EARLY ENTRY LETHALITY AND SURVIVABILITY CONTINGENCY FORCE OPERATIONS USING ARMY AVIATION

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

JAMES T. GAETJEN, MAJ, USA
B.S., Sam Houston State University, Huntsville, Texas, 1976

Fort Leavenworth, Kansas
1993

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED

4. TITLE AND SUBTITLE
Early Entry Lethality and Survivability Contingency Force Operations Using Army Aviation.

5. FUNDING NUMBERS

6. AUTHOR(S)
MAJ James T. Gaetjen, USA

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
Attn: ATZL-SWD-GD
FT. Leavenworth, KS 66027-6900

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for Public Release: distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This study analyzes contingency force projection of U.S. Army forces, emphasizing deployability, survivability, lethality, and sustainability by using U.S. Army Aviation assets. This study examines currentoperational force structure of the Corps Aviation Brigade, light and heavy Division Aviation Brigades. It also discussedthe operational continuum, contingency operations, power projection, early entry lethality and survivability, and the employment of Army aviation assets in earlier contingency operations. The analysis examines the required capabilities as outlined in the early entry lethality and survivability battle dynamic operations concept: deployability; lethality; survivability; and sustainability. The analysis looks at the concept of early entry operations and compares what the early entry force must be capable of doing with the Aviation Mission Essential Task List (METL). Operations Urgent Fury, Just Cause, and Desert Shield/Desert Storm were used as part of this study to see if the requirementsare met. The study concludes that Army aviation can act as a base unit or a component of a base unit also. That Army aviation forces meet the requirements for contingency force projection of U.S. Army forces that emphasize deployability, lethality, survivability, and sustainability.

14. SUBJECT TERMS	15. NUMBER OF PAGES
Early Entry Lethality and Survivability; Depoloyability, lethality, survivability, and sustainability; Urgent Fury, Just Cause, Desert Shield/Desert Storm	116
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCALSSIFIED	UNCLASSIFIED	UNCLASSIFIED	

EARLY ENTRY LETHALITY AND SURVIVABILITY CONTINGENCY FORCE OPERATIONS USING ARMY AVIATION

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

JAMES T. GAETJEN, MAJ, USA
B.S., Sam Houston State University, Huntsville, Texas, 1976

Fort Leavenworth, Kansas
1993

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

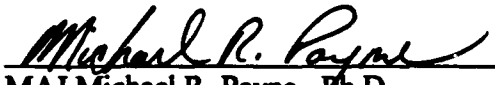
Name of Candidate: MAJ James T. Gaetjen

Title of Thesis: Early Entry Lethality and Survivability Contingency Force Operations Using Army Aviation

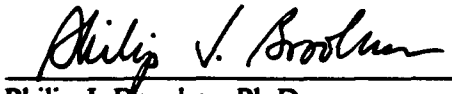
Approved by:


, Thesis Committee Chairman
LTC William V. Backlund, M.S.S.M.


, Member
LTC Wayne Randolph, B.S.


, Member, Consulting Faculty
MAJ Michael R. Payne, Ph.D.

Accepted this 4th day of June 1993 by:


, Director Graduate Degree Programs
Philip J. Brookes, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

EARLY ENTRY LETHALITY AND SURVIVABILITY CONTINGENCY FORCE OPERATIONS USING ARMY AVIATION: An Analysis And Historical Overview Of Recent Operations, by Major James T. Gaetjen, 116 pages.

This study analyzes contingency force projection of U. S. Army forces, emphasizing deployability, survivability, lethality, and sustainability by using U. S. Army Aviation assets. This study examines current operational force structure of the Corps Aviation Brigade, light and heavy Division Aviation Brigades. It also discussed the operational continuum, contingency operations, power projection, early entry lethality and survivability, and the employment of Army aviation assets in earlier contingency operations. The analysis examines the required capabilities as outlined in the early entry lethality and survivability battle dynamic operations concept: deployability; lethality; survivability; and sustainability. The analysis looks at the concept of early entry operations and compares what the early entry force must be capable of doing with the Aviation Mission Essential Task List (METL). OPERATIONS URGENT FURY, JUST CAUSE, and DESERT SHIELD/DESERT STORM were used as part of this study to see what Army Aviation contributed to see if the requirements are met. The study concludes that Army aviation can act as a base unit or a component of a base unit also. That Army Aviation forces meet the requirements for contingency force projection of U.S. Army forces that emphasize deployability, lethality, survivability, and sustainability and can apply this force in an early entry lethality and survivability roles.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Purpose and Scope

The primary purpose of this thesis is to study contingency force projection of U.S. Army forces that emphasize deployability, survivability, lethality, and sustainability by using U.S. Army Aviation assets as the base unit. The study will concentrate on early entry lethality and survivability contingency force projection in the conflict area of the operational continuum.[1]

This study is undertaken as a result of recent changes in battlefield dynamics, lessons learned from the last three conflicts involving U.S. forces, and changes in the geopolitical environment caused by the thaw in East-West relations,[2] and the implied implications for U.S. military strategy. As the 1991 *National Security Strategy of the United States* points out, U.S. security concerns are currently less driven by an immediate, massive threat to Europe or the danger of global war; however, a need to deal with regional contingencies still exists. As a result, contingency operations will shape how we organize, equip, train, deploy, and employ our active duty and reserve forces in the future.[3]

The reduction of the Soviet threat does not mean an end to all hazards. as the on-going actions in the Persian Gulf and other areas make clear. Primary issues at stake now are threats to stability, rather than the expansionist communism.[4] As the recent deployment of forces to Somalia and Kuwait can attest the military is becoming percieved more and more as a source of reassurance and foundation for security, both regionally, and globally.

The four fundamental demands in this new era are stated clearly in the *National Security Strategy*: "...to ensure strategic deterrence and defense, to exercise forward presence in key areas, to respond effectively to crises and to retain the national capacity to reconstitute forces should the need arise." Crisis response is also described in the 1992 *National Military Strategy* and has more than just global strategic value, it contributes to regional deterrence and stability, as well as collective security. In order to put crisis response into perspective we must understand that crisis response requires power projection.

The *National Military Strategy* (NMS) and *Field Manual 100-5* discusses our ability to project power, both from the United States and from forward deployed locations. As stated in the 1992 *National Military Strategy*, "...the challenge the military must face is based on contingency operations and a strategy of "come-as-you-are" spontaneous, often unpredictable crises, requiring fully-trained, highly-ready forces that are rapidly deliverable, and initially self-sufficient." One implication is that U.S. interests can be achieved and security maintained with less forward deployed forces. Meaning a return to a military based largely in the continental United States. The "sine qua non" of such a military force is its rapid projection to areas of the world where U.S. interests are threatened.[5] This increased emphasis on force projection poses a new challenge to the U.S. Army. Projecting forces takes time. Force projection operations are included in the 1992 preliminary draft revision of *FM 100-5, Operations.*[6]

Identifying the Task

The primary task that faces the U.S.Army is the focus on force projection and on early entry forces, composition, sustainability, and mission. In order to analyze the need the U.S. Army TRADOC created a series of battle labs to study the concept of early entry lethality and survivability.[7] The following is an extract from the early entry lethality and survivability battle dynamic operations concept.

> In order to comply with the National Military Strategy (NMS) the Army must possess the capability to rapidly deploy and insert "first to fight " forces. Operation Desert Shield/Storm exposed the vulnerabilities of our "first to arrive," lightly equipped contingency forces to threat equipped with heavy armor. Our armored forces equipped with a sizable number of armored units, while survivable and lethal, are heavy, large, and cumbersome to transport in a time sensitive environment. The future Army must have the capability to conduct early entry operations with tailored armored, light and special operations forces that are more deployable, lethal, survivable, and sustainable.

These labs comply with the guidance from the *National Military Strategy (NMS)* and also established the need for these forces to be deployable, lethal, survivable, and sustainable.

When looking at early entry lethality and survivability an examination must be made of the battlefield framework, roles, and missions and how the forces fit into the scheme of maneuver. These forces must also have the ability to be integrated into joint and combined operations.

Thesis Question

By recognizing the need for contingency force projection of U.S. Army forces that emphasize depolyability, lethality, survivability, and sustainability and by applying this force in an early entry lethality and survivability roles can Army aviation act as base units or provide a component that meets the requirements?

Hypothesis

Early entry and force projection operations or the capabilities to support these operations must consider the critical areas in the pre-crisis or crisis phases of planning.

Even though operations in Southwest Asia were successful, it was only one of a wide assortment of possible contingency operations. The exact circumstances of the crisis that led to Desert Shield and Desert Storm were not anticipated and the strategic warning was short. It suggests that forces must respond quickly, on short notice, and must be flexible, versatile, and lethal, especially in the early days of the crisis. If Iraq had attacked

earlier, not allowing for the build-up of coalition forces, the outcome could have been different.

The focus of this study is on the current aviation force structure and aviation capabilities to determine if aviation can provide the answer to the thesis question.

Endnotes

CHAPTER 1

[1]U.S. Army, TRADOC Pam 525-5, AIRLAND OPERATIONS, Fort Monroe, VA., Deparment of the Army, Headquarters United States Army Training and Doctrine Command,(1 August 1991), 8.

[2]Paul Tiberi and James C. Wood, Gathering the Storm: Contingency Planning and Force Projection, The Land Warfare Papers No. 7 (Arlington, VA: The Insitute Of Land Warfare, Association of the United States Army, 1991), 1.

[3]Carl E.Vuono, General U.S. Army, "The Strategic Army," VITAL SPEECHES OF THE DAY, Vol LVI, No. 6, (January 1, 1990), 165-169.

[4]The White House, National Security Of The United States August 1991, (Washington, D.C., U.S.Government Printing Office, 1991), 1.

[5]Tiberi , Gathering the Storm: Contingency Planning and Force Projection, p 1.

[6]U.S.Army, Field Manual 100-5, Operations, (Preliminary Draft) Washington, D.C., Department of the Army, (21 August 1992), 3-7.

[7]US Army, Draft 11.5, Early Entry Lethality and Survivability Battle Dynamic Operations Concept, Fort Monroe, Va: HQ, TRADOC, Early Entry Lethality Survivability Battle Lab, (Dec1992), 1.

CHAPTER 2

REVIEW OF LITERATURE

Purpose and Scope

The review of literature for this thesis examines multiple sources that discuss the operational continuum, contingency operations, power projection, early entry lethality, survivability, and the employment of Army aviation assets in general, and how Army aviation fits into contingency operations, in particular.

Background

It is important to look first at the roots of force projection and contingency operations. These concepts started with the Kennedy administration with the strategy of "flexible response." At the same time, Secretary of Defense Robert McNamara created an organization with the mission of "furnishing rapidly deployable, combat-ready forces."[1] Following its ordeal in Vietnam, the U.S. shifted its emphasis to NATO and contingency forces were relegated to the back seat for ten years. As described in *Gathering the Storm: Contingency Planning and Force Projection,*[2] the spotlight began to shift back to a rapid deployment concept in the late 1970s. During the 70s a review of national security strategy produced a series of memoranda and directives one of which served as the conceptual basis for rapid deployment forces (RDF). However, no real attention was given to the RDF concept until 1978, when Secretary of Defense Harold Brown made only passing reference to the RDF. But, the media focused on the reference to RDF, citing Secretary Brown, and described it as an elite military strike force, ready to rush to trouble spots around the world; the core of that force would consist of the Army's 82d

Airborne and 101st Air Assault Division, and one Marine Division. Still, the U.S. did little to further develop the concept until the fall of the Shah of Iran in 1979 when President Carter officially announced formation of an RDF for such future contingencies. In February 1980 Brown ordered the formation of a Rapid Deployment Joint Task Force (RDJTF) to commence operation 1 March 1980. In 1983 the RDJTF became a separate command. Army rapid deployment forces of the RDJTF were:

24th Infantry Division (Mechanized)

82d Airborne Division

101st Airborne Division (Air Assault)

197th Separate Infantry Brigade (Mechanized)

6th Combat Brigade Air Cavalry[3]

Since the formation of the RDF in 1983, the U.S.Army has been projecting force in contingency operations in support of the National Security Strategy. In force projection operations, flexibility was key, along with the realization that the force must consider early entry lethality and survivability. A wide array of projection force options exist today, but are limited by the duration and the objective to be accomplished. Below are examples of some contingency operations, note they are not all the same.

Operation BLAST FURNACE was the 1986 aviation task force support of the Bolivian Narcotics Police involving 6 UH-60 helicopters with an accompanying support, security, and intelligence package. The mission was to assist in targeting and transport of the host country's assets to conduct raids on concaine production facilities.

Operation URGENT FURY was the mission on the island of Grenada in 1983, to rescue American medical students and reduce Cuban influence. It was a violent, short duration operation, oriented on an armed rescue and the immediate reduction of hostile forces. U.S. Forces were purposely tailored to achieve decisive results in a short time.

Operation HAWKEYE was the XVIII ABN Corps Task Force deployment to the island of St. Croix to assist local law enforcement following hurricane Hugo in 1989. The task force included command and control, military police, civil affairs and medical personnel These examples illustrate the wide variety of operations, and that the specific objective should dictate the type of forces and required response rather that a predetermined formula for a standard response.[4]

Desert Shield and Desert Storm validated the requirement for integrating flexible Army forces into a power projection framework. Also, as a result of this "validation," the Army has changed its focus for the future and now requires all units to be deployable worldwide. This future focus on power projection means that flexibility of forces and doctrine is paramount in military operations.

planning for for power projection, requires the development of operation plans in concept format (CONPLAN), or operation plans in complete format (OPLAN), as part of the deliberate planning process[5] or crisis action planning[6] for expected contingencies. These plans are based on the appropriate courses of action, and economic, and political constraints, and are used to assemble and project forces. The relative speed of deployment is based on the mission, whether a forcible entry must be made, the type of combat power needed early in the operation and the required lethality, and sustainment requirementsof the force, once it is sent. Based on past experience, the initial force must have the ability to deploy by air. and must be light so that it can go anywhere with suitable airstrips. Such a force can act as a deterrent to aggression if it is tailored correctly. Follow-on units by sea can provide mass and can carry more sustainment packages.

Operational Continuum

The operational continuum encompasses a range of operations that can progress from levels of hostility in three general states--peacetime competition, conflict, and war. Peacetime competition is largely a non-hostile state. Conflict and war are hostile states where the combat power of military forces is predominant.[7]

The spectrum of conflict[8] that deals with this continuum means operation can include counter-terrorism, civil war, and possibly conventional war and include the variations that fall between them, with a higher probability of conducting counter-terrorism operations and lower probability of conducting conventional war depending

upon the level of conflict. *FM 1-100, Army Aviation In Combat Operations* contains a depiction of this continuum and discusses it in detail. See Figure 1 in the appendix.

U.S. national military strategy continues to hold deterrence as its principal goal. Should deterrence fail, then the military must have the capability to respond to the "crisis" with a force that can inflict overwhelming destruction on its enemies. This is a shift from the previous strategy of forward deployment to crisis response. This means that the fundamental needs to this deterrence strategy is the ability to project overwhelming combat power from the Continental United States (CONUS). The Army must therefore be able to deploy forces on short notice and operate throughout the entire *operational continuum.*[9] The Army aviation white paper *Army Aviation in Contingency Operations* discusses this continuum and elaborates on the type of missions that a contingency force may have to perform.[10] Figure 2 in the appendix contains a brief depiction and description of this continuum.

Looking at the spectrum we find varying degrees of involvement by the military based on the operations. I will focus my examination of this spectrum on Army aviation, looking briefly at the types of operations in the spectrum and looking more thoroughly at violent uses of the military.

Peacetime Engagement

Peacetime engagements at the low end of the spectrum are predominately non-hostile activities. Army aviation assets that operate in this part of the spectrum consist primarily of lift, command and control, or medical evacuation type units in support of other U.S. agencies or host nation organizations. Attack type assets would probably be prohibited.

Conflict/Hostilities Short Of War

Conflict/Hostilities short of War covers the middle ground of the spectrum, reflecting a gradual increase in the use of military combat power. Low intensity conflict

dictates a restricted use of force in this area and concentrates on a combination of the instruments of national power political, informational, economic, and military. Low intensity conflict can range from subversion to the use of armed force. Tactical military involvement includes unconventional warfare and special operations. Aviation contributions here include attack and air cavalry assets.

War

The War part of the spectrum is dominated by the use of military force. It appears less likely that the U.S. military would operate here because of the current world strategic environment. We can expect full doctrinal employment of aviation assets here.

Post-War Turmoil

Post-War Turmoil may not mean an end to hostilities, and the military will continue involvement at some level to oversee the transition to peace. Restoration is the driving factor here, with an objective of progressing from minimal military operations to non-military peacetime engagement. Conditions can quickly deteriorate into armed conflict.

Employment of aviation assets here is situation dependent.

Violent Uses of the Military

Flexible deterrence options can mean the instruments of power, non-violent uses of the military, and violent uses of the military. For the purposes of this study I will examine the violent uses of the military and how they relate to the thesis problem.

"Conflict" or "hostilities short of war" offer several flexible deterrence options. They can include a range of responses from non-violent options that can turn violent to operations in low intensity conflict. A brief look at those listed and how aviation can contribute follows.

Rescue/recovery operations include rescue of U.S. and/or friendly foreign nationals or the recovery of things critical to national security. Army aviation involvement could range from lift and medical evacuation (MEDEVAC) through special operations assets. In most cases, these missions are classified and require specially trained units.

Security assistance covers the instruments of national power under the headings of economic, political, and informational, and are used to help the internal defense of a foreign nation. Military involvement is usually in the form of advisors. From the aviation side of the house there could be seen maintenance training teams, providing air transportation to civil affairs personnel, providing access to remote areas, and providing airlift of material. Usually companies or detachments are used depending on the mission.

Counter-drug operations have reached new importance in the last few years and the military has joined the "war on drugs." The military can provide numerous support to these operations to include all forms of intelligence gathering, command, control, and communications (C3), airlift, night operations, etc. This can also mean loaning equipment only to support operations. The assistance may be provided to U.S. government agencies or foreign nations. Here again aviation units could participate from a detachment size to a battalion size element inside or outside CONUS. Missions could be flown in support of finding and destroying drug operations or interdiction of routes into the U.S.

Noncombatant evacuation operations (NEO) can mean removing U.S. citizens out of a hot spot, or foreign nationals done as a sign of support to a country in which we have a national security interest. They are usually done as a prelude to hostilities or possibly as a deterrence to the same. Aviation involvement would include a repetition of the same assets of lift, command, control, and communications (C3), MEDEVAC, and possibly some attack assets for force protection.

Peacekeeping operations usually are established with the idea of deterrence in mind and accompany an agreement that ceases hostilities (e.g., a cease-fire agreement). Aviation's role here includes the ones mentioned earlier (reconnaissance/surveillance and

security, airlift, C3, logistic support, and air assault) with the idea of to maintain stabilization of the situation and prevent the collapse of the peace. The point is aviation could find itself in a hostile situation if the peace collapses. Here force protection is of utmost importance.

Show of force or demonstration again is used as deterrence and shows commitment to U.S. promises. Basically designed to cause hostile nations to cease actions contrary to those desired by national or international interests. These actions demonstrate U.S. resolve and regional influence, as well as a willingness to take action when necessary. Aviation units could range from a battalion size task force to an aviation brigade. Employing a brigade as part of a larger combined arms task force as the most probable course of action.

Combating terrorism usually involves special operations forces, but any Army unit could be employed in this role. It is a time sensitive mission and could require protecting personnel, equipment, and facilities. Aviation involvement could include a brigade but a battalion size or smaller unit is the most probable choice.

Strikes and raids are conducted to destroy specific targets. They demonstrate U.S. capability and determination to protect U.S. regional interests and achieve certain objectives. Strikes involve direct application of systems against specific objectives. Here you may see attack helicopters and scouts along with C3 and MEDEVAC. Raids, on the other hand, involve temporary seizure and possibly destruction of objectives, followed by quick withdrawal of forces. Here, aviation may be used to conduct air assaults of combat troops with the support of attack helicopter and scouts. Additionally, airlift of artillery and other required equipment may be desired as part of the raid. Aviation special operations usually do this type mission.

Insurgency/counterinsurgency operations are part of low intensity conflict (LIC) but may be done as a deterrent against conventional war. Army aviation assets involved

are the same as found in conventional war and have the same missions, only at the same different intensity. See conventional war below.

Conventional war and nuclear war are the ultimate deterrence options to force a hostile nation to cease a particular activity unacceptable to the U.S. national interests. Here active Army and reserve component aviation, from detachment sizes through brigades, could be assigned roles in regional or global missions in mid-intensity to high intensity war.

Refugee control may be required during and after a war in order to protect displaced civilians. The mission may even move in to the humanitarian assistance arena as it has after Desert Shield/Desert Storm War. Aviation involvement here could be in the form of airlift and MEDEVAC, and mission requirements could include providing logistical supply, refugee control, and command and control operations.

All these operations can be executed as contingencies and to understand this in terms of projecting force contingency operations must be understood.

Contingency Operations

Contingency operations for the purposes of this study are a way of projecting force as violent uses of the military in conflict or the hostilities short of war area of the operational continuum. The missions depicted in this area are considered contingency operations. Contingency operations are defined in *Strike Operations Handbook for Commanders, (Coordinating Draft).*

> Contingency operations are politically sensitive military actions requiring rapid deployment of military forces in support of national security policy, usually in conditions short of war. These operations are undertaken when limited national interests are at stake, and when direct and indirect diplomacy and other forms of influence have been exhausted or need to be supplemented by either a show of force or direct military action.[11]

Contingency operations are phased operations: predeployment/crisis action, deployment/initial combat actions, force buildup/combat operations, decisive combat

operations, and redeployment.[12] The focus of this study is early entry lethality and survivability of contingency force operations. This study will look at recent operations and aviation contributions to the first two phases of contingency operations.

