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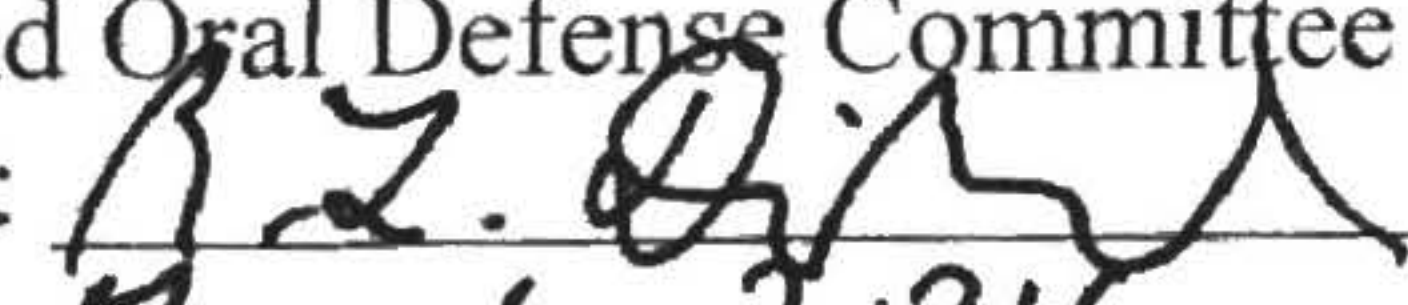
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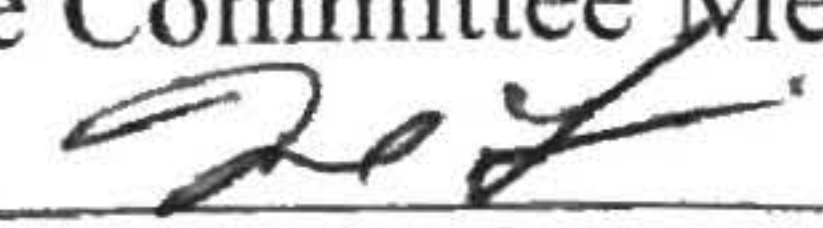
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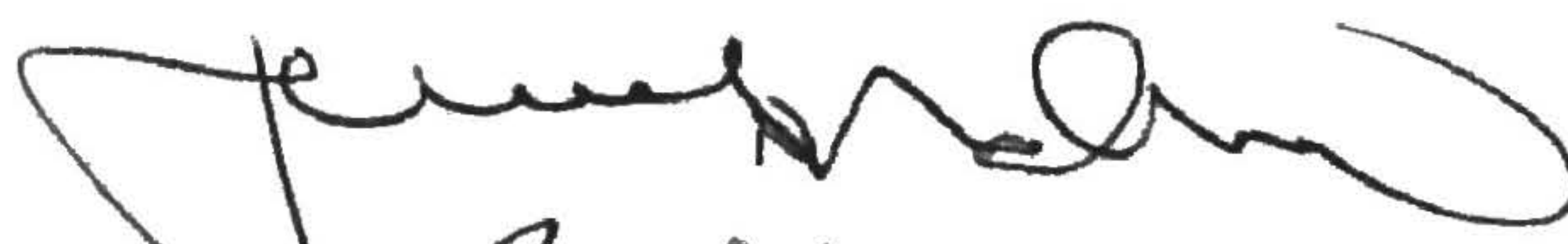
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Preface

Currently a debate is taking place in the US Army and US Army Aviation in particular regarding the best way to spend the limited resources available, while still providing the ground warfighters the premier support they deserve. In an effort to accommodate a constricting budget, US Army Aviation has taken a hard look at itself to determine where and how it can save money, while still improving its capabilities and adapting to future conflicts and technologies. The Army Aviation Restructuring Initiative (ARI) is a response to the budgetary constraints imposed in the Budget Control Act of 2011. Initially, I had planned to address how Army Aviation had made a mistake in divesting the OH-58 and closure of three active component combat aviation brigades, particularly the 12th CAB out of Germany and the 2nd CAB in Korea. After conducting further research, I now understand the importance of these decisions in saving the military money and the modernization of the aviation community as a whole. I humbly hope that this body of work may help to inform other aviation officers of the need for ARI and contribute to the ongoing debate regarding the replacement of the OH-58D Scout reconnaissance mission.

I would like to thank several mentors who have assisted me over the years and throughout the completion of this product. COL Frank Intini, who has served as a mentor to me throughout my career and always displayed an aggressive fighting spirit, particularly while helping to introduce UH-60 employment concepts discussed within this paper while serving as an Aviation Task Force Commander in Afghanistan. My wife, Cristin, who listened to me ramble on regarding the pros and cons of ARI and as I discussed the importance of maintaining the human dimension while flying combat missions. And Dr. Richard L. DiNardo, who has supported me through the project and ensured that I remained focused on finishing the product.

Executive Summary

Title: Army Aviation Restructuring Initiative: Driving Aviation Leaders to Expand Aircraft Roles and Responsibilities

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Thesis: The Army Aviation restructuring initiative is a necessary reallocation of combat power and capabilities that will require a mindset shift by aviation leaders regarding the roles and responsibilities of the remaining aircraft in order to continue providing premier aviation support to the ground warfighter, while remaining fiscally responsible.

Discussion: The Army is currently undergoing an aviation restructuring initiative (ARI). These changes are occurring due to a need to modernize Army Aviation while operating in a fiscally constrained environment. There are numerous components to ARI. Some of these include the retirement of the TH67 training aircraft and the OH-58D Kiowa Warrior, the introduction of unmanned aerial systems (UAS) in a partnered scout capacity, the regional alignment of aviation forces, and the restructuring of active and reserve component aviation brigade compositions. ARI allows for the modernization of Army Aviation despite fiscal constraints. To accomplish the modernization of its primary platforms, Army Aviation chose to retire its dedicated scout reconnaissance aircraft, the OH-58D Kiowa Warrior. The retirement of the OH-58D leaves a gap in Army Aviation's ability to execute reconnaissance missions and requires aviation leaders to relook the current roles and responsibilities assigned to the remaining platforms. Current plans call for the use of Manned and Unmanned Teaming (MUM-T), the pairing of an UAS with an AH-64 to execute aviation reconnaissance. Unfortunately, this strategy further reduces the ability of the AH-64 to execute its primary role as an attack platform, pulling a low-density high demand asset away from its conventional attack and security mission set, particularly in a decisive action conflict. Instead, aviation leaders must change their mindset regarding the roles of the UH-60 platform and work to integrate the lift community into the recon and security mission. UH-60s can execute recon missions independently, while partnered with UAS, or in a purple team paired with an AH-64. Dedicating reconnaissance training time to UH-60s will provide both ground and aviation commanders flexibility when allocating resources across future battlefields.

Conclusion: ARI is a necessary and long awaited redesign for Army Aviation. After almost fifteen years of continued conflict, aviation has maintained one of the highest OPTEMPO rates of all the branches within the Army, routinely deploying on a less than 1:1 dwell to deployed cycle. ARI attempts to mitigate these demands while downsizing. Shortcomings in ARI require adaptive aviation leaders that are willing to break previous stigmas regarding aircraft usage, in order to maximize the capabilities of the current aviation fleet, to provide top rated support to the ground fighter and combatant commanders.

