

Space Doctrine Publication 6-0

# MISSION COMMAND

DOCTRINE FOR SPACE FORCES



UNITED STATES  
SPACE FORCE

Space Doctrine Publication (SDP) 6-0, *Mission Command*  
Space Training and Readiness Command (STARCOM)  
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## Foreword

*"Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity."*

General George S. Patton, Jr

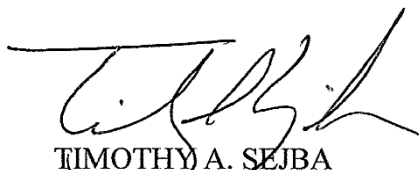
Mission command as a philosophy balances the art of command, the science of control, and the discipline of decision making. It empowers every Guardian to exercise sound judgment in the conduct of their assigned tasks by emphasizing mutual trust, disciplined initiative, and creativity.

Every Guardian needs to understand mission command and how to apply its principles to their missions given the uncertainty of the operational environment, the tempo of operations in the space domain, and the increasing aggression of our adversaries.

Commander's intent, mutual trust, risk acceptance, mission-type order (MTO) methodology, shared understanding, disciplined initiative, and competence are the principles that define mission command. Exercising mission command requires continual adaptation as the Space Force develops new capabilities, and as Guardians learn to delegate authority and resist the temptation to retain control at the highest levels. Commanders should embrace the challenges and rewards of mission command and aggressively develop their subordinates to demonstrate initiative and competence across the competition continuum.

Space Doctrine Publication (SDP) 6-0, *Mission Command*, keystone doctrine for the United States Space Force (USSF), describes the official advice and best practices for exercising mission command for all Space Force organizations, and in supporting the joint force in gaining and exploiting a position of advantage in the space domain.

I encourage you to study and learn from the best practices of our Services compiled in this volume. Semper Supra!



TIMOTHY A. SEJBA

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## Space Force Doctrine

Space Force doctrine guides the proper use of spacepower and Space Force forces in support of the Service's cornerstone responsibilities. It establishes a common framework for employing Guardians as part of a broader joint force. Doctrine provides fundamental principles and authoritative guidance as an informed starting point for decision-making and strategy development. Since it is challenging to predict the timing, location, and conditions of the next fight, commanders should be flexible in the implementation of this guidance as circumstances or missions dictate.

The Space Force doctrine hierarchy includes four levels of doctrine and a glossary. Each level builds on the one above it, reflecting the role of Guardians in every specialty area. A set of six keystone doctrine publications follows the Space Capstone Publication, *Spacepower*. Below the keystone level, Space Force is developing multiple operational level doctrine publications, each expanding on a specific area. Tactical doctrine provides details at the level of specific systems and tactics, techniques, and procedures. As the mission evolves the Space Force will add to the doctrine hierarchy.

### Space Doctrine Publication (SDP) 6-0

Space Doctrine Publication (SDP) 6-0, *Mission Command*, one of the six keystone doctrine publications, provides the Space Force's authoritative best practices for command and control (C2), and presents mission command as the Service's chosen approach for C2. Through mission command, the Space Force empowers Guardians to operate in uncertain, complex, and rapidly changing environments through mutual trust, disciplined initiative, and shared understanding.

- Chapter 1 introduces the philosophy of mission command, the strategic imperative for its implementation, and its key principles.
- Chapter 2 discusses the relationship between C2 and mission command, mission command's characteristics in the C2 of military space operations, and importance of military judgment in the application of mission command.
- Chapter 3 addresses C2 processes including orders, conditional authorities, and control procedures.

Callout boxes (light blue text boxes with rounded corners) introduce actions and concepts underway to support and enhance mission command for the Space Force.



## Chapter 1 Introduction to Mission Command

*“The battlefield is a scene of constant chaos. The winner will be the one that best controls that chaos, both his own and that of the enemy.”*

Napoleon Bonaparte

### The Definition of Mission Command

Mission command is a philosophy centered on the art of command, the science of control, and the discipline of decision making. This philosophy of leadership characterizes the Space Force approach to command and control (C2) of space operations, through the commander’s maximum distribution of control and delegation of authorities, informed by strong military judgment and appropriate to the strategic and operational context.

When applied, mission command empowers individuals across all Space Force organizations to exercise sound judgment in how they conduct their assigned tasks by emphasizing trust, disciplined initiative, competence, and innovation.

Mission command begins with the commander delivering clear guidance and intent to subordinates on the mission objectives, 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.

### The Strategic Imperative for Mission Command

Military space operations, born out of the Cold War and focused on strategic missions, have historically adopted a highly centralized C2 model, with authorities held at the highest level. This paradigm is not adequate for the challenges of great power competition.

An increasingly ambiguous, complex, and dynamic operational environment confronts the Space Force today. We are competing with adversaries on a global scale, across interdependent domains, with a growing network of partnerships, and at a pace accelerated by technological innovations. As the complexity of space operations grows, a centralized C2 model may result in delayed or ineffective decisions. Interdependencies with joint, allied, interagency, and commercial partners create shared opportunities, but also complicate how the Service identifies what information is relevant, who needs it, and how to disseminate it. Delays, disruptions, manipulations, or denial of the communication pathways that deliver that critical information can further challenge space operations in communications-isolated environment.

In conflict, the C2 organizations, decision-makers, and centralized models that hold the preponderance of decisions at single C2 nodes present high-reward targets. The speed and quality of decisions directly contributes to the joint force’s ability to set the operational tempo

and to effectively operate within an adversary's decision-making cycle. Embracing mission command allows commanders to seize comparative advantages, reduce vulnerabilities, and create compounding dilemmas for our adversaries.

- a. Outpacing adversaries in the execution of operations.
- b. Enabling space forces to seize initiative at all echelons.
- c. Ensuring space forces can out-maneuver adversaries.
- d. Fostering shared awareness and unified action with joint, allied, interagency, and commercial partners.
- e. Ensuring space operations persevere through communications-challenged conditions.
- f. Enhancing the resiliency, flexibility, and agility of space force C2 across echelons.

Collectively, these advantages establish a strategic imperative for further inculcating mission command into our Service.

### **Mission Command Principles**

Seven key principles codify the mutually reinforcing enablers and outputs of mission command.

