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DoD budget cuts require the Air Force to look for new ways to cut costs while still meeting mission requirements. Implementation of a flight Warrant Officer (WO) career field would decrease personnel costs while meeting the demand for additional RPA pilots driven by increasing ISR mission requirements. All service branches except the Air Force currently utilize WOs. Both enlisted and WO equivalent pilots were used by the Army Air Corps during World War II. The Army and Navy have WO pilot programs providing a specific template for their reintroduction into the Air Force. This study describes how RPA pilots are currently trained and how WOs could fill the same role now met by commissioned officers. Using WOs as RPA pilots would result in reduced annual and lifetime personnel costs compared to commissioned officers. Utilizing the Army aviation model with two-thirds of RPA pilots being WOs provides technical specialists capable of performing the mission while reducing annual personnel costs by approximately $13.4 million.

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MASTER OF MILITARY STUDIES

Air Force Remotely Piloted Aircraft (RPA) Warrant Officers:

Meeting Requirements while Reducing Costs

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

Jeremy C. Coonrad, MAJ, USAF

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Executive Summary

Title: Air Force Remotely Piloted Aircraft (RPA) Warrant Officers (WOs): Meeting Requirements while Reducing Costs

Author: Major Jeremy Coonrad, United States Air Force

Thesis: Implementation of a flight WO career field in the Air Force would decrease personnel costs while meeting the demand for additional RPA pilots driven by Intelligence, Surveillance, and Reconnaissance (ISR) mission requirements.

Discussion: Continued DoD budget cuts require each service branch to look at different ways to reduce costs while still meeting mission requirements. Meanwhile, the Air Force has a much higher percentage of officers compared to the other services resulting in comparatively higher personnel costs. At the same time the Air Force has had difficulty meeting the increased requirement for RPA pilots as the demand for ISR coverage has exploded in the last decade. Although new training and personnel programs have reduced the cost of producing RPA pilots it is possible to achieve additional savings by shifting some of the commissioned officer pilots to WO positions. The Air Force does not currently utilize WOs in any capacity but their historical use in the other service branches, the Army Air Corps and the early days of the Air Force provides relevance on their use within the RPA pilot community. Additionally, both the Army and Navy use WOs as pilots providing a specific template for their reintroduction into the Air Force. This study describes how RPA pilots are currently trained and how WOs could fill the same role now met by commissioned officers. Converting two-thirds of the RPA pilot positions to WOs provides annual savings of roughly $13.4 million while additional savings would be achieved during the period any of those pilots would draw retirement pay.

Conclusion: Using WOs as RPA pilots would result in reduced annual and lifetime personnel costs compared to commissioned officers. Utilizing the Army aviation model with two-thirds of RPA pilots being WOs provides technical specialists capable of performing the mission while reducing overall personnel costs.

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Introduction

The Federal budget of the United States Government is on an unsustainable path of continued annual deficits due to increased spending. As this trend continues, and the wars in Iraq and Afghanistan wind down, the Department of Defense (DoD) is increasingly looked at as an area for reduction as part of the overall budget strategy. The Service Chiefs have argued against continued cuts to defense funding but the expected future reductions make it in each services best interest to find new ways to reduce spending.[1] This paper outlines how a flight warrant officer (WO) career field in the Air Force can reduce personnel costs while meeting the demand for additional Remotely Piloted Aircraft (RPA) pilots driven by Intelligence, Surveillance, and Reconnaissance (ISR) mission requirements.[2]

The use of WOs as pilots in the DoD is not a new idea. On the contrary, they are actively serving in the Army and Navy in manned fixed-wing aircraft, helicopters, and RPA. There is also a strong historical precedent for WO use in the Army Air Corp, the predecessor to today's independent Department of the Air Force. The precedent began with their use during World War II and continued until the retirement of the last Air Force WO in 1980, although the appointment of pilot WOs (known as Flight Officers) ended with the war and the Flight Officer grade was formally repealed in 1947.[3] The current DoD fiscal situation combined with growth in RPA pilot requirements make it time for the Air Force to once more consider WO utilization.

Current Fiscal Situation

The DoD budget is already subjected to deep cuts with even more on the horizon. Overall, the DoD is expected to absorb approximately $1 trillion in budget cuts over the next decade as a result of the failure of the special Congressional debt-reduction panel in November of 2011.[4] This is occurring after a continued rise in personnel costs that have doubled DoD-wide since FY01 while the overall full-time military personnel have only increased 8%.[5] Air Force

1

personnel costs are projected to decrease in FY2013 to $28.9 billion but will still absorb 26% of

the budget overall as shown in figure 1, even with the additional cut of 9,900 Airmen in

FY2013.[6] The personnel reduction for FY2013, in addition to the reduction of 48,000 personnel

since 2004, puts the Air Force on a better trajectory but additional methods of personnel savings
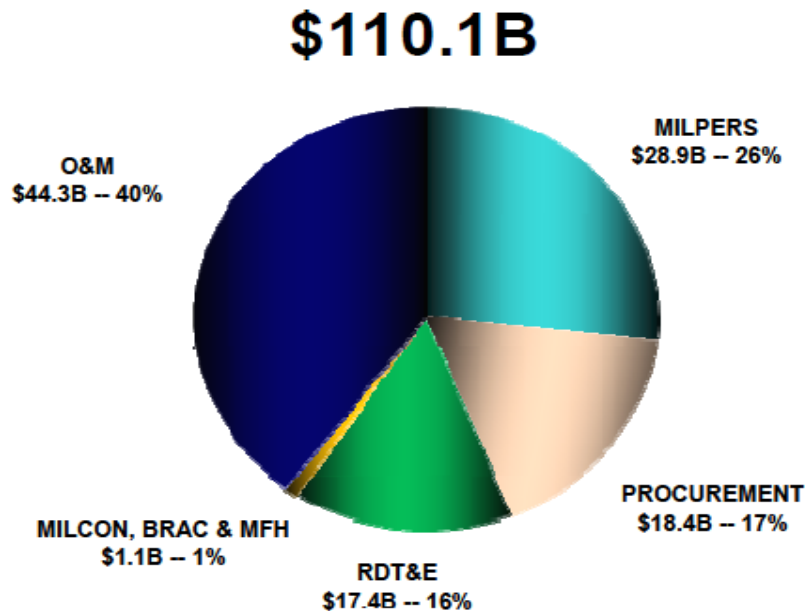
besides end strength reduction need to be explored.[7]

Figure 1. FY2013 Budget Request[8]

As a whole the Air Force is not the largest branch of service, the Army has approximately

556k soldiers compared to the Air Forces 328k airmen, but it does have the largest percentage of

officers at 19.7% of its active duty force.[9] This top heavy force structure has not historically

been the case but instead is a result of a continuing trend of a disproportionate reduction in

enlisted personnel compared to officer personnel over the last half century. A greater

comparative reduction in enlisted force structure has been previously justified by the fact that it

is more difficult to grow officers than enlisted personnel. Rather than expanding evenly across

the force structure it is easier to add junior personnel since it can take decades to effectively

grow and train field grade and higher officers.

At the peak of its strength in 1953, the modern Air Force was composed of 980,205 personnel, with officers (including WOs) comprising 13.2% of its force.[10] Funding to support those personnel was $50.1 billion (FY2012 constant dollars), for a per service member cost of almost $51,000 per year. For FY 2011 this cost ballooned to over $108,000 (FY2012 constant dollars) for each active duty airman, in part due to the increasingly officer heavy force structure over the last half century.[11] The additional cost of the top heavy force structure is demonstrated by the officer corps composing 19% of the force but requiring almost 30% of the Pay and Allowance section of the FY 2012 Air Force Active Duty Military Personnel budget.[12]

One source of the ballooning personnel costs have been across the board pay raises for all service members. A 2002 personnel management study showed that each 1% of pay raise cost the DoD more than $600 million in personnel costs the subsequent year.[13] Having a larger portion of the force in the more expensive officer grades increases the budgetary effects of pay raises. Additionally, pay raises increase the budget cost not only in the year enacted but cascade into each succeeding year. This was most noticeable during the past decade when lawmakers set the basic pay raise 0.5 percentage points higher than the employment cost index (ECI) for FY 2004 to 2010.[14] Replacing existing billets with a lower grade, and therefore less expensive, service member would achieve a reduction in personnel costs by reversing the trend of an increasing percentage of Air Force personnel located in the officer corps.