*“Army Aviation integrates into unified land operations by conducting air-ground operations as the aviation maneuver force of the combined arms team. Air Ground operations (AGO) are the simultaneous or synchronized employment of ground forces with aviation maneuver and fires to seize, retain, and exploit the initiative.
-Army Aviation in Unified Land Operations¹*

Introduction

Army Aviation is currently undergoing its most comprehensive restructuring initiative since the transition of the US Army Air Forces into the US Air Force in 1947.² This transformation is an effort to streamline Army Aviation into an organization capable of providing US and coalition ground warfighters the premier support they have come to expect while working within the confines of current budgetary constraints. In an effort to accomplish this task, US Army Aviation leaders have taken a comprehensive approach to examining Army Aviation to determine the most appropriate method to provide cost savings while working to improve Army Aviation’s ability to accomplish its current mission sets and prepare for future combat roles. Determining where to implement cuts while improving an aging fleet and minimizing risk to aviators and the ground forces they support, is an immense challenge. Army Aviation leadership has struggled with determining the best method to implement cost saving procedures since the Budgetary Control Act (BCA) of 2011, the driving force behind the necessity for the Army’s Aviation Restructuring Initiative (ARI).³ The 2011 BCA cut Army Aviation’s budget significantly, with a 40% reduction to training and sustainment funds and a three billion dollar decrease in annual procurement and modernization money through 2019.⁴

The tough decisions required to enhance Army Aviation while working within budgetary constraints have undergone scrutiny from within both the aviation community, particularly the National Guard (NG), and from external opponents attempting to fight ARI for personal or fiscal

interests. ARI implementation began in fiscal year 2014 with a scheduled completion in 2019. With ARI's conclusion, the Reserve Component (RC), including all National Guard (NG) and US Army Reserves (USAR), will transfer their entire AH-64 fleet to the Active Component (AC). This will significantly disrupt the RC in over twenty states, reducing jobs, funding, and units across the community.⁵ Arguments regarding these planned reductions have gained traction within Congress where lawmakers are attempting to help their individual states rather than focusing on what is best for the total Army force. Bell helicopter manufacturer will also feel the effects of ARI through the divestment of the TH-67 training helicopter, OH-58A/C, and OH-58D, all three Bell platforms.⁶ Despite arguments against ARI, aviation leaders have remained focused on the end state -cost efficiency- while modernizing capabilities within the Army Aviation community. Many of these arguments have garnered undue attention and have distracted away from the true shortcoming within the ARI plan, the overall reduction in attack capacity and reconnaissance capability across Army Aviation.

Four fundamental principles led to the development of the current ARI plan. The first principle included the need to provide a modernized, capable force while divesting all legacy aircraft. The second principle addressed a need to improve training for modern day 21st century aviation leaders. This training would include the use of a multi-engine training aircraft, glass cockpits, and moving maps to ease the transition into primary aircraft, introducing advanced technologies early into training pipelines. The third principle adapts and standardizes the aviation force structure to ensure it remains capable of providing effective support, despite downsizing. This principle drove the necessity to move all of the low-density, high demand AH-64s into the AC where they could maintain the highest level of readiness, while remaining capable of deploying for extended periods if necessary, without having to work within RC deployment

constraints, particularly the 1:5 desired deployment ratio. The last principle focused on enhancing efficiency in the sustainment arena by reducing the community from seven total rotary-wing fleets into four fleets, streamlining maintenance procedures and reducing training requirements.⁷ All of these efforts attempt to save resources while refocusing aviation support efficiency. The Army Aviation restructuring initiative is a necessary reallocation of combat power and capabilities that will require a mindset shift by aviation leaders regarding the roles and responsibilities of the remaining aircraft in order to continue providing premier aviation support to the ground warfighter, while remaining fiscally responsible.

To understand ARI and to continue to grow as an aviation community, leaders must understand the implications involved in the retirement of the OH-58D scout reconnaissance platform. With the decision made to reduce this Mission Design Series (MDS) from the Army inventory, aviation leaders must explore new and innovative ideas to replicate the OH-58's previous capability. The retirement of the OH-58 drives many of the decisions inside of ARI. While the inclusion of unmanned aircraft systems (UAS) into aviation brigades will help to replace some reconnaissance capabilities, UAS platforms remain unable to provide the ground warfighter the same situational awareness or feeling of security once provided by an OH-58D Kiowa Warrior flying low overhead.⁸ Another method of replicating the scout reconnaissance capability should include the increased involvement of UH-60 Blackhawks partnered with AH-64s to provide close air support, maneuverability, and flexibility to ground commanders. While this technique may not remain a viable option in all operating environments, it would help to spread a low-density asset, AH-64s, across an area of operations. This partnership is increasingly important in low threat or counter insurgency (COIN) operations where the teaming of dissimilar abilities can enhance the inherent capabilities in each platform.

This paper attempts to arm future US Army Aviation leadership with an understanding of ARI, the implications ARI will impose and mitigation measures they may use to continue providing the best possible support to ground warfighters. To provide this understanding, leaders must examine the current mission sets tasked to Army Aviation, the components of ARI, and the implications ARI has to the future success of these missions. Lastly, leaders should explore the required development of new (and in some cases old) tactics, techniques, and procedures (TTP) to efficiently employ reduced aviation assets while still accomplishing all assigned missions.

The Role of Army Aviation in the Combined Arms Team

Current Army Aviation doctrine establishes seven core competences that aviation units must provide. These core competencies support the unified land operations and maximize Army Aviation's "inherent mobility, flexibility, and persistent reconnaissance capabilities," helping to provide the combined arms team with multiple options to "seize, retain, and exploit the initiative" across the operating environment.⁹ The core competencies include: provide accurate and timely information collection; provide reaction time and maneuver space; destroy, defeat, disrupt, or delay enemy forces; air assault maneuver forces; position personnel, supplies, and equipment; evacuate casualties and conduct personnel recovery; and enable mission command in support of the combined arms team.¹⁰ Army Aviation utilizes these seven core competencies to execute its ten tactical, enabling, and sustaining tasks, reduced from sixteen mission sets previously outlined in FM 1-100 Aviation Operations.¹¹ These ten consolidated missions include movement to contact, attack, reconnaissance, security, air assault, mission command support, personnel recovery, air movement, and aeromedical evacuation.¹²

To simplify, there are four general aviation mission types: Attack, Reconnaissance, Assault, and General Support. Previously, Combat Aviation Brigades (CAB) included four

operational battalions aligned with each of these four mission types. With the implementation of ARI, the aviation community is attempting to replace its reconnaissance capabilities through the expanded utilization of attack and UAS assets. Working within ARI will require new technologies and expanded mission roles to fill the recon void in the Army inventory. Army Aviation utilizes the seven fundamentals of reconnaissance to accomplish its four assigned reconnaissance missions.¹³ The seven fundamentals of reconnaissance include: gain and maintain enemy contact, orient on the reconnaissance objective, report all information rapidly and accurately, retain freedom to maneuver, develop the situation rapidly, ensure maximum reconnaissance force forward, and ensure continuous reconnaissance.¹⁴ Although all seven-reconnaissance fundamentals are achievable with both helicopters and UAS, some are certainly more suited to manned platforms that can provide a detailed and processed analysis to commanders, increasing their situational awareness. Aviation leaders must weigh inherent UAS limitations when determining future employment of manned versus unmanned platforms to accomplish reconnaissance tasks.

Combined Arms leaders require an understanding of the capabilities Army Aviation brings to an operation and proper implementation techniques to maximize the effectiveness of the entire force. Similarly, those leaders who are determining the future of Army Aviation through the design and implementation of ARI must ensure that the Army Aviation community remains poised and ready to accomplish these assigned and necessary tasks. Providing these capabilities despite budget reductions, divestments, and force structure adjustments must remain a top priority while implementing ARI.

ARI Background

ARI is the Army's plan to continue executing all of the aviation communities' assigned missions while reducing its budget and the size of aviation's force structure in response to the congressionally mandated spending reductions set forth in the BCA of 2011.¹⁵ Aviation and Army leaders have developed ARI in an effort to comply with budgetary constraints while continuing to modernize the force. Prior to the 2011 BCA, Army Aviation planned to maintain the AC at thirteen CABs, while modernizing the AH-64 Apache, UH-60 Blackhawk, and CH-47 Chinook fleets.¹⁶ Additionally, the community planned to upgrade the OH-58 Kiowa Warrior with a cockpit and sensor upgrade program (CASUP), at a cost of over \$3.3 Billion, and complete a service life extension program (SLEP) on the OH-58 that would have maintained the aging aircraft in the fleet for the next 10-20 years, at a cost of \$6.96 Billion.¹⁷ An additional SLEP scheduled for the TH-67 Creek training helicopter, as well as the development of a new training helicopter, involved an additional \$1.6 Billion in costs.¹⁸ Under the 2011 BCA reductions, the Army was unable to continue with these planned improvements driving the development of multiple alternative plans regarding the future of Army Aviation. The other primary course of action (COA) proposed by the Army involved the deactivation of five active and reserve component CABs with their associated aircraft, reducing approximately 460 airframes from the Army fleet, while maintaining the OH-58D, and dramatically slowing the modernization plan for the other three primary MDS aircraft: the UH-60, AH-64, and the CH-47.¹⁹

This alternate COA would have delayed the fielding of the AH-64E, the UH-60M, and CH-47F model upgrades by up to ten years, significantly reducing the US military's ability to remain one-step ahead of competitors in the realm of technology.²⁰ The alternate COA also resulted in a substantial reduction in aviation's total capacity with the reduction of five CABs.

