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The State of the Art and the State of the Practice

C2 Puzzle: Space Authority and the Operational Level of War

C2 Architecture

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The C2 Puzzle:

Space Authority & the Operational Level of War

Who commands space? Who controls space? Who does space support? Who is the lucky warfighter that gains so much support from space? These pointed questions lie at the heart of space power advocates and operational commanders, as they try to decipher the conundrum known as "space." Commanders ask, "What can space do for me?" and the ideally the advocates can answer, "Space can do this for you, and this and this…"

However, as with most heavily debated topics, the answers clearly depend upon whom you ask. The national agency advocate (i.e. NRO or NSA) might say, "I can provide you this, but only at certain times and under certain conditions." The joint force advocate might say, "I can provide you anything, unless they were previously requested by someone else." The military service advocate might say, "I can give you anything my satellites provide, but I need the request to come from my boss, not directly from you."

In-place C2 constructs and force development clearly shows United States space control and capabilities were originally intended and operated for strategic purposes. Space supported strategic nuclear forces, reconnaissance, National Command Authority (Presidential/Secretary of Defense) communications, and other high-level national needs. Satellites were not anticipated for operational/tactical applications, hence the creation of the programs such as Tactical Exploitation of National Capabilities (TENCAP).

Although TENCAP was highly successful in accomplishing the spreading of space power benefits to all military forces, it has also diluted the knowledge base of space power and appreciation of how these capabilities came to be. The blowback from this has inadvertently caused arrogance among all non-space recipients of TENCAP and similar programs since end-users ('the warfighters') remain unaware of the true origin of the provided support (information/intelligence, communication, location, etc). Uninformed users therefore hold firm beliefs that a few select USAF space units regulate space hardware in orbit and they can also otherwise perform their mission unimpeded without 'space.'

In a brief moment of clarity, this nation's space leaders task organized its space assets with a combatant command, U.S. Strategic Command (USSTRATCOM), after dismantling

U.S. Space Command in 2002. However, with just as much rapidity, the vision lost focus with the creation and dubious implementation of the Joint Space Operations Center (JSpOC) and the Director of Space Forces (DIRSPACEFOR or DS4) in 2005. With this major action, terms such as space coordinating authority (SCA) and command & control (C2) became muddled, and the clear and concise flow of information and control from the combatant commander to the warfighter changed from a straight, clear road to a curvy path with roadblocks.

To maintain, or even increase, the force multiplying effect space has on the battlefield, ideas such as JSpOC need correct implementation. By correctly using these constructs, ideas on how space can, should and will be used to maximum effect will affect institutionalized space thought in the form of improved doctrine. At minimum, corresponding joint and service space doctrine should reflect changes in technology and capabilities for space assets, not just merely mirror another medium's doctrine (i.e. air, naval, or marine). When this mirror imaging occurs, ideas such as DIRSPACEFOR are confused in scope and responsibility with their better-defined counterparts such as JFACC/COMAFFOR.

Space C2: a Historical Quandary

> *"American leadership will make no mistakes, the enemy offer no surprises and the situation proffer no unexpected opportunities"*
>
> -Frederick Kagan,[1]

The United States' current command and control $(C2)^2$ structure for space systems can be traced back to the budget and planning decisions made in the early 1980s. Decisions originating in the Carter Administration were later sustained and expanded during the Reagan Administration. These systems were designed and purchased to render a sufficient network for nuclear warfare C2 at the strategic/presidential level. Some of the systems for this complex nuclear C2 network include the Defense Support Program (DSP) missile warning satellites, the Nuclear Detection System (NDS) aboard Global Positioning System (GPS)

satellites, the Defense Satellite Communication System (DSCS III), the Military Strategic Tactical and Relay Satellite Communications System (MILSTAR) and Fleet Satellite Communication System (FLTSATCOM) communication satellites. These programs and many others were central to the global C2 structure that was required by the National Command Authority during nuclear conflict.[3] During the later 1980s and throughout the 1990s, military planners believed the influence of C2 dominance on the planned nuclear and conventional battlefields spilled over to shape space forces at the operational level; the reality today is C2 dominance is integral upon being dominant in space first. This view was not always the case…

During the dawn of the Space Age, inherent divisions were created, separating and duplicating efforts without a common goal in mind. From the outset, there were multiple duplicative efforts by the Navy, Army, and Army Air Corps involving captured German V-2 rockets. To lesser extent, the civilian National Advisory Committee for Aeronautics (NACA) and its successor, the National Aeronautics and Space Administration (NASA) performed additional efforts in research.[4] The rivalry and splitting of focus within the United States Government is evident in many early space projects:

- RAND Corp's 1946 study on a "world circling spaceship"
- U.S. Army's Redstone medium-lift boosters
- U.S. Navy's Aerobee and Viking research rockets
- USAF intercontinental ballistic missile (ICBM) research

Even America's first foray into space showed signs of rivalry, pitting the U.S. Navy's Project Vanguard against a more experienced U.S. Army rocket team. Project Vanguard was chosen for its use of 'civilian' research rockets (Aerobee and Viking), instead of modified military missiles, as the booster. The failure of Project Vanguard's first two attempts pushed the Army's plan into action, successfully orbiting the *Explorer I* satellite in 1958. Until the late 1950s, no service had taken great interest in space: the Army viewed missiles as an extension of artillery, the Air Force focused its attention on its manned bomber fleet, and the

Navy supported freedom of all services to develop missiles in response to its own internal needs.[5]

Everything changed on 4 Oct 1957 with the launch of the Soviet's *Sputnik*; with underlying tones of worldwide reach by Communism, space became a United States' national priority. Creation of coordinating agencies for space programs came fast and furious. The Department of Defense (DoD) created the Advanced Research Projects Agency (ARPA), controlling both military and civilian programs until NASA took the civilian portion in 1958. The creation of NASA took resources from the now-defunct NACA and also raided the Navy and Army programs nearly completely. This left the Air Force as the dominant military player in space. However, even operations with *Discoverer/CORONA* left the lines of command and control blurred during the joint CIA/USAF effort.

More fragmentation occurred in 1961, with the creation of National Reconnaissance Office (NRO), causing the opposite effect from an agency's creation that was to control *all* overhead intelligence gathering. The NRO took control of all reconnaissance satellites as directed by Undersecretary of USAF (a.k.a. the NRO Director), but excluded any control or participation directed from HQ USAF. From these brief examples, it is evident that this multi-polar slicing of national space power early in the Space Race and the vacuum of joint cooperation has brought United States' space forces to the point where we are today. This jumble might have been bearable for U.S. forces to operate this way in conflict and peacetime, if not for one missing component: doctrine.

Doctrine: the Glue that Holds it Together or the Ties that Bind?

Fifty years and many agencies later, space doctrine has not kept pace with technological developments or political constraints pertaining to space and the battlefield. New developments are taking place faster than the traditional 5-year doctrinal writing cycle structure (submissions, write/re-write, approval, publish/distribute, submissions). Doctrinal terms that were relevant in the past (operational vs. support) have now become blurred or outright obsolete depending on the situation and platform used. What term adequately describes a situation where one unit's 'support' came from someone else's 'operation?' For

the vast majority of space assets, and for the sake of simplicity, their assistance is rendered in the form of 'support' to 'operational' war-fighters.