RPA Force Growth

Although cost reductions will probably affect most functional areas of the Air Force, there are certain sectors that will continue to warrant funding increases. One of these areas is the continued increase in the amount of ISR assets required to meet geographic Combatant Commander's mission requirements. The DoD's 2012 Budget Request demonstrates the priority on ISR capabilities with the continued year over year increase in the total number of Predator-

Class Combat Air Patrols (CAP)/orbits, see figure 2.[15] The target of 65 Predator-class orbits by

FY 2013 directed to the Air Force represents a 1,200% growth in operations since the war in

Afghanistan began with an expectation for continued growth in the future.[16] This target is

projected to be met in FY2012, but only by stretching available crews beyond their programmed

usage rate. Additionally, the DoD plans to build a temporary surge capability to 85 orbits

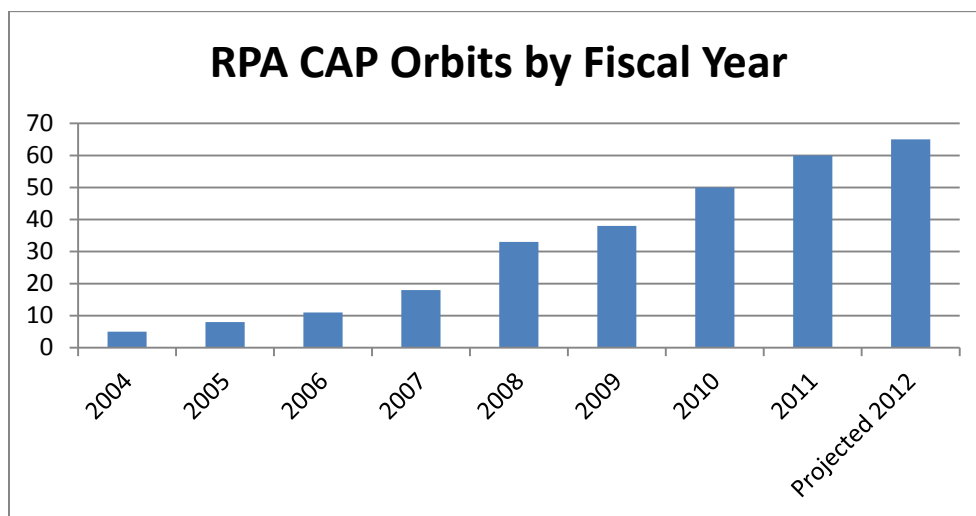beyond the steady state 65 orbit capacity thereby pushing RPA pilot requirements beyond the FY

2012 plan.[17]

**Figure 2. Growth in Air Force medium-altitude MQ-1 Predator
and MQ-9 Reaper Combat Air Patrols[18,19,20]**

As requirements for ISR coverage continue to grow, there is a corresponding growth in

both personnel and equipment to meet that requirement. The current standard of measure for

ISR support is the Predator-Class CAP or orbit. Each orbit is defined as the ability to maintain

24 hour coverage over a single geographic location and is programmed to require four RPA and

ten aircrew split evenly between pilots and sensor operators for sustained operations.[21] To meet

surge demands manning has dropped to an average of eight crews per orbit with a corresponding

drop in quality of life for those crews. When the Air Force first operated RPA they were known

as Unmanned Aerial Vehicles (UAVs) and utilized line-of-sight control allowing one ground control unit to control one RPA from take-off to airborne operations and then to landing. As technology improved a change was made to remote-split operations that allow a launch and recovery unit to handle multiple RPA in theater by controlling each takeoff and landing in turn while crews at stateside bases control the majority of subsequent airborne operations. Even while this increased the efficiency of existing RPA operations the continued growth in personnel requirements has put a severe strain on the pilot force.

Over the last decade the Air Force has struggled to meet the increased mission requirements for RPA with the increased personnel requirements, specifically in the pilot career field, being the most difficult to meet. Initial RPA manning came from the rated manned aircraft pilot career field during what is termed as an ALFA tour, a two to three year career broadening assignment as an instructor in Air Education and Training Command, at their assigned aircraft Flying Training Unit, or finally as a Forward Air Controller or Air Liaison Officer. This tour occurs after the pilot has completed Undergraduate Pilot Training (UPT) and their first or second operational tour in their assigned aircraft. Following their ALFA tour pilots have traditionally returned to their assigned aircraft. This creates a heavy demand on the RPA training pipeline as experienced pilots from manned aircraft are sometimes used for only a single three to four year tour operating RPA.

However, as the demand for RPA pilots continued to grow the Air Force initiated several measures to meet the requirement. One of the first measures taken was the freezing of RPA assignments in January of 2008.[22] This extended the pilot's normal three year tour to a minimum of four years, with some service members being forced to remain in place as long as five years. The assignment freeze has continued to be extended each subsequent year to keep qualified RPA

pilots initially trained in manned aircraft in RPA squadrons, a demoralizing prospect for some

pilots who expected to return to manned aircraft after three years. A second measure was taken

in September of the same year when the Air Force Chief of Staff directed 100 UPT graduates

would transition directly to RPA instead of moving into manned aircraft.[23] The final measure

was the creation of a new Air Force specialty code, 18X, to designate an RPA only pilot career

field. All of these measures have been taken in an attempt to meet the upcoming requirement for

1350 RPA pilots by 2013, more than double the 600 pilots that were qualified in mid 2010.[24]

RPA Pilot Selection and Training

Currently RPA pilots enter the training pipeline from one of three sources: experienced

pilots from manned aircraft, pilots directly out of UPT, and the recently established

Undergraduate RPA training (URT) pipeline.[25] Each of these sources requires a commissioned

officer with a four year college degree, but no specific degree specialization is mandated. While

the length of each training pipeline varies, they all meet at their operational squadron to complete

Mission Qualification Training. With respect to RPA specific training both veteran pilots from

manned aircraft and pilots directly from UPT have accomplished the same basic course. The

airframe that veteran pilots transition from makes the greatest difference in length of time and

cost for their training. This results in the most expensive method of sourcing the RPA pilot

requirement as veteran pilots from fighter/bomber platforms since more than $2.6 million is

spent during their training.[26] Airlift pilots, however, only cost about $600,000 to train but are

less desirable due to the increased use of RPA as weapons platforms.[27]

The second method of RPA pilot selection, directly following UPT, falls in the middle of

the cost band for training since operational airframe training costs are negated. The final training

method, the URT, provides the most cost savings and is designed to turn officers without prior

flying experience into operators of RPA.[28] This six month training program is significantly less expensive than training a pilot for manned aircraft and then transitioning them to RPA.

While similar in structure to UPT the newly formed URT course includes a minimal amount of actual flight training and focuses on the skills directly related to RPA operations. Both URT and UPT candidates initially receive flight instruction in small aircraft to gain a basic air sense; but this is the only actual flight time URT students receive. Following the initial screening, URT students take academic instruction and receive 36 training missions in T-6 simulators followed by a month long RPA Fundamentals course. At this point, approximately six months after starting their training they are URT complete in approximately half the time required for a student to complete UPT.   Their final phase of training is accomplished on the specific RPA they are assigned, normally a two month process at either Creech or Cannon Air Force bases. Appendix A graphically depicts current RPA and UPT training pipelines.