This Alternate COA, involving a delay to modernization efforts and the significant reduction in total CABs, was unacceptable to the Army Chief of Staff, General Ray Odierno (USA). In 2012, he provided aviation leaders guidance to “determine the best force structure and modernization balance to retain the most capabilities and capacity that is in the highest demand by our Combatant Commanders and recurring civil and homeland defense requirements.”²¹ With this in mind, aviation leaders set out to develop a comprehensive plan that would continue modernizing the three primary MDS platforms, while attempting to provide the most widely demanded support to the ground commanders.

ARI Components

In order to accomplish assigned cost-cutting tasks, aviation leaders developed a comprehensive plan that included four significant Lines of Effort (LOE), in addition to the numerous smaller components, which comprise ARI. Most of these LOEs have caused initial controversy throughout the Army and aviation community, leading some aviation leaders to question the validity of ARI. However, these LOEs remain necessary to ensure ARI’s success and with minor modifications should facilitate accomplishment of all of Army Aviation’s assigned mission sets. The four significant ARI LOEs include 1.) The phasing out of the TH-67 Training Aircraft and the introduction of the LUH-72 Lakota as the future training platform; 2.) The reduction from thirteen to ten AC CABs with the standardization of AC brigades, and the use of Regionally Aligned Forces (RAF) to handle the reduction by establishing a rotational pool of CAB’s aligned with overseas tours in Asia and Europe; 3.) The movement of all attack aviation assets from the RC to the AC and the standardization of 10 of the 12 RC aviation brigades; and 4.) The retirement of the OH-58D Kiowa Warrior and the use of UAS and manned and unmanned teaming (MUM-T) into Aviation Brigades to fill Army Aviation’s scout

reconnaissance capability.²² Major General Mike Lundy (USA), the commander of United States Army Aviation Center of Excellence (USAACE), said “ARI is designed to provide the Nation with the most modernized fleet in aviation history while providing the most available combat power given fiscal constraints,” speaking at a World Wide CAB Commanders conference to all of the available CAB commanders in 2014.²³ MG Lundy and his staff have remained adamant in the necessity of ARI while highlighting the importance of getting ARI right for the future of the Army.

The first LOE involves the phasing out of the TH-67 training aircraft. In so doing, Army Aviation saves significant money in the maintenance of an aging TH-67 fleet and in development of a new training helicopter. Instead, the ARI plan uses a combination of current AC LUH-72s and the procurement of 100 additional LUH-72s to provide a new training fleet to FT Rucker, while allowing the National Guard community to maintain all 212 LUH-72s in its fleet for various homeland security missions. The upgraded training fleet will be fully operational in 2018.²⁴ The LUH provides students an advanced airframe including a glass cockpit system and twin engines, greatly enhancing the training experience at flight school and reducing transition time to advanced airframes, all while reducing costs and divesting approximately 182 aging TH-67 airframes.²⁵ Some arguments against this plan stem from the acquisitions and manufacturing community whom worry that the US will continue to reduce its already weak helicopter manufacturing capability by not continuing to stress the industry for new products.²⁶ When the government does not place bids within a manufacturing sector it tends to reduce its capability to produce new technologies and diminishes the manufacturing industries capacity to surge productions in the event of a crisis. Despite this criticism, aviation leaders have assumed risk in manufacturing to reduce cost and redirect funds into other sectors.

The second LOE, the reduction from thirteen to ten AC CABs involves the addition of UASs into AC CABs and the standardization all ten of these units. (See Figure 1: Standardized Active Component CAB structure for the future AC CAB example.²⁷) The reduction and restructuring will ensure that each AC Division has one AC CAB assigned to it for future resourcing. This will help the Army to achieve its regionally aligned forces initiative, aligning divisions and CABs to specific regions in the world to provide familiarity for individuals and units assigned to provide coverage to these regions. With the reduction to ten AC CABs, the AC will reduce its manpower requirements by approximately 3,482 personnel, also helping the Army to reach its diminishing manpower objective end strength.²⁸ The reduction in CABs also creates a demand to provide rotational forces to deploy in support of both the European theater of operation and the Pacific theater of operation. These rotational units are one of the main concerns active duty aviators have expressed regarding ARI. Concerns arrive from a unit's ability to deploy into foreign locations for relatively short durations and to become familiar with the region's particular flight requirements and specific procedures. Units are attempting to alleviate local familiarity shortfalls through subject matter experts (SME) and classes prior to deployments, in an effort to ensure personnel are prepared to fly upon arrival into theater. In Europe, the deactivation of the 12th CAB now requires state side units to deploy for 9-month rotations to provide coverage to EUCOM and European allies. In Korea, the planned deactivation of 2 ID CAB in 2018 will require a similar rotational requirement from stateside units to maintain previously agreed upon protection requirements to the Republic of Korea and the necessary support to forward stationed forces in that region.²⁹ Rotational units pull resources from strategic surge capabilities and limit the total number of units available in case of another extended conflict. Recent arguments against this reduction have focused on maintaining 2ID

CAB in Korea to reduce these possible shortfalls.³⁰ Unfortunately, this reduction in CABs is a necessary component within ARI and helps to save over 1.1 Billion dollars in annual operations and support costs each year.³¹ These cost savings allow for the continued modernization of the Army fleet.

The third LOE, involving the movement of all attack aviation platforms from the RC to the AC, is by far the most controversial.³² The LOE attempts to cut costs by reducing attack aviation from thirty-seven to twenty “shooting” BNs across the total army force.³³ To alleviate this reduction risk, ARI reallocates all of the remaining shooting BNs into the AC where they can be kept at the highest state of readiness, deployed on extended schedules with reduced notification requirements, and with less dwell time restrictions than what is necessary in the RC.³⁴ By transferring the AH-64s from the RC and redistributing the airframes from deactivating AC CABs, Army Aviation will provide every AC CAB with one Heavy Attack Reconnaissance Squadron (HARS) consisting of 24xAH-64s, 12xRQ-7 Shadows UAS and one the Attack Reconnaissance Battalions (ARB) comprised of 24xAH-64s and 12xMQ-1C Gray Eagles.³⁵ The redistribution allows the Army to maintain these low-density, high demand battalions available on an AC surge timeline for maximum availability and responsiveness.³⁶ Simultaneously, the RC will standardize ten of its twelve aviation brigades, and add 159 UH-60 airframes that are more suitable to a stateside defense support to civil authority (DSCA) mission. (See Figure 2: Standardized Reserve Component CAB structure for a future RC CAB structure example.³⁷) Additionally these twenty attack BNs will now also attempt to fulfill the reconnaissance role previously accomplished by the OH-58D community. The two Apache battalions in each AC CAB will work to fill the scout reconnaissance mission sets using a variety of manned and unmanned teaming (MUM-T) techniques. This plan is still in an infancy status and requires

further exploration to ensure there is no degradation in the AC CAB's ability to conduct attack or reconnaissance missions in future conflicts.

The final LOE includes the retirement of 280 OH-58A/C and 336 OH-58Ds.³⁸ OH-58Ds previously served as the primary scout reconnaissance platform for the Army. With the OH-58 divestment, an ongoing project scheduled for completion in 3rd quarter of FY 2016, Army Aviation is working to develop means to replicate this critical mission set. Current plans focus on the above-mentioned integration of UASs into aviation brigades and the development of MUM-T TTPs. Currently, three AC CABs have undergone the MUM-T transition and the remaining seven AC CABs will complete the UAS procurement and realignment in 1st quarter FY19.³⁹ (See Figure 3: Army Aviation planned end state for a pictorial presentation of the plan for all Army Aviation in FY19.⁴⁰) Unfortunately, these UAS cannot provide the same reconnaissance or close combat attack capability of an OH-58, and their fielding completion is two and a half years behind the divestment of the OH-58s.⁴¹ Aviation leaders are attempting to mitigate these reductions through the increased use of AH-64s in a reconnaissance role, despite the platform's original design, which is to deliver heavy munitions onto targets. By refocusing on reconnaissance, AH-64s reduce capacity to execute their primary mission of delivering munitions in support of the ground commander's objectives. The degradation in reconnaissance capability requires a close examination to ensure aviation leaders are properly preparing for the next conflict.

