

CLOSE AIR SUPPORT COMMAND AND CONTROL
AT THE OPERATIONAL
LEVEL

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General Studies

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DAVID G. SHOEMAKER, Maj, USAF
B.S., U.S. Air Force Academy, CO, 1994

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Name of Candidate: Major David G. Shoemaker

Thesis Title: Close Air Support Command and Control at the Operational Level

Approved by:

_____, Thesis Committee Chair
Lt Col Steven E. Ramer, M.S.

_____, Member
LTC Gregory F. Sierra, MMAS

_____, Member
Dr. Ronald E. Cuny, Ed.D.

Accepted this 14th day of December 2007 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

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ABSTRACT

CLOSE AIR SUPPORT COMMAND AND CONTROL AT THE OPERATIONAL LEVEL by Maj David Shoemaker, 95 pages.

Close Air Support is inherently one of the most joint endeavors in today's military. Coordination and integration of air and ground assets are the keys to successful close air support. Command and control at the operational level can set the stage for success or failure. Advances in technology, changes in warfare, and transformation of Army organization have led to rapid change in the world of command and control. Doctrine publications at all levels struggle to keep pace with changes. With this problem in mind, the primary question is whether or not Joint, US Air Force, and US Army doctrine and TTPs work together to ensure effective CAS command and control at the operational level in the current operational environment. This study starts with a history of air-ground coordination and the command and control of close air support. It then compares current Joint, Air Force, and Army publications to find doctrinal disconnects that might lead to gaps in joint integration and suggests changes to the lifecycle and update methods of Joint and service doctrine documents.

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I owe my professional upbringing and experience to my brother Buzzards of the 510th Fighter Squadron and Juvats of the 80th Fighter Squadron. Without them I could have never attacked this topic.

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ACRONYMS

A2C2	Army Airspace Command and Control
AAA	Anti-Aircraft Artillery
AAGS	Army Air-Ground System
ACM	Airspace Control Measure
ACO	Airspace Control Order
ACTS	Air Corps Tactical School
AFARN	Air Force Air Request Net
AFDD	Air Force Doctrine Document
AGOS	Air-Ground Operations System (World War II-era)
ALO	Air Liaison Officer
ASC	Air Support Control
ASO	Air Support Officer
ASOC	Air Support Operations Center
ASP	Air Support Party
ATACMS	Army Tactical Missile System
ATO	Air Tasking Order
AWACS	Airborne Warning and Control System
BCD	Battlefield Coordination Detachment
BCT	Brigade Combat Team
C/JAOC	Combined/Joint Air Operations Center
C/JFACC	Combined and Joint Force Air Component Commander
C2	Command and Control
CAOC	Combined Air Operations Center

CAS	Close Air Support
CCRP	Command and Control Research Project
CFACC	Combined Force Air Component Commander
DASC	Direct Air Support Center
FAC	Forward Air Controller
FAC (A)	Forward Air Controller (Airborne)
FLOT	Forward Line of Own Troops
FM	Field Manual
FMI	Field Manual Interim
FSCL	Fire Support Coordination Line
FSCOORD	Fire Support Coordinator
GCI	Ground Controlled Intercept
GLO	Ground Liaison Officer
JAOC	Joint Air Operations Center
JARN	Joint Air Request Net
JFACC	Joint Force Air Component Commander
JFC	Joint Force Commander
JFLCC	Joint Force Land Component Commander
JFO	Joint Fires Observer
JOC	Joint Operations Center
JP	Joint Publication
JTAC	Joint Terminal Attack Controller
OIF	Operation Iraqi Freedom
ROE	Rules of Engagement
SPINS	Special Instructions

TACP	Tactical Air Control Party
TACS	Theater Air Control System
TARS	Tactical Air Request System
TGO	Terminal Guidance Operations
TTP	Tactics, Techniques, and Procedures

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CHAPTER 1

INTRODUCTION



As the Global War on Terror (GWOT) has developed, military doctrine and tactics, techniques, and procedures (TTP) have evolved. At the onset of the GWOT in 2001, the established “rules” for close air support (CAS) were written for a linear battlefield. Many of our TTPs and much of our doctrine was forged in the Cold War and proven on the battlefields of Desert Storm.

Today the fight has changed. The areas of operation are non-linear and the Army has transformed into a modular, deployable force. Service doctrine and TTP manuals are struggling to keep up with the changes. Adding to the complexity of the problem, each Service has its own written TTPs and doctrine in addition to the joint* publications. CAS technical capabilities and command and control at the tactical level have improved in the last six years. However, problems with CAS command and control at the operational level remain.

Many Soldiers have anecdotes of times they needed airpower and had a difficulty getting timely CAS. Likewise, many pilots can share experiences of flying in circles

* Doctrine documents are not consistent with the capitalization of the words “joint” and “service.” This study will use the convention set forth in Chairman of the Joint Chiefs of Staff Instruction 5120.02A, *Joint Doctrine Development System*, in which “Service” is capitalized while “joint” is not.

doing nothing on a typical CAS sortie in the GWOT. The author witnessed firsthand inefficiencies of CAS command and control at the operational level as a liaison officer in an Air Operations Center. Turf battles and self-styled workarounds at the mid-level officer and noncommissioned officer levels seemed to “drive the fight.” In day-to-day operations, these inefficiencies are a major annoyance. When ground forces find themselves in serious need of airpower, these annoyances quickly turn into life or death situations, frustrating to both the CAS provider and ground troops. If the CAS community can determine the source of the problem, they can start finding solutions that lead to a better joint environment.

The purpose of this chapter is to present the research questions, explain the significance of the research, and discuss limitations, assumptions and definitions.

Primary and Secondary Research Questions

The researcher will determine whether or not joint, US Air Force, and US Army doctrine and TTPs work together to ensure effective CAS command and control at the operational level in the current operational environment. The answer to this question will need to account for disconnects in the Services’ and joint doctrine.

To understand any disconnects in doctrine in the context of transformational changes in the Department of Defense, the study will answer the secondary question of whether potential shortfalls exist in operational level command and control in close air support. These are shortfalls in the doctrine, not simply errors executing established doctrine. Anecdotes involving mistakes or players not following joint doctrine do not ultimately affect research into doctrinal disconnects. Tying the questions together, the study will look at potential shortfalls by examining our current doctrine in the context of

the transformed military. Finding the doctrinal shortfalls that lead to CAS command and control issues will link directly to the research question and ultimately provide points for solutions.

Significance of the Research

The military leadership's emphasis shift from the large linear battlefield to the small, mobile, non-linear fight has affected many operational specialties. Some of the changes, such as the reorganization of the transformed Army, have far-reaching effects that have not been fully researched. Other changes, such as the shift to largely urban (non-linear) operations are also affecting how CAS is trained and used. This paper will look for solutions to doctrinal shortfalls across the Services.

Assumptions

Disconnects in doctrine can be in the actual text of the documents or in the interpretation of that text. The researcher assumes joint language is sufficient to describe the problem. Additionally, the picture of the transformed Army has evolved over the past five years. The analysis will take the current model of the transformed Army and its BCT construct. The assumption then will be that although the Army's modular organization is constantly evolving, the basic modular Army is set. This study will assume the Army organization of June 2007. In this organization, the Air Support Operations Center (ASOC) resides with the Division Headquarters and fits into the Theater Air Control System-Army Air-Ground System (TACS-AAGS) as depicted in Figure 1.

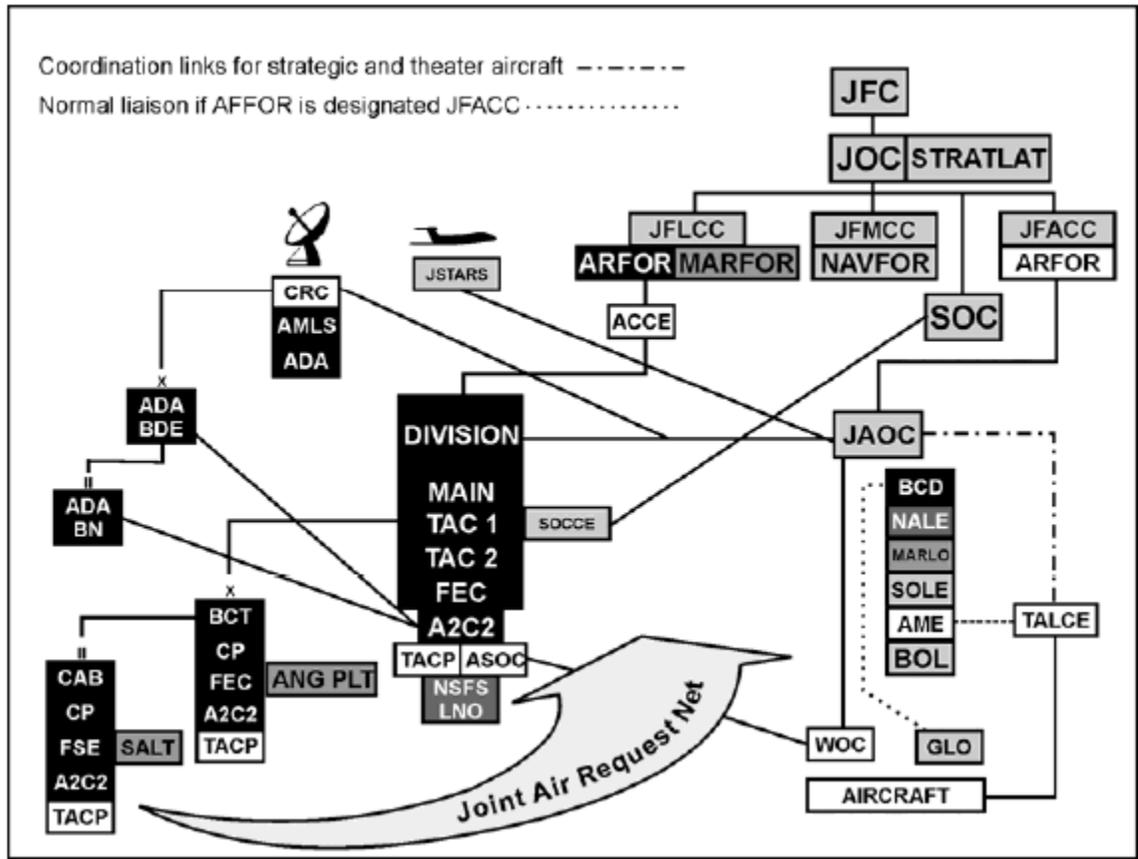


Figure 1. TAC-AAGS.

Source: Field Manual Interim 3-91, *Division Operations* (Washington, DC: Headquarters, Department of the Army, Draft, February 2006), D-3.

Definitions

Command and control is a concept that many military members grasp and understand, but find difficult to define. The Command and Control Research Project (CCRP) operates at the Secretary of Defense level and is charged with improving command and control with an emphasis on emerging technology. CCRP's functions include "Command and Control theory, and associated operational concepts that enable [the Department of Defense] to leverage shared awareness to improve the effectiveness

and efficiency of assigned missions.”¹ In CCRP’s basic publication *Understanding Command and Control*, the authors struggle with inconsistencies in the definitions of command and control throughout the Department of Defense: “A major discontinuity that will need to be addressed will be the definition of the words themselves.”² The authors strive to provide a framework for the reader through several models but shy away from a textbook definition of command and control. The complexity of the issue of command and control is evidenced by this 222-page book that, in the end, was written only to define the term.

The US Air Force and Army define the term in slightly different language. The library of Air Force Doctrine Documents (AFDD) show that understanding of the concept of command and control is assumed: Although the term is used in ten definitions in AFDD 1-2, the Air Force’s basic glossary, the term itself is not defined in the glossary.³ The Air Force’s basic doctrine document AFDD 1 defines command as “the legal authority exercised over subordinates by virtue of rank or assignment. Command is also the art of motivating and directing people and organizations into action to accomplish missions.”⁴ The same document defines control as “the process and system by which commanders plan and guide operations.”⁵ AFDD 1 then further defines Command and Control as

... the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. C2 includes both the process by which the commander decides what action is to be taken and the systems that facilitate planning, execution, and monitoring of those actions. Specifically, C2 includes the battlespace management process of planning, directing, coordinating, and controlling forces and operations.⁶

The Army's definition of command is similar to the Air Force definition: "Command is the authority that a commander in the armed forces lawfully exercises over subordinates by virtue of rank or assignment."⁷ Control is also similarly defined between the Services, although the Army seems to concentrate more on the actual physical systems and the staff's role in the process:

Within command and control, *control* is the regulation of forces and battlefield operating systems to accomplish the mission in accordance with the commander's intent. It includes collecting, processing, displaying, storing, and disseminating relevant information for creating the common operational picture, and using information, primarily by the staff, during the operations process.⁸

Field Manual 1-2, the Army's basic glossary document somewhat equivalent to AFDD 1-2, includes the DOD definition of command and control from the joint publication then lists the Army definition.⁹ The first sentence of the Army's definition of Command and Control is identical to Air Force's, but then the Field Manual adds "[c]ommanders perform command and control functions through a command and control system."¹⁰ Furthermore, the definition includes seven conclusions, one of which is "Commanders exercise authority and direction over forces by establishing command or support relationships."¹¹ Including this conclusion in the definition of command and control is an issue the researcher will study more closely in following chapters.

The subtle differences in the Services' definitions of command and control are important to analyze in this study. However, this paper will use the joint definition of command and control:

The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by

a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission.¹²

Obviously the Services agreed on the basic definition, which is included as the first sentence in each document. From there, each Service inserts its own take on command and control.

The Services also agree on the basic definition of close air support, and the same sentence appears in FM 1-02, AFDD 2-1.3, and JP 3-09.3: “CAS is 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.”¹³ This definition suits the study, but in some cases the Services’ differing interpretations are key to understanding disconnects.

This research is designed to look at the operational level of war, which is defined in JP 1-02 as

The level of war at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives within theaters or other operational areas. Activities at this level link tactics and strategy by establishing operational objectives needed to achieve the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events.¹⁴

For close air support, this study will define the operational level as the activities of the Joint/Combined Air Operations Center (C/JAOC) and the Air Support Operations Center (ASOC) at division or corps level and the interaction and coordination between the two. This paper will consider individual Joint Terminal Attack Controllers (JTAC) to operate at the tactical level of war.

One pitfall of much of the literature on CAS is the tendency to allow an air or ground bias into the writing. Bias can unwittingly lead to furthering the cause of the writer's Service instead of honestly studying the issue with a joint lens. Several theses on CAS have been produced in the last few years from the US Army Command and General Staff College and War College that contain a ground bias, just as several air-centric papers have been produced from other institutions. Using these examples, this study will strive for an unbiased analysis of Service and joint doctrine. The thesis committee was intentionally formed with all Services represented to guard against an air bias from an author who is an air officer.

Limitations and Delimitations

Many of the TTP documents in the Air Force are classified at the Secret level and above. However, this research is all unclassified. The applicable material is labeled "Unclassified" inside the text of the manuals. The limitation was only in the physical location of the research, not in the classification of the thesis.

This study looks at CAS in the context of Army, Air Force, and joint Doctrine. It does not attempt a study of Navy/Marine Corps doctrine or TTPs, although the discussion of joint publications includes all four Services. Because the US Marine Corps is the executive agent for Joint Publication 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support*, discussions of joint publications will necessarily include them.

The primary research question could generate secondary questions regarding close air support training and command and control. This study will not look into training issues. Additionally this study will not try to solve the issues of manning related to Army restructuring. This paper will research doctrine issues only.

Conclusion

The purpose of this chapter was to introduce the reader to this study's topic. To set the stage for the thesis, this chapter covered boundaries of the research questions, basic definitions, and limitations/delimitations. Chapter 2 will discuss research accomplished and resources available pertaining to command and control of close air support at the operational level. It will also provide historical perspective on close air support Command and Control based on the literature available.

¹ David S. Alberts and Richard E. Hayes, *Understanding Command and Control*, Washington, DC: CCRP Publication Series, 2006, Introduction.

² *Ibid.*, vii.

³ Headquarters, Department of the Air Force, Air Force Doctrine Document 1-2, *Air Force Glossary* (Washington, DC, 11 January 2007).

⁴ Headquarters, Department of the Air Force, Air Force Doctrine Document 1, *Air Force Basic Doctrine* (Washington, DC, 17 November 2003), 49.

⁵ *Ibid.*

⁶ *Ibid.*, 49, 50.

⁷ Headquarters, Department of the Army, Field Manual 6-0, *Mission Command: Command and Control of Army Forces* (Washington, DC, August 2003), 1-4.

⁸ *Ibid.*

⁹ Headquarters, Department of the Army, Field Manual 1-02, *Operational Terms and Graphics* (Washington, DC, September 2004), 1-37.

¹⁰ *Ibid.*, pg 1-1.

¹¹ *Ibid.*, 1-2.

¹² Office of the Secretary of Defense, Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, DC, 13 June 2007), 101.

¹³ Office of the Secretary of Defense, Joint Publication 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)* (Washington, DC, Incorporating Change 1, 2 September 2005), 101.

¹⁴ JP 1-02, 392.

CHAPTER 2

LITERATURE REVIEW

Chapter one described the origin of the problem of CAS command and control at the operational level. It also presented the research questions, listed assumptions, defined terms, and discussed limitations of the study.

