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Space Warfighting Culture: A White Paper

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Introduction

There has been a vigorous discussion and debate over the past several decades about whether our nation needs a separate military service for space. In December of 2019, a bipartisan majority in both houses of Congress passed the National Defense Authorization Act (NDAA) for Fiscal Year 2020 and the NDAA was signed into law on December 20, 2019. With the stroke of a pen, the President established the United States Space Force (USSF) within the Department of the Air Force as part of a formal change to Title 10, United States Code.

With this action, the United States declared it would create a purpose-built military service whose *raison d'être* is to protect and defend the United States in, from, and to the space domain. The space domain is governed by physical laws and principles very different from air, land, and sea, and these differences enable different concepts of employment than in the other warfighting domains. These unique characteristics underpin spacepower as a distinct form of military power and they give rise to a separate service dedicated to its advancement. And a service solely dedicated to current and future space missions defined by our civilian and military leadership via strategy, policy, and orders; to creating a culture of space warfighters to directly influence the development of systems, doctrine, and operations needed to defend against the threats of today and tomorrow; and to applying all of its intellectual energy and resources towards that core mission.

The creation of the Space Force involves countless required actions and almost every day brings some “new news” about how the Space Force will be organized, how space acquisition will be managed, how personnel are being transferred into the new service, and how the service is creating its own identity. All of these items are important, but two of the



most critical items to be developed and instantiated are the creation of an initial USSF space warfighting doctrine and the creation of a USSF space warfighting culture.

On Aug 10, 2020, the new service released the USSF’s Space Capstone Publication, entitled Spacepower: Doctrine for Space Forces. This foundational doctrine serves as a key guidepost for the ethos and values of the USSF, embraces the reality that space is a warfighting domain, and documents the initial warfighting doctrine for the USSF.

The next major challenge, and the focus of this paper, is the development of a space warfighting culture. Today, there is a distinct lack of a warfighting culture in the space community. Out of necessity, the USSF has adopted an existing or “legacy” culture from the U.S. Air Force, but that culture is insufficient for and incompatible with the strategic and operational environments the USSF now faces. Not only do we need to create a warfighting culture, we also have to transform the existing culture – one that is almost the antithesis of a warfighting culture – to get there.

Specifically, I will address the following three fundamental questions:

- What is a space warfighting culture?
- Why is establishing a space warfighting culture important?
- How does the USSF create space warfighting culture?

Background and Context Setting

I have a unique perspective to offer on this important topic. As an active duty Air Force officer, I spent much of my 34-year career in assignments associated with warfighting in both the space and cyber domains.



From my first assignment as a second lieutenant on a Space Defense Operations Center (SPADOC) combat crew deep inside Cheyenne Mountain Air Force Station, to my last assignment as the three-star Deputy Commander of United States Cyber Command, I have been a direct participant in and a student of the myriad challenges in establishing warfighting cultures in the highly technical, functionally oriented domains of space and cyberspace. I also have had the good fortune of being immersed in other warfighting organizations and cultures, such as my assignment as the Vice Commander at the United States Air Force Warfare Center and as the Deputy Director of Operations at U.S. Strategic Command. While this white paper is focused on a space warfighting culture, there are many lessons from my cyber and other experiences that apply to the topic at hand.

What is a Space Warfighting Culture?

The word “culture” can be an elusive concept. The definitions and attributes of a culture are as varied as there are groups of people and the organizations in which they exist. Still, there are consistent attributes to include having a shared set of values; a collection of shared knowledge; shared behaviors that derive from the experiences of the group; and a collective perceived identity that distinguishes the members of one group from another. Even more difficult to define is the concept of a warfighting culture, recognizing that the definition can and does vary among people directly involved in warfare across military services or in different domains.

In this paper, I will focus on the specific attributes of a space warfighting culture and these attributes will be grouped in the following three subsets:

- Those that reflect the enduring nature of war and apply to any warfighting culture in any domain;
- Those that reflect the uniqueness of warfare in the space domain, the domain uniquely assigned to the USSF; and
- Those that reflect the ever-changing character of war, which offers strategic opportunity and risk to the USSF and every other military service.

Attributes of a Space Warfighting Culture

From their first day of service, members of the USSF should be inculcated with a set of values, knowledge, behaviors, and ways of thinking that forge their collective and individual identities in this new service. The entire USSF -- from the lowest organization element, to the field commands, and to the service headquarters -- must adhere to these same values, behaviors, and ways of thinking. As this occurs, a new space warfighting culture will emerge. During this critical formative period, the USSF should deliberately work to set its new culture along three broad and guiding principles associated with the development of a new space warfighting culture. These three principles are explored in more detail below:

I. A space warfighting culture must be mindful of and reflect the enduring nature of war.

The *nature* of war describes its unchanging essence: that is, those things that differentiate war (as a type of phenomenon) from other things. War's nature is violent, interactive, and fundamentally political. Absent any of these elements, what you're talking about is not war

but something else.¹ Below are specific aspects required in a space warfighting culture that are tied to the enduring nature of war.

