Addressing Counterspace Doctrine through Naval Composite Warfare

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Introduction

The declaration of space as a war-fighting domain and the growth of the threat within the domain has brought about an increase in attention and action driving thought toward how the United States might respond. Unfortunately, this evolution has been without a commensurate development of supporting military doctrine. The growth of intelligence on space threats and the desire to prepare and respond has driven changes across all space forces to refocus and adjust priorities directed previously on terrestrial force support and force enhancement. The space doctrine, however, has lagged in this growth, failing to provide sufficient guidance for space force employment and the organization for protection and defense. At the tactical and operational level, the defense of space assets and the method by which we organize forces is currently an afterthought with assumed-away, nonexistent solutions. To recover from this deficit, it is necessary to build off of organizational similarities found in the maritime domain and its guiding doctrine.

This article describes how Air Force Doctrine Document (AFDD) Annex 3-14, *Counterspace Operations*, lacks the employment and organizational guidance necessary for space forces to compete with current threats and how the Navy approaches a similar problem using Navy Warfare Publication (NWP) 3-56, *Composite Warfare: Maritime Operations at the Tactical Level of War*. Finally, the article will provide recommended additions to current counterspace doctrine based on the maritime example to organize tactical and operational space forces for space superiority.

Air Force Doctrine Annex 3-14 Analysis

The foundational element that guides Air Force understanding and employment of force is its doctrine. Specific to space, AFDD Annex 3-14, *Counterspace*

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Operations, addresses threat descriptions, mission area descriptions, high-level organizational descriptions, force enhancement command and control, and initial space planning guidance. While the information is valuable, several areas exist that clearly fall short of meeting the expectation to provide an effective foundation. To address space as a war-fighting domain, the doctrine must mature ahead of the technology, something that has not happened in the past, to guide the organization and preparation of space forces for a war-fighting domain.[1]

The current Air Force doctrinal language found within AFDD Annex 3-14, *Counterspace Operations*, is very specific and limiting with respect to national space assets and threat response. It states:

> "The 2017 National Security Strategy recognizes the benefits space provides and the potential threats to US space capabilities by stating: The United States considers unfettered access to and freedom to operate in space to be a vital interest. Any harmful interference with or attack upon critical components of our space architecture directly affecting this vital US interest will be met with a deliberate response at a time, place, manner, and domain of our choosing."[2]

In this declaration, the doctrine specifically identifies vital interests and critical components of our space architecture as the capabilities that, when interfered with or attacked, will trigger a response. This doctrine leaves open to interpretation the status or identification of a system that elicits a response to a threat or interference. While, in some cases, this may be valuable providing both decision space and ambiguity, it also introduces the opportunity for gray-zone conflict muddying the waters of proportional response and the declaration of hostilities. This doubt, paired with the limitations imposed by the second portion of the statement, make responding to threats with justified actions difficult. The implication found in just the word *response*, is that we will take the first hit and then make a decision on when and where to respond. This is troublesome as it abdicates the initiative to the attacking force. Losing the initiative, especially in the space domain, may very well also lose us any chance at victory. If the enemy can coordinate a set of actions against multiple, limited, and critical space assets, the resulting position may be one that does not require a response, as we have already lost our ability to provide an asymmetric advantage to our forces.

AFDD Annex 3-14, *Counterspace Operations*, does provide a workable definition of *space superiority*, identifying it as the objective and goal of counterspace operations and the provision for sufficient freedom of action to create desired effects.[3] Therefore, commanders should determine the appropriate level of space control required to accomplish their mission and assign a commensurate level of effort to achieve it.[4] This determination is also effective if the desired intent is to

maintain the status quo. What this strategy does suggest, however, is the level of effort applied may be less than that required for a dominant victory. In the same way that force ratios in other domains are dictated by the threat and the environment, this same type of barometer should be applied within the space domain to ensure victory is assured and not contested in the pursuit of national security interests. To even make these sort of apportionment decisions however, the doctrine needs to address the command and control of space forces.