The purposes of this chapter are to put the study into context using literature and research already conducted in the field and provide historical perspective of air-ground operational command and control issues from World War I through Vietnam. Many articles, books, and theses have been written on similar topics. Not all deal with command and control, but they look at aspects of joint operations that will help describe the problem. Even with a large body of works, the fast pace of organizational change quickly creates gaps in research involving CAS command and control.

The RAND Corporation has presented several studies on close air support and the air-ground integration challenge. According to its company website, “[t]he RAND Corporation is a nonprofit institution that helps improve policy and decision making through research and analysis.”¹ Summing up the overall push for change in the field was the groundbreaking RAND offering *Beyond Close Air Support: Forging a New Air-Ground Partnership*. This report used case studies, anecdotal evidence, and quantitative research to tackle the joint issues of the CAS war. The authors offered a wide range of solutions to their identified problems, even briefly addressing doctrine. The study was one of the few recently published comprehensive works that includes a discussion of the effects of new Army organization on CAS command and control at the operational level. This report in particular describes some of the problems with organization, but does not

discuss doctrine and TTP development. This study will reference findings in the RAND paper and test their validity at the operational level.

Many sources deal with CAS integration and tactical problems. In another example of a RAND study, *Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post-Cold War Era*, Dr. David Johnson, a retired Army officer, researched Operation Anaconda in the context of changing roles for the military in a post-Cold War world. As he did with five major operations in this book, he used the best information possible to present a case study. He then presented the ground-centric viewpoint of lessons learned followed by the air-centric version. He then melded the two extremes into the joint lessons learned. In Anaconda, he looked deeper than the tactics addressed by MG Hagenbeck. He found that “stove piped” planning and command and control issues led to less effectiveness in the CAS war. He also presented a concern that leaders at the extremes of the argument were less likely to extract the helpful lessons from the mistakes made in joint CAS operations. Works that use case studies and historical analysis like Dr. Johnson’s point to Service disconnects. These disconnects can guide research by identifying problems with command and control. This book is representative of a body of work written in the last ten years on joint considerations for command and control. The examples and conclusions from these works, when applied to current CAS doctrine, are applicable to this study. However, they point to a need for more concentration on command of the air-ground battle.

This study uses material to provide a limited historical perspective on the development of CAS command and control. While its focus is not a historical analysis, the role of history in developing our current CAS construct is relevant. History can

always be interpreted in multiple ways, and some of these works in the field are thinly veiled attempts to further Service agendas. Authors disagree on the timeliness, effectiveness, and efficiency of airpower used to directly support ground troops. However, the historical perspective is important in showing “how we got here.” Books like *Case Studies in the Development of Close Air Support* provided an excellent history of CAS command and control, but did not present solutions to modern problems in the air-ground system.

Other publications will be useful in defining command and control and its role in joint military operations. *Understanding Command and Control*, a publication from the Office of the Assistant Secretary of Defense’s Command and Control Research Program (CCRP), set the framework for the research by defining military command and control. Defense think-tanks have published other studies and papers on military command and control, but a gap exists in CAS command and control issues. This body of work does not provide insights into specific CAS-related problems, but gives a conceptual basis for effective command and control. Part of this research will explore differences in doctrinal definitions.

There is no shortage of material on CAS tactics, techniques, and procedures. Theses from all professional military education sources cover a wide range of detail-oriented CAS works. Other works in this category are published articles in military journals, many by commanders recently engaged in Operations Iraqi Freedom and Enduring Freedom. Many of these theses and articles tended to be very Service-centric and focused on the tactical level of war. This study will not be focused on the tactical

arena. However, these papers helped guide the research and allowed the researcher to glean a good operational perspective.

Finally, the study will analyze Army, Air Force, and joint doctrine/TTP manuals, mostly using current publications. As with the historical books and articles, the research will only use past iterations of the manuals to present the evolution of CAS command and control. Most of these publications are unclassified. As discussed in Chapter One, “Limitations,” the study uses unclassified portions of some manuals with overall classifications of “Secret,” but will be limited to all unclassified information.

Close Air Support: Historical Perspective

To fully understand operational level command and control of close air support, one must appreciate the history of interaction between land and air forces. The development of the current command and control structure is deeply rooted in the backgrounds of the Services. Many arguments, both ground- and air-centric, have not changed in 90 years.

Modern airpower can trace its beginnings to observation balloons used in the mid-19th century. The balloon provided instant high ground to the land commander looking for an edge. At the dawn of the age of powered flight, military men saw the airplane as an upgraded platform for observation and reconnaissance.² The first recorded use of airpower other than reconnaissance could actually be categorized as close air support: An Italian pilot dropped three small bombs on Turkish positions in support of friendly ground troops on 1 November 1911.³ The airplane was new technology untested on the battlefield, and no procedures were in place to use airpower. Therefore, as described by historian Lee Kemmett, air support was “random, incidental, and often at the initiative of

the individual aviator.”⁴ The French were the first to use combined attacks featuring coordination between air and ground in Morocco in 1912-1913. This coordination was accomplished ad hoc, as the first set of procedures for planning and conducting air and ground operations appeared in 1914. The French noted the serious effects of airpower on enemy morale. As World War I began, the first aircraft dedicated to bombing appeared. The airplane was used as long-range artillery and was rarely used close to friendly troops.⁵

Command and control arrangements between the ground and air forces were largely driven by the task of observation and artillery spotting. Each of the major combatants attached flying squadrons to ground forces. Communications systems were very primitive. Spotter aircraft normally carried radios, but often dropped written messages to ground troops due to the radios’ lack of reliability.⁶

The Allies introduced a new use of air in 1915. The infantry contact patrol was a really just an updated observer role, significant in its innovative communications.* Pilots dropped situation maps to headquarters behind friendly lines. They were the first to develop a system of real-time communication with ground forces, using a system of streamers, engine revolutions, flares, smoke, and panels on the ground to facilitate two-way communications. Each unit coordinated its own procedures until 1916 when the French authored the first set of instructions for infantry contact patrol techniques. The British and US Army adopted a translation of the instruction the same year.⁷

* While the air-to-air dogfights receive much of the focus of airpower theorists, observation/reconnaissance (eventually armed) flights were the major use of airpower in the war. Fighters were developed to attack enemy observation planes, and the patrol mission was developed to protect friendly observation planes (Air Service in the Great War, 39).

The infantry contact patrol started as a pure observation/reconnaissance mission but evolved into an attack mission. Instead of reporting enemy positions, pilots began to attack them. Even in the earliest cases of close air support commanders and pilots alike were concerned about proper visual identification of enemy and friendly Soldiers with troops in contact; pilots routinely made passes at less than 1,000 feet to identify Soldiers by uniform.⁸

The first instance of a modern air ground operation was at Amiens in August 1918. The operation was planned and executed by air and ground officers under a ground commander, but most air attacks were far from friendly troops and did not require real time coordination.⁹ Attacks were deconflicted, not integrated.

The best use of air ground integration in World War I was by the Germans. They developed an instruction that outlined the use of airpower in conjunction with ground forces. The Germans were the first to put in writing the idea of massed airpower at a battle's decisive point.¹⁰ This instruction showed an early form of on call close air support.

At the close of World War I, all of the combatants looked closely at lessons from airpower. The recurring theme from all Services was the morale effects of airpower. While the actual damage inflicted by air was light, air attacks had a paralyzing effect on the enemy.¹¹ At the same time, friendly troops' morale was boosted by the arrival of air support. Soldiers on the ground felt that when air showed up to help, the higher headquarters cared about their fight.¹²

Friction between ground and air Services developed between the wars. As Germany and Britain formed separate air forces, the United States Army held on to its

airpower. In all of these militaries the first terminology disconnects appeared during this period. Doctrine of ground and air Services did not match. Close air support was referred to as close, direct, or immediate attack, and the definitions of each varied by Service manual.¹³

The US Army Air Force concentrated its energy on strategic bombing in the decade before World War II. Chief of Staff General MacArthur in 1935 voiced his displeasure with the lack of development of what he called “demonstrated and proved” Air Force employment, including close air support.¹⁴ This concentration on strategic bombing can be partially explained by a lack of technology. New anti-aircraft artillery (AAA) was developed that pushed bombers above 10,000 feet to remain safe. At that altitude, aircraft developed in the mid-thirties could put about two percent of their bombs on a target the size of a football field.¹⁵ Given the definition of close air support as engaging targets in close proximity to friendly forces, this accuracy issue precluded close air support development.

Command and control of airpower was also a hot topic between the wars. In 1926, training manual TR 440-15 advocated assigning attack aviation directly to ground commanders. The Air Corps fought direct assignment to ground units through their doctrine and education center, the Air Corps Tactical School (ACTS).¹⁶ The ACTS spent the 1920s and 1930s developing the Army Air Corps’ strategic-bombing-heavy doctrine. The 1930 ACTS text, *The Air Force*, showed the feeling of the air officers about close air support: “the air force does not attack objectives on the battlefield or in the immediate proximity thereof, except in most unusual circumstances.”¹⁷ In the 1939 version of the same text, the wording had changed to “except in cases of great emergency.”¹⁸ Ground

support was defined as attacking the enemy as he massed prior to the fight or cutting off his supply lines,¹⁹ roughly the equivalent of today's air interdiction mission.* Rather than fight the less-than-optimal close air support command and control structure offered by TR 440-15, ACTS decided to drop the mission altogether.

Close air support was used in several smaller wars in the 1930s, most notably the Spanish Civil War. As World War II loomed on the horizon, all players struggled to pull operational lessons from these conflicts. For the first time, airpower was decisive in the close air support role in the Spanish Civil War, but the biggest lesson did not change from World War I: The main contribution of airpower seemed to be psychological.²⁰

France was the first Allied country to be tested in World War II by the Germans. The French had been the first to solidify close air support procedures, and by 1940 they had a mature command and control system in place. Because the system was born in the trench warfare of World War I, it was very elaborate and slow. Observers noted that the fastest close air support response time was four hours, and French records show an average response time of six to eight hours.²¹ Even with training and exercises, the command and control structure and organization bogged down close air support to an almost unusable source of firepower.

The fall of France highlighted the lack of appropriate close air support command and control to the Army Air Corps. General Henry H. "Hap" Arnold, Chief of the Army Air Corps, acknowledged the need for close air support procedures, to include operational command and control organization and systems.²² The first attempt at command and

* Air Interdiction is defined as "air operations conducted to divert, disrupt, delay, or destroy the enemy's military potential before it can be brought to bear effectively against friendly forces, or to otherwise achieve JFC objectives." AFDD 2-1.3, 5.

control doctrine was the Army's *Training Circular No. 52*, which formed the position of Air Task Force Commander and formed an Advanced Air Support Command Post collocated with the headquarters of the unit supported.²³ This structure was the first step toward a modern air ground command and control system.

The United States' entry into World War II hurried the evolution of a usable command and control structure for air ground interaction. In the deserts of North Africa, ACTS academic works on strategic bombing did not impress ground commanders under immediate fire. As David Syrett noted in his synopsis of the Tunisian campaign, "Ground force commanders viewed tactical problems as those requiring immediate solutions, and they were not particularly interested in the longer term effects of interdiction or strategic bombardment."²⁴ In April 1942, the War Department introduced FM 31-35, *Aviation in Support of Ground Forces*. This field manual established air ground organization for combat. The intent was good, but historian Lee Kennett described the product as a "crash effort to establish a comprehensive system of CAS."²⁵ In accordance with command and control procedures in FM 31-35, ground forces requested CAS through their chain to the first headquarters with an Air Support Party. The Air Support party usually resided with the division. The Air Support Officer (ASO), a pilot in the Air Support Party (ASP), would advise the division commander on priorities, and the division commander would approve or deny requests. Approved requests would then go to the corps commander for the final decision. If the corps commander approved a request, Air Support Control (ASC) issued the attack order directly to the bomber or attack unit. The requesting ground unit was notified of the approval or disapproval through the ground chain of command.²⁶

Air officers felt that under the FM 31-35 ground commanders had too much control over the approval process. In keeping with the ACTS doctrine of the mid-1930s, the Air Forces did not want to hit any targets within artillery range of the ground forces at the start of the African Campaign. The invasion of North Africa was hastily thrown together without much thought given to doctrine or command and control beyond FM 31-35.

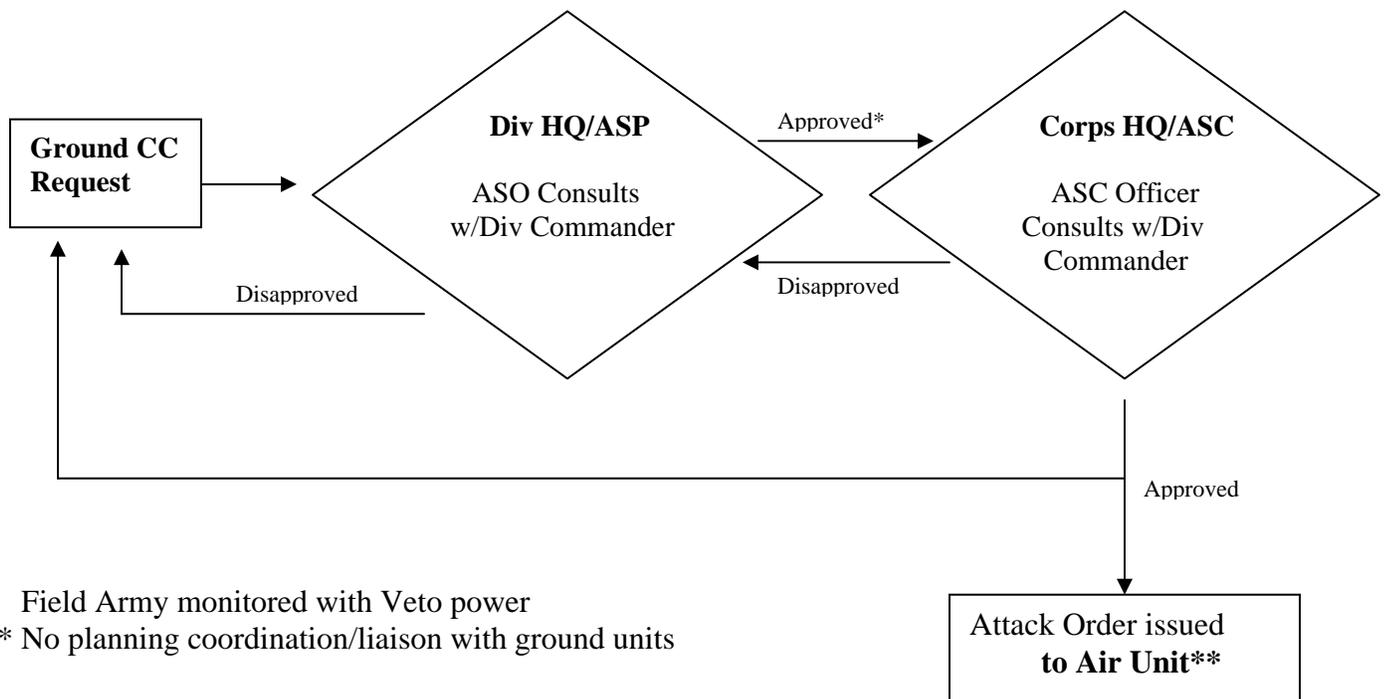


Figure 2. CAS Request System, FM 31-35, 1942.

Because of the lack of air-ground planning, command and control relationships caused some of the biggest problems of the North Africa Campaign. Air Marshall Welsh was air advisor of the Eastern Task Force, while General Doolittle was air advisor for the

Western Task Force (Figure 3). The two air advisors did not speak to each other.²⁷ Although they appointed these air advisors, ground commanders had direct control of airpower, leading to many decisions deemed inappropriate by air officers.²⁸ Tensions mounted as the ground forces complained about lack of support and the air forces complained of inefficient use of airpower by ground commanders. One incident in particular drove change in the command and control structure: Ten of ten British aircraft were lost on a close air support mission while responding under protest to a perceived suicide mission order by a ground commander. General Doolittle called for a separate air commander.²⁹

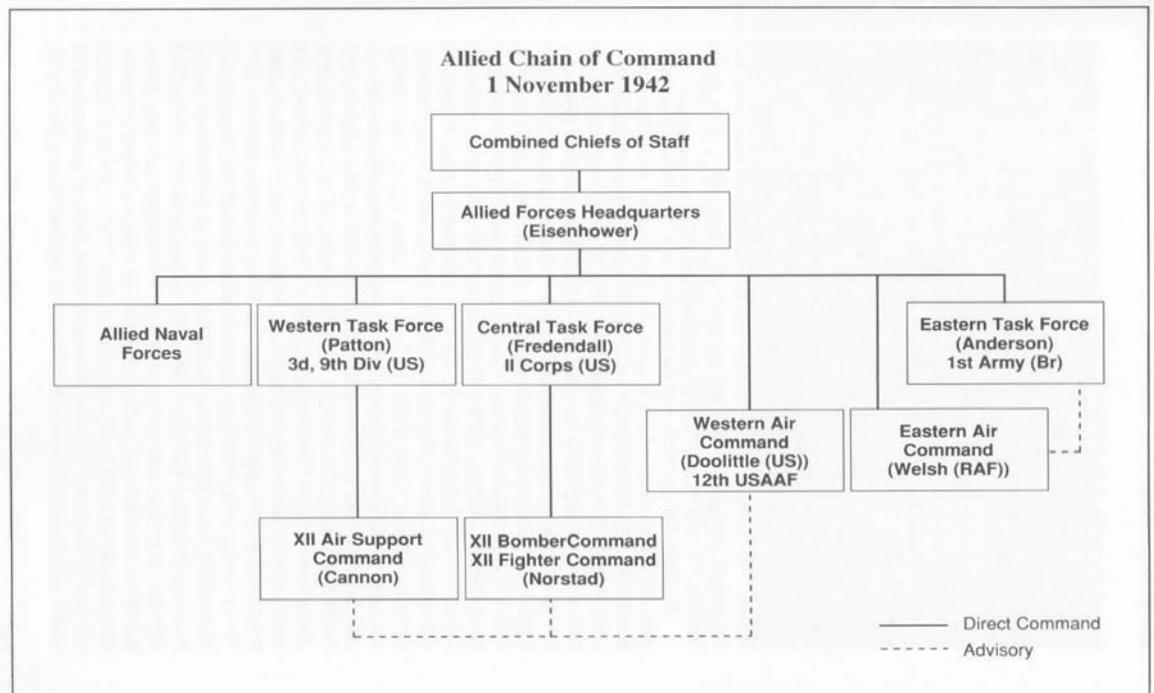


Figure 3. Allied Chain of Command November 1942

Source: David Syrett, "Tunisian Campaign," *Case Studies in the Development of Close Air Support* (Washington, DC: Office of Air Force History, 1990), 163.

