

Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations

by

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Abstract

Joint interdependence grows out of the growing reliance of the Army on the Air Force as it becomes more agile and sheds some of its organic fires. Therefore, this research paper only addresses those areas where air and ground operations merge, on the battlefield. There are four questions addressed herein: What are the implications of joint interdependence? What are the doctrinal friction points? Where is the potential for operational seams? What might be the options for a way ahead?

Organizing the services to become more interdependent makes sense operationally and strategically. Yet, experiences in Afghanistan and Iraq demonstrate that the services have much to accomplish to institutionalize joint interdependence despite the spirit of cooperation that now exists between the air and land services in both areas of operations. The simultaneous ground operations of the US Army's V Corps and the US Marine Corps' I MEF during Operation Iraqi Freedom provides a unique opportunity to evaluate the issues of joint interdependence and propose potential solutions towards creating mutually enabling air and ground operations. This recent experience combined with the historical accounts of past air-ground cooperation provides some of the answers to the questions posed above and is also indicative of the difficulty in actually institutionalizing the organizational, training, and doctrinal changes necessary to make an interdependent land and air force. This will be hard work. Understanding the implications of creating a truly interdependent force capable of withstanding the pressures of the next inter-war period is the first step.

Preface

The observations, analysis and recommendations expressed in this research paper are filtered through the lens of my Marine Corps experience. This perspective may seem parochial and even myopic. But it is a perspective shaped by the experience of being a member of both sides of an air-ground team that has demonstrated its tactical effectiveness many times over. The aviation arm of the Marine Corps is a tactical air force organized and trained to be an element of the Marine Air Ground Task Force. It is therefore easy for one to assert that the organizational structure of the MAGTF that makes its air and ground forces interdependent may not have application when applied on a larger scale, i.e., molding a joint, interdependent land force and air force. Today, perhaps a more appropriate analogy is that the Marine Corps' air-ground system evolved within a notoriously paranoid culture whereby combat and sometimes service survival depended upon finding efficiencies in maximizing combat power while reducing the deployment footprint. Finely honing the art of aviation employment at the expense of heavier and less mobile forms of fires like self-propelled artillery resulted in an *interdependent* ground force and air force.

However, before the perspective presented herein can be considered a perspective perhaps unaware of larger issues that may trump the interdependence initiative, one should consider the public statements of the US Air Force Chief of Staff, General T. Michael Moseley, US Army Chief of Staff, General Peter J. Schoomaker, and the Chairman of the Joint Chiefs of Staff, General Peter Pace. Joint interdependence is now a priority for the Air Force, Army, and the Joint Staff. In fact, the Air Force Doctrine Center sponsored the topic of this research paper "the implications of joint interdependence" for the Air War College class of 2006. The collection of books and studies written by Benjamin Cooling, John Schlight, Benjamin Lambeth, Robert F. Futrell and Bruce Pirnie et al. adds weight to the importance of joint interdependence.¹ It is the collective opinion of these authors—aviation experts, Air Force historians, former Air Force pilots, and members of Rand Corporation's Project Air Force--that since airpower became a major contributor to warfare each conflict fought with airpower demonstrated an air-ground coordination maturation process whereby an initially dysfunctional air-ground system evolved into a system that was fairly effective. Alternatively, each of these authors uses the Marine Corps' system of air-ground coordination as a constant by which to measure the other services' air-ground system.

Yet, invariably their complementary analogies are qualified with statements that imply that the Marine air-ground system does not have application on a grander scale and is not in consonance with the hard-learned lessons of Operation Torch. A common opinion expressed to me among many Air Force and Army officers was that the reason the Marine Corps system functioned so well was because "...that's all Marine aviation exists for."

This opinion of the Marine air-ground system does not capture the seemingly simple, but in practice, very difficult process of air-ground coordination supported by a complex organization that melds the Marine Corps' air arm and ground arm into seamless functionality and interdependence. One should also consider that during opening days Operation Iraqi Freedom this air-ground system accepted a crushing load of unplanned coalition air often with just ten minutes of fuel remaining, with relative ease. The Marine air-ground system utilized this excess air with devastating effect on the Iraqi forces located throughout the depth of the MEF battlespace. Yet, when the Marine Corps' air-ground interdependence is indicted by airpower proponents for being wasteful by needlessly aligning valuable airpower for the sole use of Marines at the expense of the overall air effort they do so without full understanding of the entire Marine Air Command and Control System that is specifically designed to efficiently meld airpower into the ground scheme of maneuver. During OIF this system demonstrated its effectiveness to not only employ Marine Airpower, but also the unplanned and unanticipated weight of coalition airpower provided to, but not used by V Corps.

Taken in this context, an un-biased outsider's view of the challenges faced by the Army and the Air Force in becoming a jointly interdependent air and ground force may be of some value. As the Army sheds up to one-third of its organic fires and reduces its deployment footprint without a corresponding reduction in net combat power, as the Air Force faces its most challenging recapitalization efforts ever, the ideas expressed herein may offer some insight towards a potential road ahead as the air and land force transform to meet an ever changing threat and environment. The Marine Corps has traveled this road before.

Introduction

Joint Pub 3-3 defines joint interdependence as:

The synchronized employment of land, air, sea, space, and SOF, therefore, provides the joint commander with the widest range of strategic, operational, and tactical options. Although each Service contributes its own unique capabilities to the joint campaign, each dominating its own environment, their operational and even tactical interdependence is critical to overall joint force effectiveness. *Joint interdependence* is achieved through the deliberate reliance of each service on the capabilities of others to maximize its own effectiveness, while minimizing its vulnerabilities.

That definition of joint interdependence as written is seemingly comprehensive.

However, lurking between the lines of the definition are the realities that confront the land and air forces in achieving joint interdependence for air and ground operations by relying upon each other's capabilities to be successful. This is particularly daunting considering the friction points that exist among land and air forces. These points are burned into the culture (people) of each service by the ever present defense budget battles. The frictions blocking interdependence are in part a by-product of the Title 10 delineation of roles and missions and the service responsibilities for organizing, training and equipping the forces independently and then employing them to battle and win the nation's wars jointly. They are also caused in part from service cultures that since the end of WWII have grown to rely upon each other "sequentially" and not depend upon each other "reciprocally" particularly in combat.² Therefore, the thrust of this paper is focused on joint interdependence and the implications for air and ground operations. More specifically, the definition of joint interdependence above can be narrowed to mean the deliberate reliance of the land forces upon the capability of the air forces and vice versa, for mutually enabling effect.

The institutional, organizational and training implications of interdependence are complex. Perhaps nowhere are the implications as important as they are for interdependence for air and ground operations. At a minimum, misunderstanding this or waving off interdependence by applying the common excuses of not enough people, money, or the ultimate excuse of "we already learned the lessons, we've got it figured

out” will undermine the capabilities of the Army and the Air Force. But ultimately, these excuses will undermine the soldier and the Airman by not providing them with the best possible organization to battle and win our nation’s wars in a militarily efficient manner: quickly and with the fewest casualties. If we don’t get the air-ground team right we either lose in battle, or we win at higher cost, slowly and with higher casualties.

The lack of trust between the services underpins the frictions preventing interdependence for air and ground operations. This mistrust is so severe and has lasted so long that rebuilding trust while addressing the Quadrennial Defense Review and transformation will require bold leadership and difficult choices. What will be required is the establishment of deliberate dependencies upon each other’s core capabilities codified by doctrine and organizational changes that can withstand the inter-war period. Trust, not technology, is what will enable joint interdependence. Therefore restoring that trust will be largely a human endeavor. Most of my research has centered on those aspects of joint interdependence for air and ground operations where the interaction of soldiers and Airmen can be improved and thereby their mutual trust restored.

Perhaps the reality is that interdependence may be impossible to institutionalize. Long ago officers like Patton and Weyland, Quesada and Bradley figured joint interdependence out. They knew the answers; they knew what was at risk if they were not jointly interdependent: failure in combat. The typical post-war drawdown that is the aftermath of each conflict often proves to be a more capable adversary to jointness and the services than the enemy just defeated. Processes emerge where each service is independently forced to justify their budget, force structure and procurement in anticipation of the next war while having just defeated the adversary jointly in the past war. This has historically repeated itself following the conclusion of every major conflict America has fought since achieving independence. A process that ignores the battlefield successes and the importance of personal relationships forged and tested in combat is not a sound basis for doctrine.

Yet, moving the air and land forces forward towards joint interdependence makes sense financially, operationally and strategically. The Air Force’s commitment to back fill the Army’s reduction in organic fires with aerial fire support as the Army transforms raises the stakes. This point is very important and must not be misunderstood by the reader. A critical part of the Army’s transformation plan is to reduce its organic fires (artillery) capability by 30-40% in order to “lighten” their deployment footprint. This is significant and portends many implied tasks

for the air and land services if aerial fires are to compensate for the divestiture while simultaneously adhering to the tenets of airpower. Inefficiencies in the current military model—the luxury of redundancy—are no longer affordable or even desirable. More importantly, redundancy can no longer be a crutch for unsound doctrine and service organization that does not engender interdependence.

The author understands that the leadership of the Army and the Air Force are beyond the issues of Anaconda.³ They have learned the lessons just like the organizations did after WW II, the Korean War, and the Vietnam War. But, unless there are organizational changes instituted in both services to ensure the “lessons learned” are not re-learned after the next inter-war period, Operation Anaconda could happen again. For joint interdependence of air and ground operations to work, it must be institutionalized through organizational and training changes designed to strengthen the bonds between the land and air service. The Air Force has many competing demands of which close air support is just one, particularly during the opening phase of a joint campaign. The challenge for joint interdependence for air and ground operations then is to determine how to best balance the air component’s capability with the ground component’s capability for mutually enabling strategic effect. In the process, the polarizing opinions of land power proponents (“the Air Force is never there when I need it”) and air power proponents (“all the Army wants us to do is be flying artillery”) will move closer towards the middle.

Ultimately, if the services fail to achieve joint interdependence for air and ground operations, America will be the bill payer in the form of potentially more casualties and longer conflicts. The goal here is to provide options for a the road ahead to achieve joint interdependence for air and ground operations that is both effective and more efficient than current methods while increasing the relevance of the services’ core missions. This will require top down leadership and hard decisions. Overall success in this endeavor depends upon mutual *trust* between air and ground forces. What follows is an assessment of what is required to insure this occurs.

Vignette

So I want y'all to understand where an Air Chief is coming from when I talk about interdependence. I mean that. I mean that relative to jointness and I mean that relative to fighting a long war on terrorism as a member of the joint team. So my priorities are to look at ways to continually improve the joint warfight... So, to continue to improve the joint war-fight and to continue to focus on the notions of being truly interdependent really matter to me.

Gen T. Michael Moseley CSAF⁴

Does this quotation demonstrate a necessity to improve the 'joint warfight' by "focusing on the notions of being truly interdependent?" Is the renewed interest in joint interdependence based upon recent experience during Operations Enduring Freedom and Iraqi Freedom? If so, then one would probably agree that there are service friction points and operational seams that need to be examined and understood before joint interdependence for air and ground operations can be achieved. The following vignette describing air operations within the I Marine Expeditionary Force (MEF) Area of Operations during Operation Iraqi Freedom (OIF) is useful in highlighting the friction points and seams between the Air Force and Army. In turn, this will suggest recommendations that offer a potential road ahead for the Army and the Air Force to achieve joint interdependence for air and ground operations.

From the beginning of Operation Iraqi Freedom the Marine FA-18D Airborne Forward Air Controller (FACA) crews witnessed the Regimental Combat Teams (RCT) of the 1st Marine Division march up from Kuwait. They were very familiar with the current location of RCT-5 and the division's other regimental combat teams. The FACA crews had previously flown with many of the air officers and forward air controllers now on their ground tour working for and advising the infantry commanders on employing rotary-wing and fixed-wing air. In fact, voice recognition over the radio was the norm and they were intimately familiar with what the ground commanders wanted attacked and left alone. This, they accomplished through meetings and rehearsals that were held between the Marine aviators and the Marine ground commanders well before OIF began.

During the months leading up to OIF Marine aviators attended numerous "Rehearsal of Concept" sand table exercises or "ROC drills" hosted by the infantry commanders. During the last ROC drill just days before the war began MajGen Mattis, the 1st Marine Division Commander,

was very clear in articulating his concerns and his desires for Marine Aviation. At the conclusion of the drill, the two thousand or so leaders in attendance broke up into the typical 'what do you think' side bar discussions. The Marine aviators attending the drill were the normal mix that represented the capability of Marine Air Wings. Cobra, Harrier, Hornet pilots and Hornet Weapons and Sensors Officers stood in a circle discussing their observations of the division's scheme of maneuver. There were other Marine aviators among the group. These aviators were the division's Forward Air Controllers (FACs) and Air Officers (AOs). Serving a twelve to eighteen month tour with the infantry, it was their job to share their aviation expertise with the "grunts" and coordinate and control Close Air Support (CAS). They too represented the mix of rotary-wing and fixed-wing aviation of the Marine Air Wing and they understood they were critical to the infantry's success.

It was at this that point MajGen Mattis unexpectedly broke into the aviator's circle and laid his personal battle map, an aviation Joint Operational Graphic on the sand in the center of the aviators.

"Gents, let me explain one more time my intent for Marine aviation." "Chaos" (Maj Gen Mattis' call sign) explained to the aviators in explicit detail the routes of maneuver and expected timeline for the first thirty-six hours of the war. He then explained with less clarity where he expected to maneuver his regimental combat teams, a close equivalent to an Army Brigade, for the remainder of the campaign ultimately stopping at Baghdad six to seven weeks later.

"My principal enabler for speeding the division's advance is Marine Aviation. Therefore, my biggest concern is Marine Aviation's ability to find Iraqi artillery and surface to surface missiles capable of delivering chemical munitions thus slowing our speed of advance. I don't want you concerned too much about Iraqi tanks, I have the best anti-tank weapon in the world, and that's the M-1. Where are my Cobra guys?"

Three to four pilots, one of them a squadron commander, raised their hands and MajGen Mattis again points to the map and says "you guys need to be just behind but no further than my forward lines and looking for targets to my immediate front and to the maximum range of your TOW and Hellfire missiles. If there's armor to our front, you will be directed to attack key vehicles before they get within range of my M-1's. If there's nothing going on, I want you to land behind my lines and save gas. If there's something big I'll expect your FACAs to work with the fixed-wing CAS and direct them where you need them. Where are my fixed-wing guys?"

About ten aviators raise their hands.

“You guys are equally as critical; you need to be ranging from five clicks to sixty miles to my front and along the flanks of my route of advance and find and kill Iraqi artillery, surface to surface missiles, command posts, and armored columns in that order of precedence. You also need to screen my eastern flank and alert me of any Iraqi movement towards the west. After that, fly deeper and look for and kill surface to surface missiles, command posts, and massed Iraqi forces. I will also want you to be available for CAS, but I don’t expect that to happen often. The Cobra is my best CAS asset and that’s what I plan on using it for. Above all else, I am most vulnerable to Iraqi artillery capable of delivering chemical munitions. You fixed-wing guys are the eyes of my division; you have to find and destroy the Iraqi artillery before it can engage my Marines and I’ll engage or maneuver around the rest; any questions?”⁵

There weren’t. And as operations began, things worked well. An illustration can be seen in the mission of “Akimbo 42.” His story follows.

“Akimbo 42,” a Marine FA-18D crew flying a scheduled nighttime Airborne Forward Air Controller (FACA) mission for the 1st Marine Division, had twenty minutes of fuel remaining after being airborne over four hours. The FACA crew was performing Strike Coordination and Reconnaissance (SCAR) strikes in an open killbox about sixty miles in front of Regimental Combat Team five (RCT-5). The target area they were working was an Iraqi vehicle convoy that was passed to them by the Joint Surveillance Target Acquisition and Reconnaissance System (JSTARS). They had coordinated the attacks of Marine, Navy, and Air Force aircraft and there were still many targets to attack. But Akimbo 42 was at the end of their assigned time on station, and the relief FACA crew was now on station. They had expended all of their ordnance over an hour before but were using their targeting pod to generate target coordinates and guide the laser weapons for the strike aircraft as they arrived on station. After passing the pertinent information about their target area to the oncoming FACA they then called “Tropical,” the Marine Tactical Air Operations Center (TAOC), and passed their mission report. They also informed Tropical that they intended to conduct a visual reconnaissance with their remaining fuel for Iraqi activity as they flew home towards Kuwait. The “backseater” or Weapons and Sensors Officer (WSO) of Akimbo 42 tuned the second radio to “Blacklist” the 1st Marine division’s Direct Air Support Center (DASC) frequency and passed the same information.

The pilot and WSO of Akimbo 42 searched for signs of Iraqi convoy movement along one of the major highways that connected Al Kut and Baghdad, about ten miles in front of RCT 5. After about eight to ten

minutes, they detected six pairs of closely spaced lights moving east along Highway 6 towards RCT-5. The pilot of Akimbo 42 maneuvered the jet to get the Hornet's targeting system centered on the vehicles. "Blacklist" had previously told Akimbo 42 that RCT 5 was stationary for the night. As Akimbo 42 approached the suspicious convoy, the pilot descended low enough to positively identify the vehicles as Iraqi artillery. Recording the target coordinate from their targeting system, both aviators plotted the artillery battery on their 1:100,000 grid chart. The target was definitely short of the fire support coordination line (FSCL), but more importantly it plotted inside an open killbox. Simultaneously the WSO called Blacklist to forward the information and target location of the Iraqi artillery. The WSO then changed frequencies and talked directly to RCT-5's air officer. Major "Fingers" Ferringa, a FA-18 pilot, was serving a one-year air officer tour with the Regiment. He confirmed that the regiment had no friendly units in that location, "key pad seven" and added the killbox is open but overlays the division's battlespace, "contact them to get attack clearance" he said.

The Iraqi artillery battery was in an "open killbox." This meant that there were no friendly units in the area and the aviators were cleared to attack any targets found in the 30' X 30' kill box, roughly thirty nautical miles square without detailed coordination with the ground forces that owned the killbox. If it was closed, they would have to clear their fires with the division air officer. Each killbox was further subdivided into nine squares 10' X 10' or roughly ten by ten nautical miles. The squares are numbered like the keypad on a telephone, one through nine. The killbox was short of the Fire Support Coordination Line, but the Akimbo 42 aviators at this point had come to rely upon the killbox system of fire support coordination more than the traditional fire support coordination line they had habitually trained to during their careers. Due to the rapid movement of the ground forces, the aviators operating within the MEF Area of Operations found that the killbox system was much effective than traditional fire support coordination measures; it was a very flexible system, particularly in such a fast paced battle. However, the unique flexibility of killboxes allowed them to be opened and closed instantly as the ground situation changed and about one hour had elapsed since they were updated on the status of the killbox by "Tropical." The amount of caution displayed by Akimbo 42 was normally not required since the FACA crew was briefed by "Tropical" that killbox 87AU was 'open.' They were exercising extra caution in case its status may have changed since they last checked.

By this time the FACA crew identified the convoy as an Iraqi artillery battery and noticed that the battery had moved off the road and began to set up in a field with their tubes oriented towards RCT-5. The WSO of Akimbo 42 rolled the frequency knob of his radio to “Blacklist” and passed the new Iraqi artillery location to them. “Blacklist” also confirmed that no other friendly units were operating in the open kill box. Akimbo 42 asked if there were any additional aircraft in the area that could be used to attack the artillery battery before they began to fire on the Marines. “Blacklist” replied that no aircraft were currently working with the division but a section of A-10s was due in about 15 minutes and to contact the “Tropical” for approval to divert them. With this information Akimbo 42 was about to ask “Tropical” for available aircraft to attack the battery before it could fire on RCT 5. Just before the WSO of Akimbo 42 keyed the mike, the FACA crew heard “Degree 77” check in with “Tropical” on the TAOC frequency.

Degree 77, a section of F-15E Strike Eagles had just spent the last twenty five minutes supporting V Corps by holding in a CAS stack with about six other sections of CAS aircraft. It was clear to them that either there was way too much air supporting the CAS requirements of the 3rd Infantry Division or something was preventing the efficient use of CAS; they just couldn’t identify what the problem was. For some reason, it took an inordinate amount of time to get called out of the CAS stack and assigned to either a ground terminal attack controller or to work a killbox. They experienced this frustration many times since the ground offensive began. One thing appeared certain; tonight may turn out like the others—they would finish their assigned time on station without being assigned a mission. However, during the planning for tonight’s mission they learned from squadron mates that if “Warhawk,” V Corps Air Support Operations Center (ASOC), couldn’t gainfully employ the Strike Eagle crews by the end of their time on station they should use a “DASC bingo.” More specifically, save some gas in order to expend their ordnance in the Marine area of operations to avoid heading home with all of their bombs. They heard that the Marines always had targets available and developed a reputation for employing aircraft even with just five-ten minutes of fuel remaining. Hoping to avoid last night’s experience, at the end of their assigned thirty-minute time on station they called “Warhawk” and declared “Degree 77 bingo, returning to base.” Climbing to 37,000 feet to transit the Marine Airspace on their way home, they contacted the TAOC checked in.

“Tropical, Degree 77?”

The Marine TAOC replied, “Degree 77, Tropical, say ordnance and time on station remaining.”

The pilot remarked to the WSO over the ICS...“hell I’m surprised they even acknowledged our call sign since we’re not on the ATO to support the Marines tonight.” The WSO responded by keying the mike.

“Tropical, Degree 77 is a section of Strike Eagles with eight-GBU-12’s (500 lb laser guided bombs) each and 15 minutes time on station remaining...do you have any work for us?”

Tropical replied, “Degree 77, Tropical, proceed to killbox 87AU and contact Akimbo 42 on Mauve 15,” the killbox coordination frequency for the southern area of operations.

“Akimbo 42, Degree 77” called the WSO from the lead plane of the F-15Es. “Degree 77, Akimbo 42 stand by for target coordinate and target area brief, say type aircraft, ordnance and time on station.”

The Strike Eagle WSO replied, “Akimbo 42, Degree 77 is a flight of two Strike Eagles, 8 GBU 12’s each, 15 minutes time on station remaining, LANTIRN capable” announced the WSO of the lead Strike Eagle.

The WSO of Akimbo 42 remarked to his pilot over the intercom “what a waste of capability...all that gas and all those bombs and two guys per plane and there’re just a couple of bomb trucks...do you think the Air Force will ever let them do FACA?”