- a. **Competence.** An organization's ability to operate using mission command relates directly to the competence of its Guardians. Commanders continually assess the competence of their subordinates and their organizations. This assessment informs the degree of trust commanders have in their subordinates' ability to execute orders in a decentralized or distributed environment. Supported by repetitive, realistic, and challenging training, it is also the subordinate units' responsibility to build competence within their unit, supporting mutual trust at all echelons of leadership.
- b. **Mutual Trust.** Mutual trust is the shared confidence between commanders, subordinates, and partners that they can be relied on and are competent in performing their assigned tasks. Building trust with subordinates and partners is one of the most important things a commander accomplishes. Subordinates are more willing to exercise initiative when they believe their commander trusts them. They will also be more willing to exercise initiative if they believe their commander will accept and support the outcome of their decisions. Likewise, commanders delegate greater authority to subordinates who have demonstrated competency and good military judgment.
- c. **Risk Acceptance.** Mission command requires that commanders and subordinates make risk-informed decisions and manage accepted risk. Chairman of the Joint Chiefs of Staff Manual 3105.01B, *Joint Risk Analysis Methodology*, defines risk as the probability and consequence of an event causing harm to something valued. Mission command relies on a shared understanding of risk, with consideration for probability and consequence, so that decision-makers in all organizations and echelons can act, informed by the same risk assessments. Additionally, commanders with trust in their subordinates must accept the

inherent risks of delegating decisions, for the inherent benefits in enabling disciplined initiative.

- d. **Shared Understanding.** Shared understanding is critical to unity of effort, achieving commander's intent, integrating warfighting functions, and breaking down information silos to enable decentralized execution. Shared understanding equips decision-makers at all levels with the insight and foresight required to make effective decisions, to manage risks, and to consider second and third order effects. Shared understanding deepens trust, clarifies authorities for action, assists problem framing as part of design, and enriches guidance and intent to release the disciplined initiative of subordinates. Shared understanding of the situation, along with the flow of information to the lowest possible level, forms the basis for unity of effort and subordinates' initiative. Effective decentralized execution is not possible without shared understanding.
- e. **Commander's Intent.** Commander's intent is a clear and concise expression of the purpose and desired end state of a mission. Commander's intent does not specify how to achieve the desired end state but does provide constraints and restraints and clarifies what the mission should achieve and why. This guidance is not static and will continuously refine as operations progress, informed by feedback up and down the chain of command. By communicating their intent clearly, commanders empower their subordinates to act in keeping with the overall mission goals and achieve success.
- f. **Mission-type Orders (MTOs) Methodology.** The MTO methodology for writing orders codifies the commander's intent, focusing on the purpose of the mission, while providing subordinates the flexibility to adapt in a dynamic operational environment to achieve the commander's desired results. The proper level of detail in an order is situationally dependent and tailored to the specific requirements of the operation, but should aim to provide maximum decision-space, while still ensuring that operational activities are deconflicted across purpose, means, time, and space.
- g. **Disciplined Initiative.** Disciplined initiative is an outcome achieved by the other principles of mission command and refers to the individual actions subordinates exercise to achieve a desired end state in a dynamic environment. It is the ability to exercise sound judgment and make decisions in the absence of continuous orders or guidance, operating within their sphere of delegated authorities and intent. This enables a bias for action at every echelon. Commanders rely on subordinates to act to meet their intent, not simply adhere to a plan that is no longer working. When faced with an unfamiliar operational environment or an unexpected adversary activity, requiring immediate action, it is the responsibility of all Guardians to make risk-informed decisions weighed against the potential for mission success.

## The Principles of Mission Command in Practice

In practice, mission command helps commanders capitalize on subordinate ingenuity, innovation, and decision making to achieve the *commander's intent* when conditions change, or



current orders are no longer relevant. It requires subordinates who seek opportunities and commanders to accept prudent risk for subordinates trying to meet their intent. Subordinate decision making and decentralized execution help manage uncertainty and enable the tempo of operations at every echelon.

Employing mission command in low-risk environments is essential to creating the foundation for its employment in high-risk environments. A mission command culture demands that Guardians understand risk, exercise creative and critical thinking, foster curiosity in a learning environment, and execute *disciplined initiative* to support decision making at all echelons to move towards an *end state* that achieves the *commander's intent*, rather than simply executing assigned tasks. Organizations exercising appropriate control are essential to allow Guardians to act with *disciplined initiative* at the speed of relevance. The principles of mission command, through iteration, effort, and time, establish the conditions necessary for success.

Over time, the *mutual trust* between a unit's members and leadership develops and evolves. Commanders should delegate authorities to the appropriate levels, as Guardians demonstrate the ability to exercise increased authority. To build *mutual trust*, the commander should educate and mentor subordinates thereby increasing *shared understanding* throughout the unit. As *shared understanding* and *mutual trust* increase, the team's competence grows, the commander can delegate more decisions, and subordinates can trust their commanders to support their decisions, making them more effective space operators.

### **Challenges to Mission Command in Space Operations**

The global, remote, and often inherently strategic characteristics of military space operations can involve increased risks and pose challenges to achieving shared understanding and disciplined initiative. C2 of space forces requires closing a complex decision cycle, often on compressed timelines, at great physical standoff with remote access, and synchronized across disparate coordinating organizations, while managing a limited pool of high-demand, low-density resources.

In military space operations, risk acceptance has historically been a challenge. Many tactical actions, to include a single engagement or spacecraft maneuver, may have strategic or political implications that extend beyond the space domain. Space operations do not enjoy the reversibility of decision cost (e.g., use of fuel) common in other domains, and space systems are particularly expensive and comparatively slow to regenerate. Historically, this has driven the retention of many decisions for space operations at strategic or national levels.

Achieving shared understanding can also be challenging. The vastness of the space domain, and dependencies on systems in the terrestrial and link segments (including the electromagnetic spectrum) prevents a human-vision derived sight picture from which to share understanding. A lack of shared awareness challenges disciplined initiative as well. Military space forces can rarely operate as discrete, isolated units today because few single units possess the complete operational picture needed to execute uncoordinated tactical actions in a complex environment.

Regardless of these challenges, Guardians and their commanders cannot accept these as universal rules but as conditional barriers which apply to varying degrees in particular contexts. The Service must continuously seek approaches that erode and navigate around these barriers to risk acceptance, shared understanding, and disciplined initiative. Ultimately, the Space Force cannot succeed in great power competition without embracing mission command.

### **Evolving to Support Mission Command**

The ability for Guardians to understand the elements of the operational environment that enable *shared understanding* and the ability to take *discipline initiative* in meeting the *commander's intent* is critical to mission command. The integration and consolidation of data to provide flexible/rapid solutions in service of operational sight pictures, information streams, and human user integration supports *shared understanding* within and between every echelon. The Space Force is focused on developing the visualization tools (e.g., spectrum analyzers), data filters (e.g., spacecraft telemetry and tracking, malware protection), and data sources (e.g., ground antennas, star trackers) that integrate and present data from multiple domains to enable mission command.

### **Developing Guardians for Mission Command**

Education, training, and experience are the foundation of good military judgment. Education is key to inculcating a common professional language and a shared understanding of the principles of space operations and mission command. Like training and experience, taught history is also an effective teacher in developing good military judgment. Training devices, simulations, and exercises can provide the mental repetitions necessary to execute good military judgment in stressful, ambiguous, time-constrained situations, as well as build confidence in the operational competence of forces at each echelon. During operations where time is not a factor or risk is low, commanders should train with their subordinates, building trust, and slowly loosening control. This is valuable for subordinates to gain experience in problem solving and confidence in exercising disciplined initiative and for commanders to develop an understanding of the capabilities of subordinates.

