for the Service; leads requirements generation and force design policy for the Service; manages our workforce of the future; directs innovation and incorporation of advanced technology; enables operations and training to optimize readiness; oversees intelligence activities, policies and operations, and acts as Head of the Space Force Intelligence Community Element, Defense Intelligence Component Head, and Chief, Service Cryptologic Component.

- ▲ **Field Commands and Direct Reporting Units.** Space Force field commands (FLDCOMs) and direct reporting units align under Headquarters, Space Force. These organizations report to the CSO and execute organize, train, and equip responsibilities on behalf of the Secretary of the Air Force. Working together the FLDCOMs generate, present, sustain, train, and educate Guardians; develop, acquire, field, sustain, test, train, and exercise capabilities; forecast future threats; develop and validate concepts; and conduct wargaming activities to prepare the Service.
- ▲ **Deltas.** Deltas under the FLDCOMs conduct the day-to-day activities to develop and sustain the capabilities, infrastructure, and personnel required for the Service’s mission. The Space Force structure includes several types of Deltas.
 - ▲ **Space Deltas.** Space Deltas support institutional functions. These Deltas are responsible for training, doctrine, tactics, wargames, lessons learned, range and aggressor activities, education, test and evaluation, and exercises.
 - ▲ **System Deltas.** System Deltas perform acquisition functions including research, development, and initial fielding of space capabilities.
 - ▲ **Mission Deltas.** Mission Deltas unify the elements of readiness and ensure unity of effort for Space Force mission areas. These Deltas ensure collaboration between the operations, capability enhancement, and sustainment of a weapon system with the addition of cybersecurity and intelligence support as part of the structure.
 - ▲ **Space Launch Deltas.** Space Launch Deltas provide agile, responsive, and resilient spaceports, launch and test range capabilities for the Nation.
 - ▲ **Space Base Deltas.** Space Base Deltas provide installation operations support and community support services enabling delivery of space capabilities for national defense.
- ▲ **Squadrons.** A squadron is the unit that performs the preponderance of mission execution across the Service. Squadrons execute missions under the direction of their parent Delta. These include but are not limited to mission squadrons, combat training squadrons, space range squadrons, and space aggressor squadrons.
- ▲ **Detachments.** Organizations whose size or scope do not require a separate squadron may form as a detachment within an existing squadron. Due to mission requirements, detachments often function as geographically separated units and will have a commander.

Relationship to the Air Force

The Space Force, like the Air Force is an Armed Service under the Department of the Air Force. Upon its establishment, Congress directed the Space Force to limit the duplication of common functions and to leverage the support from the Air Force including from active-duty Airmen, Department of the Air Force civilians, Air Force Reservists, and Air National Guardsmen to execute the space mission. Air Force members provide personnel services to Guardians, and installation and facilities support for Space Base Deltas, Space Launch Deltas, and

geographically separated locations. These Airmen and their contributions are essential to the success of the Space Force mission and our Guardians. In addition to installation and personnel support functions, the Air Force also provides medical, legal, religious affairs, historian, finance, contracting, public affairs, meteorological, analytical, scientific, and mortuary affairs support to Guardians. The Air Force also provides combat service support functions for Guardians in deployed locations and EiP installations including transport, facilities, search and rescue, and evacuation.

Relationship to Other Government Agencies

The Space Force's relationship with interagency partners is essential to the coordinated, mutually beneficial conduct of activities within a shared operational environment. Clear, mutually supportive agreements and close coordination with the intelligence community are essential to achieving shared strategic aims. The Space Force's relationship with civil agencies is equally critical to maximizing spacepower across all the national instruments of power. These organizations include, but are not limited to, the Department of Transportation, the Department of Commerce, and the National Aeronautics and Space Administration. As part of the Department of Transportation, the Federal Aviation Administration plays a key role in positioning, navigation, and timing activities as they bear on safety of flight concerns, as well as the protection of public safety and government space assets during launch and reentry activities. The Department of Commerce is home to several organizations supporting space operations, including the National Oceanic and Atmospheric Administration, the Office of Space Commerce, and the National Telecommunications and Information Administration. The National Oceanic and Atmospheric Administration provides natural environmental data and exploitation information in partnership with Space Force and other DoD environmental monitoring agencies. The Office of Space Commerce is responsible for space traffic management in cooperation with the Space Force. The Space Force coordinates with the National Telecommunications and Information Administration for electromagnetic spectrum management, and with the Federal Communications Commission for communications systems management. Finally, the National Aeronautics and Space Administration and the Space Force maintain a close, mutually supportive relationship to conduct activities related to the civilian space program, aeronautics, and space research and development. While not an all-encompassing list of interagency partners, these organizations possess critical relationships with the Space Force.

Relationship to Allies and International Partners

Mission success and the ability to prevail against our strategic competitors is unattainable without robust foreign partnerships. The Space Force relies on these partnerships to achieve our objectives. The Space Force collaborates with key partners to integrate and synchronize space operations that produce enduring operational advantages, reinforcing global norms of responsible behavior that benefit the United States, and our allies and international partners alike. These partnerships support a safe, secure, stable, and sustainable space domain while eroding adversary opportunities. Strengthening these relationships requires direct collaboration and information

sharing with our key partners and eliminating barriers to collaboration such as over-classification, cultural differences, and incompatible systems. Developing these relationships requires Guardians in key positions to establish and maintain strategic partnerships and security cooperation. These coordinated efforts are critical across the competition continuum, ensuring freedom of action in the space domain for the joint force and our allies and partners.

Relationship to Commercial and Academic Partners

The Space Force engages with commercial and academic partners to capitalize on new technology and perspectives while leveraging shared capabilities that enhance space operations and complicate adversary decisions. As stated in the *U.S. Space Force Commercial Space Strategy*, the Space Force is focusing on stronger partnerships with commercial providers (domestic and in allied and partner nations) and the integration of commercial space solutions to provide more resilient, redundant, and combat-effective capabilities for the joint force. Employing hybrid space architectures allows the Space Force to leverage a variety of goods, services, and activities from the commercial and academic partners to provide flexibility in meeting mission needs.

Operating In, From, and To the Space Domain

Operating in, from, and to the space domain requires operating within:

- ▲ **Space Domain.** The space domain is the area above the altitude where atmospheric effects on airborne objects become negligible. It is an austere, highly radiated environment congested by environmental and human-made debris and subject to drastic temperature fluctuations. Physics in the domain create challenges for position, movement, maneuver, security, and safety of flight.

Within the space domain, the Space Force currently considers three orbital regimes for current and future space operations. An orbital regime is a region in space associated with a dominant gravitational system capable of capturing the orbit of other objects.

