

# RETURNING THE DEEP ATTACK AS AN OPTION FOR THE OPERATIONAL COMMANDER

A Monograph

by

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## ABSTRACT

RETURNING THE DEEP ATTACK AS AN OPTION FOR THE OPERATIONAL COMMANDER, by Major John W. Brengle, 55 pages.

Deep operations and the deep attack remain an integral part of the full spectrum of military capabilities the U.S. Army is expected to perform in support of operational and strategic objectives. But there exists debate about the Army's ability to execute a deep attack that does indeed support operational and strategic objectives. The purpose of this monograph is to study how the deep attack capability provides options to the operational commander and to show that a UAS pure deep attack capability increases operational flexibility and reduces operational risk. The monograph used operational art as the overarching framework for the discussion and specifically addressed operational risk, operational flexibility, deep operations, and options available to operational commanders. An analysis of the U.S. Army's execution of deep operations in support of NATO's Operation Allied Force during the 1999 Kosovo War and Operation Iraqi Freedom during the Iraq War from 2003 serve as the historical context for the Army's lack of capability. Recommendations to regain the deep attack capability are informed by the Aviation focused actions and recommendations of the U.S. Army's Howze Board from 1962. In short, an unmanned aircraft systems pure deep attack capability will reduce operational risk, increase operational flexibility, and provide viable options to the operational commander necessary to achieve operational and strategic objectives.

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## ACRONYMS

ADP	Army Doctrine Publication
ADRP	Army Doctrine Reference Publication
AFDD	Air Force Doctrine Document
AAH	Advanced Attack Helicopter
AGM	Air to Ground Missile
AH	Attack Helicopter
ATKHB(s)	Attack Helicopter Battalion(s)
BN	Battalion
CH	Cargo Helicopter
CIDS	Capabilities Integration Development System
DOCC	Deep Operations Coordination Cell
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, and Facilities
FLOT	Forward Line of Own Troops
FM	Field Manual
JCIDS	Joint Capabilities Integration Development System
JP	Joint Publication
JSEAD	Joint Suppression of Enemy Air Defense
MEDEVAC	Medical Evacuation
NATO	North Atlantic Treaty Organization
SEAD	Suppression of Enemy Air Defense
SWARM	Smart Warfighting Array of Reconfigurable Modules
TF	Task Force
TOW	Tube-launched Optically-tracked Wire-guided
UAS(s)	Unmanned Aircraft System(s)
UH	Utility Helicopter

## INTRODUCTION

The U.S. Army has all but eliminated the deep attack as a capability available to operational commanders. Once the signature mission for attack helicopters, the deep attack disappeared from modern U.S. Army doctrine. However, as unmanned aircraft system (UAS) technology continues to advance, U.S. Army Aviation will be poised to return this valuable tool back to the operational commander. This monograph intends to reaffirm the importance of the deep attack for operational commanders and argue that the UAS is the ideal means for such a necessary capability.

Recent professional writings have focused on defending attack helicopters, both in terms of a state of the art Army weapons program and of their operational relevance since the perceived poor performance in 2003 during the American led invasion into Iraq. Many of the writings have rightly pointed to the mismatch between the enemy tactics Apache pilots thought they would encounter and the actual tactics the enemy used during that invasion. Even more have rightly argued the Apaches proved to be extremely valuable by providing close combat attack in close proximity to friendly forces.<sup>1</sup> But the problem is that none of the writings have satisfactorily concluded that the Army maintains a deep attack capability.

The purpose of this monograph is to study how the deep attack capability provides options to the operational commander and to show that a UAS pure deep attack capability increases operational flexibility and reduces operational risk. This work also endeavors to contribute to the larger body of knowledge focused on operational art.

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<sup>1</sup> Department of the Army, *FM 3-04.126, Attack Reconnaissance Helicopter Operations* (Washington, DC: Government Printing Office, February 16, 2007), 1-4. Army attack helicopter units conduct two basic types of attack – close combat attack or interdiction attack. Close combat attack requires detailed integration with a friendly ground force due to proximity while interdiction attack does not.

This study is significant because it is the first professional work focused on the operational utility of a UAS pure deep attack capability for the U.S. Army. In order for the Army's efforts with UAS to remain relevant for operational commanders, the professional discussion within the Army must broaden beyond the incremental evolution of technology and the refinement of tactical employment. This monograph adds to the discussion the incredible opportunity of using UAS as the hardware to provide operational commanders with a capability to affect their operational environment between the fire support coordination line and the forward line of own troops (FLOT).

The two major terms with respect to the thesis of this monograph are operational flexibility and operational risk. Acceptance and understanding of the definitions are critical to the argument that follows in later sections. Flexibility is the condition of having numerous options available. An operations plan is flexible if it provides the commander with the ability to adapt to a wide range of circumstances.<sup>2</sup> Risk is the chance of loss due to a hazard.<sup>3</sup> The U.S. military considers both the probability of an event occurring and the severity of the outcome if an event occurred when analyzing risk.

To qualify the above terms as operational flexibility and operational risk is to relate each to the operational level of war. The operational level of war is that level which links tactical engagements to strategic objectives.<sup>4</sup> Operational flexibility and operational risk can be understood as how flexible or how much risk is inherent in the commander's chosen course of action or plan linking tactical actions to achieving strategic objectives.

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<sup>2</sup> Department of the Army, *ADP 5-0, The Operations Process* (Washington, DC: Government Printing Office, May 17, 2012), 10.

<sup>3</sup> U.S. Joint Staff, *JP 5-0, Joint Operation Planning* (Washington, DC: Government Printing Office, August 11, 2011), A-2.

<sup>4</sup> U.S. Joint Staff, *JP 3-0, Joint Operations* (Washington, DC: Government Printing Office, August 11, 2011), I-13.

To understand the theoretical framework connecting deep attack and the operational level of war, the concept of operational art must be understood. Operational art is “the pursuit of strategic objectives, in whole or in part, through the arrangement of tactical actions in time, space, and purpose.”<sup>5</sup> In its simplest form, an attack is an offensive tactical action designed to destroy or defeat the enemy or seize or secure terrain.<sup>6</sup> For the purposes of this monograph, to qualify an attack as a deep attack, the attack must be arranged in space to occur in the deep area of the operational commander’s area of operations. The deep area is the region where a commander can shape enemy forces before they come in contact with friendly forces. In other words, an Army operational commander would arrange for a deep attack to occur against an enemy in that part of his area of operations where there are no friendly forces on the ground. The aptitude to properly decide when and where to conduct a deep attack in support of strategic objectives relates back to the operational commander’s ability to employ operational art.

In order to determine if a UAS deep attack capability benefits the operational commander, two hypotheses are tested. First, when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander’s operational flexibility is increased. Second, when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander’s operational risk is reduced.

Two research questions are used to determine the nature of the benefits, or liabilities depending on the research, of providing a UAS deep attack capability. First, how does a UAS

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<sup>5</sup> Department of the Army, *ADRP 3-0, Unified Land Operations* (Washington, DC: Government Printing Office, May 16, 2012), 4-1.

<sup>6</sup> Department of the Army, *FM 3-90, Tactics* (Washington, DC: Government Printing Office, July 4, 2001), 5-0.

deep attack capability increase the operational commander's operational flexibility? Second, how does a UAS deep attack capability reduce the operational commander's operational risk?

This monograph has the following limitation; research material, sources, case studies, etc., are all unclassified material. Written discussion, analysis, and recommendations are also unclassified. The consequences of this limitation are positive in nature and tie directly back to the intended significance of the monograph. This unclassified work has the potential to reach a larger audience of interested parties furthering the discussion of operational capabilities and the role UAS can play.

Several delimitations help narrow the scope of the research as it pertained to UAS, deep operations, and U.S. Service doctrine. This monograph focused on the U.S. Army's employment of UASs, not other service's or agency's employment of them. This bounds the discussion to situations where little or no special coordination between services are required for the Army to use an operational capability. In other words, changing the mechanism that provides the deep attack capability from a manned helicopter to an unmanned aircraft keeps the issue from becoming complicated by logically excluding a discussion of competing services' roles, missions, functions, and responsibilities. Joint and U.S. Army doctrine similarly reduces complexity by minimizing coordination and maximizing flexibility by providing the ground operational commander the fire support coordination line. This monograph focuses on the operational commander's capability to operate between his own forward line of troops and the fire support coordination line. Additionally, U.S. Army doctrine was the preferred doctrinal reference with Joint service doctrine used only in cases where Army doctrine specifically deferred to Joint service doctrine or where Army doctrine did not address a subject at all when Joint service doctrine did. The use of Army centric doctrinal terms and concepts preserved intersubjectivity for the discussion of an Army centric operational capability.

This study relies on two assumptions. First, operational commanders will want a capability to conduct deep attack operations to shape their operating environment. This monograph would be moot if operational commanders did not want to shape their operating environment through interdiction attack, an attack conducted by army aircraft against an enemy before the enemy can affect friendly forces.<sup>7</sup> Second, UAS and supporting technologies will continue to advance to enable the creation of a UAS deep attack capability on the order discussed in later sections. This monograph makes recommendations on the function of providing deep attack UAS capability to operational commanders knowing that forms of aircraft systems, doctrine, tactics, techniques, and procedures are not currently established or developed to do so. This paper assumes form design will follow the functions operational commanders desire.

This monograph is presented in six sections. The Introduction section includes the background of the study, statement of the problem, purpose of the study, significance of the study, definition of terms, theoretical framework, research hypotheses and questions, limitations, delimitations, assumptions, and the organization of the study. The Literature Review section presents a review of the literature focusing on operational art, operational flexibility, operational risk, and deep attack operations. The Methodology section describes the logical framework used link facts from history to a strategy for the future. The framework that the Methodology section describes, and that the subsequent sections follow, begins with historical context, identifies the old theory, presents current context, identifies the current problem, presents a new theory, describes a new operational approach, and ends with a plan for the way ahead. The Conclusion section readdresses the hypotheses given the preceding logical arguments, presents recommendations, and identifies areas for future academic work.

