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14. ABSTRACT

The priority assigned to CAS has created animosity within the services since the beginning of aviation support. The Army refuses to acknowledge its rotary wing CAS capability, the Air Force views CAS as its lowest priority, while the Marine Corps has developed its war fighting doctrine based on fully integrating its ground and aviation fires capabilities. The timing and magnitude of Sequestration under the 2011 Budget Control Act, along with the 2013 Defense Budget Continuing Resolution, will create budget shortfalls in training leading to deficiencies in combat readiness. As the Nation's strategic focus pivots to the Pacific, the services must acknowledge the changes required in joint doctrine and joint training to ensure the next conflict is engaged by a fully integrated air-ground team in the CAS environment. The lack of implementing a fully integrated CAS doctrine and training plan will lead to repeated lessons learned from World War II, Korea, Vietnam, Desert Storm, Operation Enduring Freedom, and Operation Iraqi Freedom.

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MASTER OF MILITARY STUDIES

Close Air Support in a Joint Environment: Disconnect between the services and how to improve Close Air Support.

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OF THE REQUIREMENTS FOR THE DEGREE OF
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Executive Summary

Title: Close Air Support in a Joint Environment: Disconnect between the services and how can Close Air Support be improved.

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Thesis: Close Air Support (CAS) is deemed a high priority within the ground community, but there is a major disconnect between the services with prioritizing and executing CAS. The services must embrace CAS in doctrine and training in order to be prepared for the next military conflict.

Discussion: The priority assigned to CAS has created animosity within the services since the beginning of aviation support. The Army refuses to acknowledge its rotary wing CAS capability, the Air Force views CAS as its lowest priority, while the Marine Corps has developed its war fighting doctrine based on fully integrating its ground and aviation fires capabilities. The timing and magnitude of Sequestration under the 2011 Budget Control Act, along with the 2013 Defense Budget Continuing Resolution, will create budget shortfalls in training leading to deficiencies in combat readiness. As the Nation's strategic focus pivots to the Pacific, the services must acknowledge the changes required in joint doctrine and joint training to ensure the next conflict is engaged by a fully integrated air-ground team in the CAS environment. The lack of implementing a fully integrated CAS doctrine and training plan will lead to repeated lessons learned from World War II, Korea, Vietnam, Desert Storm, Operation Enduring Freedom, and Operation Iraqi Freedom.

Conclusion: The U.S. budget deficit and the consequences of sequestration will hamper the military's ability to train its forces for combat operations. It is incumbent for the services to develop a joint doctrine and joint training regiment that will prioritize CAS in order to ensure the next conflict is engaged by a fully integrated air-ground team.

PREFACE

I began my military career as an AH-1W pilot serving three tours in Iraq supporting Army and Marine ground forces. After my time in the HMLA community, I completed a tour with 1st ANGLICO where I deployed to Afghanistan as a SALT leader. Once I completed my tour with 1st ANGLICO, I successfully screened and was assigned to a Naval Special Warfare unit where I conducted research and development in the fire support field. While in that unit, I volunteered to deploy to Afghanistan as a Fires Officer where I became acquainted with Air Force CAS players. Throughout my time in the military, and my five deployments, I was involved in the CAS arena in some form or another. The one lesson that I was constantly reminded of was the disconnect between the services when conducting CAS. This paper will investigate why there is such disconnect in CAS and how the military can most effectively integrate the air-ground team to enhance its effectiveness in CAS. To realize the full potential of CAS, this paper will address and recommend changes to doctrine and joint training.

I would like to thank Dr. Mark Jacobsen for his guidance and mentorship throughout this endeavor. My gratitude is also owed to the instructors of the Skid Shop at Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) and the instructors at Expeditionary Warfare Training Group Atlantic (EWTGLANT) who took the time to shape my concept and point me towards a solution to improve CAS. I would also like to thank the pilots (Army, Air Force, Marine and Navy) who gave me a different perspective on their services' views on Close Air Support.

INTRODUCTION

After years of operating in the Middle East, the U.S. military is beginning to conduct a strategic pivot towards the Pacific. The movement signifies a shift in what has become the norm in the U.S. military, combat operations in Iraq and Afghanistan. The quest to reduce the Nation's fiscal debt has projected impacts on the Department of Defense budget. As a result, there is an increased possibility of creating a hollow force due to a convergence of budget conditions and legislations, which will cause deficiencies in force readiness. The timing and magnitude of Sequestration under the 2011 Budget Control Act along with the 2013 Defense Budget Continuing Resolution will cause a 20 percent decrease in funding. Funding cuts for training exercises, included in the 20 percent funding decrease, will leave the military insufficiently prepared for combat operations.[1]

Joint Operations requires continuous training, a holistic way of thinking, and a sound doctrine to maximize unity of effort.[2] Joint operations among the services, and with U.S. allies, have proven extremely beneficial during the past decade as the world confronted the threat of terrorism. These counterinsurgency (COIN) operations and the lessons learned have created unity in military operations not previously seen in the history of the U.S. military.

Close Air Support (CAS) requires joint operations bringing together members of different services in a three dimensional arena that requires "detailed planning, coordination and training for effective and safe execution."[3] The U.S. military has reached a stage where integration of ground and air forces is more the norm than the

exception. However, the military still requires more specific joint training for both pilots and joint terminal attack controllers (JTACs) in order to increase CAS effectiveness.[4]

Joint Publication 3-09.3, defines CAS as an "air action by fixed-wing and rotor-wing aircraft against hostile targets that are in close proximity to friendly forces, and requires detailed integration of each air mission with the fire and movement of those forces."[5] The phrases "close proximity to friendly forces" and "detailed integration" make CAS an intricate mission if there are deficiencies in coordination between the air-ground team. CAS procedures should be second nature to pilots and JTACs because of the inherent dangers associated with delivering high explosive weapons near friendly forces. A mistake by a CAS player can have serious consequences, which will inevitably affect mission accomplishment.

CAS is deemed a high priority within the ground community, but there is a disconnect between the services when executing CAS. The Army refuses to acknowledge its rotor wing CAS capability, the U.S. Air Force (USAF) views CAS as its lowest priority, while the Marine Corps developed its war fighting doctrine based on fully integrating its CAS capability. This paper will analyze the doctrinal approach and training mindset within the military, which demonstrates why there is distinction between the services when applying CAS in the battlefield. If the services do not embrace CAS in doctrine and training, as the withdrawal of forces from Afghanistan and the pivot to the Pacific occurs, the military is bound to relearn the same lessons from World War II (WWII), Korea, Vietnam, Desert Storm, Operation Enduring Freedom (OEF), and Operation Iraqi Freedom (OIF).

HISTORY OF CLOSE AIR SUPPORT EFFECTIVENESS

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

A study in evolution of CAS, the misalignment in the services' doctrines, and the repeated lessons learned from past conflicts must be conducted to understand the differences in how the services view CAS. Joint Publication 3-09.3 acknowledges seven conditions required to effectively conduct CAS. Of the seven conditions, there are three that, if not done correctly, will hamper the execution of effective CAS:

1) Thoroughly trained personnel with well-developed CAS skills,
2) Effective planning and integration between the ground and air services, and
3) Effective command and control of air operations.[6]

Throughout the history of CAS, the lack of implementing these conditions has been a source of friction between the services and the execution of effective CAS.