Warrant Officer Basics

An in depth look at WO use among the service branches reveals a potential source of meeting the Air Force's RPA personnel requirements. The history of WOs serving in the United States military begins with their service starting in the Navy in 1775 in a variety of positions. In 1917, the WO grade became part of the Marine Corps as quartermaster clerks and gunners. Then the Army began their official use of the WO grade in 1918 as part of the Army Mine Planter Service where they served on mine planting vessels as masters, mates, chief engineers and assistant engineers.   Meanwhile, WOs served in both the Army Air Corp and the Air Force after its creation in 1947 until the grade structure was phased out. Today, they comprise the smallest of the three main groups of military personnel: traditional commissioned officers, WOs, and

enlisted. Much like their original purpose they are still used as technical experts and currently

serve in the Army, Navy, and Marine Corps in that capacity.

Originally, the WO structure was created to differentiate between officers who were

warranted into their position and officers who were commissioned. As time passed, the Navy

and the Marine Corps divided up the WO structure between traditional WOs and higher grade

WOs who held a commissioned officer status. Then in 1954, the Warrant Officer Personnel Act

standardized the grades among the services with W-1 for WOs and CW-2 to CW-4 for

commissioned WOs using the title of "chief warrant officer." The next major service wide event

was the passage of Defense Authorization Act of 1986 requiring appointments of all Chief WOs

(W2-W-4) to be made by commission, this primarily affected the Army as both the Navy and

Marine Corps were already commissioning their Chiefs. Finally, successful incorporation of the

Warrant Officer Management Act into the National Defense Authorization Act for FY 1992

created the grade of CW5 with a 5% cap in each service, a tenure requirement based on years of

WO service, and a single promotion system across the services for WOs.

Although the WO grade has been in use for almost one hundred years, there is still

confusion with the term "commissioned officer" in discussions regarding WOs. As

commissioned officers it is important to understand that Chief WOs (CW2 to CW5) have the

same command authority inherent in all commissioned officers; and are used in that command

capacity in multiple service branches. This also drives DoD commissioned officer end strength

numbers to include the WO grades, and was one reason the USAF ceased to utilize that grade

structure. Even though Chief WOs are commissioned officers, for ease and clarity of writing any

references to "commissioned officers" in this report references traditional commissioned officers

that are those officers above the WO grade structure. The varied uses of WOs results in a large

disparity between both the total number and percentage of personnel among the different service branches as shown in figure 3.

	Enlisted		Commissioned Officer		Warrant Officer		
	Number	Percent	Number	Percent	Number	Percent	Total
Army	469,761	83.3%	78,434	13.9%	15,470	2.7%	563,665
Navy	271,235	83.6%	51,404	15.8%	1,711	0.5%	324,350
Marine Corps	180,470	89.3%	19,718	9.8%	1,912	0.9%	202,100
Air Force	263,438	80.3%	64,762	19.7%	0	0.0%	328,200
All Services	1,184,904	83.5%	214,318	15.1%	19,093	1.3%	1,418,315

Figure 3. Estimated FY2011 Department of Defense Force Structure[29]

History of the Air Force Warrant Officer

Historically the Air Force has utilized the WO rank, although it is no longer in use with the last active duty WO retiring in 1980 and the last reserve WO in 1992. Prior to 1947 the Army Air Force grade structure included commissioned officers, WOs, and enlisted personnel. The passing of the National Security Act on September 17th created the Air Force out of the existing Army Air Force. As such, the Air Force inherited the same force structure, including WOs, which had existed in the Army Air Force. However, in 1958 an Air Force personnel committee recommended that WO procurement be discontinued until the impact of the new enlisted E8 and E9 grades were reviewed.[30] A subsequent study recommended the retention of the WO grade but in the end WO ascensions were never resumed although no documentation stating the reason has been found.

In addition to the WO program that existed in the Army Air Force there was another rank available, the Flight Officer. As part of the personnel buildup during World War II Congress created a Flight Officer rank in 1942. It was created in order to give it to the existing enlisted pilots in order to "avoid the socially unthinkable prospect of having NCOs command aircraft on which commissioned officers served as crew members."[31] Both the enlisted sergeant pilots and

the subsequent flight officer ranks increased the pool of potential applicants available for flight duty by reducing the education requirements that existed for commissioned officer pilot candidates. The appointing of flight officers stopped when the war ended and the requirement for large quantities of pilot candidates was sharply reduced.

When the Air Force began its life as a separate service it inherited 1,200 WOs.[32] It continued to appoint more but the lack of a specific WO career plan resulted in personnel being scattered throughout the service instead of being used for specific technical duties as originally designed. Its first attempt to standardize the utilization of WOs occurred when it defined them by regulation. In June, 1953 it released AFR 36-72 which stated that WOs were "technical specialist with supervisory ability, who is appointed for duty in one superintendent Air Force specialty."[33] By reaffirming the WOs place squarely between the enlisted and officer ranks, the regulation allowed for them to act as either "superairmen or as substitute officers."[34] However, with WOs counting as commissioned officers in the budget process, few new warrants were appointed since the Air Force was loathe to trade a commissioned rated officer billet for additional WOs. The confusion regarding WO use led to their eventual demise when two new enlisted ranks, E-8 and E-9, were created in 1959.

Since the creation of the Department of the Air Force in 1947, all new pilots have come from the ranks of the commissioned officers. This occurred even with the historical precedent of both an enlisted flying sergeant program and a flight officer rank that was equal in status to the rank of WO junior grade. Both staff sergeant pilots and flight officers flew in all major theaters of the war with 17 sergeant pilots and many more flight officers becoming aces, including Major General Charles "Chuck" Yeager who began his career as flight officer.[35] Ultimately, it seems

the Air Force could not reconcile itself with how to integrate noncommissioned pilots when they could end up in charge of commissioned officers on the same crew.

Warrant Officer use in the Army

In contrast to the Air Force, the Army makes extensive use of the WO resulting in the largest program in the Department of Defense; both in overall size and percentage of the force (see figure 3). More than 15,000 soldiers are integrated throughout the Army force structure composing 2.7% of the Army's active duty force in FY2011.[36] The largest segment of WOs, with 45% of the Army total WO force, are utilized in the Aviation branch in career fields such as Rotary or Fixed Wing Aviators, Aviation Maintenance Technicians, or Tactical Unmanned Aerial Systems (TUAS) Operations Technicians.[37]

The Army, much like the Navy and Marine Corps definitions, describes the WO as a "self-aware and adaptive technical expert, combat leader, trainer, and advisor."[38] Additional clarification is given in the Field Manual on Army Leadership that states that WOs "possess a high degree of specialization in a particular field in contrast with the general assignment pattern of other commissioned officers."[39] All five available WO ranks are used by the Army with an individual initially appointed as Warrant Officer One (WO1) and then progressing to Chief Warrant Officer Two (CW2) after two years. Subsequent promotion is competitive and occurs approximately every six years for aviation WOs from the rank of CW2 to CW5.[40] Although Army WOs fill some staff positions their career track is primarily oriented with progressing within their career field instead of focusing on increased levels of command and staff positions.

Within the Army there is a distinct difference in the methods of accession to the WO ranks between aviation and non-aviation branches. The majority of Army WO aviators are selected within their first or second term of enlistment (early select model), while the remainder enter directly from civilian life (direct select model).[41] High school graduation or a GED is a

requirement for both sources. Army technicians are selected in their mid-career between 9-12 years of service and their enlisted specialty is a direct lead into their WO technical branch (mid select model). Retirement for Army WOs follows the general trend of all service members with 65% of those who reach 20 years service retiring before reaching 24 years of service.[42]

Inside the aviation community, aviation WOs fulfill the role of a technical expert that remains within their career field; as opposed to the career broadening assignment pattern of other commissioned officers. This results in approximately two-thirds of the pilot billets in the aviation community being filled with WOs while the rest are filled with other commissioned officers. The Army's use of aviation WOs as technical experts commanding aircraft provides a model of how the Air Force could incorporate their use. Additionally, the ratio of commissioned officers to WOs differs between the different types of helicopter units but the two-thirds number provides an average that could be used in Air Force RPA units.

