

How Should the Joint Force Handle the Command and Control of Unmanned Aircraft Systems?

**A Monograph
by
Major Scott R. Cerone
United States Air Force**



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

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Major Scott Robert Cerone

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Approved by:

_____ Monograph Director

Jacob Kipp, Ph.D.

_____ Director,
Stefan Banach, COL, IN School of Advanced
Military Studies

_____ Director,
Robert F. Baumann, Ph.D. Graduate Degree
Programs

Abstract

HOW SHOULD THE JOINT FORCE HANDLE THE COMMAND AND CONTROL OF UNMANNED AIRCRAFT SYSTEMS by Major Scott R. Cerone, USAF, 44 pages.

The purpose of this monograph is to formulate an improvement to and highlight deficiencies in the current manner of the command and control of unmanned aircraft systems. The paper employs a historical method of analysis of the centralization of the command and control of airpower derived from the Casablanca Conference of 1943 during World War II. It then applies the classification problems associated with aircraft and discusses the lack of applicability of those taxonomies as technological advances make aircraft multi-role capable assets. This multi-role capability of armed unmanned aerial vehicles has the aircraft straddling the command and control line between being a simple reconnaissance platform and an air-to-ground strike platform.

There are three recommendations that emerged from this research. The first is that the Department of Defense must appoint executive agents for unmanned aircraft systems. The second is that all Tactical 3, Operational/Theater, and Strategic UASs be centralized under the command and control of the air component commander. The third recommendation is to terminate the MQ-1 Predator program and increase procurement of the Sky Warrior aircraft.

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Introduction

On any given weekend, one can find a child marveling at the sight of a remote control airplane soaring in the warm summer sky. These remotely controlled airplanes have gone through a dramatic metamorphosis for military use. Today unmanned aerial vehicles (UAVs) are currently flying combat missions in Afghanistan and Iraq. Satellite communications, advanced sensors, and precision guided munitions are three technologies that characterize modern UAVs. Technology has advanced UAVs beyond the remote controlled airplane purchased at a local hobby store, to a multi-role capable combat aircraft.

Technology has historically altered the way armed forces employ aircraft. Balloons, initially designed as observation devices, allowed the military commander to observe enemy movements on the battlefield. Powered flight extended the range of observation aircraft beyond the front lines. The next leap in aircraft capabilities took place during the Italo-Turkish War of 1911. Italian pilots performed the first bombing mission by dropping bricks on enemy positions.

The obvious minimal effects these pilots and their aircraft had during this time pale in comparison to today. UAVs, originally designed as observation aircraft, are not dropping bricks. They are dropping five-hundred pound, laser-guided bombs, striking targets with pinpoint accuracy. These UAVs are performing reconnaissance, interdiction, and close air support missions due to their vast array of advanced sensors, precision-guided munitions, and long loiter time. Along with the expanding missions of UAVs comes an increase in demand for these highly capable aircraft.

The number and differing types of UAVs employed by the United States military and its allies is on the rise. The increase in the number of unmanned aircraft flying over the battlefield has increased the importance of airspace deconfliction for manned and unmanned aircraft. The

Department of Defense and its respective services are investing billions of dollars into these aircraft. The thesis of this paper is that the Department of Defense must appoint executive agents for UAVs and that the joint force must centralize theater capable UAVs under the command and control of an air component commander.

The United States Air Force Institute for National Security Studies (USAF INSS) provided a grant for the research of this paper. The INSS's initial research request was to determine how the United States Air Force should command and control UAVs. During the research for this project, it was determined that the command and control of unmanned aircraft systems was a joint issue and not one for a single service. The USAF INSS agreed and approved the topic change to answer the question of how the joint force should command and control UAVs.

This monograph is comprised of four sections. The first section describes the difficulty associated with classifying aircraft and defines key terms associated with UAVs. The second section investigates the historical background that precipitated the centralization of the command and control of airpower in the United States military. This section begins with the first American attempt to centralize airpower in World War I, an in-depth analysis of the North African Campaign during World War II, followed by a brief summary of the various attempts to centralize the command and control of airpower from the Korean War through Operation Desert Storm. The third section of the monograph outlines two current command and control relationships regarding UAVs. The first is the acknowledgement of the need to centralize UAVs by the United States Army. The second relationship highlights an internal look at how theater capable UAVs are tasked and controlled within the Combined Air and Space Operations Center. This section concludes with a discussion of the legal missions assigned to the services and a newly passed law that may prove to be unconstitutional. The final section of this monograph

outlines recommendations for the Department of Defense and the joint force with regard to the command and control of UAVs.

The debate regarding the command and control of unmanned aircraft systems is important to military commanders because of the ever-increasing capabilities that these air assets provide. UAVs are not simple balsa wood and epoxy airplanes flown at the local soccer field. These highly advanced aircraft are lethal, effective, and provide a critical advantage to ground forces in the current counter-insurgency wars in Afghanistan and Iraq. It is imperative that the joint force streamline acquisitions of UAVs, establish standard communications architecture, and allow the appropriate commander to effectively command and control UAVs for the type of conflict our military faces. This paper will attempt to provide a joint perspective on the command and control of unmanned aerial vehicles using a historical framework. It advocates centralizing the command and control of theater capable assets, highlights economic and operational inefficiencies, while providing solutions for current operations with the foresight of battles yet to come.

Classification of Aircraft

The Department of Defense currently employs a vast array of unmanned aircraft. Some unmanned aircraft are as docile as the home-built remote controlled airplane while others cost more than some jet aircraft and can carry more weapons. There is a difficulty in classifying unmanned aircraft but this is not new. Manned aircraft faced the same daunting task many years ago. Manned aircraft were first categorized by the single mission those aircraft performed. This simple classification was appropriate during World War I, but as the capabilities of aircraft advanced, the classification system proved inadequate. This problem had reemerged as UAVs become multi-role capable.

The United States Air Service classified aircraft in three categories at the outset of World War I, pursuit, bombardment, and observation. The role of pursuit aircraft was to clear the sky of enemy aircraft. This group of aircraft solicits images of the Red Baron, Captain Eddie Rickenbacker, and bi-planes swirling in a dogfight over the battlefields of the Western Front. The second classification for aircraft at this time was bombardment. Aircraft, such as the De Havilland DH-4, were in this group. These aircraft attacked enemy ground forces and facilities. The final group for aircraft leading into World War I was observation aircraft. These included balloons and slow, unarmed aircraft. Observation aircraft flew missions to adjust artillery fires, report enemy movements, and to take aerial photography. The aircraft of World War I were difficult to fly; pilots had little training in comparison to modern standards, and seldom performed missions beyond their assigned role due to a lack of capability. This initial classification of manned aircraft was appropriate for the time but soon the capabilities of the aircraft outgrew their simple taxonomy.

The advent of multi-role capable aircraft during World War II and later through the jet age illustrates the difficulty associated with simple aircraft classification. One example is the Republic P-47 Thunderbolt. This aircraft is arguably the first multi-role aircraft. The P-47 was capable of pursuit, bombardment, and observation missions. The capabilities of the P-47 shattered the World War I classification system and this trend extended into the jet age. The Boeing B-52 Stratofortress, originally classified as a strategic nuclear bomber has never dropped a nuclear weapon in combat. Arguably, this nuclear bomber was most effective in its history performing close air support during the Battle of Khe Sahn in the Vietnam War. B-52s dropped thousands of tons of ordnance from over 30,000 feet, often within one kilometer of friendly troops, with devastating effect. The commonality of the rugged P-47 and the enduring B-52 is that they broke the common perspective of aircraft categorization. This historical progression of aircraft capabilities has reemerged with unmanned aircraft.

The classification of unmanned aircraft has followed the same pattern as manned aircraft. The first step to classifying unmanned aircraft is to first define two key terms. An unmanned aerial vehicle (UAV) is simply a remotely controlled aircraft. It is the “balsa wood and epoxy” that when assembled is an aircraft. Some of these aircraft are smaller than a Rubik’s Cube, an example are the new micro-UAVs underdevelopment, or larger than an F-16, (e.g. MQ-9 Reaper). The aircraft however is not a stand-alone piece of military hardware. The UAV is part of a total package of computers, sensors, personnel, and control apparatus. Collectively these are the unmanned aircraft system (UAS). The outputs of a UAS can range from full motion video (FMV) to the employment of a 500-lb laser-guided bomb. Next, we will follow the history of classifying UASs from 1996 through today.

There is a vast array of different types of UAVs employed by the United States military and just as many ways to classify them. As illustrated above, classifying manned aircraft has proven to be a difficult task due to the rapid increase in the capabilities of aircraft. This is no different with regard to UAVs. The first formal UAV classification by the United States Air Force occurred in 1996.¹

The initial classification divided UAVs into four operational groups: maneuver range, tactical range, medium range, and endurance.² This classification system simply divided the

¹ During the research of this project, the earliest United States Air Force documentation on the classification of UAVs that the author found was the Air Combat Command Concept Operations document from 1996. Another historical document may exist that preceded this classification attempt but it is unknown to the author.

² Air Combat Command, Concept of Operations for Endurance Unmanned Aerial Vehicles, 3 December 1996, Version 2.

UAVs based upon the range that the aircraft could fly. This breakout was a byproduct of the Cold War and the doctrinal concepts of air and land power at that time. The 1982 version of Field Manual 100-5, officially known as AirLand Battle, stressed the importance of attacking the Soviet advance in depth.³ The first, second, and follow-on echelons would need to be attacked simultaneously. The first echelon was the Army's fight while the follow-on echelons would be the Air Force fight. One could then deduce the ownership and employment of the UAVs categorized the way they were in 1996, to align with the AirLand Battle concept. Maneuver and tactical UASs would directly support the Army while endurance UASs would be Air Force assets for the deep battle with follow-on echelons. This classification, if still in use today, would place current UAVs such as the Air Force's MQ-1 Predator and Global Hawk into the endurance category.⁴ Although this classification did have its merits, another attempt to classify UAVs according to altitude emerged.