Since the birth of the airplane, war fighters have envisioned different methods of employing air power in combat. As early as 1916, the British began experimenting with aircraft strafing tactics during the Battle of the Somme.[7] A year later, aviation employment advanced to a point where it could kinetically contribute to ground combat operations.[8] However, rather than using the effects of air delivered fires against enemy forces, ground commanders preferred the psychological effects CAS brought to the battle field.[9] The result of this type of mindset created difficulties in convincing ground force commanders that aviation fires could be employed in close proximity to friendly forces and throughout the deep battle space.[10]

World War II

World War II gave the airmen a chance to provide different aviation venues against adversarial forces. The technological developments of airpower offered greater opportunities at the operational and strategic level, which included air superiority and

strategic bombing missions.[11] However, the low priority placed on CAS at the tactical level stagnated the capability of aircraft supporting ground forces.[12] Such developments prompted General George Marshall and Lieutenant General Henry Arnold, Chief of Staff of the Army and Army Air Force (AAF) respectively, to push for a new joint doctrine for CAS.[13]

The Army's new doctrine, FM 31-35 *Aviation in Support of Ground Forces,* published in April 1942, was a compromise solution. It established centralized control over tactical air operations under an AAF officer, who was an air advisor officer to a ground commander.[14] The ground commander provided the intent for aviation, while the AAF officer would dictate how to achieve that intent. However, the lack of coordination in planning and execution of CAS between ground and air commanders led to inefficiencies in the integration of the air-ground team.

In July 1943, the AAF published a new manual, FM 100-20 *Command and Employment of Air Power*, which provided centralized control of aviation assets and rendered CAS as "the last priority of tactical air missions" after air superiority and interdiction.[15] Unbeknownst to the Army, the AAF published the FM 100-20 as a "declaration of independence" stating that "land power and air power are co-equal and interdependent forces; neither is an auxiliary of the other."[16] The publication further stated that the AAF's primary mission was to neutralize the enemy's air forces. The breakdown in doctrinal approach in implementing air support for ground forces further increased friction between the Army and the AAF.

On July 26, 1947, President Truman signed the National Security Act (NSA) along with Executive Order 9877. These two documents created a new military structure

by specifying roles to the different military services. The NSA also led to the establishment of the USAF as an independent service, and mandated that all attack fixed wing aircraft from the Army be assigned to, and under full operational control of the USAF.[17] As the newest service in the military, the USAF felt the need to prove its worth as an independent branch, creating further dichotomy with the Army.

Korea

On June 25, 1950, almost three years after the USAF became an independent service, the North Korean People's Army (NKPA) invaded South Korea.[18] The USAF, still trying to prove its worth as an independent service, saw its "primary mission as the nuclear bombing of Soviet industrial and political targets."[19] To its credit, the USAF's ability to prosecute deep targets and logistical nodes, while still maintaining air superiority, proved to be instrumental for the success of ground operations. [20] However, this mindset caused the USAF to be "unprepared for the anachronistic aspect of the conflict" which led to relearning CAS lessons from WWII.[21] For example, the USAF's jets were state of the art aircraft designed for aerial combat but were less effective against enemy ground troops in close proximity to friendly forces.[22] The USAF's inability to deliver accurate fires within close proximity of ground forces led to heavy criticism and animosity from the ground troops, further hindering the air-ground relationship.[23]

The Marine Corps, on the other hand, relied extensively on Marine CAS. During the war a common statement from Marine ground commanders was that if they could not have Marine CAS they would rather have no air support at all.[24] To the Marines, CAS was an additional fires capability utilized against the enemy. During the Inchon landing, the only aviation supporting the landing force was from carrier-based units. Throughout

the withdrawal from the Chosin Reservoir, Marine pilots often flew under mortar fire to deliver ordnance in support of their brethren Marine ground counterparts.[25] This is not to say that Marine pilots were more skilled; the key factor that led to that type of support was the personal relationship shared between the Marine air-ground team.[26]

Vietnam

Friction and lack of cohesiveness between the services, to include doctrinal differences in command and control and strategic views for a limited war between the Army and the USAF, continued into the Vietnam War.[27] At the operational level, the USAF aimed at uniting all air power assets, under the control of the USAF's Tactical Air Control System (TACS). This led to further animosity between the ground services, specifically the Marine Corps, who sought to maintain its own organic aviation resources.

The Army, introducing the first attack helicopter, also sought to regain its own aviation resources. The UH-1 Iroquois, commonly known as the Huey, appeared in 1958. Although envisioned to be a utility aircraft, the Army soon found applicability for the Huey in aviation fire support.[28] The Army's new capability for organic CAS became a point of contention for the USAF.[29] To the USAF, Army CAS represented a threat to its tactical air power and its doctrinal tenet that all air assets fall under the USAF's control. However, the USAF still believed its role during the war was that of air superiority and air interdiction rather than a supporting role to ground operations.[30]

Throughout the Vietnam War, the armed helicopter proved to be more responsive to what the ground commander requested. The situation in Vietnam required speedy reaction on the part of air assets to engage fleeting targets. Utilizing Army helicopters in

direct support of the ground commander proved to be faster than requesting fixed wing fighters through the TACS.

Towards the end of the Vietnam conflict the USAF, concerned about losing its role in the CAS environment, reluctantly fielded the only USAF aircraft designed primarily for CAS, the A-10 Thunderbolt II.[31] Fielding this aircraft ensured the USAF maintained its CAS role and satisfied the Army's need to further develop advanced attack helicopters.[32] However, the lack of sound doctrinal guidance, command and control, and CAS training continued to affect the integration of air and ground forces.

Goldwater-Nichols Act [33]

The intent of the 1986 Goldwater-Nichols Act was to unify the military services in order to "create a joint force that could train, communicate, fight as one," and to enable the services to work together by utilizing "all the tools in the toolbox to any given campaign.[34] The Goldwater-Nichols Act created the Joint Forces Air Component Commander (JFACC) concept to increase air unity of command and unity of effort. To the USAF an "airman", who would control all aviation assets to include those from the Marines and Navy, would command the JFACC.[35] The Marines quickly protested the very concept of the JFACC. As the Marines Corps saw it, if the Marines had the "responsibility for a specified area… within that area it was the commander of the Marine Air Ground Task Force (MAGTF), not the JFACC, who determined missions and priorities."[36] To dilute further friction, the USAF and Marine Corps came to an agreement that Marine aviation would support the Marine ground force first, and if there were additional air assets not employed, they would be tasked to the JFACC.[37]

Ultimately, the end result of the Goldwater-Nichols Act created little to no jointness specifically in terms of CAS.