- ▲ **Geocentric Regime.** The geocentric regime is the spherical region of space where Earth's gravity dominates, and objects follow orbits and trajectories around the Earth, extending out to and beyond geosynchronous Earth orbits (including but not limited to transfer orbits and the disposal belt).
- ▲ **Cislunar Regime.** The cislunar regime is the spherical region extending out from geosynchronous orbit to the Second Earth-Moon Lagrange point and characterized by the combined gravitational effects of the Earth and/or the Moon. This includes the space between these bodies, the orbits and trajectories around the Earth-Moon Lagrange points, and lunar orbits where the Moon's gravity is dominant.
- ▲ **Heliocentric Regime.** The heliocentric regime, defined by the Sun's gravitational field, encompasses regions in the solar system that are not primarily under the influence of the Earth, Moon, or other solar system body. The heliocentric regime also includes the Sun-Earth Lagrange points and their associated orbits and trajectories.
- ▲ **Electromagnetic Environment.** The electromagnetic environment includes the range of wavelengths or frequencies of electromagnetic radiation, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma rays. The electromagnetic spectrum is essential to all space operations, enabling communications, sensing, and the delivery of information and effects via transmitted signals in an increasingly congested and contested environment.
- ▲ **Cyberspace.** Within the information environment, cyberspace consists of the interdependent networks of information technology infrastructures and resident data, including the internet, telecommunications networks, computer systems, and embedded processors and controllers. By this definition, we conduct all space operations within cyberspace and share the environment with allied, neutral, and adversarial parties. The Space Force's ability to project spacepower relies on its ability to maneuver to, from, and through cyberspace.

- Air, Land, and Maritime Domains.** These domains possess critical infrastructure upon which the success of friendly and adversarial space operations rely, as well as the user equipment which receives space-enabled information. Awareness and protection of activities, infrastructure, and personnel in these domains are critical to military space operations.

Core and Enterprise Functions

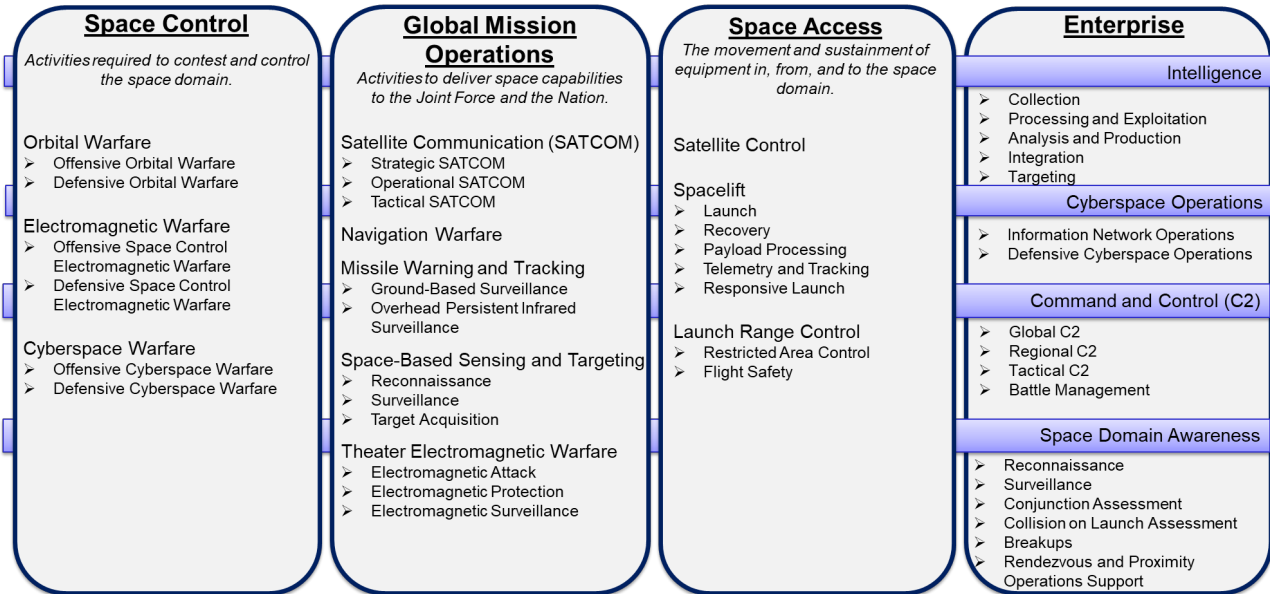


Figure 6. Alignment of Core Functions and Enterprise Functions

The Space Force has three core functions aligned to our mission, that we conduct in, from, and to the space domain: space control, global mission operations, and space access. Our core functions are the broad and enduring operational roles that we organize, train, and equip Guardians to perform. Mission areas and mission sets, groupings of interrelated activities, contribute to each of the core functions. See appendix b for a complete listing and descriptions of the core functions, mission areas, and mission sets.

- A Space Control.** Space control comprises the activities required to contest and control the space domain. The desired outcome of space control activities is space superiority, a degree of control that allows forces to operate at a time and place of their choosing without prohibitive interference from space or counterspace threats, while also denying the same to an adversary. Space control consists of offensive and defensive actions, referred to as counterspace operations. Three mission areas contribute to space control: orbital warfare, electromagnetic warfare, and cyberspace warfare.
- A Orbital Warfare.** Combat operations conducted through fires, movement, and maneuver to control the space domain.

- ▲ **Electromagnetic Warfare.** Combat operations on the link segment through electromagnetic spectrum fires to control the space domain.
- ▲ **Cyberspace Warfare.** Combat operations conducted in cyberspace through fires, movement, and maneuver to control the space domain.
- ▲ **Global Mission Operations.** Global mission operations are those activities to deliver space effects in support of military operations. Through global mission operations, the Space Force offers a space-enabled combat edge, ensuring the United States can out-see, out-shoot, out-maneuver, and out-communicate any adversary. The global mission operations core function includes five mission areas: satellite communication, navigation warfare, missile warning and tracking, space-based sensing and targeting, and theater electromagnetic warfare.
 - ▲ **Satellite Communications.** Secure, resilient communication services provided through space-based platforms.
 - ▲ **Navigation Warfare.** The assurance or denial of positioning, navigation, and timing data through space, cyberspace, and electromagnetic spectrum operations.
 - ▲ **Missile Warning and Tracking.** Activities to detect missile launches, track their trajectory, and issue timely warnings.
 - ▲ **Space-Based Sensing and Targeting.** Space-based activities and operations to provide terrestrial battlespace awareness.
 - ▲ **Theater Electromagnetic Warfare.** Actions taken in the electromagnetic spectrum to protect or prevent the ability to communicate using space-based platforms.
- ▲ **Space Access.** Space access is the movement and support of military equipment and personnel into the space domain, from the space domain back to Earth, and through the space domain. These activities "set the space theater" for military operations. Satellite control along with launch and range control are the space access mission areas.
 - ▲ **Satellite Control.** Activities necessary to assure the infrastructure, networks, equipment, and connectivity that enables mission control (i.e., telemetry, tracking, and commanding) of satellites.
 - ▲ **Spacelift.** The movement of payloads (spacecraft or other materials) to and from the space domain.
 - ▲ **Launch Range Control.** Activities to ensure the provision of a safe and secure range for space launch operations.
- ▲ **Enterprise.** The Space Force recognizes four cross-cutting enterprise functions which are key enablers of the core functions. These include intelligence, cyberspace operations, command and control, and space domain awareness. A set of nested enterprise areas support each function (see appendix b for the full list and descriptions).
 - ▲ **Intelligence.** The products resulting from the collection, processing and exploitation, analysis and production, integration, and targeting concerning

foreign nations, hostile or potentially hostile forces, and areas of actual or potential operations.

- ▲ **Cyberspace Operations.** The employment of networked, stand-alone, and platform-embedded information technology infrastructure for the access to and use of data to achieve effects in or through cyberspace.
- ▲ **Command and Control.** The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission.
- ▲ **Space Domain Awareness.** The detection, characterization, attribution, prediction, and targeting of activities in the space domain to inform decision making.