The second attempt at classifying UAVs established the low, medium, and high altitude groups. Low altitude UAVs were those that flew below 3,500 feet above ground level (AGL). Medium altitude UAVs flew between 3,500 AGL and approximately 18,000 mean sea level (MSL) and high altitude UAVs were those that flew in excess of 18,000 MSL.⁵ Low altitude

³ John L. Romjue, "The Evolution of the AirLand Battle Concept," *Air University Review* 35, no. 4, (May-June 1984), <http://www.maxwell.af.mil/au/cadre/aspj/airchronicles/aureview/1984/may-jun/romjue.html> [accessed August 19, 2008].

⁴ Air Combat Command.

⁵ According to the USAF's Air Combat Command Directorate of Operations, Unmanned Aircraft Systems Branch, the delineation between medium and high altitude was generally accepted as 18,000 MSL. This altitude was chosen since 18,000 MSL and above also represents

UAVs were those that flew below the coordinating altitude, an airspace control measure often employed by an airspace coordination authority. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines a coordinating altitude as, “A procedural airspace control method to separate fixed- and rotary-wing aircraft by determining an altitude below which fixed-wing aircraft will normally not fly and above which rotary-wing aircraft will not normally fly.”⁶ The land component and the air component often use the coordinating altitude as a simple means to deconflict Army rotary winged aviation assets from fixed wing aircraft. The Army deconflicts aircraft below the coordinating altitude by procedural means. The air component employs positive control measures to deconflict the airspace above the coordinating altitude. The air tasking order is the deconfliction measure the air component commander produces daily to deconflict air assets flying above the coordinating altitude in time and space. The low, medium, and high altitude classification for UAVs followed this concept. Logically, one would expect the land component commander would retain the command and control of those low altitude UAVs for direct support missions. The medium and high altitude UAVs would fly missions in support of the joint force commander’s taskings and were deconflicted from each other and from manned aircraft due to the air tasking order. The joint organization tasked to develop the roadmap and future of UAVs in the Department of Defense was next to offer a classification system for UAVs.

the Federal Aviation Authority’s Class A airspace. Flying in excess of 18,000 MSL requires aircraft to have specific communications and performance attributes not generally found on aircraft that fly at lower altitudes.

⁶ Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 (As amended through 22 March 2007), 124.

The Joint Unmanned Aircraft Systems Center for Excellence (JUAS COE), based at Creech Air Force Base in Nevada, initially established a classification for UASs based upon operating altitude, capabilities, and mission. This center of excellence, established by the Joint Requirements Oversight Council in July 2005⁷, has a mission to “provide support to the joint operators and Services to pursue solutions that optimize UAS capabilities and utilization.”⁸ The JUAS COE published *The Joint Concept of Operations for Unmanned Aircraft Systems, First Edition*, in March 2007. This concept of operations plainly explains that it has taken a, “capabilities-based approach to UAS employment,” and implements a broad classification method, “attending to the need and requirements of two ‘user’ groups.”⁹ The two groups are civilian and military. This bifurcation of the classification is essential in understanding the logic posed by the classification matrix outlined by the JUAS COE in the concept of operations.

The two major branches in unmanned aircraft classification published by the Joint Unmanned Aircraft System Center of Excellence are domestic use category and joint use category. The domestic use UAS levels parallel Federal Aviation Administration (FAA) aircraft classification standards. This provides a means of understanding between the Department of Defense and the FAA with regard to unmanned aircraft flying in American airspace. This commonality is important because the military trains its UAS crews within the United States airspace system. Additionally, these pilots may fly UAVs in support of Homeland Defense

⁷ Joint Requirements Oversight Council Memorandum 136-05.

⁸ Joint Unmanned Aircraft Systems Center of Excellence, *Joint Concept of Operations for Unmanned Aircraft Systems*, March 2007, I-2.

⁹ *Ibid.*, vii-viii.

missions or military support of civilian authority missions. For these reasons, a common language regarding UAVs must apply to the civilian and military organizations that share airspace. This paper will not explore the differing opinions between the Army and Air Force regarding the requirement of UAV pilots to have an FAA pilot rating but it remains a topic requiring further study. The second branch of classification will be the focus of the paper.

The JUAS category is broken out into five groups. The groups are Tactical 1, Tactical 2, Tactical 3, Operational/Theater, and Strategic.¹⁰ A Tactical 1 UAV is an aircraft that would range approximately 10 nautical miles, controlled by line-of-sight communications, and would only support one maneuver unit per sortie (i.e. the Wasp, Hornet, and BATCAM). These aircraft primarily perform direct support to small tactical units such as platoons or special operations forces. Tactical 2 systems include the Neptune, Mako, and the Shadow. These UAVs are associated with the regimental or brigade level organizations. Tactical 3 UAVs include I-Gnat-ER, Hunter, and Hummingbird and are associated with divisions, corps, and Marine Expeditionary Forces. Operational/Theater and Strategic categories incorporate aircraft such as the MQ-1 Predator, MQ-9 Reaper, and the RQ-4 Global Hawk. These UASs perform multiple missions per sortie, with a high loiter time, many carry weapons, and can be rapidly retasked to meet the joint force commander's requirements.

The Joint Unmanned Aircraft Systems Center of Excellence Concept of Operations for Unmanned Aircraft Systems published in March 2007 provided a logical and appropriate categorization for classifying unmanned aircraft, the JUAS COE will soon published a new categorization. The 2008 revision of the JUAS COE Concept of Operations will include the

Department of Defense's next framework for classifying UAVs. Although the joint staff has approved this classification breakout, additional commentary continues to peck at the current accepted classification system.

Lieutenant General David Deptula, the Air Force's Deputy Chief of Staff for Intelligence, Surveillance, and Reconnaissance, published an article in *Joint Force Quarterly* where he argued that the, "categorization of UAS by operating altitude of the aircraft does not address the versatility or capacity of a given system." He continued, "UASs are more appropriately thought of, categorized, and employed on the basis of the scope of their capabilities, which must not be confused with the level of their effects."¹¹ Deptula's argument was published almost a year after the JUAS COE published its classification matrix. His argument regarding capabilities is valid but the JUAS COE had already published a comprehensive matrix that addressed his concerns. The current matrix acknowledges the inefficiencies of historical, simplified classifications of manned aircraft. Additionally, this capabilities based approach to classification will reemerge in the third section of this paper. That section will expand on the arguments about who should control armed UAVs, intelligence or operations personnel.

The remainder of this monograph will address UAVs based upon the JUAS COE Concept of Operations classification of Tactical 1,2,3, Operational/Theater, and Strategic UAVs.

The next section of this monograph will be a historical investigation of the centralization of airpower. This history piece provides an understanding of the reasoning for the centralization of

¹⁰ Ibid., II-7.

¹¹ David A. Deptula, "Unmanned Aircraft Systems – Taking Strategy to Task," *Joint Force Quarterly*, no. 49 (2d quarter 2008) 49.

airpower. Additionally it will provide a backdrop for comparison of UAV command and control recommendations in the current wars in Afghanistan and Iraq.

Centralization of the Command and Control of Airpower

The centralization of the command and control of airpower has been a slow process that begins with the birth of the Royal Flying Corps and continues over the skies of Afghanistan and Iraq. The Royal Flying Corps gained invaluable experiences with airpower in combat prior to the American involvement in World War I. The lessons learned by the Royal Flying Corps directly shaped American military leaders' perspectives regarding the application of airpower. Later during World War II, the centralization of the command and control of airpower would go even further and, once again, was a byproduct of British experiences prior to American involvement.

The Casablanca Conference of 1943 was the key event that is the benchmark for the centralization of airpower. The conference led the U.S. military to adopt Field Manual 100-20. This document codified the centralization of the command and control of airpower in the United States military. The wars in Korea and Vietnam saw airpower centralized to varying degrees. Operation Desert Storm, often cited as the culminating event of the centralized command and control of airpower, was not a pristine example of the lessons learned from North Africa. The doctrinal journey of the command and control of airpower began during the Great War.

The British experiences in World War I influenced how American military commanders would apply airpower. The Royal Flying Corps was established as an independent service in 1912. Britain entered World War I two years later in 1914. The United States did not declare war against Germany until April 6, 1917. The United States lacked any experience with aircraft in combat and therefore looked to benefit from the lessons learned of the Royal Flying Corps.

Acknowledging this lack of experience, the War Department sent an aeronautical officer, Lieutenant Colonel William "Billy" Mitchell, to Paris to observe the allied application of

airpower during the war. Mitchell was fortunate to learn the opinions and observe how the Royal Flying Corps' leader, Brigadier General Hugh Trenchard, the father of the Royal Air Force, employed airpower. Soon, Mitchell became an advisor to Major General John J. Pershing, the commander of the United States Expeditionary Forces. Mitchell's job was to determine how the United States should apply airpower in the war. In a letter Mitchell prepared for Pershing's chief of staff, he wrote, "The decisive value of this service is difficult to appreciate at a distance from the field of military operations. It should be an independent arm as artillery or infantry."¹² Pershing accepted his advisor's recommendation and established the Air Service in June 1918. This formally established airpower as an independent entity equal to artillery, infantry, and cavalry.¹³ The lessons learned from the Royal Flying Corps experiences and the undeniable influence of Trenchard on Mitchell led to the first American application of centralization of airpower under Mitchell at the Battle of St. Mihiel.

