Who Pushes the Pickle Button?

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CHAPTER 10
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I. Introduction

Tension has risen on the frontline battlefields in the air between the aviators executing their missions and their command and control. This tension has resulted in many aviators asking the question "Who is pushing the pickle button?" Tension has grown along with the increase of technology in the aircraft those frontline aviators are flying. Just because technology has given the ability to reach into the cockpit of the frontline aviators doesn't mean this should necessarily de done. Present ROE (Rules of Engagement) and technology do not alleviate the frontline aviator of his moral or lawful responsibilities. Where did this trend start and how has it manifested itself throughout the past decade of aerial warfare? What can a CFACC (Combined Forces Air Component Commander) do to alleviate this tension? More importantly, what can the CFACC do to ensure that the JFC's (Joint Force Commander) campaign plan is being executed in the manner in which he intends and with the highest level of success?

There are many factors to be considered on both sides of the issue pertinent to this discussion. First the issues of morality, law, and doctrine will be discussed. Second, how this trend was nurtured throughout our operations over the past decade will be tracked and discussed. Finally, several recommendations for today's CFACC will be outlined that best alleviate this tension. This will ultimately result in the CFACC being able to prosecute aerial warfare with the highest level of effectiveness and efficiency, which will be crucial to future warfare.

There are a multitude of both cited and anonymous sources for this paper. Officers interviewed from the ranks of Lieutenant to General and in all four services have been extremely forthright in their responses to the questions posed to them. Airmen both inside CAOCs (combined air operations center) and on the frontlines in a myriad of fighter aircraft spanning all conflicts the United States has been involved in over the past 20 years have given firsthand testimony to air warfare as they experienced it. To be true to the spirit in which they have given their stories and viewpoints, some will not be found with direct references. Please take the testimonies of those who are not cited as seriously as those that are.

Since 1943, with rare exception of limited duration in Korea and Vietnam, the United States military has generally found itself in a position of a preponderance of forces in the air. That reality has quite often led to an inefficient application of air power. Due to past successes, the United States increasingly presumes access, and air superiority and relies upon it. If an enemy could deny either of these, the landscape of battle would change drastically. The motive behind this paper is simply to make a USAF that can best defend and support the Constitution of the United States through the most effective and efficient use of air and space power. It is to the men and women who have, are, and will put their lives on the line that this paper is so dedicated.

II. Sources

Ethics and Morality

The uniqueness of the military vocation plays an integral part in the moral background and foundation of this discussion. To many within the military, it is a "calling" to serve. Martin Cook describes this unique situation in relation to society.

> On the one hand, there are few places in our society where the concepts of duty and service above self have such currency…For many years now, polling data have shown that Americans respect and trust their military more than any other group in our society. No other group in society is given as much latitude to define its own standards of conduct and talks so frequently and openly about the core values that define it. Only when the military articulates and lives up to its highest values can it retain the nobility of the profession of arms. Only when it retains a proper sense of its role in American democratic life does it retain the trust and respect General George C. Marshal spoke of. Only a military that daily lives out its values and feels its connection to the citizens is a military that engenders the respect and loyalty of the nation and keeps it from being feared. But while producing excellence of character and virtue, the military exists to serve the will of the political leadership of a particular state.[1]

The respect and trust gained through this deep sense of morality in warfare is prevalent throughout U.S. history. It is this individual sense of morality that has been ingrained in every soldier, sailor, and airman and makes up the foundation of the respect the military has earned from society. It is imperative that warfare prosecuted by the United States military continues to be conducted with this foundation continuously in mind.

The lawful order is another integral part of military service. This concept of the lawful order is stronger and more complete than that of almost any other human relationship in our societal structure. Samuel Huntington describes this legal order in the *The Soldier and the State*:

> When the military man receives a legal order from an authorized superior, he does not argue, he does not hesitate, he does not substitute his own views; he obeys instantly. He is judged not by the policies he implements, but rather by the promptness and efficiency with which he carries them out. His goal is to perfect an instrument of obedience; the uses to which that instrument is put are beyond his responsibility. His highest virtue is instrumental not ultimate. Like Shakespeare's soldier in Henry V he believes that the justice of the cause is more than he should "know" or "seek after." For if the king's "cause be wrong, our obedience to the King wipes the crime out of us.[2]

This description is only partially correct. For the king to be right today, the United States must balance international authority with the reality of disparity in military capabilities.[3] In addition to this, the individual still has a moral responsibility that is not totally dissolved by following just any order given by the king.

Brigadier General Malham M. Wakin elaborates on this unique relationship of the military man and his moral responsibility that he alone bears.

> Military leaders cannot be merely instrumental to the state. They are instrumental, yes; but they must at the same time accept a portion of the responsibility for the uses of the military instrument. How else, without investigating the issues involved, could any military leader ever make a decision concerning the legality or morality of his orders?[4]

General Makin goes on to outline four kinds of conflict that can arise between military obedience and nonmilitary values. It is within these four areas where we are justified in violating one of our moral obligations. Disobedience is allowed only when these values are in conflict with each other and we cannot follow both.

> Military obedience may conflict with political wisdom as in the case of Gen Macarthur, who disagreed with the policies laid down by his civilian superiors for prosecuting the Korean War. Military obedience may conflict also when civilian leaders dictate military strategy, which supposedly rests within the professional competence of the military leaders. Further conflicts with military obedience include the obvious cases of legality and morality. Our rule of action is that we are justified in violating our universal moral obligations only when they conflict with a higher obligation and we cannot fulfill both at once. Thus if one is torn between obedience to an order and fulfillment of another moral obligation, he or she must judge which is the higher obligation in those circumstances.[5]

This aspect of warfare cannot be wrestled out of the combat aviator on the front lines. The ultimate moral responsibility of pushing the pickle button will continue to lie in their hands. This challenge will be increasingly complicated in the future due to the complexity and amount of information available to that warrior.

A CFACC may have the purest of intentions in attempting to obviate the frontline aviator from the responsibility of servicing a target, yet he cannot do so completely. This personal moral responsibility that the frontline aviator has before pushing the pickle button cannot be taken off of his shoulders, nor should it. For example, looking at streams of infra-red video from targeting pods does not allow the CFACC to see if there is a red cross or a red crescent on the vehicle about to be struck. It is only the frontline aviator and his mark one eyeball that can see such identification leading to that ultimate decision not to prosecute the attack. The immediacy of an armor column minutes away from attacking friendly forces or the potential for collateral damage due to timing of a vehicle coming down the road may not be ascertained through the soda straw view of a Predator (RQ-1A Predator unmanned air vehicle). In these instances, it is the frontline aviator who will be able to ascertain the critical time

element and complete the OODA (observe- orient-decide-act) loop within seconds.

In a speech to the Carnegie Council on Ethics and International Affairs, Michael Schmidt described the great and unique challenges of future wars.

> In wars of the future, hostilities will be four-dimensional – war will be everywhere. No longer will civilians be separated from the battle area by limitations in the range of weaponry. Even today, attacks can be launched from continents away with pinpoint accuracy. Unfortunately, at least in the context of preserving the principle of distinction, this means that targets will increasingly present themselves in area where civilians and civilian objects are collocated. Future war will also evidence a growing inability to distinguish combatants from civilians. Given the exponential increase in surveillance and reconnaissance capabilities, as well as other advances that render the battlespace increasingly transparent, combatants have a growing incentive not to identify themselves. Lest super high-tech war fighters "ping" them at will…consider over-the-horizon, remotely controlled weapons. Although standoff weapons offer attacking forces greater safety, and though such weapons are highly accurate, ultimately if you cannot see the target, if you remove the human link, mistakes will be made.[6]

The human link alluded to is quite often that combat aviator pushing the pickle button or the soldier and airman performing the role of FAC (forward air controller). This is especially true in Type I or II CAS (close air support). The command and control function within the CAOC is not that link of which he is speaking.

Michael Schmidt describes five aspects of this future war that must be considered.

> First, there will be increasing technological ability to discriminate between military objectives and protected objects/persons due to advances in weapons guidance and battlespace transparency, a very positive consequence of future war. However, the increasing ability of high-tech forces to blind an enemy in order to achieve information

> dominance will diminish the enemy's ability to achieve distinction. Second, I expect to see a growing tendency to directly target civilians and civilian objects, both due to the spread of terrorism and as a result of capability gaps that will drive "have-not" forces facing advanced militaries into asymmetrical strategies and tactics. Third, because of technological capabilities, advanced militaries will see their humanitarian law mission planning focus shift from proportionality issues to those of surrounding their duty of care…the key question will be whether or not the attacker exhausted the resources available to avoid incidental injury and collateral damage…Fourth is relativity. I predict that humanitarian law will move towards an "if you can, you must" standard…Fifth, war will almost certainly extend into new areas such as space that are presently not fields of combat.[7]

Although one may not entirely agree with the five aspects described by Schmidt, the fact that they will affect how we plan and execute in future wars is one with which we have to reckon. The capability of the "man in the loop" on the frontlines will increase in importance as a result and not diminish. The U.S. pours incredible assets into training its frontline aviators to act with skill and tenacity. It is a travesty not to allow them to execute in a manner equal to those skills.

Admiral James Stockdale provides another point. He sums up this moral aspect on a very personal level in saying "Are our students getting the message that without personal integrity intellectual skills are worthless? The one thing I came to realize was that if you don't lose your integrity you can't be had and you can't be hurt."[8] Intellectual skills and military prowess are next to worthless without the personal integrity and morality required on the battlefield. Our claim to the high moral ground is imperative to the wars and battles fought for our country and this claim ultimately lies with the warriors on the front lines who push the pickle button.

Law

Military operations must be conducted in accordance with domestic and international law. Developments like the new International Criminal Court mean the United States has to be concerned about potential personal liability when discharging duties abroad. At its most basic level,

the law of war tells us when and by what methods the killing of other human beings is justifiable and excused. It is the law that distinguishes killing in wartime from murder. The law of war assumes that attacks on noncombatants generally serve no military purpose, confer no operational advantage, and are therefore defensibly outlawed. The definition of noncombatants has grayed as we see more technicians and contractors on the front lines today. The traditional principle of discrimination states that we are obliged to discriminate, in our use of force, between those directly involved in military activity and those not involved, however proximate in space or kinship. The traditional principle of proportionality applies as well. This prohibits any use of force that may produce unintended harm clearly disproportionate to the advantage obtainable through such force.