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<sup>7</sup> Army, *Attack Reconnaissance Helicopter Operations*, 1-4.

## LITERATURE REVIEW

This section presents a rationale for the study of deep attack operations as it relates to the potential uses of U.S. Army Aviation. Military theorists, senior leaders, and U.S. military doctrine have all touched upon aspects of this issue in the past. The capabilities inherent in Army Aviation provide operational commanders with increased operational reach, the potential to maintain a higher operational tempo than without, and a more diverse range of options to consider when developing his operational approach and courses of action. This study intends to build upon the literature by identifying the relationship between the deep attack, UAS, operational risk, and operational flexibility. The following review of the literature represents the literature germane to the exploration of this topic. This section is divided into subsections covering the overall guiding theoretical principle, supporting concepts, empirical context, and a discussion of the hypotheses.

The overarching body of knowledge this monograph intends to contribute towards is the idea of operational art. The concept of operational art, that which broadly turns strategic guidance into supporting tactical actions, is a recent evolution of the worldly body of military knowledge; recent as in the last 200 years when compared to how long man has been warring with itself. In light of the above description of operational art, Carl Von Clausewitz, the famous Prussian military theorist, described operational art as the use of tactical actions, the engagements, for the purpose of war.<sup>8</sup>

Dr. James M. Schneider, recognized expert on military theory and Professor Emeritus of military theory at the School of Advanced Military Studies, U.S. Army Command and General

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<sup>8</sup> Carl Von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton, New Jersey: Princeton University Press, 1984), 177. In this instance, Clausewitz used the term strategy not operations; however, his early 1800s definition for strategy here is more closely aligned with modern U.S. Army understanding of operational art than the modern understanding of strategy.

Staff College, defined operational art as "the creative use of distributed operations for the purposes of strategy."<sup>9</sup> Schneider prescribed seven necessary conditions for operational art to flourish. One of which is operational durability which means military "formations must be able to conduct a succession of battles and deep maneuvers indefinitely."<sup>10</sup>

U.S. Joint doctrine defines operational art as "the use of creative thinking by commanders and staffs to design strategies, campaigns, and major operations and organize and employ military forces."<sup>11</sup> In this definition the U.S. Joint Staff does not explicitly link tactical actions to strategic guidance. The reader is left to infer the employment of military force can include tactical actions and engagements. The Joint Staff does, however, specify that operational art is the process by which strategies are created. This is different than both Clausewitz and Schneider who see strategy independently, albeit not consistently, than operational art. They view operational art as the process of arranging action to achieve the strategy.

Modern U.S. Army doctrine defines operational art as "the pursuit of strategic objectives, in whole or in part, through the arrangement of tactical actions in time, space, and purpose".<sup>12</sup> The Army's definition is more in line with Clausewitz and Schneider, placing operational art subordinate in purpose to strategy. The Army goes a bit further to explain the supporting tactical actions can be arranged temporally, physically, and according to intent. It is the U.S. Army's definition that will serve as the frame of reference for this study.

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<sup>9</sup> James J. Schneider, *Vulcan's Anvil: The American Civil War and the Foundation of Operational Art*, Theoretical Paper No. Four (Fort Leavenworth, KS: Command and General Staff College, June 16, 1992; repr., Presidio Press, 1994), 58.

<sup>10</sup> *Ibid.*, 60. The underline emphasis is Dr. Schneider's.

<sup>11</sup> Joint Staff, *Joint Operations*, II-3

<sup>12</sup> Department of the Army, *ADP 3-0, Unified Land Operations* (Washington, DC: Government Printing Office, October 10, 2011), iv.

The following discussion bridges the gap between the overarching concept, operational art, and the thesis of this paper that focuses on minimizing risk and increasing flexibility to operational commanders by providing a deep attack capability. When arranging tactical actions in time, space, and purpose, the operational artist can arrange actions in one of three ways. He can arrange tactical actions directly. He can arrange collections of tactical actions all supporting the achievement of a common military purpose, sometimes referred to as a campaign. Or he can arrange numerous campaigns that support the achievement of a common objective. All three efforts to arrange these military activities must ultimately support the achievement of the strategic objective.

The next concept relevant to this study is the idea of deep operations. The term deep operations comes from thinking about operations spatially. Deep was relative to the enemy's front lines and operations conducted with the intent to have effects beyond the front lines can be considered deep. When properly arranged in time, space, and purpose, the deep attack is a way to arrange tactical actions to support a strategic objective directly or support a campaign that in turn supports either a higher campaign or strategic objective.

The modern notion of conducting deep operations evolved from ideas first pioneered by the Soviet military thinkers as a way to overcome their military failings against the Poles in 1920 and the trench lines seen during World War I. The deep operation is an offensive concept where the attacker attacks the defender throughout his entire depth targeting the defender's military force and key command nodes.<sup>13</sup> G. S. Isserson made great strides in refining Soviet theories and concepts about deep operations. Isserson sought to harness the developing industrial might of the Soviet Union, in terms of mass production of emerging and proven military technologies, into an operational approach that would ensure Soviet success on the battlefield and in turn ensure

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<sup>13</sup> Richard W. Harrison, *Architect of Soviet Victory in World War II: The Life and Theories of G.S. Isserson* (Jefferson, North Carolina: McFarland Publishers, 2010), 67.

strategic success. The newer machines and weapons systems would extend Soviet operational reach and improve lethality through maneuver and firepower.<sup>14</sup> Isserson's vision of the Soviet deep attack had three simultaneously occurring elements. The first element was a combined arms force would advance and attack the enemy's front seeking deep penetration and the creation of assailable flanks. The second element was the use of air power to attack the enemy's key logistics and control nodes well ahead of the advancing ground force. The third element was the availability of follow on forces able to take advantage of the successes of the initial attack by executing exploitation, pursuit, or other additional offensive operations. Isserson's principles shaped Soviet doctrine, and the United States' response to it, for years to come.

Joint doctrine expands the concept of depth to include ideas beyond geographic distance. Depth now includes the operations distributed in time, as well as distance, that are carried out to overwhelm the enemy's ability to adapt and continue fighting.<sup>15</sup> Some of the ways depth can be leveraged are through strategic attack, interdiction, and information operations. Strategic attacks, generally conducted by the Air Force, are offensive actions designed to directly achieve national strategic objectives without necessarily achieving operational objectives.<sup>16</sup> The Joint Staff defines interdiction as "an action to divert, disrupt, delay, or destroy the enemy's military surface capability before it can be used effectively against friendly forces, or to otherwise achieve objectives."<sup>17</sup>

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<sup>14</sup> Harrison, *Architect of Soviet Victory in World War II*, 86.

<sup>15</sup> Joint Staff, *Joint Operation Planning*, III-35 - III-36.

<sup>16</sup> Department of the Air Force, *AFDD 3-70, Strategic Attack*, Rev. ed. (Washington, DC: Government Printing Office, November 1, 2011), vii.

<sup>17</sup> U.S. Joint Staff, *JP 1-02, Department of Defense Dictionary of Military and Associated Terms*, Rev. ed. (Washington, DC: Government Printing Office, July 15, 2012), 159.

Similar to the Joint concepts, the U.S. Army maintains both spatial and conceptual concepts of depth. Spatially, it relates to the area beyond a unit's forward line of troops or beyond a unit's ability to directly engage with the enemy with its ground forces.<sup>18</sup> Conceptually, it relates to uncommitted enemy capabilities, enemy capabilities not directly engaged with friendly forces, where deep operations are designed to disrupt or prevent the enemy from committing those capabilities in a "coherent manner."<sup>19</sup> Both of these uses of depth by the Army align themselves with the Joint understanding of interdiction. As a point of terminology, the term deep attack does not appear in current Army doctrine save for an aviation related field manual from 1997. Attacks conducted against targets in the deep area, or against targets outside the direct effects of ground forces, or against an enemy that is not currently committed to fighting the friendly force are all considered interdiction. The study elaborates this point below by discussing Army aviation's interdiction attack capability.

The next two supporting concepts tie directly to the hypotheses of this study. Flexibility is not specifically defined in either Joint or U.S. Army doctrinal publications. The topic of flexibility is discussed at great length as either a required characteristic of planning and execution at the Joint level or as one of six tenets of operations for the Army.<sup>20</sup> Both the Army and the Joint services greatly desire planning for and maintaining flexibility before and during operations to provide the commander the ability to react to unforeseen circumstances and maximize options.

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<sup>18</sup> Army, *ADRP 3-0, Unified Land Operations*, 1-11.

<sup>19</sup> *Ibid.*

<sup>20</sup> U.S. Joint Staff, *JP 5-0, Joint Operation Planning* (Washington, DC: Government Printing Office, August 11, 2011), Introduction by Chairman of the Joint Chiefs; Department of the Army, *ADRP 3-0, Unified Land Operations* (Washington, DC: Government Printing Office, May 16, 2012), 2-12.

The Joint Staff and the Army have a common understanding of risk. Risk is the "probability and severity of loss linked to hazards."<sup>21</sup> Both sets of doctrine prescribe that risk is inherent in all operations and it is something to be managed in order to mitigate or reduce it for the conduct of military operations. Operational risks are those risks associated with the consequences of executing an operation. They can relate to injuries or death to soldiers and civilians, damage or destruction of equipment, or effects on mission accomplishment.<sup>22</sup>

A look at old, and not yet superseded, Army doctrine shows that as late as 1997 the status quo was Army attack helicopters were expected to conduct attacks hundreds of kilometers behind the enemy's front, deep in his rear area.<sup>23</sup> They were to be "most effective when used in mass in continuous operations on the enemy's flanks and rear."<sup>24</sup> This is the mindset the Army brought into the 2003 invasion of Iraq.

Reactions to AH-64 Apache Attack Helicopter performance from the 2003 invasion of Iraq were mixed. The bravery and heroism of the pilots have never been put in question. The institutional preparedness for a real world deep attack, as opposed to a doctrinal description or exercise training event, was questioned heavily on two counts. The first was the amount of damage inflicted by the enemy. In one regiment alone over 30 attack helicopters took damage.<sup>25</sup> The second was a need to improve air ground integration between ground forces and supporting

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<sup>21</sup> Joint Staff, *Department of Defense Dictionary of Military and Associated Terms*, 273.