Gulf War

The military campaign during the Gulf War was designed around four distinct phases: "Phase I: Strategic Air Campaign, Phase II: Air Supremacy in Kuwait, Phase III: Battlefield Preparation, and Phase IV: Offensive Ground."[38] It was the first time the USAF employed the JFACC concept, which focused on unity of effort from every service's air assets. The JFACC was responsible for "planning, coordination, allocation, tasking, and apportionment" of all air assets for the Joint Force Commander.[39] The JFACC was able to exercise its new responsibilities through the Air Tasking Order (ATO), which "provided detailed directions for all Coalition flight operations."[40] This new authority further increased the friction between the USAF and the other services. To the Army, Navy, and Marine Corps, the ATO was used to fulfill what the USAF prioritized as essential. Although the USAF "focused on how to exploit the potential of air power in warfare and how to win a greater role for air power in joint operations," CAS was still perceived as a lower priority, which led to insufficient support to the ground forces.[41]

Operation Enduring Freedom (OEF)

During the initial stages of OEF, the USAF and Special Operation Forces successfully collapsed the Taliban and al Qaeda's major command and control nodes and air defense systems. However, in March 2002 the Army conducted its first major ground combat operation in Afghanistan, Operation Anaconda. During the planning phase of the operation the Army failed to involve the USAF, which ultimately led to unresponsive

fixed wing air support during the execution phase. The lack of integration during the planning phase led to USAF CAS players being unfamiliar with the ground commander's maneuver plan and intent thus creating the perception among the soldiers that the USAF lacked the interest and skill required to support ground forces. This operation demonstrated the significant shortfalls within the U.S. military to achieve cross-service integration. The result of Operation Anaconda, and the lack of integration between the USAF and the Army, created further consternation between the air-ground team.[42]

Operation Iraqi Freedom (OIF)

Eighteen months later the air effort, coordinated by the JFACC during the initial stages of OIF, were crucial in allowing the ground forces to maneuver freely through the battlefield and rapidly collapse the Iraqi regime. The combination of "air dominance, improved command and control, and an all weather capability" gave the U.S. the ability to seek and destroy the enemy under any condition.[43] As the Army and Marines moved towards Baghdad and the surrounding populated areas, there was a major disconnect with respect to CAS between the Army-USAF relationship and that of the Marines. The Marines' "willingness to integrate CAS into an urban fight" surprised USAF pilots who were accustomed to the Army's slow approval process.[44]

As a result of the USAF's centralized control system and integration with the Army, approval to prosecute targets was maintained at the operation level, thus creating delays in ordnance employment.[45] The lack of CAS command and control training and familiarity in capabilities between the Army and the USAF led to CAS being employed inefficiently and ineffectively. Due to delays in the CAS mission approval process and the lack of air employment, it became common for coalition air assets to depart an Army

zone and request to proceed to a Marine zone where they would be employed expeditiously.[46]

After the collapse of the Iraqi regime the U.S. military witnessed the rise of insurgency around urban areas, however, CAS still played a vital role against the new threat. Operation Phantom Fury, led by the Marine Corps in November 2004, provides a perfect example of how the services can integrate their ground and air assets to achieve effective CAS. [47] From the inception of the plan, Operation Phantom Fury did not resemble the "win from the sky" mentality.[48] Instead, the plan embraced the "boots on the ground but supported from the sky" philosophy used in the MAGTF.[49] The fire support plan for Operation Phantom Fury was based on the Marine Corps' combined arms doctrine that emphasized the integration of all air and ground fires assets.

Previous to Operation Phantom Fury the command and control of air assets reverted to the JFACC, except in a Marine area of operation where the Marine's Direct Air Support Center (DASC) owned 11,500 feet and below. Having two air controlling agencies created unnecessary delays when the Marines were trying to employ fixed wing CAS. In order to maximize and expedite the employment of air assets during Phantom Fury, the Marines requested and received a high-density airspace control zone (HiDACZ) from surface to 25,000 feet with a 15-mile radius.[50] The system led to over 310 precision bombs, 391 rockets and missiles, and 93,000 cannon rounds employed against insurgents with no fratricide incident.[51] The inherent Marine air-ground relationship was the main reason for the success of the operation.

CURRENT COIN CONFLICT

The conflict in Iraq and Afghanistan brought forth a combat environment that integrated conventional and unconventional operations. The majority of these operations have been conducted within the urban environment where the enemy has had the advantage of disappearing within the local populace. In 2006, the Army and Marine Corps published the U.S. Army Field Manual 3-24 and Marine Corps Warfighting Publication 3-33.5 to address the issues of counterinsurgency (COIN). The COIN environment requires detailed ground interaction and warns that collateral damage caused by conducting CAS can and will "be used as propaganda against the counterinsurgent."[52] The lack of input from the USAF while developing these ground-centric COIN publications influenced the USAF to develop its own COIN doctrine, Air Force Doctrine Document 2-3, which describes the benefits the USAF brings to the COIN environment.[53] Ironically, the implementation of CAS continued to be a source of controversy within top military leaders.

In 2009, General Stanley McChrystal, Commander of International Security Assistance Force (ISAF) stated that "air power contains the seed of our own destruction," which further alienated the relationship between the services.[54] Minimizing collateral damage in a COIN conflict must be adhered to, but the apprehensions of second and third order effects have caused unnecessary delays in the CAS approval process. Multiple after action reports (AARs) submitted by Marine battalions remarked on the inefficient approval system of CAS missions.[55] The lack of joint ground-air training, lack of ground commander's familiarity with aircraft capabilities, and appropriate weapon to target match have caused a continual break in the integration of CAS in support of ground

forces. Training exercises that focus on the integration of the air-ground team will maximize the operational effectiveness during any combat operations.

THE FUTURE OF THE AIR FORCE

> *Controlling and executing CAS needs to be a primary mission for the supporting assets and should not be looked at as a sideline or part-time job.*[56] *– Steve Call*

The USAF has the responsibility to fight at the strategic level. Title 10, United States Code, clearly defines the reason why the USAF's mindset towards CAS is different from the other services.[57] The culture embraced by the USAF is one of "worshiping the altar of technology," and as such it must look at how to implement those technologies to meet strategic objectives.[58] Conversely, the Army and Marine Corps are predominately employed at the tactical level.

To remain viable as an independent service over the last ten years, and because of the CAS-centric environment, the USAF has accepted its role in CAS. The land-centric combat environment has influenced the belief within the USAF that its primary duties are to support ground forces.[59] Conversely, there is currently a perception within the USAF that its airmen have lost the air-mindedness that has made it unique among the other services.[60] To USAF purists, the best use of USAF assets is against a peer competitor in the Pacific where the Air-Sea Battle concept can be applied.

The reform within the USAF emphasizes a change in the land-centric mentality in order to concentrate on the USAF's core functions. The USAF has recently refined its core duties and responsibilities reorganizing what were previously six distinct capabilities and seventeen operational functions into twelve core functions.[61] The USAF's leadership has recommended a prioritization of seven core functions: "(1) Nuclear Deterrence Operations, (2) Air Superiority, (3) Space Superiority, (4) Cyberspace Superiority, (5)

Global Precision Attack, (6) Rapid Global Mobility, and (7) Global Integrated Intelligence, Surveillance, and Reconnaissance (ISR)", where CAS is conspicuously absent.[62] Although these core functions are extremely important to attain the nation's strategic objectives, they would also take away from the mentality required to perform CAS.

The most recent Department of Defense Directive (DODD) 5100.01 requires the USAF to gain and maintain air superiority and air supremacy, gain and maintain space superiority, and conduct nuclear operations in support of strategic deterrence.[63] Although DODD 5100.01 does mention the responsibility of the USAF to provide CAS to ground forces, it is not a top priority. In 2011, General Norton Schwartz, Air Force Chief of Staff, stated that these seven core functions needed to be protected from the potential budget cuts. These functions provide the nation's leaders with strategic options to include "exploitation of the air and space domains, as well as mission assurance in cyberspace; global strike, rapid global mobility, and worldwide ISR."[64] Holding these core functions above CAS will inevitably lead to undertrained CAS players, a lack of seamless integration between the USAF and ground forces, and ultimately a lack of effective ground support.

RECOMMENDATIONS

The increase in technology and highly precise weapon systems has created a myth that CAS is an easily executable mission. In reality, CAS is one of the most difficult missions to execute. All services have the capability to perform CAS and, as shown from operations in Iraq and Afghanistan, the proficiency of CAS players is at an acceptable

level. However, there are doctrinal and training issues that must be addressed by the military in order to increase CAS effectiveness within the services.