Space Systems Architecture

Guardians employ space systems to conduct activities and create effects in, from, and to the space domain. Space systems include components in three segments operating across all operational environments and domains.

- ▲ **Orbital Segment.** The orbital segment includes space systems operating in the environment of the space domain.
- ▲ **Terrestrial Segment.** The terrestrial segment systems operate in the land, air, and maritime domains.
- ▲ **Link Segment.** The link segment of space systems operates in the electromagnetic spectrum.

The integration of the space architecture across the three segments determines capabilities, limitations, and vulnerabilities for space operations. Preserving a space capability requires protection in all three segments. An attack on any segment of the space architecture can deny, degrade, or destroy a space capability.

Command and Control of Spacepower

Effective command and control (C2) is essential to the application of spacepower. Joint Publication 1, Volume 2, *The Joint Force*, defines C2 as the exercise of authority and direction by a properly designated commander over assigned, attached, or allocated forces in the accomplishment of the mission. It includes three basic functions:

- ▲ Gaining and maintaining situational awareness.
- ▲ Enabling operational decision making.
- ▲ Directing forces.

Command includes both the authority and responsibility to use resources to accomplish assigned missions. Command at all levels requires motivating and directing people and organizations to accomplish missions. Timely and relevant intelligence enables commanders to make decisions and execute those decisions more rapidly and effectively than the enemy.

Control is inherent in command. It allows commanders to manage and direct forces and functions consistent with their authority. Control of forces and functions helps commanders and staff compute requirements, allocate means, and integrate efforts. Control is necessary to determine the status of organizational effectiveness, identify variance from set standards, and correct deviations from these standards. This permits commanders to acquire and apply means to support the mission and develop specific instructions from general guidance.

C2 and battle management are different. C2 are the activities used by the chain of command to provide forces the direction needed to accomplish an overall objective. Battle management does not require command authority but supports the control of forces in a dynamic operating environment to optimally achieve mission objectives established by the chain of command.

As with any physical domain, joint operations area, or AOR, the C2 of space forces reflects the distinctive character of space operations and the unique attributes of the space domain's physical dimension.

- ▲ **Unique characteristics of space capabilities makes them difficult to apportion.** Some capabilities support multiple AORs simultaneously, others are rapidly shifted, and some cannot persistently support a single AOR. In other cases, space forces may operate completely within one AOR to support another combatant command. C2 approaches should consider these factors and develop methods to reduce operational friction.
- ▲ **Operations in, from, and to the space domain regularly cross AOR boundaries.** The C2 of spacepower in any AOR requires coordinating, deconflicting, and as necessary, controlling the transit of effects in and out of other combatant commands' AORs.

Command and Control Guiding Principles

These guiding principles should inform the development and employment of C2 approaches for space forces.

- ▲ **Commander Driven.** Commanders have command authority by virtue of rank or assignment and are expected to exercise their responsibility for C2. Staffs and operations centers execute these authorities on behalf of the commander.
- ▲ **Command at Echelon.** The Space Force organizes combat forces with at least two echelons of command: (1) Service component and (2) combat formation. The Commander of Space Force Forces (COMSPACEFOR) may aggregate combat detachments or combat squadrons under a combat delta with delegated authority to increase decision speed based on the timing and tempo of combat operations. Chapter 4 provides additional details about combat formations.

- ▲ **Mission Command.** The most effective way to C2 space forces in a contested, degraded, and operationally limited environment is through C2 at echelon using the principles of mission command. Mission command, discussed further in the next section, relies on a shared understanding and trust between echelons and empowers subordinate units to exercise disciplined initiative and independent action to support commander's intent and direction.
- ▲ **Shared Understanding.** Commanders and their staffs require relevant information to facilitate sound and timely decision-making, key to successful military operations at all echelons. Unified and synchronized actions guide the force towards objectives and mission accomplishment. Shared understanding of the operational environment and commander's intent is critical to ensuring this unified and synchronized action across echelons.
- ▲ **Process Focused.** C2 is a continuous process which can be made more effective by tailored materiel systems and a consistent battle rhythm commensurate with a Service's warfighting concepts. Materiel systems may facilitate planning and increase the speed and clarity of orders but are not the C2 mechanism themselves. Effective C2 conveys the commander's intent, a desired end state, prioritization of tasks, rules of engagement, and any special instructions or unique procedures required. This occurs through the joint planning process. The joint planning process leverages an orderly, analytical set of logical steps to frame a problem; examine a mission; develop, analyze, compare, and select the best course of action; and produce a plan or order that aligns tactical action with commander's intent.
- ▲ **Integration and Synchronization.** Integration and synchronization with other Service and functional components, interagency mission partners, commercial providers, and coalition partners occurs at the appropriate echelon level and across domains.
- ▲ **Decentralized Execution.** Effective C2 at echelon requires commanders to delegate planning and execution responsibilities to the lowest appropriate level. Tactical planning and execution occur in the combat formations. The uncertainty associated with real-time execution of a mission necessitates rapid decision making and critical thinking to achieve commander's intent. Elevating decision making during high-risk activities by exception is far easier than delegating decision making during high tempo operations out of necessity.
- ▲ **Coordination.** Effective C2 at echelon requires direct liaison authority and robust coordination agreements so that combat formations can directly and effectively coordinate with each other during execution without additional higher echelon guidance.

Mission Command

The Space Force views mission command as a leadership philosophy centered on the art of command, the science of control, and the discipline of decision making. Mission command empowers Guardians to exercise sound judgment in how they conduct their assigned tasks by

emphasizing mutual trust between commanders and subordinates, disciplined initiative, and innovation. The philosophy of mission command applies to decision making across all Space Force organizations and requires continuous cognitive effort to understand, adapt, and effectively direct the achievement of intent under evolving conditions and environments.

This philosophy characterizes the Space Force's approach to C2. Mission command empowers Guardians to make decisions at the necessary operations tempo, enabled by mission-type orders, conditional authorities, and control and coordination procedures. Mission command begins with the commander delivering clear guidance and intent to subordinates on the mission end goal, rationale, and any boundaries or limitations. To carry out the commander's guidance and intent, all echelons continuously adapt to understand the dynamic environment, identify unforeseen opportunities to exploit, exercise risk analysis and risk management, and recommend updates to the commander's intent when appropriate. This approach increases the agility and flexibility of operations in, from, and to the space domain.

Battle Management

Battle management as defined in Joint Publication 3-01, *Countering Air and Missile Threats*, is the management of activities within the operational environment based on the commands, direction, and guidance given by appropriate authority. Battle management is inherently multi-domain and demands joint and multi-disciplinary competencies. Battle management for space operations includes direction, coordination, integration, and deconfliction of fires, maneuvers, information, links, and sensors during operational execution. The uncertainty associated with real-time execution of a mission necessitates rapid decision making and critical thinking to achieve commander's intent. The delegation of authorities and conditional authorities, while not a necessity for battle management, can shorten the timeline from decision to action.

A collection of enduring assumptions, emerging naturally from the scope, scale, and complexity of engagements, apply to battle management in every domain.