As a result of these discussions, Lt Gen Eisenhower appointed MGen Spaatz air commander in late November 1942. MGen Spaatz immediately created Air Support Command and attacked command and control problems with new procedures focused on better unity and more efficient apportionment (Figure 4). Sweeping changes in command and control were underway when the Axis powers attacked at Kasserine in February 1943. Unfortunately, the changes had not yet been completed, and the battle highlighted problems with the air-ground command and control system.³⁰

After Kasserine, Air Vice Marshall Arthur Coningham, commander of Tactical Air Forces in North Africa, argued that the unique problem of command and control of air forces is that they fight two battles, strategic and tactical, while the ground forces only fight the tactical battle. After the war, Coningham wrote his thoughts on the development of air-ground command and control in a journal article:

- (1) air superiority is the first requirement for any major land operation
- (2) the strength of air power lies in its flexibility and capacity for rapid concentration
- (3) it follows that control must be concentrated
- (4) air forces must be concentrated and not dispersed in penny packets
- (5) the [ground and air] commanders and their staffs must work together
- (6) the plan of operation should be mutually adjusted and combined from the start³¹

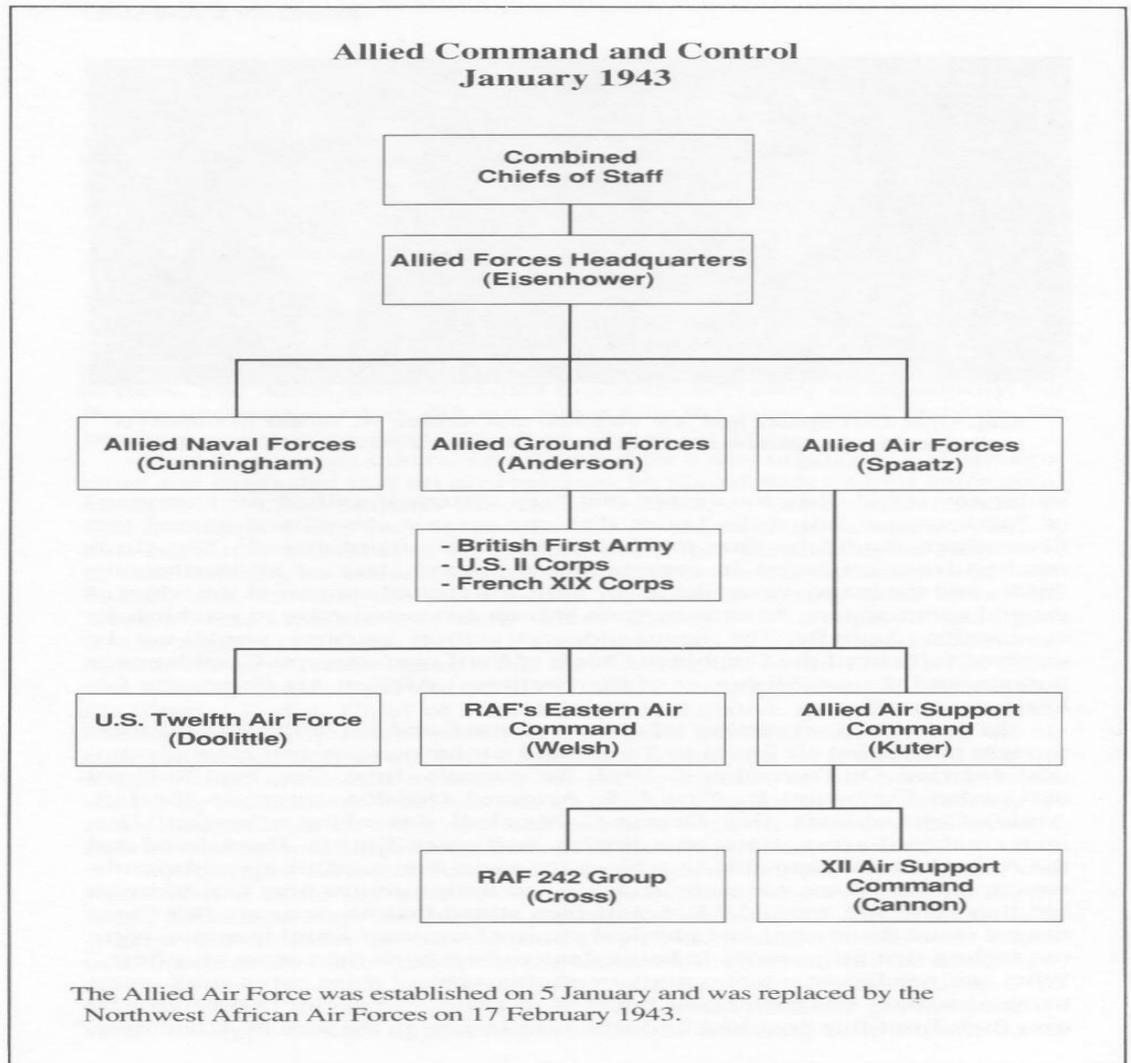


Figure 4. Allied Command and Control January 1943.

Source: Arthur Coningham, "Development of Tactical Air Forces," *Journal of the Royal United Service Institution* (May 1946), Vol 91, 166.

Based on the Tunisian campaign, General Marshall, Army Chief of Staff, ordered a new field manual for the command and control of airpower. The result, FM 100-20 *Command and Employment of Air Power*, formalized changes made in the field in North Africa.³² It was adopted in 1943 without concurrence of ground commanders. For the

first time in US aviation history, FM 100-20 stressed equality between air and ground commanders to ensure flexibility and the ability to mass firepower: “Land power and air power are coequal and interdependent forces; neither is an auxiliary of the other.”³³

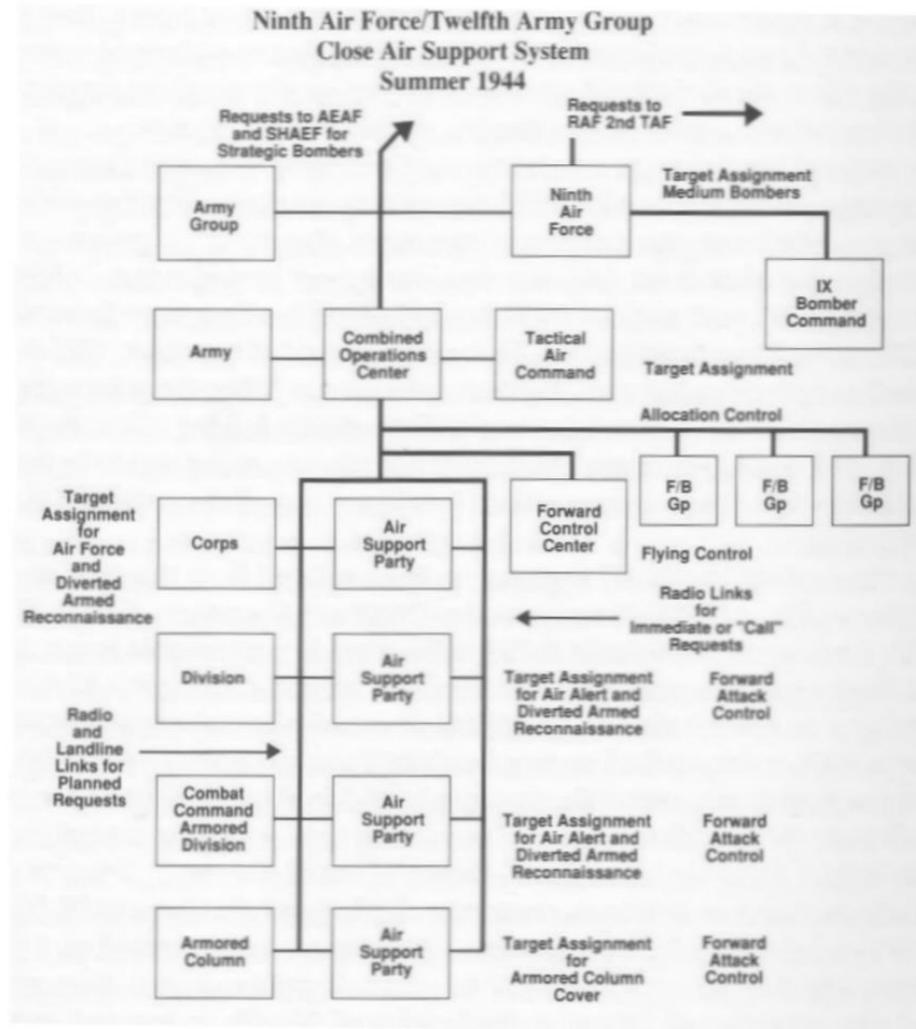


Figure 5. CAS System, Summer 1944.

Source: W.A. Jacobs, “The Battle for France, 1944,” *Case Studies in the Development of Close Air Support* (Washington, DC: Office of Air Force History, 1990), 229.

The first full-scale test of FM 100-20 took place in the Normandy invasion in June 1944. The command and control structure used was directly from the field manual (see Figure 5). The structure included several innovations including an air strike request system that loosely resembled the modern request system and procedures to use alert aircraft or divert airborne fighters to fill immediate requests. Airspace coordination measures also began to look like modern measures, with use of a “bomb line” to avoid fratricide and loosely deconflict fires.³⁴ Coordination improved, but both air and ground commanders were still learning how to best use airpower. Lessons learned in North Africa translated into more effective command and control doctrine in Europe, which formed the framework for modern CAS command and control.

After World War II the Army accomplished another review of command and control of airpower and published an update to FM 31-35, *Air Ground Operations*, based on experience in Europe in 1944-1945. This version of the field manual incorporated much of the spirit of FM 100-20 and maintained the equality of air and ground force commanders. It established a position for a theater air commander that answered only to the theater commander. The air commander and ground commander would coordinate operations through a Joint Operations Center (JOC) collocated with the Army headquarters. Because all CAS had to be approved by both the ground and air commanders, air officers maintained control of the use of airpower.³⁵

FM 31-35 also featured a new tactical air request system (TARS) using the Air-Ground Operations System (AGOS). The TARS featured ground officers assigned to the AGOS at the army, corps, and division levels. As requests moved up the TARS chain, these ground officers, known as G-2 (air) and G-3 (air), would prioritize targets based on

the ground commander perspective. Air Liaison Officers (ALOs) might be assigned to each headquarters, but their role was purely advisory. Once the request list arrived at the JOC, the senior air officer prioritized the list based on an air perspective. The JOC then sent missions to individual wings, where detailed planning was conducted with the help of Ground Liaison Officers (GLOs).³⁶ The TARS system gave the ground officers a significant input into the command and control of CAS, but left an air officer ultimately in charge of air assets.

The Services retained FM 31-35 when the Army and Air Force separated in 1947. However, eight major exercises between 1947 and 1950 identified glaring problems with command and control of close air support. In accordance with FM 31-35, an AGOS and a JOC were generated for each of the eight exercises, but neither the Army nor the Air Force could provide the proper manning or equipment. The Air Force only formed a single control group of Tactical Air Control Parties (TACPs) capable of CAS control, and that group was rated 30% effective by Air Force inspectors. Millett contends:

Ironically, Air Force commanders appreciated their units' deficiencies far better than the Army's tactical commanders. Only MGen Clovis C. Byers, Commander, 82d Airborne Division, questioned the small number of TACPs, the centralization of all mission-tasking in the JOC, and the long response time for sorties. When Tactical Air Command began its doctrinal review, it found greater interest in Congress than in much of the Army, whose senior commanders appear to have regarded close air support as a lost cause after the Air Force became a separate service.³⁷

The results of the exercises were bad enough to prompt the Air Force to recommend a joint publication in 1949, arguing again for equality between ground and air commanders. In response, Tactical Air Command and Army Field Forces published "Joint Training Directive for Air-Ground Operations" in June 1950. Army and Air Staff did not recognize the directive as policy, but let it stand. The document contained no

substantive changes from FM 31-35, but expanded on its established doctrine. In the directive, responsibility for the TARS system was placed squarely on the Army, although it made allowances for air requests from ALOs and TACPs in unusual circumstances. The division was the lowest echelon assigned TACPs. Coordination and integration were not as important as deconfliction, and the directive formalized the Bomblines as the deconfliction line for Air Force fires.³⁸

The Joint Training Directive and FM 31-35 governed close air support when the Korean War began. A JOC was immediately established, undermanned as it had been in peacetime exercises. The Air Force manned the JOC at 65%, and the Army side was “virtually unmanned” according to Millet.³⁹ The Air Force initially provided three TACPs on the ground, and two of the parties were decimated early in the fighting. The Air Force quickly started exclusively using Tactical Air Coordinators (TACs), the forerunner of the Forward Air Controller (Airborne) (FAC [A]) for survivability. This change led to even less integration, as the TACs worked almost all of their targets outside of the Bomblines with no coordination required.⁴⁰ CAS command and control was decidedly ineffective.

In October 1950, MGen Weyland was appointed Vice Chief (Ops) of the Far East Air Force and immediately worked to make an effective CAS command and control system. He ordered the JOC be manned and operated according to doctrine. He considered and implemented some successful procedures from the US Marine Corps, including on-call CAS aircraft and TACPs in ground maneuver units.⁴¹ In the midst of these modifications the Army asked for other changes: Army TACPs with strike authority, CAS flying units assigned directly to ground commanders, and a TACP for

every battalion. The Army argued that these changes would decrease reaction time. The Air Force suggested allowing time for a doctrinally correct JOC to work. Under this system, CAS success was dependent on the ground unit. The 25 Infantry Division systematically used CAS in their combat plans, allowing the command and control system to work according to doctrine. They considered CAS very effective. Other units only used CAS in emergencies, and complained that CAS was unresponsive.⁴² In the final analysis, command and control of CAS in Korea was inefficient. The Army blamed the command and control structure and system established in the Joint Training Directive and FM 31-35. They asked for a complete overhaul of the system. The Air Force argued that the structure and system were sound, and blamed the Army for not adhering to the doctrine in place. Both Services agreed CAS could improve, but they could not agree on the method.

Following the Korean War, the Air Force focused its time, resources, and training to nuclear capabilities. Therefore, conventional capabilities, including CAS, did not receive much attention between the Korean and Vietnam conflicts.⁴³ A US Army Command and General Staff College study of CAS in 1961 recommended three changes that affected command and control (of four total changes): decentralized joint operational planning to field army/tactical air force; resources should be allocated adequate for need; and CAS should be under the operational control (OPCON) of the ground commander. Also of note, in the early 1960s CAS was defined for the first time as “Air action against hostile targets...in close proximity to friendly forces and which requires detailed integration of each air mission with the fire and movement of those forces.”⁴⁴ This definition has changed very little since. In 1963, the Joint Chiefs convened the Joint

Army-Air Force CAS Boards to resolve command and control issues. The Air Force argued for the Joint Force Commander (JFC) to have final authority over air assets, while the Army wanted CAS to be OPCON to the division commander.⁴⁵ These talks resulted in the “Concept for Improved Joint Air-Ground Coordination” in 1965, which formalized the apportionment and allocation process as well as the air request structure.

Apportionment was accomplished by the JFC, and allocation was left to the ground commander. The Concept provided ALOs and Forward Air Controllers (FACs) down to battalion level, with direct access to the Direct Air Support Center (DASC), collocated with the corps (see Figure 6). To shorten response time, approval was implied between battalion and corps level. All levels of the chain monitored the request net and had five minutes to disapprove a request.⁴⁶

The Air Force had shut down the air control system used for CAS in Korea and World War II.⁴⁷ The new TACS rebuilt for Vietnam grew incrementally throughout the Vietnam conflict and was effective by 1968. Both the Army and Air Force seemed satisfied with CAS command and control, with immediate requests normally filled within 20 minutes with fighters airborne, or 40 minutes with alert fighter scrambles.⁴⁸ Air Force Vice Chief of Staff General Holloway stated in 1968, “I believe that when the Vietnam war is concluded, the rapid evolution of close air support will emerge as the outstanding airpower achievement of the war.”⁴⁹ His statement rings true in a system that has remained virtually unchanged in the last 40 years.

