STRATEGY RESEARCH PROJECT

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THE ARMY AVIATION OBJECTIVE FORCE 2020: A STRATEGIC VISION FOR TRANSFORMING U.S. ARMY AVIATION

BY

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ABSTRACT

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This essay recommends a strategic vision for the Army Aviation objective force of 2020. It formulates a comprehensive operational and organizational concept as well as a strategy for the development of future Army Aviation systems. It is described in the context of Joint Vision 2020 and the Army Transformation and the Objective Force. The Army Aviation Force of 2020 will be a fully integrated member of the pre-eminent and totally transformed land force, exploiting advancements in information and aerospace technology and employing complimentary air and ground future combat systems (FCS) as a system of systems. Army Aviation systems will be reduced to two manned platforms and one un-manned platform. The soldiers and the systems will be organized into Aviation Units of Action (AUA). These AUA will enable the Brigade Combat Team, Corps or JTF commander to weight the main effort, attack and maneuver at operational depths in non-linear, non-contiguous battlespace and deliver massed effects at the place and time of his choosing. This bold vision for the Army Aviation Objective Force holds the promise of providing future commanders the tools necessary to conduct rapid and decisive operations across the full spectrum when committed by the Secretary of Defense.

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THE ARMY AVIATION OBJECTIVE FORCE 2020:
A STRATEGIC VISION FOR TRANSFORMING US ARMY AVIATION

> "...Someday bigger, faster and better helicopters will carry the infantry into battle, forever freeing it of the tyranny of terrain and permitting war to proceed at a pace considerably faster than that of a man walking. The helicopter holds the possibility of making the battlefield a truly three-dimensional nightmare for an enemy commander."[1]
>
> —Lieutenant General Hal Moore

PURPOSE.

Today Army Aviation stands at a crossroad. Army Aviation's short, but storied history validates the warfighting theories of military visionaries like Generals Gavin, Howze and Galvin. The synergy of air-ground integration has proven itself repeatedly in conventional, as well as special operations from Vietnam to Desert Storm and today in Afghanistan. We have arrived at a point in history where once again there is an opportunity to revolutionize the way our Army fights. A new generation of military leaders has created a climate in which the institution can truly transform. Their vision, enabled by new technology has shown us what is in the realm of the possible. Unfortunately, Army Aviation's approach to transformation has been incremental, not revolutionary. We speak in terms of modernization, not transformation. History counsels against this incremental approach. Our innovative thinking and creativity has been constrained by the "pathway dependency" of our stove piped systems. Our parochial interest and loyalty to a particular mission design series of aircraft clouds our judgment. As a result, we may not be making the best use of our limited resources and could be out of step with the Army Objective Force. In the pages that follow, I will offer an "out-of-the-box" approach for a bold new vision for the Army Aviation Objective Force of the future. This strategic vision draws on the concepts laid out in Joint Vision 2020 and incorporates the required characteristics and leap ahead capabilities that are the goal of the Army's Objective Force.

PART I – SHAPING THE VISION.

JOINT VISION 2020.

The ideas expressed in Joint Vision 2020 provide the fundamental tenets for the Army Aviation Objective Force of 2020. The challenge for Army Aviation leadership today is to develop a strategic vision for an aviation force that is dominant across the full spectrum of military operations and incorporates the interdependent application of dominant maneuver, precision engagement, focused logistics and full dimensional protection. (Footnote JV 2020)

The transformation of Army Aviation forces over the next two decades will be influenced by new aerospace and information technologies that will permit unprecedented capability and synergy to the overall Army Objective Force.

Dominant Maneuver.

"Dominant maneuver is the ability of forces to gain positional advantage with decisive speed and overwhelming operational tempo to achieve military tasks." [2] The Army's main Science and Technology (S&T) effort today is the development of the Future Combat System (FCS). The FCS will be the primary platform for ground maneuver elements. It will be highly mobile, but still be limited by the "friction" of the terrain. The FCS is a multi-mission chassis that will incorporate, infantry transport, direct fire, indirect fire, command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) variants.[3] This "system of systems" approach will significantly influence Army Aviation with regard to the design of future aviation platforms. Army Aviation Objective Force 2020 operational concept, systems, and organization must compliment the FCS and will extend the operational reach of the maneuver force. The notion of "vertical envelopment" will mature and evolve to the concept of "operational maneuver in the third dimension". Army Aviation Objective force units will be organized with Objective Force units achieving maximum air-ground integration and synergy.

Precision Engagement.

"Precision engagement is the ability of forces to locate, discern and track targets; select, organize, and us the correct systems to engage or attack; generate desired effects; assess results; and reengage with decisive speed and overwhelming effect."[4] Attack and reconnaissance will remain enduring missions of the Army Aviation Objective Force. Aviation systems must be integrated into the air-ground team and employ both kinetic and non-kinetic precision strike weapons. The weapons will have the highest probability of hit and appropriate effects for the target, while minimizing collateral damage. Aviation systems will have the ability to leverage joint and indirect fires in support of air-ground team operations across the spectrum. "The pivotal characteristic of precision engagement is the linking of sensors, delivery systems, and effects."[5]

Focused Logistics.