## Chapter 2 Mission Command in Command and Control

*“Mission command is not a top-down sequence of ‘fire and forget’ orders. Rather, it is a dynamic approach that shifts, morphs, and evolves as all echelons actively build a shared understanding of the mission.”*

General B. Chance Saltzman, Chief of Space Operations

### The Relationship Between Command and Control and Mission Command

Commanders are responsible for the C2 of their forces. Through C2, commanders provide purpose and direction to integrate all military activities towards a common goal—mission success. C2 under mission command requires commanders empowered with appropriate operational and administrative command authorities. However, commanders cannot fulfill this responsibility without the support of their staffs and subordinate commanders, through which they exercise and execute the art and science of C2. For this reason, it is the responsibility of every Guardian to understand the best practices of C2.

**command** - The authority that a commander in the armed forces lawfully exercises over subordinates by virtue of rank or assignment. (Joint Publication 1, Volume 2, *The Joint Force*)  
**control** - Authority that may be less than full command exercised by a commander over part of the activities of subordinate or other organizations. (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. (Joint Publication 1, Volume 2, *The Joint Force*)

### Definitions - Command and Control

### Command and Control of Space Operations

As a leadership philosophy, mission command underpins the Space Force approach to all activities, including C2. When applied to the art of command and the science of control, mission command enhances the ingenuity, resiliency, agility, and responsiveness of space operations.

- a. **Command.** Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the success of the mission. It also includes responsibility for health, welfare, morale, and discipline of assigned personnel. Commanders may delegate authorities and control over forces depending on the situation.
- b. **Control.** Control is the regulation of forces and warfighting functions to accomplish the mission in accordance with the commander’s intent. A commander exercises and delegates control to direct and adjust operations as conditions dictate. Unlike aspects of

command, which remain similar among echelons, control functions increase in complexity at each higher echelon. Control, as contrasted with command, is more science than art. As such, it relies on objectivity, facts, empirical methods, and analysis.

- c. **Execution.** In the context of C2 frameworks, execution describes the employment of space systems in accordance with approved orders and direction, to include requisite mission planning and assessment functions. Execution relies on system-specific expertise and constitutes direct Guardian operation of these capabilities across a range of missions, disciplines, and environments. Space operations require the conduct of command, control, and direction of execution at all operational-to-tactical echelons, just as each echelon conducts plan, task, execute, and assess responsibilities as required.

### Space Operations Control System

The *Command and Control Functional Concept 2030* introduces the Space Operations Control System or SOCS as the C2 system for the Space Force. The SOCS is an emergent system which functionally defines the shared infrastructure, core services, and behaviors of individuals and units by which the Space Force conducts C2. SOCS is the Space Force equivalent of other Services' control systems such as the Air Force's theater air control system or the Navy's tactical air control system.

In every domain, commanders exercise control over all forces in their area of operations, aided by their C2 system. Commanders, supported by their staffs, control operations by receiving and communicating information to build shared understanding and to direct, coordinate, and synchronize the actions of subordinate units. See appendix C for more information.

### Command and Control Characterized by Mission Command

Distributed control, decentralized execution, and delegation of authorities are essential characteristics of C2 under mission command. These characteristics are vital to thriving, innovating, and adapting in uncertain, complex, and rapidly changing environments and dynamically managing risk in competition and conflict. These characteristics are also critical to operating through environments of degraded or denied communications and ensuring continuity of operations and devolution of command in contingencies.

- a. **Distributed Control.** Distributed control is the dispersal of control responsibilities (to include planning, coordination, execution, and assessment) to subordinate echelons or dispersed locations assigned or allocated to the same combatant command. These forces can conduct all or some operational planning, targeting, and orders development functions on their own behalf. In practice, commanders should carefully consider what aspects of control to distribute and which to retain. Successfully distributing control expands C2 options, enhances resiliency, and supports the achievement of an effective span of control for space forces at all echelons.

- b. **Decentralized Execution.** Decentralized execution is essential to seizing, retaining, and exploiting the operational initiative. It is most critical in environments experiencing rapid change and uncertainty, and to achieve a tempo and intensity that adversary forces cannot match. Decentralized execution requires achieving situational awareness and disseminating information with sufficient clarity to the unit level, where Guardians directly operate space systems. Commanders empower subordinates to make informed decisions and exercise disciplined initiative based on a shared understanding of both the situation and their commander's intent. The more dynamic the circumstances, the greater the need for disciplined initiative to make execution decisions at lower levels.
- c. **Delegation of Authorities.** The delegation of authorities is a key enabler of mission command because it compresses the timelines between the decision-maker and the operator. Within environments of degraded or denied communications, this minimizes delays that could occur in the control chain and maximizes options to adapt in uncertain, complex, and rapidly changing environments.

### **The Role of Military Judgment in Applying Mission Command**

In exercising mission command for C2 of space forces, the commander applies sound military judgment to consider a wide range of factors. The conduct of C2 is always contextual, falling along a spectrum of minimum to maximum decentralization, and delegation of specific authorities. Both decentralization and centralization of control provide unique operational benefits. Commanders weigh values such as resiliency, adaptability, and responsiveness against others such as efficiency, cost, and precision in determining the appropriate placement and level of control for a given operation. The strategic context and consideration of the competition continuum also informs the balance between values and risk in the C2 of space forces. In some situations, decentralization and delegation may be more or less appropriate due to operational barriers, current threat assessment, risk assessment, or the tempo of operations.

| ← MORE CONTROL ————— LESS CONTROL →                                                                                                |                      |                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                    | Considerations       |                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Unpredictable</li> <li>• Unknown</li> <li>• Communications denied or degraded</li> </ul>  | Situation            | <ul style="list-style-type: none"> <li>• Predictable</li> <li>• Known</li> <li>• Communications assured</li> </ul>                                              |
| <ul style="list-style-type: none"> <li>• Inexperienced</li> <li>• New team</li> </ul>                                              | Unit Cohesion        | <ul style="list-style-type: none"> <li>• Experienced</li> <li>• Mature team</li> </ul>                                                                          |
| <ul style="list-style-type: none"> <li>• Untrained or needs practice</li> </ul>                                                    | Level of Training    | <ul style="list-style-type: none"> <li>• Trained</li> </ul>                                                                                                     |
| <ul style="list-style-type: none"> <li>• Being developed</li> </ul>                                                                | Level of Trust       | <ul style="list-style-type: none"> <li>• Established</li> </ul>                                                                                                 |
| <ul style="list-style-type: none"> <li>• Top down</li> <li>• Explicit communications</li> <li>• Vertical communications</li> </ul> | Shared Understanding | <ul style="list-style-type: none"> <li>• Reciprocal information</li> <li>• Implicit communications</li> <li>• Vertical and horizontal communications</li> </ul> |
| <ul style="list-style-type: none"> <li>• Restrictive</li> </ul>                                                                    | Rules of Engagement  | <ul style="list-style-type: none"> <li>• Permissive</li> </ul>                                                                                                  |
| <ul style="list-style-type: none"> <li>• Optimal decisions later</li> </ul>                                                        | Required Decision    | <ul style="list-style-type: none"> <li>• Acceptable decisions sooner</li> </ul>                                                                                 |
| <ul style="list-style-type: none"> <li>• Synchronization</li> </ul>                                                                | Appropriate To       | <ul style="list-style-type: none"> <li>• Orchestration</li> </ul>                                                                                               |

