

United States Military Space Organization

*Inaugural speech in the RSAWS, Department III, on 16
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Resumé

I sitt inträdesanförande beskriver ledamoten Bruce Acker fjolårets etablerande av United States Space Force. En inledande beskrivning av författarens verksamhet syftar till att ge en bild av rymddomänen. Författaren beskriver vad United States Space Force har för ursprung, dess budget och dess uppgift, nuvarande doktrin, liksom hur US Space Forces organiseras för att lösa sina uppgifter. Slutsatserna inkluderar att rymden kommer att utgöra en egen domän som kan stödja eller ta emot stöd från respektive luft-, mark-, och sjödomänerna. Dessutom att etableringen av US Space Force inte nödvändigtvis kommer att innebära att rymden kommer att bli mer militariserad, även om detta inte kan uteslutas.

THE PURPOSE OF this presentation is to help shed some light on how the United States Military Space project is organized, what the newly minted United States Space Force is relative to the newly resurrected United States Space Command, and provide some historical perspective on why it came to be, and what this might mean in the future.

A short introduction of the authors background relative to Space is perhaps in order here since a Space career field is relatively unknown in Sweden. After studying undergraduate Aerospace engineering at the United States Air Force Academy, a few years as an operational flight test engineer for fighter aircraft and weapons, and a graduate degree in aircraft flight controls, he became an assistant professor in the Astronautics (Space) department of the Air Force Academy, where he taught astrodynamics, satellite design, and thermodynamics. From there he was among the initial cadre of operators of the then-new and unique (ca 1988) Global Positioning System, which now is a ubiquitous utility.

He eventually became the lead operational engineer, leading 30 or so engineers responsible for the ground stations, on-orbit maintenance planning, navigation data management, and nuclear detonation detection systems. From that assignment he moved to a satellite-based missile detection system used at the time in a cold war context to warn of strategic missile attacks. From there, he moved on to the Pentagon as an Air Force representative to the Department of Defense's office overseeing procurement and policy for all services' Space activities as well as tangentially to the Intelligence activities in Space (more on that distinction later). After a tour as a Strategic Missile Commander (at the time a part of the Space career field), he returned to the Pentagon as the deputy head of the staff unit responsible for proposing the coming 5 years budget for space operations and procurement. The year was 2002.

So, a few disclaimers. Despite a rather varied and in-depth background in the science, technology, operations, plans, and proposed capabilities of the US military Space project,

this was soon 20 years ago. Furthermore, the current changes in US military Space project are occurring at a very fast pace, that means there are doubtless several in the audience who are more up to date than he on the latest developments, budgets and doctrine.

The US Space Force and US Space Command are primarily organizational changes, not to be confused with new systems, increased budgets, or sweeping changes in strategy. To fully understand the US military Space organization, one needs a foundation of understanding in all US military organization. Prior to 1947 (and the formation of the Air Force), the US had a Secretary of Navy and Secretary of War (including land-based air power), and each of the services (Army, Navy and Marine Corps) had pretty broad authority under their respective activities. Some of the flaws in this thinking made themselves evident during WWII, and the Defense reorganization act of 1947 streamlined this to a Secretary of Defense, Service Secretaries not part of the President's Cabinet, and powerful service Chiefs.

Perhaps those who studied the Cuban Missile Crisis or Vietnam recognize powerful names like Nimitz, LeMay or Westmoreland as more recognizable than today's office holders because they often had more prominent roles. But Vietnam, the Iran Hostage crisis, and Grenada revealed that interservice rivalry and ineffective cooperation between branches seriously hindered our ability to effectively counter the Soviet threat in Europe. In 1986, The Department of Defense reorganization Act, also known as Goldwater-Nichols, directly addressed this interservice cooperation (jointness) and established what is for the most part the US modern approach to organization.

Among many initiatives, it separated joint warfighting from, what you call in Sweden, production. The result—the services, Navy,

Army, Marine Corps and Air Force, were assigned the task of organizing, training, and equipping forces (production), while Regional and task specific Commands (US European Command as a regional example, and Transportation Command as a specified example) were assigned the task of using the produced forces in an operational context. The Chief of Naval Operation, Chief of Staff of the Army, or Marine or Air Force counterparts nor any of their subordinate commanders, have the authority to engage in, plan for, or deploy for armed combat. These staffs and their subordinate units resemble what in Sweden you have grouped under the Production activity, with the notable exception that US Services "production" include logistics, procurement, and research and development

Last winter, US Space Force was formed as an independent Service under the Secretary of the Air Force, with a Chief of Space Operations at the same level as the other Service Chiefs and a co-equal member of the Joint Chiefs of Staff. This service, like all others, organizes, trains, and equips forces for one or more of the combatant commanders to use. More or less at the same time, US Space Command was re-established (having been active from 1985–2002) to become one of those combatant commanders. US Space Command and their staff are headquartered at Peterson Air Force Base Colorado, and the Space Force, like all other Services, has its headquarters and Staff in the Pentagon.