The command and control framework, outlined in AFDD Annex 3-14, *Counterspace Operations*, is focused on how space effects are provided in support of combatant commanders. It describes relationships like the space coordinating authority and the director of space forces, both elements of supporting a combatant commander with space effects.[5] AFDD Annex 3-14, *Counterspace Operations*, goes on to provide a description of different command and control centers that play a role in the use and management of space power and space systems.[6] Some of the descriptions are relevant to the counterspace mission and provide a good capture of the organizations relevant to space command and control. These descriptions, however, do not account for the organization of forces in a contested domain with multiple types of threats. The guidance can be improved by including a framework for forces to utilize in response to threats that adequately shares protection tasks and functions.

The driving question born from the current limitations found in counterspace doctrine becomes: What additions to current space doctrine must be made to address the war-fighting domain? While space is a unique domain, the concepts and methods by which forces organize to address threats are not. Responses and organization can be adapted and applied from other domains to address the growing threats in space. In particular, the way the US Navy addresses composite force warfare at the tactical level of war with NWP 3-56 has clear parallels to leverage as an initial building block for the tactical organization of space forces.

Composite Warfare: Maritime Operations at the Tactical Level of War Analysis

The primary purpose of NWP 3-56 is to provide guidance for the organization of US Navy tactical forces and a framework to decentralize execution at the tactical level of war. It also provides options for planners and commanders to consider in organizing and employing forces for operations in any domain.[7] The portions of NWP 3-56 with the most interest and applicability for space forces can be organized into three categories: composite warfare organization, command guidance, and mission application.

The basic component of the naval approach to composite force warfare is the way forces are organized at the tactical level. This way of organizing forces allows for offensive and defensive combat operations against multiple targets and threats simultaneously.[8] NWP 3-56 describes three tiered levels (see fig. 1), which are differentiated by focus, command function, and responsibility. At the top of the structure is one commander who is given the title of composite warfare commander. This commander then designates command tasks, usually associated with a mission area or function. In the case of the next tier, the warfare commander's responsibility is assigned when a duty involves the control of weapons deployment or sensor system employment across the entire force. Examples of these commanders are the air and missile defense, surface, information operations, strike, and sector warfare commanders.[9]

Functional group commanders, the tier below the warfare commanders, conduct a specific activity supporting the overall mission using a subset of the force within the operations area. An example of a functional group commander is the screen group commander. According to NWP 3-56, the screen commander commands "an arrangement of ships and aircraft to protect a main body or convoy. Typically, screen ships provide protection by placing themselves between the adversary and the high-value asset (HVA). The screening group is an organization of escort platforms, typically multimission ships. Warfare commanders may have authority delegated to them to detach ships from the screening group."[10] The functional group commanders and this method of organization is an effective way to organize forces, specifically for the tactical defense and protection of assets. Both the warfare commanders and functional group commanders have the support of coordinators, the execution tier of the construct.

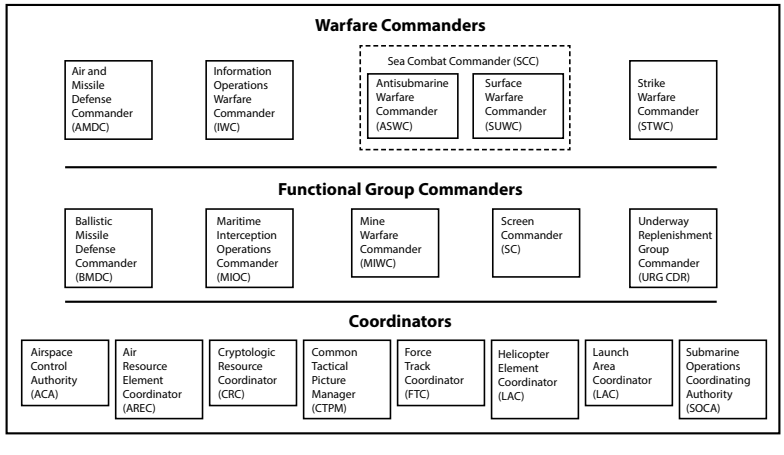

Figure 1. Naval tiered composite force structure

Source: NWP 3-56, *Composite Warfare*, 5–16

"Coordinators are asset and resource managers. They carry out the policies of the overall commander and respond to the specific tasking of either warfare commanders or functional group commanders," according to NWP 3-56.[11] Supporting assets for the Navy include the positions like the common tactical picture manager, air space control authority, and force track coordinator. All of these resources are critical to the execution of the primary mission and enable all or some components of the functional groups and warfare commanders. This organizational construct allows the maritime forces to organize and operate in support of the assigned mission and commander's intent.