- At a fundamental level, every military service exists to deter war if possible, and to win wars when deterrence fails. As such, the warfighting cultures in military services are anchored in a common ethos based on simple concepts such as (1) defending the country, (2) winning our nation’s wars, and (3) executing actions in the domain unique to that service. The enduring nature of war demands that these same three concepts must be front and center in space warfighting culture.
- It is worth noting that the Department’s framework for joint operations means that all military warfighting services and organizations can find themselves in a position of supporting or enabling operations of the other services or in other domains. That said, none of the other services mention this fact in their core mission statements. Just because it is not overtly stated doesn’t mean they won’t support the missions of other services. The legacy space culture in the U.S. Air Force was one of providing support to the Air Force and the other services, and it was not a culture directly involved in joint combat operations. For this reason, it is critical that the USSF deliberately sets its initial values and reason for existing on the primary task of defending the country by winning the nation’s wars in the space domain. America’s leaders did not create a new warfighting service to provide space support, as we

¹ Mewitt, Christopher, “Understanding War’s Enduring Nature Alongside its Changing Character,” War on the Rocks, Jan 21, 2014.

- already had an organization (the U.S. Air Force) that did that well. That said, supporting the other services must remain a derived responsibility, no different than the close air support or airlift missions for the U.S. Air Force. Yet, the core reason for existing must not be anchored in providing support, but in ensuring security and winning wars in the space domain.
- The enduring nature of war makes it important that a space warfighting culture is set in a clear context -- namely, that the service and its people exist to directly fight our nation's wars by conducting combat operations to defeat our nation's enemies. In a warfighting culture, the essential purpose of the organization and the people in it are to fight and actively participate in defeating our enemies. The violence and interactive nature of war must be emphasized in the new space warfighting culture. From new accessions, to individual warfighters, to small teams, and to teams-of-teams, there must be a continual process of training, competition, evaluation, assessment, and exercise of space warfighting skills. USSF leaders must instill the drive to be the best and emphasize that only the best will succeed in combat against a thinking and determined adversary.
 - The enduring nature of war requires a warfighting culture that is outwardly focused on the adversary and threat, not internally focused on the operations of platforms or solving problems associated with the operations of platforms and making them work more efficiently. The Space Force must value the ability to wield a weapon system at the speed of war and in a cognitive fashion against a thinking adversary who is trying to defeat or destroy our country. This approach is required for those

- people and teams that conduct space warfare, as well as those that are involved in joint combat operations involving joint and coalition forces. In all cases, the teams must focus on warfighting outcomes against an adversary, not simply operating support systems where the focus is mainly on operating the space platforms that provide support to others.
- The new USSF warfighting personnel must be highly expert in all aspects of their weapons, platforms, and formations, but they must realize those are simply means to an end, not the end state itself. This orientation will change everything in terms of the service ethos across all of its elements. This will be a specific challenge for the USSF as much of the existing culture from decades of Air Force space operations was internally focused on the operation of rockets, satellites, and ground systems and not focused on fighting in, from, and through a contested environment against formidable, thinking, and determined adversaries.
 - Warfighting cultures within specific military services or organizations have unique organizational mission, purpose, core values, and vision statements, as well as specific creeds and mottos that further define specific sub-cultures within each of the services. In many cases, warfighting cultures are anchored in overt statements and beliefs that the mission will always be accomplished, victory will always be achieved, the enemy will always be defeated, and failure is never an option. These values and statements help set the organizational culture. The USSF, in the early stages of its history, must publish its own set of clear and easily understood statements that define its warfighting culture. These statements may have some

things in common with the other services, but there should be aspects that are unique to the USSF alone. Below are some examples:

- Air Force Vision Statement: “Integrity First, Service Before Self, and Excellence In All We Do”
- Navy Core Attributes: “The four core attributes of initiative, accountability, integrity and toughness serve as guiding criteria for our decisions and actions. If we abide by these attributes, our values of honor, courage and commitment will be clearly evident in our actions.”
- Army Warrior Ethos: “I will always place the mission first, I will never accept defeat, I will never quit, and I will never leave a fallen comrade. The Warrior Ethos is a set of principles by which every Soldier lives.”
- Marine Corps Values: “Honor, courage and commitment, the core values of the Marines, define how every Marine in the Corps thinks, acts and fights. Throughout the evolving battlefields of the 21st Century, every Marine in the Corps must be confident in the abilities of themselves—and each other. In the chaos of battle, character matters.”
- Space Force Cornerstone Traits: “Agility, innovation, and boldness have always been the cornerstone traits of military space forces, and we must continue to harness these traits as we build our new service and a new professional body of knowledge.”²

² Space Capstone Publication, Spacepower, Doctrine for Space Forces, Headquarters United States Space Force page iii, June 2020.

