

USAWC STRATEGY RESEARCH PROJECT

**Army Aviation's Objective Force for the 21<sup>st</sup> Century**

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## ABSTRACT

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The attacks of 11 September provide compelling evidence that the strategic environment remains dangerous and unpredictable. Uncertainty marks the global war on terrorism, and our soldiers continue to be involved in smaller-scale contingencies and conflicts. Yet, the potential for large-scale conventional combat operations will continue to lurk just beneath the surface. Adaptation or change will naturally focus on the adversary's view of our perceived centers of gravity and methods of operation, and will focus on our vulnerabilities. Today's aviation organization was designed to confront a well-known conventional adversary. The collapse of the Berlin Wall not only signaled the end of the Cold War but also signaled the urgency for aviation transformation. The emerging strategic environment that characterizes the 21st Century demands an Aviation Objective Force anchored on advanced technologies and capable of effective response against both modernized conventional and unconventional forces employed in accordance with asymmetric strategies and tactics. This paper provides a guiding vision and solution for the development of an Aviation Objective Force that will meet the requirements of the Objective Force in the 21<sup>st</sup> century.



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## ARMY AVIATION'S OBJECTIVE FORCE FOR THE 21<sup>ST</sup> CENTURY

### **PURPOSE**

The attacks of 11 September provide compelling evidence that the strategic environment remains dangerous and unpredictable. Uncertainty marks the global war on terrorism, and our soldiers continue to be involved in smaller-scale contingencies and conflicts. Yet, the potential for large-scale conventional combat operations will continue to lurk just beneath the surface. Adaptation or change will naturally focus on the adversary's view of our perceived centers of gravity and methods of operation, and will focus on our vulnerabilities. The enemy will forego mass formations and momentum through echelonment and pursue a policy of selective precision strike, maneuver and other asymmetric actions. To limit the effectiveness of our targeting efforts, the adversary will hide and disperse large formations in areas of physical and moral sanctuary often located in complex, urban terrain, shielded by civilians and manmade structures.<sup>1</sup> Today's aviation organization was designed to confront a well-known conventional adversary. The collapse of the Berlin Wall not only signaled the end of the Cold War but also signaled the urgency for aviation transformation. The emerging strategic environment that characterizes the 21<sup>st</sup> Century demands an Aviation Objective Force anchored on advanced technologies and capable of effective response against both modernized conventional and unconventional forces employed in accordance with asymmetric strategies and tactics. The Quadrennial Defense Review 2001 Working Group defined military transformation as "the set of activities by which DOD attempts to harness the revolution in military affairs to make fundamental changes in technology, operational concepts and doctrine, and organizational structure."<sup>2</sup> With this framework in mind, I will provide in the following pages the emerging environmental challenges of the 21<sup>st</sup> century, the vision, concepts and capabilities that support the 21<sup>st</sup> century Defense Strategy, and technological solutions for Army Aviation in the 21<sup>st</sup> century. Finally it examines Army Aviation organizations and provides a recommendation for the future organization that characterizes the Army's Aviation Objective Force of the 21<sup>st</sup> Century.

### **PART I – FUTURE THREAT**

#### **CHALLENGING OPERATIONAL ENVIRONMENT**

The emerging security challenges of the 21<sup>st</sup> century and the need to respond more rapidly and decisively across the full spectrum of operations requires that the Army transform itself. The attacks of September 11, 2001 brought to realization the fact that our strategic

environment remains challenging and dynamic. Geopolitical trends and their accompanying phenomena presage a future operational environment wrought with diffuse threats that are harder to detect. However, the potential threat environment, the events of September 11, and America's subsequent declaration of a lengthy war on terrorism unmistakably demonstrate that Defense Transformation in general and Army Transformation specifically, are imperative.<sup>3</sup>

#### COLD WAR VICTORY

Historically, threat forces have organized and armed in anticipation of regional conflicts. Although recently the Soviet Union and Warsaw Pact provided an exception, their demise resulted in the shift of U.S. focus from a bipolar world with two acknowledged super powers to a world with a single super power but multiple regional concerns. Some characteristics of this world are:

- U.S. will have no peer competitor until 2020 or beyond.
- Nations will continue to field armed forces and use these forces as a tool to pursue national interests.
- Pursuit of national interests may cause U.S. intervention either unilaterally or as a coalition partner with or without United Nations (UN) mandates.
- Nations who believe that the U.S. will act counter to their national interests will develop diplomatic and military plans to manage U.S. intervention.
- Nations will modernize their armed forces within the constraints of their economy but in ways that may negate U.S. overmatch in niche areas.
- Non-state actors will play an important role in any regional conflict.
- All combat operations will be significantly affected by a number of variables in the environment beyond simply military forces.

As the U.S. shifts focus and the challenges of the operational environment continue to evolve, the U.S. Armed Forces must adapt to maintain the ability to accomplish the national military objectives in accordance with the National Military Strategy. The changes in the geo-political landscape over the last several years have led the U.S. to reevaluate the future potential risks to national security. While no one can foresee the exact threat of the future, potential threats and environments can be examined to assist the military to understand its weaknesses and vulnerabilities, as well as to identify opportunities to exploit.<sup>4</sup>

## PERCEIVED U.S. VULNERABILITIES

Common threat perceptions are the U.S. is unwilling to accept heavy losses and is risk-adverse, avoids close combat and relies on stand-off technologies and air superiority, is sensitive within the national leadership to domestic and world opinion, lacks commitment over time, and has predictable patterns of military operations. Potential adversaries will capitalize on this perceived predictability. Also, the U.S. currently employs strategies that require extensive and prolonged entry operations and a deliberate force build-up, primarily because the U.S. lacks other options. The adversaries will attempt to prevent U.S. forces from obtaining and using operational bases in the region by attacking expected and historical patterns of U.S. deployment and employment. Potential adversaries are becoming more diverse and developing capabilities more suited to their unique cultures, circumstances, and perceived threats. They will likely invest in advanced niche technologies and employ high-speed mobile forces and precision fires.<sup>5</sup> Relative to perceived U.S. vulnerabilities; potential adversaries will likely take actions as follows:

### **Operational Shielding.**

- Use advanced air defense (ADA) systems to protect military forces against coalition air power.
- Disperse forces in complex terrain/urban areas in order to operate from sanctuary (limit coalition target sets).

### **Operational Exclusion.**

- Disperse forces into smaller units to cause U.S. dispersion and difficulty in massing forces.
- Use Weapons of Mass Effects (WME) on deployment locations to force coalition to use multiple ports of debarkation.

### **Limit U.S. Access into Theater.**

- Use tactical ballistic missiles (TBM), unconventional, and terrorist actions against ports of embarkation and debarkation.
- Exploit cultural/religious fears through media.

### **Control Tempo.**

- Disrupt U.S. maneuver.
- Use WME (conventional and unconventional).
- Deploy decoy Weapons of Mass Destruction (WMD) sites.

**Neutralize U.S. Technological Overmatch.**

- Jam Global Positioning Systems (GPS) signal against precision guided munitions (PGM) and navigation systems.
- Purchase intelligence from third party.
- Disperse forces in complex terrain and urban areas.

**Change nature of the Conflict.**

- Draw forces into urban and complex terrain fight.
- Change focus of U.S. attack to one of religion and culture.
- Emphasize threat defense of homeland.

**Cause Politically Unacceptable Casualties.**

- Draw U.S. forces into urban fight.
- Highlight civilian casualties by coalition.

**Allow No Sanctuary.**

- Continuous unconventional and terrorist attacks against all U.S. forces throughout theater and homeland.
- Target countries supporting U.S. forces.

Adversaries will likely invest in technologies that make medium to high-altitude air operations increasingly vulnerable. Widespread technology proliferation will accelerate, enabling potential adversarial states to access WME, ballistic and cruise missiles, information warfare capabilities, and precision munitions. To counteract their vulnerabilities to U.S. air superiority and precision strikes, potential adversaries will avoid massing their forces in linear offensive and defensive echelons. Instead they will disperse their forces, employ selective precision strikes, and conduct rapid tactical and operational maneuver from areas of physical and moral sanctuary often located in complex, urban terrain and shielded by civilians and man-made structures. They will pressure and mass precision capabilities and mobile formations in time and space to strike carefully selected targets.<sup>6</sup> They will initiate force-on-force battles at a time and place of their choosing, integrating decentralized, non-linear maneuver and precision fires with simultaneous operations by special purpose and unconventional forces. They will look for seams in U.S. systems, from space and ground. They will conduct focused, decentralized operations when they perceive an advantage, using linked operational and tactical intelligence, surveillance, and reconnaissance (ISR) capabilities to determine where and when opportunities exist for offensive action, even from a dispersed posture. They will mitigate air, ISR, and other

U.S. technological advantages by fighting during periods of reduced visibility and in complex terrain and urban environments that provide sanctuary from U.S. effects.<sup>7</sup>

## **PART II – SETTING THE PROPER AZMUTH**

### **PROVIDING CLARITY AND DIRECTION FOR CHANGE**

Clarifying the direction for change is important because, more often than not, people disagree on direction, or are confused, or wonder whether significant change is really necessary. An effective vision and back-up strategies help resolve these issues. With clarity of direction, the inability to make decisions can disappear. A good vision acknowledges that sacrifices will be necessary but makes it clear that these sacrifices will yield particular benefits and satisfactions that are far superior to those available today – or tomorrow – without attempting to change.<sup>8</sup> The fundamental principles outlined in both Joint Vision 2020 and the Army Vision provide the Army Aviation Objective Force of 2020 the clarity and direction for change to defeat the challenges created by the emerging threats of the 21<sup>st</sup> century.