"The goal of the focused logistics concept is to provide to the Army the right supplies and services at the right place, at the right time."[6] The Army Aviation Objective Force of 2020 will reduce logistics costs and in-theater logprint. The aviation force design will minimize personnel,

supplies, maintenance, materiel and transportation requirements. These goals will be achieved through the application of the emerging logistical concepts of anticipatory logistics, demand reduction, velocity management, commonality of spares, reach capability; encompassing reach back, reach laterally, and reach forward capability.[7] Additionally, Army Aviation Objective Force systems will be key enablers for sustainment to the overall Army Objective Force. These aviation systems will be capable of operating in non-contiguous battlespace and provide responsive and capable, aerial retail and wholesale re-supply without the requirement for a fixed airfield.

Full Dimensional Protection.

The ability of Army forces to protect its personnel and other assigned assets required to decisively execute assigned tasks is a critical component of the future operational concept. The Army Aviation Objective Force will exert control over the area of operations to ensure friendly forces maintain freedom of action during deployment, maneuver, and engagement. This force will also be able to demonstrate to potential adversaries the futility of attacking Army forces.[8] Enhanced situational understanding (SU) through information superiority will allow aviation commanders to know when his aviation resources are at risk and take action to avoid or eliminate the threat. Future aviation systems will be designed to increase survivability through the application of low observable technology, enhanced aircraft survivability equipment and SU systems.

Information Superiority.

Information Superiority is the keystone of Army Transformation. It will provide Army commanders with an overwhelming competitive advantage throughout the electronic spectrum on future battlefields.[9] The so-called "Revolution of Military Affairs" (RMA) theorizes that C4ISR systems will enhance battlespace awareness thus allowing for the precise use of force at the place and time of our choosing.[10] It is imperative that the Army Aviation Objective Force systems be fully integrated with all Army Battle Command Systems (ABCS) and equipped with beyond line of sight, long-range voice and digital connectivity with C4ISR networks. Information superiority creates a network centric Army Objective Force that will "see first, understand first, act first, and finish decisively."[11]

PART II - ARMY TRANSFORMATION AND THE OBJECTIVE FORCE.

GENERAL.

The vision for Army Transformation is to develop a future force that is strategically responsive and dominant across the full spectrum of operations.[12] The Objective Force will be employed in the conduct of battles and engagements in shaping and decisive operations nested in the joint campaign.[13] "The FCS equipped force will be able to respond to a military situation, with overwhelming capabilities, within 96 hours anywhere in the world."[14]

The Future Combat Systems.

The design, development, and fielding of Objective Force future ground and air combat systems are key elements of the vision. As stated, the land FCS will be highly mobile and survivable. The FCS will consist of a family of systems that have a common chassis, digital connectivity to a command network and multi-mission functionality. It is envisioned that infantry transport, direct fire, indirect fire, reconnaissance and C4ISR variants will be produced. Two key design criteria are that the weights of any system not exceed 40,000 pounds and that it fit into a standard US Air Force C-130 sized cargo compartment.[15] Unfortunately, the C-130, C-17, or C-5 air transport fleet all require a 5,000 to 10,000 foot long airport runway in order to land. The Objective Force requires the marriage of lighter weight armored systems with an improved vertical take of and landing (VTOL) capability to enable operational maneuver and reduce the requirement for fixed airfields.

The framework for the organization of Objective Force units is the Unit of Action (UA) and the Unit of Employment (UE). These units will be organized around sets of multi-functional tactical and operational elements that contribute directly to the joint force to achieve rapid decision in the land campaign.[16] Information Technology will allow for further "flattening" of organizations, thus eliminating the need for the traditional division headquarters[17].

Units of Employment.

"UE's are higher-level echelons that integrate and synchronize Army forces for full spectrum operations."[18] Higher echelons will be scaleable and tailorable for specific missions and the flexibility to change even during employment. UE's function as tactical and operational-level command and control headquarters that assign task and purpose to UA's, set the conditions for success, enable operations and weight the main effort with effects and information.[19] UE's have the capability to project forces and effects to operational distances and direct subordinate land elements in concert with joint interdiction operations. "UE's execute Joint

Task Force, Joint Force Land Component Command and/or ARFOR responsibilities with the inherent capacity to interact effectively with other component, multinational forces as well as interagency, non-governmental organizations and local leaders and populations."[20]

Units of Action.

UA's are standing organizations of maneuver, maneuver support, and maneuver sustainment functions. Maneuver UA's are the fighting component of the Objective Force. Maneuver support UA's will support the fight with force protection, mobility/counter mobility, and communications. Maneuver sustainment UA's will provide precise delivery of supplies and services to sustaining all units.[21]

Maneuver Unit of Action.