- Warfighting cultures are anchored on the fact that it may be necessary to risk or sacrifice one's life in the defense of the country. In the past few decades, those at most risk have been our ground forces, especially those involved in Operation Desert Storm, Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), and Operation Inherent Resolve (OIR). However, the advent of long range, precision weapons capable of striking targets thousands of miles away can place any combatant in harm's way in the future and all military personnel may find themselves deployed in active combat zones. As the U.S. Central Command Director of Space Forces during OEF/OIF, my team and I were often forward deployed to operating bases in Iraq and Afghanistan and exposed to risks far greater than those located in our CONUS operations centers. In a future conflict, one can expect that critical space facilities and personnel supporting missions such as command and control, launch, and satellite operations will be targeted by a range of adversary kinetic and non-kinetic capabilities.

While it is not a near-term focus, it is also possible that future USSF military personnel will conduct military operations while aboard spacecraft in earth orbit or elsewhere in our solar system. Whether carrying a rifle, sailing in a warship, or controlling an offensive space capability, concepts such as personal courage in combat and willingness to risk one's life in the service of the country must be inherent in any warfighting culture. It would be a mistake to create a culture that assumes it will always wage war from a safe operations center inside the United States.

II. A Space Warfighting Culture Must Reflect the Uniqueness of Warfare in the Space Domain.

The recently published Capstone Publication Spacepower: Doctrine for Space Forces does an excellent job of defining and describing the uniqueness of the space domain as it applies to a military service. For brevity purposes, I list below those elements that are unique to a service that operates and fights in the space domain. These unique elements form part of the core set of values, knowledge, behaviors, and ways of thinking that will forge the collective and individual identities in the new USSF; these attributes will drive a new space warfighting culture.

- The Space Domain itself must be defined and taught to all members of the USSF, but it must be covered in great technical detail to those directly involved in space combat operations. This must include details such as the attributes and challenges of spaceflight and space maneuver in earth's orbit and beyond, space system architectures, fundamentals of basic and advanced space operations. These basic attributes will form the core elements of the initial and advanced technical and operational training of those USSF members directly involved in space warfare.
- The theory, policy, and legal aspects of national spacepower are also unique and must be taught to members of the USSF. This knowledge and information must be mastered by members of the USSF that are involved in the development of national, DoD, and USSF strategy, the development of strategic, operational, and tactical plans, and the execution of space combat operations. This information includes how space power fits into broader Departmental and national policy and strategy and as one of many important instruments of national power. This will ensure unified

- action within the USSF and will keep those actions tied to those policies and strategies that exist above the USSF.
- It is also essential that the core tenets of military spacepower are defined and taught throughout the USSF. The USSF is a warfighting service and its business is executing combat operations and winning wars by executing combat operations in, from, and to the space domain. This cannot be considered outside the context of joint combat operations, because the execution of all USSF missions will be under the authority of a joint combatant command, most likely U.S. Space Command (USSPACECOM). For that reason, war's enduring nature and ever evolving character must be instilled into the ethos of the service and its members. While mentioned earlier in this paper, it bears repeating that members of the USSF will execute operations aimed at ensuring security in the space domain and defeating America's enemies in the space domain to ensure victory in war. Space warfare is the trade of this new service and every member should understand the value that military spacepower brings in defending the country, ensuring our security, and winning our wars.
 - A key difference associated with space warfare deals with how the concept of sovereignty applies in the domain. Prior to the 1957 launch of Sputnik 1, the first successful satellite launch in history, there was no widely accepted view as to whether the overflight of a satellite violated the sovereignty of the nation below. Once Sputnik 1 achieved orbit, it flew over every country in the world between 65 degrees north and south latitude and no conflict erupted due to overflight being labeled as a violation of sovereignty. This single launch and those that followed

- established a new norm and a new principle that satellite overflight was not a violation of sovereignty. This principle, which is far different from those tied to the domains of air, land, or sea, creates unique challenges and opportunities for the USSF. Over time, other unique, but related principles have been established in international law to include no existence of political boundaries, freedom of passage, and the sovereignty of space vehicles. These unique aspects should be taught and understood by all USSF members.
- Space forces will be employed in accordance with operational and tactical space doctrine. Some elements of this doctrine already exist, because they are associated with elements of space operations that already exist. However, much of the doctrine at this level is only now being defined and it must be taught in detail to the practitioners of space warfare. At a high level, the USSF has defined the following three cornerstone responsibilities associated with the employment of space forces: preserve freedom of action, enable joint lethality and effectiveness, and provide independent options in, from, and to space. The USSF has also defined the initial set of core competencies of military spacepower as space security, combat power projection, space mobility and logistics, information mobility, and space domain awareness. These competencies will likely evolve and mature with time, experience, and the changing strategic environment.
 - Finally, a space warfighting culture must continually be focused on developing spacepower expertise across the breadth of the service, forging a spacepower

mentality among its personnel, developing and continually refining the art of space warfare, and always being ready and prepared to answer the nation's call.