Using the composite warfare organizational model allows for the force to then execute operations with command by negation type orders, executing preplanned responses, with the shared use of capabilities. Command by negation refers to:

> ". . .the tactical commander retaining the option to command force action, particularly weapons employment, through command by negation. In many aspects of maritime warfare, it is necessary to preplan the actions of a force to an assessed threat and to assign some command functions to a subordinate. Once such functions are assigned, the subordinate is to take the required action without delay, keeping the commander informed of the situation with the expectation that silence is consent. The commander retains the power to negate or modify any particular action, but will do so actively."[12]

This type of order and execution provides the tactical commander the freedom to execute his preplanned actions and orders, not dependent on direction from leadership or having to seek additional approvals. The approval to execute is implicit in the preplanned response actions and orders that enable leadership the ability to negate or modify if required by circumstances dictated within the situation, rules of engagement, and so forth. One of the keys to the success of command by negation is the development of preplanned responses.

Preplanned responses are valuable for composite warfare for several reasons. They not only provide direction for subordinate commanders, but they allow all members of the composite force to have a basic understanding and shared idea of how other components will act in certain situations. NWP 3-56 describes this concept and provides the following description of preplanned responses:

> . . . preplanned responses provide subordinate commanders and subordinate forces with the commander's desired response in the event of certain enemy or other force actions. Preplanned responses, therefore, establish criteria for commanders to initiate autonomous action when circumstances warrant such action. Preplanned responses must be clearly crafted to avoid confusion and include clear definitions of the preconditions that may trigger a response. Because preplanned responses provide clear understanding of the commander's intent, they

> facilitate common understanding, reduce the possibility of confusion, and increase the effectiveness of operations, even when operating in potentially denied or degraded environments."[13]

The documentation of this approach to command is especially useful as it provides guidance and methods to the force for developing actions with a shared understanding and levels of responsibility. It also addresses the communication challenges faced by the tactical units and provides guidance for operations taking place in a contested and potentially degraded environment. When paired with the guidance on shared resources, this becomes a powerful enabler for the composite force.

The sharing and use of resources among members of the composite force is where the real power of composite force warfare comes from, allowing capabilities from multiple platforms to be leveraged against problem sets based on the needs of the warfare commander or functional group commander in need of support. NWP 3-56 notes this guidance several times providing the reminder: "composite warfare organization enables multiple warfare and/or functional group commanders to share weapons and sensors on a single platform."[14] This flexibility and fluid organization between the different assets allows for a more system-of-systems approach to applying force and executing the assigned mission. The application of these concepts is best exemplified with the example of HVA protection described in NWP 3-56, chapter 7.

This section describes *high-value asset* (*HVA*) *defense* as a primary focus for every composite warfare commander is protecting his HVAs (see fig. 2). HVAs are classified as friendly critical assets requiring protection. They may be any forces, facilities, area, or so forth, the friendly commander requires for the successful completion of the mission. Maritime high-value assets may include aircraft carriers, maritime prepositioning ships, combat logistics force ships, and amphibious warfare ships conducting amphibious assaults and landings. Maritime high-value airborne assets may include E-2, EP-3, and P-8 aircraft; depending on the defensive situation, other special mission aircraft may be considered. Active protection normally is provided by maritime air and missile defense-capable systems (e.g., fleet air defense assets); however, they may be supplemented by other functional component forces and capabilities if needed. Surveillance area (SA): classification, identification, and engagement area (CIEA); and vital areas (VA) are established to provide a buffer around the HVA. Each of the areas within figure 2 are defined within NWP 3-56 to provide direction and guidance for the mission and activities taking place within their bounds. The definition of each is provided below as an example of what defines and sets the conditions for the composite force to execute the HVA protection mission set:

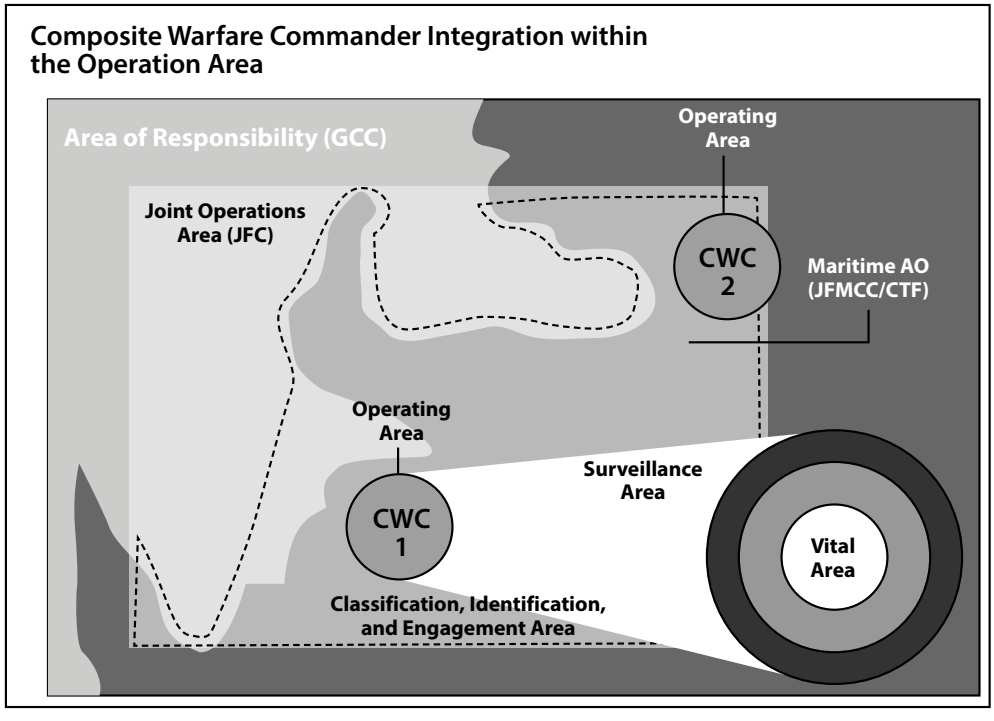

Figure 2. Buffer areas surrounding a high-value asset

Source: AFDD Annex 3-14, *Counterspace Operations*, 7-6

Surveillance area: In surface warfare, the area in the operational environment that equals the force's ability to conduct a systematic observation of a surface area using all available and practical means to detect any vessel of possible military concern. The dimensions of the surveillance area are a function of strike group surveillance capabilities, indications and warnings sensors, and available theater and national assets.

Classification, identification, and engagement area: In maritime operations, the area within the surveillance area and surrounding the VA(s) in which all objects detected must be classified, identified, and monitored; and the capability maintained to escort, cover, or engage. The goal is not to destroy all contacts in the CIEA, but rather to make decisions about actions necessary to mitigate the risk that the contact poses. The CIEA typically extends from the outer edge of the VA to the outer edge of where surface warfare forces effectively monitor the operational environment. It is a function of friendly force assets/capabilities and reaction time, threat speed, the warfare commander's desired decision time, and the size of the VA.

Vital area: A designated area or installation to be defended by air defense units. The VA typically extends from the center of a defended asset to a distance equal to or greater than the expected threat's weapons release range. The intent is to engage legitimate threats prior to them breaching the perimeter of the VA. The size of the VA is strictly a function of the anticipated threat. In some operating environments, such as the littorals, engaging threats before their breaching the VA is not possible because operations are required within the weapons release range of potential threats. Preplanned responses should include measures for when contacts are initially detected within the VA.