The greater role of law in the planning and execution of campaign plans is clear. There is an ever-growing role of staff JAGs (Judge Advocate Generals) in targeting decisions. The operational aspect of the law has moved closer to the forefront as we now see JAGs sitting beside the CFACC in the CAOC making real-time decisions. This role can effectively limit a commander's discretion and give the JAG a feeling that they have to be in on the decisions of whether or not to fire on a target. It became somewhat commonplace to find a lawyer sitting next to the CFACC in ONW (Operation Northern Watch) and OSW (Operation Southern Watch). Aircrew were severely restricted from engaging against surface to air threats firing at them until receiving verbal clearance from the CFACC, over a thousand miles away sitting in the CAOC. The CFACC would often directly consult with the JAG sitting next to him before giving his decision. What level of situational awareness existed in a CAOC a thousand miles away with no direct video link in comparison with the frontline aviator being shot at? To make his decision, the CFACC at times had only a picture overlaid with a made-up form of grid lines taken from an indirect angle, which was difficult at best to reconcile with the frontline aviator's current view. The frontline aviator would then have to attempt to reconcile what he just observed by looking at a copy of the CFACC's map in his cockpit and try to figure out from where the firings came. All this would be done over the radio while flying out of visual and sensor range of the fighter, resulting in having to find the target again, even if that was possible.

OEF (Operation Enduring Freedom) also contains several examples of this role and relationship between the JAG and the CFACC. It was a JAG lawyer who effectively blocked the missile attack against the Taliban leader Muhammed Omar as his convoy escaped Kabul in November 2001.[9] The principle that the bombing of Afghanistan should

be discriminate was repeatedly stated in OEF. The U.S. was particularly sensitive about accusations that it had acted indiscriminately. Following the fall of the Taliban regime in early December 2001, the bombing raised two issues. The first was the use of cluster bombs involving the risk of immediate and possible future civilian casualties. The second issue was the use of bombing in the hunt for Taliban and al-Qaeda personnel. Both these issues are certain to persist as the U.S. continues to fight its war on terrorism.

Current anti-terrorist military operations being played out in adherence to our current national security strategy have resulted in a flurry of discussion among lawyers. They have delineated the use of force and the laws we are to fight under with the following justification:

> First, according to a strict interpretation of their terms, the main treaties relating to the conduct of international armed conflict are formally and fully applicable to anti-terrorist military operations only when those operations have an inter-state character. Where anti-terrorist operations have the character of civil war, the parties must apply, as a minimum, the rules applicable to civil wars. Second, in anti-terrorist military operations, certain phases and situations may well be different from what was envisaged in the main treaties on the laws of war. They may differ from the provisions for both international and non-international armed conflict. Recognizing that there are difficulties in applying international rules in the special circumstances of anti-terrorist war, the attempt can and should nevertheless be made to apply the law to the maximum extent possible.[10]

Thus, in what may be classified as anti-terrorist operations today, we are still to abide by the laws of armed conflict.

In addition to all the above restrictions, an attacker has requirements that must be met according to *Protocol Additional I* of the Geneva Convention. He must do everything feasible to verify that a target is legitimate. He must use methods and means of attack, such as smart weapons if available and militarily sensible, which minimize incidental injury to civilians and collateral damage to civilian property. In particular, an attack must be cancelled if an attacker realizes that it is not legitimate, or that the resulting collateral damage or incidental injury will be disproportionate.[11] This final responsibility lies squarely on the shoulders

of the one pushing the pickle button. Although a CFACC has a level of accountability, the final decision lies with the warrior on the front lines with the situational awareness he possesses.

Doctrine: Centralized Control and Decentralized Execution

Current doctrine for joint operations addresses the concepts of centralized control and decentralized execution. These concepts remain a central tenet for air and space power. The tenets of air and space power state are that it should be centrally controlled and decentrally executed, flexible and versatile, produce synergistic effects, and offer a unique form of persistence. It also must achieve concentration of purpose and be prioritized and balanced. Centralized control and decentralized execution remain critical to effective employment of air and space power. They are the fundamental organizing principles, having been proven over decades as the most effective and efficient means of employing air and space power. According to joint publication (JP) 3-30, joint air operations are normally conducted using centralized control. The employment of joint air operations are conducted using decentralized execution to achieve effective span of control and foster initiative, responsiveness and flexibility. JP 3-30 defines both centralized control and decentralized execution in this way:

> Centralized control is placing within one commander the responsibility and authority for planning, directing, and coordinating a military operation or group/category of operations. Through centralized control of joint air operations, the JFACC provides coherence, guidance, and organization to the air effort and maintains the ability to focus the tremendous impact of air capabilities/forces wherever needed across the theater of operations. Additionally, this assures the effective and efficient use of air capabilities/ forces in achieving the JFC's objectives. Decentralized execution is the delegation of execution authority to subordinate commanders. This makes it possible to generate the tempo of operations required and to cope with the uncertainty, disorder, and fluidity of combat.[12]

The latest Air Force Doctrine Center (AFDC) proposal adds more flesh to these principles. Yet, as the Center's staff admitted, the USAF

still has not reconciled the contradiction of these two terms at opposite ends of the spectrum. Their definitions are similar:

> Centralized control of air and space power is the planning, direction, prioritization, synchronization, integration, and deconfliction of air and space capabilities to achieve the objectives of the joint force commander. Centralized control maximizes the flexibility and effectiveness of air and space power; however, it must not become a recipe for micromanagement, stifling the initiative subordinates need to deal with combat's inevitable uncertainties. Decentralized execution of air and space power is the delegation of execution authority to responsible and capable lower-level commanders to achieve effective span of control and to foster disciplined initiative, situational responsiveness, and tactical flexibility. It allows subordinates to exploit opportunities in rapidly changing, fluid situations. The benefits inherent in decentralized execution, however, are maximized only when a commander clearly communicates his intent.[13]

As technology has increased, the Air Force Doctrine Center is recognizing the tension between command and control and the frontline aviators. The loss of initiative, situational awareness, and tactical flexibility are all results of centralizing execution. The AFDC offers this sage warning:

> Modern communications technology provides a temptation towards increasingly centralized execution of air and space power. Although several recent operations have employed some degrees of centralized execution, such command arrangements will not stand up in a fully stressed, dynamic combat environment, and as such should not become the norm for all air operations. Despite impressive gains in data exploitation and automated decision aids, a single person cannot achieve and maintain detailed situation awareness when fighting a conflict involving many simultaneous engagements taking place throughout a large area. A high level of centralized execution results in a rigid campaign unresponsive to local conditions and lacking in tactical flexibility. For this reason, execution should be decentralized within a command and control architecture that exploits the ability of strike package leaders, air battle

managers, forward air controllers, and other front-line commanders to make on-scene decisions during complex, rapidly unfolding operations. Nevertheless, in some situations, there may be valid reasons for execution of specific operations at higher levels, most notably when the JFC (or perhaps even higher authorities) may wish to control strategic effects, even at the sacrifice of tactical efficiency.[14]

The USAF C2 Warrior School has further delineated this problem:

> Centralized Control and decentralized execution are fundamental tenets of US airpower. Command and control systems are tailored to support this tenet. Integrated C2 systems enhance unity of effort and facilitated the decision-making needed to effectively execute operations. The level of control that exists for Offensive operations at the JAOC may vary greatly from operation to operation. Centralized control may be retained at the JAOC if situational awareness is high. As awareness degrades the JAOC may choose to decentralize operations, delegating execution authority down to subordinate levels (ACE, BCCC, JSTARS, and ASOC). The decision to delegate execution authority is based on a multitude of factors that include but are not limited to demands of coalition partners, situational awareness, the ability to identify targets, and threats. In examining the levels/types of control we find a wide spectrum. At one extreme is procedural control, whereby because the target appears on the ATO the aircrew is given permission by the JFACC to deliver ordnance on the target, assuming the aircrew identifies the target correctly and feels comfortable enough to release weapons on the target. This level of control may be used in many different circumstances but is normally seen in large air operations, where the flying extends over great distanced or the number of aircraft is so great that a single entity cannot control all strikes. A more difficult challenge exists at the other extreme of the spectrum, that is similar to direct control, much like that which exists with a tactical air controller on the ground, whereby the JAOC must give

> permission (or rather may withhold permission) to attack a targets based on its situational awareness and the ability to identify targets. The degree of execution authority held at the JAOC is dependent upon a multitude of factors, some of which may include coalition considerations, collateral damage, and the ability to accurately identify potential targets and then task assets against them. Situational awareness plays a major factor in the determination of the level of control. With greater communication capabilities and ISR assets, the ability to control weapons release authority at the JAOC has increased. Communications is a critical piece when deciding at what level to place execution authority.[15]

It is evident that a spectrum of decentralized to centralized control exists as well as a spectrum of decentralized to centralized execution. Putting these two concepts together gives a matrix of four possibilities: centralized control and decentralized execution, centralized control and centralized execution, decentralized control and decentralized execution, and decentralized control and centralized execution. Circumstances, technologies, and missions may result in different gradations along these two scales. The ability of a single commander to command and control a relatively small operation with technology at his fingertips will continue to pull him to a more centralized command, control, and execution.

It is this distinction between too much centralized control and too little decentralized execution that results in the tension between the frontline operators and those attempting to control them. Overcontrolling of air and space forces robs the operators of their flexibility and takes away their initiative. Undercontrolling of air and space forces fails to capitalize on the joint force integration and reduces the overall effectiveness of the JFC's forces.[16] It is the CFACC's responsibility to set up an architecture that will maximize the effectiveness of air and space forces under his command.

Technology and the CAOC

How did we get to this point of friction between centralized control and decentralized execution, considering it has been such a strong tenet of airpower for the past century? It is the old argument questioning whether technology drives doctrine or doctrine drives technology. The ability to transmit and share massive amounts of information has enabled

commanders to reach out to the forces on the battlefield like never before. As this ability has grown, so has the tendency to do just that.

Information flow is both vertical and horizontal on the battlefield. The dynamic fusion of information allows timely consideration and decisions by the air and space commander vertically –centralized control. At the tactical level, proper information fusion allows better situational awareness horizontally—enabling decentralized execution.[17] Network-centric warfare does not necessarily have to go down the road of more centralized control.[18] It can result in increased situational awareness for all players with greater collaboration between platforms, allowing forces on the front lines to synchronize themselves more effectively.

Vertical information flow is fundamental to centralized control. Two-way information flow between commanders and operators is often depicted as a vertical or "up-and-down" flow. Commanders rely on vertical information flow for feedback and to aid in controlling the common tactical battle picture and giving subordinates direction. Horizontal flow allows commanders to have a better understanding of the big picture and the local situation anywhere on the frontlines. Without both of these flows, commanders cannot give meaningful feedback when controlling operations.[19] The key is how much the commander uses this information to direct overall operational-level orchestration or dives into the tactical world in isolation of that big picture.

Horizontal information flow is closely related to decentralized execution. It naturally occurs between operators and among combat support elements. Horizontal information flow is essential for common situational awareness. This shared situational awareness allows information from many sources to be combined and shared resulting in a force multiplier.[20] It is this horizontal flow of information that is the added benefit of technology. Frontline aviators are now able to receive information from multiple sources, which directly allows them to accomplish their mission more effectively. There is a danger of information overload, so great care must be taken. The tendency to believe everything coming over the network is also very strong. Here is where the human interface may save the day when the automatic input is not quite making sense.