Another operational command and control decision in 1968 caused a firestorm throughout the military: General Westmoreland’s appointment of a single air component commander. The Army and Navy politically fought the move, but in the end, Chairman

of the Joint Chiefs of Staff General Wheeler, sided with his commander on the ground and allowed the change.⁵⁰ This change was arguably the most significant command and control modification since World War II. For the first time a single air component commander ensured the unity of command that the Joint Force Air Component Commander (JFACC) provides today.

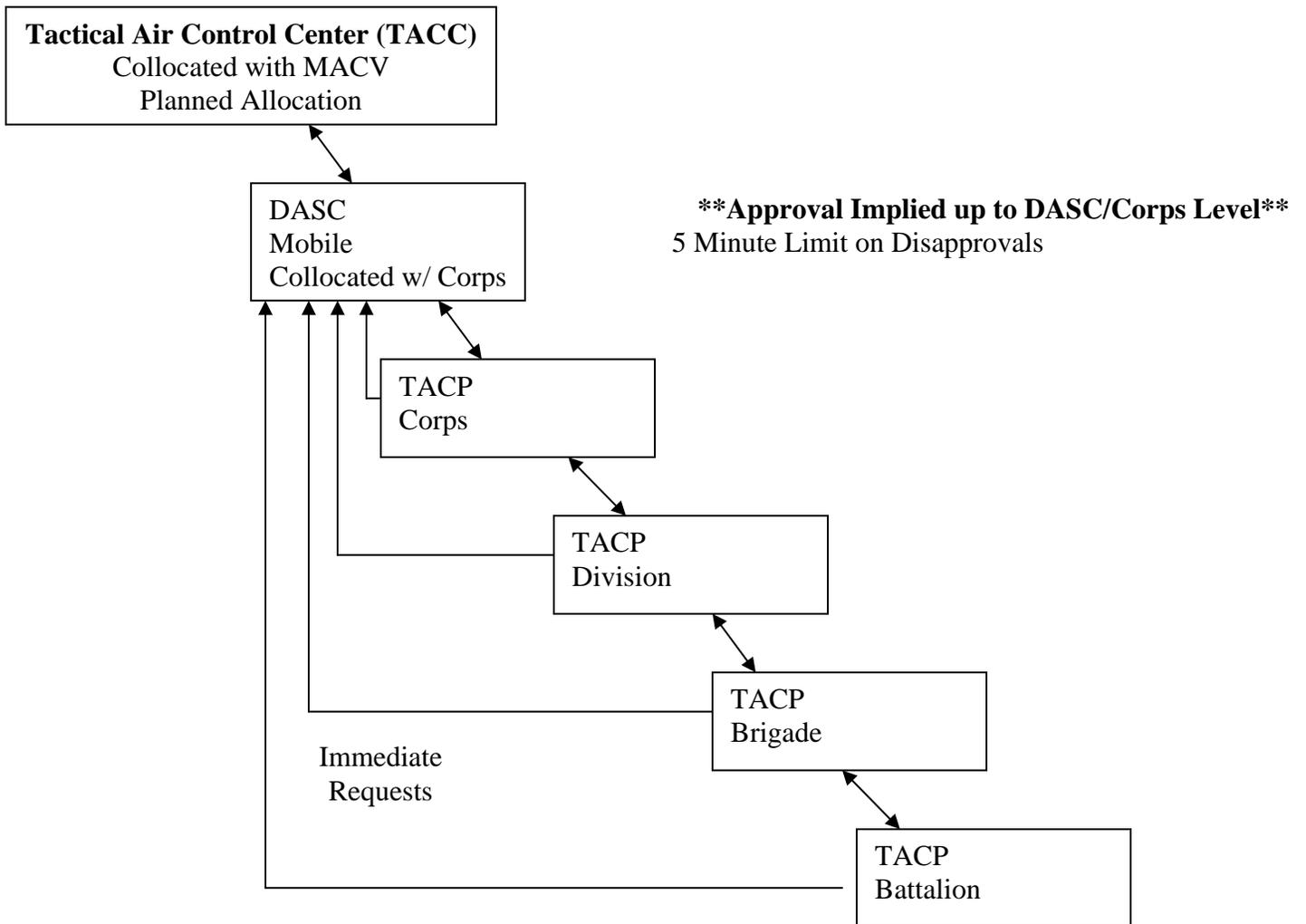


Figure 6. Command and Control of CAS, 1965.

The TACS remained intact from Vietnam through Desert Storm in 1991 with a few minor modifications. This historical perspective is intended to provide background for modern CAS command and control concerns. Chapters four and five of this study will deal with issues arising in recent conflicts.

Conclusion

The purpose of Chapter Two was to offer the background literature available on the topic of close air support in general, and command and control in particular. This literature provides context to the reader and also identify gaps in research. Finally, this chapter reviewed literature on the history of close air support command and control and presented a summary for context.

Endnotes

¹ RAND Corporation, "About RAND: History and Mission," RAND Corporation, <http://www.rand.org/about/history/> (accessed 5 May 2007).

² Lee Kennett, "Developments to 1939," in *Case Studies in the Development of Close Air Support*, ed. Benjamin F. Cooling (Washington, DC: Office of Air Force History, 1990), 14.

³ *Ibid.*, 15.

⁴ Ibid.

⁵ Ibid.

⁶ Ibid., 16.

⁷ Ibid., 17.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid., 19.

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¹² Ibid., 21.

¹³ Ibid., 28.

¹⁴ John F. Shiner, “The Heyday of the GHQ Air Force, 1935-1939,” in *Winged Shield, Winged Sword: A History of the United States Air Force, Volume I*, ed. Bernard C. Nalty (Washington, DC: Air Force History and Museums Program, 1997), 149.

¹⁵ Kennett, “Developments,” 29.

¹⁶ Ibid., 49

¹⁷ *The Air Force*, ACTS Text, 1930, 70.

¹⁸ *Air Force, Employment of Combat Aviation*, ACTS Text, April 1939, 25.

¹⁹ Kennett, “Developments,” 47.

²⁰ Ibid., 40.

²¹ Ibid., 31.

²² Ibid., 53.

²³ *Training Circular 52, Employment of Aviation in Close Support of Ground Troops*, Aug 29, 1941, 9.

²⁴ David Syrett, “Tunisian Campaign,” in *Case Studies in the Development of Close Air Support*, ed. Benjamin F. Cooling (Washington, DC: Office of Air Force History, 1990), 155.

²⁵ Kennett, “Developments,” 56.

- ²⁶ Syrett, "Tunisian Campaign," 156.
- ²⁷ *Ibid.*, 163.
- ²⁸ *Ibid.*, 162.
- ²⁹ *Ibid.*, 164.
- ³⁰ *Ibid.*, 170.
- ³¹ Arthur Coningham, "Development of Tactical Air Forces," *Journal of the Royal United Service Institution* (May 1946), Vol 91, 215.
- ³² Syrett, "Tunisian Campaign," 185.
- ³³ Allan R. Millett, "Korea," in *Case Studies in the Development of Close Air Support*, ed. Benjamin F. Cooling (Washington, DC: Office of Air Force History, 1990), 347.
- ³⁴ W.A. Jacobs, "The Battle for France, 1944," in *Case Studies in the Development of Close Air Support*, ed. Benjamin F. Cooling (Washington, DC: Office of Air Force History, 1990), 260.
- ³⁵ Millett, "Korea," 347.
- ³⁶ *Ibid.*, 348.
- ³⁷ *Ibid.*, 349.
- ³⁸ *Ibid.*, 350.
- ³⁹ *Ibid.*, 354.
- ⁴⁰ *Ibid.*, 364.
- ⁴¹ *Ibid.*, 368.
- ⁴² *Ibid.*, 377.
- ⁴³ John J. Sbrega, "Southeast Asia," in *Case Studies in the Development of Close Air Support*, ed. Benjamin F. Cooling (Washington, DC: Office of Air Force History, 1990), 411.
- ⁴⁴ *Ibid.*, 414.
- ⁴⁵ *Ibid.*, 416.
- ⁴⁶ *Ibid.*, 430.

⁴⁷ John Schligt, “The War in Southeast Asia, 1961-1968,” in *Winged Shield, Winged Sword: A History of the United States Air Force, Volume II*, ed. Bernard C. Nalty (Washington, DC: Air Force History and Museums Program, 1997), 263.

⁴⁸ Sbrega, “Southeast Asia,” 448.

⁴⁹ *Ibid.*, 450.

⁵⁰ *Ibid.*, 462.

CHAPTER 3

RESEARCH DESIGN

Chapter Two covered the existing body of research available concerning close air support coordination and operational command and control. Most research has involved close air support at the tactical level. Some older research into operational command and control needs to be updated. The challenge of this project was to create relevant, up-to-date research.

This chapter explains the methods used to gather the data presented in this paper. The author did not use any statistical or mathematic methods. All research was comparison study of multiple doctrine manuals and interviews of key personnel. Information was collected to determine whether or not joint, US Air Force, and US Army doctrine and TTPs work together to ensure effective CAS command and control at the operational level in the current operational environment.

The first step was to research the most up-to-date doctrine. The author's last operational flight as a Forward Air Controller (Airborne) was December 2006, and he was familiar with Air Force TTP 3-1 and Joint Pub 3-09 and 3-09.3 that were current at that date. All of these manuals change rapidly. The research reflects documents current as of 1 September 2007.

One of the challenges for a career Air Force pilot was to pay appropriate attention to the Army-specific doctrine related to close air support. Since the research question required a working knowledge of transformed Army organization, the research will also need to include the latest Army doctrine defining BCT organization. The paper reflects transformed Army organization current as of 1 June 2007. This research takes the latest

joint doctrine, compares it to Service doctrine, and looks for shortcomings based on new organization. “Connecting the dots” between these documents is the key to answering the research question.

With a firm understanding of the basics, research continued into the history of CAS command and control as it relates to the current architecture. Understanding the evolution of close air support answers questions about the applicability of current doctrine and TTPs.

The research includes an explanation of processes used to update and refine joint and service doctrine. The author combined information from Air Combat Command, the Air Ground Operations School, Joint Forces Command, and TRADOC to understand the lifecycles of these documents. Once again, comparisons of these different pieces of data tell the story behind seeming disconnects in doctrine and point the research toward some possible recommendations.

From this overview, the following research phases were applied:

1. *History of Air-Ground Command and Control.* This research included analysis of historical works tracking the history of leadership interaction and air-ground relationships.

2. *Comparison/Contrast of joint and service doctrine and TTPs.* This phase was broken down into three subcategories:

a. *Comparison of definitions of joint/service common terms.* For this subcategory, all applicable doctrine and TTP manuals (service and joint publications) were reviewed for definitions. The author noted deviations in definitions and whether service publications acknowledged deviations from joint doctrine.

b. Comparison of joint/service doctrine. This portion of the research focused on Joint Publications (JP), Air Force Doctrine Documents (AFDD) and Army Field Manuals (FM) devoted to Army doctrine. The comparison paid particular attention to command and control, close air support, and air-ground integration.

c. Comparison of joint/service Tactics, Techniques, and Procedures (TTP) manuals. After the comparison of the broad-brush doctrine manuals, the study looked at more specific TTPs related to the research question. Documents reviewed included JP and FM dedicated to TTP and Air Force Tactics, Techniques, and Procedures (AFTTP) manuals.

3. Research into the life cycles of joint and service doctrine/TTPs. This final phase looked at the process for reviewing and updating doctrine and TTP manuals. It examined the interaction amongst doctrine authors and approval authorities in the joint and service arenas.

The study will offer analysis of existing documents and operations in Chapter Four using the methodology outlined in this chapter. Chapter Five will meld analysis with current operations to provide recommendations for the way ahead.

CHAPTER 4

ANALYSIS

The first two chapters gave the reader background on the history of close air support and the need for study of its operational command and control. Chapter Three provided a brief overview of the research methods used in this study. The aim of Chapter Four is to review current close air support operational command and control procedures, and to analyze current joint, Air Force, and Army doctrine covering operational command and control of close air support. The chapter opens with a brief overview of the current operational command and control of close air support. Next it will look at joint and Service philosophies on the role of doctrine as defined in their own doctrine publications. With the role of doctrine defined, the study will compare doctrinal publications in five subcategories of close air support operational command and control. Finally, it will assess the current operational command and control system using the nine tenets of joint command and control from Joint Publication 1.

Overview of Close Air Support Command and Control Process

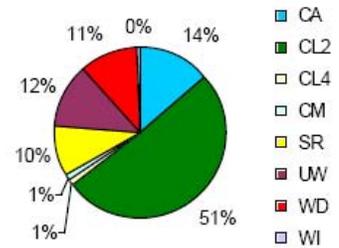
Before analyzing doctrine and doctrinal references to close air support, the current command and control system must be reviewed. Under the system of combatant commands and joint force commanders set in place by the Goldwater-Nichols Department of Defense Reorganization Act of 1986, the Air Component is organized under a single Joint Force Air Component Commander (JFACC)* who reports directly to

* JFACC is the term used in the Joint environment. In the multinational (“combined”) environment, the term CFACC is used. Most recent doctrine publications use the term C/JFACC, covering the combined and Joint arenas. In any case, CFACC, JFACC, and C/JFACC can be used interchangeably for the purposes of this specific doctrine discussion.

the Joint Force Commander (JFC). The JFACC is responsible for all air activity of the joint force, to include Close Air Support. The first step in planning airpower for the joint force is apportionment. The apportionment process identifies the proportion of available total sorties dedicated to each type of mission, and can further be broken down into proportion of available total sorties dedicated to a specified task. Apportionment is normally stated as a percentage. The JFACC recommends apportionment to the JFC who makes the final apportionment decision. Figure 7 shows the unclassified air apportionment for the initial stages of Operation IRAQI FREEDOM (OIF) as broken down by tasks.

CFACC APPROVED APPORTIONMENT

- Average Apportionment (by percentage)
 - CA 14.1%
 - CL2 50.7%
 - CL4 1.2%
 - CM 1.0%
 - HA 0.0%
 - JR 0.0%
 - SR 9.8%
 - SS 0.0%
 - UW 12.5%
 - WD 10.2%
 - WI 0.5%



- CA Maintain Air and Space Supremacy in the ITO
- CL2 Support CFLCC to achieve defeat or compel capitulation of RGFC & RA and conduct Security and Stabilization Operations (SASO)
- CL4 BPT support the prevention of non-combatant forces from impeding CFC Operations
- CM Support CFMCC to Maintain Maritime Supremacy
- HA Support CFC to secure regional and international support
- JR Conduct JRSOI of Follow-on/Combat Replacement FEs and maintain air posture
- SR Continue suppression of Iraqi Regime's ability to command Iraqi forces & govern State
- SS BPT establish and operate secured airfields in Iraq IOT establish alternate APODs in support of CFC ops
- UW Support CFSOCC Ops
- WD Suppress Iraqi TMD/WMD delivery systems
- WI BPT support CFLCC in neutralizing/controlling WMD infrastructure & SSE

Figure 7. Apportionment for OIF

Source: USCENTAF Assessment and Analysis Staff, *Operation Iraqi Freedom: By the Numbers* (Washington, DC: 30 April 2003), 5.

Once the apportionment decision is made by the JFC, the JFACC accomplishes allocation. Allocation assigns aircraft to the apportionment decision, turning the apportionment percentages into actual sorties. Allocation is purely a function of the JFACC and is the first time consideration is given to actual airframes dedicated to different types of missions.

Until this point in the planning process, all planning is accomplished at the JFACC's headquarters, the Joint Air Operations Center (JAOC).^{*} Once the allocation is complete, close air support sorties are forwarded to the Air Support Operations Center (ASOC), normally collocated with the division headquarters. The ASOC is comprised of Air Force personnel working in liaison with Army personnel. At this point in the planning, the ASOC matches allocated sorties (actual assets) to support requests via the process of distribution.

One of the key components of operational level command and control of close air support is airspace control. Airspace is controlled using two types of measures: positive control and procedural control. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines positive control as “[a] method of airspace control that relies on positive identification, tracking, and direction of aircraft within an airspace, conducted with electronic means by an agency having the authority and responsibility therein.”¹ Air Force agencies can provide positive control at the operational level to aircraft under radar coverage using Airborne Warning and Control System (AWACS) aircraft, ground controlled intercept (GCI) sites, and remote radio and

^{*} For the purposes of this doctrine discussion, the terms Air Operations Center (AOC), Joint Air Operations Center (JAOC) and Combined Air Operations Center (CAOC) may be used interchangeably. See footnote on page 37.

situational awareness consoles in the JAOC. Procedural control is defined in Joint Publication 1-02 as “A method of airspace control which relies on a combination of previously agreed and promulgated orders and procedures.”² The JFACC, in his role as the airspace control authority, sets forth airspace control measures (ACM) which define procedural control for the theater in the Rules of Engagement (ROE), Airspace Control Order (ACO), Air Tasking Orders (ATO), and Special Instructions (SPINs). These documents also prescribe authority and methods for other agencies to provide procedural control and establish ACMs. Reference Figure 8 for examples of each type of control.