### **JOINT VISION**

Joint vision 2020 establishes a conceptual template that guides America's Armed Forces through the continuing transformation process. It describes the operational concepts necessary for change. Furthermore it supports the National Military Strategy (NMS) with its primary focus on the third approach, prepare now for an uncertain future. The overarching goal of Joint Vision 2020 is the creation of a force that is dominate across the full spectrum of military operations – persuasive in peace, decisive in war, preeminent in any kind of conflict. Full spectrum dominance is achieved through the interdependent application of dominant maneuver, precision engagement, focused logistics, and full dimensional protection.<sup>9</sup> Army Aviation leadership must harness the many unique dimensions of Army Aviation and create a force that is capable of bringing the full spectrum dominant force to a reality.

### **Dominant Maneuver**

The force capable of dominant maneuver will possess unmatched speed and agility in positioning and repositioning tailored forces from widely dispersed locations to achieve operational objectives quickly and decisively. Dominant maneuver is the ability of joint forces to gain positional advantage with decisive speed and overwhelming operational tempo in the achievement of assigned military tasks.<sup>10</sup> Army Aviation through its very nature enhances maneuver through increased speed and range of operation. Army Aviation enables joint force

commanders to reposition forces in-depth for immediate operations against lucrative targets. Air assault of dismounted forces anywhere in the operations area exponentially increases the dilemma of the enemy commander in planning his defense. Vertical maneuver of mounted units adds a new operational dimension to the battlefield, and allows the joint force commander to conduct operational maneuver from strategic distances. Similarly, maneuver of friendly forces out of contact enhances shaping of the battle space and allows attack at the time and place of our choosing. In Operation Anaconda, Apache fires provided critical battle-winning close air support. With Al-Qaeda fighters so close to U.S. troops that close air support from “fast mover” jets, operating under altitude and speed restrictions imposed by the Air Force, was often impossible, the Apaches became the only fire support available to ground commanders.<sup>11</sup> “The weapon that changed the face of battle for us was the Apache,” said COL Wiercinski.<sup>12</sup> Similarly, the CH-47 and MH-47 transport helicopters proved invaluable in moving soldiers quickly around the high-altitude battlefield.<sup>13</sup> The flexibility and agility offered by Army Aviation to the maneuver sustainment effort greatly enhances pulsed logistics operations and subsequent ground maneuver.<sup>14</sup> The Objective Force requires equipment that enables operational and tactical responsiveness across the full spectrum of conflict. Current aviation heavy lift systems will not meet envisioned Objective Force capabilities to operate on/from unprepared surfaces with the required lift capacity to move the Future Combat System (FCS). This capacity is necessary to provide dominant maneuver that is outlined in the operational concepts of Joint Vision 2020. This shortcoming will be addressed in detail later in this document.

### **Precision Engagement**

Precision engagement is the ability of joint forces to locate, surveil, discern, and track objectives or targets. The pivotal characteristic of precision engagement is the linking of sensors with delivery systems. This capability will enable the joint force commander to assess the effects and direct reengagement with decisive speed and overwhelming operational tempo as required across the full spectrum of military operations.<sup>15</sup> There continues to be a need for manned aerial reconnaissance systems that provide the “man-in-the-loop”, working with UAVs to make timely decisions and provide a more timely and responsive sensor to shooter link. Army Aviation advanced Intelligence, Surveillance and Reconnaissance (ISR) capabilities will enable the Objective Force to better execute the warfight. Comanche, drawing information, updated in near real-time, from a wide variety of automated and on-board sensors, provides the means for improving and accelerating the decision-action cycle. The ability to integrate information from various ISR platforms, coupled with the Comanche crew and on-board data

processing, will be a major contributor to the ISR collection effort.<sup>16</sup> In the far term, true attack teaming with manned Army aviation assets will be a reality. The revolutionary capacity to act first with a UAV without putting a manned aircraft at risks will be a part of Army Transformation. Several manned/unmanned flight demonstrations have been conducted to date, including the AH-64D Apache Longbow's control of a Hunter UAV and its Electro-optic and infra red (EO/IR) payload. The Hunter Standoff Killer Team Advanced Concept Technology Demonstration successfully demonstrated the power of teaming manned and unmanned systems in the future fight.<sup>17</sup>

### **Focused Logistics**

Is the ability to provide the joint force the right personnel, equipment, and supplies in the right place, at the right time, and in the right quantity, across the full range of military operations. Through transformational innovations to organizations and processes, focused logistics will provide the joint warfighter with support for all functions. The increased speed, capacity, and efficiency of advanced transportation systems will further improve deployment, distribution, and sustainment.<sup>18</sup> Army aviation assets will play a significant role in Objective Force sustainment operations. Intra-theater air movement of time sensitive/critical supplies and aerial resupply to forward-deployed troops and/or widely dispersed forces are combat enablers for the Objective Force. Enemy anti-access measures may make aviation sustainment support critical in early entry operations. Because of the inability to rely on fixed airports and seaports, aviation will play a major role in resupply and evacuation, and movement of supplies to deployed units. Even where strategic sustainment relies on sealift, as it will have to in most major contingencies, intra-theater air – to – sea distribution will remain vital, and the sustainment system, therefore, must permit smooth sea – to – air transshipment without prior establishment of large and vulnerable in-theater logistical staging and transshipment facilities. This will require greater ship to shore interoperability with Army heavy/medium lift aircraft, and likely increased requirements for Army aircraft to support sustainment missions.<sup>19</sup>

### **Full Dimensional Protection**

Full dimensional protection is the ability of military forces to protect its personnel and other assets required to decisively execute assigned tasks. Full dimensional protection is achieved through the tailored selection and application of multilayered active and passive measures, within the domains of air, land, sea, space, and information across the range of military operations with an acceptable level of risks.<sup>20</sup> Army aviation assets provide both active and

passive capabilities to the force through armed reconnaissance, security, air-to-air combat, suppression of enemy air defense, and medical evacuation. Its speed and agility promote survivability to all elements of the force. If ground lines of communication (LOC) extend for unusually long distances, or are overly hampered by terrain, Army aviation may be the primary means to provide extended range force protection. Armed reconnaissance aircraft, specifically the Comanche, will conduct security operations for friendly forces and act as an economy of force role. Attack and assault aircraft conduct missions to deter or defeat enemy forces to provide additional time for the deployment of follow on forces. Aeromedical evacuation aircraft provide the primary means of evacuating seriously wounded casualties until ground LOCs can be established.<sup>21</sup>

### **Information Operations**

Information superiority is essential to achieving full spectrum dominance. The ultimate purpose of information superiority is to facilitate and protect the ability of U.S. forces in the decision making process and in time of combat degrade those of our adversaries. While the activities and capabilities employed to conduct information superiority are traditional functions of military forces, the pace of change in the information environment dictates that we expand this view and explore broader information superiority strategies and concepts.<sup>22</sup> Advanced C4ISR capabilities are essential to the Objective Force, introducing potentially revolutionary advances in force effectiveness and enhancing the application of all other capabilities to execute knowledge- based operations. In particular, the Objective Force will rely on a knowledge-based architecture, vertically and horizontally integrated from the strategic to the tactical level. The architecture will provide the means for forces at all levels to see first through situational awareness and establish, maintain, and distribute a common operational picture tailored to unit task, purpose and situation.<sup>23</sup> The Army Aviation Objective Force of the 21<sup>st</sup> Century will be armed with the systems that enable it to be fully integrated with all Army Battle Command Systems (ABCS). The Army Airborne Command and Control System (A2C2S) provides battlefield information processing capabilities equivalent to those found in a tactical command post or Battle Command Vehicle. The future A2C2S will provide beyond line of sight, long-range voice and digital connectivity. The capabilities of the A2C2S will be described in greater detail in the technology and innovation portion of this paper.