This horizontal flow of information is a great force multiplier. But when it is used to hold back the frontline aviator rather than enhance his situational awareness and ability to make more informed decisions, this force multiplier can actually diminish the combat capability of the frontline aviator. C2 (command and control) architectures are not facilitating the requests for time-critical information from the frontline

operational units at the bottom of most systems. Often they are only focused on passing the commander's orders downward. In Desert Storm this resulted in much of the imagery passed to the theater not filtering down to the operational units that needed it most.[21]

Today, the greatest percentage of this information flow culminates within the CAOC. Here is where we see the battle between centralized control and decentralized execution often raging. According to joint publications, the mission of the CAOC is the centralized planning and decentralized execution of joint air operations. To fulfill this role, the CAOC function is to plan, produce, and execute the ATO (air tasking order) in support of the JFC's operation or campaign plan.[22] Through a highly effective Combat Plans Division, an ATO can be developed that aids greatly in the decentralized execution of the JFC's campaign plan. If this is not the case, the Combat Operations Division within the CAOC may be found wrestling the reins of decentralized execution away from the frontline aviators stifling initiative and flexibility. Thus, today the battle for centralized control primarily occurs within the walls of the CAOC.

Horizontal information flow must also occur within the CAOC through the different liaison cells and divisions.[23] The primary activities of the Combat Operations Division are to monitor and execute the ATO; integrate information and resources for execution of the current ATO; analyze and prioritize execution options; provide options and recommendations to the CFACC to redirect assets; direct changes to the ATO, the ACO (air coordination order), the SPINS (Special Instructions), and the ADP (air defense plan).[24] All these functions are critical for a seamless plan to occur. Yet concentrating on only the air and space mediums takes away from the synergy of the JFC's campaign plan. Perhaps a JOC (joint operations center) with all the CAOC functions yet combined with the other Services' command and control is a better answer, and one that is discussed more fully in the recommendations section.

Where is the USAF going with the CAOC in the future? CAOC-X will focus on web enabling all C2 applications and developing user-friendly force-level C2 systems.[25] A "cockpit" is being produced to provide decision quality information to the CFACC. An initiative to make the CAOC a weapons system will result in increased funding and the ability to get more qualified personnel in the CAOC. The standardization of training to include check rides will ensure more seamless operations between theaters and allies.

However, downfalls to both these initiatives exist. One is to further cloud the delineation of centralized control and decentralized

execution. With the CAOC being designated as a weapons system and the CFACC being able to sit in a cockpit in the CAOC, the idea of decentralized execution residing within the walls of the CAOC looms even larger. A major warning of the limitations to technology should not be overlooked, as the U.S. armed forces' largest area of asymmetric warfare could also turn into an Achilles' heel if care is not taken. The bombing of SOF (special operations forces) due to battery failure causing a GLID (ground laser identifier) to portray its own coordinates as the target coordinates is evidence of this warning.[26] Although this was on the battlefield, the lesson of the limits to technology should not be overlooked. Can an airman in the CAOC have better situational awareness than the frontline aviator? If he does, then one must ask the question why is there information in the CAOC that is not being given to that frontline aviator who is risking his life and will have ultimately have the release authority anyway? The CAOC of the JOC of the future must make certain that it is aiding the troops on the front lines rather than hindering them. A brief look at history provides a glimpse of where these new concepts may be headed.

III. History

There is both a technological and human aspect to this problem. Technology made possible the latent human desire of leaders at the highest levels to become directly involved in the tactical application of their campaign plans. As technology increased, the capability to command and control from higher levels has also increased. Paralleling these advancements in technology was an expectation of what precision and airpower could accomplish. Politicians saw the concept of supposed "clean wars" from airpower emerging. Airpower as a source of preferred power used by those who either did not completely understand its capabilities and limitations or were sold an unrealistic expectation of it was the result. Technological links at the highest levels of military and politics are now a reality. The tie between politicians and war fighters on the frontline has not only strengthened but also shortened. The capability to affect events on the battlefield that will have military and political significance is too great a tie. The operational-level commander is expected to control the tactical level to a higher degree to ensure no strategic-level event will occur that would have negative political effects. It did not occur overnight but was an insidious change without senior leadership realizing it was happening.[27]

The first instance of a commander reaching into the cockpit is impossible to determine but likely occurred at a Red Flag sometime during the 1980s.[28] The Red Flag commander was getting his first look at an overhead view of all the aircraft as they were ingressing the target area. He noticed a flight that was straying close to the border of the area. As he was looking over the shoulders of the controllers, he immediately pointed this out to them and ordered them to inform the aircraft to get back in the area. The controller promptly did so. This occurrence is a common one today, and a quite often necessary input from a controlling agency (especially at Red Flag). Yet, did that commander know the flight was indeed going out of the area? Were the aviators just hugging the border to get past the Red Air to the target area? Was there weather precluding them from following the route that was predetermined? Were they reacting to a threat in an appropriate manner? Did the call from the controlling agency put the flight in danger by distracting them when their situational awareness may already have been low, or was it simply a great save? Was the picture displayed to the commander indeed even accurate? The mere fact an order was issued without completely knowing the situation makes a claim from that level that the commander thought he knew more of what was going on than the aircrew themselves. This is a dangerous precedent to set, as will be seen in the following timeline.

Desert Storm

One might think that Desert Storm would have had many instances of this tension between centralized control and decentralized execution within the air forces, but it did not. Many factors contributed to this not occurring. One factor was the scale of the conflict. It was simply not possible for the CFACC to control single missions because of the large scale of the missions being flown. In addition, agencies like ABCCC (airborne command and control center) helped with the decentralized execution of the airpower on the front lines. ABCCC was able to funnel airpower where needed and best used with a high level of situational awareness due to its communications and real-time feedback from fighters egressing the target area.

Another important successful aspect was the employment of the kill box concept. In effect, this was a throwback to the days when fighters roamed the roads and rails, looking for lucrative targets, strafing and rocketing trains and convoys in World War II.[29] At Normandy, armed reconnaissance by fighter-bombers was very effective in interdicting enemy ground forces en route to the battlefield.[30] In Desert Storm,

fighters tasked for what was then called battlefield interdiction were given a primary and secondary target to strike. If it was not possible to hit either of these targets or there was a greater priority, then C2 would assign a kill box defining a geographical area to find targets to hit. This empowered the aircrew by allowing them to make decisions on the frontlines that followed the commander's intent but also made the best opportunity of employing ordnance against the enemy. Another reason for success was the briefing given to the frontline aviators exclusively in person by a senior official who was involved in the planning before the bullets began to fly. This showed a deep level of trust between the CFACC and his combat aviators. It also allowed those same aviators the ability to better understand the JFC's campaign plan and thus know how to best support it through decentralized execution.

Some friction between centralized command and decentralized execution did occur between the ground forces and the air forces. Even though kill boxes increased the number of effective sorties, Army ground commanders thought the technique took target selection out of the hands of soldiers on the ground who knew best how to shape the battlefield and left it to flight leads in the air. "Only an Army targeteer, they argued, could discern from a 30 square mile field of targets which ones were the most threatening to ground forces…In addition, the kill boxes were based on geometric convenience rather that the corps commander's scheme of maneuver and thus were not necessarily concentrated on the most menacing Iraqi defenses."[31] This argument fails to take into consideration two major factors: the ability of the aircrew to find the target that the Army might value so highly and the unique perspective the airman has. The airman's point of view is one that the ground forces may not have or did not have at the time. An ideal area to put together the Army targeteer and the airpower experts would be in the JOC.

One can hardly argue with the results that airpower had on diminishing the ground forces of the enemy. On the eve of G-day, CENTCOM concurred with CENTAF planners' estimate that air attack had destroyed approximately 40 percent of Iraqi tanks, 40 percent of Iraqi artillery, and one-third of Iraqi armored vehicles in the Kuwaiti theater of operations. The intelligence community estimated that losses were no greater than 20 to 30 percent with some analysis declaring them as low as 15 percent. According to a Marine Corps University Command and Staff article, the actual losses to the Iraqis by the eve of G-day were much higher—on the order of 60 percent of tanks, 60 percent of artillery, and 40 percent of armored vehicles.[32]

Another area that was not pristine in Desert Storm was the coordination of deep fires via the FSCL (fire support coordination line). The Army commander had to approve air strikes inside the FSCL, but the CFACC controlled all air strikes beyond the FSCL, to include Army artillery and aviation attacks, to minimize the occurrence of friendly fire incidents between aircraft and the Army's long-range weapon systems.[33] Both the Army and Air Force acknowledged problems relating to hitting targets near the FSCL. Spending the night in a holding pattern rather than hitting the Iraqi's escaping divisions, because they were 40-50 miles in front of VII Corps FLOT (forward line of troops) but inside the FSCL, was neither an effective nor an efficient use of airpower. The FSCL had been moved outside the area that the FACs were controlling, giving the enemy a sanctuary to afford an unscathed escape. Thus, these two divisions escaped the full wrath of joint fires and would have to be engaged again a decade later. Despite these areas of friction, airpower effectively supported the JFC's campaign plan.

ONW/OSW

Following Desert Storm, the seeds of centralized control really began to flourish in Operations Northern and Southern Watch, each of which had all the ingredients to fertilize this process. The mission was highly political, resulting in a complicated ROE, an unclear mission, and eventually a JAG sitting beside the CFACC during flying operations. The scope of each operation was small enough in number and complexity to allow one person to monitor it all. The missions were short enough in time to allow a single person to control them without a handover required. The majority of leadership, aircrew, intelligence, and C2 representatives were collocated at the same base, which allowed them to brief in the same room prior to each mission. The technology had advanced enough to allow real time monitoring and communication in the CAOC. These two operations thus became the first of the "boutique" wars of the 1990s.[34]

Added to all these factors, forces were being swapped out at a high frequency that aided the process toward centralized control taking over. Some aircrew swapped out at the rate of every two weeks, while others were on a standard 90-day AEF (Air Expeditionary Force) rotation. Instead of bringing over entire wings with their leadership, squadrons were chopped to the CFACC, resulting in squadron commanders working for a group and a wing commander they did not know. Conversely, the group and wing commanders did not know them either. On the other hand, the top leadership was in place for six months to a year, resulting in

a split between those who had the mission down due to the longer stay and those who were seen as only temporary. Thus, the forces swapping out were not as intimately aware of mission intricacies. Another consequence was the lack of time to build the necessary trust up and down the chain of command. Such trust ultimately smoothes out and fills in the missing information that is prevalent in any operation. When the squadron-level aviators asked questions about the ROE, it was seen as a challenge to the CFACC rather than a simple honest questioning to help bring them up to speed. As a result, the CFACC practiced highly centralized control over the forces.

The inherent right of self-defense was not taken away, but the interpretation was to maneuver away and not engage the sites shooting at aircraft unless a call had been made to the CFACC to get attack clearance. Most of the time this took over 15 minutes as the frontline aviators would desperately try to describe the situation to the CFACC hundreds of miles away inside the CAOC.

Because much of today's leadership were groomed as CFACCs in this environment, the concept of centralized control and centralized execution was deeply embedded into many of them. The uniqueness of this set of operations cannot be overemphasized. Yet the following operations show that these lessons were repeated and applied to an even higher level.