For the most part, let us leave combatant operations for another day and focus on US Space Force.

Why a Space Force? Like the evolution of Air Forces, this medium of combat has evolved and has impact at the tactical and strategic level, requires specialized skills often unknown in the other military activities, and has recently emerged as a potentially

decisive capability, though like air power invites heated debate on whether it should be independent or subordinate. Typically, a land commander has far better understanding of the capabilities and limitations of air and sea units than they do of space, and similar comparisons exist for air and sea commanders. As the saying goes, in the US, the Navy's Army has an Air Force (US Marine Corps Aviation) that few other National Air Forces can challenge. This came about because of specific tactical and operation needs that the Army, Navy and the Marines could not outsource to the Air Force, yet air power, due to its speed, range and flexibility could not be universally distributed down to a battlefield commander without significant loss of effectiveness. Space is an extreme example of this same phenomenon. A group of thoughtful Academy of War Sciences members, led by General Mats Helgesson recently studied in depth these issues and I recommend its reading.

Suffice to say, Space military activities have capabilities that can directly impact a firefight in Afghanistan and literally minutes later can monitor nuclear weapons treaty compliance on the other side of the world. In the US, it was not until well after Air Power began destroying targets that the US Air Force was formed. In my opinion, Space Forces are not as well developed at target destruction in the kinetic sense as Air Forces were at the formation of a separate service, but then again kinetic warfighting does not dominate to the same extent that it once did either. These were the issues at play when the decision was made.

To understand what Space force is tasked to do, let's have a look at all US government Space activities, Defense Space Activities, and Space Forces assigned tasks.

Non-DoD government Space is primarily NASA, charged with manned space flight,

exploration, and associated research and development, together with the space-based environmental programs of NOAA this accounts for about 25 Billion USD of federal funding

Total DoD funding of space is a tough number to get at, as a fair amount of it is managed through intelligence programs, and drawing the line between space and other activities like missile defense is not always straight forward. Likewise, not all DoD Space activities will be assigned to Space Force to organize train and equip. Notable exceptions are National Reconnaissance Office (NRO) intelligence satellite programs (on the order of 15 Billion USD) and Army and Navy Missile Defense programs. What was once considered a space activity and a merged career field in the Air Force, ICBM's, also remained outside of Space Force. Just as all the services are directed to work closely with one another by Goldwater Nichols, these synergistic activities remain closely coordinated even if in separate organizations. That leaves about 14 Billion USD for the Space Force (contrast that to US Marine Corps Budget of about 40 Billion).

Space Forces mission is to organize, train and equip forces for the operational commands to use. Let us look at these tasks one at a time.

Organize

The newly released Space doctrine document, called the Space Capstone Publication 10 defines the following Space Power disciplines. Not surprisingly the new organization closely reflects these definitions (*figure 1*).

On the left you see what the doctrine statement calls out as mission areas, and on the right you see what the new Space Force has adopted as an organization. You will note that these are grouped not unlike how an Air



Figure 1.

Force or Navy might group their respective capabilities, at least functionally.

(Figure 2) Here is the organization presented more artistically. Despite similarity in their functional descriptions, the other services do not organize this way.

Unlike the Army, Navy, Air Force and Marines, where the capabilities are generally organized in units that can readily be deployed and reassigned to a combatant commander, Space Forces apparently will be functionally organized. Since many of the functions will serve more than one combatant at a time, control of them will likely remain above the field command level, as was historically experienced with certain long-range weapons like aircraft and artillery. This was at least part of the motivation for the Air Force as a separate service in the last century, and appears to have contributed to a similar decision with Space in this century

Train

Certainly, the skills to manage and operate Space assets are different than other warfighting tools, though Naval underwater specialties differ greatly from Naval aviation without motivating a separate service, likewise attack helicopters and infantry in the Army. I believe there are two main characteristics of the Space profession that cause the recruitment and training of personnel to place different demands on the service than any of the other services.

- 1) It is becoming increasingly rare that a space operator (not to be confused with a user) is needed in a traditional forward warfighting environment, except as an expert liaison to forward headquarters and units. The functions of a space operator are properly classified as inherent military activities because of their poten-



Figure 2.

tially violent and destructive nature, but the tasks can more often than not be conducted far away from the grueling physical environment of traditional combat. Nearly all other military service is easily connected to a reasonably high likelihood of physical exertion. This is not to imply that healthy, physically and mentally robust individuals are not required, but the filter for likely successful individuals could be substantially different.