- ▲ No two entities in the battlespace are in identical states simultaneously. No two units occupy the same place, configuration, and vector at the same time. Current, credible information on the disposition of friendly, hostile, and other forces is essential.
- ▲ The distribution of entities in the battlespace is not uniform. Force disposition and targeting varies on a continuum between concentrated (massed) and dispersed.
- ▲ The battlespace evolves over time. Natural forces and the behavior of thinking adversaries cause constant changes in the operating environment. Because the operating environment is perpetually changing, perceptions that were sufficient and decisions that were valid in one epoch may not be applicable in another.
- ▲ Information available to decision makers is incomplete and may be inaccurate. While improvements to the quality and availability of information will continue, no technological or procedural solution can provide perfect information.

- ▲ The forces available for a mission are not infinite in quantity, availability, and readiness. Even if forces are sufficient, they can never be in every place to support every need simultaneously.

Presentation of Space Forces

As a Service Force Provider, the Space Force prepares and presents forces to the combatant commanders for the purposes of fulfilling strategic, operational, and tactical objectives through the application of spacepower. Space Force units, and the forces under their control, plan, direct, and execute operations under the authority of a joint force commander.

Commander of Space Force Forces

A COMSPACEFOR leads each of the Service components presented by the Space Force to combatant commands. Under the authorities of the Secretary of the Air Force, the COMSPACEFOR exercises administrative control over assigned or attached Space Force forces, to include responsibility for sourcing, oversight, development, and discipline of Guardians and members within the command. Normally, the combatant commander, or the joint force commander (if separated from the combatant commander) will also delegate operational control of assigned, attached, or allocated space forces to the Service component commander with the preponderance of forces and the ability to C2 those forces. If designated as the Combined/Joint Force Space Component Commander, the COMSPACEFOR also executes tactical control and coordination over the attached space forces of other military Services, and coalition space forces.

Component Field Command

The Space Force C-FLDCOM is the organizational structure through which a COMSPACEFOR, or Space Force commander, conducts Service component responsibilities. Through the C-FLDCOM, the COMSPACEFOR:

- ▲ Provides C2 of assigned, attached, or allocated space forces.
- ▲ Coordinates space operations to support the combatant commander's campaign plan.
- ▲ Synchronizes space effects with the other Service components.
- ▲ Integrates allied and partner space capabilities as force multipliers.
- ▲ Supports national, civil, international, and commercial users as appropriate.
- ▲ Conducts space-related security cooperation activities with allies and partners.

Each C-FLDCOM is comprised of Guardians from multiple career fields performing operations under the combatant command authority of the combatant commander. A COMSPACEFOR controls these Space Force formations and operations. These units are responsible for planning, directing, and executing operations, and assisting with collaboration between Service component commands at the operational level. They also serve as the primary interface between the Space Force and the combatant commands for activities such as joint space-related training, requirements, system fielding, integrated priority lists, security cooperation, and host-nation

coordination. C-FLDCOMs employ Space Force capabilities, tactics, techniques, and procedures, and C2 structures executed through mission command. They do so while integrating with their sister Service components to successfully execute their combatant command's plans and operations.

Space Mission Task Force

The SMTF is a warfighting structure comprised of Space Force combat formations tasked to execute a named operation of a combatant command. When a combatant commander gives operational control to a COMSPACEFOR of assigned, attached, or allocated space forces, and mission or span of control requirements dictate, the COMSPACEFOR may organize subordinate space forces as one or more SMTFs. Every SMTF is an aggregation of elements including a commander, an element that performs C2 on behalf of the commander, and combat formations that conduct military space operations. The structure of the SMTF varies based on span of control considerations and the number of forces in theater.

Combat Formations

Combat deltas, combat squadrons, combat detachments, and force elements are the types of combat formations presented to the combatant commanders via a C-FLDCOM. Force elements from one or more of the force generation squadrons will form these combat formations.

- ▲ **Combat Deltas.** The Space Force presents combat deltas to a combatant commander through the C-FLDCOM. Combat deltas support the operational-level mission space operations planning, execute C2 of assigned, attached, or allocated forces, and synchronize and coordinate with allies and partners operating at a commensurate level. If directed, these units coordinate space requirements with other combatant commands, agencies, allies, and partners.
- ▲ **Combat Squadrons.** A combat squadron is an EiP operational formation assigned to a combatant command to provide space effects supporting combatant-command mission requirements.
- ▲ **Combat Detachments.** Combat detachments are the Space Force's deployable operational formation. Detachments deploy as forces allocated to support of combatant-command requirements.
- ▲ **Force Elements.** Force elements are a subordinate formation of a combat squadron or combat detachment that performs a distinct activity in support of the mission. There are three force elements: operations crew, mission-planning cell, and a mission support element.
- ▲ **Operations Crew.** An operations crew performs weapon system operations in support of mission activities.

- ▲ **Mission Planning Cell.** The mission planning cell leads planning, scheduling, and assessment for operational activities.
- ▲ **Mission Support Element.** A mission support element conducts support activities like engineering, analysis, maintenance, and communications. These may include Airmen in non-Space Force specialties who provide capabilities required to execute the mission (e.g., force protection, emergency services, civil engineering).

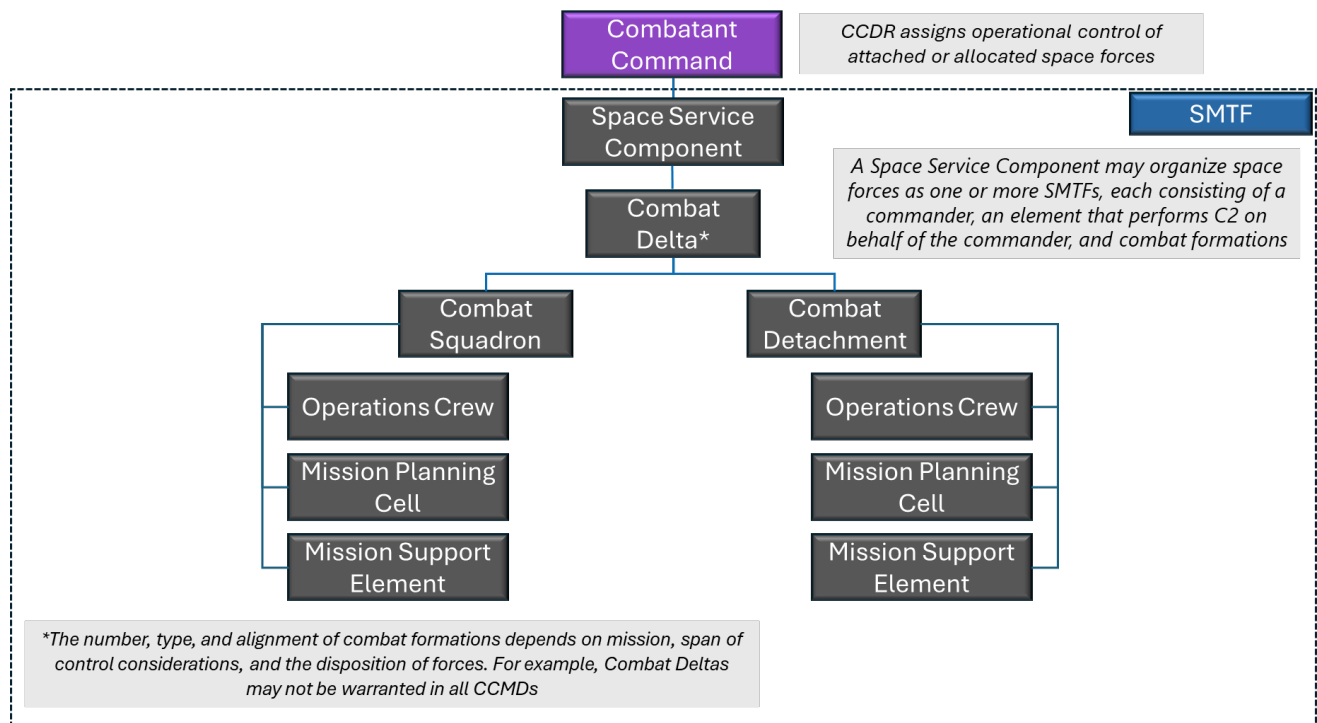


Figure 7. Alignment of Combat Formations

Readiness - Space Force Generation

Our forces are engaged, postured, and ready with credible strength to assure, deter, and defend in an increasingly complex security environment. Maintaining readiness to secure our Nation’s interests in, from, and to space, while supporting military operations in all other domains is a Space Force responsibility. The DoD requires every Service to monitor and assess their operational readiness and capabilities for forces assigned, attached, or allocated to combatant commands.