The pilot quipped, “Knowing the Air Force, I doubt it.”

Akimbo 42 WSO sent the target coordinates to the Degree 77 and the F-15E WSO read it back to Akimbo 42 to verify its accuracy. Both the pilot and the WSO concurred it was correct. Akimbo 42 WSO said “Degree 77 proceed to keypad five. Commence your attack from the 120 degree radial, right turn off target and then back to keypad 5.”

After confirming the laser code of the Strike Eagle’s first bomb the FA-18D pilot maneuvered his aircraft to guide the F-15E’s first bomb into the artillery battery just six minutes after establishing contact with the Degree 77. The resulting explosion and fire of the burning vehicle provided a great “mark” from which Degree 77 could orient the rest of their attacks. As Akimbo 42 observed the impact of the laser guided bomb they determined that their fuel state was now critical; the FACA WSO handed off the target area to the Strike Eagle crew as the SCAR manager and returned to base.

This vignette highlights key differences between two ground forces operating independently towards a common objective in the employment of coalition airpower in consonance with maneuver. The next section analyzes these differences in more detail.

Analysis

There's no central focus on the striking of the primary targets of an opponent as much as it was just trying to stay out of each other's way. There's no central planning with that, there's no central focus, there's no central metric. That takes you nowhere other than, again, just staying out of each other's way.

Gen Michael Moseley, CSAF

Perhaps the best way of comparing the V Corps experience to the I MEF experience is to correlate it with methods of inventory management. The V Corps example was “first in first out” form of Close Air Support (CAS) aircraft inventory management. Coalition CAS aircraft were ‘pushed’ to the V Corps area of operations where they were stacked in altitude by the air support operations center while waiting to be called out of the stack and employed before their time on station expired. The I MEF example can be equated to “just in time” CAS aircraft inventory control. 3rd Marine Aircraft Wing aircraft were ‘pushed’ to the I MEF Area of Operations (AO) where they were assigned an agency and / or area to operate based upon their mission assignment and qualification. Each approach to planning for CAS aircraft is sound but the conditions on the battlefield to which each method is applied differ.

Both inventories of CAS aircraft were sourced, coordinated, and centralized under the air component commander by pushing aircraft to the V Corps or I MEF area of operations. During the planning phase of Operation Iraqi Freedom the preponderance of 3rd Marine Aircraft Wing sorties were dedicated to I MEF and the preponderance of Air Force and Navy tactical fixed-wing sorties were dedicated to the V Corps area.⁶

This issue is always a source of friction between Marines and Airmen, and OIF was no different. Anticipating this friction, during the summer of 2002 the Combined Joint Force Air Component Commander Lt Gen Moseley met with the leadership of I MEF. In preparation for OIF, the Marine leadership briefed him on Marine Aviation and the Omnibus Agreement that was a footnote to the Goldwater Nichols Act of 1986. Specifically, the Omnibus Agreement allowed the MEF commander to maintain control of Marine fixed-wing sorties since they directly support the Marine Air Ground Task Force. The Marine leadership desired to discuss the implications of the Omnibus agreement with General Moseley in order to alleviate any potential frictions over the control of Marine fixed-wing sorties.

An agreement was reached between General Moseley and the Marine leadership. Marine fixed-wing sorties had to be “processed” through the CFACC in the form of a “direct support” Marine Air Tasking Order (ATO) embedded within the CFACC ATO. In exchange, the MEF would provide their “best 0-6” to the CFACC staff to head up the CAS effort for the entire Area of Operations, not just the Marine Area of Operations. This compromise worked both ways. The MEF had a trusted agent working CAS issues for the MEF, and in return General Moseley and the CFACC gained a form of “access” to the Marine fixed-wing sorties of the 3rd MAW. The CFACC’s position was that there may be times that require Marine FA-18s to fly long range missions and their sortie equivalent would be replaced with A-10 sorties. The bottom line is that the friction between the CFACC and the Marine Air Wing over the control and use of Marine sorties was reduced through a mutual understanding and commitment among leaders.⁷

Lt Gen Moseley reinforced the fact that he was not looking to control Marine CAS sorties. Contrarily, he promised the entire weight of the USAF’s low density high demand assets like AWACS, JSTARS, Global Hawk, and Rivet Joint would support the MEF and V Corps equally. Nothing would be put in writing guaranteeing this; his word to the Marine leadership was that they will get everything the CFACC had and more. The interesting footnote to this meeting was that the MEF’s original purpose of keeping Marine tactical sorties solely for the support Marines turned out to be unfounded. By the third day of the conflict the MEF was employing an almost equal amount of CFACC sorties as 3rd MAW sorties.⁸ However, the majority of additional CFACC sorties sent to support the MEF were sorties originally planned to support V Corps. Long standing inter-service doctrinal issues between the Army and the Air Force manifested itself in a unique way. Coalition aircrew scheduled to support V Corps, but ultimately not used, developed a “DASC bingo” to save enough fuel after their assigned time on station supporting V Corps to look for “opportunity” CAS within the MEF AO. The inefficiency of the V Corps air-ground coordination stood in stark contrast to the efficiency of I MEF’s. This manifested itself into an unplanned system of just in time close air support that the MEF employed with devastating effect.

The Coalition Force Air Component Commander maximized the sortie capability of the multiple squadrons and locations from which they emanated in accordance with joint doctrine and the allocation and apportionment agreed to by the land component and the air component and approved by the Coalition Force Commander. Yet, the V Corps example kept the CAS aircraft in stacks tightly controlled by the Air

Support Operations Center (ASOC) while the I MEF example allowed the pushed sorties to flow to multiple agencies all working in consonance with each other.⁹

The CAS aircraft inventory allocation was doctrinally centralized under the CFACC through the use of the Air Tasking Order (ATO). In the V Corps Area of Operations (AO) the employment mechanism was decentralized to the ASOC, an organization led and run by Air Force aviators and certified Airmen. The former were rated Air Force aviators representing the fighter and bomber community and the latter were either certified Joint Terminal Attack Controllers (JTAC) or in training to be JTACs. In contrast, in the I MEF Area of Operations the execution mechanism was decentralized to the 1st Marine Division's Direct Air Support Center (DASC), an organization led and run by formally trained air control specialists similar to Air Force Air Battle Managers consisting of Marine company grade officers and enlisted personnel.¹⁰ Both organizations are comparable in size.

At first glance, the centralized control and decentralized execution worked. Unused CAS sorties flowed from an AO that didn't need them to an AO that did. Airpower proponents would probably agree that this is precisely the strength of airpower when it is not tightly controlled using a 'penny packet' approach. It can be flowed from one area to another rapidly and efficiently demonstrating its inherent flexibility. However, deeper analysis demonstrates something quite different was happening.

A relatively new method of aerial fires coordination was employed by CENTCOM during OIF. Killbox interdiction / Close Air Support (KI/CAS) was a maturation of the killbox reference system used during Desert Storm. KI/CAS was designed to enhance airspace deconfliction and the rapid shifting of aviation assets through the area of operations. It also enhanced the navigation and assignment of rotary-wing and fixed-wing aircraft in the conduct of CAS, FACA, SCAR, air interdiction, and armed reconnaissance long and short of the FSCL.

The 'killbox' is a 30 by 30 minute grid system that's roughly 30 nautical miles square and is delineated by the lines of latitude and longitude depicted on an aviation graphic chart. The box will always be 30 nautical miles in depth but its width will vary depending where it is geographically on the earth's surface. CENTCOM planners further subdivided each killbox into 10 X 10 minute sub-squares. Each killbox was named by an alpha-numeric designator and each of the nine sub squares was numbered like the keypad on a telephone (see figure 1).

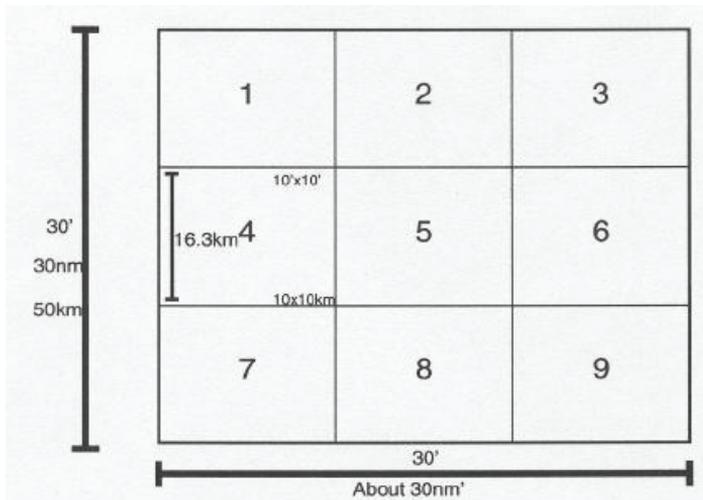


Figure 1. Killbox Reference System

Using this model, CENTCOM planners built charts that depicted the killbox reference system overlaying traditional fire support coordination measures and unit boundaries between V Corps and I MEF. Those killboxes and keypads that overlaid the area between the forward line of troops and the Fire Support Coordination Line (FSCL) were “closed” to air attack unless the ground commander opened the kill box through his representative in the Combined Air Operations Center (CAOC). Killboxes long of the FSCL were “open” for air attack unless the responsible ground commander coordinated through his representative in the CAOC to close it. Employed in this manner, killboxes took on the fire support coordination requirements of the area of which they overlaid.

Essentially, a closed killbox had two meanings, depending upon one’s perspective. For the ground commander, it meant that he was responsible for the timing, priority, and effects of all fires employed within it. In the case of V Corps, long-range organic fires consisted of Army Tactical Missile System (ATACMS) and the Apache attack helicopter. This meant that organic fires had to be coordinated with aviation fires. For the aviator, a closed killbox meant that attacking targets within it required close coordination with the agency that owned it, because other fires like artillery and rockets were sharing the same airspace he was flying in. It also meant that there was a high probability of friendly units operating within the closed killbox.

Therefore, V Corps placed the FSCL at a distance that maximized the effects of the corps’ organic fires, or in the case of OIF, between 100-140 kilometers in front of the forward line of troops. Killboxes overlaying this

area were originally planned to be closed so the corps commander could shape his battlespace with systems like ATACMS and / or Apache attack helicopters operating as a deep maneuver element. The organic fires of I MEF consisted mostly of fixed-wing aviation, augmented by a battery of ATACMS. Therefore, a slightly different approach was developed to maximize the use aviation delivered fires in conjunction with long-range organic fires.

I MEF placed a Battlefield Coordination Line (BCL) at the maximum range of the division's artillery, or about 20-30 kilometers in front of the forward line of troops (see figure 2). Killboxes that overlaid the area between the BCL and the FSCL (shaded boxes of figure 2) were "open," enabling the MEF to effectively use its primary deep shaping force, Marine Aviation for maximum effect. Killboxes overlaying the area between the forward line of troops and the BCL (white boxes of figure 2) were closed and aviation attacks in this area had to comply with the close coordination requirements of the entity that owned the killbox. This ensured aviation freedom of action between the FSCL and BCL and air actions short of the BCL were conducted with close coordination with ground forces.

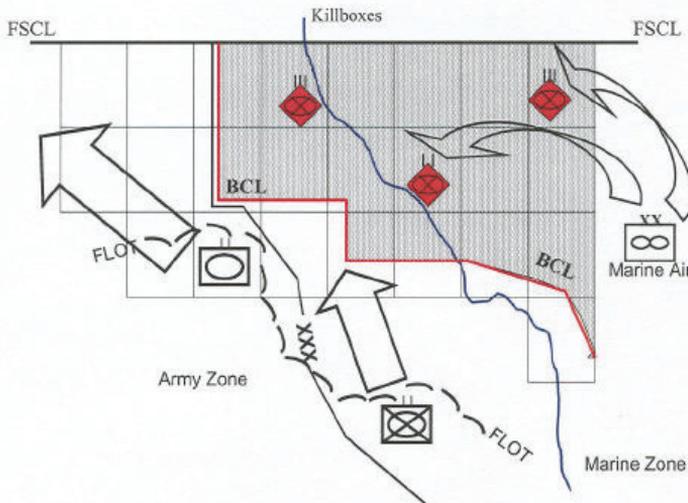


Figure 2. Killboxes and Traditional Fire Support Measures

Control of interdiction sorties long of the FSCL was coordinated by the Airborne Warning and Control System (AWACS). KI/CAS sorties in closed killboxes and keypads short of the FSCL were coordinated by the ASOC / DASC, depending upon the area of operations assigned. KI/CAS sorties were planned to attack targets assigned on the Air Tasking Order (ATO) or to attack targets that were changed or modified from the plan on

the ATO. In the V Corps AO changes to the ATO assigned targets were delegated to the ASOC, and the DASC was delegated this authority in the I MEF AO.

The importance of understanding the impact of proper positioning and use of fire support coordination measures, such as the fire support coordination line (FSCL) and killboxes is essential if both are to be used. V Corps and I MEF used traditional fire support coordination measures in addition to KI/CAS, yet each experienced different results. Coalition aircraft supporting V Corps spent more time in CAS stacks and returned to base with unexpended ordnance more often than aircraft supporting the MEF.¹¹ The vignette demonstrates a joint air effort that worked in the I MEF AO but had difficulty in the V Corps AO.¹² The efficiencies that enabled the excess flow of sorties were achieved because a more effective air-ground organization existed in one AO and not the other. Familiar inter-service arguments over the meaning and use of the FSCL limited airpower's effectiveness on one half of the battlefield but not the other.

The battlespace of V Corps was essentially divided into three zones. The first zone was that portion affected by 3 ID's organic fires extending about 30 kilometers (km) to its front. The next zone was that portion able to be ranged by V Corps' organic fires, such as Army Tactical Missile System (ATACMS) and attack helicopters. This area began at about 30 km and ended between 100 and 140 km from the forward lines of the 3 ID. Bounding this outer limit was the FSCL. Air component sorties, such as CAS and AI, were planned for each of the three areas. V Corps used terms such as "Division" CAS, "Corps" CAS, and aerial interdiction to indicate the distribution of sorties that would be dedicated to each zone.¹³

The execution of the plan fell short of its desired effects. Corps assets such as ATACMS and AH-64 attack helicopters were planned to range and attack the Iraqi forces in the corps' zone as described above. As discovered, helicopters operating deep in uncontrolled enemy territory were not survivable without close coordination with fixed-wing aircraft, and their contribution to the deep battle was largely curtailed after their experience in Najaf.¹⁴ Additionally, long range systems like ATACMS are dependent upon external Intelligence, Surveillance, and Reconnaissance (ISR) systems for targeting. Insufficient ISR assets prevented effective and timely targeting of ATACMS over such a large and expansive area, while the potential for their use hamstrung fixed-wing operations from operating in the Corps' zone.¹⁵ Therefore, the planned shaping of V Corps' zone with its organic assets from 30 km in front of 3 ID to the FSCL failed to accomplish its intended effect.

CFACC air designated as “corps CAS” and “killbox interdiction” was also planned to operate over this battle space and within the killboxes overlaying it.¹⁶ This “new” concept of “corps CAS,” operating without a deep battle manager, quickly overwhelmed the corps’ ability to coordinate and direct their efforts. Complicating matters, those killboxes covering the division and corps zone of action were short of the FSCL and were therefore “closed.” By definition aircraft operating in a closed killbox “can only attack if under type 1, 2 or 3 terminal control (FAC/FAC(A)).”¹⁷ During the first five days of operations, the V Corps commander was hesitant to open killboxes short of the FSCL for fixed-wing interdiction even though there were no friendly forces in the killboxes.¹⁸ This had a cascading effect of stacking “killbox interdiction sorties,” “corps CAS” sorties with the “division CAS” aircraft in CAS stacks. The stacks were positioned to keep aircraft clear of the trajectories of tube launched and rocket artillery and were normally over friendly territory. The net result was wasted air effort for the deep battle and an over-stocked inventory of CAS for the close battle. This imbalance created the unintended consequence of creating a critical enemy sanctuary within the V Corps zone short of the FSCL and was a result of holding the coordination and employment of CAS at too high an echelon, in this case the corps.

According to the KI/CAS plan, sorties not used were expected to “go deep” and conduct aerial interdiction. The problem with this process was that the deep battle was typically sixty to one hundred miles farther from home base, potentially adding an additional 200 miles onto a mission. Additionally, the Air Force ASOC, and Control and Reporting Center (CRC) architecture in the V Corps Area of Operations lacked the ability to quickly direct the CAS aircraft to new target sets many of which were mobile in V Corps’ deep battle before fighters had to return to base for fuel. Fighters either brought their bombs home or checked in with the Marine Area of Operations, hoping for a quick target assignment to drop their ordnance on before returning to base.

Those sorties fortunate enough to be put in contact with a SCAR or FACA aircrew after being “re-roled” from CAS to interdiction had a much greater chance of successfully finding a target since the SCAR / FACA crew would have already performed the work of finding, identifying, and prioritizing targets by the time the CAS aircraft arrived on station. More importantly, they were ‘present’ in the battle space forward of the leading edge of the battle conducting attack, reconnaissance, or even helping with C2. This proactive method of pushing SCAR/FACA aircraft forward enabled the flexibility in the MEF AO described in the vignette. Aircraft

with critical fuel reserves just had to arrive in a particular killbox, get the target coordinate and area brief from the FACA, drop their bombs, and go home.

In the V Corps Area of Operations, unused aircraft were stacked up, waited for a CAS mission, and either left at the end of their time on station or when they reached a pre-determined fuel state that allowed time to employ their ordnance in the MEF Area of Operations. As demonstrated in the vignette, this proved to be an extremely inefficient method of planning and employing fixed-wing aircraft in support of the maneuver forces in the V Corps AO but turned out to be an efficient use of fixed-wing air in the I MEF AO. From the ground commander's perspective and that of the infantryman within V Corps, the CAS log jam appeared to be a good thing. When they called for CAS, they got it very quickly and it was always there for them. But this came at the expense of the corps' deeper battle and the long term perspective. The "excess air" should have been operating deeper shaping and attacking targets within and beyond the range of organic fires and short of the FSCL. A critical element of this very important event is that as the excess air from V Corps flowed into the MEF's AO and was an instant contributor to the deep battle by flowing through the DASC, directly adjacent to the 1st Marine Division headquarters, not the MEF headquarters. 3rd Infantry Division (3 ID) after action reports made the point that V Corps was one echelon too high to have sufficient situational awareness of 3 ID'S close battle and the deep battle, which contributed to its inability to effectively manage airpower between the two.

In the I MEF area of operations, fixed-wing FACAs operated forward of friendly lines and used their skills to coordinate attacks in open and closed killboxes short of the FSCL with commander's intent.¹⁹ Cobra pilots qualified as rotary-wing FACAs used their skills to coordinate aerial attacks in the close battle. Together they operated as extensions of the ground Forward Air Controllers (FACs), the Air Officers (AOs), the Direct Air Support Center (DASC) and the Tactical Air Operations Center (TAOC). Their capabilities were understood by all levels of command and therefore were given more autonomy over the battlefield. Marine liaison officers assigned aboard Airborne Warning and Control System (AWACS) and Joint Surveillance Tracking and Reconnaissance System (JSTARS) aircraft were enablers in the process of flowing V Corps CAS to the I MEF AO.²⁰ The DASC, ground FACs, and the air officers within the Marine maneuver units knew that when they were talking to a FACA he was qualified to coordinate air attack in consonance with maneuver. This mindset allowed FACAs to act as a relief valve for the Marine

command and control nodes like the DASC and TAOC.²¹ This system was well practiced leading up to OIF and engendered a sense of trust among all participants.

The 1st Marine Division ground commanders from the company level to the division commander himself trusted Marine aviators--rotary-wing and fixed-wing--to carry out their intent. The aviators in turn trusted the ground commanders to employ their capabilities in such a way that maximized their strengths and minimized their weaknesses for a combined effect of speeding the advance of the division to their objective. The enabling function of this process was the command and control that understood the capability of each entity, to include the FACA operating in depth over the battlefield. It was a matter of trust developed by deliberate cross pollination of the air-ground team at all levels of command and training specifically designed to exercise that trust.²²

Air Force and Army aviators reading this paper would most likely approve of the direct guidance given by the *Division* commander to the Marine aviators in the above vignette. Achieving the level of knowledge of aviation planning and employment of rotary-wing and fixed-wing fires displayed by the division commander in the vignette is demonstrative of a career of cross pollination. Contrast that experience with the following experience of a brigade commander in Iraq two years *after* OIF began and a full three years after the Army and the Air Force *learned the lessons* of Anaconda:

In my first few months in country, I rarely put air into my plan—this was because we did not understand how it could assist us in a counter insurgency battle—then I saw the incredible results in Fallujah and in our follow-on operations. After that, in our North Babil operations and election prep, I never left without my JTAC and always requested air to support our operations.²³

Soldiers and Airman should not be doing this the first time in combat, and this point is reinforced by the former 3rd Marine Air Wing Commander, Maj Gen Stalder. “Joint interdependence [for air and ground operations] means much more than the Army and Air Force understand. It means a changed sense of identity. It requires the air guys to establish the relationship with the ground force at all levels.”²⁴ Even in the Marine Corps, an organization that is purposely organized to depend upon its aviation arm, aviators have to ensure aviation is properly injected into the planning process.