## **Command and Control**

Command and control is the exercise of authority and direction over the force. Command and control includes planning, directing, coordinating, and controlling forces and operations, and is focused on the effective execution of the operational plan: but the central function is decision making. The Aviation Objective Force Army Aviation Command and Control System (A2C2S) integrates software components of the Army Battlefield Command Systems, to provide situational awareness to on-board commanders and selected staff personnel. The A2C2S will have the capability to function as an airborne Tactical Command Post (TACCP) or as a “jump” Tactical Operations Center (TOC), currently hosted on a UH-60 helicopter, providing command and control and situational awareness, via a host of workstations with applicable software to ensure mission accomplishment.<sup>24</sup> This system will give a commander, at any level, the capability to command and control his assets over extended distances. With networked digital communications systems commanders and staffs can assimilate significantly greater amounts of data, faster, and with greater clarity. Battlespace is limited only by a commander’s ability to acquire and engage the enemy and to maintain control of his own fighting forces. However, there is often no substitute for “on the ground, face to face” leadership. The ability to rapidly reposition as the situation develops enables commanders to better “see” the battlefield and be at the critical point at the critical time. The Army Aviation Objective Force fills the voids in the common operational picture when required and increases the speed and effective range of movement for Objective Force commanders. In the future Army Aviation may be the only practical means for the Objective Force commander to quickly cover the greater distances of the dispersed Objective Force battlefield.<sup>25</sup>

## **THE ARMY VISION**

The Army Objective Force will be more strategically responsive and dominant at every point on the spectrum of military operations than the Legacy Force. It will provide the Nation an array of more deployable, more agile, more versatile, more lethal, more survivable, and more sustainable formations that are affordable and capable of reversing the conditions of human suffering rapidly and resolving conflicts decisively. These capabilities will enable the Objective Force to win on the offense, to initiate combat on their terms, to gain and retain the initiative, build momentum quickly and win decisively. As part of Objective Force development, The Army is elevating discussion of force design beyond existing frameworks. Objective force development is based upon seven force design principles.<sup>26</sup>

## **Responsiveness and Deployability**

To be truly responsive, the Army Aviation Objective Force must be deployable and capable of quickly and rapidly concentrating combat power in an operational area. At the tactical level, as a maneuver force, Army Aviation is the most responsive maneuver element on the battlefield. Attack and lift assets can move heavy-hitting munitions and air assault capable warriors around the battlefield as no other asset can. It can place firepower quickly on distributed targets and project fires at ranges that afford self-protection and protect supported ground units.<sup>27</sup> This was clearly evident during Operation Anaconda, attack and lift helicopters were able to quickly move throughout the battlefield delivering precise firepower and troops in restrictive terrain. The significant challenges experienced in the movement of Task Force Hawk in 1999 highlighted the fact that current aviation systems and organizational structures were too dependent on strategic airlift. This experience coupled with the emerging complexity of the strategic environment led to the need for Army Aviation to make revolutionary changes to address deployment issues. The ability of aviation forces to deploy quickly is critical. The current Aviation Force Modernization Plan fails to adequately address the deployability issue. The “big four” concept, AH-64D Apache Longbow, UH-60Plus Black Hawk, CH-47F Chinook, and RAH-66 Comanche, possesses three systems that cannot deploy via theater airlift. Self-deployment is an option, Army attack and support helicopters have self-deployment capabilities for the airframes themselves; however they have no airborne refueling capabilities, as some special operations helicopters have. As a result, attack helicopters must make stops every 750 nautical miles (1,200 for future Comanche), not enough range for safe overseas deployments. An entire Apache battalion, including its aircraft, requires strategic airlift of at least 41 C-17s and 25 C-5s. The Army Aviation Objective Force of the 21<sup>st</sup> century must be unburdened of significant deployment and sustainment tonnages, and must be deployable by a variety of lift platforms to include C-130 profile aircraft. Future technological advancements such as the RAH-66 Comanche and V-44 tiltrotor will serve to alleviate the deployability challenges. The Comanche can be transported via C-130 and can be operational within 90 minutes upon arrival. Comanche provides an inter/intra-theater independence not afforded by current helicopters, freeing valuable strategic and theater airlift assets.<sup>28</sup> From the strategic deployment perspective, tiltrotor technology will provide Army Aviation and the Army in general great benefit. It will facilitate transoceanic deployment of airmobile assets without relying on Air Force strategic assets. There is some concern that the tilt-rotor may lack tactical flexibility as compared to our present medium lift aircraft. Using the same thought process that the Army is presently using for the development of the Future Combat System (FCS). That the Army can move to faster

and lighter vehicle because of information dominance stands true for the future aviation systems as well. As evidenced during the Vietnam War, Somalia and more recently in Operation Enduring Freedom Army Aviation is extremely vulnerable when employed under direct fire range. Armed with information dominance tilt-rotor technology will be more survivable than aviation systems in past conflicts.

### **Agility and Versatility**

At the operational level of war, agility describes the mental and physical ability to transition forces rapidly with minimal physical adjustments from stability operations to warfighting and back again. Versatility describes the inherent capacity of the Objective Force formations to dominate at any point of the spectrum of military operations. These formations will be capable of adapting to changes of mission with minimal adjustment.<sup>29</sup> The Army Aviation Objective Force will fight as members of the Army's combined arms team in joint and multinational operations. Aviation's strength remains in its flexibility, agility, and versatility operating in the third dimension. Army Aviation will serve as an invaluable member in the Objective Force's ability to see first, understand first, act first, and finish decisively. Aviation brings the Objective Force a variety of capabilities to enhance the combined arms team and the Joint force ability to achieve this quality of first. Objective Force units see first by detecting, identifying, and tracking the individual components of enemy units. Aviation enablers for seeing first include aerial maneuver, manned and unmanned aerial reconnaissance, combat identification systems, organic onboard sensors, sensor fusion, low observables, and advanced pilotage and airworthiness. Objective Force units understand first through exploitation of a common operational picture of the battle space allowing soldiers and leaders to understand what the enemy is doing and better anticipate his intentions. Army Aviation, with its stealth and onboard automated sensor processing capabilities will be the commander's "weapon of choice" to fill the void in information gathered from the integrated, joint and national reconnaissance systems. The ability to provide "man in the loop" forward anywhere in the battle area is crucial in filling this void. Through mobility and tactical reconnaissance over extended distances, mobile command and control through the A2C2S system enables the ground commander to achieve information dominance and operate inside the enemy's decision cycle. Objective Force units act first by virtue of the superior situational awareness that permits them to engage at times and places of their choosing. Aviation contributes to that information dominance through its onboard sensors, fusion of external sensors, data collection and reporting, and aggregation and connectivity, which add relevance to the common operational picture. Engagement at a time

and place of our choosing is significantly enhanced by aviation unit's ability to develop the situation in and out of contact, move friendly forces with speed and over distances that exceed the enemy's ability to react, and rapidly transition from one mission to the next. In distributed operations on the non-contiguous battlefield aviation enables the commander to present the enemy with an untenable situation by moving, shooting, and reengaging throughout the battle space, faster than the enemy. Objective Force units finish decisively by destroying the enemy's ability to continue the fight and achieving moral dominance over him. Aviation units contribute to decisive operations by building momentum and rapidly transitioning to assault and exploitation operations without allowing the enemy time or opportunity to regroup and continue the fight. Aviation's superior mobility, relentless operational tempo, and overwhelming firepower enable the commander to continue to dominate the enemy and pursue subsequent objectives.<sup>30</sup>

### **Lethality**

The Objective Force's lethality must exceed that of today's conventional heavy forces. Through technological improvements in weaponry and munitions, the Objective Force will have the capability to destroy the enemy at longer ranges, with greater precision, and more devastating target effects.<sup>31</sup> The Army Aviation Objective Force will use precision fires to shape, shield and isolate enemy forces, establish an unrelenting operational tempo and extend the reach of land maneuver forces as part of a fully integrated Air-Ground team to enable decisive operations. Attack and reconnaissance helicopters will employ advanced air to ground missiles (AGM), loitering munitions, as well as guided and unguided rockets, air-to-air missiles and automatic cannons in the conduct of their missions.<sup>32</sup> An example of an advanced capability the Army Aviation Objective Force will bring to the fight is the Low Cost Precision Kill (LCPK) 2.75 inch guided rocket. The LCPK emerged from lessons learned during Operation Desert Storm and subsequently reinforced during operations in Panama, Somalia and Haiti. Those operations revealed the need for an air-to-ground weapon system, smaller and less costly than the Hellfire missile, that would increase the number of onboard stowed kills of non-tank targets including selected personnel, air defense assets, small watercraft and lightly armored vehicles while presenting minimum collateral damage. With this system the Army Aviation Objective Force will provide the commander the capability to engage the enemy with precision accuracy with minimum concern for collateral damage or fratricide.<sup>33</sup> In light of recent events in Operation Enduring Freedom the production and fielding process for the LCPK has been expedited. The LCPK is scheduled to begin fielding in fiscal year 2006.

