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BEYOND KARBALA:
THE U.S. ARMY'S APPROACH TO APACHE DOCTRINE

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ABSTRACT

In the last decade the U.S. Army has faced significant criticism of the AH-64 Apache in the deep strike role. This criticism has largely centered on what were widely perceived to be the failure of both Task Force (TF) Hawk during the Kosovo campaign of 1999 and the deep strike raid on the Medina Armored Division near Karbala, Iraq in 2003. The failures of both Task Force Hawk and the raid on Karbala to achieve any meaningful effects, coupled with the significant costs of both missions, lead many to conclude that the Apache capability had become an expensive relic of the Cold War requirement to fight Soviet Armor in Western Europe. As a consequence of these high profile mission failures, both academics and members of the U.S. defence community have called for the U.S. Army to relinquish the deep strike mission profile.

As a counterpoint to the criticism of the Apache in the deep strike role, doctrinal adaptation by U.S. Army Aviation during stability operations in both Iraq and Afghanistan has successfully refocused the capability on the close support mission. While the change in mission focus has muted some of the criticism aimed at the capability, the doctrinal adaptation that supported this resurgence did not necessarily signal the U.S. Army's intent to abandoned operations in depth.

Doctrinal adaptation by U.S. Army has deconstructed both the concept of deep close and rear battlespace and linear and non-linear areas of operation. The subsequent adoption of a new paradigm in which battlespace is divided into only contiguous and non-contiguous areas of operations has refocused U.S. Army Aviation on close support while maintaining the ability to conduct a full spectrum of operations including operations in depth in support of formation maneuver.

This paper will demonstrate that doctrinal adaptation by the U.S. Army in response to the pragmatic requirements of the battlefield has occurred episodically throughout the history of the U.S Army Attack Helicopter and that based on current doctrine and emerging technologies, the U.S. Army has postured the Apache capability to effectively support operations across the full spectrum of conflict including shaping operation in depth.

LIST OF ACRONYMS

AAC	Army Air Corps
AAH	Advanced Attack Helicopter
AH	Attack Helicopter
AGF	Anti Government Forces
AUAV	Armed Uninhabited Aerial Vehicle
ATACMS	Advanced Tactical Missile System
ATGM	Anti-Tank Guided Missile
ATKHB	Attack Helicopter Battalion
CAS	Close Air Support
COIN	Counter Insurgency Operations
CCA	Close Combat Attack
DTTP	Doctrine Tactics, Techniques and Procedures
FCR	Fire Control Radar
HPT	High Pay off Target
HVT	High Value Target
IA	Interdiction Attack
ISR	Intelligence Surveillance and Reconnaissance
JAAT	Joint Air Attack Team
JAM	Jaish al-Mahdi
FCR	Fire Control Radar
FEBA	Forward Edge of the Battle Area
FLOT	Forward Line of Own Troops
FM	Field Manual

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List of Acronyms (Continued)

MANPADS	Man Portable Air Defense System
MLRS	Multiple Launch Rocket System
MUM-T	Manned Unmanned Teaming
NATO	North Atlantic Treaty Organization
NEO	Non-combatant Evacuation Operations
NOE	Nape of the Earth
NVA	North Vietnamese Army
OEF	Operation Enduring Freedom
OIF	Operation Iraq Freedom
ROE	Rules of Engagement
ROI	Rules of Interactions
RPAS	Remotely Piloted Aircraft System
RFI	Radio Frequency Interferometer
SASO	Stability and Security Operations
SEAD	Suppression of Enemy Air Defense
SA	Situational Awareness
TF	Task Force
TIC	Troops in Contact
UAV	Uninhabited Aerial Vehicle
UAS	Unmanned Aircraft System
X-FLOT	Crossing Forward Line of Own Troops

INTRODUCTION

In the last decade the U.S. Army has faced significant criticism of the AH-64 Apache in the deep strike role. This criticism has largely centered on what were widely perceived to be the failure of both Task Force (TF) Hawk during the Kosovo campaign of 1999 and the deep strike raid on the Medina Armored Division near Karbala, Iraq in 2003. The failures of both Task Force Hawk and the raid on Karbala to achieve any meaningful effects, coupled with the significant costs of both missions, lead many to conclude that the Apache capability had become an expensive relic of the Cold War requirement to fight Soviet Armor in Western Europe. As a consequence of these high profile mission failures, both academics and members of the U.S. defence community have called for the U.S. Army to relinquish the deep strike mission profile.

As a counterpoint to the criticism of the Apache in the deep strike role, doctrinal adaptation by U.S. Army Aviation during stability operations in both Iraq and Afghanistan has successfully refocused the capability on the close support mission. While the change in mission focus has muted some of the criticism aimed at the capability, the doctrinal adaptation that supported this resurgence did not necessarily signal the U.S. Army's intent to abandoned operations in depth. This paper will demonstrate that doctrinal adaptation by the U.S. Army in response to the pragmatic requirements of the battlefield has occurred episodically throughout the history of the U.S Army Attack Helicopter and that based on current doctrine and emerging technologies, the U.S. Army has postured the Apache capability to effectively support operations across the full spectrum of conflict including shaping operation in depth.

In order to explain the context in which both the Apache and associated doctrine has developed, this paper will briefly examine the birth of the nascent operational helicopter during World War II through to the evolution of a helicopter capable of providing fires during the Vietnam War. The development of the attack helicopter (AH) in response to the requirements of both the Vietnam War and Cold War and the interrelationship between these requirements will be explored. The progression of a fully articulated anti-armor helicopter capability designed to address the mismatch of Soviet and Western armor in Europe will be discussed in order to set the stage for an explanation of the development of the Apache and associated doctrine of deep strike battalion sized anti-armor operations.

Apache success in the Gulf War will be discussed in order to highlight a number of key assumptions that lead to the post-Cold War configuration of AH doctrine. This paper will demonstrate that U.S. Army AH doctrine used during the Gulf War was based on the conceptualization of the battlespace in linear contiguous Cold War terms. This doctrine was widely considered successful based only on limited operations of the Gulf War, the most widely published of which was the opening engagement of the ground war by Task Force Normandy. Given the nature of the TF Normandy mission it will argued that the mission was not fully representative of the high intensity war fighting environment envisioned by deep strike doctrine. The perception of unqualified success by U.S Army attack helicopters resulted in the enshrining of a doctrine designed for battalion size deep strike against massed enemy armor. This paper will demonstrate that while the doctrine used during the Gulf war succeeded within the constraints of the short ground war that characterized the Gulf War it was at odds with the wider post-Cold War

conflict environment and that this approach to AH operations would subsequently result in the failure of TF Hawk.

In order to support the case for the misalignment of Cold War doctrine and the post-Cold War conflict reality, the U.S. Army's 1999 deployment of 24 Apaches to Albania as Task Force Hawk will be discussed in detail. The U.S. Army approach to Suppression of Enemy Aid Defence (SEAD) will be discussed in order to demonstrate that the intent to use indirect fires from U.S Army Multiple Launch Rocket Systems (MLRS) and Advanced Tactical Missile System (ATACMS) was not consistent with the post-Cold War conflict environment that characterized the Kosovo conflict. This paper will also demonstrate that the failure of the U.S. Army to evolve doctrine based on the lessons learned from the TF Hawk experience was a precondition of the subsequent failure of the deep strike raid on the Republican Guard's Medina Division in the outskirts of Karbala during the 2003 invasion of Iraq. Additionally, the 1999 United Kingdom doctrine in support of the Apache operations will be briefly examined in order to add context to the post Task Force Hawk discourse and to further strengthen the link between the aircraft capability and the associated doctrine that framed the employment of the Apache prior to the Operation Iraqi Freedom (OIF).

In order to further explore the doctrinal environment that characterized the failure of the raid on Karbala, the early stages of Operation Enduring Freedom (OEF) in Afghanistan will be examined. The success of Apache fire support during the 2002 Operation Anaconda will be highlighted in order to demonstrate U.S. Army Aviation's

ability to adapt to the pragmatic requirements of the battlefield. This ability to adapt will provide a further counterpoint to subsequent raid on Karbala during OIF.

The U.S. Army's failure during the raid on Karbala during OIF will be examined in detail in order to both demonstrate the limitations of the deep strike doctrine system of the time and to set the conditions for an explanation of the subsequent doctrinal shift that occurred. The reliance on MLRS and ATACMS as SEAD in the nonlinear non-contiguous battlespace that characterized OIF before the fall of Bagdad was based on the incoherent doctrine that had remained in place since the Gulf War. Additionally this paper will propose that the initial response to the failed raid was the rapid adjustment of tactics but a measured response in terms of doctrinal adaptation.

The doctrinal changes driven by the U.S. Army in the wake of the Karbala mission will be examined in detail. The deconstruction of both the concept of deep close and rear battlespace and linear and non-linear areas of operation has resulted in the adoption of a new paradigm. Divided into only contiguous and non-contiguous areas of operations this new paradigm has refocused U.S. Army Aviation on close support while maintaining the ability to conduct a full spectrum of operations. Accordingly, this new conceptualization of the battlespace includes operations in depth in support of formation maneuver.

In developing a case for future U.S. Army Apache operations in depth, British Apache operations during the 2011 NATO intervention in Libya will be discussed. An examination of British Army Air Corps (AAC) Apache involvement in the Libya will demonstrate that operations in depth on a non-contiguous battlefield can be successfully

conducted in a relatively robust air defense environment. Using Joint SEAD and the aircrafts organic systems, British Apaches were able to use precision fires to strike targets that might otherwise not have been accessible.

Contemporary Apache operations will be examined in order to add context to the doctrinal discussion. Stability operation in Afghanistan and Iraq will be discussed in order to both highlight the success of the capability in the post-cold war conflict environment as well as link emerging technologies to future operations. Finally, this paper will demonstrate that while recent doctrine has deemphasized indirect fires from ATACMS and MLRS as SEAD in support of operations in depth, the U.S. Army's has recognized the value of Unmanned Aerial Vehicle (UAV) and Manned Unmanned Teaming (MUM-T) technology in filling the capability gap that has resulted.

Few will argue that the AH-64 is not one of the most high profile weapons system in the U.S Army inventory and recent operations in Iraq and Afghanistan continue to shine a spotlight on the capability. The attack helicopter and the doctrine that supports it have evolved episodically since their initial use during the Vietnam War. The most recent adaptation of the Apache and associated doctrine by the U.S. Army particularly in light of the emerging technologies of UAV and MUM-T, has postured the Apache capability to effectively support operations across the full spectrum of conflict including shaping operations in depth.

CHAPTER ONE - DEVELOPMENT OF THE APACHE CAPABILTY

1.1. Introduction

The following chapter explores the development of the U.S. Army attack helicopter capability and associated doctrine from the Second World War to the end of the First Gulf War. The development of the AH-1 Cobra helicopter and later AH-64 Apache will be related to the evolution of air mobility and anti-armor doctrine. The development of the AH-1 Cobra in response to the pragmatic requirement for fires in support of airmobile operations in Vietnam will be discussed in order to highlight the tension between the requirement for a relatively simple attack helicopter, designed to provide intimate fire support to ground forces in contact and the requirement for more sophisticated Anti-Armor helicopters. The chapter will go on to examine the evolution of Deep Strike doctrine in response to the Soviet Armor threat in Europe that resulted in the development and fielding of the Apache. Apache success in the First Gulf War will be discussed in order to highlight a number of key assumptions that lead to the post-Cold War configuration of the Apache Attack Helicopter System.

By the end, this chapter will have demonstrated that the evolution of Apache attack helicopter system and the associated Deep Strike doctrine used in the First Gulf War was based on the conceptualization of the battlespace in Cold War terms. The imagining of a near linear and echeloned battlefield meshed well with the Iraqi way of war in 1991 and as a result the AH-64 enjoyed a success that cemented an inflexible doctrine of battalion size deep strike against massed enemy armor.

1.2. Early Helicopter Employment

The use of the helicopter as a practical aircraft for military operations dates to the Second World War. Both Allied and Axis forces developed rudimentary helicopters used primarily for the light aviation tasks and rescue missions in denied or austere locations. By the end of the War, the United States had obtained over 400 Sikorsky R-4 and R-6 helicopters the operational highlight of which was their use in support of casualty evacuation in Burma.[1] Given the density of armed aircraft during the war little consideration was given to arming helicopters with the exception of some minor experimentation.[2]

With the creation of the USAF in 1947, parochial issues soon began to pre-empt any rapid post-war development of a helicopter that could provide fires in support of the Army. In 1948, Secretary of Defense, James V Forrestal, issued the policy paper titled "Functions of the Armed Services and Joint Chiefs of Staff." [3] Commonly known as the Key West Agreement the document limited the U.S Army to "such aviation…as may be organic therein." Based on this agreement and subsequent agreements between the U.S. Army and USAF, army aviation was essentially limited to light aircraft in observation and liaison roles.[4] As a result, while the Korean conflict saw the nascent use of helicopters to maneuver troops on the battlefield and medical evacuation of wounded

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[1] Matthew Allen, *Military Helicopter Doctrines of the Major Powers: 1945-1992, Making Decisions About Air-Land Warfare*. (Westport: Greenwood Press. 1993), 3.

[2] James Bradin, *From Hot Air to Hellfire: The History of Army Attack Aviation*. (Novato: Presidio Press, 1994), 61.

[3] Walter J Boyne, *How the Helicopter Changed Modern Warfare.* (New York: Pelican Publishing, 2011), 56.