Warrant Officer use in the Navy and Marine Corps

With respect to the size of its WO force the Department of the Navy is in the middle of the DoD with its use of WOs in both the Navy and the Marine Corps as technical officer specialists in a variety of career fields. The overall percentage of WOs in the two services is relatively small at 0.5% for the Navy and just under 1% for the Marine Corps (see figure 3). Although small in percentage of the force, WOs provide the services with both valuable technical and managerial skills in positions where their experience is not lost as it is with commissioned officers as the officers promote out of technical positions into higher level leadership positions.

A major change to the Navy WO program occurred in 2006 with the addition of the Navy's Active-Duty Flying Chief Warrant Officer Pilot Program. The program allows E-5 through E-7 sailors with a minimum of an associate's degree to apply for either Pilot or Naval

Flight Officer (NFO) training. Additionally, sailors must be commissioned by their 27th birthday, although age waivers can be requested. Successful completion of the program commissions the sailor as a CWO2 and incurs an eight year commitment for Naval Aviators or a six year commitment for NFOs. At the end of FY 2010 a total of 32 pilots and 19 NFOs have been selected into the program with one of the pilots from the first class becoming the first Chief Warrant Officer Patrol Plane Commander in P-3 fleet history.[43] Although the Navy has had success with its limited Flying Chief Warrant Officer program there appears to be no interest by the Marine Corps in a similar program as it still restricts all pilot and navigator billets to commissioned officers.

Warrant Officers as a Solution

The strong historical precedent in the U.S. military and current use of WOs within the majority of the service branches encourages the question of their feasibility as RPA pilots in tomorrow's Air Force. They could provide many benefits while meeting the requirement for a technically oriented service member to operate a complex piece of equipment. Tangible benefits include lower overall personnel costs based on pay, lower training costs, and increased specialization stabilization in the career field. Other, harder to quantify benefits would be the increased recruitment pool that would allow volunteers to know exactly what they are getting themselves into prior to signing up, increased morale for the manned aircraft pilot force, and increased retention of RPA operators. Finally, successful implementation of WOs in the RPA career field could be used as a template for the introduction of WOs in other career fields in the Air Force, bringing its use of WOs in line with the other service branches.

An Air Force RPA pilot force structure should include the best of both the Army and Navy aviation WO programs. The overall structure should be approximately two-thirds WOs

and one-third rated officers that transition from manned aircraft similar to current Army Combat Aviation Brigade manning. Direct selecting WOs who have a minimum of a two-year associate's degree in line with the Navy Chief Flying WO program creates a competitive selection process, which should reduce the overall attrition.

While the majority of the RPA pilot force would be WOs, the remaining third would come from the manned aircraft community, primarily from fighter and ISR aircraft within Air Combat Command and Air Force Special Operations Command. This would provide a crossflow of information regarding weapons employment between the manned and RPA communities and ensure the best possible success with weapons employment supporting the warfighter on the ground. An additional source of rated officers would be those pilots of manned platforms that lose their medical qualification for unrestricted flight status but can still maintain the medical standards required for RPA pilot duty. The cadre of rated officers would transition between manned aircraft assignments, RPA assignments and staff assignments while attending professional military education at the same rate as their peers that remain solely in the manned aircraft community. Commissioned officers would fulfill the leadership positions within RPA units, just as they do in Army Combat Aviation Brigades and its subordinate units.

The cost savings associated with using WOs compared to commissioned officers is the most quantifiable benefit. A direct comparison of basic pay between a 20 year commissioned officer and a direct entry model WO shows a cost reduction of over $400,000 per service member over a 20 year career (see figure 3). This is conservative since the WO would provide 19 years of operational service (20 year career minus 1 year of initial training) while the commissioned officer would only provide 16 years of RPA service (20 year career minus initial training, PME, and staff assignments). The comparison is limited to basic pay with an

assumption that special incentive pay, basic allowance for housing, basic allowance for subsistence, and retention bonuses would be comparable between the two rank structures.

In comparison to the direct entry model, an early select model would not be result in savings over a commissioned officer based strictly on pay. The early select model results in a higher pay scale for the WO at the end of their active duty service compared to a commissioned officer. In this case the five years of enlisted service prior to a twenty year WO career results in twenty-five total years of service and subsequent higher pay scale. This also carries over into greater retirement pay based on the High-3 multiplier of .625 for twenty-five years instead of a .5 multiplier for the twenty years in service for the commissioned officer (see Appendix B).

	Active Duty	Retirement Pay	Total Pay	AD Savings	Total
Com. Officer	1,636,169	3,381,942	5,018,111	N/A	N/A
Warrant Ofcr Direct Entry	1,260,955	2,768,448	4,029,404	375,213	988,707
Warrant Ofcr Early Select	1,260,361	3,892,702	5,455,794	73,076	-437,683

Figure 4. Personnel Cost Reductions by Method of Service Entry

Comparison of active duty and retiree pay using the U.S. National Center for Health Statistics average lifespan to 79 years of age for a male provides a cost reduction almost $1 million per service member.[44] Compounding this savings across a 1,350 member RPA pilot force that is two-thirds direct entry WOs would yield a cost reduction of more than $880 million. Appendix B contains the calculations by year and additional assumptions used. These savings would be even greater if Air Force WOs follow the trend of Army Aviation WOs and retire beyond 20 years of active duty service.

Another method of rough cost analysis is provided in the Congressional Budget Office (CBO) study from 2002 titled *"The Warrant Officer Ranks: Adding Flexibility to Military Personnel Management"* describing how each service branch utilized the WO rank and also

included accession methods and promotion rates. Air Force WO use was not discussed since none are currently serving. Although no specific cost comparisons for an expanded WO force were made due to limited existing data, it did state that "the services might decide to test the concept of an expanded warrant officer system in some small occupational area" and that "the DoD might also consider whether the warrant officer career path . . . would be a cost-effective alternative for positions that are now being filled by conventional commissioned officers."[45] A WO RPA pilot program would provide both "small occupational area" and "a position being filled by a conventional commissioned officer."[46] Even though no force wide calculations were accomplished, the report did compare the annual regular military compensation (RMC) for different WO selection methods against other personnel. Figure 5 shows that the difference between a commissioned officer and an early-select warrant (the Army Aviation Warrant model) to average approximately $15,000 per year during the majority of the respective careers, multiplied across two-thirds of 1350 RPA pilot force would achieve savings of roughly $13.4 million annually based on the CBO study.
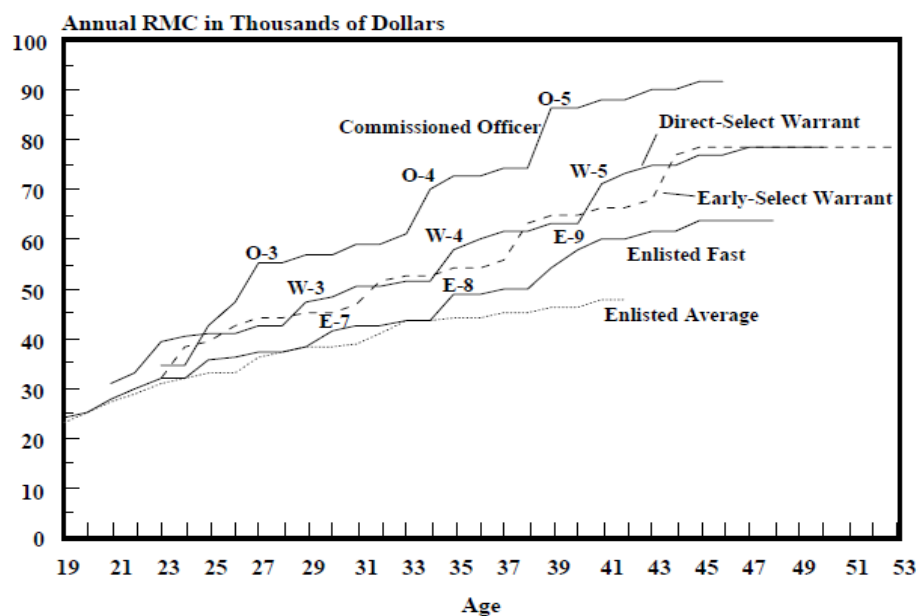

Figure 5. Typical Pay Profiles for Early Select WOs and other Personnel[47]

A second source of cost savings would be achieved in the use of the URT pipeline for the majority of RPA pilots. As previously discussed in the *RPA Pilot Selection and Training* section the URT program offers significant savings over traditional UPT sourcing methods of RPA pilots. The combined number of WOs and URT commissioned officers that are RPA only qualified would compose approximately 75% of the manning required. Full utilization of the planned 180 URT training slots per year with savings of at least $500,000 on each pilot would save a minimum of $90 million annually.[48] A large portion of the training cost savings are already programmed into the USAF budget with the growth of the URT pipeline, using WOs would simply enhance the use of the pipeline.