Predeployment/Crisis Action

This is probably the most critical phase of contingency operations. Success during the remaining phases hinges on the successful planning done here. The command- Joint Task Force, Army force (ARFOR) CORPS, Air Force force (AFFOR), and Naval force (NAVFOR) and subordinate commands must anticipate the conditions for success, select, tailor, and sequence the right force, determine the activities of that force, identify resource requirements, and define a desired end state. The objective during this phase is to determine operational concepts that will set up the conditions for success and desired end state for each phase since the conditions of each phase must be met before moving to the next phase. A tailored force for each phase can then be determined.

The timeliness of this activity can vary based on the crisis. It affects the information flow as far as the force required to deploy, intelligence preparation of the battlefield (IPB), transportation requirements (airlift, sealift, or self-deploy), command and control, and logistic requirements.

Contingency operations require the force to be tailored for the mission. Echelonment is then used to permit simultaneous deployment and employment of the force. The initial force or early entry force must be organized with sufficient combat power to perform the forced entry (opposed or unopposed), to seize the lodgment area, and to begin initial combat operations. Expansion of the lodgment area follows and is usually done by the next echelon that follows the early entry force during the force buildup/combat operations phase. The final echelon then must provide the sustainment for decisive combat operations. Command and control must be sequenced early in the operation. For example, in the transition from Desert Shield to Desert Storm, offensive

operations were viable only after large military forces were accumulated in theater. However, there is no assurance another enemy will allow future contingency forces to assemble with such impunity.

Deployment/Initial Combat

In this phase, the early entry force initiates the execution of the contingency operation and establishes the initial lodgment in the objective area as mentioned earlier. As mentioned in the planning phase, an opposed or unopposed forcible entry is accomplished during this phase. Depending on the crisis, this entry may be into either a hostile, chaotic, or seemingly benign environment. Airborne and/or air assault forces are the best designed to achieve surprise in this phase. If an armor threat is present, an anti-armor capability must accompany the early entry force or be part of the follow-on forces. Other assets that must be considered are air defense artillery (ADA) for an ADA "umbrella," engineers to repair runways or provide mobility support to ground forces, and other combined arms capability such as field artillery assets.

As discussed above, some contingencies require making a forcible entry into a hostile or non-permissive environment. An air assault forcible entry into a non-permissible environment can require an intermediate staging base (ISB) in order to prepare the force for the assault and a place to reassemble aircraft or re configures the force for the assault. In this circumstance, the deployment may be made into a permissive or semi-permissive environment.

The early entry force begins initial combat operations as required to expand the lodgment area in preparation for the follow-on forces. Ssynchronization of combat power is critical to this part of the deployment/initial combat.

Echelonment of these forces is important in order to maintain a balance of capabilities. The initial aviation task force will usually deploy with a mix of several

different types of aircraft prior to deploying the complete units to also allow for a spread of capabilities.

Contingency operations tie into power projection by explaining the phases of the operations, types of entries that could be made, as well as combat, combat support, and combat service support missions that must be addressed.

Power Projection

Power projection is discussed in TRADOC Pam 525-5 which elaborates on the fact that we have a global responsibility, reduced forward deployments, and must train our force in order to project overwhelming combat power to be an effective deterrent.[13]

FM 100-5, Operations, the United States Army's keystone doctrinal manual defines and explains power projection in the 21 August 1992 preliminary draft revision of the 1986 version. It explains that power projection is the central element of the national military strategy of the United States and that the entire Army contributes to this strategy through force projection. This means that the Army must rapidly alert, mobilize, and deploy forces anywhere in the world.[14]

Force Projection

The Literature on force projection is limited. FM 100-5, OPERATIONS (Preliminary Draft) discusses it in Chapter 3.[15]

Force projection operations are generally divided into eight phases: pre-deployment activities, mobilization, deployment, entry, decisive operations, restorations, redeployment and demobilization. These phases overlap in space and time and are not distinct, requiring synchronization by the commanders who execute them. In order to understand the focus of this study the emphasis of the discussion will include the predeploment, deployment, entry, and decisive operations phases of force projection.[16]

Force projection operations seldom begin with a clear mission statement or desired end state that translates into uncertainty of the needed force. In addition to force

composition, other questions that arise are: How fast must the force respond? How easily can it be tailored for different contingency operations and type threat opposed? Can the force be easily sustained? If so, where can it be sustained? Can the force provide early arrival of reconnaissance, security, and force protection for later follow-on forces?

Not only must these forces be able to provide reconnaissance, security, and protection for later follow-on forces, they must also provide self-protection and enough combat power should they become decisively engaged defensively or offensively. This may mean an early entry force needs to be versatile to fight its way in, fight simultaneously with deploying forces (follow-on), and fight after deployment if no battle handover is done. This requires the optimization of lethality and survivability of these early entry forces. Their composition must include mobility and sustainability. Integration of SOF and other services is paramount in order to enhance lethality and survivability.

The early entry force must have flexibility for contingency missions because of the gaps between capabilities of the early entry force and the main body based on the arrival of the later. This force must have the ability to be integrated into any scheme of maneuver. When we look for a force to perform early entry and one that is lethal and can survive we have to look at battlefield missions: attack; reconnaissance and security; air assault; air combat; special operations; and command and control. We must also remember battlefield roles: maneuver(combat); combat support; and combat service support,as well as the battlefield operating systems (BOS): maneuver; fire support; command, control and communications (C3); mobility, countermobility, survivability; combat service support (CSS); air defense artillery (ADA); and intelligence. Reconnaissance is required anywhere in the "area of operations" like any place along the 400 mile Saudi-Iraq border during Desert Shield. Security and force protection mean enough firepower for self-protection and arrival protection of follow-on forces. Offense and defense mean enough force to do either mission until the main force arrives. Deterrence means a large enough or capable enough force to deter aggression from the threat.

Army Aviation and Its Roles and Missions

Army aviation can play a vital role in force projection and early entry lethality and survivability. *FM 1-100 Army Aviation in Combat Operations* discusses the battlefield functions and battlefield roles of Army aviation. Army aviation employment can also be examined for deployability, lethality, survivability, and sustainability. We will first examine the battlefield focus and then discuss some issues concerning force projection and aviation.

The battlefield focus[17] of the Army aviation includes support to the echelons above corps, corps, and division areas of operations and their piece of the fight. This focus also includes battlefield roles and functions. The battlefield roles and function are broken down into combat, combat support, and combat service support missions. Combat the missions include: attack; reconnaissance and security; air assault; air combat; special operations; and command and control. Under combat support you find: command, control, communications and intelligence (C3I) enhancement; air movement; fire support; aerial mine warfare; intelligence and electronic warfare, search and rescue; and air traffic services. Lastly, under combat service support there is air movement, aeromedical evacuation (MEDEVAC), and aviation maintenance.

Army aviation units can expect deployment as an element of force projection forces in the same spectrum of AirLand Battle operations as the rest of the Army, but possibly as the early entry force. This wide spectrum presents a training challenge to Army aviation units. It may requires training to missions scenarios across the operational continuum with the same Mission Essential Tasks List (METL). This expansion includes peacetime non-hostile activities, conflict or hostilities short of war, war, and, as experienced after the defeat of Iraq, post-war turmoil and transition to peace.

For example, during the Persian Gulf War between Iran and Iraq Army aviation deployed special operation forces on board U.S. Naval vessels and barges to stop attacks

on commercial shipping in the gulf and protect U.S. Naval vessels from attack by the Iranians.

Summary

In summary, numerous sources identify the need for force projection based on recent U.S. military involvement in Southwest Asia, Panama, and Grenada. The bipolar world, which for the past 40 years has seen the United States and the Soviet Union in a state of cold war, no longer exists. Since 1989 there have been great changes caused by a few events that have happened, Germany has reunited and the Warsaw Pact no longer exists. We have shifted from relations with the Soviet Union to a multi-polar world where political, economic, religious, and technological factors have surfaced to great emphasis. In some instances these elements were suppressed and they have resurfaced with vengeance and chaos. The resultant instabilities of the socio-economic conditions have created favorable conditions for insurgency, terrorist activity and narcotics trafficking. These pose a threat to U.S. interests. Governments friendly to the U.S. are overthrown, de-stabilizing regions, and denying access to vital natural resources, military bases, or over-flight privileges. The proliferation of technology spread by economic needs adds to this instability, including nuclear weapons.

The U.S. still uses military deterrence as its principal tool. If deterrence fails, then there is a need for a military capable of inflicting overwhelming destruction on its enemies.

The U.S. military is moving away from forward deployed forces, such as in Germany, toward a combination of forward presence, crisis response and reconstitution. During crisis response there is more emphasis put on contingency operations, the intensity of the conflict, and what force is adequate to accomplish the mission. As a result the Army must be prepared to deploy on short notice and operate throughout the entire spectrum of AirLand Battle Operations.

Therefore, Army aviation units are in the front-line in this new role--as demonstrated in Panama and Southwest Asia, they can operate safely in a variety of geographical and climatic environments that is hostile in support of operations. They also have demonstrated the ability to operate jointly with other services and as part of a coalition force in support of United Nations sanctioned operations.

Endnotes

CHAPTER 2

[1]William Kaufmann, The McNamara Strategy (New York: Harper & Row, 1964), 51-56 and 191.

[2]Paul Tiberi and James C. Wood, Gathering the Storm: Contingency Planning and Force Projection, The Land Warfare Papers No.7 (Arlington, VA: The Insitute Of Land Warfare, Association Of the United States Army, 1991), 2-3

[3]Ibid., 4.

[4]U.S. Army, BULLETIN, Introduction to Low Intensity Conflict, Fort Leavenworth, KS. Center For Army Lessons Learned, Combined Arms Training Activity, Fort Leavenworth, 90-4 (May 90), 12.

[5]Armed Forces Staff College, AFSC Pub 1, The Joint Staff Officer's Guide 1991,(National Defense University, Armed Forces Staff College, Norfolk Va. 1991), 7-39 and 7-40.

[6]Ibid., 7-39 and 7-40.

[7]U.S. Army, TRADOC Pam 525-5, AIRLAND OPERATIONS, Fort Monroe, VA., Deparment of the Army, Headquarters United States Army Training and Doctrine Command,(1 August 1991), 8.

[8]US Army, FM 1-100, Army Aviation In Combat Operations (Washington: Department of the Army, 1989), 1-13.

[9]U.S. Army, White Paper, Army Aviation Deployment Contingency Operations, (Final Draft), Fort Rucker, AL, United States Army Aviation Center, (July 1992), I-3.

[10]Ibid., I-3 through I-5.

[11]US Army, Strike Operations Handbook for Commanders, (Coordinating Draft), (Fort Leavenworth, KS CTAC, Comand and General Staff College, 23 March 1990), 1-1.

[12]US Army, FM 100-15, CORPS Operations (Washington: Department of the Army, 1989), 8-2.

[13]U.S. Army, TRADOC PAM 525-5, AIRLAN OPERATIONS, (HQ U.S. ARMY TRADOC, FORT MONROE, VA and HQ U.S. AIR FORCE, Lngley Air Base, VA., 1 August 1991), 9.

[14]U.S.Army, Field Manual 100-5, Operations, (Preliminary Draft), Washington, D.C., Department of the Army, (21 August 1992), 3-1.

[15]U.S. Army, Field Manual 100-5, Operations,(Preliminary Draft), Washington, D.C., Department of the Army,(21 August 1992), 3-1.

[16]US Army, FM 100-5, Operations,(Preliminary Draft), Washington, D.C., Department of the Army, (21 August 1992), 3-8 to 3-10.

[17]US Army, FM 1-100, Army Aviation In Combat Operations ,Washington, D.C., Department of the Army, (1989), 2-16.

CHAPTER 3

METHODOLOGY

Purpose and Scope

The purpose of this chapter is to describe the methodology used to determine whether or not Army aviation can provide an early entry force for contingency operations that is deployable, lethal, survivable, and sustainable.

This analysis will examine the required capabilities as outlined in the early entry lethality and survivability battle dynamic operations concept: deployability; lethality; survivability; and sustainability.[1] Then by looking at the concept of early entry operations and comparing and contrasting what the early entry force must be capable of doing with the Aviation METL and what Army Aviation contributed to the recent operations used as part of this study it should be possible to see if the requirements are met.

The analysis will include a review of aviation brigade mission and roles, organization of each unit, aviation joint, combined, and contingency operations, Army aviation brigade capabilities and limitations. Also included is a look at army aviation mission essential task list (METL) for the brigade and subordinate elements that will be used to depict missions performed in recent operations by the Aviation Brigade.

At the end of the analysis an attempt will be made to validate the capabilitites of Army aviation, test/examine the limitations, and lastly discover if there are any new capabilities or limitations.

In order to determine Army aviation contributions to contingency operations in early entry lethality roles the analysis, will look at the contribution's aviation brigades

made in OPERATION URGENT FURY, OPERATION JUST CAUSE, and OPERATIONS DESERT SHIELD/DESERT STORM. The focus on these operations will include the predeployment, deployment, entry, and decisive operations phases of force projection.[2] In some cases not every phase will be apparent because of the unavailability of the unclassified data from these operations.

Army aviation's contribution to recent operations was drawn from: After Action Reports (AAR); individual study projects; books, newspaper, and magazine articles written about the operations; and other unclassified assessments.

OPERATION URGENT FURY will include historical evidence of the operation conducted in October 1983, including predeployment, deployment, entry, and decisive combat operations, as they apply.

OPERATION JUST CAUSE will include a synopsis of events leading up to the crisis from February 1988 and will also include historical evidence that showing predeployment, deployment, entry, and decisive combat operations through December 1989.

OPERATION DESERT SHIELD/DESERT STORM will start at 2 August 1990 and include historical evidence from missions performed by Army aviation in an attempt to provide an overview of contributions.

Each operation will also include the Army aviation organization for combat and also depict any changes that occurred as a result of force buildup or operational requirements for command and control.

Endnotes

CHAPTER 3

[1]US Army, Draft 11.5, Early Entry Lethality and Survivability Battle Dynamic Operations Concept, Fort Monroe, Va: HQ, TRADOC, Early Entry Lethality Survivability Battle Lab, (Dec 1992), 16.

[2]US Army, FM 100-5, Operations,(Preliminary Draft), Washington, D.C., Department of the Army, (21 August 1992), 3-8 to 3-10.

CHAPTER 4

REQUIREMENTS VERSUS CAPABILITIES

Purpose And Scope

Chapter two examined current literature that discussed the operational continuum, contingency operations, power projection, early entry lethality and survivability, the employment of Army aviation assets in some early operations, and Army aviation roles and missions.

Chapter three discussed the methodology for use in this chapter where the following is examined: the Aviation Brigade; its roles and missions; its organization; employment in joint, combined, and contingency operations; aviation brigade capabilities and limitations; and Army Aviation Brigade METL. Additionally examined are Army Aviation contributions to recent combat operations: URGENT FURY, JUST CAUSE, and DESERT SHIELD/DESERT STORM.

This chapter also examines the required capabilities as outlined in the early entry lethality and survivability battle dynamic operations concept: deployability, lethality, survivability, and sustainability.[1] Then by looking at the concept of early entry operations and comparing what the early entry force must be capable of doing with the Aviation METL and what Army Aviation contributed to the operations used as part of this study it should be possible to see if the requirements are met.

An essential element of this analysis is determining whether or not Army aviation can provide an early entry force for contingency operations that is deployable, lethal, survivable, and sustainable.

Mission and Roles

Aviation brigades are assigned at Echelons-Above-Corps (EAC), Corps, and Division levels. All aviation brigades have the same basic mission: to find, fix, and destroy enemy forces, by using fire and maneuver to concentrate and sustain combat at the critical time and place on the battlefield. They have unit of command over aviation assets. They provide combat support (CS) and combat service support (CSS) in unity of command over other aviation assets. They provide CS and CSS in coordinated operations as an integrated member of a combined arms team. These operations may differ depending on the echelon (EAC, Corps, or division) at which they are conducted.

Aviation brigades' roles can fall under combat missions, combat support missions, and combat service support missions. During combat missions, aviation brigades perform attack, reconnaissance and security, air assault, air combat, special operations, and command, control, communications and intelligence (C3I) enhancement. The CS missions include fire support functions, C3I, search and rescue, aerial mine warfare, intelligence electronic warfare (IEW) missions, and air traffic control services. The CSS Missions include air movement of personnel, equipment, and supplies; aeromedical evacuation missions; and aviation maintenance. The following summaries come from FM 1-111, Aviation Brigades and elaborate on the roles under each type mission.

Combat Missions

Combat missions that the aviation brigades can accomplish contribute to the offense or defense in numerous ways. This can include the attack, anti armor, antipersonnel, joint air attack team (JAAT), and suppression of enemy air defense (SEAD). Another important role is reconnaissance and security, normally a cavalry mission, using visual or other detection means. It could involve a screen or guard mission. Air assault of combat forces directly into close combat against the enemy uses the quick response and mobility of the aviation brigade. Both in a defensive self-protection or force

protection role or in an offensive force protection role in air combat, the aviation brigade is a vital part of the combined arms force. Special operations, normally handled by special operations (SOA) aviation units, can be accomplished by an aviation brigade if SOA units are unavailable or over-tasked. The aviation brigade can contribute significantly to combat operations through command and control, internal and external, using its assets.

Combat Support Missions

Aviation brigades contribute to numerous CS missions. They provide C3I enhancement through reconnaissance, surveillance, security of lines of communication, retrans/relay, and messenger service. They can transport troops, supplies, and equipment through air movement operations. They can provide area security for engineers and actually emplace minefields through aerial delivery. They can perform search and rescue operations of friendly air crews or cut off ground units. They can support the Army airspace command and control (A2C2) system; provide navigational and terminal services with their air traffic services. They can provide mobility fire support through movement of systems, ammunition, and personnel and target acquisition through aerial observation. They can also provide intelligence and electronic warfare support with aerial platforms or through sensor emplacement.

Combat Service Support Missions

Aviation Combat Service Support (CSS) consists of logistics operations, aviation maintenance operations, aeromedical evacuation, and support to graves registrations. Aviation assets provide assistance to overall logistical operations that helps sustain combat forces. They can provide airlift or air movement to emplace or reposition logistical support in the form of equipment, materiel, and supplies. It can also includes moving personnel. Aviation maintenance operations are in the form of the aviation unit maintenance (AVUM) and aviation intermediate maintenance (AVIM) for the aviation brigades. Aeromedical evacuation is performed by the medical evacuation battalion

primarily but assault or medium helicopter units can augment them when necessary. Graves registration (GRREG) supported is in the form of providing airlift to the GRREG teams. It could include transporting the remains of those killed in action (KIA).

Aviation Brigade Mission And Structure

Echelons-Above-Corps Aviation Brigades

EAC Aviation brigades support echelons-above-corps operations.[2] On the basis of the theater operational requirements, they can perform combat, CS, and CSS missions. They also conduct integrated joint and combined operations in support of the theater campaign and provide support to the theater special operations forces. Their main mission is to provide C3I enhancement, CS, and CSS air movement for theater army operations.

EAC aviation brigades are designed, tailored, and configured for the theater in which they operate. They are organized, as needed, with attack, reconnaissance, assault, or medium helicopter units or a combination of these the requirements. A typical EAC aviation brigade may consist of a headquarters and headquarters company, an air traffic service (ATS) battalion or company, a theater aviation battalion, a medium helicopter battalion, and two attack helicopter battalions. Additionally, an aviation maintenance battalion is collocated with the brigade to provide AVIM and depot level support. Figure 3 in the appendix shows and example of an EAC aviation battalion.

Corps Aviation Brigade

Corps aviation brigades perform a full range of combat, CS, and CSS missions. The brigade supports the corps scheme of maneuver through planning, coordinating, and executing aviation and combined arms operations. Brigade attack helicopter units destroy the enemy by fire and maneuver. Assault and medium lift helicopter units airlift combat personnel, supplies, and equipment for corps operations. Brigade command and control units enhance C3I.

The corps aviation brigades consist of a headquarters and headquarters company, an aviation group, and two attack helicopter groups. This structure provides a unique maneuver capability that enables the corps commander to focus on high tempo aviation operations. This also allows the corps commander flexibility in shifting the balance of combat power around the battlefield when aviation is employed as part of a combined arms team.[3] The brigade does this by employing attack, reconnaissance, assault, and medium lift helicopters to exploit the third dimension of the battlefield. Figure 4 in the appendix shows an example of a corps aviation brigade.

Division Aviation Brigade

The division aviation brigade finds, fixes, and destroys enemy forces using fire and maneuver to concentrate and sustain combat power at the critical time.[4] The aviation brigade does this either as a pure aviation brigade or as a task organized force. Some of the capabilities of this brigade are as follows: provide timely reconnaissance and intelligence throughout the division area; mass attack helicopter fire; quickly shift reserves; perform air assault and air movement operations; and enhance C3I for the division commander. These capabilities provide anti-armor, antipersonnel, air assault and air movement to the division commander.

Division aviation brigades are organic to and designed for each of the different types of Army divisions. The organization of the brigades depends on the type of division they are assigned to--heavy, light, airborne, or air assault. This allows the division commander the proper aviation assets to shape the battlefield. The missions for all the division aviation brigades are basically the same, but may vary because each division is unique. The division aviation brigade provides the division commander the ability to perform combat, CS, and CSS operations.

Heavy Division Aviation Brigade

The heavy division is normally employed in mid- to high-intensity conflicts against another armored or mechanized force.[5] The aviation brigade would then be employed mainly in an anti armor role. The heavy division aviation brigade consists of a headquarters and headquarters company, a cavalry squadron, usually two attack helicopter battalions (forward deployed divisions have two attack helicopter battalions, CONUS-based, only one), an assault helicopter company and a command aviation company; in most instances the latter two have been task organized into a command aviation battalion. The aviation intermediate maintenance is provided by the division aviation support battalion (DASB) from the division support command (DISCOM). Figure 5 in the appendix shows an example of the heavy division aviation brigade.

Light Division Aviation Brigade

Light divisions as their name implies are organized and equipped for combat operations against light threat forces in a low-intensity conflict.[6] This does not preclude them from employment at all levels of intensity found in the operational continuum of war. These aviation brigades provide air assault capability and they may be the only reconnaissance and anti-armor capability the light division commander or force commander has. The light division aviation brigade consists of a headquarters and headquarters company, a cavalry squadron, an aviation battalion, and an attack helicopter battalion. Figure 6 in the appendix is an example of a light division aviation brigade.

