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Air Mech Strike: Revolution in Maneuver Warfare

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The author proposes a revolutionary maneuver warfare concept he calls Air Mech Strike, which would use rotary-wing aircraft to project a combined arms force. He speculates that Air Mech Strike will maneuver at significantly greater speed, increasing air assault agility and lethality through improved situational awareness enhanced by battlefield digitization and information technology. His article further discusses how helicopter technology has greatly improved the AH-64A Apache, the AH-64D Longbow Apache and the "next-generation" RAH-66 Comanche. This article is a "quick read" worthy of consideration by force planners and developers alike.

Air Mech Strike is a revolutionary maneuver warfare concept that displaces the current heavy-mechanized doctrine as the dominant land combat form for the next century. The concept uses rotary-wing aircraft to project a combined arms force that maneuvers at significantly greater speed and depth than current heavy-armored formations. It solves the limitations in ground mobility, protection and firepower of current light-force designs and maximizes the benefits of the digitized battlefield and precision weapon advances. The Air Mech Strike design gives a theater-wide force the air assault agility and lethality to destroy heavy armor and retain a substantial mechanized combat capability. This concept heralds the end of the land battleship-heavy-tank doctrine-fully integrating air and ground maneuver.

50 Years of Maneuver Warfare

Heavy mechanized warfare has dominated land combat for more than 50 years. While of great concern, guerrilla or insurgency warfare has not affected the overall balance of military power to the extent that armored warfare has. Since the Germans introduced it in World War II, mechanized warfare has remained the primary influence in land force structures in most armies. Although nations have developed airborne, air assault and light infantry forces, these forces have largely remained subordinate to mechanized warfare. Light organizations often use aircraft to gain positional advantage; however, they generally lack the ground mobility, protection and firepower to compete in direct-fire confrontations with heavy armor. Thus, they are primarily used as early-entry forces or against a nonmechanized enemy in rough terrain. History has abundant examples of light airborne forces suffering badly in direct operations against heavy armor, as the British and Polish airborne units did in Operation `Market Garden` during World War II.1

Armies have attempted to build light armored vehicles that can be transported by air and address the mobility, protection and firepower deficiencies of air-inserted forces. The best examples are the Russian BMD airborne combat vehicle and the German Wiesel light-armored vehicle, both capable of being paradropped and transported by helicopter-the BMD via the massive Mi-6 and Mi-26 aircraft. While these lightweight vehicles have remarkable capabilities, they are no match for heavy armor in a direct-fire engagement.2 An armored vehicle and aircraft combination usually consists of many light vehicles of limited capability moved by large helicopters or a few heavy vehicles of significant capability moved by enormous cargo aircraft to prepared landing areas.

Mechanized warfare enjoyed great success when first introduced against the slower infantry foot soldier. The early German victories with this Blitzkrieg warfare resulted from applying a new maneuver doctrine rather than simply introducing tanks on the battlefield. Many Allies had better tanks than the Germans but suffered early defeats, partly because they viewed tanks and artillery as supporting the infantry. To achieve a combined arms force with mechanized speed, the Germans modified the roles of infantry and artillery to support the tank's advance.3 The Air Mech Strike concept takes a similar approach by modifying the traditional roles of ground maneuver and artillery to achieve a combined arms force that supports the advance of rotary-wing aircraft.

Modes of Maneuver

Today, there are three basic maneuver warfare modes: dismounted, mechanized and air assault. Each has an optimal operating time and space factor. Combat commanders all seek to move as fast as possible on the battlefield to gain and then exploit positional advantage over the enemy. However, the price of increasing speed is a corresponding reduction in close-combat capability. Tanks move much faster than foot infantry but are vulnerable in forest, mountain or urban terrain. Helicopters move much faster than armor but are ill-suited to duel with dug-in tanks. Ideally, a force structure should avoid committing to combat out of mode. Light infantry should not be used to quickly cover tens of kilometers in open terrain; tanks should not be fought in dense cities; and helicopters should not fly within direct-fire reach of enemy defenses. Unfortunately, maneuver mode mismatches do occur and are sometimes driven by tactical necessity. Of course, such mismatches on the enemy's part are desirable. However, for friendly forces, they often result in high losses or mission failure. The Air Mech Strike concept will reduce mismatches by fielding a force that is capable of maneuver in all three modes and by providing the ability to move the entire force in the fastest mode-air assault.