The Space Force supports global combatant command mission requirements by presenting assigned, attached, or allocated forces to the combatant commands. SPAFORGEN is the Space Force’s model to manage the battle rhythm of rotational forces, ensuring these forces can maintain the highest possible level of overall readiness. SPAFORGEN execution includes three phases: Prepare, Ready, and Commit. All force generation units follow the three-phases of the SPAFORGEN model.

- ▲ **Prepare Phase.** In the Prepare phase, combat formations focus on personnel reconstitution, leave, and replenishment of supplies and equipment. Force elements also conduct Service-led activities such as training and positional upgrades, professional military education, and qualification training.
- ▲ **Ready Phase.** During the Ready phase, force elements conduct training, small and large force-employment exercises, squadron-level validations, and other preparations for operations in a contested space domain against a thinking adversary.
- ▲ **Commit Phase.** During this phase, force elements are fully resourced, validated, and ready to conduct operations and are assigned, attached, or allocated to a combatant command for an operational mission. The Space Force presents force elements to combatant commands that are either EiP as combat squadrons or that are deployed as combat detachments.

The relative length of each phase varies for combat squadrons and combat detachments due to the nature of mission requirements for EiP versus deployed operations. However, the purpose of each phase is consistent across both combat formations.

Through SPAFORGEN, the Space Force establishes and maintains a predictable, standardized battle rhythm ensuring rotational forces, both EiP and deployed, are properly organized, trained, equipped, and ready to execute joint force commander or combatant-commander directed operations.

Conclusion

The overarching objective of the Space Force is to provide military spacepower for our Nation and this is why we exist as a Service. Our mission is to *secure our Nation's interests in, from, and to space*. As part of the joint force, Guardians stand ready to conduct operations across the competition continuum to shape the operational environment, prevent conflict, and, if necessary, prevail in conflict.

In this doctrine publication we have addressed why a Space Force is necessary and the national imperative for spacepower. Every Service develops its own culture; we are Guardians, and our values shape how we evolve and how we serve. As a Service charged with organizing, training, and equipping forces, we are maturing how we develop and employ military spacepower for the joint force, to include how we conduct C2, embrace mission command, and conduct battle management. Finally, the Space Force presents ready forces through the SPAFORGEN model and a range of scalable combat formations and organizations, ensuring we present ready combat forces to the joint force.

As protectors of the ultimate high ground, Guardians are ready when called.

Semper Supra!

Appendix A History of Military Space Operations

The roots of US military space operations are traceable back to rocket and spacecraft feasibility studies in the immediate post-World War II period, but not until the 1950s did actual orbital operations become a reality. In January 1959, to support the Discoverer program, Lockheed completed an interim spacecraft control center in Palo Alto, California. During 1960, Lockheed and Air Force controllers moved to Sunnyvale, where they drafted the first procedural manuals for telemetry, tracking, and commanding of spacecraft. Secretary of Defense Robert McNamara, in November 1963, directed that the Sunnyvale facility be “nationalized” to serve as the nucleus for development of a single orbital facility for all DoD programs, even as a worldwide Air Force Satellite Control Network emerged.

While Air Force Systems Command managed a considerable portion of military space activities, other organizations gained relevant responsibilities as space systems matured. For example, Air Defense Command—redesignated Aerospace Defense Command in 1968—handled space surveillance and the ground-launched Program 437 antisatellite program. After the launch of Defense Support Program early-warning spacecraft in the 1970s, Aerospace Defense Command performed on-orbit control and data processing. By 1977, an amalgam of space systems and users had led to an inadequate appreciation of capabilities, inefficient utilization of assets, and lack of clearly articulated goals.

The need for a separate major command for space operations within the Air Force became increasingly apparent. A succession of Aerospace Defense Command commanders and Pentagon space officers campaigned for this, but contrary to their appeals, Headquarters Air Force dismantled Aerospace Defense Command and transferred its space-related responsibilities to Strategic Air Command in November 1979. Nonetheless, Air Force Manual 1-1, *Functions and Basic Doctrine of the United States Air Force*, published earlier that year had officially identified space operations as one of the Service’s basic missions.

Finalization of the decision, in March 1981, to locate near Colorado Springs a Consolidated Space Operations Center, which included a Shuttle Operations and Planning Center for military missions, recharged the campaign for a space command. Air Force Chief of Staff General Lew Allen reluctantly consented in April 1982 and directed General James Hartinger to organize one. Air Force Space Command (AFSPC) activated in September 1982, but SAC retained its space operational systems until May 1983, and Systems Command would not transfer to AFSPC its control of the AFSCN common-user element and of space launch until 1987 and 1990, respectively.

Meanwhile, President Ronald Reagan’s Strategic Defense Initiative announcement in March 1983 had provided a crucial boost for General Hartinger to propose establishment of a unified space command, which became active in September 1985 under General Robert Herres. During 1990-1991, in Operations Desert Shield and Desert Storm, USSPACECOM employed the full range of space capabilities in theater combat operations for the first time. Over the next decade, during coalition operations in the Balkans, Southwest Asia, and Afghanistan, USSPACECOM further operationalized and normalized space capabilities to support US domination of the

battlespace. Its vision statement in February 2000 was to “integrate space forces into warfighting capabilities across the full spectrum of conflict.”

In its January 2001 report, the congressionally mandated Commission to Assess National Security Space Management and Organization, chaired by Donald Rumsfeld, considered whether US vulnerability in space merited establishment of a space Service but deemed a “rechartered Air Force” as best suited to organize, train and equip space forces in the near term. The commission did, however, emphasize cultivating a substantial cadre of space-qualified military and civilian professionals within each of the military departments. Later, as President George W. Bush’s Secretary of Defense, Donald Rumsfeld, implemented most of the commission’s recommendations, but terrorist attacks against the US homeland on 11 September 2001 compelled senior military leaders to establish a United States Northern Command and disestablish USSPACECOM. Operational responsibilities for space merged into United States Strategic Command (USSTRATCOM) on 1 October 2002.