Recommendations

The background and reference information presented provide a sight picture for the environment necessitating an update to AFDD Annex 3-14, *Counterspace Operations*. Senior leaders have, at length, discussed the importance of treating space as a war-fighting domain and developing the force in such a way that we maintain the advantage in the space domain. The brief examination of AFDD Annex 3-14 and NWP 3-56 provides a snapshot of the current status of Air Force counterspace doctrine and how the Navy, in the maritime domain, addresses similar operating environments. The time to adjust and update our doctrine is now, ahead of the need and at a time when it can serve as a foundation for much of the development and reorganization taking place within the military space community. The following recommendations are a huge step in acknowledging the issues facing our forces and provide guidance to address existing gaps in our thinking as we look at the threat environment.

Space Composite Warfare Construct

The basic construct by which the maritime forces organize is the composite force warfare organization. This concept can be applied to the space domain fairly easily. The framework provided below in figure 3 is an initial starting point to address the threat while utilizing the Air Force Space Command war-fighting functions as a preliminary framework for the functional warfare commanders.[15] This alignment matches responsibilities with expectation and training while using doctrine as a guiding foundation for the organization of forces at the tactical level. To accomplish this, the five major provisions of composite warfare tiered structure, responsibility, subordination, planning and reporting, and preplanned responses, as well as a tiered organizational structure, described below, can be adapted for space forces from NWP 3-56.

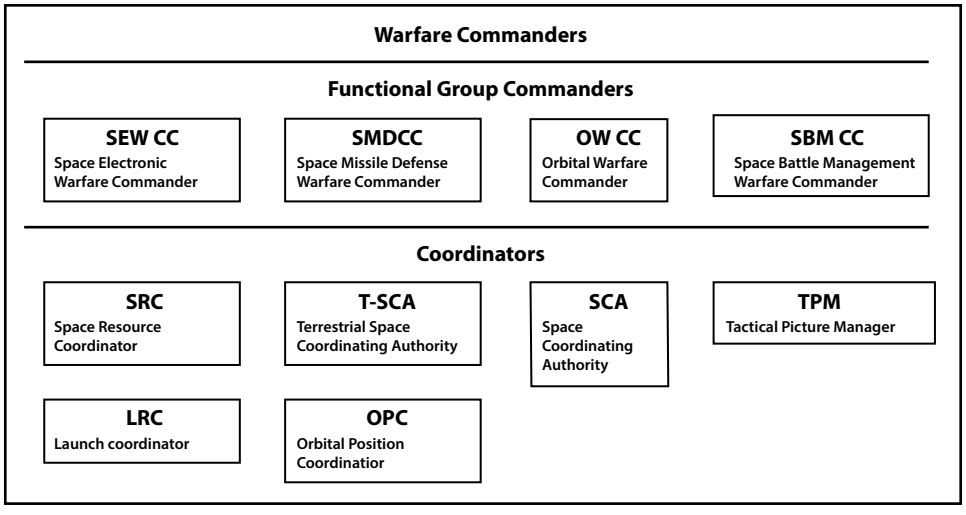

Figure 3. Space Composite Force Warfare Construct

Warfare commander. The warfare commander is an officer who has been delegated authority to conduct some or all of the offensive and defensive functions of the force. This individual provides guidelines for operational conduct and uses mission-type orders and command by negation to control the mission and the functional warfare commanders. The warfare commander also controls the composite warfare organization by ensuring transfers between primary and alternate commanders are correctly and efficiently accomplished.

Functional warfare commanders. Functional groups conduct a specific activity to support the warfare commander's overall mission with a subset of the warfare commander's force within the specified area of operations. The establishing authority determines the command authority and functions of the functional group commander. Typically, these commanders exercise tactical control (TACON) of both assigned and attached spacecraft. When the functional group is operating near the vital area of an HVA or other spacecraft assigned to the warfare commander, the weapons and sensors of platforms assigned and attached to the functional group commander are monitored and controlled by the HVA's warfare commander or functional warfare commander.

When the functional group is operating away from the vital area and other spacecraft assigned to the warfare commander, typically the functional warfare commander is assigned all command functions associated with warfare tasks. These commanders are subject to command by negation from the warfare commander. The warfare commander may have all functional warfare commanders assigned or may be required to execute the responsibilities without additional staffing. In such

cases, the warfare commander may designate these responsibilities as necessary to best accomplish the assigned mission. This construct and organization are scalable from the individual spacecraft crew level to large force execution.