Airborne Division Aviation Brigade

The airborne division generally fights like any other US Army division.[7] It is organized similar to an infantry division. Its aviation brigade is employed like that of the light infantry division. The structure is the same as a light division aviation brigade with one exception, it has an organic reconnaissance squadron. The airborne aviation brigade is deployable worldwide. It performs anti-armor, antipersonnel, air assault, and air

movement operations after an airhead or forward operating base is established. It also conducts extensive joint and combined operations. Figure 7 in the appendix shows the airborne division aviation brigade.

Air Assault Division Aviation Brigade

Although the air assault division is unique, it is employed much like an infantry division.[8] The air assault division also operates across the entire width and depth of the battlefield. It can move rapidly anywhere on short notice, relying heavily on the aviation brigade. The aviation brigade is an integral part of the combined arms team and executes aviation operation in support of the team. It can find, fix, and destroy the enemy. It provides the division intelligence and anti-armor capability. It consists of a headquarters and headquarters company, an air reconnaissance squadron, a command aviation battalion, a medium helicopter battalion, two assault helicopter battalions, and four attack helicopter battalions. Figure 8 in the appendix depicts the air assault division aviation brigade.

Aviation Joint, Combined, And Contingency Operations

Future doctrine is based on the assumption of routine cooperation between Army units and other services in joint and combined operations.[9] Army aviation is, and will continue to be, involved with the military forces and national agencies of the U.S. and other nations as well. Army aviation is currently playing an active role in joint, combined, and contingency operations.

Army aviation exploits the aerial dimension of the joint battlefield.[10] There are numerous contributions to this aerial dimension by Army aviation. Army aviation can conduct operations during daylight, at night, and during times of limited visibility in support of joint objectives. Organic aviation assets can integrate into and synchronize with the efforts of joint maneuver and support forces. Aviation can support the counterair operations and provide the full range of combat, CS, and CSS function to the joint force. They can conduct air assaults and air movement, providing the rapid movement of troops

and logistical air movements of troops, supplies, and equipment. This also includes laterally repositioning joint artillery, air defense, and engineer assets across the width and depth of the battlefield. Aviation can provide timely and accurate aerial reconnaissance and intelligence throughout the joint area of operations. Aviation can provide massed fires rapidly in support of close, deep, and rear operation by using attack helicopters. It can also rapidly shift these attack assets along with the joint operational and tactical reserves to counter enemy penetrations.

Army aviation can operate as part of a combined operation with land, air, and naval forces of both the US and possible allied or coalition forces. This routine has already been established for the future as demonstrated by ongoing operations in Somalia and earlier during the crisis in the Persian Gulf that led to Operation Desert Shield and Desert Storm. Aviation forces will normally operate as part of U.S. Army component forces during combined operations. The aviation commander will be the advisor to the Army component commander or allied force commander and is the subject matter expert for aviation employment in support of contingency operations. Aviation exploits the aerial dimension of the combined battlefield the same way as in joint operations with the addition of supporting host-nation requirements as well.

Aviation's role in contingency operations is significant. We can realize the potential of aviation in combat, CS, and CSS operations with the right planning. The fact that many aviation forces are self-deployable and can rapidly perform a wide range of missions enhances their readiness in response to any contingency operation. These abilities support the idea of early entry operations by aviation providing a force that is deployable, lethal, survivable, and sustainable. This facilitates the rapid buildup of essential combat forces in support of contingency operations.

Aviation Brigade Capabilities And Limitations

The aviation brigade contributes much to the operational scheme of maneuver by exploiting the aerial dimension of the battlefield. Before discussing the Army aviation mission essential task list (METL) and the missions performed by the aviation brigade or its subordinate elements, we must first look at capabilities and limitations of the aviation brigade.

In order to understand the employment of the aviation brigade its capabilities[11] in relationship to the battlefield must be understood. Some of the information discussed may be a repeat but it deals with what the brigades can do. All the operations discussed can be performed in joint and combined arenas.

Aviation brigades can provide timely reconnaissance throughout the theater, corps, or division area or a combination thereof. They can provide combat force in the aerial dimension of the battlefield and influence the tempo of battle. They can conduct operations during day, night, limited visibility, and adverse conditions or environments. They can quickly mass fires with attack helicopters or rapidly shift reserves. They can weight the combat power of the theater, corps, or division commander or a combination of the three. They can rapidly move forces to achieve mass at critical times and places. They can conduct air combat, JAAT, SEAD, air assault, and air movement operations. They can rapidly reposition troops, equipment, supplies for current and future operations. They can also conduct airfield operations and provide air traffic services to the users.

The limitations of a aviation brigades must also be considered[12] in order to properly employ them, since they are a limited asset and should not be used needlessly. The following is a summary of the limitations. Aviation can provide timely reconnaissance, but these reconnaissance assets have limited capability to operate on wide frontages. Aviation requires accurate, rapid, and fresh intelligence that is continuously updated. Aviation can influence the tempo of the battle but the aviation tempo may be slowed when the brigades are augmented with ground maneuver forces. Aviation brigades

can conduct operations during day, night, limited visibility, and adverse enviromental conditions, however, weather and obscuration affect the observation, acquisition, and engagement range of weapons systems as well as employment of the whole aviation force. Additionally, Aviation brigades have a limited night capability when employing systems other than the AH-64 or the OH-58D. Night vision devices allow aviation to fight at night but require additional planning considerations. Aviation can perform rapid, long range movements, but the aircraft consume large amounts of fuel, ammunition, and repair parts. This requires CSS across the entire battlefield. Extended range operations also strain the C3 of the controlling headquarters. Army airspace command and control (A2C2) operations must be planned to preclude fratricide. Aviation brigades cannot protect themselves. They are austere manpower wise and cannot secure unit assembly areas.

Aviation brigades contribute to the strategic, operational, and tactical levels of war.[13] Aviation brigades can shape the battlefield in joint and combined operations as well as contingency operations across the operational continuum. They can enhance the ground-paced maneuver or accelerate the tempo and allow the force commander to retain the tactical advantage over the enemy. Considering employment, aviation brigades fight as an integral part of the combined arms team and can exploit the capabilities of other branches and other services (U.S., allied, or coalition). They can capitalize on intelligence gathering and provide the commander with accurate real time intelligence. They can perform SEAD missions against enemy ADA acquisition and weapons systems. They can allow the commander to exploit quickly massed mobile firepower using the element of surprise. Through the use of terrain for survivability, they can maintain flexibility, displacing forward elements frequently, and exercise staying power to get the mission accomplished.

Army Aviation Mission Essential Task List (METL)[14]

As stated earlier we will take a quick look at the Army aviation mission essential task list. This will help in analyzing the contributions of aviation to the recent combat operations to be examined. We should be able to pick out the contributions of aviation to early entry lethality and survivability operations as part of contingency force projection operation in each of the combat operations. We should be able to determine if aviation can act as a base unit or provide a component that meets the requirements of early entry lethality and survivability. The METL is depicted in figure 9 in the appendix.

Summary

In summary we have discussed Army aviation brigade missions and roles defining the basic mission of the aviation brigades: to find, fix, and destroy enemy forces by using fire and maneuver. We have discussed that the brigade roles fall under combat missions, combat support missions, and combat service support missions. We have discussed aviation brigade mission and structure at the EAC, Corps, and Division (Heavy, Light, Airborne, and Air Assault) levels as well as in joint, combined, and contingency operations. We have also discussed aviation brigade capabilities and limitations and have taken a quick look at the aviation brigade METL. We will now analyze some recent operations (URGENT FURY, JUST CAUSE, and DESERT SHIELD/DESERT STORM) and identify out the contributions that depict early entry lethality and survivability.

Urgent Fury

To set the stage for a review of aviation contributions to OPERATION URGENT FURY, the U.S. invasion of Grenada, a brief introduction with a few facts about Grenada is necessary. Thanks to the massive aid of the Soviets and the Cubans, Grenada was one of the most heavily armed and militarized islands in the western Caribbean region. The Grenadan regime was one of the most brutal and corrupt in the hemisphere. The 1983

American invasion of Grenada was conductedin the interest of the safety of U.S. citizens, but it also put an end to the regime in Grenada and restored democracy.

We will start the examination of aviation contributions by looking at the JCS execute order that started the operation. The order was issued at 4:54 PM on Saturday, 22 October 1983.

> "... conduct military operations to protect and evacuate US and designated foreign nationals form Grenada, neutralize Grenadian forces, stabilize the internal situation, maintain the peace. In conjunction with OECS/friendly government participants assist in the restoration of a democratic government on Grenada."[15]

The focus of the study is on aviation missions and will not include discussion of the ground tactical plan and missions.

Task Force 160

The helicopter force Task Force 160 (TF 160) was made up of elements of the Army's 158th, 160th, and 101st Aviation Battalions. Their mission, along with the Air Force, was to airlift special forces (SEAL teams and Delta Force) and/or Rangers to targets like the Peoples' Revolutionary Army (PRA) headquarters at Fort Rupert, the PRA base at Calivigny, and the prison on Richmond Hill.[16]

The first missions[17] for TF 123 (the combined force of Ranger battalions, Delta Force, Seal Team 6, and helicopter from TF 160) were seizure: of the Radio Free Grenada transmitting house to control radio broadcasts; and of the Government House to secure the safety of Sir Paul Scoon, the governor-general; and Richmond Hill Prison to release the political prisoners. TF 160 provided the aircraft (A company provided four helicopters, B Company provided two helicopters, and C Company provided three helicopters) to the assault that was to begin at H-hour (5:00 AM) 25 October during hours of darkness for surprise.

To meet the timetable, nine UH-60s "Blackhawk" and two MH-6 "Little Birds" of TF 160 were packed inside three C-5A Galaxies and flown to Barbados for

prepositioning.[18] Prepositioning included picking up the special forces for the missions as well as the helicopters. There were some problems during the arrival in Barbados and the attack time for the specified targets was passed: the Galaxies arrived late; the M-60D machine-gun ammunition for the aircraft was not belted and had to be replaced; and the aircraft and assault teams had some problems linking up with one another.[19]

A Company's four UH-60s were to take SEAL Team 6, two aircraft to seize the radio station and two to the Government House. B Company and C Company's UH-60s were to take the Delta and Ranger force to Richmond Hill prison. Nothing was known about the terrain near the targets. Available maps were virtually useless. The impression given was, "We don't know much about the objective, but don't worry; we will surprise them, anyway it should be a walkover."[20] The aircraft departed at 5:30 AM. During the flight to the destination of the first SEAL team the pilots overheard that the invasion had started on Radio Free Grenada. The marines were ashore at Pearls and the Rangers were parachuting into Salines. It was well after 6:00AM and the sun was up.

A Company/TF 160 pilots had little difficulty finding the radio station. The SEALS were dropped off. They dashed for the station and quickly overpowered the four or five guards and tied them up inside the building. By 6:30 am the station was secured. The SEALS did not hold the station for long due to a lack of sufficient protection or firepower to fight the PRA, who arrived shortly there after.

The remaining seven TF 160 blackhawks, (two from A Co, two from B Co, and three from C Co), got a much hotter reception than they had been led to expect. Four air defense guns at Fort Rupert, one or two at D'Arbeau, two more at Fort Frederick, together with some APCs enroute to the town, and any PRA soldier who could fire his weapon opened up.[21]

A Companys aircraft, destined for the Government House, circled frantically for several minutes trying to identify the building and their objective. Once they found it, an attempt was made to locate a suitable landing zone. The fire they received from the

ground was so intense they aborted the mission. They flew back to sea with numerous hits and several wounded on board. They reached the *Guam*, off loaded the wounded and turned around for a second attempt. This time they were able to put the SEALS in their objective area. The SEALS repelled under fire and then both A Company Blackhawks departed. The SEALS rescued the Governor-general, but had to holdout for approximately 24 hours before they were relieved, all without a single injury to the SEALs or civilians.

The last five Blackhawks also received a shock as they headed for the prison. The prison bore no resemblance to what intelligence led them to expect and they were met with the same hail of gunfire as the other missions. As the aircraft approached their objective "every one seemed to be firing from everywhere."[22] To make matters worse the crews could not find a good LZ nearby; the prison was on a high ridge, surrounded by dense jungle and shrub. Additionally, the prison was dominated by the higher terrain of Fort Frederick (300 meters) armed with air defense guns. After taking numerous hits, the aircraft pulled away from the "death trap" in order to regroup over the sea.[23] All five aircraft were still flying despite being hit repeatedly. Within a few minutes, they were ordered to go in again. At 6:30 they made the second attempt but the aircraft were repelled again. As the flight broke up and scattered to get out of the area, two flew over the PRA base at Frequente where a previously hit aircraft was hit again, causing the controls to lock and the aircraft to crash on top of a hill. The mission was a failure because of a flawed plan.

During the mission to secure the Governor-general the commander of the JTF sent some Marine AH-1 Cobras to assist the SEALS, they ran into the same gunfire encountered by the Army UH-60s and subsequently lost two Cobras.

The lesson learned here by TF 160 and the Marines was that unsupported helicopters over St. George's invited disaster.[24]

82d Airborne Division Combat Aviation Brigade (CAB)

The mission given to 82d CAB was to air assault elements of the1st (C Company) and 2nd (A, B, and C Companies) 75th Ranger Battalion into Camp Calivigny, the barracks of the PRA. H-hour was set to follow a half an hour's extensive bombardment of the barracks. Three batteries of M102 105-mm howitzers from the 82d's 1st/319th and 1st/320 Field Artillery (8,000 meters away), five inch naval guns, 105mm howitzer from the AC-130 Specter gunships, and A-7 close air support aircraft. The mission was assigned to B Company of the CAB. They were given barely an hour to plan and brief the mission and no time for reconnaissance, except for aerial photographs of the camp.

The assault was for four sorties of four UH-60s each. They would orbit out at sea, then fly in successive sorties just above the water at 100 knots. Approaching the camp from the south, they would climb rapidly above the cliffs before setting the troops down in the camp itself.[25] The UH-60 doorgunners would provide suppressive fire.

A and C Co 2d /75th were to air assault into the southern end of the compound, with A on the right and C on the left, heading north, line up, and sweep through the camp. B Company would air assault to the southeast and take out the suspected air defense position before rejoining the other companies. C Company 1st/75th would be the last in , as a reserve, to secure the southern perimeter area.

The fire support plan for the assault began at 4:00 PM with the three batteries of 105-mm howitzers. The problem of the artillery fire missing the camp completely became apparent when all the shells fired, except one, landed in the sea. The artillery had not brought the required equipment, mis-plotted their location by 700 meters, and had inaccurate coordinates for the Calivigny barracks.[26] Additionally, the Naval gunfire did no better. The mission commander controlling the mission from a UH-1 helicopter delayed the air assault by fifteen minutes and brought the Spectre and A-7s in to do the job. By the time they finished blasting the buildings with rockets and bombs, there was little left of Calivigny.

The first sortie of UH-60s roared in over the waves and climbed sharply to the cliff top; immediately below them, closer to the edge of the cliff than they expected, was the shattered barracks. The lead helicopter had to decelerate fast to pick an exact landing spot inside the perimeter fence. The rest of the flight was right behind them, one behind the other, with fifteen or so Rangers on board, ready to leap from the open doors at the moment of touch down.[27]

The lead aircraft put down correctly and safely near the southern edge of the camp. As the UH-60 touched down, the Rangers were out without a problem. The second aircraft touched down, and the Rangers started to dismount. When the third aircraft suffered some damage (attributed to hostile fire, but unproven); it spun forward and smashed into the second aircraft. The fourth aircraft's crew saw the crash during the approach and veered right to avoid it, thereby landing badly in a ditch, damaging the aircraft tail rotor. The pilot, unaware of the damage attempted lift off. The aircraft rose up sharply and then seemed to spin forward before crashing. Three UH-60s down in twenty seconds. There were three Rangers on the ground killed and some injuries to others.

The other to sorties landed safely. The Rangers advanced through the camp and discovered no enemy bodies, no wounded-nothing except the rubble from the close air support. As the exasperated platoon leader put it, "We didn't find anything worth shooting at."[28]

Just Cause

To most of us, the military involvement in Panama began with the deployment of forces to conduct Operation Just Cause in December 1989 and January 1990. The truth is, however the military was involved from the beginning of the crisis in mid-1987.

In February 1988, coinciding with indictment of Noriega, head of the armed forces of Panama, for drug-related charges, the Panamanian Defense Forces (PDF) began

systematic harassment of U.S. Forces and their families. Also the president of Panama attempted to fire Noreiga. In March, Noreiga survived a coup attempt and charged that U.S. forces were involved. As a result the U.S. drew up a new Panama Canal Defense plan that assumed a hostile PDF. However, the in-country forces were insufficient to provide the required security according to the new plan. As the threat to American lives, property, and interests became more evident, President Reagan deployed augmentation forces to assist the in-country units with a mission of security enhancement. The additional forces included an aviation task force (TF HAWK) from the 7th Infantry Division (Light); elements of the 3rd Battalion, 123 Aviation, and an attack helicopter company composed of elements of the 1st Squadron, 9th Cavalry (TF HAWK-CO(-) /3-123 AVN (ASLT), 15 UH-60; ATK HEL CO, 7 AH-1E, 4 OH-58). Because of the augmentation to the in-country, forces command and control became an issue. Therefore, Joint Task Force Panama was activated in April 1988. The mission was to protect American lives and property, conduct joint training and exercises, and draft contingency plans.[29] This was a peacetime contingency operation which provided training opportunities. One of the participants in the operations in Panama described this peacetime environment as "the fine line between peace and war."[30] Subsequently, the crisis cooled down, and many of the augmentation forces returned to the States except the aviation forces (TF HAWK) and a few others.

In May 1989, elections were held in Panama which were closely watched by international observers. Noreiga was defeated despite his attempts to rig the election. As a result, he declared the election void and retained power. The results that followed included numerous demonstrations. President Bush's response included deploying more troops to Panama (the build-up code-named NIMROD DANCER) and consolidation of all military personnel and their families on U.S. military installations. This increased security and prepositioned units called for in the contingency plans.[31] Additionally,

Operation BLADE JEWEL, a partial non-combatant evacuation operation (NEO), was executed to reduce the number of family members in country.

With the arrival of the buildup forces during NIMROD DANCER, JTF Panama organized into three task forces. Along with these forces were the two initial aviation battalions, TF HAWK and 1-228 Aviation. In order to streamline coordination, standardization, safety, and command and control, TF EAGLE was established on 3 August 1989.[32] TF EAGLE task organization is depicted in figure 11 in the appendix.

These aviation units participated in a series of operations supporting JTF PANAMA. These were exercises of U.S. "freedom of movement" treaty rights called *SAND FLEA* and *PURPLE STORM.* Aviation conducted air assaults, show of force operations, reconnaissance, resupply missions, and provided command and control. In addition, TF EAGLE planned and executed a JAAT operation with Air Force A-37 fighter support. Air Assault missions included operation *HEAVY HAWK* consisting of 4 UH-60 aircraft with external fuel tanks flying a circuitous route over Panama, demonstrating U.S. resolve to the PDF.[33] These *SAND FLEA* and *PURPLE STORM* operations took place once a week starting in June 1989.

In July 1989, JTF PANAMA initiated a series of readiness exercises called *Contingency Readiness Exercises* (CRE).[34] One of the missions called for the 1-228 Aviation to air assault the 508th Airborne Infantry from FT Kobbe to secure U.S. Military family housing on FT Amador. Another called for TF HAWK to support one of the three task forces that made up JTF PANAMA by air assaulting a platoon/company to Madden Dam or into the city of Gamboa. The dam was a supply for both drinking water and back-up water supply for the canal. Gamboa was a Panama Canal Commission Housing area.

During the coup attempt against Noreiga units from TF-EAGLE (the 1-228) moved the 1-508 Abn Inf to FT Amador and attack teams from TF HAWK provided aerial escort for DODDS school busses.

Task Force Wolf

Task Force WOLF was made up of B Company, 1 Battalion (AH-64A), 82 Aviation, 82d Airborne Division and consisted of 6 AH-64A and 3 OH-58C Kiowas. They provided additional "surgical" firepower.[35] They were deployed covertly to Panama in October. Their Apaches were kept in a hangar at Howard Air Force Base and flown only at night to remain as covert as possible. Additionally, unit members removed the 82d Abn patches from their uniforms and wore the BDU hat instead of the signature beret.

Task Force Aviation

Created out of necessity since the aviation battalions in Panama had insufficient personnel and equipment to establish a brigade headquarters,.[36] the 7th Infantry Division Aviation Brigade commander and staff made up TASK FORCE AVIATION. TF AVIATION brought together the proper knowledge and experience that allowed preparation for combat to continue.

The Trigger Event[37]

On 15 December, Noreiga declared that he was "Maximum Leader" of Panama and that "Panama was in a state of war with the U.S." He then apparently gave his subordinates permission to harass the Americans. AH-64s and OH-58s were immediately launched to provide reconnaissance of the routes into Panama City. On 17 December, Task Force Aviation was formally activated and assumed operational control of all conventional aviation forces.

President Bush gave the go ahead for operation JUST CAUSE on 17 December 1989 and D-Day was set for 20 December with H-hour at 0100 hours.

Task Force Aviation Combat Operations

As mentioned earlier, TF AVIATION was the headquarters in charge of all conventional aviation. A detailed aviation operations order supplementing JTF SOUTH's OPLAN 90-2 was written.

TF AVIATION MISSION

> Deploy and conduct defensive combat operations to protect U.S. lives and property, secure key Panama Canal sites and facilities, and on order, conduct offensive combat operations to neutralize the PDF and support installation of a U.S. recognized government in Panama.[38]

H-Hour

TASK FORCE AVIATION conducted four simultaneous air assaults under night vision goggles at H-hour to initiate Operation JUST CAUSE. The D-Day Task Organization of TASK FORCE AVIATION is depicted in figure 12. What follows is a summary of aviation operations by units of the TF.