Mitchell's command of the air assets employed during the Battle of St. Mihiel in September 1918 was the first attempt by American leaders to centralize the command and control of airpower under a single air commander. Mitchell's plan for the battle contained three phases. The first phase of operations would be to use pursuit aircraft to control the air. Mitchell stated in a letter to Pershing, "Once supremacy of the air has been established, airplanes can fly over

¹² Mauer, Mauer, ed., *The U.S. Air Service in World War I – Volume II*, Washington D.C.: The Office of Air Force History, Headquarters USAF, 1978, 108.

¹³ John Morrow Jr., *The Great War in the Air*, Washington D.C.: Smithsonian Institute Press, 1993, 30.

hostile country at will.”¹⁴ A subpart of this initial phase would be the need for pursuit aircraft to protect the vulnerable observation balloons and the observation aircraft used to adjust artillery fire and report on enemy movements. The second phase of the operation would be termed the strategic phase where, “the air attack of enemy material of all kinds behind his lines. To be successful, large combatant groups of airplanes must be organized, separate from those directly attached to army units.”¹⁵ The final phase began what Mitchell called the attack missions. In describing the effects of these missions he wrote, “the lower the altitude at which attack airplanes operate, the greater the morale and material effect. For this reason, attack airplanes will operate as low as the terrain and their weapons permit. If machine-gunning troops in the open, descents as low as ten meters are advocated.”¹⁶ The three phases of Mitchell’s plan were simply stated and this was by design as he was about to command one of the largest formations of air assets ever assembled for a battle in human history.

Mitchell commanded of over 1,500 aircraft and reconnaissance balloons from the United States, France, Britain, and Italy during the Battle of St. Mihiel. On September 11, 1918, Mitchell read aloud his orders to his officers, “OUR AIR SERVICE WILL TAKE THE OFFENSIVE AT ALL POINTS WITH THE OBJECT OF DESTROYING THE ENEMY’S AIR SERVICE, ATTACKING HIS TROOPS ON THE GROUND AND PROTECTING OUR OWN

¹⁴ Johnny R. Jones, *William “Billy” Mitchell’s Air Power*, Alabama: College of Aerospace Doctrine, Research, and Education, Maxwell AFB, 1997, 25.

¹⁵ Mauer, 108.

¹⁶ Mauer, 294.

AIR AND GROUND TROOPS.”¹⁷ Mitchell chose to have his orders typed with all capital letters to emphasize the offensive nature of his concept of operations. Mitchell was able to mass the air assets for maximum effects during the battle. Additionally, as the deputy to Pershing, Mitchell was able to interweave his operational plan into the overall ground maneuver force commander’s plan to push to the north after St. Mihiel was taken. The significance of the Battle of St. Mihiel was Pershing’s appointment of Mitchell as the overall air commander. This concept of centralizing airpower acknowledged the lessons learned and applied by the Royal Flying Corps.

The U.S. Army Air Corps would study the lessons of World War I and from those studies, primarily centered at the Air Corps Tactical School at Maxwell Field, Alabama, emerged the strategic bombing doctrine. This doctrine did not focus on destroying an enemy’s ground forces. One of the co-authors of this doctrine, Brigadier General Haywood Hansell stated, “Modern nations cannot wage war if their industries are destroyed.” He continued, “Airwarfare [sic] is...a method of destroying the enemy’s ability to wage war. It is primarily a means of striking a major blow toward winning a war, rather than a direct auxiliary to surface warfare.”¹⁸ This strategy may have been one attempt to limit the vast carnage of the Great War. There was no single decisive, Napoleonic-type battle during World War I. The strategic bombing doctrine

¹⁷ William Mitchell, 1879-1936 Papers, 1917-1958, Manuscript Collection, McDermott Library, Special Collections, United States Air Force Academy, Microfilm Roll 1, Battle Orders No. 1.

¹⁸ Brigadier General Haywood S. Hansell, “The Development of the United States Concept of Bombardment Operations,” lecture presented at the Air War College, February 16, 1951 (published by Maxwell Air Force Base, Alabama: Airpower Research Institute), p. 7., as quoted in David E. Johnson, *Learning Large Lessons – The Evolving Roles of Ground Power and Air Power in the Post-Cold War Era*, Virginia: Rand Corporation, 2006, 11.

would dominate the Army Air Corps and later the Army Air Force as the United States entered
World War II.

The United States Army Air Forces once again relied upon British combat experience to shape its organizational command and control relationships of airpower in World War II. The Royal Air Force's experiences prior to the United States involvement in World War II set the stage for how future air forces would be command and controlled.

The organization of the Royal Air Force and its experiences fighting the Axis Powers shaped its adoption of the centralized command and control of airpower and the establishment of an air command to support the Royal Army. The Royal Air Force's dominant doctrine entering World War II was of "strategic air warfare involving bombardment of an enemy's homeland and air defense of Great Britain."¹⁹ The missions of the two RAF Commands, Bomber Command and Fighter Command, were easily derived from this doctrine.

The marginal performance of the RAF to support the Royal Army during the German advance across Europe forced the RAF to form the Army Cooperation Command. Winston Churchill placed this organization under the command of the Royal Army since the RAF viewed air support to the Royal Army as a diversion of airpower.²⁰ The leaders of Fighter Command understandably felt that they could not divert any aircraft to support the Army because of their experiences during the Battle of Britain.

¹⁹ Richard P. Hallion, *Strike from the Sky – The History of Battlefield Air Attack 1911-1945*, Washington: Smithsonian Institution Press, 1989, 149.

²⁰ Stephen J. McNamara, Lieutenant Colonel, USAF, *Airpower's Gordian Knot – Centralized Versus Organic Control*, Alabama: Air University Press, 1994, 9.

The Battle of Britain pinned the RAF against the numerically superior Luftwaffe in one of the most significant battles of aerial combat in history. The RAF had a mere 650 fighters to counter the Luftwaffe, which was able to fly 1,500 sorties across the English Channel on August 15, 1940.²¹ Two technologies allowed the RAF to mass its strength, radar and Ultra, the method of deciphering encoded German radio transmissions. The centralized command and control of the Royal Air Force, assisted by radar and Ultra, allowed the RAF halt the German advance and prevent the invasion of the British Isles. Sir Winston Churchill summed up the success of the RAF's Fighter Command with his eternal sentiment, "never in the field of human conflict was so much owed by so many to so few."²²

The lessons learned by the RAF during the Battle of Britain and the East African Campaign set the stage for the American entrance into the war. The Battle of Britain has already shown its influence on the RAF but the East African Campaign deserves mention as well. The significance of this campaign is the influence it had on Air Vice Marshal Arthur "Mary" Coningham. Coningham eventually becomes the architect for one of two key documents published during and after the North African Campaign. Coningham studied the South African "Close Support Flight" and its excellent air support of the British Army. The South African aircraft were part of a theater air command under the centralized command and control of an RAF Air Commodore. The one-star equivalent established his headquarters with the ground

²¹ Bernard C. Nalty, ed., *Winged Shield Winged Sword – A History of the United States Air Force* Vol. I, Washington: Air Force History and Museums Program, 1997, 170.

²² Sir Winston Churchill, Speech to the House Of Commons, August 20, 1940, The Churchill Centre, <http://www.winstonchurchill.org/i4a/pages/index.cfm?pageid=420> [accessed September 3, 2008]

commander, a three star general. The coordination and synchronization of this joint force was excellent and expelled the Italian forces from Eastern Africa.²³ These experiences of the RAF reinforced the need to centralize the command and control of airpower in the mind of the senior RAF officers. As the RAF was adjusting command and control relationships of airpower while engaged in combat operations, the U.S. Army Air Forces (AAF) experimented with the same issues at home.

The Carolina and Louisiana games were a series of war games that the U.S. Army and AAF used to prepare for involvement in World War II based upon Allied experiences. The outcome of these war games was War Department Field Manual 31-35, *Aviation in Support of Ground Forces*, published April 9, 1942, which established “air support commands.” These commands only possessed observation aircraft and relied upon theater air commanders to supply combat aircraft.²⁴ The document also stated that airpower assets fell under the authority of the ground commander who could further delegate air assets to lower echelon commanders.²⁵ The delegation of air assets to lower echelon commanders often resulted in ownership type arguments and an unwillingness to share assets. One example of this occurred when the United States II Corps Commander, Major General Lloyd Fredendall, refused to allow his air assets to assist the

²³ Hallion, 152.

²⁴ Ibid., 150.

²⁵ Field Manual 31-35, *Aviation in Support of Ground Forces*, United States Government Printing Office, 1942.

French XIX Corps troops that had requested air support.²⁶ The lower in echelon one went, the less experience commanders had with employing air assets. This lack of experience would often cause ground commanders to fly their air assets over their own territory as a defensive shield to prevent attack from enemy aircraft, often known as the air umbrella concept.

The implementation of the air umbrella concept was a key reason for the eventual centralization of the command and control of airpower at the Casablanca Conference. The air umbrella concept, or as Field Marshal Bernard Montgomery termed it “penny packets,” is a defensive tactic that required aircraft to fly above friendly positions and defend the ground forces from attacking enemy aircraft. The problems of this tactic are numerous. The first problem is the lack of resources. Parceling out aircraft to numerous ground commanders disperses your aircraft.

These dispersed aircraft are then not sufficient to defend against enemy fighter and bomber formations that could appear at anytime and from any direction. Secondly, with fewer aircraft under one commander’s control, other assets are often unsupported and therefore ineffective. The

following is just one example.

The Deputy Commanding General of the North-West African Tactical Air Force, Brigadier General Laurence Kuter, described one ground commander’s unwillingness to abandon this air umbrella concept. The initial plan was to dislodge two battalions from the Faid Pass in Tunisia. The allies estimated that the Germans had 24 Ju-87 Stukas available to attack Allied ground troops. The American ground commander insisted that his organic fighter aircraft fly nonstop during daylight hours for two days to prevent any attacks by the Luftwaffe.