III. The last major set of attributes that should drive a new space warfighting culture are

connected to the ever-changing character of war. The character of war describes the changing way that war as a phenomenon manifests itself in actual operations. As war is a political act that takes place in and among nations and societies, its specific character will be shaped by those politics and those societies—by what Clausewitz called the “spirit of the age.” War's conduct is undoubtedly influenced by technology, law, ethics, culture, methods of social, political, and military organization, and other factors that change across time and place.³

The following paragraphs illustrate that the USSF was established at a significant inflection point in the changing character of war; thus, the new service has a great opportunity to set a new culture that reflects those rapidly changing technologies, threats, and other drivers that require new ways of thinking across many aspects of military strategy, planning and warfighting. These attributes can be grouped into both current and near-term drivers of the changing character of war, as well as some on the more distant horizon. The USSF has the opportunity to identify these drivers and set a culture that reflects the reality of where we are going, not where we have been.

Another category of attributes tied to the changing character of war is more difficult to achieve and reflects the challenge associated with ensuring the space warfighting culture

³ Ibid.

has an ethos that is always challenging existing paradigms, always assessing whether earlier assumptions or conditions have changed and how those changes should drive new ideas inside the service. This is the hardest thing for a bureaucracy to deal with, but the USSF has an opportunity to weave a new warfighting culture out of whole cloth based on the types of drivers listed below and that is comfortable with change, risk taking, and innovation.

- Big Data, Machine Learning, and Artificial Intelligence. The rapid adoption of these technologies and capabilities in both the commercial and military sectors is transforming societies and the character of war. Autonomous systems, with humans in some of the loops, are on the horizon and the USSF warfighting culture will need to rapidly adopt these new technologies, as well as create ways to defeat adversary use of the same. These technologies will underpin and power many of the capabilities mentioned below.
- Remote Controlled, Very Long-Range Weapons. One major technological change altering the character of warfare is associated with capabilities that are remotely controlled (or autonomous), very long range, kinetic or non-kinetic weapons. Current examples include both armed, remotely piloted aircraft (RPA) and cyber warfare units. These units are able to conduct persistent and remote ISR and also deliver kinetic and non-kinetic combat effects against targets on the other side of the planet in ways that are consistent with international law and U.S. policy. A new USSF warfighting culture is perfectly suited to be expert in and fully comfortable with the remote delivery of warfighting effects not only anyplace on the globe, but also anyplace in space.

- Massing of Combat Power, Technology, and Human Talent. Another important change in the character of war stems from the combination of the remotely controlled, very long range weapons such as those discussed above with a back-end enterprise that is not only consists of the people directly controlling the weapons, but a broader team that may be comprised of hundreds of other experts distributed around the world that provide intelligence, targeting, data integration, and many other disciplines magnifying the value and effects of a single RPA or a single cyber warfare unit. All of these capabilities will be augmented and accelerated by artificial intelligence, autonomy, and machine-to-machine processes. This same back-end enterprise allows joint commanders in both geographic and global combatant commands to integrate all types of warfighting capabilities in operations around the globe. The real power behind concepts such as Joint All Domain Command and Control (JADC2) effort is the ability to mass combat power, technology, and human talent at the time and place of our choosing. Furthermore, it enables non-linear operations, synchronized in time and space across the globe, where we can mass effects, without having to mass forces. The new USSF warfighting culture should be inculcated with an ethos that not only understands its greatest value is the ability to solve the hardest problems facing U.S. policy makers, but to also to ensure our space warfighting enterprise is built from the beginning to mass available technology and multi-disciplined human talent in ways that multiply the effectiveness of USSF capabilities.

- Modern Definition of a Warfighter. Every military service has sub-cultures of personnel and units that conduct warfare operations associated with understanding, attacking and destroying the enemy. Over many years, these sub-cultures significantly shape broader service intellectual approaches regarding strategy, requirements, concepts of operation, leader development, etc. This fact, in and of itself, is not a bad thing -- but if left unchecked, these subcultures morph into separate classes within a service in which the warfare operations cultures can become too narrowly defined, fail to keep pace with the changing character of war, hinder the introduction of new ideas, and stifle critical thinking. The USSF must establish a warfighting culture based on the expectation that warfare's rapidly changing character will place a premium on critical thinking, require its members to continually challenge existing dogma, and to champion strategic and tactical innovation. A service that has this culture will not just keep pace with both current and future threats but will outpace them and always have the ability to gain and maintain the strategic advantage and initiative. All space warfighters must be "wired" to think this way.
 - One key to success in this area is for the USSF to build a space warfighting culture that is broadly based on all of the various sets of expertise that directly participate in space warfare missions. The new service should be careful not to set any one set of specialties on a pedestal or to become wed to any particular type of platform or mission. During my career as a space officer, I watched the ebb and flow of cultures inside the space community

and saw how the space community within the Air Force could become wed to ideas that were not focused on future challenges or anchored in critical thinking. As noted earlier, the Air Force space culture was focused on the operation of unthreatened space platforms and placed the highest value on the space operator.

