# Operational Maneuver in the 90's: Is Army Aviation a Viable Option?

A Monograph
by

Major Michael T. Inman
Aviation


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

Second Term, AY 89/90

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

## REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

| | |
|---|---|
| 1a. REPORT SECURITY CLASSIFICATION<br>UNCLASSIFIED | 1b. RESTRICTIVE MARKINGS |
| 2a. SECURITY CLASSIFICATION AUTHORITY | 3. DISTRIBUTION/AVAILABILITY OF REPORT<br>Approved for public release; distribution unlimited. |
| 2b. DECLASSIFICATION/DOWNGRADING SCHEDULE | |
| 4. PERFORMING ORGANIZATION REPORT NUMBER(S) | 5. MONITORING ORGANIZATION REPORT NUMBER(S) |
| 6a. NAME OF PERFORMING ORGANIZATION<br>School of Advanced Military Studies<br>6b. OFFICE SYMBOL (If applicable)<br>ATZL-SWV | 7a. NAME OF MONITORING ORGANIZATION |
| 6c. ADDRESS (City, State, and ZIP Code)<br>Fort Leavenworth, Kansas 66027-6900 | 7b. ADDRESS (City, State, and ZIP Code) |
| 8a. NAME OF FUNDING/SPONSORING ORGANIZATION<br>8b. OFFICE SYMBOL (If applicable) | 9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER |
| 8c. ADDRESS (City, State, and ZIP Code) | 10. SOURCE OF FUNDING NUMBERS<br>PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO. |
| 11. TITLE (Include Security Classification)<br>OPERATIONAL MANEUVER: Is Army Aviation a Viable Option? (U)<br>in the 90's | |
| 12. PERSONAL AUTHOR(S)<br>Major Michael T. Inman, USA | |
| 13a. TYPE OF REPORT<br>Monograph<br>13b. TIME COVERED<br>FROM _____ TO _____ | 14. DATE OF REPORT (Year, Month, Day)<br>90/5/4<br>15. PAGE COUNT<br>59 |
| 16. SUPPLEMENTARY NOTATION | |
| 17. COSATI CODES<br>FIELD / GROUP / SUB-GROUP | 18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)<br>Army aviation; airmechanization; Operational maneuver; air maneuver; AirLand Battle Future; air assault |

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Operational maneuver is a key element of operational art and AirLand Battle Doctrine. Some prominent theorists have argued that our modern mechanized forces do not possess the requisite characteristics for modern operational maneuver. Brigadier Richard E. Simpkin and General Ferdinand M. von Senger und Etterlin wrote extensively during the 1980's on airmechanization, the employment of a force organized around a rotary wing Main Battle Air Vehicle (MBAV) in an air maneuver role.

This study examines the history and theory of operational maneuver to determine the requisite characteristics for an operational maneuver force. It then examines current and conceptual Army rotary wing forces, to include Soviet air assault brigades, to determine if these forces possess the capability to perform operational maneuver. (Continued on other side of form)

| | |
|---|---|
| 20. DISTRIBUTION/AVAILABILITY OF ABSTRACT<br>☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS | 21. ABSTRACT SECURITY CLASSIFICATION<br>UNCLASSIFIED |
| 22a. NAME OF RESPONSIBLE INDIVIDUAL<br>MAJOR MICHAEL T. INMAN | 22b. TELEPHONE (Include Area Code)<br>(913)-684-2138<br>22c. OFFICE SYMBOL<br>ATZL-SWV |

DD Form 1473, JUN 86 *Previous editions are obsolete.*

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

Continuation of DD Form 1473, para 19.

The conclusion of the study is that current Army aviation units, in particular the corps aviation brigade, are capable of fulfilling the role of operational maneuver forces. The vertical envelopment capabilities of the air assault division give that division operational maneuver capabilities. Present aviation organizations are not optimally configured for operational level air maneuver. The organizations have difficulty achieving significant mass, and sustaining themselves for long periods in independent operations. Further, our doctrine does not emphasize the employment of aviation in mass to achieve operational results. The proposed AirLand Battle Future corps aviation has the potential to overcome these limitations

The study recommends that doctrinal and organizational revisions now in progress place more emphasis on the employment of operationally significant air maneuver forces in mid- to high-intensity conflicts.

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

Major Michael T. Inman

Title of Monograph: OPERATIONAL MANEUVER IN THE 90'S:
Is Army Aviation a Viable Option?

Approved by:

Lieutenant Colonel Thomas E. Mitchell, MPA — Monograph Director

Colonel William H. Janes, MA, MMAS — Director, School of Advanced Military Studies

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

Accepted this 7th day of June 1990

**ABSTRACT**

OPERATIONAL MANEUVER IN THE 90S: Is Army Aviation a Viable Option? by Major Michael T. Inman, USA, 41 pages.

Operational maneuver is a key element of operational art and AirLand Battle Doctrine. Some prominent theorists have argued that our modern mechanized forces do not possess the requisite characteristics for modern operational maneuver. Brigadier Richard E. Simpkin and General Ferdinand M. von Senger und Etterlin wrote extensively during the 1980's on the subject. They argued that the answer to the problem was airmechanization, the employment of a force organized around a rotary wing Main Battle Air Vehicle (MBAV) in an air maneuver role.

This study examines the history and theory of operational maneuver to determine the requisite characteristics for an operational maneuver force. It then examines current and conceptual Army rotary wing forces, to include Soviet air assault brigades, to determine if these forces possess the capability to perform operational maneuver.

The conclusion of the study is that current Army aviation units, in particular the corps aviation brigade, are capable of fulfilling the role of operational maneuver forces. The vertical envelopment capabilities of the air assault division give that division operational maneuver capabilities. Present aviation organizations are not optimally configured for operational level air maneuver. The organizations have difficulty achieving significant mass, and sustaining themselves for long periods in independent operations. Further, our doctrine does not emphasize the employment of aviation in mass to achieve operational results. The proposed AirLand Battle Future corps aviation has the potential to overcome these limitations.

The study recommends that doctrinal and organizational revisions now in progress place more emphasis on the employment of operationally significant air maneuver forces in mid- and high-intensity conflicts.

## TABLE OF CONTENTS

# OPERATIONAL MANEUVER IN THE 90S:
# Is Army Aviation a Viable Option?

**Mobility is the Keynote of War.**
**Napoleon**[1]

## I. INTRODUCTION

In 1982 the United States Army introduced a new warfighting doctrine called AirLand Battle. The new doctrine was developed in part to counter criticism that the Army relied too much on firepower and attrition in its Active Defense doctrine.[2] It recognized the increased emphasis which the Army was placing on operational art and maneuver. AirLand Battle doctrine calls for seizing the initiative and using it aggressively to accomplish the mission. The doctrine states that the "best results are obtained when powerful blows are struck against critical units or areas. . . . [T]hese operations must be rapid, unpredictable, violent, and disorienting."[3]

AirLand Battle Doctrine calls for fast paced actions with operational objectives that provide for the creation of opportunities to fight on our terms by taking advantage of the enemy's vulnerabilities. It stresses flexibility, concentration, and synchronized joint operations, and calls for "aggressive exploitation of tactical gains to achieve operational results."[4] The doctrine is embodied in the "four basic tenets, *initiative, agility, depth, and synchronization.*"[5]

AirLand Battle Doctrine places heavy emphasis on the use of maneuver in the conduct of battles and campaigns.

Maneuver refers to "the movement of forces in relation to the enemy to secure or retain positional advantage."[6] Clausewitz wrote that "In its ordinary meaning of the term maneuver carries the idea of an effect created out of nothing, so to speak . . . by using the mistakes into which the enemy can be lured. . . ."[7]

The concept of tactical maneuver in warfare has been understood at least since 371 B.C., when the Theban Epaminondas introduced mass and economy of force to end Spartan hegemony at the Battle of Leuctra.[8] Operational maneuver was not commonly recognized until after the American Civil War, although the idea of maneuvering large forces rapidly to gain positional advantage was an essential part of Napoleonic warfare.[9]

"*Operational maneuver* seeks a decisive impact on the conduct of a campaign. It attempts to gain advantage of position before battle and to exploit tactical successes to achieve operational results."[10] Inherent in the maneuver concept is the idea of movement in relation to the enemy. This requires a difference in the relative mobility, agility and flexibility, both within the maneuvering force and between the two opposing forces. The possession of superior mobility or superior firepower by one side has frequently led to victory in wars throughout history.[11]

Operational maneuver is a key element of operational art and AirLand Battle Doctrine. However, some prominent theorists have argued that our modern mechanized forces do not possess the requisite characteristics for operational maneuver. Richard E. Simpkin, then a retired Brigadier in

the Royal Tank Corps, and the late General Ferdinand M. von Senger und Etterlin, former Commander in Chief, Allied Forces Central Europe (CINC AFCENT), wrote extensively during the 1980's on the subject of airmechanization.[12] They held the belief that ground maneuver forces do not possess the speed and mobility to serve as reserves and counterattack forces for North Atlantic Treaty Organization (NATO) armies.[13]

Airmechanization refers to the employment of large rotary wing forces built around a main battle air vehicle (MBAV). General von Senger, based on his experience as CINC AFCENT, saw a need for such forces as operational reserves for theater commanders.[14] While the theories of Brigadier Simpkin and General von Senger differed in the details of how such a force might be organized, both men agreed that such a force provided the mobility and firepower for maneuver that would be required in future wars. U.S. Army doctrine acknowledges the capabilities of aviation for tactical air maneuver, but does not recognize this potential at the operational level.[15]

The purpose of this study is to determine if modern rotary wing aviation formations can perform the functions of operational maneuver. The study will examine the history and theory behind operational maneuver to determine the requirements for high mobility maneuver forces and the characteristics of such forces. The study will then examine the capabilities and limitations of aviation organizations (conceptual and existing) to determine if aviation can meet these requirements for the U.S. Army in the 1990's.

## II. MANEUVER IN HISTORY AND THEORY

> Speed is the essence of mobility. Take advantage of the enemy's unpreparedness; travel by unexpected routes and strike him where he has taken no precautions.
>
> Sun Tzu[16]

### Early Tactical Mobility and Maneuver

Commanders have always sought an advantage in mobility over their opponent in war.[17] They have traditionally included a mobile element in their force to provide this advantage. The Greek introduction of the *phalanx*, a formation of heavy and light infantry, was in recognition of this principle. Alexander capitalized on the principle when he matched the mobility of his cavalry with the superb Greek infantry. He ". . . organized heavy and light cavalry, and trained them to fight in close cooperation with his infantry."[18]

Napoleon, perhaps more than any commander in history, understood the importance of mobility. The military maxim "march divided and fight concentrated"[19] required his army to possess an advantage in speed and agility over his opponents. To achieve this he lightened his infantry and quickened the rate of march to 120 paces per minute. Napoleon also highly valued his cavalry, and exploited the mobility advantage of that arm. He once said, "[c]avalry is useful before, during and after the battle."[20] Napoleon formed his cavalry into several types of heavy and light organizations. He employed the heavy cavalry to defeat the enemy cavalry and to exploit breaches created by artillery fire. Heavy cavalry constituted the bulk of his cavalry

reserve. Dragoons were essentially used as mounted infantry, using their horses for mobility, but dismounting to fight. The light cavalry was primarily concerned with screening and reconnaissance duties.[21]

## Origins of Operational Maneuver

The role of cavalry did not significantly change until the American Civil War. Both the Union and Confederate Armies began the war using their cavalry in the traditional roles of security, shock action, and raiding. As the war progressed, Union cavalry tactics changed. Gradually, the Union began to use their mobility more as a means to deliver firepower rather than for shock action or raids. By the end of the war Union cavalrymen more often than not fought dismounted in dug in positions.[22]

Early in the war General James H. Wilson, serving as Chief of the Cavalry Bureau for the Union Army, argued for a larger role for cavalry units. His earlier experience with cavalry armed with the Spencer repeating rifle led him to believe:

> that large bodies of men, possessing the fire power that the Spencers gave them, called 'cavalry' for convenience, but ***using horses merely to make them more mobile*** in the highest degree, could, without the aid of infantry, fight their way through the opposition, and if need be, could even occupy territory.[23]

The Union Army's use of cavalry provides perhaps the earliest example of operational maneuver.[24] In 1865 General Wilson led a separate cavalry corps of 13,000 troops, essentially a separate army, on a bold maneuver through Alabama to seize the key Confederate cities of Tuscaloosa, Selma, Montgomery, and Columbus, Georgia. In undertaking

this venture he abandoned his lines of communications and supplied his army from captured stocks.