**Figure 1. Spectrum of control**

- a. **Operational Barriers.** Operational barriers to distribution of control and delegation of authorities include a range of materiel, human, and environmental factors. As figure 1 depicts, the commander also considers additional factors such as the competency and level of training in their forces, the complexity or novel nature of adversary activities, and other geopolitical and strategic conditions, where more control (e.g., centralized control) or less control (distributed control) at the commander's level may be appropriate.
- b. **Threat Assessments.** Commanders consider known threats to existing C2 and communication infrastructure. Full awareness of critical infrastructure and operational dependencies, to include the likelihood and severity of assessed threats across the competition continuum, allows commanders to make more informed decisions regarding decentralization of control, and the delegation of authorities. Commanders understand that the transfer of control functions may be challenging. In many cases it will be preferable to make these adjustments as operations begin to progress along the competition continuum. See SDP 2-0, *Intelligence*, and SDP 5-0, *Planning*, for additional details about threat assessment as part of the intelligence and planning processes that support C2.



- c. **Assessments of Risk.** As outlined in SDP 3-0, *Operations*, Guardians at all echelons need to use sound military judgment to continuously assess risk in the execution of space operations. Key challenges lie in identifying risks and the tradeoffs between them, as well as understanding which commanders own the risk. Guardians need to be mindful of the following categories of risk:
- 1) Risk-to-mission – the potential failure to achieve mission success.
  - 2) Risk-to-force – the potential loss or incapacitation of Space Force forces (materiel or human).
  - 3) Risk-to-escalation – the potential for unintended escalation.
  - 4) Risk-to-program protection – the potential to reveal sensitive capabilities or techniques.
  - 5) Risk-to-partnerships – the potential for alienating or losing support from international, intergovernmental, or commercial partners.
  - 6) Risk-to-intelligence loss – the tradeoff of potential intelligence gains or losses.

Commanders understand they cannot eliminate all risk. Identification of residual risk builds shared understanding and clarifies decisions and the potential effects. Complex decisions within these categories of risk are frequent challenges for commanders at all levels. The categories of risk can also be in tension with each other. For example, some defensive operations, intended to minimize risk-to-force could pose an escalation risk depending on the broader strategic context and state of hostilities. Some space activities, intended to minimize risk-to-mission, may pose a risk to key sources of intelligence.

The complexities of risk calculations further increase when a single commander does not have responsibility for minimizing all the identified risks, and the decision bridges multiple organizations. For example, a combatant commander may wish to accept the risk of losing a spacecraft tomorrow, if it reduces the risk for fielded forces today during a critical battle. Another combatant commander, also dependent on the spacecraft for enduring support, may not agree. An Intelligence Community member that would have to reveal key sources and methods to support the defense of the same spacecraft will also have a position. These situations can quickly drive these decisions up to strategic and national level decision makers. The strategic and operational tensions, inherent in risk calculations, restrict the ability of commanders to delegate some, but not all authorities. Understanding these tradespaces and associated risks, allows commanders to make informed decisions regarding how far to delegate key decisions.

## Chapter 3 Command and Control Processes

### Command and Control Processes

Successful C2 relies on effective C2 processes. These continuous processes develop, disseminate, and adapt key information, to include commander's intent, desired end state, task prioritization, rules of engagement, and any special instructions needed for operations. While not C2 processes in and of themselves, high-quality materiel solutions which harness modern technology are key to optimizing the flow of information and out-pacing adversaries.

### The Role of Orders

An order is a communication—verbal, written, or signaled—that conveys instructions from a higher headquarters, or commander, to a subordinate unit. The five-paragraph format (situation, mission, execution, administration and logistics, and command and signal) is the standard format for joint operations (see appendix d). There are nine types of five-paragraph format orders, each of which serve different purposes and require different approval authorities.

| Order Type                       |          | Intended Action                                                                                                                   |
|----------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------|
| Tasking Order                    | TASKORD  | Directs subordinate units to accomplish a specified mission and the associated tasks.                                             |
| Warning Order                    | WARNORD  | Initiates development and evaluation of courses of action by the supported commander. Requests commander's estimate be submitted. |
| Planning Order                   | PLANORD  | Begins planning for the anticipated commander selected course of action. Directs preparation of OPORDs or contingency plans.      |
| Alert Order                      | ALERTORD | Begins execution planning on the commander's selected course of action. Directs preparation of OPORDs or contingency plans.       |
| Operation Order                  | OPORD    | Effects coordinated execution of an operation.                                                                                    |
| Prepare to Deploy Order          | PTDO     | Increase or decrease deployability posture of units.                                                                              |
| Deployment or Redeployment Order | DEPORD   | Deploy or redeploy forces or establish date and time. Increase deployability. Establish joint task force.                         |
| Execute Order                    | EXORD    | Implement the commander's decision directing execution of a course of action or OPORD.                                            |
| Fragmentary Order                | FRAGORD  | Issued as needed after an OPORD to change or modify the OPORD execution.                                                          |

**Figure 2. Order types**

An MTO is not a specific order type, but a technique or methodology for writing any of the types of orders. Developing orders using the MTO methodology is appropriate for both operational and administrative chains of command. Effective use of orders ensures that commanders and subordinates achieve a shared understanding of mission success. This requires establishing a shared understanding of the operational environment. Orders developed using the MTO methodology creates shared understanding because it clearly defines the operational environment and commander's intent.

An order directs a future action and needs to be broad enough in scope and detail to allow for commanders and staffs at the lowest level to synchronize activities, initiate planning, and execute assigned tasks. Orders created using the MTO methodology allow commanders to focus on the purpose of the operation. Commanders focus on clearly defining what “success” looks like, rather than the details of how to perform assigned tasks. This facilitates distributed control and execution allowing subordinates the greatest possible freedom of action to accomplish tasks. Finally, when delegating authority to subordinates, commanders set the necessary conditions for success by allocating appropriate resources to subordinates based on assigned tasks and missions.

