THE ANSWER IS? FRICTION OVER WHO SHOULD PLAN & CONTROL JOINT FIRES BEYOND THE FSCL

A MONOGRAPH
BY
Major Mark H. Ayers
Infantry

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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Major Mark H. Ayers

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Approved by:

LTC Clarence E. Taylor, MMAS — Monograph Director

COL Danny M. Davis, MA, MMAS — Director, School of Advanced Military Studies

Philip J. Brookes, Ph.D. — Director, Graduate Degree Program

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ABSTRACT

The Answer Is? Friction Over Who Should Plan and Control Joint Fires Beyond the FSCL. By Major Mark H. Ayers, USA, 56 pages.

This monograph examines the question of who should plan and control joint fires beyond the fire support coordination line (FSCL). Since the Gulf War, the Army and Air Force have met at the annual Army-Air Force Warfighter Talks to reconcile doctrinal disparities in order to ensure their preeminence as the world's finest air-land team. At the 1994 Talks, a working group was chartered to tackle the contentious issues that impact on the development of Joint doctrine One such issue was the friction over who should plan and control joint fires beyond FSCL. Overlapping areas of responsibility create questions over control of combat assets. On a dynamic battlefield, the military cannot afford disagreements over targeting. As partners in the air-land team, the two services must have a mutual understanding of command relationships to ensure smooth and seamless operations throughout the theater. The contentious issue over who should plan and control the use of combat assets beyond the FSCL requires resolution in order to enhance the JFC's ability to maximize the effects of joint fires and minimize "friction" between the Services. Ultimately, unresolved disagreements in a theater of war or operations could kill soldiers, sailors, airmen, or marines.

This monograph uses the Gulf War as case study to determine what lessons learned from that conflict helped shaped the Army's and Air Force's interpretations of how joint fires should be planned and controlled during a theater campaign. With interpretations identified, the author examines their impact on current and emerging service and joint doctrine. Finally an analysis of the doctrine will determine if the questions of who should plan and control joint fires beyond the FSCL is adequately addressed in current doctrine, emerging doctrine, or the issue requires further resolution.

While the nature of future conflict is uncertain, US participation in it and the need for responsive and flexible joint fires is not. Shortcomings identified during the Gulf War are being addressed and initial signs are promising. Joint doctrine must provide workable procedures for the joint force commander to maximize joint fires and the procedures must be instituted and practiced before our armed forces are committed to the next war The targeting of joints fires beyond the FSCL is best accomplished by a JTCB at the joint forces command level while the attack assets to service the targets are best controlled by a JFACC.

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BY

Major Mark H. Ayers

Infantry

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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Chapter 1

Introduction

Let me tell you about one area where I think joint doctrine is broken and we need to fix it. That is the Air-Land Battle portion. Our joint doctrine allegedly forged between the Army TRADOC (Training and Doctrine) Command and Langley (Tactical Air Command) says that, "Every theater is supposed to operate essentially the same when it comes to how Air-Land Battle is fought." I will tell you it looks good on paper. But I haven't found a theater commander yet, especially a theater air commander, that believes or operates by it.[1]

LTG Calvin Waller, Deputy USCINCCENT

Both the Air Force and the Army gained insights into 21st century military operations from the Gulf War; however, each service had some divergent interpretations of that conflict. Since the Gulf War, these two services have met at the annual Army-Air Force Warfighter Talks to reconcile doctrinal disparities in order to ensure their preeminence as the world's finest air-land team. At the 1994 Talks, a working group was chartered to tackle the contentious issues that impact on the development of Joint doctrine. One such issue was the friction over who should plan and control joint fires beyond fire support coordination lines (FSCLs). The Air Force considers the Joint Force Air Component Commander (JFACC) as best suited to coordinate operations beyond the FSCLs, while the Army thinks the Land Component Commander (LCC) should plan and synchronize fires in the entire land AO.[2]

Overlapping areas of responsibility create questions over control of combat assets. Joint fires, a traditional domain of the Air Force, have evolved with the advent of extended-range acquisition and attack systems such as the AH-64, Apache attack

helicopter; the multiple launch rocket system (MLRS); and the Army Tactical Missile System (ATACMS). The increasing range and accuracy of rocket and missile systems, combined with maneuver and attack helicopters and light forces, now provide the LCC with his own organic operational fire capability. The ability of each service to engage targets at operational depths demonstrates the inherent joint nature of fires and the need for coherent joint doctrine and procedures.

On a dynamic battlefield, the military cannot afford disagreements over who is responsible for targeting. As partners in the air-land team, the two services must have a mutual understanding of command relationships to ensure smooth and seamless operations throughout the theater. Ultimately, unresolved disagreements over targeting in a theater of war or operations could kill soldiers, sailors, airmen, or marines.

This monograph will examine the Gulf War to determine what lessons learned from that conflict helped shape the Army's and Air Force's current interpretations of how joint fires should be planned and controlled during a theater campaign. Although our military's participation in joint warfare dates back to the Battle of Yorktown, joint force integration (JFI) is a relatively new phenomenon. Congress passed the Goldwater-Nichols Defense Reorganization Act of 1986 following a series of operational failures (Iran hostage rescue and Grenada). This legislation was designed to force the services to integrate their individual capabilities into a more efficient joint team.[3] The Gulf War was the first major conflict to test the services attempt at integrating capabilities, especially in the area of joint fires. Although the Gulf War was a tremendous success, many significant problems did exist in integrating the Services. Numerous post Gulf War studies have identified planning, coordination, and attack execution as campaign shortfalls.[4] An

important of our analysis is the identification of lessons learned and how they were interpreted by each Service. This is critical because of the influence it has on doctrine development.

After identifying the different Service interpretations, the author will examine their impact on current and emerging service and joint doctrine The Services and the Joint community have published several doctrinal manuals that address joint fires as they continue to develop and test the doctrine during various exercises.

Finally an analysis of the doctrine will determine if the question of who should plan and control joint fires beyond the FSCL is adequately addressed in current doctrine or emerging doctrine, or whether the issue requires further resolution.

Before we begin, we must have a common understanding of the terms relevant to this debate. The first term is joint fires which is now defined in Joint Pub 3-09, *Doctrine for Joint Fire Support.* The Army and Air Force have agreed on the following definition:

> Fires that result from joint operations involving two or more components/Services acting together or when one component supports another component of the joint force.[5]

The next term is the Fire Support Coordination Line or FSCL; a controversial subject in its own right The FSCL is defined in Joint Pub 1-02, *DOD Dictionary of Military and Associated Terms*, as:

> A line established by the appropriate ground force commander to ensure coordination of fire not under the commander's control but which may affect current tactical operations The fire support coordination line is used to coordinate fires of air, ground, or sea weapons systems using any type of ammunition against surface targets The fire support coordination line should follow well—defined terrain features The establishment of the fire support coordination line must be coordinated with the appropriate tactical air commander and other supporting elements Supporting elements may attack targets forward of the fire support coordination line without prior

> coordination with the ground force commander provided the attack will not produce adverse surface effects on or to the rear of the line. Attacks against surface targets behind this line must be coordinated with the appropriate ground force commander.[6]

The new JP 3-03 changes the "ground force commander" to "land or amphibious commander." This minor change is approved for inclusion in the next edition of JP 1-02. The Army's terms and graphics manual, FM 101-5-1, mirrors the JP 1-02 definition; but expands the definition of the FSCL to read:

> A permissive fire control measure, established and adjusted by the ground commander, in consultation with superior, subordinate, supporting and other affected commanders. It is not a boundary; synchronization of operations on either side of the FSCL is the responsibility of the establishing commander out to the limits of the land components forward boundary [author's emphasis]. It applies to all fires of air, land, and sea weapon systems using any type of ammunition against surface targets. Forces attacking targets beyond the FSCL must inform all affected commanders to allow necessary coordination to avoid fratricide.[7]

This Army addition to the joint definition expands the responsibility of planning and controlling operational fires for the ground commander by stating the land component commander is responsible for synchronizing operations on either side of the FSCL out to his forward boundary.

There is no debate on who controls operations short of the FSCL. The contested area is the space from the FSCL to the LCC's forward boundary. Although used in emerging joint doctrine, the term "forward boundary" is defined only in the Army's draft doctrinal terms and graphics manual. The definition reads:

> The farthest limit; in the direction of the enemy, of an organization[']s responsibility. It is responsible for deep operations to that limit. The next higher headquarters is responsible for coordinating deep operations beyond that limit. In offensive operations it may move from phase line to phase line dependent on the battlefield situation.[8]

The contentious issue over who should plan and control the use of combat assets in the area between the FSCL and the forward boundary requires resolution in order to enhance the JFC's ability to maximize the effects of joint fires and minimize "friction" between the Services.

Chapter 2

Gulf War Case Study

Almost all things have been found out, but some have been forgotten.[9]

Aristotle

The Gulf War was the first attempt at integration of joint fires since the Goldwaters-Nichols DOD Reorganization Act of 1986. Operation Desert Storm was primarily a sustained forty-three day air operation by the United States and Coalition forces between 17 January and 28 February 1991; accounting for ninety percent of the conflict's duration. The ground attack occupied only the final hundred hours of the war. Nearly 40,000 air-to-ground sorties were flown.[10] An examination of how joint fires were planned and executed during this war provides a valuable opportunity for understanding the ongoing joint doctrine debates and the compromises in current and draft joint publications.

We should begin with how CENTCOM was organized to plan and execute joint fires prior to its deployment to the Gulf. CENTCOM had few on-the-shelf documents that addressed joint targeting for the command and its components. Joint targeting procedures for interaction between the JFACC and the rest of CENTCOM were nonexistent. Major procedural deficiencies existed prior to the conflict. CENTCOM's command post exercise (CPX), "Internal Look," conducted in July 1990, did not fully examine the intricacies of joint targeting Most of the focus was on the deployment and employment of forces to Southwest Asia. CENTCOM's primary direction for targeting was contained in a J-2 (Director of Intelligence) document. Titled *Military Intelligence-*

Targeting and focusing on intelligence aspects, the regulation identified the CINC as the senior targeting authority and designated the J-2 as the CINC's executive agent for targeting matters.[11] This command and control hierarchy for targeting joint fires would change considerably once CENTCOM deployed to Saudi Arabia.

To ensure unity of effort, General Schwarztkopf designated Lieutenant General Horner as the Joint Force Air Component Commander (JFACC). GEN Schwarztkopf said, "There's only going to be one guy in charge of the air: Horner. If you want to fight your interservice battles do it after the war."[12] This was the first time in history that the US military had a single manager for air power. GEN Schwarzkopf made LTG Horner responsible for the coordination, planning, deconflicting and execution of the overall theater air campaign to meet GEN Schwarzkopf's guidance and objectives Furthermore, LTG Horner had the responsibility for coordinating the interdiction efforts of all components. He had the authority to require consultation among components, but did not have authority to compel agreement GEN Schwarzkopf would resolve essential disagreements. The CENTCOM J-3 was not involved in the joint fires targeting process In essence, LTG Horner was in charge of the strategic air campaign and the tactical shaping or apportionment of air on the battlefield.