New Aviation TTPs in Support of ARI

In an ideal world, the defense budget would have money to maintain, upgrade, or develop new airframes, allowing the OH-58D or an airframe similar to it to remain in the inventory, fulfilling a single purpose reconnaissance role. Unfortunately, this is not reality and leaders must

improvise to accomplish assigned missions with the tools at hand. To do so aviation leaders must rethinking how to use the remaining aircraft available to accomplish multiple and overlapping mission sets. No longer will the Kiowa Warrior remain available to accomplish the majority of Army Aviation's reconnaissance tasks, leaving the Apache to conduct attack centric missions, while Blackhawks conduct troop transport. Aviation leaders must develop new TTPs that will maximize assets across the battlefield, while attempting to provide ground force commanders the persistent aviation support (PAS), 24/7 aircraft coverage, they deserve.⁴² The mere presence of aircraft overhead serves as a deterrent to enemy forces, reducing an enemy's freedom of maneuver and enabling friendly forces to seize the initiative. Combining this with aviation's ability to see and understand the battlefield and relay these findings to the ground force commander has proven invaluable across both Iraq and Afghanistan.⁴³ In order to achieve effective aviation support and potentially PAS, aviation leaders must reevaluate how they employ the current fleet, remaining open to the use of lift assets in a reconnaissance capacity.

Dr. William Lewis from the Army's Aviation development directorate identified the "CAB recon and security gap as the number one critical capability gap in the Army" while briefing MG Lundy, the Commanding General of the USAACE on 29 September 2015.⁴⁴ Current Army plans to solve this gap include the integration of Shadows and Grey Eagles into CABs, working in a MUM-T capacity. The Army defines MUM-T as the "synchronized employment of Soldiers, manned and unmanned air and ground vehicles, robotics, and sensors to achieve enhanced situational understanding, greater lethality, and improved survivability."⁴⁵ MUM-T is a relatively new technology and tactic that allows AH-64s to receive real-time full motion video (FMV) and imagery into the cockpit, enhancing a pilot's situational awareness with a goal of improving target acquisition times.⁴⁶ MUM-T is an evolving technology and TTP that

will expand with ARI's inclusion of UASs directly into the Army's CABs. By making Army Aviation the proponent for Army UASs, Army leadership has significantly increased the standardization and training in the UAS community, an area that had previously been weak, resulting in accidents and the degraded integration of UAS capabilities into ongoing operations in the emerging years of UAS operations.⁴⁷ The inclusion of UASs directly into aviation brigades allows for an improved mutual understanding of capabilities and limitations of all the platforms involved and the development of new TTPs as units build habitual working relationships through increased training opportunities.

Manned-Unmanned Teaming Advantages

An important component of ARI involves the conversion of over 320 former OH-58 pilots into UAS operators, adding a reconnaissance, security mindset and an inherent knowledge of aviation operations into the UAS community that was previously missing.⁴⁸ In another move to further develop the MUM-T expertise and fill the reconnaissance gap, aviation leaders established a two week Aviation Reconnaissance Course designed to build synergy between manned and unmanned systems and to improve Army Aviation's reconnaissance expertise.⁴⁹ All of these MUM-T initiatives within ARI focus on bringing the manned and unmanned communities together as they determine how to enhance individual capabilities while supporting the ground community. MUM-T provides a cost effective solution to the use of the AH-64 as a scout platform and allows an aviation commander to become closer to achieving the desired PAS solution for the ground force commanders. COL Tom von Eschenbach, the Army Training, and Doctrine Command's capability manager for UAS says, "I think one plus one -- a Shadow plus an Apache -- equals three," indicating that the use of mutually supporting capabilities will help aviation leaders achieve asymmetric advantages in future operations.⁵⁰

Although the AH-64 certainly has the capability to conduct the scout mission, its original design was for the Cold War era, built as a tank destroyer for decisive operations in a force on force scenario. The average flight hour for an AH-64D is over double that of the previously utilized OH-58D at a cost of \$6,560 versus \$2,931 an hour to operate.⁵¹ These costs include anticipated maintenance expenses, parts requirements, and fuel. By utilizing Shadow and Grey Eagle assets in a partnered capacity with an AH-64, aviation leaders can reduce AH-64 flight hours to conduct basic reconnaissance, saving precious manned flight hours for missions that require a manned airframe. By utilizing a UAS's attributes, its slow airspeeds, extended station times, high altitudes, and persistent observation capabilities, a UAS can provide effective reconnaissance without increased risk to personnel. The use of MUM-T also helps to achieve PAS, a goal an aviation leader should strive to achieve whenever requested by a ground commander. Although the presence of a drone does not provide the same level of intimidation to the enemy or full situational awareness that an aircrew can provide, it does help fill a piece of the reconnaissance gap.

Manned-Unmanned Teaming Disadvantages

Despite the advantages MUM-T brings to the combined arms team, Army Aviation needs to remain aware of the disadvantages involved in the current generation of UASs while developing bridging strategies to fill the reconnaissance gap left by the divestment of the OH-58D. Downsides to the use of MUM-T primarily involve the lack of situational awareness attained from a UAS versus a manned helicopter, particularly during a dynamic situation. LTC Pat Davis, the BN commander for 1-229 ARB, highlighted this point in an interview just after his return from a deployment in Afghanistan in early 2015 in which his unit used both the AH-64Es in a MUM-T capacity with MQ-1Cs and OH-58Ds attached to his Task Force.⁵² When asked

which he preferred, manned or unmanned aircraft, he said that “a lot depends on what your mission set is. A helicopter with a human being inside can provide better situational awareness by actually being on the mission and seeing it, smelling it, hearing it,” highlighting a lack of situational awareness encountered in the current generation of UASs.⁵³ In a helicopter, pilots can literally see the expression on people’s faces when conducting low-level reconnaissance missions.⁵⁴ This level of fidelity greatly enhances the situational awareness of both the crew and the commander the crew is reporting to. The technology in drones still limits their image clarity and their ability to capture a full understanding of complex situations. When a UAS focuses in on a target or objective area, the system’s field of vision (FOV) reduces dramatically, similar to looking through a straw. FOV can have significant impacts on success and require consideration when assigning UASs to a mission. While operating at a wide FOV a UAS has significantly less visual clarity particularly once operators account for altitude, atmospheric conditions, sensor type, and target description. With a narrower FOV, the UAS can increase clarity but will only be able to focus on that one target area.⁵⁵ This significantly inhibits the operator’s ability to maintain full situational awareness of a scenario and can lead to potential misinterpretations of a situation. Unfortunately, these misinterpretations have evidenced themselves in a number of misguided drone strikes throughout the wars in Iraq and Afghanistan, leading to scenarios involving unintended collateral damage.⁵⁶

There are other emerging threats that may inhibit the future use of UAS. These include anti-radiation weapon systems focused on jamming UAS’s communications, rendering the systems useless; attacks degrading global positioning systems, crucial to the operation of UASs; or the use of cyber technology to attack a UAS’s software, hardware, mission planning, or aviation support systems.⁵⁷ Technological vulnerabilities are not unique to UAS but they are

accentuated in unmanned systems and could easily render them useless; leaving a ground commander relatively blind if the aviation community relies too heavily on this burgeoning technology. Additionally, UAS require a prepared runway to operate from, no less than 2,000 feet for the MQ-1C Grey Eagle and 710 feet for the RQ-7 Shadow.⁵⁸ Runway requirements significantly reduce the locations UASs can deploy to, particularly under expeditionary conditions. UAS are also more susceptible to weather and terrain phenomenon than their manned counterparts based on their light size, frailty, and necessity for favorable atmospheric conditions while flying at altitude to provide a clear picture to the operators. UAS encounter degraded capabilities when operating in mountainous terrain or encountering other natural or manmade obstructions, which can lead to limited line of sight (LOS); reduce a UASs range, laser, and weapon capabilities; or require the employment of a second UAS using a data relay capability to provide information back to operators.⁵⁹ Commanders must continue to understand UAS limitations while not overestimating a UASs reconnaissance capacity when compared to a manned platform. Although UAS may remain cheaper to fly, \$2,300 per flight hour for Grey Eagles, they lack the ability to provide the same reliability and level of fidelity while developing situations when compared to their manned aircraft brethren.⁶⁰