Each order addresses (1) the mission; (2) planning considerations such as task assignment, unit dissemination; and (3) conditional authorities included for the duration of the order. Within the order, commanders emphasize unity of command and decentralized execution, as applicable. Upon receipt, subordinate units and C2 entities immediately begin preparing for feedback to the order-issuing authority.

The level of specificity in direction, to support integration and deconfliction, may significantly increase for certain missions. Operations which require tight synchronization from a wide range of Space Force elements, may drive more prescriptive direction and control to ensure fully integrated and deconflicted planning. For example, a group of force elements supporting an orbital engagement may operate under the direction of a tactical C2 element, or they may use control measures in accordance with the next higher echelon's order. In contrast, a positioning, navigation, and timing force element, which rarely requires tight synchronization with other elements, should be able to operate within an existing set of orders without further direction.

### **Conditional Authorities**

Conditional authorities involve the delegation of specific tasks or actions to subordinate commanders, subject to the operational environment, commander's confidence, or defined criteria. This allows for flexibility in command structures while ensuring decisions are appropriately based on the circumstances or established criteria. By delegating authority subject to specific conditions, Space Force organizations can effectively respond to dynamic and evolving operational environments while maintaining accountability and ensuring that decisions and actions are in alignment with the overall mission objectives.

The conditions attached to conditional authorities can vary depending on the situation, mission requirements, and the level of trust between a commander and subordinate commanders. These

conditions may include factors such as the occurrence of a specific event, the presence of a particular threat, or the passage of a defined amount of time.

By granting conditional authority, commanders empower their subordinates to act or make decisions under specified conditions. This approach enables efficient and effective decision-making, as it ensures exercise of authority at the appropriate level in response to specific circumstances.

Examples of conditions that commanders may attach to conditional authorities include the loss of life, the loss of critical or high-value assets, the isolation of forces, or the perishability of capabilities. These conditions serve as triggers for the exercise of delegated authority, allowing subordinate Guardians to act decisively and autonomously, when necessary to meet commander's intent.

The Space Force exercises conditional authorities through pre-planned responses and pre-approved activities. A commander may direct subordinate forces to develop pre-planned responses or activities, tied to potential changes in the operational environment or other key decision points. Examples of changes to the operational environment include indications of hostile intent against a spacecraft, severe solar flares, malware attacks, or a ballistic missile attack on fielded units. Commander's intent informs all pre-planned responses and pre-approved activities and drives planning for subordinate forces. Development of pre-planned responses or activities provides commanders a range of options under certain conditions and connects those conditions with specific operational activities. The primary utility for pre-planned responses or activities is preparing Guardians for contingencies and compressing operational response times.

## **Control Procedures**

Control procedures are a means for commanders to control, deconflict, and integrate forces, effects, and information in space and time. Control procedures provide a standardized vocabulary, and standardized format, which facilitates understanding by capturing intent without detailed explanation. Control procedures allow precise adaptation of C2 to emerging operational conditions. They also support the normalization of procedural control measures and permissive coordination measures, which can improve the efficiency of C2.

Control procedures fall into three categories: (1) control measures, (2) coordination measures, and (3) communication measures.

- a. **Control Measures.** Control measures increase operational effectiveness by promoting the safe, efficient, and flexible operations. Institutionalizing a mix of procedural and positive control measures increases operational effectiveness. Properly employed, these methods maximize the effectiveness of operations without unduly restricting the capabilities of any Service or component throughout the competition continuum. Capabilities of the units executing operations shape the appropriate composition of procedural and positive control measures. Positive and procedural control measures protect friendly forces by establishing specific coordination requirements. Commanders responsible for C2 of space operations ensure close coordination among joint force

components, allowing for adaptability in response to changing requirements and priorities as operations progress.

- 1) **Procedural Control.** Procedural control relies on a combination of standard operating procedures and previously agreed-upon and disseminated orders. Under most conditions, standard operating procedures are previously determined and distributed in various forms such as rules of engagement, identification procedures, fire support coordination measures, maneuver control measures, payload control measures, and communications standards. The nature of an engagement, the required responsiveness and timeliness, and the current operational environment determine the ability to maximize procedural control.
  - 2) **Positive Control.** Positive control measures rely on surveillance, accurate identification, and tracking of spacecraft, as well as continuous communication between a designated C2 element and all entities conducting operations in the operational environment. Positive control enables precise decision making, frequent updates, and quality control of maneuvers and tactics. Recent or frequent positive sensor contacts or telemetry reports (owner/operator reported ephemeris data) are necessary to employ positive control.
- b. **Coordination Measures.** Coordination measures facilitate the collaboration or deconfliction of two or more force elements operating in a shared or overlapping battlespace. Permissive coordination measures require no further coordination before taking a prescribed action if a set of underlying conditions is satisfied. The primary purpose of permissive coordination is to facilitate rapid, independent action. It is preferable to restrictive coordination because it empowers lower-echelon commanders to take actions based on previously issued orders. Restrictive coordination measures impose requirements for specific coordination prior to the prescribed action. The primary purpose of restrictive measures is to provide safeguards for friendly forces. For example, a change of inclination maneuver may require restrictive coordination measures to reduce the risk of conjunctions with other spacecraft or debris caused by the maneuver.
- c. **Communication Measures.** Communication measures standardize the exchange of C2 guidance and orders based on time- or event-based triggers, while not restraining action. Commanders may require time-based communications (e.g., daily reports) to ensure situational awareness or event-based communications after predesignated actions (e.g., following a planned maneuver or engagement, completion of scheduled or unscheduled maintenance).

Implementation of procedural control and permissive coordination, coupled with standardized communication measures, can conserve sensor time, and allow Guardians to focus on adversary activity while maintaining appropriate deconfliction of friendly activities. Given the expansiveness of the space domain, control procedures help create a safe and efficient battlespace while facilitating freedom of action, decision making, disciplined initiative, and shared understanding. As a result, control procedures are a critical mechanism to effectively exercise mission command during the execution of operations.

The dynamic nature of C2 for space operations requires tradeoffs between efficiency, control, and independent action. An uncontrolled battlespace offers users the most flexibility and can exert the least drain on resources; however, it increases the risk to United States, allied, and partner forces. The exclusive application of positive control measures, on the other hand, provides the best mitigation for risk at the expense of flexibility while requiring significant resources and communications to implement. The optimal balance between control and independent action is rarely static; instead, commanders need to adapt with changes in the operational environment, the objective in question, higher-headquarters' assessment of the acceptable level of risk, and, most importantly, the actions of the adversary. Control procedures cannot eliminate these trade-offs. Finite resources, ambiguity in the operational environment, and adversary actions make complete control unachievable and unconstrained independent action reckless. Instead, normalized control procedures allow for greater levels of control and independent action than would otherwise be possible.