²⁶ John L. Frisbee, “The Lessons of North Africa,” *Air Force Magazine*, September 1990, <http://www.afa.org/magazine/1990/0990lessons.html> [accessed August 19, 2008].

Additionally, he stated that these fighter patrols were a prerequisite for his ability to take the offensive and as well as his ability to plan for the mission. Frustrated, Kuter brought in the most senior air commander in theater to discuss this mission with the ground commander. Due to the distance the fighters would need to fly and the number of aircraft available at the time, there would only be 12 aircraft available to fly his air umbrella missions. This number would be woefully inadequate to stop a force twice the size and coming from an unknown direction. Additionally, the fighters dedicated to the umbrella mission eliminated their availability to escort the vulnerable bomber and reconnaissance assets the ground commander had at his disposal. The ground commander stuck with the air umbrella tactic and the bombers and reconnaissance aircraft sat idle due to lack of escort assets. Kuter argued that had the air assets been employed in an offensive role to achieve local air superiority, the light bombers could attack the Stukas at their home airfields, and the air umbrella mission would be obsolete. Kuter wrote, "The ground commander insisted upon the umbrella thus emasculating all the offensive power and ignoring all of the reconnoitering capabilities of the sizeable air force at his disposal for one defensive function of doubtful value."²⁷ This is just one example of the inefficient use of airpower due to the air umbrella concept.

President Franklin Roosevelt and Prime Minister Winston Churchill gave General Dwight Eisenhower the authority to reorganize the Allied forces in North Africa at the Casablanca Conference on January 14, 1943. Roosevelt and Churchill approved the establishment of an independent air command January 26, 1943, which forced the ground, naval, and air

²⁷ Laurence Kuter, Memorandum on the Organization of American Air Forces May 12, 1943, 2. Contained in the papers of Lawrence Kuter, Manuscript Series 18, Box 2, B.6.1., McDermott Library, Special Collections, United States Air Force Academy.

commanders to report directly to Eisenhower. Air Marshall Arthur Tedder, described some of the outcomes of the conference, “To compliment the strategic decisions reached at Casablanca, alterations were introduced into the command structure in the Mediterranean.”²⁸ Churchill and Roosevelt appointed Tedder as the newly created Air Commander-in-Chief for the Mediterranean theater position. Subordinate to Tedder were three Air Officers Commanding, they were responsible for North-West Africa, the Middle East, and Malta. At this point in the war, the North-West African region was the main effort of the Allied offensive. The commander of the North-West African region was Major General Carl Spaatz. Spaatz had three sub-commands. Tedder goes on to describe this breakdown, “one to control heavy and medium bombers with their fighter escorts, another for general reconnaissance and fighter aircraft for the defence [sic] of shipping and ports, and the third to specialise [sic] in the air support for the ground forces.”²⁹

The centralization of airpower was overdue.

The need for centralization of the air assets was apparent to both air and ground commanders. Tedder explained, “no one had attempted at Casablanca to hide the fact that the need to pull together the organization of our air forces in North Africa was urgent. A message from Spaatz told me on 22 January that the situation was by now so critical that part of the new plans must be implemented before the whole had been approved.”³⁰ Some of the ground commanders agreed with the air commanders. General Bernard Montgomery, while in Tunisia,

²⁸ Arthur William Tedder, G.C.B., *With Prejudice*, Boston: Little, Brown and Company, 1966, 393.

²⁹ *Ibid.*, 393.

³⁰ *Ibid.*, 395.

distributed a pamphlet titled, *Some Notes on High Command in War*.³¹ In that pamphlet, Montgomery made some profound statements regarding the use of airpower. He said, “The greatest asset of air power is its flexibility, and this enables it to be switched quickly from one objective to another in the theater of operations.” Additionally he wrote, “It follows that the control of the available air power must be centralized, and command must be exercised through R.A.F. channels,” and that, “nothing could be more fatal to successful results than to dissipate the air resources into small packets placed under command of army formation commanders, with each packet working on its own plan.”³² The Deputy Commander of the North-West African Tactical Air Force, Brigadier General Laurence Kuter, forwarded Montgomery’s words regarding the command and control of airpower to the commander of the U.S. Army Air Corps, General Henry H. “Hap” Arnold.

Kuter is a central person in the restructuring of the command and control relationships of airpower in the United States military. In a letter from Kuter to Arnold dated May 12, 1943, Kuter explains that the command and control changes authorized during the Casablanca Conference must become part of the doctrine of the Army. The changes approved at the Casablanca Conference only altered the command organizations established for the ongoing campaign and Kuter stated that, “these radical changes should be reflected in the organization of

³¹ It is generally accepted that most, if not all, of this pamphlet was authored by Coningham. Tedder hints of his suspicion of Coningham’s authoring of the pamphlet in his autobiography. Tedder explained that many of the words used are indicative of Coningham’s writing. This is the basis of the author’s statement of the influence the South African command and control structure to support the Royal Army in the Middle East influenced Coningham.

³² Bernard L. Montgomery, *Some Notes on High Command in War*, Tripoli, January 1943, 2. Contained in the papers of Lawrence Kuter, Manuscript Series 18, Box 2, B.7.1., McDermott Library, Special Collections, United States Air Force Academy.

our air forces, and particularly in the training and equipment of additional air units, and of replacements without delay.”³³ His conclusion to General Arnold is simply that, “it is clear that a modern battle is not fought or won by a ground force alone or by a naval force alone. Any modern successful battle consists of a battle in the air which must be won before the surface battle is begun.”³⁴ The final recommendation from Kuter to Arnold was to, “rewrite the War Department publications to delete all references to the supporting role of aviation and to stress the coordinate role of air, land and sea forces.”³⁵ Kuter would co-author Field Manual 100-20, *Command and Employment of Airpower*, the manual that replaced Field Manual 31-35. The first sentence of the new manual published in 1943 was, “1. Relationship of Forces – LAND POWER AND AIR POWER ARE CO-EQUAL AND INTERDEPENDENT FORCES; NEITHER IS AN AUXILIARY OF THE OTHER.”³⁶ This statement is the final acceptance by American military leaders that airpower must be commanded by a single air commander.

The centralization of the command and control of airpower under a single air commander during the North African Campaign of World War II warrants further analysis. Some of the key reasons supporting the centralization of airpower were efficiency, the need to employ air assets in an offensive manner, and to achieve massed effects. The air umbrella discussion previously

³³ Laurence Kuter, Memorandum on the Organization of American Air Forces May 12, 1943. Contained in the papers of Lawrence Kuter, Manuscript Series 18, Box 2, B.6.1., McDermott Library, Special Collections, United States Air Force Academy.

³⁴ *Ibid.*, 6.

³⁵ *Ibid.*, 6.

³⁶ Field Manual 100-20, *Command and Employment of Air Power*, Washington D.C.: United States Government Printing Office, 1943, 1.

illustrated how this concept of employment was inefficient. The concept of owning air assets by a ground commander is inherently inefficient from a theater perspective. Air assets are flexible, can rapidly cross-ground commander's boundaries, and are best applied in mass. Based on this discussion, centralizing airpower based upon a discussion of efficiency is a valid argument.

A second reason for centralizing the command and control of airpower following the Casablanca Conference is the offensive nature of airpower. Giulio Douhet discusses his view on the offensive nature of the airplane in his work, *Il Domino dell'aria*. He explains that the independence of surface limitations and the superior speed of airplanes make it the best offensive weapon available in combat. Douhet wrote,

the greatest advantage of the offensive is having the initiative in planning operations – that is, being free to choose the point of attack and able to shift its maximum striking forces; whereas the enemy, on the defensive and not knowing the direction of the attack, is compelled to spread his forces thinly to cover all possible points of attack along his line of defense.³⁷

He states that this is the whole game of tactics and strategy. Douhet's view of the offensive nature of airpower reemerges twenty-two years later in the North African Campaign as described above in the discussion regarding the inappropriate use of aircraft for air umbrella missions.

The final basis for the centralization of airpower was to maintain the ability to mass forces in combat. The parceling out of air assets to individual ground commanders diminishes the number of aircraft available to attack enemy positions. The concept of massing of forces is not a foreign one to military leaders but the small packets of aircraft that Montgomery describes in his

pamphlet highlight the understanding that there is a mission higher than the firefight in front of a ground commander. Kuter discussed the overwhelming influence ground commanders have on

the overall commander,

The higher commander, who is usually a ground officer, is influenced by the subordinate ground commander to a greater extent than he is by the air commander and so the requests of the former for direct support aviation are sympathetically received at the expense of a concentration of the air effort. Again it is desired to point out that even a reconnaissance mission detracts from a concentrated air effort as it normally required fighter protection in some form.³⁸

Do not lose sight of the context of this argument. The Allies had not yet achieved air superiority to provide the ground forces with the ability to maneuver uninhibited by enemy air forces. This is not a simple pay me now or pay me later concept. If the air forces are unable to take command of the air, in an offensively efficient manner by capitalizing on its ability to mass its weapons effects, enemy air force assets will continually target friendly ground forces. The parceling out of air assets leaves them most vulnerable to enemy attack and the ability to regenerate aircraft and trained crews takes longer than it does to train and equip a new soldier. Parceling out air assets in a piecemeal fashion allows enemy air or ground assets to concentrate on these small packets of aircraft. As aircraft are lost, so goes the ability to control the air. If a force loses the ability to control the air, many argue that the war is all but lost.

The Casablanca Conference of 1943 during the North African Campaign of World War II was the single event that forever codified the centralized command and control of airpower. This

³⁷ Giulio Douhet, translated by Dino Ferrari, *The Command of the Air*, New Hampshire: Ayer Company, 1999, 15.

³⁸ Kuter, 5.

decision, made in January of 1943, has influenced how military forces employed airpower over the next sixty-five years.