## **Survivability**

The Objective Force will take advantage of technologies to provide maximum protection for the force. Ground and air platforms will leverage the best combination of active and passive protection to include low observable, ballistic protection, long-range acquisition, early discreet targeting, shoot first every time, and target destruction each time we pull a trigger. By seizing the initiative and seeing, understanding, and acting first, the Objective Force will enhance its own survivability through action and its retention of the initiative.<sup>34</sup> The Army Aviation Objective Force will leverage both passive and active aircraft survival technologies to provide the maximum protection to the systems and the aircrews. Aviation will use passive aircraft survival by avoiding detection by the threat through the balanced use of signature reduction, low observables, situational awareness, and systems capable of providing warning about the total spectrum of ground and air threats. These systems will provide early warning well outside of the threat system's detection and effective engagement ranges. Aviation will use active aircraft survival measures by neutralizing threat detection acquisition, and by countering weapon systems (such as air defense systems and threat air vehicles) through employment of effective active countermeasures or by attacking with fire and forget weapon systems at maximum ranges.<sup>35</sup> The teaming of Unmanned Aerial Vehicles (UAVs) with manned systems provides enhanced survivability features. This team establishes a synchronized, dynamic, execution centric capability with a decider forward. The unmanned system focuses on the dangerous tasks while the manned system focuses on the decisions required in executing decisive air-ground operations.<sup>36</sup>

## **Sustainability**

The Army Aviation Objective Force logistics organizations will be tailorable, modular in design, rapidly deployable, and highly mobile.<sup>37</sup> Total Asset Visibility (TAV), capability to perform simultaneous operations and automated logistical functions will give the Aviation Objective Force flexibility. Diagnostic and prognostic test equipment, man-portable computer systems, and the Standard Army Management Information System (STAMIS) will be standardized, integrated, and securable. These systems will be linked horizontally across the organization and vertically throughout the Combat Service Support (CSS) community. Component modularization will decrease maintenance manpower requirements and repair times while increasing aircraft availability. Innovations in aviation technology will produce aircraft with greater functionality and reliability. Embedded technologies will provide "real time" aircraft status information using integrated diagnostic test equipment and automated information

systems. The two-level maintenance support concept is the Aviation Objective Force structure. The far term goals for aviation logistics and maintenance equipment include intelligent diagnostics and prognostics, able to detect system failures prior to occurrence through the use of onboard collection systems, and automatically transmit aircraft systems data to CSS units, maintenance facilities, and Forward Area Rearm and Refuel Point (FARP) personnel. This information will shorten the lead-time necessary for maintenance resupply, refit, and refurbishment, and will optimize the scheduling of maintenance actions with minimal impact on aircraft readiness. Additionally, standardization of aircraft components and equipment coupled with evolutionary changes in technology will reduce the in-theater logistics footprint as well as operational and support costs. Requisitioned parts will flow through the system in a matter of hours instead of days and be tracked via embedded electronics so that asset visibility is maintained wherever the unit is deployed.<sup>38</sup> Currently Comanche is the only Army aircraft designed for the two levels of maintenance concept outlined in the Aviation Objective Force structure.

### **PART III – TECHNOLOGY AND INNOVATION**

#### **NEW THINGS AND NEW WAYS TO CARRY OUT MISSIONS**

Joint Vision 2010 identified technological innovation as a vital component of the transformation of the joint force. Throughout the industrial age, the United States has relied upon its capacity for technological innovation to succeed in military operations, and the need to do so will continue. It is important, however, to broaden our focus beyond technology and capture the importance of organizational and conceptual innovation as well.<sup>39</sup> The current Aviation Modernization Plan seems more evolutionary than revolutionary. The current Aviation Objective Force concept is centered around four helicopter systems commonly referred to as the “big four”. These helicopters are the RAH-66 Comanche, AH-64D Apache Longbow, UH-60plus Black Hawk, and the CH-47F Chinook. This concept depends heavily upon the recapitalization of aircraft systems that are reaching or exceeding their expected life spans. The Longbow, Black Hawk and Chinook are based on 20 to 30 year old technologies. In order to remain relevant in the 21<sup>st</sup> century the Army Aviation Objective Force must maximize the use of new technologies and innovation in its development. Several revolutionary technologies and concepts loom large on the horizon for the Army Aviation Objective Force of the 21<sup>st</sup> century.

## RAH-66 COMANCHE

The RAH-66 Comanche represents the Army's next generation armed reconnaissance and attack helicopter. It supports the Objective Force commander as a survivable, multi-mission aircraft capable of orchestrating lethal, nonlethal, precision, and direct and indirect fires, and executing reach beyond that of the current helicopter fleet.<sup>40</sup> Comanche was designed as a system, not as a group of individual attributes. Its mission equipment package and airframe combine to form a new tool for the ground commander – one that stands ready to support the Objective Force.

The Comanche is tailor made for the challenges of combat in places like Afghanistan. Currently only U.S. special operations aircraft such as the Pave Low have the vital stealthy characteristics and night-flying capabilities that are essential for such operations. These helicopters have neither the information systems nor armament to function in tactical reconnaissance or strike roles. The Comanche will change all that. It can operate at night in all weather conditions, denying a future Taliban-like enemy such refuges. Its stealth features, advanced avionics and digital sensors will permit the kinds of low-altitude, nap-of-the-earth tactics that are the best for defeating AAA and low-altitude SAMS. The RAH-66 will carry sufficient munitions to deliver devastating blows against both equipment and personnel.<sup>41</sup>

**Onboard Sensors.** Comanche's primary target acquisition system is the Second Generation Forward Looking Infrared (FLIR), which increases target acquisition range by 50 percent compared to FLIR systems fielded today. Comanche's futuristic mission equipment package will reduce extended unmasking of the aircraft to evaluate large numbers of false targets. The Aided Target Detection/Classification (ATD/C) system receives sensor inputs, performs a set of pattern-matching operations, and presents targets to the crew for identification. Detected targets can then be shared with other combat assets or be used onboard for an engagement cycle. The location and symbolic electronic map overlay data, as well as target images or sensor video can be transmitted to other users. Other Comanche sensors include the advanced solid-state day TV, a radar-warning receiver, a laser warning receiver, and radio frequency (RF) interferometer. Information from these sensors can be fused with fire control data provided by predictive fire control software to convey extremely accurate data. Comanche also has an automated search-on-the-move capability and an automated air search capability that significantly enhances counter reconnaissance and the detection of threat unmanned aerial vehicles. Comanche's sensors, coupled with the man-in-the-cockpit, allow it to establish a recognition and identification level of situational awareness (SA) that other surveillance assets can't provide.<sup>42</sup>

**Communication Package.** The modern digital battlefield is characterized by Joint Contingency Force (JFC) Operations. Comanche provides a systems approach to ensure the integration of battle command functions. Data exchange and communication protocols are designed for integration with other Services and allies. Shared data will provide a common operating picture up and down the chain of command. Integrated Communication Navigation Identification Avionics (ICNIA) is the term used to describe this system jointly developed with the Air Force F-22 Program. Comanche is designed to operate with radios and protocols for the digital messages needed to communicate with joint assets within the theater.<sup>43</sup> Comanche's extensive processing power and algorithms can combine acquired information and data generated by multispectral, onboard sensors to reduce predictive errors and provide an accurate correlated picture. ICNIA also allows tactical aircraft to use RF fire-and-forget missiles in place of line-of-sight laser-guided missiles, providing a new operational capability when the ground is obscured by weather conditions such as those experienced in Kosovo.<sup>44</sup>

**Airframe and Armament.** Designed with advanced, low-observable technologies, Comanche can conduct deep operations undetected, providing a level of survivability unmatched by any other aircraft. Low-observable technology has significantly reduced IR, radar, and acoustic signatures. Comanche will have an embedded air-to-air capability, which requires extreme agility and maneuverability including sideward and rearward flight in excess of 80 knots. In the manned and unmanned team concept Comanche's air-to-air role will be critical in protecting the slow flying UAV from attack helicopters. It has self-deploy capability of 1,206 nautical miles and is designed and hardened for shipboard operations and transportability on Air Force C-130 aircraft. Comanche provides an inter-/intratheater independence not afforded by current helicopters.<sup>45</sup> This is significant in that the Comanche is not affected by the strategic airlift stranglehold experienced during Task Force Hawk. Although Comanche is most often discussed in the role of the reconnaissance platform, the "A" in its designation stands for attack. Comanche will carry remarkable firepower: a three-barrel, 20mm mini-gun mounted on a nose turret; a fully retractable missile armament system that will enable the helicopter to carry offensive weapons without compromising its stealthy shape; and internal and external carriages that allow Comanche to enter combat with up to 14 "fire-and-forget" hellfire anti-tank missiles. The carriage system also will allow the RAH-66 to carry 56 unguided or guided rockets, 28 Stinger air-to-air missiles, or a combination of weapons.<sup>46</sup>