Liddell Hart's assessment of the Civil War led him to conclude that there are two essential elements for 'true mobility;' training and flexibility. He believed that only a professional army could meet the requirement for training. At the time of the Civil War training was available only in war. He wrote that, '. . . a long war or a short peace . . .' are essential for developing an effective organization for maneuver.[26]

Liddell Hart's second requirement for mobility was flexibility. In the Civil War the use of railroads, while vastly improving the strategic mobility of troops and supplies,[26] actually cost commanders their flexibility for large unit maneuver.[27] Railroads made it possible to field armies in multiple theaters of war for the first time, and to rapidly transfer troops and supplies between the armies. However, the reliance on railroads limited maneuver as commanders allowed themselves to become tied to the trains for support. It was the rare commander who would abandon his line of communications to maneuver freely against the enemy. Grant (Vicksburg), Sherman (Atlanta to Savannah), and Wilson were the exceptions to the rule. It took the Union Army four years to forge the instrument and develop the leaders to conduct mobile war. It would be 70 years before an army could wage mobile war on this scale again.

By World War I the dependency of armies upon the rail lines for strategic mobility had greatly increased. The loss of flexibility attendant with this change, and the

massive firepower of machine guns, artillery, and to a lesser extent airplanes, made defense the preeminent form of war. Armies, once detrained, were limited for mobility to the rate of march. In Liddell Hart's words, 'the long-overlooked lesson of the American Civil War was repeated that the development of railways, and armies' dependence on such communications . . . fostered the deployment of larger numbers than could be maintained. . . .'[28]

World War I, begun with the bold operational maneuvers of the Schlieffen Plan and Joffre's countering Marne maneuvers, quickly turned into a war of attrition. Neither side could:

> solve the problems of combat movement, mobile fire-support, or logistical support in order to carry tactical exploitation to its logical, decisive conclusion before the defender could shift reserves to close the gap.[29]

In November 1917, the British, seeking to overcome the mobility deficiency in the combat units, launched the first mass tank attack in history at the Battle of Cambrai. Increased logistics demands and lack of planning for reserves doomed the operation to failure, but not before the tank had demonstrated a potential for tactical and operational maneuver. Once again, there was available a force capable of fast paced maneuver. J.F.C. Fuller concluded that the supreme tactical lesson of the war was that:

> petrol-power enabled armor to be reintroduced, and armor enabled offensive-power to be protected, thus it enabled the primary function to be reintroduced. It reestablished tactics as art.[30]

World War I on the eastern front was much different than in the west for two principal reasons. First, the length of the front, the lower relative density of forces, and the lack of transportation infrastructure combined to create more opportunities for maneuver. Second, the opponents were more disposed to conduct maneuver warfare. The Germans had a long maneuver tradition, and the Russians had increased the emphasis on maneuver in their doctrine after their humiliating defeat in the Russo-Japanese War.[31]

> Operational maneuver persisted throughout the three years of fighting without either side being able to gain the upper hand. Commanders on both sides developed the techniques necessary for a breakthrough but were unable to transform the breakthrough into a sustained drive. . . . It is probably fair to describe the 1914-1917 struggle as a mobile war, in which neither side was able to execute decisive maneuver.[32]

The near total absence of mechanized forces allowed the cavalry to serve as the principle source of mobility on that front, although it was not particularly effective.[33]

After World War I the Soviets had an opportunity to further practice operational art and maneuver in their Civil War. Cavalry continued to enjoy a preeminence that it no longer held in the West. In August-September 1919 White Army General K. K. Mamontov used his cavalry corps to conduct a highly effective deep strike mission through the Red lines and into the rear of the Southern *Front*.[34] In November 1919, the Soviets responded to this development by organizing the First Red Cavalry Army. Composed of up to five cavalry divisions, this 'strategic cavalry repeatedly played the role of shock force striking deep into the enemy

rear, disrupting his command and control, and demoralizing his forces.'[35]

## Mechanized Warfare

After World War I there was much debate over the lessons learned and application of the new found mobility for future wars. Some theorists, Liddell Hart and Fuller among them, saw motorization as the wave of the future. Advocates for tanks (and airpower) argued that theirs would be the decisive arm in the next war. In most of the western armies the traditionalists prevailed, regarding 'motor vehicles and tanks (and aircraft) as useful adjuncts to tactics . . . to be employed when opportune in conjunction with the existing arms.'[36] U.S. Army Chief of Staff General Charles P. Summerall, in 1930, argued that mobility and shock action alone did not have the sole qualities sought by an army, 'and that a force endowed with high mobility must necessarily make a great sacrifice of firepower in favor of rapidity of movement.'[37]

In the Soviet Union V. K. Triandafillov was a major proponent for operational art and maneuver. He wrote in detail about the 'theory of successive and deep operations,' but did not believe the ''machinization' of warfare' would be decisive in the undeveloped areas of European Russia.[38] M. V. Tukhachevsky was the principal Soviet proponent for mechanization. After convincing Stalin of the merit of his ideas, Tukhachevsky was able to conduct experiments on motorization in the early 30s. He argued for combined arms and mechanized forces, emphasizing the:

> 'decisive offensive on the main axis, completed by relentless pursuit' as the only means to bring

> about the total destruction of the enemy's men and equipment. . . . Tanks were to be used in mass, mechanized formations, . . . [and] were expected to strike deep into the enemy's rear, using their mobility to outflank and encircle enemy forces. . . .[39]

By the late 1930s the Soviets had fielded a large modern mechanized army, and had developed a maneuver doctrine for its employment. However, the Soviet Army's conclusions on the Spainish Civil War, which ended in 1939, cast doubt on the validity of the "theory of deep, successive operations. . . ."[40] As a result, they virtually dismantled their mechanized forces, breaking up tank formations and assigning them to support infantry units. When Tukhachevsky and most of the other Soviet military elite were executed in Stalin's purges on the eve of World War II, all Soviet advantages in operational art and maneuver vanished.[41]

While the Soviet Army had difficult obtaining acceptance for a manuever doctrine, the German Army faced no such obstacle. The German Army had a military tradition of "strategy of decisive maneuver"[42] dating from von Moltke and von Schlieffen. This tradition aided German tank warfare advocates. General Hans von Seeckt, Commander-in-Chief of the German Army during the period 1920-26, summed up his ideas on strategy by saying, ". . . the whole future of warfare appears to me to lie in the employment of mobile armies, relatively small but of high quality, and rendered distinctly more effective by the addition of aircraft. . . ."[43] Von Seeckt believed the army of the future ". . . must satisfy these demands: first, high mobility . . . ; second,

the most effective armament; and third, continuous replacement of men and material."[44] Like Liddell Hart, he believed that mobile warfare required well-trained forces.[45]

After von Seeckt's departure the German High Command was dominated by men who favored mass conscription armies rather than the highly trained and mobile armies favored by von Seeckt. It fell to Major General Heinz Guderian to lead the high command back to a maneuver strategy. Guderian's efforts were supported by Hitler, who liked the quick solution his ideas promised.[46] Initially the High Command resisted Guderian's ideas for an armored force. It was with great reluctance that the High Command ". . . recognized the new theory of high speed warfare. . . ."[47] By the start of World War II the proportion of armored and mechanized forces was still small in relation to infantry. Nevertheless, the result was, in Liddell Hart's words, ". . . one of history's most striking examples of the decisive effect of a new idea, carried out by a dynamic executant."[48]

Armor dominated the opening moves of the war in both the east and west. The German Army swept through first France, and then western Russia, with their so called *Blitzkrieg* doctrine of tactical penetration and operational exploitation "carried out by an armoured force racing ahead of the main army, and operating independently."[49] Armor continued to dominate the European battlefield throughout the war, but after 1942 it was the Russians who capitalized on the mobility of the tank to conduct operational maneuver.

The Soviet Union, in 1943, fielded five tank armies, each "made up of two tank corps and an optional mechanized

corps."[80] A sixth army was organized by early 1944. With 400 to 600 tanks each, an effective command and control system, and sustainment capabilities for deep operations, these armies reflected ". . . a growing sophistication in the Soviet force structure. . . ."[81]

The Soviets demonstrated their new maturity in operational art beginning as early as the summer of 1943, learning to shape the battlefield in response to German offensives. In the Belgorod-Khar'kov counteroffensive in August 1943, the Soviets used tank and mechanized corps to exploit the tactical penetration made by army rifle forces as they attacked to reduce the German salient around Belgorod and Khar'kov. The armor formations penetrated the front and "drove to a depth of some 120 kilometers before German reinforcements fought those units to a halt."[82] The operation demonstrated the ability of the Soviets to conduct large scale maneuver, penetrate deep into enemy lines, and fight the German reserves to a standstill."[83]

"Throughout 1944 and 1945 the Soviets conducted over one hundred *front* offensive operations. Many of those operations involved the use of large mechanized forces under control of army and *front* commanders."[84] Soviet operations during this period aimed at deep penetrations and envelopment of enemy forces by highly mobile armor and mechanized forces. Operation Bagration (Belorussian) is typical of these operations, although it was more successful than most. The Soviets intended to encircle German forces around the cities of Vitebsk, Mogilev, and Bobryusk (3 German Armies). After this encirclement they planned a

deeper encirclement of German forces forward of Minsk and a pursuit that would carry them to the East Prussian border.[55]

> Generally speaking the Soviets relied on their tank and mechanized corps to conduct the shallow envelopments and to pinch off German forces in the three major cities. They then used their larger mechanized forces . . . to conduct the deeper envelopment of Minsk and spearhead the exploitation all the way to the border of Germany. . . . The operational objectives achieved exceeded Soviet expectations. . .[56]

While the Soviets were the experts at maneuver warfare in World War II, they were not the only army to master that form of war. The Americans also used the advantages of mobility and firepower offered by the tank to conduct operational maneuver. Lieutenant General George S. Patton, Jr. linked "the cavalry traditions of speed and audacity"[57] to the mobility of the tank, giving his forces the agility and flexibility to react quicker than the enemy to developments on the battlefield. Patton used his armor divisions to exploit penetrations, conduct pursuit operations, and cut off and encircle enemy forces.[58] The rapid advance of Patton's Third Army across France in August and September 1944, and his abrupt turn north into the Ardennes during the Battle of the Bulge, are familiar examples of operational maneuver.[59]

The accomplishments of Patton's Third Army would not have been possible without key developments in the capability of the forces to sustain themselves. A combination of individual initiatives and technological solutions made it possible to supply the large forces. The Red Ball Express that supported Patton's dash across France

is perhaps the most famous example of such expedients. Air transport also contributed heavily to the supply effort.[60]

To summarize the discussion thus far, some general observations can be made. First, the possession of superior mobility by either side has historically given that side a tremendous advantage. This mobility advantage allows the maneuver force to operate at a higher tempo than other forces on the battlefield. Second, maneuver forces tend to be better trained and led than other forces.

Third, maneuver forces possess significant firepower, though not necessarily superior firepower. Cavalry certainly did not have superior firepower in the Soviet Civil War, but it continued to be effective when used indirectly. The U.S. tanks in World War II were not any better than German tanks. A manuever force must possess equal firepower with the enemy force it opposes.

Finally, a maneuver force must have the capability to sustain itself during independent operations. For the fast moving independent cavalry forces foraging was an answer. For World War II armored forces the cargo truck was the answer, backed up to some extent by air transport.

## Origins of Air Maneuver

The origins of the use of the air medium for maneuver can be traced to the final days of World War I. The first recorded instance of consideration of aerial maneuver came when General John J. Pershing authorized General Billy Mitchell to plan a parachute drop of the 1st Infantry Division behind German lines. The war ended while planning was in progress.[61] During the interwar years the concept of

airmobility was developed, and by the start of World War II, most armies had an airborne capability.

There were a number of airborne operations conducted by the Germans, British, Japanese, Russians and Americans during World War II.[62] A number of these had operational significance, and proved 'the value of large-scale three-dimensional combat in which the ground troops reach their objectives by air. . . . '[63]

Airborne forces were employed by both sides to seize decisive points (bridges, road junctions, mountain passes, etc.) deep in enemy territory. These decisive points either facilitated ground maneuver or trapped enemy forces from escaping.[64] The speed and flexibility of airborne assault (including airlanded and glider landed forces) operations gave the attacker an advantage. The surprise and shock of the initial assault generally offset the airborne force's disadvantages in firepower and ground mobility. The air maneuver capabilities exhibited by these airborne forces characterize modern air assault forces with the added advantages of the firepower and mobility of the helicopter.