Tactical Units of Action are fixed organizations that are cohesive, lethal, highly mobile, air-ground teams. UA's are a general- purpose force optimized for major theater war.[22] Enabled by the FCS, the combined arms air-ground task force, similar to today's Brigade Combat Teams (BCT), can be committed autonomously or semi-autonomously. It can close with and destroy enemy forces in integrated engagements, finishing by fire, maneuver and tactical assault.[23] Current organizational designs exclude Army Aviation units as organic elements of the BCT. However, the complex, three-dimensional nature of operations necessitates the need for Army Aviation to be a "fixed" element of the BCT. It is imperative that Army Aviation be included in the base design and continues to be fully integrated with ground components in order to gain synergy and be effective in combat. Experience has shown that air-ground operations are not a pick-up" game. The concept of "train as you fight" and habitual association between ground and air units produces new levels of synergy and will mitigate the challenges of unit cohesion.[24] Other enabling maneuver UA's employed by the UE will include attack helicopter, and long-range artillery. Figure 1 on the following page depicts the proposed organization of the FCS equipped BCT that includes the Air Cavalry Squadron as fixed element of the air-ground team.

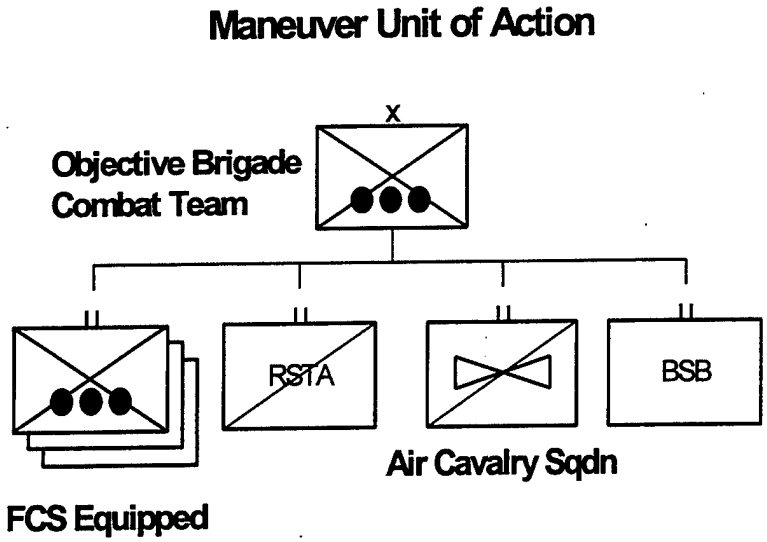


FIGURE 1

PART III – ARMY AVIATION OBJECTIVE FORCE 2020.

REQUIRED CAPABILITIES AND CHARACTERISTICS.

The Army Vision calls for strategic response and decisive action at all points on the spectrum of conflict. Missions range from stability and support operations to major theaters of war, against any threat, in any assigned area of operation. Army Objective Force required capabilities include responsiveness, deployability, agility, lethality, sustainability, survivability, and versatility. Likewise, Army aviation must be organized and equipped to inherently meet these same qualities and capabilities.[25]

Responsive and Deployable.

Strategic responsiveness demands that Army Aviation Objective Force be rapidly deployable. Aviation units will rapidly project tailorable multi-functional tactical formations capable of operating upon arrival in the battlespace. Unmanned reconnaissance systems teamed with attack helicopters will expand the commander's area of influence throughout the battlespace through precision attack and the coordination of long-range precision fires.

Operational air maneuver and tactical air assault of forces provides commanders the ability to negate the effects of complex terrain, gain positional advantage and seize the initiative. Army Aviation will be capable of rapid movement by decreasing deployment tonnages and improvements in aircraft design that will incorporate rapid blade fold and build-up capability for strategic air deployment. Crashworthy, extended range fuel systems for self-deployment, as well as air-to-air refueling will enhance deployability options. "Army helicopters will also operate from naval ships, greatly extending the joint commander's area of influence and employment options in coastal areas."[26]

Agile and Versatile.

The inherent versatility of Army Aviation allows the adaptive commander to rapidly shift the agile aviation force from peacetime engagement and training, to stability and support operations, to full-scale combat operations. "Aviation can rapidly project a sufficient force to minimize the risks encountered in the early stages of a crisis response – strategically precluding escalation. Early entry forces will be tailored based on mission, enemy, terrain, troops, time available and civilian considerations (METT-TC), thus employing the best possible capabilities-based force."[27] Land force and joint task force commanders will exploit aviation capabilities early on by leveraging situational awareness provided by tactical and strategic sensors with long-range digital connectivity tied directly to on-board aircraft displays. This seamless connectivity facilitates force projection, achieves tactical and operational agility, and postures the force for decisive maneuver by shaping the area of operations with early-entry aviation forces.[28] Army Aviation Objective Force systems must have increased range and station time, employ flexible weapons and fuel options and be shipboard compatible. "Aviation's high degree of area of influence mobility greatly increases the probability that aviation units will be at the right place, at the right time, and with the right capabilities required to meet the commander's objectives. Aviation's strength is its versatility to deploy quickly, see the battlefield, maneuver rapidly, and focus tremendous combat power at decisive points."[29]

Lethal.