**Sustainability.** The Comanche's all-composite airframe design provides numerous panels that allow easy access to line-replaceable parts. Other features are integrated onboard diagnostics and prognostics with unprecedented maintainability characteristics. An entire level

of traditional maintenance, the intermediate level, has been eliminated, resulting in Comanche sustainment with dramatically fewer personnel and significantly less support equipment than any other comparable helicopter in the world. The two-level maintenance system that supports the Comanche enables it to operate at a higher operational tempo in a more austere environment. Comanche provides improved reliability through the use of an embedded fault detection and isolation system that clearly identifies faults to maintenance personnel to effect a rapid repair or replacement of faulty items.<sup>47</sup>

#### TILTROTOR TECHNOLOGY

The Objective Force requires equipment that enables operational and tactical responsiveness across the full spectrum of conflict. Current aviation medium/heavy lift systems will not meet the envisioned Objective Force capabilities to operate on/from unprepared surfaces with the required lift capacity, volume, adverse weather operational capability and operational range.<sup>48</sup> The U.S. Army's planning pendulum seems to be swinging back toward tiltrotors, or at least several prominent generals are asking questions along those lines. LTG John M. Riggs, who's overseeing the Army's sweeping transformation efforts, says that endlessly upgrading existing conventional helicopters will not achieve the service's future objectives. "We cannot band-aid the current force to realize our vision of the Objective Force," he says. "We need to ask ourselves how we can better focus our resources for future relevance. Current rotary-wing aircraft may not be capable of keeping up with Objective Force operations, distance, maneuverability, and mobility." At some point, he said, the Army must ask itself: "Is tiltrotor technology a necessary enabler for the future, can fixed-winged aircraft absorb a portion of the tactical airlift mission?"<sup>49</sup>

**MV-22 Osprey.** The U.S. Marine Corps has taken the lead and most of the brunt in the fielding of this system. The Osprey is a revolutionary, tiltrotor, Vertical/Short Takeoff and Landing (VSTOL) aircraft designed to replace the Marine's aging CH-46E Sea Knight and CH-53D Sea Stallion helicopters. The Osprey will possess the speed, endurance, and survivability necessary to prevail on the increasingly lethal battlefields of the future. The aircraft incorporates significant technological advancements: fly-by-wire flight controls, a digital cockpit, sophisticated airfoil design, and superior manufacturing techniques. It will carry 24 combat-loaded soldiers or a 10,000-pound external load, and its 2,100-nautical mile range with a single aerial fueling gives it a strategic self-deployment capability. The Osprey's unique design configuration allows it to operate as a helicopter for takeoff and landing. Once in flight, the engines and rotors rotate forward and it becomes a highly efficient, high-altitude, turbo-prop aircraft that will cruise at 240

knots.<sup>50</sup> Although once a participant in the V-22 Osprey program, the Army rejected moving to tiltrotor technology. It decided to depend largely on the recapitalization of the UH-60 Black Hawk and CH-47 Chinook. This decision was made in large part to reduce the overall cost of the aviation modernization program.

**V-44 Future Transport Rotorcraft (FTR).** Twice a V-22 the V-44 FTR will provide a capability that does not exist anywhere in the world today. The concept for the aerial assault platform comes from the Bell Helicopter Textron. They have teamed with Boeing on the development of the Osprey and now developed a concept for a larger fuselage than the Osprey. The V-44 would be the size of a stretched C-130 Hercules, the V-44 will feature two V-22-type wings, each having an engine and a combination rotor-propeller mounted at the outboard tips. The V-44 is designed to be a heavy-hauler. The cabin will be large enough to internally carry an 8x8x40-ft. container, the Comanche helicopter, all types of high mobility multipurpose wheeled vehicles; light armored vehicles, eight standard loading pallets, or 70 (medivac) litters. The V-44 will be capable of transporting 80 to 100 troops or 10 to 20 tons of equipment and supplies at speeds greater than 300 mph over distances from 100 to 200 miles and then safely land vertically, without the need for runways or airports.<sup>51</sup>

The future capabilities of the V-22 Osprey and the V-44 Future Transport Rotorcraft clearly answer the requirements outlined for the Air-Maneuver and Transport unit within the Army Aviation Objective Force. These systems provide strategic responsiveness, operational maneuver, and tactical flexibility through vertical envelopment, and precision delivery of ground maneuver assets. The V-44 will be capable of inter-/intra-theater transport of all the component platforms of the Future Combat Systems (FCS) combat configured with its' full compliment of crew, fuel and ammunition, digitally linked to exploit enroute planning, rehearsal and real time intelligence, and capable of fighting upon arrival, without reliance on prepared landing surfaces. The most significant capability afforded by these two systems is their ability to self-deploy to any region worldwide.<sup>52</sup>

#### MANNED AND UNMANNED AIR MANEUVER TEAM

Throughout the Army's Transformation to the Objective Force, Army Aviation will continue to provide critical support to the ground commander's scheme of maneuver in a joint and combined arms environment. Manned and Unmanned (MUM) air maneuver teams, comprised of RAH-66 Comanche and the Extended Range Multi-Purpose Unmanned Aerial Vehicle (ERMP-UAV) are key enablers in achieving required air-ground synergy in Objective Force units. As an essential element of the Objective Force air-ground task force, MUM teams

conduct: reconnaissance, mobile strike, close combat with ground forces, and support of vertical maneuver (divisional air assaults and operational air assaults). Manned and unmanned air maneuver teaming, where each team member complements and compensates for the strengths and vulnerabilities of the other, enables Aviation and the Objective Force, to achieve the quality of firsts.<sup>53</sup>

**See First.** The Low Observable (LO) characteristics of the Comanche in conjunction with the ability of the ERMP-UAV to either operate at terrain flight altitudes or above the reach of enemy air defense enable the MUM team to reach position of advantage far forward in the joint operations area without detection. Cued by off-board sensors such as Joint Surveillance Targeting and Acquisition Radar System (JSTARS) and joint UAV assets, the MUM team develops the situation out of contact, observing targets from multiple aspects with complementary sensors. By using Comanche Fire Control Radar (FCR) and off-board sensors to cue the narrow view/extreme range UAV sensors, the MUM team achieves detection, classification, recognition, and identification at much greater ranges than either system could accomplish alone. The man-in-the-loop capability of MUM remains essential to achieve the final level of target affiliation, determining the difference between friend, foe, or non-combatant, to enable precision engagement. The Comanche Mission Equipment Package (MEP) integrates sensor footprints of the MUM team, allowing the crew to ensure the entire reconnaissance area is covered. In addition, Comanche and ERMP-UAV aided by advanced Aided Target Recognition (ATR) technology and Cognitive Decision Aiding Software (CDAS) enable quick and accurate reconnaissance of a given area through automated scan capability and assisted target recognition.<sup>54</sup>

**Understand First.** The MUM team's man-in-the-loop capability is the most critical when developing situational understanding and transforming reconnaissance data into useful combat information. As an integral member of the MUM team, Comanche provides two officers with 360-degree situational awareness, forward deployed at the critical point of decision. Comanche as the manned system provides a fully integrated control capability to task the UAV platform and sensors and to integrate combat information into the common operational picture while retaining the full combat effectiveness of the manned platform. The BLOS/NLOS communication capabilities of the ERMP-UAV enable immediate and reliable digital and voice transmission of combat information to all elements within the system of systems.<sup>55</sup>

**Act First.** With dominant situational understanding supported by all sensors within the MUM team, Comanche provides rapid man-in-the-loop decision making within the commander's intent. The Comanche crew, aided by CDAS, also provides the capability for dynamic retasking

across the entire operational spectrum. When presented with a fleeting target opportunity, the remote designation capabilities and organic precision munitions of both platforms in the MUM team meet the need for rapid engagement without exposure of the observing member of the team, enhancing the survivability of both systems. BLOS/NLOS communications ensure constant contact to facilitate timely action and prosecution of joint fires based on critical information provided by the MUM team.

**Finish Decisively.** When necessary, the MUM team immediately transitions from an armed reconnaissance to a mobile strike or close combat role. With reach-back capability to the arsenal of the entire system of systems, the MUM team possesses combat overmatch capability without compromising its location. Through sharing of joint precision fires to shape the battlespace, the MUM team destroys enemy targets without becoming decisively engaged.<sup>56</sup>

The operational capabilities afforded by the MUM team concept is a critical variable for the Army Aviation Objective Force to meet the requirements identified for the Objective Force in the 21<sup>st</sup> century. The MUM team concept will truly enable the Objective Force to see first, understand first, act first, and finish decisively.