TF Hawk Air Assault

TF HAWK conducted an air assault of A and B Companies from the 1-508th Abn Inf form Fort Kobbe into Fort Amador. Fourteen UH-60s conducted the assault and seven of the aircraft made a second sortie with sling loads carrying M102 howitzers and HUMMVs. Three AH-1 Cobras provided security. The air assault was into an LZ about 800 meters from the Comandancia[39] that was under attack by infantry and AC 130 gunships. It was also 200 meters from the PDF's 5th Company barracks.

Inaccurate fire was directed at the air assault by the PDF gunners who could not see the aircraft but directed their fire at the sound of the aircraft. During the air assault and sling load sorties, no UH-60s or AH-1 were hit. An OH-58C was hit during the sling load sortie and crashed into the Panama Canal.

Task Force 1-228 Aviation Air Assaults

TF 1-228th conducted three simultaneous H-hour air assaults with TF ATLANTIC. Aircraft from B Company, 1-228th Avn conducted one air assault into El Renacer prison[40]. The assault was supported by 1 OH-58C and 1 AH-1 Cobra. The AH-1 engaged the prison guard barracks with suppressive fire (20mm and 2.75" rockets) as two UH-1s landed in the prison compound. The UH-1s were "blacked out" and did not take any hits. One Cobra took a hit on a skid shoe.

One UH-1 aircraft from B Company along with two CH-47s from Company 1-228 Avn conducted a second air assault of infantry from the 3-504th Abn Inf into the town of Gamboa. The "blacked out" aircraft came under ground fire when they were departing the LZ (landing zone) but none were hit.

The third TF 1-228th air assault target was the Cerro Tigre PDF logistical complex.[41] This air assault consisted of B Co. 3-504th Abn Inf, two UH-1s from B Company and two CH-47s from C Company, 1-228th Avn, supported with an AH-1 Cobra from TF HAWK. The AH-1 prepped the area north of the LZ with 2.75" rockets prior to the assault force landing. This assault had some problems. One CH-47 went down for maintenance and a back-up aircraft was used. Later, because the weather was marginal with poor visibility, the flight got separated causing the two CH-47s to arrive at the LZ 5 minutes after the UH-1s.

After the air assaults (D-Day, 20 DEC 89)) B Company, 1-228th Avn began conducting medical evacuation missions (MEDEVAC) throughout the TF ATLANTIC area of operations. Other missions flown by TF 1-228th AVN were Class I/V aerial resupply and flying the Media Pool from Howard AFB to Fort Clayton.

82d Airborne Air Assaults[42]

The 82d Abn Div was to assemble or get into pick-up zone (PZ) posture following their jumps into Torijos International airport and then air assault simultaneously into three objectives (Cerro Tinajitas, Fort Cimarron, and Panama Viejo). They were delayed because of a major winter storm in North Carolina. The troops finally arrived just prior to daylight on the 20 December. It was nearly daylight when the air assault, performed by eighteen UH-60s from TASK FORCE HAWK and A Co, 1-228th Avn with and escort of four AH-.1 Cobras and two AH-64A Apaches from Team WOLF moved to the PZ to pick-up the troops.

The first air assault (2-504 ABN INF) which went into Panama Viejo, consisted of two flights of nine UH-60 aircraft each using two LZs (Bobcat and Lion). The assault commenced at approximately 0650 hours into LZ Lion. The final approach was seen by millions on CNN as the aircraft came in over the Bay of Panama and dropped some paratroopers off in what turned out to be treacherous mud flats.[43] (You should also recall the UH-60s as well as the civilians pulling the troops out of the mud.) No hostile fire was received during the approach into LZ Lion and no aircraft were damage despite small arms fire from Panama Viejo. The door gunners did not return fire due to the hundreds of "spectators" gathered around the site.

The assault into LZ BOBCAT was into 8 foot high elephant grass. Chalks 5 and 9 took heavy ground fire from small arms when the aircraft departed the LZ.[44] All the aircraft returned to the PZ but the two that were hit were taken out of action. One was hit in the intermediate tail rotor gear box and the other was hit in the air starter system.

The second air assault (1-504 ABN INF) went into LZ Leopard near the PDF barracks on Tinajitas Hill. This LZ was reported to be the "hottest" LZ of the entire OPERATION JUST CAUSE.[45] The LZ was a sloping ravine, crossed with electrical cables and poles, at the base of a hill 754 meters from the barracks. Tinajitas was occupied by the 1st Infantry (TIGER) company and intelligence had reported the barracks

was defended with 81mm and 120 mm mortars. The LZ and approaching aircraft could be observed by the PDF in the barracks from miles away. It was also large enough for six UH-60s at a time. A mortar from the 1-504Abn Inf was lifted into LZ Jaguar located on a hill to the west to support the attack on Tinajitas and keep the PDF from using the high ground to fire mortars on Howard AFB.

The assault consisted of two flights with six UH-60s and two AH-1 escorts in the first flight, and three UH-60s and one AH-1 escort in the second flight. Heavy and accurate ground fire erupted in the vicinity of Tinajitas.[46] Many the PDF soldiers were standing among women and children in the housing area. Flight discipline, and fire discipline in accordance with the "rules of engagement" was maintained. No one fired back unless they had clear targets. The assault aircraft landed under this heavy fire and dropped off the troops. During this lift, the flight lead commander was grazed by a round on the head, in another aircraft a door gunner was hit in the arm, and in another aircraft three troops were hit so seriously they were unable to get off at the LZ and had to return to the PZ.

This mission required a second lift. The LZ was extremely "hot" the second time as well.[47] The flight was made with one less aircraft, due to the loss of flight lead from the last lift. During this flight almost every aircraft was hit 8-18 times, many in the cockpit area.

The last D-day air assault (4-325 ABN INF) went into FT Cimarron. FT Cimarron was the home of the highly trained and well-equipped Battalion 2000.[48] They were equipped with armored cars and air defense artillery weapons (ZPU-4). The air assault mission consisted of eleven UH-60s making two turns each. Five aircraft went into LZ COUGAR to the west and six aircraft went into LZ TIGER to the south. Since the aircraft landed out of direct fire range little enemy resistance was encountered from the barracks. The FT Cimarron mission was the last of four battalion-size air assaults conducted by the same aircraft and crews in just over four hours. No assault aircraft

under NVGs were hit during night operations, but many were hit during the daylight missions.

Team Wolf Missions

H-Hour Missions. TEAM WOLF (6 AH-64 APACHE and 4 OH-58C) was "chopped" to JSOTF for the initial H-hour Ranger parachute assault at Rio Hato.[49] Because of the ability to operate at night using their infrared sights and their stand-off range the AH-64s neutralized the ZPU-4 air defense weapons at Rio Hato with their 30mm chain guns. The infrared sights on the Apache provided a key surveillance system during the hours of darkness.[50]

D-Day Missions. Apaches were used in an attempt to locate and destroy mortars firing into FT Clayton, but were unsuccessful. They were also sent in to Panama Viejo to provide overwatch for the 2-504th Inf air assault and were used in the same role the rest of the day.

One attack team (two AH64s and one OH-58) provided overwatch of the Tinajitas air assault. All the aircraft took small arms fire from the built up areas as they repositioned to support the 1-504th Inf air assault. The attack team was relieved by another attack team and this second attack team located eleven enemy personnel with automatic weapons. They engaged and killed the enemy by using their 30mm from a range of 2833 meters (Laser range).[51] Other missions performed by Team Wolf included support of the assaults into the Commandancia and Panama Viejo. The team, using their 30mm and rockets and hellfire missiles destroyed several 2 1/2 ton trucks and two armored cars.

Task Force Wolf Operations after D-Day.[52] TF WOLF received more assets from FT Bragg on 21 and 23 December, bringing them to a total to eleven AH-64s, four AH-1Es, and five OH-58Cs. TF WOLF continued to provide air assault security and support for JTSOF missions. They also conducted area and route reconnaissance, show-of-force,

movement to contact, deliberate attack and reconnaissance-in-force missions.[53] The "teams" used the same configuration mentioned earlier (two AH-64s and one OH-58) using the OH-58Cs as unarmed scouts, command and control, and downed pilot pick-up. This configuration was determined using the factors of METT-T.[54]

Daylight missions were flown by the AH-1E and night missions were flown by the AH-64s. One team with AH-64s were on standby 24 hours a day for immediate mission response to JTF SOUTH.

The AH-64 proved its versatility by the variety of missions it supported for both conventional and SOF operations. They provided a "surgical" weapons system with stand-off ability using their night vision systems to escort air assaults, RECON the LZ, and provide suppressive fires when needed. The aircraft proved its survivability by completing all combat missions despite being hit by small arms fire. Three were hit, one aircraft eight times, another fifteen times, and a third twenty-three times. They all were able to continuing flying and returned to Howard AFB. One hundred hours of their 246 hours flown were at night; all weapons systems worked, all mission completed successfully; and all battle damaged aircraft were returned to combat within 36 hours.[55]

Medevac Operations[56]

The 214th Medevac Detachment was under operational control (OPCON) of the 44th Medical Brigade (19 Dec 89 - 3 Jan 90) and then OPCON to 142 Med Bn (4 Jan -31 Jan 90). It was equipped with only 5 of 6 authorized UH-60 Medevac aircraft because one was lost in an accident in SEPT 1989. Two UH-60s and crews were chopped to the Joint Special Operations Task Force (JTSOF) to support TF Green (19 Dec 89 - 10 Jan 90).

The 214th provided area medical evacuation to U.S. soldiers and their dependents, Panama Canal Commission and DOD employees, local Panamanian nationals, and POWs

(PDF and Dignity Battalion personnel). They also provided air movement of medical personnel, equipment, supplies, and whole blood.[57]

The secondary missions of the unit were: assist the Joint Rescue Coordination Center in extraction and recovery of personnel from downed aircraft; conduct search and rescue (SAR) missions; and provide Humanitarian Services assistance.

The unit flew 72 different missions in the first 72 hours of the operation, carrying 228 patients.[58] Their first mission was transporting wounded Navy SEALS from Paitilla Airport to Howard AFB. A major problem for the scarce medevac assets was the fact that missions came in from 25 separate agencies and the unit had to sort out priorities for its missions.

Special Operations Aviation

Task Force 160 began arriving at Howard Air Force Base by C-5A on Monday, 18 December and housed in Hangar 3 (1-228th's Hangar). The AH-6s were parked inside the hangar until H-hour to provide operational security (OPSEC) while the UH-60s were parked on the ramp. Three CH-47s were self-deployed from the U.S., conducting aerial refueling enroute. Shown in figure 13 of the appendix is the special operations rotary aircraft involved in Operation JUST CAUSE. This was the largest number of special operations aircraft ever deployed. All these aircraft are reported to have flown on the morning of 20 December.[59]

TF 160 provided six different special operations teams that were employed at H-hour.[60] Two teams of AH-6 "Little Birds" supported a parachute assault on Rio Hato and Tocumen to suppress air defense weapons. One team had the mission of knocking out the control tower and two guard towers.[61]

TF160 supported the attack on La Comandancia at H-hour. Minutes before H-hour, TF 160 supported the Delta Force and Task Force GREEN rescue of Kurt Muse

from the Carcel Modelo prison right next to the Comandancia. The "little Bird" carrying Muse was shot down, but both Muse and the pilot survived.[62]

TF 160 provided the rapid mobility for Task Force Green as they searched for Noreiga. TF Green earned the nickname "Ghost Busters" for going on so many "snatches" that turned up empty.[63]

TF 160 lost three AH-6 "Little Birds" during combat operations beginning at H-hour on 20 December: Two were shot down in the vicinity of the Comandancia at around H-hour and the third was shot out of the sky over Colon during the day on 20 December, killing both crewmembers. A fourth "Little Bird" was destroyed when a parachute was blown into the rotor system while it was hovering at Tocumen Airport.[64]

The 617th Special Operations Aviation Detachment (SOAD) is an element of the 160th permanently stationed at Howard AFB in Panama. Its mission was to provide support to Task Force Black (3-7 Special Operations Forces). The missions of the 617th consisted primarily of inserting special reconnaissance and surveillance teams to overwatch critical targets prior to H-hour and striking important PDF command and control nodes.[65] The 617th was augmented with two UH-60s from A Co, 1-228th Aviation. Their most notably mission was air assaulting a special forces team at H-hour to the Pacora River bridge to block the deployment of Battalion 2000 form FT Cimmaron and thus keep them from reinforcing Torrijos/Tocumen Airport or the Comandancia. The mission was conducted just as a convoy of armored cars and trucks were approaching the bridge. With the assistance of AC-130 Specter Gunships, the team was able to stop the convoy at the bridge.[66]

Task Force Aviation D+2

On D+2, 21 December, additional aircraft were deployed from the 82d Airborne Division, FT Bragg, and the 7th Infantry Division, FT ORD. All aircraft that arrived were assembled and ready for combat operations within hours. The D+2 TF AVIATION organization[67] is depicted in figure 14 of the appendix.

TF AVIATION missions included conducting reconnaissance and surveillance of the canal with attack and scout aircraft to thwart any attempt by the PDF to disrupt canal traffic and preparation for military operations in urban terrain (MOUT) in Panama City by locating LZs. Additionally attack teams were used for counter-sniper fire. The AH-64 Apache demonstrated that it can put a Hellfire missile in the window of a building at a distance of more than 2000 meters. General Stiner commented that the "absolute outstanding surgical capability of the AH-64 to strike a building without excessive collateral damage was one of the major operational lessons" in Operation JUST CAUSE.[68]

On 22 December, TF HAWK, augmented by A/1-228 Avn, conducted the longest night vision goggle (NVG) air assault (Operation LONGREACH) of OPERATION JUST CAUSE. A battalion task force was air assaulted from Torrijos to Coclecito. Three flights of five UH-60s, five AH-1s, two OH-58s, and two CH-47s made the flight stopping to refuel at two forward area refuel points (FARPS) EMPIRE and VERNADO enroute to the LZ. The enroute weather was poor and the flights had to deviate their planned route. Ten UH-60s were required to make the second lift to complete the mission.[69]

Several other missions[70] were also rewarding. One was the rescue of eleven scientists, research assistants, and a 4-year old girl taken hostage by soldiers loyal to Noreiga. On Wednesday night, AH-1 and UH-60 searches were unable to locate the hostages. Departing again early on December, the aircraft located, rescued, and returned the hostages to FT Clayton. Another mission extracted hostages from the Marriott Hotel in downtown Panama City.

Most of the missions that followed were "stabilization operations" starting on D+3 and D+4. They were a repeat of the type missions previously conducted and will not be included in this study.

Desert Shield/Desert Storm

On 2 August 1990, Iraq invaded the small country of Kuwait, whose army was forced to flee or be destroyed. Within 48 hours of the invasion, the United States' 82d and 101st Airborne Divisions of the XVIII Airborne Corps were alerted and enroute to Saudi Arabia.

Aviation Organization In Desert Shield/Desert Storm

Aviation Organization In Desert Shield/Desert Storm is depicted in figure 15 (EAC), figure 16 (XVIII ABN CORPS), and figure 17 (VII CORPS) of the appendix.

Aviation Density

Aviation density for Desert Shield is depicted in figure 18 in the appendix.

Army Aviation Contributions To Desert Storm/Desert Shield

Army aviation executed combat (maneuver), combat support, and combat service support missions in support of all battlefield operating systems.[71] In "combat" roles, attack helicopter battalions, assault helicopter elements, air reconnaissance and cavalry elements, and Army special operations forces executed missions across the operational continuum at the operational level of war.[72] In order to present the data for the study the information will be presented in terms of contributions to combat, combat support, and combat service support.

Combat

In order to provide information under combat, a general overview of contributions will be presented and then the information will be broken down into attack helicopter operations, reconnaissance and security operations, assault helicopter operations, special operations, and joint operations.

General

Army aviation missions in Operation Desert Storm/Desert Shield crossed all areas of the close, deep, and rear battle in both joint and combined operations. Army Aviation did not wait until the war started to perform its missions. It hit the ground running. Here aviation demonstrated deployability. This was evident in the early deployment of AH-64 attack helicopter units with the Army's Rapid Deployment Forces-the 82d Airborne Division and the 101st Air Assault Division. The arrival of the 1-82d Attack Helicopter Battalion, equipped with AH-64s, early in theater bears testimony to aviation's ability to deploy rapidly around the world. The combination of ground forces and an organic AH-64 attack battalion formed the division ready brigade "heavy." The 82d, 101st, 24th Mechanized Infantry Division, 1st Cavalry Division, and the XVIII Airborne Corps all deployed with extended aviation organizations.[73] Army Aviation units were among the elements of the first task force on the ground in Saudi Arabia. They represented the initial tank-killing and reconnaissance capability of the XVIII Airborne (ABN) Corps during the initial defense of Saudi Arabia. Army aviation assumed a frontline role[74] during Desert Shield/Desert Storm. One of the first units to arrive with the XVIII ABN was the 101st Aviation Brigade. Once on the ground, its mission was to blunt the anticipated Iraqi armored attack into Saudi Arabia.[75]

> Aviation made significant contributions to the fight. Aviation units exercised their ability to rapidly deploy to the theater as elements of rapid deployment tasks forces. The major combat power of several AH-64 battalions were deployed by C-5As and made combat-ready only hours after landing in Saudi Arabia. Six AH-64s can be loaded on one C-5A, which represents a significant armor capability that can be employed in short order. These initial, as well as subsequent, aviation units represented the majority of CENTCOM's tank-killing firepower and reconnaissance/security capability during its initial defense of Saudi Arabia.[76]

> In the initial defense of Saudi Arabia, the 12th Aviation Brigade was assigned a covering force mission with an area of operations the size of an armored cavalry regiment. Attack, assault, medium lift, and command aviation elements were all a detailed part of the planned execution.[77]

The first aviation units to arrive performed screen operations behind the Saudi Arabian army facing Kuwait. As a screen, they provided early warning while the U.S. armored ground forces arrived from the U.S. and the United States Army Europe (USAREUR) and prepared for combat operations. Once the buildup was completed, they also became the mobile force covering the spaces between ground combat units. These screening forces were able to conduct reconnaissance of the "broad avenue of approach" along the desolate 400 mile Saudi Arabia-Iraq border.[78]

Units flew missions from the minute an aircraft became flyable upon offload from its ship during Desert Shield. These same units flew missions until the aircraft were redeployed after the cease-fire.

Army aviation, flying in the "third dimension" of the battlefield, provided the ground maneuver commanders the ability to extend their areas of interest, which quickened the operational tempo of the battlefield.[79]

With the exception of air combat operations, Army aviation performed all missions of the combat aviation battlefield roles.[80] Versatility was demonstrated frequently.[81]

Attack helicopters performed the following missions: security, armed reconnaissance, counter reconnaissance, deep operations, joint air attack team (JAAT) operations, joint suppression of enemy air defense (JSEAD) operations, pursuit operations, exploitation operations, and aerial security for long-range surveillance unit (LRSU) insertions and extractions. On several occasions, attack helicopter battalions were the advance guard for attacking heavy divisions.[82]

OH-58Ds conducted security, reconnaissance, and targeting operations for the French 6th Light Armored Division. During the attack by the French 6th Light Armored Division, the OH-58Ds provided aerial fire support observation for artillery support.[83] OH-58Ds were used as Scouts with air cavalry troops and attack helicopter battalions were used to conduct reconnaissance and cavalry type missions. OH-58A/Cs provided

quick transport to the commanders, staff officers, liaison personnel, and couriers throughout the battlefield.

Assault helicopter units, along with their traditional air assault missions, conducted LRSU insertions and extractions. They quickened the pace for the light forces by providing rapid mobility.

Attack Helicopter Operations

During Operation Desert Shield/Storm, AH-64 equipped battalions successfully conducted attack, security, and reconnaissance missions during all types of weather and light conditions. Lethality was proven time and time again by the AH-64.

Initially Army aviation provided a screen behind Saudi Arabian forces facing Kuwait. It became the mobile force covering spaces between ground combat units. It also provided patrols along the border. This gave time for the arrival of the main forces to move into their positions. Army Aviation opened the way for the Air War.[84] Army aviation was the first to strike Iraq and pave the way for the air war by knocking out air defense radars.

> The Apache received much praise for its performance, ruggedness, crashworthiness, ballistic tolerance, and lethality. AH-64s were selected by special operations forces and the Joint Forces Commander for the campaign joint SEAD mission. This mission was to destroy two forward radar sites that would allow air assets safe passage to Baghdad on the night of 16 January 1991. The mission was 100 percent successful, and all eight Apaches returned to base after a 1,500-mile round trip.[85]

AH-64 battalions were extremely successful conducting cross FLOT and deep attacks at night. Performing the missions at night gave the advantage to the AH-64 because they were able to do these missions undetected. The enemy air defenders were unable to determine their positions during these night attacks because of the AH-64's standoff range and use of the forward-looking infrared radar (FLIR) sighting systems.

In addition Attack helicopters conducted exploitation and pursuit operations to cut the Iraqis off. The XVIII Airborne Corps ordered two of the aviation brigades under its

command--the 101st and the 24th-- to surge ahead, continue exploitation, and cut the final escape route of the Iraqi Army's mechanized elements. Three AH-64 battalions (the 2-229th, the 1-101st, and the 1-24th), as well as the air troops of the cavalry squadrons of the 101st and the 24th took part in the "Battle of the Causeway," engaging hundreds of vehicles either on the causeway itself or on the roads to the causeway. By the end of the day, the escape route was cut and large portions of Iraq's mechanized army lay trapped to the south of the Euphrates river.[86]

There were some problems however.[87] Intelligence assets could not provide accurate enemy targets for attack helicopter battalions, because of the dispersion, static nature (no hot spots from vehicle engines for the FLIR to pick up), and disarray of the enemy. The OH-58Cs assigned to these battalions were ineffective at night because of the lack of suitable night sight devices other than night vision goggles (NVG). Many AH-64 battalion commanders used some of their AH-64s as scouts during night time operations thereby reducing their combat power. The OH-58Ds that were under the operational control (OPCON) of AH-64 battalions provided success to the battalions but they were also limited by the NVGs. Command, control, and communications (C3) of the attack helicopter battalion was difficult. The AH-64 communications were poor and long range communications were impossible. The UH-60 that is assigned to the battalions did not have a night system and the pilots had to use NVGs so it could not be used for C3. As a result, many battalion commanders operated from an AH-64 which again reduced their combat power.