If the concept of support is to remain a common thread throughout the space forces, another underlying concern is "who's in charge?" or "who's in control?" A clear example of the muddled chain-of-command intertwining multiple agencies and missions can be found in the Defense Meteorological Support Program (DSMP), the DoD's primary weather satellite:

> "DMSP weather satellites, provided specifically by and for DOD and limited national-level operations, (currently fall under the combatant command of USSTRATCOM), but are controlled on a daily basis by the National Oceanographic and Atmospheric Administration (NOAA) under the Department of Commerce (DOC). Yet, requirements for on-board sensor tasking are provided by the Air Force Weather Agency, a direct reporting unit to the Chief of Staff, United States Air Force (CSAF)." [6]

Air Force Doctrine Document (AFDD) 2-2 uses DMSP as a positive example as how multiple agencies, missions, and functions can be rolled up into one satellite program while still performing its duties at a high level of confidence. While great for a textbook level analysis, this example is not a true representation of the space arena and all of its 'power' players and their competing interests. Table 1 shows just a small number of the U.S. Government agencies that have a vested interest in space:

U.S. Air Force	National Security Agency	Department of State
U.S. Navy	National Reconnaissance Office	Department of Commerce
U.S. Army	Central Intelligence Agency	National Aeronautics and Space Administration
National Geo-spatial Intelligence Agency	Defense Information Systems Agency	National Oceanographic and Atmospheric Administration

Table 1: Selected US Agencies

While space provides a significant percentage of the global C2 infrastructure, Table 1 shows the USAF is not the sole provider in this domain. Can existing military doctrine bridge gaps between military and civil systems (i.e. DMSP and GPS) or military and 'national' systems (i.e. NRO and NSA) when each agency has its own way of doing things? The answer is no. Governmental space doctrine (joint, service, and multi-service) must catch up to the near term, encompassing civil, military, commercial, and national systems and its C2 aspects before a 'stressed' environment (war, conflict, crisis, natural disaster, etc.) exposes its flaws at the cost of human lives. Fixing the doctrine problem is a step in the right direction, however, without wholehearted agency support from all involved players, fragmentation of space asset control will continue to exist.[7]

The Conundrum: STRATCOM, JSPOC and DIRSPACEFOR

With the demise of U.S. Space Command in 2002, it seemed that hand-off of space responsibilities to USSTRATCOM would be seamless and a huge force-multiplier for combat forces. In the years immediately following the transition, no major changes to space force C2 were announced, until Air Force-wide changes forced units to 'operationalize' space. In mid-2005, military leaders unveiled a new plan to unify space as a weapon system with 'centralized' C2 in order to increase (presumably deployed) joint force operational effectiveness and efficiency. This space C2 structure plan draws from the agency currently responsible for space (USSTRATCOM), a proposed 'focal point' of space activity (Joint Space Operations Center or JSpOC), and administratively controlling entities (USAF's 8th and 14th Air Forces), and introduces a new construct, the Director of Space Forces (DIRSPACEFOR or DS4). This plan seems simple when summarized as above, but becomes a bit murky when laid out graphically and with some narrative dialog:

Figure 1: JSpOC Organizational Structure. (Source: JSpOC briefing, 8 Jun 05)

Joint Confusion Center?

Part of this new space C2 plan, outlined in a memorandum from Commander, Space & Global Strike (JFCC SGS), to Commander, Joint Space Operations (CDRJSO), established the Joint Space Operations Center or JSpOC. Its official purpose is to "ensure unity of command and unity of effort" for space forces. It should be noted, the CDRJSO is also the 14th AF commander, under Air Force Space Command (AFSPC) and Vandenberg is his stomping ground. While the JFCC SGS is the 8th AF commander under Air Combat Command (ACC) and Barksdale is his home – neither location directly controls space assets, aside occasional launch vehicles at Vandenberg. Figures 2, 3, 4 and 5 (taken directly from briefings) graphically display some of the disparity and confusion this has wrought.

The JSpOC is between the service components and USSTRATCOM but has two layers of leadership (8th & 14th AF) before it gets to CDRUSSTRATCOM. Its divisions are similar to an Air Operations Center (AOC) layout, with Plans, Operations, and Strategy divisions. One main difference with JSpOC is, it is part of a 'virtual AOC' planned to be one of many distributed facilities (Barksdale's AF Global Strike, and 'other' AF AOCs to be determined) as seen in Figure 4. A huge failing in the 'mirroring' of its air counterpart is the reality that the JSpOC cannot directly control any space assets (i.e. sensor tasking and orbital maneuvers). Space forces are not the same as terrestrial (air/surface) assets and should not be treated as such. They were never intended for use at the tactical level. They cannot 'surge' or be 'packaged' and tailor made for short-term operations as aircraft, tanks and ships.

With the inclusion of JSpOC, the command (ADCOM, COCOM, TACOM) chain gets very complex. This new space C2 design, seen through the JSpOC organizational chart in Figure 1, involves two USAF major commands (MAJCOMs), and two USAF numbered air forces (NAF), all under the mantle of USSTRATCOM, a unified combatant command. At first glance, it seems there are new positions to clarify the chain-of-command from the 'satellite driver'[8] to the combatant commander, however, when delving a little deeper, it is evident that the positions listed just become additional job titles for existing commanders.

Figure 2: Component Relationships to US Strategic Command[9]

Figure 3. Source: Air Force Componency to USSTRATCOM, 8 Jun 05

Figure 4. Source: Air Force Componency to USSTRATCOM, 8 Jun 05

Figure 5. Source: Air Force Componency to USSTRATCOM, 8 Jun 05

Who Am I Today? Command Responsibility in Space C2

In adding to the pre-existing C2 structure, the powers-that-be compounded the responsibility hierarchy. Here is a summary of the people and titles involved in these new changes:

The Air Force Space Command commander (MAJCOM Air Force Space Command) is the Air Force liaison to Strategic Command (AFSTRAT) and the commander, Air Force Forces (COMAFFOR) for USSTRATCOM unless AFSPC/CC delegates AFSTRAT as the AF War Fighting HQ (AF WFHQ); in which case responsibility would fall to 8AF/CC (under MAJCOM Air Combat Command). In addition to the above relationships, 14AF/CC (belonging to AF Space Command) also holds the position of Deputy Commander for AFSTRAT (AFSTRAT/CD).

This position-shifting and wearing multiple 'hats' is quite surprising, especially within Air Force Space Command, since one recommendation of the Space Commission of 2000 was separating very large job responsibilities to individual positions[10]. Taking the multiple positions of supreme importance (i.e. JSpOC commander) and stacking them with one person (i.e. 14AF/CC) seems to be going against the Space Commission recommendations and against common sense[11]. Even outside of the space arena, multiple job titles for commanders seem to be the norm. For example, the CDR JFCC SGS is quadruple-hatted: CDR JFCC SGS is also the 8AF/CC, AFSTRAT, and AFNETOPS/CC.

With the multiple job titles, the flow of command authority is just as unclear. In figures 4 and 5, AFSTRAT/STRATAF/8th AF/CC reports to AFSPC/CC (as COMAFFOR) for USSTRATCOM. The operational chain (COCOM, OPCON, TACON, Support) runs from the CDRUSSTRATCOM (Offutt), to AFSTRAT/CDR JFCC SGS (Barksdale) then CDR JSO (Vandenberg), to the war-fighter.[12] Even the proposed center of operations, the AFSTRAT Air & Space Operations Center (AFSTRAT AOC) is the 'virtual' AOC broken into three pieces at distanced locations: Barksdale AFB for AF Global Strike, Vandenberg

AFB for AF Space Ops (i.e. JSpOC) and 'other' AF AOCs yet to be determined (TBD) shown in Figure 4.

Somehow, AFSTRAT AOC will have the capability to provide C2 for USAF forces assigned or attached to USSTRATCOM and be able to serve as the "one stop shop" for all military space power, provided 'virtual link' communications do not break down between these distanced facilities. If this does not sound dubious enough, imagine the hands-on command and control required for the number of military and national satellites on orbit. The Air Force Association's *Space Almanac* states as of 31 May 2004 there were 2,884 satellites in orbit, in varying states of operation (fully and partially operational, dead, and in check-out)[13]. In the 7 December 2005 issue of the Washington Post, journalist Katherine Shrader states:

> "Currently, 43 countries own satellites and there are 413 United States and 382 other operational satellites in orbit."

Discounting the civil and commercial satellites, even the sanest individual could not convincingly believe that the JSpOC could command, control and disseminate the products from most, if not all, military and national space systems.

Figure 6. Command Authorities [14]

Blast from the Past? SAC Lives!