- In the USSF, a space warfighting culture must instead be focused on the threat posed by a thinking adversary and must be built on the notion that teams of different backgrounds and specialties must be created and employed to come up with ways to best deter our adversaries by imposing costs on them, denying them the benefit of actions, and defeating them if deterrence should fail. In this framework, the warfighter will not only include platform operators, but must also include specialties such as platform and system engineers, intelligence operations experts, defensive and offensive cyber and EW warfare experts, strategists and planners, technologists and experts in rapid capability development, legal and policy experts, and battle management/command and control experts. All of these specialties must be raised inside a USSF culture and molded into teams focused on space warfare. Senior leaders could come from any of these specialties and all of the individual specialties should be expected to continually innovate, think critically, and adapt to changes in technology or the threat. Another sign of maturation will be when a USSF commander

leads a joint operation where capabilities in multiple domains are successfully employed.

- It is important to raise a caution on the above point. In many cases, an existing, legacy culture can become overly focused on self-protection and its own place in the organization. Often arguments are used that place a special premium on the operator, on who actually pulls a trigger, or who actually is deployed into a current combat zone. Those are important, but the changing character of war provides an opportunity to bring many more perspectives and skills into the conduct of space warfare. A successful culture will demonstrate that it truly values the power of multi-disciplinary teams across the spectrum of our new service.
- Better Connecting Space Operations, Space Research and Development, and Space Acquisition Communities. In 2001, I wrote the following words that were published in both the Rumsfeld Space Commission report and an associated Staff Background Paper on Military Space Culture:

Perhaps more than other areas, space benefits from a unique and close relationship among research, development, acquisition and operations, as spacecraft are usually procured in far fewer numbers, sometimes as few as one or two, than are tanks, airplanes or missiles. Exchange of personnel across space communities, between the operational and acquisition commands and between the Air Force and the NRO, is clearly desirable but at present there are barriers that restrict the cross flow of personnel among these communities. Personnel managers in the Air Force need to have a comprehensive view of all space career positions within the national security space community and the means to manage individual assignments among the acquisition, operations and intelligence communities. Improving the exchange of personnel among these organizations would expand the space manpower base and could also help to reverse the retention problem among

space acquisition officers by opening up new career paths and leadership opportunities within the Air Force.⁴

These words are as true today as they were twenty years ago. However, the changing character of war, the creation of the USSF, and the creation of a new space warfighting culture create a strategic opportunity for the USSF to achieve much greater speed and innovation throughout the depth of the service. This specific opportunity is tied to the standup of Space Systems Command (SSC), the new USSF field command that will be responsible for the development, acquisition and maintenance of satellites and ground systems, the procurement of satcom and launch services, and for making investments in next-generation technologies. Much has been written about the SSC and how future USSF acquisition will be organized and managed, but less has been written about the culture within this new command as it pertains to a tighter relationship between the space warfighting operational organizations and the new SSC.

In this area, it is helpful to borrow from organizations that have had success in fielding successful acquisition models that value speed, risk tolerance, scale, inclusivity and relationships, as well emphasizing an aggressive, operator-focused and innovative acquisition culture with an emphasis on agility and speed of delivery to the customer. The USSF would benefit from the creation of an USSF development and acquisition culture that also adopts the above tenets. As mentioned in the

⁴ McLaughlin, J. Kevin, "Military Space Culture, A Commission to Assess National Security Space Management and Organization Staff Background Paper," January 2001.

- previous section, the new space warfighting culture should include a broad range of specialties such as operators, engineers, technologists, and strategists. The USSF leadership should also take steps to ensure the creation of a very close bond between the space warfighting operations culture and the culture within the new space development and acquisition community. In addition to acquisition agility, the USSF should ensure comparable agility in the definition and modification of requirements, as well as in budgeting, programming, and funding. All of these changes will create much tighter cultural alignment across the entire USSF, instead of today's model that does not foster such close ties.
- One aspect of the changing character of war deals with the ubiquitous nature of cyber, now part of the fabric of almost every element of global society, as well as global military forces. These changes also include the integration of broader Electromagnetic Spectrum (EMS) capabilities such as electronic warfare, as well as information operations. Many of the greatest threats our nation faces are in the cyber domain and there is a great deal of investment in increasing the resiliency of our overall cyber footprint, while building cyber forces that can defend our country from attack and project force against our adversaries as needed. In 2013, six years before the creation of the USSF, each of the military services was directed to build offensive and defensive cyber forces that would be wielded by the new U.S. Cyber Command. Each of the services also began to think about whether offensive and defensive cyber capabilities were important to their own service missions in the air, land, and sea domains. Since then, there has been much cyber experimentation and