In the quest to optimize planning, execution, and force management, space operations under USSTRATCOM underwent several organizational changes during the next decade and a half. Evolving from a single Joint Functional Component Command for space and global strike in January 2005, USSTRATCOM formed Joint Functional Component Command, Space in July 2006. USSTRATCOM designated AFSPC’s Fourteenth Air Force commander as Joint Functional Component Commander, Space. Meanwhile, the Joint Space Operations Center opened at Vandenberg Air Force Base in May 2005. The presence of commercial space operators and allied partners led to Joint Space Operations Center redesignation in July 2018 as the Combined Space Operations Center. A further, higher-level effort to collectively improve space operational capabilities by including the Intel community had led to the establishment of a Joint Interagency Combined Space Operations Center at Schriever Air Force Base in October 2016; it became the National Space Defense Center in April 2017.

By this time, China’s successful ground-launched antisatellite test and the Russian presence of nesting-doll spacecraft in orbit confirmed that space was rapidly becoming a contested environment. To set the stage for reestablishing a separate sub-unified space command, USSTRATCOM Commander, General John Hyten and AFSPC Commander, General John Raymond agreed to normalize Service component alignment by reassigning the Joint Functional Component Command, Space commander’s responsibilities to the AFSPC commander, making the latter Joint Force Space Component Commander for USSTRATCOM, thereby transforming AFSPC into a warfighting headquarters. This occurred on 1 December 2017. General Raymond emphasized becoming “an intel-driven organization, with integrated and synchronized indications and warning and operational intelligence across the enterprise.”

Based on growing congressional pressure for significant organizational changes to US space operations in response to aggressive foreign behavior, planners at AFSPC headquarters in Colorado Springs already had begun contemplating its transition from a USSTRATCOM component command to a sub-unified command. President Donald Trump’s mention of a “space force” in his March 2018 speech in San Diego, California, followed by his direction in June that the DoD undertake establishment of the new Service, set processes for change in high gear. First,

in his Joint Force Space Component Commander role, General Raymond chartered Task Force Sierra to plan for establishing a separate unified combatant command for space. Next, in his role as AFSPC Commander, coordinating with DoD planning groups, he chartered Task Force Tango to flesh out a US Space Force structure. White House release of “Space Policy Directive 4, *Establishment of the United States Space Force*”, on 19 February 2019 provided specific guidance on the missions and organization of the new Service.

On 29 August 2019, USSPACECOM was officially re-established. Presidential signing of the Fiscal Year 2020 National Defense Authorization Act on 20 December 2019 officially redesignated Headquarters AFSPC as Headquarters United States Space Force and created the CSO as its leader.

Appendix B Terms of Reference (Functions, Mission Areas, and Mission Sets)

Purpose

The Military Space Operations (MSO) Terms of Reference (ToR) organizes and describes the operational and support activities a military force – either red or blue – could perform in, from, or to the space domain. Because this ToR is informed by existing technology rather than policy or resourcing, the inclusion of a mission area does not imply the existence of a corresponding capability.

Framework

Core Function (CF). A broad and enduring operational role a Service has designed, equipped, and trained its forces to perform. Core functions are comprised of mission areas.

Mission Area (MA). A major grouping of interrelated activities required to accomplish a core function. Mission areas are comprised of mission sets.

Mission Set (MS). A family of capabilities that performs similar tactical tasks.

Enterprise Function (EF). A cross-cutting activity that enables all core functions. Enterprise functions are comprised of enterprise activities.

Enterprise Activity (EA). An element or subdivision of an enterprise function.

Core Functions

1. (CF) Space Control. Space Control comprises the activities required to contest and control the space domain. The desired outcome of Space Control activities is Space Superiority, a degree of control that allows forces to operate at a time and place of their choosing without prohibitive interference from space or counterspace threats, while also denying the same to an adversary. Space Control consists of offensive and defensive actions referred to as counterspace operations. Counterspace operations are conducted across the orbital, link, and terrestrial segments of the space architecture.

1.1 (MA) Orbital Warfare (OW). Combat operations conducted through fires, movement, and maneuver to control the space domain.

1.1.1 (MS) Offensive OW. Negation of enemy ability to use space or counterspace systems.

1.1.2 (MS) Defensive OW. Protection against enemy ability to attack friendly space systems.

1.2 (MA) Electromagnetic Warfare (EW). Combat operations on the link segment through electromagnetic spectrum fires to control the space domain.

1.2.1 (MS) Offensive Space Control EW. Negation of enemy ability to use space or counterspace systems.

1.2.2 (MS) Defensive Space Control EW. Protection against enemy ability to attack friendly systems.

1.3 (MA) Cyberspace Warfare (CW). Combat operations conducted in cyberspace through fires, movement, and maneuver to control the space domain.

1.3.1 (MS) Offensive CW. Negation of enemy ability to use space or counterspace systems.

1.3.2 (MS) Defensive CW. Protection against enemy ability to attack friendly systems.

2. (CF) Global Mission Operations. Activities to deliver space capabilities to the joint force and the Nation.

2.1 (MA) Satellite Communication (SATCOM). Secure, resilient communication services provided through space-based platforms.

2.1.1 (MS) Strategic SATCOM. SATCOM support to nuclear command, control, and communication (NC3) users.

2.1.2 (MS) Operational SATCOM. SATCOM support to fixed-site users.

2.1.3 (MS) Tactical SATCOM. SATCOM support to mobile, disadvantaged, or tactical data link users.

2.2 (MA) Navigation Warfare (NAVWAR). The assurance or denial of positioning, navigation, and timing (PNT) data through space, cyberspace, and electromagnetic spectrum operations (EMSO).

2.3 (MA) Missile Warning and Tracking (MWT). Activities to detect missile launches, track their trajectory, and issue timely warnings.

2.3.1 (MS) Ground Based Surveillance (GBS). Collection, processing, and dissemination of data to the Integrated Tactical Warning and Attack Assessment (ITW/AA) system using ground-based radar phenomenology.

2.3.2 (MS) Overhead Persistent Infrared (OPIR) Surveillance. Provision of infrared phenomenology to the ITW/AA system and/or Theater Event System.

2.4 (MA) Space-Based Sensing and Targeting (SBST). Space-based activities and operations to provide terrestrial battlespace awareness.

2.4.1 (MS) Reconnaissance. A mission undertaken to obtain information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, geographic, or other characteristics of a particular area, by visual observation or other detection methods.

2.4.2 (MS) Surveillance. The systematic observation of aerospace, cyberspace, surface, or subsurface areas, places, persons, or things by visual, aural, electronic, photographic, or other means.

2.4.3 (MS) Target Acquisition (TA). The detection, identification, and location of a target in sufficient detail to permit the effective employment of capabilities that create the required effects.

2.5 (MA) Theater Electromagnetic Warfare (TEW). Actions taken in the electromagnetic spectrum (EMS) to protect or prevent the ability to communicate using space-based platforms.

2.5.1 (MS) Electromagnetic Attack (EA). Transmission of energy through the EMS to disrupt or degrade a terrestrial target's ability to receive signals or deliver data.

2.5.2 (MS) Electromagnetic Protection (EP). Protection of personnel, facilities, and equipment from intentional or inadvertent electronic interference.

2.5.3 (MS) Electromagnetic Surveillance (ES). The search for interception, identification, location, or localization of sources of intentional or unintentional radiated electromagnetic energy for the purpose of immediate threat recognition, targeting, planning, or future operations.

3. (CF) Space Access. The movement and sustainment of equipment in, from, and to the space domain.

3.1 (MA) Satellite Control. Activities necessary to assure the infrastructure, networks, equipment, and connectivity that enables mission control (i.e., telemetry, tracking, and commanding) of satellites.