<sup>22</sup> Department of the Army, *ADRP 5-0, The Operations Process* (Washington, DC: Government Printing Office, May 17, 2012), 1-12.

<sup>23</sup> Department of the Army, *FM 1-100, Army Aviation Operations* (Washington, DC: Government Printing Office, February 21, 1997), 1-6.

<sup>24</sup> *Ibid.*, 2-5.

<sup>25</sup> Chad H. Smith, "Employment of Attack and Reconnaissance Helicopters"(master's thesis, U.S. Army Command and General Staff College, June 2005), 40-41. In the Combined Arms Research Library Digital Library, <http://cgsc.cdmhost.com/cdm/ref/collection/p4013coll2/id/360> (accessed October 11, 2012).

attack helicopters.<sup>26</sup> This capability deficiency came from the combined arms maneuver training focus on large force on force battles at the expense of other things like working as a close combat attack asset for ground troops in a wide area security environment.

U.S. Army Aviation doctrine published in 2007 identifies two broad categories for attack missions, close combat attack and interdiction attack. Close combat attacks are conducted in close proximity to friendly forces which generally requires detailed integration between the aviation platform and ground forces.<sup>27</sup> Interdiction attacks are engagements between an aviation platform and a target, at a distance away from friendly forces eliminating the need for detailed integration, before the enemy can effectively use the target against friendly forces.<sup>28</sup> These two terms apply both in combined arms maneuver and wide area security environments.

U.S. Army Aviation capabilities would contribute to deep operations by executing deep attack missions designed to gather intelligence about the enemy's forces and attack key targets, enemy formations and key nodes, beyond the forward line of friendly troops and behind the enemy's front lines. The unique capabilities of U.S. Army Aviation assets extends the commander's operational reach and gives him the ability to shape the operating environment beyond the direct fire ranges of his ground forces.

Historically, aviation use in both Afghanistan and Iraq is heavily weighted to wide area security missions. This is also true for the Army at large. Doctrinal revisions now provide equal emphasis to wide area security operations where before the combined arms maneuver environment of large force on force conflict reigned supreme. While doctrine has become more inclusive, accounting for the varying operating environments in which the U.S. Army operates,

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<sup>26</sup> Smith, "Employment," 58.

<sup>27</sup> Army, *Attack Reconnaissance Helicopter Operations*, 3-59.

<sup>28</sup> *Ibid.*, 3-63.

references to Army Aviation conducting deep attack operations has been lost. Interdiction attack as a term does encapsulate what the Army designed AH-64 Apache helicopters to do in deep attacks against the former Soviet Union. But recent experience in the invasion of Iraq and the broadening of U.S. Army doctrine have all but taken the option of employing attack aviation assets in a deep attack out of the lexicon and out of the operational commander's set of options for a way to arrange engagements to support strategic objectives.

Based on a review of the literature, this study relies on two hypotheses to guide the research. Hypothesis one states that when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander's operational flexibility is increased. Hypothesis two states that when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander's operational risk is reduced.

The drift away from the deep attack, both in doctrine and in practice, increased operational risk in a combined arms maneuver environment because the commander lacks the capability to employ aviation to shape the fight against the enemy before his ground troops advance into contact. Risk of mission failure is higher when shaping operations do not happen in support of decisive ones. A deep attack conducted by U.S. Army Aviation assets would shape the fight between friendly ground forces and the enemy before the friendly ground forces even get in contact.

The absence of the deep attack option also decreases operational flexibility. Flexibility allows commanders to maintain options and react to a wide range of known and unforeseen circumstances. The mere absence of a capability reduces flexibility because the operational commander can no longer consider that capability as an option during the conduct of his operations.

The use of UAS provides a means to bring back the deep attack as a viable option for operational commanders. When the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander's operational risk is reduced. He would be able to gain intelligence, attrite and disrupt the enemy, and destroy key nodes behind the enemy front lines before his own ground forces engage. By providing the commander with a UAS deep attack capability to shape the operating environment, the operational commander's operational flexibility is increased. He would have one more capability he could employ in numerous combinations of time, space, and purpose in support of strategic objectives.

This section reviewed the guiding theoretical principle of operational art and identified the definition used in this monograph. It also discussed several supporting concepts that are important to this study; deep operations, depth, deep attack, flexibility, and risk. Then, it briefly touched upon the Army's 2003 deep attack into Iraq and the current status deep attack hold within current Army doctrine. Finally, this section showed how the topics discussed in the literature drove the creation of two hypotheses for the monograph. The next section discusses the research methodology this monograph uses to gather and present data for further analysis.

## METHODOLOGY

This section discusses the methodology behind the selection and presentation of data for this monograph. The structure to the presentation will follow in the following sequence: the historical context surrounding army aviation and the deep attack; the old theory or doctrine the Army had during the historical context; presentation of the current context; identification of the current problem; presentation of the new theory that accounts for the current problem; and finally a description of an operational approach that subscribes to the new theory and solves the current problem. In order to keep the historical cases relevant, they all involve army aviation forces

planning to conduct, or conducting, operations that required little or no coordination with a supporting ground force.

The historical context subsection will focus on two areas. The first will be the development of an Army aviation capability as a result of the 1962 U.S. Army Tactical Mobility Requirements Board, often referred to as the Howze Board. Commanders would later use this capability extensively in Vietnam. The second will be the design of Army attack aviation capabilities, Apache helicopters, for the destruction of Soviet armor columns in a large mechanized force on force war.

The next step will be a discussion on the Joint and Army doctrine governing the employment of Army attack aviation capabilities from the period of time leading up to the invasion of Iraq. The focus will be on the expectation of performance for a major force on force operation. After reviewing both why the Army had the attack helicopters it did, and how it planned to use them, the discussion transitions to the current context.

The current context section will review Army attack aviation capabilities through two cases. The first will be the Kosovo Crisis from 1999 which will show a deliberate lack of use of Apaches in combat operations. The second will be the invasion of Iraq from 2003 which will show the Army was caught off guard for the Apaches' actual performance in a contemporary operating environment. These cases will also present information describing the changes in doctrinal and mission focus for attack aviation. These cases are instrumental in explaining the current context and identifying the current problem that begs for a solution.

The current context section will identify the current problem that exists with the Army's attack aviation capabilities in the modern operating environment seen through the lens of the historical examples and the current doctrine. Special attention is focused on operational risk and operational flexibility. Following the identification of the problem, this monograph will propose a new theory that will address the problem paying attention to operational risk and operational

flexibility. Then a new operational approach is proposed based upon the new theory: the use of UAVs to supplement manned attack aviation as the means to overcome the problem set. This subsection will show how UAS have the potential to reduce operational risk and increase operational flexibility.

The way ahead subsection will offer an Army aviation solution for the identified capability problem in a fashion similar to the way the Howze Board recommended an Army aviation solution to a capability problem. The monograph will describe organizational, technological, and doctrinal changes that will provide for reduced operational risk and increased operational flexibility to the operational commander.

This section just described the selection of historical cases used to support the monograph's argument and the framework by which the argument will be presented in the following section. The historical cases include the recommendations of the Howze Board, pre-2003 Joint and Army doctrine, the Kosovo Crisis from 1999, the Iraq invasion from 2003, and changes to Army doctrine post 2003. The sequence that the argument will follow starts with the historical context surrounding army aviation and the deep attack, the old theory or doctrine the Army had during the historical context, presentation of the current context, identification of the current problem, presentation of the new theory that accounts for the current problem, an operational approach that subscribes to the new theory, and ends with a description of a way ahead that addresses operational risk and operational flexibility. Presentation of the historical cases within the framework described above begins in the following section.

## HISTORICAL CONTEXT

In spite of the departure of the Army Air Forces from the Army and the official recognition of the Air Force as a separate armed service in 1947, the Army retained aircraft to perform limited functions. Those functions included command and control related missions of liaison and communications; missions in support of fires including observation, fires adjustment,

and topographic survey (a limited and specific form of reconnaissance); missions airlifting personnel and materiel; and medical evacuation (MEDEVAC) missions.<sup>29</sup> But that did not stop the Army from learning from history and running experiments to develop their aviation capabilities beyond those functions.

During the Korean War in 1951, the Marine Corps began using helicopters to conduct vertical envelopment operations, antecedents to modern air assault operations, first with a rifle company and then with progressively larger units.<sup>30</sup> The Army absorbed lessons from the Marine Corps' experience and sought to maximize the potential of their own helicopters. Under the specter of a future atomic battlefield, Army forces needed to stay dispersed in order to deter and prevent an effective nuclear attack on those forces, to preserve the ability to rapidly mass against the enemy to destroy him. One of the ways the Army intended to do this was through the development of helicopter-borne infantry or "sky-cavalry" units.<sup>31</sup> In late 1955, the Joint exercise Sagebrush served as the test vehicle for the Army's Sky Cav concept. The exercise involved over 110,000 soldiers and 30,500 airmen at Fort Polk, LA. It lasted for 45 days. The Army successfully tested the Sky Cav unit's ability to perform reconnaissance and surveillance, to rapidly deploy via helicopter as a blocking force to critical locations on the battlefield, and to exploit success by deploying anti-tank and artillery forces by helicopter. Test conditions included both day and night operations on both the friendly and enemy sides of the forward line of

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<sup>29</sup> James W. Williams, *A History of Army Aviation: From its Beginnings to the War on Terror* (New York: iUniverse, Inc, 2005), 78.

<sup>30</sup> Ronald J. Brown, *Whirlybirds: U.S. Marine Helicopters in Korea* (Washington Navy Yard, DC: U.S. Marine Corps Historical Center, 2003), 49-54, <https://www.mcu.usmc.mil/historydivision/Pages/Staff/Publication%20PDFs/Whirlybirds%20US%20Marine%20Helicopters%20in%20Korea%20%20PCN%2019000410500.pdf> (accessed February 24, 2013).