LTG Horner did not have a joint staff. His Ninth Air Force staff, with a few liaison officers from the other Services, handled the responsibilities of CENTAF and the JFACC. His mechanism for controlling air power was the Tactical Air Control System (TACS). It was designed to control theater-level air operations focusing on the battlefield However, LTG Horner was also tasked to conduct an independent strategic air campaign. He tailored the TACS to serve both functions. LTG Horner formed a

special planning group under the direction of Brigadier General Buster Glosson. The ad hoc group focused on planning a strategic offensive air campaign.[13]

In December 1990, BG Glosson's special planning group, nicknamed the "Black Hole," was integrated into the CENTAF staff. This move made BG Glosson the JFACC's Director of Combat Plans under a new deputy chief of staff for operations, Major General John Corder. As Director of Combat Plans, BG Glosson was responsible for translating the air campaign plan first into a Master Attack Plan (MAP) and finally into a executable Air Tasking Order (ATO). His plans staff included representatives from each Service and the Royal Air Force, but the staff was predominately USAF officers. The "Black Hole" had only one US Army lieutenant colonel assigned from August until September, 1990.[14]

BG Glosson assumed command of the fighter wings when LTG Horner made him an air division commander. He retained his position as Director of Combat Plans. This preserved BG Glosson's formal direct link to LTG Horner. As an air division commander, BG Glosson could bypass MG Corder and the rest of the TACC to talk directly to LTG Horner and GEN Schwarzkopf or the wing commanders. This arrangement gave the chief planner the authority to redirect sorties as well.

The Gulf War theater campaign was designed to achieve the six theater objectives in four phases:

Theater Objectives	PHASE I Strategic Air Campaign	PHASE II Air Supremacy in the KTO	PHASE III Battlefield Prep	PHASE IV Ground Offensive Campaign
Leadership/C^3	X			
Air Supremacy	X	X		
Cut Supply Lines	X	X	X	X
NBC Capability	X		X	
Destroy Rep Guards	X		X	X
Liberate Kuwait City				X

Figure 2-1: Theater Campaign Plan and Military Objectives[15]

The joint integration of operational fires may be divided into two main periods for the Gulf War. Operational fires integration during the air campaign (Phases I-III) and fires during the ground campaign (Phase IV).

The air campaign was developed to provide an offensive option in the early fall. It was the "strategic" plan designed to accomplish the following objectives:

- Destroy/neutralize air defense command and control.
- Destroy nuclear, biological, and chemical storage and production capability.
- Render the national and military command, control, and communications infrastructure ineffective.
- Destroy key electrical grids and oil storage facilities.
- Eliminate long-term offensive capability.
- Render Republican Guard forces combat ineffective.

By January 1991, there were enough aircraft available in theater to execute the first three phases of the air campaign almost simultaneously.

The ground commanders assumed that they would begin controlling joint fires during Phase III because the battlefield preparation was designed to reduce the Iraqi units they would face by fifty percent The Corps commanders worried most about the Iraqi artillery (with its chemical round capability) that could be massed against coalition forces during breaching operations.

The target nomination process for the corps level ground commanders was initially a consolidation process at the two component headquarters (ARCENT and MARCENT):

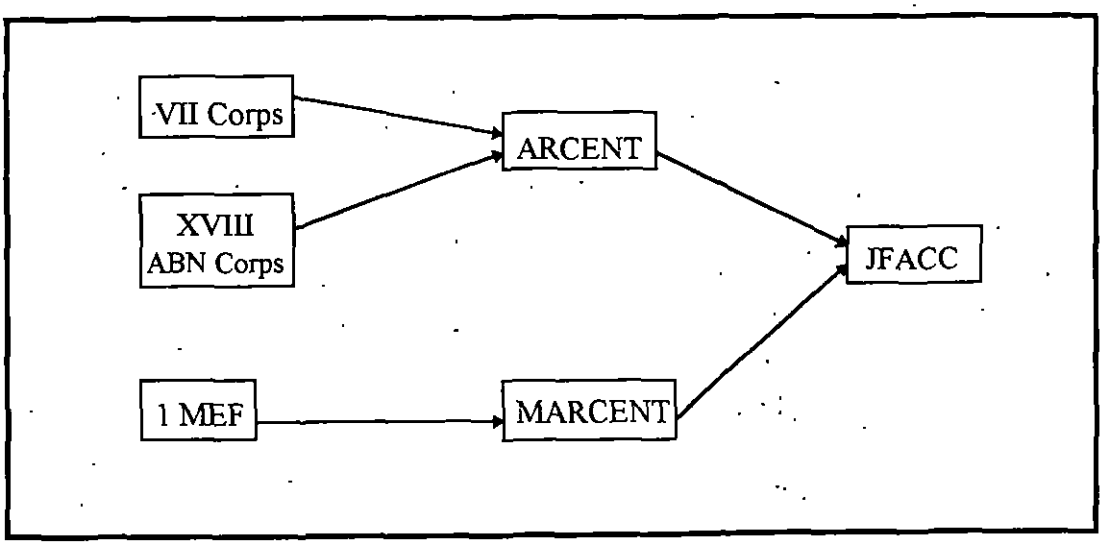

Figure 2-2: Target Nomination Flow Diagram

The JFACC consolidated the ARCENT and MARCENT target lists and planned to service the targets as resources became available. Each corps could normally nominate up to forty targets a day.

The ground commanders felt that their target nominations were not receiving high enough priority and as a result were not being adequately serviced. Several reasons are responsible for their misperception. While VII Corps was making its sweep to the west, GEN Schwarzkopf would not allow the JFACC to target the Iraqi units in the western zone. He did not want to compromise the theater deception plan.

Second, he directed BG Glosson not to attack units already reduced below fifty percent strength. This guidance was not provided to the corps commanders. GEN Schwarzkopf's prime concern was the destruction of the Republican Guard divisions, while the corps commanders were initially concerned with breaching the front line divisions.

Third, the battle damage assessment (BDA) procedures were faulty. GEN Schwarzkopf made the ARCENT and MARCENT commanders responsible for assessing BDA in their AOs since they were to conduct the attacks when Iraqi forces were reduced to fifty percent strength CENTCOM had not established assessment rules prior to the war. The JFACC staff assumed that all pilot mission reports (MISREPs) would be the primary means for determining BDA. ARCENT was only using A-10 MISREPs. Other Coalition air strikes were not counted in BDA unless overhead sensors picked up equipment damage. With intelligence collectors already overloaded with strategic attacks, it is easy to see how discrepancies in BDA mounted between the Air Force and the Army. The JFACC did not service targets submitted by the corps that were outdated or previously hit.

Schwarzkopf formed a Joint Targeting Board (JTB) on 7 February 1991 as a JFC-level review mechanism to resolve targeting issues between the JFACC and the ground forces Figure 2-3 identifies the members of the JTB

TITLE	STAFF FUNCTION
CHAIRMAN	DCINC/LTG
DEPUTY FOR PLANS	J3/BG
ASSISTANT FOR OPERATIONS	J3/COL
ASST FOR SPECIAL TECHNICAL OPS	J3/MAJ
TARGETING OFFICER	J2/LTC
ASSTISTANT TARGETING OFFICER	J2/MAJ
INTELLIGENCE OFFICER	J2/LTC
ASST INTELLIGENCE OFFICER	J2/MAJ
LOGISTICS	J4/LTC

Figure 2-3 CENTCOM Joint Targeting Board

The JTB reviewed only the ground commanders' target nominations in an effort to mollify some of their frustrations with the JFACC.

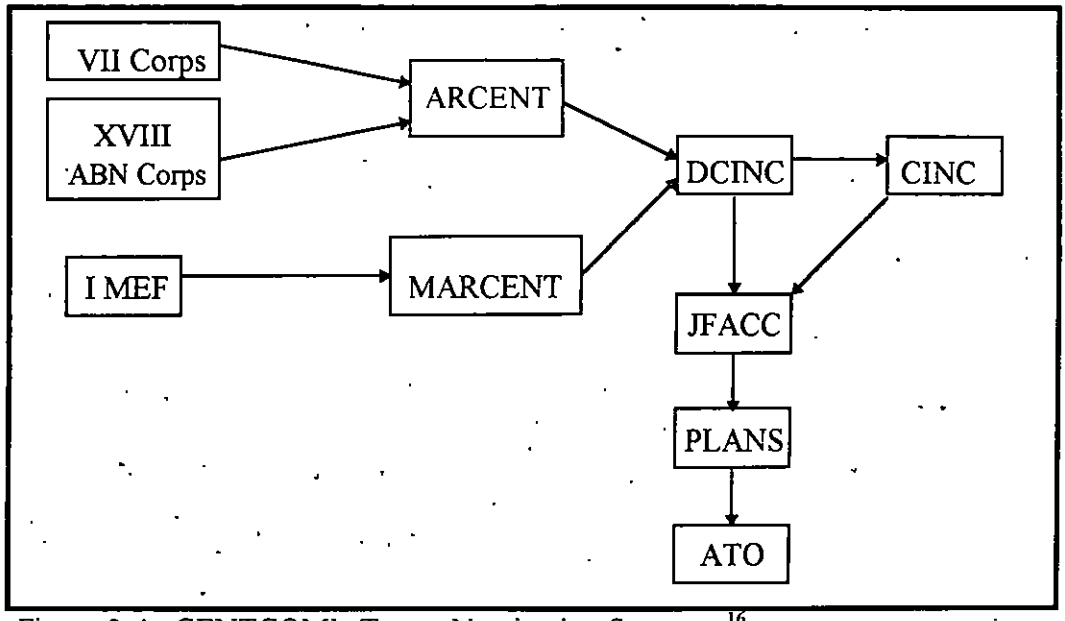

Figure 2-4: CENTCOM's Target Nomination Structure[16]

Figure 2-4 reflects CENTCOM target nomination structure after 7 February. The JTB allocated sorties equally so the ground commanders felt they were getting their fair share.[17]

During the eight months of the Gulf War, joint targeting procedures were developed, tested, modified, and implemented. The overall results were effective, but the process was not smooth, and interservice cooperation suffered because of a lack of standing operating procedures

A well thought out plan for the integration of fires did not exist when CENTCOM and its components deployed to Saudi Arabia. Initially the JFACC and his internal JTCB filled the joint targeting void left by the CENTCOM staff. Creation of the DCINC's JTB briefly added jointness to the targeting effort as the focus shifted to the ground war. In reality, CENTCOM did not exercise effective control or daily involvement in the targeting

process. The overall joint targeting process lacked the essential "purple suit" ingredient that would have lent balance. No agency exercised oversight of the targeting effort once the CINC's guidance had been issued. A lack of direct interaction between the air and ground commanders, coupled with a lack of information flow between the CINC and his corps commanders led to commanders and staffs pulling in different directions when targeting joint fires.[18]

The management of finite resources and coordination of the CINC's weight of effort for campaign planning requires a doctrinally sound and well structured organization through which the unified commander and his staff exercise influence and oversight. The way the services answer the lessons learned during the Gulf War will greatly influence how the military integrates joint fires in the next major war. It is also the basis for significant procurement and force sizing decisions today.