3.2 (MA) Spacelift. The movement of payloads (spacecraft or other materials) to and from the space domain.

3.2.1 (MS) Launch. The placement of payloads (spacecraft or other materials) into space.

3.2.2 (MS) Recovery. The recovery of payloads (spacecraft or other materials) returning from space.

3.2.3 (MS) Payload Processing. Integration of payloads onto a launch vehicle.

3.2.4 (MS) Telemetry and Tracking. Monitoring the position, velocity, and system performance of the launch vehicle throughout flight operations.

3.2.5 (MS) Responsive Launch. Deployment of capability into space on operationally relevant timelines in a contingency or crisis.

3.3 (MA) Launch Range Control. Activities to ensure the provision of a safe and secure range for space launch operations.

3.3.1 (MS) Restricted Area Control. Monitoring and restricting access to land, airspace, cyberspace, and maritime areas surrounding the launch site.

3.3.2 (MS) Flight Safety. The termination of a launch or destruction of a vehicle if it deviates from the planned trajectory, experiences a catastrophic failure, or poses a threat to public safety.

Enterprise Functions

1. (EF) Intelligence. The products resulting from the collection, processing and exploitation, analysis and production, integration, and targeting concerning foreign nations, hostile or potentially hostile forces, and areas of actual or potential operations.

1.1 (EA) Collection. The acquisition of information and the provision of this information to processing elements.

1.2 (EA) Processing and Exploitation. The conversion of collected information into forms suitable to the production of intelligence.

1.3 (EA) Analysis and Production. The conversion of processed information into intelligence through the integration, evaluation, analysis, and interpretation of all-source data and the preparation of intelligence products in support of known or anticipated user requirements.

1.4 (EA) Integration. The infusion of intelligence processes and products into operational units for the accomplishment of military objectives.

1.5 (EA) Targeting. The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities.

2. (EF) Cyberspace Operations. The employment of networked, stand-alone, and platform-embedded information technology infrastructure for the access to and use of data to achieve effects in or through cyberspace.

2.1 (EA) Information Network Operations (IN Ops). The security, configuration, operation, extension, maintenance, and sustainment of cyberspace terrain integral to military space activities.

2.2 (EA) Defensive Cyberspace Operations (DCO). Defensive actions within the defended network or portion of cyberspace, to include threat hunting and active countermeasures to eliminate and mitigate threats.

3. (EF) Command and Control (C2). The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission.

3.1 (EA) Global Command and Control (Global C2). C2 in support of global space superiority operations.

3.2 (EA) Regional Command and Control (Regional C2). C2 in support of regional or theater operations.

3.3 (EA) Tactical Command and Control (Tactical C2). The direction and coordination of forces engaged against an adversary to accomplish objectives.

3.4 (EA) Battle Management. The management of activities (e.g., target sort, weapons pairing, fire control) within the operational environment based on the commands, direction, and guidance given by appropriate authority.

4. (EF) Space Domain Awareness (SDA). The detection, characterization, attribution, prediction, and targeting of activities in the space domain to inform decision making.

4.1 (EA) Reconnaissance. A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the characteristics of a particular area or aspect.

4.2 (EA) Surveillance. The systematic observation of space by visual, aural, electronic, photographic, or other means.

4.3 (EA) Conjunction Assessment. The identification of close approaches using a catalog of space objects.

4.4 (EA) Collision on Launch Assessment. Activities taken to ensure objects launched into space are not at immediate risk of conjunction with a known object.

4.5 (EA) Breakups. Activities taken to process and analyze debris generated by on-orbit events.

4.6 (EA) Rendezvous and Proximity Operations Support. The provision of situational awareness and analysis to allow friendly or cooperative space objects to operate near one another.

Appendix C Acronyms, Abbreviations, and Initialisms

AFSPC	Air Force Space Command
AOR	area of responsibility
C2	command and control
CF	core function
C-FLDCOM	component field command
COMSPACEFOR	Commander of Space Force Forces
CSO	Chief of Space Operations
CW	cyberspace warfare
DCO	defensive cyberspace operations
DoD	Department of Defense
DoDD	Department of Defense Directive
EA	electromagnetic attack
EA	enterprise activity
EiP	employed-in-place
EMS	electromagnetic spectrum
EMSO	electromagnetic spectrum operations
EP	electromagnetic protection
ES	electromagnetic surveillance
EW	electromagnetic warfare
FLDCOM	field command
GBS	ground-based surveillance
IN Ops	information network operations
ITWAA	Integrated Tactical Warning and Attack Assessment
JFC	joint force commander
JTF	joint task force
MA	mission area
MA	mission set
MSO	military space operations
MTI	moving target indicator

MTO	mission-type orders
MWT	missile warning and tracking
NC3	nuclear command, control, and communications
NAVWAR	navigation warfare
OPIR	overhead persistent infrared
OW	orbital warfare
PNT	positioning, navigation, and timing
SATCOM	satellite communications
SBST	space-based sensing and targeting
SDA	space domain awareness
SMTF	space mission Task Force
SPAFORGEN	Space Force Generation
TA	target acquisition
TEW	theater electromagnetic warfare
ToR	terms of reference
US	United States
USSF	United States Space Force
USSPACECOM	United States Space Command
USSTRATCOM	United States Strategic Command

Appendix D Glossary

analysis and production - The conversion of processed information into intelligence through the integration, evaluation, analysis, and interpretation of all-source data and the preparation of intelligence products in support of known or anticipated user requirements. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 2-0, Joint Intelligence*)

battle management - The management of activities within the operational environment based on the commands, direction, and guidance given by appropriate authority. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 3-01, Countering Air and Missile Threats*)

battlespace awareness - The collection, processing, and dissemination of militarily relevant data.

battle management - The management of activities (e.g., target sort, weapons pairing, fire control) within the operational environment based on the commands, direction, and guidance given by appropriate authority.

breakups - Activities taken to process and analyze debris generated by on-orbit events.

campaigning - The persistent conduct of related operations, activities, and investments that align military actions with the other instruments of national power, supporting global integration across the competition continuum in pursuit of strategic objectives.

Source: (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 3-0, Joint Campaigns and Operations*)

collection - The acquisition of information and the provision of this information to processing elements. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 2-0, Joint Intelligence*)

collision on launch assessment - Activities taken to ensure objects launched into space are not at immediate risk of conjunction with a known object.

command - The authority that a commander in the armed forces lawfully exercises over subordinates by virtue of rank or assignment. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 1, Volume 2, The Joint Force*)

command and control - The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Also called C2. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 1, Volume 2, The Joint Force*)

conjunction assessment - The identification of close approaches using a catalog of space objects.

control - Authority that may be less than full command exercised by a commander over part of the activities of subordinate or other organizations. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 1, Volume 2, The Joint Force*)

cyberspace operations - The employment of networked, stand-alone, and platform-embedded information technology infrastructure for the access to and use of data to achieve effects in or through cyberspace.

cyberspace warfare - Combat operations conducted in cyberspace through fires, movement, and maneuver to control the space domain. Also called CW.

defensive cyberspace operations - Defensive actions within the defended network or portion of cyberspace, to include threat hunting and active countermeasures to eliminate and mitigate threats. Also called DCO.

defensive cyberspace warfare - Protection against enemy ability to attack friendly systems. Also called defensive CW.