Following World War II, the nation and the United States Air Force hung its hat on the might of Strategic Air Command and nuclear deterrence to protect the United States and its interests. President Harry Truman desired to get inflation under control and strengthen the U.S. economy. To do this he needed an economic solution to the security needs of the United States while continuing to maintain the availability of sufficient funds to support the military and economic aid programs of the Marshall Plan. Truman would cut defense spending from 40 percent of the gross national product in 1944 to 4 percent by 1948.³⁹ The newly hatched independent Air Force pushed the results of the United States Strategic Bombing Survey, a document that is suspect and rightly considered biased. The survey and its supporters argued that strategic airpower was the most economical choice and cost-effective for the defense of the nation. Truman agreed, and the Air Force received a lion share of the defense budget entering the Cold War. The Air Force entered the Cold War with a focus on nuclear deterrence. Over the next forty years, three wars would see three different approaches to the centralized approach to command and control of airpower.

The command and control of airpower saw varying degrees of centralization from 1950 through 1991. The Korean War represents the first post-World War II example utilizing a theater air component commander.⁴⁰ All Air Force aircraft and, by 1951, all Marine aircraft were under

³⁹ Mike Worden, Colonel USAF, *Rise of the Fighter Generals – The Problem of Air Force Leadership 1945-1982*, Alabama: Air University Press, 1998, 27.

⁴⁰ McNamara, 79.

the centralized control of the Far East Air Force Commander. Naval aircraft, part of Task Force 77, remained organic to the Navy but the Far East Air Force Commander had “coordination authority.” This was a compromise due to the limited range of naval aircraft. The limited range of the aircraft indirectly controlled the aircraft carrier’s movements at sea. Control of these air assets would de facto control the aircraft carrier. This was unacceptable to the Navy.⁴¹ Overall, the Korean War did apply airpower in a centralized manner. A little over a decade later, the Vietnam War saw a setback in the centralized approach to airpower.

The Vietnam War saw the first challenge to the centralized concept of airpower command and control in the United States military since World War II. The command relationships followed that:

the commander in chief Pacific Command (CINCPAC)- a Navy admiral- retained control of Task Force 77 aircraft; the Marines had de facto control of their air assets even though Seventh Air Force had official control; the Army fought for and won permanent control of its helicopters despite losing control of its cargo aircraft in the trade; and even the Air Force split its command lines between Pacific Air Forces (PACAF) and Strategic Air Command (SAC) aircraft.⁴²

This airpower construct is indicative of the uncoordinated and often dangerous application of air assets that permeated the air war over Vietnam. Some problems with this method of command and control were airspace deconfliction, duplication of target selection, and long response times to close air support requests from ground forces. The final conflict that highlights the American military evolution of airpower unfolded in the Middle East, the same

⁴¹ Ibid., 81.

⁴² Ibid., 97.

place that Sir Arthur Coningham became so heavily influenced by the centralized concept of airpower employed fifty years earlier.

Operation Desert Storm may have been the purest form of centralization of air assets throughout this American military journey of the centralized command and control of airpower. The Goldwater-Nichols Department of Defense Reorganization Act of 1986 led the Joint Staff to publish JCS Pub 26, *Joint Doctrine for Theater Counterair Operations (for Overseas Land Areas)* in April 1986. This document formally established the joint force air component commander in joint doctrine. The initial centralized command and control of airpower prior to Desert Storm was very close to the North African ideal. All air assets were under the centralized command and control of the air component commander, Lieutenant General Charles Horner, at the outset of hostilities on January 17, 1991. This centralized approach to employing air assets lasted for a mere 36 hours at which time the Marine Corps began to withhold sorties from the air component commander. The reason for this was Marine concerns that “the JFACC was not responsive to their battlefield preparation needs.”⁴³ To mitigate this deviation from the centralized approach outlined at Casablanca, Horner was able to compromise to meet the Marine desires. He traded A-10 close-air-support sorties to target the forces the Marine ground forces would face in exchange for using faster Marine F-18s to strike enemy targets deeper in Iraq. This compromise is one example of an operational commander deviating from doctrine to best adapt to the situation at hand.

The journey of the centralization of airpower is categorized by the adaptation of ever-evolving technologies and applying them in combat. The experiences of the Royal Flying Corps

and later the Royal Air Force paved the way for the American adaption of the centralized approach to airpower in World War II. Commanders have wrestled with varying degrees of centralization of airpower from the Korean War up through Operation Desert Storm. Today, military commanders are toiling with the command and control of UAVs as these aircraft continue to increase their capabilities.

Control, Current Operations, Missions and the Law

The complicated nature of modern combat makes command and control of UAVs an important debate for military commanders. The rising demand for UAV support in the ongoing wars in Afghanistan and Iraq and the increases in the Department of Defense budget requests for UAVs has kept the debate regarding the command and control of UAVs at center stage. This section contains four distinct parts. The first will explain the Air Force's attempt to become executive agent for operational and strategic level UAVs. The subsequent two parts describe current command and control relationships currently supported by the Army followed by the internal discourse at the CAOC regarding supremacy of control of UAVs between the intelligence and operations divisions. The last part will examine the roles and mission of the Army and Air Force. The discussion will focus in on the blurring of the lines of responsibilities of these services due to newly passed legislation. The goal of this section is to highlight current service tensions regarding acquisitions and standardization, centralization, and service responsibilities.

⁴³ Ibid., 128.

The United States Air Force sought appointment as the executive agent for medium and high altitude unmanned aircraft systems in 2007. Executive agency, as described in Department of Defense Directive 5101.1 is,

The Head of a DoD Component to whom the Secretary of Defense or Deputy Secretary of Defense has assigned specific responsibilities, functions, and authorities to provide defined levels of support for operational missions, or administrative or other designated activities that involve two or more of the DoD Components.⁴⁴

The Chief of Staff of the United States Air Force at that time, General T. Michael Moseley, published his reasoning for his proposal for the Air Force to become the executive agent for medium and high altitude UASs. He explained:

Demand for UAVs currently exceeds supply, and it will continue to do so even after all the Services have fielded all their programmed UAVs. My proposal (to the Deputy Secretary of Defense) is all about getting the most “Joint” combat capability out of these limited Intelligence, Surveillance and Reconnaissance (ISR) resources, while promoting Service interdependence and ensuring the best stewardship of America’s tax dollars.⁴⁵

He went on to state that executive agency would aid in streamlining the acquisition process, would help the joint force to field more UAVs faster, and that it was a more efficient use of taxpayer’s dollars. The final piece of his discussion centered on the importance of airspace deconfliction due to the increase in the number of aircraft flying over the battlefield and the lack of standardization of communications and avionics equipment for those UAVs to tie into the current airspace command and control network. This is a key concern for an Airman since the comprehensive airspace coordination and air defense plans deconflicts the airspace throughout a

⁴⁴ Department of Defense Directive 5101.1, September 3, 2002.

⁴⁵ General T. Michael Moseley, *CSAF’s Scope on Unmanned Aerial Vehicles (UAVs)*, May 21, 2007, <http://www.af.mil/specials/scope/archive/uav.html> [accessed August 19, 2008].

theater of operations and are both the responsibility of the air component commander.⁴⁶ These plans reduce opportunities for air-to-air, surface-to-air, and air-to-surface fratricide and minimize the potential for mid-air collisions. General Moseley went on to state, “Here’s the bottom line:

I’m pursuing the UAV EA role to make the Joint Force – not the Air Force – more combat capable.”⁴⁷ Moseley’s reasoning for the Air Force to become the executive agent for medium and high altitude unmanned aircraft systems is in line with the mission of the United States Air Force.

Some did not agree.

Many opinions circled throughout the Pentagon and across the media regarding Moseley’s attempt to have the Air Force named as the executive agent for medium and high altitude UASs. Amy Butler, the senior Pentagon editor for *Aviation Week and Space Technology Magazine*, published an article titled “Power Play” where she stated, “the United States Air Force is beginning to detail its controversial plans to assume control over the Pentagon’s entire fleet of unmanned aerial vehicles flying over 3,500ft.”⁴⁸ She insinuated the Air Force proposal was solely an attempt to secure a windfall of cash for the Air Force. Butler failed to refute Moseley’s reasoning for advocating the Air Force’s proposal. The Joint Staff sided with Moseley.

The Joint Requirements Oversight Council, part of the Joint Chiefs of Staff whose responsibility it is to advise the Secretary of Defense on military matters, recommended the

⁴⁶ Joint Publication 3-30, *Command and Control of Joint Air Operations*, 5 June 2003, II-2.

⁴⁷ *Ibid.*

⁴⁸ Amy Butler, “Power Play – USAF Refines Plans to Control UASs Despite Sister Services’ Resistance,” *Aviation Week and Space Technology*, August 6, 2007, 28.

appointment of the United States Air Force to become the executive agent for medium and high altitude UASs to the Deputy Secretary of Defense on July 16, 2007. Admiral Edmund Giambastiani, while he was the Vice Chairman of the Joint Chiefs of Staff, signed the memorandum written for Deputy Secretary of Defense, Gordon England. In that memorandum, he stated that the executive agent should “address MHA UAS equipment standardization and acquisition streamlining across DOD. The Executive Agent will not have authority to direct operational issues.”⁴⁹ The Deputy Secretary of Defense refused to accept the Joint Staff’s recommendation. He then directed the creation of a task force to better integrate UASs in the Department of Defense. Additionally he addressed the need to merge the Army’s Sky Warrior and the Air Force’s Predator programs due to capabilities overlap. England’s decision to demur on the Joint Staff’s recommendation has significantly hampered the Department of Defense’s ability to become more efficient and more effective with regard to UAV acquisition and employment.