Chapter 3

Service Interpretation

You may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life—but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman legions did, by putting your young men in the mud.

T. R. Fehrenbach

Gulf lesson one is the value of air power....(it) was right on target from day one. The Gulf war taught us that we must retain combat superiority in the skies....Our air strikes were the most effective, yet humane, in the history of warfare.

President George Bush

Each Service had its own interpretation of the lessons learned from the Gulf War. The major contributor to the differences can be attributed to culture. Our doctrine is often a reflection of our service culture. For the Army, doctrine is an important method for control. It is driven by the commander's requirement to control thousands of independent individuals and weapon systems. The Air Force sees doctrine in much more general terms. Airmen pride themselves on flexibility; and rigidly stating how one is going to conduct war seems contrary to how many of their leaders want to conduct operations.[19] These cultural confrontations were apparent throughout the war, especially in the area of the planning and control of joint fires.

Seventh Corps, tasked with destroying the Republican Guard, was the JFLCC's main effort. Prior to the Gulf War, VII Corps' warfighting procedures and training

focused on combat against the massive armies of the former Soviet Union and other Warsaw Pact countries in central Europe. This is the conflict that AirLand Battle doctrine was designed to win. Command and control procedures developed for AirLand Battle and practiced in the NATO theater would be at odds in CENTCOM's theater. A key component of the Army's AirLand Battle doctrine is battlefield air interdiction (BAI) BAI was defined in the 1986 version of FM 100-5, *Operations* as air interdiction attacks against targets which have a near term effect on the operations or scheme of maneuver of friendly forces, but are not in close proximity to friendly forces. BAI is executed by the air component commander as an integral part of a total air interdiction effort.

One of the first frustrations encountered by VII Corps units was the JFACC's refusal to recognize and implement procedures for BAI, a concept developed for NATO. BAI was not defined in Joint Pub 1-02 (December 1989). In BAI, the air strike can be inside or outside the FSCL Attack aircraft do not need to be under the control of a forward air controller when delivering ordnance The U.S. Army in Europe liked the BAI concept because it allowed Corps commanders to nominate targets and provided them with a measure of control over air assets.

LTG Horner had eliminated BAI as an air mission type for CENTCOM because he considered it unnecessary; a mission which would complicate and possibly degrade the application of air power on the battlefield The Air Force believed dividing interdiction into two separate categories complicated command and control without significant benefits. Horner acted within USAF and joint doctrine, but not in accordance with the *31 Initiatives* of 1984 where the Air Force and the Army agreed to develop and test procedures synchronizing BAI with ground maneuver.

Lieutenant Generals Franks and Luck felt that the JFACC was not allowing either Corps adequate influence in preparing and integrating air power into the ground scheme of maneuver. The ARCENT G-3 released a message that read:

> Air supported related issues continue to plague final preparations for offensive operations and raise doubts concerning our ability to effectively shape the battlefield prior to initiation of the ground campaign. Too few sorties are made available to VII and XVIII Corps and, while air support missions are being flown against first-echelon enemy divisions, Army-nominated targets are not being serviced. Efforts must be taken now to align the objectives of the air and ground campaigns, and ensure the success of our future operations.[20]

The CENTCOM Deputy Commander believed that the air planners were trying very hard to win the war without having to resort to a ground attack—so they could say that the air won the war. The Air Force did not want the air effort defused across the battlefield.

The Air Force usually divides air support of the ground battle into close air support (CAS) and air interdiction (AI). The Army targets and controls CAS and AI is targeted and controlled by the Air Force.[21] It was the Army that wanted the subcategory BAI—targeted by the Army and controlled by the Air Force.

The Air Force professes that it brings a theater wide perspective to the fight. It is not as constrained as the Army with their narrower focus and doctrinal concern with battlefield preparation. The Air Force has fought aggressively for centralized control and decentralized execution of air resources. Historical evidence has shown that parceling out air assets to individual units is not a productive way of employing air power. Furthermore, many in the Air Force see the Army's firepower capabilities beyond the FSCL as minuscule when compare to tactical fixed-wing air power. They believe that the Army's deep fire assets are a hindrance to the effective employment of airstrikes.[22]

The Army believed it was the decisive force in theater and therefore should decide how the Air Force, as a supporting component, should shape the battlefield for the surface commander's scheme of maneuver. The Air Force believed it was the decisive force with its strategic reach and that with General Schwarzkopf acting as the JFLCC, it was supporting the surface commander. No one can argue against the fact that airpower prepared the battlefield well for the ground offensive. Battlefield preparation represented 80 percent of the strike sorties flown.[23] Also, many of the targets nominated by the corps were either outdated or had already been destroyed during Phases I-III. General Horner noted and General Yeosock confirmed a large number of the targets selected by the corps were no longer valid.[24] But, one could argue that the Air Force was able to fly so many battlefield preparation sorties while continuing strategic attacks because of the over abundance of aircraft in the theater Will we have this luxury the next time?

Many of lessons learned about joint fires during the Gulf War were interpreted differently by the Army and the Air Force Here are their perspectives:

US Army

- Longer range weapons such as Army Tactical Missile Systems (ATACMS) and the ability to see deeper with systems like the joint surveillance target attack radar system (J-STARS) increased the ground commanders' capability to influence the battlefield at greater ranges. Corps Commanders should be responsible for controlling all operations with their area of operations.[25]

- LTG Waller stated that the lesson he learned was that the individual in charge of the strategic air campaign should not be the same individual who is in charge of the tactical shaping or apportionment of air on the battlefield.[26]

U.S. Air Force

- For the first time in history, air power was the major determinant in war.[27] An Air Force White Paper, *Air Force Performance in Desert Storm*, describes the Operation Desert Storm as the "1100 hour war in the desert."[28] This statement illustrates the Air Force community's reaction to being viewed as a supporting force. The "air campaign" was not a preparatory fire for the ground offensive, but an independent operation capable of winning the war. Many argue that had the ground war been delayed and the air war continued, the air strikes would have decimated the Iraqi army.

- The JFACC provided the needed command and control of the disparate component air forces. The result was both a unity of purpose and a flexibility in execution that would not have been possible otherwise.[29] The component commanders with forces at risk beyond the FSCL are the JFACC and the Special Operations Component Commander. The JFACC's C3I architecture is uniquely capable of planning and controlling operations in territory occupied by hostile forces. The JFACC is responsible for a number of missions, none of which has geographical boundaries. Responsibility for synchronizing theater interdiction assets should be vested in the commander who has the preponderance of attack assets and the C3I capability to conduct these operations. It is normally the JFACC who has the preponderance of attack assets and the C3I capability for interdiction operations.[30]

- The ATO ideally maximized the effectiveness of Coalition air power.[31] MG Corder, CENTAF Director of Operations, said. "he who controls the target list—and the sequence in which targets are attacked—controls the war."[32] Corps cannot expect to have

dedicated sorties. Had the JFACC been forced to relinquish more control, air power's overall effect would have been diluted.[33]

To what extent was the effectiveness of joint operations during the Gulf War influenced by service perspectives? At the component level and above, rational decisions were made and rational actions were implemented to prosecute the war. The Goldwater-Nichols legislation did not make as much headway in integrating the services below the level of component commander. Unlike the most senior levels of command, decisions made and actions taken were not always implemented for the most rational reason. At times, decisions and actions were not optimal because the decision maker/actor lacked information, had a different service perspective, and/or inadequately understood and empathized with members of the other services.[34]

Another cause for conflict was battlefield air interdiction. The Army had incorporated BAI from the *31 Initiatives* into its doctrine, but the Air Force had not. Figure 3-1 is one example of how "BAI" was incorporated into Army doctrine.

	AI	BAI	CAS
Target	Indirect	Directly affecting friendlies	
Area	Beyond FSCL	Both sides FSCL	Close proximity
Coordination	Joint planning and coordination		Detailed integration
Control	None required		Direct or Indirect

Figure 3-1: Characteristics of AI, BAI, and CAS[35]

Although the Air Force provides a majority of the BAI attack assets; BAI is not part of their doctrine.

The Service interpretations of the lessons from the Gulf War influence each service's doctrine. The Services capstone doctrinal manuals, FM 100-5 and AFM 1-1; and the Army's new FM 100-7 have examples of this influence.

This Army's new doctrinal manual, FM 100-7, *Decisive Force: The Army in Theater Operations* was developed after the Gulf War. It has the most detail on joint fires of any Army field manual and reflects many of the ideas in emerging joint doctrine manuals for which the Army is the lead agent. The following excerpts from FM 100-7 appear to be the result of Army lessons learned from the Gulf War.

- The senior army commander, in supporting the CINC's campaign plan, plans operational fires [referred to as joint fires in emerging joint doctrine] within his AO [this includes the area between the FSCL and the army commander's forward boundary]. His major role is to synchronize ground and air operational fires [joint fires] in his AO to achieve operational and tactical objectives.[36]

- The army commander plans joint fires from the top down (the operational commander establishes objectives and designates and integrates targets, then passes them to subordinate joint or allied units for execution). The Army commander executes attacks with organic and allocated assets and by nominating targets that he cannot strike with these assets to the JTCB. He uses the targeting process to shape the battle space and synchronize fire support, interdiction, and maneuver. He does this by using the decide, detect, deliver, and assess (D^3A) methodology and participating in the JFC's joint targeting process.[37]

- Fires alone are unlikely to achieve all of the operational objectives. Integrated properly with operational maneuver, fires can help achieve a decisive impact on the operation.[38]

- The ARFOR commander is normally the supported commander planning and executing a major operation. Then, the execution of the operation's general direction is exercised by the ARFOR commander This has a significant impact on the planning of deep operations; deep fires; interdiction; Army airspace command and control (A2C2); and reconnaissance, intelligence, surveillance, and target acquisition (RISTA) within the senior army commander's AO.[39]

- Sometimes, the ARFOR commander may be a supporting commander as well as the supported commander. For example, the ARFOR may be the supporting commander to the JFACC by providing army assets in support of joint suppression of enemy air defenses (J-SEAD) during an air interdiction mission.[40]

The Army's capstone doctrinal manual, FM 100-5, *Operations* was updated shortly after the war. "Battlefield air interdiction" that appeared in the '86 edition was dropped from the '93 edition This was probably in recognition of the fact that BAI is not part of Air Force doctrine However, the Army continues to believe it will provide decisive results The revised FM 100-5 states.