Reconnaissance And Security

The Desert Storm recon/counter recon battle was fought at the tactical and operational level. At the operational level the purpose was to deny enemy information about the campaign by destroying his recon assets and preserving our own at the tactical level, units performed this mision from initial deployment until the cease fire.

There were several phases to the recon/counter-recon battle: secure the Saudi-Iraqi border, determine the disposition of the enemy and intelligence preparation of the battlefield (IPB), and screen the movement of the divisions and brigades during the ground attack.[88]

The mobility, speed, and versatility of aviation on reconnaissance and security missions provided commanders with multiple capabilities anywhere on the battlefield. Air reconnaissance/cavalry troops and squadrons conducted traditional cavalry operations throughout the battlefield, but normally well forward of friendly ground troops.[89] The cavalry units redefined reconnaissance to mean "deep" reconnaissance by operating as far as 150 kilometers (km) beyond the forward line of troops (FLOT).[90] They provided highly accurate and valued intelligence and target information to the ground maneuver commander.

The AH-64-equipped attack battalions frequently performed armed reconnaissance and counter-reconnaissance missions without any problems, they too went 150 km beyond the FLOT. Field commanders exploited the reconnaissance capability of the AH-64 and assigned AH-64s the secondary reconnaissance missions as an additional use of their videotape system that records their engagements. As the aircraft flew to and from their targets they could record images of chosen sites for later examination.

Heavy Aviation brigades used their cavalry squadrons to perform screening missions, usually forward and /or on the flanks, and movement to contact operations in support of the division's attack.

The OH-58Ds also performed extensive night recon missions and scouted for the AH-64 battalions.

Assault Helicopter Operations

Assault helicopter units successfully completed a wide variety of missions throughout Operation Desert Shield/Storm.

The 101st ABN Division (Air Assault) conducted one of the largest air assault in history.[91] At the start of the ground war, G-Day, the 101st blitzed 70 miles into Iraq to establish forward operating base (FOB) Cobra. FOB Cobra was secured by an entire infantry brigade lifted in by 126 UH-60 and 60 CH-47 sorties. The depth of FOB Cobra was the operating radius of the CH-47s with a sling load. By the end of the first day 131,000 gallons of fuel and pallets full of ammunition, food, and water were lifted in by four teams of CH-47s. This logistics base supported air assaults into the Euphrates River valley and attacks against the causeway that blocked the escape and trapped the Iraqi army. Security was provided by OH-58Ds, air cavalry, and attack helicopter units bringing with them firepower and staying power to the assault task force.

While the air assault by the 101st was the largest and most decisive, there were numerous other air assaults during the campaign, all contributing to the defeat of the Iraqi army.

Assault helicopter units also conducted C3I giving the ground commander enhanced ability to command and control unit operations. Insertion and extraction of LRSUs, not part of the METL for these units, became a common mission. They were performed with increased risk, but the missions were successful. AH-64s and OH-58Ds provided security for these operations. UH-60s performed combat search and rescue (CSAR) missions, also not in the METL, but practicality made it necessary in order to rescue downed pilots.MEDEVAC and air ambulance companies and detachments provide timely support to the entire theater for the movement of injured or ill personnel. Finally, UH-60s moved countless repair parts, supplies, and key personnel throughout the battlefield; in heavy divisions, they helped sustain the combat force.

Aviation Special Operations

Control of these units remained at the joint level. They performed numerous missions that included CSAR, raids, and LRSU insertion and extraction. They also

inserted direct action teams, emplaced navigational aids, performed photo reconnaissance, took soil samples; and conducted nuclear, biological, chemical (NBC) surveys. Most of these missions were in Iraq and were undetected.

Joint Operations

Army aviation participated in numerous joint operations proving its versatility during Operation Desert Shield/Storm.

At 2:38 AM on 17 January 1991, Task Force Normandy, made up of eight AH-64s from the 101st Aviation Brigade together with four Pave Low helicopters from the US Air Force's First Special Operations Wing, successfully executed the JSEAD mission that paved the way for the coalition air forces enroute to targets in and around Baghdad. Catching the Iraqi by surprise, the AH-64s destroyed critical operational elements of each radar site within seconds of one another. As a consequence, they created a hole in the early warning radar system through which the coalition air forces passed.[92]

Use of the helicopters instead of fixed-wing aircraft, allowed a more accurate immediate assessment of the battle damage caused by this crucial raid. Central Command planners "wanted to ensure they had eyeballs on the target."[93]

The Apaches operated in two teams. They made visual contact with their targets at distances greater than 12 km, verified the identification of the targets at ranges beyond 7 km and launched weapons at ranges of 3-6 km.[94] Each AH-64 was equipped with an external fuel tank that enabled a 1,500 mile trip.

JAAT was the most common joint operation. Aviation units conducted preplanned and spontaneous JAATs during the day and at night. Because of wide dispersion most of the JAATs did not involve artillery.

OH-58Ds provided targeting and laser spotting for US Marine AH-1W Hellfire helicopters during training before the war. Armed OH-58Ds provided armed reconnaissance for the US Navy. They also recorded battle damage assessment (BDA) of

several offshore oil well platforms, small boats, a Silkworm missile site, and the capture an Iraqi held island.[95]

Combat Support

Aviation performed numerous combat support mission for the maneuver forces. They overlapped a great deal into the other missions described and they supported all the battlefield operating systems. This study will not go into detail about any of these missions and takes in to consideration that all the after action reports verify aviation role in combat support.

Combat Service Support

During Operation Desert Shield/Storm, commanders relied heavily on their air movement assets to rapidly resupply their forces.[96] Because of the great distances between support bases and combat forces, sometimes exceeding 300 km, commanders used air movement operations to reduce transportation times in the sustainment of their units. Assault helicopter and medium lift helicopter units, in support of combat operations, quickly moved field artillery pieces along with their crews and ammo. Other missions included movement of critical supplies, numerous sorties to evacuate captured Iraqi soldiers to the rear, search and rescue operations, and transportation of combat forces.

Army aviation demonstrated a new concept of intratheater airlift by flying five C-23B Sherpa transports over 250,000 miles during Operation Desert Shield/Storm. These missions, numbering 500, totaled over 1,400 flight hours and transported over 800,000 pounds of cargo and 400 passengers. These aircraft met the demands of the rapid movement of critical repair parts forward to the combat weapons systems that needed them.[97]

Summary

In this chapter we have reviewed employment of the Aviation Brigade in recent combat operations in order to determine their contributions to contingency operations in early entry lethality roles. The chapter included aviation brigade mission and roles, organization of each unit, aviation joint, combined, and contingency operations, Army aviation brigade capabilities and limitations, army aviation mission essential task list (METL) for the brigade and subordinate elements, and the contribution's aviation brigades made in OPERATION URGENT FURY, OPERATION JUST CAUSE, and OPERATIONS DESERT SHIELD/DESERT STORM.

Endnotes

CHAPTER 4

[1]US Army, Draft 11.5, Early Entry Lethality and Survivability Battle Dynamic Operations Concept, Fort Monroe, Va: HQ, TRADOC, Early Entry Lethality Survivability Battle Lab, (Dec1992), 16.

[2]U.S. Army, Field Manual 1-111, Aviation Brigades, Washington, D.C., Department of the Army, (27 August 1990), 1-3.

[3]Ibid., 1-5.

[4]Ibid., 1-6.

[5]Ibid., 1-7.

[6]Ibid., 1-9.

[7]Ibid., 1-9.

[8]bid., 1-10.

[9]U.S. Army, Field Manual 1-100, Army Aviation In Combat Operations, Washington, D.C., Department of the Army, (28 February 1989), 3-30.

[10]Ibid., 3-31.

[11]U.S. Army, Field Manual 1-111, Aviation Brigades, Washington, D.C., Department of the Army, (27 August 1990), 1-12.

[12]Ibid, 1-13.

[13]U.S. Army, Field Manual 1-111, Aviation Brigades, Washington, D.C., Department of the Army, (27 August 1992), 3-6.

[14]U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated), 385.

[15] Major Mark Adkin,. Urgent Fury, The Battle for Grenada, Lexington Books: D.C. Heath and Company, Lexington, Mass; 1989, 126.

[16]Ibid., 137.

[17]Ibid., 174.

[18]Ibid., 176.

[19]Ibid., 179-180.

[20]Ibid., 180.

[21]Ibid., 184.

[22]Ibid., 188.

[23]Ibid., 189.

[24]Ibid., 245.

[25]Ibid., 281.

[26]Ibid., 282-283.

[27]Ibid., 283.

[28]Ibid., 285.

[29]Lawrence A. Yates, "Joint Task Force-Panama: JUST CAUSE--Before and After," Military Review 10 (October), 59.

[30]Mason, Bradley J., Major, U.S. Army, "Assault Helicopter Contingency Operations: The Fine Line Between Peace and War." School of Advance Military Studies Monograph, U.S. Army Command and General Staff College, 1991.

[31]Yates, "Joint Task Force - Panama", 60.

[32]Smith, Douglas I., LTC, U.S. Army, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. Army War College, Carlisle Barracks Pennsylvania, (15 April 1992), 9.

[33]Ibid.,12.

[34]Ibid., 12.

[35]Ibid., 22.

[36]Ibid., 23.

[37]Ibid., 29.

[38]Douglas Terrell, Operation JUST CAUSE, recorded by Terry Coakley, 40 min., Army Aviation Association of America, 1990, videocassette.

[39]Ibid., 45.

[40]Ibid., 49.

[41]Ibid., 51.

[42]Thomas Donnelly, Margaret Roth, and Caleb Baker. OPERATION JUST CAUSE: The Storming of Panama, (New York: Lexington Books, 1991), 215-235.

[43] Douglas I. Smith, LTC, U.S. Army, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. Army War College, Carlisle Barracks Pennsylvania, (15 April 1992), 57.

[44]Ibid., 59.

[45]Ibid., 59.

[46]Ibid., 60.

[47]Ibid., 61.

[48]Ibid., 61.

[49]Ibid., 63.

[50]Ibid., 63.

[51]Ibid., 64.

[52]Ibid., 64-65.

[53]Ibid., 64.

[54]Ibid., 64.

[55]Ibid., 65.

[56]Ibid., 66.

[57]Ibid., 66.

[58] Gary Drabszuk, Major U.S. Army, "214th Medical Detachment: Operation Just Cause," AAR, (214th Medical Detachment, U.S. Army South , Panama, 1990).

[59] David Hughes, "Night Invasion of Panama Required Special Operations Aircraft, Training," (Aviation Week and Space Technology, 19 February 1990), 61.

[60]Smith, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. p 68.

[61]Thomas Donnelly, Margaret Roth, and Caleb Baker . OPERATION JUST CAUSE: The Storming of Panama, (New York: Lexington Books, 1991), 189.

[62]Ibid., 85, 130.

[63]Smith,"ARMY AVIATION IN OPERATION JUST CAUSE," p 68.

[64]Ibid., 68.

[65]Donnelly OPERATION JUST CAUSE: The Storming of Panama, p 121-130.

[66]Smith, "ARMY AVIATION IN OPERATION JUST CAUSE," p 69.

[67]Ibid., 70.

[68]Ibid., 71.

[69]Ibid., 71.

[70]Ibid., 72.

[71]US Army, U.S. Army Aviation Center, "Operation Desert Shield/Storm After Action Report," (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), 3.

[72]Ibid., A-4.

[73]Rudolph Ostovich III, Major General, U.S. Army, "Aviation"s Contribution to the War in the Gulf," United States Army AVIATION DIGEST, (March/April 1991), 1.

[74]David A. Fulghum, "U.S. Army Aviation to Assume Frontline Role in Saudi Arabia," Aviation Week & Space Technology (October 15, 1990), 80.

[75]US Army, "Army Aviation Desert Shield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 92), 585.

[76]US Army Aviation Center, "Army Aviation Desert Shield/Storm After Action Report - Unclassified" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), A-3.

[77]Ibid., A-4.

[78]David A Fulghum. "U.S. Army Aviation to Assume Frontline Role in Saudi Arabia." Aviation Week & Space Technology (October 15, 1990), 80-81.

[79]US Army Aviation Center, "Army Aviation Desert Shield/Storm After Action Report - Unclassified" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), 1.

[80]Ibid., 3.

[81]Rudolph Ostovich III, Major General, U.S. Army, "Aviation"s Contribution to the War in the Gulf," United States Army AVIATION DIGEST, (March/April 1991), 1.

[82]US Army Aviation Center, "Army Aviation Desert Shield/Storm After Action Report - Unclassified" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), 3.

[83]Ibid., 3,4.

[84]Peter Grier, "US ARMY Opened Way for Air War," The Chrisitan Science Monitor, (March 27, 1991), p 8 col 2.

[85]US Army Aviation Center, "Army Aviation DesertShield/Storm After Action Report (Unclassified)" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), F-2.

[86]US Army Aviation Center, "Army Aviation in DesertShield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 1992), 36.

[87]US Army Aviation Center, "Army Aviation DesertShield/Storm After Action Report (Unclassified)" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991) , 5.

[88]US Army Aviation Center, "Army Aviation in DesertShield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 1992), 206.

[89]Ibid., 6.

[90]Ibid., 1.

[91]US Army Aviation Center, "Army Aviation in DesertShield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 1992), 354.

[92]US Army Aviation Center, "Army Aviation DesertShield/Storm After Action Report (Unclassified)" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), 9.

[93]Peter Grier. "U S Army Opened Way for Air War." The Christian Scientist Monitor, (March 27, 1991), p 8 col 2.

[94]David F Bond, "Apache Helicopter Proves Reliability To Rebut Reputation for Deficiencies." Aviation Week & Space Technology (March 4, 1991), 25.

[95]US Army Aviation Center, "Army Aviation Desert Shield/Storm After Action Report - Unclassified" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), 9.

[96]Ibid., 55.

[97]Ibid., 56.

CHAPTER 5

COMPARE/CONTRAST

Purpose and Scope

In this chapter we will examine the results of the analysis of chapter 4 and Army aviation in the terms of the early entry lethality and survivability battle dynamic operations concept: deployability; lethality; survivability; and sustainability.[1] We will look at the early entry operations requirements and discuss force projection phases. We will discuss capabilities and limitations of Army aviation brigades and try to validate them in light of recent operations. Lastly, we will look at the Aviation METL and annotate tasks that were performed in the operations that were parts of the study. These discussion will become the basis for recommendations made in Chapter 6.

Early Entry Operations Requirements

Early entry operations are the projection of military force or capabilities to support the CINC's or other JFC's concept of operations in a pre-crisis or crisis situation.[2] Early entry forces must possess the capabilities to rapidly deploy, enter the operational area, secure the lodgment, and immediately have decisive effect or create conditions for the arrival of substantial follow on forces that then conduct decisive combat operations. In terms of the phases of force projection, early entry force operations cover predeployment activities, mobilization, deployment, entry and decisive operations.[3] When we break down these requirements in terms of predeployment,[4] the force must be trained, structured, and equipped to accomplish the early entry missions. This includes joint and combined training, as well as standards for readiness and deployment. It also includes consideration for geography, climate, food, water, languages and cultures of the area as well as detailed

and accurate information about the enemy and IPB. Mobilization[5] is concerned with resources required to handle the crisis. It could include a call-up of Reserves or National Guard units to support port operations, airfields, medical, line haul, maintenance, and the other CS and CSS missions for early entry forces. Deployment concerns tailoring the composition of the early entry force based on METT-T, available strategic lift, and capabilities of the joint, combined and host nation forces in theater.[6] The need for rapid deployment of combat-configured units takes priority. Entry operations establish the preconditions for decisive combat operations. Early entry forces allow follow on force build-up. These forces must be deployable, lethal, survivable, and sustainable.[7]

Compare and Contrast

The aviation brigade contributed much to the operational scheme of maneuver by exploiting the aerial dimension of the battlefield in OPERATIONS URGENT FURY, JUST CAUSE, and DESERT STORM/DESERT SHIELD. All the operations discussed included joint and combined missions.

When we examine the capabilities[8] previously discussed in chapter three, we can validate them by comparing them with the operations that were part of this study and use them in helping to support or reject the notion of aviation in early entry operations. Aviation brigades provided timely reconnaissance on wide frontages throughout the theater, corps, or division area of operation. They provided combat force in the aerial dimension of the battlefield and influenced the tempo of battle. They conducted operations during day, night, limited visibility, and adverse conditions or environments. They quickly massed fires with attack helicopters or shifted reserves quickly. They weighted the combat power of the theater, corps, or division commander or a combination of the three. They rapidly moved forces to achieve mass at critical times and places. They conducted air combat, JAAT, SEAD, air assault, and air movement operations. They

rapidly repositioned troops, equipment, and supplies for current and future operations. They also conducted airfield operations and provided air traffic services to the users.

The following comments are summaries of aviation contributions to URGENT FURY:

> (U) Army aviation contributed much to the overall success of Operation URGENT FURY. Aviation contributed to maneuver and combat support wherever and whenever needed. When exposed to combat, aviation units performed aggressively and professionally. Courage and good training were evident throughout the aviation force. Army aviation demonstrated its ability to rapidly deploy, fight upon arrival, maintain the fleet, and complete the tactical mission.[9]

> (U) The aviation lessons learned from Operation URGENT FURY are not new subjects, but each deserves careful study. Each lessons provides another opportunity to review current and emerging doctrine as well as new equipment. We must keep this particular operation in perspective with our new worldwide contingencies. URGENT FURY vividly reemphasized the importance of continuous realistic and challenging training to both aviation and ground maneuver forces. Only through training will aviation be a responsive 24-hour combat force on future battlefields. We fight as we train.[10]

Some of the major lessons learned URGENT FURY include: Air assault operations without proper intelligence preparation of the battlefield and appropriate planning can expose the combat force to extreme risk; Current aviation organizations are well suited for combat operations; Aviation units were well trained and combat-ready; Twenty-four hour operations must be routine during peacetime training; Leadership was exceptionally good in the aviation force; Leaders led by example, demonstrating enthusiasm, technical competence, and sound judgment.

In Grenada, the Blackhawks were able to withstand anti-aircraft fire. One UH-60 had 45 bullet holes, punctured fuel tanks, holes in the tail and main rotors, much of the control instrumentation destroyed, and five people, including the pilot, wounded. Yet the crew completed the mission.[11] All the damaged UH-60s completed their missions. Ten UH-60s received combat damage with only one loss. The UH-60s met or exceeded the

crash worthiness and survivability specifications. Army aircraft assessment of the entire operations is depicted in figure 4-8 in the appendix.

Impacts indicate the threat was 7.62mm in size, possible 12.7mm. Most of the hits were to the cockpit, cabin, aft fuselage, and tailboom. A few hits were noted in the main rotor head, none in the engine compartment, but some in the inlet covers and exhaust shrouds. There were no hits to the hydraulic flight control system above the cabin, and relatively few hits in main rotor blades or tail rotor blades.

The following are some comments from after action reviews and some assessments of studying OPERATION JUST CAUSE:

> From the opening minutes of Operation Just Cause last December, rotary wing airpower moved, protected, supplied and helped control United States Forces in Panama. The invasion and stabilization of Panama ultimately involved more that 170 helicopters in "low intensity" conflict, fought largely at night. It marked the combat debut of the AH-64 Apache, demonstrated both rapid deployment and careful airspace management to put overwhelming forces where needed, safely.[12]

Army Aviation provided UH-60 and UH-1 aircraft for ground assault forces and AH-64A aircraft for security as part of a victorious joint task force that decapitated the Panamanian Defense Force in swift, precise, and decisive moves.

> The absolute key to the plan's (Operation JUST CAUSE) success was the six air assaults to break the back of the PDF quickly...without them, no way!--Would be 2.5 mile per hour approach, or less, cutting through the jungle-resulting in more lives lost through protracted fighting.[13]

> Army Helicopters ruled the night! The newest branch of the Army proved that it could fight and win "safely" in combat. The impact of Army Aviation was astounding. Right from the start Army Aviation played key roles, providing aerial fire support, suppressing air defense sites, inserting special operating teams, conducting H-hour combat air assaults, providing command and control, saving lives during daring medical evacuation missions, and supplying crucial combat supplies.[14]

> Army aviation proved that it is "pound for pound,...the most deployable, versatile, and lethal of today's Army Forces."[15]

The plan called for speed, surprise, and simultaneous operations--Army Aviation, and its unique capabilities, provided all these characteristics that contributed to overall mission success.[16]

Lastly, as demonstrated by the overall success of OPERATION DESERT SHIELD /DESERT STORM aviation was a key player. Aviation units exercised their ability to deploy to the theater rapidly and, in fact, where the majority of the tank killing power CENTCOM had for the initial defense of Saudi Arabiaf until the buildup of forces for the offense. Aviation paved the way for the air war. It performed surgical strikes that were lethal. It allowed the ground maneuver commander to sustain the battle tempo and in some cases influence it. It also provided logistical sustainment through the innovative use of C-23B Sherpas for intrtheater airliftt.

In contrast, we can examine the limitations[17] previously discussed in chapter three and, by comparing them with the operations that were part of this study, use them to help point out problems of aviation in early entry operations.

Aviation brigades have the following limitations. In order for aviation missions to be successful, aviation requires accurate, rapid, and fresh intelligence that is continuously updated. As was noted in OPERATION URGENT FURY without proper intelligence, i.e. no decent maps for the aircrews, no known enemy air defense locations, and attacking targets that pose no threat (Camp Calvigny), the results can be disastrous. Also if intelligence is not accurate, a "wild goose chase" can occur i.e. when, in OPERATION JUST CAUSE, aviation responded to reports of Noreiga's whereabouts in an attempt to capture him. Aviation can influence the tempo of the battle, but the aviation tempo may be slowed when aviation brigades are augmented with ground maneuver forces. Also, when supporting ground forces, the selection of LZs must be made correctly to prevent air assault insertions into mud flats, or sloped LZs, crossed by aircraft hazards, or heavily defended as happened in OPERATION JUST CAUSE. Aviation brigades can conduct operations during, day, night, limited visibility, and adverse conditions but weather and obscuration (sandstorms, bugs, birds) affect observation, acquisition, and engagement

range of weapons systems as well as employment. Commanders who employ aviation must know that weather can cause flights to be separated or deviations to be made to the missions which can throw off timetables as shown in air assaults by aviation units in OPERATION JUST CAUSE. Additionally, Aviation brigades had limited night capability when employing systems other than the AH-64 or the OH-58D for target acquisitions and even these two were not completely compatible for certain missions. In OPERATION DESERT SHIELD/DESERT STORM night vision devices allowed aviation to fight at night but required additional planning considerations, such as when the U.S. Air Force Pavelow Helicopters were sent in with the AH-64s to knock out the Iraqi air defense radar.