Allied Force

Allied Force would continue to build upon this concept. Even though the operation was of a greater magnitude and complexity, the ability to centrally control was present. Once again, many factors led to this situation. Because it was the first NATO (North Atlantic Treaty Organization) operation out of the region, it required a consensus of all players. Thus, coalition cohesiveness and maintenance of the alliance were extremely important, with the political aspects immense. In fact, the political influence was so strong that many of the commanders bought into the idea that it would only be a 72-hour operation. In addition, SACEUR (Supreme Allied Commander Europe) overshadowed the JFC and CFACC and continued to have VTCs (video teleconferences) with officers above the JFC. This was done to determine the what, when, how, who, and where of the war's prosecution. The chain of command at the operational level was not allowed to run the operation. This cascaded down to the tactical level, as the chief of staff at the CAOC, Colonel William L. Holland, recalled mistakes that were made early on:

> SACEUR did not understand the targeting approval process. As airmen, we should have been pushing that forward with a package from the CAOC to SACEUR. I don't know what happened. We started off allowing SACEUR to have tactical control of everything. The first VTCs supported this preconceived notion of how the target approval process would work. Because of the preconceived notions, the first VTC started off reviewing the nuts and bolts of each individual target, and that's what drove us to be well within [preempting] the doctrinal planning cycle.[35]

The United States was the first country to go back to its capital for targeting approval, which was soon followed by the rest of the nations. This led to taking an already complicated set of operations and targeting to an even higher level of complexity. Collateral damage was a larger issue than in previous operations. It played out in this formula: if there were x amount of people possibly hurt, the target could not be struck. This formula was not completed by the aviator in the air but was resident within the CAOC. Add to this the altitude restrictions in place and the fact that there were no ground personnel to help identify targets, and it is no wonder the lack of success that was obtained by a campaign plan with so many hindrances.

Technology once again played a major role. The ability of SACEUR to control through VTCs was combined with the CAOC's ability to monitor all strike packages in and out of the area of operations. The timing between packages allowed close monitoring by the CAOC. The maximum of two airborne FACs at a time allowed close control of even the CAS portion of the fight. In addition, the Predator was incorporated more than ever before, allowing commanders at the highest level, even SACEUR, to view Predator video and see what was occurring on the battlefield. Many times A-10 pilots tasked with hunting down Serb tanks, APCs, artillery, and other military vehicles complained of the constraints imposed and opportunities missed due to the requirement of obtaining permission from the CAOC to engage.[36]

This story from the CFACC, Lt General Short, demonstrates SACEUR's level of control:

> About 45 days into the war, Predator was providing great coverage for us. About 5 o'clock in the afternoon, we had live Predator video of three tanks moving down the road in

> Serbia and Kosovo. As most of you know, my son is an A-10 pilot, or he was at the time. We had a FAC [Forward Air Controller] overhead and General Clark [Gen. Wesley K. Clark, SACEUR] had the same live Predator video that I had. "Mike, I want you to kill those tanks." I quickly responded, I had something else in mind, "Boss, I'll go after that for you." When shift time came, [Maj. Gen.] Garry Trexler was on the floor, finishing up in the daytime, and Gelwix arrived to take the night shift. I was there because the SACEUR wanted those three tanks killed. We had a weapon school graduate on the phone talking direction to the FAC on the radio. Call went something like this: "A lot of interest in killing those tanks, 421. I'd like you to work on it." "Roger." Two or three minutes went by, and 421 clearly had not found those tanks. The young major's voice went up a bit and said, "ComAirSouth, and SACEUR are real interested in killing those tanks. Have you got them yet?" "Negative." About two more minutes went by and the weapons school graduate played his last card. "General Short really wants those tanks killed." And a voice came back that I've heard in my house for the better part of 30 years and he said, "God damn it, Dad, I can't see the f---ing tanks![37]

What was strategic leadership, SACEUR in this case, doing watching Predator video in his office, calling directly to the CFACC bypassing all chain of command, and directing a tactical strike on such an insignificant target seen through the soda straw view of a Predator? Why was targeting being discussed above the JFC and CFACC by SACEUR directly to the CSAF? The results of this operation in actual targets killed lend credence to the fact that this was not the way to employ airpower effectively. The political situation played an enormous part in this equation. Its effects were logical with the track record that was being experienced in ONW/OSW and the belief of the cleanness of employing airpower for political objectives. Unfortunately, stories like one are still a part of aerial warfare in the 21st century.

Operation Enduring Freedom

OEF (Operation Enduring Freedom) once again had unique aspects that contributed to the friction between frontline fighter pilots who were

pushing the pickle button and command and control agencies. In this case command and control was literally thousands of miles away. Afghanistan's culture was very different from that of the United States and her allies. Airpower was supporting a land force comprised of forces indigenous to that country. The United States had to be careful to win the hearts and minds of the people in order to rebuild once the shooting stopped.[38] OEF aircrew were allowed to strike some targets under standing ROE, while others, especially fleeting targets such as individuals driving in sport utility vehicles, had to be cleared by the CAOC at CENTCOM (United States Central Command).[39] The altitude and ruggedness of the terrain, unexpected resistance, the distance from bases to target area, and the need to find out what was in cave complexes before bombing were unique complications of OEF.[40]

Fire support control measures (FSCMs) were much more complicated than in Desert Storm. The battlefield was not linear, resulting in many of the FSCMs being more restrictive rather than permissive. Firepower from the air was crucial to the success of ground forces that found themselves outgunned and outmanned several times. This was by design, forcing land and air forces to rely on each other to accomplish the mission. To help increase the effectiveness of airpower, special engagement zones—a euphemism for free-fire areas—were established.[41] These allowed airpower to engage within certain geographic areas with little restriction.

When technology on the front lines was used horizontally it was a major success. It facilitated the OODA loop between command and control in the target area and the shooters overhead, which worked together in decentralized execution. General John Jumper called it "a whole new realm of thinking."[42] Special operations forces on horseback punched in their target coordinates on laptops, and live 'streaming' video from Predator helped direct AC-130 gunship fire onto terrorist ground targets. Thus, technology combined with innovative thinking to complete the OODA loop on the front line, minimizing sensor to shooter time and allowing decentralized execution to occur. Predator and Global Hawk were widely used during OEF. Their ability to locate difficult targets around the clock helped operators positively identify them.[43] Such was not always the case, as evidenced by aircrews flying in the operation.

The C2 architecture was reliant on a CAOC thousands of miles away from the frontlines. C2 of air and land forces was not coordinated well at the operational level. Because no ASOC (air support operations center) existed until very late in the operation, AWACS (airborne warning and control system) personnel were forced to talk directly to teams on the

ground. They filled the functional gap of ABCCC, which had been taken out of the USAF inventory almost a decade earlier. The CAOC held the clearance to go below directed minimum altitudes. Once this clearance had been obtained, clearance to employ would have to be gained, which would sometimes take up to 30 minutes in order to help out soldiers on the ground.[44] In one instance the CAOC gave permission to go to a lower altitude but the aircrew climbed back up once they began to take too much antiaircraft artillery (AAA) fire. This is just one example of the aircrew being more restrictive than the CAOC. Of course, the crew made the call to stay higher because of their situational awareness, which was not available to a CAOC thousands of miles away.

In effect, the CAOC held the trigger but could not take the responsibility from the frontline aviators. They had no first-hand knowledge of the target area and little situational awareness. A night mission east of Kabul near Jalalabad describes this frustration.[45] A flight of A-10s was eventually given approval to go below the altitude restriction in response to a request from the ground commander to look over the ridge. The CAOC injected itself into the middle of this process and gave the flight clearance to drop on anything. What the CAOC did not know was that the ground commander was just looking for reconnaissance over the ridgeline. This disconnect between the CAOC and the ground commander is disconcerting. The CAOC did not have the latest up-to-date information and was arbitrary in giving clearance to drop. Oftentimes it was the personality sitting in the CAOC that determined the clearance to engage. There were times the CAOC gave the clearance to drop "danger close" when the aircrew chose not to. The importance of the aviator's awareness of the situation on the frontlines cannot be overstressed, especially in comparison with the situational awareness of a CAOC thousands of miles away.

A low point at the operational level occurred when the Army commander failed to coordinate Anaconda with the Air Force or the joint air component of CENTCOM.[46] Though Anaconda had been in the works for weeks, the Air Force got its official notice just 24 hours before the start of the operation (Army sources claim a 5-7 day notice). This of course rippled down to the tactical level. Coordination at the component commander level is vital and warrants keen notice from all the component commanders. Time spent at the tactical level can take away from these vital operational level decisions.

The USAF spends a great deal of money and time in training its frontline aviators. They are the best in the world at what they do and have the ability to make the right decisions on the battlefield if given the trust

and guidance from the CFACC. They must be given the opportunity to use those skills to their fullest. The concept of mission-type orders, like the U.S. Army emphasizes, allow the frontline aviator's expertise to be used to the maximum. Once again, this bears further credence and will be included in the recommendations section.

Operation Iraqi Freedom

Barely a year away from OIF (Operation Iraqi Freedom), it is too soon to glean any meaningful lessons from that conflict. Many facts still need to be determined. Yet, the signs of the tension between the command and control setup and the frontline aviators are present. The division of the country into two ground thrusts made by Army V Corps and the Marines 1 MEF (Marine Expeditionary Force) led to two varying wars and unique problems when the two met. Once again, there was the frustration of being hindered by the C2 and architecture setup. The frontline aviators better understood the tactical picture. Short of the FSCL was conventional CAS with the ASOC or the direct air support center (DASC) providing the command and control to incoming fighter aircraft. Long of the FSCL belonged to the CAOC. Aircrew summed up this setup in saying, "1600 miles away trying to clear the confusion is ridiculous."[47] On one mission long of the FSCL, two fighters had identified a moving armor column as enemy but had to obtain CAOC approval to employ. They were repeatedly told to provide coordinates. As the coordinates constantly changed because the armor column was moving, and the CAOC insisted on up-to-date coordinates, the convoy eventually got away before permission was ever given.

On another day the entire A-10 fleet of 60-80 sorties was loaded with CBUs (cluster bomb units). The ATO ordered the A-10s to get tasking enroute to employ from the CAOC through AWACS. AWACS and the CAOC knew nothing about this ATO directive. The CAOC proceeded to tell the A-10s to drop on anything within 100 meters of the coordinates they were giving. The coordinates were either in the middle of towns or the middle of nowhere. The CBU pattern is well over 100 meters. To say the least, a lot of frustrated pilots and aircraft with unexpended ordnance returned to base that day.