Ultimately, joint interdependence for air and ground operations is a mindset. The reason why the Direct Air Support Center outperformed the Air Support Operations Center is because the DASC is the focal point of an air ground team, yet it is not a single point of failure.²⁵ It is an air-ground team purposely organized to depend upon each other for success or to be reciprocally interdependent.²⁶ By design, the MEF air-ground system is one with multiple overlapping complementary capabilities. True, much of the air-ground coordination came through the DASC, like the ASOC functioned for the corps. But, when the DASC became overwhelmed, it had other agencies that provided a relief valve. Subordinate air support agencies named Air Support Elements (ASEs) were assigned to Task Force Tarawa and the 1st UK Division, since they functioned as individual maneuver elements of the 1st Marine Division.²⁷ FA-18D Airborne Forward Air Controllers operated as extensions as the ground FACs or deeper on the battlefield in killboxes as SCAR aircrews. FACA-qualified attack helicopter pilots worked closely with ground Forward Air Controllers and CAS aircraft. The Tactical Air Operations Center worked closely with the DASC, airborne DASC operating from a C-130, FACAs, SCARs, and through Marine liaison officers on AWACS and JSTARS aircraft. The CFACC assigned an Air Liaison Officer to Task Force Tarawa's Air Support Element, since Task Force Tarawa was the adjacent unit to V Corps' right flank. It was a system where one entity was the focal point where air-ground coordination occurred for fixed-wing *and* rotary-wing aircraft.²⁸ For I MEF air-ground coordination occurred at all echelons; yet, it was not a new concept.²⁹

If the above analysis is not sufficient to demonstrate the effectiveness of an air-ground team, then the battles of Fallujah occurring in April and November of 2004 should be. During the first battle the 1st Marine Division once again found itself engaged in Iraq just seven months after returning to the US. This time, however, the only organic aviation fires the division employed were from Marine attack helicopters. Marine organic fixed wing squadrons were not deployed since planners thought that they would not be needed after the major ground combat ceased in 2003. The one factor that prevented Operation Phantom Fury from yielding similar results to Anaconda was that the Division deployed with all of its *organic* Forward Air Controllers and Air Officers and the Air Wing deployed the DASC. When the Division attacked Fallujah in April 2004, the entire weight of fixed wing support was provided by the CFACC, both naval-based and land-based. During the second battle of Fallujah in November, there were two organic Marine squadrons supporting the Division, in addition to a preponderance of coalition

airpower. Both battles very successfully employed airpower in the most difficult of circumstances, an urban environment. The common thread that can be attributed to the successful integration of ground maneuver and coalition airpower in these two examples is the air-ground system that coordinated and controlled the joint aviation fires. The exact same system as described earlier in the analysis but in an urban combat.

The questions remain. Are the Army and the Air Force leadership capable of moving interdependence forward to achieve seamless application on the battlefield? Are the ramifications of interdependence of air and ground operations fully understood by the senior leadership? Are the services capable of achieving joint interdependence for air and ground operations in an era where budget pressure will continue to squeeze funding for service specific weapon systems and capability? Are the services capable of making the organizational, doctrinal, and training tradeoffs required to institutionalize interdependence for air and ground operations in this environment?

“The Air Force doesn’t want to be a bill payer for the Army’s transformation plan. The Air Force is getting very little publicity in the current battle in Iraq and Afghanistan, and this has the leadership worried.”³⁰ Achieving joint interdependence for air and ground operations will not be easy. It will be a large institutional shift for the Army and the Air Force. Service stovepipes create organizational seams that prohibit *effective* cross pollination of Army and Air Force officers. This is an old problem with lots of “service baggage” that may require top down intervention similar to the automobile industry being mandated to install seat belts in cars to make them safer.

Historical Background

Indeed, with the rapid expansion of the air arm ...planners made a conscious decision to provide the army primarily with light and medium artillery and to rely on tactical aviation for additional heavy artillery support.

War Department Plans, 1941.³¹

The land forces and air forces of the United States have demonstrated an ability to overcome doctrinal difference during time of war. Current airpower doctrine--specifically establishing priorities for airpower in a campaign--owes its beginnings to the mistakes of the early days of WWII. Getting the doctrine right was often discovered in combat. The successes and failures of Operation Torch were arguably the impetus behind establishing priorities for the successful employment of air forces and land forces for mutually enabling effect. Perhaps the greatest lesson from this experience is the role personal relationships had in establishing mutually enabling air and ground operations. But personal relationships change, particularly after war. The lessons forged in combat are often ignored or considered no longer valid as time and technology distances one from the environment in which they were first learned.

The greatest examples of air forces and land forces operating interdependently for common objectives are demonstrated by several WWII experiences. General Weyland's XIX Tactical Air Command and General Quesada's IX Tactical Air Command are just two examples where highly adaptive and flexible tactical airpower was effectively employed in concert with ground forces, often against standing doctrine. Generals Quesada and Weyland proved the efficacy of joint interdependence for air and ground operations during WW II. Many airpower proponents point out that the IX and XIX Tactical Air Commands headed by Weyland and Quesada were established for the sole mission of ground support for the 3rd and 1st Army. In that role they did not have to contend with competing missions like air superiority and strategic bombing. "In the charged atmosphere of that day, critics often found fault with the air-ground relationship forged during the Second World War and returned to doctrinal citation and interpretation when supporting one position or another in air-ground disagreements or other controversy."³² The doctrinal friction points that were overcome in war by sheer personality and teamwork of commanders have been laid bare during each inter-war period since 1945. By the outbreak of the Korean War, service politics and partisan brokering

trumped the successes of cooperative wartime air-ground interdependence demonstrated by Bradley-Quesada and Weyland-Patton.

The doctrinal agreement on a single air component commander was solid doctrine based upon the experiences of North Africa and Europe. However, it failed in application on the Korean Peninsula, particularly in light of the poor performance of the newly minted Air Force in the CAS mission.³³ This experience was highlighted by the fact that essentially three separate air forces were operating in close proximity of each other but originating from service-specific bases supporting two land components. Navy and Marine aircraft operated from aircraft carriers, Marine Aviation to deployed forward expeditionary air fields, and the Air Force operated initially from mainland Japan. The interservice competition and widely varying levels of performance that abounded during the first year of the Korean War evolved into a fairly effective joint system of CAS, service parochialism notwithstanding. By the end of the Korean War, the organizational changes and practices employed by the Air Force and Army were implemented through the ‘school of hard knocks’ approach, even though the experiences of World War II had validated many of them just five years prior. Two wars fought and concluded within ten years of each other validated the same lessons concerning the integration of aviation with ground maneuver. Yet, at the beginning of the Vietnam War, the Army and the Air Force were once again unprepared for the integration of air and ground forces for enabling effect.

In Vietnam, effective CAS doctrine was once again ‘hammered out’ between the land and air forces, culminating in the organizational and procedural changes just as occurred during the previous two wars but only after many mistakes and losses.³⁴ The Army’s pursuit of the armed helicopter became the catalyst for re-energizing the argument over what service was best suited to have jurisdiction of the CAS mission.³⁵ Yet, nearly 60 years after the lessons of Operation Torch--encompassing three wars and the passing of the Goldwater-Nichols Act Operation Anaconda serves to remind us that previous successes in achieving interdependence during war are temporary and are swept aside during the interwar years. The parochial budget battles spawned by the competing relevance of one service over the other are often justified through imaginative doctrine touting the efficacy of a new weapon system to obviate the requirement of another service’s weapon or capability. Written to justify one component’s weapons systems, effectiveness, and budget independently of another service, this doctrine undermines the lessons of the past conflict and ultimately fails the test of the next conflict.³⁶

The issue that has arisen since airpower doctrine's early development is the emergence of the armed helicopter and its expanding role on the battlefield during the 1980s and 1990s. The armed helicopter should have helped to defuse the debate over CAS sortie allocation for the ground commander. Arguably, its capability is additive to fixed-wing close air support, a luxury our airpower forefathers did not have. Yet the evolving mission of the attack helicopter was written into doctrine, whereby it competed for market share not in the close air support role, but in deep attack, a mission traditionally performed by fixed-wing aviation.

Therefore, as the Army and the Air Force move towards joint interdependence by using one service's capability to supplant another's all in terms of better agility and deployability, does the Marine Corps model, illustrated in the vignette, suggest a better way of integrating rotary-wing and fixed-wing fires with ground maneuver for mutually enabling effect? Is there a way for the Army to shed a percentage of its organic fires and increase the lethality of aerial fires, rotary-wing and fixed-wing? If so, the critical question remains then, how does one achieve institutionalized interdependence so it survives the next inter-war period? The vignette is useful in evaluating the organizational seams and doctrinal friction points that prohibit institutionalizing joint interdependence for air and ground operations.

Friction Points

Fire and maneuver win battles. The purpose of movement is to get fires in a more advantageous place to play on the enemy. Air and Ground commanders must be constantly on the alert to devise and use new methods of cooperation...for there can never be too many projectiles in battle.

Gen George S. Patton Jr., USA

If one seeks to develop a roadmap to achieve interdependence, what are the friction points and operational seams that may exist between the Army and the Air Force that must be considered?

America's ground forces *depend* upon air, rotary-wing and fixed-wing, for success. Once air superiority has been achieved, America's air forces depend upon ground forces for follow-on success; OEF and OIF exemplify this.³⁷ To this end, the CFACC ensured coalition aviation planning in support of OIF was thorough and consistent for both land forces. From the perspective of the soldier and the Marine, the CFACC's execution of the air plan was equally thorough and effective in speeding the ground forces towards their objectives. Yet, OIF demonstrated significant service frictions related to methods of employing rotary-wing and fixed-wing air in consonance with maneuver. These frictions are indicative of a seam that has developed between the ground forces and air forces that must be addressed if joint interdependence for air and ground operations is to succeed. Left as is, a capable adversary will easily exploit this seam.

The air component commander devised a joint battlefield fires template to minimize seams between the air and ground components during OIF. Yet the priority, timing, and effects of aviation fires and organic surface fires in concert with maneuver were inconsistent between V Corps and I MEF.³⁸ How could such a disparity in aviation fires exist between the two ground components fighting side by side but in separate areas of operations? What caused the seam to develop between coalition airpower and V Corps? Was it the Air Liaison Officers (ALO) at the brigade and division headquarters? Was it the battalion, brigade, division, and corps commanders? Was it the ASOC operating as the direct representative of the CAOC? Did the enlisted Joint Terminal Attack Controllers (JTAC) and ALOs poorly advise their respective ground commanders on the employment of air in concert with their maneuver? Did the Battlefield Coordination Detachment at the CAOC get the CAS apportionment wrong? Was it the Air Force aviators that didn't

understand the ground scheme of maneuver? Was it the “centralized control and decentralized execution” of “air and space power...controlled by an Airmen...maintaining a broad strategic and/or theater perspective in prioritizing the use of limited air and space assets” that broke down? There were many factors that led to such inconsistent use of airpower.

The end result was that the ground force commander and the air component commander failed to employ aviation and ground component fires for mutually enabling effect. Service doctrine and parochialism perpetuated misinterpretations and misunderstandings of permissive fire support coordination measures like the Fire Support Coordination Line (FSCL).³⁹ Eliminating this major source of friction and mistrust between the land force and the air force is essential to closing this doctrinal seam and achieving joint interdependence for air and ground operations.

The land forces and air forces of the United States have demonstrated an ability to overcome doctrinal difference during time of war. Current airpower doctrine specifically, establishing priorities for airpower in a campaign owes its beginnings to the mistakes of the early days of World War II and was the source of much debate and consternation between the services. The successes and failures of Operation Torch were arguably the impetus behind establishing priorities for the successful employment of air forces and land forces for mutually enabling effect. The importance of personal relationships in establishing mutually enabling air and ground operations, partnerships built upon trust, is critical.⁴⁰ But more often than not, lessons from the past, particularly those forged in combat, are often ignored or considered doctrinally insignificant as time and budget battles weaken the institutional memory of the environment in which they were first learned.

This issue has been written about before. Here is one example: “LAND POWER AND AIR POWER ARE CO-EQUAL AND INTERDEPENDENT FORCES; NEITHER IS AN AUXILIARY OF THE OTHER.” In today’s environment, with our services engaged in war in Afghanistan and Iraq, the service chiefs have made joint interdependence a key element, and any reader would be hard pressed not to agree with it. Yet, this is not a quote from the Air Force Chief of Staff or the Army Chief of Staff. It was taken from Army Field Manual FM 100-20, *Command and Employment of Air Power*, issued July 21, 1943.

Although used in a different context following Operation Torch, *Command and Employment of Air Power* was written to ensure equal billing for air power as compared to land power. It established critical priorities that must be followed if airpower is to be successfully employed: air superiority, interdiction, and close air support, in that order. Arguably,

the primary purpose of FM 100-20 was to establish airpower as a co-equal to ground power.⁴¹ As controversial as FM 100-20 was for Army commanders, by the time it was published, key commanders of the air-ground team had already established relationships that transcended the inter-service rivalries associated with the early days of establishing interdependent air and ground operations. More importantly, ground commanders like Patton understood the importance of establishing air superiority as a precondition for success of their ground forces. Maybe it's time for the same thinking to be applied in the way helicopter attack aviation and fixed-wing attack aviation are employed on the modern battlefield. Could the attack helicopter be the solution for the land forces enduring requirement for a simple aircraft dedicated to the close air support mission that can not be called away to perform other tasking as directed by the air component commander?

A brief comparison of the following statements may help articulate two points of view concerning the employment of attack helicopters on the modern battlefield:

We were very concerned about enemy shoulder launched missiles and wanted to keep the Cobras just behind our lines or right over our heads, maybe a short distance in front (where we could observe the ground/put fires on the enemy), desiring to avoid what we called "recon by death" by the Cobras.⁴²

...AH-64s best support Army ground combat forces by establishing the operational conditions that will either preclude a close battle or severely degrade an adversary's combat power prior to his closure with the friendly ground force. Apaches can perform a close air support role but optimally, Army Aviation planners should strive to employ them in ways that mitigate the need for last minute close air support mission.⁴³

These diametrically opposed opinions concerning the employment of rotary-wing aviation were formed well before the commencement of hostilities during OIF. Perhaps most importantly, the latter opinion is indicative of the seam that has grown within the Army over the proper use of the attack helicopter, an aircraft developed and procured by the Army to support its own soldiers.

During the course of my research, I discovered that some of the sources of doctrinal friction prohibiting joint interdependence for air and

ground operations existed in unexpected places. The first source of friction is between the Army's ground forces and its own helicopter attack aviation forces. The second source of friction surrounds the doctrine and debate over fixed-wing aviation doctrine applied in concert with ground force maneuver. Understanding the sources of both forms of friction is essential if joint interdependence for air and ground operations is to succeed.

Since the fielding of the AH-64 Apache, Army attack aviation doctrinally trains as a maneuver branch instead of a fires branch.⁴⁴ Air Land Battle doctrine exemplified this operational concept and the experiences of Operation Desert Storm reinforced it. Operation Allied Force, and more specifically the experiences of Task Force Hawk, began the discussion of the logistical issues associated with deploying Army attack aviation to an expeditionary environment. More importantly, it also began the discussion that questioned the relevance of deep attack helicopter operations.

There is no question that Army attack aviation exists to support Army ground forces. However, the friction evident within Army aviation doctrine exists in the arguments of where attack helicopters are best employed on the battlefield. Should attack helicopters set the operational conditions prior to the decisive engagement of ground forces? Or, as the vignette demonstrates, should helicopter attack aviation be reserved for the close battle, maximizing its potential and capability for close combat attack in direct support of ground forces, while fixed-wing air shapes the deep battle?⁴⁵ Answering these questions will demonstrate the division that exists within the Army concerning the use of its organic attack aviation.

Combat experience since October of 2002 suggests there is a shift in opinion towards the latter argument.⁴⁶ More specifically, the relevance of helicopter attack aviation during Operations Enduring Freedom (Anaconda) and Iraqi Freedom reinforced the dangers of operating helicopters deep in an adversary's territory. In fact, the after action reports I examined, combined with the personal interviews of recent war veterans, prove the worth of the attack helicopter in the CAS role.

The lessons of Operation Anaconda should have prevented the need to relearn the lesson of the battle of Najaf. The events of 23 Mar 2003 during the battle of Najaf served as a wakeup call for the 101st Aviation Brigade.⁴⁷ After that battle, helicopter tactics for the remainder of OIF were modified and are still in use today. "For the remainder of the war, Apache helicopters adopted a close shaping role instead of conducting deep attacks and provided aviation close fires in support of

ground maneuver forces.”⁴⁸ Essentially, from that point on, attack helicopters operated primarily in direct support of ground forces. All “not so deep” or “close shaping” attack helicopter operations were conducted in close coordination with coalition fixed-wing aircraft in close proximity to ground forces and were highly successful.

This should not be misconstrued as a dim future for attack helicopter aviation. On the contrary, current operations demonstrate the capability of the attack helicopter in the direct support role of ground forces. This is well documented and continues to be an enormous contributor to current operations in Iraq and Afghanistan.⁴⁹ But what should not be lost by the reader is that the mutually enabling effect of attack helicopter and fixed-wing aviation on the modern battlefield does not occur in the *deep* battle, it occurs in the *close* battle.

After 23 March 2003, V Corps sharply curtailed deep attack helicopter operations, but still conducted limited objective attacks (LOAs). However, these LOAs were closely coordinated with Air Force A-10 and F-16, missions utilizing the principles of Joint Air Attack Tactics (JAAT). The most successful of these occurred on 28 March 2003. On this date the 101st Aviation Brigade of V Corps conducted a deep attack against the 14th Brigade of the Medina Republican Guard Division. The attack helicopters of the 101st used in-depth zone reconnaissance coordinated with CFACC fixed-wing aviation. Predictably the attack helicopters encountered similar ground fire and tactics as on the 23rd of March. But this time they were able to pull back, and directed coalition fixed-wing CAS to suppress and eliminate enemy resistance with very little damage to attack helicopters.⁵⁰ However, while helicopter battle damage was minimal in this case, it was the fixed-wing aircraft that inflicted the majority of damage on the Iraqi forces.

The reality for deep helicopter attack missions is that they require a tremendous amount of fixed-wing effort to be successful against moderately defended targets. As demonstrated during OIF, rotary-wing aviation operating deep is more survivable when operating in close coordination with fixed-wing aircraft. Questions arose about the utility of sending attack helicopters with Hellfire missiles on deep attack missions when fixed-wing aircraft with ordnance were capable of achieving the desired effect.⁵¹ If fixed-wing aircraft could accomplish a deep attack mission with minimal risk and less overhead support, such as suppression of enemy air defenses, then why send attack helicopters? For the remainder of the major combat operations phase, despite the preponderance of doctrine to the contrary, and the current ongoing operations in OIF, attack helicopters adopted a “close shaping” role. In

other words, attack helicopters provided close combat attack, or CAS, in support of ground maneuver forces. And they did this with tremendous effect.⁵²

The fact that fixed-wing aviation was able to operate in this environment with relative impunity was not lost by participants and observers of both operations. As demonstrated in the earlier vignette, the limitations of helicopter attack aviation in deep operations were well understood by Maj Gen Mattis and his air-ground team. Rotary-wing and fixed-wing aviation was planned to operate with mutually enabling effects in support of his ground forces. This close integration maximized the inherent strengths of both fixed-wing and rotary-wing aircraft in order to speed the movement of ground forces and to minimize casualties, with strategic effect.⁵³

Attack aviation's success, when combined with fixed-wing aviation in the current operations in Iraq and Afghanistan, is well documented. Here are two recent examples, one from an airman and one from an *infantryman*:

After the combined arms rehearsal for Operation Wishbone, a 39 BCT mechanized operation north of Baghdad, the Apache troop commander explained to the visiting Air Liaison Officer how commonplace Joint Air Attack Tactics [JAAT] had become, noting that almost daily they came up on common frequencies with local JTACs and overhead fighters, using the team to develop situational awareness.⁵⁴

On that morning we had several "runners" that UAVs or F-16s ID'd. The F-16s sparkled [the runners] and did an on-the-net handover to the Kiowas [OH-58D helicopters] that came in low on the targets and fixed them in place until ground forces could capture them.⁵⁵

These experiences mirror the author's own OIF experience as an FA-18D pilot and would suggest that a significant shift in attack aviation doctrine for the Army is underway. Surprisingly, this is not the case. Not only is the draft version of FM 3-04.111, *Aviation Brigades* still centered on the deep attack mission but references to joint operations to ensure the type of success described above appear almost as a footnote to the deep attack mission. The mission of deep attack aviation is still described as the attack helicopter's primary role in the following paragraph:

The aviation brigade has the *organic* capability to strike an enemy throughout the *depth* of the corps AO from multiple directions, either in support of the BCTs or *independently* in a noncontiguous battlespace. Attack reconnaissance aircraft carry a combination of missiles, rockets, and conventional ammunition to destroy high priority targets, shield the maneuver forces as they move out of contact, and enable *shaping* of the battlespace. In addition to the traditional attack functions, the attack reconnaissance unit executes all the functions that air cavalry has performed throughout the ages. As an armor killer, it is deadly against massed moving targets, and is also effective against enemy FA, AD, communications, logistics units, and point targets (bunkers, caves, windows in buildings).

...The mobile strike capability of the aviation brigade, particularly when coupled with Army and joint fires and effects, provides the commander with a significant capability to extend the battle to the maximum range of organic and supporting sensors.⁵⁶

Helicopter deep attack missions were employed in OEF and OIF with poor results.⁵⁷ Clearly, if deep attack helicopter aviation is going to be employed, it should be coordinated with fixed-wing aviation to increase effectiveness and survivability. But even then, one has to ask why a commander would embark upon such a highly complex and risky operation at ranges up to 60 miles in front of the maneuver units when other joint assets could accomplish the mission more effectively and at less cost?

It is the “we got them, we have to use them” paradox. Since the development and fielding of advanced attack helicopters, deep attack became the primary mission. Perhaps the high cost of the advanced attack helicopter was justified by an expanded mission set. Or perhaps it was because the Air Force’s interest in CAS during the eighties and nineties was waning resulting in a deepening lack of trust between the services, best described as “if I don’t own them, I can’t depend on them.” It was most likely a combination of the two.

Will joint interdependence for air and ground operations mean a shift in the focus of Army deep attack helicopter operations to close combat attack in support of the brigade and or division? Will joint interdependence for air and ground operations finally move Army attack aviation and Air Force CAS and aerial interdiction into more mutually

enabling and survivable operations? The author contends that many within the Army are of the same opinion. “There is a disconnect between Army Aviation and Army ground forces.”⁵⁸ Unless the frictions that exist between Army aviation and Army ground forces are resolved, this internal struggle within the Army will continue to be a stumbling block for joint interdependence for air and ground operations. Yet there is also a unique opportunity to seize upon the lessons of the current war concerning rotary-wing and fixed-wing aviation and move the Army and the Air Force towards interdependence.

The discussion over the primary role of attack helicopter aviation is directly related to the second source of friction within the Army, that is, the friction between the division’s battle and the corps’ battle. Coordinating the efforts of organic fires in both zones created significant debate between the division and the corps during OIF.⁵⁹ The corps sees the attack helicopter and ATACMS as its primary means to shape its zone. The division uses its organic artillery and CAS. CAS can be planned to support the corps and division and is coordinated in and around the fires of helicopters and rockets.⁶⁰ During OIF the 3 ID after action reports cite that the corps had difficulty coordinating the priority, timing, and effects of fires within an area of operations defined by a Fire Support Coordination line placed too deep within the Corps’ Area of Operations. As a result, they had little situational awareness of the division and corps zone of operations and were therefore ill-equipped to coordinate operations there.⁶¹ Army doctrine, as cited above, envisions an almost exclusive role for attack helicopters and ATACMS as the primary shaping fires of the corps zone.