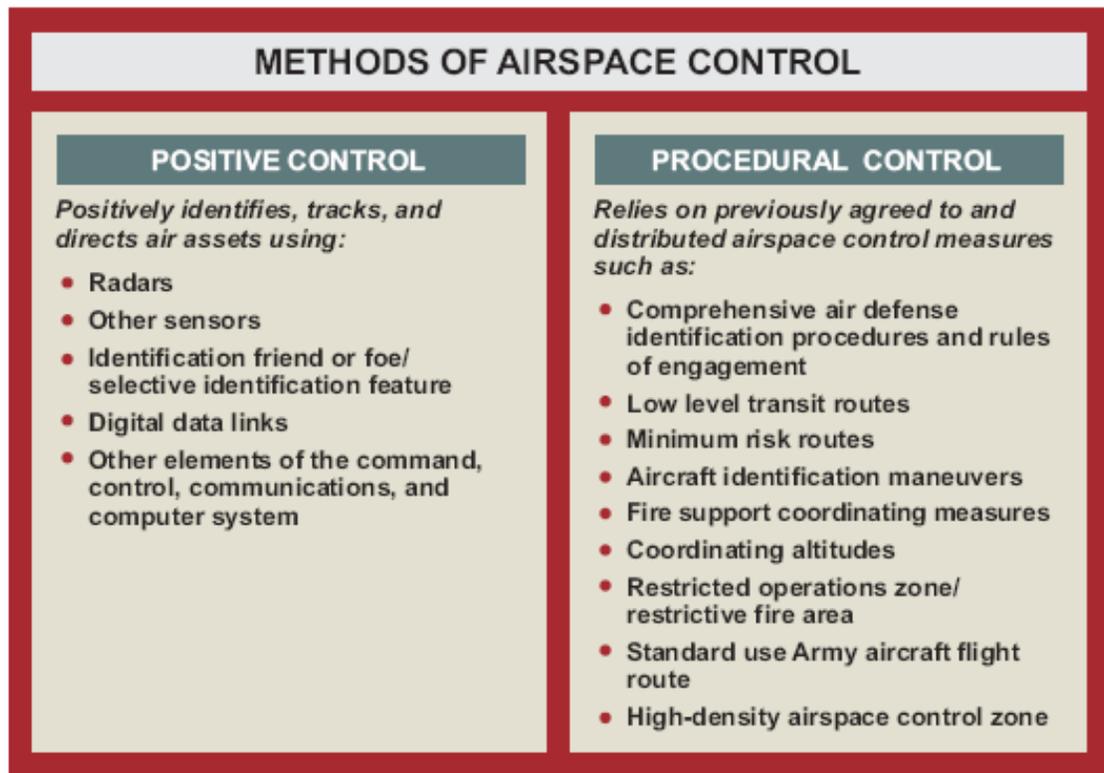


Figure 8. Methods of Airspace Control.

Source: Office of the Secretary of Defense, Joint Publication 3-52, *Joint Doctrine for Airspace Control in the Combat Zone* (Washington, DC, 30 August 2004), III-4.

The control system in place for air-ground integration at the operational and tactical level is a combination of the Air Force Theater Air Control System (TACS) and the Army Air-Ground System (AAGS), collectively known as the TACS-AAGS. This system is little changed from the air-ground system in place at the end of the Vietnam Conflict and described in Chapter 2. Figure 9 shows the AFDD2-1.3 depiction of the TACS-AAGS; note the first disconnect in Service doctrine as the ASOC is shown collocated with the Corps rather than the Division (described below in “Analysis of Joint and Service Doctrine”). However, this representation is an easy-to-understand depiction of the key elements of the TACS-AAGS.

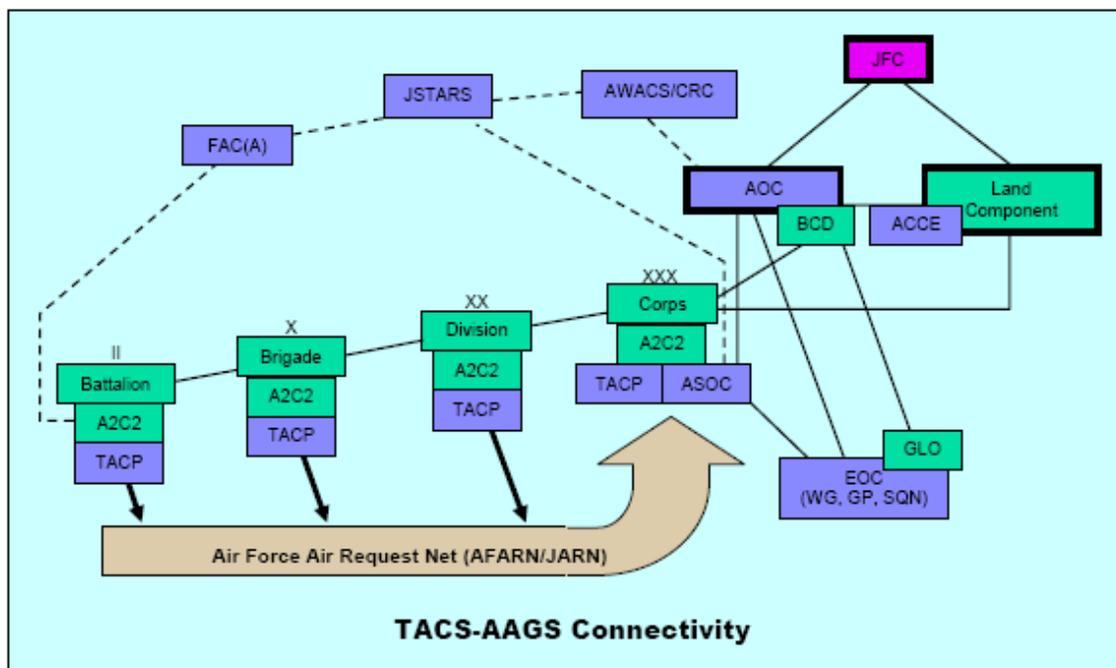


Figure 9. Key Elements of the TACS-AAGS.

Source: Headquarters, Department of the Air Force, Air Force Doctrine Document 2-1.3, *Counterland* (Washington, DC, 11 September 2006), 52.

During actual execution, the ASOC controls all CAS allocated aircraft. In the event of immediate CAS requests, the ASOC may either divert aircraft under their control to higher-priority missions, or may request sorties be diverted or rerouted from the JAOC. Using the Tactical Air Control Parties (TACP) assigned to appropriate echelons, ground commanders can request immediate air through the Joint Air Request Net (JARN). The TACS-AAGS uses command by negation in fulfilling these immediate requests, and only ground commanders at each echelon may override immediate air support requests.

The ASOC can provide procedural control to attack aircraft in its assigned area. Joint Terminal Attack Controllers (JTACs) and Forward Air Controllers (Airborne) (FAC [A]) provide a mix of procedural and positive control to attack aircraft in their assigned areas.

This overview of close air support command and control is a simplified review of the procedures currently in place. Analysis of joint and Service doctrine will provide more detail into current close air support command and control.

Deconfliction, Integration, or Interdependence?

Prior to the Goldwater-Nichols Defense Reorganization Act of 1986, the Services did not frequently train together. As the history of Close Air Support shows in Chapter Two, the lack of training between conflicts forced the Services to relearn lessons and rebuild command and control several times. In the introduction to the latest version of FM 3-0, the authors show us how far the Services have progressed as they reflect on the 1954 version of FM 100-5, which made the “unequivocal claim” of Service independence.³ Until Goldwater-Nichols forced the joint mentality on the Armed Forces, most Services conceptualized joint operations in terms of deconfliction. The term

“deconfliction” is not defined in joint or Service doctrine, but is used extensively. When Services deconflict, they use space or time to keep their forces separate. Deconfliction can be used to ease planning, reduce redundancies, or ensure safety. Examples of deconfliction have occurred in all Services throughout history. Route Packs that deconflicted Air Force and Navy attack assets in Vietnam present one of the most notorious examples of deconfliction. These laterally deconflicted air strikes led to unusual inconsistencies in rules of engagement and lessened the overall effects of the air war in Vietnam. When Services use deconfliction as their primary means of working together in joint operations, they lose the synergistic effects of joint firepower.

Instead of deconfliction, Services should strive for integration. JP 1-02 defines integration as the “arrangement of military forces and their actions to create a force that operates by engaging as a whole.”⁴ Integration uses all available capabilities to maximize effects. Since Goldwater-Nichols, integration has been the standard for joint exercises and operations.

Air Force doctrine champions integration. AFDD 1 says:

Doctrine is about *integration...not just synchronization*. Synchronization is “the arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time.” Integration, by comparison, is “the arrangement of military forces and their actions to create a force that operates by engaging as a whole.”⁵

In this case, synchronization is a type of deconfliction. The capstone Air Force Doctrine Document tells the reader to look to doctrine as a source of integration. Furthermore, the Air Force’s *Counterland* doctrine states, “it is important to realize that the proper integration of air, space, and surface forces is required for successful joint operations.”⁶

Today's joint doctrine directs the Services to take another step toward jointness: interdependence. JP 1 defines interdependence as the "purposeful reliance by one Service on another Service's capabilities to maximize complementary and reinforcing effects of both; the degree of interdependence varying with specific circumstances."⁷ This interdependence acknowledges that no Service can accomplish the mission on its own. These complementary and reinforcing effects are needed as a Joint Force.

Army doctrine has quickly embraced the use of the term interdependence. The Post-DRAG Draft 04 (Student Review) version of FM 3-0 introduces and defines interdependence in line with the joint publication. FM 3-0 uses the concept of interdependence throughout its descriptions of operations. The Army doctrine manual does a very thorough and realistic overview of joint interdependence. Specifically, it acknowledges the amount of planning and preparation necessary for an interdependent force. Additionally, it stresses the importance Joint Doctrine knowledge by staffs in particular.⁸ Finally, the Army's capstone doctrine document lists Joint Interdependence as one of the four fundamentals of the operational concept.⁹ Overall, Army doctrine explains joint interdependence much more thoroughly than joint doctrine.

Although most of the explanation of joint interdependence in Army doctrine is very precise, this study finds one minor critique of the "Joint Interdependence" paragraph in FM 3-0. FM 3-0 goes beyond the joint definition by stating "Joint capabilities make Army forces more effective than they would be otherwise."¹⁰ In the author's opinion, the intent of the Joint Publication definition would be more adequately written as "Joint capabilities make the Joint Forces more effective than any single Service." This critique is a minor point in an otherwise very well written publication.

While Air Force doctrine has very good explanations of integration, the idea of interdependence has not yet been introduced. The Air Force's capstone doctrine document is showing its age (17 November 2003), which might explain the absence of the latest terminology. However, the Air Force's doctrinal glossary was updated 11 January 2007 with no mention of joint interdependence. The Air Force needs to bring its doctrine in line with joint doctrine by defining joint interdependence and explaining how the concept affects all facets of air operations.

Integration should be the minimum standard currently achieved by joint forces, and joint interdependence should be the standard the Services work toward today. As the Air Force and Army move from deconfliction to integration to interdependence, they will require increased interoperability, joint knowledge, and joint planning. Unfortunately, due to the ease of planning and execution, deconfliction is often still used in joint operations.

Analysis of Joint and Service Doctrine

Role of Doctrine

In analyzing doctrine, we must first establish the role intended for each document. Joint Pub 1, *Joint Doctrine*, declares, "Joint doctrine presents fundamental principles that guide the employment of US military forces in coordinated and integrated action toward a common objective."¹¹ Joint doctrine is a means to standardize terminology, relationships, training, responsibilities, and processes among the Services. As with doctrine at any level, joint doctrine is not meant to be restrictive or to limit a commander. However, JP 1 describes joint doctrine as "authoritative," and states that joint doctrine "will be followed except when, in the judgment of the commander, exceptional

circumstances dictate otherwise.”¹² All joint publications are promulgated by the Joint Chiefs of Staff, therefore all Services have offered their input and agreed to the joint publications’ concepts.

Each Service also authors its own doctrine. Members of each Service are likely more familiar with their doctrine than with joint doctrine. Most training at the tactical level is very Service-specific and includes indoctrination using Service publications. Even at the intermediate-level professional military education level, students are educated almost exclusively in Service-specific doctrine. At the US Army Command and General Staff College, the book issue includes 16 Army doctrine documents (Field Manuals, Field Manuals Interim, and student texts) and only two joint publications. It follows that all Service members should be expected to know their respective Service’s doctrine. However, more than 20 years after the Goldwater-Nichols Department of Defense Reorganization Act, the individual Services have largely failed to teach “[u]nderstanding the foundations of joint doctrine is essential for the Armed Forces of the United States.”¹³

If members of the armed forces know their own Service doctrine, what role should joint doctrine play? Joint Publication 1 says that while Service doctrine is considered when writing joint doctrine, “Joint doctrine takes precedence over individual Service’s doctrine, which must be consistent with joint doctrine.”¹⁴ Joint doctrine should be broad, but the more detailed Service doctrine must fit within its framework (see Figure 10). If Service and joint doctrine conflict, joint doctrine will take precedence. If doctrine publication lifecycles are offset, Service doctrine must accurately reflect changes in joint doctrine.

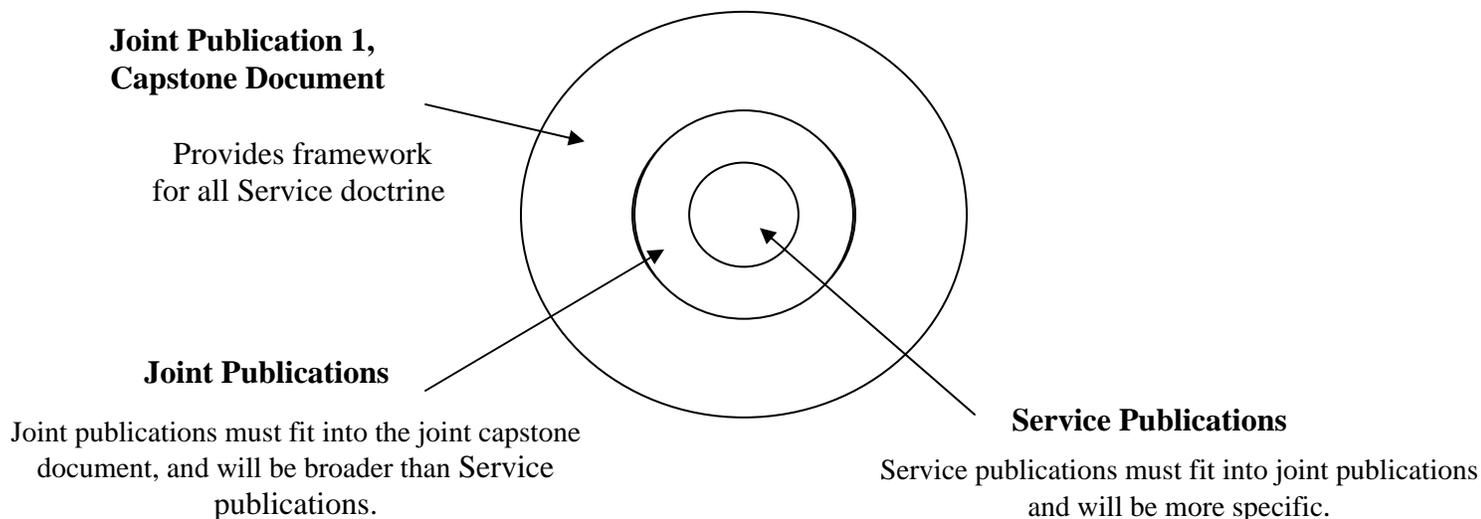


Figure 10. Interrelationship of Doctrine Publications

Army doctrine acknowledges this relationship between joint and Service doctrine in its capstone doctrine document, FM 1: “To facilitate joint interdependence, Army doctrine supports and is consistent with joint doctrine.”¹⁵ FM 1 also addresses the role of doctrine in the same terms as JP 1, although the Army manual is less formal when describing the authoritative nature of doctrine: “It [doctrine] is a guide to action, not hard and fast rules.”¹⁶

The capstone Air Force doctrine manual, AFDD 1, invests eight pages in an explanation of doctrine and its role in operations. The publication never makes a concise definition, but explains the role in the same basic manner as JP 1 and FM 1, making the specific point that “doctrine should be used with judgment. It must never be dismissed out of hand...nor should it be employed blindly without due regard for the mission and situation at hand.”¹⁷

One description of doctrine appears only in the Air Force's capstone document. AFDD 1 describes three levels of Air Force doctrine: basic, operational, and tactical. AFDD 1-series publications make up basic doctrine and describe the elemental properties of air power. AFDD 2-series documents comprise the operational doctrine, which describes specifics of air power organization and employment. Tactical doctrine is made up of the AFTTP 3-series publications. These tactics, techniques, and procedures are specific to weapons systems and are very narrow in scope.¹⁸ These levels appear in joint and Army doctrine as well, but are not defined in either capstone document.