> "Senior commanders making decisions about operations, combined with subordinates free to exercise initiative in executing those decisions, make up the heart of C2—centralized control and decentralized execution."
>
> -Air Force Doctrine Document 2-8, *Command and Control*

These C2 changes are a bit different than another plan described in a memo by General John P. Jumper as Chief of Staff, USAF to Admiral James O. Ellis Jr., then USSTRATCOM/CC dated 23 Feb 2004. That memorandum stated that three separate

numbered air force headquarters, 8th AF (Bombers), 14th AF (Space), and 20th AF (ICBMs) would combine to form AFSTRAT. The combination of these three NAFs into AFSTRAT, on the surface, appears to reconstitute a large portion of Strategic Air Command (SAC) from the days of the Cold War. Under SAC, the headquarters at Offutt AFB controlled these NAFs, just as USSTRATCOM does today. While SAC did a wonderful job against its programmed threat, resurrecting it in similar forms may not constitute the best C2 example for space assets in the 21st century.

Figure 8: DIRSPACEFOR Mirroring DIRMOBFOR[15]

Figure 8

A Conductor with No Orchestra: DIRSPACEFOR

Another area of focus has been in the designation of space "coordinating" authority (SCA) and creation of a position on the Combined/Joint Forces Air Component Commander (C/JFACC) staff called the Director of Space Forces (DIRSPACEFOR or DS4). As shown in Figures 8 and 9, the name and position is similar to the Director of Mobility Forces (DIRMOBFOR), another function within the AOC, with a key difference. This staff position is supposed to bridge the gap between Strategic, Operational[16], and Tactical application of space power. The DS4 role seems to exist at the operational level, but reality shows that misconception is due to their position's location at the Combined AOC (CAOC). All support provided is actually tactical. In a similar vein, the JSpOC is also tactically orientated because it cannot actually 'control' the strategic assets it monitors on ownership rights alone.

Agency	Level of war	Level of Command	Space Forces
USSTRATCOM	Strategic/Operational	COCOM	All military
AFSPC	N/A	OPCON/ADCON	Air Force
JFCC SGS	Operational	TACON (?)	Air Force
JSpOC	Operational (?)	*	Air Force (Navy?)
DirSpaceFor/DS4	Operational/Tactical	*	(?)

* Space Control Authority, not direct command

Table 2: Positions and their Level of War

DIRSPACEFOR is a relatively new concept, assigned to support the CFACC at the operational level of war. The DS4's central role is the senior space expert on the CFACC staff, and accordingly has a complement of 8-12 personnel including space weapons officers (W13S or 'whiskeys'). DS4's job description requires delegated space coordinating authority obtained by the CFACC, who in turn received it from the Combined Forces Commander (CFC). Before the creation of DS4, a space support team performed advisory and support functions; there was no existing concept of SCA. One important fact to note is DS4 offers only coordination, via SCA, not command & control of any forces. This is the key difference between DIRMOBFOR and DS4 - DIRMOBFOR can actually control taskings for inter- and intra-theater assets (in this case, mobility assets like cargo, tanker and personnel transport aircraft)

Adherence to joint military doctrine gives clear messages about the transferability of command authority. Joint Pub 3-14, *Joint Doctrine for Space Operations*, dated 9 Aug 2002, does discuss "space authority" to the Joint Force Commander for coordinating space operations, integrating space capabilities, and responsibility for in-theater joint space operations planning. What does joint doctrine discuss about coordinating authority? Nothing, found in Air Force doctrine as stated by AFDD 1-1, coordinating authority is:

> (1) The authority delegated to a commander or individual for coordinating specific functions and activities involving forces of two or more Military Departments or two or more forces of the same Service.
> (2) The commander can require consultation between the agencies involved but **does not** have the authority to compel agreement.
> (3) **More applicable** to planning and similar activities than to operations.
> (4) May be exercised by commanders or individuals at any echelon **at or below** the level of combatant command.

(5) A **consultation relationship** between commanders, not an authority by which command may be exercised.

(6) **Not** a command authority.

On the surface, DS4 appears to be a good centralizing solution on bringing space power and capabilities to the warfighter. However, with the DS4 being located in the AOC as part of the C/JFACC's staff, their view of space is limited to the tactical level as part of air operations. What about support for the combined forces land and maritime component commanders (CFLCC and CFMCC respectively) of the joint fight? Where is the coordination and C2 for them in the space picture? DS4 does not have much visibility outside the theater (except through reach-back to JSpOC), and has very little visibility within theater outside the AOC.

Providing the DS4 with his information flow, the JSPOC offers the same problem but on a larger scale: it is supposed to operate at all levels of war (strategic, operational, and tactical). But in its current form as a non-joint entity, JSpOC does not carry enough weight to authoritatively deal with all agencies required. The head of the JSPOC has **Global** Space Coordinating Authority (GSCA), which amounts to little for the joint fighting force and has no influence beyond Air Force space assets, equaling the uselessness provided by DS4 but on a global scale. Coordination authority has no teeth; it is only a short-term solution.

Concerning Air Force space forces, SCA is the wrong focus. Coordination and cooperation between varying entities is not leadership. The DS4 position provides neither command nor control; during a fast paced campaign, the coordinating process could waste valuable time and effort. Seen from an operational sense, SCA and GSCA provide unnecessary bureaucratic layers. This current setup fits outdated and outmoded doctrine, which is outpaced by new events constantly. The DS4 responsibility does not solve any fundamental issues (i.e. "Who controls space?") or pave the way for future flexibility. This current structure of SCA may suffice in the short term provided the system is not stressed any due to intense adversary action. How long will this situation continue?

Concerns

One mantra is always preached throughout USAF doctrine and power point briefings: *centralized decision-making, decentralized execution.* Yet, the current structure of space is a thinly spread polyglot of space power whose products and services are in high demand by everyone (military and civilian). At best, what we currently have is fragmented, compartmentalized decision-making and very little decentralized execution, if any. That only covers the US military. The situation becomes much worse when we introduce the headaches involving information sharing with other U.S. government agencies.

Upping the complexity of the problem is sharing information with coalition partners. In a combined operations center (i.e. CAOC), the information dissemination problem poses many questions: Who decides what information needs to be shared and how much? Who else has indigenous space capabilities? What do primary allies and/or host nation need to know and what is their usage or level of understanding? Do we include end user ***products*** like GPS, weather data, and imagery?

Regardless of the answers, history has shown that Allies usually equate to short-term fair weather friends, in most cases. Usually, their strategic concerns are usually not on par with the United States'. Even in rare cases when they are, sometimes governments are one election or revolution away from change. Historical evidence such as the 1979 overthrow of the Shah in Iran or recent events in Spain, Pakistan, and Venezuela show the likelihood of this. What happens when the US embraces those countries, sharing knowledge of our full capabilities in space, and then they go bad?

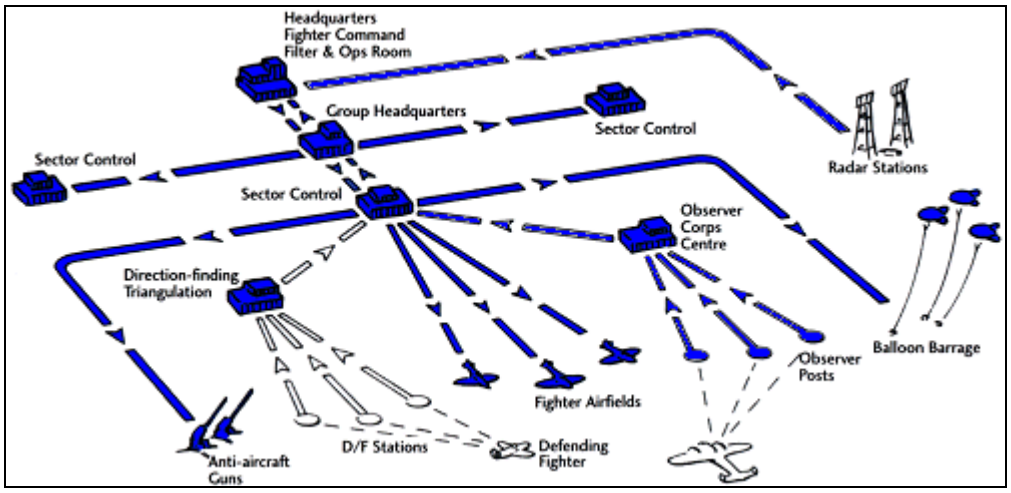
Historical Case Study: the RAF and the Battle of Britain