By design, the Army’s transformation plan will force the division and corps to increase their reliance upon joint fires, like fixed-wing aviation for battlefield shaping. In this process the reevaluation of employment priorities of attack helicopter aviation will be an important aspect. Should they be used by the Unit of Employment (UEX) or corps and division to shape the deep battle? Or, should the corps and division apportion their helicopter aviation brigades to support the close battle? The issue is not that attack aviation has become irrelevant. But, did the combat experience of the past three years invalidate the last 20 years of helicopter deep attack beliefs and doctrine? Perhaps, but more importantly, it re-validated the utility of the attack helicopter in the CAS role.

If the experiences of OEF and OIF are valid in redefining the role of attack helicopter employment, then the implications concerning how attack aviation is utilized can be another source of friction within the

Army and between the Army and the Air Force. Will attack helicopters have to be on the ATO if used solely for CAS? If helicopter attack aviation is on the ATO, will there be a requirement for a written agreement similar to the Omnibus Agreement to disarm the misunderstandings over who controls the attack helicopter sorties? Will the Air Force be threatened by the Army assuming the CAS mission, a mission that the Air Force thinks it can't afford to give up, if only for market share, as it faces the looming budget battles? Is there a doctrinal middle ground that can be reached to merge the two highly enhancing forms of close air support, attack helicopter close combat attack and fixed-wing close air support?

The 1st Marine Division Commander's employment concept for aviation, as described in the opening vignette, demonstrates a possible solution or, middle ground, with strategic effect. Here, strategic effect means speed and reduced casualties. Accomplishing this will require the Army and the Air Force to jointly reevaluate their doctrine and organizational structure to close the seams and reduce the friction points in order to capitalize on the mutual enabling capabilities of each service.

Doctrinal Friction Point: FSCL

As alluded to earlier, the FSCL remains a significant source of friction between the services and should be examined for relevance. The FSCL is defined as “A fire support coordinating measure that is established and adjusted by appropriate land or amphibious force commanders within their boundaries in consultation with superior, subordinate, supporting, and affected commanders.”⁶² At first glance, this is a pretty straight forward definition. However, its “establishment and adjustment” on the map creates friction between the land and air component, and OIF was no exception. The FSCL largely served to mark where each component’s freedom of action ended and the other’s began. The FSCL served to deconflict their operations, rather than coordinate, as was the intent of the definition. In fact, the placement of the FSCL created debate and ultimate disagreement between 3 ID and V Corps, centered on the range of each unit’s organic fires.⁶³ Ironically, the placement of the FSCL during OIF 140km in front of the lead elements of 3 ID at its deepest point—hampered the desired effects V Corps was attempting to achieve. As a result of the FSCL placement, V Corps’ ability to affect the deep battle with organic and aerial fires, when compared to I MEF, was severely limited.⁶⁴

The FSCL Debate

Much ink has been spilled over the FSCL debate. The debate and emotion regarding the placement and utility of the FSCL is perhaps associated with the JFC’s apportionment of air effort. This captures the fundamental argument concerning tactical air power. Is airpower more effective against enemy forces before they are engaged by friendly forces or after? These are key elements of the debate from the ground perspective and the air perspective. Both arguments have merit, based upon the inherent strengths of each force and how one culture sees the other’s capabilities.

Airmen contend that the placement of the FSCL should be as close to the forward line of troops as possible. This will maximize the speed and flexibility of airpower in attacking the enemy before he can get within range of land forces. The inherent strengths of airpower make it well suited for this interdiction mission and, as a result, should be controlled by the air component commander. Placing the FSCL within 30 km of the friendly forces would allow airpower to maximize its strengths and not inhibit its freedom of action by having to closely coordinate its actions with those of the ground commander. Close coordination with ground maneuver is a difficult process. It is a process that demands highly skilled and disciplined aviators and well trained aviation counterparts on the

ground coordinating and clearing their attacks. Given this effort, CAS becomes nothing more than airborne artillery. Therefore, Airmen argue that CAS is an inefficient use of airpower that negates airpower's strengths and is merely additive to the close battle. On the other hand, most land power proponents don't know how to use airpower to its fullest potential. Although most Airmen would agree that CAS is required in some quantity, the question remains just how much of the air effort the JFC should devote to CAS and how much should be devoted to other missions like aerial interdiction and strategic attack? Ultimately, the Airman desires to maximize the tenets of airpower by attacking and destroy enemy targets before they get within lethal range of the ground forces.

Land power proponents argue for the FSCL to be placed at the deepest range of their organic fires. As the responsible commander for the timing priority and effects of fires in his assigned area of operations, an area that includes the deep battle, the ground commander argues for maintaining his flexibility in employing long range systems. This opinion is conditioned through the experiences of commanders that have 'learned' not to depend upon air because it may not be there when it is required. Airpower is also 'harder' to plan and employ than artillery and attack helicopters. Land power proponents often cite that Air Liaison Officers and JTACs are in short supply and thus are sometimes not present for training evolutions due to higher priority commitments. Therefore, infantryman would rather not build fixed-wing as a critical element to the success of their plan so the plan won't fail when it doesn't arrive where and when it's needed. In other words, they plan not to use airpower interdependently. Years of training doctrinally with deep attack aviation and an abundance of artillery have reinforced this airpower opinion into the land service. Ultimately, the opinion is that the CFACC is rarely able to adequately address the Corps' fires and targeting requirements in the face of other competing requirements for CAS and aerial interdiction, particularly during the beginning of a campaign.⁶⁵

The FSCL

The original purpose of the FSCL was to aid attack pilots employing dead reckoning navigation in determining where they had to conduct "detailed coordination with ground forces" and where they could attack targets with reasonable confidence of not committing fratricide. In this context it was placed along recognizable terrain features so that aviators clearly understood when they were operating on one side of the FSCL versus the other. In fact, its placement is still defined this way in joint doctrine.⁶⁶ Yet, as the range of organic fires increased exponentially, its

placement came to mean more along the lines of *deconfliction* between air and land forces, not one of coordination.⁶⁷

Most combat aircraft now operate with global positioning system (GPS) as their primary means of navigation and targeting precision munitions. Ground forces operate extensively with GPS as their primary means of navigation and determining target location. GPS-guided rocket artillery is already operational, and GPS-guided artillery is very close to reaching operational capability. Therefore, determining one's location, whether airborne or on the ground, is much simpler and more accurate. And, whereas a terrain-feature based FSCL cannot be seen at night, GPS and modern navigation systems solve this problem.

Fire support coordination measures are 'temporally' fixed objects on a map that hinder maneuver. The speed of movement of the ground forces normally outpaces the ability to move and update the placement of the FSCL.⁶⁸ This continually compressing distance between the lead elements of the maneuver units and the FSCL ultimately challenge the very logic used for its initial placement, particularly when units can move at paces close to 15-20km / hr.⁶⁹ Additionally, the lines as drawn on the map are normally perpendicular to the route of advance of the ground unit. Figure 3 depicts a geometry problem that was experienced by the ground units during OIF. I MEF used two coordination measures, a Battlefield Coordination Line and a Fire Support Coordination Line. Since the Combined Forces Land Component Commander is responsible for the placement and movement of the FSCL, it has to be moved based upon the concurrence of both land force commanders, V Corps and I MEF. This is a lengthy process and one that could hinder Marine aviation's support to ground maneuver. Therefore, I MEF used a Battlefield Coordination Line placed at the range of its organic artillery, or about thirty kilometers in front of the forward line of troops. This allowed Marine aviation to operate short of the FSCL but long of the BCL, attacking targets without close coordination with maneuver forces.

As the independent maneuver units of V Corps and of the I MEF advanced towards Baghdad, they did so as a series of columns at different speeds. Consequently, gaps formed between the maneuver units. Yet, as they advanced to the next limiting fire support coordination measure drawn perpendicularly to their lead elements, the FSCL was snapped forward. This was based upon a pre-determined distance that may or may not have anything to do with the enemy disposition or the rate of advance of other units. In the case of V Corps, this process created unintended sanctuary for enemy forces.

The advance to Baghdad was so fast that the Army overran an established FSCL within an hour after it was established. Because the process of “moving” the line took 8 to 10 hours, air strike operations forward of the line had were impeded until it was “moved.” After finding that this same situation occurred several days in a row, they moved the line far to the north. As a result, planned air strikes were precluded over an extensive region.⁷⁰

Clearly, such a system is unacceptable. It degrades US combat capability and aids our adversary. In the best case, coordination measures like BCLs and FSCLs doctrinally take four to six hours to change among the components and then put into effect. What if there were pockets of Iraqi forces left in between the two maneuver units? How could one redraw a BCL or FSCL to take into account a non-linear example of maneuver warfare where one maneuver unit had to turn ninety-degrees to meet an unanticipated enemy counter while the adjacent maneuver unit continued along its original line of advance? As such, the lines drawn to signify fire support coordination measure on a two-dimensional map without the ‘vote’ of the enemy quickly become irrelevant when compared with their originally designed intent.

The development and use of the battlefield coordination line (BCL) by I MEF during OIF negated the debilitating effect of a deep FSCL. The BCL was developed and is in use on the Korean peninsula. During OIF its functionality was applied by I MEF only in its area of operations, as depicted in figure 3. The BCL was used as a “fire support coordination sub-measure” to enable the MEF to effectively use its primary deep shaping force, Marine aviation, without the air support coordination problems experienced by V Corps. This ensured aviation freedom of action between the FSCL and BCL, and air actions short of the BCL were conducted with close coordination with ground forces.

Despite the apparent success by I MEF, as opposed to V Corps in employing the FSCL and BCL during Operation Iraqi Freedom, an even better system for employing permissive fire support measures exists that enables the mutually enabling operations of air forces and land forces.⁷¹ Ground combat movement is not always symmetric to the fire support coordination measures placed in front of their axis of advance. For example, during OIF, units normally moved in a linear fashion and, particularly during high intensity mechanized operations, they moved in armored columns that are longer than they are wide and often at different

rates (see figure 1). Employing a linear control measure like a FSCL / BCL is not conducive to these types of operations, and, more often than not, will create enemy sanctuaries that fall within the doctrinal rules that govern its placement and subsequent movement.

Even if there was agreement on the placement the FSCL, it would still be very difficult to place along recognizable terrain features with sufficient fidelity to be relevant in a maneuver battle. Furthermore, due to the complexity of reaching agreement on the appropriate distance that it should be placed in front of the friendly lines, its movement would be equally difficult. Lastly, it is not being used in the counterinsurgency operations underway in Iraq and Afghanistan. Yet there is still a requirement for coordination of air and ground component fires.

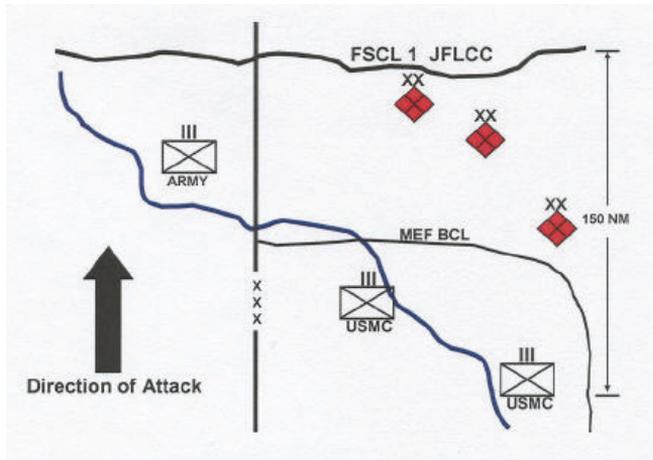


Figure 3. FSCL Placement in Operation IRAQI FREEDOM

Source: Colonel Lee Elder, USMC, MAGTF Staff Training Program (MSTP), "MAGTF Aviation, Aviation Combat Element (ACE)." On-Line. Internet. Available from <http://www.mstp.usmc.mil/spts/MAGTFBranch/ace/default.aspx>.

After action reports written by the Army and the Air Force state that the seam that developed in the V Corps area of operations was a result of the FSCL mistrust and debate.⁷² The opening vignette is also indicative of this seam. Ultimately, what is required is a joint system that defines which entity has sole authority for determining the priority, timing, and effects of the fires in a particular battlespace, and what entities should *share* this responsibility. What is required is a virtual system of fire support coordination that can be employed real time with equal meaning and interpretation for air and ground forces. To ensure seamlessness, the system should exist 'temporally' and cannot be a line along a geographic

feature. The system has to exist in the thought processes of all users. It cannot be a line that keeps land force organic fires on one side and air force fires on the other. Tactical aviation, trusted equally by the land and air component commanders, combined with flexible and temporal fire support coordination measures may be the answer.

The lessons of OIF demonstrate multiple examples where particular aircrew capabilities were not used to their full potential, excessive numbers of aircraft were held in CAS stacks, and a paucity of aircraft were operating throughout the depth of battlespace. The primary cause of this was a command and control system that became quickly overwhelmed with a pressing load of combat aircraft without a relief valve to flow the aircraft deeper into the Corps' battlespace. As a result, multiple aircrews capable of operating short of the FSCL but beyond the division's area of influence, with commanders' intent, were underutilized. The corps lost the opportunity to coordinate the efforts of attack aircraft in its deep battle area. These valuable sorties were either relegated to missions more suited for less qualified crews or not used at all. Or, as demonstrated in the vignette, they side stepped to the I MEF Area of Operations and supported the MEF's deep battle like water finding the path of least resistance.

As noted above, closed kill boxes extending to the FSCL in V Corps' zone contributed to the log jam of CAS aircraft and prevented air to shape the Corps' deep battle. Additionally, the theater air control system failed to employ sufficient numbers of seasoned and highly experienced FACA crews throughout the depth of the Corps's zone. A layered division of air, further subdivided by mission capability commensurate with the planned zone of operations, would have helped alleviate the logjam and inefficiencies.

For example, in the I MEF AO two-seat FA-18Ds were planned to primarily conduct FACA missions. In this role they doctrinally operated as extensions of the ground FAC or TACP. But they also operated as extensions of the DASC and the TAOC, depending on how deep they operated in the battlespace. Analyzing the 1st Marine Division's and the I MEF battlespace during pre-mission planning, the 3rd Marine Air Wing determined that three FACA crews would be required to be airborne simultaneously in order to comply with the division commander's intent for aviation and would need to range 5 km to 30 miles in front of his maneuver elements.⁷³ Reverse planning from that requirement determined a minimum number of FA-18D FACAs that would be tasked to cover a specific time on station and battlespace.

Using the killboxes as a time and space management tool, the Division's requirements and depth of battlespace were divided between

FACA, CAS, SCAR, and aerial reconnaissance requirements in that order of precedence. The three FACA aircraft sorties were typically divided and assigned one killbox each for the duration of their time on station, usually a four-hour block interspersed with three tanker periods. Marine fixed-wing CAS aircraft were planned to launch at 15-20 minute intervals from land bases and amphibious ships to fill the CAS requirement for a 24-hour period, and then repeated. Cobra gun ships filled in the CAS gaps by essentially providing *direct* support CAS coverage by flying in support of the division and subordinated units or shutting down behind the division's lines and waiting to be called when required. This combination of 'general support' fixed-wing CAS and 'direct support' rotary-wing CAS maximized the capabilities of each platform. This preserved the tenets of fixed wing airpower while leveraging the attack helicopter for the close battle.

FACA aircraft not required for the close battle reverted to strike coordination and reconnaissance (SCAR) when they supported the Division's or MEF's deep battle beyond the BCL and/or FSCL. Marine single seat CAS aircraft are not FACA qualified and therefore can only conduct CAS or SCAR missions. If they were not required for CAS, the DASC sent the CAS section back to the TAOC, where they were either assigned to work with a FACA or were sent to another killbox to conduct SCAR.⁷⁴ Through this process, all aircraft were kept apprised of open and closed killboxes and what aircraft and corresponding mission qualification were working in each location. The TAOC and DASC were able to ensure long-range fires could be deconflicted with deep air operations and also knew what FACA aircraft were operating autonomously or with other CAS aircraft. Deep air operations could be further restricted from other operations by the DASC and TAOC through the closing of particular keypad or pads of a killbox that may represent a no-fire area or a surface danger area for a pending ATACMS strike.

It was this method of planning, scheduling, and operating close and deep air that enabled the rapid absorption and timely execution of the unscheduled air described in the vignette. If the FACA could not work the CAS aircraft, either for lack of targets or because he was working with too many aircraft, he would send the CAS back to the TAOC for assignment or pass a known target location for them to attack on their own accord. In this mode the CAS aircraft reverted to SCAR in the particular killbox they operated in and could hand off their target to another section of CAS aircraft.

Selecting from the available aircraft within the Marine Air Wing, the direct support ATO used to support the 1st Marine Division was developed

using exclusively Marine aircraft. To use a form of comparison, it was a method of supply that pushed a requisite number of aircraft to a battlespace using the “just in time” management concept.⁷⁵ Using a “reconnaissance pull” (FACA / SCAR) demand with a push CAS supply, the MEF was able to orchestrate efficient and highly adaptable air support. If the CAS aircraft operating as SCAR or with a FACA was suddenly required for immediate CAS, they were “pulled” from the deep battle to the close battle or diverted before they flew to the killbox assigned. Even at depths of up to 100 miles, it was a nine to ten minute flight to the ground FAC requiring the CAS. In most instances, it was much closer. This method of “pull CAS” is a direct contrast to traditional forms of pull CAS, like ground alert or aircraft waiting for a mission while holding in a CAS stack, and simultaneously answers the concerns of the ground and air commanders for flexible and responsive airpower.

FACA-capable crews were planned to fly during the same time period, in the same general vicinity, and with units that they supported as much as possible. In accordance with the division commander’s intent, they were primarily employed as reconnaissance elements searching the 5 km-60 miles to the front of the division’s maneuver elements. The Tactical Air Operation Center and the Direct Air Support Center kept track of the FACA location and managed his area assignment through the use of the TAOC radar and procedurally via killboxes. Both control agencies could alert the FACA crews of pending ATACMS missions or of inbound strike aircraft that need to be worked. Using this method, three FACA crews could cover an area approximately 90 miles wide and 30 miles deep, or could be tasked 30 miles wide and 90 miles deep. CAS aircraft were then planned to operate as pairs that would either attach themselves to a ground FAC or flow forward or attach themselves to a FACA. Lastly, in instances where the FSCL has no application, killbox operations make the most sense. The fire support coordination measures that were important for maneuver warfare are equally important for security and stability operations.

Technology may finally invalidate the arguments surrounding the FSCL debate. The use of GPS and precision guided weapons will continue to cause enemy forces to disperse and employ asymmetric tactics. Carefully planned and well timed ground operations expose the enemy to aviation’s effects. As the combat operations in Iraq and Afghanistan have proven, attack helicopters are a more versatile weapon in the close combat attack role, or CAS, than in deep attack. Fixed-wing tactical aircraft excel in the deep battle and are effective on either side of the FSCL. Interleaving fixed-wing and rotary-wing aviation in the close

battle is a more efficient use of mutually enabling aviation fires to counter the tactics of dispersed operations.

The Army's transformation plan requires an increased dependence upon CFACC aviation. Interleaving CFACC air with the corps' organic fires and shaping operations will require a mutual understanding of the deep battle. Defense transformation will pressure the services to shed overlapping capacity or redundant capability, particularly if it exists in like form in another service. The services will no longer have the luxury of conducting largely independent yet coordinated actions in pursuit of a common objective.

Joint interdependence of air and ground operations will require the capabilities of one service to leverage the capabilities of another. The choice of using organic fire exclusively over aerial fires will no longer be an option for the Army. Air forces, naval forces, and land-forces based will have to interleave their effort with that of the ground force commander's scheme of maneuver and be able to cover his close and deep battles while shaping the battlespace for the joint force commander. This will require an efficiency and level of effort that is not represented in the current fire support control measures in use today. Measures that were developed years before precision navigation and targeting now constrain the fires process and its efficiency. Options to correct this deficiency will be discussed in the recommendations section.

Organizational Seams and Personnel Issues

*Equally critical will be the actual implementation of the many lessons we have gained in the course of this ongoing battle. Lessons learned must be tied to executable actions, for without implementation, lessons are never truly learned.*⁷⁶

A comparison between the Army / Air Force method of air-ground coordination and the Marine Corps' method of air to ground coordination is warranted. The intent is not to claim one method is superior to the other. Rather, it is to represent the facts as they are and let the readers form their own conclusion on the merits of one method over the other. Proposed recommendations for the Army and the Air Force will be in the conclusion section of this paper.

The current construct the Air Force uses to man the organization that is responsible for coordinating air support for the Army is a seam that may have contributed to the disparity in employing air power, as described in the vignette. Air Liaison Officers (ALOs) and Joint Terminal Attack Controllers (JTACs) make up the primary Air Force element responsible for this mission; it is called the Tactical Air Control Party, or TACP. They maintain their Air Force command structure but work closely with the Army in requesting and controlling Air Force Close Air Support (CAS) and integrating airpower with the Army's scheme of maneuver on the battlefield. The principal air control agency of the theater air control system responsible for the direction and control of air operations directly supporting the ground combat element is the Air Support Operations Center (ASOC). It processes and coordinates requests for immediate air support and coordinates air missions requiring integration with other supporting arms and ground forces. It normally collocates with the Army tactical headquarters senior fire support coordination center (usually the corps headquarters) within the ground combat element. The Army's transformation plan will challenge ongoing efforts aimed to close this seam. The Army will add ten to fifteen additional Brigade Combat Teams (BCTs) in the active forces and nineteen BCTs and eight division headquarters in the National Guard force. Sourcing the additional units will require approximately 50-60% more Joint Terminal Attack Controllers (JTAC) and 40-50% more ALOs under the current manning policy.⁷⁷

The Air Force agreed to support the Army's transformation plan by adding an additional 900-1,000 JTACs. Training and certifying the JTACs required under the Army's transformation plan, as the Air Force

transitions from the current legacy force fighters to the F-22 and F-35, will reduce the available number sorties the Air Force can provide to train and certify JTACs.⁷⁸ The corresponding net reduction in the sourcing pool of pilots and WSOs for the important ALO billets will compound matters further. New efficiencies in training and joint personnel assignments will be required to address these challenges and meet the critical currency and training standardization requirements of all individuals associated with the controlling and coordination of aviation fires.