Lethal Army Aviation Objective Force units will deliver overmatching combat power as an integrated member of the air-ground team. Army Aviation units will dominate battle through employment of advanced sensors and improved firepower capabilities – munitions, fire control, and delivery systems – at ranges that exceed those of the enemy. "The development of precision munitions and non-lethal capabilities, coupled with advances in range, C4ISR, and improved capabilities for routine employment of non-organic and joint service assets, are

collectively leading to an orientation on effects rather than the systems that deliver fires."[30] Army Aviation will provide the force commander with a variety of capabilities that will enable the precision use of force while minimizing collateral damage. As an integral part of the air-ground team, Army Aviation provides the commander the ability to execute decisive operations through early detection and synchronization of precision fires. Army Aviation Objective Force "system of systems" will detect threat elements; employ decisive fires, maneuver, and assault to assure complete destruction of the enemy throughout the area of operation. This will provide the ground commander a clear overmatch in lethality.

Survivable.

Army Aviation must leverage technologies that provide maximum protection to our Aviation systems and aircrews. Air platforms require the best available combination of low observable, ballistic protection, crashworthiness, long-range acquisition and targeting, stand-off attack, and higher first round hit and kill technologies. Army Aviation Objective Force increases survivability through the effective integration of active and passive measures, combining advanced situational understanding and mutual interaction between platforms.[31] Improved night vision and imaging systems will enable operations during periods of extreme darkness night and low visibility conditions. C4ISR systems will allow for greater tactical dispersion, yet provide for widely dispersed units to mass rapidly. Increasing crew ratio to 1.5 will minimize aircraft exposure to threats while in tactical assembly areas and increase day and night availability of aviation systems to the fight.

Sustainable.

The single greatest breakthrough to the Army Aviation Objective Force 2020 will be the result of ongoing progress in the revolution in military logistics.[32] The Army Aviation Objective Force will have successfully completed the transition from a three level to a two level maintenance as aircraft are fielded that are designed for two level maintenance support.[33] "The Aviation logistics concept consists of five fully integrated functional areas consisting of On-Aircraft, At Aircraft, At Unit, Above Unit and the Sustainment Base."[34] Aviation logistics units will employ the latest advances in information technology, including computerized logbooks, interactive electronic technical manuals, diagnostic procedures, requisitions, status reports, inventory control, and total asset and in-transit visibility.[35] Aviation Objective Force platforms will be ultra-reliable systems, employ common avionics systems, major assemblies and spare parts, have greater fuel efficiency, and improved maintainability.[36] Split based operations to

support tailored forces will be routine. Regionally available assets will be exploited. Anticipatory logistics and velocity management will allow logistics footprints to be reduced. Embedded diagnostics, prognostics and flight data recorders will be design criteria for the new systems. Integrated test equipment, standardized special tools and ground support equipment will reduce the logistics footprint. Support equipment will be containerized and modular for movement by smaller vehicles and aircraft to increase force mobility. "To support units over non-linear, non-secure lines of communication, Army Aviation will help form a seamless pipeline for battlefield distribution. Aviation's ability to move critical supplies, and provide aerial re-supply to forward deployed and widely dispersed forces is important to the commander's ability to sustain combat operations and maintain his tactical and operational flexibility."[37] Additionally, a light weight, collapsible, semi-rigid, palletized, air and ground vehicle transportable, fuel container and dispensing system will simplify fuel distribution operations. This system will compliment modular weapons, common missiles and ammunition, and palletized air/ground movement system to facilitate more efficient forward area re-arming, re-fueling and repair functions.

PART IV – OPERATIONAL ENVIRONMENT AND CONCEPT.

OPERATIONAL ENVIRONMENT.

In the early part of the 21st century, regional powers, rogue elements and non-state actors will pose security challenges to our military capabilities. Regional and internal instability will create situations where ethnic, economic, social and environmental stresses will heighten violence. Multiple belligerents and a blurring of the distinctions of national affiliations among terrorist groups, sub-national factions, insurgents and international organized crime and drug trafficking complicate and environment where a direct attack by a national military force is often the least likely course of action.[38]

Potential adversaries are concerned about US joint forces air capability that exploits altitude sanctuary, unmanned reconnaissance, precision attack, maneuver and assault, and rapid massing of direct fires.[39] This concern has lead to an evolving set of technology and operational concepts designed to offset the advantages held by the US in these areas. Where technology and new systems are not available because of access or affordability issues, new tactics and upgraded older systems are being applied with good effects.

The increasing capabilities of unmanned aerial reconnaissance platforms, rotary wing lift, and attack aircraft have not gone unnoticed by potential adversaries. "The future battlefield will demand an increased use of aviation assets with a corresponding increase in the threat to those assets."[40] Potential enemies conclude that the investment required to match U.S. capabilities is

unaffordable. What most adversaries have rightfully concluded is that you cannot permit U.S. joint forces the luxury of employing its air supremacy over an extended period of time. For this reason, nations are pursuing less expensive, yet effective technologies and asymmetric systems to offset the U.S. advantage. Their emerging capabilities include the development of advanced high and low altitude air defense missiles, low altitude target acquisition radars, gun-missile integration, anti-helicopter mines, advanced optics and night vision systems for man-portable air defense missiles. Enemy strategies will include employment of decoys, camouflage, maximum use of complex terrain, dispersed and decentralized engagement and employment of air defense ambushes.[41] Access denial is likely to be a key strategy through the employment of ballistic missiles, special operations forces, and weapons of mass effects. They would be used to strike airfields and ports to deny, delay, and degrade US intervention both in and out of the area of operations.[42]

OPERATIONAL CONCEPT.