The US Army's current force structure and warfighting philosophy are dominated by the heavy-mechanized doctrine. Our combat power is in heavy divisions that have nearly 600 tanks and infantry fighting vehicles.4 These forces are designed to use mechanized maneuver to gain positional advantage and then destroy the enemy with massed direct fires. Artillery, combat engineers, air defense and aviation are in supporting roles to set the conditions for a favorable direct-fire fight. Long-range fires or deep-fight operations shape the close battle.5 To fight and survive in the direct-fire crucible, the US Army has fielded the world's heaviest and most thickly armored tank and infantry fighting vehicle combination: the 70-ton M1 Abrams tank and the 30-ton M2 Bradley Fighting Vehicle.6 These vehicles are designed almost exclusively for dueling with other armored vehicles. The M1 mounts a massive 120mm high-velocity direct-fire cannon and the M2 Bradley carries a high-velocity 25mm auto cannon and direct-fire heavy antitank missiles.

The remaining US force structure consists of light units organized as air assault, airborne and light infantry divisions designed for dismounted action in close terrain. They employ aircraft to gain a positional advantage in either airborne or air assault operations, but like their heavy-force counterparts, their ultimate goal is to close with the enemy in a direct-fire engagement. Light-force artillery, engineers and aviation are designed to support the light infantry to this end. Generally, these divisions are easier to move strategically and are often used as early-entry forces. Due to its large helicopter fleet, the air assault division is the most difficult to move. However, more air assault division combat power can be moved per Air Force sortie than heavy division power-four UH-60 Black Hawks or AH-64 Apaches per C-17 sortie, as opposed to one M1 Abrams tank.7

Heavy and Light Division Drawbacks

Direct-fire fight rigors have increased the liabilities of modern US heavy forces. Armored and mechanized divisions have lost their early maneuver advantages over mobile foot forces because most armies today have mechanized or motorized capabilities. Even the Somali warlords use armed pickup trucks.8 Tank and infantry vehicles have greatly increased in size and weight to accommodate necessary thick armor and weapon size increases. The added weight has reduced strategic mobility, because large numbers of heavy cargo aircraft are needed to move a relatively small armored force. To compensate, the Army has invested in additional heavy division sets of equipment and pre-positioned them in potential conflict theaters or on ships near trouble spots. The only other option is to move the heavy force by sealift, which typically takes about a month. The weight of heavy-armored vehicles also requires that they be transported by heavy tractor trailers from the port or storage site to the battle area to reduce vehicle wear and prevent road destruction.

The M1 tank's weight and limited main gun elevation reduce its effectiveness in the urban, mountainous and wet terrain typically found in potential theaters of operation such as Korea. Heavy armor often requires extensive engineer assistance to cross natural and manmade obstacles. For example, it took three days of intense bridging efforts to get M1 tanks across the Sava River in Bosnia.9 Finally, the heavy division, with limited infantry and helicopters, is seldom tasked for operations other than war because it has difficulty projecting presence beyond road networks or valleys.