The Air Force currently mans a total of six ASOCs, four active duty and two Air National Guard.⁷⁹ Sourcing the ASOCs is accomplished by specialized Air Support Operations Squadrons (ASOS) that are manned and equipped to perform the C2 role of the ASOC. Each ASOC is divided into a command section, an operations section, and a logistics section consisting of about 100 personnel, ten of whom are dedicated to operations and the rest to maintenance and logistics.⁸⁰

The operational side consists of four officers and six enlisted. Three officers are rated aviation officers-typically consisting of one pilot, one navigator, and one air battle manager-and the fourth is an intelligence officer. Of the six enlisted Airmen, five are “1C4” Airmen (JTACs), and one is an intelligence specialist. Some of the enlisted Airmen billets in the ASOC are certified JTACs and some are filled by those serving in an apprentice position in order to become certified JTACs. Prospective JTACs will spend about two years as a JTAC apprentice in the Tactical Operations Center, TACP, or ASOC or as the radio operator and driver for a certified JTAC. The average length of time required for an Airman to become certified as a JTAC is between three to five years, depending upon the individual.⁸¹ The senior enlisted billet within the ASOC is normally a certified JTAC and can also function as a Battalion Air Liaison Officer (BALO).

Air Support Operations Groups (ASOGs) are physically stationed on Army installations but are operationally controlled by the Numbered Air Force Headquarters. Air Support Operations Squadrons are subordinate to the ASOGs and provide the JTACs and ALOs for Army maneuver elements during training and combat. Increased operational tempo and shortages in manning sometimes require the Air Force to source the JTAC, ALO, and ASOC personnel requirements from across the force. This practice has made it difficult to build habitual relationships between the ground forces and air forces prior to deployment.

The Air Force Tactical Air Control Parties (TACPs) consist of JTACs and ALOs and are manned by Air Force personnel consisting of certified Enlisted Terminal Attack Controllers, rated Air Force aviators

trained as Terminal Attack Controllers, and rated Air Force Officers trained as ALOs. Rated aviators that are qualified as Terminal Attack Controllers normally serve with specialized units like Ranger Battalions. The majority of infantry battalions are supported by enlisted Airmen qualified as JTACs. The JTAC billets are a permanent specialty for enlisted Airmen, while the officers assigned to the ASOS/ASOGs are rated aviators serving in the ALO billet for two years and the ASOC billet for normally three years. ALO assignments are normally two years in CONUS units and one year if stationed in Korea.

The corps Air Liaison Officer is a rated Air Force officer and is normally designated as the director of the ASOC when it is stood up for training or combat. The commander of the Air Support Operations Squadron tasked to provide the ASOC capability is assigned as the deputy ASOC director. The rated officers assigned as brigade and division ALOs remain under the operational control of the ASOS commander, not the Army unit commander the ALO advises. Upon the completion of their tour, they normally return to a flying billet.

All ALOs attend an Air Liaison Officer course prior to reporting to an ASOS for their liaison tour. ALOs are not required to be terminal attack control certified and most are not. Current Air Force policy is to only assign ALOs to the brigade and corps level. Senior certified JTACs are assigned at the battalion level, are called Battalion Air Liaison Officers or (BALOs), and are normally an E-6 or E-7.⁸²

Based upon their availability for deployment, ALOs may or may not develop a permanent relationship with the unit, which they support. At times this assignment policy can lead to a 'pick up' game atmosphere because there are not enough Air Liaison Officers to man every brigade in the Army. This is a source of friction between the Army commanders and the Air Liaison Officers as they attempt to establish working relationships. Some battalions go without an assigned BALO (senior JTAC) or may have their BALO be reassigned based upon the needs of other units with higher priorities prior to or during a deployment. Decisions to move an ALO from one unit to another must be approved by the ASOG commander and are made in coordination with the brigade commander based upon his priorities.⁸³

Maintaining sufficient numbers of combat mission ready (CMR) certified JTACs to coordinate and control fixed-wing and rotary-wing terminal attack is a daunting task for the Air Force and is a process that takes to three-five years, depending upon the individual.⁸⁴ Certifying officers, particularly those with experience in a fighter background, is a significantly quicker process, about six months.⁸⁵ In my conversations

with Chief Master Sergeant Brian Brock, head of JTAC training and certification at Langley AFB, he confirmed Col Belote's observations. When I asked him his opinion concerning helicopter pilots trained as terminal attack controllers, he replied, "Marine Cobra pilots generally learned terminal attack control skills just as quickly as fighter aircrew due to the fact that Marine attack helicopters pilots routinely perform CAS. Apache pilots don't and would probably take a little more effort, but certainly not as long as a JTAC."⁸⁶ Both sources confirmed that training enlisted Airmen as certified JTACs required more effort and sorties than training rated officers, particularly if they had a fighter or attack helicopter background. In fact, the Marine Corps TACP course trains and certifies rated officers in terminal attack control in three weeks, regardless of their aviation background. Committed to maintaining the high standards required to be a certified JTAC, the Air Force is faced with a dilemma. Realizing the increased numbers of certified JTACs to support the Army's transformation plan will take a minimum of three years and require a yet to be determined number of attack sorties dedicated to their training and certification.

Sourcing the requisite number of Air Liaison Officers is a difficult task for the Air Force, and the Army's transformation plan will make this problem more difficult. As rated Air Force officers complete their first flying assignment, they are generally considered for follow-on assignment based upon their performance during that first tour. Based upon my conversations with many Air Force officers, the typical career track for a rated aviator after he completes his first assignment can be summarized as follows: A select few of the highest performers stay in their community and are sent to the Air Force Weapons School. The middle group of pilots is eligible for a replacement training unit to train new pilots in a tactical jet. The bottom group of pilots is considered for flight instructor duty, transition to bombers, or Air Liaison Officer duty and unmanned aerial vehicles, in that order.⁸⁷

There are always exceptions to this unwritten assignment process, and in fact many Air Force colonels that I consulted for this research paper served as ALOs at some point in their career and continued to be very successful. However, this fact does not remove the negative connotation that surrounds the ALO assignment nor does it stop these same colonels from admitting that ALO assignments are generally not considered career enhancing tours for pilots and WSOs when compared to other career options. The A-10 community is perhaps the only exception to this assignment trend. Over the last 20 years, it sourced the largest percentage of ALOs compared to the other communities in the Air Force. This policy

has recently changed, and now the Air Force sources ALO billets from communities within the combat air force.⁸⁸ Perhaps the former ALO assignment policy is the reason why Air Force leaders question the Army's penchant for requesting the A-10 for CAS instead of requesting CAS "effects." This seemingly platform-centric affinity for the A-10 is bothersome for Air Force leaders.⁸⁹ It is obvious to the author that if the preponderance of ALOs over the last 20 years originated from the A-10 community, then there would be a natural inclination for Army leadership to understand more about the A-10 and, more importantly, the culture of the pilots flying them, than other platforms within the Air Force. Marine infantrymen have this same affinity with their Marine aviators when presented with a choice of joint CAS. A Marine will always ask for a Marine aviator to provide his CAS over other services. He already knows "effects" of this choice. The challenge for the Air Force then is to engender a community wide affinity for Air Force tactical aviation similar to the Army's affinity for the A-10 or the Marine's affinity for Marine CAS. Using an "effects-based" approach may not be the whole answer.

To reinforce the above discussion, I have observed an interesting paradox through the course of my research and while attending the Air War College. There are two general observations made by many, if not all, Air Force aviators interviewed for this paper, including general officers. First, on average the Air Force does not send strong performers to fill the ALO billets to represent the capabilities and limitations of airpower to ground commanders.⁹⁰ Second, the Army leadership, to include the land component commanders, does not fully understand the use of airpower. This is a compelling paradox: the Army leadership does not understand air power; yet the Air Force sends its poorer performing aviators to serve as ALOs and then only down to the brigade level. The second order effect is that there is a perception that serving an ALO is detrimental to one's chance of promotion when compared to a more traditional career track. The net result is that a percentage of ALOs either leave the Air Force after their ground tour or, for varied reasons, fail to return to an operational squadron. The current "unwritten" assignment policy prevents a healthy cross-pollination between aviators and ground officers. The ground experienced aviator has less of a chance of returning to an operational squadron where he can articulate the unique challenges faced by the end user of fixed-wing and rotary-wing airpower to his squadron.

Therefore, it should come as no surprise that the Army possesses an institutional bias to not train with or incorporate fixed-wing aviation into combat operations until it is almost too late. It should also be of no

surprise that many leaders in the Air Force complain that their ground contemporaries poorly plan for aviation or have little understanding of its capabilities and limitations beyond the A-10. Analyzing the ALO tour assignment practice is a requirement for joint interdependence to work. While the trend recently has shown a slight reversal, there is a significant stigma associated with a ground tour with the Army, expressed by the viewpoint that “Air Force aviators didn’t sign up for that (ALO tours).”⁹¹

There may be second and third order effects of increasing the number of enlisted JTACs and, subsequently, the Air Force policy of assigning senior enlisted JTACs as Battalion Air Liaison Officers. Shortages in the JTAC career field have caused younger and less experience JTACs (SrA and SSgt) to routinely serve as the BALOs, a position where they are tasked with advising a battalion commander on the employment of airpower.⁹² The ability of a JTAC to inject himself into the battalion’s planning, or even to disagree with the battalion commander on an aspect of airpower employment, rests largely on the JTAC’s personality, experience, and aggressiveness. Yet even if experienced, there can be an institutional barrier for a battalion commander to allow an E-6/7 BALO, an individual that has never seen the inside of a cockpit, into his inner circle of advisors and planners or to speak with authority about the capabilities and limitations of airpower, regardless of the BALO’s skill. As the Air Force enlarges the JTAC career field to meet the Army’s growing requirements as it transforms, fewer aviators will be exposed to the ground force point of view, with the net result a divergence between airpower culture and ground power culture, which is precisely the opposite intent of joint interdependence. If the Air Force wants to ensure the Army leadership understands airpower, the organizational process of BALO and ALO assignments should be re-evaluated.

Complicating the training of Air Force officers and enlisted assigned as ALOs and JTACs is the significant amount of time required just to get them sufficiently trained to operate effectively in a service with such a different culture than the Air Force. According to Colonel Belote, the commander of the 3 ASOG at Fort Hood, Texas, one aspect that adds to the training timeline of ALOs and JTACs are training requirements in order to sufficiently prepare Air Force personnel in the areas of personal weapon use, urban combat, counterinsurgency, and land warfare in general.⁹³ Some of these training deficits are being addressed by changes to the entry level training for those entering the Air Force, but they will still not be sufficient for JTACS and ALOs, or more appropriately, “battlefield Airmen.” These individuals will spend a significant amount of

time with the Army in a combat environment, particularly the JTACs operating directly with the maneuver units.

The three to five year period required to train JTACs is an enormous investment. The recent commitment by the Air Force to train an additional 900-1000 JTACs to support the Army's transformation plan is a significant commitment by the Air Force. But the reality is that the trained JTAC will not be certified in the actual control of aircraft until three years after he begins training at the earliest. The JTAC in training does provide an important service, such as radio operator, driver, before he becomes fully qualified. However, could there be a better way to train certified JTACs that leverages the longevity of a fully certified and proficient JTAC with that of a rated aviator certified in terminal attack control? This problem is unique to the Air Force. Marines shifting from aviation duty to service with their ground counterparts do not have the same challenges. This leads to an explanation of the organization that enables joint airpower to support the Marine infantryman.

Each of the three Marine infantry divisions is habitually aligned and supported by a DASC manned by specialists that are sourced from the Marine Air Support Squadron, a subordinate unit of the Marine Air Wing. Being a "DASC-kateer" is a permanent career field for officers and enlisted. For officers, it is a career field with command opportunity at the squadron and group level, where they are eligible to command a Marine Air Support Squadron and then a Marine Air Control Group. Similar in size and function to the ASOC, the DASC is attached to the division headquarters, not the MEF, which is one command echelon below where the ASOC is attached (see figure 4 for a graphical depiction of the Theater Air Ground System). The typical DASC is manned by 12-17 officers and enlisted, depending upon the mission, and is tactically controlled by the division but remains under the operational control of the Marine Air Wing. Sub-elements of the DASC, called Air Support Elements (ASEs) and Air Support Liaison Teams (ASLTs), can be formed with similar but limited capability as the DASC. The ASEs and ASLTs are representative slices of the DASC and can be assigned to commands subordinate to the division. Normally though, they come out of the DASC's end strength. For example, during OIF, in addition to the DASC supporting the 1st Marine Division, two ASEs were formed one for Task Force Tarawa and one for the British 1st UK Division. Also, one ASLT was formed to support Regimental Combat Team 2.⁹⁴ Since the 1st Marine Division was reinforced with three additional maneuver elements, the ASEs and ASLT were not formed from the 1st Marine Division DASC but were formed from the DASC that traditionally supported the 2d Marine Division. The

All rated naval aviators in the Marine Corps are candidates for duty as Air Officers and Forward Air Controllers. Therefore, an air shop at the battalion and regiment level will represent a typical mix of helicopter, fighter, and transport pilots. Company grade officers will serve as Forward Air Controllers, and field grade officers serve as Air Officers. The FACs work for the Air Officer, the senior aviator within the air shop. The Air Officers work for the commander of the unit as his principal staff officer on all matters pertaining to aviation. FACs and AOs are assigned to these tours for 12-18 months, depending upon the training and deployment cycle of the unit to which they are assigned.

The selection process for aviators assigned to be a Marine ground FAC is competitive and is considered to be career enhancing among those considered. The second assignment Marine aircrew selected for a ground forward air control billet serves in this capacity about 12-18 months, upon completion of a three week tactical air control party school. He leaves the school fully certified to terminally control rotary-wing and fixed-wing close air support aviation. Upon the completion of a ground tour, the aviator can expect to be assigned back to an operational squadron, where he will most likely be slated to attend the Marine Corps Weapons and Tactics Instructor course, the most coveted school for an aviator. The quick turnaround time for the forward air controllers and the air officers minimizes their out of the cockpit time. Perhaps most importantly, the experience gained while serving with the infantry is brought back to the operational squadron and put into instructional use when the aviator fills the pilot training officer billet of the squadron. This process is repeated every twelve to eighteen months, and the infantry units and all the flying squadrons are updated on the latest tactics, techniques and procedures of the air and ground operations and interdependence.

On the surface there may appear to be many similarities between the Air Force / Army air relationships and the Marine Corps' air-ground relationship. However, there are significant differences between the services in the assignment policies of aviation representatives to the ground forces. Rated Air Force aviators and certified JTACs assigned at the battalion, brigade, and corps level remain under the operational control of the ASOS commanders. By comparison, Marine aviators assigned to billets as Forward Air Controllers or Air Officers are under the operational control of the *ground* unit commander to which they are assigned. The personnel manning the DASC remain a component of the Marine Wing Control Group, a subunit of the Marine Air Wing, and thereby maintain a separate chain of command. Proponents of the Air Force assignment method argue that in order for Airmen to provide unvarnished advice to

ground commanders concerning the employment of airpower, they must be able to do so without fear of reprisal. The current USAF organization supports this. Therefore, it is best to maintain the operational control of JTACs and ALOs within the ASOS and ASOG not the battalion, brigade, or corps. Others argue that the current assignment policy institutionalizes a seam between the ground forces and air forces. Although the ASOSs and ASOGs are physically collocated and habitually associated with the ground units they support, the day-to-day working routine for the JTAC and ALO is within the ASOS, not the battalion or brigade.

Opportunities to strengthen the mutual understanding between ground forces and air forces may be missed through the lack of day to day interaction and can only be achieved through training evolutions and deployments as the JTACs and ALOs are assigned to support the ground units. There are many intangible benefits to an Air Liaison Officer operationally assigned to a unit that are missed by the current assignment policies. Perhaps among the most important is team building that would supplant misperceptions of an implied “you are not in my chain of command” attitude that may impede the strengthening of organizational bonds. A ground force and an air force designed to be dependent upon each other’s strengths must be seamless at the very location that is tasked to fuse air and surface operations, the ASOC and its subordinate elements, the TACP and ALOs. Perhaps it is time for the Air Force leadership to address their concerns with their ground counterpart’s lack of aviation knowledge through the implementation of innovative personnel assignment policies.⁹⁶ If the reader agrees that joint interdependence requires a paradigm change, then perhaps a detailed analysis of the current assignment policies are in order to address this seam that may prohibit joint interdependence for air and ground operations.

Opponents of this recommendation will argue that there are not enough Air Force aviators to fully man the current JTAC, ALO, and ASOC positions, let alone the increased requirement to support the Army’s transformation plan. This, combined with the recapitalization of the fighter force and the reduction of end strength, will make this problem even more difficult to solve. The argument gets stronger when one considers that under the current joint paradigm the Air Force is responsible for the strategic lift of all the services, and is increasingly called upon to provide transportation, security, and intelligence personnel to support other services. Potential joint solutions to this manning dilemma that close this obvious organizational seam will be explored in the recommendations section.

Recommendations

I grew up not trusting CAS, because at NTCs and Warfighters it was too hard to coordinate and was never [there] where or when I needed it. But here, every time I asked the JTAC to get air—every time—you guys answered the call.⁹⁷

Success in one will support success in others, while delay in one will impede success in others. We must aggressively identify those factors impeding our success, develop plans to overcome them, and establish metrics with which to assess our progress.⁹⁸

Joint interdependence for air and ground operations will require rebuilding individual trust between the soldier and the Airmen and rebuilding the institutional trust between the services. The individual trust is easy, that is accomplished through training. Institutional trust will require personnel policies and organizational changes to back up the speeches and resist the interwar tendencies. Changing the institutional inertia of a force accustomed to relying upon a near limitless supply of organic fires, a percentage of which are now supplanted by aviation fires, to rely more on aviation fires will require innovative thought and deliberate effort from both services. Therefore, it is in the interest of the land and air components to make this work if they are to make interdependence work. It will require a level of cross-pollination to educate one another while simultaneously becoming reliant upon one another. Perhaps nowhere is this more important than the integration of rotary-wing and fixed-wing fires with long-range organic fires. An architecture that meets the needs of the soldier while maximizing the potential of airpower is essential. Maybe the litmus test for achieving joint interdependence will be when the corps commander can cede his deep battle to the CFACC much like the 1st Marine Division commander ceded his deep battle to 3rd Marine Air Wing and the coalition sorties provided by the CFACC.

Accomplishing this will require an adaptable system that engenders trust between the services while enabling high initiative between those that control, coordinate and deliver aerial and surface to surface fires. New thinking and unified mission focus must transplant traditional service specific or component agendas to increase the flexibility and initiative of airpower employed in support of an Army transformed.

Doctrine

1. Establish the Common Geographic Reference System (CGRS) as a fire support control measure.

The Common Geographic Reference System (CGRS) is a control measure that can de-energize the FSCL debate and improve the coordination and control of aviation and ground fires upon the joint battlefield by eliminating the seams and friction that the FSCL now creates.⁹⁹ In fact a CGRS was in use during OIF (as described in the analysis) but it overlaid traditional fire support coordination measures like the FSCL and the BCL. Termed Killbox Interdiction/Close Air Support (KI/CAS) concept of operations by air component planners, its level of success as a fire support coordination measure depended upon what area of operations the user was in.

First used in rudimentary form during Operation Desert Storm, CGRS was improved upon during Operation Allied Force. Its relevance came of age during the planning process leading up to OIF but it still could not supplant traditional measures like the FSCL / BCL. It greatly enhanced the ability of the air and ground component to quickly and effectively direct the flow of attack aircraft in the close battle and the deep battle.

Since lines of latitude and longitude delineate the killbox they, exist as a common reference system throughout the world. A killbox 30 nautical miles from south to north is exactly 50 km deep and roughly 50 km wide. Each of the nine squares subdividing each box is approximately 16.5 km deep and about 16 km wide (see figure 5). More importantly, killboxes, once commonly understood by air and land forces have the potential to obviate the requirement for a FSCL all together. The obvious question is if the killbox subsumed the same control measures of the traditional fire support control measure it overlaid, what are the implications for using the killbox method exclusively for fire support coordination?

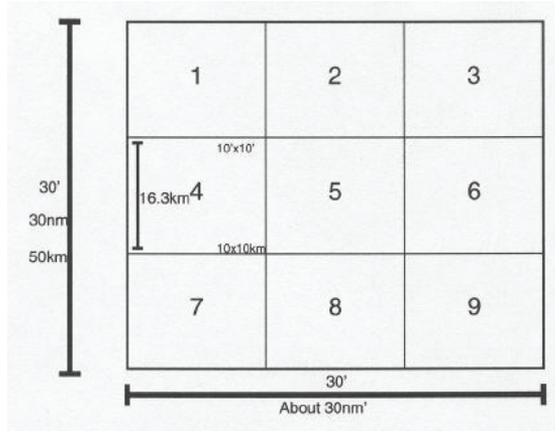


Figure 5. Killbox Dimensions

There are good attempts at improving killboxes in order for them to be used as fire support coordination measures.¹⁰⁰ The killbox concept as described in the Air Land Sea Application Center (ALSA) publication FM 3-09.34 is the most comprehensive but can be improved to make a more effective means for ground and aerial fires coordination and supplant traditional fire support coordination measures. The ALSA pub improves the killbox system employed by CENTCOM by assigning ‘entity ownership’ to the killboxes through a color system. For example, a blue killbox is owned by the JFACC and is coordinating authority for fires employed in that box (see figure 6). Land and Maritime component commanders must coordinate with air component commander in order to deliver surface-to-surface fires in a blue killbox. Similarly, a purple killbox is jointly owned by the land and air component commander but is established by the ground component. It is a three dimensional box that has a pre coordinated minimum altitude or floor designated. Aircraft can attack targets in the purple killbox without coordination with the ground component as long as they stay above the floor.