Another significant downside to the MUM-T concept involves “pilot task saturation,” a scenario in which crewmembers become overloaded with too many competing requirements leading to degraded performance, or worse, an accident.⁶¹ With the additional technology, upgraded AH-64s bring to the fight, aviation leadership must minimize the possibility of overloading crewmembers with tasks that do not involve the basics of piloting a low flying aircraft. The Tactical Common Data Link (TCDL) allows an AH-64 to receive FMV from various UAS platforms and in the case of the Grey Eagle, control the UAS’s flight path, and

targeting sensors, while both airframes are flying.⁶² Although these capabilities may provide some advantages, they can also overload pilots, inundating them with multiple tasks at one time. These tasks can include talking on multiple radios to numerous agencies, the conduct of their own reconnaissance mission, working with the friendly forces on the ground to positively identify their location and the location of enemy forces, and reacting to possible enemy contact, all while maintaining control of the aircraft.

Additionally, AH-64 pilots often serve as Air Mission commanders responsible for the management of all flying assets in the airspace, another competing priority for the limited crew inside of an AH-64. Task saturation scenarios are situations aviation leaders will have to mitigate as the levels of interoperability (LoI) between AH-64s and Grey Eagles grow. LoI 4, the highest useable LoI at this time includes the actual control of a MQ-1C's flight path, sensors, and munitions from within the AH-64. CW4 Philip Learn, an experienced AH-64 Standardization Pilot and Aviation Mission Survivability Officer explains, "There is much refining to still complete regarding MUM-T...In the future under the correct command and control we could far exceed what the OH-58's provided. We are unfortunately years away from doing this."⁶³ CW4 Learn highlighted both the lack of full situational awareness that is derivable from a UAS's FMV alone and the current complexity involved in controlling UASs from another flying airframe. It is this period of transition gap, as technology and TTPs are refined in the MUM-T community, which aviation leaders must focus on filling in order to remain successful in upcoming conflicts.

Reexamining UH-60 Blackhawks

The most significant downside to the use of AH-64s in a reconnaissance capacity is that it degrades their ability to conduct their primary attack mission, the ability to put rounds on target in support of a ground commander's scheme of maneuver. When AH-64s conduct

reconnaissance missions, they are not executing attacks or security missions for commanders on the ground. This role as a reconnaissance platform further reduces Army Aviation's attack capacity, a capability that is already extremely understrength. Instead, leaders must reexamine UH-60s as a platform to accomplish more of the recon mission for the ground commanders, leaving the attack missions to the AH-64s. This will require a shift in aviation leaders' mindsets in order to drive the UH-60 community to further train and develop internal reconnaissance capabilities while helping to maximize diminished assets. Yes, UH-60 are already heavily utilized in combat for a variety of other missions, but senior ground commanders will have to prioritize their desired effects. Having a trained and capable UH-60 community to draw from to execute reconnaissance missions will only increase a ground commander's flexibility.

To help fill the recon gap and develop redundant and complementary reconnaissance competencies, while preparing for possible scenarios in which UAS assets are unavailable, Army Aviation must examine lift platforms roles in reconnaissance missions. Currently, the Army cannot afford to develop a new-armed scout helicopter, so it must look at creative ways to perform these missions with the aircraft available. At an hourly flight rate of \$3,412, the UH-60M costs almost half the price to fly when compared to the AH-64D.⁶⁴ Although Blackhawks are not currently equipped with the same level of sensors or armament found in the AH-64s or OH-58s, UH-60s do have two crew chiefs to help develop and maintain situational awareness in combat. Additionally, a Blackhawk has a higher power-to-weight ratio improving maneuverability over an AH-64. The ability to dynamically re-task a UH-60s to reposition ground forces or supplies also increases their versatility. UH-60s can carry up to eleven additional passengers with the seats in, who can serve as SMEs and sensors themselves, an advantage not seen in the AH-64. The Army has the ability to enhance these capabilities with the

addition of an upgraded armament system, something the US Army has accomplished in its Special Operations Aviation community with the addition of sensors and configurable weapons systems on its direct action penetrator (DAP) MH-60s.⁶⁵

UH-60s already provide a reconnaissance capacity, serving in an intelligence, surveillance, and reconnaissance (ISR) role on every flight, no matter the directed primary mission. The ability of aircrews to garner information while flying over an operating area can prove invaluable to a commander's situational understanding. Often, how well these aircrews accomplish this secondary mission depends on the command climate, priorities, and the operating environment. FM 3-04.113, *Utility and Cargo Helicopter Operations*, already discusses the use of utility airframes, particularly UH-60s, in a reconnaissance role. The doctrine states, "commanders instill into crewmembers that they are reconnaissance Soldiers fighting for and confirming intelligence. Their sightings and reporting of any activity (or lack thereof) may make the difference between victory and defeat," an indication of the reconnaissance mentality already present in the utility community.⁶⁶ This line of thought and development of TTPs requires further expansion to help fill the reconnaissance role previously executed by the Kiowa Warrior. Although Blackhawks do not have the same sensor packages that are in place on AH-64s, they have crew chiefs and any other observers onboard that can help fill this role. Human eyes often see and comprehend much more than what is distinguishable from a sensor system alone. Although not ideal for attack targeting, in a reconnaissance role Blackhawks can provide comparable capabilities to that of what the OH-58 provided, and should receive further examination as an additional reconnaissance asset in the army inventory.

Reconfigurable UH-60 Blackhawks

The conversion of Blackhawks into attack and scout platforms is not a new idea. As mentioned before, DAPs, converted UH-60s, upgraded and equipped with weapon systems and sensors comparable to the AH-64, have played an integral role in the 160th Special Operation Aviation Regiment (SOAR).⁶⁷ This type of armament on a Blackhawk also evidences itself in the US Navy where the Seahawk is equipped with torpedoes in an anti-submarine role and in the US Air Force where the Pave Hawk replaces the standard 240H machine guns with mini-guns. Paying to upgrade Blackhawks would pose a large expense in both the initial purchase and the required follow-on proficiency training. However, this expense would be minimal when compared to the development and manning of a new armed scout reconnaissance platform. Utilizing the UH-60 would also streamline maintenance procedures and parts reducing operational and support life cycle costs. Restructuring CABs to include a company of armed reconnaissance, configurable Blackhawks, or the introduction of a platoon of these configurable Blackhawks into each company in the Assault Battalion would provide additional reconnaissance and attack depth, particularly in the RC. Increasing the RC's attack capacity by adding configurable armament systems to UH-60s may ease NG opposition to ARI and provide additional strategic depth that was previously lost with the movement of all rotary winged attack platforms to the AC. This flexible approach would also allow the RC to remove weapons configurations when conducting stateside mission sets that do not require this capability.