Doctrine Recommendations

Recommendation #1: Align Doctrine to prioritize CAS within every service

USAF fighter pilots are among the best in the world, but without a doctrine that prioritizes CAS as an essential role for a service, there will always be a misalignment between the air-ground team. Conversely, the Army should develop a MAGTF centric approach by integrating its air and ground assets. An Air Combat Element (ACE) integrated at the tactical level, with supporting fixed and rotor wing aircraft dedicated strictly to supporting the ground forces will enhance the Army's integration of ground forces with its supporting CAS assets.

Recommendation #2: Understanding the role of CAS players when supporting ground forces

The USAF has become proficient in supporting ground forces, but there is still consternation on who owns air delivered fires, the CAS aircraft or the ground commander. For the purposes of joint warfighting, the services should agree that the ground commander owns and approves all air and ground delivered fires. In CAS, the air service is a supporting element, which is something the USAF has a difficult time adopting. There have been multiple After Action Reports documenting the hesitancy of USAF pilots in adhering to the assigned task and weapons requested. During numerous CAS exercises Marines have discussed how USAF CAS players fail to comply with the JTAC's or ground commander's instructions.[65] For example, the Marine Corps teach JTACs and pilots that the ground force commander ultimately decides the type of ordnance, bomb fuzing, and aircraft interval for each CAS mission. The USAF, on the

other hand, teaches its CAS players that the pilots have the final say as to which type of ordnance and fuzing that should be used. The USAF views a CAS mission as a request that can be negotiated or ignored depending on the pilot's comfort level and perceived situational awareness, whereas the Marines view a CAS mission as a direct order from the ground commander. The aircrew does need to make recommendations to ensure the ground commander's intent is met and no safety of flight issues occur, but the final say on how a CAS mission will be executed rests with the ground commander. These differences must be resolved among the services, a common methodology established, and a doctrine written to support it. The mentality that CAS's primary purpose is to support the ground forces must be ingrained into every CAS participant if jointness is to be more than a slogan. Without it the potential for ineffective CAS increases exponentially.

Recommendation #3: Integrate CAS into the Army's Warfighting Doctrine

The Army should acknowledge its CAS capability. The Army's classification of aerial delivered fires is Close Combat Attack (CCA).[66] Its attack rotary wing assets have been supporting ground forces since the Vietnam War. Classifying aerial delivered fires as CCA, rather than adhering to CAS regulations, only adds friction when operating in a joint environment. For example, a CCA mission can be requested by any soldier and no "cleared hot" is necessary for the mission, whereas a CAS mission requires a certified JTAC and a "cleared hot" before expenditure of munitions. There have been instances where Army AH-64 Apaches supporting Marines were given a CAS mission and without final approval and a "cleared hot" the Apache began to expend ordnance. Instances such as these create mistrust between the Marines and Army aviation assets.

Establishing a doctrinal change in the Army that implements CAS for aerial delivered fires is necessary to maximize the integration of all air services. In order to truly be interdependent and interoperable within the attack aviation community there needs to be a single doctrinal approach. Joint Publication 3-09.3 was developed to ensure that single doctrinal approach to provide a seamless method for every service. Cohesiveness between all the services' ground forces and rotor wing pilots will only provide a stronger team to support ground forces.

Recommendation #4: JCAS Post Launch Abort Procedures must be agreed upon by all services

The "Shift Cold" method was first introduced as a tactics, technique, and procedure (TTP) used in the USAF.[67] This method allows a pilot to move a target laser designator from a target, while a laser-guided weapon is in mid-flight, to prevent a collateral damage. For example, a JTAC designates a moving vehicle as Target X and the CAS aircraft receives approval to employs a laser-guided weapon. As the weapon is in the terminal phase, the lasing platform notices a collateral concern approaching the target. Instead of keeping the laser energy on Target X, the lasing platform intentionally shifts the laser's aim point away from the target to avoid a collateral concern.[68] The question that must be clarified is who has the authority to approve this procedure? From the USAF's perspective the aircrew has the final authority to initiate the procedure, where as the Marine Corps advocates that the final authority rests with the ground commander. There are many concerns with this procedure which joint doctrine does not address. For instance, who is clearing the new weapon impact point of additional collateral concerns? Is the target considered a high value target that must be prosecuted regardless of potential collateral concerns? Is the ground commander, who owns all fires, willing to accept a

collateral damage incident in order to eliminate a threat? The bottom line is that all services must come to an agreement that the ground force commander has the final authority, while ensuring that proper coordination has been made between the air-ground team, to approve this procedure prior to weapon employment.

Joint Training Recommendations

> *One should not count on great effects from air support until air units had trained extensively with ground forces. – General George S. Patton*

Maintaining the skills necessary to accurately perform CAS is based on the services' abilities to continue a regimented training curriculum emphasizing realistic training with joint air and ground assets. In 2003, the Government Accountability Office (GAO) reported four problems that have degraded the effectiveness of CAS: 1) limited joint training, 2) CAS training not resembling combat, 3) lack of joint training standards, and 4) low priority given to CAS training.[69] These issues, which were identified over ten years ago, are still lingering in today's military.

Recommendation #1: Increase Holistic Joint Training Incorporating all the Services

The USAF Air Warfare Center, based out of Nellis Air Force Base, and the Army Combat Training Center, based out of Ft. Irwin, California, host a joint air-ground combat exercise called Green Flag. A typical Green Flag exercise includes fixed wing fighter aircraft from every service, unmanned aircraft, and electronic warfare aircraft tasked to support ground operations.[70] The Army and USAF spend months planning and preparing for the exercise; however, once the exercise begins, the day-to-day coordination and integration between ground and air counterparts tapers. Due to a lack of transportation and crew rest requirements, pilots have problems integrating in the day-to-

day operation planning cycle. This type of day-to-day integration is necessary to build a solid working relationship that leads to effective support to ground forces.

Another key element that is lacking from this exercise is the integration of rotor wing assets, particularly those of the Marine Corps. Additionally, the exercise usually does not integrate the Marine ground and air command and control units. Since effective training must anticipate what is expected in a combat zone, the military needs to integrate joint training rather than continue nursing interservice friction. At the same time, sequestration will make it challenging to execute multiple exercises of the magnitude required to integrate multiple services. When such exercises are planned, there must be consistent participation from all services with the common goal of integrating all services' capabilities.

Recommendation #2: Increase Integration Between Service Schools

There is little to no joint integration between the different service schools that teach CAS (Expeditionary Warfare Training Group (EWTG), Marine Aviation Weapons and Tactics Squadron One (MAWTS-1), Navy Strike Fighter Tactics Instructor Program, Air Force Weapons School, etc). It would be beneficial for CAS integration if each schoolhouse were to host an instructor from a sister service during a CAS formal course. Currently, MAWTS-1 has a dedicated Army 160th Special Operations Aviation Regiment instructor pilot who supports each Weapons and Tactics Instructor (WTI) course. The instructor pilot exchange program has proven valuable to the development of Marine attack rotary wing student pilots. This type of program would also benefit fixed wing student pilots at both MAWTS-1 and the USAF Weapons School. A program that utilizes

exchange instructors to bring their CAS expertise will foster crosstalk between the services, which will lead to a well-rounded and effective CAS player.[71]

Recommendation #3: Implementation of Ground / Air Appreciation Training

Fixed wing pilots, rotor wing pilots, and ground forces all have different operating environments. It is difficult for a JTAC to comprehend what fixed wing pilots are able to see from their operating altitudes. Likewise, it is difficult for a fixed wing pilot to comprehend what ground units experience during hectic combat. All the services should integrate events where pilots attend CAS exercises as ground observers. These experiences will give the pilots an appreciation and a different perspective on how ground forces operate, which will ultimately maximize the pilots' support during CAS. Conversely, JTACs should experience what flying at 20,000 feet and 400 knots does to the pilot's situational awareness. This will lead to a mutual understanding of what each experiences and how to expedite aviation fires.