<sup>31</sup> Williams, *A History of Army Aviation*, 69-70.

troops.<sup>32</sup> During the Joint planning for the exercise, Air Force General O. P. Weyland, commander of Tactical Air Command, objected to the Army testing the concept behind enemy lines as he saw attack operations conducted via aircraft in the battlespace beyond the front as Air Force domain. Air Force Secretary Donald Quarles overruled General Weyland so exercise Sagebrush could proceed. However, Secretary Quarles did not officially remove any objections to the Army acting contrary to service agreements over duties and responsibilities for aircraft roles and missions.<sup>33</sup>

Other Army experiments with helicopters included design modification and testing at Fort Rucker, Alabama. Beginning in 1956, Colonel Jay T. Vanderpool, a non-flying officer assigned to the Aviation School, organized the combat development for both experimental hardware configurations and tactics development.<sup>34</sup> His experiments included mounting .50 caliber machine guns and 80mm rocket launchers to the skids and sides of H-13 Sioux helicopters and determining the best methods for employment against targets.<sup>35</sup> Colonel Vanderpool and his team analyzed rotor downwash effects on the ballistic trajectories of projectiles. They also developed techniques for pilots to employ their fixed position weapons systems against targets on the ground while in flight.<sup>36</sup>

Due to an inability of helicopter production sources to keep up with the demands of the military services, the Army pursued an acquisition and combat development strategy that

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<sup>32</sup> Williams, *A History of Army Aviation*, 71.

<sup>33</sup> *Ibid.*, 71-72.

<sup>34</sup> J. A. Stockfisch, *The 1962 Howze Board and Army Combat Developments* (Santa Monica, CA: RAND, 1994), 9.

<sup>35</sup> *Ibid.*, 9.

<sup>36</sup> Williams, *A History of Army Aviation*, 74-76.

included both helicopter and fixed wing aircraft in order to meet mission demands.<sup>37</sup> The Army developed the Mohawk, through a Joint acquisition program with the Marines, to replace fixed wing observation platforms. This program drew the ire of the Air Force because the Army modified the Mohawk's wings' hardpoints to carry munitions making it capable of functioning as a close air support platform.<sup>38</sup> This added to the ongoing fight over service roles and responsibilities.

Not satisfied with the Army's programs related to tactical mobility, Secretary of Defense Robert S. McNamara directed the Army to reexamine its aviation requirements in order to exploit every possible improvement that aviation could provide. He wanted a "bold 'new look' at land warfare mobility" and wrote he would be disappointed unless the Army produced "a plan for implementing fresh and perhaps unorthodox concepts."<sup>39</sup> Secretary McNamara's directive established the U.S. Army Tactical Mobility Requirements Board. Secretary McNamara identified in writing Lieutenant General Hamilton H. Howze to serve on the board. The Army made Lieutenant General Howze the board's president and began referring to that board as the Howze Board.

Lieutenant General Howze structured the board into seven committees and eight working groups.<sup>40</sup> They were responsible for matters relevant to their assigned area of interest and conducted their work at various locations within the United States depending on who led each

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<sup>37</sup> Williams, *A History of Army Aviation*, 92.

<sup>38</sup> *Ibid.*, 92-93.

<sup>39</sup> Stockfisch, *The 1962 Howze Board*, 41-42.

<sup>40</sup> *Ibid.*, 15. The seven committees were titled: Reconnaissance, Security, and Target Acquisition; Tactical Mobility; Fire Power; Logistics Operations and Logistics Support; Operations Research; Field Tests; and Programs, Policy and Budget. The eight working groups were titled: Counterinsurgency; Combat Force; Logistics Forces; Long Range; Strategic Area; Operations Research; Field Tests; and Programs, Policy and Budget.

committee. For example, Brigadier General Rowney led the most resource intensive effort of the board, the Field Test Group, at Fort Bragg, North Carolina.<sup>41</sup> The Howze Board ran numerous “tactical experiments,” or side tests, to see what worked and what did not.<sup>42</sup> These side tests covered a variety of aviation related matters from takeoff and landing distances for cargo planes; weapons and ordnance testing on different aircraft; live-fire testing that compared the performance of armed aircraft, howitzers, and mortars; and comparisons of dismounted and heliborne infantry maneuver and attacks. Larger exercises tested the performance of air-mobile task forces in jungle conditions, in counter-guerrilla operations, and even included an air-mobile equipped counterfactual test of the 1950 withdrawal of forces to the Pusan Perimeter.<sup>43</sup> In addition to tests and exercises run by various working groups, the board also conducted war gaming and field research. One war game scenario involved a Soviet incursion into Iran through restrictive mountainous terrain and the strategic deployment of an air assault division to counter the incursion. Field research data came from a team sent to Military Assistance Advisory Groups in Thailand, Laos, and South Vietnam.<sup>44</sup>

The final recommendations of the Howze Board touch upon many issues but they were all related to its recommended changes to the Army’s force structure. The board’s recommendations included new types of units with explanations for their missions and functions, required number of personnel, and required number of aircraft. The Howze Board also recommended an implementation plan for those changes that identified the quantities of the new units required, cost savings for converting existing units to the recommended structure, and a

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<sup>41</sup> Stockfish, *The 1962 Howze Board*, 16.

<sup>42</sup> *Ibid.*, 17.

<sup>43</sup> *Ibid.*, 16-17.

<sup>44</sup> *Ibid.*, 17-18.

basing plan.<sup>45</sup> The board recommended 13 new unit designs and the fielding of 43 new units based on those designs. These would include five air assault divisions, 10 Reorganization Objective Army Divisions (ROAD – a separate ongoing organizational structure review) with aviation in mind, five air transport brigades, three armored cavalry regiments, three air cavalry combat brigades, one special warfare aviation brigade, three corps aviation brigades, one field army aviation brigade, one airmobile corps artillery brigade specifically for southeast Asia, and other battalion and company size units.<sup>46</sup>

Following the publication of the Howze Board's results and recommendations, the Secretary of Defense authorized 15,000 additional troops to man one provisional air assault division and one air transport brigade.<sup>47</sup> The Army activated the 11th Air Assault (Test) Division at Fort Benning, Georgia in 1963 to push the limits of air mobility. The recommendations and lessons learned from the Howze Board were a starting point, not a set of constraints, for continued efforts. The testing and experimentation was a combination of controlled tests yielding quantifiable information and qualitative demonstrations of the unit's capabilities.<sup>48</sup> Testing and refinement of tactics, techniques, and procedures progressed and in late 1964, Lieutenant General C. W. G. Rich, overall project director, recommended making the 11th Air Assault (Test) Division part of the Army's permanent force structure.<sup>49</sup> Joint exercises and testing with the Air

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<sup>45</sup> Stockfisch, *The 1962 Howze Board*, 18-24.

<sup>46</sup> *Ibid.*, table 2.

<sup>47</sup> *Ibid.*, 26.

<sup>48</sup> Robert R. Williams, interview, 23-25 October 2001, tape H-639, Side 1, transcript 131-132, *The Howze Board, Army Aviation, and Airmobility: A Look Back*, Senior Officer Oral History Program, U.S. Army Military History Institute, Carlisle Barracks, PA.

<sup>49</sup> Williams, *A History of Army Aviation*, 111.

Force continued into the next year and in mid 1965 the division was reflagged 1st Cavalry Division (Airmobile) and sent to South Vietnam for combat operations.<sup>50</sup>

Vietnam was a serendipitous proving ground for incremental experimentation and evolutionary changes in helicopter employment. Aerial MEDEVAC capabilities improved further from its beginnings in the Korean War. Army units also experimented with different armament mixes of machine guns, rockets, mortars, and missiles on UH-1 Iroquois (Hueys) and CH-47 Chinooks in response to the need to have armed escorts for air assault missions and in support of units operating on the ground.<sup>51</sup> Development and procurement of the AH-1 Cobra was a direct result of the operational needs of the deployed force. The AH-1, a highly modified UH-1, carried no troops, carried no cargo, but was faster, had a greater endurance, more survivable, and specifically served the needs of troops on the ground in a close air support type role beginning in 1967 in Vietnam.<sup>52</sup> Armed helicopters evolved from providing suppressive fire in close proximity to troops to providing direct fire support integrating with the ground unit commander's plan for operations.<sup>53</sup>

In the period of time between the early 1950s through the Vietnam War, the U.S. Army, with the approval of the Secretary of Defense, made very deliberate decisions regarding helicopters that produced huge consequences for materiel development, technology acquisitions, force structure, tactics, and doctrine for the Army as a whole. It engendered a different way of thinking. Without detracting from traditional methods, the Army embraced heliborne maneuver. Experiences with helicopters in Vietnam added to the discourse on helicopter technology's

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<sup>50</sup> Williams, *A History of Army Aviation*, 112.

<sup>51</sup> *Ibid.*, 115-118 and 133.

<sup>52</sup> James W. Bradin, *From Hot Air to Hellfire: The History of Army Attack Aviation* (Novato, CA: Presidio Press, 1994), 122.

<sup>53</sup> Williams, *A History of Army Aviation*, 123.

relevance and potential. The potential to combine the helicopter's mobility with increased lethality evolved into armed helicopters in the deep attack.