Despite their relative strategic mobility, light divisions are not the preferred force against an armored enemy. Although they possess varying levels of air assault agility, they lack the ground mobility, protection and firepower to compete in direct-fire fights with heavy mechanized units. Typically, light formations have hand-held weapons, some light vehicle weapons and small-caliber towed artillery for firepower. With no armored protection, they are extremely vulnerable to indirect fire and lack mobility when attacked by enemy mortars or artillery. Only the air assault division has significant numbers of attack helicopters to meet an armored threat. Historically, attack helicopters have proved highly effective against attacking armor. Unfortunately, the attack helicopter is limited when engaging enemy forces in close terrain or in defensive positions. Light divisions use troop helicopters to offset their infantry's foot mobility, but this has drawbacks as well. Because the light infantry are on foot, landing zones must be very close to, if not on, the objective. This significantly reduces aircraft survivability, even against modest air defenses or small arms. Light forces faced with an armored threat will attempt to prepare defensive positions for protection. However, even if they succeed with this, enemy armored forces often can simply bypass the dug-in infantry.10

Air Mechanization

Even before World War II, theorists envisioned using aircraft to project land power over the ground. In the early 1930s, Soviet Marshal M. N. Tukhachevsky published ideas about `air mechanization` that favored ground combat vehicles moving by aircraft.11 British Brigadier Richard E. Simpkin promoted a modern version of air mechanization in his 1985 book `Race to the Swift`. Simpkin built on the main battle air vehicle concept, which was originally the brainchild of Germany's General Frido von Senger.12 In the early 1990s, the German army fielded three "air mech" brigades equipped with the helo-transportable Wiesel armored vehicle.13 Retired US Army Colonel Wallace P. Franz promoted a similar concept in his February 1992 `Military Review` article, "Airmechanization: The Next Generation."14 In the 1960s, the Russians developed the light-weight armored BMD for use by airborne and air assault units and the huge helicopters to transport the vehicles. The term `airmechanization` has come to be understood as some form of air mobility with a ground mechanized capability. Despite their advantages in ground mobility, protection and firepower over US light-force designs, the German and Russian airmechanized units cannot compete in a direct-fire confrontation with heavy armor. The 4-ton

Wiesel and 8-ton BMD armed with light cannons and antitank missiles are no match for the 70-ton M1 tank and its heavy direct-fire cannon. In addition, both nations have had difficulty fielding the requisite numbers of heavy-lift helicopters to facilitate airmechanized doctrine.15

Air Mech Strike Concept

The Air Mech Strike concept charts new ground in airmechanization by departing from the force design assumption that the direct-fire fight is the ultimate way to defeat the enemy. The explosion in information technology is already digitizing the battlefield, leading to far greater situational awareness. Even at company level, ground and airborne sensors with radio and nonjammable fiber-optic links will make it nearly impossible for a large enemy armored formation to approach undetected. Heavy mechanized units will be tracked at great distances and destroyed by indirect precision munitions attacks (PMAs), rendering large-scale direct-fire fights between massed armored formations obsolete.16 During Operation `Desert Storm`, both precision and nonprecision indirect fires destroyed far more Iraqi armor than tank-to-tank direct-fire engagements.17 If massed direct fire is no longer maneuver's prime objective, armored vehicles no longer need huge direct-fire cannons and heavy depleted uranium armor plating that balloons their weight to 70 tons. Armor protection will be designed to meet small arms, shrapnel and hand-held weapon threats. Armored vehicles, no longer used for tank-to-tank duels, will be made light enough to be used in the air assault mode but still possess highly lethal high-tech indirect weapons to destroy massed armor.

Air Mech Strike armor will move away from the current heavy "Iowa Battleship" model to the light "Aegis Cruiser" design. Air mech armor provides the close terrain combat force missing in pure attack helicopter operations and the ground mobility, protection and firepower missing in light infantry units. This force's air assault agility will allow units to quickly gain positional advantage against armored formations from any direction or flank. Once air-inserted, this force will use its mechanized capacity to maneuver into battle positions. Using exact targeting data from organic and higher-echelon sensors, air mech armor will execute PMAs from safe stand-off positions. Following the PMAs, air mech infantry will maneuver in close to destroy the enemy. Direct fire between armored vehicles will be a relatively rare occurrence involving only a few participants. To win these few direct-fire engagements, air mech vehicles (AMVs) will rely on improved situational awareness for first-shot kills via packs of hypervelocity missiles similar to the current line-of-sight antitank missile. Even against an enemy entrenched in prepared defensive positions, air mech armor units will be able to air assault to a positional advantage, dismount their infantry and reduce enemy defenses.