[4] *Ibid.*, 57.

troops saved thousands of lives, little effort was made to use helicopter in the fire support role.[5]

In 1956 General Hutton, the U.S. Army Aviation School Commandant, responded to a Continental Army Command directive to progress "mobile task force operations" by assigning Col Jay D. Vanderpool, the Director of Combat Development for the Aviation School and Center, the task of determining whether the helicopter could provide the close support that the U.S. Army believed the U.S. Air Force could not or would not provide.[6] The result was experimentation with armed H-13 helicopters influential enough to receive the endorsement of both President John F. Kennedy and Secretary of Defense, Robert McNamara. This endorsement of the "gunship" concept was sufficient to temporarily silence criticism of the armed helicopter by both internal U.S. Army and USAF critics.[7]

1.3. Vietnam – Origin of the Attack Helicopter

In April 1962, Secretary of Defense Robert McNamara's issued two memorandums to then Army Secretary Stahr, directing an examination of helicopter mobility in support of the Kennedy's administration's strategy of flexible response.[8] As a result, the Army convened the ad hoc "Army Tactical Mobility Requirements Board"

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[5] James Bradin, *From Hot Air to Hellfire*…87.
[6] *Ibid.*, 94.
[7] *Ibid*., 98.
[8] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*…9.

chaired by Lt Gen. Hamilton H. Howze, then Commanding General, XVIII Airborne Corps. [9]

The Howze board conducted a three month study that included an examination of both British and French helicopter experience, field trials, computer simulations and a visit to Vietnam.[10] When the study was released the Howze board had recommended a radical expansion of the Army's Air Mobility capability including the replacement of two infantry, two airborne and one mechanized division with five Airmobile Divisions, three Air Cavalry Brigades and five Air Transport Brigades. The Howze board also recommend that the U.S. Army develop a full range of support aircraft capabilities including attack, light observation, medium and heavy lift, utility and medical evacuation helicopters as well as light fixed wing observation, close air support and transport aircraft.[11]

Although the recommendations were well received by Secretary of Defense McNamara, the expense required to implement the recommendations was considered prohibitive.[12] As a result, the decision was made to confirm the validity of the concept by establishing a full scale test airmobile test division and in February 1963, the 11th Air Assault (Test) Division was created.[13] By early 1965, the 11th Air Assault Division had successfully proven the concept in field exercises with the 82 Airborne Division and as a result was combined with the 2nd Infantry Division to become the 1st Cavalry (Air

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[9] J.A. Stockfisch, "The 1962 Howze Board and Army Combat Developments." (Santa Monica: Rand Corporation. Arroyo Centre, 1994), 15.

[10] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*…9.

[11] J.A. Stockfisch, "The 1962 Howze Board and Army Combat Developments."…24.

[12] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*…10.

[13] J.A. Stockfisch, "The 1962 Howze Board and Army Combat Developments."…26.

Assault) Division. [14] The unit was subsequently deployed to the Central Highlands of Vietnam.

While preliminary work on an armed helicopter concept began as early as 1956, and the Howze Board had included recommendations for a dedicated attack helicopter in 1962, concerted effort on arming helicopters for the fire support role did not begin until the 1st Cavalry (Air Assault) Division arrived in Vietnam.[15] Based on its experience there the U.S. Army recognized the requirement for a helicopter dedicated to providing fires in support of Air Mobility operations. Given that airmobile operations could outrange artillery support, a requirement evolved to develop an organic fire support capability that could bridge the gap between Close Air Support provided by the USAF and artillery.[16] As a result the Army developed its own capability by arming the UH-1 "HUEY" utility helicopters.[17] While the armed UH-1 proved relatively effective, it was both vulnerable and slower than the UH-1's they were escorting. Resistance from the U.S. Air Force to what they believed was the Army's encroachment on their Close Air Support role particularly in light of the Howze Board recommendation for an U.S. Army Fixed Wing Close Air Support Aircraft in the form of the OV-1 Mohawk also hampered doctrinal advancement of the capability.[18] Initially armed Helicopters were authorized to provide defensive fires only just prior to and during air assault operations.[19]

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[14] Ibid., 28.
[15] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*…13.
[16] Timothy A. Jones, "Attack Helicopter Operations in Urban Terrain." (Monogram, U.S, Army Command and General Staff College, 1997), 5.
[17] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*...13.
[18] J.A. Stockfisch, "The 1962 Howze Board and Army Combat Developments."…25.
[19] Ibid., 13.

In 1964 the U.S. Army began work on defining a future helicopter to address the shortcoming of the armed UH-1 in terms of speed, survivability and firepower. The project known as the Advanced Aerial Fire Support System (AAFSS) Program, resulted in the competitive selection of Lockheed Aircraft for the development and production of the Cheyenne helicopter.[20] Designed with an emphasis on speed and firepower the helicopter was equipped with 30 mm canon, unguided 2.75 inch rockets and eight TOW missiles. Equipped with a pusher propeller and stub wings the helicopter was capable of speeds up to 214 knots. By the time the design had matured, the helicopter was equipped with a night targeting system, and advanced fire control computer including a laser range finder. Given the sophistication of the aircraft there was little possibility that the helicopter would be fielded in time to impact operation is Vietnam.[21]

In December 1964, aware of the Army's requirement for an advanced helicopter that could provide fire support and escort for airmobile operation in Vietnam, Bell Helicopter began work on an unfunded attack helicopter program that resulted in the development the AH-1 Cobra.[22] Based on the technologically mature UH-1 Huey, the aircraft was relatively unsophisticated when compared to the Cheyenne but it was capable of the speed and weapons payload capacity required to meet the U.S Army's requirements for an interim attack and escort helicopter.[23]

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[20] Stanley S. McGowen, *Helicopters An Illustrated History of Their Impact*. (Barbara: ABC-CLIO Santa, 2005), 107.

[21] James Bradin, *From Hot Air to Hellfire…117.*

[22] *Ibid.*, 119.

[23] *Ibid.*, 121.

In March 1966, the U.S. Army ordered 1100 Cobras to replace gunships in Air Cavalry and Aerial Rocket Artillery units throughout Vietnam.[24] Given the Army's commitment to the attack helicopter capability, the USAF and U.S. Army signed a memorandum of agreement in April 1966, delineating the responsibilities associated with the provision of Air Support. Known as the McConnell-Johnson Agreement, the memorandum for all intents and purposes enshrined the U.S. Army's mandate to operate rotary winged aircraft in direct support of Army units.[25]

Highly effective throughout the Vietnam conflict, the various models of the Cobra flew both interdiction and close support missions for both U.S. Army and Marine Corps units.[26] While the Cobra proved particularly effective in direct support of company and battalion maneuver during the war, the helicopter was slow to define itself as an Anti-Armor system.

During the early stages of the Vietnam War, American forces had faced very little North Vietnamese Army (NVA) armor. In 1972 NVA tanks began to appear in numbers and as a result two UH-1Bs equipped with the Tube Launched Optically Tracked Wire Guided (TOW) missile system in support of the Cheyenne development program where deployed to Vietnam.[27] During NVA Spring offensive of 1972, the TOW equipped UH-1B was able to destroy 27 NVA tanks as well as 61 other targets.[28] This primary use of

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[24] Stanley S. McGowen, *Helicopters An Illustrated History of Their Impact*…107.

[25] Lindsey Eilon and Jack Lyon, *White Paper: Evolution of Department of Defense Directive 5100.1 "Functions of the Department of Defense and Its Major Components."* (Office of the Secretary of Defense Director, Administration & Management Organizational Management & Planning April 2010), 12.

[26] Stanley S. McGowen, *Helicopters An Illustrated History of Their Impact…*109.

[27] *Ibid*., 109.

[28] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*…24.

what was for all intents and purposes a precision anti-armor capability was only the first few tentative steps in what would become the primary role of Attack helicopters. The success of the Cobra coupled with the ongoing problems with the development of the Cheyenne eventually resulting in the cancelation of the AAFSS project on 9 August 1972.[29]

1.4. Cold War – Rise of Deep Strike

While the United States was deeply involved in the war in Vietnam, NATO continued to face off against the Soviet Union in the Cold War confrontation of Western Europe. In spite of the intensity of the Vietnam conflict, U.S. Army planners had continued to develop attack helicopter doctrine focused on the anti-armor mission.[30] American planners believed that the Soviet Union enjoyed a significant numerical and technological advantage in terms of the armor they could bring to bear in a conventional conflict with NATO.[31] By 1970 Army doctrine developers had a fully articulated aviation based concept of operations in anticipation of the fielding of the Cheyenne helicopter that foresaw the army leveraging the Cheyenne's ability to move rapidly across a West German battlefield in order to interdict columns of Soviet armor. The concept saw the Cheyenne conducting battalion sized anti-armor attacks against massed Soviet tanks using TOW missiles, Nape of the Earth (NOE) flight and static firing positions.[32]

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[29] Stanley S. McGowen, *Helicopters An Illustrated History of Their Impact*…111.
[30] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*…21.
[31] *Ibid*,. 18.
[32] United States, Department of Defense. *Employment of Attack Helicopters to Defeat Armor Threat in Europe in the Mid-1970s*, Film, Prepared for the U.S. Army Combat Developments Command, Directorate of Doctrine Air Mobility Operating Task Group, Washington, DC. 1970.

Many historians point to a later series of anti-armor helicopter trials as the geniuses of the doctrine outlined in 1970. The official U.S. Army history suggests that given the potential impact of the post-Vietnam War draw down of military forces, U.S. Army Aviation advocates saw the European Anti-Armor mission as an opportunity to ensure the relevance of the Army attack helicopter capability. [33] In 1972 a series of tests were conducted in order to prove the utility of helicopters in the anti-armor role. Conducted near Ansbach, Germany, the tests were referred to as the "joint attack helicopter instrumented evaluation." American, Canadian and German aviators flew simulated missions against maneuvering armor simulating eastern bloc forces. Both helicopters and armor were equipped with simulated weapons and instrumentation that were capable of scoring the number of successful engagements of both helicopters and tanks. In the end, the Anti-Armor equipped helicopter proved effective enough for the U.S. Army to concede that TOW equipped cobra could operate effectively against Soviet Armor in a medium to high threat environment when employed in the low level environment.[34] The result was a commitment on the part of both the leadership of the U.S. Army and Congress to the anti-armor helicopter for Europe and the hurried integration of the TOW system and Cobra helicopter by Bell helicopters.[35]

In 1972 the AAFSS program was cancelled due to delays and cost overruns in the development of the Cheyenne. As a result of the cancellation, the U.S. Army identified a requirement for a new program that would field an attack helicopter that was both

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[33] United States. Department of Defense. *American Military History Volume II The United States in the Global Era, 1917-2008.* (U.S. Government Printing Office, July 2010), 384.

[34] James Bradin, *From Hot Air to Hellfire*…127.

[35] *Ibid.,* 130.

survivable on a high intensity European battlefield and capable of carrying a large number of Anti-Tank Guided Missiles (ATGM). In order to fulfill this requirement the U.S. Army initiated the Advanced Attack Helicopter (AAH) program and in 1976 the Hughes YAH-64 Apache was selected as the competition winner. Originally designed to avoid some of the technical and financial risk that had plagued the Cheyenne, the AAH requirement eventually grew to include a sophisticated anti- armor capability.[36] Based on the requirement to operate at night the helicopter had both infrared targeting and pilotage systems. When combined with the then new laser guided "Hellfire" missile, the project resulted in an anti-armor helicopter the U.S. Army believed was capable of operating on a high intensity battlefield in Western Europe.[37]

While the U.S. Army would not take delivery of the first Apache until 1982 the doctrinal foundations of how the aircraft would be operated were already being established. In 1976 U.S. Army doctrine began to evolve to counter the Soviet threat based on the concept of *Active Defense.*[38] Focused on the "primacy of defense" the doctrine eventually evolved to become the more offensively minded "AirLand Battle". AirLand Battle conceptualized operations as Close, Deep, and Rear. Deep operations were intended to "isolate the battlefield" and shape Close operations by attacking enemy follow-on forces. As a result the Apache program was one of five systems identified by the U.S. Army needed to "fight outnumbered and win."[39] The other systems designed to

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[36] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*…27.
[37] United States, *Department of Defense. American Military History Volume II*…387.
[38] *Ibid*., 382.
[39] *Ibid*., 383.

complement the Apache in the AirLand battle where the Abrams tank, the Bradley fighting vehicle, the Blackhawk helicopter and Patriot air defence missile system.[40]

In 1981 an influential article by Major Frank E. Babiasz, appeared in the U.S. Army Aviation Digest titled "The Leak in the Soviet Air Defense Umbrella."[41] The article argued that the Soviet air defense system threat in support of the motor rifle division was not as dense or effective as U.S. Army Aviation perceived it to be.[42] While NOE operations had become the tactic of choice for anti-armor helicopter operation in Europe, the capability was primarily planned to interdict Soviet Armor that had broken through the forward edge of the battle area (FEBA). U.S. Army Aviation planners believed that NATO Attack Helicopters could not survive what was believed to be the robust Air Defense system associated with Soviet Armor. As a result, Attack Helicopter doctrine was designed primarily to blunt a Soviet armor breakthrough that had outrun its organic Air Defense system.[43]

The doctrine focused on the breakthrough of the soviet armor began to change in light of the assumptions outlined in the Babiasz article. The limitations of the ZSU-23-4 Antiaircraft Artillery system as well as the low density and limited effectiveness of Soviet surface to air missiles (SAM) against aircraft in the NOE environment implied that helicopters enjoyed a survivability advantage when operating in depth that fixed wing aircraft such as the A-10 did not. Where previously doctrine had considered the Attack

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[40] *Ibid*., 383-388.
[41] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*...37.
[42] Frank E. Babiasz, "The Leak in the Soviet Air Defense Umbrella." *United States Army Aviation Digest* 27, no. 11 (November 1981): 37.
[43] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*...21.

Helicopter battalion a mobile reserve, ready to interdict a breakthrough of Soviet armor, the reimagining of Soviet ZSU 23-4 based air defense system allowed U.S. Army planners to consider the interdiction of armor deep within the Soviet rear area. Termed crossing forward line of own troop (X-FLOT) operations, deep attack became the focus of U.S. Army Attack Helicopter operations in Europe. As a result antitank aviation operations were reconceived to consist primarily of X-FLOT operations against massed Soviet Armor.[44]

In 1982 the U.S. Army revised the Field Manual (FM) 100-5 Operations to reflect the AirLand Battle doctrine's focus on deep strike. The publication states: "The AirLand Battle will be dominated by the force that retains the initiative and, with deep attack and decisive maneuver, destroys its opponent's abilities to fight and to organize in depth."[45] Queued by advanced target acquisition and communication systems, attack helicopters, USAF attack aircraft, and irregular forces were to attack enemy follow on forces in order to shape the battlefield for the Land Force commander.[46]

Interestingly, one of the assumptions that underpinned the development of deep strike doctrine was the idea that the rapid advance of enemy forces would cause non-linearity's of the FEBA that could be exploited. *U.S. Army Field Manual 100-5 Operations (1982)* notes:

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[44] Ibid., 38.

[45]United States, Department of Defense. *FM 100-5, Operations.* (Washington, DC: U.S. Government Printing Office, 20 August, 1982), 1-5.

[46] *Ibid.,* 1-2.