Another benefit of the WO would be the increased proficiency gained by allowing pilots to keep flying instead of being removed from RPA flight duties for staff and extended professional military education assignments. There is a constant struggle for commissioned officers to maintain their aviation skill as they transition between manned aircraft and the non-flying career broadening assignments required to be competitive for promotion. This struggle is compounded when RPA assignments are also introduced in the cycle as RPA and manned aircraft aviation skills do not always translate from one system to the other. Army Flight WO experience has proven this concept with WOs normally being the most experienced pilots in Combat Aviation Brigades due to their extended time in the cockpit compared to commissioned officers. An Air Force WO program would allow the majority of RPA pilots to remain operating the system instead of leaving it to fill career broadening staff assignments.

There are a few intangible benefits that would require time after the implementation of the program to evaluate. The primary benefit would be in the competitive nature of WO selection that presented a clear job description prior to the individual entering the career field.

Many student and veteran pilots in the USAF do not have an inherent desire to fly RPA; they entered training assuming that they would be flying manned aircraft. This creates morale and retention issues when those pilots are assigned to RPA based on the needs of the Air Force, which are then compounded when they are locked into the RPA career field for extended tours through a manning freeze that has been in place for over four years. WOs entering RPA training with the knowledge that their future was in the RPA community can be assumed to have a much stronger desire to perform well compared to a manned aircraft pilot who is there involuntarily and may be biding their time until the next assignment cycle.

Arguments Against Warrant Officer Implementation

There have historically been two major arguments against the use of WOs in the Air Force, with several other minor concerns that have been raised during conversation with other officers. The first argument is against their use in general since the creation of the E-8 and E-9 ranks created a position for technically advanced enlisted service members. A second argument has been against their use as flight crew where WOs could end up commanding more senior commissioned officers on crew aircraft or in formation flights of single piloted aircraft. A few of the minor concerns include the level of personnel cost savings that could be achieved and the reduced ability to grow senior officers from the RPA community.

The first major argument is only valid if the RPA pilot positions were being filled by E-8 and E-9s, not commissioned officers. The majority of studies by the USAF before the elimination of the WOs grade regarded WOs as an enlisted grade structure promotion and studied how to transition senior enlisted positions into WO billets.[49] This paper has outlined the opposite; by arguing that officer RPA pilot billets that do not require the broad leadership skills of a commissioned officer could be shifted to the lower, and more cost effective, grade structure of WOs. The preconceived notion that WO positions should be for highly technical enlisted

personnel to be promoted into can be removed from the argument due to the lack of any existing

WO grade structure in the Air Force, instead the WO grade could be re-implemented and used to

reduce commissioned officer requirements.

Another major argument is lines of command on an aircraft could be confused if a WO

held the position of aircraft commander with more senior commissioned officers as

crewmembers. Although this could be an issue, and has been noted at times in the Army aviation

community, the Air Force could resolve the issue based on past common occurrences of lower

ranking pilots serving as pilot in command of multi-pilot aircraft. Throughout the history of the

Air Force there have been regular circumstances of officers either entering the pilot career field

late compared to their peers or moving from one aircraft to another and performing duties as co-

pilots while holding a higher rank than the pilot in command. If it were a significant issue the

Air Force would have changed its aircrew management policy to keep those types of

circumstances from occurring. Instead, the fundamental understanding among aircrew that rank

has no place during flight operations and would mitigate this concern.

Another area of concern is that any direct personnel savings would be offset by increased

personnel overhead costs of the additional WO grade structure. Limiting the added WO grade

structure to a single career field would negate any requirement for significant overhead personnel

structure. Instead, existing RPA assignment officers at Air Force Personnel Command (AFPC)

would be able to manage the RPA WO billets. The limited number of duty stations available for

RPA pilot billets would also minimize the overhead personnel requirement. Additionally, the

existing Basic Officer Training Course (BOTC) at Maxwell AFB would provide the initial

training for WOs. Currently BOTC runs seven 12-week courses per year for new recruits;

transitioning two of the courses to a Warrant Officer Training Course (WOTC) would create a

path for WO accessions. Modeling the WOTC after existing Army and Navy WO ascension courses would minimize the amount of new curriculum required, while the initial instructor cadre of the course could utilize WOs from the U.S. Army Warrant Officer Career College who have experience instructing at the Warrant Officer Candidate School.

An additional concern arises from the potential for an all RPA force in the not too distant future, with a comparable decrease in commissioned officers available for leadership positions if WOs are introduced. The argument has been made that RPA will eventually take over all manned aircraft missions, but there are several technological and policy issues that must first be overcome. Technological issues remaining include: the current RPA reliance on satellite communications when potential adversaries have a demonstrated satellite kill capability, control latency concerns between RPA and their remote operators, and potential vulnerability to electronic jamming or cyber attacks. Outstanding policy concerns include: RPA delivery of nuclear weapons, RPA cargo aircraft with passengers on board, and airspace control measures. If the technological and policy concerns can be overcome the overall pool of rated officers would be significantly reduced with WOs composing the majority of RPA pilots. However, the one-third of the force composed of commissioned officers in addition to commissioned officers in non-pilot career fields would still be available to fill leadership positions.

One final area of concern is the growth of officers from the RPA ranks into senior leadership positions as General Officers. In June of 2011, Secretary of Defense Robert Gates expressed this very concern to the Secretary of the Air Force and Chief of Staff of the Air Force. Reducing the number of commissioned officers in the pool of RPA pilots by utilizing the WO grade would result in a smaller population from which to grow general officers. However, a prerequisite for promotion to general officer rank is successful command at the squadron and