In 1940, Britain's Royal Air Force (RAF) had the most modern air defense system, while the Germans had the most modern air force. The RAF had a C2 system with outstanding fighters, ground controllers, and a new overlapping radar system with centralized control. In comparison, the Luftwaffe was the only air force in world technologically and operationally prepared for a strategic bombing campaign. They possessed capable bombers, long-range fighters and had "blind" bombing and navigation system for guiding planes to targets. Intelligence, however, was not their forte. Estimates issued just prior to the Battle of

Britain inflated German superiority and underplayed British strengths, including a lack of mention on the RAF radar system plus a condescending opinion on Fighter Command's C2:

> "*inflexible, formations are rigidly attached to their home bases . . . command at low level is generally energetic but lacks tactical skill.*"[17]

A single German Luftflotte (air fleet) had unity of command and controlled both fighters and bombers in combined operations, contrasting the RAF with separate command chains for the two tasks. In July 1940, the RAF had a total strength of 640 fighters, against more than 2600 Luftwaffe bombers and fighters. To employ effective economy of force and mass the limited fighter strength, Britain had a simplistic C2 defense system that maximized all the weapons available. Each Group was split into Sectors with RAF stations in each, one of which was the Sector Control Station, the lowest level of C2 in the system yet it seemed to perform the operational level of war. All the Sector Control Stations reported to the Group Headquarters, (this Headquarters acted as a filter and communications center) and they in turn reported to Fighter Command HQ.



RAF C2 during the Battle of Britain[18]

Central to situational awareness were coastal radar stations, which had sufficient range to detect formations while still over France. Contacts were reported to Fighter

Command HQ where it was plotted on a large map (the 'big board') while simultaneously passed to the Group HQ, who passed it down to the Sector Control affected by the plot. Observer posts reported the formation once they had crossed the coast and were behind the radar. They reported to Observer Corps Centers, who passed the information on to their Sector Control, then to Group HQ, who in turn sent it to FCHQ and the plot of the raid was kept up to date.

All information was passed up or down to the Sector Control, giving them accurate situational awareness and they directly controlled the defenses: balloons, anti-aircraft guns, and fighters. Without this vital system, resources (time and fuel) would have been wasted in constant airborne patrolling of the coast; the full effect of limited resources would not have been brought to bear and air raids could have made it to their targets with little to no warning at all. All information was transmitted to every sector to keep situational awareness spread throughout the command system. By doing this, the loss of a single Sector Control Room did not limit the elastic, effective defense.

How many United States intelligence estimates reflect the exact same words and attitude toward our potential opponents? Cumbersome and technologically superiority-based C2 does not necessarily equate to victory over a simplistic, streamlined C2 organization fighting for survival.[19]

An In-Place Solution: USSTRATCOM

What is the best solution? One need not look further than the foundation USSTRATCOM provides, and then expand on the basics: firm C2 by USSTRATCOM of all military space and direct linkage to other government agencies with space assets with tasking authority and setting priorities, with appropriate levels of assumable authority in time of war for other assets. The in-place structure of USSTRATCOM offers an excellent framework in which to build. Since USSTRATCOM already has COCOM[20] (Figure 7) for strategic forces and should not have anything below it concerning space forces, any lesser level of command (OPCON or TACON) hampers their ability to provide true unity of joint space power. Only USSTRATCOM has, with COCOM, the authority for relations with DoD agencies[21] and weight to deal with other agencies.

In addition, JSpOC should exist as an organic unit to USSTRATCOM, not a 'for-hire' unit ran by a Service-specific level of command (i.e. USAF numbered air force). Since the Air Force firmly believes in the centralization of air power, allowing it to dominate the entire theater operating area (in the form of the CFACC), the JSpOC concept goes against that belief on the joint force level. When the Air Force deploys forces, they become part of a geographic combatant command. Can't natural centralization evolve by joint space power through USSTRATCOM?

A model similar to the RAF Fighter Command in 1940 would have a central C2 node physically located at Offutt or Cheyenne Mountain (or one back up another). The primary location is not important as long as the chain of command is directly from CDRUSSTRATCOM to the C2 node (Figure 10). The space C2 system can be further streamlined from the RAF model, eliminating "multiple sector control centers" and "Group HQ," which only served to centralize and consolidate sector controls. Unless JSPOC takes the place of "Group HQ" and the sector control centers are the actual units that deal directly with space assets, the JSPOC should have actual control of all military space assets (Army, Navy & USAF) with assigned liaisons from all agencies/departments of the government with space assets. An incredibly critical component to maximizing space power, those liaisons also must have a *level of authority* to enact C2 decision-making and implementation. This is the key component to solidifying truly unified space power: rapid situation assessment and execution by all those in the space 'field' at the same time with the same information. To do otherwise, leaves the system with an ineffective, inelastic "message taking board" and not a dynamic, flexible, responsive C2 to fight our future wars.[22]

Figure 9.Source: Author

What is Best for the Future?

Distributed warfare equals coordination nightmare and that's at the *tactical* level. Until we develop uninterruptible instantaneous communications, the system currently in place will not be sufficiently responsive to rapidly changing battlefields. Self-imposed vulnerabilities in the form of critical communication nodes (i.e. DIRSPACEFOR reach-back

to JSpOC, distributed 'virtual' AOCs) hamper our ability to utilize our technologically superior assets to either mass or perform economy of force. Modern successful joint maneuver warfare depends upon speed of command. C2 of joint military space power is entirely too vital to leave anywhere below the combatant command level. Without precision guidance, there can be no precision weapons. Without robust, reliable communication, there can be no reach-back. Without a clear, dominant C2 of forces, there can be no assurance of victory.

Once the military space side of the house is brought into order with this clear C2 system, the other US government agencies with space assets will naturally follow suit. US space assets began and continue to be national-level treasures. Evolution of U.S. space assets into a solid, unified space power is a natural progression. Looking from the adversary's point of view, we are already unified: they do not care if they send the 14th AF JSPOC into crisis mode or if their attack is directed towards a 2 SOPS satellite or 1st Space Battalion crew. A U.S. satellite or space capability is seen as just that: a U.S. asset to be attacked. The more we complicate the C2 process, the slower our response becomes and greater the effect against our warfighters.

U.S. Air Force	National Security Agency	Department of State
U.S. Navy	National Reconnaissance Office	Department of Commerce
U.S. Army	Central Intelligence Agency	National Aeronautics and Space Administration
National Geo-spatial Intelligence Agency	Defense Information Systems Agency	National Oceanographic and Atmospheric Administration