Other nations around the world have already worked with Sikorsky, the producer of Blackhawks, to develop and procure conversion kits in an effort to save money. By using Blackhawks in both a utility role and as an attack asset, countries like the United Arab Emirates are streamlining their total number of required platforms, while remaining capable of executing all of the basic mission sets; assault, attack, reconnaissance, and general support with one

airframe.⁶⁸ This technique could provide a cost effective method and add additional attack capabilities to the total army, helping to supplement the overall diminished attack community. In the RC, utilizing upgraded UH-60s capable of a configurable armament system would reintroduce an attack capability that ARI plans to reduce while providing states additional utility airframes more conducive to the defense support to civilian authorities' mission. The RC community should work with the AC to develop these new capabilities and TTPs. As RC ARB aircraft transfer into the AC, reserve Apache aviators can utilize their detailed knowledge of the attack and reconnaissance mission to expand the Blackhawk's role. All of these changes require a joint effort to implement between the AC and RC. This concept would help grow partnerships between AC and RC aviation units, one of the underlying priorities in ARI. ARI has aligned AC and RC CABs to build relationships, force joint training, and alleviate the lack of attack assets in the RC CABs through a multicomponent solution. This plays into the Army's Total Force Policy, signed by Secretary of the Army John McHugh on Sept. 4, 2012. The policy integrates the Army's active and reserve components, driving an expansion of partnership and teaming between the compositions.⁶⁹

By focusing efforts on a reduced number of airframes and continuing to upgrade those platforms, Army Aviation can save money and streamline operations. While discussing the ARI and the Army's Future Vertical Lift (FVL) concepts, MG Lundy recently stressed the importance of "cockpit commonality to reduce the training base," and how like platforms can "reduce the maintenance burden."⁷⁰ Acquiring maintenance parts routinely cause delays in aircraft availability and is a leading cost to ongoing operations. Utilizing fewer airframes but accomplishing multiple mission sets with those airframes is already an integral ARI concept and has ultimately led to the retirement of the OH-58D. The use of like airframes with

interchangeable parts and maintenance procedures while executing a variety of missions ultimately saves money. These cost saving measures provide ample reason to reexamine how aviation leaders utilize the current airframe inventory when determining methods to fill capability gaps left from ARI.

Purple Teams

The expansion of UH-60 and AH-64 teaming has occurred dramatically over the past fourteen years of conflict in Iraq and Afghanistan. The concept of partnering these two platforms, often referred to as creating a “purple team,” the pairing of a blue utility aircraft with a red attack platform, has enhanced each airframe’s individual characteristics and capabilities. The firepower and sensors that an AH-64 can utilize are unquestionably useful when conducting attack missions, but the UH-60’s capacity to carry additional “eyes” particularly ground commanders can all enhance a reconnaissance missions successfulness, building the full picture for commanders. Additionally, the use of crew chiefs as reconnaissance sensors provides additional eyes focused purely on acquiring targets and information that do not have the same competing requirements as pilots who can reach task saturation, becoming less effective sensors. These burdens only dramatically increase as AH-64 pilots increase their control over UASs in a MUM-T capacity.

Purple teams enable ground commanders to maneuver within their battle space; supporting ground forces with both UH-60s and AH-64s allows for enhanced capabilities throughout an operating area. Examples of the benefits derived from pairing UH-60s loaded with specialized ground forces and AH-64s providing security were evident in Afghanistan in 2012 during *Operation Shrimps Net*, a ten-day retrograde operation from two remote bases in Regional Command-West.⁷¹ The pairing of an AH-64 with two UH-60s loaded with a ground element

containing infantry soldiers, communications specialists, EOD, and interpreters allowed the team to recon and cover a large expanse of battle space, providing early warning and near continuous coverage of an over-stretched convoy. (See figure 4 for an example Purple team configuration.) These teams routinely paired with UASs who identified targets for them to interdict, ranging from suspicious vehicles to possible IEDs. The mission set could not have been accomplished without the mutually supporting capabilities of the UH-60 with its full complement of passengers, the AH-64 with its armaments and sensors, and the UAS who helped to provide target acquisition and identification. Overall, the mission provided the ground forces as much PAS as possible, and allowed for the execution of several mission sets, including the emplacement of reconnaissance teams into high ground along the route and the execution of numerous vehicle interdictions focused on stopping possible anti afghan forces as they fled the area or as they approached the convoy. The mission also focused on the use of Navy EOD personnel to help identify IEDs while flying in UH-60s. Once identified, the EOD members and the infantry aerial reaction force (ARF) teams were able to land and disable these devices intended to target the convoy. During *Operations Shrimps Net*, these purple teams identified and disabled five IEDs and cleared numerous additional suspicious areas along the convoy's route that would have otherwise slowed the mission significantly, forcing organic assets from the convoy to stop and reconnoiter these possible IEDs.⁷²

Additional pairing between the UH-60s and AH-64s is a method to spread limited attack resources across the operating area. Pairing a UH-60 with similar station time to an AH-64 allows aviation leaders to spread attack assets in an attempt to provide the PAS that is so often desired by the ground force commanders. The use of gyroscopic binoculars and the ability of the UH-60 to fly at low altitudes to further examine a situation provides a differing perspective in the

conduct of reconnaissance from the AH-64's normal sensor capabilities.⁷³ Further expanding this role and capability requires a change in the aviation community's current mindset. Although used occasionally while in combat, this pairing technique has seen little use at home stations. Aviation leaders should reexamine the expansion of purple teams as a new norm to help alleviate the reduction in attack assets across the force.

Pathfinders

Another method of mitigating the implementation of ARI should come from the expansion of pathfinder companies into every CAB. Currently only the 82nd, 101st, and 10th Mountain Division CABs have organic pathfinder units assigned.⁷⁴ Pathfinder companies greatly enhance a CAB's capabilities and provide additional reconnaissance assets to a division commander.⁷⁵ A pathfinder company is relatively inexpensive compared to a helicopter company and can provide significant airborne, air assault, personnel recovery, and most importantly reconnaissance capabilities.⁷⁶ These companies develop habitual working relationships within their parent CABs and enhance training opportunities for both ground soldiers and aviators alike. The ability of the pathfinder to provide an organic, quick reaction force for the CAB has proven invaluable in Iraq and Afghanistan. Pathfinder units accomplish a wide variety of mission sets and provide a CAB and division commander another extremely useful tool for conducting reconnaissance missions. Army Aviation should relook the possible expansion of pathfinder units to every CAB including the RC units.

ARI Today

Currently, ARI is on track for completion in 2019, but lawmakers have slowed the process of transferring AH-64s from the RC to the AC. The 2015 National Defense Authorization Act (NDAA) restricted the transfers of any AH-64s in FY 2015 and only allows a

maximum transfer of 48 AH-64s before June 2016 to allow for further examination of the ARI plan.⁷⁷ The 2015 NDAA does allow the Army to continue retiring OH-58Ds and replacing TH-67s with UH-72A Lakotas.⁷⁸ The law also called for a National Commission on the Future Structure of the Army to evaluate ARI and the overall balance between active, guard, and reserve force with a brief back required in early 2016.⁷⁹

ARI is a necessity for Army Aviation to maintain capabilities in an ever-tightening budget constrained environment. ARI saves the Army \$1.1 Billion dollars annually in operations and support costs and reallocates \$11.9 Billion dollars in service life extension programs from retiring aircraft and another \$14.8 Billion in additional production rate costs for UH-60s and AH-64s.⁸⁰ These cost savings allow for the continued modernization of the Army fleet. Alternative COAs called for the reduction of five aviation brigades while maintaining older, underperforming aircraft and sacrificing some of the Army's most capable and modern airframes. Alternate COAs increased the strain on the entire Army Aviation community, worsening the dwell to deployed ratio, already one of the worst across the Army. Army Aviation often experienced less than the optimal 1:2 deployed to dwell ratio throughout the past fourteen years of conflict.⁸¹

The controversy stemming from ARI primarily involves the NG community. Their stance highlights the risk imposed upon the nation by reducing the RC's strategic depth capabilities by eliminating all attack aviation from the RC. The NG also wants to avoid a "slippery slope" in which the RC is relegated to service and support roles, again diminishing the nation's overall capacity to fight a protracted conflict. NG leadership highlights the disruption ARI will cause across twenty States' RC forces and the loss of a location for former AC Apache pilots to transition into once they are ready to depart active duty.⁸² The thought process in reducing

strategic depth, a known downside of ARI, revolves around the reduction of “shooting battalions” from thirty-seven to twenty across Army Aviation and the requirement to maintain these remaining battalions at the highest possible state of readiness.⁸³ Although the Army Aviation RC community has performed admirably over the past fourteen years of conflict, budgets are tightening; it will become harder to maintain a constant state of readiness, particularly in the RC community. RC readiness concerns and the extended timeline that it takes to mobilize, deploy, and redeploy RC units remain the salient reason for shifting of all attack battalions into the AC. Army planners fear that with only twenty attack battalions total, it would become unrealistic to maintain an optimal operational deployment ratio while incorporating RC units. The past fourteen years in Iraq and Afghanistan proved that it was extremely difficult to maintain an optimal deployment ratio with thirty-seven “shooting battalions.” The reduction will only increase deployment stress, requiring the flexibility that an active duty unit can provide without having to work within RC mobilization timeline limitations.⁸⁴