- investment by the services and there is a growing realization that the combat missions assigned to various service units in the future will require multi-domain approaches, to include cyber. The new USSF mentions cyber in much of its early official publications, but almost always in the context of the network or a support perspective. The changing character of war should drive the new USSF to not only embrace cyber warfare, but operations in any domain that might contribute to USSF missions.
- Until recently, our adversaries were conducting long-term operations against the United States in a manner meant to cause us strategic harm, but in ways that did not rise to the level of conventional conflict. The U.S. has now realized we are in a globally competitive environment that doesn't align nicely with traditional planning assumptions about escalation or phases of conflict. Our enemies don't intend to follow our phasing construct and they have been at war with us while we have not been at war with them. That is changing as we better embrace nation-state strategic competition and as combatant commanders such as CDR USCYBERCOM execute new authorities such as those associated with Persistent Engagement below the level of armed conflict. In this new construct, DoD is able to employ new and innovative methods to impose cost, create friction and uncertainty, and force our adversaries to expend energy and resources responding to our actions instead of operating against us in an unconstrained manner. This change in the character of war provides an opportunity for the new USSF warfighting culture to be shaped in a way that is continually assessing ways it can compete against our adversaries below

the level of armed conflict and consider more sophisticated ways of imposing costs and reducing the freedom of action for our adversaries to operate against the U.S. and our interests.

- Space as a Domain Requiring Both Security and Presence in Peace and War. The majority of this paper has been focused on the need for the USSF to fight and win our nation's wars in, from, and to space. However, over time the changing character of war will likely include a much broader expression of our country's future strategic interests in the space domain that extends to the moon, the planets in our solar system, and beyond. These interests could be focused on science, human exploration, economic and business interests, tourism, or a general expansion of human civilization beyond the earth. In this future era, the USSF will be called on to provide U.S. presence and security for U.S. interests as our focus expands outward. While these changes are not among our highest priorities today, there are many who believe the ultimate strategic value of having a USSF is tied to this future. Military theorists and geopolitical strategists such as Alfred Thayer Mahan were able to understand "the anarchical nature of international politics, the importance of geography to the global balance of power, the role of sea power in national security policy, and history's ability to shed light on contemporary world politics remains relevant to the 21st century world."⁵ A challenge for our new USSF

⁵ Sempa, Francis P., The Geopolitical Vision of Alfred Thayer Mahan, The Diplomat, December 2014.

warfighting culture will be to create and foster an environment that encourages new theorists and strategists that will seek to connect future international and interstellar politics, the strategic value of bodies beyond the earth, the criticality of space lines of communication, and unique aspects of space power in the future age.

Why is a Space Warfighting Culture Important?

Culture is vitally important in every large organization. It is the ground truth associated with any organization's identity, as well as how those inside and outside see the organization. For the USSF specifically, and any military service in general, the warfighting culture is especially important because it defines the values and shared set of beliefs of the service, and communicates identity to its own members as well as to others in the U.S. military, the American people, our allies, and even our adversaries.

The service's culture must be in close alignment with the services' stated values and philosophy, otherwise a cognitive dissonance develops that will sow confusion. A strong alignment between the warfighting culture and the stated values and beliefs of the service is a powerful concept that shapes the behaviors of its personnel and the reputation of the service internally and externally. This can be a major aspect of both recruitment of new members into the service as well as their retention.

A strong warfighting culture across a large and complex organization can be the glue that keeps the service aligned across all of its elements. There are many different specialties and functional groups within a service and a strong warfighting culture provides that common organizational purpose in which all can contribute to the broader mission.



The warfighting culture of the new USSF is critical for another reason. Establishing an entirely new culture in a brand-new organization is a hard thing to do, but even harder is creating an entirely new culture on top of an old one that has long existed. That is the situation now facing the USSF. A large percentage of the personnel in the new service were previously assigned to the U.S. Air Force and were part of a culture going back to the beginning of the space age. It's a culture I was directly joined to for much of my military career. The Air Force space culture helped win the Cold War and brought us the marvels of the military space capabilities we depend upon today like the Global Positioning System. It's a proud culture with a history to celebrate and I would never denigrate it. But that culture is not the culture our nation needs today and in the future for the USSF. The legacy culture is not a space warfighting culture aligned to the values and ethos of the USSF, but a "space-in-support" culture of Airmen aligned to the values and ethos of the U.S. Air Force and one primarily focused on operating platforms that support air, land, and sea operations and that have operated in a benign environment since the end of the Cold War.

For the USSF, its true advantage will not be the creation of sophisticated new space systems, exotic space weapons, and brilliant new concepts of operation. Its true advantage will be the development of a new warfighting culture that will drive a unified approach to every aspect of how the new service thinks, functions, operates, and fights. The new space warfighting culture will enable the personnel in the USSF to shoulder a heavier burden than their predecessors. This will enable them to master new technology, develop new doctrine and concepts of operation for space combat, understand how space power can best be used as the primary instrument of power in pursuit of U.S. objectives, as well as how it integrates with

other instruments of national power. In my view, the development of this new culture is the primary and foremost requirement of this new military service.

How do We Create a Space Warfighting Culture?