Aviation is an adaptive, multi-functional force capable of setting the conditions for the Army to assure, dissuade, deter and defend in an uncertain future.[43] Army Aviation must support the Army's requirement to conduct full spectrum strategic responsiveness. "This requires an ability to support the rapid response capability necessary of forcible and early entry contingency missions and the tactical and operational nonlinear, noncontiguous, simultaneous operations, which will characterize future operations."[44]

The primary role of the Army Aviation Objective force is to dominate with precision fires, provide accurate and timely reconnaissance, C4ISR connectivity, and enhance operations through air assault, aerial re-supply, and operational maneuver of the FCS equipped force.[45] The dispersed and decentralized nature of the future battlefield will place great demands on Army Aviation. Future Air Combat Systems equipped force "will conduct close combat in accordance with the new tactical paradigm to: 1) develop the situation out of contact, minimizing chance engagements and surprise; 2) rapidly move to position of advantage; and 3) initiate contact with overwhelming combat power at the time and place of our choosing."[46]

Advanced C4ISR capabilities will form the backbone of the Army Aviation Objective Force and enable the effective application of all other capabilities. Tactical Unmanned Aerial Vehicles (TUAV) provide reconnaissance, surveillance and target acquisition, and provide real-time feedback to the force commander. TUAV's will significantly reduce the risk to the force and aircrews through enhanced situational understanding.[47] Manned – Unmanned Teaming with

TUAV's will enhance Attack aviation's ability to maneuver rapidly and mass precision direct fire on enemy formations provides significant and essential capability on a non-linear battlefield.

Air Maneuver and Transport will enable revolutionary approaches to operational maneuver in the third dimension while providing the commander options for rapid response throughout an area of operation to negate the effects of terrain, as threats conduct simultaneous operations of varying nature at multiple locations. Army Aviation will provide a means of dealing with the three dimensional aspects of urban/complex environments that will most likely be a large part of the military future operational environment.[48]

Aviation logistics is designed so that aviation support organizations are tailorable, modular in design, rapidly deployable, and highly mobile. The two level support concept is the objective structure.[49] Automated systems that are standardized across the Army will aid logistics personnel in diagnostics and other key logistics processes. The application of these principles will achieve the overall goal of significantly reducing operating costs and the logistics footprint of the Army Aviation Objective Force of 2020.

PART V – FUTURE AIR COMBAT SYSTEMS FOR 2020.

GENERAL.

Future Air Combat Systems will be reduced to one unmanned, and two manned systems. Future Air Combat systems are a family of air systems designed to compliment the land FCS in a total system of systems approach. The TUAV will be teamed with manned systems and perform the reconnaissance and armed-reconnaissance missions. The Future Air Combat System will be manned and consist of a common basic helicopter platform. It is envisioned that attack, assault/utility, and C4ISR fusion variants be produced. The second manned system is the Future Air Maneuver and Transport. This system will enable revolutionary approaches to maneuver and sustainment in distributed operations.

Future Air Combat System (FACS).

The Future Air Combat System takes the best of the Apache, Comanche, and Black Hawk and combines them into one basic, yet versatile platform. The concept for a common air platform is not new. US Army Special Operations Aviation (SOA) developed the concept for a rapidly deployable, multi-mission platform capable of attack, assault and information fusion. Their basic platform was modified and enabled with technology insertion and long-range voice and digital connectivity for superior situational understanding. SOA use of a common platform with modular weapons packages, auxiliary fuel systems and strategic-air transport rapid blade

fold/build-up systems has increased responsiveness and significantly reduced logistics requirements.[50]

The mission for the Future Air Combat System is to provide attack, air assault, general support, command and control and medical evacuation support to Units of Action and Units of Engagement across the spectrum of conflict. FACS will embody the Objective Force characteristics of responsive, deployable, agile, versatile, lethal, survivable and sustainable.

The requirements and specifications for the basic H-76 "Sioux" helicopter include a common airframe, engines, drive train, and rotor blades; ballistics protection for crew and key components. The Sioux will have a common avionics architecture and data buses, multi-functional cockpit displays, GPS and inertial navigation with beyond line of sight reporting and tracking system, long-range voice and digital connectivity, enhanced position locating reporting system compatible with Army maneuver control systems and C4ISR systems, on-board mission rehearsal; day/night, image intensification-thermal image fusion system, fully instrumented for instrument flight rules, weather radar, low observable, advanced threat infra-red countermeasures and missile warning, and advanced integrated radar warning and electronic counter-measures. The aircraft will have on board prognostics, diagnostics and be repaired with a standardized set of common tools.

The Sioux will cruise at 160 knots, have 3.5 hours of endurance, have a crashworthy self-deployment auxiliary fuel system, and a rapid blade fold/build-up capability for strategic air transportability. The H-76 will have a rotor brake and be electro-magnetic pulse hardened for shipboard compatibility. Six Sioux helicopters will fit in a C-5B air transport and three will fit in a C-17 air transport.