In Air Mech Strike warfare, artillery's traditional role of directly supporting ground maneuver changes to a main artillery effort. Artillery rocket and missile systems will team up with attack helicopters to form an aerial strike force that engages large, heavy-armor formations at great distances. Air mech artillery will use rocket missile platforms rather than cannon systems. The proposed trailer-mounted artillery rocket system (T-MARS) marries the multiple launch rocket system pod to a one-use trailer elevation and launch platform. T-MARS will be sling-loaded by UH-60L helicopters to give the artillery air assault agility.18 The systems will be issued as a unit to eliminate the need for heavy-launch vehicles. This concept would allow the artillery commander to air-insert T-MARS anywhere on the battlefield, including enemy rear or flank areas, and then fire them via data link. Enemy counterbattery would be useless because it would only destroy an unattended, empty trailer.

T-MARS would greatly increase the ability to mass fires because all available T-MARS could be fired at

once. Artillery's air assault agility would be used in conjunction with attack helicopter deep attacks and would provide most of the massed firepower. This would free attack aircraft to engage softer high-payoff targets, carry more fuel for greater range and endurance and provide artillery targeting and battle damage assessment data. For close support of maneuver forces, the economy and precision of cannon-fired munitions would come from lightweight 155mm howitzers, also sling-loaded by UH-60s.19 Initially, these cannon units would be organized as battalions directly assigned to the maneuver regiments. Eventually, the cannon battalions would be replaced by heavy 155mm mortars mounted on future AMVs and assigned as batteries to each maneuver battalion.

Command and Control (C2) Redefined

Air Mech Strike forces would operate at a speed and depth requiring a new delineation of C2 responsibilities. Air Mech Strike warfare divides the battlefield according to battlespace rather than traditional linear partitions. The strike force of attack helicopters, air assault-capable artillery and air defense, which conducts nearly all operations in the air-space medium, is responsible for all air space. Aircraft agility, long-range rocket and missile artillery responsiveness and the need for quick air defense reaction demands a responsive controlling authority. A division staff cell, which does not directly control air-space users, would not meet the needs of a fast-paced PMA. Other nonstrike elements would coordinate for air space use with the strike force. In this case, a small lag in responsiveness would be acceptable. The air mech armor force, which conducts most of its operations on the ground, would be responsible for tactical terrain management. This will greatly simplify the clearance of fires and ground maneuver speed because all ground warfighters would be part of the air mech armor force. Finally, the air mech strike force would use functional regiments rather than traditional separate battalions and companies. This would free division staffs to concentrate on planning. Rather than loose supervision by a chief of staff, a full colonel would "command" various supporting efforts.

`Air Mech Division.` The air mech division is proposed as an interim, then objective, model for the US Army. The interim design uses currently available equipment, vehicles and aircraft and could be fielded by the year 2000. The objective design, fielded by about 2010, would feature specially designed vehicles and aircraft to facilitate self-deployability to any theater. Each air mech model would be organized as a 3-D force, with one air mech brigade, one strike brigade and one support brigade, each commanded by a brigadier general. The interim design would typically operate to a depth of 300 km, and the objective design, out to 700 km.