> Opposing forces will rarely fight along orderly, distinct lines. Massive troop concentrations or immensely destructive fires will make some penetrations by both combatants nearly inevitable. This means that linear warfare will most often be a temporary condition at best and that distinctions between rear and forward areas will be blurred. [47]

While many military theorists believed that the helicopter was too vulnerable to operate in a high threat environment, attack helicopter advocates postulated that the non-linear nature of FEBA would allow attack helicopters queued by advanced reconnaissance systems to avoid massed enemy formations while they were en route to deep targets. [48] By 1988 U.S. Army deep strike doctrine was sufficiently well developed and integrated with USAF Close Air Support doctrine that the Apache was described in Air Force Magazine as " a formidable CAS [Close Air Support] aircraft in low-threat environments and that it does surprisingly well now and then in high-threat arenas as well."[49]

1.5 The Gulf War – Apache Success

While both U.S. Army Cobra and Apache attack helicopters participate in the December 1989 invasion of Panama, Operation JUST CAUSE, combat operations were not extensive enough to validate the doctrine or training that the U.S Army had developed in the face of the Cold War standoff with the Soviet Union.[50] When Saddam Hussein's Army invaded Kuwait in 1990 it seemed obvious that the AH-64 would play a significant role in protecting Saudi Arabia and driving Iraqi forces from Kuwait.

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[47] *Ibid*., 2-1.
[48] Matthew Allen. *Military Helicopter Doctrines of the Major Powers*...38.
[49] James W. Canaan, "Sorting Out the AirLand Partnership." *Air Force Magazine* (April 1988):54.
[50] United States, Department of Defense. *American Military History Volume II*…406.

Designed to confront Soviet forces in Europe, the AH-64 seemed ideally suited to attrite the Soviet armor that comprised the bulk of Saddam Hussein's heavy forces.

Apaches of the 82^{d} Airborne Division were the first mobile anti-tank forces moved to the Persian Gulf capable of adverse weather and night operations.[51] As an element of Operation Desert Shield, Apache Helicopters conducted a guard mission along the Saudi-Kuwait border as well as reconnaissance of Iraqi front line positions.[52] Leveraging their inherent mobility and fire power, Apaches were able to secure long sections of the Saudi Arabia - Iraq border against Iraq Armor incursions.

Of the Apache operations in the Gulf War, the opening attack of Operation Desert Storm by Task Force Normandy is most commonly pointed to as an example of the Apache's ability in the deep strike role. The plan to open an air corridor across the Iraq border, Operation Eager Anvil, as it was originally designated, was initially a Special Operations Force (SOF) mission. The mission was eventually assigned to the 101st Airborne Division as a result of the firepower the Apache could bring to bear.[53]

At 02:38 on January 17, 1991, Apaches of the 1-101st Attack Battalion flew into Iraq in order to destroy two radar facilities in advance of the allied air campaign.[54] Using the GPS navigation capabilities of two MH-53J Pave Low III helicopters and escorted by UH-60 Blackhawks capable of providing refueling and personnel recovery, eight

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[51] United States, Department of Defense. *Conduct of the Persian Gulf War: Interim Report to Congress*. (U.S. Government Printing Office, July 1991), 6-5.

[52] Matthew Allen, *Military Helicopter Doctrines of the Major Powers*...39.

[53] James Bradin, *From Hot Air to Hellfire*…44.

[54] Robert F. Dorr, "Apaches Fired First Shots of the Persian Gulf War." *Army Times* 63, no. 9 (September 2002): 35.

Apaches and one back up were able to penetrate into Iraq to carry out the Suppression of Enemy Air Defense (SEAD) mission.[55] The destruction of the radar sites and associated communications facilities resulted in a 20 mile wide gap through which coalition aircraft could flow into Iraq.[56]

The SEAD mission was held up as an example of the deep strike capability of the Apache. The attack on the Iraqi radar facilities conformed to much of the doctrinal definition of deep strike. The 1-101st Apaches flew up to 240 kilometers one way to the battle positions and the radar sites were 23 and 47 kilometers inside the Iraq boarder respectively.[57] Conversely, the mission was the opening salvo of the war and as a result involved covert movement to the battle positions that did not require integrated SEAD with indirect Artillery fires.[58] As a result, while the missions were deep in the sense that they well inside Iraq and beyond the effective range of the direct fire weapons integral to the coalition units positioned along the border, the targets were static, not a part of follow-on forces and not part of armor maneuver units that possessed their own organic Air Defense capability.

While the AH-64 was feted for attack operations during Desert Storm, the AH-1 Cobra was also deployed to the Persian Gulf in support of both Operations Desert Shield and Desert Storm. While both the U.S Army and U.S. Marine Corps (USMC) Cobras

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[55] United States. Department of Defense. *Conduct of the Persian Gulf War: Interim Report to Congress*…5-4.

[56] Robert F. Dorr, "Apaches Fired First Shots of the Persian Gulf War."…35.

[57] Michael R. Rip and James M. Hasik, *The Precision Revolution: GPS and the Future of Aerial Warfare*. (Naval Institute Press, 2002), 153.

[58] Mackenzie, Richard. "Apache Attack" *Air Force Magazine* 74, no. 10 (October 1991). n/a. Last accessed 3 March 2013. http://www.airforce-magazine.com/MagazineArchive/Pages/1991/October%201991/1091apache.aspx

were involved the roles assigned to each were significantly different based on both capability and doctrine. The USMC AH-1W was solely noted in the Interim Report to Congress as providing "close in fire support to for ground forces".[59] U.S. Army AH-1F Cobras were limited to daylight armed security patrols and armed reconnaissance due to their lack of a night capable Forward Looking Infrared (FLIR) Targeting system.[60] While the USMC continues to operate the Cobra, in the end, Operation Desert Storm proved to be the swan song for significant U.S. Army Cobra operations. With the exception of operations in Somalia in 1993 and Haiti in 1994 the Cobra was set aside by U.S. Army Aviation, eventually being withdrawn from service as the AH-64 was fielded.[61] In March, 1999 the last regular force Cobras were retired and in 2002 the last Army Reserve and National Guard Cobras were place in long term storage.[62]

By the end of the First Gulf War the Apache had fired 2876 hellfire missile and had been credited with the destruction of 278 tanks and 900 other targets.[63] The capability was also singled out in *Conduct of the Persian Gulf War: Interim Report to Congress* as a system that had performed particularly well; "High technology systems, such as the Apache helicopters and M1A1 tanks proved immensely valuable and consistent performers in their first real combat test. American technology saved Coalition

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[59] United States. Department of Defense. *Conduct of the Persian Gulf War: Interim Report to Congress*…4-9.

[60] *Ibid.*, 1-3.

[61] United States. Department of Defense. United States Forces, *Somalia After Action Report and Historical Overview: The United States Army in Somalia, 1992–1994*. (Washington: U.S. Government Printing Office, 2003), 12.

[62] Stanley S. McGowen. *Helicopters An Illustrated History of Their Impact*…207.

[63] United States. Department of Defense. *Conduct of the Persian Gulf War: Interim Report to Congress*…6-6.

lives and contributed greatly to victory."[64] It can be argued that this type of praise cemented in the minds of U.S. Army leaders the value of the capability and correctness of the associated doctrine. AirLand battle had been vindicated by the rapid success of Operation Desert Storm and the Apache had been singled out as having been a key system in this battlefield success.

Other military analysts remained unconvinced that the Apache was as effective as the U.S. Army lead congress to believe. Advocates of the USAF A-10 Close Air Support Aircraft argued that the Apache was expensive and inefficient when compared to what the A-10 was able to achieve on the battlefields of Operations Desert Storm. In the article *The Apache is a Sight to Strike Fear into the Enemy. But is it the most Effective Killer*, published in the June, 1999 edition of the Royal United Services Institute (RUSI) Journal, Kenneth Freeman argues that the A-10 flew eight times the number of sorties, accounting for four times the number of kills credited to the Apache with half the number of aircraft deployed to the theatre. Freeman also argues that the unit cost of the A-10 was lower and the cost per engagement much less when comparing the 30 mm canon round that constitutes the A-10's main armament and the Apache's Hellfire missile system.[65]

While the statistic provided do support the capability of the A-10 they lack some of the context required to determine if the Apache was an effect weapons system. Freeman states that comparing the performance of both systems is "fair", given "Both the

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[64] *Ibid*., 1-2.

[65] Kenneth Freeman. "The Apache is a Sight to Strike Fear into the Enemy. But is it the Most Effective Killer?" *The RUSI Journal* 144, no. 3, (June 1999): 7.

A-10 and Apache were originally purchased to provide close air support (CAS)."[66] This simplification of the argument to one that describes both systems as CAS aircraft is not a valid start point. While both aircraft systems were designed to provide fires in support of land forces, the doctrine associated with each is necessarily different. The A-10 was tasked by the Joint Force Air Component Command Headquarters through the Air Tasking Order. Many of the missions flown were interdiction missions only loosely connected to the land force scheme of maneuver and were beyond the Fire Support Coordination Line (FSCL).[67] Conversely the Apache units were assigned to two U.S. Army Corps and controlled at the Divisional level and as a result, necessarily integrated into land force maneuver.[68]

While the level on integration that the Apache units had with the Corps they supported makes any comparison with the achievements of the A-10 of little value, the relatively small number of targets struck is an important point. During the war, Apache operations were limited to the 100 hours of the ground war phase due to concerns with the aircrafts vulnerability to the Iraq Air Defence system in an unsupported deep strike role.[69] As a result Apache units only flew a total of 652 sorties during 83 missions.[70] Given the evolution of the capability based on the assumption that the Apache could

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[66] *Ibid*., 8.

[67] Robert E. Duncan, " Responsive Air Support." *Air Force Magazine* 6, no. 2 (February 1993). Last accessed 1 March 2013. n/a. http://www.airforce-magazine.com/MagazineArchive/Pages/1993/February%201993/0293responsive.aspx

[68] United States. General Accounting Office, *Report to the Chairman, Subcommittee on Oversight and Investigations Committee on Energy, Commerce, House of Representatives, Operation Desert Storm, Apache Helicopter Was Considered Effective in Combat but Reliability Problems Persist*. (U.S. Government Printing Office, April 20, 1992.), 24.

[69] *Ibid.*, 25.

[70] *Ibid.*, 41.

conduct X-FLOT operations in a mid to high intensity battlefield, the low number of sorties speaks to recognition amongst some of U.S. Army leadership that the estimates of survivability of the helicopter during deep operations might have been flawed.

1.6. Summary of Apache Development on the Eve of the Gulf War

This chapter has discussed the evolution of the U.S. Army attack helicopter capability and associated doctrine from the end of the Second World War to the end of the First Gulf War. The development of the Cobra was shown to be a pragmatic response to the requirement for a system that could provide organic fires in support of airmobile operations as well as company and battalion level maneuver in contact with enemy forces. Given the type and intensity of the fighting that occurred in Vietnam the requirement for a relatively simple attack helicopter that could be fielded quickly out weighted the desire to develop a more sophisticated helicopter capable of conducting what had been up to that point considered the USAF role of close air support. The subsequent evolution of the AH-1 Cobra into an anti-armor system was further linked to the desire of the U.S. Army to address the overmatch in Soviet tanks faced by NATO forces in Europe. As a result the TOW system was combined with the Cobra in order to develop a system capable of responding to any possible breakthrough of Soviet Armor.

This chapter has also demonstrated that the development of the AH-64 Apache was a result of the requirement for an anti-armor system to support the U.S Army's Forward Defense doctrine and subsequent AirLand Battle Doctrine developed for a Cold War confrontation with the Soviet Union. This doctrine combined with the reimagining of the air defense threat organic to Soviet Armor resulted in an attack helicopter

capability clearly focused on the deep strike doctrine of battalion sized X-FLOT anti-armor operations. It has also been shown that during the Gulf War both the doctrine and the aircraft capability were vindicated in the minds of the U.S. Army leadership. The high profile success of TF Normandy cemented an inflexible doctrine of battalion size deep strike against massed enemy armor. As a result of this doctrine inflexibility and despite significant criticism of the deep strike concept there was little recognition on the part of the U.S. Army that the AH-64 Apache and related doctrine was ill prepared to meet the changing conflict environment of the post-Cold War battlefield.

CHAPTER TWO – POST GULF WAR CHALLENGES

2.1. Introduction

At the end of the Operation Desert Storm and in spite of the collapse of the Soviet Union, the U.S. AH-64 Apache capability was, for all intents and purposes, designed both physically and doctrinally to destroy massed enemy armor in depth. This chapter will examine U.S. Army Apache operations and associated doctrine between this start point and the 1st of May 2003, when then President George W. Bush famously declared the "end of major combat operation" in Iraqi.[71] The end point for discussion in this chapter was chosen in order to juxtapose the Apaches deep strike, high intensity, war fighting reason d'etre and two high profile mission failures that led to the re-examining of both the requirement for the capability and associated doctrine.

The U.S. Army's 1999 deployment of 24 U.S. Army Apaches to Albania as TF Hawk will be discussed in detail in order to link what was widely viewed to have been a failure, to a doctrine that was at odds with the post-cold war conflict environment. Furthermore, this chapter will link the subsequent failure of the U.S. Army to evolve doctrine based on the lessons learned from the TF Hawk experience to the failure of the deep strike raid on the Republican Guard's Medina Division in the outskirts of Karbala during the 2003 invasion of Iraq. United Kingdom Apache doctrine will be discussed in order to add context to the post TF Hawk discourse and to further strengthen the link

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[71] George W. Bush. Speech, President George W. Bush's Address Announcing End of Major Combat Operations in Iraq, 1 May 2003. Last accessed 14 April 2013. http://www.johnstonsarchive.net/terrorism/bushiraq4.html

between the aircraft capability and the associated doctrine that supported the employment of the Apache prior to the Operation Iraqi Freedom (OIF).

In addition to Apache operations during both the Kosovo conflict and the initial invasion of Iraq, the early stages of OEF in Afghanistan will be examined. Operation Anaconda will be discussed in order to provide further context to Apache doctrine post Task Force Hawk as well as to add perspective to the subsequent failure of the deep strike operations during the OIF. Finally, the U.S. Army failure during the raid on Karbala will be examined in detail in order to both demonstrate the limitations of the aircraft and deep strike doctrine system and to set the conditions for an explanation of the subsequent doctrinal shift that occurred.

This chapter will demonstrate that the U.S. Army's approach to Apache deep strike doctrine, specifically battalion sized operations, using massed indirect fires for SEAD, in a nonlinear non-contiguous battlespace was incompatible with the post-cold war conflict environment that defined both the Kosovo conflict and invasion of Iraq. While the concept of the attack helicopter has been validated based on the pragmatic requirements of the Vietnam conflict and the Cold War, institutional adjustments were necessary to refocus the Apache doctrine in order to leverage the aircrafts unique capabilities.