The assault variant of the H-76 Sioux helicopter will meet the baseline requirements listed above, and in addition be produced with for the following mission configurations modifications; crash attenuating seating for 10 combat loaded troops, fast rope insertion extraction system, cargo hook for up to 10,000 pound external load, and a common, high cyclic rate of fire armament system. In addition to enhancing tactical mobility, the Sioux will provide rapid aerial re-supply to Objective Force Units of Action operating in expanded battlespace.

The C2 variant of the Sioux will provide commanders from UA (Brigade) to UE (Corps) with and airborne command post that provides continuous situational awareness, robust communications and battlefield mobility.[51] The C2 variant will host a miniaturized version of the Army Battle Command System (ABCS) to include remote air control and video terminal for TUAV. The C2 platform will provide seating for a battle staff and commander with six-work stations.

The attack variant of the H-76 is the "Sioux Warrior." The most lethal of the Future Air Combat Systems, Sioux Warrior will conduct cavalry, attack, and assault escort missions across the depth of the battlespace. Teamed with TUAV and other ISR systems, Sioux Warrior will deliver precision strikes against time sensitive targets, focusing terminal effects from other Army and joint fires and their assessing results.[52] The Sioux Warrior will be configured with the following mission systems; advanced electro-optical target acquisition and designation system; millimeter-wave fire control radar air/ground targeting system, long-range digital connectivity, dedicated air-ground communications, and TUAV airborne control and remote video feed. The Sioux Warrior will be equipped with the following weapons systems: fire and forget common missile, low cost precision kill weapons, 20 millimeter gatling gun, with the potential for airborne directed energy and non-lethal weapons.[53]

Future Air Maneuver and Transport System.

The H-48 "Cherokee" will provide a comprehensive capability for operational maneuver that does not exist today. A critical component for the future joint campaign, the Cherokee will have a strategic deployment capability and provide intra-theater positioning of Army forces at the critical time and place to achieve operational advantage. The Objective Force requires the marriage of lighter weight armored systems with improved lift to enable operational maneuver and sustainment of rapid and distributed operations.[54]

The Cherokee will have the same design attributes of the Sioux with respect to avionics architecture, C4ISR connectivity, and threat detection and counter-measures commonality. However the Future Air Maneuver and Transport has the following critical operational requirements; vertical take-of and landing (VTOL) capability, capable of carrying the land FCS, 50 troops, or equipment, supplies, ammunition and other cargo of up to 40,000 pounds, in-flight air-to-air refueling, a minimum of 180 knots cruise airspeed, and shipboard compatibility. The Cherokee and ground FCS could be modular in design, employing snap-on/snap-off technology. Additionally, a modular container could be configured for troops or cargo thus maximizing speed and flexibility.[55]

Tactical Unmanned Aerial Vehicle.

As the Army's primary air reconnaissance, surveillance and target acquisition platform, the "Bird Dog" will significantly expand Army's capability to conduct reconnaissance operations and provide real-time information feedback to the force. The Bird Dog will have a range of 200 kilometers and operate in all battlefield environments, day or night, and in adverse weather conditions. The Bird Dog will be low observable and have high endurance. It can go deep,

"stare" at areas of interest, and guide joint precision strike missions to time sensitive targets. The Bird Dog will protect the force with it advanced electro-optical sensors, aided target recognition, long-range digital connectivity to C4ISR and team with manned attack and command and control Future Air Combat System variants. TUAV position data and imagery are downlinked to remote video terminals in ground and air control stations located in the tactical operations centers, command and control aircraft, or attack aircraft of the BCT.[56]

PART VI – ORGANIZATON.

GENERAL.

Army Aviation Objective Force organizations will be knowledge-based, general purpose forces with special purpose capability, be employed with integrated air-ground teams the lowest tactical level, maximize commonality of systems and employ a modular construct that enables rapid force tailoring.[57] Army Aviation Objective Force 2020 elements will be organized around sets of multi-functional tactical and operational elements that contribute directly to the BCT, Corps, JTF or UE commander's mission. Army Aviation Objective Force elements will be organized into four different elements. There are three Aviation Maneuver Units of Action; the Air Cavalry Squadron, the Air Maneuver and Transport Group and the Air Cavalry Regiment. Additionally the Aviation Unit of Sustainment will be found at the UE level.

Air Cavalry Squadron (ACS).