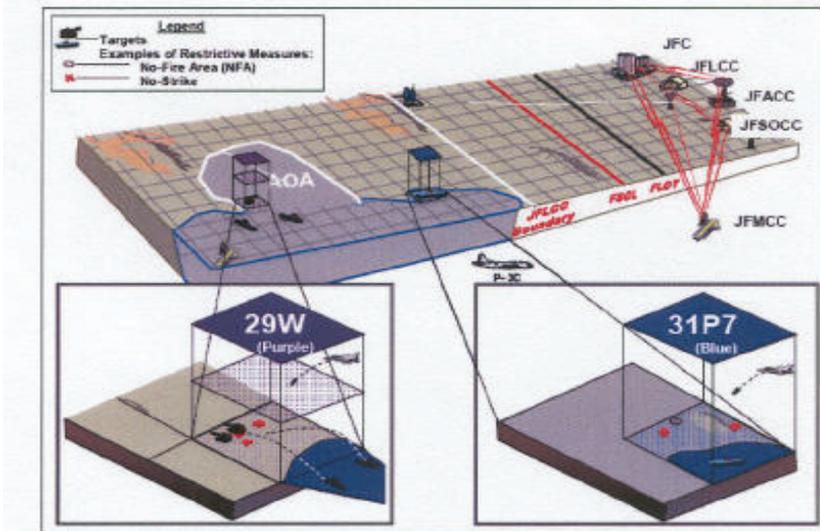


Figure 6. Killbox Ownership (Figure B-2, FM 3-09.34)

Surface-to-surface fires can engage targets within the purple killbox without coordination with the air component as long as the maximum ordinate of the projectile trajectory does not go above the floor of the killbox. When ground units approach within a pre-identified distance of the killbox they are automatically deactivated.¹⁰¹

Killbox operations as defined in the Korean Theater of Operations are similar. However, while killboxes are only established long of the FSCL, Airspace Coordination Areas are established short of the FSCL and essentially take on the same characteristics as the purple killbox described in the ALSA pub. They are color coded to depict the component that owns the killbox. However, both publications discuss the cumbersome process of gaining approval to establish the killbox and both publications still recommend the employment of traditional fire support coordination measures like the FSCL.¹⁰² Operation Iraqi Freedom demonstrated that killboxes offered a flexible method of fire support coordination due to their ease of use and the ability for commanders to rapidly open and close them based upon the maneuver elements pace of movement.

In order to move beyond the issues associated with the FSCL debate, a killbox system is required that captures the above discussion about entity ownership while facilitating all fires in conjunction with maneuver. Both of the examples of killbox employment described above fall short in developing a system that moves physically and temporally with the maneuver units. As depicted in the ALSA publication and the Combined Forces Korea instruction, there is no discussion of establishing and maintaining killboxes that are owned by the ground commanders. For

this purpose they use Airspace Coordination Areas. As depicted in figure 4, killboxes are opened and closed individually, by the appropriate HQ that owns the timing, priority, and effects of fires within that particular killbox. Figure 7 depicts how a FSCL can be placed along the boundaries of the killboxes, and it is readily apparent that placing the FSCL in this manner over the CGRS is redundant. More importantly, this process will be cumbersome.

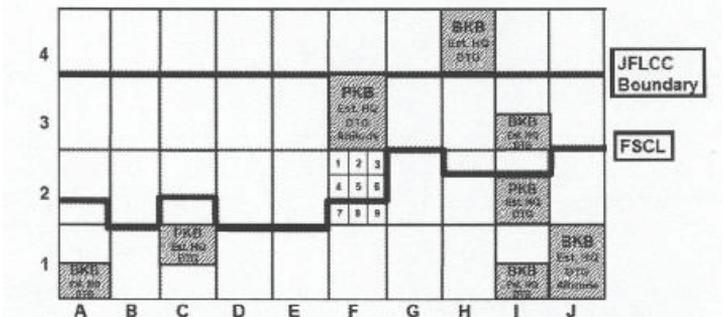


Figure 7. FSCL Placement Along Killbox Boundaries (Figure 1-3 from FM 3-09.34)

The dimensions of the killbox assigned to a brigade, division, or regiment killbox can be tailored based upon the mission, enemy, and terrain (see figure 8). Note that there is no FSCL in figure 8. More importantly the purple shaded area is an area of *shared* responsibility that eliminates a clear “division” of responsibility that the FSCL now represents. Figure 7 uses colored killboxes and key pads to represent the entity responsible for the timing, priority and effect of fires in the killbox. Also note that the colors change based upon unit position and speed of movement. Used in this manner, this version of a killbox essentially incorporates the Battlefield Coordination Line and Fire Support Coordination Line employed by I MEF during OIF into a more flexible and understandable system for all participants.

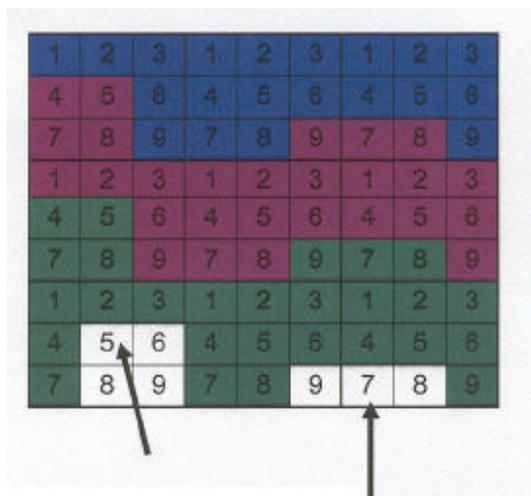


Figure 8. Tailoring Killbox Dimensions

The colored killbox width or lateral boundary can vary depending upon the terrain and disposition of attack formations of the ground units and the distance between units. Its depth could be established to the maximum range of the ground commander’s organic fires, or about 20-30 km (about 15-20 miles) in front of the division / brigade. All timing, priority, and effects within that killbox are coordinated by the division / brigade; as such it is colored green. Because this is the region that typically defines CAS, the keypads of the killbox that fall within the range of the 20-30 km range would be closed. Thereby, aviation fires delivered in a closed killbox require the terminal control of a JTAC / FAC/ FACA. As the maneuver units move forward, the keypads / killbox that fall within the 20-30km range of the lead units automatically close.

The next 30 nautical-mile sequential killbox is jointly owned by the land component and the air component and would be colored purple. This box would function as described above in the ALSA pub. The maximum distance from the forward edge of the division to the end of this boundary will be 60 nautical miles or 100km. All timing, priority, and effects within that killbox would be coordinated jointly by the corps / MEF and its appropriate air component agency, the DASC / ASOC. Pre-established ceilings and floors would make combined joint fires in the purple boxes very easy to deconflict and thereby coordinate and execute. Additionally, CFACC or Marine Air Wing aircraft capable of conducting SCAR and FACA would be designated the killbox managers or “trusted agents.” In this manner, FACA crews could be assigned to green (closed) and or purple (shared) killboxes and SCAR managers could be assigned to blue (open) killboxes and is just one example. CAS aircraft could then be

“pushed” to an assigned killbox to operate through the designated “trusted agents” and their attacks would be in accordance with commander’s intent, as executed by the FACA or SCAR manager executing from a prioritized target list. During periods of high mobility, a Tactical Air Coordinator (Airborne) aircrew could be added to function as an “air-battle manager,” essentially maintaining the big picture and monitoring the flow of aircraft from one killbox to another based upon the ground battle.

The next sequential killboxes are “blue” and are owned by the CFACC. They can extend from 60 nm to the boundary of the AO. All priority, timing, and effects would be determined by the CFACC and coordinated by the CAOC, with the JSTARS, AWACS, or CRC acting in accordance with the CFACC’s guidance for timing, priority, and effects. Air delivered fires can operate freely in blue killboxes. Employing surface-to-surface fires in blue killboxes would require the approval of the CFACC. Depending upon the mission, enemy, and terrain, all of the killboxes and keypads can be easily adjusted to accommodate maneuver space and enemy disposition.

For example, if the battle becomes static, the brigade / regiment zone of control may stretch the distance of one keypad of a killbox, or about 18 km. The important issue to resolve would be the span of control designated to each element owning the killboxes, while the responsibility of fires coordination in the killbox remains constant. As the maneuver units approach the limits of the current closed keypad and pass into another, the next keypad or killbox automatically becomes closed and the next segments of the subsequent boxes and the control of the timing, priority, and effects shift according to the next agency Corps / CFACC. The process would be equivalent to the same ‘yardstick’ of control being linked to the location and rate of movement of the ground force, thereby achieving a “temporal” effect of fire support coordination that de-energizes the FSCL debate.

The other advantage of this type of killbox employment is that it does not require any one entity or group of people to decide when or where to move it. The process is linked to the movement of the ground forces. Essentially, the ground units maneuver underneath the CGRS and based upon the previous agreed to depth of killbox ownership per entity, the killbox is closed or subdivided key pads are closed. Any fires employed in a closed killbox require the approval and coordination of the entity that owns it. This method will also naturally accommodate fast moving column like movements of ground forces much easier as compared to traditional fire support coordination measures. The end result is a stepped approach towards the coordination of aviation fires with maneuver. The

closer aviation is to the ground forces and the range of their organic fires, the more coordination is required and vice versa. Instead of the all or nothing approach caused by traditional fire support coordination measures, killbox interdiction and close air support enables a more fluid flow and coordination of aerial fires with ground maneuver.

Aviation and long-range organic fires can exploit this type of battlespace coordination more effectively. Instead of the space between the FLOT and the FSCL varying based upon individual maneuver units as the units maneuver at different rates towards the fixed FSLC, the closed and open kill boxes move commensurately with the units, thereby preserving the agreed to 'yardstick' and the degree of coordination associated with it. This way, one maneuver unit slowed down by terrain or enemy action would have the same yardstick of coordination as another moving at 20km/hr. As distance opened between two adjacent maneuver units, it could be 'opened,' thereby allowing aviation to screen for and / or attack potential enemy forces they may be in the area between the maneuver forces.

2. Employ "Just in Time" CAS and the "Deep Battle Manager."

"Push CAS" and "Pull CAS" are terms used to describe how CAS sorties are scheduled and flowed into the battlespace. Under the push CAS construct, a predetermined number of CAS sorties—based upon ground commander's intent and the apportionment—are scheduled to flow into the battlespace regardless if they are required (the process employed by CFACC during OIF). If not, after a specific time period they are normally released from the CAS controlling agency and are free to conduct interdiction or reconnaissance, depending upon the situation. Push CAS may also be the best method of scheduling CAS aircraft in a static battlefield. A recent example is Operation Phantom Fury, where US joint ground forces attacked the insurgent forces holding the city of Fallujah in November 2004.¹⁰³

The "pull CAS" construct normally implies a set number of CAS sorties are set aside in some form of alert posture, normally ground based. When they are needed, they are launched on order, or essentially pulled forward. Using a killbox system that has more fidelity than the one described in FM 3-09.23 and employed in OIF air forces can more efficiently plan and execute planned and emergent CAS requests while simultaneously satisfying interdiction requirements.

For example, the battlespace divided into killboxes can be used as a sortie modeling tool optimized for enemy disposition, terrain, weather, sortie capacity (rotary-wing and fixed-wing), that accounts for volume of airspace in the AO, desired aircraft density per square mile of air space,

type aircraft, ordnance load, enemy concentration, and terrain. To illustrate, a two-ship of F-16s carrying three precision guided munitions and thirty minutes of available time on station may be only planned to operate in one to two killboxes per time on station, as compared to a two-ship of F-15Es with 8 PGMs each and 45 minutes time on station. The Strike Eagles may be assigned to cover four to five killboxes and/or be charged to act as a SCAR box manager for an additional two or three sections of interdiction or CAS. Using this method commanders pre-determine a specific aircraft density per square mile (killbox) depending upon the situation. The weight of 'pre-planned' CAS and "on-call" CAS in the form of aircraft scheduled to operate in the corps' close or deep battle can be predetermined and scheduled appropriately. This process reduces the amount of CAS aircraft inventory that are tied up by being placed on the "shelf" via a CAS stack and creates a pre-planned number of "just in time" inventory of CAS aircraft. The "just in time" CAS aircraft are planned to operate in the middle and deep battle (purple and blue killboxes and their corresponding restrictions) 30 kilometers to 100 miles deep, at most just ten minutes from being called back to support an emerging troops in contact mission. They are essentially flying interdiction missions short or long of the FSCL, to use a familiar definition' but under the killbox concept of operations they would be operating in a purple or blue killbox under the control and coordination of a "trusted agent" FACA or SCAR specialist. The 'insurance factor' underwriting this "pull CAS" concept is the percentage of attack helicopter aviation factored into the 'CAS inventory' and the number of FACA / SCAR aircraft operating as deep battle managers. Additionally, all CAS aircraft planned and flowed into the killbox "inventory" become "CAS in waiting." As they flow through the "close battle" into the deeper battle, they can be diverted enroute from their originally planned deep killbox. Alternatively, killbox interdiction aircraft operating in blue killboxes can even be "pulled" back for CAS or even be assigned time sensitive strike missions. This process is similar to current operations in Iraq, where "troops in contact missions" can be supported with already airborne "pipeline security missions" for example.

As part of achieving a baseline minimum number of sorties, possessing an average capability a sub-optimum mix of ordnance loads for a particular mission and decreased situational awareness may result. However, this method provides a highly adaptive and flexible approach to aviation planning and execution that minimizes wasted effort and maximizes the inherent capabilities of airpower. This concept can be further enhanced through the deliberate inclusion of attack helicopters.

3. Modify army attack aviation doctrine.

Army attack helicopter doctrine should be modified so that it recognizes recent combat experience. Joint Air Attack Team (JAAT) doctrine and the survivability it affords helicopter attack aviation during OEF and OIF is thoroughly documented in after action reports. “The Multi service JAAT is a coordinated attack by rotary and fixed-wing aircraft, normally supported by artillery or naval surface fire support. JAAT operations support the joint force commander in offensive and defensive operations day or night.”¹⁰⁴ The procedures required for successful JAAT missions are precisely those that engender close cooperation between rotary-wing, fixed-wing aviation and the ground maneuver elements. JAAT tactics techniques and procedures are a “no-brainer” and are easily executed by experienced ALOs and rotary-wing aviation planners.

Yet, JAAT as written holds an almost mystical position in the maneuver commander’s toolkit and service field manuals. Doctrinally, it requires “approval from the maneuver commander responsible for the area of operations” where JAAT is scheduled to take place, i.e., a corps commander.¹⁰⁵ JAAT tactics are common sense to all participants and are being planned and executed real time during current combat operations. Unfortunately, JAAT is not common practice during training leading up to unit deployments and common feedback from OIF experienced ALOs and JTACs is that the Joint Air Attack Team is the norm, not the exception. JAAT tactics should be a primary tenet of Army attack aviation doctrine and it should supplant Army autonomous attack helicopter deep operations. In this manner, rotary-wing and fixed-wing aviation planning and execution will become the norm, not treated as a special event requiring maneuver commander’s sanction.

The Army should name armed helicopter Close Combat Attack what it really is, CAS. Naming attack helicopter operations requiring close coordination with that of ground maneuver anything but CAS institutionalizes a “what is mine is mine” seam between the land and air forces that is an outgrowth of the emotional debates of the 1960s concerning the fielding of the armed helicopter. The services should be beyond this debate over semantics. More importantly, “close combat attack” and “close shaping” fails to recognize the full capability the attack helicopter brings to the battlefield and the soldier. Attack helicopter aviation offers a unique capability to the infantryman as compared to fixed-wing aviation, and it is time to doctrinally re-link the Army’s ground force with its aviation arm.

Organization

1. Establish a joint architecture for the Brigade Aviation Element.

One potential organizational solution may be a joint architecture for the Army's Brigade Aviation Element (BAE) currently being proposed for each brigade combat team. According to draft Army publication TC 1-400 FDFD, dated 13 March 2005, the BAE would be a permanent function of the brigade staff "for integration and synchronization of aviation into the brigade commander's scheme of maneuver." The concept is modeled after the successful aviation planning cell used by the Army's Air Assault divisions. The BAE uses the aviation planning cell construct where a specific planning cell was dedicated to each of the maneuver brigades of the air assault division. The Army Aviation Task Force Study dated November 2003 recognized that the use of a dedicated aviation element at the air assault brigade combat team headquarters developed a unique chemistry between the aviation planning cell and their infantry counterparts. As a result, aviation and maneuver were fully integrated into every operation. "The challenge is to provide BAE teams comprised of well-rounded aviators, who can coordinate and assist the BCT in using aviation across the broad spectrum of aviation missions. Each member of the BAE must be an advocate for aviation and the BCT."¹⁰⁶ Ironically, this organizational change only addresses Army Aviation and is perhaps indicative of the gulf that developed over the years between attack helicopter aviation and the non-air assault maneuver units. This divide was evident in the assignment policies of helicopter squadron liaison officers to the brigade staff that mirrored the observations made in the unwritten ALO assignment policies of the Air Force.

The primary purpose of the liaison team is to keep the brigade commander and his staff apprised of the aviation issues related to the unit that the liaison officers represent. Specifically, the liaison officer's job is to articulate crew rest requirements of the pilots, employment considerations and maintenance requirements as well as advise the commander of planning and executing helicopter operations. National Training Center (NTC) exercise after action reports cited numerous problems with the Army aviation's current liaison officer assignment process.¹⁰⁷ Most of the problems centered on the liaison officers being too junior or inexperienced. This was exacerbated by the fact that they were normally 'expendable' for the unit they represented; they were poor performers and the squadron would not miss their presence.¹⁰⁸

The Army's transformation plan proposes to rectify this issue through the establishment of permanent liaison teams at the brigade headquarters, staffed normally by second tour captains possessing the

experience and credibility of the community they represent. The liaison teams, in addition to the BAE, represent a significant improvement in the aviation expertise that will reside within the brigade headquarters. However, there is potential to make the improvements even better.

The BAE as proposed will be headed by a helicopter pilot, an Army major that is “branch qualified” meaning that the individual possessed the requisite aviation credibility and expertise. Assisting him is another helicopter pilot of the rank of captain and one warrant officer that is a non-rated. The BAE would also have three enlisted flight operations specialists. This structure was specifically designed so it would match the Brigade Fire Support Element in rank and size.¹⁰⁹ Supplementing the BAE on the brigade staff are the temporarily assigned liaison officers described above. However, there is a potential opportunity that exists in this organizational change by expanding the qualifications of the liaison officers through qualifying them as terminal attack controllers, or TACs.

This process would only take three weeks if the program was similar to the Navy and Marine Corps’ Tactical Air Control Party School, and the aviator would graduate from the school a qualified TAC. This would immediately solve two outstanding problems. First, the liaison officer / TAC would then hold essentially two billets, acting as an advisor to the brigade commander on all issues related to attack helicopter aviation as well as being certified TAC. This would help alleviate the TAC shortage within the Army and ease the difficulty of the Air Force in filling them as the Army transforms. Second, this would start a process of cross-pollination between Army aviation and Army infantry while simultaneously enhancing cross-pollination between rotary-wing and fixed-wing aviation for the Air Force and the Army. Training liaison officers as ground forward air controllers would not require more personnel but would require additional training for the individual liaison officers chosen to be qualified as JTACs. Qualifying Army helicopter pilot liaison officers as JTACs will add additional JTACs to the Army brigades quicker and with less overhead than training enlisted JTACs.¹¹⁰

The BAE as proposed would consolidate Army aviation expertise in one location at the brigade level. However, there is room for improving this critical staff section. For example, consolidating joint aviation expertise in one staff section, at the brigade and corps level, working for the respective commander would help build strong working relationships between soldiers and Airmen of rotary-wing and fixed-wing background and provide a venue to seamlessly integrate the planning and execution of all aviation fires for mutually enabling effect. Brigade ALOs assigned to lead the BAE for non-air assault brigades would allow the fixed-wing

ALO and the rotary-wing liaison officers to present a joint aviation solution to the brigade commander. In the process all within the staff section and key leaders throughout the brigade would cross-pollinate concepts, tactics, techniques, and procedures on rotary-wing and fixed-wing employment.

2. Assign a percentage of ALO billets to be filled by rated Naval aviators.

The Navy, along with the Air Force, should share the responsibility for manning Brigade ALO billets. Navy aviators are equally qualified to perform in this billet, and because carrier aviation is an integral part of each combined force air component commander's plan, the Navy should fill a portion of the ALO requirements. Perhaps this can be instituted initially through volunteers, eventually evolving into a percentage of mandatory quotas phased in as the Army continues its transformation. The cross-pollination benefits to the Navy will pay huge dividends in better integrating carrier aviation with the ground scheme of maneuver.

Naval aviation plays a significant role in CJFACC operations and supporting the land component. Their FACA qualified aircrews are all graduates of the Marine Corps Tactical Air Control Party School and are certified as ground terminal attack controllers before they receive their airborne qualification. Their contributions to the CJFACC air effort and maneuver commander can be enhanced through ALO tours that will round out their experience and their perspective. Perhaps their greatest contributions will be when they bring their ground experience back to their squadrons to educate their fellow aviators on the ground commander's perspective, a point of view they have never seen before.

Majors and Navy officers selected for ALO positions should serve in these positions at a point in their career where they are considered eligible for duty as a member of their respective service or a joint staff. This assignment policy would preclude an aviator from having multiple out of the cockpit tours and keep the individual competitive for promotion and follow-on command. This option would essentially create two joint staff officer career tracks, one operationally oriented at the combat level and the other traditionally oriented at the service component staff level or the combatant commander level. Aviators serving in the BAE position for more than 22 months should be considered for joint credit, just as they would if they served on a joint staff. This would further alleviate the negative career connotations associated with ALO billets and increase the number of quality aviation officers available to cross-pollinate with their ground officer counterparts, producing multiple benefits. The ALO would bring the "ground perspective" back to a squadron, most likely in a

leadership role, and the ground commander would receive first rate advice on rotary *and* fixed-wing air employment.

3. Establish the TACP organization under the operational control of the supported commander.

The joint BAE organization described above should remain under the operational control of the respective brigade commander and be responsible for articulating the all the issues associated with aviation and ground operations. This team should be formed at an appropriate period during the “reset” or “ready” force cycle so that it can be in position to train when the battalion and brigade phase training begins. This process will enable the BAE to get the appropriated training while minimizing the added personnel burden of manning the BAE during the entire unit regeneration cycle. For example, the BAE might be manned for just the nine months prior to the “available for deployment.” phase of the “Army Forces Generation Cycle.”¹¹¹

Air Force aviators and Army aviators staffing the BAE on a permanent basis would also bring that officer’s “rolodex” to the brigade, enhancing their ability to align small unit training and better plan for large scale exercises. This process would not only institute a process of habitual relationships with the brigade aviation shop, but it would also begin the process of establishing relationships with external squadrons. They would also be the link to the Army and Air Force pilots operating as Airborne Forward Air Controllers (AFACs), or “airborne extensions” of the BAE and ASOC.