Table 1: Selected US Agencies

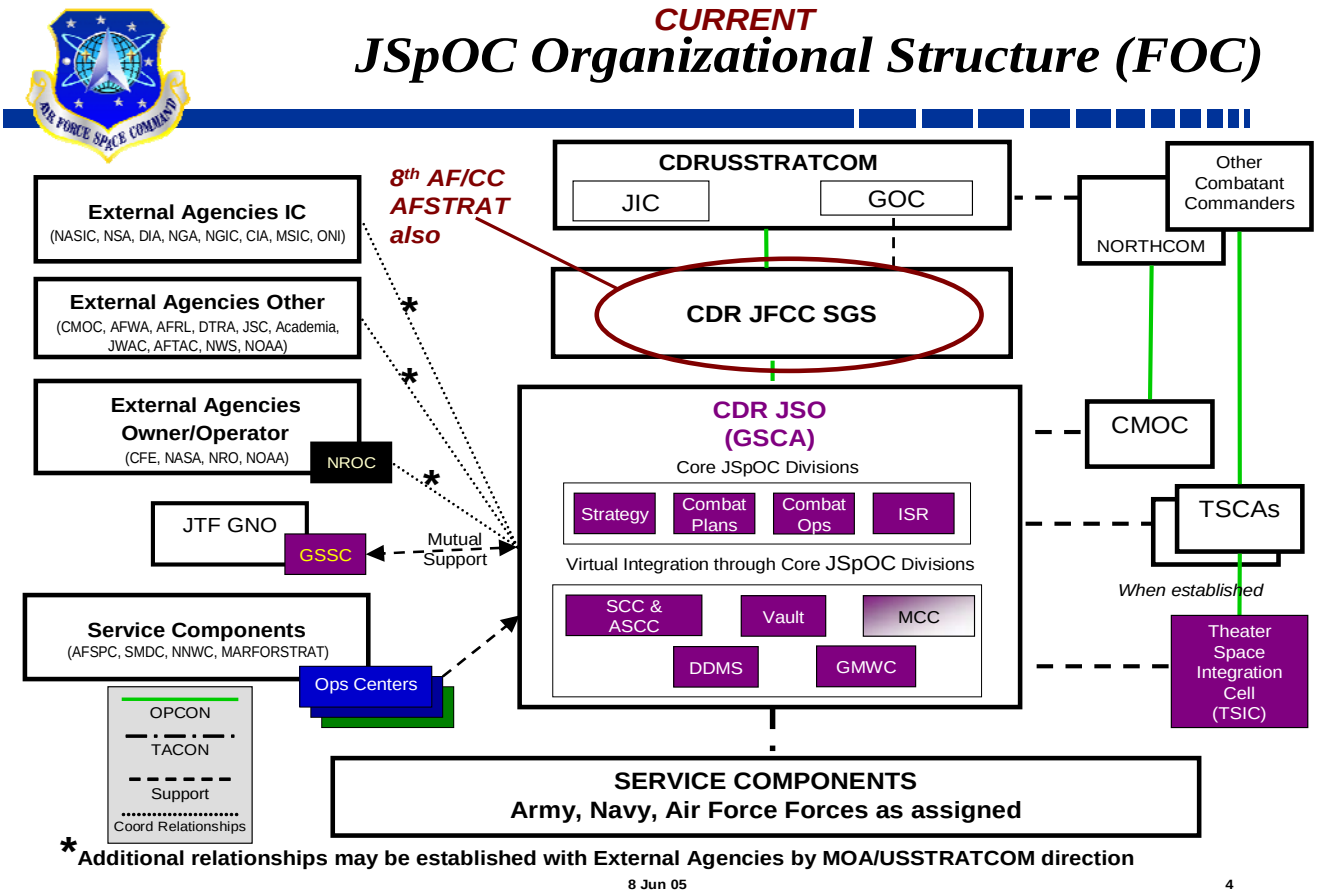


Figure 1: JSpOC Organizational Structure. (Source: JSpOC briefing, 8 Jun 05)

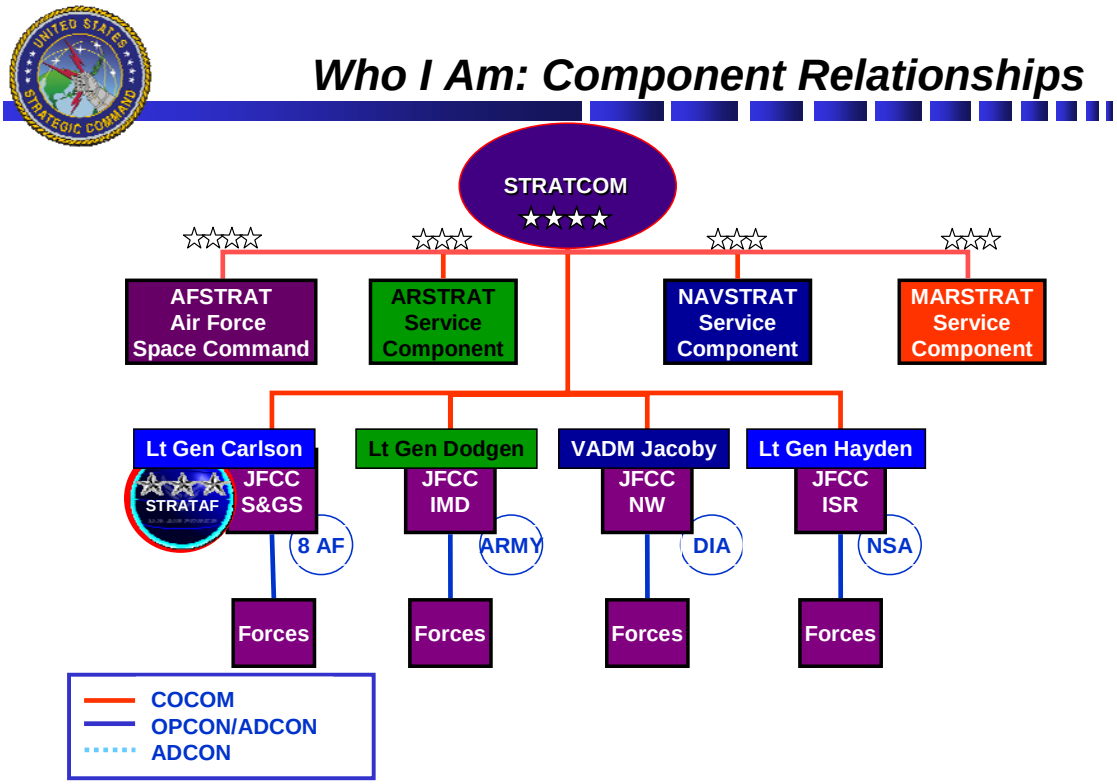


Figure 2. Source: Space and Global Strike JFCC Commander's Call 22 Apr 05

AFSTRAT Air & Space Operations Center

- **AFSTRAT AOC will have the capability to provide command and control for all Air Force Forces assigned or attached to USSTRATCOM**
  - **USSTRATCOM has retained nuclear C2 for execution of nuclear forces**
- **Near term capability provided through geographically distributed architecture**
  - **Single AOC with distributed mission operations:**
    - **Barksdale AFB (AF Global Strike Ops)**
    - **Vandenberg AFB (AF Space Ops)**
    - **Other AF ops centers (e.g. AF Net Ops & Security Center) TBD**