In describing and defining roles, relationships, and employment of Joint Forces, it is important to emphasize "words matter." Since standardization of terminology is one of the goals of joint doctrine, Service doctrine documents should use precise joint terminology when able.

No significant gaps exist between joint or Service publications in defining and describing the role of doctrine.

TACS-AAGS

The Joint Force Commander (JFC) is at the top of the TACS-AAGS chain of command. The next step down in the chain, parallel to each other, are the Joint Force Land Component Commander (JFLCC) and the Joint Force Air Component Commander (JFACC). Both the JFACC and JFLCC must be joint-minded commanders. Any conflicts between the two components must be resolved by the JFC. This relationship is commonly misunderstood by both Services. Often, Soldiers perceive the JFACC and the JAOC as Air Force-only entities, while in fact both are inherently joint, as shown by the tasks in Figure 11.

It is important to note that while Close Air Support is an integral part of the joint fight, it is rarely mentioned in joint doctrine publications concerning command and control. Joint Publication 3-30, *Command and Control for Joint Air Operations*, merely lists Close Air Support as a possible type of air mission with no mention of actual command and control of CAS. The land component's command and control publication, Joint Publication 3-31, makes only a passing mention of the liaison required for air-ground coordination, with no mention of actual Close Air Support command and control. Joint Publication 3-60, *Joint Targeting*, only lists Close Air Support in its glossary.

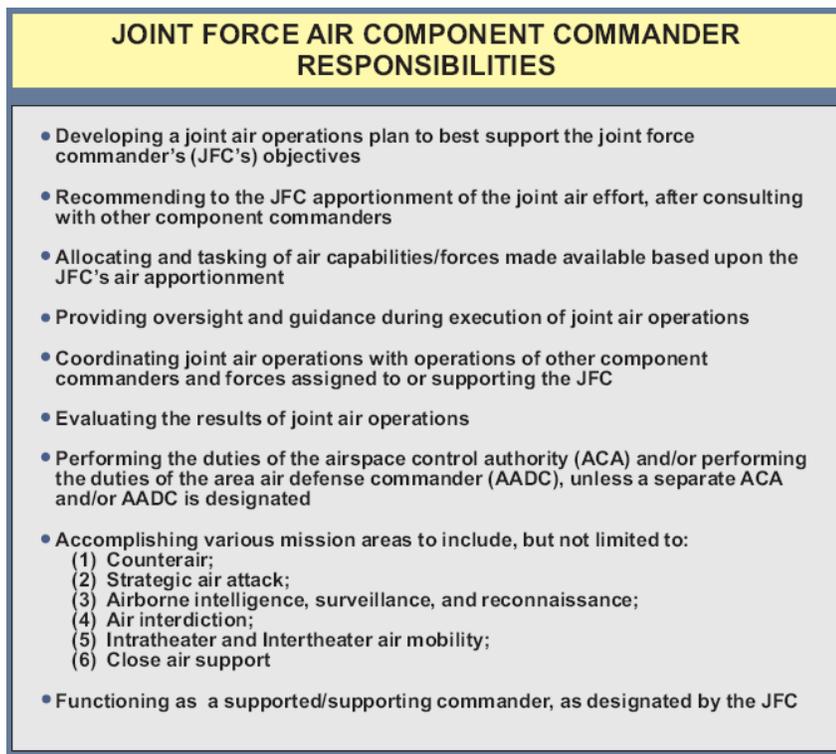
- 
- JOINT FORCE AIR COMPONENT COMMANDER RESPONSIBILITIES**
- Developing a joint air operations plan to best support the joint force commander's (JFC's) objectives
 - Recommending to the JFC apportionment of the joint air effort, after consulting with other component commanders
 - Allocating and tasking of air capabilities/forces made available based upon the JFC's air apportionment
 - Providing oversight and guidance during execution of joint air operations
 - Coordinating joint air operations with operations of other component commanders and forces assigned to or supporting the JFC
 - Evaluating the results of joint air operations
 - Performing the duties of the airspace control authority (ACA) and/or performing the duties of the area air defense commander (AADC), unless a separate ACA and/or AADC is designated
 - Accomplishing various mission areas to include, but not limited to:
 - (1) Counterair;
 - (2) Strategic air attack;
 - (3) Airborne intelligence, surveillance, and reconnaissance;
 - (4) Air interdiction;
 - (5) Intratheater and Intertheater air mobility;
 - (6) Close air support
 - Functioning as a supported/supporting commander, as designated by the JFC

Figure 11. JFACC Responsibilities

Source: Office of the Secretary of Defense, Joint Publication 3-30, *Command and Control for Joint Air Operations* (Washington, DC, 5 June 2003), II-2.

One small gap exists in doctrine concerning the TACS-AAGS. As the Army has transformed, it has shifted many headquarters and staff functions from the Corps to the Division level. Joint and Air Force doctrine show the ASOC at the Corps level,¹⁹ while Army doctrine describes the ASOC at the Division.²⁰ Army doctrine does, however, acknowledge that by joint doctrine the ASOC is located with the senior Army echelon's fire support element. The memorandum of agreement between the Air Force and Army that establishes the ASOC states that the ASOC will be located with the corps, or the "senior Army tactical echelon in the absence of corps."²¹

Apportionment and Allocation

Apportionment is the division of air effort among different air mission sets. It is usually expressed as a percentage. Joint Publication 1-02 defines apportionment as the "determination and assignment of the total expected effort by percentage and/or by priority that should be devoted to the various air operations for a given period of time."²² The JFACC makes the air apportionment recommendation, normally through his Joint Guidance, Apportionment, and Targeting team. The apportionment recommendation is made in conjunction with the joint prioritized integrated target list. In accordance with JP 3-30, the final approving authority for air apportionment is the joint force commander.²³

Not all ground attack sorties flown by the Air Force are considered joint fires. To adhere to the Joint Pub 1-02 definition of joint fires, a sortie must deliver fires "during the employment of forces from *two or more components in coordinated action* to produce desired effects in support of a common objective."²⁴ Close air support sorties are Air Force sorties that support the ground commander (presumably Army or Marine Corps) in

coordinated action and are therefore, by definition, joint fires. These are the sorties that are subject to joint doctrine concerning joint fires, and would be the only sorties, apportioned and allocated to the ground forces, subject to Army Service doctrine.

Joint Doctrine defines the next step in the process, allocation, as the process by which “the JFACC translates [the apportionment decision] into total number of sorties by aircraft type available for each objective/task.”²⁵ Allocation is the link between apportionment and the published Air Tasking Order.

Air Force doctrine merely regurgitates joint doctrine in its description of the apportionment process in AFDD 2-8, *Command and Control*²⁶ and AFDD 2-1.3, *Counterland*.²⁷ The Service’s doctrine gives a more specific definition of allocation, adding the following to the joint definition: “Allocation is the distribution of limited resources among competing requirements for employment.”²⁸ This definition further explains the process of allocation but remains within the framework of joint doctrine.

Except to define the terms, Army doctrine does not directly reference apportionment or allocation, nor is reference required. Ground commanders and staffs requiring an education on the process can reference joint publications. Indirectly, both ground and air officers should understand the basic process, and must understand which allocated sorties are considered joint fires. Army doctrine begins to get involved in the next step in the process, distribution.

There are no apparent doctrinal gaps between joint and Service doctrine documents concerning apportionment and allocation.

Distribution

When air assets are committed to close air support missions, the ground commander distributes them to his subordinate units. These sorties may be held by the division commander at the ASOC for distribution as needed, or they may be distributed to lower echelons as planned close air support sorties. AFDD 2-1.3 cautions, “Distributing CAS among many competing requests dilutes the effects of those assets and may result in less, rather than more effective air support to ground forces.”²⁹ Army doctrine echoes this distribution concept in FMI 3-91:

The JFLCC normally distributes his allocation of CAS to subordinate Army commanders who can then sub-distribute their CAS distribution to their subordinate commanders, and so forth. By retaining control over a significant portion of the CAS sorties, the Corps/Division commander can shift priorities, weight his effort, and rapidly respond to emerging opportunities without shifting CAS sorties from one BCT to another.³⁰

To maximize the flexibility of close air support sorties, Army doctrine suggests limiting distribution and retaining control at higher levels.

However, the view ground and air commanders take of the capabilities of joint fires affects this distribution. These divergent views are one of the apparent gaps in Service doctrine manuals.

The Air Force sees airpower, whether in the close air support, air interdiction, or strategic attack role, as a flexible and adaptable force option. Close air support can be preplanned to mass firepower at an advantageous place or time in the area of operations. If needed, airpower can be used for immediate requests in emergency situations to aid ground forces. Using Air Force assets to merely bomb tactical point targets is viewed as an inefficient use of airpower. The Air Force makes this view clear in its doctrine

document *Counterland*: “As an aerial maneuver force, counterland operations forces should not be considered as ‘flying artillery.’”³¹

The Army doctrine, on the other hand, immediately points out that it views airpower as just another asset providing joint fires. The Army’s Interim Field Manual on division operations starts by describing the changes in the division based on the new modular force restructuring. In the first paragraph of the document, under the heading “Fundamental Changes,” the document states, “Reductions in the number of artillery units mean the division will increasingly rely on joint fires.”³² Later in the manual, it informs readers, “Close air support can often make up for the lack of armor and heavy artillery.”³³ This is a seemingly small nuance in the wording of the Service doctrine, but it shows a fundamental disagreement regarding the use of airpower. Army doctrine views the lack of artillery as a capability gap requiring interdependence, while Air Force doctrine promotes more efficient uses of airpower. Doctrinally, the Air Force will allocate sorties to fulfill its apportionment obligation. The ground commander has the authority to distribute those sorties as he sees fit. Proper use of these sorties requires proactive Air Liaison Officer (ALO) interaction as well as ground commanders properly educated in the use of airpower.

Joint doctrine clearly defines the duty of the ALO. Joint Publication 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)*, lists the ALO as the primary advisor on air operations to the ground commander. It further states that above battalion level, the ALO will be an aeronautically rated officer (pilot, navigator, or air battle manager) and expert in airpower. Further, he “plans and executes CAS in accordance with the ground commander’s guidance and intent.”³⁴ He is expected to

Speak directly to the commander if available.³⁵ The joint publication also lists the ALOs duties throughout, to include:

1. Advising the ground commander on how and when to employ a FAC(A).
2. Advising the ground commander on the threat, aircraft availability, and weapons loads.
3. Working closely with the fire support element in the development of the fire support plan, high payoff target list, communications, control measures, and laser employment plan.

Army doctrine more thoroughly spells out the role of the ALO in operational command and control. FM 6-0, *Mission Command: Command and Control of Army Forces*, lists among the ALO's responsibilities:

1. Advising the commander and staff on employing aerospace assets.
2. Operating and maintaining the Air Force tactical air direction radio net and Air Force air request net.*
3. Transmitting requests for immediate CAS and reconnaissance support.
4. Planning the simultaneous employment of air and surface fires.
5. Coordinating tactical air support missions with the [fire support coordinator] and the appropriate [Army Airspace Command and Control] element.
6. Supervising forward air controllers and the tactical air control party.
7. Integrating air support sorties with the Army concept of operations.
8. Participating in targeting team meetings.
9. Directing CAS missions.³⁶

* Joint and Service doctrine still reference the Air Force Air Request Net (AFARN), which has been renamed the Joint Air Request Net (JARN). AFDD 2-3.1 refers to them interchangeably (AFARN/JARN).

These tasks seem to follow the model described earlier (and illustrated by the Venn diagram in Figure 10): they fall within joint doctrine and are more specific to Service needs. However, the Field Manual does not reference Joint Publication 3-09.3 in its bibliography. To ensure compliance with the joint publication, the authors of FM 6-0 should have used JP 3-09.3 as a parent publication.

Like the Army's doctrine publication, Air Force Doctrine Document 2-1.3 defines the role of the ALO within the bounds of joint doctrine while narrowing the description to Service-specifics. In addition to the JP 3-09.3 definitions, the Air Force states, "ALOs must be involved in the supported land commander's military decision-making process so they can perform detailed air support planning with their own staff."³⁷ The AFDD lists Joint Publication 3-09.3 in its bibliography.

During and after the distribution process, the ALO is a very important piece in the TACS-AAGS. The job definitions and job descriptions of the ALO in joint, Army, and Air Force doctrine are examples of the proper relationship among the different levels of doctrine publications.

While the definition of distribution is consistent in doctrine, a gap exists between Air Force and Army doctrine in the perception of airpower's role. However, the ALO can assist in closing this gap by performing his duties, well defined in both joint and Service doctrine manuals.

Airspace Control Measures

One of the primary joint publications dealing in any depth with close air support is JP 3-09, *Joint Fire Support*. Joint Fire Support defines CAS and discusses its command and control in some detail. The broad nature of joint doctrine is apparent in

statements such as, “To effectively integrate Joint fire support with the scheme of maneuver, planning must begin when the commander states the mission and provides the command guidance...This is especially important, and often the hardest to execute, when the support is being provided across component boundaries such as during CAS.”³⁸ This guidance is so broad that any Service planning doctrine should be able to comply. However, it could also be considered too broad; this planning guidance does not provide boundaries to ensure standardized responsibilities and processes among the Services as set up in Joint Publication 1.

Joint Publication 3-09 does an excellent job of establishing and defining fire support coordination measures. These measures have been used for coordination since World War II (reference the “Bomblines” discussion in Chapter Two), but have not always been defined in the joint arena.

One of the most important fire support coordination measures discussed by JP 3-09 is the Fire Support Coordination Line (FSCL) (see Figure 12). The FSCL is not mandatory, but can be used to aid in coordination. If used, the appropriate ground commander will establish the placement of the FSCL. The FSCL applies to air-ground operations and is not a boundary, but a line to ease coordination and minimize the probability of fratricide. Short of the FSCL fires must be coordinated with the appropriate ground commander. Long of the FSCL fires must be coordinated with the appropriate commander, usually the JFACC. The FSCL can expedite attacks on targets of opportunity long of the line, but creates a requirement in 3-09 for detailed integration short of the line due to the possibility of fratricide.³⁹

Joint doctrine is very clear on the employment and considerations of the FSCL. If a FSCL is to be used, the placement of the line is very important. Placing the line closer to the forward line of own troops (FLOT) expedites joint fires but can also increase risk of fratricide, especially on the offense. Placing the line further from the FLOT lowers risk of fratricide, but increases the volume of coordination required for air support, and could increase the need for qualified terminal attack controllers.⁴⁰

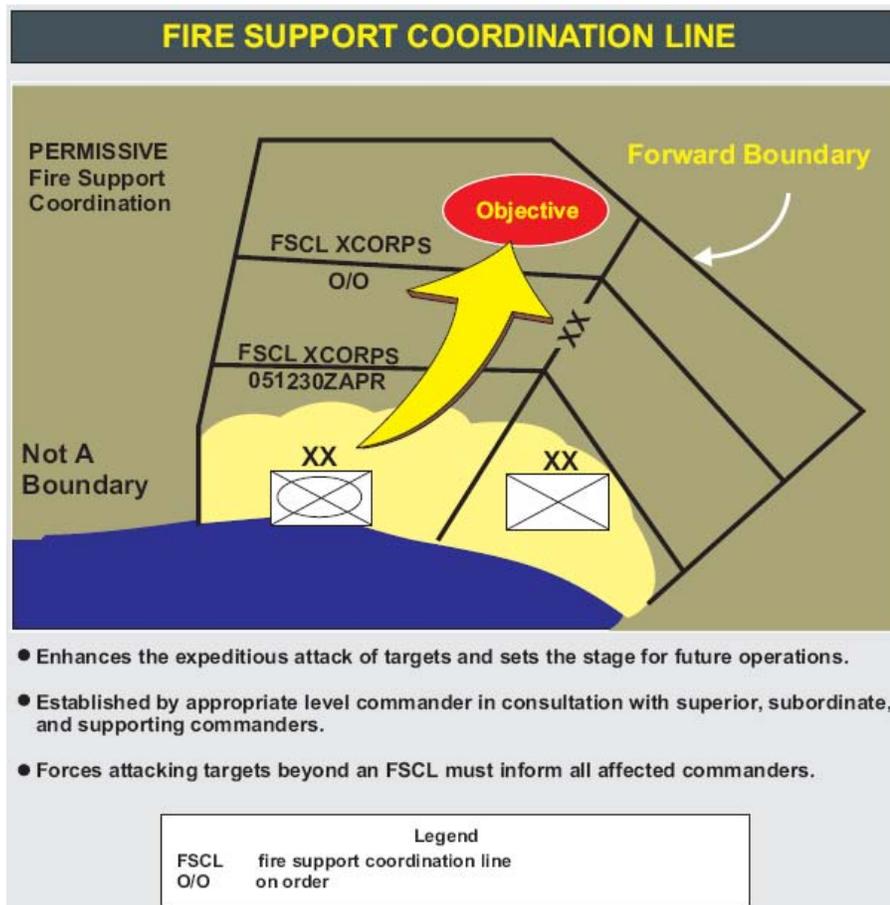


Figure 12. Fire Support Coordination Line

Source: Office of the Secretary of Defense, Joint Publication 3-09, *Joint Fire Support* (Washington, DC, 13 November 2006), A-4.