The mission of the Air Cavalry Squadron is to provide organic and dedicated reconnaissance, attack, assault, aerial re-supply, and C2 support to the Brigade Combat Teams of the Objective Force. The Air Cavalry Squadron will be organized into a headquarters and support troop; two attack troops; one reconnaissance troop; two assault troops, one active duty and one a reserve component; and an aviation maintenance troop. The Air Cavalry Squadron is equipped with the TUAV, Bird Dog, along with the attack variant, Sioux Warrior. The ACS is also equipped with the assault and command and control variants of a basic helicopter platform, the Sioux. The TUAV troop is organized under the ACS to minimize airspace deconfliction and command and control, and to maximize maintenance expertise and training with manned systems. The ACS is depicted below:

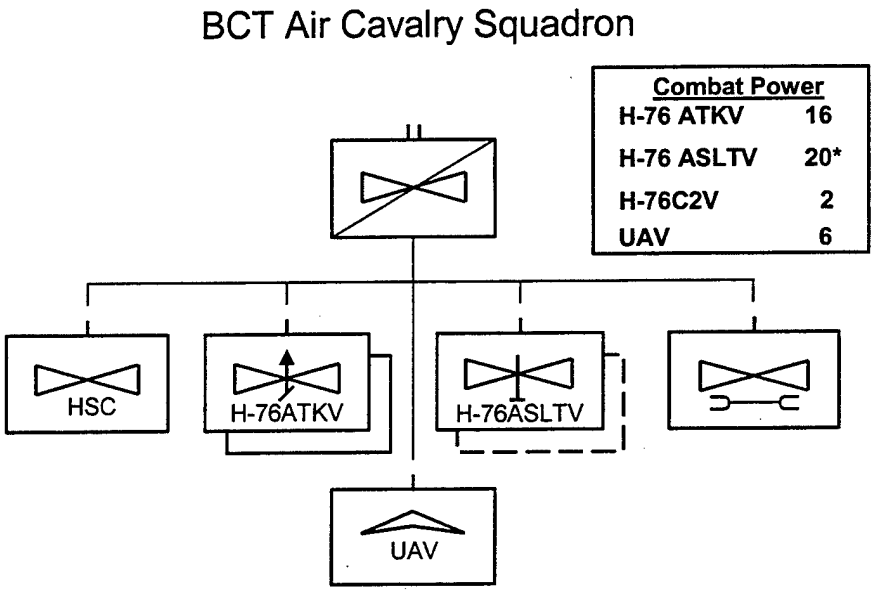
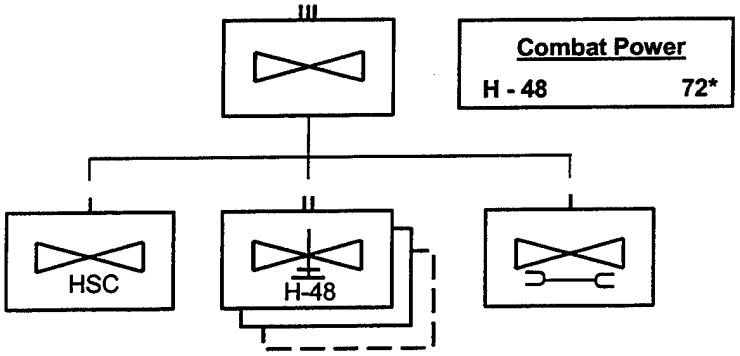


FIGURE 2.

Air Maneuver and Transport Group.

The mission of the Air Maneuver and Transport Group is to provide the UE commander with unprecedented operational reach and maneuver, as well as robust, reach back re-supply capability across the spectrum of conflict. The Air Maneuver and Transport Group will be organized with a headquarters and support company, three heavy lift battalions (one reserve component), and an aviation maintenance company. It will be equipped with the H-48, Cherokee helicopter, the companion air maneuver vehicle to the land FCS. The Group is depicted below:

Air Maneuver and Transport Group



*1 Battalion Compo 2

FIGURE 3.

Air Cavalry Regiment.

The mission of the air cavalry regiment is to provide reconnaissance, mobile strike, precision attack, and air assault security to the UE commander across the spectrum of conflict. The Air Cavalry Regiment will be organized with a headquarters and support troop, three attack squadrons (one reserve component), a reconnaissance troop, a general support aviation battalion, and an aviation maintenance troop. The Air Cavalry Regiment will be equipped primarily with the Sioux Warrior helicopter, an air reconnaissance troop of TUAV's, and a general support element equipped with assault and C2 variants of the Sioux. The Air Cavalry Regiment is depicted below:

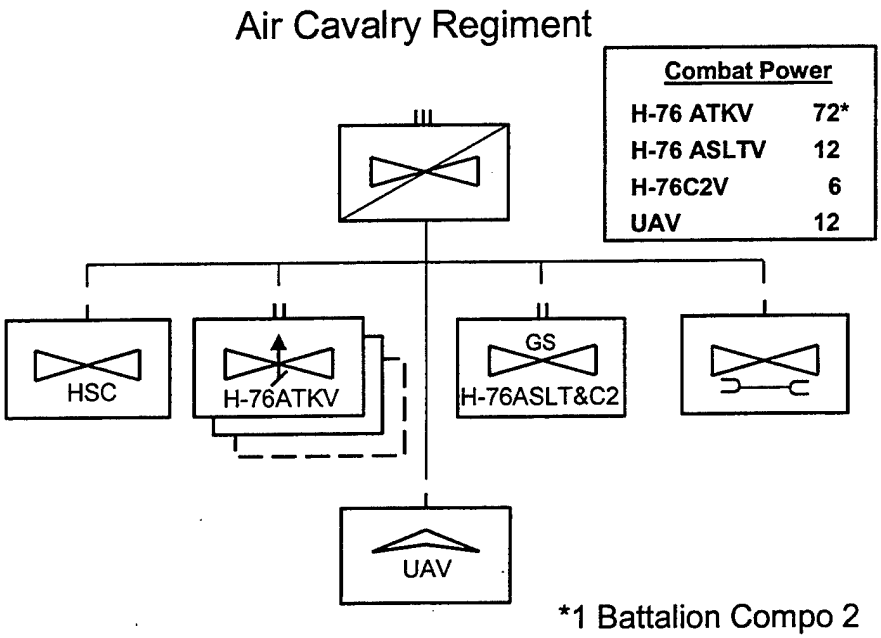


FIGURE 4.