Marine officers already enjoy this benefit. Before Marine pilots begin flight training, they attend a six-month basic infantry course where they learn the basics of ground operations. Additionally, Marine pilots selected to serve as Forward Air Controllers (FAC) serve alongside ground units to develop additional ground skills and experience. [72] This training further enhances the integration of the Marine air-ground team.

Recommendation #4: Increase Capabilities of Training Ranges

Today JTACs only receive live fire training at a certified training range. The ranges used by EWTG Atlantic, for example, are prohibited from supporting live high explosive munitions. Understanding the effects of high explosive weapons prior to seeing

them in combat will assist the JTAC in advising the ground commander on aviation ordnance and desired effects. Such knowledge is difficult for a JTAC to learn from a classroom video clip. Ranges need to provide a realistic venue for what the JTAC will experience in combat.

JTACs produced by EWTG are certified but not authorized to control CAS autonomously. JTACs must undergo additional training at their parent unit prior to being qualified to control CAS. Due to the lack of time to train, ground commanders may waive this additional training requirement if a unit is preparing to deploy to a combat zone. Potentially, a JTAC could leave the schoolhouse after only four weeks of training deploy to a combat zone and authorize CAS missions in support of ground maneuver forces. For this reason, a JTAC must know and understand the capabilities he brings to the fight.

Additionally, due to limitations and restrictions placed on ranges, JTACs and pilots are limited to specific final attack headings used to deliver ordnance. This leads to aircraft having to fly similar profiles from the same location, which does not take advantage of the multiple direction employment capability of the aircraft. Furthermore, due to the dangers associated with unexploded ordnance, ranges will usually have mandatory observation points for JTACs. Very seldom in combat does a JTAC climb to the top of a mountain or high tower with a commanding view of the battlefield and engage targets that are easily identified from a static position. Not being able to maneuver through the battlefield restricts the development of realistic training, and creates an environment of stationary ground forces. Ideally, ranges should allow a JTAC to maneuver freely and engage targets while on the move.

Recommendation #5: Incorporate Army FACs and JTACs to Army Units

The USAF provides the majority of the JTAC requirements for the Army. These JTACs, however, do not fall under the Army's operational chain of command. The JTACs are assigned to and take their operational direction from USAF Air Support Operation Squadrons (ASOS).[73] Because USAF JTACs are not under the Army's chain of command the cohesiveness between the JTACs and the soldiers breaks down. The ability to integrate Army JTACs and/or FACs into Army maneuver units will enhance the cohesiveness between the air-ground team.

Integrating Army FACs, who are already well versed in Army doctrine and knowledgeable in aviation capabilities would be an additional force multiplier. The FACs would not only assist in terminal control of ordnance but can also act as an Air Officer under the Operations Department.[74] Having these aviation experts in the Army's lower echelon units would bring a different perspective to the planning cells. This arrangement will aid ground commanders with the integration of maneuver and fire elements.[75]

Recommendation # 6: Implement the FAC (A) mission for Army Conventional Air Assets

According to JP 3-09.3 a Forward Air Controller (Airborne) [FAC (A)] is a "trained and qualified aviator who exercises control, from the air, of aircraft engagement in CAS of ground troops."[76] Detailed integration and coordination with the supporting ground unit prior to an evolution provides the FAC (A) with the information required when an unexpected situation arises. Failure to build that detailed coordination will lead to decreased situational awareness when the FAC (A) initially checks in on station.[77]

The relationship of Army attack aviation with ground units is similar to that of the Marine Corps' air-ground team. Creating an Army FAC (A) program will only enhance its air-ground integration capability. A FAC (A) program in the Army is not a new idea.

Army conventional attack helicopter pilots have advocated training to the FAC (A) role for some time now.[78] Training attack/reconnaissance aviation assets to perform the FAC (A) duties will reduce JTAC requirements while also improving their CAS role.[79] This idea proved successful during a proof of concept evolution conducted in 2006. Four AH-64 Apache pilots underwent FAC (A) ground training with the Expeditionary Warfare Training Group Pacific (EWTGPAC) school followed by a two week live fire course of instruction with Marine Aviation Weapons and Tactics Squadron One (MAWTS-1).[80] Although this proved to be a successful proof of concept, the Army has still not moved forward in incorporating the FAC (A) role.

There are training issues that must be considered with a FAC (A) program. First, according to the JFAC (A) Memorandum of Agreement there are mandatory requirements to certify a FAC (A).[81] Second, the Army would have to establish its own FAC (A) School, or rely on other services' schoolhouse. Third, since the Army does not have organic fixed wing assets, it must rely on other service aviation assets to meet the qualification requirements. However, the majority of the tasks conducted by a FAC (A) are already outlined in the training and readiness syllabus of OH-58 and AH-64D, which will facilitate the production of a FAC (A).[82] Additionally, the majority of Army pilots are Warrant Officers (WO) who, unlike the other services' pilots, never leave the cockpit. These WOs have a great deal of experience that can be implemented in the FAC (A) role. The Army needs to accept its capability to conduct the FAC (A) mission, which is a force multiplier to any service.

Recommendation #7: Maximize Capabilities and Usage of Simulator training

Simulators can assist in joint training. The military services have the ability to upload realistic visual databases scenarios to simulate conditions faced in combat. The vast majority of simulators in all services have the capability to link over the Homeland Defense Network (HDN), allowing CAS players and JTACs to operate in an integrated, joint, virtual environment with little cost and no risk of fratricide or aviation mishap.[83] However, simulators have been used primarily for training in emergency procedures, weapons switchology, and basic flight procedures. Linking the services' simulators would provide a venue to train pilots and JTACs with a reduced cost. Additionally, the simulators can provide a controlled environment where a service can maintain its CAS proficiency while experiencing different working environments (day, night, urban, moving target employment, and adverse weather). Furthermore, pilots can be trained to execute danger close missions without the inherent risk to ground forces associated with those missions.[84] Participants can conduct a phone or teleconference debrief after the simulator event, thus maximizing the learning objectives.

Training for CAS events can be done a variety of ways from chalk talks on one end of the scale to flying large force exercises with multiple players involving live ordnance on the other end of the scale. Somewhere in the middle lies the linked simulator capability. The mindset of using simulators needs to change from being a device used to learn aircraft system and emergency procedures to being a device that has the capability to simulate possible environments faced in combat. With the budget deficit and the sequestration complications the nation is currently facing, it is difficult to train every CAS player. A matured linked simulator capability that is interoperable with all of the services is very realistic and something the services should pursue.