The Army established the Advanced Attack Helicopter (AAH) program after the termination of the AH-56 Cheyenne program in 1972. The AAH was to be a day/night, adverse weather, anti-armor capability and key factor in future military operations.<sup>54</sup> North Atlantic Treaty Organization (NATO) trials conducted in Germany with U.S., Canadian, and German helicopters and crews confirmed that helicopters armed with antitank missiles would enhance the firepower of NATO forces and be effective in a defense against an armored adversary.<sup>55</sup> In 1973 the Chief of Staff of the Army, General Creighton Abrams, defended before Congress the need for the AAH explaining that the ground commander had a persistent need for the capabilities it was designed to provide.<sup>56</sup> From its inception, the employment of antitank missiles from the AAH while avoiding line of sight surface to air missile threats would be integral to its design and battlefield function. This was unlike the armed versions of the UH-1 or AH-1 where modifying the ground based Tube-launched Optically-tracked Wire-guided (TOW) antitank missile technology for helicopter use came as a secondary adaptation behind providing running or diving machine gun and rocket fires in support of ground forces.<sup>57</sup> In early 1976, the Army decided to adopt the AGM-114 Hellfire air to ground missile for the AAH use instead of the TOW missile and in December the Army announced which manufacturer's AAH design would be funded for continued testing and evaluation.<sup>58</sup>

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<sup>54</sup> U.S. General Accounting Office, *Staff Study: Advanced Attack Helicopter*, March 1974, 5, [archive.gao.gov/f0202/092647.pdf](http://archive.gao.gov/f0202/092647.pdf) (accessed March 14, 2013).

<sup>55</sup> Bradin, *From Hot Air to Hellfire*, 126-130.

<sup>56</sup> Williams, *A History of Army Aviation*, 209.

<sup>57</sup> Bradin, *From Hot Air to Hellfire*, 126-130.

<sup>58</sup> *Ibid.*, 145 and 147.

The 1976 edition of FM 100-5, *Operations*, is the field manual most closely associated with the narrative of the Active Defense, the broad overarching operating concept characterizing how the Army intended to fight and win on land against the Soviet Union in Europe. The primacy of the Soviet threat in Europe is evident throughout the manual; its initial chapters are full of quantitative comparisons between U.S. and Soviet combat system capabilities. The manual identified the masses of tanks owned by Warsaw Pact countries as the greatest threat to U.S. and allied forces as tanks were described as “the single most important weapon for fighting the land battle.”<sup>59</sup> In order to win the land battle, which requires the defeat of the masses of enemy tanks, the AAH program is envisioned to add to the Army’s combined arms team’s lethality and speed.<sup>60</sup> Attack helicopters were to strike deep in support of friendly armor forces in the offense where the “most decisive offense is one which strikes with overwhelming force into the enemy’s rear.”<sup>61</sup> This edition of Army doctrine describes a future where U.S. helicopters, armed with air to ground missiles, provide the Army combined arms team with a highly mobile “armor-killing” capability that will defeat any type of target.<sup>62</sup>

By 1981, the professional discourse on the deep attack emphasized its utility and necessity in order to bring about operational advantage. The deep attack was to be used in both the defense and offense to isolate enemy forces, spoil enemy actions, or fix enemy forces presently under attack.<sup>63</sup> Then Lieutenant Colonel L. D. Holder, later Commanding General of

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<sup>59</sup> Department of the Army, *FM 100-5, Operations* (Washington, DC: Government Printing Office, April 29, 1977), 2-6. This reference includes “Change 1” to the July 1, 1976 edition which only added an index and changed to table of contents page to include the addition.

<sup>60</sup> *Ibid.*, 2-21

<sup>61</sup> *Ibid.*, 4-6.

<sup>62</sup> *Ibid.*, 2-21.

<sup>63</sup> L. D. Holder, “Maneuver in the Deep Battle,” *Military Review: The Professional Journal of the U.S. Army* 62, no. 5 (1982): 55.

the Army's Combined Arms Center, argued that while the risks of employing maneuver forces deep into the enemy's rear area were high, the potential for success would warrant commander's accepting those risks.<sup>64</sup> Attack helicopters were to penetrate through lightly defended enemy lines and destroy targets such as the enemy's reserves or command and control nodes.<sup>65</sup>

The 1982 edition of FM 100-5 moves the deep attack concept from an emerging operational option to a capability the Army must retain.<sup>66</sup> With its embrace of AirLand Battle doctrine, the Army added to its operational approach of defeating the Soviet Union by attacking the enemy in depth. Here the deep attack is characterized as an "inseparable part of a unified plan of operations" and commanders were told they "must...attack the enemy's uncommitted forces and support facilities."<sup>67</sup> Deep battle would disrupt enemy forces, prevent them from massing or concentrating his forces, and enhance flexibility by creating opportunities for friendly forces to exploit or be used as a way to exploit opportunities as they present themselves. In the offense, particularly in the attack, loss of the initiative, either temporally or in localized areas, jeopardized the entire operation. The deep attack, and army aviation's contribution through deep interdicting fires, were essential to maintaining the initiative and staving off the risk of the entire operation failing.<sup>68</sup>

Beginning in 1983, the Army received the first of over 500 programmed AAHs, now dubbed the AH-64 Apache.<sup>69</sup> The first fully equipped unit found itself conducting exercises in

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<sup>64</sup> Holder, "Maneuver," 56.

<sup>65</sup> *Ibid.*, 55-57.

<sup>66</sup> Department of the Army, *FM 100-5, Operations* (Washington, DC: Government Printing Office, August 20, 1982), 1-1.

<sup>67</sup> *Ibid.*, 7-2.

<sup>68</sup> *Ibid.*, 8-5.

<sup>69</sup> Williams, *A History of Army Aviation*, 211.

support of its Corps commander, Lieutenant General Crosbie E. Saint, commander of III Corps at Fort Hood, Texas. Lieutenant General Saint sought to maximize the potential of this newly fielded attack helicopter and the aviation unit that owned them. He conducted live exercises that had the AH-64s conducting deep attack exercises against targets 100-150 km forward of the FLOT. He sought to add a deliberate deep attack capability to his range of options in order to deal with the threat of enemy reserve armor forces.<sup>70</sup>

The 1986 edition of FM 100-5, maintained deep operations are those conducted against enemy forces not currently engaged but adds they are designed to shape the future close fight of the friendly force.<sup>71</sup> Enemy capabilities that directly threaten the success of future friendly operations must be attacked decisively in order to achieve the desired effects. Here doctrine identifies flexibility as one component that the Army's operational planning must stress in order to succeed.<sup>72</sup> From 1986 until the end of the cold war, the Army continued to refine the tactics of employing the AH-64 as well as incorporate their capabilities into war plans for Europe. By 1999 the Army had a clear understanding of its expectations for successful deep attack operations and clear expectations for the performance of AH-64 equipped attack aviation units.

#### OLD THEORY

In 1999, U.S. Joint doctrine listed depth as one of the characteristics, or facets, of operational art. Depth had both a spatial and temporal component to it. Friendly forces were to overwhelm the enemy across the battle area as well as arrange actions in time so as to disrupt the

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<sup>70</sup> Williams, *A History of Army Aviation*, 213.

<sup>71</sup> Department of the Army, *FM 100-5, Operations* (Washington, DC: Government Printing Office, May, 1986), 19.

<sup>72</sup> *Ibid.*, 14.

enemy's ability to make decisions and shape future conditions.<sup>73</sup> Joint doctrine was not specific about what the Army called deep attacks but it did discuss interdiction operations. Doctrine defined interdiction as "an action to divert, disrupt, delay, or destroy the enemy's surface military potential before it can be used effectively against friendly forces."<sup>74</sup> On the surface this looks very similar to deep attacks which are directed against enemy targets or formations not directly engaged with the friendly force. But the Joint definition broadens the scope to not be limited spatially to a distance or relative to a coordination measure on a map and not limited temporarily to targets that may affect friendly forces within 72 hours. Deep attack operations conducted by a land force with supporting fixed or rotary wing assets were, by definition, included as a type of interdiction.<sup>75</sup>

Joint force commanders were told to build flexibility into their plans through the use of branches and sequels in order to preserve their own freedom of action.<sup>76</sup> Branches are contingency plans for events or conditions that are not desired and sequels are plans for subsequent operations following an anticipated outcome. The nature of the undesired event or condition, or even the nature of a realized anticipated outcome, may never exactly match what was planned for by the commander and staff, but planned branches and sequels allow the commander to remain flexible and continue operations when encountering the unexpected.

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<sup>73</sup> U.S. Joint Staff, *JP 3-0, Operations* (Washington, DC: Government Printing Office, February 1, 1995), III-12.

<sup>74</sup> U.S. Joint Staff, *JP 3-03, Doctrine for Joint Interdiction Operations* (Washington, DC: Government Printing Office, April 10, 1997), v.

<sup>75</sup> *Ibid.*, vii.

<sup>76</sup> Joint Staff, *Operations*, III-20.

The keystone Joint doctrinal publication from 1995 identified risk as the cost of performing a sequence of actions.<sup>77</sup> This doctrine's unique contribution to the notion of risk was directly tied to clearly articulating what the strategic end state and supporting military conditions were before initiating an operation. By knowing what the end state was, and what the military had to achieve success, commanders could make informed judgments on what levels of risk they would accept, or had to accept, in order to achieve the end state. Commanders saw risk through the lens of avoiding unnecessary costs in terms of the scarce resources of the Joint force and time by focusing activities to directly support achieving the military objectives and the strategic end state.

By 1991, the Army expected Attack Helicopter Battalions (ATKHBs) to conduct offensive and defensive operations in the rear, close, and deep areas of the battlefield.<sup>78</sup> At this time doctrine defined deep attacks as attacks against those enemy forces not currently engaged against friendly but that could influence the Division or Corps in their close areas within the next 24-72 hours. Doctrine identified deep operations as "high risk, high payoff" which included raids, ambushes, spoiling attacks, and sustained attacks.<sup>79</sup> At the time, AirLand Battle doctrine rested upon four tenants, initiative, depth, agility, and synchronization. The deep attack and attack aviation primarily contributed to the tenet of depth. "The ATKHB can attack enemy forces anywhere on the battlefield."<sup>80</sup> But the Army did not envision ATKHBs conducting deep operations alone. In fact, Army doctrine stated they *could not* [emphasis added] execute a deep

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<sup>77</sup> Joint Staff, *Operations*, II-3.

<sup>78</sup> Department of the Army, *FM 1-112, Tactics, Techniques, and Procedures for the Attack Helicopter Battalion* (Washington, DC: Government Printing Office, February 21, 1991), 3-25.

<sup>79</sup> *Ibid.*, 3-34 – 3-35.