> US Army doctrine is compatible with joint doctrine It recognizes that a joint force commander (JFC) has a variety of ground, sea, air, special operations, and space options available to accomplish strategic objectives. Nonetheless, actions by ground force units, in coordination with members of the joint team, will be the decisive means to the strategic ends.[41]

The Air Force's capstone manual is AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, Volumes I and II. This two volume set was updated after the Gulf War. Volume one states that versatility of aerospace power may be easily lost if air forces are subordinated to surface forces. Regardless of where interdiction is performed, air and surface commanders together should consider how surface forces can be employed to enhance the ability of air interdiction in support of the JFC's theater campaign objectives. To achieve efficiency and enhance effectiveness, the Air Force believes that the air component commander should control all forces performing interdiction and integrate interdiction with surface force operations to achieve the theater commander's objectives. Effective priorities for the use of aerospace forces flow from an informed dialogue between the joint force commander and his air component commander. The manual targets the two dimensional thinking of most military thinkers as a reason for not realizing the decisiveness of airpower. Air Force doctrine writers subscribe to the notion that traditional two dimensional surface warfare concepts dominate military thinking because aerial warfare history comprises only the past eighty years. Therefore, all aspects of warfare must be reexamined from the acrial or three dimensional perspective if military power is to reach its full potential [42]

AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, Volume II, contains essays that reinforce the doctrine expressed in Volume I. Since synchronization is usually vital to effectiveness, the manual proposes that the theater commander should make the joint force air component commander responsible for controlling the overall interdiction effort when aerospace forces provide the preponderance of interdiction capability. Air interdiction concentrated in a small area close to friendly surface forces is

likely to have a more immediate tactical effect and may require less time and resources. Due to their near-term influence, such attacks (battlefield air interdiction) usually require more detailed coordination with surface forces during planning than do interdiction operations which are conducted deeper in the joint area of operation. Considering air interdiction as a means of providing advantages only before or during a battle ignores the immense contribution it can make in a campaign by exploiting opportunities after the battle, i.e. during exploitation or pursuit [43] These assertions made in AFM 1-1 stem from either new lessons learned or from Air Force doctrine validated during the Gulf War.

Service doctrine addressing the subject of joint fires are a reflection of Service interpretation of the lessons learned or reinforced during the Gulf War. Historically, studies of air power have articulated differing points of view on the relative merits of focusing air attacks on either strategic targets (such as government leadership, military industry, and electrical generation) or on tactical targets (such as frontline armor and artillery). These contending points of view have been debated in many official and unofficial sources. However, the 1996 GAO report, "Operation Desert Storm. Operation Desert Storm Air War," did not address this debate because data and other limitations did not permit a rigorous analysis of whether attacks against strategic targets contributed more to the success of Desert Storm than attacks against tactical targets But, Colonel Mann (USAF) cuts to the core of the doctrinal conflict between the Army and the Air Force in *Thunder and Lighting: Desert Storm and the Airpower Debates*. He wrote that according to FM 100-5,

> airpower is an integrated but *subordinate* element of the AirLand Team. Throughout the document. air operations are depicted as fire support for ground maneuver. Although planners must coordinate "air and naval

> *support* of ground maneuver," ground maneuver *never supports* air operations.[44]

The Air Force takes umbrage with being referred to as the Army's fire support asset.

Each Service's doctrine promotes its decisiveness in war. Both the Army and the Air Force perceived it was the decisive service in the Gulf War victory.

Chapter 4

Joint Doctrine

At the very heart of war lies doctrine. It represents the central beliefs for waging war in order to achieve victory....It is the building material for strategy. It is fundamental to sound judgment.[45]

General Curtis E LeMay, USAF

Doctrine provides a military organization with a common philosophy, a common language, a common purpose, and a unity of effort.[46]

General George H. Decker, USA

Joint doctrine offers a common perspective from which to plan and operate, and fundamentally shape the way we think about and train for war.[47]

Joint Pub 1

The amount of formalized joint doctrine available to the U.S. force deploying to the Persian Gulf was limited. The military leadership recognized the need for improved joint doctrine to assist the CINCs in the executing their missions. The following observation appeared in the final report to Congress on the conduct of the Gulf War:

> The theater Commander-in-Chief has the key role in theater-level targeting, but is not clearly defined in joint doctrine. This lack of definition caused confusion and duplication Ground force commanders expressed discontent with the JFACC targeting process for not being responsive to pre-G-Day targeting nominations On the other hand, the JFACC targeting process reacted to CINCCENT direction regarding priorities and maintenance of the overall deception plan Difficulties were experienced in nominating and validating targets. CINCCENT has recommended, for future major military operations, the JFACC be staff with personnel from all using as well as providing Services. This issue will be addressed in the DOD joint doctrine development process.[48]

Five years have passed since this statement was made. Has this issue been adequately addressed in joint doctrine?

The current and emerging joint doctrine that addresses this issue is found primarily in: Joint Pub 3-03, *Doctrine for Joint Interdiction Operations* (Proposed Final Pub); Joint Pub 3-09, *Doctrine for Joint Fire Support* (Final Coordination Draft); and Joint Pub 3-56.1, *Command and Control for Joint Air Operations.* The joint doctrine community hopes to resolve joint fire issues in Joint Pubs 3-09 and 3-03.

- Joint Pub 3-09, *Doctrine for Joint Fire Support*, is in the final approval stage with an expected publication date of April 1997. The Army is the lead agent for developing the joint fire support doctrine. This publication discusses such critical issues as the joint targeting process, the role of a joint targeting coordination board vis-a-vie joint fire support, and the joint fire element (JFE). It describes the JTCB as an integrating center within the JFACC or as a JFC-level review mechanism. In addition to the JTCB concept, the publication introduces the JFE concept. This optional staff element would provide recommendations to the joint force J-3 and would accomplish a full range of planning and synchronization requirements for joint fires in sustained combat operations. This publication further states that the JFACC controls the air support that is provided to the surface component commander. The Army Air Force Warfighter Conference in December 1996 resolved most of the remaining JP 3-09 issues for the two Services.

- Joint Pub 3-03, *Doctrine for Joint Interdiction Operations* (Proposed Final Pub), was first drafted during to the Gulf War and is yet to be approved. The Air Force is the lead agent for developing joint interdiction doctrine. This publication was introduced to the force during the Gulf War and still has not received CJCS approval. It is largely a reflection of Air Force interdiction doctrine A common theme found throughout the publication is that whoever controls the planning, coordination, and integration of joint

interdiction must have a theater campaign perspective to facilitate synchronization. The Air Force does not think that the Corps commanders maintain a theater campaign perspective. Interestingly enough, the manual describes joint interdiction of follow-on forces as a subset of joint interdiction operations in its chapter on organizing joint interdiction operations. Joint interdiction of Follow-on Forces, known as Follow-on Forces Attack (FOFA), is defined as the interdiction of uncommitted enemy echelons that can be brought to bear on friendly forces. FOFA provides an operational level focus against a specific force objective to achieve a specific result over a specific time period.[49] FOFA resembles BAI, which General Horner believes is too complicated and apt to degrade the application of airpower on the battlefield.

- Joint Pub 3-56.1, *Command and Control for Joint Air Operations*, dated 14 November 1994, also addresses joint targeting, albeit only from the perspective of a joint force air component commander (JFACC). The Air Force was also the lead agent for this publication A common theme found throughout this publication is that airpower should not be defused around the battlefield This is reinforced with quotes from famous *army* commanders Field Marshal Montgomery is quoted as saying, "Air power is indivisible. If you split it up into compartments, you merely pull it to pieces and destroy its greatest assets---its flexibility "[50] General Eisenhower said, "Battle experience proved that control of the air, the prerequisite to the conduct of ground operations in any given area, was gained most economically by the employment of air forces operating under a single commander."[51] General Omar Bradley echoed the decisiveness of airpower when he said, "Airpower has become predominant, both as a deterrent to war, and---in the eventuality of war---as the devastating force to destroy an enemy's potential and fatally undermine his

will to wage war."[52] The manual also stresses the need for jointness in the notional JFACC organization by having senior component liaison officers as well as coordination elements like the BCE, NALE, and SOLE. The senior component liaison officers would serve as conduits for direct coordination between the JFACC and their respective component commanders. They would also possess the credibility and authority to represent their component commander on time sensitive and critical issues.

The joint publications mentioned above describe key concepts designed to improve to the integration of joint fire. It might be helpful here to summarize these key concepts to see how joint doctrine writers are attempting to resolves joint fire issues. The concepts are JFACC, JTCB, and supported and supporting relationships. How a JFC optimizes the employment of these concepts in the next war with sustained combat operations will determine the success of integrating joint fires.

The JFACC: According to the JFACC Primer, "the primary purpose for the JFACC is to provide unity of effort for employing air power for the benefit of the joint force as a whole."[53] Joint doctrine establishes procedures for Joint Force Commanders (JFCs) to exercise operational control (OPCON) through functional component commanders when such a command structure will enhance the overall capability of the joint force to accomplish the mission. The JFACC derives his authority from the JFC. The JFC establishes the specific command authority, i.e., OPCON or tactical control (TACON) of the forces assigned to the JFACC. However, JFACCs typically will exercise OPCON over assigned and attached forces, and TACON over other forces made available for tasking. Some air-capable assets, such as ATACMS, Tomahawk Land Attack Missiles

(TLAMs), and AH-64 attack helicopters, will normally remain under the operational control of the respective component commander.[54]

Joint force air component commander (JFACC) is defined as:

> The joint force air component commander derives authority from the joint force commander who has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission. The joint force commander will normally designate a joint force air component commander. The joint force air component commander's responsibilities will be assigned by the joint force commander (normally these would include, but be limited to, planning coordination, allocation, and tasking based on the joint force commander's apportionment decision). Using the joint force commander's guidance and authority, and in coordination with the other Service component commanders and other assigned or supporting commanders, the joint force air component commander will recommend to the joint force commander apportionment of air sorties to various missions or geographic areas.[55]

Responsibilities of the JFACC and a notional JFACC organization are described in Joint Pub 3-56.1

The JTCB: This board is an advisory body that sits at the discretion of the JFC to provide guidance on targeting issues beyond the forward edge of the battle area (FEBA). The JTCB can efficiently address targeting issues when the Deputy JFC chairs the board.[56] The JTCB is defined in JP 1-02 as:

> A group formed by the joint force commander to accomplish broad targeting oversight functions that may include but are not limited to coordinating targeting information, providing targeting guidance and priorities, and/or refining joint target lists. The board is normally comprised of representatives from the joint force staff, all components, and if required, component subordinate units.[57]

The establishment of a JTCB is not mandatory. The JFC will decide whether to convene a JTCB or to delegate targeting oversight responsibility to a subordinate commander. Joint

publications are deliberately vague about the responsibilities and organization of the JTCB; leaving it up to the JFC to define the specific role of the JTCB. JP 3-0 defines only the scope of potential responsibilities for the JTCB. It does not prescribe what specific duties it must perform because the JFC determines the actual role and responsibility for the JTCB. Joint publications do not offer any guidance on where a JTCB fits into an organization. JP 3-0 recommends that "targeting mechanisms should exist at multiple levels. JFCs may establish and task an organization within their staffs or may delegate the responsibility to a subordinate commander."[58]

There are two schools of thought about the role of the JTCB and where it best fits organizationally to assist the JFC. The Air Force advocates that the JTCB be subordinate to the JFACC and integrated into the air component planning process to prevent the historical problem of fragmented air operations. The Army advocates that the JTCB should act as the "honest broker" for all the services by operating at the JFC level, separated from the individual component commanders. Used in either capacity, the JTCB must focus at the macro level. A JTCB assists components by preparing targeting guidance, refining joint target lists, and reviewing targeting information IAW JFC guidance.[59]

Supported and Supporting Relationships: JP 3-0 states that JFCs may establish support relationships within the joint force to enhance unity of effort for given operational tasks, [and to] emphasize or clarify priorities. Establishing supported and supporting relationships between components is a useful option to accomplish needed tasks. Each subordinate element of the joint force can be a supported or supporting force. The support command relationship gives the supported commander authority to exercise

general direction of the supporting effort. General direction includes designation of targets, timing and duration of the supporting action, and other instructions necessary for coordination or efficiency.[60]

Since the Gulf War, commanders and doctrine writers have sought to reconcile various views on coordinating and conducting joint fires. Doctrine is a tool. It is not dogma. It serves as a common frame of reference for planning and conducting operations. It can improve communication and understanding among different organizations. Doctrine also provides a basis for initiating strategy and operations. In addition, joint doctrine has an additional function—it links the different services together. The Army-Air Force Warfighter Conferences have enabled the two services to resolve their doctrinal differences. The draft publications reflect those agreements. However, agreements written into joint publications are compromises which will not resolve the competition for limited resources during our next major conflict.

In the event of sustained combat operations, the conflicting Service cultures will probably outweigh the current doctrinal compromises. The Services will continue to compete to be the dominate arm in the next war. As always, the JFC has responsibility to integrate the component services to accomplish his theater objectives. His success will depend on establishing and practicing procedures at the joint staff level to plan and control joint fires prior to deployment for war

Chapter 5

Analysis and Synthesis

> *The nature of modern warfare demands that we fight as a joint team. This was important yesterday, it is essential today, and it will be even more imperative tomorrow.*[61]
>
> General John M. Shalikashvili

An understanding of the dynamics of a given situation in a past war might lead to the mastering of that situation. Looking at its fundamentals will give meaning to the experience and therefore help us understand the present conditions of war. We must remember though, that each case is unique, but we cannot forget the words of former RAF Marshal, Sir John Slessor:

> If there is one attitude more dangerous than to assume that a future war will be just like the last one, it is to imagine that it will be so utterly different that we can afford to ignore all the lessons of the last one.[62]

Our experiences in war help shape our doctrine. Events are determined in a dynamic struggle between forces. Success and failure are relational.

The Gulf War was not a true test of integrated joint operations because the Coalition forces overwhelmed the Iraqi Army. AirLand Battle and joint combined arms integration were not realized during the Gulf War. Operations were deconflicted rather than integrated. This was an example of "specialized" rather than "synergistic" joint warfare. Our success was probably more a result of an asymmetric fight with the Iraqi Army than the success of joint warfare. The Coalition possessed overwhelming resources which allowed it to apply overwhelming force. The Gulf War witnessed the most

extensive projection of air power in history. By 24 February 1991, the Coalition had 2,790 aircraft in the theater.[63] We could afford inefficiencies in our service integration. The U.S. may not have that luxury in the next war. The scheduled retirement of strike and attack aircraft such as the A-6E, F-111F, and the A-10s will make Desert Storm's sortie generation difficult to duplicate by the year 2000.[64]

The Coalition had a great deal of preparation time. Future opponents may not allow us time to develop effective command and control procedures after arriving in the theater. CENTCOM had six months prior to D-Day to develop their command and control system for the employment of joint fires and was unable to resolve all of the inter-service confrontations. Joint Doctrine allows the JFC considerable latitude in organizing his command and control structures. However, the next war may not provide the opportunity to develop some of the ad hoc structures used during the Gulf War.

The Army and Air Force disagree on how this issue should be addressed in Joint doctrine. The AirLand battle doctrinal debate reaches to the heart of the enduring question of who wins wars. Because operational targeting serves more than one master, targeting doctrine often causes conflict among services and theaters.[65] The Army, Navy, and Marine Corps support formalizing the JTCB as a tool for future joint commanders. The Air Force does not yet. They argue that airpower is a shared resource and they should share equal responsibility for target selection as well This issue figures prominently in how each service views responsibility for integrating joint fires beyond the FSCL.

The Army perspective

- Commanders at all echelons will often need more than their organic firepower to accomplish their missions. Fire support maximizes the potential of maneuver forces. It exists to provide our own forces with every possible advantage when they meet the enemy's maneuver forces. Maneuver commanders are in the best position to identify targets and plan supporting attacks in support of their forces. A fire support planning body at the JFC level is needed to ensure targeting priorities support maneuver forces.[66]

- Longer range weapons such as ATACMS and the ability to see deeper with systems like J-STARS increases the capability of ground commanders to influence the battlefield at greater ranges. Corps commanders should be responsible for controlling all operations within their areas of operations.[67]

The Air Force perspective

- Top down planning is the best way to identify the highest payoff options for attack operations. Top-down planning also identifies the tasks that must be accomplished before beginning a sustained offensive operation, i.e. suppressing air defenses or gaining effective control of the air. Attacks on distributed targets (such as railroad systems) can concentrate in purpose without massing in one location at one time. Coherent operations of this type depend on centralized planning. Because air operations expose valuable air crews and aircraft to risk, expert planning—to include targeting—can maximize the value of attacks while keeping inherent risks to a minimum.[68]

- Synchronization of all attack assets is critical to the land component commander for all fires inside the FSCL. All operations inside the FSCL are restricted by control

requirements for troop safety. For example, artillery fires use Danger Close procedures while air operations must be controlled by a Forward Air Controller. Synchronization and troop safety are just as critical to the Air Component Commander for all attacks beyond the FSCL. The air component commander has the majority of the forces at risk beyond the FSCL.[69]

- Unless there is specific JFC guidance to the contrary, joint and service doctrine/agreements give the JFACC control of only part of the total theater air assets available This may limit the JFACC's ability to integrate air assets to accomplish theater objectives.[70]

The Army-Air Force Warfighter Talks have developed solutions for assigning the responsibility for integrating the joint fires beyond the FSCL. These have been incorporated into joint publications The JFACC is supported commander for: overall air interdiction; counterair operations; theater airborne reconnaissance, surveillance, and target acquisition; and strategic attack where air provides the bulk of the assets. Interdiction target priorities within the land or naval force areas of operation (AOs) are designated by the land and naval component commanders. These priorities are considered along with the JFC's AOR/JOA-wide interdiction priorities and are reflected in the air apportionment decisions. The JFACC will use these priorities to plan and execute the AOR/JOA-wide interdiction effort.

Within their respective AOs, land/naval commanders are designated as supported commanders and are responsible for synchronization of maneuver, fires, and interdiction They have the responsibility for designating target priority, effects, and timing of

interdiction operations. They do not have responsibility for the entire joint AOR[71] The JFACC, when directed by the JFC, will function as the supporting commander for operations such as close air support, air interdiction within the land and naval component AOs, and maritime support.

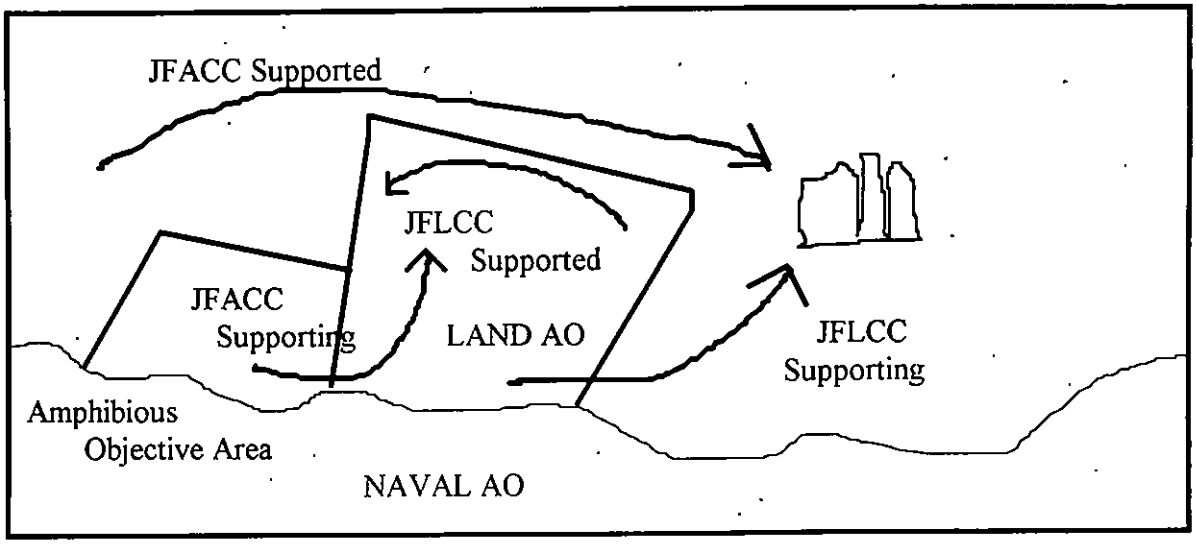

Figure 5-1: Support Relationships

There has seldom been a single decisive factor or decisive service that determined the outcome of war. It is imperative that the JFC synchronize all of his assets to achieve the best synergistic effect possible. If conflicting priorities arise, the JFC has the responsibility to determine precedence of priorities. However, a solid basis of trust between components will go a long way to alleviate potential problems. General Franks said after the Gulf War, "the idea that one service is more important than another, or is more decisive in modern combat, strikes at the heart of trust."[72]

Chapter 6

Conclusion and Recommendations

We have a moral obligation to ensure military force is applied in the most efficient manner in order to save lives, shorten the conflict period and achieve victory.[73]

LTG Charles A. Horner, Commander, USCENTAF

Conclusions:

There were conflicts in the planning and control of operational fires during the Gulf War. These conflicts did not alter the outcome of the war because we possessed abundant assets. However, significant problems could occur if we fail to improve the planning, control, and integration of joint fires. A nation that won the last conflict is often set up to lose the next one because it is often satisfied with the status quo (doctrine, organization, etc.). Due to an abundance of resources, the US military and its Coalition partners were effective without being integrated in the joint fires area. We cannot rely on abundant resources to ensure victory in future conflicts. We must rely on maximizing integration through improved and practiced joint organizational procedures. The US military needs jointness by design, not accident!