group level. The number of positions available at that level would have already thinned out the commissioned officer population available to promote and would not be affected by reducing the total number of company grade positions in the RPA pilot career field. The ability to transition manned aircraft pilots to the RPA field would also allow some of the best and brightest in that community to move into the RPA field if a shortage in suitably qualified officers was noted.
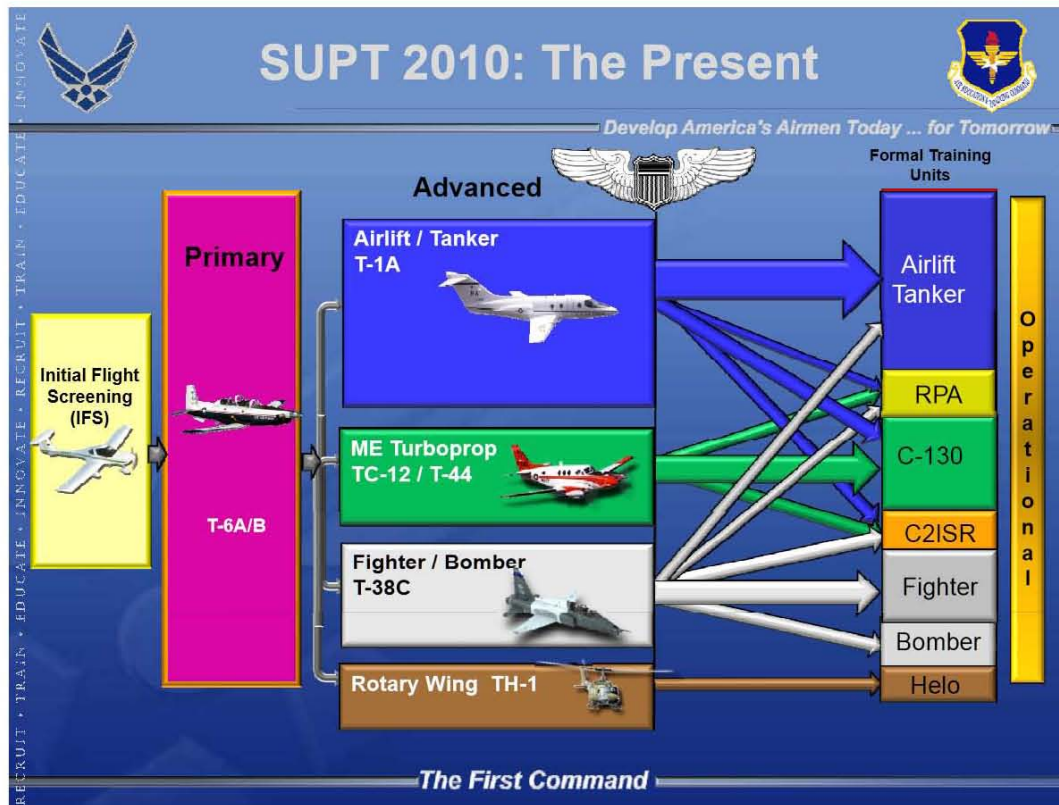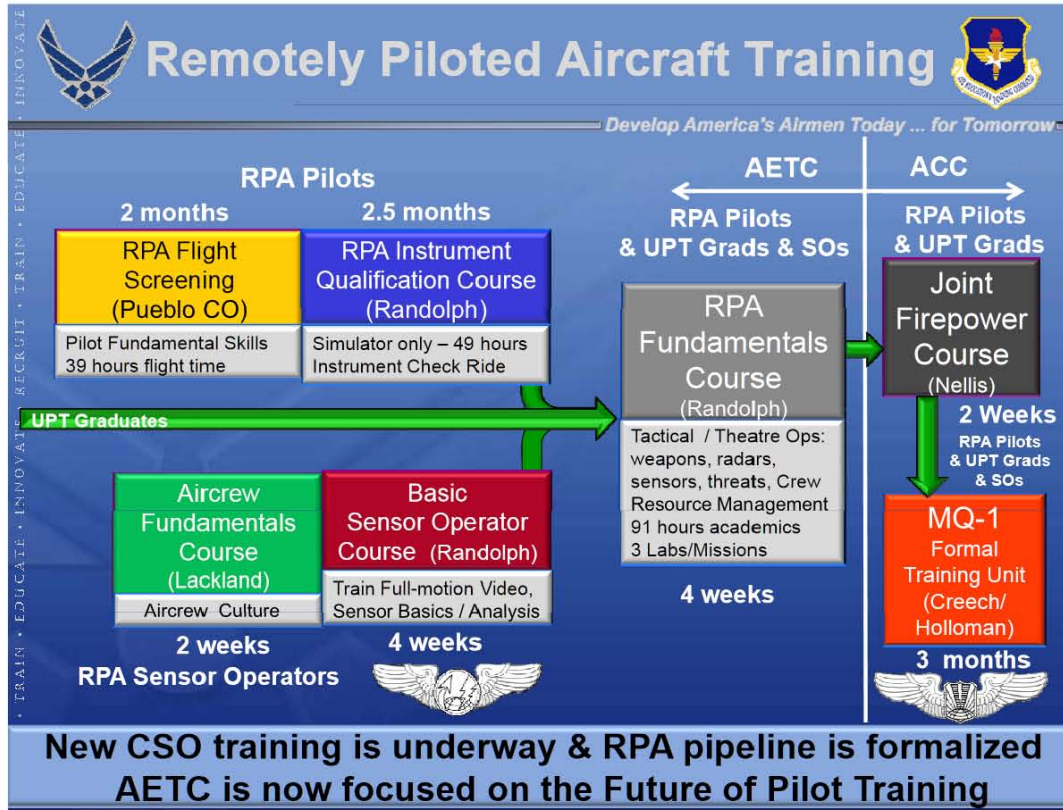
Conclusions

There is little doubt that large scale reform in the areas of health care, retirement planning, energy efficiency and system acquisition are needed to bridge the coming Air Force and overall DoD budget shortfalls. At the same time the Air Force should not neglect smaller scale reforms that meet mission requirements while reducing costs. Reforming the RPA pilot force to include a WO grade is one smaller scale reform that would result in a variety of efficiencies and solve some systemic problems with how the RPA career field is currently managed. Initial savings of roughly $13.4 million annually could be realized with a reduced grade structure during active duty service with additional savings during retirement. After successful implementation of a WO program additional savings could be realized by expanding the Air Force WO career field into additional career fields comparable to WO use in other service branches. Other potential benefits besides cost savings include enhanced morale for both RPA pilots and manned aircraft pilots achieved by providing clear career guidance at the beginning of service, instead of drastically changing expectations in the middle of their commitment period.

The only restrictions regarding the creation of a RPA pilot with a WO grade are self imposed policy restrictions by the Air Force. DoD regulatory guidance currently exists allowing for the use of WOs in all branches of service; the Air Force just has to enact policies to

reinstitute the grade. Utilizing existing overhead structure for officer training and RPA pilot management would minimize any added costs associated with the additional grade structure. The knowledge available from the Navy's recently established Active Duty Flying Warrant Officer Program and the mature Army Aviation Warrant Officer programs can be leveraged to introduce a pilot WO program. It is time for the Air Force to recognize the place for a technical specialist that is not focused on career broadening and future leadership inherent in the responsibilities of a commissioned officer. The WO grade is the correct place for that individual to reside and the RPA pilot force could use them today and in the future.

APPENDIX B

	Commissioned Officer[a]			Direct Select WO[a]			Early Select WO[b]		
Age	YoS/ Grade	Monthly Basic Pay[c]	Modified Annual Pay[d,e]	YoS/ Grade	Monthly Basic Pay[c]	Modified Annual Pay[d,e]	YoS/ Grade	Monthly Basic Pay[c]	Modified Annual Pay
18							1/E1,2	1,581	18,972
19							2/E3	1,757	21,405
20				1/WO1	2,765	33,174	3/E4	2,046	25,292
21				2/WO1	2,765	33,672	4/E4	2,157	27,053
22	1/O1	2,828	33,936	3/CW2	3,447	42,609	5/E5	2,488	31,642
23	2/O1	2,828	34,445	4/CW2	3,539	44,380	6/CW2	3,602	46,467
24	3/O2	3,711	45,868	5/CW2	3,602	45,819	7/CW2	3,806	49,788
25	4/O2	4,274	53,596	6/CW2	3,602	46,467	8/CW2	3,806	50,473
26	5/O3	5,031	63,994	7/CW2	3,806	49,788	9/CW2	4,124	55,424
27	6/O3	5,031	64,900	8/CW2	3,806	50,473	10/CW2	4,124	56,166
28	7/O3	5,272	68,958	9/CW3	4,383	58,903	11/CW2	4,281	59,078
29	8/O3	5,272	69,907	10/CW3	4,383	59,692	12/CW3	4,709	65,833
30	9/O3	5,536	74,404	11/CW3	4,709	64,986	13/CW3	4,863	68,856
31	10/O3	5,536	75,400	12/CW3	4,709	65,833	14/CW3	4,863	69,731
32	11/O4	6,417	88,555	13/CW3	4,863	68,856	15/CW3	5,041	73,190
33	12/O4	6,417	89,710	14/CW3	4,863	69,731	16/CW3	5,041	74,097
34	13/O4	6,738	95,410	15/CW4	5,618	81,575	17/CW3	5,224	77,736
35	14/O4	6,738	96,623	16/CW4	5,618	82,586	18/CW4	5,874	88,467
36	15/O4	6,960	101,059	17/CW4	5,874	87,410	19/CW4	6,084	92,720
37	16/O4	6,960	102,312	18/CW4	5,874	88,467	20/CW4	6,084	93,815
38	17/O5	7,761	115,484	19/CW4	6,084	92,720	21/CW4	6,229	97,166
39	18/O5	7,761	116,881	20/CW4	6,084	93,815	22/CW4	6,229	98,287
40	19/O5	7,982	121,646			45,834	23/CW4	6,589	105,164
41	20/O5	7,982	123,082			46,750	24/CW5	7,282	117,525
42			60,268			47,685	25/CW5	7,544	123,110
43			61,473			48,639			72,041
44			62,703			49,612			73,482
45			63,957			50,604			74,952
46			65,236			51,616			76,451
47			66,541			52,649			77,980
48			67,872			53,702			79,539
49			69,229			54,776			81,130
50			70,614			55,871			82,753
51			72,026			56,988			84,408
52			73,467			58,128			86,096
53			74,936			59,291			87,818
54			76,435			60,477			89,574
55			77,963			61,686			91,366