**The Rotary Wing Revolution**

The Army was slow to grasp the significance of the helicopter as a means to enhance tactical mobility. Both Marine and Army units used the helicopter in the Korean War for air assault operations, but it was the Marines who led in developing the doctrine for rotary wing employment.[65] After the Korean War senior Army leaders began to recognize the potential for the new machines.

In 1954 Lieutenant General James M. Gavin, then Army Deputy Chief of Staff for Operations, wrote an article for *Harper's Magazine* entitled "Cavalry, and I Don't Mean Horses." In that article he lamented the absence of cavalry from the Korean War battlefields, and expounded on the possible uses of helicopters to replace it. General Gavin argued that the mobility differential between infantry/armor divisions and cavalry units was insufficient to allow cavalry to perform the traditional missions of screening and shock action. "Today, even the most casual awareness of the historical lesson should suggest that in ground combat the mobility differential we lack will be found in the air vehicle."[6] While the military uses of the helicopter were widely recognized within the Army, the emphasis on massive nuclear retaliation to the detriment of conventional forces kept the Army from full scale deployment of heliborne forces.[7]

It was not until the early 1960's that the Army began to look seriously at how to take advantage of the helicopter's mobility. In 1962 the Army convened the Tactical Mobility Requirements Board, commonly called the Howze Board after its president, Lieutenant General Hamilton H. Howze,[8] to study how best to increase the mobility of the Army through the use of the new machines. The Howze board tested the airmobility concept and found it to have considerable utility for the Army.

The board recommended formation of five air assault divisions, three air cavalry combat brigades (ACCB), and five air transport brigades. The divisions would have 459

aircraft, and would have significantly less ground transportation than the standard U.S. Army division of that period, the Reorganization Objective Army Division (ROAD). The ACCB would have 316 aircraft, 144 of them attack helicopters with an airborne anti-tank capability.[69] In his final report General Howze reached this conclusion:

> Adoption by the Army of the airmobile concept . . . is necessary and desirable. In some respects the transition is inevitable, just as was that from animal mobility to motor.[70]

In 1963 the Army organized the 11th Air Assault Division at Fort Benning, Georgia and began full scale testing of the airmobile concept. The tests proved the merit of the airmobility concept,[71] and in July 1965 the 1st Cavalry Division (Airmobile) was activated at Fort Benning, Georgia. It combined elements of the 11th Air Assault Division and the 2nd Infantry Division. The new division was then given 90 days to prepare for and deploy to Vietnam for combat.[72]

In Vietnam, the 1st Air Cavalry Division (Airmobile), as the division was commonly known, was used as 'an Army-level shock force, capable of countrywide (or theater inclusive) employment, . . . [gaining] a premiere reputation for consistent battlefield success.'[73] The 1st Cavalry and other U.S. and Republic of Vietnam infantry units conducted hundreds of airmobile and air assault operations during the War.[74] The vast majority were tactical operations. On occasion operations were conducted which had operational significance.

In particular, Operation LIBERTY CANYON, conducted in the fall of 1968, proved the superior operational mobility of the division. The division moved from I Corps Tactical Zone to III Corps Tactical Zone, a distance of 570 miles, in 12 days. Lead combat elements withdrew from combat, self deployed to the new sector, and began combat operations in 48 hours. The division used a combination of sea and air movement in addition to the self deployment of most of its combat aircraft.[78] The 1st Cavalry Division's success led to creation of other airmobile divisions.

The 101st Airborne Division was converted to an airmobile division in 1968. With the conversion of the 23rd Infantry (Americal) to airmobile status, and the activation of the 9th Air Cavalry Brigade (Combat) (Provisional) in 1970, the Army was on the verge of achieving the force structure envisioned by the Howze Board. Unfortunately, rules of engagements, competing priorities for aircraft, and requirements to support Vietnamese units prevented this force from being fully employed to test the concept of mass maneuver of airmobile combat forces.[79]

The Army's Vietnam experience demonstrated the capabilities of the helicopter in support of combat operations. The helicopter's speed, agility, and flexibility added a new dimension to tactical maneuver. The operational movement of the 1st Cavalry Division in Operation LIBERTY CANYON indicated a potential for operational maneuver. The effectiveness of the helicopter for mobile and lethal fire support was demonstrated by the AH-1 Cobra. Most important, the Army's experience in

Vietnam showed that, with proper use of suppressive ground fires, air defense support, intelligence, and tactics, the helicopter was survivable in combat.[77]

After Vietnam the U.S. Army focused on the Soviet threat in Europe. The successes of the 1st Cavalry Division and other airmobile units in Vietnam were discounted as not relevant for the anticipated mid- to high-intensity battlefield of Europe. This despite the fact that the Air Assault tests in the early 1960's focused on Europe for the likely employment of an air assault division. Lessons from the Yom Kippur War in 1973 seemed to indicate a need for protection at the expense of mobility.[78] The 1st Cavalry Division converted to a heavy division, and the 101st was retained as the only airmobile division.[79]

### Modern Soviet Maneuver Doctrine

The Soviets recognize the potential for maneuver in future wars. According to the 1987 version of *Taktika*,

> "High maneuverability of modern battle is the result of using powerful weapons, of growth of the mobility of combined-arms units and formations owing to their full motorization and high degree of mechanization, and the result of the absence of a continuous front in defense and offense."[80]

*Taktika* defines maneuver as "the organized movement of troops or assignment of new targets to weapons in order to create advantageous conditions for combat operations."[81] Soviet combat units possess large amounts of artillery, reflecting the influence of firepower in their doctrine. They recognize maneuver as a means of quickly exploiting the effects of nuclear and conventional fires to ". . . swiftly penetrate deep into his disposition . . . by wide

maneuvering. . . .'[82]

Immediately after World War II, the Soviets moved to incorporate the lessons on operational maneuver into their doctrine and organizational structure. Within the *front* they created the combined arms army as the primary force for conducting the penetration operation. An army mobile group was assigned to each combined arms army. Consisting of one or two mechanized divisions or tank divisions, the mobile group was given the task of 'operational maneuver and exploitation.'[83] The *front* commander also had a mobile group consisting of a 'very heavy mechanized army which was designated to conduct operational maneuver. . . .'[84]

Beginning in the 1950s the Soviets moved away from their doctrine of large operational maneuver forces. In response to the nuclear threat they reorganized their forces to make them less vulnerable, and to make all forces equally maneuverable. The large mechanized armies were abolished in favor of smaller tank armies and the mechanized and rifle divisions were replaced by motorized rifle divisions.[85]

In the early 1970s the Soviets began to reverse this trend. Theoretical works began to hint at the possibility of conducting conventional operations without the inevitability of nuclear war. Motorized rifle divisions were added to tank armies and emphasis was again placed on the use of mobile corps and army operations. The modern tank army was seen as fulfilling the functions of the World War II mobile group. This army would form the core of an operational maneuver group which would be used in tandem with the new air assault brigade, and perhaps with the

*front's* airborne division, thus adding a vertical dimension to Soviet operational maneuver concepts. The Soviets are likely to expand the vertical dimension in the future with the addition of air assault corps and brigades at *front* and army levels, respectively.[66]

**Conclusions on Maneuver**

The most important conclusion we can draw from the study so far is that historically, the possession of an advantage in mobility by either side gives that side a significant advantage. The mobility advantage has traditionally resulted from one side making better use of an existing technology or tactic. This advantage allows maneuver forces to generate a higher tempo than other forces on the battlefield. But maneuver requires more than speed.

Maneuver forces tend to be better trained and led than other forces, and possess superior agility and flexibility, both in structure and leadership. They possess significant firepower, although they rely upon disruption and shock action for a portion of their success. Finally, they are characterized by the ability to sustain themselves during deep and independent operations.

Having determined the requirements for operational maneuver, the question becomes, what force can best meet them? The study of air maneuver leads to the conclusion that aviation forces can meet these requirements. Rotary wing aviation forces have superior mobility to any force on the battlefield, giving them the ability to raise the tempo of battle. Their agility, flexibility, and firepower allow the commander to rapidly shift combat power throughout the

width and depth of the battlefield. In the next section this study will examine current and conceptual aviation organizations to assess their potential for employment as operational maneuver forces.

## III. MODERN ROTARY WING AVIATION FORCES

> An aero squadron may seem to require a large amount of transportation, or the aeroplanes to require too much special equipment and tender care; but when the time comes for their work, the results accomplished will convince that they have earned their name - the Fourth Arm.
>
> First Lieutenant Henry H. Arnold
> U.S. Infantry
> 1913[87]

### U.S. Army Aviation

Rotary wing aviation in the U.S. Army today is structured to support tactical operations through division and corps (and echelon above corps) aviation brigades. This structure grew out of a series of studies conducted during the 1970s on the capabilities, organization and employment of Army aviation, and culminated in Army Chief of Staff General E. C. Meyer's decision in 1983 to organize aviation brigades in each division and corps.[88]

The size and composition of the division aviation brigades varies depending on the division's mission. Although they contain maneuver elements, division aviation brigades are not structured as maneuver brigades.[89] The air assault division is the only division with sufficient aviation assets and sustainment to conduct air maneuver at the operational level.[90] Corps aviation brigades have potential for operational maneuver, and will be examined

later in this study.[91] Appendix A includes tables of U.S. Army helicopter characteristics and capabilities.

**The Air Assault Division**

The modern air assault division 'is a flexible and lethal offensive fighting organization having use at the strategic, operational, and tactical levels of war. . . .'[92] The division provides the corps or theater commander the capability to initiate operational maneuver via vertical envelopment. The division is essentially an infantry division with increased anti-tank capabilities both in its helicopters and in the infantry units.

The air assault division is organized with three maneuver brigades, a division artillery, and an aviation brigade. Nine infantry battalions are assigned. Artillery assets consist of three 105mm howitzer battalions.[93] See Figure 1, Appendix B, for the complete division organization chart. The division derives its tactical and operational mobility from the aviation brigade. The brigade consists of two combat aviation battalions (45 UH-60 each), one medium transportation helicopter battalion (48 CH-47), three (five are authorized, but two are not activated) attack helicopter battalions, and an air reconnaissance squadron. Currently the division has one AH-64 battalion, giving it a total complement of 58 AH-1 and 18 AH-64 attack helicopters.[94]

The air assault division is configured for 'rapid worldwide deployment to defeat or destroy enemy forces and to control land area . . . by employing the unique capabilities of an air assault division.'[95] Division operational missions include: attack deep behind enemy

lines via vertical envelopment to seize and hold vital objectives; serve as a theater reserve and/or counterattack force; and conduct large scale tactical raids.[86]

The division is capable of rapid strategic deployment using Air Force assets. It projects combat power rapidly by vertical envelopment, and possesses a high degree of tactical mobility which allows it to operate without regard for terrain and most environmental conditions. The division is easily task organized, and is uniquely capable of by-passing obstacles.[87]

Unique limitations of the division are its lack of ground mobility, partially offset by airmobility; the need to consider weather in planning operations; and the need for support augmentation for supply classes III (fuel) and V (ammunition) when operating independently or for long periods.[88] With proper planning adverse weather can be a help rather than a hindrance as it gives the division the capability to achieve surprise and denies the enemy the freedom to react.[89]

In terms of air maneuver, the division's major limitation is its inability to mass sufficient aerial maneuver forces for sustained periods of combat. During normal operations an aviation unit is normally able to maintain only one-third of its combat power in contact due to refuel/rearm and transit requirements. For the air assault division (as presently configured) this means 14 AH-1s and 6 AH-64s could be in action at one time. This force is sufficient only to provide fire support for the air

assault forces, and could not have an operational impact other than in support of air assault operations.

**The Corps Aviation Brigade (CAB)**

Corps aviation brigades are significantly larger than division aviation brigades, and are configured to employ their powerful attack aviation groups as maneuver elements. This gives the corps brigades "a measure of operational mobility and flexibility," and thus a capability for air maneuver.[100] Due to force constraints the active army brigades are assigned a mix of active and reserve component battalions. Figure 2, Appendix B, is an organization chart for a CAB.

The CAB is organized to provide the corps commander with the capability for "high-tempo air maneuver."[101] A full table of organization and equipment (TOE) strength brigade has two attack helicopter groups with a total of five attack battalions. Each battalion has 18 AH-64 Apache attack helicopters, giving the brigade 90 AH-64s.