#### ARMY AIRBORNE COMMAND AND CONTROL SYSTEM (A2C2S)

The Army Airborne Command and Control System is leading the transition to the Objective Force command and control (C2) on the move. At the present time the system is hosted on the UH-60 Black Hawk helicopter. In order for the A2C2S to meet the requirements of the Objective Force in the 21<sup>st</sup> century the host aircraft must be capable of self-deployment. The MV-22 Osprey will serve as an ideal platform for the A2C2S for the Army Aviation Objective Force. I envision a roll-on, roll-off capability of the A2C2S in the future that enables commanders the flexibility to employ a command and control element anywhere on the battlefield rapidly. The Army A2C2S is the Army's only digital airborne command and control system supporting corps, division, and brigade commanders. The A2C2S provides commanders with an Airborne Tactical Command Post (TAC CP), with greater mobility than currently available in their ground TAC CP. The A2C2S supports command and control requirements for missions ranging from humanitarian assistance to deep operations in high intensity conflict. This highly mobile tactical command post provides the maneuver commander the capability to maintain situational awareness (SA) and exercise command and control. To provide the commander SA and command and control (C2), the A2C2S hosts the Army Battle Command System (ABCS) which allows the commander to access the tactical internet to manipulate, store, manage, and analyze situational awareness information, intelligence data,

and mission plans. The specific ABCS systems include the Maneuver Control System (MCS), the All Source Analysis System (ASAS), Advanced Field Artillery Tactical Data System (AFATDS), Force XXI Battle Command Brigade and Below (FBCB2), Combat Service Support Control System (CSSCS), and Air and Missile Defense Workstation (AMDWS). Aviation assets, such as A2C2S, permit commanders to quickly see their AO and command, control, and communicate on the move. The communication connectivity is supported by a robust communications suite that includes Non-Line-of-Sight radios, such as High Frequency and Satellite Communications-Demand Assigned Multiple Access (SATCOM DAMA), as well as wide band digital radios.<sup>57</sup> These capabilities enable commanders to exercise C2 of assigned and attached elements and to coordinate with adjacent, supported, and supporting Joint, Combined, or Component forces by means of voice and data equipment with battlefield information processing and operations. The A2C2S is critical to Army Transformation, enabling the Battle Command Group's ability to effectively perform combat unit operations and serve as a force multiplier for the Army's Objective Force. The A2C2S is projected to be a highly mobile, tactical command post, capable of transiting the battlefield while maintaining full connectivity with the tactical internet. The result is that the A2C2S "un-tethers" the commander from his TOC, thus allowing him to position himself at the critical point on the battlefield. The A2C2S is truly a commander/execution-centric system. The unique capabilities afforded by the A2C2S allow the commander to: see first – digital C2 systems maintain continuous situational awareness, understand first – ability to fuse C2 information with command presence, act first – constant communication, voice and data, with maneuver forces, and finish decisively – fully synchronize combat power gained by mission command through C4I systems.<sup>58</sup>

#### **PART IV – ORGANIZATIONAL CONCEPT**

##### **A SOLUTION FOR THE ARMY AVIATION OBJECTIVE FORCE**

The Army Aviation Objective Force organizations will serve as critical enablers for the Objective Force in its ability to achieve full spectrum dominance. Aviation organizations will be organized to support the units of purpose framework. Following the lessons learned from both past and recent history. Air-ground teams will be integrated at the lowest possible level. This level is currently referred to as the Units of Action (UA), brigade and below. Aviation organizations will also be embedded into the Units of Employment (UE), division level (UE1) and corps level (UE2). In keeping with the Objective Force design concept, aviation units will be modular, tailorable and standardized to the extent possible, both between echelons and components of the force. The versatility of new systems like the Comanche will create a multi-

functionality in an unit's ability to be proficient in reconnaissance, security, and mobile strike missions vice maintaining units that are cavalry or attack specific. Similarly, vertical maneuver and increased sustainment support may require lift assets at different levels than found in the current force. The anti-access environment requires vertical takeoff and landing capability not tied to improved landing surfaces. The Army Aviation Objective Force will be capable of teaming with UAVs and employing precision munitions to expand and make the battle area more lethal.<sup>59</sup> The aviation organizations at the UA and UE will be standardized to facilitate tailoring, although UE2 (corps level) will require additional combat support aviation organizations in order to conduct shaping operations or to weigh the main effort in the conduct of decisive operations. Since aviation units will not likely be included in pre-positioned equipment stocks, they will require increased emphasis on self-deployment/entry operations into unimproved areas. The Aviation Objective Force organization are structured to provide aviation capabilities for the Objective Force's Unit of Action (UA), Unit of Employment 1 (division level), and Unit of Employment 2 (corps level).

#### UNIT OF ACTION (UA) (BRIGADE LEVEL) AVIATION ORGANIZATION

The hallmarks of Unit of Action (UA) operations is its ability to develop situations out of contact, come at the enemy in unexpected ways, use teaming with leader initiative, maneuver to positions of advantage with speed and agility, engage enemy forces beyond range of their weapons, destroying them with enhanced fires, and assaulting him at times and places of our choosing.<sup>60</sup> The aviation organization designed to support the Objective Force's Unit of Action is an aviation detachment consisting of a headquarters section; a aviation maintenance support company; and two RAH-66 Comanche companies (12 RAH-66 Comanches and 8 UAVs). The aviation detachment will facilitate the integration of air-ground movement in order to find/fix enemy forces, to build and share the common operational picture tailored to air-ground team task/purpose, and to focus combat power at the decisive point at the right time. The aviation detachment will also provide security by allowing the commander time to react and maneuver out of contact with the enemy and provide early warning and protection if conditions change. The aviation detachment will combine attack aviation and unmanned systems to bring mass effects to isolate and destroy enemy forces or shield friendly forces as they move out of contact. The Unit of Action Aviation Detachment is depicted below:

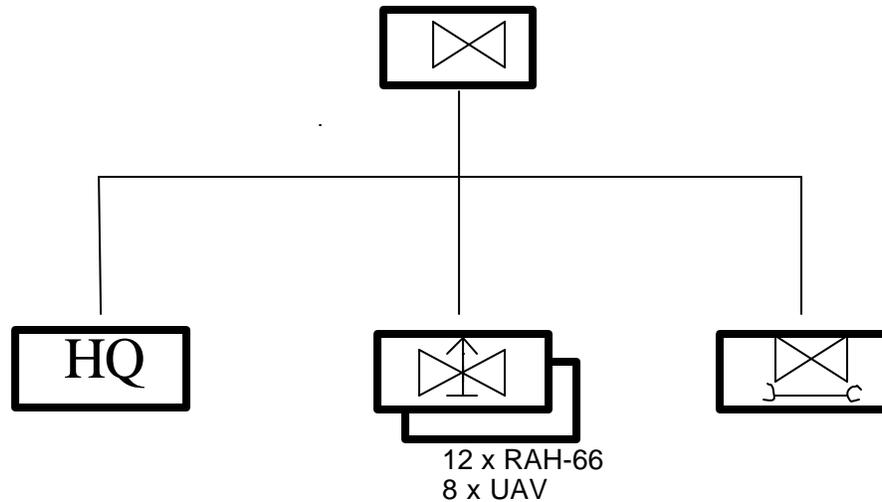


FIGURE 1. UNIT OF ACTION AVIATION DETACHMENT

UNIT OF EMPLOYMENT (UE) (DIVISION AND CORPS LEVELS) AVIATION ORGANIZATIONS

Units of Employment (UE) are highly tailorable, higher level echelons that integrate and synchronize Army forces for full spectrum operations at the higher tactical and operational levels of war. Focused on major operations and decisive land campaigns in support of joint operational and strategic objectives, units of employment participate in all phases of joint operations from initial entry to conflict termination in any form of conflict and operational environment. The structure is scalable throughout the spectrum of conflict and can permit the temporary elimination of intervening echelons when it is optimal to do so.<sup>61</sup> Strategic responsiveness is a core requirement for the Objective Force UE to provide greater options to the joint force commander for entry operations and rapid transition to decisive operations.<sup>62</sup>

**Unit of Employment 1 (UE1) (division level) Aviation Organization.** The aviation organization designed to support the UE1 (division level) consist of a group headquarters and headquarters company; two RAH-66 Comanche battalions (36 RAH-66 Comanches and 18 UAVs); two heavy lift battalions (48 MV-22 Osprey); one command and control company (6 MV-22 Osprey A2C2S equipped); and an aviation support battalion. The aviation organizations within the UE1 provide aviation assets capable of conducting mobile strikes, vertical maneuver (mounted and dismounted), logistical sustainment, and command and control (A2C2S). Mobile Strike will enable the commander to use attack aviation and unmanned systems against key enemy targets deep within the operational area. Its focus will be on enemy C2 nodes, air

defense systems, mobile long-range SSMs and artillery, and reinforcing ground forces. Vertical maneuver enables a commander to air assault mounted or dismounted elements of the UA to extend tactical reach, negate the effects of terrain, achieve surprise, and deny the enemy rest or sanctuary. The Unit of Employment 1 (division level) Aviation Organization is depicted below:

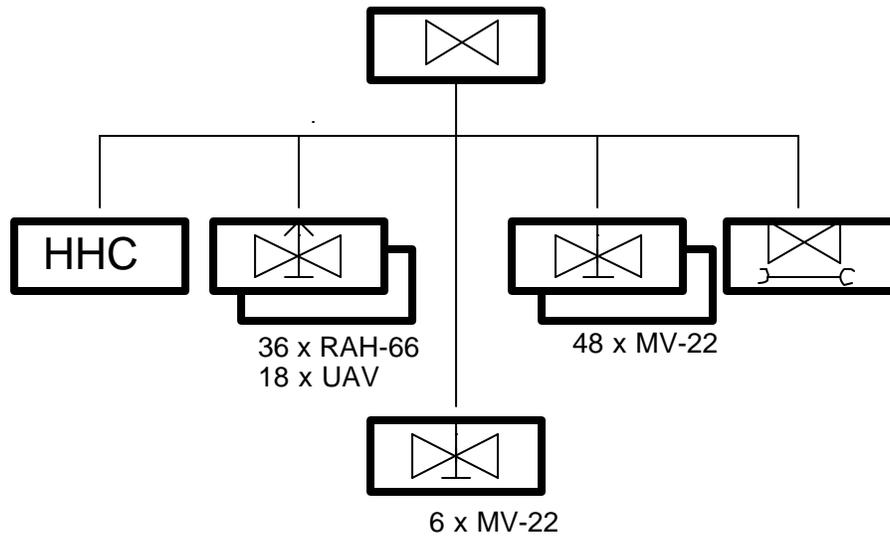


FIGURE 2. UNIT OF EMPLOYMENT 1 (UE1) (DIVISION LEVEL) AVIATION ORGANIZATION

**Unit of Employment 2 (UE2) (corps level) Aviation Organization.** The aviation organization designed to support the Unit of Employment 2 (corps level) consist of a group headquarters and headquarters company; two RAH-66 Comanche battalions (36 RAH-66 Comanches and 18 UAVs); one MV-22 Osprey heavy lift battalion (24 MV-22 Ospreys); one V-44 inter-/intra theater heavy lift battalion (24 V-44s); one command and control company (6 MV-22 A2C2S equipped); and one aviation support battalion. UE2 are capable of conducting the same type of missions as the EU1 aviation assets. The significant capability the UE2 Aviation Organization brings to the commander is an organic inter-/intra theater heavy lift asset. This organization will minimize the mobility challenges that have surfaced during recent deployments. The Unit of Employment 2 (corps level) Aviation Organization is depicted below:

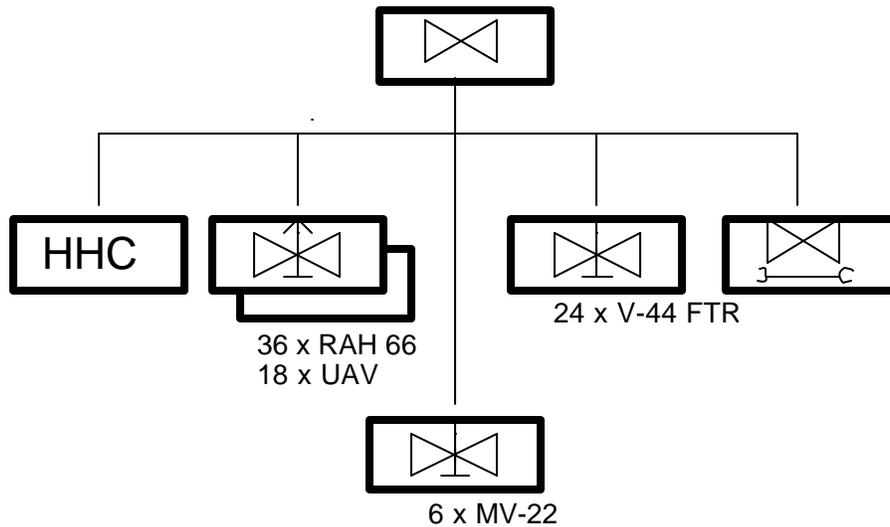


FIGURE 3. UNIT OF EMPLOYMENT 2 (UE2) (CORPS LEVEL) AVIATION ORGANIZATION

#### FUTURE AVIATION LEADERS

As the Army continues down the path to transformation our future leaders must also transform. Army Aviation will require adaptive leaders possessing the capability for situational understanding and material capable of rapid mobility, tactical and operational standoff with direct and indirect precision fires and fully integrated air-ground maneuver with great precision over both operational and tactical distances.<sup>63</sup> The independent operations characterized by the future aviation force will require young leaders who are capable of executing complex operations at the lowest operational level. Our junior leaders will not only have to be technically proficient they will also have to possess an understanding of the commander's intent, an adaptability and a multi-functionality that we currently demand from our field grade rank. Training leaders to this level of proficiency will require an adjustment to our current training model. It will also require an adjustment to our present rank structure by formation and echelon of command to maintain the proper balance of requirements in regards to experience and expertise. The effectiveness of the future Army Aviation Objective Force hinges directly on the technical and tactical abilities of our future aviation leaders and their ability to fight and win our nation's wars.

#### CONCLUSION

The collapse of our Cold War adversary the Soviet Union coupled with the terrorist attacks of September 11 have highlighted the urgency for our Army to transform now for an uncertain future. The Army Aviation Objective Force will serve as a key enabler and vital member of the

air-ground maneuver team as the Army moves ahead in the transformation process. Creating an Army Aviation Objective Force that exhibits those characteristics outlined in the frameworks of Joint and Army Vision will ensure aviation is relevant and capable of facing the challenges of the future threat. This process is not an easy as it will require us to break with the established paradigms to create a new and innovative force capable of full spectrum dominance.

This paper provides a clarity of direction for the development of the Army Aviation Objective Force for the 21<sup>st</sup> century. This direction is influenced by the fundamental principles outlined in both the Joint Vision and Army Vision. Addressing these principles in detail helps formulate the vision for the Army Aviation Objective Force. With this vision in hand we can provide a clarity of direction and acknowledge that change and sacrifices in the present aviation force will be necessary in order to reap the benefits of a superior force in the future. This paper also addresses the importance of technology and innovation as a vital component of the Army Aviation Objective Force. The current Aviation Objective Force concept is centered around the recapitalization of aircraft systems that are reaching or exceeding their expected life spans (AH-64D Longbow, UH-60plus Black Hawk, and CH-47F Chinook). In light of the present budget constraints this concept would be understandable except that these systems do not possess the capability to meet the requirements outlined in the Joint Vision and Army Vision for the Objective Force. The RAH-66 Comanche will not be fully fielded until 2020. In light of this fact it makes sense to devoid ourselves of the AH-64D Longbow recapitalization and procure additional Comanches to fill the attack role. At the present time it is not difficult to envision the Comanche as the Army Aviation FCS for the reconnaissance and attack mission. The future capabilities of the Comanche far exceed any system that exists in the near or far term. The Manned and Unmanned (MUM) air maneuver team, comprised of the RAH-66 Comanche and the Extended Range Multi-Purpose Unmanned Aerial Vehicle (ERMP-UAV) will be key enablers in the Army Aviation Objective Force achieving the air-ground synergy required in the Objective Force. This innovative concept will enable the Objective Force to achieve the quality of first. See first, understand first, act first, and finish decisively. Tiltrotor technology, specifically the V-22 Osprey and the V-44 Future Transport Rotorcraft (FTR) will enable the Army Aviation Objective Force to meet the requirements of operational and tactical responsiveness outlined in the fundamental principles. Current aviation medium/heavy lift systems do not meet the Objective Force requirements to lift the Future Combat System (FCS) over an extended operational range. The V-44 FTR is designed as a heavy lift aircraft capable of carrying all variants of the FCS and Comanche. The most significant capability of the V-22 and V-44 is their ability to self deploy and travel long operational ranges non-stop through the use of aerial

refueling. The Army Airborne Command and Control System (A2C2S) is at the forefront the Objective Force Command and Control (C2) on the move. Mounted on a V-22 Osprey this system provides the commander a highly mobile tactical command post capable of maintaining situational awareness and command and control through the use of the Army Battle Command System (ABCS). Finally, this paper provides a solution for the organization and structure of the Army Aviation Objective Force. Realizing from the hard lessons learned from Task Force Hawk that Army Aviation had become too reliant on strategic lift requirements. It has become readily apparent that the Army Aviation Objective Force must be unburdened of significant deployment requirements. Designing an Aviation Objective Force centered on the Comanche, V-22 Osprey, and V-44 Future Rotor Transport (FTR) system proactively attacks the deployability issue. The Comanche's ability to be transported via C-130 aircraft provides an inter-/intra-theater independence not afforded by the other members of the "big four", freeing valuable strategic and theater airlift assets. From a strategic deployment perspective, the V-22 Osprey and the V-44 FTR will provide Army Aviation and the Army in general great benefit. They will facilitate transoceanic deployment of airmobile assets without relying on Air Force strategic lift. To truly take advantage of the capabilities of the V-44 FTR we must break the paradigm of placing airframes with this type of profile at the theater level. We must place this capability at the Corps level operated by Army Aviators. This will provide the tactical commander the response and flexibility he will need to defeat the future threat.