- 2) Space systems from concept, research, development, deployment, and operational phases are far more tightly coupled than any weapon system we've yet experienced. Whereas many systems in other services are technologically advanced, it is rare that a new capability, still under development, becomes a widely deployed primary warfighting capability. True, rapid

development of capabilities in traditional services exist, but in space, it is quite commonplace for research and development satellites, or the first launched "test bed", to find their way into a combat order of battle. This places a high demand on the personnel to be both operationally and technically proficient.

Whereas the emphasis from the other services has historically been to recruit, train and promote from a nations pool of scholar-athletes, space will likely recruit, train and promote from a pool of healthy scholars. Perhaps they will serve in their careers longer. How Space Force develops this career segment remains to be seen, but from the authors vantage point, it is inevitable that skills valued by the other services but not by space will play a lesser role in personnel development, and other skills emphasized.

This dynamic is already beginning to appear in the other services' cyber and unmanned aerial vehicles arena, where youthful computer and gaming skills encroach on the traditional skill sets demanded by the military, but the impression is that space will take this even further.

Equip

Here is where the oil and vinegar never really mixed well in the previous organization, and this is where the Air Force has struggled to appease critics of its management of the majority of DoD Space. The ultimate sin in the Army and the Marines is to leave a fellow soldier behind on the battle field, in the Navy it would be running your ship aground. For the Air Force, at least in the Pentagon, the worst of all calamities is to lose money to the Army or Navy.

Moving past the irony, all of the services do rigorously defend their budgets, and under my time, the Air Force was constantly under pressure for the appearance that they would redirect money intended for space systems (which were important to all of the other services) to the next great airplane they had on the drawing board. The Army and Navy could not stomach giving Air Force control over their space projects, only to have that money redirected to core Air Force projects. Rightly or wrongly, the author remains convinced that the formation of the Space Force was at least in part motivated by increasing the obstacles to the Air Force's perceived control over Space budget.

Earlier I spoke about the blurring of lines between research, development, and operations and how that may change the training and development of personnel. This has a tremendous effect on procurement practices as well. It is hard and expensive to get to space. Compared to air, land and sea,

transportation to space is limited to only a few nodes, the cost is high, and once there, the hardware at least, is very difficult if not impossible to repair or replace. This makes procurement and operational practices quite different than other branches.

A US Navy Aircraft Carrier is a marvel of complex technology yet embarked on a Carrier in battle you will probably find nobody representing the original manufacturer of the ship, the airplanes, the weapons the catapults, or the electronics. Go to the operational floor of a Space Force satellite operational facility, there they will be, possibly even in operational positions (though compared to the NRO, who have historically very much relied on contract operations, this is less common). Space Force launches have many manufacturing representatives present. Yet another unique dynamic is the relatively few systems procured in a given production run. GPS is a system with a remarkably high number of satellites, roughly 30. Most others number at 10 or fewer, sometimes only one. For a glimpse into those challenges, compare that to Sweden's submarine procurement, with the added twist that once launched, it is basically unavailable for future maintenance or upgrade. Then there is the dynamic of satellites as real estate.

Most satellites have multiple auxiliary missions aboard, some experimental, some emerging technology, some operational...all intended to take maximum advantage of the highly coveted real estate aboard the precious commodity of a space launch. Taken together these create an environment where it makes economic and practical sense to have a fluid procurement process where technological risk is viewed differently, mass production of identical items is at times de-emphasized, civilians remain involved well into operations, and concurrency is commonplace. For those of you not familiar with the term concurren-

cy, it is a term that borders on blasphemy in some procurement circles in which you begin production of operational systems prior to completing the development process. It is a risky practice, mistakes can be very costly, and is just messy.

Looking forward what should we expect? Technology is making rapid progress in making space more accessible, satellites more capable and smaller, swarms of satellites replacing fewer large satellites, and automation of functions that previously were labor intensive. Our society is becoming more deeply integrated with space capabilities we take for granted. Back when I was working GPS, civil use was an ancillary capability. Now it is a ubiquitous capability for modern society, hinders military use, and creates new imperatives for protection. Space combat, once seen as exclusively providing support to terrestrial warfare will increasingly be directed at space-to-space activities to defend both society's and the military's access to space. Because military space is almost exclusively unmanned, lethal force in Space currently concerns itself with terres-

trial forces. Currently, applying lethal force from Space is generally considered less effective and more expensive than other methods, but that may not always be the case.

If you think drones are a complex technology-driven policy issue, imagine space based lethal options. There is, as of yet, scant evidence that the formation of Space Force has accelerated the process of militarizing space. There were no announcements of new systems accompanying the reorganization our Military space forces, just a change of stewardship of the systems already on the books. However, it did not slow this process down any either and the Space Force will surely be in a position to contribute significantly to new doctrine and policies in a way that the old organization did not, since previously no significant military activity had the task of advocating for Space Forces as an independent warfighting capability, integrated with the Air, Ground and Maritime capabilities.

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