`Interim Air Mech Brigade.` The interim air mech brigade is organized with one air mech infantry regiment and one air mech cavalry regiment, both equipped with the German-designed Wiesel armored vehicle. The Wiesel is light enough to be sling-loaded by UH-60L Black Hawk helicopters and comes in infantry-carrier, fire-support and antitank-missile versions. The Wiesel provides tracked mobility and armored protection up to 7.62mm for its crew of six soldiers or two soldiers and heavy weapons.20 Because landing zones for Wiesel airlift can be well-distanced from the objective, the Wiesel greatly enhances air-assault survivability. Each regiment has its own lightweight 155mm howitzer battalion for direct support, and the brigade has an assault helicopter regiment to provide the lift for the air mech infantry and cavalry regiments. The assault regiment provides supplemental fires with OH-58D Kiowas and UH-60s armed with Hellfire missiles and Hydra 70 rockets. As the division's anvil, the brigade blocks positions against enemy armor and conducts follow-on fire and maneuver to complete the destruction of the enemy following the strike brigade's PMAs.

`Interim Strike Brigade.` The interim strike brigade is organized with one attack cavalry regiment with three squadrons of 24 AH-64D Longbow Apache helicopters each. The attack cavalry regiment has

its own reconnaissance squadron equipped with OH-58Ds, unmanned aerial vehicles (UAVs) and ground scouts mounted in Wiesels. The brigade has one air mech rocket and missile artillery regiment organized into three battalions of 18 T-MARS prime movers each. An internal assault helicopter regiment provides lift for the T-MARS and aerial resupply for the attack helicopter regiment. In addition, the assault helicopter regiment can supplement the attack cavalry regiment's aerial fires. The brigade operates as an attack helicopter/rocket artillery team that can quickly execute an overwhelming PMA on an armored force out to more than 300 km. As the proponent for the division's air space, the brigade also employs the air defense battalion, which uses Avenger systems that can be sling-loaded by UH-60L helicopters.

`Interim Support Brigade.` The support brigade has one logistics regiment organized with a base support battalion and two forward support battalions tailored for the air mech and strike brigades. Company-size support organizations in each combat battalion provide additional logistic capabilities. Most brigade resupply will be provided by the assault helicopter regiments organic to each brigade. The division will operate nonlinearly from remote assembly areas separated by long distances. Thus, aerial resupply is the primary means of supporting the air mech division. The brigade also has support responsibility for the intelligence regiment, which, with its own aerial reconnaissance squadron, works directly for the division commander and provides the necessary intelligence gathering, analyzing and distribution to the combat elements. The brigade has an organic assault helicopter regiment to provide aerial logistics to the brigades, reinforce major air assaults and supplement aerial fires.

Future Air Mech Aircraft (FAMA)

The FAMA would replace the UH-60 and CH-47 Chinook helicopters in the Army inventory beginning in 2010. The aircraft would most likely resemble an improved version of the current V-22 Osprey tilt-rotor aircraft. Using close terrain flight and traveling at more than 200 knots, the FAMA

would be able to transport internally a 10- to 15-ton vehicle more than 700 kilometers and then return without refueling. The V-22 can already almost meet this parameter-it can transport a 6-ton load.21 The FAMA would use bomb bay-type doors to "winch" the AMVs to the ground. This combines the advantages of internal and external loading, thus allowing greater range and stealth and eliminating the requirement for prepared landing areas. The FAMA's cruising speed of 250 knots and aerial refueling ability would make it self-deployable worldwide. The attack aircraft in the objective air mech division would be an improved RAH-66 Comanche helicopter modified as a compound helicopter and designed to cruise at 250 knots. The modification would involve applying the Piasecki Vectored Thrust Ducted Propeller concept and result in a pusher tail configuration similar to the AH-56 Cheyenne.22 This higher cruise speed, combined with aerial refueling, would make the Comanche self-deployable.