Recommendation #8: Civilian-Contracted Air Support for JTAC Training

Today, the U.S. military uses government contracted civilian companies to provide CAS for schools such as the EWTG. As OIF/OEF began to see the potential of CAS events, the services began to mass-produce JTACs. Training these JTACs is a resource intensive process. Currently EWTGLANT is required to provide 20 Marine JTACs per class six times a year. II Marine Expeditionary Force (MEF) is tasked with supporting each class with 48 fixed wing flights, among other operational training commitments. Contracted CAS affords the MEF the opportunity to reduce its sortie requirements to 16, which allows the MEF to support outgoing combat units with pre-deployment CAS training requirements.[85]

The resource shortfalls experienced by II MEF provides an excellent venue for contracted companies to provide the support required to train JTACs. Supporting a JTAC course is an excellent setting for pilots to continue to hone their CAS proficiency skills. Yet, the deficiency in the nation's budget, specifically when it impacts training, will force the military to continue using contracted civilian companies for training. It is estimated that producing one JTAC can cost between 300,000 to 500,000 dollars when factoring in aircraft fuel, training ordnance, and maintenance cost for live fire training. As long as the requirements for JTACs continue, Congress should maximize the military's budget in order to ensure the air-ground team trains like it fights.

Recommendation #9: Increase Unmanned Aircraft During Close Air Support Training

The USAF's vision is to increase the number of Remotely Piloted Aircraft (RPA) operating in theater. A study conducted by the U.S. Army Aviation Center of Excellence predicted that, from 2016 to 2025, RPAs will be tasked with conducting ISR 50 percent

of the time, while the remainder of the time will involve convoy escort, air assault security, and CAS. From 2026 to 2035, RPAs will be tasked to perform non-ISR missions 80 percent of the time.[86] In order for the RPAs to be effective in CAS, their training needs to increase, particularly since these pilots will not experience what it feels to be airborne while supporting ground forces. Unfortunately, with the budget deficit, there will be limited training opportunities that incorporate ground forces.

There is no question that ISR assets bring an excellent capability to the intelligence community. Their increased time on station (TOS), day and night sensors, and their ability to transmit near real time full motion video (FMV) to a Tactical Operations Center (TOC) give a commander increased situational awareness (SA). Unmanned assets also provide a kinetic capability to the ground forces. The MQ-1 Predator and MQ-9 Reaper are employed in multiple countries in support of the Global War on Terror (GWOT). RPAs have provided CAS to ground troops in both OIF and OEF (Afghanistan) while also providing a national strategic attack capability used in Somalia, Yemen, and Pakistan.[87] Despite their use in delivering ordnance, there is validity in questioning the effectiveness of RPAs when conducting CAS.

The difficulty in conducting CAS with RPAs lies in the crew's ability to shift from a strictly intelligence gathering role to an ordnance releasing role. The intelligence collection demands in theater for these assets are at an all time high which requires RPA crews to spend eight hours a day flying their primary mission. As previously mentioned, one of the requirements for effective CAS is properly trained personnel with well-developed skills and effective planning and integration. It takes time and constant training to develop a proficient CAS player. The high demand for ISR assets leads to

minimal CAS training for RPA pilots. To improve RPA CAS proficiency, ground commanders must understand that there is a possibility of ISR coverage shortfalls while the RPAs conduct the required training to be efficient in CAS. The end result will be an asset that can maximize the ground commander's fires capability.

Recommendation #10: The Services Need a Dedicated CAS Platform

The A-10 Thunderbolt has been in service since the 1970s. It was created specifically to perform the combat role of CAS. As OEF and OIF kicked off, the A-10 led the USAF's efforts in conducting CAS while the F-15s and F-16s were being tasked with air-to-air and interdiction missions. Nevertheless, due to budget constrains, the USAF is decommissioning multiple A-10 squadrons. While the A-10 has proven itself numerous times in combat, the USAF is in search of an "aircraft that can conduct more than one mission" which is why it is allotting more funding to the F-35 Joint Strike Fighter (JSF) program.[88] The USAF is not the only service supporting the JSF program, but since CAS has always been perceived as the lowest priority, the USAF has the highest risk of losing its CAS effectiveness.

According to the GAO report 12-437, the F-35 is the Department of Defense's most costly and ambitious aircraft acquisition program costing the government roughly 400 billion to develop and acquire, and roughly 35,200 dollars per flight hour to operate; in comparison the A-10 costs half that amount.[89] Additionally, the JSF is unable to expend training ordnance, which means that live CAS training will undoubtedly suffer for pilots and JTACs.[90]

As a single piloted aircraft, an F-35 pilot is required to be proficient in multiple roles such as air-to-air, air interdiction, CAS, deep air support, ISR, electronic warfare,

and command and control role. Is the military expecting technology to close the gap between the lack of CAS training and the expected pilot proficiency in multiple roles? To be an effective CAS platform requires continuous CAS training, which cannot be replaced by modern technology. Lack of training in CAS will only decrease the effectiveness of air support provided to the ground forces. General James Mattis, while commanding U.S. Joint Forces Command stated:

> *Today's approach for loitering multi-million dollar aircraft and using a system-of-systems procedures for the approval and employment of airpower is not the most effective use of aviation fires.*[91]

An approach the military can take in order to ensure proficiency in CAS players is to continue developing a Light Attack Armed Reconnaissance (LAAR) aircraft dedicated solely to support ground forces. This type of aircraft will reduce the cost per flight hour, enhance support to the ground forces, and will also bestow the mindset needed to conduct CAS. It must be understood that individuals who focus 100% of their effort on their job are better than those who are a jack-of-all-trades. The military needs to stop wasting time and money in the development of the JSF program, which has become a money pit. The LAAR provides the perfect asset to assist ground forces in CAS employment especially during the economical constraints placed on the defense budget.

CONCLUSION

> *"Simply slapping on a coat of CAS paint to placate service jealousies will end up creating worthless CAS assets just as nations try to solve fiscal problems by printing more money end up with worthless money."*[92] *– Steve Call*

> *"When deciding who should conduct CAS in your fight, your first priority ought to be someone who works CAS day in, day out, year in, year out. Anything less should be reserved for bona fide emergencies."*[93] *– Steve Call*

Today's U.S. military is more effective at CAS than the military from previous combat operations. As the conflict in OEF (Afghanistan) comes to an end, it is important to capture the services' experience and lessons learned while implementing them in a regimented training syllabus that will ensure CAS proficiency is maintained for the next conflict. History has shown that during the initial stages of a combat operation, there is a high learning curve particularly with CAS. As the U.S. pivots towards the Pacific, the services' focus will shift away from CAS. The USAF will focus more on air-to-air employment and establishing air superiority in contested airspace, while the Army and Marine Corps will concentrate on ground tactical level operations. The U.S. budget deficit and the consequences of sequestration will hamper the military's ability to train its forces for combat operations. To engage the next conflict with a fully integrated air-ground team, it is paramount for the services to develop a joint doctrine and joint training regiment that will prioritize CAS.

[1] Jim Garamone, "Sequestration Will Hollow Out Force Fast, Dempsey Says", American Forces Press Service, Jan 17, 2013, http://www.defense.gov/News/NewsArticle.aspx?ID=119040

[2] U.S. Joint Chief of Staff, *Joint Operations*, Joint Publication 3-0 (Washington, DC: Joint Chief of Staff, 11 August 2011), GL-12. Joint Operations are defined as operations integrating multiple military services incorporating a specified command relationship.

[3] U.S. Joint Chief of Staff, *Close Air Support*, Joint Publication 3.09-3 (Washington, DC: Joint Chief of Staff, 08 July 2009), X.