<sup>80</sup> *Ibid.*, 1-2.

operation alone.<sup>81</sup> They would however work as part of a combined arms team relying on other arms such as indirect fires for the suppression of enemy air defense capabilities, or requiring Joint fires to suppress enemy air defense in areas beyond the ground force commander's indirect fire range, in order to conduct the deep attack.<sup>82</sup>

The doctrine in effect prior to the U.S. and NATO intervention into the Kosovo War reiterated that attack helicopters could attack “decisive points and critical targets hundreds of kilometers deep into the enemy’s rear area.”<sup>83</sup> Attack helicopter units were most effective when used continuously against the enemy’s flanks and rear, particularly in support of a friendly attack against the enemy’s second echelon forces. The attack helicopter units’ attacks would disrupt the enemy’s momentum or support a friendly defense where they attack enemy concentrations or critical nodes to disrupt the enemy center of gravity.<sup>84</sup> Doctrine emphasized the requirement for suppression of the enemy’s air defense capabilities, provided by other Army assets or Joint assets, in support of the attack helicopters’ movements deep into enemy territory. The planning and synchronization of support for deep operations was the responsibility of the Deep Operations Coordination Cell (DOCC) found at Corps and Division operations centers.<sup>85</sup> This is not to say that aviation mission planning for deep operations did not happen within aviation units, but rather that the DOCC was responsible for synchronizing the use of the deep attack option into the operational commander’s overall plan. Aviation specific doctrine from 1997 mentioned numerous tactics, techniques, and procedures to consider when planning deep attack missions like

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<sup>81</sup> Army, *Tactics, Techniques, and Procedures*, C-12.

<sup>82</sup> *Ibid.*, 5-12.

<sup>83</sup> Army, *Army Aviation Operations*, 1-6.

<sup>84</sup> *Ibid.*, 2-5 and 2-12 – 2-13.

<sup>85</sup> *Ibid.*, B-4.

flight altitudes, auxiliary fuel tank options, and sequencing aviation elements in a deep attack to first develop the situation and then to attack until mission objectives are met.<sup>86</sup>

In the 1993 edition of the Army's *Operations* field manual, operational flexibility is tied to decisive points and preserving freedom of action. Decisive points were explained as those things, once the commander seizes, retains, or destroys them, provides the commander with a "marked advantage over the enemy and greatly influence the outcome of an action."<sup>87</sup> By correctly identifying and acting upon decisive points, the commander could then earn the flexibility to select from multiple lines of operation that furthered his overall objectives. Freedom of action was preserved by building flexibility into plans for operations. This flexibility was captured by incorporating the use of branches and sequels which were themselves anticipated and planned for by the commander and staff.<sup>88</sup> In this regard, attack aviation assets provided the ground commander with increased operational flexibility due to their unique maneuver and lethality qualities as well as their ability to respond rapidly in the rear, close, or deep areas of the battlefield.<sup>89</sup>

The Army understood risks were to be minimized, but accepting necessary and calculated risks was required to "preserve the force and defeat the enemy."<sup>90</sup> At the operational level, the DOCC was responsible for conducting the risk analysis to determine if the mission payoff was

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<sup>86</sup> Department of the Army, *FM 1-112, Attack Helicopter Operations* (Washington, DC: Government Printing Office, April 2, 1997), 3-45.

<sup>87</sup> Department of the Army, *FM 100-5, Operations* (Washington, DC: Government Printing Office, June 14, 1993), 6-7 – 6-8.

<sup>88</sup> *Ibid.*, 6-9.

<sup>89</sup> *Ibid.*, 2-10 and 2-23.

<sup>90</sup> *Ibid.*, 2-5.

worth the risk of conducting the deep attack.<sup>91</sup> Based upon that analysis, the operational commander would order a helicopter deep attack, an inherently high risk endeavor, if the potential outcomes of success, the preservation of his force and defeat of the enemy, were worth the risk.

At the point of execution, the tactical level, standard written procedures contained a slight inconsistency with what was written in field manuals. The tactical standard operating procedures from the 101st Airborne Division (Air Assault) from 1999 focused on air assault operations, the movement of personnel and equipment into enemy territory through a synchronized used of fires, lift and attack aviation, support forces, and ground maneuver forces to secure a deep objective.<sup>92</sup> The conditions check brief prior to executing the mission obliges the Intelligence representative to recommend “no-go” if known enemy air defense artillery capabilities can range the routes of flight or landing zones.<sup>93</sup> This seems contrary to the notion that aircraft would conduct deep operations into enemy territory that is defended by air defense provided that suppression of enemy air defense (SEAD), either ground based or Joint (JSEAD), was available. The Fire Support representative at the brief must indicate that SEAD had been coordinated otherwise he was obliged to recommend “no-go.” This formal process, while not official Army-wide doctrine, was designed to recommend to the commander a “no-go” if the enemy could merely range any of the aircraft with air defense systems. It was a vote of no confidence in friendly SEAD

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<sup>91</sup> Department of the Army, *FM 1-111, Aviation Brigades* (Washington, DC: Government Printing Office, October 27, 1997), G-13.

<sup>92</sup> Department of the Army, *FM 90-4, Air Assault Operations* (Washington, DC: Government Printing Office, March 16, 1987), paragraph 1-4. <http://www.globalsecurity.org/military/library/policy/army/fm/90-4/index.html#pref> (accessed March 21, 2013).

<sup>93</sup> 101st Airborne Division (Air Assault), *Gold Book: Tactics, Techniques, and Procedures for Air Assault Operations* (Fort Campbell, KY: March 17, 1999), chapter 5, section A, <http://www.fas.org/man/dod-101/army/docs/101st-goldbook/index.html> (accessed March 21, 2003).

capabilities and it was a first step toward removing the deep attack option from operational commanders.

#### CURRENT CONTEXT

The U.S. Army understood how their investment in manpower, training, and Apache helicopters was supposed to provide a deep attack capability to its operational commanders. Their understanding would begin to change as a result of real world deployment performance. In 1999 the United States and NATO acted to put an end to then President of Yugoslavia Slobodan Milosevic's campaign of human rights violations in Kosovo.<sup>94</sup> U.S. Army General Wesley Clark commanded the NATO effort called Operation Allied Force. General Clark was the Supreme Allied Commander in Europe and the top military officer in NATO. General Clark's position was the Joint Task Force commander which according to U.S. Joint doctrine can have various component commands working for him when required. The operations taken to end the Milosevic's human rights violations, collectively known as Operation Allied Force, were predominantly waged from the air through the Air Component Command due to strategic and political concerns. Operation Allied Force did not have a Land Component Command but it did have a U.S. Army task force, TF Hawk, provided by U.S. Army Europe, led by the V Corps headquarters.<sup>95</sup>

General Clark asked for AH-64s for Operation Allied Force. Considering their lethality and ability operate deep into enemy territory with only the need for supporting SEAD fires, he saw that they had a place as an extension of the air campaign. The AH-64s would have essentially conducted deep attack missions because they would be operating beyond friendly lines

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<sup>94</sup> Benjamin S. Lambeth, *NATO's Air War for Kosovo: A Strategic and Operational Assessment* (Santa Monica, CA: RAND, 2001), v.

<sup>95</sup> *Ibid.*, 153 and 213.

as soon as they departed their airfield in Albania. Their ability to conduct operations under varying ceiling layers of clouds in bad weather meant there would be times when AH-64s would be ideally suited to attack targets that Air Force assets would be unable to strike due to weather.<sup>96</sup>

Normally military forces must mass when required to maneuver or engage in battle. But the Serbian Military Forces did not have cause and did not choose to mass for an attack. And due to the absence of a NATO ground campaign, the enemy's defensive approach was to remain dispersed as a means to better protect its own forces.<sup>97</sup> With no friendly ground forces engaged with the enemy, and therefore no frame of reference to judge interdiction of enemy forces *before* they engage friendly ground forces, the remaining doctrinal purpose to use a deep attack, the destruction of critical nodes, might still have been an appropriate reason to employ deep attack operations. But AH-64 employment issues rendered that logic moot.

Due to the effects of bad weather, the selection of a deployment site that was not immediately suitable for AH-64 operations, and the amount of airlift required to move the support package for the AH-64s, it took 17 days for 24 AH-64s to move from their home in Germany to their base of operations in Albania.<sup>98</sup> On April 26th, an AH-64 crashed at the base of operations in Albania. On May 5th, a second AH-64 crashed on a training mission in Albania killing both crewmembers.<sup>99</sup> In less than two weeks, TF Hawk lost two of its 24 AH-64s and suffered casualties before it had a chance to conduct attack helicopter missions in support of NATO. TF

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<sup>96</sup> Lambeth, *NATO's Air War for Kosovo*, 148.

<sup>97</sup> *Ibid.*, 191.

<sup>98</sup> *Ibid.*, 148.

<sup>99</sup> *Ibid.*, 150.

Hawk did not become operationally ready until May 26th, 49 days after it first began moving forces into the region.<sup>100</sup>

Operation Allied Force stopped its bombing campaign on June 9th after President Milosevic signed an agreement to end hostilities.<sup>101</sup> Over the two weeks between TF Hawk being operationally ready and the cessation of hostilities, the AH-64s did not perform as General Clark had envisioned. Inadequate external support for the aviation unit, combined with the commander's assessment of the risk, meant that the AH-64s from TF Hawk would not conduct any deep operations. Suppression of enemy air defense operations was poorly planned and executed for AH-64 operations. A lack of coordination between the V Corps DOCC and the Air Component Commander's Combined Air Operations Center negatively affected access to JSEAD.<sup>102</sup> A strategic aversion to the use of submunition producing long range ground based artillery weapons prohibited the use of TF Hawk's surface to surface missile systems for SEAD.<sup>103</sup> And the persistent dispersed threat of surface to air missiles made employing the AH-64s as part of the air campaign too risky an endeavor.<sup>104</sup> The risk was not worth the reward.