Commanders must also be aware of the time required to move the FSCL when considering its placement. Time required will be driven by theater, force composition, and equipment. According to JP 3-09 the JFC is responsible for establishing a time standard for the FSCL in his guidance.⁴¹

The Air Force's doctrinal definition of the FSCL is standardized with the joint definition in AFDD 2-1.3. Air Force doctrine takes the definition a step further to point out that the FSCL is merely a coordination line and does not define mission types. It also emphasizes the role of the FSCL in ground-based fires: Just as the JFACC must coordinate attacks short of the FSCL, the Joint Force Land Component Commander (JFLCC) must coordinate attacks long of the FSCL.⁴²

The Army's doctrinal definition of the FSCL also matches joint doctrine. FM 3-52 tasks the Battlefield Coordination Detachment (BCD), the Army's team in the JAOC, with coordination for any surface fires extending beyond the FSCL. As with the Air Force doctrine publications, Army doctrine clarifies that the FSCL "does not divide the area of operations by defining a boundary between close and deep operations or a zone for close air support."⁴³

Placement of the FSCL has been a contentious issue in recent conflicts. Most ground and air commanders understand the FSCL and know that its placement is essential to expeditious air attack. Some commonly accepted practices regarding the FSCL are not doctrinally based, and are perpetuated by both air and ground commanders.

The first misconception regarding the FSCL is that one must be established at all. The FSCL is optional; this point is clearly spelled out in JP 3-09 and JP 3-09.3. The ground and air commanders may use other fire support coordination measures to provide

expeditious and thorough coordination. One of these options, the kill box, will be discussed later in this section.

Another non-doctrinal perception is that the FSCL defines the type of air mission. This incorrect view holds that air operations long of the FSCL are Air Interdiction (AI) or Strategic Attack, while attacks short of the FSCL are Close Air Support. Remember, the joint, Army, and Air Force doctrines define Close Air Support as aircraft attacks “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.”⁴⁴

Additionally, both Air Force and Army doctrine specifically state that the FSCL does not define mission types. CAS can take place beyond the FSCL if it is within close proximity of ground forces. Likewise, AI missions can take place short of the FSCL if they do not require detailed integration with ground forces in close proximity. These relationships are represented in Figure 13.

The division of command and control of JFACC missions might have perpetuated this view. Although the FSCL is not an airspace boundary, aircraft control is generally divided by the FSCL for ease of coordination. The JAOC controls sorties through the TACS, using either Airborne Warning and Control System (AWACS) aircraft or Ground Controlled Intercept units. The ASOC, collocated with the ground commander, controls aircraft short of the FSCL. This arrangement is not directed by doctrine, but is explained as the usual control structure in joint (JP 3-09.3), Air Force (AFDD 2-1.3) and Army (FM 3-52) doctrine. Based on doctrine, control by the ASOC or placement of the FSCL do not define CAS.

Joint Operations Area

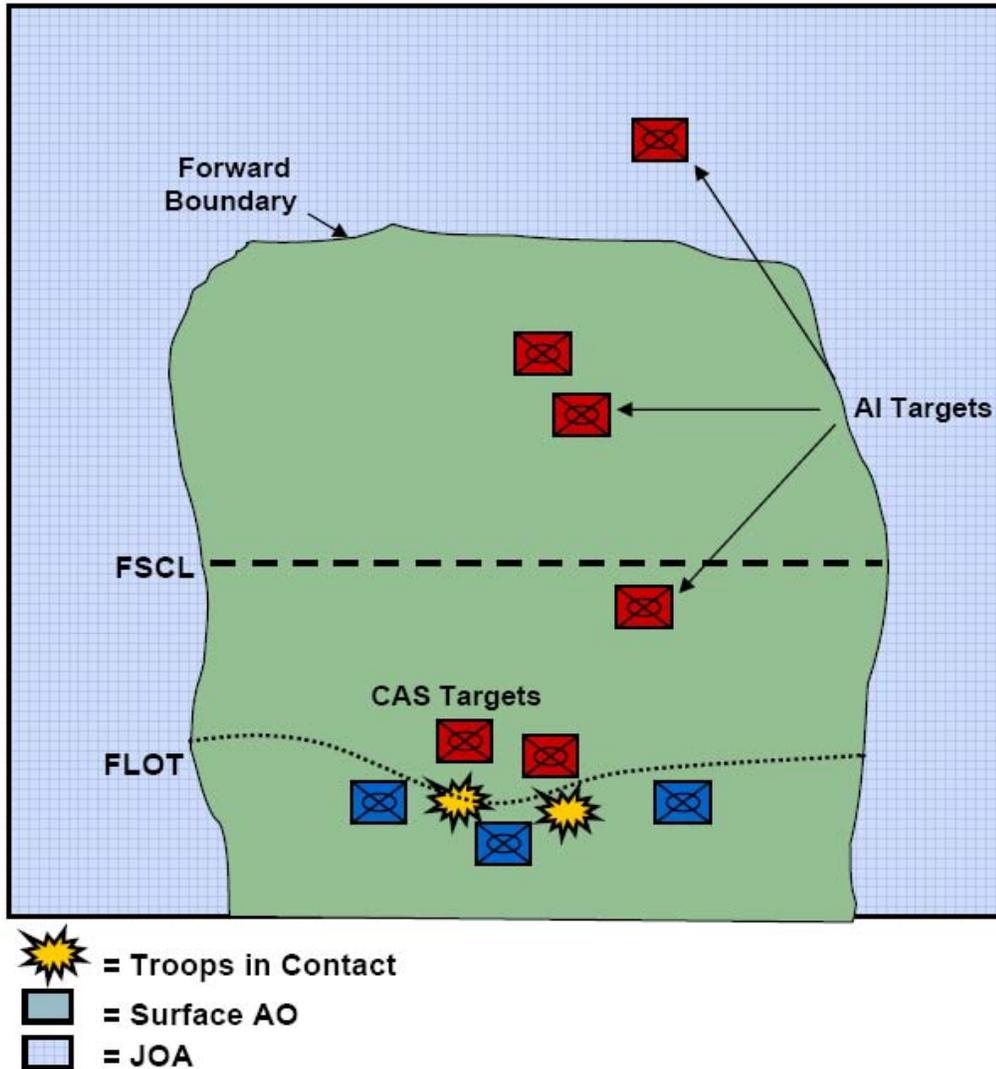


Figure 13. Joint Operations Area.

Source: Headquarters, Department of the Air Force, Air Force Doctrine Document 2-1.3, *Counterland* (Washington, DC, 11 September 2006), 70.

Some air and ground commanders have perpetuated the technique of placing the FSCCL at the edge of the maximum range of surface fires. In most cases, that range would reflect the maximum capability of the Army Tactical Missile System (ATACMS).

Placing the FSCCL at that range would relieve ground commanders of any responsibility to

coordinate for their organic fires. The danger in this placement of the FSCL is the possibility of creating a safe haven for the enemy. Since ATACMS represent a very minute percentage of surface fires, joint fires must hit most of the targets located beyond conventional artillery range. When targets exceed the range of the ASOC's ability to control aircraft or observe targets, coordination for attack becomes difficult or impossible. The area from the edge of that ability to control to the FSCL becomes the enemy's safe haven (see Figure 14).

Both Air Force and Army doctrine attack the problem and show an understanding and respect for proper placement of the FSCL. AFDD 2-1.3 uses the initial stages of Operation Iraqi Freedom as an example of a FSCL placed too far for effective operations:

The deep placement of the FSCL hampered the efficiency of airpower. Ground forces, and their associated TACPs, were incapable of detailed integration beyond the range of their organic fires because no one was able to observe adversary targets. Aircrews were still required to comply with coordination procedures short of the FSCL. The time-consuming clearance process hindered the expeditious attack of fleeting targets beyond the range of the organic artillery. As a result, the area between the maximum range of land fires and the established FSCL created a sanctuary for enemy forces.⁴⁵

Air Force doctrine's answer to FSCL placement is where the preponderance of surface effects end and air effects begin. It further suggests this distance is the edge of tube artillery range.

Army doctrine recognizes the possibility of creating an enemy sanctuary by improper FSCL placement, but takes a different view of the cause. FM 3-91, *Division Operations*, recommends setting the FSCL at the maximum range of ASOC communications capability.⁴⁶ The concept makes sense assuming the FSCL is being used as a command and control coordination line described as the "normal arrangement" in both Services' doctrine manuals. This reference goes on to describe ways to use other

assets to extend that communication range, however, and misses the point of FSCL placement causing a possible gap in joint fires.

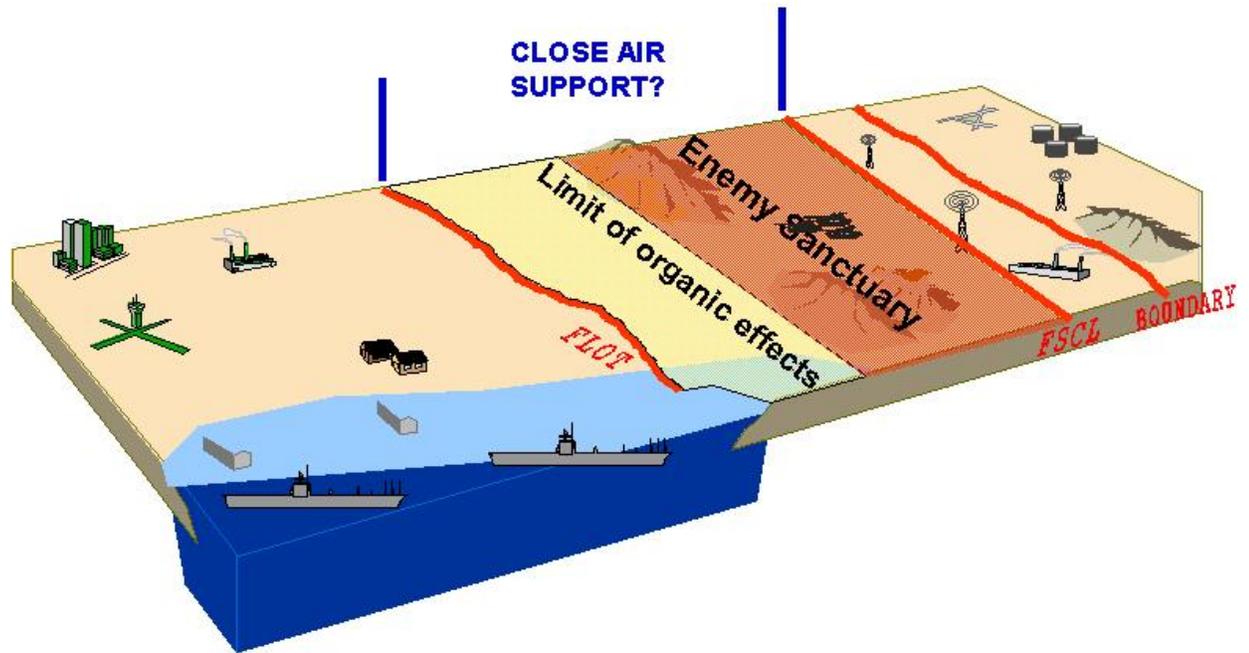


Figure 14. Unintended Sanctuary Caused by Incorrect FSCL Placement
Source: Air Force Element, *CAS Integration and Execution* (Leavenworth, KS: US Army Command and General Staff College, 25 October 2007), slide 14.

One possible solution to the dilemma of the FSCL is another FSCM: the kill box. The kill box is defined in JP 3.09 as a three-dimensional airspace designed to “allow lethal attack against surface targets without further coordination with the establishing commander and without terminal attack control.”⁴⁷ JFACC assets in an open kill box may attack targets of opportunity without a JTAC or FAC (A) unless more restrictive FSCMs inside the kill box apply.

AFDD 2-1.3 gives an in-depth explanation of the use of kill boxes. It defines the JAOC as the command and control agency responsible for coordinating fires in a JFACC-

controlled kill box and the ASOC as the command and control agency responsible for a JFLCC-controlled kill box. Furthermore, it suggests that kill boxes may be used in conjunction with other traditional FSCMs for maximum effect.⁴⁸ One suggested combination is a kill box system in conjunction with an FSCL. The ASOC would control kill boxes short of the FSCL and the JAOC would control kill boxes long of the FSCL. This system would provide more precise, up-to-date FSCMs for JFACC-provided assets while mitigating risk of fratricide in a fluid operation.

Joint kill box doctrine was reverse-engineered from a multiservice TTP originally coordinated through the Air Land and Sea (ALSA) Center in 2005. This multiservice TTP, adopted by every Service but not officially “Joint,” was written by doctrine and subject matter experts representing all of the Services. In writing the TTP, the authors considered the latest experiences from the non-linear areas of operations in Iraq and Afghanistan.⁴⁹ Because the multiservice TTP was incorporated into joint and Service doctrine, it is a very strong example of seamless integration of the Services.

Another doctrinal solution to the coordination of joint fires is the Joint Fires Observer (JFO). The JFO is not yet defined in any joint publications, but was agreed upon in a Memorandum of Agreement between the Army and Air Force dated 14 Nov 05. The JFO is defined as “A trained Service member who can request, adjust, and control surface-to-surface fires, provide targeting information in support of type 2 and 3 close air support terminal attack controls, and perform autonomous terminal guidance operations.”⁵⁰ The JFO can provide visual confirmation of targets to assist the air-ground command and control structure already in place. The JFO does not have the training or expertise to provide terminal attack control, but can extend the reach of a JTAC in CAS

operations or of the ground commander in AI operations. The JFO could be used in conjunction with airspace control measures to provide more precise coordination in air-ground operations.

To better understand the role of the JFO, the reader should be aware of the updated close air support command and control concepts and definitions in the latest revision of JP 3-09, dated 13 November 2006. One of the latest additions to the joint air support arena is the term *terminal guidance operations* (TGO), defined as

those actions that provide electronic, mechanical, voice, or visual communications that provide approaching aircraft and/or weapons additional information regarding a specific target location. Various ground elements or aircrews conducting a wide variety of missions can search for, identify, and provide the location of targets using systems like Global Positioning System (GPS), laser designators/range finders, aircraft targeting pods, etc. Unless qualified as a JTAC or forward air controller (airborne) (FAC[A]), personnel conducting TGO do not have the authority to control the maneuver of or grant weapons release to attacking aircraft. These functions must be done by appropriate C2 authorities or JTAC/FAC(A).⁵¹

This term allows joint users to discuss terminal guidance divorced from the term close air support. There are times that terminal guidance will be needed outside of the CAS-defined proximity of friendly forces, and this new definition in joint doctrine will allow more precise discussion of air-ground command and control issues.

The term Terminal Guidance Operations makes its first appearance in Service doctrine in Air Force Doctrine Document 2-1.3, *Counterland* (11 September 2006). It is discussed in the context of using the JFO to direct TGO in areas that do not require a Joint Terminal Attack Controller (JTAC) or Forward Air Controller (Airborne) (FAC [A]).⁵² In this case, joint and Service doctrines comply with the doctrine concept discussed earlier; Air Force doctrine fits within the joint doctrine, and further defines

TGO in greater detail. While TGO is a tactical term, the concept can be used in conjunction with the JFO to fix a problem with operational command and control.

The new concept of JFO comes with a warning, however. A JFO should not be a substitute for Joint Terminal Attack Controllers or FAC (A). An amplification to the AFDD 2-1.3 definition of JFO states “[t]he intent of a JFO is to add joint warfighting capability, not circumvent the need for qualified JTACs.”⁵³ The services must resist the urge to produce more JFOs just to avoid the more costly and time-consuming JTAC training.

Army doctrine does not discuss or define TGO or JFO. This gap in doctrine can be attributed to fast-paced changes in the world of joint fires; the Army agreed to the 2005 Memorandum of Agreement. Both terms should be introduced in the next doctrine updates.

Joint and Service doctrines paint a fairly coherent picture on airspace control measures. The best joint and Service integration is with kill box doctrine. The biggest gaps still exist between Air Force and Army doctrine concerning the FSCL. Beyond the gaps in doctrine, poor FSCL placement in recent conflicts points to a misunderstanding of ACMs by both ground and air commanders.

Joint Tenets of Command and Control

The final piece of doctrine analysis will concentrate on overall command and control of close air support. The capstone joint publication establishes tenets for joint command and control. Within the joint and Service doctrine command and control concepts for close air support should adhere to these tenets:⁵⁴

1. *Clearly Defined Authorities, Roles, and Relationships.* This tenet says that the command and control structure is aligned for unity of command. Additionally, all nodes must understand the command relationships. Joint and Service doctrine on operational command and control of close air support show this clear chain of command and relate the chain back to a single Joint Force Commander. No perceivable gaps exist between joint and Service doctrine concerning this tenet.

2. *Information Management.* Command and control entities must have the ability to share appropriate information for planning and decision-making. This tenet implies both equipment interoperability and open lines of communication between levels in the chain of command. This connectivity is shown in joint, Army, and Air Force doctrine (see Figure 9). Additionally, joint doctrine shows examples of specific equipment interoperability (see figure 15). Information management responsibilities are listed as tasks for the ASOC and ALO in both Army and Air Force doctrine. No gaps in doctrine exist concerning information management in CAS command and control.