The brigade is also assigned an aviation group consisting of two assault battalions (UH-60) and a medium lift battalion (CH-47 Chinook). An air reconnaissance squadron is assigned when the corps has no armored cavalry regiment. In practice the brigades are organized with only three attack battalions, one assault battalion, and the medium lift battalion. Two of the attack battalions, an assault battalion, and the three group headquarters are organized in the reserve components.[102]

The brigade headquarters has a staff that is capable of planning aviation and air maneuver operations. Subordinate

attack group headquarters are also capable of planning air maneuver operations.[103] With appropriate augmentation the brigade can plan and supervise combined arms operations, including "task-organized armor, infantry, artillery, [and] air defense . . . as necessary."[104] According to FM 1-111 (draft), *Aviation Brigades*, "the combined arms approach provides force commanders the unique capability to accelerate the tempo of ground maneuver operations while employing decisive ground and air maneuver to keep the enemy off balance."[105]

The capabilities and limitations of the corps aviation brigade are similar to those of the air assault division aviation brigade. Its primary capability is "the exploitation of the aerial dimension of the battlefield."[106] The brigade influences the tempo of the battle with its ability for unrestricted maneuver. It can mass fires rapidly at the critical place and time, then disperse for protection. It can act as a reserve, or provide the air movement for ground reserves. With the modern aircraft and avionics now available, the brigade can operate at night, during periods of limited visibility, and under adverse environmental conditions.[107]

Limitations of the brigade include the effects of weather and obscuration on observation, visual acquisition means, and range of combat systems. Just like the air assault division, the corps aviation brigade consumes large amounts of Class III and Class V. The brigade has the capability to sustain itself during operations, but must compete with other corps elements for use of its own lift

assets. Augmentation with ground maneuver units will slow the tempo of the brigade.[108]

### Soviet Rotary Wing Forces

Soviet generals look at the helicopter as a lightly armored tank, but ". . . one which is capable of high speeds and unrestricted cross-country performance. . . ."[109] In their view, "in battle a tank can seize enemy territory and a helicopter can do the same. But an aircraft cannot."[110] The Soviet's current main battle helicopter, the MI-24 Hind, reflects this philosophy with its combined troop hauling and attack capabilities.

Soviet aviation at Army level consists of an attack helicopter regiment with 40 Hind and 20 Hip (MI-17) helicopters, and an air assault battalion.[111] Aviation at *Front* level, consisting of heavy and medium lift assets, is organized in regiments under the Aviation of the *Front*. These assets are apportioned to the Armies based on their mission, with the majority going to support the main effort. *Fronts* can also be assigned an air assault brigade. The aviation assets for this brigade are provided from *Front* aviation regiments.[112]

The air assault brigades provide the *Front* commander with a tremendous air maneuver capability. They include two BMD equipped battalions and two parachute infantry battalions, and provide the commander with considerable flexibility in the employment of the assets. The Soviets lack the helicopter assets at *Front* level to lift the entire brigade at once, and appear to prefer to commit it in elements of one or two battalions.[113] It is generally

believed that the brigades were formed to support Soviet operational maneuver groups (OMG) by seizing 'key terrain critical to a successful advance such as obstacle-crossing sites and so forth.'[114]

The Soviet concept is to employ their air assault brigades to support the operational maneuver group. Air assault assets would be deployed in battalion size packets to seize key terrain. This does not constitute operational maneuver in itself, although it certainly could achieve operational effect. Should the Soviets eventually deploy air assault corps, as was earlier mentioned, they certainly would have the potential for operational air maneuver.

**Airmechanization.**

Brigadier Simpkin, writing in *Armor* magazine in 1981, laid out his original ideas for an airmechanized force. He placed great reliance on antitank (attack) helicopters and artillery. The division's combat power was concentrated in two mechanized infantry brigades (8 battalions), a division artillery of 3 artillery regiments, and an air cavalry regiment. Figure 3, Appendix B, is an organization chart for the original conceptual airmechanized division.

Simpkin understood that the capability was not yet available to lift mechanized forces, but believed it soon would be. He thought that western armies would soon field high mobility-agility (HIMAG) armor vehicles which would so speed up the tempo of mechanized forces that cavalry and reserve forces would no longer have a mobility advantage. He argued that the ability to airlift these light mechanized forces would treble the mobility of ground maneuver forces.

"Once the mechanized maneuver forces achieve HIMAG mobility, the ultramobile force . . . must be rotary wing. . . ."[115]

A key point in Simpkin's argument was that heliborne forces had a distinct terrain advantage in what he called "mobiquity," or the ability to cross rough or soft terrain.[116] Coupled with the expanded artillery, it would "increase the dimensions of the division's battlefield, the tempo of its operations and above all its ability to concentrate fighting power in time and space."[117]

In a later work Simpkin pointed out that the nature of the threat and projected developments in equipment called "for a shift in the weight of combat power away from the mechanized maneuver force as such towards the helicopter element and the artillery."[118] He eventually accepted General von Senger's MBAV ideas, but never totally rejected the idea of air lifting light armor. In an analysis of the two ideas in 1984, he concluded,

> [t]he crunch question is whether it is more effective, and more cost effective, to leave the track/rotor interface as it is and helilift light armour when needs be, or to provide MBAV-based formations which would at once bridge this interface and enhance the combat worth of independent rotary-wing forces.[119]

Simpkin concluded that the MBAV idea was worth further exploring, and that this opened ". . . up the whole question of whether future mobile forces should be based on the track or rotor."[120] In *Race to the Swift*, published in 1985, Simpkin decided the heavy-lift option was not viable, and cited three reasons. Once set down, the armored force would revert to their inherent mobility, wasting the advantages of rotary wing movement. Without the scope or tempo of

airmobility, the units would operate in accordance with their tradition and training. Finally, the burden of supplying fuel for both the air maneuver force and the armored force would overwhelm the logistics system.[121]

General von Senger, writing in *RUSI* in 1983, proposed an airmechanized division that differed significantly from the Simpkin idea. Von Senger built his hypothetical division around the MBAV, a proposed aircraft similar in capabilities to the AH-64.[122] Von Senger's division consisted of three brigades; an airmechanized brigade, containing two battalions of 28 MBAV each; an air transport brigade; and an airmobile infantry brigade. Figure 5, Appendix B, is a chart depicting the organization of the division.

Von Senger felt the division should be employed under two broad principles. First, the new forces should not be scattered among other combat arms elements, but rather should be concentrated in large independent formations. Second, a new doctrine should be developed for the tactical and operational employment of these new forces to "encompass fighting under all conditions of weather and terrain in all types of war, nuclear and conventional, and all types of combat, attack as well as defense and delay."[123]

Von Senger believed the division was especially suited for employment as an operational reserve. He believed the reliance on ground reserves for central Europe was not wise due the anticipated devastation that would be caused by air interdiction, artillery and nuclear fires in a major war. The airmechanized force's mobility could be exploited in

such situations.[124] Von Senger saw a need to employ infantry with the airmechanized force to hold ground.[125]

Von Senger argued that the limitations of the helicopter are no more difficult to overcome than the difficulties of other innovations in previous eras. He cedes the vulnerability of the helicopter, but argues that it is no more so than other vehicles on the battlefield.

> It is always surprising that losses of helicopters in their tens are decried while tank losses in their hundreds (some 2000 in the Yom Kippur War) appear to be acceptable. The helicopter in the forward area survives by its tactics and by its speed and agility, and by spending the minimum time in that zone.[126]

The airmechanized division would require a significant logistics effort. Von Senger believed it would not be out of proportion to that required to support the new ground mechanized forces. He said:

> All technological progress has to be paid for by a higher logistic effort. This has to be off-set against the substantial increase in combat effectiveness which such progress affords.[127]

The airmechanized division is, as one author concluded, an evolutionary rather than revolutionary concept.[128] The MBAV's predecessors, cavalry and armor, were first employed as supporting arms. Just like massed cavalry and armored forces, the massed aviation forces of the airmechanized division offer significant potential as an operational maneuver element.

The division incorporates three main components; airmobile infantry, the MBAV, and the light airmobile armor vehicles. Two of these are reflected in our current aviation force structure. The airmobile infantry is

incorporated into our air assault division, and the MBAV is similar to our AH-64. Von Senger's idea of organizing airmechanized divisions (consisting of one MBAV brigade, an air transport brigade, and an airmobile brigade) would give the operational commander tremendous flexibility.

The third component, the heavy lift option, does not appear to be viable. Ten years after Simpkin first proposed airlifting light armored vehicles the U.S. Army still does not have a heavy lift helicopter[129] Fueling both air and ground vehicles through an air line of communication would be impossible to accomplish. Given current resource constraints and the difficulty of supporting such a concept, it cannot be seriously considered for the near term future.

**AirLand Battle Future Corps Aviation.**

In recognition of the changes in the threat and political situation in Europe, the U.S. Army has undertaken a "study to examine alternative warfighting concepts and designs to execute the Airland Battle Future umbrella concept."[130] The concept envisions a nonlinear and extended battlefield where a corps is given an area of operations that far exceeds the typical sector of the current corps.[131] The restructured threat is expected to rely heavily on fire to achieve decisive results.[132] To counter this threat, friendly force commanders will rely heavily on reconnaissance and surveillance to see the enemy before he sees them, then long range artillery and rapid maneuver to destroy the enemy forces.[133]

The AirLand Battle Future (ALBF) concept calls for an increased role for aviation, in particular attack

helicopters. Most of the attack helicopters currently in the divisions would be consolidated into brigades under a corps aviation structure.[134] Figure 4, Appendix B, depicts a proposed corps aviation organization under the ALBF concept. The proposed organization has a total complement of 469 rotary wing (including 48 CH-47's) and five fixed wing aircraft. There are 150 (AH-64) attack helicopters (70 armed LHX[135] are allotted for scout/observer duties) consolidated in one organization. The assault helicopter brigade has 120 UH-60's to support the light infantry division's air assault operations. The ALBF corps aviation appears to have considerable potential for operational air maneuver.

The logistics support structure for the brigade has not been developed, nor have final conclusions on the sustainment capability of the organization. Considering the heavy demands from ground maneuver units for the medium lift helicopters, the organization does not appear to have enough lift capability to support itself in conducting operational level air maneuver.

The concept for employment of the corps calls for employing the attack helicopter brigades in conjunction with ground maneuver forces to destroy the enemy forces as part of a coordinated fire strike. Aviation fires would be coordinated by the corps fire support element.[136] This indicates that the intent of the new organization is not so much air maneuver, particularly at the operational level, but rather to provide aviation units to support ground maneuver. This is no different from the current concept of

assigning aviation brigades to the divisions. The concept could actually result in less helicopters being available for operational maneuver as it represents an overall reduction in corps aircraft.

**Summary of Rotary Wing Air Maneuver Capabilities**

Rotary wing aviation forces possess tremendous potential for employment as operational maneuver forces. They have a high mobility potential with their speed, agility and flexibility. They can move rapidly over the battlefield to concentrate fires where needed. They have great potential for shock and disruption. While certainly more vulnerable than armor to the lethal effects of fires on the modern battlefield, rotary wing forces rely on supporting fires from the other combined arms team members, intelligence, and tactics for protection. U.S. Army air assault and attack helicopter forces, in particular, possess the characteristics for operational maneuver.

The flexibility and lethality of the air assault division makes it well suited for a role in operational maneuver. The ability of the division to mass infantry and attack helicopters quickly over great distances gives the operational commander flexibility not available in other forces, offering him the capability for seizing the initiative from the enemy.[137] The unit requires additional lift assets to conduct division sized operations for more than a few days. The division aviation brigade is not organized as an air maneuver brigade. Combat support and assault aviation are grouped in one organization limiting the brigade's ability to concentrate on air maneuver.

The corps aviation brigade is capable of conducting operational maneuver. The subordinate attack groups, when activated, give the brigade the capability to sustain a sizeable aviation operation for an extended period. Organizing the brigades with the attack groups in the reserve components prevents the organizations from achieving the level of training required for large scale maneuver. Current employment concepts favor placing the attack groups in support of ground maneuver divisions or using them individually for cross forward line of own troops (FLOT) deep attacks similar to cavalry raids. The brigade does not have the medium lift assets to perform its support missions for other corps units and to support mass air maneuver operations at the tempo that would be required.

The airmechanized division offers a potential for operational air maneuver. However, two of the three main components (airmobile infantry, the MBAV, and the heavy lift option) are already reflected in our current aviation force structure. The airmobile infantry is incorporated into our air assault division, and the MBAV is similar to our AH-64. The third component, the heavy lift option, does not appear to be viable due to the absence of an affordable heavy lift helicopter and the difficulty of supporting both an aviation and armored force over an air line of communications.