[4] Ibid, ix. JP 3-09.3 Close Air Support defines a joint terminal attack controller as "qualified (certified) Service member who, from a forward position, directs the action of combat aircraft engaged in CAS and other air operations." A qualified JTAC is the only ground personnel authorized to give a "clear-hot", which signifies to air players that they are approved to employ ordnance on an approved target.

[5] Ibid, ix.

[6] JP 3-09.3 recommends seven conditions which will lead to performing effective close air support: 1) thoroughly trained personnel with well developed skills, 2) effective planning and integration, 3) effective Command and Control (C2), 4) air superiority, 5) target marking and/or acquisition, 6) streamlined and flexible procedure, and 7) appropriate ordnance.

[7] John McGrath, *Fire for Effect: Field Artillery and Close Air Support in the US Army*, (Fort Leavenworth: Combat Studies Institute Press, 2010), 38.

[8] Ibid, 38.

[9] Steven Olive, "Abdicating Close Air Support: How Interservice Rivalry Affects Roles and Mission," (Master's thesis, U.S. Army War College, 2007), 2.

[10] Ibid, 2. Marshal Ferdinand Foch and later General John Pershing, Allied Commander in Chief and American Expeditionary Force Commander respectively, insisted that the aircraft was created strictly for immediate support of ground armies.[10] The applicability of airpower employment marked the beginning of the contentious relationship between the air service and the supporting ground units, which has sustained through today.[10]

[11] Benjamin Cooling, "Case Studies in the Development of Close Air Support," (Washington DC: Office of Air Force History, 1990), 298.

[12] John McGrath, *Fire for Effect: Field Artillery and Close Air Support in the US Army*, (Fort Leavenworth: Combat Studies Institute Press, 2010), 63.

[13] Ibid, 69.

[14] Ibid, 69.

[15] Benjamin Cooling, "Case Studies in the Development of Close Air Support," (Washington DC: Office of Air Force History, 1990), 298.

[16] Richard Hallion, *Strike From the Sky: The History of Battlefield Air Attack 1910-1945* (Tuscaloosa, Al: The University of Alabama Press, 1989), 173.

[17] Lindsey Eilon and Hack Lyon, Evolution of Department of Defense Directive 5100.1 (Washington DC: Office of the Secretary of Defense Director, Administration & Management Organizational Management & Planning, April 2010), 7-8. The Key-West Agreement of 1948 replaced Executive Order 9877, with the intentions to more clearly define the different roles of the services. Instead, the agreement "reinforced the traditional prerogatives and individualism" of each service.[17] The military services were still free to pursue their own agendas. Allowing the services to retain their autonomous authorities to "organize, train, and equip" led to duplication of effort and incompatibility.[17] The intended cohesiveness required to operate as a joint force was still missing.

[18] Michael Langley, *Inchon Landing: MacArthur's Last Triumph*, (New York: Times Books, 1979), 6.

[19] Standly Sandler, *The Korean War: No Victors, No Vanquished*, (Lexington: The University Press of Kentucky, 1999), 171.

[20] Bruce Comings, *The Korean War: A History*, (New York: Modern Library, 2010), 149.

[21] Standly Sandler, *The Korean War: No Victors, No Vanquished*, (Lexington: The University Press of Kentucky, 1999), 171

[22] Lindsey Eilon and Hack Lyon, Evolution of Department of Defense Directive 5100.1 (Washington DC: Office of the Secretary of Defense Director, Administration & Management Organizational Management & Planning, April 2010), 11.

[23] Standly Sandler, *The Korean War: No Victors, No Vanquished*, (Lexington: The University Press of Kentucky, 1999), 193.

[24] Ibid, 172.

[25] Ibid, 193.

[26] Benjamin Cooling, "Case Studies in the Development of Close Air Support", (Washington DC: Office of Air Force History, 1990), 542.

[27] Ian Horwood, *Interservice Rivalry and Airpower in the Vietnam War* (Fort Leavenworth: Combat Studies Institute Press, 2006), 63-64.

[28] John McGrath, *Fire for Effect: Field Artillery and Close Air Support in the US Army*, (Fort Leavenworth: Combat Studies Institute Press, 2010), 105.

[29] Ian Horwood, *Interservice Rivalry and Airpower in the Vietnam War* (Fort Leavenworth: Combat Studies Institute Press, 2006), 124.

[30] Ibid, 69.

[31] Lindsey Eilon and Hack Lyon, Evolution of Department of Defense Directive 5100.1 (Washington DC: Office of the Secretary of Defense Director, Administration & Management Organizational Management & Planning, April 2010), 12.

[32] John McGrath, *Fire for Effect: Field Artillery and Close Air Support in the US Army*, (Fort Leavenworth: Combat Studies Institute Press, 2010), 122-125. The debate of which assets could and could not conduct CAS continued throughout the rest of the Vietnam War. The 1966 agreement between General Harold

Johnson and General John McConnell, Chief of Staff of the Army and Air Force respectively, acknowledged the Army's usage of the attack rotor wing aircraft and formalized its role in aviation at the tactical level, thus sanctioning two rivaling aviation forces competing for the CAS role.[32]

[33] Lindsey Eilon and Hack Lyon, Evolution of Department of Defense Directive 5100.1 (Washington DC: Office of the Secretary of Defense Director, Administration & Management Organizational Management & Planning, April 2010), 17. The operational failures and major defense organizational changes between 1958 and 1986 led to the creation of the Goldwater-Nichols Defense Reorganization Act. Among other things, the reform concentrated on the inability of the services to operate jointly and the lack of unity of command.[33] The 1980 failed Iran Hostage Rescue mission and the invasion of Grenada in 1983 highlighted the traits, such as "disunity of command, and the serious lack of joint interoperability," which are required to operate as a joint force.[33] The applicability of air power suffered because of the diverging doctrinal views within the services, lack of sufficient joint planning, and failure to properly conduct joint training.

[34] Richard Lowry, *New Dawn: The Battle for Fallujah*, (New York: Savas Beatie LLC, 2010), xvii-xviii.

[35] Steven Olive, "Abdicating Close Air Support: How Interservice Rivalry Affects Roles and Mission," (Master's thesis, U.S. Army War College, 2007), 11.

[36] Luis, Villalobos, "Proposal for the Future of JCAS Doctrine," (Master's Thesis, Marine Corps University, 2008), 13.

[37] Ibid, 14.

[38] David Johnson, *Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post – Cold War Era*, (Santa Monica CA: RAND Corporation, 2007) 23.

[39] Ibid, 24.

[40] David Johnson, "Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post – Cold War Era", Executive Summary (Santa Monica CA: RAND Corporation, 2007), 19.

[41] Ibid, 21.

[42] Ibid, 34.

[43] Ibid, 46.

[44] Fred Allison, "Close Air Support: A Core Contributor to successful integrated operations in Fallujah," Marine Corps Gazette, http://www.mca-marines.org/gazette/article/close-air-support-0, (accessed 4 Jan 2013)

[45] Fred Allison, "Close Air Support: A Core Contributor to successful integrated operations in Fallujah", Marine Corps Gazette, http://www.mca-marines.org/gazette/article/close-air-support-0, (accessed 4 Jan 2013)

[46] Ibid.

[47] Richard Lowry, *New Dawn: The Battle for Fallujah*, (New York: Savas Beatie LLC, 2010), 49.

[48] Ibid, 56.

[49] Ibid, 56.

[50] Fred Allison, "Close Air Support: A Core Contributor to successful integrated operations in Fallujah", Marine Corps Gazette, http://www.mca-marines.org/gazette/article/close-air-support-0, (accessed 4 Jan 2013)

[51] Ibid.