2.2 Deep Strike's Fall From Grace

After the success of Operation Desert Storm, the capabilities and doctrine for the employment of the AH-64 had been vindicated in the minds of the U.S Army Aviation leadership. Battalion sized, deep strike missions involving NOE operations and static firing position had become the doctrinal template for Apache operations.[72] In 1994, U.S. Army Command and General Staff College student Major Mark N. Mazarella would write a thesis paper that foretold the challenges U.S. Army Apache operations would experiences as a result of a doctrinal focused exclusively on the deep strike mission:

> No one will argue Army Aviation's resounding success in Operation DESERT STORM. Fortunately, Operation DESERT STORM fit existing ATKHB [Attack Helicopter Battalion] DTTP [Doctrine, Tactic, Techniques and Procedures] quite well. But what about a single attack helicopter company deployed on a NEO [Non-Combatant Evacuation Operations] … Or when a light infantry company is pinned down in the mountains, out of artillery range, and the immediate employment of attack helicopters is their only hope. … These are the types of scenarios that our DTTP must address in addition to those associated with operations in the traditional armor-rich environment. Doing so now will pay great dividends later.[73]

Given the prescience with which Major Mazarella was able to frame his argument it is worth examining how ridged adherence to doctrine in terms of the tactical employment of the aircraft and doctrinal flexibility with respect to the deployment of the attack helicopter as a capability would create significant challenges both during an ill-fated deployment to Kosovo and in major ground operations during OIF.

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[72] United States. Department of Defense. FM 1-112, *Attack Helicopter Operations*. (Washington, DC: U.S. Government Printing Office, 2nd April, 1997), 3-11.

[73] Mark N. Mazarella, "Adequacy of U.S. Army Attack Helicopter Doctrine to Support the Scope of Attack Helicopter Operations In a Multi-Polar World." (Master's Thesis, U.S. Army Command and Staff College, 1994). 2.

2.3. Kosovo – Task Force Hawk

In March 1999 Gen. Wesley K. Clark, NATO's Supreme Allied Commander Europe, directed the U.S. Army to deploy "a task force centered around aviation and field artillery capable of conducting deep strike operations in support of NATO's ongoing Operation ALLIED FORCE."[74] The original concept of operations called for Apache helicopters to conduct deep strikes operations from Macedonian against Serbian Forces in Kosovo. The original intent was to augment fixed wing attack operations by using the Apache to attack "widely dispersed and camouflaged enemy ground forces when weather prevented effective Close Air Support operations."[75] A U.S. Department of Defense Joint Statement on the Kosovo After Action Review notes;

> . . . the decision to deploy Task Force Hawk was made at a time when persistent poor weather had been hampering air operations and NATO's tactics for attacking mobile targets in Kosovo were in the early stages of development. Under these circumstances, the contributions that the Apaches might make to prosecuting mobile targets in Kosovo were considered potentially worth the risks associated with their use.[76]

Initially planned to deploy to Macedonia as a 1700 person formation, TF Hawk was to include 24 AH-64 Apaches, 15 Blackhawk and four Chinook helicopters supported by an Aviation Brigade Headquarters, a Mechanized Infantry company and a MLRS Battalion. When the Government of Macedonia refused to allow operations

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[74] United States. Department of Defense. Center for Army Lessons Learned (CALL). 2000. *Tactics, Techniques and Procedures from Task Force Hawk Deep Operations: Volume II, Issue III*, (Fort Leavenworth: U.S. Army Training and Doctrine Command. Newsletter No. 01-5, March 2001), 1.

[75] *Ibid*., 1.

[76] United States. Department of Defense. "Joint Statement on the Kosovo After Action Review" presented by Secretary of Defense William S. Cohen and Gen. Henry H. Shelton, Chairman of the Joint Chiefs of Staff, before the Senate Armed Services Committee, October 14, 1999. viii. Last accessed 10 February 2013. http://www.defense.gov/releases/release.aspx?releaseid=2220

against Kosovo from Macedonian territory, U.S. Army planners shifted the deployment location to Albania, a country that had no established U.S. military infrastructure and was "not viewed as having a stable security environment."[77] As a result, force protection requirements saw the deployment swell to 5350 personnel, 22 Blackhawk utility, electronic warfare and command and control helicopters, eight Chinook medium lift helicopters, self-propelled and towed artillery, support and coordination elements.[78]

In spite of the enormous effort required to deploy the Task Force, no combat missions were flown. With two aircraft destroyed in accidents, and given the huge mobility and sustainment effort required to support the task force, the mission became a lightning rod for criticism of the U.S. Army's attack helicopter capability.[79] With the Apache capability long seen as a direct competition to the USAF Close Air Support mandate, the influential Air Force Association, Air Force Journal criticized the deployment of TF Hawk as a standalone deep strike capability in its February, 2002 edition:

> Beyond these problems created by the Army's decision to bring along so much additional overhead, there was a breakdown in joint doctrine for the combat use of the helicopters that was disturbingly evocative of the earlier competition for ownership and control of coalition air assets that had continually poisoned the relationship between the Joint Force Air Component Commander and the Army's corps commanders during Desert Storm. The issue stemmed in this case from the fact that the Army has traditionally regarded its attack helicopters not as part of a larger airpower equation with a theater wide focus but rather as an organic

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[77] United States. General Accounting Office, Report to the Chairman Committee on Armed Services, House of Representatives, Kosovo Air Operations…4.

[78] Bruce R., Nardulli, et al. *Disjointed War Military Operations in Kosovo*, 1999. Santa Monica: Rand Corporation, 2002.74.

[79] Benjamin S Lambeth,. "Task Force Hawk." *Air Force Magazine* (February 2002): 80.

> maneuver element fielded to help support the ground maneuver needs of a division or corps.[80]

Fundamental to the argument proposed by the Air Force Journal was that the concept of operations for TF Hawk was incompatible with the overall intent to limit operations in Kosovo to an air campaign. Traditional Deep Strike doctrine involved attack helicopters operating as part of a "combined arms" team where Apache units supported by indirect fires would attack massed armor in depth as one of a coordinated grouping of maneuver units. The U.S. Army Field Manual *1-112 Attack Helicopter Operations* (1997 Edition) was unequivocal on this point:

> An ATKHB never fights alone. Attacks are coordinated with other maneuver, combat support, CSS [Combat Service Support], and joint forces to form a combined arms team. This team surprises and overwhelms the enemy at the point of attack. Attacks may be conducted out of physical contact with other friendly forces but synchronized with their scheme of maneuver, or they may be in direct contact with friendly forces.[81]

With no U.S. Army unit in Kosovo to support, TF Hawk was doctrinally dislocated from a coherent concept of operations. A level of integration with the overall air campaign was required that had previously been considered unnecessary given the U.S. Army's doctrine of maintaining control of the attack helicopter capability at the Corps or Divisional level.[82] Additionally, Army doctrine called for SEAD in the deep strike mission primarily by indirect fires from the MLRS and 155 mm artillery systems located in Albania.[83] Given the missions sensitivity to collateral damage this method of

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[80] Ibid., 81.

[81] United States. Department of Defense. FM 1-112, *Attack Helicopter Operations*. (Washington, DC: U.S. Government Printing Office, 2 April, 1997), 1-1.

[82] Bruce R., Nardulli, et al. *Disjointed War Military Operations in Kosovo*...78.

[83] United States. Department of Defense. Center for Army Lessons Learned (CALL). 2000. *Tactics, techniques and procedures from Task Force Hawk deep operations* … 10.

SEAD was not in tune with the overall intent of the campaign plan.[84] As a result, TF Hawk Apache operations were reliant on the Combined Air Operations Centre for a coordinated Joint Suppression of Enemy Air Defence (JSEAD) plan involving specialized USAF fixed wing assets.[85]

With the vast number of small arms, light antiaircraft artillery (AAA) and man portable air defence systems (MANPADS) that were believed to be possessed by the Serbian Army in Kosovo, U.S. Army planners were never satisfied that the conditions they had set to minimize risk to Apaches involved in a deep strike mission could ever be meet.[86] With fixed-wing JSEAD aircraft primarily focused on the threats associated with radar systems and incapable of locating the majority of the antiaircraft systems that did not emit electromagnetic radiation, the U.S. Army were reliant on the doctrinal template of indirect fires for area SEAD. Due to limitations imposed on indirect fire systems designed to minimize collateral damage, TF Hawk was incapable of using MLRS or 155 fires in support of area SEAD. As a result, no target set ever appeared when the benefit of striking the target would have outweighed the risk to the attacking helicopters. [87]

The U.S. Army, however, continued to insist that the failure of TF Hawk was not one of the inherent mismatches between the mission intent, doctrine, capability and threat. The Report to Congress, *Kosovo / Operation Allied Force After Action Report* notes the lack of combat operations by TF Hawk but frames the deployment as a success,

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[84] Bruce R., Nardulli, et al. *Disjointed War Military Operations in Kosovo*…27.
[85] Ibid., 84.
[86] Ibid., 89.
[87] United States. Department of Defense. "*Joint Statement on the Kosovo After Action Review"*…viii.

stating; "Ultimately, while Task Force Hawk represented a threat to Milosevic's ground forces and was likely a factor in his decision to capitulate, attack elements of Task Force Hawk were not used."[88] Additionally when explaining the failure of TF Hawk to generate any combat power in support Operation ALLIED FORCE, Joint Chiefs of Staff Chairman Army General Henry H. Shelton in written comments to the Senate Armed Services committee wrote; "As the campaign progressed and the weather improved, the effectiveness of higher-flying fixed-wing aircraft improved and the benefits of Apache operations at low altitude were no longer judged to outweigh the risk of their vulnerability to shorter-range air defenses."[89]

The oversimplification of the issues associated with performance of TF Hawk would set the conditions for the subsequent challenges related to the combination of the Apache capability and deep strike doctrine that was to occur during operations in Iraq. Of the lessons learned identified in the General Accounting Office, *Report to the Chairman Committee on Armed Services, House of Representatives, Kosovo Air Operations, Army Resolving Lessons Learned Regarding the Apache Helicopter*, none sought to reconcile the fundamental issue of the Apaches vulnerability in the face of small arms and close in air defence when area SEAD systems such as MLRS were not available or suitable for use. [90]

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[88] United States. Department of Defense. Report to Congress. Kosovo / Operation Allied Force After Action Report, (Washington, DC: U.S. Government Printing Office, 31 January 2000) 76.

[89] United States. Department of Defense. "*Joint Statement on the Kosovo After Action Review"…*viii.

[90] United States. General Accounting Office, *Report to the Chairman Committee on Armed Services, House of Representatives, Kosovo Air Operations, Army Resolving Lessons Learned Regarding the Apache Helicopter*, March 2001.18.

2.4. British Army and the Apache Deep Strike Model

The U.S. Army was not alone in framing Apache operations almost exclusively in terms of deep strike well after the collapse of the Soviet Union. In 1996, the United Kingdom announced the purchase of 67 license built AH-64D Apaches from Westland Helicopters (designated WAH-64D).[91] Originally planned in the early 1990s, the acquisition of the Apache was based on the requirement for an Anti-Armor helicopter that was capable of confronting Eastern bloc forces in Europe and was designed to replace the Lynx Anti-Armor capability.[92]

With the disappearance of the Soviet Union, the British Army was compelled to develop a doctrine that sought to reconcile the Apaches capability with the perception of the new threat environment.[93] The resulting doctrine, discussed in Jane's International Defense Review's June 1, 1999 edition, continued to focus Apache operations on the deep strike mission.

The article describes the British Army proposal for a formation that grouped a combination of attack helicopters and helicopter borne and parachute forces within a single brigade (16 Air Assault Brigade). 16 Air Assault Brigade would then be capable of seizing terrain in-depth and once established would be capable of operating independently in support of the wider battle.[94] Defined as "air maneuver" the doctrine

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[91] United Kingdom National Audit Office. Ministry of Defence. *Building an Air Manoeuvre Capability: The Introduction of the Apache Helicopter*. Report by the Comptroller and Auditor General HC 1246 Session 2001-2002: 31 October 2002.1.

[92] *Ibid.,* 4.

[93] *Ibid.,*22.

looked to leverage the capabilities of the Apache by operating scalable elements in-depth and independently of land lines of communications.[95] Brigadier Stephen White, director of the Attack Helicopter Team in 1999 summarized the purpose of the WAH-64D "as being either to add air maneuver to the land component by delivering pure firepower or strike capability to (say) 200km – or maneuvering to maintain a sustained presence or effect as armored or mechanized brigades do today." [96] While this doctrine would allow for support to UK troops in the close battle, the doctrine was primarily focused on deep operations. That part of the doctrine oriented toward the close battle was unit level fire and maneuver in support of formations as opposed to the Close Combat Attack operations.

In the same way the U.S. Army had never resolved the issue, UK doctrine as articulated by Brigadier White, recognized the threat small arms and light AAA posed to the deep strike mission in the nonlinear non-contiguous battle field but were without a coherent doctrinal solution. While the British Army accepted that MLRS or ATACMS was the preferred method of SEAD in support of deep strike operations, by 1999 they had not yet developed the system necessary to support the capability. As a result, the British Army would have to rely on Air Force based SEAD to support Apache deep operations.[97] Additionally, the British Army suggested that the use of Fire Control Radar (FCR) and Radar Frequency Interferometer (RFI) were the key to survivability in the deep battle.[98]

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[94] Rupert Pengelley and Joris Janssen Lok. "UK and Netherlands Forge New Doctrine on Apache Warpaths." *Jane's International Defense Review* 032, no. 006 (June 1999): 1.

[95] *Ibid.*, 1

[96] *Ibid.*, 1.

[97] *Ibid.*, 1.

Both the FCR and RFI were system designed to support SEAD but in the context of a linear battlefield and primarily against relatively sophisticated Soviet era radar based threats.[99]

The British approach to Apache Doctrine, pre 9-11, mirrored that of the U.S. Army in terms of a focus on deep operations. While the UK appeared to be more flexible in the grouping used to conduct deep strike, the inherent design of the aircraft, particularly the integration of the FCR and RFI, appears to have focused the UK's approach on independent operations in depth. Given that it could be argued that the FCR or RFI would not have been particularly effective against relatively simple small arms and light AAA system on a European battlefield, UK attack helicopter doctrine of the time appears to have no more coherent than the U.S. Army doctrine that stymied TF Hawk.