The AirLand Battle Future Corps Aviation appears to have excellent potential for air maneuver. More than any other existing or conceptual aviation organization, it could provide the ability to mass sufficient attack helicopter forces to defeat large enemy armor formations. The

preliminary employment concepts being developed do not address air maneuver. Rather it appears to be an organization designed to consolidate aviation assets within the corps. Aviation units would then be task organized to support ground maneuver forces.

## IV. SUMMARY AND CONCLUSIONS

> **We are therefore certain that no rules of any kind exist for maneuver, and no method or general principle can determine the value of the action; rather, superior application, precision, order, discipline, and fear will find the means to achieve palpable advantage in the most singular and minute circumstances.**
>
> **Carl von Clausewitz[138]**

Historically, commanders have used specialized maneuver forces having superior speed, agility, and flexibility to increase the tempo of battle to a level higher than the opponent can achieve. These forces, often operating independently or in advance of the main effort, have achieved their results as much from shock effect and surprise as from firepower. One common characteristic of these forces has been the mobility advantage they held over other forces on the battlefield.

In the past cavalry and armor forces have successively filled the maneuver role. More recently, rotary wing air assault and attack forces have been used to perform maneuver, but only at the tactical level. The Army has created a force structure that supports air maneuver at the tactical level. Each division has an aviation brigade made up of a mixture of attack and assault helicopters.

In practice, aviation is employed more in a fire support role than as a maneuver force. Small aviation elements (battalions and companies) are typically task organized to support ground maneuver brigades. This use of aviation amounts to 'penny-packeting' the assets, and dilutes combat power. The writings of Brigadier Simpkin and General von Senger, backed up by our own experience in Vietnam, indicate a much greater potential for rotary wing aviation forces.

Army aviation forces have the capability to perform air maneuver at the operational level. Aviation units have a significant mobility advantage over the other arms, and current attack helicopters can equal tanks in their ability to kill enemy weapon systems. They are much less affected by terrain and battlefield congestion than other combat forces. Their speed, agility and flexibility will enable them to set the tempo higher than any other force on the battlefield. While current aviation forces have limitations and vulnerabilities, technology and employment tactics have come a long way in overcoming them.

Simpkin and von Senger's airmechanized divisions offer potential for air maneuver at the operational level. This author does not accept the arguments of Simpkin and Major Darrell Crawford[139] about the utility of the heavy lift option. Adding armor protection to the helicopter would begin a process that might yield an aircraft that is too large and too expensive to deploy and operate. The idea of combining airmobile infantry and powerful attack helicopter elements in a division organization is an evolutionary

concept. It is not a big step to go from our current air assault and aviation organizations to the airmechanized division. And, as Crawford wrote, we do not have to wait for advanced aircraft to implement these ideas. None of the forces mentioned above offers more potential for mass air maneuver than the proposed AirLand Battle Future corps aviation structure.

The proposed corps aviation organization would allow the massing of a full brigade of attack helicopters at a time. This mass is required for the division to achieve the shock and destructive effect likely to be required to defeat the massive armor forces of a future mid- to high-intensity war. Addition of an air assault infantry brigade would give the organization a ground holding capability to complement its ability to dominate ground.

The air maneuver force should be developed on a division base, with sufficient assets to sustain itself in high tempo mass air maneuver operations. The new organization should give the commander the flexibility to employ the assets in support of ground maneuver when necessary. However, emphasis in both doctrine and structure should be on mass air maneuver. This requires a new way of thinking about aviation.

In the past the U.S. Army has emphasized consolidating its helicopters into larger organizations as a means of managing the assets. Under the concept this author is proposing, aviation elements should be divided into maneuver and combat support elements. The maneuver elements would include sufficient medium and utility (and heavy lift when

fielded) aircraft to sustain independent large air maneuver operations. Other corps units would draw aviation support from a corps combat support aviation battalion or brigade separate from the air maneuver division. The aviation commander would be a maneuver commander, not bothered by the responsibility to support other commanders at the same time as he is trying to employ his maneuver assets.

## V. IMPLICATIONS

**It is not big armies that win wars;**
**it is the good ones.**
**Maurice de Saxe[140]**

The major implication of this study is that the U.S. Army has a requirement for a highly mobile operational maneuver force. In its aviation elements, the Army has the potential for such a force. However, current doctrine does not emphasize the employment of aviation in mass to achieve operational results. The Army should take advantage of the upcoming doctrine and organizational structure revisions to develop and field an aviation force that is optimized for operational air maneuver.

While the immediate result of this organizational change should be a division sized force, it is not difficult to envision corps sized air maneuver forces consisting of air assault and air maneuver divisions being fielded in the next century. The LHX program, and its follow-on, will undoubtedly yield faster, more agile, and more powerful helicopters. These may more closely approximate von Sengers MBAV than the AH-64. However, we must not hold up the

fielding of the new organizations while we wait for a better machine.

The tenets of AirLand Battle provide a prescription for success on the future battlefield. Mr. James J. Schneider and Lieutenant Colonel Lawrence L. Izzo eloquently described the effect created by the operational artist's correct application of these tenets:

> The operational artist seeks to maneuver dispersed. He swarms to create a center of gravity faster than his opponent (*agility*). He creates this concentration of combat power at a decisive point and time (*synchronization*). After the blow is delivered he quickly disperses in preparation for the next encounter. His forces continue the maneuver of swarm-fight-disperse sequentially and simultaneously throughout the *depth* of the theater of operations. The cumulative victories of each encounter, governed by an overall strategic framework, serve to set the terms of the operations and so maintain the *initiative*.[141]

More than any other force on the battlefield, Army Aviation can provide the operational commander the agile, flexible, and responsive force required to create this effect. We must act today to develop the aviation force we will need tomorrow.

## ENDNOTES

1. Matthew Cooper, *The German Army 1933-45: Its Political and Military Failure,* (New York: Stein and Day, 1978), p. 130.

2. John L. Romjue, "From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982," TRADOC Historical Monograph Series. (Fort Monroe, VA: USA Training and Doctrine Command, 1984), p. 61.

3. Department of the Army Field Manual (FM) 100-5, *Operations,* (Washington, D.C.: GPO, 1986) p. 14. Hereafter cited as FM 100-5.

4. Ibid.

5. Ibid, p. 15.

6. Ibid.

7. Carl von Clausewitz, *On War,* ed. and trans. by Michael Howard and Peter Paret, (Princeton: Princeton Univ. Press, 1984), p. 541.

8. R. Ernest Dupuy and Trevor N. Dupuy, *The Encyclopedia of Military History from 3500 B.C. to the Present,* 2nd ed. rev. (New York: Harper & Row, 1986), pp. 39, 42-43. See also B. H. Liddell Hart, *Strategy,* 2nd ed. rev., (New York: Praeger Pubs., 1967), pp. 13-16.

9. See David G. Chandler, *The Campaigns of Napoleon.* New York: Macmillan, 1966., p. 153.

10. FM 100-5, p. 10.

11. General Dr. Ferdinand. M. von Senger und Etterlin, "New Operational Dimensions: A lecture given at the RUSI on 2 February 1983," *RUSI,* 128 (2 Jun 1983) 2, p. 21. Cited as von Senger.

12. von Senger, pp. 11-15.

von Senger, "The Air-Mobile Divisions: Operational Reserves for NATO," *RUSI,* 132 (Mar 87) 1, pp. 23-30 (Based on notes collected after von Senger's death). Cited as von Senger, "Air-Mobile Divisions."

Brigadier Richard E. Simpkin, 'Airmechanized Forces for the '90s,' *Armor*, XC (Jul-Aug 1981) 4, pp. 54-57. Cited as Simpkin, 'Airmechanized Forces.'

_____, 'Flying Tanks? - A Tactical - Technical Analysis of the 'Main Battle Air Vehicle' Concept,' *Military Technology*, VIII (Aug 84) 8, pp. 62-82. Cited as Simpkin, 'Flying Tanks?'

_____, *Antitank: An Airmechanized Response to Armored Threats in the 90s.* Oxford: Brassey's Pub. Ltd., 1982. Cited as Simpkin, *Antitank.*

_____, *Race to the Swift: Thoughts on Twenty-First Century Warfare.* London: Brassey's Def. Pub., 1985. Cited as Simpkin, *Race.*

13. Their assessments of the difficulty of moving a heavy maneuver force were reinforced by a study conducted by a group of senior U.S. Army officers at the Advanced Operational Studies Fellowship (AOSF) at Fort Leavenworth, Kansas in 1989. The study determined that strategic and operational movement of a heavy U.S. corps in Europe would be difficult or impossible. See Colonel Ronald E. Curry, et al., 'Operational Maneuver in Europe: A Case Study,' Study conducted by Advanced Operational Studies Fellowship, School of Advanced Military Studies, U.S. Army Command and General Staff College, Fort Leavenworth, KS, (28 Feb 1989), pp. 2-4, A-1-1 to A-1-2. See also Colonel Richard H. Sinnreich, 'White Paper: Employment of Combat Aviation,' unpublished, 1986. Cited in SAMS Course 2 Readings, AY 89/90, pp. 89-91.

14. von Senger, p. 15.

15. FM 100-5, pp. 42-43.

16. Sun Tzu, *The Art of War*, trans. by Samuel B. Griffith, (New York: Oxford University Press, 1963), p. 134.

17. Major General Heinz Guderian, 'Armored Forces,' *The Infantry Journal Reader*, 44 (Sep-Oct & Nov-Dec 1937) 5, p. 235. Cited in CGSC Reprint.

18. Major General James M. Gavin, 'Cavalry, and I Don't Mean Horses,' *Harper's Magazine*, 208 (April 1954) 1247, p. 56.

19. Robert Debs Heinl, Jr., *Dictionary of Military and Naval Quotations*, (Annapolis, MD: U.S. Naval Inst., 1966), p. 63. The maxim is often attributed to von Clausewitz, but actually reflects the idea developed by Marshal de Broglie in the mid 1700's. Napoleon was the first to fully

implement the idea. See Brigadier General T. R. Phillips, ed., "Military Maxims of Napoleon," *Roots of Strategy: The 5 Greatest Military Classics of All Time* (Harrisburg, PA: Stackpole Books, 1985), p. 403. See also: Chandler, *The Campaigns of Napoleon.* New York: Macmillan, 1966., p. 153; Clausewitz, pp. 314-315; and F. O. Miksche, *Attack: A Study of Blitzkrieg Tactics,* trans. by Tom Wintringham, (New York: Random House, 1942), p. 19 (cited in U.S. Army Command and General Staff College reprint for Course P118, 1988-89).

20. Chandler, p. 351.

21. Ibid.

22. Gavin, p. 57.

23. Stephen Z. Starr, *The Union Cavalry in the Civil War,* (Baton Rouge: Louisiana State Univ. Press, 1979), p. 30. Emphasis added.

24. James J. Schneider, "The Loose Marble - And the Origins of Operational Art," *Parameters,* (Mar 89), p. 93.

25. Liddell Hart, *Strategy,* pp. 124-5.

26. Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton,* (Cambridge: Cambridge University Press, 1977), p. 232. Cited as van Creveld, *Supplying War.* The author identifies three periods of logistic history in modern times based on the means of supplying the armies. They are: the age of standing armies, the 'predatory' warfare of the Napoleonic era, and the current period where armies are supplied from a base with a system of continuous supply. While his argument is sound, he errs in identifying the beginning of the third era as 1870-1, and in omitting the American Civil War from his discussions.

27. Liddell Hart, *Strategy,* p. 125.

28. Ibid, p. 156.

29. Dupuy and Dupuy, p. 916.

30. Ibid.

31. Dr. Jacob W. Kipp, "Mass, Mobility, and the Red Army's Road to Operational Art, 1918-1936," Unpublished Paper from The Soviet Army Studies Office (SASO), U.S. Army Combined Arms Center (USACAC), Fort Leavenworth, KS, 1988, pp. 8-9.

32. Ibid, p. 9.

33. Ibid, p. 13.

34. Ibid, p. 13.

35. Ibid, pp. 12-14.

36. van Creveld, *Technology*, p. 178.

37. Quoted in von Senger, p. 11.

38. Kipp, p. 20.

39. Ibid, 24.

40. Ibid.

41. Ibid.

42. Cooper, p. 135.

43. J.F.C. Fuller, *Decisive Battles of the Western World*, (London: Eyre & Spottiswoode, 1956), p. 381-2. Cited in Cooper, *The German Army*, p. 135.