In a report intended for the incoming Chief of Staff of the Army, then Brigadier General Richard Cody, Director of Operations, Resources, and Mobilization, remarked that the AH-64 crews were undertrained and underequipped for the mission they were given. He also noted the crews were not all qualified to fly with night vision goggles, the aircraft lacked radios capable of

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<sup>100</sup> Williams, *A History of Army Aviation*, 376-377.

<sup>101</sup> Lambeth, *NATO's Air War for Kosovo*, v.

<sup>102</sup> Lambeth, *NATO's Air War for Kosovo*, 154.

<sup>103</sup> *Ibid.*, 153.

<sup>104</sup> Sheila Foote, "Shelton: Risk was the Key in Decision Not to use Apaches," *Defense Daily* 203, no. 50 (September 10, 1999), <http://search.proquest.com/docview/234080652> (accessed March 22, 2013).

maintaining communications during deep operations, and that the suite of equipment designed to protect the helicopter from man portable surface to air missile threats was unreliable.<sup>105</sup>

Regardless of whether or not the deep attack was an appropriate option given that the enemy did not behave the way an enemy facing a ground opponent behaves, the AH-64 force's poor performance, lack of proficiency, and equipment shortcomings all point to AH-64 forces not being able to conduct a deep attack.

A second call to reevaluate the U.S. Army's deep attack capabilities came during the 2003 invasion of Iraq. The Joint and Army doctrine published after operations in Kosovo changed little with respect to the concepts of depth, deep operations, interdiction, flexibility, and risk. Both sources of doctrine published newer *Operations* manuals in 2001 that provided additional or clarifying information related to these concepts but they did not fundamentally change their nature prior to the U.S. invasion of Iraq. In theory, the deep attack was still a viable form of maneuver available to operational commanders.

V Corps, this time as the Army's corps and operational headquarters, controlled by the Land Component Command, ordered the 11th Aviation Group to conduct deep attacks against the 2nd Armored Brigade, Medina Division, of the Republican Guard near Najaf, Iraq before they could engage friendly ground forces. Their primary targets were armor and artillery.<sup>106</sup> The deep attack commenced on the night of March 23rd. It failed.

The mission involved 32 helicopters, one command and control aircraft and 31 AH-64s.<sup>107</sup> Mission planners created routes that avoided templated enemy units possessing surface to air missile or anti-aircraft artillery capabilities but exact enemy positions were unknown. The

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<sup>105</sup> Lambeth, *NATO's Air War for Kosovo*, 155-156.

<sup>106</sup> Gregory Fontenot, E. J. Degen, and David Tohn, *On Point: The United States Army in Operation Iraqi Freedom* (Fort Leavenworth, KS: Combat Studies Institute Press, 2004), 179.

<sup>107</sup> Ibid.

commander of the 11th Aviation Group delayed the start time of the mission however, the pre-planned JSEAD provided by fixed wing was not adjusted accordingly. One AH-64 crashed while departing due to a brownout caused by dusty conditions near the ground.<sup>108</sup> Ground based SEAD timing was adjusted, and fired in accordance with the V Corps' standard of 30 minutes before the arrival of helicopters into the area, but the timing led pilots to wonder if the SEAD fires served as a warning to the enemy rather than having the intended effect of suppressing the enemy's surface to air fire.<sup>109</sup> The aircraft experienced such a high volume of surface to air fire en route to and within their objectives that they could not locate or decisively attack their intended targets. During the conduct of the deep attack, enemy fire forced an AH-64 down leading to both pilots' capture. The remaining 29 helicopters returned with some sort of damage by small arms fire or anti-aircraft artillery.<sup>110</sup> It took the 11th Aviation Group 30 days to repair them all effectively removing their ability to provide an aviation brigade to support combat operations.<sup>111</sup>

The Iraqis neutralized the 11th Aviation Group's deep attack through the use of widely dispersed small arms fire, rocket propelled grenades, and anti-aircraft artillery commanded and controlled through the use of voice commands transmitted over cell phones and visual commands transmitted via the blinking on and off of lights in urban areas.<sup>112</sup> As in Kosovo, this was another case of the Army's aviation deep attack failing due to enemy's ability to neutralize the deep attack capability. First, the deep attack failed because SEAD fires, a requirement for a deep attack where the threat of an enemy air defense exists, were ineffective against a dispersed

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<sup>108</sup> Fontenot, Degen, and Tohn, *On Point*, 186.

<sup>109</sup> *Ibid.*

<sup>110</sup> *Ibid.*, 189.

<sup>111</sup> *Ibid.*, 190.

<sup>112</sup> 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 (2003): 42.

enemy. Second, a lack of understanding of the enemy's disposition and tactics pitted the deep attack against a threat that effectively neutralized their efforts. At the end of the mission, "aside from killing some air defense systems, a few gun trucks, and a number of enemy firing small arms," the deep attack did not shape the environment for ground maneuver forces in accordance with the V Corps Commander's plan.<sup>113</sup>

#### CURRENT PROBLEM

The current problem at hand is that the U.S. Army Aviation's deep attack capability has been shown to be an ineffective option for operational commanders. When employed to shape the environment for follow on ground forces, the mission was either "aborted" due to threat conditions or ineffectual based upon the assessment of the strikes conducted.<sup>114</sup> Over time the operating environment changed. Lethality of surface to air weapons systems improved and the enemy evolved their tactics. The deep attack capability army attack helicopters and their crews were resourced to provide is no longer an option available to operational commanders. Operational commanders will still weigh the risk versus the reward of employing deep attacks against the enemy. But recent history showed the risk to aircrews of attack helicopters has been too great for the expected gains and that the expenditure of manpower and materiel in deep attacks has not yielded the gains expected. Consequently, the operational flexibility of the commander has reduced as a result of the enemy's ability to neutralize this shaping operation. This ultimately increased the risk associated with the decisive operation.

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<sup>113</sup> Fontenot, Degen, and Tohn, *On Point*, 189.

<sup>114</sup> *Ibid.*, 192.

## NEW THEORY

The new theory, informed by the lessons of recent history, is captured by identifying relationships between independent and dependent variables. If the relationships are properly identified, and then leveraged to produce a desired result, the new theory serves as the framework to overcome the current problem. The following relationships between risk, flexibility, the overall operation, and the deep attack capability embody the new theory.

If risk to aircrews is reduced, the cost perceived by the operational commander of executing a deep attack is decreased. When the cost of conducting the deep attack is reduced, its value relative to the gains of conducting the deep attack becomes more acceptable to the operational commander. If the operational commander employs deep attacks that successfully shape the operating environment, then operational risk, risk to the decisive operation, decreases.

If the deep attack is an option for the operational commander, then the commander's range of options for operational approaches and courses of action increases. If the range of options increases, then options increase for both the main course of action as well as those for branches and sequels. If options for branches and sequels increase, the commander's operational flexibility increases. These relationships beg for a decrease in the severity of risk associated with operations beyond the forward line of friendly troops so that the operational commander can have a better chance of achieving higher strategic objectives.

## NEW OPERATIONAL APPROACH

A way to reduce the severity of risk associated with a deep attack is to reduce the element of risk to the aircrews. Past approaches to reduce the risk to aircrews included perfecting the intelligence picture depicting enemy positions and dispositions; neutralizing surface to air fires through suppression of enemy air defense; designing precision air to ground munitions capable of engagement over great standoff distances between the shooter and target; engineering more survivable aircraft and aircrew protective equipment; and establishing units dedicated to combat

search and rescue for downed aircrewmembers. Recent experience with deep attacks has generated the professional discourse to question “under what conditions flying attack helicopters deep will produce the kind of benefits that warrant the potential risk.”<sup>115</sup> The new operational approach introduced here is to remove the severity of risk to aircrews by removing the aircrews from the deep attack.

The use of UAS to perform deep attack operations eliminates the risk associated with attack helicopter crews flying behind enemy lines. Given the new theory above, when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander’s operational flexibility is increased. And when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander’s operational risk is reduced.

First the Army embraced the mobility that emerging helicopter technology could provide. Then it armed its helicopters and employed them as part of a combined arms team to mass at the decisive points of battles and operations. Next the Army deliberately invested in technological research and acquisition of highly mobile, armor defeating, deeply penetrating advanced attack aircraft capable of spoiling an armored Soviet attack into Western Europe during the cold war. Institutionally, the Army embraced the need for deep operations to shape the close decisive fight. But when the Army’s deep attack capability was tested in 1999 and again in 2003, the capability did not materialize as envisioned due to the increased risk to aircrews. This ultimately reduced the operational commander’s flexibility and increased his operational risk. Because of the clear reduction in risk, the logical and prudent next step for the Army is to invest in technological research and acquisition of unmanned aircraft capable of returning the deep attack as an option

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<sup>115</sup> Fontenot, Degen, and Tohn, *On Point*, 189.

for the operational commander. Offered next is a way ahead, a general approach, to the development of an unmanned deep attack capability.

### THE WAY AHEAD

The U.S. Army should look to equipping and organizing the force to create UAS units capable of providing the deep attack capability to operational commanders to reduce operational risk and increase operational flexibility. To do this, the Army must dedicate funding and resources to improve current UAS technology, satisfactorily test the unmanned aircraft and the unit that owns them while conducting deep attacks, and then field the unit so that UAS deep attack capability is available to operational commanders as the operating environment dictates. The bulk of the work and the recommendations covered in the Howze Board's final report are as relevant today as they were when they were made. But in absence of a mandate from the secretary of defense, the manner in which the Howze Board made technological improvements, tested the performance of equipment and units, and presented recommendations for fielding would require procedural adjustments for today.

In the taxonomy of the present, the Army develops capabilities in response to recognized capability gaps, deficiencies that must be overcome in order for the Army to maintain its ability to meet its responsibilities to the United States. These gaps are defined either by shortcomings apparent in the present or projected shortcomings to achieving national security and defense strategies in the future. The mechanism through which the Army shortens or closes capability gaps follows policies and procedures of the Joint Capabilities Integration Development System (JCIDS) and its supporting but service specific Army Capabilities Integration Development System (Army CIDS). JCIDS and Army CIDS provide a framework for recommending synchronized resource changes that will close the associated capability gap. The framework that organizes the discussion of resources is doctrine, organization, training, materiel, leadership and

education, personnel, and facilities (DOTMLPF).<sup>116</sup> The interconnected nature of the resource areas may require changes in some, all, or possibly none of the others depending upon the severity of the resource changes necessary to close a capability gap. Using UAS to provide a deep attack capability will require changes to all.