3. *Communication.* The tenet discusses mission-type orders to encourage initiative at lower levels of command. Joint doctrine specifically discusses commander's intent for fires, and directs the ALO's role in determining this intent.⁵⁵ Army doctrine discusses commander's intent and mission-type orders in great detail, but a separate intent for fires is not mentioned in reference to the ASOC or ALO's duties. Air Force doctrine notes mission-type orders as the preferred method of communication from the ground commander,⁵⁶ but does not use the term "intent for fires." The idea of mission-type orders is clearly expressed throughout joint and Service doctrine, but to fully align with JP 3-09.3, Service doctrine should address a commander's intent for fires.

AMPHIBIOUS TACTICAL AIR CONTROL SYSTEM COMMUNICATIONS NETWORK

NET	FREQUENCY	TACC USN	TACC USMC	TADC	TAOC	DASC	MAG	TACP	A/C
Tactical Air Request/ Helicopter Request Net	High Frequency (HF) Very High Frequency (VHF)	X				X		X	X
Group Common	Ultra High Frequency (UHF)						X		#
Guard	UHF VHF	X			X	X			X
Squadron Common	UHF								#
Tactical Air Command	HF UHF								
Tactical Air Control Party Local and Tactical Air Direction	VHF					#		X	#
Tactical Air Direction	UHF VHF	X	X	#	#	X		#	#
Tactical	HF	N	N	#	#	X		X	
		"X" Indicates normal participation in the specified net. "#" Indicates participation when directed, or as required.				"N" Indicates participation by Naval Tactical Air Control System agencies.			

Figure 15. Communication interoperability for CAS Command and Control.⁵⁷
 Source: Office of the Secretary of Defense, Joint Publication 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)* (Washington, DC, Incorporating Change 1, 2 September 2005), II-16.

4. *Timely Decision Making.* This tenet facilitates faster decision-making through superior information gathering and effective management of the common operational picture to gain military advantage. For Joint Fires, this tenet is enabled by the first three. No gaps in doctrine exist that would hamper timely decision making.

5. *Coordination Mechanisms.* These mechanisms include “memoranda of understanding, exchange and/or liaison officers, direct and integrated staffing, interoperable communications systems, information sharing, exercises and plan development.”⁵⁸ All of these exist in joint and Service doctrine, to include Air Liaison Officers, Ground Liaison Officers, staff integration (battlefield coordination detachment,

ASOC), and interoperable communications systems (see Figure 15). Coordination mechanisms are one of the strongest command and control tenets supported by doctrine. No gaps in doctrine affect coordination mechanisms.

6. *Battle Rhythm Discipline.* Briefings, meetings, reporting requirements, and planning cycles should be synchronized and predictable. Battle rhythm discipline is very difficult in CAS command and control because of the differing battle rhythms between the air and ground components. Joint doctrine points out the challenge and shows the constraints of the Air Tasking Order planning cycle. Difficulties in battle rhythm for CAS command and control are mitigated by the coordination mechanisms listed above. No significant gaps in doctrine exist concerning battle rhythm; however, a better discussion of on call CAS procedures in joint doctrine could minimize complaints about the lengthy Air Tasking Order cycle.

7. *Responsive, Dependable, and Interoperable Support Systems.* Once again, this tenet looks for interoperability through commonality, compatibility, and standardization of support systems. Joint doctrine addresses this tenet even before planning begins, directing CAS planners to consider support systems in their running estimates.⁵⁹ Service doctrine echoes joint doctrine, with the Army adding this planning to the ASOC's responsibilities.⁶⁰ No gaps in doctrine exist concerning this tenet.

8. *Situational Awareness.* According to JP 1, situational awareness is the prerequisite to a commander "anticipating opportunities and challenges" and should therefore be the primary objective for the staff.⁶¹ Joint CAS doctrine further states that situational awareness by command and control elements is necessary to avoid fratricide.⁶² The key to a ground commander's CAS situational awareness is the ALO

according to JP 3-09.3. Air Force doctrine reiterates the need for situational awareness for fratricide avoidance, and adds airspace control measures as another technique to aid in gaining and maintaining situational awareness.⁶³ Army doctrine also discusses digital data link systems that can enhance situational awareness in CAS command and control. No gaps exist in doctrine based on this tenet.

9. *Mutual Trust.* Mutual trust is necessary for proper integration in joint command and control chains. As the capstone joint doctrine publications states, “Mutual trust results from honest efforts to learn about and understand the capabilities that each member brings to the joint force, demonstrated competence, and planning and training together.”⁶⁴ Mutual trust has been at the heart of many issues with joint command and control involving ground and air forces over the years, as noted in the history section of Chapter 2. Better trust can be developed through joint exercise and experience, but can also be cultivated by proper liaison elements. Joint doctrine is very specific about these elements as discussed in the paragraph concerning Coordination Mechanisms. Service doctrine also gives each of these elements specific tasks and responsibilities. Competent, doctrinally sound liaison elements will help develop mutual trust in CAS command and control. No gaps in doctrine exist concerning this tenet.

Joint command and control in CAS faces unique challenges as noted in JP 3-09.3: “CAS requires an integrated, flexible, and responsive C2 structure to process CAS requirements and a dependable, interoperable, and secure communications architecture to exercise control.”⁶⁵ With some minor exceptions, the command and control structure for close air support achieve their purpose while conforming to doctrinal tenets. Only two minor gaps in doctrine exist when measured against the tenets: “Intent for Fires”

missing from Service doctrine and underdeveloped on call CAS procedures in joint doctrine.

Conclusion

This chapter has provided an analysis of joint and Service doctrine concerning command and control of CAS at the operational level. First, the study described the command and control process used today to cover changes since the historical references in Chapter 2. Then the study compared joint, Air Force, and Army doctrinal references to key command and control factors for close air support. Finally, this picture of joint CAS command and control was measured against joint doctrine's Joint Command and Control Tenets.

Overall, joint and Service doctrine are mostly congruous. The study noted several small gaps in doctrine that might be attributed to the documents' ages. However, the study did find one gap that, while seemingly minor, demonstrates a fundamental difference in how the Services view the role of airpower. These divergent views represent longstanding traditions of the Services and echo arguments referenced in the history section of Chapter 2. However, these disagreements can be mitigated by joint command and control procedures, which use liaison elements to maximize the expertise of both Services.

¹ Office of the Secretary of Defense, Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, DC, 13 June 2007), 417.

² *Ibid.*, 428.

³ Headquarters, Department of the Army, Field Manual 3-0, *Operations: Full Spectrum Operations*, (Washington, DC, Post DRAG Draft 04, Student Review, Summer 2007), vii.

⁴ JP1-02, 266.

⁵ Headquarters, Department of the Air Force, Air Force Doctrine Document 1, *Air Force Basic Doctrine* (Washington, DC, 17 November 2003), 6.

⁶ Headquarters, Department of the Air Force, Air Force Doctrine Document 2-1.3, *Counterland* (Washington, DC, 11 September 2006), 11.

⁷ Office of the Secretary of Defense, Joint Publication 1, *Doctrine for the Armed Forces of the United States* (Washington, DC, 14 May 2007), I-2.

⁸ FM 3-0, 5-17, E-2.

⁹ Headquarters, Department of the Army, Field Manual 1, *The Army*, (Washington, DC, June 2005), 3-3.

¹⁰ FM 3-0, 1-11.

¹¹ JP 1, *Joint Doctrine*, ix.

¹² *Ibid.*, A-1.

¹³ *Ibid.*, I-22.

¹⁴ *Ibid.*

¹⁵ FM 1, iii.

¹⁶ *Ibid.*, 1-20.

¹⁷ AFDD 1, 3.

¹⁸ *Ibid.*, 7-8.

¹⁹ JP 3-09.3, AFDD 2-3.1.

²⁰ Headquarters, Department of the Army, Field Manual Interim 3-91, *Division Operations* (Washington, DC, Draft, February 2006), 2-12.

²¹ Memorandum of Agreement Between the US Army and US Air Force for Army/Air Force Liaison Support, 16 June 2003, 5.

²² JP 1-02, 40.

²³ Office of the Secretary of Defense, Joint Publication 3-30, *Command and Control for Joint Air Operations* (Washington, DC, 5 June 2003), III-19.

²⁴ JP 1-02, 285. Emphasis added.

²⁵ JP 3-30, III-23.

²⁶ Headquarters, Department of the Air Force, Air Force Doctrine Document 2-8, *Command and Control*, (Washington, DC, 1 June 2007), 71.

²⁷ AFDD 2-1.3, 8.

²⁸ *Ibid.*, 84.

²⁹ *Ibid.*, 33.

³⁰ FMI 3-91, D-10.

³¹ AFDD 2-1.3, 10.

³² FMI 3-91, 1-1.

³³ FMI 3-91, A-3.

³⁴ Office of the Secretary of Defense, Joint Publication 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)* (Washington, DC, Incorporating Change 1, 2 September 2005), II-10.

³⁵ *Ibid.*, III-36.

³⁶ Headquarters, Department of the Army, Field Manual 6-0, *Mission Command: Command and Control of Army Forces* (Washington, DC, August 2003), D-33.

³⁷ AFDD 2-1.3, 62.

³⁸ Office of the Secretary of Defense, Joint Publication 3-09, *Joint Fire Support* (Washington, DC, 13 November 2006), III-12.

³⁹ *Ibid.*, A-4.

⁴⁰ *Ibid.*

⁴¹ *Ibid.*, A-3.

⁴² AFDD 2-1.3, 69.

⁴³ Headquarters, Department of the Army, Field Manual 1-02, *Operational Terms and Graphics* (Washington, DC, September 2004), 1-80.

- ⁴⁴ JP 1-02, 91, emphasis added.
- ⁴⁵ AFDD 2-1.3, 69.
- ⁴⁶ FMI 3-91, 2-13.
- ⁴⁷ JP 3-09, A-6.
- ⁴⁸ AFDD 2-1.3, 76.
- ⁴⁹ LTC Karl E. Wingenbach, "Kill Box: The Newest FSCM," *FA Magazine*, (Jul/Aug 2005): 13-15.
- ⁵⁰ AFDD 2-1.3, 98.
- ⁵¹ *Ibid.*, III-4.
- ⁵² AFDD 2-1.3, 63.
- ⁵³ AFDD 2-1.3, 98.
- ⁵⁴ JP 1, IV-15 through IV-18.
- ⁵⁵ JP 3-09.3, IV-2.
- ⁵⁶ AFDD 2-1.3, 29.
- ⁵⁷ JP 3-09.3, II-16.
- ⁵⁸ JP 1, IV-17.
- ⁵⁹ JP 3-09.3, III-4.
- ⁶⁰ FMI 3-91, 2-13.
- ⁶¹ JP 1, IV-18.
- ⁶² JP 3-09.3, I-4.
- ⁶³ AFDD 2-1.3, 77.
- ⁶⁴ JP 1, IV-18.
- ⁶⁵ JP 3-09.3, II-1. Original emphasis.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Chapter Four provided analysis and comparison of joint and Service doctrine to answer the primary research question, “Do joint, US Air Force, and US Army doctrine and TTPs work together to ensure effective CAS command and control at the operational level in the current operational environment.” This chapter will expand on the initial conclusions from Chapter Four and recommend changes and additional research into the issue of CAS command and control at the operational level.

1. In the realm of doctrine, precise terminology matters. Joint, Air Force, and Army doctrine manuals all include glossaries and definitions. These definitions must match. As directed by joint doctrine and Chairman of the Joint Chiefs of Staff Instruction, “joint doctrine takes precedence over individual Service doctrines, which must be consistent with joint doctrine.”¹ Since joint doctrine champions interdependence, Air Force doctrine should do the same. Air Force doctrine promotes integration, which is a step in the right direction, but is a far different concept than interdependence. Air Force doctrine authors should ensure the next change to AFDDs reflect joint doctrine on this subject.

2. When describing joint operational concepts, Service doctrine should represent all Services involved. Just ensuring consistency with joint doctrine might not be enough. Confusion can result if one Service’s doctrine is consistent with joint doctrine but conflicts with the other Service. Air Force and Army doctrine should describe CAS in the same way. Likewise, both Services should describe the challenges and tradeoffs of FSCL placement. Currently there is no formal system for joint review of Service

doctrine in development. While informal agreements may exist, formalizing procedures for joint review would ensure consistency in Service doctrine involving joint operations.

The development of kill box doctrine is a good example of joint and Service doctrine integration. Because the doctrine started as a multiservice manual, Army and Air Force Service doctrine organizations were involved and cross talking from the beginning. Other important pieces of joint doctrine can follow the same model.

3. Better education and training on joint operational command and control of CAS must be developed for all participants. Only small discrepancies exist in joint and Service doctrine regarding CAS command and control. However, joint doctrine education is lacking. An officer's first joint doctrine-based professional military education directed by the Goldwater-Nichols Military Reorganization Act of 1986 is intermediate level education.² Therefore, the first formal education in joint doctrine most officers receive is as an O-4 even though many operate in the joint environment much earlier. We must educate our officers earlier with programs like the Joint Firepower Course required for all Joint Terminal Attack Controllers and Forward Air Controllers (Airborne), which teach joint and Service doctrine on CAS command and control. Additionally, we must educate tactical- and operational-level leaders on the importance of updates to joint doctrine, to include TTPs. In the Air Force, operational units are held accountable for keeping Service doctrine libraries current; the Services must ensure units are held equally responsible for applicable joint doctrine currency.

When able, units should train in a joint environment. CAS exercises will not train joint mechanisms if they involve only one Service. All parts of the CAS joint operational command and control chain should be trained, including fully operational ASOCs

collocated with division staffs. Objectives for this training should be derived directly from joint doctrine. Lessons learned from joint training will better educate users on joint doctrine and may also provide inputs for change to joint doctrine.

Because joint and Service doctrine are mostly consistent, the area of education and training warrants closer examination. The author recommends future study regarding education and training of joint command and control doctrine. One area for study would be the professional timing of education (i.e., “How early should an officer receive professional military education concerning joint command and control doctrine?). Another area for study, possibly combined with the first, would be the frequency of training exercises that apply operational level CAS command and control concepts in a true joint environment. This study could investigate Green Flag exercises for more joint participation and integration of operational level command and control.

4. Services must provide subject matter experts to all liaison elements responsible for the operational command and control of CAS. The Services consider joint issues more than ever before. Army commanders have seen effective Air Force interaction from the beginnings of their careers and understand airpower much better than their predecessors. Air Force commanders understand their role in close air support and their contribution to the joint fight much better than a generation ago. To take that joint mentality to the next level, each service must provide top-notch liaisons. It may seem counterintuitive to send the brightest joint thinkers to the other Service as liaisons, but the move can pay huge dividends. Having a true airpower expert sitting with the division commander can ensure better application of airpower while reducing counter productive interservice rivalry. The Army sending its best Soldiers to the BCD will make joint

processes at the JAOC proceed much more smoothly while ensuring efficient planning and use of airpower to support the ground scheme of maneuver. The Services might need to provide incentives to make the liaison jobs more competitive, and must remove any stigma associated with being a GLO, ALO, or BCD member. As noted in Chapter 4, many of our gaps in doctrine or understanding can be bridged by good liaison; the Services must ensure they send the best.

Conclusion

This study began with the author's concept of joint and Service doctrine as inconsistent and inadequate. In the course of the research, the study found that although some small inconsistencies exist, joint and Service doctrine are up-to-date, complete, and fairly congruous. Frequency of training and timing of education are possible causes for breakdowns in operational command and control, and warrant further investigation and deeper analysis. Joint and Service doctrine organizations can still strive for more precision, but overall US Air Force, and US Army doctrine and TTPs work together to ensure effective CAS command and control at the operational level in the current operational environment.

¹ Joint Staff, Chairman of the Joint Chiefs of Staff Instruction 5120.02A, *Joint Doctrine Development System*, (Washington, DC, 31 March 2007), A-2.

² *Ibid.*, A-6.

APPENDIX A

LIST OF OBSERVATIONS AND RECOMMENDATIONS FOR FURTHER STUDY

Observations

1. Joint and Service doctrine are mostly congruous with a few exceptions.
2. The Army and Air Force still have a fundamental difference in their view of the role of airpower
3. Precise, standardized terminology must be used to overcome Service differences.
4. Service doctrine expressing joint concepts should be representative of all Services involved.
5. Better education and training on joint operational command and control of CAS *must* be developed for all participants.
6. Services *must* provide subject matter experts to all liaison elements responsible for the operational command and control of CAS.

Recommendations for Further Study

1. How will JFOs affect command and control of CAS in the modular Army?
2. Is joint doctrine education occurring early enough in key officers' careers?
3. Is joint doctrine training at intermediate-level JPME adequate?
4. Is the frequency of joint training adequate?
5. Is CAS operational command and control ever properly exercised in a peacetime environment?

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Lt Col Steven Ramer
Air Force Element
USACGSC
100 Stimson Ave.
Fort Leavenworth, KS 66027-2301

LTC Gregory Sierra
CTAC
USACGSC
100 Stimson Ave.
Fort Leavenworth, KS 66027-2301

Dr. Ronald Cuny
Consulting Faculty
USACGSC
100 Stimson Ave.
Fort Leavenworth, KS 66027-2301