The Deputy Secretary of Defense’s decision not to appoint an executive agent for unmanned systems has stalled attempts by the services to reduce inefficiencies in acquisitions, decrease interoperability issues, and minimize the duplication of capabilities for the numerous UAVs currently in the Department of Defense inventory. This further exacerbates the Government Accountability Office findings of the inefficient use of taxpayers’ dollars with regard to UAS research and development, acquisitions, and employment. These findings include interoperability issues, where one UAS cannot communicate to other UASs or command

⁴⁹ Admiral Edmund Giambastiani, “Memorandum for the Deputy Secretary of Defense regarding Executive Agency for Medium and High Altitude Unmanned Aircraft Systems,” July 16, 2007.

networks, and a lack of a strategic plan to guide UAS development and investment.⁵⁰ Moving out of the Pentagon and onto a battlefield, the historic lessons learned regarding the centralization of airpower has reemerged with the U.S. Army's decision to centralize UAVs in Iraq.

Lieutenant General Raymond Odierno published an article in *Joint Forces Quarterly* where he called for the centralization of UAVs and other ISR assets under the corps commander. Odierno, the commander of Multi-National Corps-Iraq, stated that the current ability of conventional forces to be more "SOF-like" in the war in Iraq is due to the increase in the intelligence, surveillance and reconnaissance, analysis and exploitation assets delegated down to the brigade combat teams.⁵¹ He went on to explain how the decentralized nature of the COIN environment makes it imperative to decentralize ISR assets to the lowest possible echelon. He stated that the correct level of centralization in Iraq is the corps level. "ISR is working in Iraq because tactical leaders are maximizing the effectiveness of a limited resource. The optimal use of ISR is enabled through decentralized control that provides the greatest flexibility at the lowest levels within the command."⁵² Two important points regarding the context of Odierno's statement warrant emphasis. First, Odierno is referring to numerous ISR assets including but not exclusively UAVs. Secondly, the current war in Iraq is a counter-insurgency fight. The United States military is not currently fighting a classic war of maneuver as it did in North Africa in 1943.

⁵⁰ Government Accountability Office Report, *Unmanned Aerial Systems- Advance Coordination and Increased Visibility Needed to Optimize Capabilities*, July 2007, 2, <http://www.gao.gov/new.items/d07836.pdf> [accessed August 19, 2008].

⁵¹ Raymond T. Odierno, Nichol E. Brooks, and Francesco P. Mastracchio, "ISR Evolution in the Iraqi Theater," *Joint Force Quarterly* 50 [3d Quarter 2008]: 52.

⁵² *Ibid*, 55.

Odierno states that the current system of ISR tasking employed in the United States Central Command is serving ground forces well.

The combatant commander apportions ISR to subordinate units, including MNF-I [Multi-National Force Iraq] and Mult-National Corps-Iraq (MNC-I), based on his priorities. MNC-I can then weight the battlefield with a mix of theater- and corps-level systems by allocating ISR assets to subordinate divisions combined joint special operations task forces, and BCTs/RCTs based on the commander's priorities. Corps, as the operational headquarters for coalition forces, is really the highest level at which this can be done with a true feel for what is going on at all levels, and MNC-I receives virtually all ISR for conventional forces in Iraq.⁵³

He goes on to state that, "Corps level is where these decisions are best made because a higher or more distant command and control node cannot act quickly enough or with sufficient insight into the implications of its decision making process."⁵⁴ Odierno has rightfully described the need for greater ISR product availability to the lowest level of command for the current counter-insurgency fight. His initial statements suggest a decentralized approach to ISR but then he advocates centralization at the corps level. Airpower theorists should not view Odierno's comments as contrary to the original concept of centralized airpower that emerged from the Casablanca Conference. Nor should land forces take his statement of decentralization as the right fit for all military operations. Odierno's reasoning for centralization of ISR at the corps commander level would give the senior ground commander in Iraq organic assets that would be under his command and control. A second point that Odierno highlights is the need for more ISR assets for the war effort.

⁵³ Ibid, 54.

⁵⁴ Ibid,54.

The demand for UAS capabilities in Iraq and Afghanistan may be exceeding the capabilities of the services' current force structures. The Secretary of Defense, Robert Gates, recently stated that he had been trying for months "to get the Air Force to send more surveillance and reconnaissance aircraft, like the pilotless Predator drone that provides real-time surveillance video to the battlefield."⁵⁵ He continued, "While we've doubled this capability in recent months, it is still not good enough."⁵⁶ The Air Force has continued to expand its budget for the acquisition of UAVs. A year earlier, the Air Force programmed over \$2.3B of its FY 2007 budget for UAV and UAS procurement. This budget allocation allowed the Air Force to double its Predator coverage for combat operations in Iraq and Afghanistan.⁵⁷ To refute Gates' comments, the Air Force published an article stating that the Air Force is two years ahead of the Department of Defense mandate to provide 21 combat patrols by the year 2010. As of May 1, 2008, the Air Force had provided 24 combat patrols with its Predator system.⁵⁸ By the end of 2008, the Air Force expects to be flying 34 combat air patrols with its Predator aircraft.⁵⁹ UAV coverage is increasing. The

⁵⁵ Associated Press, "Defense Secretary Gates Says Air Force must step up efforts in Iraq, Afghanistan," April 21, 2008, Fox News, <http://www.foxnews.com/story/0,2933,351964,00.html> [accessed June 20, 2008].

⁵⁶ Ibid.

⁵⁷ General T. Michael Moseley, Memorandum for the Deputy Secretary of Defense regarding Executive Agency for Medium- and High-Altitude Unmanned Aerial Vehicles (UAVs), March 5, 2007.

⁵⁸ United States Air Force, "Predator Combat Air Patrols Double in 1 Year," Air Force Link, Washington D.C.: May 6, 2008, <http://www.af.mil/news/story.asp?id=123097395> [accessed June 20, 2008].

joint force is currently attempting to determine if the number of UAVs currently in service is adequate to meet requirements.

The Joint UAS Center of Excellence is currently trying to do an empirical analysis of the use of UAVs in Iraq and Afghanistan to establish what level, if any, force-structure changes the Department of Defense should take. The study is focusing on the use of operational and strategic level UASs and may be helpful for future decisions regarding the force structure changes needed for the Department of Defense. Brigadier General Charles Shugg, the commander of the Joint UAS Center of Excellence, explained that the study is necessary to determine the efficient use of UAVs.⁶⁰ The study is not complete and therefore the results of the analysis were not available for this monograph. The next part of this paper examines an ongoing debate between operations and intelligence. Who should control multi-role capable UAVs?

The evolution of armed UAVs (i.e. MQ-1 Predator, MQ-9 Reaper, and the MQ-4 Sky Warrior) has perpetuated the debate within the joint force about command and control. These aircraft are essential assets in the current wars in Afghanistan and Iraq. These UAVs provide FMV for ground forces, can track enemy movements and determine human patterns of behavior, and can strike with surgical precision. Some argue that these aircraft are no different from a multi-role fighter disregarding the speed at which they fly. Additionally some feel that the current manner of tasking armed UAVs, specifically the MQ-1 Predator, is inefficient.

⁵⁹ Colonel Christopher Chambliss, 432nd Wing Commander, Creech AFB, telephonic interview by author, July 25, 2008.

⁶⁰ Brigadier General Charles Shugg, Joint Unmanned Aircraft Systems Center of Excellence Commander, interview by author, July 18, 2008.

Colonel Christopher Chambliss, the 432 Wing Commander, stated that tasking the MQ-1 Predators should be similar to tasking fighter aircraft due to their multi-role capability. Predators are currently ISR assets. As such, these aircraft fly missions as directed by the ISR Division of the CAOC. The ISR Division tasks air assets to collect information in accordance with the joint force commander's collection strategy. Joint Publication 3-30, *Command and Control of Joint Air Operations* states that, "The JFACC is responsible for planning and coordinating, allocating, and tasking assigned airborne ISR assets to accomplish and fulfill JFC tasks and requirements."⁶¹

The debate begins when ground forces request air support due to a troops-in-contact situation. Chambliss stated, "ISR is a mission. It is a mission just as interdiction and close air support are missions."⁶² He continued, "First, ISR taskings should be serviced in a similar manner that traditional targets are serviced." Chambliss' target servicing is a reference to the joint integrated prioritized targeting list (JPITL). This list is the joint force commander's prioritized list of targets. "Second, UASs [operational/theater armed UASs] must fall under the control of the combat operations division because of their multi-role capability. This control would allow for the most rapid and efficient retasking of a UAS from an ISR collection mission to a close air support mission in a troops-in-contact situation."⁶³ Chambliss' reasoning for supporting a more efficient relationship within the CAOC to retask the Predator in a troops-in-contact situation comes from experience. Chambliss and several Predator pilots shared experiences with the author of missions where the ISR Division in the CAOC did not allow the pilot to support a

⁶¹ Joint Publication 3-30, III-29.

⁶² Ibid.

⁶³ Ibid.

troops-in-contact situation. Chambliss deems this as inefficient and troublesome since technology has expanded the capabilities of Predators to service both ISR and traditional target sets.

The true question is not about capabilities, it is about priorities. Armed UAVs such as the Predator have demonstrated their ability to accomplish both ISR and strike missions. The air apportionment and allocation process is the focus of this debate. The air component commander is subordinate to the joint force commander. The joint force commander makes a decision to weight his air effort based upon the current situation. This weighting of effort is termed air apportionment. Joint Publication 1-02 defines air apportionment as “the determination and assignment of the total expected effort by percentage and/or by priority that should be devoted the various air operations for a given period of time.”⁶⁴ An example of this would be the joint force commander deciding that 60% of all air operations should be dedicated for air superiority missions, 30% for interdiction missions, and 10% for close air support. The joint force air component commander (JFACC) converts the apportionment percentages into the number of sorties that specific aircraft will fly in each category. Joint Publication 1-02 defines allocation as “the translation of the air apportionment decision into total number of sorties by aircraft type available for each operation or task.”⁶⁵ Here is where a multi-role aircraft’s value is apparent. An armed UAV can fly interdiction, close air support, or ISR missions. A-10s equipped with a targeting pod can perform ISR missions and a Predator can perform close air support missions because each aircraft has the capability to perform these missions. Retasking assets due to a

⁶⁴ Joint Publication 1-02, 41.