Ultimately, rotary-wing and fixed-wing fires expertise would be consolidated in one staff section beginning at the brigade level. This manning construct would also enable the BAE to take on an “ASOC light” mission. In this capacity they could function similar to the Marine Corps sub-element to the DASC, the Air Support Element (ASE) if required by the mission. In this capacity, the BAE would be able to act as a pressure relief valve as well as coordinate the aviation fires, rotary-wing and fixed-wing of the brigade.

4. Certify Army and Navy pilots as ground FACs.

An alternate solution to the BAE organization is to consider training Army and Navy pilots as ground FACs in addition to those that are filling the BAE and the liaison officer billets. A typical pilot could be eligible for Tactical Air Control Party School after he successfully completed at least three years in a squadron and obtained a favorable endorsement from his commanding officer. Army and Navy aviators selected for this program would serve 12-18 months as a ground FAC and then return to their squadron, achieving cross-pollination benefits similar

to those described above. The Marine Corps successfully uses this concept, and it would further the air-ground partnership between the Army and the often overlooked source of airpower, the Navy. The Army pilots selected to be trained as FACs could be put into service much quicker than their Air Force enlisted or officer counterparts, since they are already “acclimatized” to the Army and have the additional skill of being familiar with aviation terminology and communication.¹¹² There already exists within the Navy a certified pool of FACs. By requirement, Navy aircrew qualified as Airborne Forward Air Controllers attend the Marine Corps’ TACP School before they earn their FACA qualification in the F-14 and FA-18F. Therefore, they are fully qualified ground Forward Air Controllers as well as FACAs. Naval aviators could serve a year with the Army in a ground FAC billet and return to their squadron without having to attend aircraft refresher training. Their presence would help explain the nuances associated with employing naval aviation to Army officers.

Seasoned Army helicopter pilots trained as ground FACs would arguably require less training effort than enlisted soldiers and Airmen undergoing initial JTAC certification. Marine and Navy aircrew, rotary-wing and fixed-wing, are certified forward air controllers after they complete a three week training course conducted by Expeditionary Warfare Training Group Atlantic / Pacific. Since the Army routinely sources liaison officers to higher headquarters, it would make sense to qualify the liaison officers as ground FACs within the process and thereby eliminating helicopter squadrons from losing an additional pilot.

5. Establish airborne extensions of the TAGS.

Battlefield command and control is the glue that enables land forces and air forces to achieve operational and strategic effect. The now decommissioned Airborne Battlefield Command Control Center (ABCCC) was designed for this mission and employed specifically trained C2 specialists to operate as an airborne extension of the ASOC. The extensive communications suite, combined with the specifically trained Airmen within the EC-130 platform, enabled the ABCCC to fulfill a critical niche in coordinating air with land force maneuver. AWACS and JSTARS crews now perform this mission, but their performance in filling the airborne battlefield command and control niche in addition to their *primary* duties was marginal during OEF and OIF. Mission specific platforms like AWACS and JSTARS were not designed for battlefield management and are deficient in the communications suite and aircrew training to perform air battle management in addition to their primary missions.¹¹³ This combined with the time and effort to manage the sensor

suite aboard both platforms limits the controller's ability to gain and maintain battlefield situational awareness.

The potential for tactical fighter crews to operate as "air-ground battle managers" entrusted with specific C2 authority should be explored. Two-seat Marine FA-18D squadrons perform this mission and their success during Operation Iraqi Freedom is well documented.¹¹⁴ FACA qualified A-10 and F-16 pilots operating throughout the depth of the battlespace coordinated by F-15E "air battle managers" may be a suitable alternative to the loss of the ABCCC capability. On board systems like Link 16 would be a force multiplier in coordinating their efforts with JSTARS and AWACS and would establish a flexible, layered, and redundant battlefield management system.

This aircraft / crew combination could be made even more versatile if the crew obtained the AFAC qualification as a prerequisite to gaining a qualification in "air-ground battle management" or "TAC / AFAC manager." Strike Eagles performing these roles while actually seeing and hearing the battle unfold may prove to be an effective air battle manager "gap filler."

Command and Control elements like the ASOC, AWACS, JSTARS, and Marine DASC should have joint representation. Land force and air force expertise must be represented in order to institutionalize the trust between the components. Perhaps nowhere is this more important than the Air Support Operations Center, the agency that is responsible for ensuring air and ground forces are best used for operational effect. If JSTARS continues to assume the mission of the former ABCCC, it too will have to be a representation of institutionalized joint interdependence. Operation Iraqi Freedom has proven the merits of manning the C2 nodes that by their nature span service specific command elements. Command and control elements like AWACS, JSTARS, and the 1st Marine Division's DASC were manned with liaison officers from other services with great success.¹¹⁵ But at best, this is an ad-hoc approach. Achieving interdependence will require a critical evaluation of what service command and control nodes should be manned on a permanent basis with joint representation.

To be effective on the maneuver oriented battlefields of the future, joint command and control elements should permanently incorporate personnel that represent the land and air forces. Liaison officers temporarily assigned to fulfill these roles do not form the lasting relationships between services that are required to build effective teams. At a minimum, the ASOC, DASC, JSTARS, and AWACS should be studied to evaluate what billets can be manned by permanent joint service

equivalent qualifications. Additionally, the joint billets should be evaluated to determine which one should rate joint credit.

The Army should consider training attack helicopter pilots as Airborne Forward Air Controllers (FACAs), to operate as “airborne extensions” of the JTACs and BAE. The idea of training Army aviators as FACAs and ground FACs is foreign to most in the Army and will largely serve to re-orient the soldier with his aviation supporting arm and vice versa. Considering Army aviation as an air maneuver element “...is probably a mistake, and providing FAC capability to helicopter units a no-brainer.”¹¹⁶ Heliborne FACAs should be qualified at calling in and adjusting artillery in addition to controlling the attacks of fixed-wing aircraft similar to Marine heliborne FACA and should be certified under the Joint FACA syllabus. The “heliborne” FACA could serve as a link between Army’s artillery forward observers and be qualified as a “JTAC light” or a “Joint Fires Observer” operating as a “disaggregated JTAC” as described by Bruce Pirnie and Alan Vick in *Beyond Close Air Support*.¹¹⁷ There will be a personnel bill associated with qualifying Army aviators as FACAs and ground FACs that will require ‘top down’ leadership. But the Army’s transformation plan and the joint interdependence initiative should not stop with the Army and the Air Force. Including Naval aviation will help alleviate the manning dilemma faced by the Air Force. Additionally, to free up multi-mission fighters to be more relevant on the battlefield, the Air Force must take a hard look at Cold War legacy missions that are perhaps more suited for single mission platforms like long range bombers.

6. Train F-15E squadrons in the FACA mission.

The Air Force should consider training F-15E squadrons to the FACA mission. The F-15E is a platform that is ideally suited for the FAC(A) mission because of its “two-seat design (reduced task load on pilot, greater overall focus on mission by pilot / WSO team), advanced avionics (synthetic aperture radar, latest generation target pods, LINK-16 Fighter Data Link), extended loiter time, and large, very flexible, munitions payload.”¹¹⁸ The background paper referenced details the training syllabus, time required to certify crews, and the cost benefit analysis of this initiative, while acknowledging that a re-prioritization / reduction of the F-15E community’s current mission set will be required.

The F-16 and the A-10 are currently the only squadrons that are qualified as FACAs in the Air Force. Granting this qualification to the Strike Eagle will increase the number of squadrons capable of filling requests for forces requiring FACA mission qualifications and / or increase the density of FACAs available to coordinate air for the deep battle. The author’s own experience during OIF validates the two seat

concept as a force multiplier for the very dynamic and high task loading FACA mission. As this concept matures, corps commanders and CJFACCs will come to trust and eventually rely upon FACA crews to facilitate the deep battle in a way that transcends the old CAS versus interdiction argument. Additionally, the two-man crew has the potential to be more capable as a “super FACA,” whereby it assumes a battle manager or super SCAR role for the corps / CFACC in the deep battle. As demonstrated during OIF, there is a requirement for an entity to bridge the gap between the brigade / division close battle and the corps’ deep battle and the JFACC’s interdiction responsibilities. Ironically, the Air Force is the only service that does not use a two-seat aircraft in this role.

The potential for Strike Eagle crews to operate as “air-ground battle managers” or “TAC/FACA managers” entrusted with specific C2 authority as an extension of the TACP, BAE, and Air Support Operations Center may fill the airborne battle manager gap left by the ABCCC. This is not an initiative to turn the Strike Eagle into a “communications relay” platform. On the contrary, this aircraft / crew combination is unique in the Air Force and will lend significant firepower and situational awareness to the battlefield and aviators flying over it. Strike Eagles performing these roles while actually seeing and hearing the battle unfold may prove to be more effective than the ABCCC that traditionally operated as a communications relay at some distance from the battle.

7. Ensure joint representation over the joint battlefield.

Command and Control elements like the ASOC, AWACS, JSTARS, and Marine DASC should have joint representation. Land force and air force expertise must be represented in order to institutionalize the trust between the components. Perhaps nowhere is this more important than the Air Support Operations Center, the agency that is responsible for ensuring air and ground forces are best used for operational effect. If JSTARS continues to assume the mission of the former ABCCC it too will have to be a representation of institutionalized joint interdependence. Operation Iraqi Freedom has proven the merits of manning the C2 nodes that by their nature span service specific command elements. Command and control elements like AWACS, JSTARS, and the 1st Marine Division’s DASC were manned with liaison officers from other services with great success.¹¹⁹ But at best, this is an ad-hoc approach. Achieving interdependence will require a critical evaluation of what service command and control nodes should be manned on a permanent basis with joint representation.

To be effective on the maneuver oriented battlefields of the future, joint command and control elements should permanently incorporate

personnel that represent the land and air forces. Liaison officers temporarily assigned to fulfill these roles do not form the lasting relationships between services that are required to build effective teams. At a minimum, the ASOC, DASC, JSTARS, and AWACS should be studied to evaluate what billets can be manned by permanent joint service equivalent qualifications. Additionally, the joint billets should be evaluated to determine which one should rate joint credit.

8. “Weaponize” the ASOC.

The Air Combat Command’s (ACC) draft ASOC Enabling Concept proposes significant revisions for the ASOC organization and training in order to better support the Army’s modular Brigade Combat Team construct.¹²⁰ These efforts are far reaching and promise to bring meaningful changes to the Air Force’s ability to better integrate aviation fires with traditional ground maneuver forces and non-traditional forces like Special Operations Task Forces. However, more can be done.

The most significant challenge facing the Air Force in accomplishing the ASOC enabling concept will admittedly be the training.¹²¹ It is in this area that the draft enabling concept falls short. The Air Force should leverage the initiative to “weaponize” the Air Operations Center into a training and manning construct for the ASOC to support the modular Army. These should be a top to bottom review of the billets, to include the Air Force Specialty Codes of the individuals manning the operations side of the ASOC and those billets that support the maneuver units of the Army that are manned by Air Force personnel (JTACs, ALOs).

The personnel manning the ASOC should be “weaponized” by rounding out the officers and enlisted ASOC force structure so they form a professional and specialized command and control career field. This would enable the ASOC to retain an institutional memory concerning the lessons of past conflicts as normal personnel rotations take place. Tour lengths should be a minimum of three years, which would also prevent the ASOCs from becoming an organization that comes together prior to a deployment, sometimes in an ad-hoc manner, depending upon the timing and unit deployment schedule of the Army unit to which it will be attached. Career aspirations can be enhanced for the ASOC specialist by affording him the opportunity to command the Air Support Operations Squadron and the Air Support Operations Group. The billets filled by rated Air Force aviators and JTACs that formally man the ASOC could then be used to help alleviate the shortage of ALOs and JTACs. This manning solution should also include Army C2 specialists capable of integrating helicopter operations with that of fixed-wing aviation.

Another proposal worth pursuing would be changing the operational control of the ALOs and JTACs assigned to the Army. The ASOC organization should remain operationally controlled by the numbered air forces and the AOC. However, manning ASOCs by C2 specialists allows the ALOs assigned to the corps and below to be assigned under the operational control of the Army headquarters to which they are assigned. This will enable them to devote their full effort to becoming a permanent member of the ground commander's staff enhancing the ALO's ability to plan, coordinate airpower, and ultimately educate the commander on the employment of airpower. Airpower experts can then build the bonds with their Army counterparts to enhance air / ground cooperation while preserving the tenets of a single air component commander-centralized command, decentralized execution.

Personnel

1. Modify rated aviator career progression.

Army and Air Force aviator training and career progression to paths should be changed so as to institutionalize joint interdependence. The current two year tour out of the cockpit assignment for Air Force ALOs makes it difficult for Air Force aviators to maintain a competitive edge with those remaining in the cockpit. Because this process makes it difficult to get 'volunteers,' squadrons are forced to send those that are 'expendable.' The Air Force, along with the Navy and Army, should examine the ramifications of sourcing Officer TAC / ALO billets for 12-18 months, aligned with the brigade's deployment cycle (see figure 9). The columns represent a typical aviator career path between the three services indicated. The "ALO" note after the years indicated under the Air Force column indicates where an ALO captain or ALO major is normally selected. The middle column indicates the timing during a Marine aviator's career where he can expect to serve as a Ground Forward Air Controller or Air Officer with an infantry unit in a billet capacity commensurate with his rank and experience. A typical Marine captain interested in career progression will either attend career school or take a Ground Forward Air Controller billet after he has served about three years in his first operational squadron.¹²² Both are considered career enhancing and both equate to roughly the same amount of time out of the cockpit. However, given two aviators with similar records, one with career level school and one with a Ground Forward Air Controller tour, the one with the ground tour will be more competitive.

Typical Career Aviator Progresión: USAF VS USMC VS USA*

	USAF	USMC	USA
GO	23-26 years	26+ years	26+ years
CO Wing /Group/Reg	20-21	24-26	23-26
Ops officer / CO Sqn/Bn	17-20	18-21	18-21
Staff	14-16	15-18 Air Officer (Div)	14-16
Squadron / Bn Staff	12-14 ALO	11-15 Air Officer (Reg)	12-14
ACSC	10-12	10-12	10-12
Company Command	NA	NA	5-7
Company grade school	6-8	6-8	4-5
UPT to squadron	2-11 ALO	3-10 GFAC (Bn)	2-4

Figure 9. Comparison of Aviator Career Progression Across the Services

*(These numbers represent an average career track for an aviator in each service and are by no means scientific. The ranges indicated were determined from speaking to members of each service and only indicate a consensus of opinion.)

Expanding this concept to the Army / Air Force / Navy would gain the same benefits. For example, company grade officers completing their first three years in a squadron can either attend career level school or complete a one year assignment with the Army as a BALO dual qualified as a JTAC. Officers selected for these billets should be considered ‘promotable’ and possess sufficient credentials to earn a seat at the Air Force weapons school or, in case of the Army, be considered for company command. This would entice aviators to look at the land service from a different perspective. The intended benefit would be that the squadron would get more pilots with ground experience and the infantry commander would get quality aviation experts. The quick turn out of the cockpit will lessen the impact of the current two year tours, particularly for captains completing their first tour.

Air Force and / or Navy ALOs should be selected based upon their ability to represent the issues surrounding airpower and above all else their ability for career advancement. Their return to a flying billet after their 12-18 months should be a guarantee so cross pollination among the ground and aviation communities is achieved. Nominees for ground tours should be closely screened to ensure they have potential to return to their squadron capable of attending the Fighter Weapons School or its equivalent. This process would ensure the “trainers” get a well rounded experience of specific ground and aviation experience. Of course, implementing this assignment policy would be a significant career path

shift for the Army, Navy, and the Air Force. Top down leadership would be required to ensure its success. This recommendation helps ease the shortage of Air Force pilots required to fully man the ALO and ASOC positions let alone the increase requirements to support the Army's transformation plan.

2. Increase the number of aircrew qualified as a FACAs.

Shortfalls in sourcing current TAC requirements accurately predict the problems with sourcing more TACs, as required by the Army's transformation plan. "Disaggregating" some TAC functions to qualified Army enlisted controllers, properly networked and coordinated, and qualifying Army helicopter pilots as FACAs is just one solution.¹²³ Additionally, expanding the FACA mission to the Strike Eagle and the Army attack helicopter communities increases rotary-wing-fixed-wing integration as each community requires the other to act as "training" aides in order to achieve FACA qualifications. This in turn would force improved working relationships between the Army and the Air Force as they schedule more routine training evolutions designed for mutual qualification. This "cross-certification" could occur at informally arranged small-scale upgrade flights or during large force exercises.

Unit Level Training

*We must transition from an interoperable to an interdependent force where different capability sets can be rapidly integrated to achieve desired effects. Innovative operations concepts, training, and experimentation along with a focus on team-work are key to success.*¹²⁴

One should not count on a very great effect from air support until air units had trained extensively with ground forces.

Gen George S. Patton

1. Reestablish the trust.

The only way to engender the trust required to make joint interdependence for air ground operations work is through joint training specifically designed to score air-ground interaction. The two largest training exercises held at the National Training Center and Red Flag are the first places to start. These exercises, along with the smaller and service specific exercises, like the Navy's Air Wing Fallon exercise and the Marine Corps' Combined Arms Exercises, must be part of the overall joint training picture to ensure seamless interaction among the services while still accomplishing service specific mission performance standards.

There are elements of each of the exercises above that can be modified without jeopardizing service culture or effectiveness while nurturing trust and teaching the very important lessons of air and ground operations.

The National Training Center (NTC) has traditionally served as training venue for a helicopter supported mechanized maneuver force against a living, breathing, mechanized opposition force.¹²⁵ It was specifically designed to test brigade and corps level application of current Army doctrine. All fires are simulated, allowing commanders to test their planning and decision making criteria as the battle unfolds. A common complaint heard among Air Force leaders is that it is not designed to test the impact fixed-wing air would have upon a mechanized force before it came within range of corps level organic fires.¹²⁶ As structured, the exercise gives credit to Apaches and ATACMS for the destruction of enemy forces but does not give credit to fixed-wing interdiction as the opposition closes with range of the Corps / Brigade fires. NTC does not test the ground component commander's planning considerations and opportunity costs associated with fire support control measures that may enhance the use of organic fire support agencies at the exclusion of another. Lastly, NTC exercises do not test the understanding of one service's knowledge of the other service's core missions.

RED FLAG exercises can be considered the opposite of NTC exercises. They are designed to replicate the opening days of a war and are centered on those missions the CJFACC will be tasked to conduct to establish air superiority among others. Red Flags are an air centered exercise focusing on large force employment at the tactical level of war. To a limited extent, they also exercise the Air Operation Center's ability to control. Red Flag exercises have evolved to where they incorporate a larger percentage of CAS, SCAR, and FACA, but these missions are not conducted in coordination with ground maneuver and organic fires such as attack helicopters and the Army Tactical Missile System. Testing the air apportionment process (strategy) and sortie allocation (plans) in coordination with organic maneuver unit fires does not occur. Killbox operations are part of the exercise but are absent the frictions associated with the injection of ground maneuver forces. Effectiveness of supporting commander's intent or grading the performance of Air Liaison Officers, JTACs, and the ASOC are beyond the scope of the exercise. Recent changes have instituted FACA and SCAR control of air operations in killboxes short of the FSCL and also include elements of the Air Support Operations Center.

Combined Arms Exercises (CAX) are designed to train and test Marines in the integration of air and surface fires at the battalion level in

the form of a Marine Air Ground Task Force (MAGTF). Much smaller in scope than NTC exercises they are an air-ground exercise utilizing live fire against a notional enemy based upon a building block approach. There is a heavy focus on close air support in conjunction with artillery and mortar indirect fire supporting blue force maneuver. Each CAX consists of the four elements that make up a MAGTF—a ground combat element, air combat element, combat service support element, and a command element. The Fire Support Coordination Center and the Direct Air Support Center's ability to integrate aviation and organic fire support with the ground scheme of maneuver is evaluated and critiqued through a number of scripted, short duration exercises designed to test fires coordination in the offense, and defense under different enemy scenarios. This is the critical part of CAX training. Not only are the ground units and aviation units trained to specific objectives, but the DASC and the fire support coordination center are trained and tested in their execution of the command and control of air in concert with maneuver during each and every CAX training event.

CAX training is much smaller in scope as compared to NTC and Red Flag. Though CAXs offer limited fixed-wing aviation value beyond close air support and the employment of live munitions the training evolutions provide a tremendous value in enabling infantry, aviation and command and control to interact personally on a daily basis. This interaction pays huge dividends in the development of air and ground leaders in the mutually enabling effects of air and land power.

A sub element to the CAXs is the Weapons and Tactics Instructor course hosted twice a year by Marine Aviation and Weapons Training Squadron-One in Yuma, Arizona. Elements of the MAGTF are brought together to “train the trainer” in the employment of all aviation elements of the MAGTF, fixed and rotary aviation employment, and command and control. Graduates of the course return to their squadrons to become training officers.

Air Wing Fallon training exercises are the Navy's version of Red Flag Exercises. The exercises are focused on a crawl, walk, run approach that gradually integrates all elements of the carrier air wing similarly focused on the first days of a campaign. It consists of scenarios that span the mission width and breadth of those capabilities resident in a carrier air wing. Like the Red Flag exercises, they practice elements of ground support but only at the terminal attack controller level and do not exercise

their ability to integrate with a coordination center like the ASOC or DASC. There is no integration with the Air Wing with organic ground fires or ground maneuver.