## **RECOMMENDATION**

The Army and Army Aviation should adopt the strategic vision (principles) outlined in this paper for the development of the Army Aviation Objective Force in the 21<sup>st</sup> century. Following this framework will ensure the Aviation Objective Force meets the requirements of both Joint and Army Vision. The Army must distance itself from the "big four" concept and recapitalization to capitalize on leading edge technologies that are available in the 21<sup>st</sup> century. The force concept identified in this paper will provide an aviation force that is strategically responsive and dominant at every point across the full spectrum of military operations. It will provide an Army Aviation Objective Force that is more deployable, agile, versatile, lethal, survivable, and sustainable.

WORD COUNT=: 10,243



## ENDNOTES

- <sup>1</sup> MG John M. Curran, "Moving Out to the Objective Force," Army Aviation, (August-September 2001), 8.
- <sup>2</sup> David Jablonsky, "Army Transformation: A Tale of Two Doctrines", Parameters, US Army War College Quarterly,-(Autumn 2001), 43.
- <sup>3</sup> Army Transformation Roadmap, June 2002, vii.
- <sup>4</sup> TRADOC Analysis Center, Future Combat System (FCS) Mission Area Analysis (MAA) Report (TRAC-F-02-008), Headquarters, United States Training and Doctrine Command, Fort Monroe, Virginia, April 2002, 2.
- <sup>5</sup> United States Army Aviation Center, Air Maneuver and Transport (AMT) Mission Area Analysis, Fort Rucker, Alabama, 30 August 2002, 3.
- <sup>6</sup> Ibid., 4.
- <sup>7</sup> Ibid., 5.
- <sup>8</sup> John P. Kotter, Leading Change, Harvard Business School Press, Boston Massachusetts, 1996, 70.
- <sup>9</sup> United States Army Aviation Center, Air Maneuver and Transport (AMT) Mission Area Analysis, Fort Rucker, Alabama, 30 August 2002, 5.
- <sup>10</sup> Joint Vision 2020, Chairman of the Joint Chiefs of Staff, Washington D.C., June 2000, 20.
- <sup>11</sup> Department of Military Strategy, Planning and Operations, The First Year: U.S. Army Forces Central Command During Operation Enduring Freedom (Draft), U.S. Army War College, Carlisle Barracks, Pennsylvania, 1 November 2002, 18.
- <sup>12</sup> Warren Zinn, "In Shah-e-Kot, Apaches save the day – and their reputation", Army Times, 25 March 2002, 15.
- <sup>13</sup> David D. McKiernan, The Army—one force, one mission: "Win this war and prepare for future wars", Army, Arlington, Virginia, October 2002, 145.
- <sup>14</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 14.
- <sup>15</sup> Joint Vision 2020, Chairman of the Joint Chiefs of Staff, Washington D.C., June 2000, 22.
- <sup>16</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 14.

- <sup>17</sup> COL Michael A. Hamilton and Michael C. Padden, "Army Tactical UAVs – Supporting Army Transformation," Army Aviation, February 28, 2002, 20.
- <sup>18</sup> Joint Vision 2020, Chairman of the Joint Chiefs of Staff, Washington D.C., June 2000, 24,25.
- <sup>19</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 15.
- <sup>20</sup> Joint Vision 2020, Chairman of the Joint Chiefs of Staff, Washington D.C., June 2000, 26.
- <sup>21</sup> TRADOC Pamphlet 525-3-0, "The United States Army Objective Force Concept (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 17 January 2002, 29.
- <sup>22</sup> Joint Vision 2020, Chairman of the Joint Chiefs of Staff, Washington D.C., June 2000, 28.
- <sup>23</sup> TRADOC Pamphlet 525-3-0, "The United States Army Objective Force Concept (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 17 January 2002, 29.
- <sup>24</sup> Army Airborne Command and Control System (a2C2S), available from <http://www.aatd.eustis.army.mil/Business/FactSheets/A2C2S/A2C2S.asp> Internet, Accessed 25 November 2002, 1.
- <sup>25</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 14.
- <sup>26</sup> United States Army White Paper: Concepts for the Objective Force, available from [http://www.army.mil/features/White\\_Paper/Objective\\_ForceWhitePaper.pdf.htm](http://www.army.mil/features/White_Paper/Objective_ForceWhitePaper.pdf.htm) Internet, Accessed 17 November 2002, 8.
- <sup>27</sup> Lewis M. Jamison, "Will Army Aviation be invited to play in the next war?", Military Review, Fort Leavenworth, May-June 2002, 40.
- <sup>28</sup> Thom Crouch, "The RAH-66 Comanche: Key to the Army Vision", Army Aviation, (March-April 2000, 20.
- <sup>29</sup> TRADOC Pamphlet 525-3-0, "The United States Army Objective Force Concept (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 17 January 2002, 12.
- <sup>30</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 5,6.

<sup>31</sup> TRADOC Pamphlet 525-3-0, "The United States Army Objective Force Concept (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 17 January 2002, 13.

<sup>32</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 9.

<sup>33</sup> Scott R. Gourley, "Army Aviation and Army Transformation", Army Magazine, Arlington, Virginia, January 2002, 3.

<sup>34</sup> TRADOC Pamphlet 525-3-0, "The United States Army Objective Force Concept (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 17 January 2002, 13.

<sup>35</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 18.

<sup>36</sup> *Ibid.*, 10.

<sup>37</sup> *Ibid.*, 13.

<sup>38</sup> *Ibid.*, 13.

<sup>39</sup> Joint Vision 2020, Chairman of the Joint Chiefs of Staff, Washington D.C., June 2000, 10.

<sup>40</sup> William R. Richardson; Crosbie E. Saint, "Why Comanche", Army Magazine, Arlington, Virginia, August 2002, 2.

<sup>41</sup> Daniel Goure, "A Comanche Transformation", Rotor&Wing, February 2002, 2.

<sup>42</sup> MG Joseph L. Bergantz, "Comanche: Leading the Army's Transformation", Army AL&T, November-December 2000, 2.

<sup>43</sup> *Ibid.*, 3.

<sup>44</sup> *Ibid.*, 3.

<sup>45</sup> Thom Crouch, "The RAH-66 Comanche: Key to the Army Vision", Army Aviation, (March-April 2000), 20.

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<sup>49</sup> Defense Update, "AUSA/AAAA Examine Army Aviation Goals", available from <http://www.aviationtoday.com/reports/rotorwing/previous/0202/0202defup.htm>, Internet; accessed 18 November 2002.

<sup>50</sup> GEN Charles C. Krulak, "Advancing Aviation", Marines, March 1999, 5.

<sup>51</sup> Scott R. Gourley, "V-44: The Pentagon's next transport flies like a plane, lands like a helicopter and unloads enough firepower to start—or stop—a war", available from <http://216.239.33.100/search?q=cache:QmZYiYafAhcj:popularmechanics.com/science/aviation/2000/9/v4...> Internet, accessed 29 November 2002.

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<sup>53</sup> TRADOC White Paper: Manned and Unmanned Air Maneuver Teaming in Objective Force Air-Ground Operations, TRADOC Systems Manager-Comanche, Fort Rucker, Alabama, 24 May 2002, 2.

<sup>54</sup> *Ibid.*, 9.

<sup>55</sup> *Ibid.*, 9.

<sup>56</sup> *Ibid.*, 9.

<sup>57</sup> United States Army, Army Airborne Command and Control System (A2C2S) Operational Concept, Acquisition Strategy, and Fielding Assessment Study, Final Report, (Draft), June 2001, 2-2.

<sup>58</sup> *Ibid.*, 27.

<sup>59</sup> TRADOC Pamphlet 525-3-04, "Objective Force Army Aviation Warfighting Concept of Operation (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 23.

<sup>60</sup> Objective Force: Organization and Operations Concept (Final Draft), Objective Force Study Group, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 5 February 2001, 11-12.

<sup>61</sup> TRADOC Pamphlet 525-66, "Objective Force Capabilities (Draft)", Department of The Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia, 1 October 2002, 6.

<sup>62</sup> *Ibid.*, 22.

<sup>63</sup> MG John M. Curran, "Moving Out to the Objective Force," Army Aviation, (August-September 2001), 10.



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