**Appendix A: Acronyms, Abbreviations, and Initialisms**

|                  |                                                |
|------------------|------------------------------------------------|
| ALERTORD         | alert order                                    |
| C2               | command and control                            |
| COMSPACEFOR-CENT | Commander Space Force Forces - Central Command |
| CSTO             | combined space tasking order                   |
| DEPOORD          | deploy or redeploy order                       |
| EMI              | electromagnetic interference                   |
| EXORD            | execute order                                  |
| FRAGORD          | fragmentary order                              |
| MILSATCOM        | military satellite communications              |
| MTO              | mission-type orders                            |
| OPORD            | operations order                               |
| OPR              | office of primary responsibility               |
| PLANORD          | planning order                                 |
| PTDO             | prepare to deploy order                        |
| SBIRS            | space-based infrared system                    |
| SDP              | Space Doctrine Publication                     |
| SDS              | Space Defense Squadron                         |
| SOCS             | Space Operations Control System                |
| SOD              | space operation directives                     |
| SOPS             | Space Operations Squadrons                     |
| SPINS            | special instructions                           |
| STARCOM          | Space Training and Readiness Command           |



|            |                             |
|------------|-----------------------------|
| TASKORD    | tasking order               |
| USSF       | United States Space Force   |
| USSPACECOM | United States Space Command |
| WARNORD    | warning order               |

## Appendix B: Glossary

**acceptable level of risk** - Loss or harm to forces, failure of all or some mission objects, escalation in tension with the enemy that commanders deem appropriate or necessary trades to success as related to a specific mission and the current operational environment.

**art of command** - The commander's ability to use leadership to maximize performance. (*Department of Defense Dictionary of Military and Associated Terms* / Joint Publication 1, Volume 1, *Joint Warfighting*)

**combined [operations]** - Two or more forces or agencies of two or more allies operating together. (*Department of Defense Dictionary of Military and Associated Terms* / Joint Publication 3-16, *Multinational Operations*)

**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*)

**command and control system** - The personnel, facilities, equipment, communications, and procedures essential for a commander to plan, direct, and control operations of forces pursuant to the missions assigned. (*Department of Defense Dictionary of Military and Associated Terms* / Joint Publication 6-0, *Joint Communications*)

**constraint** - In the context of planning, a requirement placed on the command by a higher command that dictates an action, thus restricting freedom of action. (*Department of Defense Dictionary of Military and Associated Terms* / Joint Publication 5-0, *Joint Planning*)

**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*)

**end state** - The set of required conditions that defines achievement of the commander's objectives. (*Department of Defense Dictionary of Military and Associated Terms* / Joint Publication 3-0, *Joint Campaigns and Operations*)

**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*)

**high-value asset** - A part of the force, formally designated by a competent authority, as requiring special care for protection, defense, and use.

**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*)

**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 Change 2*, 31 March 2023)

**mission-type orders (MTO)** - 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.

**restraint** - In the context of planning, a requirement placed on the command by a higher command that prohibits an action, thus restricting freedom of action. (*Department of Defense Dictionary of Military and Associated Terms* / Joint Publication 5-0, *Joint Planning*)

**risk** - The probability and consequence of an event causing harm to something valued, classified within one of four risk levels (low, moderate, significant, or high). (Chairman of the Joint Chiefs of Staff Manual 3105.01B, *Joint Risk Analysis Methodology*)

**risk-to-force** - The probability and consequence of planned and contingency events causing harm to the provision and sustainment of sufficient military resources. (Chairman of the Joint Chiefs of Staff Manual 3105.01B, *Joint Risk Analysis Methodology*)

**risk-to-mission** - The probability and consequence of planned and contingency events causing harm to current or future military objectives. (Chairman of the Joint Chiefs of Staff Manual 3105.01B, *Joint Risk Analysis Methodology*)

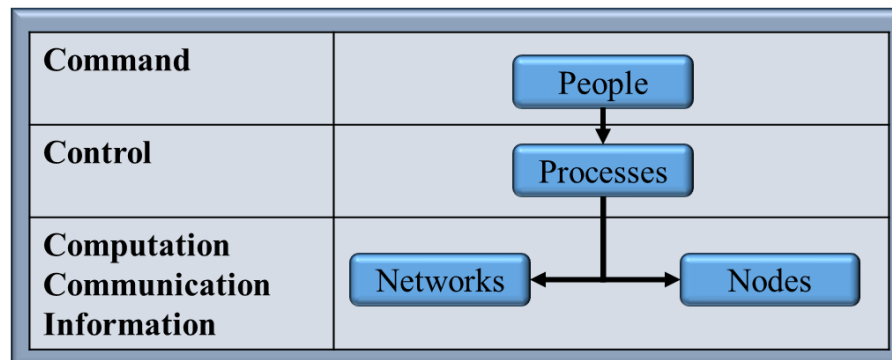
**unified action** - The synchronization, coordination, or integration of the activities of governmental and nongovernmental entities with military operations to achieve unity of effort. (*Department of Defense Dictionary of Military and Associated Terms* / Joint Publication 1, Volume 1, *Joint Warfighting*)

**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*)

## Appendix C: Space Operations Control System

The *Command and Control Functional Concept 2030* introduces the Space Operations Control System or SOCS as the future of C2 for the Space Force. The SOCS functionally defines the shared infrastructure, core services, and behaviors of individuals and units by which the Space Force conducts C2. SOCS is the Space Force equivalent of other Services' control systems such as the Air Force theater air control system, the Navy tactical air control system, Army air-ground system, Marine air command and control system, and represents the Space Force's contribution to Combined Joint All-Domain Command and Control, including interfaces with joint, interagency, international, and commercial partners.

The SOCS is emergent as opposed to a formal acquisition, development activity, organization, or weapons system. The shared infrastructure, core services, and behaviors of individuals and units functionally define the structure of SOCS. The SOCS as depicted in figure 3, includes dedicated control systems and units, interfaces with the ground segments of tasked weapons systems, the coordination of centrally managed supporting effects, and the Guardians who operate them. This includes a complex collection of legacy vertically integrated and newer interdependent networks and systems to provide core services to all elements of the SOCS and to tasked forces. This structure reflects a highly distributed force and acknowledges a state of manually integrated system of systems with an increasing number of machine-to-machine services.



**Figure 3. Space Operations Control System**

**People** – The people in a C2 system include commanders, subordinates, and leaders.

**Processes** – Process for executing C2 to minimize confusion and promote standardization.

**Networks** – Networks in the C2 system collect, process, store, display, disseminate, and protect information worldwide. They enable the execution of command and control, and they support operations through the wide dissemination of data and relevant information.

**Nodes** – A node consists of the people, processes, and networks necessary to perform C2 functions. Functions of a node include building and maintaining situational understanding, controlling operations, and assessing operations. Depending on mission complexity and the level of environmental degradation, decentralized nodes may employ distribution of command and functions where feasible and practical.