2. Tailor joint interdependent training.

Tailoring elements of each of the service's training exercises can make significant improvements to the joint training of CFACC aviation. These are listed below:

a. The close proximity of Fort Irwin, Nellis AFB, 29 Palms, Navy Fallon, and WTI at Yuma Marine Corps Air Station offers unique opportunities to align service-specific training opportunities so that portions of each exercise overlaps to test joint integration when ever possible. Joint Forces Command should coordinate this effort.

b. The National Training Center at Ft Irwin should evolve into a true joint exercise structured to test joint learning objectives centered on employing air and ground capability for mutually enabling effects. Recognizing the fact that armor and attack helicopters still need to train against a strong opposition force, NTC can be restructured to test the integration of fixed-wing fires and ATACMS in a deep battle, and then the exercise can be reset to test the closer battle and the integration of artillery, close combat attack, and close air support against the "reconstituted" opposition.

c. NTC exercises should highlight Joint Air Attack Tactics for rotary-wing and fixed-wing operations as a cornerstone element of the close battle. The complexities of JAAT necessitate frequent exposure to the nuances of putting all of the moving parts of JAAT together so that it becomes second nature during time of war.

d. A joint schoolhouse or joint weapons school should be chartered and tailored to "train the trainers" in planning and employing interdependent capabilities like rotary-wing and fixed-wing aviation. Army aviation does not currently have a "weapons school" designed for the development of training officers that is equivalent to the Air Force's Weapons School, Navy's Top Gun, or the Marine Corps' WTI program. As the primary end user of fixed-wing aviation the Army should take the lead in developing such a school in conjunction with service partners.

As shown above, although there is a significant training investment being made by the services to prepare America's forces for combat, most of the investment only exercises service-specific training goals. Many of the exercises are joint, but they are not focused to evaluate joint interdependence. By taking a joint interdependent approach, perhaps

coordinated through Joint Forces Command, they can achieve the interdependence envisioned by the service chiefs.

Conclusion

The only thing we learn from history is that we don't.

- Unknown

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Ultimately, the last question remaining to be answered is “so what?” If nothing is done to institutionalize a culture of interdependence—or more specifically, not institutionalize the lessons of the current conflict and the ones that preceded it—the services will do what they have always done and ultimately use the spirit of cooperation and the strength of personal relationships to compensate for doctrinal frictions and organizational seams by working things out real time in a conflict. After all, under the Title 10 responsibilities for each of the services, the service chiefs are responsible for the organization, training, and equipping of their components for the joint commander, not to ensure they are interdependent.

Therefore, my answer to the “so what?” question is that in the next war the Joint Force Commander may not have the opportunity to fix the problems of non-interdependent forces, exemplified through redundant and overlapping service capability, before the inefficiencies of increased casualties and lengthier campaigns have a negative strategic effect upon the democracy that we serve. Operation Anaconda is just one example where throwing more airpower into a poorly planned, non-interdependent operation was the wartime equivalent to sending good money after bad.¹²⁷

Addressing the issues to reduce the areas of friction and close the seams between the land forces and the air forces that are outlined in this paper cannot be left up to the services alone to implement. Title 10 “deconfliction” must give way to interdependent doctrine, force structure, training exercises, and personnel policies. It will require a top down “31 Initiatives” like approach; but this time it must be carried through to fruition. However, the inter-war periods of the last 60 years prove that the service components have so far been incapable of such a feat. Therefore, developing a culture of interdependence will require much bottom up and top down leadership and will have associated costs. But such joint leadership from the service chiefs is necessary if these problems are to be resolved.

If we continue along our current track of applying incremental changes that move us closer to interdependence without ever achieving it, our costs will be in the form of higher casualties, longer time, more money, and perhaps, ultimately, failure of the campaign. All indications are that under the Department of Defense’s transformation plan these inefficiencies of

the past will no longer be able to be compensated for with overlapping and redundant service capability. Excess capacity is becoming a scarce commodity. Implementing interdependence will be expensive but only in terms of money. Perhaps the most plentiful resource our democracy possesses.

Experience over the past 60 years proves we know what the problems are. It also proves we know what the answers are. But these past six decades demonstrate that joint interdependence for air and ground operations is elusive. Perhaps this experience is best characterized mathematically. Following each conflict the land forces and the air forces recognize the deficiency. While their intentions are good, their steps only move them halfway towards a solution. Though progress is made for each step taken, they never arrive at their desired goal. There is always half the distance between the lessons learned of the last war and solutions to prevent their being re-learning during the next. Therefore, my only “unanswerable” question is: “why do we still have the problem?”

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² Col Christopher R. Papparone, U.S. Army, and James A. Crupi, Ph. D. "What is Joint interdependence Anyway?" *Military Review*, July-August 2004. p. 38.

³ Richard L. Kugler et al., "Operation Anaconda: Lessons for Joint Operations," (Washington D.C.: Center for Technology and National Security Policy, National Defense University) 8 September, 2003. See page 6 Key Lessons. They are: 1. Joint forces must continue to improve efforts to create unity of command, joint command structures, forward-deployed joint staffs, and joint planning processes for expeditionary operations. 2. Accurate intelligences estimates, well-constructed battle plans, and jointly prepared branches and sequels (adaptive plans), which continue to be critical for successful joint combat operations with small mobile forces, remain a necessity. 3. U.S. Joint forces need improvements in conducting integrated air-ground operations in such battles. Improvements are needed in creating a common understanding of joint force employment concepts, establishing effective information networks and joint communications systems, as well as in ensuring appropriate command and control of air strikes in support of ground force operations. 4. U.S. forces in battle require adequate mission orders, rules of engagement (ROE), and associated fire restrictions that give clear guidance and exert proper controls while providing force commanders the authority and latitude to execute their missions. 5. Joint forces must be fully equipped and jointly trained for impending combat operations and (to the extent possible) unanticipated surprises. Multilateral operations with allies must be well construed. Joint forces must understand the implications for training, equipping, and operating forces. 6. Defense transformation should be pursued with joint operations, as well as mastering the air-ground interaction down to the tactical level, clearly in mind-including the areas of materiel and nonmaterial solutions as well as joint training transformation.

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⁵ LtGen James N. Mattis, comments are as recollected by the author and confirmed accurate via email confirmation with LtGen Mattis. 15 November 2005.

⁶ LtGen T. Michael Moseley, Commander USCENTAF Shaw AFB. Task Force Enduring Look Interview transcript, 25 June 2005. This transcript details the personal commitment of the CFACC to keep the preponderance of Marine Aviation supporting I MEF through the use of a Direct Support ATO. LtGen Moseley stated his commitment to supporting the MEF with all available Joint Assets like AWACS, JSTARS and RIVET JOINT. In return I MEF provided a Colonel to head up the joint CAS planning effort at the CFACC. At the end of hostilities (May 2003) the 3rd MAW commander expressed his gratitude to General Moseley by presenting him an enlisted sword to commemorate the superb support the USAF provided to the MEF. The enlisted sword symbolized the many

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¹¹ Col David Larivee USAF. CFACC Briefing to USAFE, his notes from the brief. 5 May 2003. Air Force Historical Research Center, Maxwell, AFB. Montgomery Alabama.

¹² Ibid.

¹³ "Corps CAS" was a non-doctrinal term developed by V Corps to use air to work in the area between the division's forward boundary and the FSCL. Aircraft schedule for this mission fell under the apportionment guidance for "CAS." Actually, these Corps CAS sorties should be apportioned as AI even though they were planned to be employed short of the FSCL.

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¹⁵ <http://call.army.smil.mil/products/aar/asp/3IDAAR/ch12.asp>, Issue: Corps shaping versus combined air operations center air interdiction for deep shaping operations.

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¹⁷ USCENTCOM KI/CAS CONOPS, US Air Force Historical Research Center. 09 Feb 2003. p5.

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¹⁹¹⁹ LtCol Lawrence R. Roberts and John P. Farnam, USMC "Airborne Recon Supported Marines' Advances in Iraq" *U. S. Naval Institute Proceedings*, Jun 2004, p.45. See also, Killbox Interdiction / CAS Debrief. USCENTAF. Majors Greg "Skidder" Defore, and Mike "Homey" Cedarholm, 5 May 2003. The reaction of Iraqi ground forces in response to the rapid advances of the US ground forces necessitated a more reactive targeting process than that provided by JSTARS and UAV's. This requirement was largely filled by SCAR and FACA aircrew operating in the deep battle attacking targets based upon the ground commander's target priorities. The 72 hour targeting cycle could not keep pace with the ground operation.

²⁰ See MACG-38 LL ID# 2003IPOS2291, Issue #260 04/27/2003. In this role the liaison officers provided a "clearing house" function aboard AWACS between the DASC, TAOC, JSTARS Air Support Elements. The daily average of V Corps Sorties pushed to the I MEF was 150-225 per day, totaling 5600 additional sorties in support of I MEF.

²¹ Major Mark Tobin, USMC. He was assigned to Air Support Element (a sub-element of the DASC) for Task Force Tarawa. Email to author 7 Dec 2005.

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²⁴ Maj Gen Keith Stalder, USMC. Former 3rdMAW commander and Commander Training and Education Command, Quantico Va. Interviewed by author 15 Sep 2005.

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³³ Benjamin Franklin Coolie, *Case Studies in the Development of Close Air Support*. (Washington, DC Office of Air Force History, United States Air Force, 1990). p. 542.

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³⁵ The Army calls helicopter attack aviation in support of the ground forces close combat attack. The DOD Dictionary defines close air support as: “air action by fixed- and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of each air mission with the fire and movement of those forces” [emphasis added]. Close combat attack versus close air support, what is the difference? As defined by FM 3-04.111 close combat attack (CCA) is “the application of Army aviation into the close battle using integrated air-ground operations.” Joint doctrine does not recognize the term close combat attack. As attack helicopter aviation moves into the emotional and highly fought over mission of close air support, it must be done in a way that recognizes the mutually enabling characteristics of rotary-wing and fixed-wing in the close air support role.

³⁶ Bruce R. Pirnie, et al., *Beyond Close Air Support: Forging a New Air-Ground Partnership*, (Santa Monica, CA. The RAND Corporation, 2005), p. 55.

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³⁷ Bruce R. Pirnie, et al., *Beyond Close Air Support: Forging a New Air-Ground Partnership*, (Santa Monica, CA.: the RAND Corporation, 2005), pg. 27. Their point is US Airpower superiority will cause enemy forces to disperse and or hug civilian population.

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⁴⁰ David N. Spiers, *Air Power For Patton's Army: The XIX Tactical Air Command in the Second World War*, (Washington, D. C.: Air Force History and Museums Program, 2002). See chapter 2.

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⁵⁷ See “Operation Anaconda: Lessons for Joint Operations.” Richard L. Kugler, Michael Baranick, and Hans Binnendijk. Center for Technology and National Security Policy, National Defense University. September 8, 2003. See Operation Iraqi Freedom: <http://call.army.smil.mil/products.aar.asp.3IDAAR/ch5.asp> Also see *Beyond Close Air Support; Forging a New Air Ground Partnership* Bruce R. Pirnie, Alan Vick, Adam Grissom, Karl P. Mueller, David T. Orletsky. 2005 Rand Corporation

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⁶⁵ Ibid.

⁶⁶ JP 3-09.3 Joint Tactics Techniques and Procedures for Close Air Support, p. GL-10.

⁶⁷ For a detailed analysis of the FSCL debate see LtCol R. Kent Laughbaum, USAF “Synchronizing Airpower and Firepower in the Deep Battle.” (Maxwell AFB, Alabama. College of Aerospace Doctrine, Research, and Education), January, 1999. p. 16.

⁶⁸ Report of the Defense Science Board Task Force on Integrated Fire Support in the Battlespace, (Washington, D.C.: Office of the Under Secretary of Defense For Acquisition, Technology, and Logistics), October 2004, p. 62.

⁶⁹ Ibid p. 64

⁷⁰ Report of the Defense Science Board Task Force on Integrated Fire Support in the Battlespace, (Washington, D.C.: Office of the Under Secretary of Defense For Acquisition, Technology, and Logistics), October 2004, Pg. 62

⁷¹ Bruce R. Pirnie, et al., *Beyond Close Air Support: Forging a New Air-Ground Partnership*, (Santa Monica, CA.: the RAND Corporation, 2005), p.83

⁷² <http://call.army.smil.mil/products/aar/asp/3IDAAR/ch12.asp>. See also Task Force Enduring Look, Volume II “Operation Iraqi Freedom: Shaping the Battlespace and Decisive Operations.” 19 March-30 April 2003. HQUSAF, March 2004. USAF Historical Research Agency, Maxwell AFB, Alabama. Pg. 2-34-35.

⁷³ Majors Greg Skidder, Mike Cederholm. US CENTAF Lessons Learned debrief. 5 May 2003. V Corps’ requirement was for one FACA to support 24/7 coverage.

⁷⁴ Major Mark Tobin, USMC. He was assigned to Air Support Element (a sub-element of the DASC) for Task Force Tarawa. Personal interview with the author 14 Dec 2005.

⁷⁵ Ohno, Taiichi. *Toyota Production System: Beyond Large-Scale Production*. Productivity Press, Cambridge Massachusetts. p.5. It was a process of “planning parts backwards” from the finished product, in this case it was CAS aircraft on station.

⁷⁶ General Peter Pace, USMC. “The 16th Chairman’s Guidance to the Joint Staff.” *Joint Forces Quarterly*, Issue 40, 1st Quarter 2006. p 3.

⁷⁷ HQ USAF / XOOY brief, TACP/ASOC *Integration With Modular Army* 26 Oct 05

⁷⁸ HQ USAF / XOOY brief, TACP/ASOC *Integration With Modular Army* 26 Oct 05

⁷⁹ The Air Force is currently studying significant changes to the ASOC organization described in this chapter. However, this is the ASOC that supported V Corps although it was augmented with additional personnel for OIF. The proposed changes to the ASOC organization and will address billet qualifications, training standards and propose a new organizational structure to better support the Army's transformation plan. However, it will largely retain its current functionality.

⁸⁰ Joint Firepower Course Student Workbook, Nellis AFB. C2-06, Page 4

⁸¹ Col Howard D. Belote, CC of 3 ASOG, Fort Hood Texas. Phone conversation with the author 5 December 2005. Master Sergeant Brian Brock, Langley AFB. Phone call with the author 18 October 2005

⁸² Col Howard D. Belote. Phone conversation with the author, 5 December 2005.

⁸³ Col Belote.

⁸⁴ See Air Force Instruction 13-112, Terminal Attack Controller Training Program, 28 September 2005.

⁸⁵ Col Howard D. Belote. Phone conversation with the author, 5 December 2005.

⁸⁷ This "unwritten" personnel policy was supported by multiple USAF sources that I interviewed. LtGen Michael Short USAF (RET), LtCol Brian Fujimoto, former personnel assignment officer Air Force Personnel Center, to reference just two.

⁸⁸ Col. Belote.

⁸⁹ Lt Gen Short. During my interview with General Short he was forcefully advocating that the Army needs to get over their desire to always request the A-10 over other CAS capable platforms. The Army should be asking for an "effect" not a platform. "They have to get over the misconception that effective CAS can only be delivered by a low-flying A-10." He used the following comparison: "F-16's employing laser guided munitions with a Lightning pod from 15,000' can deliver the same CAS effect as an A-10 from lower altitudes."

⁹⁰ Col. Belote. However, Col Belote has observed a reversal in this trend over the past couple of years, mostly attributed to the GWOT and a genuine desire for Air Force officers to control airpower for the Army in combat.

⁹¹ Statement made to the author by an Air Force officer following a discussion of why the Air Force personnel system does institutionalize career incentives for those serving in ALO tours.

⁹² Col Belote. Phone conversation with the author, 15 Dec 2005

⁹³ Col Belote. Phone conversation with the author, 15 Dec 2005. According to Col Belote it takes at least six months to fully prepare an Air Force ALO / JTAC for operations with the Army. See also 18 ASOG AAR commander's comments, posted on CENTAF website.

⁹⁴ Major Mark Tobin, email to the author 9 Dec 2005. Major Tobin was a member of Marine Air Support Squadron -1 the squadron assigned to augment the 1st Marine Division DASC (organized and manned by 3rd MAW control group personnel) by forming two Air Support Elements during OIF.

⁹⁵ The Marine Corps will soon begin training its own JTACs in order to meet the demands of Distributed Operations. However, Marine JTACs will not supplant the requirement to train the traditional number of ground FACs and AOs.

⁹⁶ The author's experience while in attendance at the Air War College. There is a common trend among the Air Force senior leadership guest speakers to speak of the Army's senior leadership lack of airpower understanding.

⁹⁷ Col Howard D. Belote, CC of 3rd ASOG and III Corps ALO during Sep04-Feb 05. This quote was a compilation of responses he received from ground force commanders at the battalion and brigade level when asked their opinion on the quality of CAS received by the JFACC.

⁹⁸ General Peter Pace, USMC. ChAirman of the Joint Chiefs of Staff. "The 16th ChAirman's Guidance to the Joint Staff," *Joint Forces Quarterly*, Issue 40, 1st Quarter 2006. p 2.

⁹⁹ Bruce R. Pirnie, et al., *Beyond Close Air Support: Forging a New Air-Ground Partnership*, (Santa Monica, CA.: the RAND Corporation, 2005), p. 82.

¹⁰⁰ FM 3-09.34 Multi Service Tactics, Techniques, and Procedures for Kill Box Employment. Air Land Sea Application Center. June 2005. Also see CFCD-OP-A. Head Quarters Combined Forces Command, Killbox Operations-Korea.

¹⁰¹ *Ibid*, pp II-4,5

¹⁰² CFCD-OP-A. Head Quarters Combined Forces Command, Killbox Operations-Korea.

¹⁰³ Col Howard D. Belote.

¹⁰⁴ FM 90-21 JAAT: *Multi Service Procedures for Joint Air Attack Team Operation*. Air Land Sea Application Center, June 1998, p 1-1.

¹⁰⁵ FM 90-21 JAAT: *Multi Service Procedures for Joint Air Attack Team Operation*. Air Land Sea Application Center, June 1998, p 1-1.

¹⁰⁶ Draft Army Publication TC 1-400 FDFD dated 13 May 2005, Headquarters Army Aviation Center, Fort Rucker Alabama. p. 1-1.

¹⁰⁷ Typical LNO was sent at the last minute, thereby creating 'ad-hoc' relationship. He was considered "expendable" and therefore did not represent the battalion well from which he came.

¹⁰⁸ LtCol Grady King, USA. Army Aviation Doctrine Command, Fort Rucker Al. Interviewed by the author 17 September, 2005.

¹⁰⁹ Brigade Aviation Element Overview. Powerpoint brief given at Army Aviation Doctrine Center, Fort Rucker Al. 17 Sept, 2005. Brief attended by the author.

¹¹⁰ CMSgt Brian Brock, USAF Air Combat Command, A3YC Langley AFB. Interviewed by author, 20 September 2005. Chief Brock is a certified JTAC and is in charge JTAC training in the USAF. His observations of JTAC training includes monitoring the progress of enlisted and officer JTAC training. He said that rated aircrew require fewer controls to certify than their enlisted counterparts. On average Marine Cobra pilots became certified in similar time and effort as fixed-wing fighter pilots. On average, enlisted JTACs under training took the longest since they had minimal radio experience and were less experienced overall than their rated aviator counterparts. The disparity of training time for a young enlisted JTAC with only a few months in the Air Force compared to a rated aviator with typically 5-6 years of experience is a compelling comparison that lends weight to training qualified Air Force, Navy and Army aviators to this skill set.

¹¹¹ See TACP/ASOC Integration with Modular Army brief give by Major Robert Nelson, HQ USAFE/XOOY, 26 October 2005. The brief proposes aligning ASOCs with the Army Forces Generation Cycle. Essentially, each Army brigade is on a three-year cycle. Reset-retrain first year, ready for deployment second year, available for deployment third year, cycle repeats. Aligning ALO / JTAC assignments and ASOC standup with this

process will better incorporate a “team” mindset and alleviate the often ad-hoc procedures the current process causes.

¹¹² Col Howard D. Belote, Commander, 3 ASOG, Fort Hood Texas. Phone conversation with the author 5 December 2005. Air Force ALOs and enlisted JTACs require up to six months of Army acclimatization before they can be considered proficient and familiar with Army operations.

¹¹³ Colonel Mick Cantrall USAF. Col Cantrell is a C2 specialist that was the commander of a JSTARS squadron aircraft during OIF. He remarked that the JSTARS crews have difficulty managing the airborne battlefield command, control, and communication tasking simultaneously with the battlefield sensors aboard the aircraft. Radio limitations combined with managing sensors and battlefield situation understanding became very difficult.

¹¹³ Colonel John Terrell, USA, US Army War College. Email conversation with the author, 7 Nov 2005.

¹¹⁴ LtCol Lawrence R. Roberts and John P. Farnam, USMC “Airborne Recon Supported Marines’ Advances in Iraq” *U. S. Naval Institute Proceedings*, Jun 2004, p.45.

¹¹⁵ Colonel Mick Cantrall USAF.

¹¹⁶ Colonel John Terrell, USA, US Army War College. Email conversation with the author, 7 Nov 2005

¹¹⁷ *Beyond Close Air Support; Forging a New Air Ground Partnership* Bruce R. Pirnie, et al., (Santa Monica, CA.: the RAND Corporation, 2005). p. 154.

¹¹⁸ Col Kenneth Laughbaum, CC of 48th Operations Group, Mildenhall, England. Background Paper on F-15E Forward Air Controller (Airborne) Mission at the 48th Fighter Wing, Mildenhall, England. Paper emailed to the author 2 December 2005 by 48th OG Commander.

¹¹⁹ Colonel Mick Cantrall USAF.

¹²⁰ Headquarters Air Force ACC/A3YC Draft ASOC Enabling Concept, undated 2005. p. 1.

¹²¹ *Ibid*, p.3.

¹²² The process by which these officers are selected is not scientific. A typical squadron will have to fill about two-three ground FAC billets during a year. Candidates have the option of volunteering or are selected based upon their time on station and reputation / ability to represent Marine Aviation. Their normally return to the parent unit of the squadron the previously served and then are considered for placement and training as a training officer the most coveted billet for a junior officer in a squadron.

¹²³ Bruce R. Pirnie, et al., *Beyond Close Air Support: Forging a New Air-Ground Partnership*, (Santa Monica, CA.: the RAND Corporation, 2005), p. 27.

¹²⁴ General Peter Pace, USMC, Chairman of the Joint Chiefs of Staff. “The 16th Chairman’s Guidance to the Joint Staff,” *Joint Forces Quarterly*, Issue 40, 1st Quarter 2006. p 3.

¹²⁵ For years NTC operated in this manner. However, NTC was recently changed to replicate current conditions in Iraq focusing on urban operations and stability and support operations.

¹²⁶ LtGen Michael Short, USAF (RET). Interviewed by the author 15 Sept 2005.

¹²⁷ Ben Lambeth, Franklin Cooling, Robert F. Futrell, John Schlight, Bruce Purnie.