2.5. Operation Enduring Freedom –Close Combat Attack

On the 2nd of March 2002, American, Afghan and Coalition forces supported by U. S. Navy and USAF CAS aircraft and Apaches of the 101st Aviation Regiment moved into the Shah-i-kot Valley in what was the first major U.S. conventional force offensive of OEF.[100] Operation Anaconda, as it was known, was designed to destroy Al Qaeda forces operating in the mountainous areas of North Eastern Afghanistan. Facing significantly stiffer resistance than expected, Apache fire support played a critical role in

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[98] *Ibid*., 1.

[99] Hugh M Dimmery, "The AH-64D Apache Longbow, Affordable Evolution" Paper presented at the RTO SCI Symposium on "Aircraft Update Programmes. The Economical Alternative? held in Ankara, Turkey, 26-28 April 1999 and published in RTO MP-44.

[100] Jonathon Bernstein, *AH-64 Apache Units of Operations Enduring Freedom and Iraqi Freedom*. (Oxford: Osprey Publishing Limited, 2005). 2-11.

the eventual success of the operations.[101] Accounts of the fighting indicate that much of this success was the result of the rapid adaptation of tactics techniques and procedures (TTP) that allowed the supporting Apache unit to provide close fires in support of troops in contact (TIC). As a result, while published U.S. Army doctrine would not deemphasize deep strike until 2007, pragmatic requirements forced Apache units to adapt well before.[102]

During Op Anaconda, fires from the Apache, sometimes within 200 meters of friendly positions would be critical to the success of the operations.[103] The ability to provide very close fires was key as indirect fires in support of the operation were limited to 81 mm and 120 mm mortars.[104] Additionally, U.S. Navy and USAF CAS aircraft, while plentiful, were less able to distinguish enemy positions or provide weapons effects as closely as the AH-64.[105] Compounding these problems, communications issues, difference in the interpretation of the rules of engagement and lack of responsiveness to nonemergency requests for Close Air Support further reduced the flexibility of ground commanders to employ fixed wing CAS during the initial days of the operations.[106] The success of the Apache was so critical, that Task Force Commander Col Wierncinski framed the support provided by the aircraft in terms reminiscent of the mandate given the

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[101] Jonathon Bernstein, *AH-64 Apache Units of Operations Enduring Freedom and Iraqi Freedom.* . . . 2-27.

[102] United States. Department of Defense. FM 3-04.111, Aviation Brigades. (Washington, DC: U.S. Government Printing Office, December, 2007), 1-3.

[103] Ryan Welsh. "Operation Anaconda; the Battle in the Shah-i-Kot Vally." *Armor* (Nov-Dec 2003): 38.

[104] Ibid., 40.

[105] Jonathon Bernstein, *AH-64 Apache Units of Operations Enduring Freedom and Iraqi* Freedom…2-30.

[106] Richard L. Kugler, Michael Baranick, and Hans Binnendijk, *Operation Anaconda Lessons for Joint Operations,* (Center for Technology and National Security Policy, National Defense University March 2009), vii.

Huey and Cobra escort helicopters of Vietnam; "I was just so impressed by its capabilities…its ability to protect us en route, its ability to set the conditions on the landing zones and then its close combat attack [CCA] capability to take out fires."[107]

Other analysts are more ambivalent with respect to the performance of the Apache in the CCA role. Significant criticism was leveled at attack helicopter operations after the battle as a result, of the amount of damage the Apaches incurred. A Center for Technology and National Security Policy at the National Defense University report entitled, *Operation Anaconda, Lessons for Joint Operations* highlights the vulnerability of the Apache as an issue stating; "Five of seven Apaches assigned for Anaconda were not available after the first day. …the absence of additional attack helicopter support was a constraining factor during the initial days."[108] Additionally, the report recognizes the effectiveness of the Apache but implies that the running fires used inhibited the effectiveness of the unit; "Army attack helicopters performed well but could not hover for extended periods along the ridgelines because of altitude restrictions."[109]

The use of the Apache during Operation Anaconda highlighted a paradox of the Apache capability. While credited with saving lives by providing very close fires in order to prevent friendly forces from being overrun, the aircraft sustained a great deal of damage from small arms and rocket propelled grenades. [110] Of the seven Apaches

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[107] Jonathon Bernstein, *AH-64 Apache Units of Operations Enduring Freedom and Iraqi Freedom* …2-40.

[108] Richard L. Kugler, Michael Baranick, and Hans Binnendijk, *Operation Anaconda Lessons for Joint Operations* . . . 50.

[109] *Ibid*., 50.

involved in the first day of the mission all were hit by small arms, two were damaged by Rocket Propelled Grenades (RPG) and five were damaged so badly that they were unable to return to combat for the next two days.[111] Conversely, no Apaches were actually shot down during the fighting and the helicopter was able to defeat first generation MANPADS such as the SA-7 and HN-5.[112] So successful was the Apache in providing close fires that thirty six hours after the start of the operation an additional 24 Apaches arrived from the continental United States to help support the battle.[113]

The mixed success of the Apache capability during Op Anaconda provides context to the subsequent failure of the Raid at Karbala. By any objective definition of the term, the Apache operations during Op Anaconda could not be categorized as deep strike. Al Qaeda fighters in the Shah-i-kot Valley were not the dense array of armor that the Apache was designed to attrite and fires were provided in direct support of troops in contact and not against echelons of follow-on enemy forces. The Apache was, however, able to rapidly adapt TTP to provide close fires much as had Cobra pilots of the Vietnam War. Additionally, as an organic part of the formation being supported, Apache operations were not hampered by coordination and communications issues that characterized fixed wing CAS during the initial part of the operation. Conversely, given the close nature of the battle and the extensive battle damage that the aircraft sustained it is easy to understand how the TTP used did not inform subsequent operations during the

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[110] Jonathon Bernstein, *AH-64 Apache Units of Operations Enduring Freedom and Iraqi Freedom* . . . 2-27.

[111] *Ibid.,* 2-30.

[112] *Ibid.,* 2-27.

[113] Richard L. Kugler, Michael Baranick, and Hans Binnendijk, *Operation Anaconda Lessons for Joint Operations* . . . 6.

early part of the Operation Iraqi Freedom. What would remain unchanged was the helicopters vulnerability to small arms and RPG fire when area SEAD was not available.

2.6. Failed Raid at Karbala

Of the major attack helicopter operations that have occurred during both OIF and OEF the failed raid at Karbala during the initial invasion of Iraq is the one that is most often pointed to as a failure of the Apache system and associated deep strike doctrine. The conservative national heritage foundation in a July 2003 retrospective of lessons learned from the invasion of Iraq, calls for a study to determine if the failure that occurred was a result of poor tactics or if, in their words, "the battlefield role of rotarywing attack aircraft is a technological dead end." The following section will describe the raid in enough detail to provide context to the discussion that resulted. Additionally, it will discuss some of the criticism leveled at the aircraft and doctrine as well as the initial U.S. Army's perspective on the lessons learned from the failed raid.

On the 20th of March 2003 the ground offensive of OIF began with U.S. lead coalition forces crossing into Iraq along the Kuwaiti border.[114] Initial attempts at deep strike using AH-64s resulted in an inauspicious start to attack helicopter operations during the Gulf War. The 11th Aviation Regiment (Avn Regt) in support of the 3rd Infantry Division's (3rd ID) initial push into Iraq was launched against the Iraqi 11th Infantry Division in the area of Tallili Air Base. Dust and haze resulted in poor visibility

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[114] Col Gregory Fontenot (Retired), LTC E.J. Degen and LTC David Tohn. *On Point: The United States Army in Operation IRAQI FREEDOM*, (Fort Leavenworth: Combat Studies Institute Press, 2004): 86.

which prevented command and control Blackhawk and refueling Chinook Helicopters from continuing safely. As a result, the 11th Avn Regt aborted the mission and the 3rd ID crossed into Iraq without the shaping operations assigned to the 11th Avn Regt having been completed.[115] The initial failed attempt to use regimental sized attack helicopter operation resulted in pressure on the unit to conduct a deep strike mission before the rapid collapse of the Iraqi Army prevented the unit from supporting the war in a "meaningful way."[116]

On the 23rd of March 2003, the 11th Avn Regt was tasked to destroy the Republican Guard Medina Division's armor and artillery in support of the 3rd ID maneuver through an area known as the Karbala gap.[117] With what has been described as "inexact intelligence,"[118] and missing key communications and Forward Arming and Refueling systems, 30 Apaches were sent to destroy the division in the built up areas west of Karbala. SEAD, as was the case for the TF Hawk concept of operations, was based primarily on indirect fires, in this case ATACMS.[119]

As Apaches approached their objects, they were faced with intense small arm and light AAA fire. The Iraqi Army had anticipated the low level, hovering fire tactics that defined U.S. Army deep strike doctrine of the previous Gulf War. By dispersing their forces and using unsophisticated coordination system such as phones, low power radios and the flashing of the urban lighting systems, the Iraqis were able to coordinate a

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[115] Col Gregory Fontenot (Retired), LTC E.J. Degen and LTC David Tohn. *On Point: The United States Army in Operation IRAQI FREEDOM . . .* 109.
[116] *Ibid*.. 184.
[117] *Ibid*., 180.
[118] *Ibid*., 180.
[119] *Ibid*., 180.

defense that relied on the massed firing of small arms and light AAA. With little signal intelligence, poor communications and the coordination and collateral damage issues involved in using ATACM in urban areas, Apache crews had little ability to suppress enemy threats.[120]

By the time the mission was aborted all 30 aircraft launched had been damaged by small arms fire. Of the 30 damaged, one was damaged to the point where the aircraft had to be landed and both pilots were taken prisoner by the Iraqi Army. While most of the aircraft were returned to service within a few days, two required a month to repair and the unit did not conduct another battalion sized operation for nine days. [121] In terms of the effect achieved, only a small number of air defense systems and trucks were destroyed and a small number of Iraqi personnel killed in a mission originally designed as a two day operation to destroy an Iraqi division.[122]

The Karbala mission did not, however, end the Army's attempt to use deep strike in support of divisional maneuver. On the 28th of March 2003 the 101st Aviation Brigade conducted what was a second deep strike against the 14th Mechanized Infantry Brigade of the Medina Division. This time using a combination of carefully planned routes, closely coordinated ATACM, Close Air Support and organic suppressive fires, the 101st Aviation Brigade in combination with USAF and USN aircraft were able to destroy six

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[120] *Ibid*., 186.
[121] *Ibid*., 186.
[122] *Ibid*., 186.

armored personnel carriers, four tanks, five trucks and fiber-optic facility and kill approximately 20 troops.[123]

The regimental deep strike mission on the 28th of March would prove to be the last time Apaches were used in significant numbers in the deep strike role during OIF.[124] By April 6th, air supremacy was declared across Iraq and U.S. Army Aviation began to focus on providing close support in urban areas.[125] While the deep strike mission of the 28th of March was only marginally successful by any objective standard, lessons learned documents continued to point to the success of the mission as vindication of the deep strike doctrine:

> Although not a high count by "exercise standards," the attack marked an effective use of deep-strike Army attack aviation against a highly adaptive enemy. Moreover, it illustrates how quickly Army and fixed-wing aviators adapted to an enemy that had caused significant damage to the pervious deep strike. [126]

The results of the raid of the 28th of March and subsequent success of the Apache in the close support role did not forestall significant criticism of the aircraft and associated deep strike doctrine. In October 2003, Richard J. Newman discounts the accomplishment of the 28th of March deep strike mission. In the Air Force Magazine article "Ambush at Najaf," Newman states, "Apache pilots know they never could have flown over Iraqi cities if fixed-wing fighters and other weapons hadn't neutralized Iraqi

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[123] *Ibid.,* 195.

[124] Robert M. Cassidy. "Renaissance of the Attack Helicopter in the Close Fight." *Military Review: The Professional Journal of the U.S. Army* 83, no 4 (July-August 2003): 42.

[125] Anthony H. Cordesman, The Iraq War: Strategy, Tactics, and Military Lessons (Washington DC: The Center for Strategic and International Studies, 2003), 104.

[126]Col Gregory Fontenot (Retired), LTC E.J. Degen and LTC David Tohn. *On Point: The United States Army in Operation IRAQI FREEDOM*…195.

air defenses and friendly ground troops hadn't secured the territory beneath them."[127] Additionally, Major General McPeak (ret) former Chief of Staff of the United States Airforce criticized the Apache deep strike capability in an editorial published in the June 5, 2003 Washington Post. In the article, McPeak, states that the Apache is "unlikely to achieve operationally useful amounts of speed and stealth, the best defenses against aimed ground fire. As a practical matter, the army should restrict the Apache to close air support – or, if it must go deep, hand it over for joint tasking." [128]

The leadership of U.S. Army Aviation, however, was unwilling to concede that the Apache was poorly placed to support an independent deep strike mission. Major General John Curran then Commanding General, United States Army Aviation Center and Chief of the aviation branch framed both missions as a validation of the deep strike capability of the Apache in an October 2003 edition of the Army Aviation Magazine:

> Battle damage assessment (BDA) for both attacks was low, causing some critics to question the validity of shaping operations. But, in reality, the shaping operation accomplished its mission because it verified that the enemy was forced to disperse his assets across the battlefield, making him virtually useless against follow-on ground forces.[129]

In addition to the assertion of the value of Apache deep strike, Curran also notes the value of a "rolling barrage" of ATACMS based SEAD. As was planned but not used during TF Hawk, the 101st Aviation Brigade operation of the 28th of March was dependent on the use of ATACMS indirect fires to provide SEAD along the route to the

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[127] Newman, Richard J. "Ambush at Najaf." *Air Force Magazine* (October 2003): 63. http://www.airforce-magazine.com/MagazineArchive/Documents/2003/October%202003/1003najaf.pdf

[128] McPeak, Merrill A., "Leave the Flying to Us." *Washington Post,* (June 5, 2003): 33.

[129] John M. Curran. "Army Aviation Operations During Operation Iraqi Freedom." *Army Aviation Magazine.* (Oct 3, 2003): 4.

target area. While in line with the published doctrine at the time, the use of "rolling barrage" indirect fires in a non-contiguous nonlinear battlespace seems at odds with the principles of proportionality as defined by the U.S. Army Judge Advocate General's Office.[130]

Summary of Post-Gulf War Challenges

This chapter has demonstrated that after the collapse of the Soviet Union, the U.S. Army's approach to Apache deep strike doctrine, specifically, battalion sized operations using indirect fires for SEAD was incompatible with the post-cold war, nonlinear, non-contiguous battlespace conflict environment that defined both the Kosovo conflict and invasion of Iraq. Further, the U.S. Army failed to recognize the limitation of their approach to deep strike after the failure of TF Hawk and as a result was ill prepared for deep strike operation in the initial stages of OIF and OEF. Of the lessons learned that were identified after TF Hawk none sought to reconcile the fundamental issue of the Apaches vulnerability in the face of small arms and manually aimed direct fire air defence when area SEAD systems such as MLRS, ATACMS or artillery were not available or suitable for use.