An OIF success story lies in the final movement of V Corps during the dust storm. The V Corps commander had decided upon an attack on several axes to make the final push to Baghdad. The enemy's reaction was to move its forces west to try and stop this avenue of attack. During the major dust storm of OIF, this move of the enemy exposed its forces,

making them extremely vulnerable to airpower. Joint fires took the Republican Guard Division from 92% to 29% strength through this shaping of the battlefield.[48] Successful handing off of the target area from flight to flight made this happen. The OODA loop was literally minutes in duration and existed on the frontlines. Funneling of airpower into the area was all that was needed. Fighters scheduled in an ATO into the same target area with enough overlap to hand off in the air are an extremely deadly use of tactical airpower on the front lines. This situation can only occur when the aircrews are given the level of decentralized control required to make it happen and a CFACC to set it up in a well thought-out ATO.

Inside the FSCL on the Marine side was another story. In fact, it can be said that the USAF was sending extra sorties to support the Marine Corps. This is in contrast to how the USMC and USAF usually operate. The Marines developed a unique FSCM called the battle control line (BCL). The BCL allowed aviators to employ ordnance after talking either to the DASC or SCAR (strike coordination and reconnaissance) aircraft inside the FSCL without the normal CAS restrictions. This procedure was successful in allowing multiple fighters to employ their ordnance when the ASOC and CAOC were unable to do so.

United States Navy fighters were especially adept at finding target areas to employ their ordnance.[49] They would hop from frequency to frequency until they found an agency that would allow them to drop. This was more important to them due to the restrictions of landing back on the aircraft carrier with unexpended ordnance. It did not take long until other services caught on to this tactic. Many fighters would check in with the AWACS/ASOC/CAOC where they would receive no guidance except holding. They would then press over to the DASC to be funneled into the fight on the Marine side. SCAR aircraft would assign target areas in the air. By keeping aircraft in the area at all times, direct hand-off and quicker passing of information and situational awareness resulted in fast servicing of targets. This entire process allowed the OODA loop to occur in the shortest time possible and resulted in destruction of many enemy forces. The obliteration of multiple Iraqi divisions on the side of 1 MEF is an example of this type of control where airpower was unleashed against enemy forces exposed to its fury.

The Marine AV-8s devised yet another way to best prosecute the air war on their terms. Due to the distance of their missions, they would fly off the ship in the morning, go to a forward operating base after their first and second mission, and then return on their third or fourth missions. To more effectively attack targets, they would look at their own target pod

video post mission once back on the carrier and determine targets for the next day. When their command and control was unable to keep up with the battlefield, they could continue servicing target areas that contained lucrative targets. They were then able to keep the BDA and targeting loop within their own forces and prosecute the war with greater efficiency and effectiveness.

The man in the loop on the front lines prevented several potential fratricides. Although command and control elements had approved employing ordnance on target, it was the aircrew that "smelled something wrong" and prevented fratricide by further identifying the target. Two of these incidents are captured in the following testimony:

> Upon returning from the tanker, we learned that the targets were in fact U.S. Army troops that had crossed the Tigris River without any liaison with the Marines and in fact we would have been cleared on them had we not given Blacklist an addition 30 minutes by heading to the tanker. A further recce pass at "5 thousand feet" confirmed that one of the vehicles under the trees in the traffic circle was in fact an M-1A1 Abrams. We were fortunate in that this traffic circle was only 4-5km south of our quickfire coordinates, and I feel that had we reported this as artillery, we would have been cleared immediately on it.
>
> Another incident from Hawk aircrew was on the night of the 10th, while working with JSTARs, one of our FAC(A)s was targeted into a column of vehicles near Tikrit. The column had no IR strobes on and no overt identification as friendly. The vehicles were 6-wheeled APCs and trucks (later confirmed to be SOF units with some "defectors" from the Iraqi army. After a couple of passes (lower and lower) over the column, the FAC(A) IDed them as non-US vehicles. Fortunately after the last low pass, once again at "5 thousand feet", the column immediately turned on all their IR strobes and made it plain they were coalition forces. Another close call....[50]

In both of these testimonies, the aircrews were proven worthy of their trust in restraining the use of firepower until accurate identification of the target was completed.

During OIF we were still applying some of the principles from the boutique wars referred to by Lt General Santarelli post-Desert Storm in

the 1990s.[51] Collateral damage was extremely important, as it affected the winning of the hearts and minds of the Iraqi people while taking out Saddam's regime. The focus on shock and awe, as the media referred to the strategic campaign, was an entirely different area along with the employment of JDAMs (Joint Direct Attack Munitions) against emerging "vital targets." The fact that laser-guided bombs, requiring human eyes or infrared targeting pod on target prior to release and through time of flight of the weapon, were more effective overall than JDAMs speaks volumes. The need for the man in the loop who could put the mark-one eyeball with peripheral vision to insure the right area and lower the chances for collateral damage was once again evidenced and crucial to success.

Aircrew discipline has been highlighted as a problem in OIF. Two specifics brought up in the OIF lessons—adhering to altitude restrictions and attacking only assigned targets—highlight the friction between C2 and the frontline aviator.[52] Aircrews were given the impossible mission of identifying vehicles without the means to identify them at the altitudes assigned. This was not as difficult as Allied Force, yet the concept was still in force. To successfully accomplish their missions, aircrew had to fly lower to complete their mission. It is absurd to think that one altitude is relevant over an entire country. Different areas will have different defenses and different targets will require closer examination to ensure their validity and identity. Simply throwing out one altitude restriction over an entire theater of operations severely restricts the initiative and tactical expertise of the frontline aviators.

Altitude restrictions are not without merit. They simply should be situationally dependent. Aircrew will fly much higher than the minimum altitude most of the time, but there will be times when the situation may require lower altitudes. It is important for the CFACC to explain to the frontline aviators the level of risk in relation to the need to prosecute an attack against certain target sets. Often a fine line exists between an act receiving an admonition from the operations officer and a medal for heroic action.

The charge of not prosecuting attacks against the targets assigned to them resulting from a lack of discipline also bears discussion. When the ASOC at V Corps was unable to effectively use the airpower funneled its way, these same frontline aviators again took the initiative to get the mission accomplished. They went from V Corps ASOC over to the DASC or other fighters acting in the SCAR role to effectively employ their ordnance instead of simply returning again with a full bomb load. Dropping indiscriminately violates trust, discipline, and potentially the laws of armed conflict. Such situations cannot be condoned and must be

dealt with by the chain of command. Yet, initiative on the frontlines must not be taken away from the frontline aviator.

These actions may be seen as aircrew discipline problems, or as a sign of the lack of command and control to stay abreast of what is happening on the frontlines, which is why it is so critical to keep communication open throughout the chain of command. These workarounds are ultimately a sign of ineffectively using that precious commodity of airpower to support the soldiers on the ground. This is an example of the growing gap between the tactical and operational level of warfare. Without a commander at the operational level to reverse this trend, we will continue to see this divide between the frontline aviator and the command and control.

The Army is not immune to this dilemma either. General Tommy Franks believes that OIF should teach the Army a lesson about "'flattening' its 'command and control organizations.'"[53] Flattening emphasizes horizontal sharing of information, allowing frontline forces to execute mission-type orders more effectively and efficiently. It also lessens the emphasis on the vertical dimension of network-centric warfare that has resulted in command and control organizations over-controlling the frontline battle. An argument can be made for allowing more initiative in the field. In the words of Peter Boyd, initiative on the frontlines is one of the fundamental tenets of the military reforms.[54] The past decade has seen an increasing transfer in control of frontline aviators to the operational command and control level. This trend does not enhance the warfighter's capabilities to fulfill his mission. Rather it is a hindrance to the initiative that is built into every fighter pilot from the first day of flying training. This does not have to be the norm, nor should it be. There are several recommendations to the CFACC that will help bridge this gap and ensure the greatest result from the precious commodity of airpower.

IV. Recommendations

A CFACC can employ several initiatives to maximize the effectiveness of his forces. These recommendations will also help define the areas of centralized control and decentralized execution. Many of these come from prior CFACCs who, out of personal experience and honest self-criticism, have identified better ways to prosecute an air war. These are not wishes for the good old days but instead are calls to maximize technology's effectiveness on the front lines. Before discussing the recommendations, an analysis of CoGs (centers of gravity) is necessary.

An analysis of friendly CoGs at the operational and tactical level of any campaign identifies similarities in the future of warfare for the United States. While it is dangerous to pick CoGs without the specific forces and situation in mind, some commonalities bear in on any discussion of friendly CoGs. Arguably, one friendly operational CoG today is the ability to command and control through centralized command. A tactical CoG could be the ability for decentralized execution. Keeping these two CoGs in mind will help highlight the criticality of these recommendations.

The importance of defending against any critical vulnerabilities in these two areas should not be ignored.[55] An enemy will do everything it can to exploit critical vulnerabilities in these areas. Systems must be set up that decrease those vulnerabilities. Equally important, those vulnerabilities must not be exasperated by negating or throwing away the incredible innate advantages that have enabled such dominance on today's battlefields. The following recommendations can stop the critical requirements of these CoGs from becoming critical vulnerabilities.

Time Sensitive Targets (TSTs)

There are times when centralized control is appropriate. Most of these will be delineated by the JFC as TSTs. TSTs, are "those targets requiring immediate response because they pose (or will soon pose) a clear and present danger to friendly forces or are highly lucrative, fleeting targets of opportunity."[56] TSTs do not necessarily have to be found by national assets. Those identified on the front lines by tactical aircraft should be quickly attacked following clear guidance already passed on to the aircrews through the ATO or other means well before the conflict has begun. The only requirement should be an immediate report back that the target was destroyed. If national assets identify them, there should be no hesitation in allowing tactical aircraft to immediately know of their existence. Then the aircraft can immediately engage the TSTs, especially if their vulnerability to attack is temporary in time. All of this can be accomplished within the campaign plan as long as the aircrew have been properly briefed and understand the intent of the JFC.

One of the most important actions taken during the joint targeting process will be the JFC's approval of the TSTs recommended by his staff. This is based on his campaign and the impact the TSTs may have on it.[57] There were three TSTs for OIF: leadership, WMD, and terrorists. Perhaps the two best-known prosecutions of attack were the early strike on Baghdad and the JDAM drop by the B-2 late in the conflict. The battle at Al Khafji and the destruction of ten Iraqi aircraft which suddenly appeared

in the open and were suspected of preparing for a WMD attack (they were promptly destroyed while still on the ground) are examples of successful prosecution of TSTs in Desert Storm.[58]

On the other end of the spectrum, over 2,400 sorties were diverted in support of the "Great Scud Hunt" alone.[59] The results were inconclusive if you look at the operation from a Jominian point of view. In that view of linear warfare, the rate of Scud firings averaged about five per day for the first ten days of the war and about three per day for the last week of the war. Tactical results showed no apparent correlation between the number of sorties flown and the number of Scuds launched. Yet in a Clauswitzean point of view, though General Schwarzkopf allocated nearly 40 percent of the coalition strike aircraft to this end, it did prevent Israel from entering the war. Thus, what was arguably a failure on the tactical level was a success at the strategic level. The "Great Scud Hunt" was an example of a successful effects-based operation resulting in the coalition being held together. The war was successfully prosecuted without a major shift due to an entrance of Israel into the conflict.