Age	Commissioned Officer[a]			Direct Select WO[a]			Early Select WO[b]		
	YoS/ Grade	Monthly Basic Pay[c]	Modified Annual Pay[d,e]	YoS/ Grade	Monthly Basic Pay[c]	Modified Annual Pay[d,e]	YoS/ Grade	Monthly Basic Pay[c]	Modified Annual Pay
56			79,523			62,920			93,193
57			81,113			64,178			95,057
58			82,735			65,462			96,958
59			84,390			66,771			98,897
60			86,078			68,107			100,875
61			87,799			69,469			102,893
62			89,555			70,858			104,951
63			91,346			72,275			107,050
64			93,173			73,721			109,191
65			95,037			75,195			111,374
66			96,938			76,699			113,602
67			98,876			78,233			115,874
68			100,854			79,798			118,192
69			102,871			81,394			120,555
70			104,928			83,021			122,966
71			107,027			84,682			125,426
72			109,167			86,376			127,934
73			111,351			88,103			130,493
74			113,578			89,865			133,103
75			115,849			91,662			135,765
76			118,166			93,496			138,480
77			120,530			95,366			141,250
78			122,940			97,273			144,075
79			125,399			99,218			146,956
80			127,907			101,203			149,895
81			130,465			103,227			152,893
82			133,074			105,291			155,951
83			135,736			107,397			159,070

	Commissioned Officer	Direct Select WO	Early Select WO
Active Duty Pay	1,636,169	1,260,955	1,563,093
Retirement Pay	3,909,125	3,185,566	4,510,512
Total Pay	5,545,294	4,446,522	6,073,604

Notes

   a. Based on 20 Years of Service (YoS) retirement

   b. Based on 25 YoS retirement to complete 20 years of RPA pilot service

   c. From DFAS 2012 Military Pay Table

   d. Incorporates estimated 1.5% annual ECI adjustment

      Modified Annual AD pay = Monthly Pay * 12 months + (.015 ECI * (YoS-1))

   e. Incorporates estimated 2.0% annual COLA adjustment after 1st year of retirement pay

      1st Year of Retirement Pay = Average of High-3 annual pay * (YoS*2.5)

      Subsequent years = 1.02 * previous year Retirement Pay

[1] Robert Burns, "Military chiefs warn against bigger DoD cuts," *ArmyTimes*, November 2, 2011, http://www.armytimes.com/news/2011/11/ap-military-chiefs-warn-against-bigger-dod-cuts-110211/ (accessed February 15, 2012).

[2] RPA are also known as Unmanned Aerial Vehicle (UAV), Unmanned Aerial Systems (UAS) and drones

[3] J.H. MacWilliam and Bruce D. Callander, "Air Force Magazine." *The Third Lieutenants*, March 1990, 102.

[4] Nathan Hodge and Julian E. Barnes, "Fight is Just beginning over cuts in Defense" Wall Street Journal, Nov 22, 2011

[5] Headquarters Air Force, *Air Force Priorities for a New Strategy with Constrained Budgets. (*Washington, DC: U.S. Air Force), February 2012, 5.

[6] Headquarters Air Force, *United States Air Force FY 2013 Budget Overview*, *(Washington, D.C.: SAF/FMB),* 7, http://www.saffm.hq.af.mil/shared/media/document/AFD-120210-112.pdf (accessed 4 April, 2012).

[7] HAF, *Air Force Priorities,* 3.

[8] HAF, *USAF FY 2013 Budget Overview,* 7.

[9] U.S. Department of Defense, *Defense Manpower Requirements Report, Fiscal Year 2011 (Washington, DC: Office of the Under Secretary of Defense for Personnel and Readiness, December 2010 (corrected February 2011)* , 27 & 51, (accessed Dec 24, 2011)

[10] Operations Statistics Division DCS/Comptroller, HQ USAF, *United States Statistical Digest, Fiscal Year 1953 (Washington, DC: Government Printing Office, 1953). 358, http://www.dtic.mil/dtic/index.html.*

[11] DoD, *Defense Manpower Requirements Report, Fiscal Year 2011,* 51.

[12] Headquarters Air Force, *United States Air Force FY 2012 Budget Overview*, *(Washington, D.C.: SAF/FMB),* 8, http://www.saffm.hq.af.mil/shared/media/document/AFD-110210-034.pdf (accessed 11 March, 2012).

[13] Congressional Budget Office, *The Warrant Officer Ranks: Adding Flexibility to Military Personnel Management (*Washington, DC: 2002), 49,
http://www.cbo.gov'ftpdocs/32xx/doc3287/WarrantOfficer.pdf (accessed 12 Dec, 2011).

[14] Senate Committee on Armed Services, Personnel Committee Subcommittee. *Evaluating Military Compensation: Statement before the Subcommittee on Personnel Committee on Armed Services,* 111th Cong., 2nd sess., April 28, 2010, 5.

[15] U.S. Department of Defense. *Fiscal Year 2012 Budget Request: Overview.* Office of the Under Secretary of Defense (Comptroller)/CFO, February, 2011, 4-4.

[16] Aaron Church, "RPA Ramp Up," *AIR FORCE Magazine,* June 2011, 58.

[17] Adam Entous, Julian E. Barnes and Siohan Gorman, "More Drones, Fewer Troops," *Wall Street Journal*, 26 January, 2012.

[18] Headquarters Air Force, *Air Force Unmanned Aerial System (UAS) Flight Plan: 2009-2047.* (Washington, DC: U.S. Air Force),
http://www.defense.gov/dodcmshare/briefingslide/339/090723-D-6570C-001.pdf (accessed January 6, 2012), 5.

[19] Senate Committee on Appropriations, Defense Subcommittee. *Air Force Fiscal Year 2011 Budget,* 111th Cong., 2nd sess., May 12, 2010, 15.

[20]Church, 58.

[21] Church, 58.

22 HAF, *Air Force Unmanned Aerial System (UAS) Flight Plan,* 35.

23 John A. Tirpak, "Putting the Pilot in the RPAs, *AIR FORCE Magazine,* July 2010, 63.

24 Church, 58.

25 Church, 58.

26 Michael Hoffman, "UAV pilot career field could save \$1.5B," *Air Force Times*, 1 March 2009, 1, http://www.airforcetimes.com/news/2009/03/airforce_uav_audit_030109 (accessed January 1, 2012).

27 Hoffman, 1.

28 Tirpak, 62.

29 DoD, *Defense Manpower Requirements Report, Fiscal Year 2011,* 5.

30 Harvey W. Lyter III, "The Warrant Officer Rank: Should the USAF Reinstate It?" (Master's Thesis, Air War College, 1989), 11.

31 Bruce D. Callander, "Air Force Magazine." *The In-Betweens*, November 1991, 71.

32 Callander, 72.

33 U.S. Department of the Air Force. *Officer Personnel: Air Force Warrant Officer Utilization Policy.* AFR 36-72. Washington, DC: Department of the Air Force, 2 June, 1953.