⁶⁵ Ibid., 31.

changing battlefield and the development of a troops-in-contact situation once the aircraft are airborne is simple and efficient process due to the joint force commander's (JFC) intent.

Retasking airborne aircraft is a simple process that follows the joint force commander's intent. Joint Publication 3-30, *Command and Control for Joint Air Operations*, states that, "the JFACC conducts air operations in accordance with the JFC's intent and concept of operations." The joint force commander may specifically state that troops in contact situations are his top priority for air operations. If a troops-in-contact situation develops, the joint force air component commander may divert, rerole, or launch an air asset to support the ground forces request. The air asset selected may be an armed UAV or a manned aircraft depending upon the situation. Often, the best choice to support ground forces is a faster, more heavily armed aircraft, and pilot trained specifically to perform close air support. An armed UAV may not be the best choice. The final part of this section will examine the blurring of the missions between the Army and Air Force.

The final discussion of this section explains how Congressional self-interest has hampered the Department of Defense's ability to reduce UAV inefficiencies. Newly passed legislation altered the mission of the United States Army and infringed upon the mission of the United States Air Force. Title 10 of the United States Code governs the armed forces of the United States. Title

10, Subsection D, describes the United States Air Force. The code reads,

The Air Force includes aviation forces both combat and service not otherwise assigned. It shall be organized, trained, and equipped primarily for prompt and sustained offensive and defensive air operations. It is responsible for the preparation of the air forces necessary for the prosecution of war except as otherwise assigned.⁶⁶

⁶⁶ United States Code, Title 10, Subtitle D, Part I, Chapter 807, Section 8062, Laws in effect as of January 3, 2006. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=browse_usc&docid=Cite:+10USC8062 [accessed August 19, 2008].

The phrase “except as otherwise assigned,” is the key to the allowance of the Marine Corps, Navy, and the Army to maintain air assets. This code is the product of years of compromise since the establishment of the independent United States Air Force. The Key West agreement of 1948 “appointed the Air Force with “primary interest” for operations in the air and became lead agent for air systems development.”⁶⁷ The Army and Air Force have been reevaluated their roles and missions as new technologies emerged throughout the Cold War. Dr. Rebecca Grant, a respected airpower theorist and the founder and president of IRIS Independent Research, illustrates this point in her article, “Clash of the UAV Tribes.” She references the wide use of helicopters during the Korean War and the development of helicopter gunships during the Vietnam War as two examples of technological advances that forced the Army and the Air Force to redefine service mission boundaries.⁶⁸ The gunship debate of the Vietnam era resulted in the Army agreeing not to pursue armed fixed-wing aircraft. Airpower advances in UAV technology and capabilities have once again pushed the services to debate mission boundaries.

The 2006 Defense Appropriations Bill, passed by the United States Congress, has altered the mission of the U.S. Army with regard to UAVs. The law reads,

SEC. 8119. (a) None of the funds appropriated by this Act may be used to transfer research and development, acquisition, or other program authority relating to current tactical unmanned aerial vehicles (TUAVs) from the Army.

(b) The Army shall retain responsibility for and operational control of the Extended Range Multi-Purpose (ERMP) Unmanned Aerial Vehicle (UAV) in order to support the

⁶⁷ Rebecca Grant, “Clash of the UAV Tribes,” *Air Force Magazine*, September 2005,46. <http://www.afa.org/magazine/sept2005/0905UAV.asp> [accessed August 19, 2008].

⁶⁸ *Ibid*, 50.

Secretary of Defense in matters relating to the employment of unmanned aerial vehicles.⁶⁹

The ERMP UAV cited in the Act is the Sky Warrior UAV. Senator Richard Shelby (R-AL) described the legislation in a press release by stating, “I am pleased that this bill includes funding for these important North Alabama defense-related programs.”⁷⁰ The U.S. Army UAV Center of Excellence, located at Fort Rucker, and the Army’s UAV test facility, Redstone Arsenal, are both located in Alabama. This legislation is contrary to the Department of Defense Directive 5100.1, *Functions of the Department of Defense and its Major Components*. The directive states that the Air Force is responsible for organizing, training, and equipping forces for aerial photography and tactical air reconnaissance.⁷¹ Although the 2006 Authorization Act is law and supersedes a Department of Defense Directive, there is an ongoing question whether this legislation is in conflict with the United States Constitution.

The statement that specifically gives the operational control of the ERMP UAV to the U.S. Army may have crossed the line of legislative authority with respect to the Constitution. Article I, Section 8 of the U.S. Constitution states that the Congress shall have the power to, “to raise and

⁶⁹ Department of Defense Appropriations Act 2006, United States Government Printing Office Website, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_bills&docid=f:h2863enr.txt.pdf [accessed August 6, 2008].

⁷⁰ Richard C. Shelby, Press Release – *Shelby Announces defense funding for North Alabama*, December 15, 2005, <http://shelby.senate.gov/news/record.cfm?id=249923> [accessed August 3, 2008].

⁷¹ Department of Defense Directive Number 5100.1., *Functions of the Department of Defense and Its Major Components*, August 1, 2002, Bullet 6.6.3.2.5., 22.

support armies.”⁷² Article II, Section 2 states that, “The President shall be the Commander in Chief of the Army and Navy of the United States.” It is not within the bounds of the Congress to direct how the executive branch organizes the military. This precedent of Congressional self-interest and directing the manner in which a specific weapon system be controlled is a topic that warrants further investigation. The author has made an inquiry to the Department of Defense General Council of Fiscal Law to determine if the Department of Defense has published a written opinion on the legitimacy of Section 8119 (b) of the 2006 Defense Appropriations Act. The DoD General Council of Fiscal Law has not yet responded.

Recommendations

The counterinsurgency wars in Afghanistan and Iraq will eventually end but the United States will continue to engage in military operations across the globe. These operations will range from major combat operations to support, sustainment, transition and reconstruction operations and every other type of operation in between. UAVs will play a significant role in these wide-ranging operations. The current inefficient use of UAVs has a dramatic impact on our current and future operations. This paper makes three recommendations to the joint force to improve UAV command and control. The first recommendation is for the Department of Defense to appoint the U.S. Army as executive agent for Tactical 1 and Tactical 2 categories of unmanned aircraft systems. Additionally, the Department of Defense must name the United States Air Force as the executive agent for Tactical 3, Operational/Theater and Strategic unmanned aircraft systems. The second recommendation is to centralize all Tactical 3, Operational/Theater, and Strategic UASs under the command and control of the air component commander. The third

⁷² The Constitution of the United States of America, Article I, Section 8.

recommendation is to cancel the MQ-1 Predator program in favor of the Sky Warrior system. These three recommendations account for historical experiences of airpower, recommendations cited by the Government Accountability Office, military theorists, and operational commanders currently fighting two wars in Afghanistan and Iraq.

The first recommendation is for the Department of Defense to establish executive agents for UAVs. Establishing the Army as the executive agent for Tactical 1 and 2 UAVs, and the Air Force as executive agent for Tactical 3, Operational/Theater, and Strategic UASs has three benefits. First, the Department of Defense would be able to increase interoperability between UASs by demanding contractors meet communications standards across the joint force. Simple contractual agreements to establish communications standards and interoperability with the current command and control networks are essential to address the key “visibility” issue in the GAO report dated July 2007. By increasing the interoperability of these systems, and mandating standardization of communications with established headquarters communications networks to include the Combined Air and Space Operations Center (CAOC), the joint force can become more effective. Secondly, executive agency would reduce the number of different UASs thereby increasing the commonality of systems that reduce the different training requirements and streamlines maintenance and spare parts issues. The third reason for advocating executive agency is it will minimize the capabilities overlap. From a fiscal point of view, executive agency allows for the most efficient use of taxpayers’ dollars.

The United States Army must become the executive agent for Tactical 1 and 2 UASs. The Army is the service that typically contributes the largest number of ground forces for the joint force commander. Although the Marine Corps often supplies the preponderance of ground forces in certain operations, the overwhelming size and requirements of the Army warrant this appointment. Additionally, both services often combine to create the land component for a joint

force commander. They should have coequal status regarding Tactical 1 and 2 UAS requirements but the Army, as the appointed executive agent, will have ultimate authority to minimize bureaucratic paralysis. By allowing the Army and Marine Corps to focus their requirements on UAS that would almost always be within their organic organizations, land component forces are best suited to developing the UAS that best meet their land centric requirements. Additionally, by limiting the number of different UAS each service acquires, additional fiscal savings in research and development would allow for additional aircraft procurement or improved capabilities. By tying the two land component services together to develop unmanned systems tailored to meet their requirements, the services become interdependent.

The Department of Defense must appoint the United States Air Force as the executive agent for Tactical 3, Operational/Theater, and Strategic UASs. The Air Force provides the preponderance of air assets to the air component commander and Title 10 of the U.S. Code states that this is within the responsibility of the United States Air Force. Additionally, the high price tag of these systems, the USAF's MQ-9 Reaper is approximately \$53.5 million for four aircraft and all of its sensors, would show good stewardship acquisition monies.⁷³ Executive agency is crucial to enabling our military to best use the tax dollars paid by the American people to defend our nation. Knowing that no one can predict the scale of future conflicts, the air component commander must have the ability to command and control all UAVs that are capable of performing missions across an entire theater of operations during major combat operations. This is the basis for the next recommendation.