During the Cold War, the United States and its allies established large standing armies with redundant capabilities to counter the Soviet threat. Today forces built on mass alone are unnecessary and too expensive to field and maintain. The effectiveness and success of joint operations will depend more on integrating service maneuver and precision strike capabilities than on marshaling large service components for the decisive battle.

Since 1990, the efforts of the Armed Forces have evolved from "specialized" to slightly less than "synergistic" joint warfare. The Gulf War represented specialized joint warfare because the coalition employed an impressive array of multinational, multiservice, multidimensional, and multifunctional forces with the common objective of removing Iraqi forces from Kuwait. The United States and its allies had the luxury of powerful, massed, deeply redundant, separate services fighting in the same battlespace. Service capabilities were deconflicted rather than integrated.

Although specialized joint operations in the Gulf War were an improvement over multiservice operations that occurred prior to the Goldwater-Nichols Act, the United States can no longer afford the inefficiencies of a system that brings redundant forces together for the first time on the battlefield:[74] Redundant forces will not be available in future conflicts due to the current draw down of the military and other resource constraints. Also, it is clear that our next opponent will not give us six months to work out ad hoc command and control procedures before opening hostilities.

At the upper end of conflict spectrum, long-range and highly lethal precision-guided munitions—launched from an assortment of ground, naval, and air platforms and guided by a complex web of command and surveillance assets—will continue to blur the lines separating land, sea, and air warfare [75] TLAMs, ATACMS, MLRS, and attack helicopters as well as Air Force, Navy, and Marine fixed wing aircraft contribute to joint fires operations.

Victory will depend on the ability of JFCs to master the "system of systems" composed of multiservice hard and soft-kill capabilities linked by advanced information technologies. A JFC orchestrating a battle must rapidly process and disseminate

information to his forces so they can attack to deny an enemy sanctuaries of time and space. At some point, the system may become so complicated that Gulf War-type organizational ad hoc solutions or fixes may be inadequate. In sum, joint forces will have to be thoroughly integrated to fully exploit the synergism of land, sea, and air combat capabilities before the conflict.[76]

Our current and emerging joint doctrine is taking steps in the right direction to provide joint force commanders the processes they need to plan and control joint fire targeting beyond the FSCL. By allowing the air and surface component commanders to be both supported and supporting commanders, joint doctrine acknowledges the decisive role each Service can play in war But this support relationship compromise will most likely fuel the fight for limited resources as each component commander executes his mission. Service culture is a major influence on how the components fight and how they think they should be supported during operations. It will take the joint force commander and the procedures he establishes at the JFC level to ensure effective integration of joint fires. These procedures will have a greater chance at success if the JFC establishes and practices them before going to war

Recommendations:

To continue to improve interservice integration, we need to. teach concepts of service integration early in an officer's career, expand joint interaction in schools and training; and provide some additional standardization among theaters.[77] The tactical orientation of many senior leaders (especially army leaders) can cause problems in a joint environment. This is a result of a lack of joint experience or exposure to other service officers. For many, their initial exposures occur while they are senior majors or lieutenant

colonels. The fifteen year mark or beyond my be too late to overcome service culture biases. A holistic understanding of the other services would lead to better cooperation and trust in the joint arena. Joint military education can also increase cooperation among all officers at the expense of service parochialism.

The Unified Endeavor (UE) series of exercises should continue for the foreseeable future. These exercises allow JFCs and their staffs the opportunity to practice and assess joint doctrine and procedures by causing them to work through complex scenarios based on real-world threat, environmental, and terrain data bases. Effective assessments of evolving joint doctrinal concepts, like JFACC and JTCB, require JCS-directed exercises to provide the objective forums. The battlefield should determine the best methods for winning wars--even when the battles are simulated.[78]

As in the past, the US Armed Forces will fight future wars as a joint team. Since military units will generally fight the way they train, they need to train in a joint environment. Training the team as they will fight builds the bonds of trust that are critical in joint operations. If concepts like Joint Air Attack Team (JAAT) are considered viable, then they should be practiced prior to combat, not during it. Linking exercises such as the Air Force's Blue Flag Program with the Army's BCTP Program to accomplish JFCs' training objectives during simulations could provide tremendous benefits.

The Army and Air Force both see better integration as important to joint warfare. But each service is reluctant to allow the other Service to control its assets. Due to inherent Service culture and biases, the procedural mechanism for the planning and controlling joint fires beyond the FSCL should be at the combatant command or joint force task force level. This level of command can provide the big picture understanding of

the situation, a picture that is not always available to subordinate commanders and staffs This procedural mechanism will be the most effective if resourced and practiced prior to any conflict.

A JFACC should be designated to centrally control air assets by drafting the joint air operations plan to support the JFC's campaign objectives and building and executing the daily joint air tasking order. A JFACC staff with robust liaison teams like the senior component liaisons and coordination elements will provided jointness to joint fires. Using ad hoc joint staffs places a tremendous training burden on air component commanders assigned JFACC responsibilities. In a crisis, training time may be unavailable or inappropriate because of operational security concerns. A trained and ready core of joint players need to be permanently assigned to a theater CINC's air component staff Blue Flags and JFACC Theater Air Strategy Symposiums provide excellent training opportunities to further improve the joint fires process and to foster trust if done with joint staffs that will go to war together

While the nature of future conflict is uncertain, US participation in it and the need for responsive and flexible joint fires is not Shortcomings identified during the Gulf War are being addressed and initial signs are promising Joint doctrine must provide workable procedures for the joint force commander to maximize joint fires and the procedures must be instituted and practiced before our armed forces are committed to the next war. The targeting of joints fires beyond the FSCL is best accomplished by a JTCB at the joint forces command level while the attack assets used to service those targets are best controlled by a JFACC

Glossary

Joint Doctrinal Terms
(*) identifies terms approved for both DOD and NATO use.

Air Interdiction(*)—air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against forces at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required.

Battlefield coordination element (BCE)—an Army liaison provided by the Army component commander to the Air Operations Center (AOC) and/or to the component designated by the joint force commander to plan, coordinate, and deconflict air operations. The battlefield coordination element processes Army requests for tactical air support, monitors and interprets the land battle situation for the AOC, and provides the necessary interface for exchange of current intelligence and operational data.

Deep supporting fire(*)—fire directed on objectives not in the immediate vicinity of our forces, for neutralizing and destroying enemy reserves and weapons, and interfering with enemy command, supply, communications, and observations.

Interdiction—an action to divert, disrupt, delay, or destroy the enemy's surface military potential before it can be used effectively against friendly forces. See also air interdiction.

Fire support coordination line(*)—a line established by the appropriate ground commander to ensure coordination of fire not under the commander's control but which may affect current tactical operations. The fire support coordination line is used to coordinate fires of air, ground, or sea weapons systems using any type of ammunition against surface targets. The fire support coordination line should follow well--defined terrain features. The establishment of the fire support coordination line must be coordinated with the appropriate tactical air commander and other supporting elements. Supporting elements may attack targets forward of the fire support coordination line without prior coordination with the ground force commander provided the attack will not produce adverse surface effects on or to the rear of the line. Attacks against surface targets behind this line must be coordinated with the appropriate ground force commander.

Definition in Joint Pub 3-0. A line established by the appropriate *land or amphibious force* commander to ensure coordination of fire not under the commander's control but which may affect current tactical operations. The fire support coordination line is used to coordinate fires of air, ground, or sea weapons systems using any type of ammunition against surface targets. The fire support coordination line should follow well-defined terrain features. The establishment of the fire support coordination line must be coordinated with the appropriate tactical air commander and other supporting elements. Supporting elements may attack targets forward of the fire support coordination line

without prior coordination with the *land or amphibious* force commander provided the attack will not produce adverse surface effects on or to the rear of the line. Attacks against surface targets behind this line must be coordinated with the appropriate *land or amphibious* force commander. (Approved for inclusion in the next edition of JP 1-02.)

Joint force air component commander—the joint force air component commander derives authority from the joint force commander who has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission. The joint force commander will normally designate a joint force air component commander. The joint force air component commander's responsibilities will be assigned by the joint force commander (normally these would include, but be limited to, planning coordination, allocation, and tasking based on the joint force commander's apportionment decision). Using the joint force commander's guidance and authority, and in coordination with the other Service component commanders and other assigned or supporting commanders, the joint force air component commander will recommend to the joint force commander apportionment of air sorties to various missions or geographic areas.

Joint targeting coordination board—a group formed by the joint force commander to accomplish broad targeting oversight functions that may include but are not limited to coordinating targeting information, providing targeting guidance and priorities, and/or refining joint target lists. The board is normally comprised of representatives from the joint force staff, all components, and if required, component subordinate units

Joint target list--a consolidated list of selected targets considered to have military significance in the joint operations area.

Targeting—1. The process of selecting targets and matching the appropriate response to them, taking account of operational requirements and capabilities. 2. The analysis of the enemy situations relative to the commander's mission, objectives, and capabilities at the commander's disposal, to identify and nominate specific vulnerabilities that, if exploited, will accomplish the commander's purpose through delaying, disrupting, disabling, or destroying enemy forces or resources critical to the enemy. See also joint targeting coordination board.

Target list—the listing of targets maintained and promulgated by the senior echelon of command; it contains those targets that are to be engaged by supporting arms, as distinguished from "list of targets" that may be maintained by any echelon as confirmed, suspected, or possible targets for informational and planning purposes.

NALE Naval Air Liaison Element

SOLE Special Operation Liaison Element

Army Doctrinal Terms

Air interdiction—same as JP 1-02; but adds, " Normally conducted forward of the land component commander's forward boundary." FM 101-5-1 (Final Draft).