While the U.S. Army had not resolved the doctrinal problems that lead to the failure of TF Hawk prior to the invasion of Iraq, UK, doctrine of the time suffered from the same incoherent doctrinal approach. In the same way the U.S. Army was dependent

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[130] United States. Department of Defence. Law of Armed Conflict Deskbook. United States Army Judge Advocate General's Legal Center and School. Washington, DC: US Government Printing Office, 2012.

on indirect fire systems for SEAD, the British Army had accepted that MLRS or ATACMS was the preferred method of area SEAD in support of deep strike operations. Given that by 1999 the UK had not yet acquired the MLRS system, the British Army were reliant on Air Force based SEAD and the technological advantage the aircraft was designed to enjoy in terms of suppressing emitting enemy air defense systems.

Given the failure to identify the incoherent nature of deep strike doctrine centered on indirect fires for SEAD in a nonlinear non-contiguous battlefield, the U.S. Army must be credited at the tactical and operation level with being able to rapidly adapt TTP to support ground maneuver. During Op Anaconda, U.S. Army Apache pilots hastily adapted flight profiles to counter intense small arms fire. Much as had Cobra pilots of the Vietnam War, Apache pilots were able to operate in a high threat environment as an organic part of the supported formation without being hampered by coordination and communications issues that characterized fixed wing CAS during the initial part of the operation. Without the support of MLRS, ATACMS or artillery, Apache pilots were reliant on maneuver, speed and the ability of the Apache to take significant damage form small arms fire in order to fight and survive.

The failure of the raid on Karbala during OIF reignited debate concerning the U.S. Army's deep strike Apache mission. Given the experience of TF Hawk and the result of Op Anaconda it could be argued that U.S Army doctrine developers should have anticipated the condition that lead to the failure of the raid on Karbala. That they did not is not surprising given then Chief of the Aviation Branch, Major General Curran's framing of the results, even after it was clear the Karbala mission had been a failure.

Obviously committed to indirect fires based SEAD, MG Curran continued to champion deep strike based on the doctrine established in the context of a linear contiguous battlefield.

Given that the deep strike doctrine used to plan and execute the failed raid at Karbala was endorse by MG Curran, there is value in examining the direction U.S. Army attack helicopter doctrine has gone since the “end of major combat operations” in Iraq and the subsequent decade of conflict in Afghanistan. The next chapter will examine U.S. Army doctrine from 2003 onward and propose what future deep strike attack helicopter might look like in the near future.

CHAPTER THREE – APACHE DOCTRINAL ADAPTATION

3.1. Introduction

The following chapter will examine how U.S. Army doctrine has deconstructed the concepts of deep, close and rear operations and linear battlespace in order to align the Apache's original deep strike capability with the current operational environment. As a start point, the chapter will highlight the success of the Apache in the counter-insurgency environment of Iraq and Afghanistan that occurred after the fall of Bagdad. The discussion will link the success of support Stability and Support Operations (SASO) in both OIF and OEF to the doctrinal adaptations that occurred as a pragmatic response to the requirements of the battlefield and the criticism of both the aircraft and doctrine that culminated in the aftermath of the failed raid on Karbala. The narrative will also examine how U.S. Army Aviation doctrine has shifted away from a focus on fully articulated deep strike while retaining the doctrine necessary to shape the battlefield in support of formation level maneuver. British Apache operations in the Libya campaign of 2011 will be looked at as the most recent example of Apache operations that arguably meet the now defunct U.S. Army definition of deep operations. Finally, the future of Apache doctrine will be related to the capability of the helicopter to support shaping operation by leveraging the emerging technologies of UAV and MUM-T.

Given the high profile mission failures of both Task Force Hawk and the raid at Karbala it would be easy to conclude that the Apache had become a relic of Cold War requirements. This chapter will demonstrate that contrary to this, the Apache capability is well postured to support both current and future operations. Doctrinal adaptation by U.S.

Army Aviation has deconstructed both the concept of deep close and rear battlespace and linear and non-linear area of operation. By adopting a new paradigm of battlespace divided into only contiguous and non-contiguous areas of operations, U.S. Army Aviation has focused on the current fight while maintaining the ability to conduct a full spectrum of operations including operations in depth in support of formation maneuver. Additionally, while recent doctrine has deemphasized ATACMS and MLRS based SEAD in support of operations in depth, the U.S. Army's development of UAV and MUM-T technology will fill the resulting capability gap.

3.2. Stability Operations

While the deep strike mission at Karbala of the 23rd of March was by any measure a failure and given the relatively minor nature of the success of the 28th of March it would be easy to conclude that the Apache underperformed throughout the conventional operations that characterized the initial invasion of Iraq until the occupation of Bagdad. The statics however, tell a different story; from the 23rd of March until the 1st of May 2003, Apaches of the 101st Aviation Brigade destroyed 866 targets including tanks, artillery, Air Defence Artillery, missile launchers and infantry fighting vehicles during subsequent close support and armed reconnaissance operations.[131] Of more significance however, is the Apache's performance once OIF transitioned to the SASO mission.

As the intensity of the fighting in Iraq ebbed and flowed in the years following the fall of Bagdad, the U.S. Army continuously adapted the Apache capability to meet the

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[131] Robert M. Cassidy. "Renaissance of the Attack Helicopter in the Close Fight."…42. http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA512326

needs of the supported commanders. When the Apache was transitioned to the close support role, working directly in support of the Brigade Combat Team (BCT) during cordon and search operations, the capability was credited with being effective in the interdiction of fleeing paramilitaries. This ability was based on the aircrafts being able to bring significant fires to bear on the avenues of escape that conventional forces were unable to cover.[132] During the Battle for Fallujah in 2005[133] and Sadhr City in 2004[134] and 2008[135], the Apache was credited with being an essential element of the operations to counter the insurgency that had taken hold in urban environments.

Given combat operations continue in Afghanistan, relatively little empirical open source information is available with respect to how well the capability performed and continues to perform. Anecdotal information however, point to the strengths of the aircraft and doctrine in support of contemporary Counter Insurgency (COIN) and SASO operations. Both the aircraft and doctrine has proven to be particularly effective as part of the COIN operations occurring in the rugged terrain of Afghanistan. In these operations the capability is tasked at the BCT level and individual Apache sections respond to request for support from the lowest level.[136] Captain Preston Pysh, Commander of Alpha Company, 1-101st Avn. Regt when commenting in 2009 on his Apache unit's close

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[132] *Ibid.,*44.

[133] Ted, McKenna. "New Tactics for U.S. Army." *The Journal of Electronic Defense.* 25. No. 9 (December 2005): 21.

[134] Jonathon, Bernstein. *AH-64 Apache Units of Operations Enduring Freedom and Iraqi Freedom* . . . 2-30.

[135] David E. Johnson, M. Wade Markel and Brian Shannon. *Occasional Paper: The 2008 Battle for Sadhr City.* Santa Monica: Rand Corporation, 2011. 15.

[136] Majumdar, Dave. "The Apaches of the 1-101st Aviation Regiment: Expect No Mercy." *The Examiner Online.* (June 25,2009): n/a. Last accessed 12 April 2013. http://www.examiner.com/article/the-apaches-of-the-1-101st-aviation-regiment-expect-no-mercy

support operations stated; “the infantry groups will not survive without helicopter support. This is what it’s about, defending the ground forces. We’re not focused on the mass hordes anymore.”

With U.S. Army Aviation now focused on supporting TICs, the habitually critical Air Force Association Air Force Magazine praised the Apache for its ability to provide intimate support to troops. A June 2012 article recounting the experience of USAF Special Tactics Officer Captain Barry Crawford, credits the Apache with saving the lives of Crawford and the Afghan troops he worked with. In Crawford’s words; “The professionalism of the Apaches’ [crews] was incredible…they were actually waking people up to come out and putting ad hoc flight together to support us. If I said I need weapons here they didn’t question it…because they knew too many lives were on the line.”[137]

While the article is supportive of the Apache and its ability to support TICs, it paradoxically highlights one of the historical strengths of the attack helicopter capability in the deep strike role. As was part of the reasoning for Gen Clark’s decision to deploy Apaches to Albania during the Kosovo conflict, the Apaches in support of Captain Crawford’s unit were able to work in rugged terrain below cloud. Air Force Magazine states: “ A few hours in to the fight a heavy layer of clouds covered the mountaintops and rain started pouring down, forcing Crawford to rely heavily on the Apaches.”[138]

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[137] Amy McCullough. “Caught in the Crossfire.” *Air Force Magazine.* 95, no. 6 (June 2012): 30. http://www.airforcemag.com/Features/airpower/Pages/box040612crawford.aspx

[138] *Ibid.*,30.

Operation of attack helicopters in the CCA role in the COIN environment are not universally seen as an unequivocal success. A United Nations Assistance Mission in Afghanistan report notes an alarming trend in the number of civilians killed by "Air Strikes" in 2010. The study states that while fixed wing CAS strikes had increased by 51% in the first six months of 2010 compared to 2009, civilian deaths due to fixed wing airstrikes had declined. Conversely civilian casualties as a result of Apache CCA had increased markedly during the same period.[139]

The upsurge in civilian deaths due to Apache operations in 2010 must be viewed in context. The total number of deaths of civilians killed and injured by Pro Government Forces decreased by 11% for the same six month period.[140] By comparison, civilian deaths and injuries due to anti-government forces (AGF) increased by 21 % during the same period. Additionally, as indicated in the report, the total number of CCA mission flown by Apache aircraft was not reported nor are the statics base lined against the general level of violence or activity conducted by AGF. [141] It is possible therefore, that the upturn in civilian deaths and injuries is a result of the Apache being used more often in response to an increase in AGF activity.

3.3. Post Karbala Evolution of Doctrine

With the high profile nature of the failed raid at Karbala, it is not surprising that tactics were adapted to reflect the reality of the combat that was occurring. What is

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[139] United Nations, *Afghanistan Midyear Report 2011 Protection of Civilians in Armed Conflict,* United Nations Assistance Mission in Afghanistan, Kabul, July 2011. 24.

[140] *Ibid.,*30.

[141] *Ibid.,*24.

perhaps more surprising is that doctrinal adaptation began to appear as early as August 2003. In the U.S. Army Field Manual (FM) 3-04.111 *Aviation Brigades,* dated August 2003, a new section appeared on what was referred to as "Conducting Operations in Urbanized Terrain." The manual notes; "Hovering in urban areas exposes aircraft to small arms fires and should only be done if essential to the mission and adequate *overwatch* fires are available."[142] The FM also describes the impact of operations in both a nonlinear and non-contiguous battlespace and defines operations in urbanized terrain in the following terms:

> Whether engaged in MTW [Major Theatre War], SSC [Small Scale Contingencies], or SASO [Stability and Support Operations], the aviation brigade probably will conduct operations in urbanized terrain. This is partly because of growing populations, but also results from a potential adversary's tendency to create a nonlinear battlefield rather than attempt to face U.S. forces directly. Potential adversaries can be expected to use urbanized terrain for cover and concealment, and to reduce U.S. combat superiority by taking advantage of weapons restrictions and reduced options available to commanders under ROE [Rules of Engagement], ROI [Rules of Interactions] , and Law of War.[143]

By way of the comparison the 1997 version of the publication mentions nonlinear battlespace only in passing and contains no reference to non-contiguous battlespace.[144]

While recognizing the realities of operations in non-contiguous battle space, the 2003 *Aviation Brigade* FM did not attempt to change the doctrinal template for Apache deep strike operations. In describing the scope of operations the manual notes; "Attack units can conduct operations in deep areas or attack with ground maneuver units during

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[142] United States. Department of Defense. *FM 3-04.111, Aviation Brigades*. (Washington, DC: U.S. Government Printing Office, August 2003): 4-11.

[143] *Ibid*., 6-10.

[144] United States. Department of Defense. *FM 1-111, Aviation Brigades*. (Washington, DC: U.S. Government Printing Office, 27 October, 1997): J-11.

close and rear battle operations. Attack units normally are most effective when used in mass on the enemy's flanks and rear."[145] In addition to continuing to define the battlespace in the same terms as previous doctrine, the manual did nothing to deemphasize the use of indirect area fires in the deep strike support role listing both ATACM and MLRS as systems available for lethal and non-lethal Joint SEAD.[146]

By early 2006, the U.S. Army had determined that a doctrinal adjustment to the concept deep strike was required. In the *Army Times* article "TRADOC cuts Apaches' role in deep attack" Gen William Wallace, then Commander Training and Doctrine Command (TRADOC) signaled the intention to modify doctrine related to how the U.S. Army conducted deep strike operations. In conversation with reporters at the United State Army's Winter Symposium, Wallace indicated that new doctrine would include "less integration of Apache Helicopters . . . and more use of Multiple Launch Rocket Systems, perhaps even with unitary rounds that are long-range precision." Wallace also stated that the U.S. Army would be more reliant on the Air Force for deep attack operations.[147]

Wallace's stance on deep strike doctrine is echoed in a 2007 Rand report written for the USAF and titled "Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era." In the report the author, David Johnson, called for the U.S. Army to forgo deep strike as a means of shaping the operational battle. Johnson recommended that the U.S. Army abandon both the Apache and ATACMS, and

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[145] United States. Department of Defense. *FM 3-04.111, Aviation Brigades.*(Washington, DC: U.S. Government Printing Office, August 2003): 6-11.

[146] *Ibid*., 5-6.