8 Jun 05 10

Figure 3. Source: Air Force Componency to USSTRATCOM, 8 Jun 05

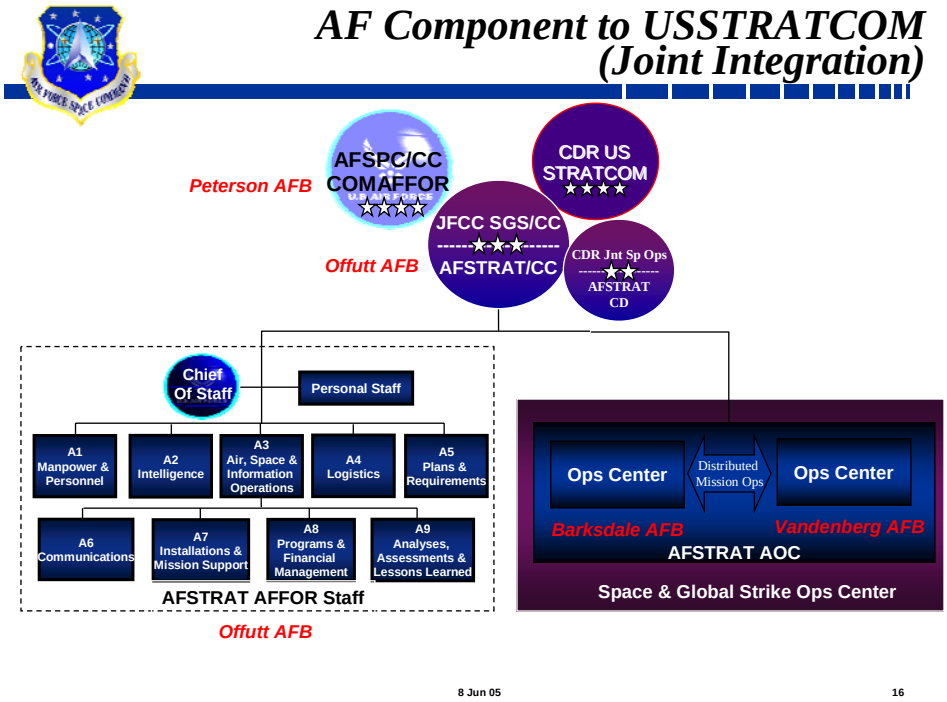


Figure 4. Source: Air Force Componency to USSTRATCOM, 8 Jun 05

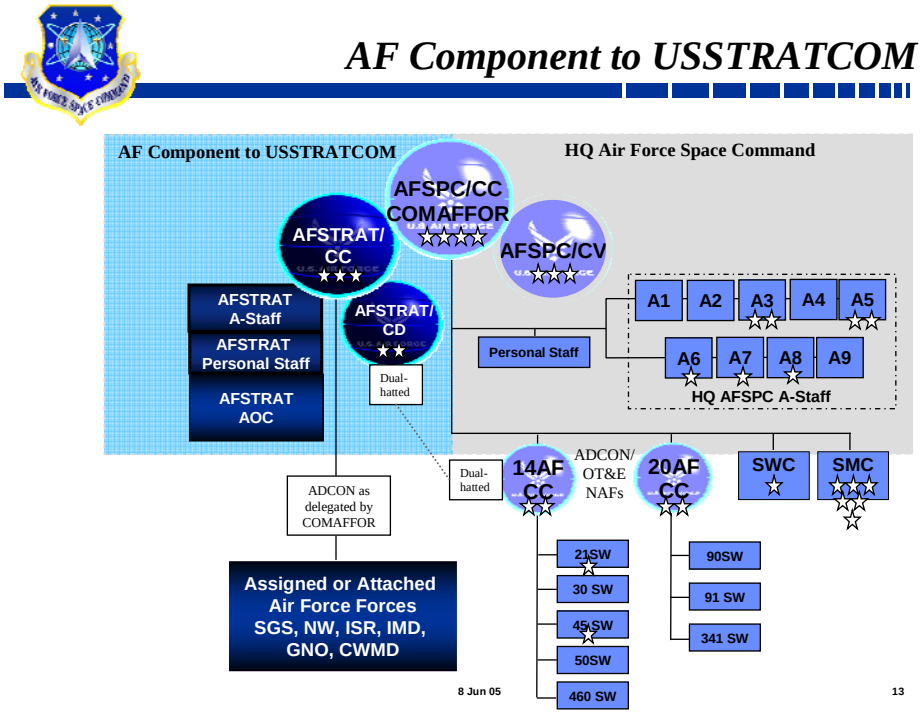
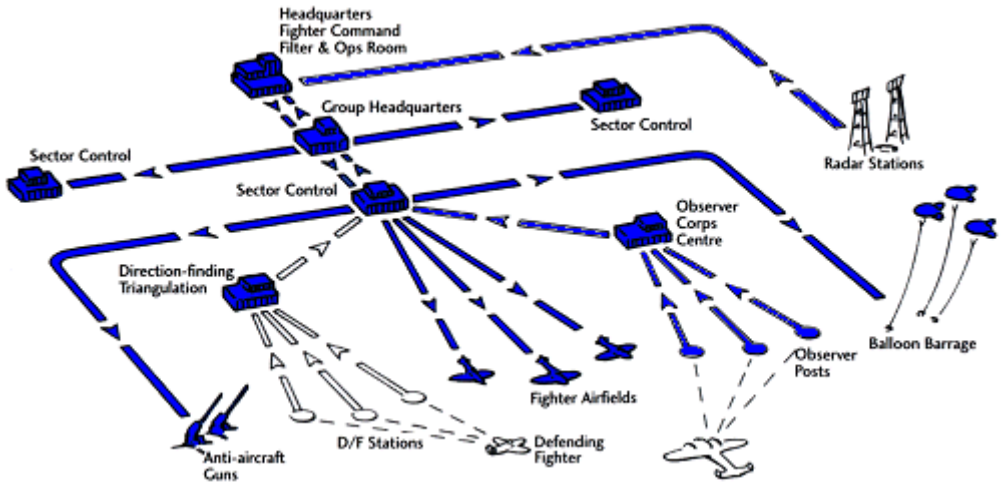


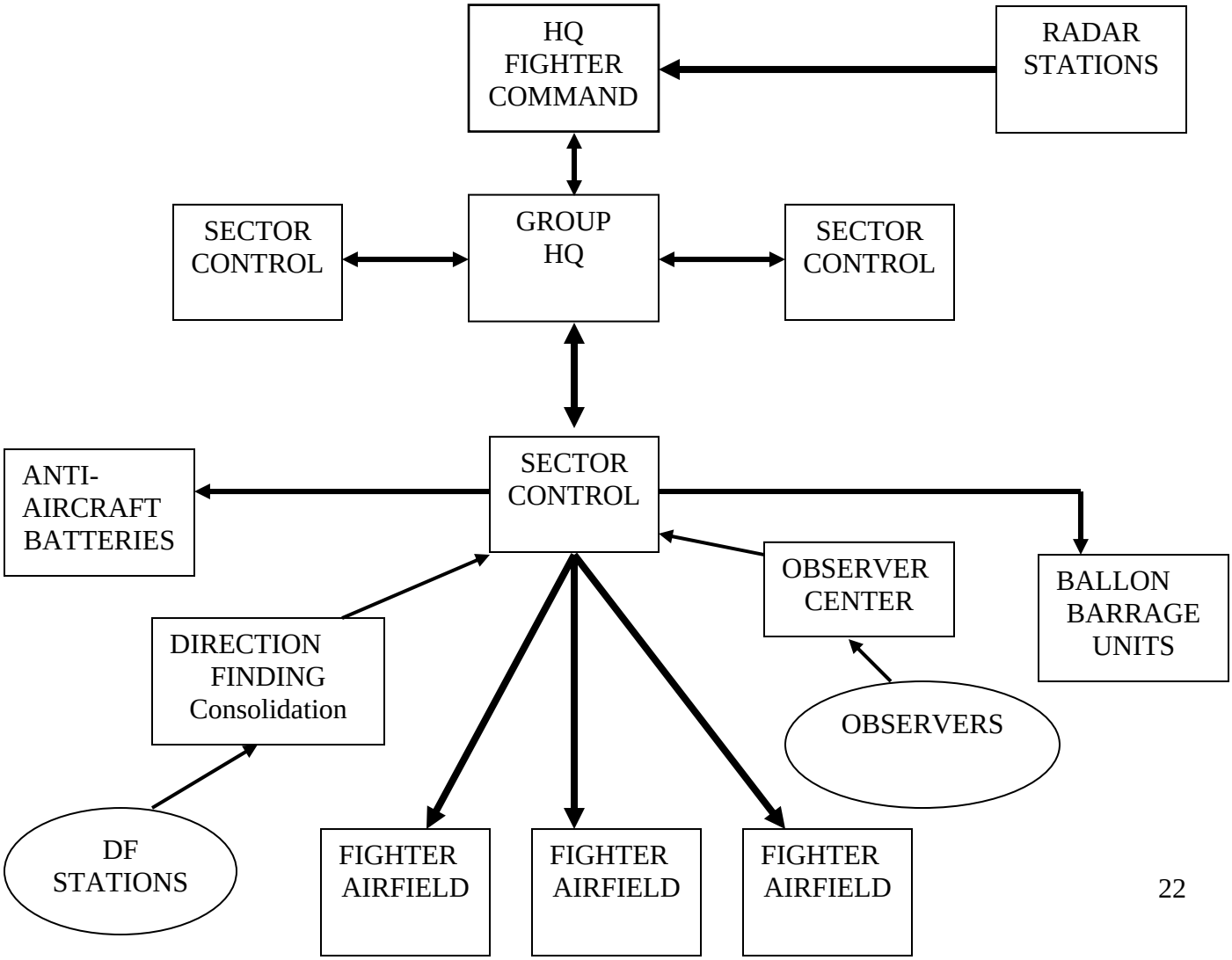
Figure 5. Source: Air Force Componency to USSTRATCOM, 8 Jun 05

(Figure insert for Case Study)



Source: Battle of Britain homepage- http://www.raf.mod.uk/bob1940/bobhome.html

Or use:



Agency	Level of war	Level of Command	Space Forces
USSTRATCOM	Strategic/Operational	COCOM	All military
AFSPC	N/A	OPCON/ADCON	Air Force
JFCC SGS	Operational	TACON (?)	Air Force
JSpOC	Operational (?)	*	Air Force (Navy?)
DirSpaceFor/DS4	Operational/Tactical	*	(?)