Deep operations—operations designed in depth to secure advantages in later engagements, protect the current close fight, and defeat the enemy more rapidly by denying freedom of action and disrupting or destroying the coherence and tempo of its operations. FM 100-5

—those operations directed against enemy forces and functions which are not in contact at forward line of troops (FLOT), line of departure (LD), or friendly perimeter and are between the FLOT/perimeter and the forward boundary of the unity conducting the operation. These operations employ long range-fires, helicopter attacks, ground maneuver, and C2W to defeat the enemy by denying him freedom of action and disrupting his preparation for battle, his support structure, and/or disrupting/destroying the coherence and tempo of his operations. FM 101-5-1 (Final Draft)

Deep supporting fires—same as JP 1-02; but added, "(forward of the friendly forward line of troops (FLOT))." FM 101-5-1 (Final Draft)

Fire support coordination line—a permissive fire control measure, established and adjusted by the ground commander, in consultation with superior, subordinate, supporting and other affected commanders It is not a boundary; synchronization of operations on either side of the FSCL is the responsibility of the establishing commander out to the limits of the land components forward boundary. It applies to all fires of air, land, and sea weapon systems using any type of ammunition against surface targets. Forces attacking targets beyond the FSCL must inform all affected commanders to allow necessary coordination to avoid fratricide. FM 101-5-1 (Final Draft) Note: also provides JP 1-02 definition.

Forward boundary—the farthest limit, in the direction of the enemy, of an organizations responsibility. It is responsible for deep operations to that limit. The next higher headquarters is responsible for coordinating deep operations beyond that limit. In offensive operations it may move from phase line to phase line dependent on the battlefield situation. FM 101-5-1 (Final Draft)

Interdict/interdiction—actions to divert, disrupt, delay, or destroy the enemy before it affect friendly forces. FM 100-5

—actions to divert, disrupt, delay, or destroy the enemy's surface military potential before it can be effectively used against friendly forces. FM 100-7

—using fire support or maneuver forces; 1. To seal off an area by means; to deny use of a route or approach. 2 A tactical task which is oriented on the enemy to prevent, hinder, or delay the use of an area or route by enemy forces. FM 101-5-1 (Final Draft) Note: also provides JP 1-02 definition.

Operational firepower—to apply the amount of fire that may be delivered by operational forces through all available means and systems; the application of firepower and non-lethal means to achieve a decisive impact on the conduct of a campaign or major operation FM 100-7

Operations in depth—the totality of the commander's operations against the enemy—composed of deep, close, and rear operations which are usually conducted simultaneously in a manner that appears as one continuous operation against the enemy. FM 100-5

Notes

[1]P. Mason Carpenter, *Joint Operations in the Gulf War: An Allison Analysis*, (Maxwell Air Force Base, Alabama: Air University, February 1995), p. 39.

[2]Ronald R. Fogleman, and Dennis J. Reimer, "Joint Warfare and the Army-Air Force Team," *Joint Force Quarterly*, Spring 1996, p. 10.

[3]John J. Sheehan, "Next Steps in Joint Force Integration," *Joint Forces Quarterly*, Autumn 1996, Number 13, p. 42.

[4]Albert R. Hochevar, James A. Robarbs, John M. Schafer, and James M. Zepka, "Deep Strike: The Evolving Face of War," *Joint Force Quarterly*, Autumn 1995, p. 81.

[5]The Joint Chiefs of Staff, Joint Publication 3-09, *Doctrine for Joint Fire Support*, (Washington, D.C.: U.S. Government Printing Office, 1997), p. I-2.

[6]The Joint Chiefs of Staff, Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms*, (Washington, D.C.: U.S. Government Printing Office, 1991), p. 158.

[7]Headquarters, Department of the Army, FM 101-5-1 (Final Draft), *Operational Terms and Graphics*, (Washington, D.C.: U.S. Government Printing Office, 15 July 1995), p. 1-120.

[8]Ibid, p. 1-127.

[9]*The Oxford Dictionary of Quotations*, 3d ed. (Oxford University Press, 1979), p. 12.

[10]GAO Report PEMD-96-10, "Operation Desert Storm: Operation Desert Storm Air War," 2 July 1996, p. 5.

[11]John W. Scmidt and Clinton L. Williams, "Disjointed or Joint Targeting?", *Marine Corps Gazette*, September 1992, p. 67. COL Schmidt (USMC) served in CENTCOM J-3 Plan Division and COL Williams (USA) was the J-3 representative to JTB chaired by the CENTCOM DCINC.

[12]Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, (New York, NY: Houghton Mifflin Company, 1993), p. 217.

[13]Eliot A. Cohen and Thomas A. Keaney, *Gulf War Air Power Survey Summary Report*, (Washington, D.C.. U.S. Government Printing Office 1993), p. 147. Referred to hereafter as GWAPS Summary.

[14]Eliot A. Cohen and Thomas C. Hone, *Gulf War Air Power Survey, Volume I: Planning and Command and Control*, (Washington, D.C.: U.S. Government Printing Office 1993), pp. 164-5.

[15]Department of Defense, *Conduct of the Persian Gulf War-Final Report to Congress Pursuant to Title V of the Persian Gulf Conflict Supplemental Authorization and Personnel Benefits Act of 1991 (Public Law 102-25)*, (Washington, D.C.: U.S. Government Printing Office, April 1992), p. 75. Referred to hereafter as *CPGW-Final Report.*

[16]Richard B. H. Lewis, "JFACC. Problems Associated with Battlefield Preparation in Desert Storm," *AirPower Journal*. Spring 1994, Vol. VIII, No. 1, p. 6.

[17]Rudy T. Veit, *Joint Targeting: Improving the Playbook, Communications, and Teamwork*, (Carlisle Barracks, PA: U.S. Army War College, 11 April 1996), p. 13.

[18]Schmidt, pp. 68-71.

[19]Carpenter, pp. 70-71.

[20]Atkinson, p. 339.

[21]Richard M. Swain, *"Lucky War": Third Army in Desert Storm*, (Fort Leavenworth, KS.: U.S. Army Command and General Staff College Press, 1994), p. 215.

[22]Carpenter, p. 56.

[23]GWAPS Summary, p. 102

[24]Carpenter, p. 43.

[25]Deputy Chief of Staff, Plans and Operations Headquarters, United States Air Force, *JFACC Primer*, (Washington, D.C.: U.S. Government Printing Office, February 1994), p. 33.

[26]Carpenter, p. 41. LTG Waller felt that until he was granted authority to oversee the battlefield preparation sorties LTG Horner, acting as JFACC, had the license to say, "I want to divert X amount of air from, let's say, shaping the battlefield to some strategic target."

[27]Bruce W. Watson, ed., *Military Lessons of the Gulf War* (Novato, CA: Presidio Press, 1991), p. 77.

[28]Department of the Air Force. "Air Force Performance in Desert Storm." White Paper, April 1991, p. 1.

[29]Watson, pp. 77-78.

[30]*JFACC Primer*, p. 33.

[31]Watson, p. 70.

[32]GWAPS Summary, p. 192.

[33]Lewis, p. 21.

[34]Carpenter, v.

[35]Headquarters, Department of the Army, FM 6-20-30, *Fire Support in the AirLand Battle*, (Washington, D.C.: U.S. Government Printing Office, 17 May 1988), p. 3-3.

[36]Headquarters, Department of the Army, FM 100-7, *Decisive Force: The Army in Theater Operations*, (Washington, D.C.: U.S. Government Printing Office, 31 May 1995), p. 5-5.

[37]Ibid.

[38]Ibid, p. 5-7.

[39]Ibid, p. 4-11.

[40]Ibid, p. 4-11.

[41]Headquarters, Department of the Army, FM 100-5, *Operations*, (Washington, D.C.: U.S Government Printing Office, 14 June 1993), p. 2-0.

[42]Headquarters, Department of the Air Force, Air Force Manual 1-1, *Basic Doctrine* (Volume I), (Washington, D.C.: U.S. Government Printing Office, 1994), pp. 8-15.

[43]Headquarters, Department of the Air Force, Air Force Manual 1-1, *Basic Doctrine* (Volume II), (Washington, D.C.: U.S. Government Printing Office, 1994), pp. 161-165

[44]Edward C. Mann III, *Thunder and Lightning: Desert Storm and the Airpower Debates*, (Maxwell Air Force Base, Alabama: Air University Press, April 1995), p. 29.

[45]AFM 1-1 (Vol. I), p. 25.

[46]George H. Decker, USA, speech given at the US Army Command and General Staff College, Fort Leavenworth, Kansas, 16 December 1960, quoted in Robert D. Heinl,

Jr., *Dictionary of Military and Naval Quotations*, (Annapolis, Maryland: Naval Institute Press, 1986), p. 95.

[47]The Joint Chiefs of Staff, Joint Publication 1, *Joint Warfare of the US Armed Forces*, (Washington, D.C.: U.S. Government Printing Office, 11 November 1991), p 6.

[48]*CPG W-Final Report*, pp 180-181.

[49]The Joint Chiefs of Staff, Joint Publication 3-03, *Doctrine for Joint Interdiction Operations* (Test Pub), (Washington, D.C.: U.S. Government Printing Office, 1990), p. IV-1.

[50]The Joint Chiefs of Staff, Joint Publication 3-56.1, *Command and Control for Joint Air Operations*, (Washington, D.C.. U.S. Government Printing Office, 1994), p. II-1.

[51]Ibid, p. III-7.

[52]Ibid, p. III-5.

[53]*JFACC Primer*, p. 11.

[54]*JFACC Primer*, p. 9.

[55]Joint Publication 1-02, p 220.

[56]Dan Smith, "Doctrinal Issues in Joint Targeting," *Military Intelligence*, October-December 1994, p. 38

[57]Joint Publication 1-02, p 227.

[58]The Joint Chiefs of Staff, Joint Publication 3-0, *Doctrine for Joint Operations*, (Washington, D.C.: U.S. Government Printing Office, 1995), p. III-36.

[59]Fogleman and Reimer, p 12.

[60] Joint Publication 3-0, p. II-9

[61]Sheehan, p 41.

[62]*CPG W-Final Report*, p. 147

[63]Bruce W. Watson, ed., *Military Lesson of the Gulf War*. (Novato, CA: Presidio Press, 1991), p 61.

[64]GAO Report PEMD-96-10, p 15.

[65]Dan Smith, p. 39.

[66]*JFACC Primer*, p. 31.

[67]Ibid, p. 33.

[68]Ibid, p. 31.

[69]Ibid, p. 33.

[70]Ibid, p. 32.

[71]Fogleman and Reimer, p. 11.

[72]Frederick M. Franks, Jr. and Gary B. Griffin, "The Army's View of Joint," *Naval Institute Proceedings*, May 1993, p. 56.

[73]*JFACC Primer*, Forward.

[74]Sheehan, p. 42.

[75]Ibid, p. 41.

[76]Ibid, p. 42.

[77]Carpenter, p. v.

[78]Smith, p. 42.