Conclusion

In summary, although some may criticize ARI, it is an important initiative that builds readiness while operating within the fiscal constraints imposed by the government. ARI will disproportionally affect the AC over the RC, with active duty aviation reducing three combat aviation brigades, 23% of its total ACFT, and approximately 3,100 service members while standardizing the AC CABs. This compares to the RC, which will maintain all 12 Aviation Brigades and only lose 8% of RC total aircraft.⁸⁵ The reduction of attack platforms from the RC will reduce the nation’s strategic depth, but the addition of UH-60s to the NG provides states an airframe that is well suited to the DSCA mission. General Raymond Odierno (USA) stated that the UH-60 is the “center piece of Army Aviation while in a combat role” in a Senate armed

service committee hearing, discussing the role of UH-60s in combat and the future of Army Aviation in 2014.⁸⁶ The UH-60 has flown the most combat hours of all the platforms in Iraq and Afghanistan over the past 14 years, while providing ground warfighters flexibility and maneuver capabilities.⁸⁷ The transition of 159 UH-60s into the RC, replacing over half of the transferring 192 AH-64s, is not in an effort to relegate the RC to the sidelines in future conflicts, but merely an effort to maintain the reduced attack community at the highest level of readiness possible.

Between ARI's shortcomings, the strategic depth question should not be at the forefront of leader's concerns. Instead, the aviation community must ensure that it can accomplish its assigned mission tasks. ARI has significant implications to the community's ability to accomplish both the attack and reconnaissance mission. By utilizing the expensive AH-64 to conduct reconnaissance, it naturally degrades from the community's ability to conduct attack missions. The retirement of the A-10 Warthog from the US Air Force and the ability for the military establishment to provide close combat attack and close air support for ground soldiers concerns Army planners.⁸⁸ Both the AH-64 and A-10 perform similar missions, and with the A-10s' retirement it will become even more important to ensure AH-64s remain prepared to execute their primary attack mission. Army Aviation leaders must work on adapting their mindset to include UH-60s into the reconnaissance mix to help spread the limited resources as far as possible.

With the divestment of the Army's dedicated scout platform the Kiowa Warrior, both the AH-64 and the UH-60 community should explore efficient means for their airframes to fill the recon void to include Purple Teams, MUM-T, and reconfigurable Blackhawks. Aviation leaders must break previous misconceptions regarding the sole uses of each airframe to determine new and flexible roles and responsibilities for the current fleet to provide support to ground

counterparts, Army Aviation's number one mission. Additionally, as funding becomes more prevalent, new technologies expanding MUM-T capabilities and the further expansion of the UH-60 Blackhawks sensor capacity, require examination to fill inherent gaps left by ARI. Based on the Army's new Operating Concept, MG Lundy also believes the aviation community must examine "additional ways to increase speed, range, and payload to enable expeditionary ops; fly and fight in all environments, weather, and visibility conditions; develop agile survivability solutions that stay ahead of emerging threats."⁸⁹ These desires remain achievable under ARI through cost saving initiatives and adaptive thinking by aviation leaders. ARI is good for Army Aviation, saving significant money, standardizing CABS to streamline operations and maintenance, and allowing for a rapid upgrade to the CH-47F, UH-60M and AH64E. Opponents may not see ARI as ideal, and it does have its shortcomings, but it is a good solution to an extremely complex problem resulting from ongoing budgetary constraints. Any attempts to derail ARI now would require a thorough analysis to ensure the reasons are in the best interest of the total Army Force and not just an individual community or constituent.