[52] Peter Herrmann, "Airpower in Counterinsurgency (COIN) Operations: Considerations for Low-Tech Aircraft for Effective Close Air Support in COIN", (Master's Thesis, Marine Corps University, 2011), 6.

[53] Ibid, 5.

[54] Ibid, 7.

[55] Ibid, 8.

[56] Steve Call, *Danger Close: Tactical Air Controllers in Afghanistan and Iraq*, (College Station: Texas A&M University Press, 2007), 236.

[57] *Title 10, Armed Forces*, U.S. Code. vol. 5, chap. 807, sec 8062 (1905), Title 10 states the Air Force's mission as:

> (1) Preserving the peace and security, and providing for the defense, of the United States, the Commonwealths and possessions, and any areas occupied by the United States
> (2) Supporting the national policies
> (3) Implementing the national objectives
> (4) Overcoming any nation responsible for aggressive acts that imperil the peace and security of the United States.

[58] David Johnson, "Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post – Cold War Era", (Santa Monica CA: RAND Corporation, 2007), 189.

[59] Adam Lowther, and John Farrell , "From the Air: Rediscovering Our Raison D'etre," Air & Space Power Journal , no. Jul-Aug (2012): 61.

[60] Air-Mindedness is described as a global, strategic mindset providing perspective through which the battle space is not constrained by geography, distance, location or time.

[61] U.S. Air Force. *Air Force Basic Doctrine*, Air Force Doctrine Document 1. (Washington DC: U.S. Air Force, October 14, 2011), 43.

[62] Adam Lowther, and John Farrell , "From the Air: Rediscovering Our Raison D'etre," Air & Space Power Journal , no. Jul-Aug (2012): 63.

[63] U.S Department of Defense, *Functions of the Department of Defense and Its Major Components*, Directive 5100.01, December 21, 2010, 34.

[64] Adam Lowther, and John Farrell , "From the Air: Rediscovering Our Raison D'etre," Air & Space Power Journal , no. Jul-Aug (2012): 65.

[65] Conversation between author and multiple Marine and Navy pilots, Air Force and Marine JTACs, and author's own experiences in combat and training.

[66] U.S. Joint Chief of Staff, *Close Air Support*, Joint Publication 3.09-3 (Washington, DC: Joint Chief of Staff, 08 July 2009), V-62. US Army describes close combat attack (CCA) as a hasty or deliberate attack by Army aircraft providing air-to-ground fires for friendly units engaged in close combat as part of the Army combined arms team. Due to the close proximity of friendly forces, detailed integration is required. Due to capabilities of the aircraft and the enhanced situational awareness of the aircrews, terminal control from ground units or controllers is not necessary. CCA is not synonymous with close air support (CAS).

[67] "JCAS Post Launch Abort Procedures for AGM-114 Hellfire" Position Paper, 29 June 2012, Headquarters, United States Marine Corps. Position Paper was emailed to author by MAWTS-1 instructor on 15 January 2013.

[68] "Shifting Laser Energy in Regional Command Southwest Afghanistan" Information Paper, 13 April 2012, Regional Command South West (RC (SW)). Information paper was emailed to author by MAWTS-1 instructor on 15 January 2013.

[69] Government Accounting Office, Lingering Training and Equipment Issues Hampering Air Support of Ground Forces, GAO-03-505, 2 June 2003, 2.

[70] "Green Flag-West Fact Sheet", Nellis Air Force Base, accessed 20 Jan 2013, http://www.nellis.af.mil/library/factsheets/factsheet.asp?id=19524

[71] The idea of integrating Service Schools such as MAWTS-1, EWGT and USAF Weapons School during a CAS course has been advocated for quite some time. As early as 2008 when Major Michael H. Johnson wrote "Cleared to Engage: Improving Joint Close Air Support Effectiveness" for the Air Command and Staff College. Currently there is still little to no integration between the different Service Schools with respect to CAS.

[72] A Forward Air Controller (FAC) is an aviator who is certified as a JTAC.

[73] Stephen Wetz, *Redefining Joint Fires Service Functions to Better Support Joint Force Operations* (Norfolk: National Defense University Joint Forces Staff College, 2012), 42

[74] U.S. Joint Chief of Staff, *Close Air Support*, Joint Publication 3.09-3 (Washington, DC: Joint Chief of Staff, 08 July 2009), II-15. The Air Officer serves as the primary advisor to the ground commander for integration of all functions of aviation with ground combat operations.

[75] Stephen Wetz, *Redefining Joint Fires Service Functions to Better Support Joint Force Operations* (Norfolk: National Defense University Joint Forces Staff College, 2012), 86.

[76] U.S. Joint Chief of Staff, *Close Air Support*, Joint Publication 3.09-3 (Washington, DC: Joint Chief of Staff, 08 July 2009), II-16.

[77] Ibid, III-42.

[78] The author served with multiple conventional Army aviation units where Army pilots advocated the FAC (A) role.

[79] Michael Johnson, *Cleared to Engage: Improving Joint Close Air Support Effectiveness (*Maxwell Air Force Base: Air University Press, June 2008), 14.

[80] Ibid, 15.

[81] Per the JFAC (A) Memorandum of Agreement, the minimum certification requirement to produce one FAC (A) is as follows:

- Six Type 1 Control
- One Type 2 Control
- One Type 3 Control
- Six fixed wing controls
- One rotary wing control
- One control must employ an airborne laser designator
- Four must expend live or training ordnance
- Four non-permissive controls
- Two controls must be during the day
- Two controls must be at night
- One must be in support of a qualified JTAC

Once certified, the FAC (A) will remained qualified by conducting six successful controls within the past six months consisting of a minimum of:

- Two Type 1 controls
- One Type 2 controls
- One Type 3 controls
- Three fixed wing controls
- One rotary wing control
- One control must employ an airborne laser designator
- One must expend live or training ordnance
- Two non-permissive controls
- One must be at night
- One must be in support of a qualified JTAC

[82] Hoby Cupp, *A U.S. Army Formal FAC (A) Program is the Solution for Improving Joint Fires Integration for the Maneuver Commander* (Maxwell Air Force Base, AL: Air University Press, April 2009), 13.

[83] Conversation with a Marine pilot working at Marine Aviation Training System Sites in New River North Carolina, January 05, 2013.

[84] U.S. Joint Chief of Staff, *Close Air Support*, Joint Publication 3.09-3 (Washington, DC: Joint Chief of Staff, 08 July 2009), V-20 Danger Close is defined as: Ordnance delivery inside the 0.1 percent Pi distance will be considered “danger close.” The supported commander must accept responsibility for the risk to friendly forces when targets are inside the 0.1 percent Pi distance. Risk acceptance is confirmed when the supported commander passes his initials to the attacking CAS aircraft through the JTAC/FAC(A), signifying that he accepts the risk inherent in ordnance delivery inside the 0.1 percent Pi distance. When ordnance is a factor in the safety of friendly troops, the aircraft weapon’s axis of attack should be parallel to the friendly force’s axis or orientation. The intent is to preclude long and/or short deliveries from being a factor to friendly forces.

[85] Email correspondence with EWTGLAN instructor, January 05, 2013.

[86] Lee Robinson, "Bull in a China Shop? Attack Aviation and the COIN Battlefield," Small Wars Journal, http://smallwarsjournal.com/jrnl/art/bull-in-a-china-shop-attack-aviation-and-the-coin-battlefield (accessed January 05, 2013)

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