The CFACC should nominate to the JFC very few TSTs to ensure they are worth diverting aircraft from missions that are preplanned in the ATO. The JFC must consider risk to friendly forces, collateral damage, and disruption to his battle plan. These areas must be balanced against the results of what destruction of a TST will accomplish. TSTs should be targets that have direct effects at the operational or strategic level and are worthy of divergence from the tactical targets being serviced on the frontlines.

Intelligence

Realize the limitations of intelligence. Due to technology, we now know more facts about the enemy, but this does not necessarily make our conclusions and analysis that much better. Colonel John Boyd summed this point up by stating, "Machines don't fight wars. Terrain doesn't fight wars. Humans fight wars. You must get into the minds of humans. That's where the battles are won."[60] Intelligence problems are human problems of perception, subjectivity, and wishful thinking. They are not likely to disappear no matter how much the technological means of intelligence improve. War is still primarily a human endeavor. Therefore, the suggestion that war since the time of Napoleon and Clausewitz has lost much of its "friction" is baseless. The necessity for perfect information and rapid decision-making is a major weakness in the execution and assessment of effects-based operations. Effects-based operations are

valuable but not the answer to all warfare. Colonel Gary Cheek sagely states, "the information age brings with it additional issues that challenge the decision cycle: dependency on information, potential for massive overload of information, and over-centralization of command."[61] Much of today's technological warfare relies on having essentially perfect intelligence allowing one to predict what the enemy will do in time to take action to prevent it.[62] This may be asking the impossible from our intelligence community.

The aircrew on the front lines deserves the best and highest level of intelligence they can get. No cards should be held in the CAOC that will assist the aircrew on the front line to do their job, and the CAOC should not depend entirely on the ISR (intelligence, surveillance, and reconnaissance) division for BDA (battle damage assessment). Reports from the aviators on the frontlines while airborne or immediately after their missions in debrief (especially with review of their tapes post mission) are vital to an accurate estimation of the campaign plan's effectiveness. This loop should be tightened as much as possible and its inputs incorporated into the ISR division's estimates.

There should be restraint in the production of powerpoint slides. Instead, concentrate on a rolling estimate of the war's progress that is not based purely on Jominian number crunching. This estimate will help funnel airpower to worthy targets that have not already been hit multiple times. If BDA is in question, requiring double or triple targeting, let the aircrew know. Have them aid with BDA, giving them the ability to go to other targets if that target set is destroyed.

Superior Command Relationships

It is vital that the CFACC performs at his level of command and leadership. Any decisions that are even slightly skewed at the strategic and operational level will have great consequences at the tactical level. The relationship between the JFC and the CFACC must be functional and strong. One cannot provide the guidance required to the aircrew at the tactical level if the strategic and operational level guidance is not clear. The CFACC must work up the chain of command with the JFC to find out as early as possible what he will be allowed to do and when he will have to ask, "Mother may I?"

If it is a leadership target, one will most likely have to go to the JFC. The CFACC must ask the JFC what he can do without asking him. The CFACC must also brief the JFC on what he is going to allow his captains on the frontlines do without asking him (prosecuting attack

through the mission of SEAD [suppression of enemy air defenses] or delineation of self defense). Much of this will be target dependent and may be somewhat delineated in the TST list that the JFC decides upon.[63] Once again, this list must be kept short. Diversion of assets from the daily ATO will most certainly have consequences on the overall campaign plan.

Lateral Command Relationships

An important area in lateral command relationships can be the delineation of who is the supported and supporting commander. In OIF the CFACC was the supported commander in the west, the CFLCC (Combined Forces Land Component Commander) in the south, and the JSOCC (Joint Special Operations Component Commander) in the north. There is only one campaign plan, though, and that is the JFC's campaign plan. In light of this, a harmonious lateral trust and cohesiveness among CFACC, CFLCC, JSOCC, and CMCC (Combined Maritime Component Commander) is the best solution. Make certain that the other component commanders understand how the JFC's airpower is going to be used to help them in their different areas.[64] Then ensure there is a joint answer to how requests and changes will occur once the battle begins. Don't allow planning to occur in a vacuum in any of the component commander's headquarters. Rather than concentrating on who is the supported and supporting commander, perhaps a better solution lies in the fact that all the component commanders are supporting the JFC's campaign plan and should strive to use the best assets to service targets in a truly joint fashion. Establishment of a JOC can help in this area, too.

Command and control architecture and how it will respond are important concepts to delineate. The flexibility that the CFACC has built into the ATO, whether it is CAS alert, push CAS, kill boxes, etc. is important for the other component commanders to understand and appreciate. In looking at apportionment, it is best to prioritize according to mission-type orders that provide the who, where, when, and what but not the how, thus allowing greater flexibility.[65] In addition, examine target-based timing requirements. These will delineate the value of targets, depending on their contributions to an enemy's capacity to function governmentally, militarily, or economically. Examples of these include TSTs, fleeting targets, mobile targets, the desire to limit collateral damage, and targets that required immediate battle damage assessment.[66]

There are several connections between the land and air component that can be accomplished to enhance operations between the two. The ground FACs should communicate with the wings daily if at all possible to

give the scheme of maneuver to the aircrew so they can better support the overall campaign. An important part of this flexibility will be placement of the FSCL. Although this is the JFC's decision, the agreement between the CFACC and CFLCC should be met. More flexibility on the close side of the FSCL allows better use of airpower. Examples like the movement of the Republican Guards division, resulting in their reduction down to 29% combat effectiveness (mentioned earlier in the OIF section), should be joint efforts designed from the beginning to maximize effects jointly thinking of all mediums. The Marines' concept of the BCL is of merit and deserves a hard look. The BCL can provide a greater level of flexibility, especially if the FSCL is relatively far from the FLOT (forward line of troops).

Subordinate Command Relationships

This final area of command and control covers the relationship of the CFACC to the aircrew and commanders below. The CFACC must keep the lines of communication open up and down the chain. No plan survives unscathed beyond first contact with the enemy. There will be surprises and areas that may not have been thought of. To ensure that airpower attains its highest level of effectiveness, these lines of communication must be kept wide open, especially in the first few days. This must be impressed upon the CFACC staff, as they are the ones who will be receiving most of these inputs. They must be open to suggestions and not take things personally. If there is a misunderstanding between the operational and tactical level, ask the question "where can I clear this up and minimize the chance of it occurring again?" If the CFACC does not do this, he will be out of touch with what is occurring on the frontlines. The aviators will most likely still get the job done but the consequences may not be tolerable if they do not understand all of the ramifications of their actions.

The CFACC should delegate execution as far down as possible. This will give him more time to concentrate on the operational and strategic level. It will also let the tactical level experts get the job done unhindered and most efficiently. This trust will cascade down through his organization, resulting in more expertise rising from his subordinates as they see him place a greater value and confidence in their work. This will facilitate more initiative within the C2 architecture, bringing out the warrior aspect throughout the chain of command.

The better the aircrew understand the overall plan, including capabilities and limitations, the better they can execute it. Have the

Strategy Division brief the overall plan to the aircrew. Produce an air operations directive (AOD) with each ATO that explains the overall goals for that ATO cycle and how they fit into the overall phasing of the campaign plan. Synthesize the information in the SPINS into a one-page overview. Open up lines of communication from subordinate commanders so adjustments can be made if required. Provide the greatest flexibility possible in the SPINS (i.e., altitude restrictions that are situationally dependent).

Rules Of Engagement

Due to the ramifications and factors already discussed, this area demands much time both in development and dissemination. It is imperative that ROE is written covering all possible scenarios. ROE can change during different phases and for varying missions. An overall concept should be communicated, and then specific branches such as air-to-air and air-to-ground ROE thoroughly developed. Before operations begin, the CFACC should test the ROE by disseminating it to each platform. As a minimum, disseminate it down to the wing or even the squadron level and have them look at scenarios they envision encountering. Aircrew from the different units can brainstorm the ROE developed to test it fully before official dissemination in the ATO and SPINS.

Once ROE is ready for dissemination, have the teams who have developed the plan brief it to the aircrew in sessions that provide the opportunity for more feedback. Once the battle has begun, any changes to the ROE can be discussed in the AOD that accompanies the ATO daily. Remember that the AOD audience includes the JFC (so he can see you are meeting his intent), other component commanders, planners, aircrew, and the CAOC, so they can make the decisions through the CFACC's eyes.

CAOC Operations

Does the Operations Division of the CAOC enhance the aviator's mission effectiveness? This is the ultimate question. If there are any areas that are not making the aviator's job better, they must be fixed. This does not necessarily mean that the CFACC himself must go down to the CAOC floor. If the CFACC finds himself on the CAOC floor directly involved with any part of the operation, he must ask himself "Is this where I belong?" All of the officers interviewed were very open and gave personal stories of how they had either personally gotten into the weeds at

the CAOC or knew stories of others who had. In all those instances, they regretted having done so. There were consequences ranging from loss of trust of officers working in the CAOC to the shoot down of an aircraft in an actual operation.[67] By staying away from this temptation, the CFACC will impart confidence in his staff and lead by example. The CFACC is the orchestra director. His orchestration is crucial to the operational art of warfare. The CFACC is always personally involved, yet if he finds himself talking directly to a frontline fighter, he must ask himself what could have been done so this type of personal involvement was not required.

A clear plan allowing handoff of target areas from one flight of airborne aircraft to another should have little need for CFACC or CAOC involvement. Designing an ATO to set up such a flow of assets overlapping the target area in time will provide the framework for operations where the initiative of the aviators will be maximized. This will keep the OODA loop the shortest, allowing the battle to be prosecuted well within the enemy's OODA loop. As mentioned earlier, this allows the aviators to task themselves in essence to target areas where the enemy has exposed himself to the onslaught of airpower by using the advantages of network centric warfare to its fullest.

Tactical operations will always have strategic consequences. These consequences may be as a piece of sand in comparison to the overall strategic plan, yet they might just be the piece that causes breakdown of the enemy center of gravity. If this fact has been taken into consideration, the procedures and ROE developed will carry the operation through. Do not be deceived into believing that the CAOC actually employs the ordnance. The coordination of joint fires is perhaps the best definition of what is being accomplished. This application of airpower needs to be devolved to the lowest level possible with the greatest level of situational awareness. There are few times this will reside within the CAOC. In those times that it does, once again the question as to why the aviator on the frontlines was not able to have this information to best help him make that decision of pushing the pickle button needs to be asked.

C4ISR

C4ISR (command, control, communications, and computer; intelligence, surveillance, reconnaissance) capabilities CONOPS (concept of operations) have promising applicability for this discussion.[68] The USAF is looking at the delivery of information to decision-makers in the priority and format they specify. This would allow quicker discernment of

the information and a tighter OODA loop. Machine to machine interface capability will help reduce the possibility of fratricide on the frontlines, allowing more decentralized execution. In addition, by enhancing battle management, planning and operations divisions can be better blended together, resulting in a greater capability to engage the enemy at the time and place of our choosing due to the flexible improvements in C4ISR.