Aviation performed rapid and long range movements but the aircraft consumed large amounts of fuel, ammunition, and repair parts. During OPERATION DESERT/DESERT SHIELD this required CSS across the entire battlefield or establishing forward operating bases (FOB) such as the XVIII ABN CORPS used to close the back door on the Iraqi army. Also during OPERATION DESERT SHIELD/DESERT STORM, extended range operations strained the C3 of the controlling headquarters resulting in units out of range of radio communication with their operation cells in the desert. Army airspace command and control (A2C2) operations must be planned to preclude fratricide which continues to be a problem as far as maintaining positive control when working joint operations as experienced in JUST CAUSE. Aviation brigades cannot protect themselves, they are austere manpower wise and cannot secure unit assembly areas. Dur[illegible] OPERATION DESERT SHIELD/DESERT STORM it took a whole infantry brigade to secure the FOB established by the XVIII ABN CORPS.

Aviation brigades can contribute to the strategic, operational, and tactical levels of war.[18] Aviation brigades can shape the battlefield in joint and combined operations as well as contingency operations across the operational continuum. They can enhance the ground-paced maneuver or accelerate the tempo and allow the force commander to retain

the tactical advantage over the enemy. Considering employment, they fought as an integral part of the combined arms team. They exploited the capabilities of other branches and other services (U.S., allied, or coalition). They capitalized on their ability to gather intelligence and provide the commander with accurate real time intelligence. They performed SEAD missions against enemy ADA acquisition and weapons systems. They massed mobile firepower quickly and exploited their advantage over the retreating enemy using the element of surprise. Through the use of terrain for survivability, they can maintain flexibility, displacing forward elements frequently, and exercise staying power to get the mission accomplished.

Aviation Mission Essential Task List

If we take a subjective look the missions performed by aviation during the operations discussed we can examine the missions performed. The figure on the next page (see also figure 19 in the appendix) depicts an updated METL based on the operations discussed in this study. The placement of the X is based on the review of the numerous sources used throughout this study. The intent of this study was not to include an example of each METL performed. Army aviation validated most of its METL during OPERATION DESERT/DESERT STORM.

Shown in the table below is a compressed look at the METL and tasks performed during each of the operations studied.

METL	URGENT FURY	JUST CAUSE	DESERT SHIELD/STORM
TACTICALLY DEPLOY	X	X	X
C3	X	X	X
CONDUCT RECON			X
CONDUCT SECURITY OPS		X	X
ATTACK OPS	X	X	X
CONDUCT JAAT		X	X
CONDUCT AIR CBT	X	X	X
DEFEND*			X
CONDUCT DIVER. OPNS			X
CONDUCT A RAID	X	X	X
AIR ASSLT OPNS	X	X	X
AIR MOVEMENT OPNS	X	X	X
C3I ENHANCE. OPS		X	X
BATTLE HANDOVER			X
CONDUCT PASS.OF LINES			X
CONDUCT SEAD/JSEAD			X
JOINTAND COMBINED OPNS	X	X	X
CONTROL DIRECT FIRES		X	X
EMPLOY INDIRECTFIRE SPT	X	X	X
AERIAL DELIVERY	X	X	X
CONDUCT CONTIN. OPS	X	X	X
SUSTAIN UNITS	X	X	X
RECONSTITUTE FORCES	X	X	X
CONDUCT IEW OPS			X
CONDUCT SAR			X
CONDUCTA/C RECOV	X	X	X
AUGMENT MEDEVAC	X	X	X
OPS IN ADVERSE CONDITIONS	X	X	X

Summary

We have examined the required capabilities as outlined in the early entry lethality and survivability battle dynamic operations concept: deployability; lethality; survivability; and sustainability.[19] We have looked at the concept of early entry operations and discussed force projection phases. We have discussed capabilities and limitations of Army aviation brigades and validated them. We have looked at the Aviation METL and tasks that were performed in the operations that were parts of the study. In the next chapter we will discuss recommendations based on the conclusions discussed in this chapter.

Endnotes

CHAPTER 5

[1]US Army, Draft 11.5, Early Entry Lethality and Survivability Battle Dynamic Operations Concept, Fort Monroe, Va: HQ, TRADOC, Early Entry Lethality Survivability Battle Lab, (Dec1992), 16.

[2]Ibid., 6.

[3]Ibid., 10.

[4]Ibid., 10.

[5]Ibid., 11.

[6]Ibid., 12.

[7]Ibid., 16-19.

[8]U.S. Army, Field Manual 1-111, Aviation Brigades, Washington, D.C., Department of the Army, (27 August 1990), 1-12.

[9]U.S. Army, OPERATION URGENT FURY ASSESSMENT (UNCLASSIFIED), Fort Leavenworth, KS., US Army Training and Doctrine Command, Combined Arms Center, (1985), XI-1.

[10]Ibid, XI-5.

[11]Ibid., 358.

[12]Frank Colucci, "Rehearsal Reaps Rewards," Defence Helicopter (June-July 1990), 18-24.

[13]Carl Stiner, "Operation JUST CAUSE" presentation, Army Aviation Ball, Fort Rucker, AL, April 1990.

[14]Douglas I. Smith, "ARMY AVIATION IN OPERATION JUST CAUSE," Carlisle Barracks, PA., US Army War College, USAWC Military Studies Program (15 April 1992), 113.I

[15]Rudolph Ostovich,III, "Contingency Warfare: Our Strong Suit," (ARMY AVIATION, 31 October 1990) .

[16]Douglas I. Smith, "ARMY AVIATION IN OPERATION JUST CAUSE," Carlisle Barracks, PA, US Army War College, USAWC Military Studies Program (15 April 1992), 113.

[17]Ibid., 1-13.

[18]U.S. Army, Field Manual 1-111, Aviation Brigades, Washington, D.C., Department of the Army, (27 August 1992), 3-6.

[19]US Army, Draft 11.5, Early Entry Lethality and Survivability Battle Dynamic Operations Concept, Fort Monroe, Va: HQ, TRADOC, Early Entry Lethality Survivability Battle Lab, (Dec1992), 16.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

Purpose and Scope

Chapter Five analyzed Army aviation in terms of the early entry lethality and survivability battle dynamic operations concept: deployability; lethality; survivability; and sustainability[1] and discussed Army's aviation ability to meet these requirements. Chapter 5 discussed the concept of early entry operations and force projection phases, capabilities, validated them and reaffirmed limitations of Army aviation brigades as far as recent operations. Chapter 5 looked at the Aviation METL and annotated tasks that were performed in the operations that were parts of are study.

This chapter will discusses if Army aviation can act in an early entry lethality and survivability role as a base unit or provide a component that meets the requirements for contingency force projection of U.S. Army forces that emphasize deployability, lethality, survivability, and sustainability. The results of answers to the thesis question and recommendations are discussed in this chapter.

Early Entry Lethality And Survivability

Army aviation contributed to early entry force operations in all aspects of the force projection phases discussed and examples were evident in OPERATIONS URGENT FURY, JUST CAUSE AND DESERT SHIELD/DESERT STORM. There were some problems with URGENT FURYas discussed at the conclusion to the operation in Chapter Four. However, by the time DESERT SHIELD rolled around, the problems were fixed and Army aviation met the requirements of early entry forces. Based on the operations studied we have seen examples that aviation is deployable. This was demonstrated by

aviation units that deployed for OPERATIONS URGENT FURY, JUST CAUSE, and DESERT SHIELD. We have seen that aviation is lethal. The AH-64 attack helicopter contributed lethal firepower the ground maneuver commander's operational scheme of maneuver in OPERATIONS JUST CAUSE and DESERT SHIELD/DESERT STORM. Aviation has aircraft and doctrine to fight these aircraft that make aviation survivable on the battlefield. Aviation can sustain itself, but because of its austere organization it still requires CSS and other logistic support to sustain itself for long periods. Aviation unit-level and intermediate-level maintenance (AVUM, AVIM) slices are required because of its high OPTEMPO (operational tempo). CLass III (POL) support is the lifeblood of aviation operations and location at the ISB, if used, and at the lodgment site is paramount. Class V (Ammunition) requirements beyond the unit basic loads should accompany the early entry force up front in the sequence. Self-sustainment capability must be included in the deployment loadup so that the equipment is operational when it arrives. Early entry forces can't count on host nation support, which is another reason self-sustainment is important, and includes all classes of supplies. Lastly, the early entry force needs to bring whatever equipment it needs for off-loading, handling and assembly.

When we address Army aviation units that are deployed via strategic air, they must be landed into an airfield that has been assaulted and secured by U.S. or allied airborne or ground forces. Army aviation can help secure and enlarge the lodgment area for future combat operations. Some of the predeployment planning considerations done in the reverse planning sequence needs to anticipate the operational requirements that must occur upon arrival. Some of these requirements include rapid intelligence, firepower, Class III (POL) and Class V (ammunition), conduct of joint operations, security of the lodgment area (meaning operating twenty-four hours a day), and high initial OPTEMPO .

In order to do this the aviation force package must be tailored. It should be not less that a brigade-size organization and can include multiple aviation brigades. Tailoring

this brigade or a regimental aviation squadron may be accomplished to make it more versatile, lethal, and survivable as well as mobile and sustainable.

Because of the requirements for rapid intelligence and firepower in the early entry aviation force, the proper sequencing of the aviation brigade must be accomplished to have the greatest influence. The suggested priority for sequencing an augmented aviation brigade is found in *Army Aviation Deployment For Contingency Operation (White Paper)*[2] : Attack helicopter battalion; Cavalry Squadron, Assault helicopter company/battalion; Second attack helicopter battalion; Command aviation company (-); MEDEVAC; Medium helicopter company/battalion; and Command aviation battalion (-).

Questions

Army Aviation can perform early entry and it is lethal and can survive. It can perform missions in support of the battlefield functions: attack, reconnaissance and security, air assault, air combat, special operations, and command and control. It can perform the battlefield roles: maneuver, combat support, and combat service support. Lastly, Army aviation can enhance the battlefield operating systems (BOS): maneuver, fire support; command, control and communications (C3), mobility, countermobility, survivability, combat service support (CSS), air defense artillery (ADA), and intelligence. In addition, Army Aviation can be integrated into any scheme of maneuver. However, several questions are still raised when we look at early entry force selection: What should the force be composed of? How fast must it respond? How easily can the force be tailored for different contingency operations and the type of threat opposed? When and how easily is the force sustained? Can the force provide early arrival of reconnaissance, security and force protection for later follow-on forces? Can it provide the same for itself? We have answered most of these questions in this study and found that Army aviation can provide a force for the early entry lethality and survivability role if provisions are made to augment it to overcome its shortcomings.

Conclusions

Army aviation, specifically helicopters, provide land forces a capability to outmaneuver the enemy and control the tempo of the battle. An attack helicopter and an armed scout helicopter are ideal weapons to fix the enemy on the non-linear battlefield. A helicopter is not stopped by minefield, rivers, or refuge columns. Attack helicopters have the ability to infiltrate, surprise, and strike the enemy on his flanks and rear with devastating results.

An aviation force is a versatile, lethal, and survivable force for contingency operations. A thorough comprehension of the capabilities and limitations of aviation and type aircraft available is necessary. This must be coupled with METT-T: Mission, Enemy, Terrain (and weather), Troops, Time Available. Reiterated, the force package must be designed and organized to accomplish the mission. Army aviation is flexible enough to concentrate forces in response to a local threat and it can be organized to facilitate the logistical support needed to preserve its effectiveness and protect itself.

Versatility, deployablility, and lethality were the keys to success in OPERATIONS URGENT FURY, JUST CAUSE, and DESERT SHIELD/DESERT STORM. Army aviation demonstrated its worth. Army Aviation lends many desirable qualities to early entry forces: deployability, lethality, survivability, and sustainability. Deployable--aviation units today are light enough today to deploy 100% by air or sea. Lethal--that allows an operational commander to quickly focus at a decisive point. Survivable--with some additional air defense assets and some field artillery assets it becomes a self-contained, self-protecting combat force. Sustainable--integrated with a slice of combat service support coupled with the ease of maintenance of the aircraft fleet, it can sustain itself. Army aviation forces arrive fresh, carry the fight to the enemy and, at a decisive place and time, finish rapidly and survive to fight the next battle.

Aviation performed numerous METL tasks in the operations that were part of the study. Army aviation validated most of its' METL during OPERATION DESERT/DESERT STORM. A significant conclusion that was found is that Army Aviation does not need to change its' METL but train to the different missions that are assigned across the operational continuum.

Recommendations

When I started this study I had the impression that the Army Aviation METL might have to be change. After analysis I feel strongly that the METL is adequate. What Army aviation needs to do is to train using the METL against the different scenarios that might be faced in the future. I also think that some aviation doctrine on employment of aviation assets needs to be updated in support of survivability. Preplan the augmentation needed to sustain aviation in this role and provide the necessary battlefield operating systems to aviation to make it survivable. As noted in Chapter 5 the capabilities of aviation were validated but the limitations are still apparent. Some recommendations for further study should focus on: intelligence, augmentation with ADA and other ground forces to provide protection of the trains, employment of aviation in adverse enviromental conditions, logistic support, command, control, and communications, and lastly airspace commnad and control. Finally, use Army Aviation in the early entry role to provide lethality and survivability to the early entry force.

Endnotes

CHAPTER 6

[1]US Army, Draft 11.5, Early Entry Lethality and Survivability Battle Dynamic Operations Concept, Fort Monroe, Va: HQ, TRADOC, Early Entry Lethality Survivability Battle Lab, (Dec1992), 16.

[2]U.S.Army, White Paper, Army Aviation Deployment Contingency Operations, (Final Draft), Fort Rucker, AL, United States Army Aviation Center, (July 1992), III-24.

APPENDIX

FIGURE 1

US Army, FM 1-100, Army Aviation In Combat Operations (Washington: Department of the Army, 1989)1-13. The following figure is an extract and depicts this continuum in a "Spectrum Of Conflict:"

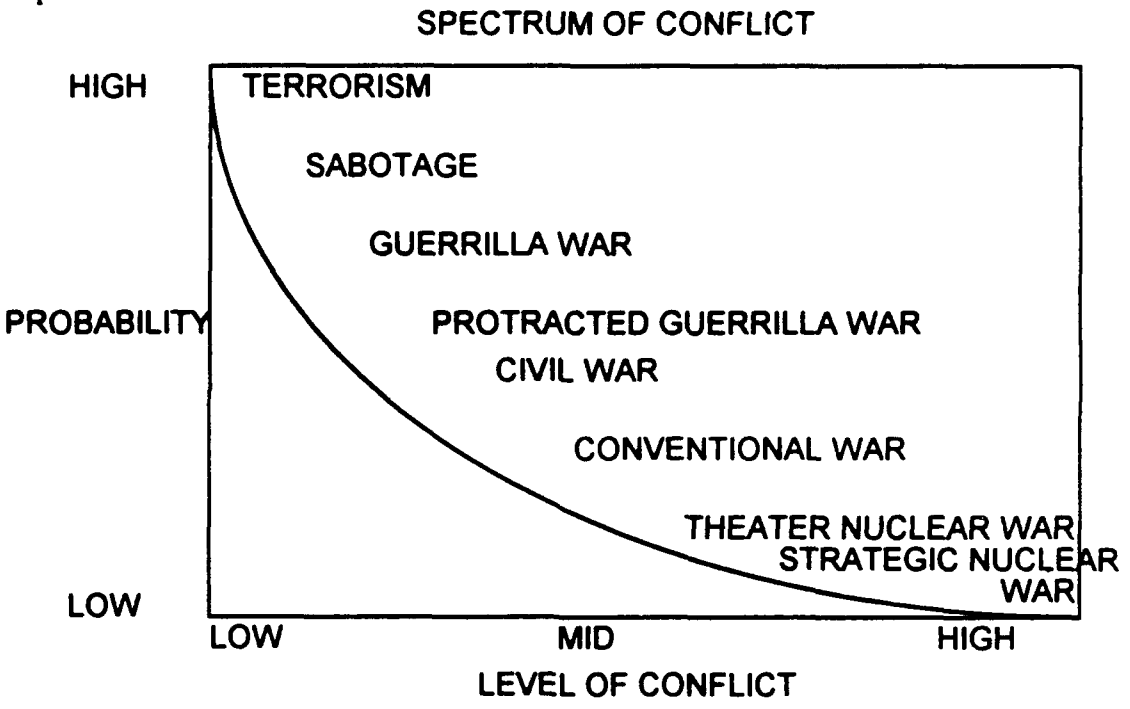
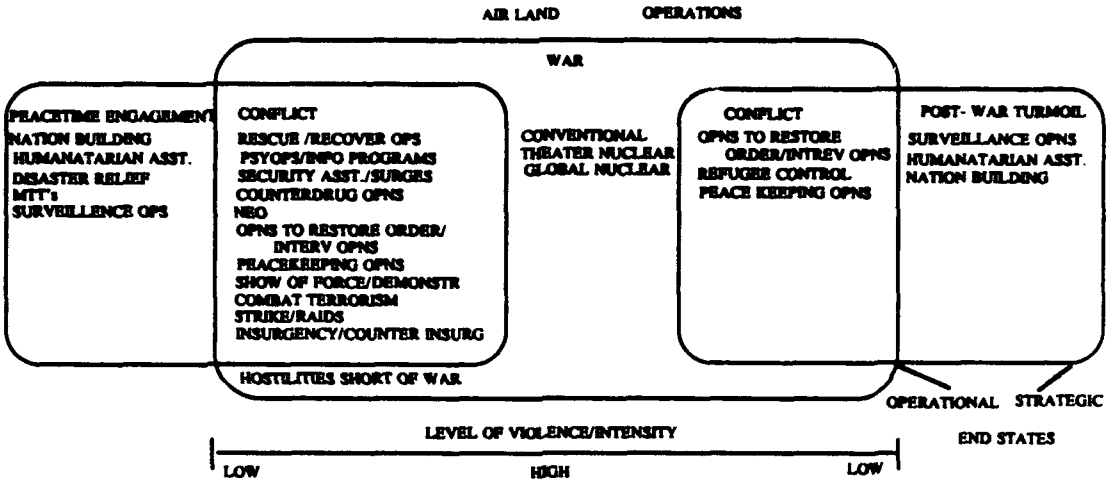


FIGURE 2

U.S. Army, White Paper, Army Aviation Deployment Contingency Operations

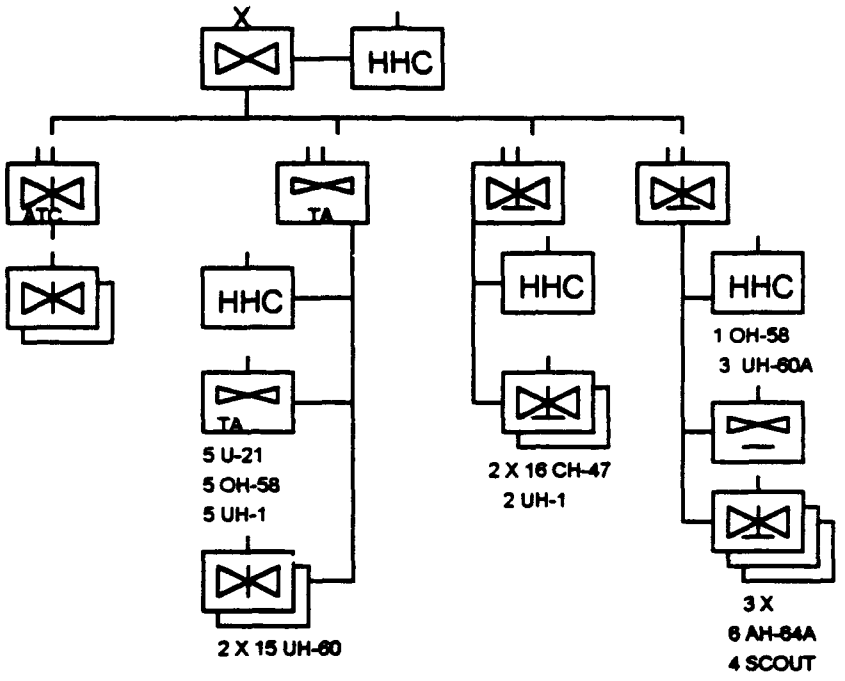


Operational Continuum

The wide spectrum of activities presents a difficult training challenge to Army aviation organizations. The operational environment may be classified as permissive, semi-permissive, or non-permissive. In a permissive environment, host country military and law enforcement agencies are in control and have the intent and capability to support US operations. In a semi-permissive, host governments do not have total effective control of the entire territory and population within the intended area of operations. In a non-permissive environment, hostile forces are in control and have both intent and capability to effectively oppose or react to the operations which the US intends to conduct. The order in which the operations are depicted on the chart is not intended to raise debate as to whether one type operation should be listed before or after another type. Rather, it is to show a general progression from non-hostile operations to hostile operations and, as appropriate, a return to non-hostile operations in what is termed "post-war turmoil."