34 Callander, 72.

35 Lee Arbon, *They Also Flew: The Enlisted Pilot Legacy 1912-1942 (Washington, DC: Smithsonian Institution Press, 1992), 153*

36 DoD, *Defense Manpower Requirements Report, Fiscal Year 2011,* 18.

37 U.S. Army. *The Army Training and Leader Development Panel: ATLPD Phase III-Warrant Officer Study Final Report*. (Washington, DC: U.S. Army), WO-3.

38 Headquarters U.S. Army, *Commissioned Officer Professional Development and Career Management,* DA Pamphlet 600-3   (Washington, DC: Headquarters U.S. Army, 1 February, 2010), 3-9.

39 Headquarters U.S. Army, *Army Leadership*, FM 6-22 (Washington, DC: U.S. Army, October 2006), 3-12.

40 United States Army Combined Arms Center, *U.S. Army Warrant Officer Career College: WO Program,* http://usacac.army.mil/cac2/wocc/woprogram.asp#gradestructure.html.

41 Congressional Budget Office, *The Warrant Officer Ranks: Adding Flexibility to Military Personnel Management* (Washington, DC: Congressional Budget Office, 2002), 18.

42 CBO, *The Warrant Officer Ranks,* 29.

43 Robert Maul, "VP-16 qualified first CWO patrol plane commander," Jax Air News, 9 March, 2011, http://jaxairnews.jacksonville.com/military/jax-air-news/2011-03-09/story/vp-16-qualifies-first-cwo-patrol-plane-commander (accessed January 16, 2012).

44 Elizabeth Arieas, *National Vital Statistics Report: United States Life Tables, 2007.* Volume 59, No 9. September 28, 2011. 10, http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_09.pdf. (accessed 20 January, 2012).

45 CBO, *The Warrant Officer Ranks,* 2, 4.

46 CBO, *The Warrant Officer Ranks,* 2.

47 CBO, *The Warrant Officer Ranks,* 33.

48 Hoffman, 1.

49 Lyter III, 10-12.

50 Air Education and Training Command, *Moving Forward: The Next Generation of Combat Aviators.* http://www.dtic.mil/dtic/index.html

Bibliography

Arbon, Lee. *They Also Flew: The Enlisted Pilot Legacy 1912-1942.* Washington, DC: Smithsonian Institution Press, 1992.

Aries Elizabeth. *National Vital Statistics Report: United States Life Tables, 2007.* Volume 59, No 9. September 28, 2011. http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_09.pdf. (accessed 20 January, 2012).

Burns, Robert. "Military chiefs warn against bigger DoD cuts." *ArmyTimes*, November 2, 2011, http://www.armytimes.com/news/2011/11/ap-military-chiefs-warn-against-bigger-dod-cuts-110211/ (accessed February 15, 2012).

Callander, Bruce D. "The In-Betweens." *Air Force Magazine,* November, 1991.

Church, Aaron. "RPA Ramp Up." *Air Force Magazine,* June, 2011. http://www.airforce-magazine.com/MagazineArchive/Pages/2011/June%202011/0611RPA.aspx. (accessed 9 December, 2011).

Congressional Budget Office. *Long-Term Implications of the 2012 Future Years Defense Program.* CBO Report for Congress No. 4281. Washington, DC: Congressional Budget Office, June, 2011. https://www.cbo.gov/ftpdocs/122xx/doc12264/06-30-11_FYDP.pdf. (accessed 11 December, 2011)

Congressional Budget Office. *The Warrant Officer Ranks: Adding Flexibility to Military Personnel Management.* CBO Report for Congress. Washington, DC: Congressional Budget Office, February, 2002. http://www.cbo.gov'ftpdocs/32xx/doc3287/ WarrantOfficer.pdf (accessed 12 Dec, 2011).

Entous, Adam and Julian E. Barnes, Siohan Gorman, "More Drones, Fewer Troops," *Wall Street Journal*, 26 January, 2012.

Headquarters U.S. Air Force. *Air Force Unmanned Aerial System (UAS) Flight Plan: 2009-2047.* Washington, DC: U.S. Air Force. http://www.defense.gov/dodcmshare/ briefingsllide/339/090723-D-6570C-001.pdf (accessed January 6, 2012).

Headquarters U.S. Air Force. *United States Air Force FY 2012 Budget Overview.* Washington, D.C.: SAF/FMB. http://www.saffm.hq.af.mil/shared/media/document/AFD-110210-034.pdf (accessed March 11, 2012)

Headquarters U.S. Air Force. *United States Air Force FY 2013 Budget Overview.* Washington, D.C.: SAF/FMB. http://www.saffm.hq.af.mil/shared/media/document/AFD-120210-112.pdf (accessed April 4, 2012)

Headquarters U.S. Army. *Army Leadership.* FM 6-22. Washington, DC: Headquarters U.S. Army, October, 2006.

Headquarters U.S. Army. *Commissioned Officer Professional Development and Career Management.* DA Pamphlet 600-3. Washington, DC: Headquarters U.S. Army, 1 February, 2010.

Hodge, Nathan and Julian E. Barnes. "Fight is just beginning over cuts in Defense." *Wall Street Journal,* November 22, 2011. http://214.14.134.30/ebird2/ebfiles/e20111122855351.html (accessed December 12, 2011)

Hoffman, Michael. "UAV pilot career field could save \$1.5B." *Air Force Times,* March, 2009. http://www.airforcetimes.com/news/2009/03/airforce_uav_audit_030109 (accessed January 1, 2012).

Lyter, Harvey W. "The Warrant Officer Rank: Should the USAF Reinstate It?" Master's Thesis, Air War College, 1989.

MacWilliam, J.H. and Bruce D. Callander. "The Third Lieutenants." *Air Force Magazine,* March 1990.

Maul, Robert. "VP-16 qualified first CWO patrol plane commander." *Jax Air News,* 9 March, 2011. http://jaxairnews.jacksonville.com/military/jax-air-news/2011-03-09/story/vp-16-qualifies-first-cwo-patrol-plane-commander (accessed January 16, 2012).

Operations Statistics Division DCS/Comptroller, HQ USAF. *United States Statistical Digest, Fiscal Year 1953.* Washington, DC: Government Printing Office, 1953. http://www.dtic.mil/dtic/index.html.

Tirpak, John A. "Putting the Pilot in the RPAs." *Air Force Magazine,* July, 2010. http://www.airforce-magazine.com/MagazineArchive/Pages/2010/July%202010/0710drones.aspx. (accessed 15 December, 2011)

U.S Air Force, Air Education and Training Command. *Moving Forward: The Next Generation of Combat Aviators.* http://www.dtic.mil/dtic/index.html.

U.S. Army Combined Arms Center. *The Army Training and Leader Development Panel: ATLDP Phase III – Warrant Officer Study Final Report.* 18 July, 2001. http://www.au.af.mil/au/awc/awcgate/army/atld-panel/wo_report.pdf. (accessed 12 January, 2012)

U.S. Army Combined Arms Center. *U.S. Army Warrant Officer Career College: WO Program.* http://usacac.army.mil/cac2/wocc/woprogram.asp#gradestructure.html. (accessed 10 January, 2012).

U.S. Congress, Senate. Committee on Appropriations, Defense Subcommittee. *Air Force Fiscal Year 2011 Budget.* 111th Cong., 2nd sess., May 12, 2010.

U.S. Congress, Senate. Committee on Armed Services, Personnel Committee Subcommittee. *Evaluating Military Compensation: Statement before the Subcommittee on Personnel Committee on Armed Services.* 111th Cong., 2nd sess., April 28, 2010.

U.S Department of the Air Force. *Air Force Priorities for a New Strategy with Constrained Budgets.* Washington, DC: U.S. Air Force, February 2012.

U.S. Department of the Air Force. *Officer Personnel: Air Force Warrant Officer Utilization Policy.* AFR 36-72. Washington, DC: Department of the Air Force, 2 June, 1953.

U.S. Department of Defense. *Defense Manpower Requirements Report, Fiscal Year* 2011. Washington, DC: Department of Defense, December 2010 (corrected February 2011).

U.S. Department of Defense. *Fiscal Year 2012 Budget Request: Overview.* Washington, DC: Department of Defense. February, 2011.