Before this study addresses changes to DOTMLPF, it must touch upon the necessity for the capability. This monograph, in light of recent history, argued the deep attack capability is currently lacking, that operational commanders must have it to reduce operational risk and increase operational flexibility, and that UAS are a solution to bringing the deep attack back to the operational commander. This monograph did not address the specific requirement for deep attack capabilities relative to the strategic operating environment the U.S. Army currently and potentially finds itself. That point is beyond the scope of the analysis previously presented here. However, the Executive Branch and the Department of Defense have analyzed the strategic environment, the world, with respect to our nation's interests and security. They published complementary strategies intended to secure our interests and provide the security required. The 2010 National Security Strategy, issued by the President, requires the military to be ready to address "the full range of military operations."<sup>117</sup> The 2008 National Defense Strategy, signed by the Secretary of Defense, requires the Department of Defense to "be position to defeat enemies...across the spectrum of conflict."<sup>118</sup> The 2011 National Military Strategy, issued by the Chairman of the Joint Chiefs of Staff, requires the armed services to be able to "respond to any

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<sup>116</sup> U.S. Joint Staff, *CJCSI 3170.01E, Joint Capabilities Integration and Development System* (Washington, DC: Government Printing Office, May 11, 2005), 1.

<sup>117</sup> President, *National Security Strategy, May 2010* (Washington, DC: Government Printing Office, May, 2010), 14.

<sup>118</sup> U.S. Department of Defense, *National Defense Strategy, June 2008* (Washington, DC: Government Printing Office, June, 2008), 13.

attack across the full spectrum of military capabilities.”<sup>119</sup> The consistent theme is that the military must be prepared to address concerns to national interests and national security by being able to win the fight at any level of intensity with the entire might of the military available if need be. The Secretary of Defense went on to say “we must maintain the edge in our conventional forces.”<sup>120</sup> Regaining the deep attack capability, closing that capability gap in the full spectrum of military capabilities, will sharpen the edge dulled in recent history.

The following strategy, using DOTMLPF as the interdependent framework for discussion, posits changes to each resource area necessary to bring about this capability. It is not the all exhaustive detailed analysis JCIDS and Army CIDS requires but it lays the foundation for more detailed work and serves as a point of departure for further analysis.

Army doctrine would need changes that incorporate the existence of a UAS Battalion (BN) as an element of the Army’s Aviation force structure and a shift in language and thinking that adds destruction of massed armored and mechanized forces through the use of aerial firepower and shock effect to the mission sets unmanned systems currently have.<sup>121</sup> The UAS BN would have the requirement to “shape the operating environment through aggressive interdiction attacks.”<sup>122</sup> The UAS BN would best answer to the operational commander if operationally controlled at that commander’s echelon. This command and control relationship would be similar to that observed in 2003 between V Corps, the 11th Aviation Group, and the group’s subordinate attack helicopter formations. The UAS BN capabilities would be employed

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<sup>119</sup> U.S. Joint Staff, *National Military Strategy of the United States of America, 2011: Redefining America’s Military Leadership* (Washington, DC: Government Printing Office, February 8, 2011), 6.

<sup>120</sup> Department of Defense, *National Defense Strategy*, 13.

<sup>121</sup> Army, *Attack Reconnaissance Helicopter Operations*, 3-59.

<sup>122</sup> *Ibid.*, table 1-1.

at the direction of the operational commander. Priority would go to ensuring this capability is responsive to that commander's operational needs regardless of the layers of command and control between the operational commander and the UAV BN headquarters. This capability would be able to work for a division, corps, army, or joint task force depending upon which commander is the ground force operational commander.

Organizational structure considerations include the design of a new UAS BN to include personnel and equipment necessary for internal command and control, maintenance, movement, launch and recovery of the unmanned aircraft, armament, and control of the aircraft aloft. Other organizations, higher level maintenance and support units, would need modifications to their structure to account for UAS BN specific maintenance requirements and any other support requirements added personnel and non UAS specific equipment may generate. Regarding the quantity of UAS BNs, creating one per standing Corps headquarters would be the minimum in order to provide those commanders with the deep attack capability. At present that would be four, dropping to three with the potential inactivation of V Corps after its mission concludes in Afghanistan.

Training considerations are numerous. The Army must allocate time at military ranges to allow UAS BNs to conduct live fire training and time and resources must be dedicated to maintaining deep attack proficiency at national training centers. Airspace deconfliction procedures to facilitate a UAS BN in the attack must be perfected. This, and many other issues, can be tested by the U.S. Army Test and Evaluation Command through iterative trials of different unit structures, materiel improvements, and tactics, techniques, and procedures development. The lessons learned can be packaged into instructional materials for UAS personnel and doctrine updates. UAS deep attacks must also be incorporated into the National Training Center, Joint Readiness Training Center, and Mission Command Training Program run exercises.

Changes in materiel resources would be required. Currently UAS generally fly as a single aircraft answerable to its controller informed by the authority responsible to ensure the airspace is deconflicted to avoid mid-air collisions with other aircraft or with fires moving through the air to the target. Current UAS are also used to complement manned aircraft efforts by aiding in reconnaissance, target identification, and target destruction. But during the conduct of an unmanned deep attack, the UAS BN will need to be able to conduct their own situation development, target identification, target destruction, and battle damage assessment without manned aircraft or ground forces near the objective. Reconnaissance and target related data must be passed back from multiple unmanned aircraft to a single location in order to develop a common operating picture that all unmanned aircraft in the deep attack can use. Weapons payload capacity must also be increased in order to have the desired effect on large enemy formations. Considering the dynamic teamwork required between manned aircraft for a deep attack, a UAS pure deep attack would require the continued development of smart warfighting array of reconfigurable modules (SWARM) technology where multiple UAS act both as individual aircraft as well as parts of the interconnected whole in order to achieve the operational commander's objectives. The potential exists for SWARM technology to govern and optimize the flight paths, target selection, and target destruction across numerous semi-autonomous UAS deep into enemy controlled territory.

The leadership and education resource area may be the least affected as current army leadership doctrine applies to all types of units. But the new concepts and doctrine for the employment of such a capability must be included into professional military education programs.

The personnel resource area will need adjustments to professional development and career progression models. Company and battalion leadership in the UAS BN must be developed over time and possible sources include the UAS occupational specialties currently in the Army for enlisted and warrant officers or the development of a commissioned officer specialty solely

for unmanned aircraft. Personnel with unmanned aircraft expertise would also need to be authorized for inclusion into units with DOCCs in order to aid in planning, supporting, and executing deep operations with UAS.

The facilities resource area would require a review of available hangar space, flight line space, and range facilities with airspace suitable to support UAS training. Other factors that require the facilities review are ammunition storage site capacities and workspace for UAS BN support personnel.

The way ahead combines all elements of DOTMLPF into a synchronized strategy to provide the ultimate goal of giving operational commanders the ability to conduct deep attacks using UAS as the means. By synchronizing efforts in all resource areas the army can close the gap and restore operational commanders' ability to exercise the full range of military capabilities in pursuit of the United States' national interests and defense.

## CONCLUSION

The purpose of this monograph was to study how the deep attack capability provides options to the operational commander and to show that a UAS pure deep attack capability increases operational flexibility and reduces operational risk. Using the theoretical framework of operational art, the arrangement of tactical actions in time, space, and purpose to achieve strategic objectives, the questions of how a UAS deep attack capability decreases operational risk and increases operational flexibility were explored and answered.

Beginning with the Army's gradual increase in use of helicopter technology, fiercely expanded as a result of the Secretary of Defense's creation of the Howze Board in 1962, the Army developed a highly mobile and lethal heliborne arm that increased the operational flexibility and reduced the operational risk commanders had before helicopters. The Army continued to invest in improving helicopter technology and increased their acquisitions. The Army also defined the way it would fight the deep battle by exploiting the advantages armed

helicopters provided. But operational commanders in 1999 identified risk to aircrews as the reason to not conduct deep attack operations in Kosovo and in 2003 they saw deep attacks fail to shape the enemy for future decisive operations in the close fight.

The first hypothesis stated that when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander's operational flexibility is increased. Using the framework of operational art and the relationships between options, risk, and flexibility, this hypothesis is supported. Operational commanders with UAS capable of conducting deep attacks, a less risky proposition than manned aircraft conducting deep attacks, will have more options available to them and therefore have greater operational flexibility. The second hypothesis stated that when the U.S. Army provides operational commanders with a UAS deep attack capability to shape their operational environment, the operational commander's operational risk is reduced. This hypothesis is also supported. A viable UAS deep attack will destroy the enemy's key nodes and unengaged ground forces which puts friendly forces in a more advantageous position relative to the enemy for the close fight. Gaining and maintaining that relative advantage reduces operational risk.

This monograph recommended the risk mitigating measure of substituting manned aircraft with unmanned aircraft for deep attack operations. This would reduce risk of loss of life which would change the threshold for mission abort criteria allowing for this capability to be viable in traditionally higher threat circumstances. This monograph also provided a start point using the DOTMLPF resource framework to suggest implications and work required to develop a functioning UAS BN with the mission to conduct deep attacks for operational commanders.

This monograph identified increased operational risk and reduced operational flexibility with the absence of a deep attack capability and identified the development of a UAS pure deep attack to reduce the operational risk and increase the operational flexibility of operational commanders as they employ the full range of military options in pursuit of strategic goals. The

development of this monograph revealed an area that requires further research. What was beyond the scope of this monograph is whether or not the full range of military options is indeed necessary to achieve strategic objectives in the current operating environment. The answer to that point will have far greater implications on the capabilities the United States of America truly needs to resource and provide in order to succeed strategically.

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