FIGURE 3

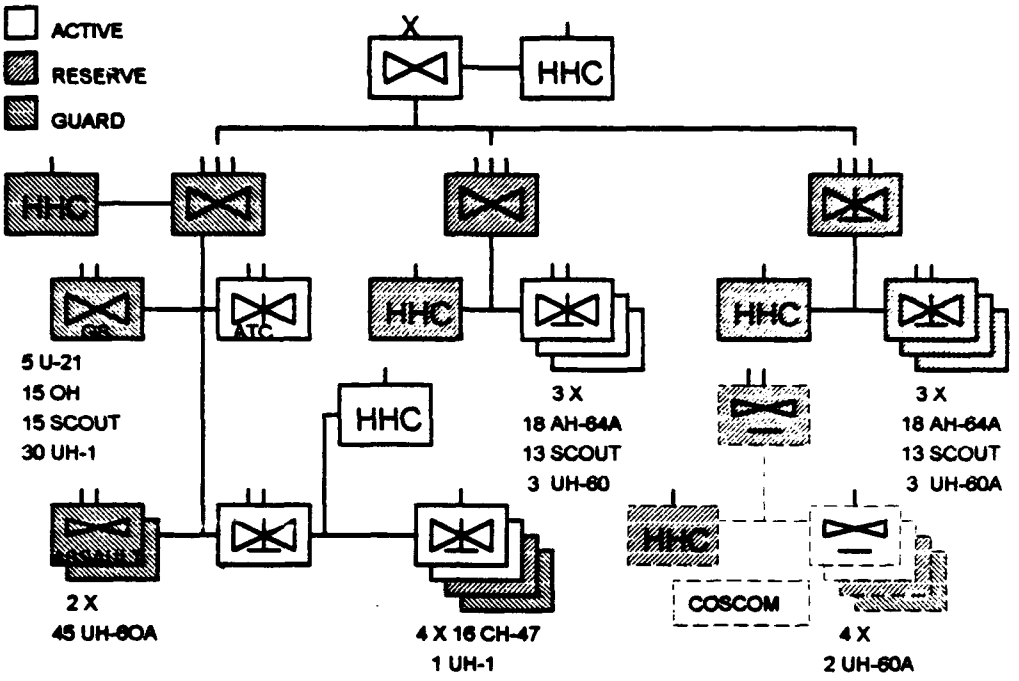
Echelons-Above Corps Aviation Brigade.



Taken from U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated).

Figure 4

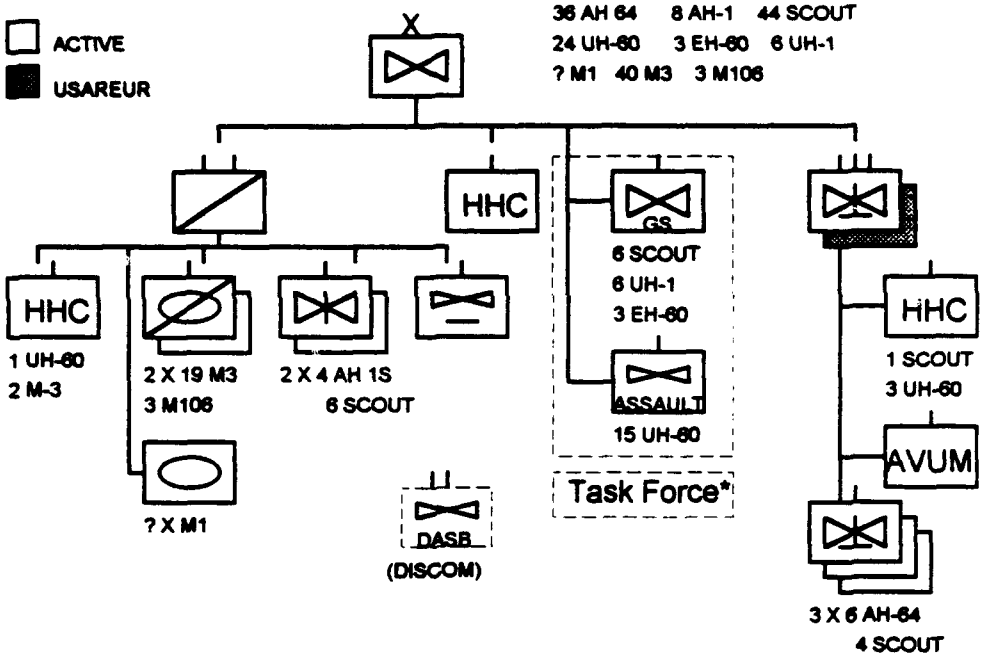
CORPS Aviation Brigade.



Taken from U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated).

FIGURE 5

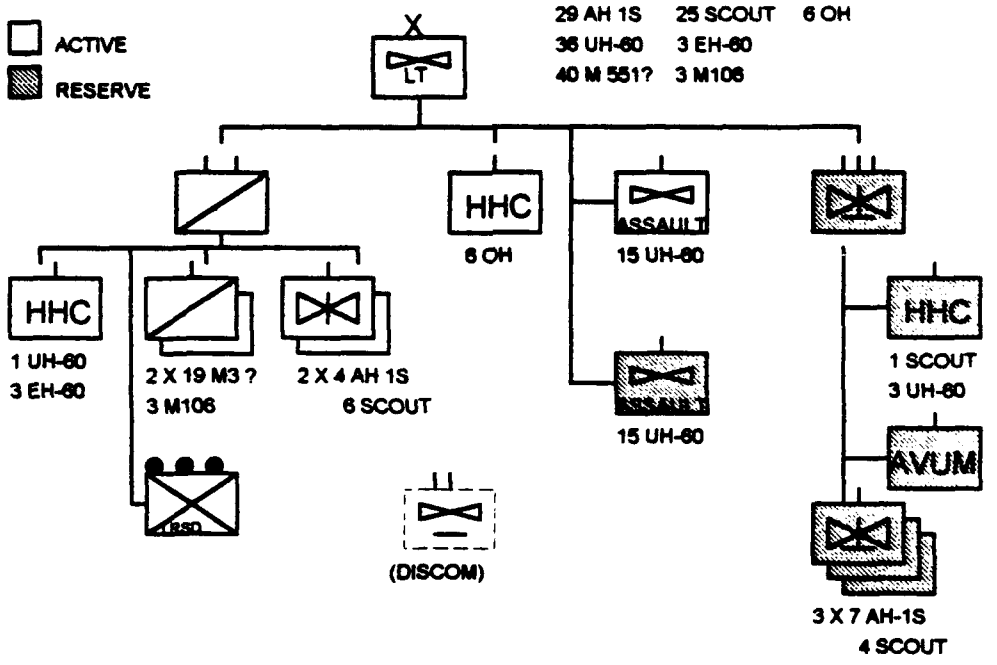
Heavy Division Aviation Brigade.



Taken from U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated).

FIGURE 6

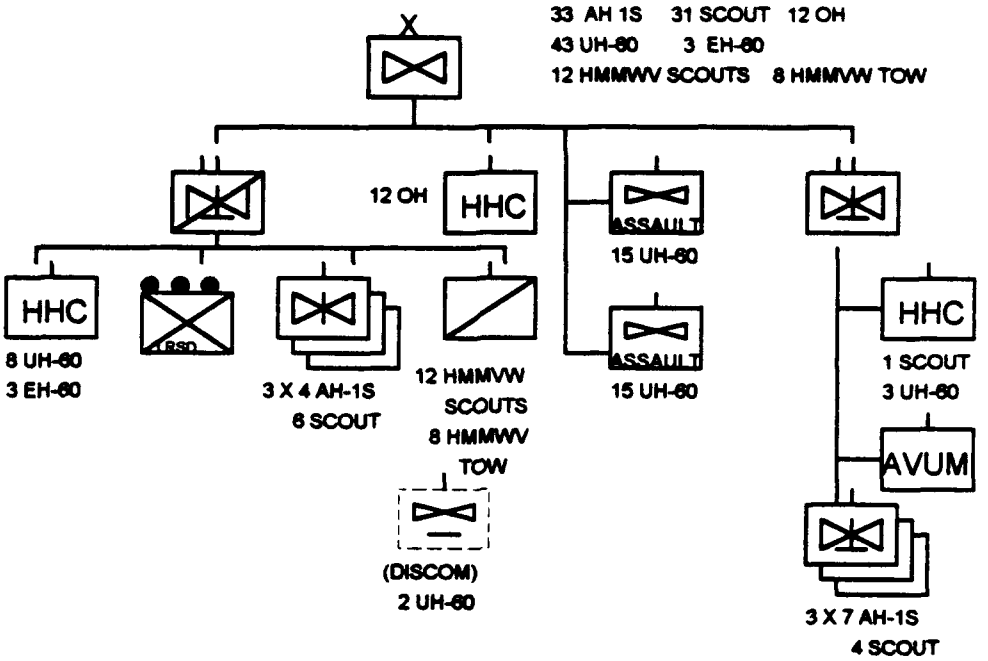
Light Division Aviation Brigade.



Taken from U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated).

FIGURE 7

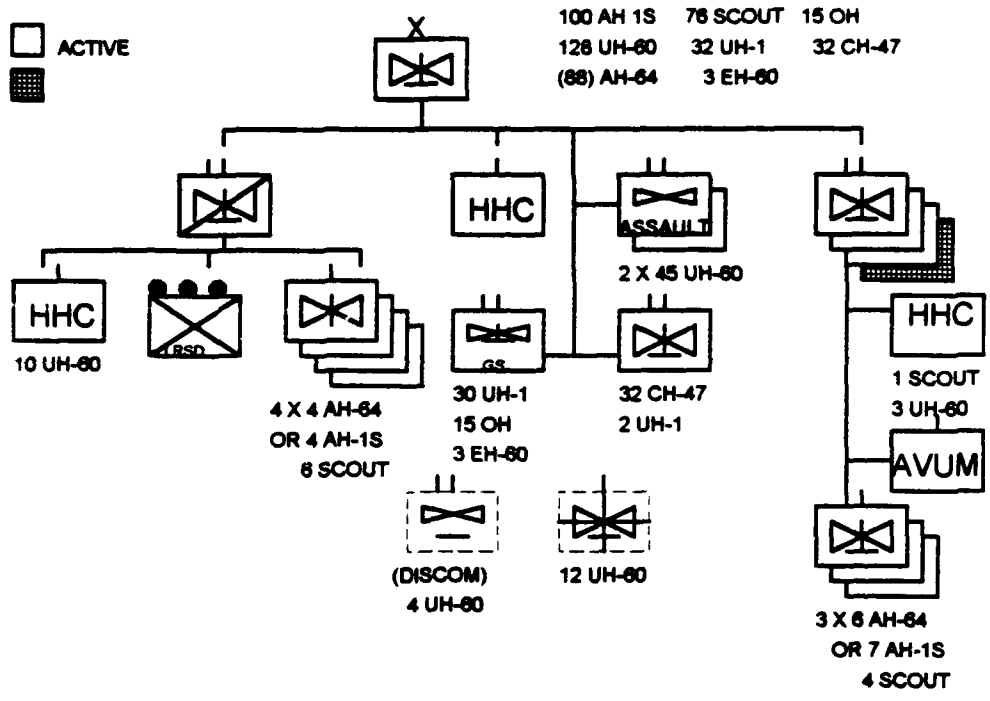
Airborne Division Aviation Brigade.



Taken from U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated).

FIGURE 8

Air Assault Aviation Brigade.



Taken from U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated).

FIGURE 9

AVIATION MISSION ESSENTIAL TASK LIST

METL	BRIGADE	CAV SQDN	ATK BN	ASSLT CO	CAC
TACTICALLY DEPLOY	X	X	X	X	X
COMMAND CONTROL, & COMMUNICATE WITH SUBORDINATES	X	X	X	X	X
CONDUCT RECON	X	X	X		X
AREA	X	X			
ZONE	X	X			
ROUTE	X	X	X		
NBC	X	X	X		X
CONDUCT SECURITY OPS	X	X	X		
SCREEN	X	X	X		
GUARD*	X				
COVER*	X				
CONDUCT ATTACK OPS	X	X	X		
HASTY	X	X	X		
DELIBERATE	X		X		
EXPLOITATION*	X		X		
PURSUIT*	X		X		
PROVIDE AIR ASLT SECURITY	X	X	X		
CONDUCT JAAT	X	X	X		
CONDUCT AIR CBT OPERATIONS	X	X	X	X	X
DEFEND*	X				

FIGURE 9 (continued)

METL	BRIGADE	CAV SQDN	ATK BN	ASSLT CO	CAC
DELAY*	X	X	X		
CONDUCT DIVER. OPNS (FEINT, DEMO)	X	X	X	X	X
CONDUCT A RAID	X	X	X		
CONDUCT AIR ASSAULT OPNS	X			X	
CONDUCT AIR MOVEMENT OPNS	X			X	
C3I ENHANCE. OPS	X	X		X	
CONDUCT BATTLE HANDOVER	X	X	X		
CONDUCT PASS. OF LINES	X	X	X	X	
CONDUCT SEAD/ JSEAD	X	X	X		
CONDUCT JOINT AND COMBINED OPNS	X	X	X		
DISTRIBUTE AND CONTROL DIRECT FIRES	X	X	X		
EMPLOY INDIRECT FIRE SPT	X	X	X		
AERIAL DELIVERY	X			X	
CONDUCT CONTINUOUS OPERATIONS	X	X	X	X	X

FIGURE 9 (continued)

METL	BRIGADE	CAV SQDN	ATK BN	ASSLT CO	CAC
SUSTAIN UNITS	X	X	X	X	X
RECONSTITUTE FORCES	X	X	X	X	X
CONDUCT IEW OPS	X				X
CONDUCT SAR	X	X	X	X	X
CONDUCT AIRCRAFT RECOVERY	X			X	
AUGMENT MEDEVAC	X			X	
CONDUCT OPS UNDER ADVERSE CONDITIONS					
NBC ENVIROM.	X	X	X	X	X
EW ENVIROM.	X	X	X	X	X
DAY/NIGHT	X	X	X	X	X
MARGINAL WEATHER	X	X	X	X	X

*When task-organized with ground maneuver units.

Taken from U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated).

FIGURE 10

Aviation Assessment (Urgent Fury).

AIRCRAFT	NUMBER
UH-60	32
UH-1	9
AH-1	25
OH-58	19

BATTLE DAMAGE
1 UH-60 Destroyed
1 UH-60 AVIM repair
4 UH-60 Depot repair

Impacts indicate the threat was 7.62mm in size. possible 12.7mm. Most of the hits were to the cockpit, cabin, aft fuselage, and tailboom. A few hits were noted in the main rotor head, no in the engine compartment, but some in the inlet covers and exhaust shrouds. There were no hits to the hydraulic flight control system above the cabin, and relatively few hits in main rotor blades or tail rotor blades.

Taken from Adkin, Major Mark. Urgent Fury, The Battle for Grenada, Lexington Books: D.C. Heath and Company, Lexington, Mass; 1989, 126.

FIGURE 11

TASK FORCE EAGLE TASK ORGANIZATION

1-228 AVN	
HHC/1-228AVN	3 C-12 F/W 2 UH-60 CINC
A/1-228 AVN	15 UH-60* *2 UH-60s atchd from 9th ID
B/1-228 AVN	14 UH-1H 8 OH-58A 8 CH-47C
C/1-228 AVN (AVIM)	1 UH-60 3 CH-47C ORF 2 UH-1H ORF
214th Medical Evac DET	6 UH-60
TASK FORCE HAWK	
CO(-)/3-123 AVN (ASLT)	15 UH-60
ATK HEL CO	7 AH-1E 4 OH-58

Taken from Smith, Douglas I., LTC, U.S. Army, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. Army War College, Carlisle Barracks Pennsylvania, (15 April 1992).

FIGURE 12

TF AVIATION ORGANIZATION.

TASK FORCE HAWK	
A/3-123 AVN (ASLT CO)	15 UH-60
B/1-123(-) AVN	5 AH-1E 3 OH-58C
A/1-228 AVN (ASLT CO)	18 UH-60*
*(E CO, 228 AVN UH-60 attached)	
TASK FORCE 1-228 AVIATION	
B/1-228 AVN CO (CAC)	15 UH-1 (w/ORF) 8 OH-58A 3 C-12
C/1-228 AVN (Medium Lift)	9 CH-47C (w/ORF)
TM/B/1-123 AVN (Atk Team)	2 AH-1E 1 OH-58C
214th Medical Det	15 UH-60 Med
Team WOLF	
B/1-82 AVN (AH-64A)	6 AH-64 3 OH-58C

Taken from Smith, Douglas I., LTC, U.S. Army, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. Army War College, Carlisle Barracks Pennsylvania, (15 April 1992).

FIGURE 13

Special Operations Aircraft.

Number	Type	Unit
11	AH-6 Gunships	Task Force 160
20	UH-60 Blackhawks	Task Force 160
5	MH-53 Pave Lows	1st Spec Opns Wing
4	MH-60 Pave Hawks	1st Spec Opns Wing
9	MH-6 Slicks	Task Force 160
3	CH-47D Chinooks	Task Force 160
2	MH-47	Task Force 160
5	UH-60	617th Spec Opns Avn Det

Taken from Smith, Douglas I., LTC, U.S. Army, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. Army War College, Carlisle Barracks Pennsylvania, (15 April 1992).

FIGURE 14

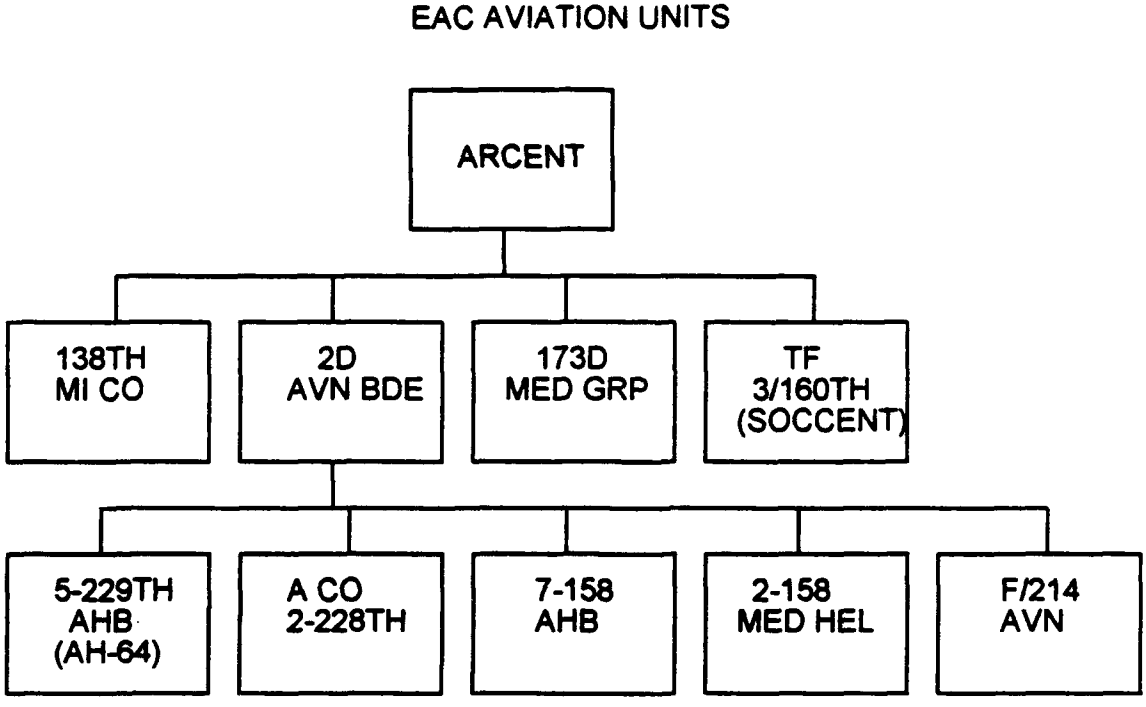
TF AVIATION D+2.

TASK FORCE HAWK	
A/3-123 AVN (ASLT CO)	15 UH-60
B/1-123 (ASLT CO)	11 UH-60
TASK FORCE 1-228 AVIATION	
A/1-228 AVN (ASLT CO)	18 UH-60*
*(E CO, 228 AVN UH-60 attached)	
B/1-228 AVN CO (CAC)	15 UH-1 (w/ORF)
	8 OH-58A
	3 C-12
C/1-228 AVN (Medium Lift)	9 CH-47C (w/ORF)
214th Medical Det	5 UH-60 Med
Team WOLF	
A/1-17 CAV (RECON)	4 AH-1E
	2 OH-58C
B/1-82 AVN (AH-64A)	11 AH-64
	3 OH-58C
B/1-123 AVN (Atk Team)	7 AH-1E
	3 OH-58C

Taken from Smith, Douglas I., LTC, U.S. Army, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. Army War College, Carlisle Barracks Pennsylvania, (15 April 1992).