The first step is for the leadership of the USSF to take bold steps to clearly define its space warfighting culture. There are already elements of the culture being defined in early USSF writings and documents, such as the new Capstone Doctrine document. Many other elements that could comprise a new space warfighting culture are covered in this paper and I hope each of them will be given serious consideration. One suggestion would be for the Chief of Space Operations (CSO) to charter a team to specifically define the space warfighting culture of the USSF. This could be the same multi-disciplinary team or a team similar to the one that created the Capstone Space Doctrine document.

The more difficult steps associated with establishing a space warfighting culture are associated with ensuring that the broad range of practices across the breadth of the USSF are aligned with the space warfighting culture as articulated by the CSO and that they mirror the values and practices of the leadership and the organizations within the USSF. These include:

- Consistency among space leaders at all levels to ensure they understand and constantly communicate the values, ethos, and vision tied to the space warfighting culture. Every action these leaders will take will be judged as consistent or inconsistent with the announced space warfighting culture. Leaders who cannot or will not act in accordance with the stated culture must be removed, as this dynamic is one of the greatest threats to establishing a new culture on top of an old one.

- It is likely that some very talented Air Force leaders may not be willing or have the tools needed to make the transition to the new space warfighting culture. I saw the same dynamic as we were on the journey of building a cyber warfighting culture. The new cyber warfighting culture was very different from the service communications and IT cultures that had been in place for decades. As one relevant example from my time as the Deputy Commander of US Cyber Command, the new cyber warfighting culture placed a premium on deep technical cyber competence for both enlisted and officers in cyber warfighting career fields. Some of the leaders from the older IT-focused culture did not possess deep cyber technical skills, because they were not required in that particular legacy culture. Most former IT leaders adapted and found ways to contribute and help grow the new warfighting culture, but a few resented the new focus and worked to undermine the needed changes. These people who had served honorably in the previous era were not able to succeed in the new culture. In some cases, it was necessary for them to move on rather than stay and fight against the changes needed to instill the new culture. This same dynamic will occur in the USSF. Senior space leaders should do all they can to help their legacy personnel not only adjust to and embrace the new culture, but to become its greatest champions. However, senior leaders must also be watchful for those few who are unable to adjust and who must be moved to other challenges outside the USSF.



- Another specific area of focus should involve the degree to which other existing service or warfighting cultures are deliberately brought into the new USSF space warfighting culture. I have heard numerous arguments along the lines that the new USSF must bring warfighters from other services into the USSF to help create a new space warfighting culture. Bringing space personnel from the Army, Navy, and Marine Corps should be considered if those personnel meet the requirements and reflect the new space warfighting culture and can contribute to its further development. They should not be considered solely because a person from another service has experience in the warfighting culture different from that needed by the USSF.
- Organizational policies and associated regulations, instructions, and procedures must reflect the defined warfighting culture. Failure to achieve such alignment may create divisions and convey to those inside the organization that the leadership is merely paying lip service to the stated culture.
- Training and education of USSF personnel must be 100% aligned to the new space warfighting culture from initial accession training for all military and civilian personnel through their continuing technical training and professional military education. It should be a high priority to develop dedicated USSF courses across the entire spectrum of USSF training and education.
- One way to inculcate a strong warfighting culture is for the service to operate routinely in combat environments against capable and thinking adversaries. The nation is fortunate that U.S. space forces are not currently engaged in combat operations against

our adversaries, but USSF personnel and units can still develop and mature their space warfighting culture if we place a premium on creating realistic virtual environments for wargaming, simulation, training, rehearsal, and testing. The USSF must also create units and capabilities that know, teach, and replicate highly capable peer adversary forces in the virtual environment described above.

Space Warfighting Culture, the USSF, and USSPACECOM

A significant area of confusion among many in and out of the military has revolved around the roles of the USSF and the U.S Space Command. These are two very different organizations, but with very similar names and a unique relationship. That said, I believe the USSF has the primary, but perhaps not the only responsibility for creating a space warfighting culture inside the Department of Defense.

Four challenges must be considered to better delineate the roles of the USSF and US Space Command.

- Which organization has the authority to conduct space warfighting operations?
- Which organization executes space warfighting operations at the operational and tactical levels?
- How do the above authorities and responsibilities drive the development of a warfighting culture?

Which organization has the authority to conduct space warfighting operations? All U.S. warfighting operations occur under the authority and orders of combatant commanders. All

day-to-day operations of USSF units formally assigned to USSPACECOM by the Secretary of Defense will be under USSPACECOM's combatant command authority. This is not a new concept. Even when I commanded the 2nd Space Operations Squadron (2 SOPS) responsible for operating the Global Positioning System and the 50th Operations Group (50 OG) executing DoD satellite command and control operations, our daily missions were under the direction and tasking of a combatant command. Today this includes day-to-day taskings for operations in, from, and to the space domain, as well as tasking to provide space support to joint operations.