Another initiative that holds promise in C2 of airpower is the MC2C (multi-sensor command and control aircraft).[69] This wide-body aircraft will combine the capabilities of JSTARS, AWACS, and Rivet Joint and bring together sensors along with space assets and UAVs (unmanned aerial vehicles). The key will be how this platform integrates into the command and control of the operation. If it is used to help funnel airpower into target areas where the frontline aviator will be able to execute the mission with the information being provided, it will greatly aid the campaign. If it becomes another agency crawling into the cockpit of that same aviator, the effectiveness and force multiplying capability will be diminished.

C4ISR resides within all the functions of a campaign plan. High-level leadership and decision makers within C4ISR divide it into three groups: finders, deciders, and shooters. These three functions are an excellent way of defining this area of operations. Yet when they talk of these functions residing within the CAOC primarily, they miss the ability of the frontline aviator to perform all three functions within a matter of minutes. The fastest F2T2EA (find, fix, track, target, engage, assess) cycle, also known as the "kill chain," is that frontline aviator performing all of those functions and destroying the target. With mission-type orders and C4ISR systems to support, the CFACC can attain the quickest kill chain possible through a high level of decentralized execution. An operational headquarters performing truly joint functions can and should be an integral part of this capability. A joint operations cell provides the answer.

Joint Operations Cell

A serious look at the organization of the CAOC in relation to the operation centers of the other component commanders bears discussion. As U.S. forces continue to transform over the next decade, smaller numbers of platforms will most likely be the result. In addition, the areas of overlapping capabilities will diminish. Within the pressure to have more deployable forces will reside the need to be "lighter" and have a smaller footprint. This may result in areas where vulnerabilities will

emerge that were heretofore nonexistent due to lack of such a strict requirement for quick deployability. Defense against asymmetric attacks will require greater flexibility in time and space, too. This will bring forth increased reliance between components and more joint campaign plans. OIF offered just a taste of this evolution.

Once components are more reliant on each other's capabilities, there will be a greater requirement for seamless operations between them. By combining the component's operations centers into one JOC (joint operations center), the transparencies of borders can begin to appear. The JOC can be divided geographically into a deep, close, and rear fight, with all the services involved. Specific functions like CSAR, TMD, and TST can be cells within the JOC. All of the functions of the current CAOC doctrinally can exist within the JOC but with greater synergy among all components. For example, the Joint Targeting Board, chaired by the CFACC in most operations, can more easily take place with all component commanders present or their designated representatives. Without talking platforms, the decision as to what is most important to the JFC's campaign plan can be more easily discussed when Service-oriented discussions are put aside. The CFACC should not care if a wheel is turned in the campaign plan, and the CFLCC should not care if one boot is put on the ground of enemy soil. The goal is to meet the end state given, regardless of platform or service.

A speaker at Air War College purported the idea of not being concerned if attack helicopters ever went deep behind lines or if ATACMs (advanced tactical missile systems) were even in the CFLCC's control or not. If we are not thinking completely joint, in his words "we are dinosaurs." He was more than willing to depend on the USAF for the deep battle and shaping of those enemy forces. In a JOC, an Air Force officer can best understand limitations and capabilities of available airpower. An Army officer sitting beside him who understands what enemy forces amassing in the second and third echelon are most dangerous to the land component can help make certain that those forces most influential to the land portion of the JFC's campaign are attrited by joint fires. Once this is meshed together in a JOC, the fire hose of airpower can be sent to the best possible area of the battlefield to have the best effectiveness.

Thus, a JOC at the operational level is worthy of thought as C2 is set up for any campaign. The DASC, ASOC, tactical air control centers, etc. are still required at the tactical level. Allowing true decentralized execution at the tactical level will give the JOC the ability to better manage the operational level where the component commanders need to

keep their emphasis. This will also take away the growing requirement of so many liaison elements within the CAOC and other component's operations centers. The concept of the JOC will decrease the time to contact other components as to what best fits their plans. Furthermore, it will take away the vulnerability of communications, as people might actually be able to discuss issues side by side instead of over e-mail to a person who is sitting thousands of miles away. An operational picture displayed that has the land, sea, and air parts in the same building and room is another benefit. The JOC has many advantages, as long as the requirements for C4 and the scope of the battle are not overwhelming. Having a high level of decentralized execution can greatly aid in the development and success of a JOC.

V. Conclusion

The tension between command and control and the frontline aviators has grown insidiously without leadership realizing its full effect. The unintended consequences of well-intended actions have resulted in a situation that neither maximizes the effectiveness nor the efficiency of airpower. There is a need to constantly monitor and review the execution of operations, and not just treat doctrine and C2 relationships as immutable. The man must be kept in the loop. The decision to release weapons is still ultimately held by the aircrew on the frontlines. The moral, ethical, and legal responsibility of the individual pushing the pickle button cannot be lifted from his shoulders, nor should it. Whoever has the highest level of situational awareness and is closest to the fight in time and space must be the ultimate decision maker. In nearly every conceivable situation, that person will be the frontline aviator with his finger on the pickle button.

This paper has proposed several recommendations to help the CFACC employ his resources most efficiently and effectively. The selection of TSTs needs to be carefully balanced against the risks of collateral damage, potential fratricide, exposure of friendly forces, and disruption of the campaign plan as sorties are diverted from that days ATO. Acknowledgement of the limitations and capabilities of intelligence and the realization that it is still primarily a human endeavor is imperative. Information must not be kept from the frontline aviators. On the contrary, every effort must be made to provide the information required to make the decisions that will best support the JFC's campaign. The aviator must then be allowed to use initiative and judgment cultivated through years of

training to get the mission accomplished. Only then can military power from the air be unleashed to its fullest measure.

Additional recommendations deal with command relationships and CAOC operations. Superior, lateral, and subordinate command relationships are critical, especially between the component commanders. The CFACC must gain the trust of the JFC, establish a rapport with the other component commanders, and maintain clear and open communication with subordinate commanders and aircrew. Clearly defined, well understood, and flexible ROE are critical to the operation. The CFACC must trust frontline aviators to follow his guidelines. Letting those aviators help brainstorm the many situations that might be encountered will better enable the execution of the JFC's campaign plan and result in better ROE. Processes in the operations center must delegate decentralized execution to the forces closest to the front lines with a robust C4ISR architecture. In addition, if the CFACC finds himself on the CAOC floor directing at the tactical level, some soul searching should occur. He needs to consider how he can help the frontline aviator make the right decision without direct involvement from the operational or strategic level. A JOC where the land, sea and air components can fuse together their operations to the highest levels should be seriously considered.

As the United States continues to transform her forces into smaller and lighter units, the different services will find themselves relying more heavily than ever before on each other. Redundancy and overlapping capabilities will be terms of the past. The requirement for efficient and effective forces will be critical. Through astute technology purchases, doctrinal clarification and refinement, inventive operational structure (both within and outside the CAOC), and training that encourage more decentralized execution on the frontlines, the trend over the past decade can be reversed. The maximum effectiveness and efficiency of airpower can then be fully realized.

Limitations and vulnerabilities of technology will continue to require the initiative and expertise on the front lines at the tactical level. Only through decentralized execution will the United States maintain its supremacy on the battlefield. The greatest strength is not in the equipment but in the initiative and training of the frontline warriors. Those who put their lives on the line must be given the best opportunity of survival and success. It is ultimately those frontline warriors who will have the moral, ethical, and lawful decision to push or not to push the pickle button. It is imperative that decentralized execution is embedded deep within the organizations, leadership, and systems in all future conflicts.

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Notes

[1] Martin L. Cook, "Moral Foundations of Military Service," *Parameters*30*,* no. 1 (Spring 2000), 147.

[2] Samuel B. Huntington, *The Soldier and the State* (New York: Random House, 1957), 62.

[3] Martin L. Cook, "Ethical and Legal Dimensions of the Bush Preemption Strategy," *Harvard Journal of Law and Public Policy,* June 2004, 806.

[4] Brig General Malham M. Wakin, "The Ethics of Leadership I," *American Behavioral Scientist* 19*,* no. 5 (May/June 1976), 133.

[5] Ibid., 137.

[6] Michael N. Schmitt, "Ethics and Military Force: The Jus in Bello," speech transcripts, January 2002, Carnegie Council on Ethics and International Affairs, 188.

[7] Ibid., 189.

[8] Admiral James Bond Stockdale, "The World of Epictetus: Reflections on Survival and Leadership," *The Atlantic Monthly,* April 1978, 98-106.

[9] Dr. Mark Osiel, University of Iowa address, September 2003.

[10]Adam Roberts, "Counter-terrorism, Armed Force and the Laws of War" *Survival* 44, no. 1 (Spring 2002), 26.

[11] Michael N. Schmitt, "Ethics and Military Force," 188.

[12] Joint Publication 3-30, *Command and Control for Joint Air Operations*, 5 June 2003, I-3.

[13] Air Force Doctrine Center personnel, interview 20 October 2003.

[14] Ibid.

[15] "Force Execution," Force Execution Advance Sheet 248, July 2002, US Air Force C2 Warrior School, Hurlburt AFB FL, 5.

[16] "Foundation of Command and Control for Aerospace Operations," Air Force Doctrine Document 2-8*, Command and Control,* Chapter 1, 16 February 2001, 5.

[17] Ibid., 6.

[18] David S. Alberts, John J. Garstka, and Frederick P. Stein, "Network Centric Warfare," *Network Centric Warfare: Developing and Leveraging Information Superiority*, 2nd ed. (Washington DC: DOD Command and Control Research Program, August 1999), 104.

In an experiment which compared the operational performance of F-15Cs performing counter air operations with and without data links, the USAF found the kill ratio to increase by 100 percent with network-centric operations. The U.S. Army found that when more emphasis was placed on commander's intent permitting more freedom of action to lower echelon forces, the forces were able to self synchronize and operate nearly autonomously by retasking themselves.

[19] "Foundation of Command and Control for Aerospace Operations," Air Force Doctrine Document 2-8*, Command and Control,* Chapter 1, 16 February 2001, 6.

[20] Ibid.

[21] Barry D. Watts, "The Current American Advantage in the Military Use of Near-Earth Space," *The Military Use of Space: A Diagnostic Assessment* (Washington DC: Center for Strategic and Budgetary Assessments, February 2001), Chapter 3, 45-46.

[22] Joint Publication 3-30, II-7.

[23] "Liaisons," Liaison Advance Sheet 122, April 2002, US Air Force C2 Warrior School, Hurlburt AFB FL.

[24] Joint Publication 3-30, II-7.

[25] "The Combined Aerospace Operations Center (CAOC) of the Future," 6th International Command and Control Research and Technology Symposium, United States Naval Academy, Annapolis, Maryland, June 19-21, 2001. Published by the Director of the U.S. Department of Defense Command and Control Research Program (CCRP) and the Superintendent of the U.S. Naval Academy.

[26] Nick Cook, "Revolutionary Thinking," *Jane's Defense Weekly,* 11 September 2002, 35.