[147] Greg Grant. "TRADOC cuts Apaches' role in deep attack." *Army Times* (17 April 2006): 1.

suggested that the Apache is not survivable when conducting deep operations.[148] The article went on to suggest that the U.S. Army's requirement to control airspace for ATACMS based SEAD in support Apache deep strike operations limited the ability of the USAF to shape the operational battlespace. Framed in terms of a linear battlespace, the article called for the U.S. Army to give up control of those portions of the battlespace that could have been shaped only with ATACMS, MLRS and Apaches. By relinquishing deep operations the U.S. Army would allow the line that delineated the requirement for the Air Force to coordinate strikes with the Army, the Fire Support Coordination Line (FSCL), to be moved much closer to the Forward Edge of the Battle Area (FEBA);

> . . . because the Apache was (and is) a key system in the Army's concept of executing deep battle operations. Thus, to be able to employ the Apache effectively in deep battle, the Army doctrinally controls sufficient battlespace to employ it at operational depths. If the Apache was not survivable, then the Army's claim on an expansive battlespace and a far-forward FSCL—would be less compelling.[149]

In the end, the report argued that the U.S. Army should focus the Apache capability on "close support of ground forces, armed reconnaissance, and precision attack in urban areas" and that the resources freed up by the abandonment of the deep strike mission be reassigned to air power.[150]

In 2007, both the 1997 *Attack Helicopter Operation* FM 1-1142 and the 2000 *Air Cavalry Squadron and Troop Operation* FM 1-114 were combined to produce *Attack*

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[148] David E. Johnson, *Learning Large Lessons. The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era*. (Santa Monica: Rand Corporation, 2007): 63. http://www.rand.org/content/dam/rand/pubs/monographs/2007/RAND_MG405.1.pdf

[149] David E. Johnson, *Learning Large Lessons…*36.

[150] *Ibid*., 76.

Reconnaissance Helicopter Operation Field Manual 3-04.126.[151] The updated manual was a significant departure from previous doctrine as it deconstructed the conceptual framework of linear battlespace. The new manual made no reference to either close deep or rear operations or linear and nonlinear battlespace and helicopter attack operations were now classified simply as Interdiction Attack (IA) and CCA. The FM described the difference between the two as; "While an IA is used against specific targets out of contact with friendly forces, CCAs quickly focuses aerial firepower onto enemy forces in the close fight to support friendly ground maneuver."[152]

While some would argue that the changes that appeared in the aviation doctrine released in 2007 were aligned with the recommendations of 2006 Rand Report, the evidence does not appear to support this. While the deep strike mission was no longer labeled as such, it could be argued that the 2007 doctrine was written such that the ability to strike in depth in support of formation maneuver continued to exist in the form of what became IA. The manual notes, "The battalion contributes to shaping the operational environment by assisting in finding, fixing, and engaging the enemy." Additionally, while not expressly referred to as deep strike the concept of the Joint Air Attack Team (JAAT) and the employment methods of phased continuous and maximum destruction

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[151] United States. Department of Defense. FM 3-04.126, *Attack Reconnaissance Helicopter Operations*. (Washington, DC: U.S. Government Printing Office, February, 2007): i. http://armypubs.army.mil/doctrine/DR_pubs/dr_a/pdf/fm3_04x126.pdf

[152] United States. Department of Defense. FM 3-04.126, *Attack Reconnaissance Helicopter Operations* . . . 3-59.

used to conduct IA remained unchanged from the 1997 *Attack Helicopter Operation* Field manual outlining ATKHB operations.[153]

In addition to the changes to the *Attack Reconnaissance Helicopter Operation FM*, significant changes were made to Brigade level doctrine. FM 3-04.111, *Aviation Brigades*, also released in 2007, describes IA as combining "ground-based fires, attack aviation, unmanned systems, and joint assets to mass effects (beyond friendly forces in contact). [It is] Focused on key objectives, fleeting HVTs, and threats to friendly maneuver.[154] This definition is arguably designed to encompass those missions that had previously been described as deep operations.

In 2008 the Aviation doctrine approach to conceptualizing the battlespace was validated by the release of the U.S. Army keystone doctrine, FM 3-0 *Operations*. The manual explicitly notes the deconstruction of the concepts of deep, rear and close operation and linear and non-linear battlespace. In the Summary of Major Changes, Chapter 5, Command and Control FM 3-0 states:

> Chapter 5 makes the following changes . . . Rescinds the terms deep, close, and rear areas. Uses close combat to describe operations in what used to be called the close area . . . Eliminates linear and nonlinear as ways to describe the array of forces on the ground. Army doctrine now describes force arrays as occupying either contiguous or non-contiguous areas of operations.[155]

While the FM 3-0 reconceptualised battlespace as only contiguous or non-contiguous it did not signal the intent of the U.S. Army to abandon operations in depth to

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[153] United States. Department of Defense. FM 1-112, *Attack Helicopter Operations* . . . 3-14.

[154] United States. Department of Defense. FM 3-04.111, *Aviation Brigades*. (Washington, DC: U.S. Government Printing Office, December, 2007): 3-1.

[155] United States. Department of Defense. FM 3-0, *Operations*. (Washington, DC: U.S. Government Printing Office, February, 2008): D-4.

the USAF. FM 3-0 notes; "Army forces use combined arms, advanced information systems, and joint capabilities to increase the depth of their operations. The complementary effects produced by executing simultaneous operations in depth overwhelm enemy forces, forcing them to respond piecemeal or not at all."[156]

Although aligned with the 2008 FM 3-0, in terms of the changes to the conceptualization of battle space, what the 2007 *Aviation Brigade* FM does not include is equally important. While the 2003 *Aviation Brigade* FM continues to emphasise the importance of integrating both MLRS and ATACMS into deep operations, the 2007 FM make no mention of ATACMS and refers to MLRS only as one of the interface responsibilities of the Utility Helicopter Command and Control system.[157] While the requirement for the integration of both ATACMS and MLRS continued to reside in the 2007 *Attack Reconnaissance Helicopter Operation* FM, they are mentioned as only one of a number of possible SEAD systems available and only if "authorized".[158]

The doctrinal changes implemented by the U.S. Army in general and U.S. Army aviation specifically will probably do little to convince the critics of the Apache's capability to operate in depth. The problems associated with TF Hawk and the raid on Karbala dovetail too conveniently with the arguments calling for the U.S. Army to forgo operations beyond the range of their direct fire weapons in favor of fixed wing air interdiction operations. While much of the debate is based on the capability and mandate

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[156] *Ibid*., D-4.

[157] United States. Department of Defense. FM 3-04.111, *Aviation Brigades*. (Washington, DC: U.S. Government Printing Office, December, 2007): B-13.

[158] United States. Department of Defense. FM 3-04.126, Attack Reconnaissance Helicopter Operations. 2007...C-16.

of the respective services to shape the battlespace, the raid on Karbala is often pointed to as the most concrete example of the Apaches vulnerability in the low altitude air defence environment.[159]

While there is little debate that the 11th AHR was mauled by the non-traditional air defense encountered at Karbala, to extend this experience to all future operations in depth would be problematic. Lt. Gen. Wallace, then commander of the Army's V Corps credits the Apache with supporting Corps level maneuver in the advance on Bagdad by establishing a reconnaissance screen on his right flank:

> . . . [there] was a significant area between the two corps formations that had not been cleared by any ground forces…I used the 11th Aviation Regiment to go out and clear that area and in fact they found enemy air defense...they found a large number of abandoned enemy equipment. They did not find any substantial enemy artillery formations out there, which gave me a degree of security and sense of security at least associated with our right flank.[160]

According to U.S. Army Aviation doctrine at the time, the mission to screen V Corps would have been classified as a close operation. [161] If reframed in the lexicon of current doctrine, the mission would be classified as a security mission in a non-contiguous area of operations not fundamentally different from IA missions in depth. While the FM 3-04-111 Aviation Brigade Doctrine continues to describe screens in support of BCT maneuver as a subset of security operations, the manual emphasizes the interrelation between the security and IA mission:

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[159] Johnson, David E. Learning Large Lessons. The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era. Santa Monica: Rand Corporation, 2007. 63.

[160] "V Corps Commander: Army 'Altered use' of Apaches Following Failed Attack." *Helicopter News* 29, no. 10 (May 20, 2003): n/a. Last accessed 18 January 2013. http://search.proquest.com/docview/202800175?accountid=9867

[161] United States. Department of Defense. FM 1-112, *Attack Helicopter Operations* . . . 1-7.

> The combination of attack reconnaissance aircraft and UAS enable commanders at all levels to quickly move or deploy interactive and interpretive intelligence collectors over great distances to provide early warning, and gain and disseminate a timely picture of the battlefield. These aircraft quickly transition from a reconnaissance/counter reconnaissance or security mission to an economy of force or attack mission to provide reaction time, maneuver space, and protection for air-ground operations.[162]

Given the Apache achieved the screen mission successfully beyond range of the supported Corps, it can be argued that the low level air defense environment across Iraq was not uniform. As a result, it can also be reasoned that the vulnerability of the Apache is dependent on the local enemy low level air defence disposition and the U.S. Army's awareness of it. To relinquish all shaping operations to fixed wing aircraft as a result of the singular failure of the raid on Karbala regardless of the supported unit's level of intelligence with respect to the enemy local low level air defense situation is a leap the U.S. Army appears unwilling to take.

3.4. Libya 2011

Given the change in the conceptualization of the battlespace that has occurred in the context of the current SASO and COIN environment there is value in examining one of the most recent uses of attack helicopters outside the confines of both Iraq and Afghanistan. In May 2011 both the United Kingdom and France launched what could be defined as deep strike attack helicopter operations against targets in Libya. The strikes were in support of the enforcement of United Nations Security Council Resolution 1973 demanding an immediate ceasefire, an end to attacks on civilians and a ban on all flights

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[162] United States. Department of Defense. FM 3-04.111, *Aviation Brigades*. (Washington, DC: U.S. Government Printing Office, August 2003): 3-6.

in Libyan airspace.[163] Flying a total of 22 missions, British AAC Apaches fired 99 Hellfire missiles, 4800 rounds of 30 mm canon ammunition and sixteen 2.75 inch rockets, during strikes that destroyed 116 targets including vehicle checkpoints, command and control systems, MLRS and vehicles.[164]

If viewed from the perspective of U.S. Army doctrine, the British AAC mission over Libya constituted operations in a non-contiguous battlespace. The missions flown were not integrated into a ground scheme of maneuver as coalition forces were limited to enforcing a no fly zone in defence of Libya's civilian population and as a result prohibited from mounting a land force intervention.[165] Additionally, The Israeli Institute for National Security Studies reported that, prior to the start of the civil war, the Libyan military possessed approximately 30 heavy and 17 medium surface to air missiles batteries as well as 55 SA- 9/SA-13/SA-24 launchers and over 400 SA-7/SA-14/SA-24 MANPADS.[166] In addition to the missile systems, Libya was reported to have had 730 AAA systems of which 440 were ready for use.[167]

Given that Apache operations were conducted over terrain that was not being controlled by coalition forces and the density of antiaircraft systems available to the Gadhafi régime, the missions were flown in what was considered a "high threat

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[163] Royal Aeronautical Society. "Lesson Offered From the Libya Air Campaign" London: Royal Aeronautical Society July 2012. 5.

[164] *Ibid*., 12.

[165] Barrie Douglas, "Libya's Lessons: The Air Campaign." *Survival: Global Politics and Strategy.* 54, no. 6 (2012): 57.

[166] Institute for National Security Studies, *Review of Armed Forces, Middle East Military Balance Files. Libya*. (Tel Aviv, University of Tel Aviv, 19 Jan 2012). 11.

[167] *Ibid*., 12.

environment for AH".[168] While significant fixed wing SEAD was available, British Apache's faced a dense air defence threat and were often required to use their organic SEAD capabilities to destroy both radar facilities and AAA systems such as the ZSU 23-4.[169]

In order to fully appreciate the decision to deploy the Apache to Libya a comparison of the number of fixed wing airstrikes is useful. Over the course of the seven months of conflict 26,000 NATO sorties were flown. Of these sorties, only 400 were flown by French and British helicopters. Although many of the details of the mission are still classified, it is logical to assume that much of the reason the Apache capability was used during the Libya campaign was its ability to detect and service targets that conventional fixed wing aircraft could not. As noted in the previous chapter, the WAD-64D is equipped with a sophisticated RFI and FCR that facilitates the targeting of radar based anti-aircraft systems. Additionally, the precision capability of the Hellfire missile system is ideally suited to attrite armor targets in defiladed locations.[170] The idea that the Apache was better able to service specific targets than the fixed wing strike aircraft available was supported by the Royal Aeronautical Society's assessment of the success of combined Royal Air Force and AAC operations:

> The principal lessons identified were that "AH strike from the sea works" and that the integration of 'fast air' and AH is possible and effective. The combination of,

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[168] Royal Aeronautical Society. "Lesson Offered From the Libya Air Campaign… 12.

[169] Anrig, Christian F. "Allied Air Power over Libya: a preliminary assessment." *Air & Space Power Journal* 25, no. 4 (Winter, 2011), 100.

[170] Hugh M. Dimmery. 'The AH-64D Apache Longbow, Affordable Evolution" Paper presented at the RTO SCI Symposium on "Aircraft Update Programs. The Economical Alternative? held in Ankara, Turkey, 26-28 April 1999 and published in RTO MP-44. A22-2.

> on the one hand, Tornado and Typhoon and, on the other, Apache, offered a wide range of weapon and sensor options to the force commander.[171]

While many of the lessons learned in Libya concerning attack helicopter operations are important, it would be a mistake to claim the campaign was a template on which all future AH operations should be based. While Libya had a robust prewar soviet era air defense system, a month of civil war must have necessarily degraded the capability.[172] Additionally, given that it was a civil war, it is logical to assume that a coherent approach to air defense by the Libyan Army would have been more difficult than it was for the Iraqi Army at Karbala.

The Libya campaign has, however, demonstrated that the Apache is capable of attack operations in depth, unsupported by indirect area fires such as MLRS and ATACMS when integrated into the Joint SEAD plan. Additionally, it can be concluded that the Apache, as a system, offers unique capabilities that warrant its use in a high threat anti-aircraft environment. What remains to be demonstrated is how the recently changed U.S. Army conceptualization of the battlespace and the lessons learned in Libya can be integrated to support future U.S. Army Apache operations in depth.