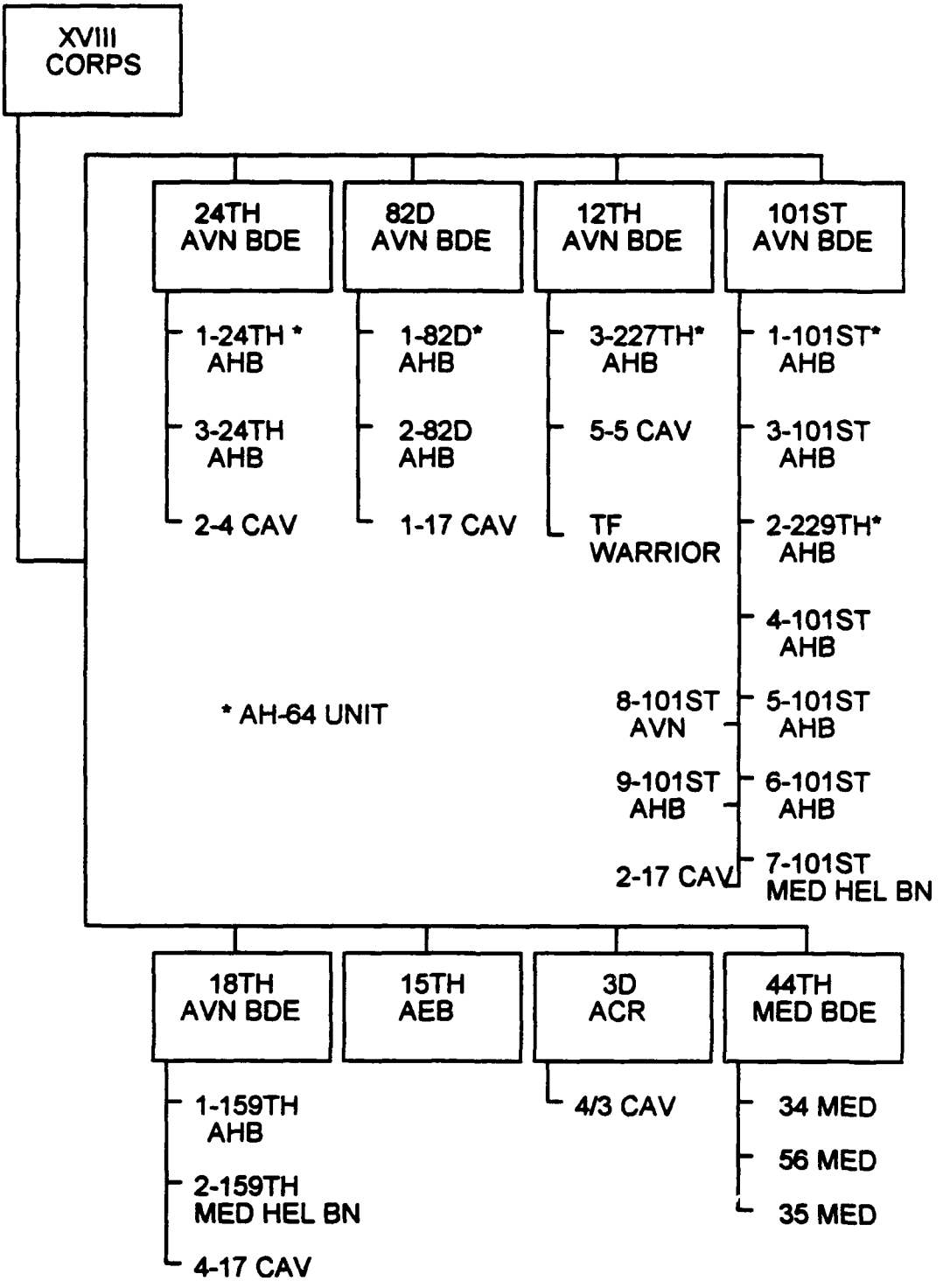
FIGURE 15

EAC Aviation Desert Shield/Desert Storm.



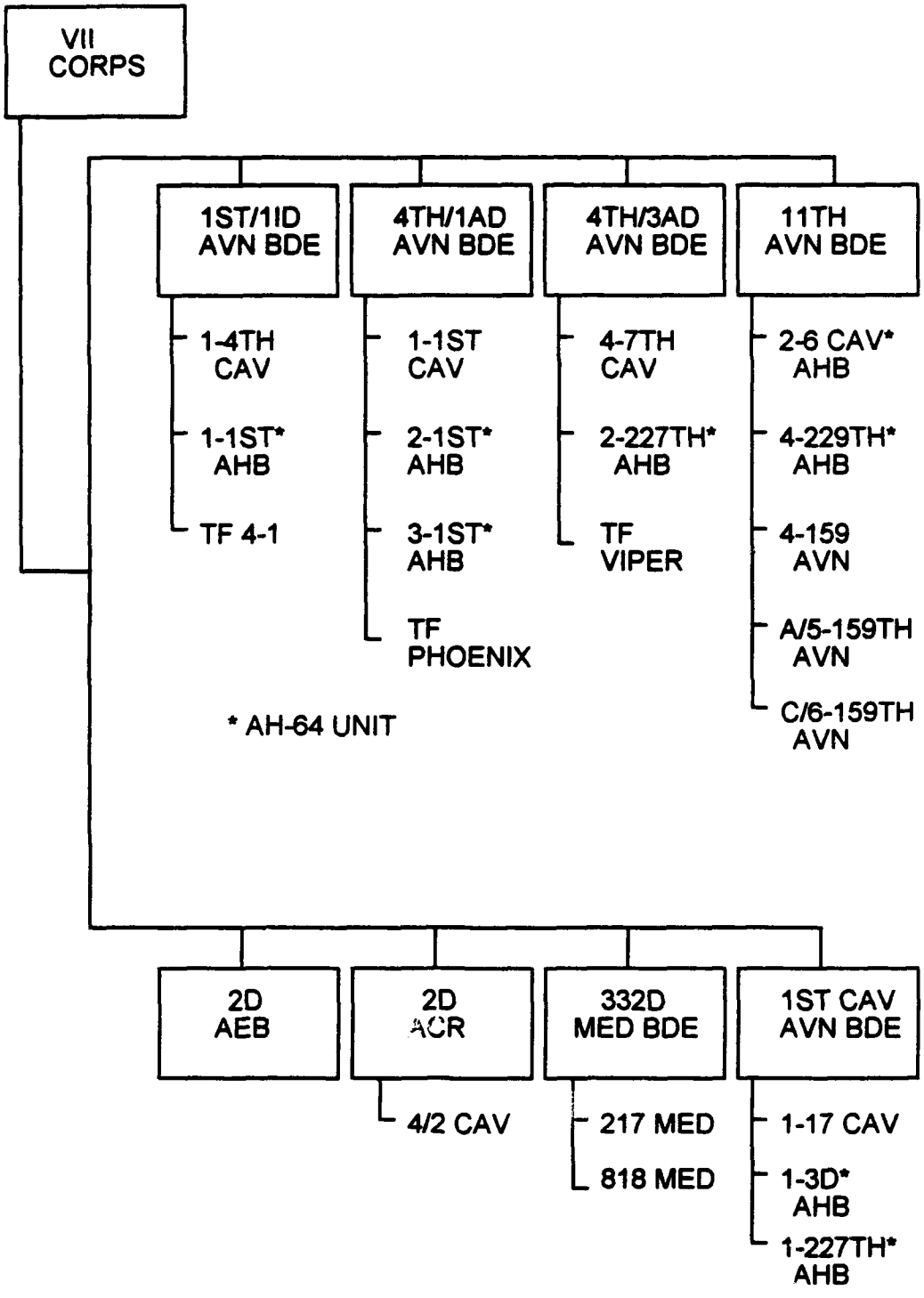
Taken from US Army, "Army Aviation Desert Shield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 92).

FIGURE 16
XVIII CORPS AVIATION (OPERATION DESERT SHIELD/DESERT STORM)



Taken from US Army, "Army Aviation Desert Shield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 92).

FIGURE 17
VII CORPS AVIATION UNITS (OPERATION DESERT SHIELD/DESERT STORM)



Taken from US Army, "Army Aviation Desert Shield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, [illegible] June 92).

FIGURE 18

AVIATION DENSITY Desert Shield.

DESERT SHIELD 1*		DESERT SHIELD 2**	
AH-1	82	AH-1	134
AH-64	142	AH-64	255
CH-47D	82	CH47D	167
EH-60	15	EH-60	27
OH-58	171	OH-58	325
OH-58D	58	OH-58D	92
OV-1	26	OV-1	30
RU-21	13	RU-21	12
UH-1	163	UH-1	364
UH-60	253	UH-60	426

*XVIII ABN CORPS
**XVIII CORPS PLUS UP AND VII CORPS

Taken from US Army, "Army Aviation Desert Shield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 92).

FIGURE 19

AVIATION MISSION ESSENTIAL TASK LIST Review

If we take a subjective look at the missions performed by aviation during the operations discussed we can examine the missions performed. The placement of the X is based on the review of the numerous sources used throughout this study. The intent of this study was not to include an example of each METL performed.

METL	URGENT FURY	JUST CAUSE	DESERT SHIELD/STORM	
TACTICALLY DEPLOY	X	X	X	
COMMAND CONTROL, & COMMUNICATE WITH SUBORDINATES	X	X	X	
CONDUCT RECON			X	
AREA			X	
ZONE			X	
ROUTE			X	
NBC				
CONDUCT SECURITY OPS				
SCREEN		X	X	
GUARD*		X	X	
COVER*		X	X	
CONDUCT ATTACK OPS				
HASTY	X	X	X	
DELIBERATE	X	X	X	
EXPLOITATION*			X	
PURSUIT*				X
PROVIDE AIR ASLT SECURITY	X	X	X	

FIGURE 19 (continued)

METL	URGENT FURY	JUST CAUSE	DESERT SHIELD/STORM
CONDUCT JAAT		X	X
CONDUCT AIR CBT OPERATIONS	X		X X
DEFEND*			X
DELAY*			
CONDUCT DIVER. OPNS (FEINT, DEMO)			X
CONDUCT A RAID	X	X	X
CONDUCT AIR ASSAULT OPNS	X	X	X
CONDUCT AIR MOVEMENT OPNS	X	X	X
C3I ENHANCE. OPS		X	X
CONDUCT BATTLE HANDOVER			X
CONDUCT PASS. OF LINES			X
CONDUCT SEAD/ JSEAD			X
CONDUCT JOINT AND COMBINED OPNS	X	X	X
DISTRIBUTE AND		X	X
CONTROL DIRECT FIRES			
EMPLOY INDIRECT FIRE SPT	X	X	X

FIGURE 19 (continued)

METL	URGENT FURY	JUST CAUSE	DESERT SHIELD/STORM
AERIAL DELIVERY	X	X	X
CONDUCT CONTINUOUS OPERATIONS	X	X	X
SUSTAIN UNITS	X	X	X
RECONSTITUTE FORCES	X	X	X
CONDUCT IEW OPS			X
CONDUCT SAR			X
CONDUCT AIRCRAFT RECOVERY	X	X	X
AUGMENT MEDEVAC	X	X	X
CONDUCT OPS UNDER ADVERSE CONDITIONS			
NBC ENVIROM.			
EW ENVIROM.			X
DAY/NIGHT	X	X	X
MARGINAL WEATHER			X

*When task-organized with ground maneuver units.

BIBLIOGRAPHY

Manuals

US Army. Field Manual 1-100, Army Aviation In Combat Operations, Washington D.C., HQ Department of the Army, 1989.

US Army. Field Manual 1-111, The Aviation Brigade, Washington D.C., HQ Department of the Army, 1985.

US Army. Field Manual 1-112, The Attack Helicopter Battalion, Washington D.C., HQ Department, 1986.

US Army. Field Manual 71-100, Division Operations, Washington D.C., HQ Department of the Army, 15 November 1988.

US Army. Field Manual 100-5, Operations, Washington D.C., HQ Department of the Army, 5 May 1986.

U.S.Army, Field Manual 100-5, Operations, (Preliminary Draft) Washington, D.C., Department of the Army, (21 August 1992) 3-7.

US Army. Field Manual 100-15, Corps Operations, Washington D.C., HQ Department of the Army, 15 November 1988.

US Army. Field Manual 100-25, Military Operations In Low Intensity Conflict, Washington D.C., HQ Department of the Army, 5 December 1990.

US Army. Field Manual 101-5, Staff Organizations and Operations, Washington D.C., HQ Department of the Army, 25 May 1984.

US Army. Field Manual 101-5-1, Operational Terms and Graphics, Washington D.C., HQ Department of the Army, 1986.

US Army. Field Manual 101-10-1/2, Staff Officers' Field Manual Organizational, Technical, and Logistic Data Planning Factors (Volume 2), Washington D.C., 7 October 1987.

US Army, Forces/Capabilities Handbook, Carlisle Barracks, PA, U.S. Army War College, 21 September 1988.

U.S. Army, TRADOC Pam 525-5, AIRLAND OPERATIONS, Fort Monroe, VA., Deparment of the Army, Headquarters United States Army Training and Doctrine Command,(1 August 1991).

Armed Forces Staff College, AFSC Pub 1, The Joint Staff Officer's Guide 1991,(National Defense University, Armed Forces Staff College, Norfolk Va. 1991) 7-39 and 7-40.

Student Text 63-1, Airland Battle Sustainment Doctrine (Division and CORPS), Fort Leavenworth, KS, U.S. Army Command and General Staff College, 1 June 92.

Student Text 100-3, Battle Book, Fort Leavenworth, KS, U.S. Army Command and General Staff College, 1 April 92.

Student Text 101-6, G1/G4 Battle Book, Fort Leavenworth, KS, U.S. Army Command and General Staff College, 1 June 92.

Student Text 100-9, The Command Estimate. Fort Leavenworth, KS, U.S. Command and General Staff College, July 1992.

Books

Adkin, Major Mark. Urgent Fury, The Battle for Grenada, Lexington Books: D.C. Heath and Company, Lexington, Mass; 1989, 126.

Bellamy, Chris. The Future of Land Warfare, New York, NY, St. Martin's Press, 1987.

Donnelly, Thomas, Margaret Roth, and Caleb Baker. OPERATION JUST CAUSE: The Storming of Panama, (New York: Lexington Books, 1991) 215-235;

Fuller, J.F.C. Armored Warfare, Harrisburg, PA, The Telegraph Press, 1943.

Kaufmann, William. The McNamara Strategy, (New York: Harper & Row, 1964)

Liddell Hart, Basil H., Strategy, New York, NY, Praeger Publishers, 1967.

Paret, Peter. Makers of Modern Strategy, Princeton, NJ, Princeton University Press, 1941.

Simpkin, Richard E. Antitank: An Airmechanized Response to Armored Threats in the 90's, Oxford, Brassey's Publishers, Ltd,1982.

Articles

Bond, David F. "Apache Helicopter Proves Reliability To Rebut Reputation for Deficiencies." Aviation Week & Space Technology, (March 4, 1991), 25.

Brown, Frederic J. "AirLand Battle Future-The Other Side Of The Coin," Military Review, (February 1991), 2-11.

Burba, Edwin H., Jr. "Gulf Crisis Demonstrates the Need for Contigency Force Vesatility." Army, (October 1990), 46-54.

Colucci, Frank. "Rehearsal Reaps Rewards," Defence Helicopter, (June-July 1990): 18-24.

Hughes, David. "Night Invasion of Panama Required Special Operations Aircraft, Training," Aviation Week and Space Technology, (19 February 1990) 61.

Grier, Peter. "U S Army Opened Eay for Air War." The Christian Scientist Monitor, (March 27, 1991) p 8 col 2.

Goodrich, Lawrence J. "Army Faces Days of "Glanost," Lean Budget." The Christian Science Monitor, (Nov 20, 1989) p1 col 1.

Gordon, Michel, et. al. "Army, Facing Cuts, Reported Seeking to Reshape Itself." The New York Times, (DEC 12 1989) pA1(N) pA1(L) col 6.

_ _____. "Army and Air Force Fix Sights On the Changing Face of War." The New York Times, (MAY 21, 1990) pA1(N) pA1(L) col 1.

Fulghum, David A. "U.S. Army Aviation to Assume Frontline Role in Saudi Arabia." Aviation Week & Space Technology, (October 15, 1990) 80-81.

Mann, Paul. "Mammoth Air/Ground Assault Defeats Iraq in Gulf War." Aviation Week& Space Technology, (March 4, 1991) 20-22.

Mundy, Carl E., Jr. "Capabilities Are Key to US Forces Reorganization." Armed Forces Journal International, (October 1992) 52-56.

Otis, Glen K. "Our Deployment into the Persian Gulf--Three Views." ARMY, (November 1990), 11-13.

Ostovich, Rudolph III. "Army Aviation in AirLand Battle Future." Military Review, (February 1991) 25-29.

Ostovich, Rudolph III, Major General, U.S. Army, "Aviation"s Contribution to the War in the Gulf," United States Army AVIATION DIGEST, (March/April 1991) 1.

Ostovich, Rudolph III, "Contingency Warfare: Our Strong Suit," ARMY AVIATION, (31 October 1990).

_____. "Army Aviation: Lethal, Versatile, Deployable." ARMY, (August 1990) 21-24.

Pasztor, Andy. "Army Helicopter Pilots Are Preparing To Play Big Role In Ground Offensive." The Wall Street Journal, (Tuesday, January 22, 1991) pA10(w) pA16(E0 col 1.

Silvasy, Stephen, Jr. "AirLand Battle Future: The Tactical Battlefield." Military Review, (February 1991), 2-12.

Sullivan, Gordon. "How the Army Sees a New World." The Washington Post, (Feb 23, 1992), pC3 col 3.

Summers, Harry G. "A lonely March into a New Era." Los Angeles Times, (April 20'90).

_____. "AirLand Battle: Next Stage Crucial." Los Angeles Times, (Feb 11, 1991), pA8 col 3.

_____. "The Army is a Juggernaut, Not a Light Brigade." Los Angeles Times, (Aug 27, 1989), sec V p5 col 1.

Vuono, Carl E. General U.S. Army, "The Strategic Army," VITAL SPEECHES OF THE DAY, Vol LVI, No. 6, (January 1, 1990) ,165-169.

Yates, Lawrence A. "Joint Task Force-Panama: JUST CAUSE--Before and After," Military Review, 10 (October) 59.

After Action Reports/Reviews

US Army, U.S. Army Aviation Center, "Operation Desert Shield/Storm After Action Report," (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 22 November 1991), 3.

US Army, "Army Aviation Desert Shield/Storm" (Fort Rucker, AL, HQ, US Army Aviation Center and Fort Rucker, 8 June 92), 585.

U.S. Army, BULLETIN, Introduction to Low Intensity Conflict, Fort Leavenworth, KS. Center For Army Lessons Learned, Combined Arms Training Activity, Fort Leavenworth, 90-4 (May 90), 12.

U.S. Army, OPERATION URGENT FURY ASSESSMENT (UNCLASSIFIED), Fort Leavenworth, KS., US Army Training and Doctrine Command, Combined Arms Center, (1985), XI-5.

Drabszuk, Gary, Major U.S. Army, "214th Medical Detachment: Operation Just Cause," AAR, (214th Medical Detachment, U.S. Army South , Panama, 1990).

Manuscripts

Bendyk, John C. "Detailed Planning Consideration fo Divisional Attack Helicopters in the Division Deep Battle, A defensive Operation Perspective." Fort Leavenworth , KS: MMAS Thesis 1989.

Crawford, Darrell E. "Airmechanization: Determining its Tactical Viability on the AirLand Battlefield." Fort Leavenworth, KS: AMSP Monograph, 1989.

Hood, Carlton, L. "Determining the Optimum Aviation Organization for the Operational Level of War." Fort Leavenworth, KS, MMAS Thesis, 1948.

Inman, Michael T. "Operational Maneuver in the 90's: Is Army Aviation a Viable Option?." Fort Leavenworth, KS, AMSP Monograph, 1990.

Long, Clyde, L. "Synchronization of Combat Power at the Task Force Level: Defining a Planning Methodology." Fort Leavenworth KS, MMAS 1989.

Mason, Bradley J. Major, U.S. Army, "Assault Helicopter Contingency Operations: The Fine Line Between Peace and War." School of Advance Military Studies Monograph, U.S. Army Command and General Staff College, 1991.

Mowery, James L. "The Division Aviation Brigade: Operational or Tactical?" Fort Leavenworth, KS, SAMS Monograph, 4 May 1987,

Packett, Virgil L. II, "Airmechanization: The Direction and Dynamics of Army Aviation from a Combined Arms Perspective." Fort Leavenworth, KS, MMAS Thesis, 1985.

Simmons, James E. "Army Aviation: Does It Provide an Answer to Operational Manuver in the Central Region?" Fort Leavenworth, KS SAMS Monograph, 1990.

Sinclair, E. J. "Air Attack Division: AirLand Battle Futre's Operational Contigency Force." Fort Leavenworth, KS, SAMS Monograph, 5 May 91.

Smith, Douglas I. LTC, U.S. Army, "ARMY AVIATION IN OPERATION JUST CAUSE," U.S. Army War College, Carlisle Barracks Pennsylvania, (15 April 1992), 9.

Tiberi, Paul, et. al.. "Gathering the Storm: Contigency Planning and Force Projection." The Land Warfare Papers No.7 September 1991, The Institute of Land Warfare, Arlington ,VA.

Miscellaneous

U.S. Army, White Paper, Army Aviation Deployment Contingency Operations, (Final Draft), Fort Rucker, AL, United States Army Aviation Center, (July 1992) I-3.

US Army, Strike Operations Handbook for Commanders, (Coordinating Draft), (Fort Leavenworth, KS CTAC, Comand and General Staff College, 23 March 1990)1-1.

U.S. Army, Command and General Staff Officer Branch Specific Training, Fort Rucker, AL., United States Army Aviation Center, Directorate of Training and Doctrine, Advance Tactics Branch, Combined Arms Division, (Not dated), 385.

US Army, Draft 11.5, Early Entry Lethality and Survivability Battle Dynamic Operations Concept, Fort Monroe, Va: HQ, TRADOC, Early Entry Lethality Survivability Battle Lab, (Dec1992)1.

Stiner, Carl. "Operation JUST CAUSE" presentation, Army Aviation Ball, Fort Rucker, AL, April 1990.

Terrell, Douglas. Operation JUST CAUSE, recorded by Terry Coakley, 40 min., Army Aviation Association of America, 1990, videocassette.

The White House, National Security Of The United States August 1991, (Washington, D.C., U.S.Government Printing Office, 1991), 1.

INITIAL DISTRIBUTION LIST

1. Combined Arms Research Library
U.S. Army Command and General Staff College
Fort Leavenworth, KS 66027-6900

2. Defense Technical Information Center
Cameron Station
Alexandria, VA 22314

3. Lieutenant Colonel Wiliam V. Backlund
Center For Army Tactics
U.S. Army Command and General Staff College
Fort Leavenworth, KS 66027-6900

4. Lieutenant Colonel Wayne Randolph, LTC
Department Of Sustainment And Resourcing Operations
U.S. Army Command and General Staff College
Fort Leavenworth, KS 66027-6900

5. Major Michael R. Payne
1231 Par 4 Road
Kalamazoo, MI 49008

6. HQ TRADOC
ATCD-L, ATTN: MAJ Miller
Early Entry Lethality Survivability Battle Lab
Fort Monroe, VA 23651-5000

7. CDR, USAAVNC
ATTN: ATZQ-TDC, ATTN: COL BURKE, DOTD
Fort Rucker, AL 36362-5000

8. Lieutenant Colonel Bill Bryan
P.O. Box 620753
Fort Rucker, AL 36362