Combatant commands have headquarters staffs that support the commander across a wide variety of important functions to include intelligence, plans, operations, command and control, etc. These staffs allow the combatant commander to exercise combatant command authority over all assigned forces and they play an important role in exercising joint warfighting operations. These staffs are typically comprised of a mixture of DoD civilians and military personnel assigned to joint billets inside the command. The combatant command headquarters team does not operate at the operational or tactical level, but it is important that the CCMD staffs have effective warfighting cultures inside their own teams. This will be a challenge in USSPACECOM as a new command, and one similar to a challenge I faced when we were building and maturing what is now the USCYBERCOM headquarters staff. We did not have enough people or a team with all of the needed experiences in cyber combat operations. As a stopgap measure, we relied upon some joint warfighting experts from other domains, but our long-term strategy depended on each of the services to deliberately develop cyber warfare personnel and cultures so we would eventually have a large group of experts from which to choose.

USSPACECOM will likely have to use some version of this same strategy, but they would benefit greatly from US Space Force efforts to build a warfighting culture so that over time USSF personnel become sufficient in numbers and experience to serve at USSPACECOM. I predict that US Space Command will eventually be comprised primarily of US Space Force personnel and those Army and Navy personnel who are expert in integrating space into joint operations. There will almost certainly always be some non-space experts from other domains, but I expect them to reduce as a percentage over time. USSPACECOM should look at USSOCOM, USSTRATCOM, and USCYBERCOM for lessons learned and examples.

Which organizations execute space warfighting operations at the operational and tactical levels? The execution elements for warfighting are the components to combatant commands. CCMD components, not CCMD headquarters staffs, execute combatant command missions at the operational and tactical levels of war. In many cases, joint component commanders are also dual-hatted as organize, train, and equip commanders working for their respective service chief under the authority of a service secretary. It is inside the services and under these service authorities that a service warfighting culture is defined, built, and nurtured. Service personnel are immersed in the service warfighting culture from the day they start basic training and that culture is solidified, reinforced, and practiced inside the service. The services build and execute service career paths that include training, exercises, wargames, and professional military education. Since passage of the Goldwater-Nichols reform legislation, the services also teach joint warfighting in their service schools, so their people are also familiar with joint doctrine, strategy, tactics, planning, command and control, etc.

The services organize, train, and equip entire operational units that are then presented as ready forces to combatant commands. These forces not only come with their overall combat capability, but they come complete with an ingrained warfighting culture ready for combat and ready to execute combatant command assigned missions.

For these reasons, the services are the most important drivers of warfighting cultures in DoD, and the USSF will be the most important driver of a space warfighting culture. If done well, the USSF warfighting culture will impact the breadth of the service and guarantee that USSF service components are not only properly organized, trained, and equipped, but are also highly effective in the joint space warfighting missions they will conduct in support of USSPACECOM assigned missions. They will also provide experienced people for integration into joint commands such as USSPACECOM.

Summary

For the fledgling USSF, there are few things more important than the clear and intentional establishment of a new space warfighting culture that has an enduring joint warfighting ethos, combined with knowledge that the rapidly changing character of warfare will place a premium on critical thinking and require its members to continually challenge existing dogma and champion strategic and tactical innovation. A warfighting culture such as this will grow with the maturation and likely expansion of assigned missions and changes in the strategic landscape and context for a space service. It is less important that we know all of the missions now, but essential that the culture allows the service to anticipate and welcome

strategic change and place a premium on the ability to gain and maintain the strategic advantage and initiative. America's space warfighters must be wired to think this way.

For the USSF, a strong warfighting culture will be the primary delineator between the creation of a transformative, high-impact military service and a rearranging of deck chairs among legacy U.S. Air Force Space units. This all-important culture will reflect the ground truth of the new USSF values, identity, and philosophy. It will ultimately drive the reputation of the USSF among its own people, external audiences, and potential new recruits. The culture will be the glue that keeps the service aligned across all of its elements.

A new warfighting culture is the one change that will ensure a complete break with the legacy culture associated with the U.S. Air Force and the creation of an independent service having a unified approach to how it thinks, functions, operates, and fights.

Finally, the establishment of a new warfighting culture is the answer to the constant debate about the strategic vision and focus of the USSF. Does the USSF look up, or look down? Is the USSF tied to a strategic maritime view or shaped by air doctrine theorists? Does it focus only on operations in the space domain or will it continue to provide space support to the joint warfighter? Creating a strong USSF warfighting culture will ensure the creation of an entirely new service that is not tied or bound to any school of thought associated with another service, but instead to a new set of attributes that allow the USSF to meet the needs of the nation. It will ensure the USSF is a military service wherein its culture reflects both the enduring nature of war and the uniqueness of a service that conducts warfare in the space domain. It will also ensure that this new service will have the DNA required to constantly evolve and adjust with the ever-changing character of war.



Today, Title 10 of the U.S. Code defines the mission of the USSF as providing for freedom of operations in, from, and to the space domain for the United States, providing independent military options for joint and national leadership, and enabling the lethality and effectiveness of the joint force. A new, effective, and strong space warfighting culture will ensure the new service can successfully execute the current and future missions assigned to it by the nation's leaders.