⁷³ USAF MQ-9 Reaper Fact Sheet, <http://www.af.mil/factsheets/factsheet.asp?fsID=6405> [accessed August 19, 2008].

The second recommendation is to centralize the command and control of Tactical 3, Operational/Theater, and Strategic UASs under the air component commander. This is a direct reflection of the lessons learned from 1943 and agreed to by all of the services in joint doctrine:

Through centralized control, the JFACC provides coherence, guidance, and organization to the air effort and maintains the ability to focus the tremendous impact of air capabilities/force wherever needed across the theater of operations. Additionally, this ensures the effective and efficient use of air capabilities/forces in achieving the JFC's objectives.⁷⁴

Previously discussed, the centralization of airpower varied in degree from the Korean War through Desert Storm. One veteran from Desert Storm, General Barry McCaffrey, USA (Ret.), also a former regional combatant commander, reinforced the need to return our current command and control of airpower to a more centralized set-up. He stated, "We are confusing the joint battle space doctrine. Air Component Commanders should coordinate all UAVs based upon Combatant Commander situational war-fighting directives."⁷⁵ McCaffrey's assessment is a complete validation of the current joint doctrine regarding the command and control of air operations. The JFC's intent guides how the JFACC applies and dynamically redirects air assets to adjust to the changes on the battlefield. McCaffrey understands airpower's history. It is a direct reflection of our military's lessons learned dating back to 1943 in addition to his own personal experiences in combat. Another rationale for centralization is deconfliction of the airspace.

⁷⁴ Joint Publication 3-30, *Command and Control for Joint Air Operations*, 5 June 2003
vii.

⁷⁵ General Barry R. McCaffrey, USA (Ret.), After Action Report, Visiting Nellis and Scott AFB, 14-17 August 2007.

Centralizing the Tactical 3, Operational/Theater, and Strategic UASs under a single air component commander also allows for the most efficient use of the limited airspace over a battlefield. The skies over the battlefield becoming more congested as additional UAVs and other air assets become available to the joint force commander. In addition to the UASs flying over the battlefield, there can be several thousand manned sorties flown in a 24-hour period. Mid-air collision avoidance is paramount to the safe and effective employment of airpower. Colonel Chambliss expanded on this point, “There have been many mid-air collisions between small UAVs and rotary winged aircraft in Iraq.”⁷⁶ This deconfliction problem highlights a key inefficiency that Odierno did not address in his advocating to become the centralized level of command for ISR in Iraq. The Army’s procedural control of air assets below the coordinating altitude has led to mid-air-collisions between manned and unmanned aircraft. Additionally, deconfliction of civil flights and special operations air assets would need to be deconflicted. A corps commander does not have the expertise nor the equipment required to assume this responsibility. The JFACC does and is responsible for developing coordination and deconfliction measures for the safe and efficient use of the airspace above battlefield.

The third and final recommendation is to cancel the MQ-1 Predator program and expand the Sky Warrior program. Currently, the Joint Requirements Oversight Committee, as directed by the Deputy Secretary of Defense England, is evaluating the overlap in capabilities between the USAF’s Predator and the US Army’s Sky Warrior systems. The delay in establishing an executive agent has wasted taxpayers’ dollars since both systems are essentially identical with only a few minor differences. The Sky Warrior is slightly larger and can carry a larger payload.

⁷⁶ Chambliss, interview by author.

The Air Force may end procurement of the MQ-1B Predator in favor of the MQ-1C Warrior. Lieutenant General Donald Hoffman, the military deputy to the office of the assistant Secretary of the Air Force for acquisition, in speaking in front of the Senate Armed Services Committee's airland subcommittee stated that the Air Force was purchasing two Sky Warrior UAVs for test and evaluation.⁷⁷ The Sky Warrior carries a larger payload of weapons and can outperform the Predator and if the JROC or the Air Force decides to end funding the Predator program, that would be one less duplication of capabilities for the Department of Defense.

One successful example of streamlining acquisitions without an executive agent has been a joint effort between the Navy and the Air Force. The United States Navy has recently awarded a \$1.16B contract to Northrop Grumman for production of the Broad Area Maritime Surveillance Unmanned Aerial System (BAMS UAS). This unmanned aircraft system is a maritime version of the USAF's RQ-4 Global Hawk and tailored for maritime use.⁷⁸ The financial benefits of the Navy acquiring this aircraft are numerous. Two examples of this frugal approach to acquisitions are the savings due to the interoperability of parts between the Air Force and the Navy and the vast quantities of money saved for not researching and developing an entirely new system. This kind of streamlining would be commonplace if the Department of Defense would appoint a single service to be executive agent for UASs.

⁷⁷ Erik Holmes, "Warrior UAV Likely to Replace Predator," *Air Force Times*, 15 April 2008.

⁷⁸ Northrop Grumman Press Release, April 28, 2008, http://www.irconnect.com/noc/press/pages/news_releases.html?d=140693 [accessed June 10, 2008].

Summary

Powered flight has forever altered the face of combat. The use of unmanned aerial vehicles in modern combat is another advance in airpower technologies that have changed military organizations doctrine, force structures, and tactics. The centralization of the command and control of airpower after the Casablanca Conference in 1943 shaped the manner in which modern militaries employ airpower. The difficulty of classifying UAVs, especially multi-role capable armed UAVs, also brings into the fold the debate of the differences, if any exist, between manned and unmanned aircraft. Today, the United States fights two wars simultaneously in Afghanistan and Iraq and UAVs are playing a pivotal role in both.

Without question, the centralization of airpower during World War II was a keystone event for modern military forces. Eisenhower, Montgomery, Bradley, and Patton all agreed. A single air commander must have centralized command and control of air assets. The inefficient use of the air umbrella tactics in the early stages of the American involvement North African Campaign highlighted the American inexperience with airpower in combat. The experiences of the Royal Air Force and the opinions of Tedder and Cunningham helped the American ground commanders to understand a centralized approach to the command and control of airpower. The American military commanders of World War II learned from their Allied counterparts. They embraced these concepts, codified them, and forever altered how airpower would be organized and employed.

The development of unmanned aerial vehicles and their associated systems has left many questioning how to classify these new aircraft and who should control them. One simple breakdown of these aircraft cannot sufficiently delineate the broad capabilities and outputs that a joint force commander reaps from these air assets. There will inevitably be more suggestions regarding how to classify these systems in the future. The current classification system published

in the Joint Unmanned Aircraft Systems Center of Excellence Concept of Operations is a thoroughly inclusive breakdown. The initial dichotomy between civil use and military UAVs acknowledges the use of UAVs within the civilian controlled airspace of the United States. This common terminology is necessary for military and Federal Aviation Administration personnel to be able to operate efficiently together. The tiered breakout of the joint military use UAVs is also a good foundation for classifying UAVs for combat operations.

The most efficient manner to acquire and employ unmanned aircraft systems is to name the United States Army and the United States Air Force as executive agents for specific levels of UAVs. This decision would minimize interoperability problems and reduce spending on systems that duplicate effort. This would then allow more funds to purchase more aircraft and continue to shrink the gap between demand and availability of UAS outputs.

Airpower is most efficient when centralized under the command and control of a single air commander. The Tactical 3, Operational/Theater, and Strategic UAVs will best meet the joint force commander's intent if centralized under the air component commander. The Combined Air and Space Operations Center allows the air component commander to effectively command and control thousands of sorties daily. The unique nature of airpower requires that an experienced airpower leader be the one commander that directs its application in accordance with the joint force commander's intent. The only headquarters that has the communications and network capabilities to perform this detailed integration and fusion of efforts is the Air Force's CAOCs.

ISR is simply one mission that a UAV can perform. They also can perform interdiction, close air support, and other missions. Allied forces are embroiled in two simultaneous, counter-insurgency wars in Iraq and Afghanistan. These wars warrant an apportionment decision weighted toward ISR and less on interdiction and close air support. Odierno's recommends an increase in the ability for ground forces to obtain the outputs from ISR assets. This concept does

not run counter to the concept of centralized command and control of airpower. The concept is almost akin to the manner in which aircraft are flying direct support mission for close air support.

This research project set out to determine how the United States military should command and control unmanned aircraft. UAVs are a technological advance that we must embrace and push to the limit of its capabilities while determining the most efficient manner to further the integration of air and ground forces in combat. Historically, the integration of air and land forces depends most upon the personalities of the commanders involved. The cooperation between General Patton and General Weyland during World War II is one example where our forces performed extremely well. This relationship was one of mutual respect and understanding of the nature of land and air forces. Each of these storied commanders acknowledged the other's separate commands and different responsibilities but worked together as a team. Weyland spoke of this unique relationship in an interview in 1974 and may help to tie this all up. Regarding air operations, Weyland said:

The decisions were mine as to how I would allocate the air effort. And we had a joint operations center with staff officers [from XIX TAC] and from his [Patton's] forces...they would feed in all their inputs. What they wanted and what not. We would try to support him, but we had other chores to do like maintaining air superiority, interdiction to the rear to clobber reserves, ammunition, supplies, and things like that so they wouldn't be used against him, and so forth. He readily agreed to that [principle]

and was faithful to it.⁷⁹

Patton and Weyland together, orchestrated one of the most efficient and effective uses of airpower in conjunction with land power in history. These are great words and lessons for us to follow today as we determine how to best integrate UAVs over the modern battlefield.

⁷⁹ Dr. Alan F. Wilt, *Coming of Age – XIX TAC's Roles during the 1944 Dash across Europe*, Air University Review, March-April 1985, <http://www.airpower.maxwell.af.mil/airchronicles/aureview/1985/mar-apr/wilt.html> [accessed August 19, 2008].

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