Future Air Mech Vehicle (FAMV)

The FAMV would be about the size of an M113 armored personnel carrier but would use advanced composite armor. Dual engines and tracks would be employed to keep the vehicle operable if hit by mines or antitank weapons. Internal blast shields would also be used to limit armor penetration damage, and the unmanned pedestal weapons turret would provide hull defilade attacks without exposing the crew. Externally, all FAMVs would look the same to confuse the enemy. However, the vehicles would be configured internally as tanks, personnel carriers, C2 vehicles, self-propelled mortars or air-defense platforms. The FAMV tank would have a crew of two and a two-scout dismount team. Personnel would sit at the rear and use virtual reality visors to observe and identify targets seen by vehicle-mounted sensors or reported by higher echelons. Millimeter-wave radar and thermal-vehicle sensors would be

supplemented by direct-view periscopes. A bank of vertically launched antitank, antipersonnel, antiaircraft and reconnaissance missiles would provide the long-range eyes and indirect firepower to execute PMAs. The pedestal turret would feature a general purpose cannon of 30 to 50mm caliber and stations for direct-fire hypervelocity missiles or other weapons as required. The FAMV personnel carrier would have infantry seating in its center instead of the bank of vertically launched missiles.

Operations Concerns and Limitations

Although air defenses are a great concern in all military aircraft operations, recent history has shown that with proper planning and preparation, they can be defeated. Western air power planners learned enemy air defense lessons from Vietnam and, especially, the 1973 Arab-Israeli War. Since then, few aircraft, either fixed wing or rotary wing, have been lost in combat operations. This is particularly significant, given the increased sophistication of hostile air defenses and the number of missions flown. For example, during `Desert Storm`, only one AH-64 Apache was shot down, and in Somalia, no AH-1 Cobras were lost after a year of operations. Recent losses that did occur resulted from accidents during combat conditions or high-risk special operations. Recently, Israeli Cobra and Apache attack helicopters have conducted attacks in Southern Lebanon with no reported losses, despite several daylight missions.23 Today, aviation commanders routinely exploit air defense limitations, such as terrain relief, radar dependence, vulnerability to countermeasures and static firing modes. In the future, air mech strike commanders will continue to have serious regard for enemy air defenses but will have enhanced survivability thanks to displaced landing zones, stand-off weapon platforms and mechanized air assault forces. In the final analysis, antiaircraft weapons are similar to antiarmor systems: they cannot be ignored, but their effectiveness can be negated by proper tactics, techniques and procedures. They will seldom stop determined air or armor maneuver forces.

Helicopter technology has greatly improved over the past decade. The Vietnam vintage aircraft such as the AH-1 Cobra and UH-1 Huey are grounded if winds exceed 35 knots or visibility is less than one-quarter mile, and they have only night-vision goggles for night operations. The AH-64A Apache is capable of operations in up to 45-knot winds and can fly in near-zero visibility, day or night, using its unique flying Forward Looking Infrared (FLIR) system. However, the Apache's laser-guided Hellfire missile needs much better visibility. The AH-64D Longbow Apache, which will be available next year, can use its millimeter-wave radar to attack targets at maximum range with no visibility requirements.24 The RAH-66 Comanche will further improve on this with the added capability to fly in up to 80-knot winds.25 The all-weather attack helicopter era is quickly approaching. Lift aircraft have also shown great improvements in weather tolerance. Helicopters such as the newly fielded special operations MH47E Chinook, equipped with radars and FLIRs, already have significant capabilities to operate in poor weather. The air mech division will never be completely "all weather," but there are very few places on the globe where winds exceed 80 knots for very long. Even in such extreme circumstances, the air mech division has a significant mechanized capability, allowing it to continue maneuvering. Contrast these brief weather holds with the extended delays to heavy-armored maneuver units caused by seasonal thaws, rains and flooding.

The Air Mech Strike concept offers a force that can operate in all three maneuver modes: dismounted, mechanized and air assault. This agility allows the force to better exploit the improved situational awareness that is gained through battlefield digitization. The force has the speed advantage of air maneuver to act on the information without sacrificing ground mobility, protection and the firepower necessary to defeat heavy forces. Air mech strike maneuver doctrine will render the world's heavy tank armies obsolete. The concept capitalizes on the advantages in US air power and uses rapid force projection strategy from bases in the Continental United States. The Air Mech Strike division will be a

force for all seasons that can defeat armored formations or employ its aircraft, light vehicles and infantry in disaster relief operations. In this era of shrinking defense budgets, the US Army cannot afford to maintain a large heavy-force structure that is effective in only a few deployment scenarios. The choice for future force developers is clear: either use new technology to enhance the old land combat "battleship" model or apply it to enable the next revolution in maneuver warfare. ***MR***