Bibliography

Books

Aspin, Les and William Dickinson. *Defense for a New Era: Lessons of the Persian Gulf War*. McLean, VA: Brassey's (US), Inc., 1992.

Atkinson, Rick. *Crusade: The Untold Story of the Persian Gulf War*. New York, N Y.: Houghton Mifflin Company, 1993.

Billiere, Sir Peter De La. *Storm Command*. London, Great Britian: Harper Collins Publishers, 1992.

Blackwell, James. *Thunder in the Desert: The Strategy and the Tactics of Persian Gulf War*. New York, N.Y.: Bantam Books, 1991.

Cohen, Eliot A. and Thomas Keaney. *Revolution in Warfare? Air Power in the Persian Gulf*. Annapolis, MD: Naval Institute Press, 1995.

Gordon, Michael R. and Bernard E. Trainor. *The General's War: The Inside Story of the Conflict in the Gulf*. Boston, MA: Little, Brown and Company, 1995.

Heinl, Robert D., Jr., ed. *Dictionary of Military and Naval Quotations*. Annapolis, Maryland: Naval Institute Press, 1986.

Scales, Robert H *Certain Victory: The US Army in the Gulf War*. Fort Leavenworth, KS: U.S. Army Command and General Staff College Press, 1994.

Schwarzkopf, H. Norman. *It Doesn't Take a Hero*. New York, N.Y.: Bantam Books 1992.

Swain, Richard M. *"Lucky War": Third Army in Desert Storm*. Fort Leavenworth, KS.: U.S. Army Command and General Staff College Press, 1994.

The Oxford Dictionary of Quotations 3d ed Oxford University Press, 1979.

U.S. News & World Report. *Triumph Without Victory: The Unreported History of the Persian Gulf War*. New York. Random House, Inc., 1992.

Warden, John A., III. *The Air Campaign*. Washington, D.C.: National Defense University Press, 1988

Watson, Bruce W. ed. *Military Lesson of the Gulf War*. Novato, CA: Presidio Press, 1991

U.S. Military Manuals

The Joint Chiefs of Staff, Joint Publication 1, *Joint Warfare of the US Armed Forces*. Washington, D.C.: U.S. Government Printing Office, 1991.

___Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms*. Washington, D.C.: U.S. Government Printing Office, 1991.

___Joint Publication 2-01.1, *Joint Tactics, Techniques, and Procedures for Intelligence Support to Targeting* (Draft). Washington, D.C.: U.S. Government Printing Office, 1995.

___Joint Publication 3-0, *Doctrine for Joint Operations*. Washington, D.C.: U.S. Government Printing Office, 1995.

___Joint Publication 3-03, *Doctrine for Joint Interdiction Operations*. Washington, D.C.: U.S. Government Printing Office, 1990.

___Joint Publication 3-05.5, *Joint Special Operations Targeting and Mission Planning Procedures*. Washington, D.C.: U.S. Government Printing Office, 1993.

___Joint Publication 3-09, *Doctrine for Joint Fire Support* (Final Draft). Washington, D.C.: U.S. Government Printing Office, 1993.

___Joint Publication 3-52, *Doctrine for Joint Airspace Control in a Combat Zone* Washington, D.C.: U.S. Government Printing Office, 1995.

___Joint Publication 3-55, *Doctrine for Reconnaissance, Surveillance, and Target Acquisition Support for Joint Operations*. Washington, D.C.: U.S. Government Printing Office, 1993

___Joint Publication 3-51.1, *Command and Control for Joint Air Operations*. Washington, D.C.: U.S Government Printing Office, 1994.

___Joint Publication 5-0, *Doctrine for Planning Joint Operations*. Washington, D.C.: U.S. Government Printing Office, 1995.

Headquarters, Department of the Air Force, Air Force Manual 1-1, *Basic Aerospace Doctrine of the United States Air Force*. Washington, D.C.: U.S. Government Printing Office, 1992.

___*JFACC Primer* (Second Edition). Washington, D.C.: U.S. Government Printing Office, 1994.

Headquarters, Department of the Army, Field Manual 1-100, *Army Aviation in Combat Operations*. Washington, D C.: U.S. Government Printing Office, February 1989.

___Field Manual 6-20, *Fire Support in the AirLand Battle*. Washington, D.C.: U.S. Government Printing Office, May 1988.

___Field Manual 6-20-30, *Tactics, Techniques, Procedures for Fire Support for Corps and Division Operations* Washington, D.C.: U.S Government Printing Office, October 1989.

Headquarters, US Army Training and Doctrine Command, Field Manual 90-21 (FMFRP 5-44, TACP 50-20, USAFEP 50-20, and PACAFP 50-20), *JAAT: Multi-Service Procedures For Joint Air Attack Team Operation*. Fort Monroe, VA., October 1991.

Headquarters, Department of the Army, Field Manual 100-5, *Operations*. Washington, D.C.: U.S. Government Printing Office, 1993.

___Field Manual 100-7, *Decisive Force: The Army in Theater Operations*. Washington, D.C.: U.S. Government Printing Office, 1995

___Field Manual 100-15, *Corps Operations*. Washington, D.C.: U.S. Government Printing Office, 1996.

___Field Manual 100-15-1, *Corps Operations, Tactics and Techniques*. Washington, D.C.: U.S. Government Printing Office, April 1991.

___Field Manual 100-103, *Army Airspace Command and Control in a Combat Zone*. Washington, D.C.: U.S Government Printing Office, October 1987.

___Field Manual 100-103-2, *Multiservice Procedures for the Theater Air-Ground System*. Washington, D.C. U S Government Printing Office, October 1994.

___Field Manual 101-5-1 (Final Draft), *Operational Terms and Graphics*. Washington, D.C.: U.S. Government Printing Office, 15 July 1995

Headquarters, United States Marine Corps, FMFM 2-7, *Fire Support in Marine Air-Ground Task Force Operations* Washington, D.C., 26 September 1991

Headquarters, US Army Training and Doctrine Command, TRADOC Pam 525-5, *AirLand Operations* Fort Monroe, VA., 1 August 1991.

U.S. Government Documents and Reports

Carpenter, P. Mason. *Joint Operations in the Gulf War: An Allison Analysis*. Maxwell Air Force Base, Alabama: Air University, February 1995.

Cohen, Eliot A. *Gulf War Air Power Survey: Planning and Command and Control*. Volume I. Washington, D.C.: U.S. Government Printing Office, 1993.

Cohen, Eliot A and Thomas A. Keaney. *Gulf War Air Power Survey: Summary Report*. Washington, D.C.: U.S. Government Printing Office, 1993.

Burgess, John C., Jr. *Operation Fires: Maximizing Effectiveness*. Newport, RI: Naval War College, 20 May 1996.

Department of the Air Force. "Air Force Performance in Desert Storm." White Paper, April 1991.

Department of Defense. *Conduct of the Persian Gulf War-Final Report to Congress Pursuant to Title V of the Persian Gulf Conflict Supplemental Authorization and Personnel Benefits Act of 1991 (Public Law 102-25)*. Washington, D.C.: U.S. Government Printing Office, April 1992.

Government Accounting Office Report PEMD-96-10. "Operation Desert Storm: Operation Desert Storm Air War." 2 July 1996.

Mann, Eward C., III. *Thunder and Lighting: Desert Storm and the Airpower Debates*. Maxwell Air Force Base, Alabama: Air University Press, April 1995.

Martin, Jerome V. *Victory From Above: AirPower Theory and the Conduct of Operation Desert Shield and Desert Storm*. Maxwell Air Force Base, Alabama: Air University Press, June 1994.

Powell, Colin L. "A Doctrinal Statement of Selected Joint Operational Concepts." *Joint Electronic Library*. April 1996

Reynolds, Richard T. *Heart of the Storm: The Genesis of the Air Campaign Against Iraq*. Maxwell Air Force Base, Alabama: Air University Press, January 1995.

The Institute of Land Warfare. *The U.S. Army in Operation Desert Storm*. Arlington, VA: Association of the United States Army, June 1991.

Veit, Rudy T. *Joint Targeting: Improving the Playbook, Communications, and Teamwork*. Carlisle Barracks, PA. U.S. Army War College, 11 April 1996.

Periodicals

Brooks, James. "A Framework for Effective Warfighting." *The AirLand Sea Bulletin*, December 1996, Issue No. 96-3.

Fogleman, Ronald R. and Dennis J. Reimer. "Joint Warfare and the Army-Air Force Team." *Joint Force Quarterly*, Spring 1996.

Foss, John W. and Russ. "Air Attack on the Modern Battlefield." *AirLand Bulletin*, 30 September 1989.

Franks, Frederick M., Jr. and Gary B. Griffin. "The Army's View of Joint." *Naval Institute Proceedings*, May 1993, Volume 119/5/1,083.

Furr, William F. "Joint Doctrine—Progress, Prospects, and Problems." *Air Power Journal*, Fall 1991.

Heredia, Michael D. "Campaign Planning for PRAIRIE WARRIOR 96 " *Military Review*, July-August 1996, Volume LXXVI, No. 4.

Hochevar, Albert R., James A. Robarbs, John M. Schafer, and James M. Zepka. "Deep Strike: The Evolving Face of War." *Joint Force Quarterly*, Autumn 1995.

Horne, Oliver T. and Harry L. McIntosh, Jr. "Airspace Coordination in Joint Operations." October 1993.

Lewis, Richard B. H. "JFACC: Problems Associated with Battlefield Preparation in Desert Storm " *AirPower Journal*, Spring 1994, Vol. VIII, No. 1.

Mann, Edward C. "Desert Storm, No Textbook for AirLand Battle." *Army Times*, 30 April 1991.

Moore, Molly. "War Exposes Rivalries, Weaknesses in Military." *Washington Post*, 10 June 1991 A1.

New, Terry L. "Where to Draw the Line Between Air and Land Battle " *Airpower Journal*, Fall 1996, Volume X, No 3.

O'Bryon, James. "Gulf War Provides No War Blueprint." *Defense News*. 18 March 1991.

Pivarsky, Carl R. "Dangerous Doctrine " *Military Review*, September 1993, Volume LXXIII, No. 9.

Ruhlman, Phil. "Operation Joint Targeting Procedures." *The AirLand Sea Bulletin*, November 1995, Issue No 95-3.

Scmidt John W. and Clinton L. Williams. "Disjointed or Joint Targeting?" *Marine Corps Gazette*, September 1992.

Sheehan, John J. "Next Steps in Joint Force Integration." *Joint Forces Quarterly*, Autumn 1996, Number 13.

Smith, Dan. "Doctrinal Issues in Joint Targeting " *Military Intelligence*, October-December 1994.

Welch, William G. "Joint Targeting Concept." *The AirLand Bulletin*, 30 June 1992, Issue No