## Appendix D: Order Format

Order outline using the five-part structure of the MTO methodology.

Copy \_\_\_\_ of \_\_\_\_ copies

Organization

Location

Effective Date Time Group

ORDER NUMBER (NAME or TITLE)

References:

1. Situation or Purpose
2. Mission, Event, or Tasking
3. Execution, or Key Actions - Including Tasks to Specific Units
4. Administration and Logistics
5. Command and Signal / Command and Control

[Signature]

[Name]

[Rank/Service]

Commander

Annexes: As Needed.

## **Appendix E: Mission Command Vignettes**

Mission command and its principles are applicable to every echelon of the Space Force, and in every type of organization or operation. Institutionalizing it under a wide variety of conditions is essential for developing the Space Force culture. To facilitate understanding, below are vignettes from the operational, tactical, and institutional staff perspectives which highlight the role of mission command in today's Space Force.

### **Operational Application Examples**

#### **Component Field Command Example**

##### **Generating Contingency/Crisis Concept of Operations and Orders**

Exercise: Commander Space Force Forces - Central Command (COMSPACEFOR-CENT) 2022-2023

The Service Mission Area concept of operations provides details regarding effects the Space Force Service Component provides to the supported commander. The concept of operations explains how employment of the provided capabilities mitigates existing and future problem sets (contingency/crisis).

In the execution of mission command, the COMSPACEFOR-CENT draws upon combatant commander mission, vision, and end state via campaign plan and execution order (EXORD) to inform the mission, vision, and end state provided to COMSPACEFOR-CENT staff. This guidance informs mission analysis, to generate orders using the MTO methodology aligned with the commander's intent provided to assigned and allocated units.

Meanwhile, COMSPACEFOR-CENT establishes/employs externally developed coordination measures to collaborate and deconflict with two or more force elements. This is important in collaboration and deconfliction between United States Central Command and United States Space Command operational space components. Subordinate units will know how to receive and give feedback/status through established communication measures to maintain a shared understanding of the operational environment.

Executing orders in the form of special instructions (SPINS), space operation directives (SOD), or a combined space tasking order (CSTO), in conjunction with internally and externally imposed control measures identifies the framework the organization will use to achieve the commander's end state on a tactically relevant timeline. These orders are cyclical documents, updated as the operational environment and mission evolves, and are consistent with strategic guidance.

Combatant command and Service component Night Orders (FRAGO) allow for agile, out-of-cycle taskings to tactical units necessary to maintain alignment with an evolving battlespace, until such a time commanders incorporate the guidance into cyclical documents.

Tactical units employ disciplined initiative because orders using the MTO methodology provide a shared understanding of their specific assigned responsibilities within the larger higher-headquarter's vision, intent, and desired end state.

Successful employment of this model facilitates three goals: 1) Posture a nascent Service Component to fully support a combatant command during a contingency/crisis; 2) Arm a component staff with tools necessary to inform and produce mission type orders; and 3) Establish/refine procedural norms for tactical units in a heightened state.

### **Missile Warning Example**

#### **Responsive Decision Making Enhances Force Protection**

A Space Cell at a regional operations center is manned 24/7 by Guardians and operates as the primary C2 element. It leverages space-based and space-enabled capabilities to support regional operations. One of the primary missions of the cell is to provide theater missile warning as directed by the regional joint force commander. As soon as Space Force capabilities detect a missile launch the primary C2 element notifies the subordinate elements which drives appropriate actions at the projected target area.

Previously a joint force commander received warning intelligence that hostile forces with known ballistic missile capabilities were planning to attack dispersed friendly forces sites in the region. The Space Cell understood that threats to force protection were one of the commander's priority intelligence requirements, and providing timely missile warning was one of the key tasks assigned to the cell.

Guardians at the Space Cell challenged the assumption that the dispersed sites will receive timely missile warning through second and third tier C2 elements. The cell used the shared understanding of the theater C2 architecture, comprehension of the commander's intent, and competence of the trained and experienced operators to take disciplined initiative. They quickly established connections with the dispersed sites and determined that they were not in the missile warning notification architecture. Employing established coordination measures between force elements, the Space Cell coordinated through the Army and Air Force Special Operations liaison officers and informed the Battle Captain of the operational gap.

Empowered by leadership, Guardians used their resident subject matter expertise and operational awareness to modify the missile warning notification procedures. By establishing vertical and horizontal communications, they were able to build mutual trust within the operations center and with the dispersed sites. Most importantly, by building an updated plan within the control measures and rehearsing the plan, the Space Cell was able to maintain an acceptable level of risk for timely theater missile warning despite modifications to standard operating procedures.

A few months later, the space-based infrared system (SBIRS) constellation detected the launch of over one dozen ballistic missiles against the United States and coalition targets in theater. Guardians at the regional operational center successfully provided early warning for personnel,

at the targeted site to seek shelter. As a result, United States and coalition troops sustained zero fatalities and limited infrastructure damage.

### **Tactical Application Examples**

In the tactical environment the Delta or the lowest self-contained military element capable of independent action, are responsible for employing mission command principles. Though the span of control is significantly different between a Component Field Command commander and a crew commander, the principles of mission command and employment of mission command philosophy in application of authority and executing control are the same. The difference is the scale and scope of responsibility. In each case, the commander, whether Commander Space Force Forces or the crew commander provides the information necessary to establish a shared understanding with subordinates and enable effective decision making within the scope of their responsibilities. Commanders provide additional clarification as necessary to facilitate disciplined initiative.

#### **Space Electromagnetic Warfare Example**

##### **Dynamic Fires Support to Theater Operations**

A deployed Space Crew Commander conducting space operations using electromagnetic warfare capabilities in support of in-theater operations, received tasking for a short-notice mission. The Guardian referenced higher-level orders to ensure a shared understanding of the task within the overall mission, key tasks, objectives, and commander's intent. The Crew Commander issued an order using the MTO methodology to the crew to begin planning the mission. In planning, the crew verified the target with the appropriate intelligence agency, identified the desired effects with the correct frequencies and energy requirements, developed measures-of-effectiveness for other entities to verify (such as a space domain awareness sensor detecting a lack of maneuvering by the target indicating impaired commanding), and defined timeframes to execute the effects to reduce risk in affecting unintended targets. The crew further identified contingencies for unexpected events, such as reduced power availability or the target being at an other-than-predicted location. To ensure the crew could execute with disciplined initiative, the crew had trained for this situation to proficiency. Now with shared understanding and appropriate training, the crew was prepared to execute with the freedom of action given to them through mission command.

The Crew Commander then issued an order using the MTO methodology, ensuring shared understanding within the crew to execute the mission within the commander's intent to achieve effects in-theater. The noncommissioned officers, upon receipt of the MTO, mission guidance, key tasks, and commander's intent, exercised disciplined initiative in conducting rehearsals and verifying the system's capability for effects in the desired frequency bands and minimum required energy levels.