44. Cooper, p. 135.

45. Ibid.

46. B. H. Liddell Hart, *History of The Second World War*, (New York: G.P. Putnam's Sons, 1970), p. 22.

47. Ibid.

48. Ibid, p. 66.

49. Liddell Hart Papers, Letter from Liddell Hart to Guderian, dated 7 Oct. 1948. Cited in Cooper, *The German Army*, p. 115.

50. Colonel David M. Glantz, "DEEP ATTACK: The Soviet Conduct of Operational Maneuver," Unpublished study by SASO, USACAC, Fort Leavenworth, KS, April 1987, p. 37.

51. Ibid.

52. Ibid, pp. 37-41. Quote is from p. 41.

53. Ibid, p. 41.

54. Ibid.

55. Ibid, pp. 44-45.

56. Ibid, p. 45.

57. Patton and many of his officer's were former cavalry officers, and "were thoroughly imbued with the cavalry traditions of speed and audacity" (Hugh M. Cole, *The Lorrain Campaign,* from U.S. Army in World War II: The European Theater of Operations series, (Washington, D.C.: GPO, 1950), p. 13.).

58. Contrary to the popular notion, Patton's Third Army was not heavy in armor forces. Third Army consisted of three corps on 5 September 1944. The VIII Corps was in Brittany. The two corps that were on the front included only two armor divisions and five separate tank battalions. This gave Patton a total of 669 medium tanks.

59. Cole, pp. 12-13.

60. Van Creveld, p. 220.

61. John R. Galvin, *Air Assault: The Development of Airmobile Warfare,* (New York: Hawthorne Books, Inc., 1969), pp. 1-6.

62. Ibid, pp. 137-151 & 162-190.

63. Ibid, p. 249.

64. Sometimes referred to as *pivots of maneuver.* See James J. Schneider, "The Theory of Operational Art," SAMS Theoretical Paper No. 3, COMPS Exam Special, Fort Leavenworth, KS: SAMS, Mar 88, pp. 37-39. See also Henri-Antoine Jomini, *The Art of War,* trans. by G. H. Mendel and W. P. Craighill (Westport, CT: Greenwood Press, 1862, reprint 1977), pp. 88-90.

65. Ibid, pp. 262-264.

66. Gavin, p. 60.

67. Lieutenant General John J. Tolson, *Airmobility: 1961-1971,* (Vietnam Studies), (Washington, D.C.: GPO, 1973), pp. 3-5, 6, 10-15.

68. Ibid, pp. 22-24.

69. Ibid.

70. Ibid, p. 24.

71. Ibid.

72. Galvin, p. 287.

73. Shelby L. Stanton, "Air Cavalry & Airmobility: Lessons Learned or Lost," *Military Review*, LXIX (Jan 1989) 1, p. 80.

74. Tolson, pp. 102-104. The 1st Aviation Brigade, a division sized organization, provided aviation support to the non-airmobile U.S. and Vietnamese units in Vietnam through most of the war.

75. Ibid, pp. 209-213.

76. Stanton, pp. 81-85. Neither the 101st or 23rd Divisions ever achieved full airmobile status due to shortages of aircraft, and from 1969 to their departure from Vietnam performed essentially area security missions. "The mobility and shock action that typified wide-ranging 1st Cavalry Division operations were not required" as U.S. forces assumed an increasingly defensive posture in the war.

77. Tolson, pp. 257-258.

78. See Romjue, pp. 6-7, and General William E. Dupuy, "Implications of the Middle East War on U.S. Army Tactics, Doctrine and Systems," undated briefing by then TRADOC commander on lessons from Yom Kippur War (on file in Combined Arms Center Library). The conclusion of most doctrine writers was that the airmobile division could not survive on a mid- to high-intensity battlefield. The lessons from Vietnam indicate that critics over estimate the vulnerability to ground-to-air fire. See Tolson, p. 257.

79. Stanton, p. 85.

80. Vasiliy Gerasimovich Reznichenko, Ivan Nikolayevich Vorobyev, and Nikolay Fedorovich Miroshnichenko, *Taktika*, trans. by Joint Publications Research Service (JPRS), (Moscow: 1987), p. 23.

81. Ibid, p. 21.

82. Ibid, p. 23.

83. Ibid, p. 57.

84. Ibid.

85. Ibid, pp. 62-67.

86. Ibid, pp. 71-74.

87. First Lieutenant Henry H. Arnold, "Air Craft and War," *Infantry Journal*, X (Sep-Oct 1913) 2, p. 229.

88. See Major Carlton L. Hood, "Determining the Optimum Aviation Organization for the Operational Level of War," USACGSC Masters Thesis. Fort Leavenworth, KS: USACGSC, 1984, pp. 39-49, for a discussion of the various studies and decisions leading to the present aviation brigade structure. The most significant of these was the Aviation Requirements for the Combat Structure of the Army III (ARCSA III), Fort Monroe, VA: U.S. Army Training and Doctrine Command, 31 Oct 1976. Overall document classification is Secret.

89. FM 1-100, p. 2-12.

90. Sinnreich, p. 92.

91. The U. S. Army uses a variety of helicopters to accomplish its combat missions. The primary attack helicopters are the AH-1S Cobra and the AH-64 Apache. The primary troop lift aircraft are the UH-60 Blackhawk and the CH-47D Chinook. Appendix A gives the characteristics and capabilities of these helicopters. The Army uses the UH-1H for command and control and the OH-58C/D for scout and observer duties.

92. *The Air Assault Division and Brigade Operations Manual*, 101st Airborne Division (AIR ASSAULT), Fort Campbell, Kentucky, (Aug 88), p. 1-4.

93. Ibid, p. 1-11.

94. Ibid.

95. Ibid, p. 1-10.

96. Ibid, p. 1-12.

97. Ibid, p. 1-12.

98. The division has sufficient organic medium lift capability to supply he aviation brigade. There is little lift capacity remaining for the rest of the division. See FM 101-10-1/2, *Staff Officers' Field Manual: Organizational, Technical, and Logistical Data Planning Factors (Vol 2)*, (Washington, D.C.: GPO, Oct 1987), pp. 2-79 & 2-131 - 2-132. Also see appendix A for helicopter lift capabilities.

99. Ibid, pp. 1-12 to 1-13.

100. Hood, p. 47.

101. FM 1-100, p. 2-9.

102. FM 1-111 (draft), p. 1-7.

103. Ibid.

104. Ibid, p. 3-3.

105. Ibid, p. 3-4.

106. Ibid, p. 1-12.

107. Ibid, p. 1-13.

108 Ibid, p. 1-14.

109. Viktor Suvorov, *Inside the Soviet Army*, (New York: Berkley Books, 1984), p. 224.

110. Ibid.

111. Department of the Army (DA) Field Manual (FM) 100-2-3, *The Soviet Army: Troops, Organization, and Equipment*, (Washington, D.C.: GPO, 1986), p. 4-106.

112. Ibid, pp. 4-123 to 4-125 & 4-131 to 4-132.

113. Major Robert E. Bort, "Air Assault Brigades: New Element in the Soviet *Desant* Force Structure," *Military Review*, LXIII (Oct 1983) 10, pp. 23-25.

114. Ibid, p. 36.

115. Simpkin, "Airmechanized Force," p. 57.

116. Simpkin, "Flying Tanks?" p. 78.

117. Simpkin, *ANTITANK*, p. 273.

118. Ibid, p. 272.

119. Simpkin, "Flying Tanks?" p. 82.

120. Ibid, p. 82.

121. Simpkin, *Race to the Swift*, p. 127.

122. Von Senger's MBAV would have a maximum speed of 300 KM per hour (AH-64 - 290 KPH), a cruising range of 600 KM (AH-64 - 508), a payload of 2 tons (AH-64 - 4090 lbs.). Source for MBAV, von Senger, "New Operational Dimensions," p. 12. Comparison copied from Major Darrell E. Crawford,

'Airmechanization: Determining its Tactical Viability on the Airland Battlefield,' SAMS Monograph, (Fort Leavenworth, KS: USACGSC, 1989), p. 3.

123. Von Senger, 'New Operational Dimensions,' p. 13.

124. Ibid, p. 15.

125. Ibid, p. 13.

126. von Senger, 'The Air-Mobile Divisions,' p. 27.

127. Von Senger, p. 13.

128. Major Darrell E. Crawford, 'Airmechanization: Determining its Tactical Viability on the Airland Battlefield,' SAMS Monograph, (Fort Leavenworth, KS: USACGSC, 1989), p. 32.

129. Ibid, p. 14.

130. 'AirLand Battle Future White Paper Draft,' Unpublished study, Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity (USACACDA), 5 Feb 1990, p. I-1. Further citations as ALBF.

131. Ibid, p. III-1.

132. Ibid, p. II-1.

133. Ibid, pp. III-1 to III-9.

134. Ibid, p. III-11.

135. Light Helicopter Experimental. Currently in design stage and not expected to go into production until the mid 1990s. See Jim Martin, 'LHX: The Army's High-Tech War Bird,' *Defense Science*, 8 (May 1983) 4, pp. 48-52.

136. Ibid, p. III-11.

137. Ibid, pp. 1-14 to 1-15.

138. Clausewitz, p. 542.

139. See Crawford, pp. 32-33.

140. Quoted in Heinl, p. 287.

141. James J. Schneider and Lawrence L. Izzo, 'Clausewitz's Elusive Center of Gravity,' *Parameters*, XVII (Sep 1987) 9, p. 57.

# APPENDIX A. AIRCRAFT CAPABILITIES

| Type Aircraft | Weapon Systems[1] | Maximum Number of Rounds | Maximum Effective Range (meters) | Endurance (hrs:min) | Maximum External Load (pounds) | Average Speed[2] (knots) |
|---|---|---|---|---|---|---|
| AH-1S | 20-mm Cannon M197 (Vulcan) | 950 | 1,500 | 2:00 | 1,380 | 120 |
| | 2.75-in Rocket | 38 (Two rocket pods of 19 each) or 14 (Two pods of 7 each) | 5,200 | | | |
| | TOW | 8 | 3,750 | | | |
| AH-64 | 30-mm Chain Gun | 1,200 | 3,000 | 1:45 | 6,200 | 140 |
| | 2.75-in Rocket | 76 (Four rocket pods of 19 each) | 5,200 | | | |
| | Hellfire Missile | 16 | 6,000 | | | |

[1]Can be armed with any system or combination, if maximum rounds are reduced.
[2]Low-level flight for planning route to and from deep attack target. Nap of the earth flight speed averages 35 knots (65 KMPH).

## CHARACTERISTICS OF U.S. ATTACK HELICOPTERS

U.S. Army Command & General Staff College (USACGSC) Student Text ST 100-3, *Battle Book: Center for Army Tactics*, Fort Leavenworth, KS: USACGSC, 1988, p. 3-9.

| Type aircraft | Max range (NM) | Cruise speed (knots) | Endurance (hours) | Normal payload (lbs) |
|---|---|---|---|---|
| UH-60 | 326 | 145 | 2.25 | 3,360 |
| CH-47D | 387 | 140 | 2.5 | 20,206 |

## CHARACTERISTICS OF U.S. UTILITY/ MEDIUM LIFT HELICOPTERS

Ibid, p. 3-10.