However, innovation – particularly when applied too rapidly – can bring its own hazards, as well. Gen Jumper relays an account of a SOF operator in Afghanistan who typed in the GPS coordinates of a target on his laptop but had to change the battery before relaying the information. It cost him his life. Because of a software glitch, with the new battery installed, the laptop gave the SOF operator's own position as the target to circling UD fighter, with inevitable and tragic consequences.

It is important, Gen Jumper says, that these kinds of fallibilities are removed from the "system." Data, he says, is best fed directly into a weapon and then merely confirmed by a human in the loop. "Fat-fingering' data, particularly in the cockpit, should be avoided wherever possible. The degree to which automation and robotics should be applied to the battlefield is a debate that is only just beginning. It has been pulled sharply into focus by some appalling incidents of 'collateral damage' from recent wars; the destruction of the Chinese embassy in Belgrade during the 1999 Kosovo campaign and the deaths in July of Afghans at a wedding celebration after a mistaken attack by an AC-130. In both cases, data inputs by people were the common denominator.

[27] Lt General Short interview. According to Lt Gen Short, it "all came together in the last seven years without senior leadership realizing it."

[28] Colonel Ted Hailes, interview 12 December 2003.

[29] Rebecca Grant, "The Clash About CAS" *Air Force Magazine* 86, no.1 (January 2003), 56.

[30] Major Roger F. Kropf, "The US Air Force in Korea: Problems that Hindered the Effectiveness of Air Power," *Airpower Journal* 4, no. 1 (Spring 1990), 40.

[31] Allen P. Hazlegrove, "Desert Storm Time-Sensitive Surface Targeting: A Successful Failure or a Failed Success?" *Defense Analysis* 16, no. 2 (August 2000), 127, as quoted in Major General Robert Scales' *Firepower in Limited War*, 255. According to Scales, General Fred Franks, VII Corps commander, was the source for this citation.

[32] "JFACC: Operational Asset or Joint Force Dilemma," CSC 1995, Marine Corps University Command and Staff College, 1995.

In addition, the kill boxes were based on geometric convenience rather that the corps commander's scheme of maneuver and thus were not necessarily concentrated on the most menacing Iraqi defenses.

[33] Allen P. Hazlegrove, "Desert Storm Time-Sensitive Surface Targeting," 125.

[34] Lt Gen Santarelli, interview 7 November 2003.

[35] Paul C. Strickland, Lt Col, "USAF Aerospace-Power Doctrine: Decisive or Coercive?" *Aerospace Power Journal* 14, no. 3 (Fall 2000), 21.

[36] Rebecca Grant, "Reach Forward," *Air Force Magazine* 85, no. 10 (October 2002), 46.

[37] Lt Gen Michael C. Short, AFA Air Warfare Symposium 2000, 25 February 2000.

[38] Lt Gen Santarelli, interview 7 November 2003.

[39] Rebecca Grant, "The Clash About CAS," 58.

[40] Lt Gen Santarelli, interview 7 November 2003.

[41] Lt Col Christopher F. Bentley, "Afghanistan Joint and Coalition Fire Support in Operation Anaconda," *Field Artillery,* September-October 2002, 12.

[42] Nick Cook, "Revolutionary Thinking," 34.

[43] Ibid., 44.

[44] Elaine M. Grossman, "Left In Dark For Most Anaconda Planning, Air Force Opens New Probe," *Inside the Pentagon*, 3 October 2002.

[45] Lt Col Rick Turner, interview 20 October 2003.

[46] Adam J. Hebert, "After Leaving USAF Out of Anaconda Planning, Army General Blasts Air Support," *Air Force Magazine* 85, no. 11 (November 2002), 14.

[47] Lt Col Rick Turner, interview 20 October 2003.

When target meets ROE you should be able to drop but C2 is saying no. Time loss of talking to AWACS and CAOC when all they would say was "You have clearance to look at the target." I wanted to kill the target.

[48] Ibid.

[49]Commander Joe Breedlove, interview 13 February 2004.

[50] Capt. Douglas W. Glover, F/A-18D Weapon Systems Officer, interview 13 February 2004.

On 8 April 2003, Awake 35 launched from Al Jaber as a single-ship FAC(A) to support TF Tarawa as they moved east from Al Kut towards Al Amarah. They did not need Awake 35, so we checked in with Blacklist, the Marine DASC to see if there was some work in Baghdad. Blacklist had a few points they needed visual recce of as the Marines conducted a river crossing on the NE side of town (Diyala River). Awake 35 spent one TOS checking out these points for vehicle formations or artillery batteries that might be targeting the Marines during the vulnerable river crossing. After an hour with nothing to show for our work, we departed to the tanker and returned to work with Blacklist again. At the start of the second TOS, we were given a quickfire mission on the north side of Baghdad. Apparently Artillery in the area had fired at the Marines and we were the platform tasked with finding it. We proceeded overhead the coordinates, which plotted in a mixed agricultural and urban neighborhood NW of Sadaam City. There was no artillery to be found (by us) and after about 20 minutes of searching the area directly under the coordinates, my pilot and I expanded our search pattern. We confirmed that the lead trace of the RCT in our zone of action was still at the Diyala River on the East side of our AOR and had not pushed west.

From my past experience, Iraqi artillery usually hid in palm groves near their firing points, so naturally we began searching a large palm grove along the East side of the Tigris river. With no arty to be found, we searched further south into "Sadaam Land" the Amusement park and found a number of vehicles arrayed around the riverbank and in amongst the buildings. About 1 km south was a traffic circle with a large concentration of vehicles in it (MB 399 989 on the included map). At the center of the circle was a grey T-62 pointing south and another grey T-62 on the east side, also pointing south (towards the Marine axis of advance). There were other tan colored vehicles around the traffic circle, but I couldn't ID them on the first pass... and for the record we were at "5 thousand feet (wink, wink)," which was even below the 10k deck imposed over Baghdad after the A-10 shootdowns. We reported the armor to Blacklist and requested permission to engage while once again reconfirming that no friendlies were in the area. While Blacklist did the legwork to track all friendlies, we made three more passes at "5

thousand feet" over the traffic circle to ID more vehicles. I could see that a number of them were blocky looking APCs, none had air panels or other ID markings, all were desert colored. By this time we were starting to second guess ourselves, but Blacklist told us that clearance to engage would be coming shortly, they just had a few more Marine units to check on. By this point we were assuming guilt by association, since there were 2 T-72s (IDed from the angled-V on the glacis plate. once again at "5 thousand feet') in the traffic circle, no tracers or obvious firefight and some of the tan vehicles were parked in close proximity to the T-72s. Additionally we found a section of towed mortars about 2-3km south of the traffic circle, parked in a palm grove, still attached to their prime mover vehicles. Blacklist once again promised us that clearance to engage would be forthcoming, but we had run out of gas and had to head to the tanker once again.

"Upon returning from the tanker, we learned that the targets were in fact U.S. Army troops that had crossed the Tigris River without any liaison with the Marines and in fact we would have been cleared on them had we not give Blacklist an addition 30 minutes by heading to the tanker. A further recce pass at "5,000 feet" confirmed that one of the vehicles under the trees in the traffic circle was in fact an M-1A1 Abrams. Fortunately, this traffic circle was only 4-5km south of our quickfire coordinates, and I feel that had we reported this as artillery, we would have been cleared immediately on it.

Another incident from Hawk aircrew was on the night of the 10th. While working with JSTARs, one of our FAC(A)s was targeted into a column of vehicles near Tikrit. The column had no IR strobes on and no overt identification as friendly. The vehicles were 6-wheeled APCs and trucks. After a couple of passes (lower and lower) over the column, the FAC(A) IDed them as non-US vehicles. Fortunately after the last low pass, once again at "5 thousand feet," the column immediately turned on all their IR strobes and made it plain they were coalition forces. Another close call...."

[51] Lt Gen Santarelli, interview 7 November 2003.

[52] Lt Gen Croker briefing, 3 December 2003.

[53] Peter Boyer, "The New War Machine," *The New Yorker*, 30 June 2003, 70.

[54] Ibid.

[55] Dr. Joe Strange, "Centers of Gravity & Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can Speak the Same Language," *Perspectives on Warfighting,* Number Four, Second Edition, ix.

Centers of Gravity: Primary sources of moral or physical strength, power, and resistance. **Critical Capabilities:** primary abilities that merit a Center of Gravity to be identified as such in the context of a given scenario. **Critical Requirements:** Essential conditions, resources and means for a critical capability to be fully operative. **Critical Vulnerabilities:** Critical requirements or components thereof which are deficient, or vulnerable to neutralization, interdiction or attack in a manner achieving decisive results

[56] Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms,* 11 April 2001, 538.

[57] Lt Colonel Bernard L. Ingram, "Joint Targeting for Time-Sensitive Targets," *Field Artillery,* May-June 2001, 29.

[58] Allen P. Hazlegrove, "Desert Storm Time-Sensitive Surface Targeting," 113.

[59] Ibid., 135.

[60] Colonel John R. Boyd, quoted by Henry Eason, "New Theory Shoots Down Old War Ideas," *Atlanta Constitution*, 22 March 22 1981 and reprinted in Grant T. Hammond, *The Mind of War: John Boyd and American Security* (Washington DC: Smithsonian Institution Press, 2001), 122-123.

[61] Colonel Gary Cheek, "Effects-Based Operations: The End of Dominant Maneuver?" *Transformation Concepts for National Security in the 21st Century*, Williamson Murray, ed., (Carlisle PA: Strategic Studies Institute, September 2002), chapter 3, 79.

[62] Frederick W. Kagan, "War and Aftermath," *Policy Review*, no. 120, August-September 2003, 7.

[63] "Fire Support in Joint Operations," Joint Operations Advance Sheet 231, June 2001, US Air Force C2 Warrior School, Hurlburt AFB FL, 3.

[64] Sean D. Naylor, "Long Time Coming," *Air Force Times,* 30 September 2002, 16.

[65] "Air Allocation and Master Air Attack Plan," Air Allocation and Master Air Attack Plan Advance Sheet 246, May 2002, US Air Force C2 Warrior School, Hurlburt AFB FL, 2.

[66] "Air Allocation and Master Air Attack Plan," Air Allocation and Master Air Attack Plan Advance Sheet 246, May 2002, US Air Force C2 Warrior School, Hurlburt AFB FL, 4.

[67] A story was shared of how a CFACC had worked over two years to ingrain initiative and confidence in CAOC staff. During an exercise a new deputy asked a CAOC officer why he had placed the DCA CAP in a certain position and if it would not be better placed elsewhere. The CFACC tapped the new deputy on the shoulder and escorted him out of the CAOC. Once they were behind closed doors, he made it clear to the new deputy how he had built trust in the personnel on the CAOC floor for over a year and they were now making decisions without looking over their shoulder for approval constantly. That deputy lost months of training in that one action.

[68] *Space & C4ISR Capabilities CONOPS*, Version 8.1, 29 September 2003.

[69] General John P. Jumper, "Focused on Integration," *ISR Journal*, Issue 4, 2002, 9.