As the mission evolved, changes in the positions of unintended targets necessitated modifying the mission execution time. Upon receiving the FRAGORD from the higher headquarters, modifying the allowed time to affect the on-orbit target, the Crew Commander refined their guidance, including their own FRAGORD to comply with this constraint. The Crew Commander at the tactical level exercised mission command by issuing multiple orders using the MTO methodology to provide clear directives and commander's intent. This allowed all members of the crew to take disciplined initiative necessary to posture themselves to support joint force operations.

### **Electromagnetic Interference Example**

#### **Spacecraft Interference**

Recently, mission experts in one of the Space Operations Squadrons (SOPS) began receiving consistent electromagnetic interference (EMI) indications on a spacecraft. For several months, as the cause was both unknown and not reflected in conjunction reports. The SOPS crews processed these indications by submitting Joint Spectrum Interference Reports. However, as this issue persisted, a Crew Commander, and a mission expert, demonstrating the qualities of mission command by exercising disciplined initiative and personal competence with the trust of their leadership, took action to investigate further, and were able to identify trends with the EMI indications on this spacecraft. The Guardians characterized these EMI indications as suspicious based on their combined expertise. In response, they developed a comprehensive timeline of their spacecraft support actions, overlaying them with the date and times of the EMI indications. As they began to compare the two data frames, they quickly realized EMI indications occurred at relatively consistent date and time combinations, indicating a correlation to pattern-of-life attributes. Furthermore, the SOPS almost always detected the EMI indications in pairs, often separated by similar time intervals, which caused them to suspect 'active' and 'passive' times originating from another spacecraft. The SOPS Weapons Officer confirmed these suspicions through further investigation.

Ultimately, leveraging their combined spacecraft expertise and personal competence, the Guardians attributed months of 'unresolvable' EMI and promulgated greater electromagnetic spectrum deconfliction understanding across the joint force.

### **Spacecraft Operations Example**

#### **Relocation**

In the fall of 2023, 4 SOPS was monitoring the relocation of a spacecraft, which was supporting a higher headquarters directed International Telecommunications Union tasking. After a prolonged period of relocation operations, the spacecraft was performing a final series of burns to stabilize its new position. However, the burns were having the opposite effect. The Guardian, having operated this type of spacecraft for eighteen concurrent months, immediately recognized the anomaly and initiated corrective actions. The on-shift Crew Commander was not as

intimately familiar with spacecraft operations. However, appreciating the Guardian as a subject matter expert, the Crew Commander, employing the principles of mission command by establishing mutual trust with the crew under steady state conditions, empowered the spacecraft expert to coordinate anomaly resolution with minimal oversight. Consequently, the Guardian was able to employ their technical expertise to execute timely corrective actions.

These actions consisted of cancelling upcoming burns and executing multiple, short-notice momentum dumps. Mutual trust through the chain of command enabled rapid decision-making and expedient emergency actions that prevented the vehicle from automatically entering an emergency state. This would have resulted in immediate and prolonged mission impact.

Mission Command empowers Guardians to act with disciplined initiative and demonstrate mutual trust between commanders and subordinates.

### **Mission Degradation Example**

#### **Typhoon Damage**

When a typhoon blew their radome down and nearly destroyed their strategic control antenna, the spacecraft controllers of United States Army Company E, 53d Signal Battalion [now Space Force Detachment 5, 53 SOPS] took immediate action to preserve as much of the antenna as they could. The unit's non-commissioned officer exercised creative problem-solving and worked with a local Marine Corps unit to quickly restore spacecraft control capability through two tactical antennas. Commanders praised the unit for their initiative and outside-the-box problem solving. These unprecedented events to restore a critical spacecraft control function exemplify disciplined initiative resulting from understanding commander's intent and mutual trust between commanders and subordinates.

### **Spacecraft Station Change Example**

#### **Employing Control Procedures**

A Space Force MILSATCOM spacecraft needed to conduct a station change to a new location and in the process would need to pass by four other spacecraft. The commander included specific control procedures as part of her commander's intent in order to:

- Maintain safety of flight
- Maintain communications to the greatest extent possible
- Avoid interference with another spacecraft
- Reduce risk-to-force and risk-to-mission

Implementing control measures for this maneuver involved various levels of control based on the level of situational awareness that the crew operating the spacecraft had versus the awareness of the commander. As long as the spacecraft operator could view a common picture of other

spacecraft in the domain, procedural control could define a ‘keep out zone’ from other on-orbit objects, and the crew could define a flight profile that met the control measure.

In this scenario, permissive coordination allowed the MILSATCOM spacecraft to transmit radio frequency energy within certain longitudinal boundaries without any further coordination. However, in some regions with the potential for interference, the commander could have dictated a restrictive coordination measure that would allow the spacecraft operator to emit radio frequency energy only after coordinating and receiving approval.

### **Institutional Staff Application Vignettes**

Mission command principles are just as important to enabling effective staffs as they are for enabling combat units. Competence, mutual trust, orders using the MTO methodology, shared understanding, commander’s intent, disciplined initiative, and risk acceptance all serve to unlock Guardian talent to seize opportunities and address enduring, emerging, and surprise challenges. How these principles and the control and coordination measures are employed may be different, but the philosophy is the same. Whether a Field Commander or Director, Delta Commander or Division Chief, Flight Commander or Branch Chief, commanders all rely upon developing trust, shared understanding, and clear intent, to provide coordinated, timely, resource constrained solutions.

Leadership reviewed the product prepared by Delta 2 and 19 SDS and determined it met the objective of the original tasker.

### **Combatant Command Staff Example**

#### **Translating Executive Direction into Action and Policy**

In July 2021, the Secretary of Defense issued a single-page memorandum describing five tenets of responsible behavior for Department of Defense operations in space. The memorandum tasked Commander, United States Space Command, with developing behaviors based on those tenets that the Department of Defense will adhere to in space activities and operations.

The commander shared executive intent established initial connections and partnerships, and provided guidance to the staff for developing options. The United States Space Command staff empowered by their commander, clarified commander’s intent and purpose, issuing a PLANORD using the MTO methodology to headquarters staff and components that included awareness of concurrent United States efforts through the United Nations to normalize responsible behavior in space. The staff formed an operational planning team to begin working the task.

The operational planning team leveraged available expertise and professional military judgment to conduct mission analysis, course of action development, and course of action comparison. The team shared the results with partner nations to develop mutual trust. The team provided their final product to the commander, who subsequently responded to the Secretary of Defense with the proposed course of action.

In February 2023, the Secretary of Defense approved the recommended terms of reference for behaviors in space, establishing national guidance for norms of responsible behavior in the space domain.

## Appendix F: References

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