## APPENDIX B. AVIATION ORGANIZATION CHARTS

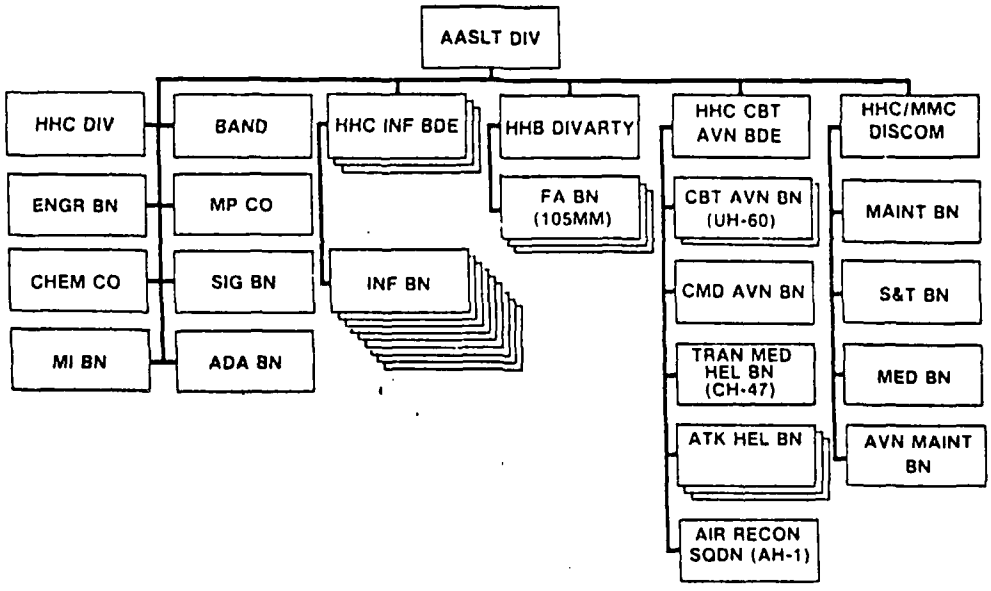



**FIGURE 1. THE AIR ASSAULT DIVISION**
**Source:** *The Air Assault Div. and Bde. Operations Manual.* FT. Campbell, KY: 101st Abn Div (AIR ASSAULT), Aug 1988, p. 1-11 (Fig. 1-2).

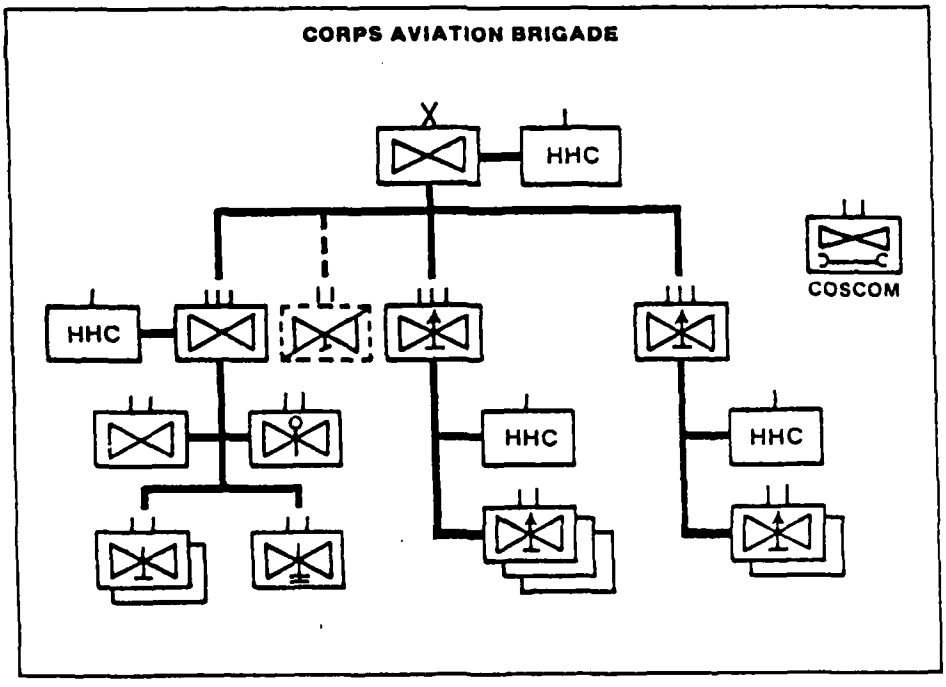



FIGURE 2. CORPS AVIATION BRIGADE
Source: FM 1-100, page 2-10.

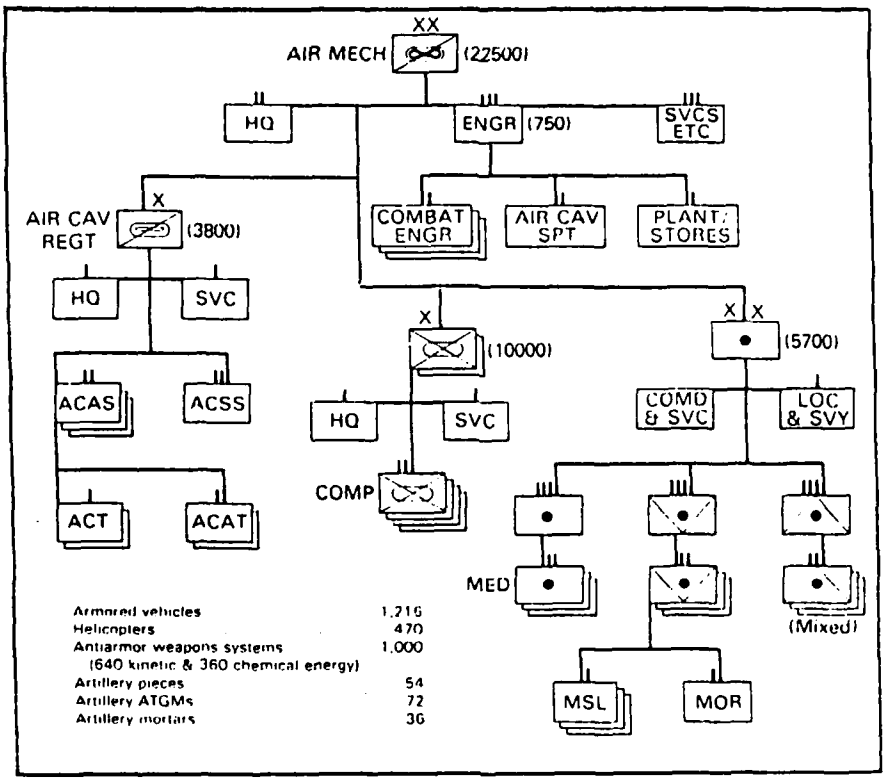
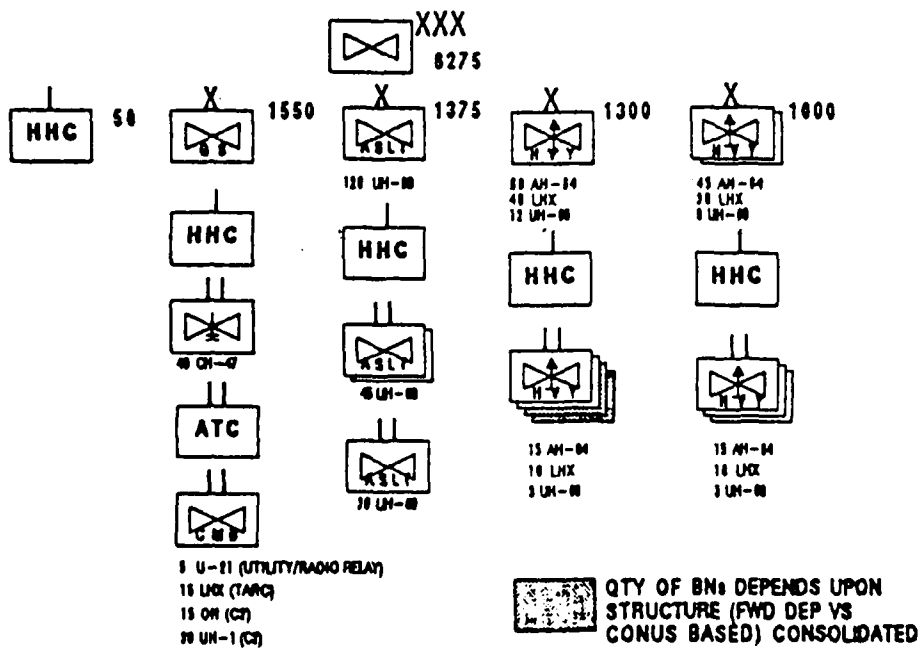


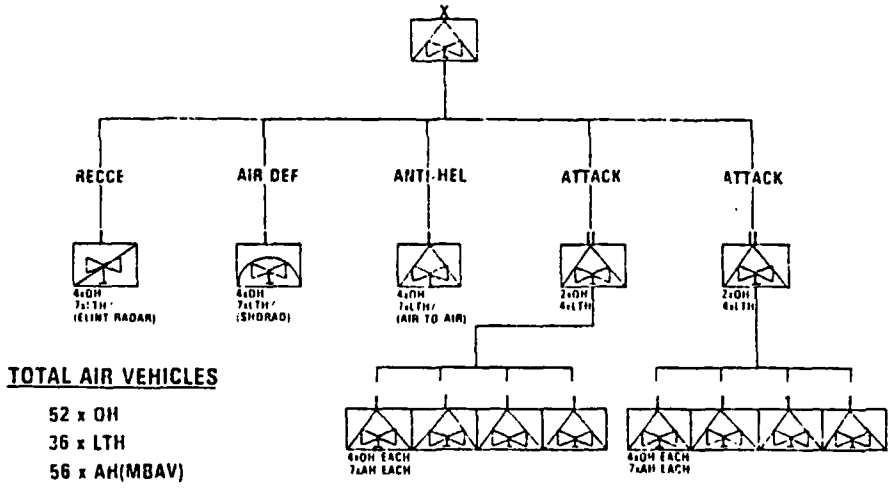

**FIGURE 3. BRIGADIER SIMPKIN'S AIRMECHANIZED DIVISION**
Source: Simpkin, 'Airmechanized Forces,' p. 56.




*NOTE: OH-58D MAY REPLACE LHX DUE TO FUTURE FUNDING UNCERTAINTY*

**FIGURE 4. AIRLAND BATTLE FUTURE AVIATION ORGANIZATION**
Source: ALBF, p. VI-32.

## BASIC AIRMECHANIZED BRIGADE
### (WITHOUT SERVICE SUPPORT ELEMENTS)

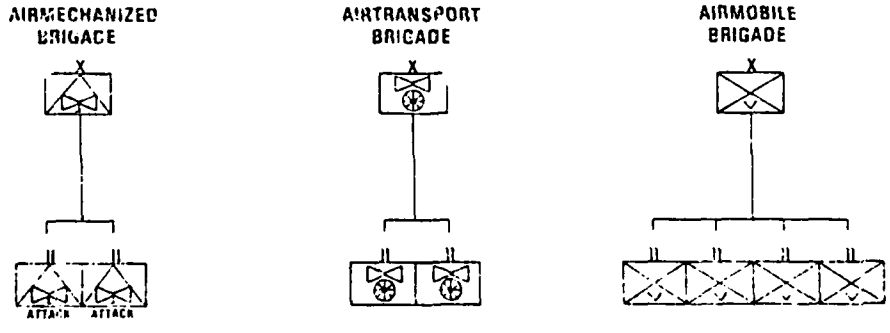



**TOTAL AIR VEHICLES**

52 x OH
36 x LTH
56 x AH(MBAV)

(The symbols do not necessarily conform to any standardised NATO or nationally agreed system)

## BASIC AIRMECHANIZED DIVISION




(28 MBAV EACH) ~ (60 TRANSPORT HELICOPTERS)

(The symbols do not necessarily conform to any standardised NATO or nationally agreed system)

**FIGURE 5. VON SENGER'S AIRMECHANIZED FORCE**
**Source: Von Senger, p. 14.**

## BIBLIOGRAPHY

### BOOKS


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

Chandler, David G., *The Campaigns of Napoleon.* New York: Macmillan, 1966.

Cole, Hugh M., *The Ardennes: Battle of the Bulge.* U.S. Army in World War II: The European Theater of Operations series. Washington, D.C.: GPO, 1950.

_____, *The Lorraine Campaign.* U.S. Army in World War II: The European Theater of Operations series. Washington, D.C.: GPO, 1950.

Cooper, Matthew, *The German Army 1933-45: Its Political and Military Failure.* New YorK: Stein and Day, 1978.

Dupuy, R. Ernest & Dupuy, Trevor N., *The Encyclopedia of Military History from 3500 B.C. to the Present*, 2nd ed. rev. New York: Harper & Row, 1986.

Eisenhower, David, *Eisenhower: At War 1943-1945.* New York: Vintage Books, 1987.

Fuller, J.F.C., *Decisive Battles of the Western World*, 3 Vols. London: Eyre and Spottiswoode, 1956. Cited in Cooper, *German Army.*

Galvin, John R., *Air Assault: The Development of Airmobile Warfare.* New York: Hawthorne Books, Inc., 1969.

Heinl, Robert Debs, *Dictionary of Military and Naval Quotations.* Annapolis, MD: U.S. Naval Inst., 1966.

Isby, David C. & Kamps, Charles, Jr., *Armies of NATO's Central Front.* London: Jane's Publishing Co., Ltd., 1985.