3.5. UAV and Manned Unmanned Teaming.

Of the issues identified in open source literature with respect to British AAC operations in Libya, one of the most interesting is the discussion of cancelled missions. Of the twenty two missions cancelled, 90% were as a result of a lack of situational

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[171] Royal Aeronautical Society. "Lesson Offered From the Libya Air Campaign" ...12.
[172] Christian F. Anrig,. "Allied Air Power over Libya…91.

awareness (SA) with respect to the location of both pro and anti-Gadhafi forces. This lack of SA is attributed by the Royal Aeronautical Society to the lack of available Intelligence Surveillance and Reconnaissance (ISR) assets.[173] The Royal Aeronautical Society goes on to conclude its discussion of Attack Helicopter Operation in Libya by noting; "The use of RPAS [Remotely Piloted Aircraft Systems] is likely to increase partly because they are well suited to the 'dull and dangerous' missions and partly because a loss is less unacceptable than that of a manned aircraft and the crew."[174]

The idea that UAVs can support Apache Operations while minimizing risk is not new. A Rand Corporation report on the 2008 battle for Sadhr City in Iraq, highlights the ability of an integrated UAV/Apache capability to engage fleeting targets in a urban environment noting:

> Integrated sensors, communication systems, and strike assets gave 3-4 BCT the ability to find and kill JAM rocket teams . . . a radar or other sensor detected a rocket launch. A Shadow UAS was then vectored to the location of the launch and proceeded to follow the target. Finally, a Predator or Apache killed the target.[175]

The report goes on to link the teaming of Apaches and UAVs for target cueing to the survivability of the Apache; "Predators were particularly useful because JAM [Jaish al-Mahdi] was expected to have SA-7 man-portable air defense systems and the UASs [Uninhabited Aircraft Systems] enabled attacks on JAM without putting Apache crews at risk."[176] It could be argued that the survivability of the Apache aircraft would be

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[173] *Ibid*., 5.
[174] *Ibid*., 12.
[175] David E. Johnson, M. Wade Markel and Brian Shannon. *Occasional Paper: The 2008 Battle for Sadhr City*. (Santa Monica: Rand Corporation, 2011.). 15.

enhanced by the use of UAV and AUAV in deep operations in much the same way that the capability supported operation in the urban environment of Sadhr City.

The complexity of the battlespace in Libya in terms of the combatants seems to dovetail well with the U.S. Army's concept of non-contiguous battlespace. Given the constraints imposed on Apache aircrew due to incomplete SA it is reasonable to assume that MLRS and ATACMS could not have been used as a primary means of SEAD. As discussed earlier, current U.S. Army doctrine continues to support the concept of operations in depth (however conceptualized) and as a result the U.S. Army Aviation has a requirement to generate SA beyond that which was available during both TF Hawk and the raid on Karbala. As a result, when constrained by the operational environment from using massed fires such as MLRS and ATACMS for SEAD the U.S. Army will inevitably have to rely on UAV and MUM-T technology to develop the required SA.

Current plans by the U.S. Army to operate UAV as part of a manned unmanned team point to this capability. The 24th of March 2013 edition of the journal, C4ISR, notes; "Manned-unmanned teaming promises to be one of the most revolutionary capabilities available to these [Gray Eagle UAV Companies], officials say. A soldier, from the cockpit of an Apache AH-64E Block III aircraft, can fly the Gray Eagle and use its sensors and weapons from more than 70 miles away."[177] It appears therefore, that the U.S. Army is counting of MUM-T to resolve the doctrinal gap created by the delinking of ATACMS and MLRS from SEAD in support of operations in depth. Quoted in the same

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[176] *Ibid*., 15.

[177] Gould, Joe and Michelle Tan. "Buying in Bulk." C4ISR (2013): 24. Last accessed 11 April 2013. http://search.proquest.com/docview/1321809489?accountid=9867

C4ISR article, Lt. Col. Mark Colbrook, chief of unmanned aerial systems for the Army's office of operations, plans and policy at the Pentagon stated; "When you start talking about division battlespace versus brigade battle space, it's much larger…This capability allows us to extend out to the edges of that."[178]

The USAF appears unconvinced that MUM-T is the right direction for U.S. Army Attack operations. In a 2009, criticism of the MUM-T capability appeared in C4ISR . In the journal, Michael Keaton, an F-16 pilot and former Predator [UAV] Squadron Commander questioned if Apache Aircrew would be capable of maintaining SA while simultaneously directing armed UAV operations. Additionally and in more pointed but anonymous criticism C4ISR quoted another USAF official claiming; "If an Apache took a shot [from a UAV] within five years, I'd be amazed."[179]

While current Aviation Brigade and AHR Operations doctrine does not reflect the level of integration possible with MUM-T, the U.S. Army appears convinced of its potential.[180] MG William Crosby, US Army Program Executive Officer, Aviation, responding to a question in Defense Helicopter magazine about the U.S. Army's integrations of lessons learned from ten years of conflict stated: "Although not necessarily new to army aviation, MUM-T has evolved and matured to a point where it is recognized as a game-changing capability in aviation support operations"[181]

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[178] *Ibid*., 24.
[179] *Ibid*., 24.
[180] Neither the FM 3-04.111 Aviation Brigade 2007 ed. nor the FM 3-04.126 Armed Reconnaissance Helicopter Operations 2007 ed. include the term MUM-T.
[181] Scott R. Gourley. "Flight delays." *Defence Helicopter* 32, no. 2 (March/April 2013): 8.

3.6. Summary of Apache Doctrinal Adaptation

This chapter has demonstrated that while U.S. Army Aviation is currently focused on effectively supporting troops in the close fight, current U.S. Army doctrine and developing capabilities support the employment of the Apache in shaping operations in support of formation maneuver. The U.S. Army has refocused doctrine and by deleting the terms close, rear and deep from their lexicon and reconceptualising battlespace from one of linear and non-linear areas of operations to one of contiguous and non-contiguous areas of operation. As well, the U.S. Army has deemphasized the use of indirect massed fires for SEAD in support operations in depth and as a result, is pursuing UAV and MUM-T capabilities to fill this gap.

The success of the U.S. Army Apache during stability operations in both Iraq and Afghanistan is widely accepted. Both of these missions had and in the case of Afghanistan still have, focused on supporting troops involved in the close fight in relatively low threat enemy air defense environments. The shift in U.S. Army operations toward the close support mission has been accompanied by a corresponding shift in U.S. Army Aviation doctrine. Once classified as linear and nonlinear, the U.S. Army has deconstructed previous concepts of battlespace to now include only contiguous and non-contiguous areas of operation. While at first glance this battlespace concept appears to signal the intent of the U.S. Army in general and U.S. Army Aviation specifically to abandon shaping operations in depth this is not the case. Careful reading of Operations, Aviation Brigade and AHR FMs demonstrates that the U.S. Army continues to plan to conduct operations that do not require close coordination with supported divisions and

corps. Current doctrine continues to support what previously had been described as deep strike but in terms of a contiguous and non-contiguous battlespace.

Recent Attack Helicopter operations in Libya have demonstrated that Apache operations in a relatively high threat air defense environment are both feasible and worth the associated risk. Additionally, the operations in Libya have confirmed that the integration of UAVs, fixed wing SEAD and the Apache's organic capabilities is a feasible alternative to SEAD based on massed indirect fires in complex non-contiguous battle space. Finally, the U.S. Army's development of MUM-T technology demonstrates both a commitment to operations in depth and a recognition that the de-emphasis of ATACMS and MLRS for SEAD leaves a capability gap that MUM-T technology may resolve.

CONCLUSION

In the last decade the U.S. Army has faced significant criticism of the AH-64 Apache in the deep strike role. This criticism has largely centered on what were widely perceived to be the failure of both TF Hawk during the Kosovo campaign of 1999 and the 2003 deep strike raid on the Medina Armored Division of the Iraqi Army near Karbala. The failures of both Task Force Hawk and the raid on Karbala to achieve any meaningful effects, coupled with the significant costs of both missions, lead many to conclude that the Apache capability had become an expensive relic of the Cold War requirement to attrite Soviet Armor in Western Europe.

As a counterpoint to the criticism of the Apache in the deep strike role, doctrinal adaptation by U.S. Army Aviation during stability operations in both Iraq and Afghanistan has successfully refocused the capability on the close support mission. While the change in mission focus has muted some of the criticism aimed at the capability, the doctrinal adaptation that supported this resurgence did not necessarily signal the U.S. Army's intent to abandoned operations in depth.

This paper has demonstrated that doctrinal adaptation by the U.S. Army in response to the pragmatic requirements of the battlefield has occurred episodically throughout the history of the U.S Army Attack Helicopter. Based on the adaptation that has occurred since the Karbala raid and the integration of emerging technologies, the U.S. Army has postured the Apache capability to effectively support operations across the full spectrum of conflict, including, shaping operation in depth.

In examining the history of the attack helicopter as a capability, the development of the AH-1 Cobra was shown to be a pragmatic response to the requirement for a system that could provide organic fires in support of airmobile operations as well as company and battalion level maneuver. The subsequent evolution of the Cobra into an anti-armor system proved to be a stop gap measure that addressed the U.S. Army's requirement to resolve the numerical advantage Soviet tanks possessed over NATO forces in Europe.

The development of the AH-64 Apache, capable of operating at night and carrying precision guided missiles in the form of the Hellfire was examined. As part of the AirLand Battle system, the much more capable Apache became the center piece of the U.S. Army's deep strike X-FLOT anti-armor operations. As a result of the emergence of AirLand Battle doctrine and the reimagining of a less capable Soviet Armor close air defense system, Apache operations became focused on battalion sized deep strike operations designed to attrite Soviet armor in depth.

Followed closely on the heels of the collapse of the Soviet Union, the Gulf War proved to be a defining moment in terms of the U.S. Army's approach to AH doctrine. Deep strike doctrine was validated from the perspective of the U.S. Army, based on the perception of success that the Apache enjoyed as a result of the conflict. The doctrine of battalion sized deep strike against massed enemy armor and supported by massed indirect fire became the template upon which subsequent Apache operations would be based.

Despite the success of the Apache during the Gulf War some concerns with respect to the effectiveness of the capability remained. Advocates of the A-10 in the deep air interdiction mission pointed to both the cost of the Apache and the number available

as weaknesses in the capability. Additionally, Apache deep strike operations were limited during the 100 day ground offences due to concerns with the helicopters survivability. In spite of these reservations there was little recognition on the part of the U.S. Army that the AH-64 Apache and related doctrine was ill prepared to meet the changing threat of the post-Cold War battlefield.

After the collapse of the Soviet Union, the U.S. Army's approach to Apache deep strike doctrine, specifically, using indirect fires for SEAD was incompatible with the post-cold war, nonlinear, non-contiguous battlespace conflict environment that defined both the Kosovo conflict and Invasion of Iraq. Further, the U.S. Army failed to recognize the limitation of their approach to deep strike after the failure of TF Hawk and as a result was ill prepared for deep strike operation during the initial stages of OIF. Of the lessons learned that were identified after TF Hawk none sought to reconcile the fundamental issue of the Apaches vulnerability in the face of small arms and manually aimed direct fire air defence when area SEAD systems such as MLRS, ATACMS or artillery were not available or suitable for use.

While the U.S. Army had not resolved the doctrinal shortcomings that lead to the failure of TF Hawk, UK doctrine of the time suffered from the same incoherent doctrinal approach. In the same way that the U.S. Army was dependent on indirect fire systems for SEAD, the British Army had accepted that MLRS or ATACMS was the preferred method of area SEAD in support of deep strike operations. Given that by 1999 the UK had not yet acquired the MLRS system, the British Army were reliant on Air Force based SEAD

and the technology inherent in the combination of the Hellfire, FCR and RFI for suppressing emitting enemy air defense systems.

As OEF began in response to the events of September 11th , the U.S. Army had not yet identified the incoherent nature of deep strike doctrine centered on indirect fires for SEAD in a nonlinear, non-contiguous battlefield. In spite of this, U.S. Army Aviation was able to rapidly adapt TTP to support troops in direct contact with enemy forces. During Op Anaconda, U.S. Army Apache pilots hastily adapted flight profiles to counter intense small arms fire, much as had the Cobra pilots of the Vietnam War. In the days following the raid on Karbala however, the U.S. Army was able to successfully conduct both deep strike and screening missions by integrating fixed wing based JSEAD systems. Operations beyond the range of the Corps direct fire support weapons including deep strikes and screens were conduct with varying degrees of success.

The failure of the raid on Karbala during OIF reignited debate concerning the U.S. Army's deep strike doctrine. Given the experience of TF Hawk and the result of Op Anaconda, U.S Army doctrine developers may have been able to anticipate the conditions that lead to the failure of the raid on Karbala. That they did not, is not surprising given the Chief of the Aviation Branch, MG Curran's, framing of the results even after it was clear the Karbala mission had been a failure. Obviously committed to indirect fires area based for SEAD, MG Curran continued to champion deep strike based on the doctrine established in the context of a linear contiguous battlefield.

The success of the U.S. Army Apache during stability operations in both Iraq and Afghanistan is widely accepted. Both of these missions had and in the case of

Afghanistan still have, focused on supporting troops involved in the close fight in relatively low threat enemy air defense environments. The shift in U.S. Army operations toward the close support mission has been accompanied by a corresponding shift in U.S. Army Aviation doctrine. Doctrinal adaptation by U.S. Army has deconstructed both the concept of deep close and rear battlespace and linear and non-linear areas of operation. The subsequent adoption of a new paradigm in which battlespace is divided into only contiguous and non-contiguous areas of operations has refocused U.S. Army Aviation on close support while maintaining the ability to conduct a full spectrum of operations including operations in depth in support of formation maneuver.

While at first glance this battlespace concept appears to signal the intent of the U.S. Army in general and U.S. Army Aviation specifically to abandon shaping operations in depth this is not the case. Careful reading of the Operations and Aviation Brigade and AHR FMs demonstrates that the U.S. Army continues to plan to conduct operations that do not require close coordination with supported divisions and corps.

Recent British AAC experience in Libya has demonstrated that Apache operations in a relatively high threat air defense environment are both feasible and worth the associated risk. Additionally, the operations in Libya have confirmed that the integration of UAVs, fixed wing SEAD and the Apache's organic capabilities is a feasible alternative to SEAD based on massed indirect fires in complex non-contiguous battlespace. The U.S. Army's development of MUM-T technology demonstrates both a commitment to operations in-depth and recognition that the de-emphasis of ATACMS and MLRS for SEAD leaves a capability gap that needs to be resolved.

This paper has demonstrated that while U.S. Army Aviation is currently focused on effectively supporting troops in the close fight, U.S. Army doctrine and developing capabilities support the employment of the Apache in shaping operations in support of formation maneuver. The U.S. Army has refocused doctrine by deleting the terms close, rear and deep from their lexicon and reconceptualising battlespace from one of linear and non-linear areas of operations to one of that is either contiguous or non-contiguous. With the reconceptualization of the battlespace and with the integration of the emerging technologies of UAV and MUM-T and the U.S. Army AH doctrine is well placed to support future operations.

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