* Space Coordinating Authority, not direct command

Table 2: Positions and their Level of War

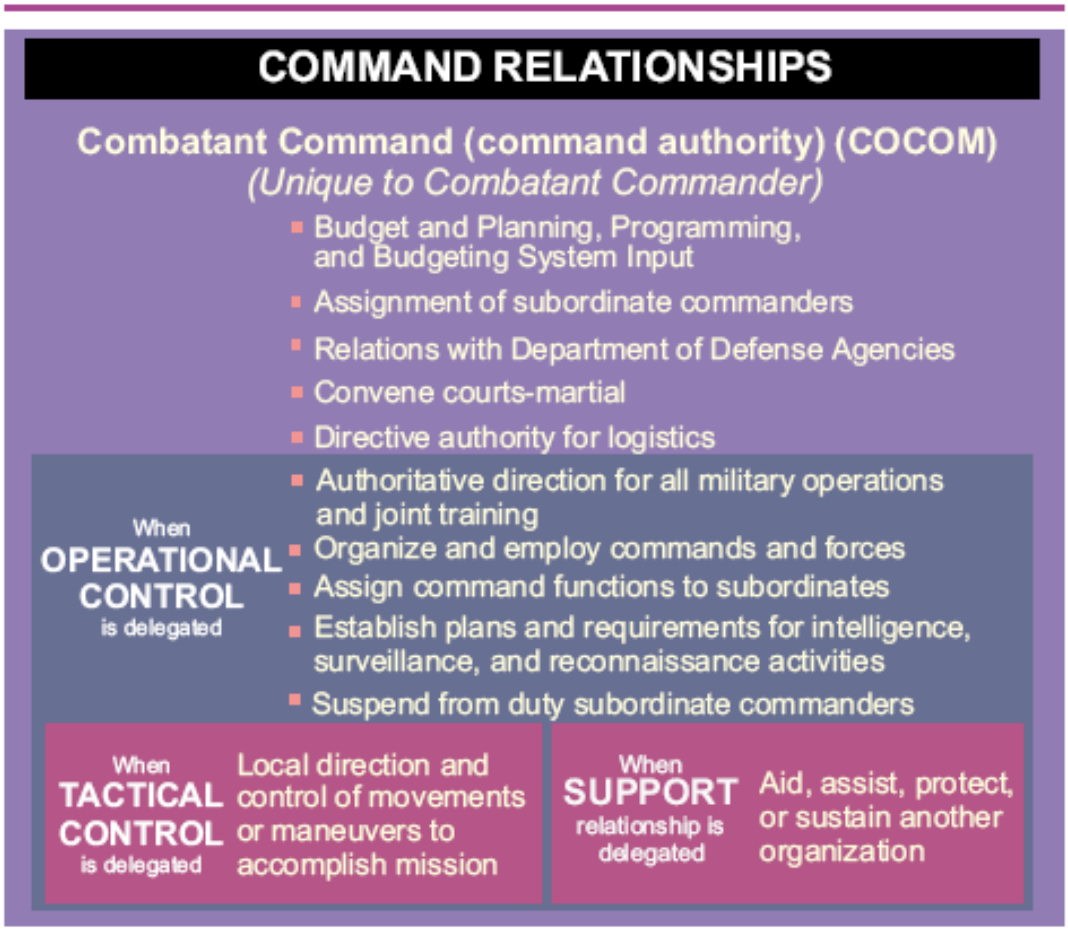


Figure 6. Source: Joint Publication 3-0, Doctrine for Joint Operations, page II-7

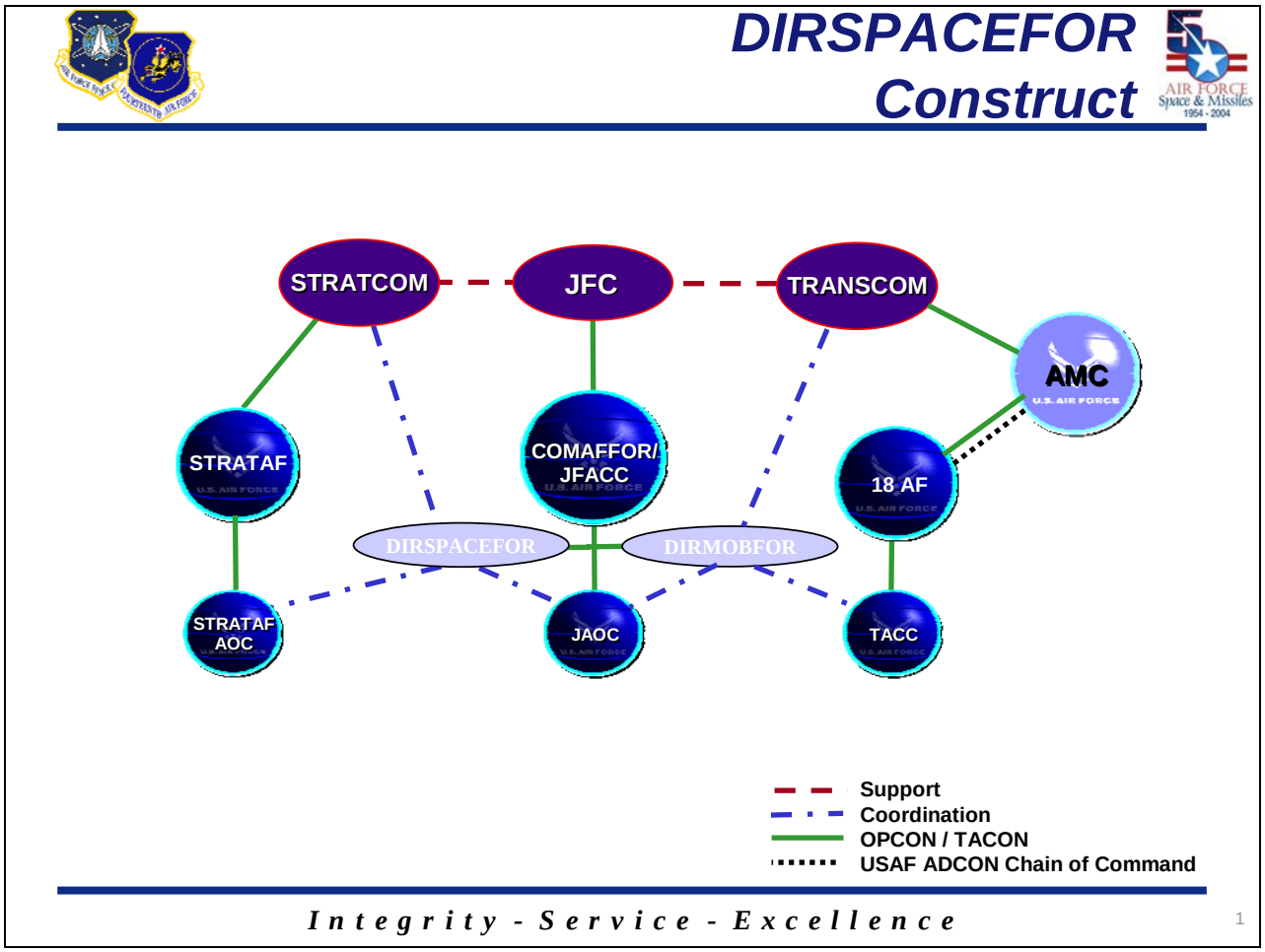
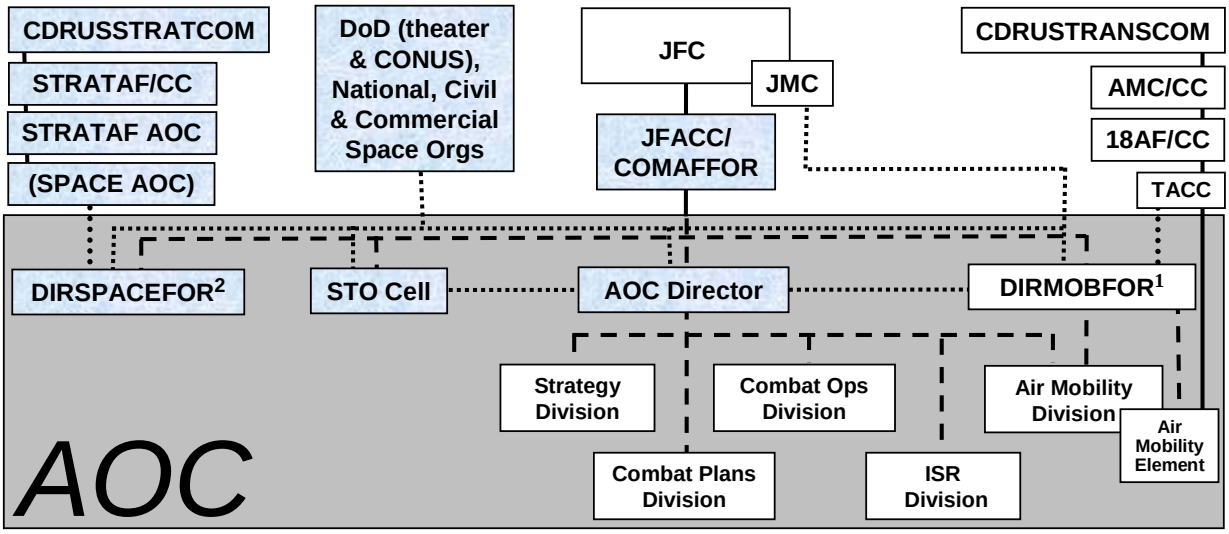