NOTES

1. John Keegan, `Second World War` (New York: Viking Penguin Books, 1989), 437 and 438.

2. US Army Field Manual (FM) 100-2-3, `The Soviet Army: Troops, Organization and Equipment` (Washington, DC: US Government Printing Office [GPO], 1991), 4-144 and 5-37.

3. Kenneth Macksey, `Guderian: Panzer General` (London: Greenhill Books Inc., 1992), 57-97.

4. US Army Student Text (ST) 100-3, `Battle Book` (Fort Leavenworth, KS: US Army Command and General Staff College [USACGSC], 1995), 3-1 and 3-9.

5. FM 100-5, `Operations` (Washington, DC: GPO, 1993), 6-14.

6. `Jane's Armour and Artillery 95-96`, edited by Christopher F. Foss and T. Cullen (Coulsdon, UK: Jane's Information Group Ltd., 1996), 137 and 142. A review of tanks and infantry fighting vehicles reveals that the US M1 Abrams tank and M2 Bradley Fighting Vehicle are the heaviest vehicles fielded in significant numbers by a major military power.

7. US Army ST 100-3, `Battle Book` (Fort Leavenworth, KS: USACGSC, 1995), 3-1 and 3-9. The total numbers of key weapon systems counted for each division model compared with the lift capacity of the C-17 Globemaster III are found in `Jane's All the World's Aircraft 1996`, edited by P. Jackson (Couldsdon, UK: Jane's Information Group Ltd., 1996), 584-88.

8. MAJ Emmett Shaffer, member of 160th Special Operations Helicopter Regiment planning staff, interview by author, 12 November 1995.

9. CNN report on crossing the Sava River in Bosnia, 12 January 1995.

10. This is based on my experience as an observer/controller for 28 rotations at the National Training Center, Fort Irwin, California, from 1989 to 1990.

11. Richard E. Simpkin, `Race To The Swift, Thoughts on Twenty-First Century Warfare` (London: Brassey's Defence Publishers Ltd., 1987), 119.

12. Ibid., 123.

13. Bundeswehr, organizational document received from the German liaison office (Fort Leavenworth, KS: USACGSC, February 1996).

14. Wallace P. Franz, "Airmechanization: The Next Generation," `Military Review` (February 1992), 59-64.

15. International Institute for Strategic Studies, `The Military Balance 1995-1996` (London: Institute for Strategic Studies, 1996), 45 and 115.

16. BG Huba Wass de Czege, lecture on advanced warfighting in the early 21st century (Fort Leavenworth, KS: USACGSC, 10 January 1996).

17. Dale R. Steinhauer, resident expert on Middle East wars, interview by author, 6 April 1996, Army Knowledge Network, USACGSC, Fort Leavenworth, KS, 6 April 1996.

18. `Jane's Armour and Artillery 95-96`, 675. The weight of the pod is 5,600 pounds, allowing for a 2,400-pound trailer. Total weight=UH-60L external limit, 8,000 pounds.

19. Ibid., 675.

20. Ibid., 364 and 365.

21. `Jane's All the World's Aircraft 1996`, 497.

22. Ibid., 621.

23. CNN footage showing Israeli AH-1 and AH-64s firing at Hezbolla positions in daylight, 19 April 1996.

24. This comes from my personal experience in training with the AH-64, AH-1 and UH-1 helicopters at Fort Rucker, Alabama, while assigned to the Aviation Training Brigade from 1993 to 1995.

25. CW04 Ronald Ferrell, US Army Aviation Center resident expert on RAH-66 capabilities, interview by author, Fort Rucker, Alabama, 6 April 1996.

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