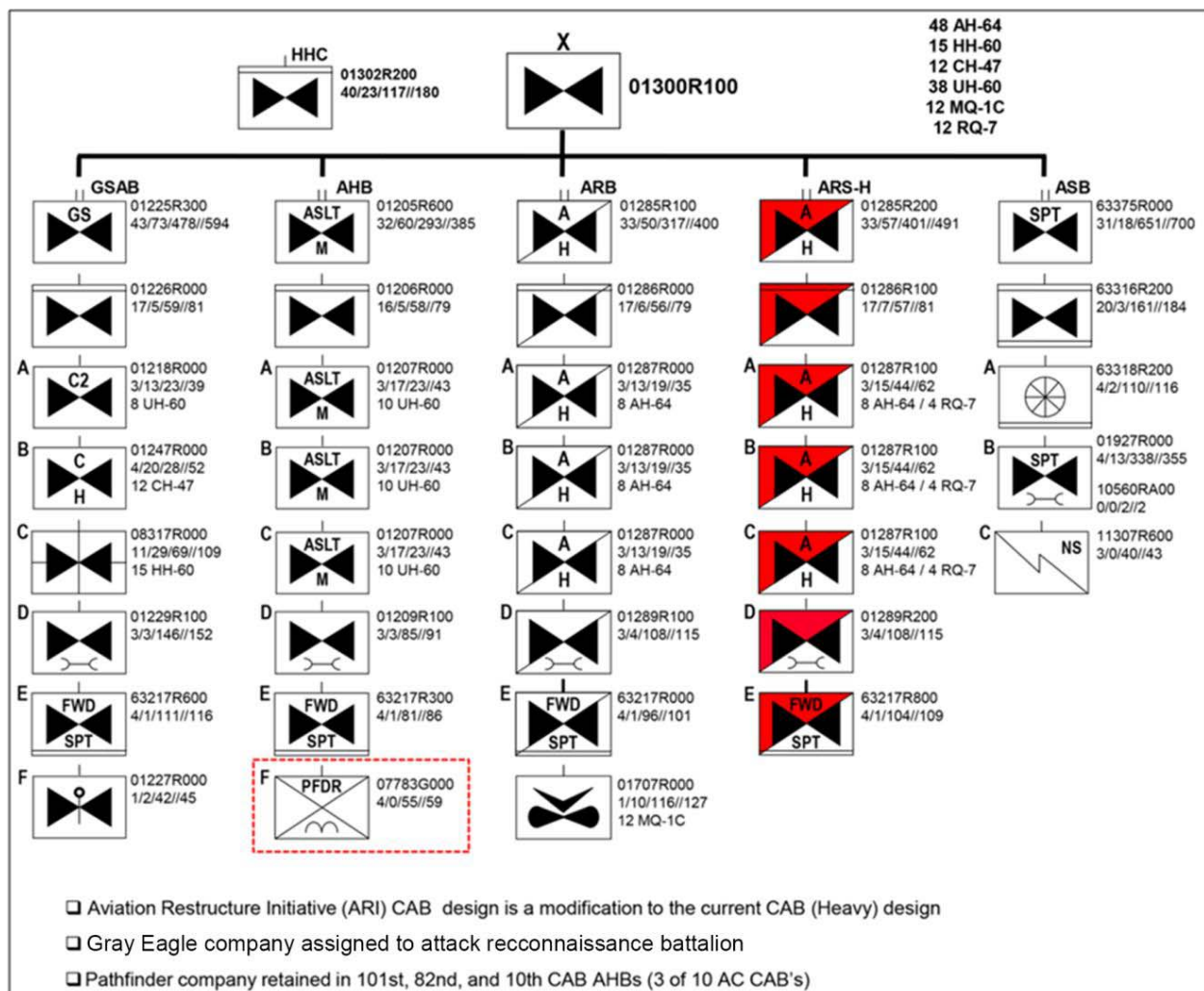


Figure 1 – Active Component CAB Configuration – Post ARI

12 x Reserve Component Aviation Brigades
8 x ARNG, 2 x USAR*, 2 x TABs**

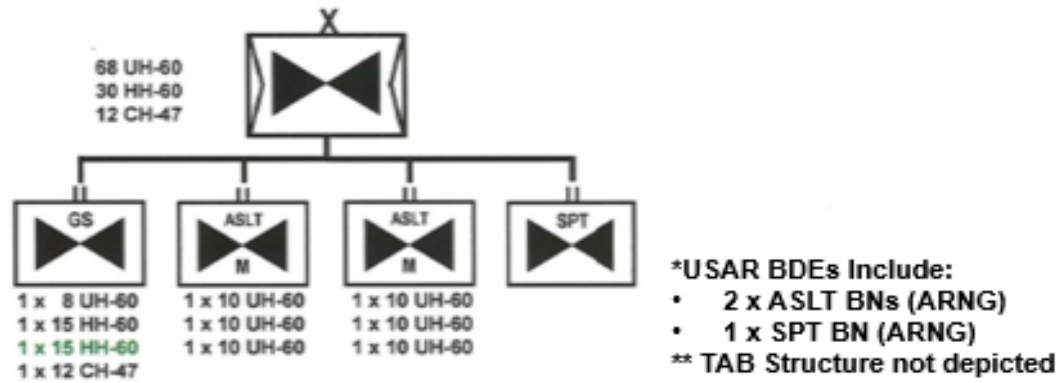


Figure 2 – Reserve Component CAB Configuration – Post ARI

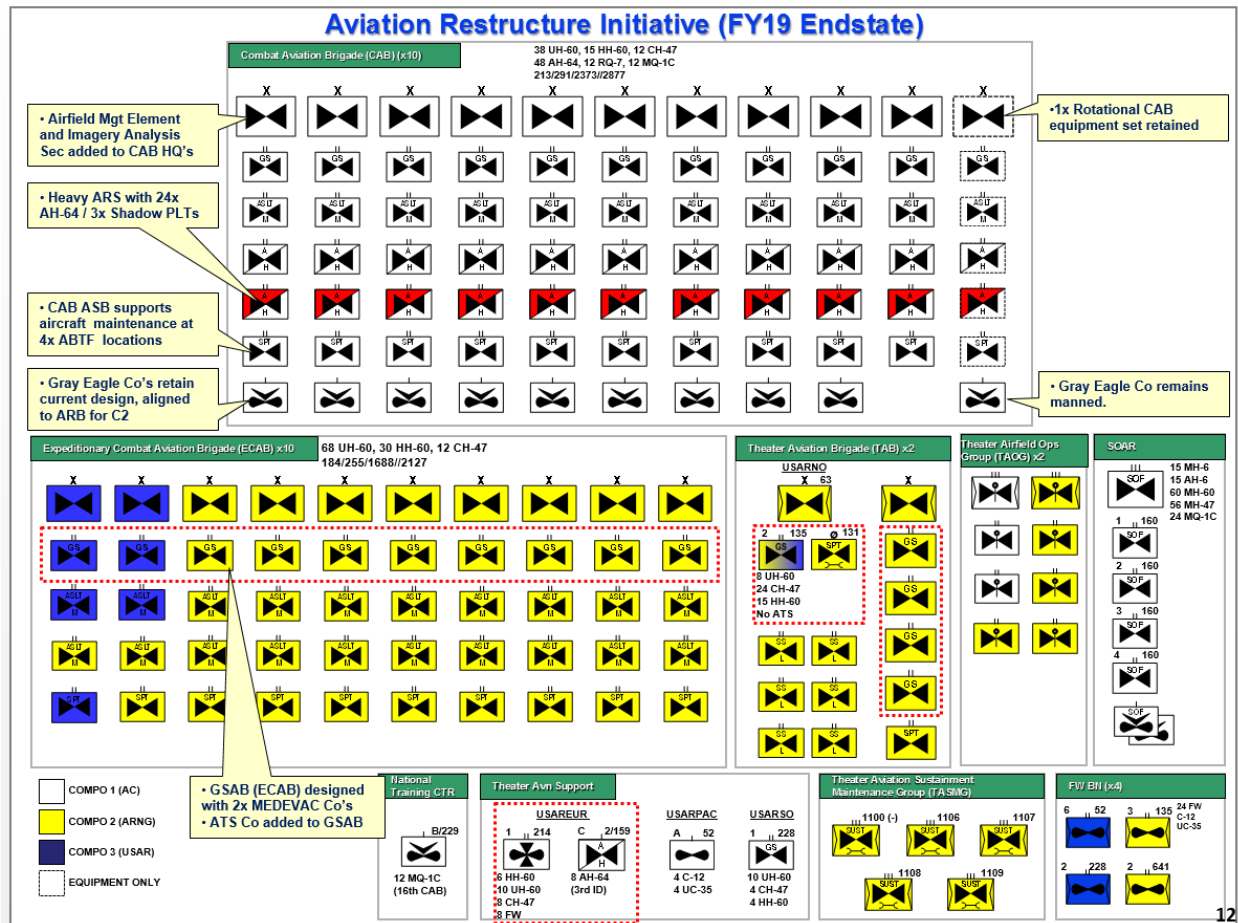


Figure 3 – ARI Planned Endstate, FY2019

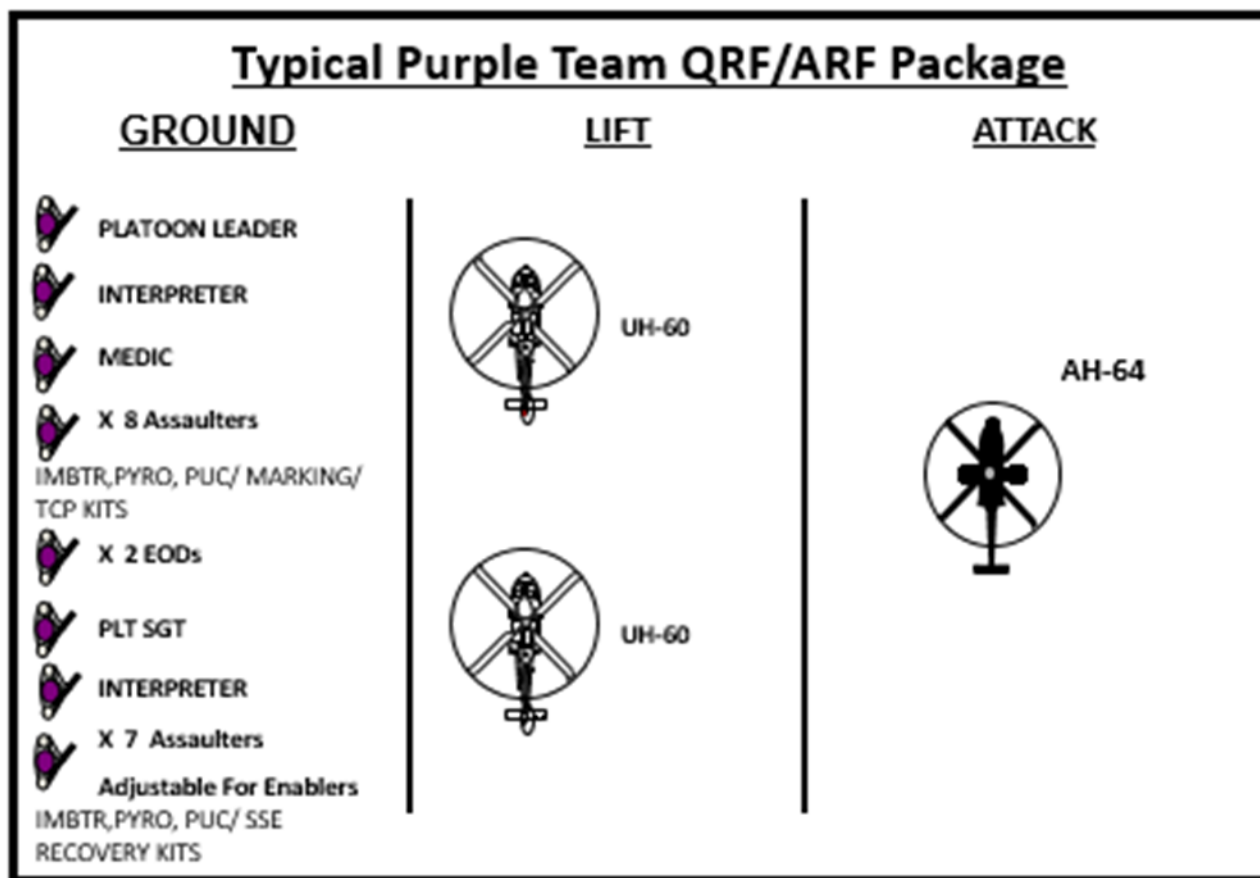


Figure 4 – Purple Team Configuration

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