defensive orbital warfare - Protection against enemy ability to attack friendly space systems. Also called defensive OW.

defensive space control electromagnetic warfare - Protection against enemy ability to attack friendly systems. Also called defensive space control EW.

electromagnetic attack - Transmission of energy through the EMS to disrupt or degrade a terrestrial target's ability to receive signals or deliver data. Also called EA.

electromagnetic protection - Protection of personnel, facilities, and equipment from intentional or inadvertent electronic interference. Also called EP.

electromagnetic surveillance - The search for interception, identification, location, or localization of sources of intentional or unintentional radiated electromagnetic energy for the purpose of immediate threat recognition, targeting, planning, or future operations. Also called ES.

electromagnetic warfare - Combat operations on the link segment through electromagnetic spectrum fires to control the space domain. Also called EW.

flight safety—The termination of a launch or destruction of a vehicle if it deviates from the planned trajectory, experiences a catastrophic failure, or poses a threat to public safety.

force - An aggregation of military personnel, weapon systems, equipment, capabilities, and necessary support, or combination thereof. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 1, Volume 1, Joint Warfighting*)

global command and control – Command and control in support of global space superiority operations. Also called global C2.

global mission operations - Activities to deliver space capabilities to the joint force and the Nation.

ground based surveillance - Collection, processing, and dissemination of data to the Integrated Tactical Warning and Attack Assessment (ITW/AA) system using ground-based radar phenomenology. Also called GBS.

information network operations - The security, configuration, operation, extension, maintenance, and sustainment of cyberspace terrain integral to military space activities. Also called IN Ops.

integration - The infusion of intelligence processes and products into operational units for the accomplishment of military objectives.

intelligence - The products resulting from the collection, processing and exploitation, analysis and production, integration, and targeting concerning foreign nations, hostile or potentially hostile forces, and areas of actual or potential operations. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 2-0, Joint Intelligence*)

joint force - A force composed of significant elements, assigned, or attached, of two or more Military Departments that operate under a single joint force commander. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 1, Volume 1, Joint Warfighting*)

joint operations - Military actions conducted by joint, and those Service forces employed in specified command relationships with each other, which, of themselves, do not establish joint forces. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 3-0, Joint Campaigns and Operations*)

launch - The placement of payloads (spacecraft or other materials) into space.

launch range control - Activities to ensure the provision of a safe and secure range for space launch operations.

missile warning and tracking - Activities to detect missile launches, track their trajectory, and issue timely warnings. Also called MWT.

mission command - The conduct of military operations through decentralized execution based upon mission-type orders. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 3-31, Joint Land Operations*)

mission-type orders - A methodology for writing orders that provides the subordinates the ability to adapt as they take actions in a changing operational environment to achieve the commander's desired results. Also called MTO. (Space Doctrine Publication 6-0, *Mission Command*)

moving target indicator - The collection, processing, and dissemination of track data on moving targets in the terrestrial domains. Also called MTI.

navigation warfare - The assurance or denial of positioning, navigation, and timing (PNT) data through space, cyberspace, and electromagnetic spectrum operations (EMSO). Also called NAVWAR.

orbital warfare - Combat operations conducted through fires, movement, and maneuver to control the space domain. Also called OW.

offensive cyberspace warfare – Negation of enemy ability to use space or counterspace systems. Also called offensive CW.

offensive orbital warfare - Negation of enemy ability to use space or counterspace systems. Also called offensive OW.

offensive space control electromagnetic warfare - Negation of enemy ability to use space or counterspace systems. Also called offensive space control EW.

operational satellite communications - Satellite communications support to fixed-site users. Also called operational SATCOM.

overhead persistent infrared surveillance - Provision of infrared phenomenology to the Integrated Tactical Warning and Attack Assessment (ITW/AA) system and/or Theater Event System. Also called OPIR surveillance.

payload processing - Integration of payloads onto a launch vehicle.

processing and exploitation - The conversion of collected information into forms suitable to the production of intelligence. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 2-0, Joint Intelligence*)

reconnaissance - A mission undertaken to obtain information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, geographic, or other characteristics of a particular area, by visual observation or other detection methods.

recovery - The recovery of payloads (spacecraft or other materials) returning from space.

regional command and control – Command and control in support of regional or theater operations. Also called regional C2.

rendezvous and proximity operations support - The provision of situational awareness and analysis to allow friendly or cooperative space objects to operate near one another.

responsive launch - Deployment of capability into space on operationally relevant timelines in a contingency or crisis.

restricted area control - Monitoring and restricting access to land, airspace, cyberspace, and maritime areas surrounding the launch site.

satellite communications - Secure, resilient communication services provided through space-based platforms. Also called SATCOM.

satellite control - Activities necessary to assure the infrastructure, networks, equipment, and connectivity that enables mission control (i.e., telemetry, tracking, and commanding) of satellites.

space access - The movement and sustainment of equipment in, from, and to the space domain.

space-based sensing and targeting - Space-based activities and operations to provide terrestrial battlespace awareness. Also called SBST.

space control - Space control comprises the activities required to contest and control the space domain. The desired outcome of Space Control activities is Space Superiority, a degree of control that allows forces to operate at a time and place of their choosing without prohibitive interference from space or counterspace threats, while also denying the same to an adversary. Space Control consists of offensive and defensive actions referred to as counterspace operations. Counterspace operations are conducted across the orbital, link, and terrestrial segments of the space architecture.

space domain awareness - The detection, characterization, attribution, prediction, and targeting of activities in the space domain to inform decision making. Also called SDA.

spacelift - The movement of payloads (spacecraft or other materials) to and from the space domain.

space superiority - The degree of control that allows forces to operate at a time and place of their choosing without prohibitive interference from space or counterspace threats, while also denying the same to an adversary.

strategic satellite communications - Satellite communications support to nuclear command, control, and communication (NC3) users. Also called strategic SATCOM.

surveillance - The systematic observation of space by visual, aural, electronic, photographic, or other means. This type of surveillance supports SDA.

surveillance - The systematic observation of aerospace, cyberspace, surface, or subsurface areas, places, persons, or things by visual, aural, electronic, photographic, or other means. This type of surveillance supports SBST.

tactical command and control - The direction and coordination of forces engaged against an adversary to accomplish objectives. Also called tactical C2.

tactical satellite communications - Satellite communications support to mobile, disadvantaged, or tactical data link users. Also called tactical SATCOM.

target acquisition - The detection, identification, and location of a target in sufficient detail to permit the effective employment of capabilities that create the required effects. Also called TA.

targeting - The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (*Department of Defense Dictionary of Military and Associated Terms /Joint Publication 3-0, Joint Campaigns and Operations*)

telemetry and tracking - Monitoring the position, velocity, and system performance of the launch vehicle throughout flight operations.

theater electromagnetic warfare - Actions taken in the electromagnetic spectrum (EMS) to protect or prevent the ability to communicate using space-based platforms. Also called TEW.

unified action - The synchronization, coordination, or integration of the activities of governmental and nongovernmental entities with military operations to achieve unity of effort. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 1, Volume 1, Joint Warfighting*)

unit - 1. Any military element whose structure is prescribed by competent authority. 2. An organization title of a subdivision of a group in a task force. (*Department of Defense Dictionary of Military and Associated Terms / Joint Publication 3-33, Joint Force Headquarters*)

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