Aviation Unit of Sustainment.

The Aviation Unit of Sustainment will provide direct and dedicated multifunctional aviation logistics and maintenance support to Aviation Units of Maneuver assigned to the UE. The Aviation Unit of Sustainment is the second level of aviation maintenance and will provide back-up aviation unit maintenance, aviation repair parts supply support, and repairable exchange parts support to aircraft assigned to the UE. Army Aviation will benefit from systems commonality and responsive battlefield distribution.[58]

CONCLUSION.

The Army Aviation Objective Force 2020 will be a key enabler as well as integral member of the US Army's Objective Force air-ground maneuver team. General John R. Galvin, in his book entitled, Air Assault: The Development of Airmobile Warfare, first published in 1969, articulated a vision for the future of modern warfare and Army Aviation.

> "The impact of highly maneuverable, versatile vehicles that can both streak through the sky and stand at a hover, that need no worldwide system of airfields, that are highly adaptable, easy to repair, and easy to fly, is enough to change the principles that have governed combat for a very long time. That change is already coming about, with the first of the new air vehicles now in service, casting an entirely different perspective the military importance of high ground, the use of

> barriers, the defense of rear areas, the employment of the reserves, the coordination of supporting fires, the protection of the flanks, the use of deception and surprise. The new kind of land warfare – the airmobile battle – is unique in that it takes place not just on the surface of the earth but also in the first thousand feet or so above the ground, where air vehicles carry troops and supplies, provide supporting firepower, and allow commanders to move quickly from place to place to direct the fighting. The use of this third dimension frees the foot soldier from the restrictions of the terrain and makes possible a whole new range of tactical maneuver, where there is always an open flank – over the top."[59]

General Galvin's vision is profound. His thoughts inspire us today, over 33 years since he set down these ideas. His vision should continue to influence our thinking as the Army sets forth its transformation strategy, exploiting information and aerospace technology, employing a system of systems approach and capitalizing on the synergy of ground-air integration.

This essay provides a bold vision for the Army Aviation Objective Force for 2020. It describes four key elements that are essential to the fulfillment of the vision. First; Army Aviation must be integrated with ground elements at the lowest possible level. Only through the habitual relationships between air and ground units can we create the necessary level of synergy to be successful in battle. Secondly, the advancements in UAV technology have made it necessary to reassess the risks associated with manned reconnaissance platforms. The Comanche program has experienced significant delays and reports of problems with weight and systems integration call into question its future relevancy. Recent statements by the Army leadership lead you to believe that Army Aviation must reevaluate the need for this system.[60] As an alternative, the Army may be better served by applying its scarce resources towards TUAV development and procurement instead. Third; the quest for reduced operating cost and increasing commonality with its resultant reduced logistics footprint drives us towards a multi-functional Future Air Combat System. This revolutionary air platform should replace Apache, Comanche, Kiowa Warrior, and Black Hawk. There will be tradeoffs required, but the overall capabilities gained necessitate the requirement to develop this common platform. The last and most essential element to fulfilling the Army Aviation vision is the development and procurement of the Future Air Maneuver and Transport. This concept has strong potential for a Joint Service Program and this platform can replace CH-47, CH-53, CH-46 and V-22. The high-risk technology V-22 program is facing many challenges and may not come to fruition. The problems with tilt-rotor design and aerodynamic instability associated with "vortex ring state" may be insurmountable.[61] Additionally, the extremely slow approach to landing transitional flight does not fit military combat mission profiles due to prolonged exposure and vulnerability during this

mode of flight. Tandem rotor design may offer the best solution, but makes tradeoffs for higher cruise speeds in favor of safety and maneuverability.

RECOMMENDATION

The Army should adopt the operational and organizational concept, and system of systems approach to aviation materiel acquisition strategy described in this document. This strategic vision for an Army Aviation Objective Force of 2020 fulfills the requirements of Joint Vision 2020, compliments the CSA's vision, and is considerate of the aviation requirements of the National Guard and reserve component as it relates to homeland defense. This force concept is optimized for joint operations, tailored for all types of terrain and environments, as well against a myriad of threats. Army Aviation Objective Force 2020 is fully integrated with the land combat force. Future Air Combat Systems and Aviation organizations are enabled through information technology, lethal weapons, improved logistics processes and reduced footprint, and unprecedented maneuver to achieve decisive action through positional advantage. The centerpiece of the Army Aviation Objective Force of 2020 will remain the adaptive leaders and soldiers who understand joint warfighting and are the best at flying and maintaining their systems.

Word Count: 6081

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