Figure 7: DIRSPACEFOR Mirroring DIRMOBFOR

DIRSPACEFOR Construct (cont'd)



Note[1]: DIRMOBFOR provides direction for intratheater mobility assets; coordinates all other Air Mobility operations supporting the theater.
Note[2]: DIRSPACEFOR coordinates AF theater space needs and assists coordination of Joint theater space requirements as necessary.
All lines of coord not shown for clarity (DIRSPACEFOR emphasized).

Figure 8

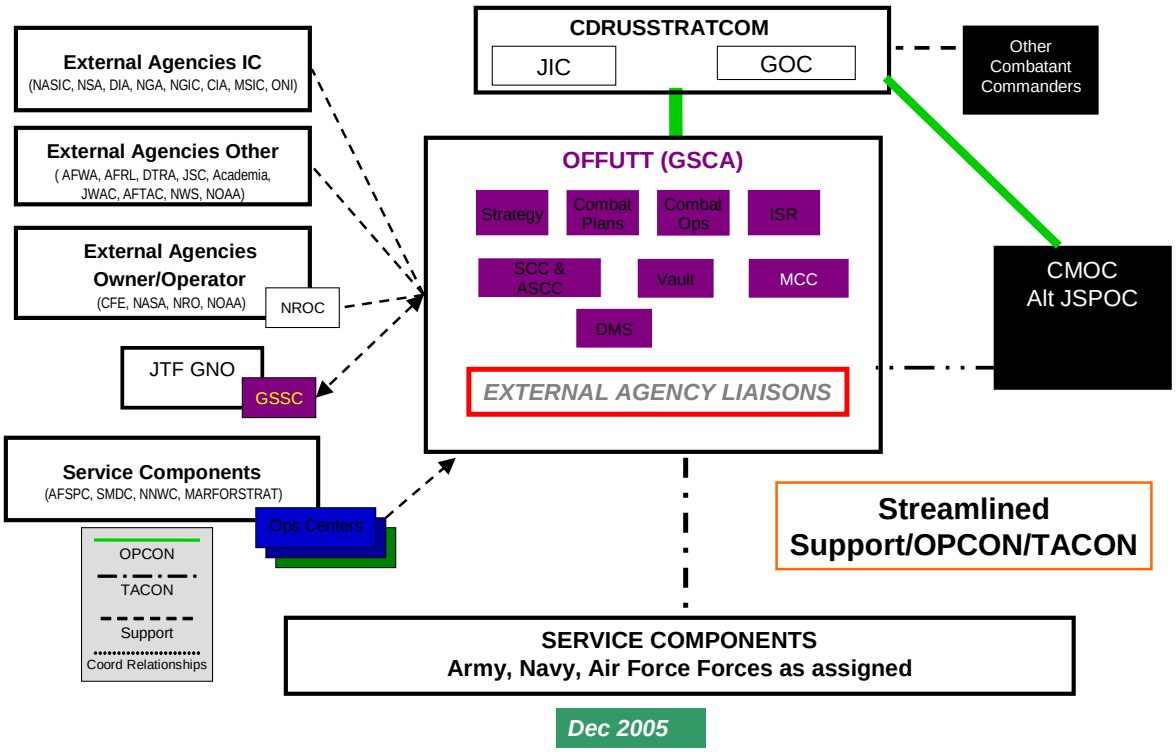


Figure 9.Source: Author

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[1] Mullen, R. "Dearth of Reserves Threatens US, Expert Says", Defense Today, 19 Aug 05, pg 1

[2] Joint Publication JP 1-02, *DOD Dictionary of Military and Associated Terms*: Command and Control (C2): "The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. C2 functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission."

[3] Coakley, T. (1992). *Command and Control for War and Peace*. NDU Press, pgs 60-63

[4] Spires, D. Beyond Horizons chapter 1 Air University Press, 1998, 3rd printing 2002

[5] Ibid.

[6] AFDD 2-2 Space Operations 27 Nov 01 page 23

[7] "Military activities in space . . . strongly influence all armed forces on Earth. Military space policymaking, planning and programming at the apex (of command) should transcend partisan interests. Sound organizational decisions based on objective reviews of realistic options . . . because far-reaching decisions made in the near future will have long-term ramifications." Page 74 Military Space Forces: The Next 50 years. John M. Collins, 1989

[8] 'Satellite driver' is a generic term for the person or unit who operates a space system.

[9] Space and Global Strike JFCC Commander's Call, Lt Gen Bruce Carlson, 22 Apr 05

[10] AFSPC Public Affairs, *Key Events in AFSPC History*, http://www.peterson.af.mil/hqafspc/history/chronology.htm, Accessed on 19 January 2006
[11] Report of the Commission to Assess United States National Security Space Management and Organization, http://space.au.af.mil/space_commission/
[12] Email message traffic between author and Captain Ray Fernandez, HQ AFDC/DR, USAF Doctrine Center, Maxwell, AFB, 15 & 16 Nov 2005
[13] Air Force Association, *Space Almanac 2004*, Air Force Magazine, 31 May 2004, pg 28.
14 Source: Joint Publication 3-0, Doctrine for Joint Operations, page II-7

[15] Director of Space Forces Briefing, 13 Apr 2005
[16] Joint Publication JP 1-02, *DOD Dictionary of Military and Associated Terms*: Operational Level of War: "the level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or areas of operations. Activities at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives."
[17] "How Did 'The Few' Win" by Williamson Murray, Great Battles magazine special issue 2003, pages 36-46 & 92
[18] Battle of Britain homepage, UK Ministry of Defence, http://www.raf.mod.uk/bob1940/bobhome.html
[19] History is replete with examples of how simple yet effective C2 can overcome mass, superior technology, arrogance, etc. The RAF example, while affecting a relative short-term time frame, one must understand that at that point in time, Germany had every reason to believe that the British would capitulate and make peace which also added to the overconfidence. The Nazi war machine was in for a shock that upset the operational timetable and had lasting effects on grand strategy as well.
[20] Joint Publication 3-0, page II-6: Combatant Command: "COCOM is the command authority over assigned forces vested only in the commanders of combatant commands by title 10, USC, section 164, or as directed by the President in the UCP, and cannot be delegated or transferred."
[21] Selected agencies include: NASIC/AIA, NSA, DIA, DISA, NGA, CIA, AFWA, DTRA, JSC, AFTAC, NOAA, NASA
[22] *The commander will never have all the information desired. Accepting and taking reasonable risks to achieve mission success is the norm in warfare—efficient and effective C2 minimizes that risk.* AFDD 2-8 page 3

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Space C2 Weapon System Information Brief, Major General Douglas Fraser, 8 Jun 05
Space and Global Strike JFCC Commander's Call, Lt Gen Bruce Carlson, 22 Apr 05