Warfare Commander Descriptions

Space Electronic Warfare Commander Threat: Electronic Warfare / Defensive Electronic Warfare

Space electronic warfare is all attack or action through the electromagnetic spectrum (EMS). This definition includes electronic protection, electronic warfare support, and link management to defeat threats to space effects by protecting critical electromagnetic spectrum links. The space electronic warfare commander will manage all activities that disrupt, deny, degrade, destroy, and deceive adversary access to space effects through the EMS. Also, they will manage the protection and defense of all warfare commander-assigned assets from DEW.

Space Missile Defense Warfare Commander Threat: Direct Ascent-Anti-Satellite (ASAT)

Space missile defense (SMD) consists of all active and passive measures designed to detect, identify, track, and defeat attacking missiles (and entities) during any portion of their flight trajectory or to nullify or reduce the effectiveness of such attack. SMD includes those measures taken to defend assets on the defended asset list missile attack. The space missile defense warfare commander (SMDWC) should be an experienced commander, supported by adequate C2 systems and planning tools capable of providing sufficient tactical awareness to manage SMD for the force. The SMDWC should normally be assigned on the most capable SMD asset to account for this level of support. Because of the broad scope of the SMDWC's responsibilities and the amount of communications and intelligence, surveillance, and reconnaissance system support the SMDWC requires, an alternate SMDWC is not normally designated.

Orbital Warfare Commander Threat: Co-Orbital-ASAT

The orbital warfare commander is responsible for maintaining and setting conditions for all spacecraft health and safety during contested operations. This includes planning, executing and assessing the employment of on-board and off-board resiliency capabilities as well as orbital engagement maneuvers. This planning and execution is especially critical for actions and measures taken to ensure the safety of all HVA assigned as part of the warfare commander's responsibility.

Space Battle Management Warfare Commander

The space battle management warfare commander directs the operation of surveillance and identification sensors to maintain threat custody, direct sensors, data links, and communication systems to prioritize tactical and operational tasks, information, and communication flow for battle space situational awareness. They are responsible for the execution, supervision, coordination, and direction of dynamic adjustments to operations which may include, maintaining force accountability, force package development and real time targeting.

Coordinators. Coordinators are asset and resource managers. Coordinators allow the warfare commander and staff to focus on the primary mission of the force, without the distractions of resource appropriation and allocation and/or service maintenance. They carry out the policies of the warfare commander and respond to the specific tasking of either warfare commanders or functional group commanders. Coordinators differ from warfare commanders and functional warfare commanders in that coordinators execute tasks or missions but do not initiate autonomous actions, nor do they normally exercise TACON over assigned forces. The warfare commander may designate or request additional coordinators as required to accomplish the assigned mission.

Coordinator Descriptions

Space Resource Coordinator

Individual or agency responsible for maintaining ready access to all spacecraft and ensuring the appropriate resources are available to maintain continuous operations and communication for the warfare commander.

Terrestrial Space Coordinating Authority

This is the combatant command's representative who ensures the space effects necessary for execution of the terrestrial mission are appropriately tasked and coordinated.

Space Coordinating Authority

The space coordinating authority ensures all space effects necessary for execution of the mission in the space domain are appropriately tasked and coordinated.

Tactical Picture Manager

Maintaining the tactical picture and ensuring all tracks are updated and part of the common operating picture is the primary responsibility of the tactical picture

manager. They will ensure the proper communication is in place to support the warfare commander and will make any adjustments or additions real-time to the common operating picture in support of warfare commander or functional warfare commander requests.

Launch Coordinator

The launch coordinator will monitor, update, track, and inform the warfare and functional commanders of any launches that will change the operating environment or insert any objects into orbit or re-enter the atmosphere in the vicinity of any supported or supporting terrestrial or space assets.

Orbital Position Coordinator

The orbital position coordinator will monitor, track, and inform the warfare and functional commanders of any changes or updates in orbital positions not previously reported or part of the common operating picture.