Jomini, Henri-Antoine, *The Art of War*, trans. by G. H. Mendel and W. P. Craighill (Westport, CT: Greenwood Press, 1862, reprint 1977), pp. 88-90.

Krepinevich, Andrew F., Jr., *The Army and Vietnam.* Baltimore: Johns Hopkins Univ. Press, 1986.

Liddell Hart, B. H., *History of The Second World War.* New York: G. P. Putnam's Sons, 1970.

Liddell Hart, B. H., *Strategy.* New York: Praeger Pubs., 1967.

Miksche, F. O., *Attack: A Study of Blitzkrieg Tactics*, trans. by Tom Wintringham. New York: Random House, 1942. Cited in USACGSC Course P118 Reprint, AY 88/89.

Phillips, Brigadier General T. R., ed., "Military Maxims of Napoleon," *Roots of Strategy: The 5 Greatest Military Classics of All Time.* Harrisburg, PA: Stackpole Books, 1985.

Reznichenko, Vasiliy Gerashimovich, Vorobyev Ivan Nikolayevich & Miroshnichenko, Nikolay Fedorovich, *Tactics,* 2nd ed., trans. by Joint Publications Research Service. Washington, D.C.: GPO, 1987.

Savkin, Vasiliey Yefisanich, *The Basic Principles of Operational Art and Tactics: A Soviet View,* trans. and published under the auspices of the USAF. Washington, D.C.: GPO, 1972.

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

_____, *Race to the Swift: Thoughts on Twenty-First Century Warfare.* London: Brassey's Def. Pub., 1985.

Starr, Stephen Z., *The Union Cavalry in the Civil War.* Baton Rouge: Louisiana State Univ. Press, 1979.

Sun Tzu, *The Art of War,* trans. by Samuel B. Griffith. New York: Oxford Univ., 1963.

Suvorov, Viktor, *Inside the Soviet Army.* New York: Berkley Pub. Gp., 1984.

Tolson, Lieutenant General John J., *Airmobility 1961-1971.* Vietnam Studies, Washington, D.C.: GPO, 1973.

Tukhachevskiy, Mikhail, *New Problems in Warfare.* Originally published in Moscow in 1931, updated in 1962. Extract cited here was published by U.S. Army War College Art of War Colloquium, Carlisle Barracks, PA, 1 Nov 83.

von Clausewitz, Carl, *On War,* ed. and trans. by Michael Howard and Peter Paret. Princeton: Princeton Univ. Press, 1984.

van Creveld, Martin, *Supplying War: Logistics from Wallenstein to Patton.* Cambridge: Cambridge Univ. Press, 1977.

Vouno, General Carl E., *The United States Army: A Strategic Force for the 1990s and Beyond.* Washington, D.C.: Department of the Army, January 1990.

**PERIODICALS**

Arnold, First Lieut. Henry H., "Air Craft and War," *Infantry Journal,* X (Sep-Oct 1913) 2, pp. 224-229.

Bort, Major Robert E., "Air Assault Brigades: New Element in the Soviet *Desant* Force Structure," *Military Review*, LXIII (Oct 1983) 10, pp. 21-38.

Curtis, Ian, "Helicopters: New or Old, How Do You Use Them?" *Defense and Foriegn Affairs*, XVII (Feb 89) 2, pp. 23-31.

Donnelly, C. N., "The Soviet Helicopter on the Battlefield," *International Defense Review*, 17 (May 84) 5, pp. 559-566.

Franz, Wallace P., "Grand Tactics," *Military Review*, LXI (Dec 81) 12, pp. 32-39.

Fuller, Colonel J.F.C., "Tactics and Mechanization," *Infantry Journal*, XXX (May 1927) 5, pp. 457-465.

Gavin, Lieutenant General James, "Cavalry - And I Don't Mean Horses," *Harper's Magazine*, 208 (Apr 1954) 1247, pp. 54-67.

Glanz, Colonel David M., "Soviet Operational Maneuver in a Period of Reform," *Military Review*, LXIX (Dec 89) 12, pp. 31-43.

Gouré, David, "A New Soviet National Security Policy for the 21st Century," *Strategic Review*, XVII (Fall 1989) 4, PP. 35-46.

Guderian, Colonel Heinz, "Armored Forces," *The Infantry Journal Reader*, 44 (Sep-Oct 1937) 5, pp. 418-21, and (Nov-Dec 1937) 6, pp. 522-28. Cited in USACGSC Reprint for Course P613 (1989), pp. 238-254.

"Helicopters Add a New Dimension . . . AIR ASSAULT," *Defense Update International*, (Aug 1984) 51, pp. 26-38.

Holder, LTC L. D., "Maneuver in the Deep Battle," *Military Review*, LXII (May 1982) 5, pp. 54-61.

Lind, William S., "Some Doctrinal Questions for the United States Army," *Military Review*, LXVII (March 1977) 3, pp. 54-65.

Luttwak, Edward H., "The Operational Level of War," *International Security*, 5 (Winter 80/81) 3, pp. 61-79.

_____, "The American Style of Warfare and Military Balance," *Survival*, (Jan/Feb 1979), pp. 57-60.

Martin, Jim, "LHX: The Army's High-Tech War Bird," *Defense Science*, 8 (May 1983) 4, pp. 48-52.

McClellan, Captain Thomas L., "Operation Bumblebee: How the U.S. Marine Corps Developed Airmobile Tactics During

the Korean War," *U.S. Army Aviation Digest*, (Jun 1988), pp. 38-44.

Pfaltzgraff, Robert L., Jr., "The Army as a Strategic Force in the 90s and Beyond," *Army*, 40 (Feb 1990) 2, pp. 20-26.

Saint, Lieutenant General Crosbie E. & Yates, Colonel Walter H., Jr., "Attack Helicopter Operations in the AirLand Battle: Close Operations," *Military Review*, LXVIII (Jun 1988) 6, pp. 2-15.

_____, "Attack Helicopter Operations in the AirLand Battle: Deep Operations," *Military Review*, LXVIII (Jul 1988) 7, pp. 2-9.

_____, "Attack Helicopter Operations in the AirLand Battle: Rear Operations," *Military Review*, LXVIII (Oct 1988) 10, pp. 2-10.

Schneider, James J., "The Loose Marble - And the Origins of Operational Art," *Parameters*, (Mar 89), pp. 85-99.

Schneider, James J., and Izzo, Lawrence L., "Clausewitz's Elusive Center of Gravity," *Parameters*, XVII (Sep 1987) 9, pp. 46-57.

von Senger und Etterlin, General Dr. F. M., "New Operational Dimensions: A lecture given at the RUSI on 2 February 1983," *RUSI*, 128 (2 Jun 1983) 2, pp. 11-15.

_____, "The Air-Mobile Divisions: Operational Reserves for NATO," *RUSI*, 132 (Mar 87) 1, pp. 23-30 (Based on notes collected after von Senger's death).

Simpkin, Brigadier Richard E., "Airmechanized Forces for the '90s," *Armor*, XC (Jul-Aug 1981) 4, pp. 54-57.

_____, "Flying Tanks? - A Tactical - Technical Analysis of the 'Main Battle Air Vehicle' Concept," *Military Technology*, VIII (Aug 84) 8, pp. 62-82.

Stanton, Shelby L., "Air Cavalry & Airmobility: Lessons Learned or Lost," *Military Review*, LXIX (Jan 1989) 1, pp. 74-86.

Turbiville, Dr. Graham H., Jr., "Soviet Airborne Operations in a Theater of War," *Foriegn Policy*, XIII (Jan-Feb 1986) 1-2, pp. 160-183. Cites V.F. Margelov, "Development of the Theory of Employment of Airborne Troops in the Postwar Period," *Voenno - Istoricheskil zhurnal* (Jan 1977): 54.

## MANUSCRIPTS AND MONOGRAPHS

"AirLand Battle Future White Paper," Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 5 Feb 1990.

Aviation Requirements for the Combat Structure of the Army III (ARCSA III), Fort Monroe, VA: U.S. Army Training and Doctrine Command, 31 Oct 1976. Overall document classification is Secret.

Crawford, Darrell E., "Airmechanization: Determining Its Tactical Validity on the AirLand Battlefield," School of Advanced Military Studies (SAMS) Monograph. Fort Leavenworth, KS: U.S. Army Command & General Staff College (USACGSC), 1989.

Curry, Colonel Robert E., et al., "Operational Maneuver in Europe: A Case Study." Study conducted by the Advanced Operational Studies Fellowship, SAMS, Fort Leavenworth, KS: USACGSC, Feb 1989.

DePuy, General William E., "Implications of the Middle East War on U.S. Army Tactics, Doctrine, and Systems." Undated briefing on subject (CARL).

Franz, Colonel Wallace P., "Intellectual Preparation for War," U.S. Army War College (USAWC) Art of War Colloquium Vol. I, Carlisle Barracks, PA: USAWC, Jun 1983.

Franz, Wallace P., "Large-Unit Maneuver, or Operations Above Division," Unpublished Manuscript. Undated.

Franz, Colonel Wallace P., "The Character of Modern War: Theory-Doctrine-Practice at the Operational Level." An occasional paper for the Strategic Studies Institute, USAWC, Carlisle Barracks, PA: USAWC, 15 Dec 1981.

Glantz, Colonel David M., "DEEP ATTACK: The Soviet Conduct of Operational Maneuver," Unpublished study by Soviet Army Studies Office (SASO), U.S. Army Combined Arms Center (USACAC), Fort Leavenworth, KS, April 1987.

Hood, Major Carlton L., "Determining the Optimum Aviation Organization for the Operational Level of War," Masters Thesis. Fort Leavenworth, KS: USACGSC, 1984.

Kipp, Dr. Jacob w., "Mass, Mobility, and the Red Army's Road to Operational Art, 1918-1936," Unpublished SASO study, Fort Leavenworth, KS: USACAC, 1988.

_____, "The Development of Soviet 'Tactical' Aviation in the Postwar Period," Unpublished SASO study, Fort Leavenworth, KS: USACAC, 1988.

Liddell Hart, B. H., "Liddell Hart Papers." Cited in Cooper, *The German Army*.

Matheny, Major Michael R., "The Development of the Theory and Doctrine of Operational Art in the American Army, 1920-1940," SAMS Monograph. Fort Leavenworth, KS: USACGSC, 1988.

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

Romjue, John L., "From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982," U.S. Army Training and Doctrine Command (TRADOC) Historical Monograph Series. Fort Monroe, VA: TRADOC, 1984.

Schneider, James J., "The Theory of Operational Art," SAMS Theoretical Paper No. 3, COMPS Exam Special, Fort Leavenworth, KS: SAMS, Mar 1988.

Sinnreich, Colonel Richard H., "White Paper: Employment of Combat Aviation," Unpublished, 1986. Cited in SAMS Course 2 Readings, AY 89/90, pp. 89-105.

"The Principles of Strategy for Independent Corps or Army in a Theater of Operations," U.S. Army Command and General Staff School (USACGSS) text, 1935-36. Fort Leavenworth, KS: USACGSS Press, 1936. Republished by USAWC Art of War Colloquium, and cited in AMSP Course 1 Readings for AY 89/90.

Wass de Czega, Colonel Huba, "Toward a New American Approach to Warfare," USAWC Art of War Colloquium Vol. II, Carlisle Barracks, PA: Sep 1983.

## GOVERNMENT PUBLICATIONS

Department of the Army (DA) Field Manual (FM) 1-100, *Doctrinal Principles for Army Aviation in Combat Operations*. Washington, D.C.: GPO, Feb 1989.

DA FM 1-111, *Aviation Brigades*, (Coordinating Draft). Fort Rucker, AL: U.S. Army Aviation Center, Nov 1988.

DA FM 90-4, *Air Assault Operations*. Washington, D.C.: GPO, 1987.

DA FM 100-2-3, *The Soviet Army: Troops, Organization and Equipment*. Washington, D.C.: GPO, 1984.

DA FM 100-5, *Operations*. Washington, D.C.: GPO, 1986.

FM 101-10-1/2, *Staff Officers' Field Manual: Organizational, Technical, and Logistical Data Planning Factors (Vol 2)*. Washington, D.C.: GPO, Oct 1987.

*The Air Assault Division and Brigade Operations Manual*. Fort Campbell, KY: 101st Abn Div (AIR ASSAULT), Aug 1988.

USACGSC Special Text (ST) 100-3, *Battle Book: Center for Army Tactics*. Fort Leavenworth, KS: USACGSC, 1988.