Fundamental Provisions for the Space Composite Warfare Construct

To implement this construct, several fundamental provisions need to be documented, trained, and embodied within doctrine. These provisions allow for the successful execution of the Space Composite Warfare Construct and set the initial conditions for forces to operate under this structure.

1. **Responsibility.** The warfare commander retains responsibility for missions and forces assigned. This fundamental responsibility shall not be delegated to subordinates, even though the warfare commander may assign command functions to conduct offensive and defensive operations.

2. **Subordination.** Although the warfare commander may retain a functional warfare commander duty, the warfare commander and functional warfare commanders are always separate and distinct, even when the same commander fills both roles. The functional warfare commander is a command duty subordinate to the warfare commander.

3. **Planning and reporting.** Skillful, dynamic, and aggressive commanders and coordinators whose judgment and actions earn the warfare commander's confidence are central to the composite warfare construct. The warfare commander and coordinators assist the functional warfare commanders with planning, and they keep the warfare commander apprised by communicating near-real-time, evaluated information.

4. **Preplanned responses (PPR).** Critical to successful operations in a composite warfare structure is the development of PPRs for use by the force. PPRs provide subordinate commanders and subordinate forces with the commander's desired response in the event of certain enemy or other force actions. PPRs, therefore, establish criteria for commanders to initiate autonomous action when circumstances warrant. Because PPRs provide clear understanding of the commander's intent, they facilitate common understanding, reduce the possibility of confusion, and increase the effectiveness of operations, even when operating in potentially denied or degraded environments.

A Concept for Space HVA Protection

The final recommended addition is a section necessitating the importance of protecting HVAs. Every system on-orbit is extremely expensive, threatened by multiple different countries and means, and critical to our nation's military and way of life. This reasoning justifies the recognition of the difficulty in protecting these systems and requires a basic framework and acknowledgement in the updates to current counterspace doctrine.

Conclusion

The current dilemma faced by space forces is twofold. First, our senior leaders are directing the force to prepare and act in a manner consistent with a common understanding that space is a war-fighting domain. This strategy is challenging as the preponderance of guidance is written to guide the employment of space forces supporting the terrestrial fight in a benign environment. At the same time, our enemies are presenting a threat picture that not only challenges our ability to provide this support but also draws into question how our forces will organize and address this contested environment. The concept that strategy and doctrine provide the conceptual link between action and effect and are the bond between instrument and objective.[16] Because of this link, it is necessary that we address the deficiencies and update our current counterspace doctrine.

Making the updates identified above to the existing counterspace doctrine will go a long way toward making our counterspace doctrine useful and relevant. With our senior leaders commenting frequently on space as a war-fighting domain, the military needs to show some effort toward addressing the necessary changes and maturing the thinking and guidance to make us effective against our adversaries. The threats faced in space represent a clear benchmark that at the basic level, our doctrine fails to meet. China and Russia are both reorganizing forces, developing capability, and documenting doctrine and strategy that places us in a position of

disadvantage.[17] Our current attempts to address this with a limiting, definitions-based counterspace annex, buried within Air Force doctrine is not enough. The first step toward addressing these deficiencies needs to be one that capitalizes on our strength of thought in the maritime domain and the implementation of the proposed additions to AFDD Annex 3-14. This implementation will place us on a trajectory to elevate our guidance and strategy above that of our adversaries in the space domain. ✪

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Notes

1. Carl H. Builder, *The Masks of War: American Military Styles in Strategy and Analysis* (Baltimore, MD: Johns Hopkins University Press, 1989), 71.
2. Air Force Annex Joint Publication (JP) 3-14, *Counterspace Operations*, 27 August 2018, 3.
3. Air Force Annex JP 3-14, *Counterspace Operations*, 3.
4. Air Force Annex JP 3-14, *Counterspace Operations*, 6.
5. Air Force Annex JP 3-14, *Counterspace Operations*, 18.
6. Air Force Annex JP 3-14, *Counterspace Operations*, 22.
7. Navy Warfare Publication (NWP) 3-56, *Composite Warfare: Maritime Operations at the Tactical Level of War*, December 2015, 1-1.
8. NWP 3-56, *Composite Warfare*, 1-15.
9. NWP 3-56, *Composite Warfare*, 3-1.
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