

## The Drone Elogy

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## The Drone Elegy

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### Abstract

Service culture shaped by air minded dogma of the last century obstructed Air Force senior leadership views of an emerging paradigm shift that if accepted in absolute, would exponentially increase airpower's advantage. The Air Force has struggled with fielding Remotely Piloted Aircraft (RPA), producing and retaining pilots, and satisfying the Joint Warfighter's insatiable demand. Regardless of the debate surrounding an enlisted RPA program and a Congressional mandate that intends to fix the problem, the Air Force will continue to face sluggish programmatic evolution and political scrutiny unless the RPA program is given due regard as an equal among traditional weapons systems and their communities. This paper contends that Air Force culture, group think, and biases for manned flight stifles new ways of thinking about employing airpower at its fullest potential when confronted with prospective capabilities that break outside of preferred paradigms.

## **The Drone Elegy**

Unmanned Aerial Systems (UAS) have risen to prominence as essential platforms used by Combatant Commanders (CCDR) for enhanced battlespace awareness and precise aerial delivered fires yielding high reward with seemingly low risk. UASs, called Remotely Piloted Aircraft (RPA) by the United States Air Force, are its “most in demand” capability having flown millions of hours in support of contingencies around the world since the mid-1990s.<sup>1</sup> Consequently, the Air Force has struggled with fielding the fleet, producing and retaining pilots, and satisfying the Joint Warfighter’s insatiable demand. This paper contends that Air Force culture, group think, and biases for manned flight stifles new ways of thinking about employing airpower at its fullest potential when it breaks outside of preferred paradigms.

The RPA enterprise is one example of a stunted Air Force program that garnered harsh political and Defense Department scrutiny, questioning its institutional credibility so much that Congress took measures in their own hands to fix a problem without truly understanding the effects of its action. The Congressional mandate to integrate enlisted pilots into the entire enterprise is arguably a shortsighted solution to a problem that manifested from much larger issues. The Air Force is now on a path that fixes nothing while also creating unnecessary cultural tumult for an enterprise that is still trying to establish its identity. If, however, the Air Force must implement enlisted pilots there are options this paper will identify that are preferable to the current trajectory.

Congressional memories of multiple Air Force missteps throughout the 2000’s, such as the controversies surrounding the KC-46 tanker and other contracts, fifth generation fighter acquisitions programs, nuclear weapons mishandling, perceived dawdling in fielding RPAs, and most recently the A-10 divestment imbroglio have

unfortunately invited Congressional scrutiny and skepticism of the Air Force's credibility.<sup>2</sup> What is more, the sister services are outpacing the Air Force with respect to future RPA technologies and employment concepts for nearly the same reasons that it was outpaced in Intercontinental Ballistic Missiles (ICBM) programs by both the services and the Russians in the 1950s.<sup>3</sup> Under this shadow it is apparent that Congress, in frustration with the Air Force, took action of its own in an attempt to solve the chronic Air Force RPA pilot shortages. The 2017 National Defense Authorization Act (NDAA) mandates that the Secretary of the Air Force "transition the Air Force to an organizational model for all Air Force remotely piloted aircraft that uses a significant number of enlisted personnel as operators of such aircraft rather than officers only."<sup>4</sup>

This paper examines how culture shaped by air minded dogma of the last century obstructed Air Force senior leadership views of an emerging paradigm shift that, if accepted in absolute, would exponentially increase airpower's potential. Regardless of the debate surrounding an enlisted RPA program and a Congressional mandate that intends to fix the problem in lieu of perceived inaction, the Air Force will continue to face sluggish programmatic evolution and political scrutiny unless the RPA program is given due regard as an equal among traditional aircraft and weapons systems.<sup>5</sup>

### Culture, Biases, and Challenges

Except for periods during the early days of aviation and World War II (WWII), the Air Force has a long history of relying primarily on officers to fly aircraft. This practice is based upon the well-established doctrinal tenet of decentralized execution by which the duties performed by pilots, regardless of aircraft flown, shall be executed by aeronautically rated officers.<sup>6</sup>

The Air Force traces its officer pilot lineage to the Air Corps Act of 1926 of which today's Air Force Instructions (AFI) bear resemblance to its historical precepts.<sup>7</sup> The act was aimed at ensuring the Air Corps did not fall under the complete dominion of ground minded officers who would likely have misguided the development of airpower while viewing its potential from a land power only paradigm. The Air Corps Act laid the foundation for an independent air service that could concentrate on the development and employment of airpower under distinct air minded values and culture. It unified airmen around the idea that the nation possess an Air Force unstifled by other services, that complements combined arms warfighting, and can strike at the strategic heart of the enemy anywhere, anytime, and any place on earth...*no matter the ways and means.*<sup>8</sup>

Where the ends should always be to win our nations wars, the ways and means by which airpower is applied should be agnostic and indivisible. Yet history has demonstrated that Air Force biases favored manned platforms as the only means of providing airpower to our nation.<sup>9</sup> Carl Builder in his 1994 book *The Icarus Syndrome* commented, "when other means such as unmanned aircraft, guided missiles, and spacecraft became available, it was the aviators who revealed, by deeds more than words, that their real affection was for their airplanes and not the concept of airpower."<sup>10</sup>

After WWII the Army and Navy, aided by captured German scientists, investigated the military potential of ballistic missiles such as the V-1 and V-2 systems.<sup>11</sup> The Air Force, dominated by WWII bomber pilots, saw this as a threat to its future in jet aircraft delivering atomic bombs and did not pursue ballistic missiles with any fervor.<sup>12</sup> The Air Force treated its space and ballistic missile enthusiasts as "harmless fringe

elements” and knew nothing of the Soviet Union’s 1953 decision to base its entire nuclear strategy on ICBMs in place of long-range bombers.<sup>13</sup> “The United States was indeed caught in a missile race, a strategic competition of profound importance of which it was quite unaware, and in which it was behind.”<sup>14</sup> The spark igniting a change in the level of importance the Air Force placed on its missile programs was the 1957 launch of the Soviet’s first earth orbiting satellite, Sputnik.<sup>15</sup>

The Air Force went into high speed, scrambling to gain control of ICBMs for fear that, “Unless the Air Force dominated missiles and space, the role of airplanes in the Air Force of the future could be threatened.”<sup>16</sup> Soviet rocket developments, Army and Navy competition with the Air Force in the Jupiter, Thor, and Polaris missile programs, and the Air Force Atlas ICBM program energized a revolution in guided missile and satellite development in just a decade.<sup>17</sup> This was the catalyst for the inclusion of space and missile operations, though without complete acceptance. Builder stated, “The aviators dominated the institution; and while they tolerated others . . . the exhibited discrimination was not in favor of an altruistic mission-striking quickly at the heart of an enemy-but in favor of an elite class: the pilots.”<sup>18</sup>

By the mid-1990s the Army and Navy, with assistance from the CIA, again surpassed the Air Force with the inception of a new capability. This time it was in the revolutionary field of RPAs and once again few in the Air Force were willing to embrace something other than traditional manned platforms.<sup>19</sup> The first Predator “combat deployment” was flown in 1995 primarily by the Army – from the same Albanian airfield that the CIA had used in 1994 to fly Predator’s predecessor, the Gnat 750.<sup>20</sup> Even

though the Army, Navy, and Marines all sent pilots to fly the Predator, tellingly not one Air Force pilot was present.<sup>21</sup>

Air Force Chief of Staff General Ronald Fogleman, himself a fighter pilot, took notice, “the U.S. Air Force on my watch is going to aggressively embrace the UAV (Unmanned Aerial Vehicle) concept.”<sup>22</sup> In early 1996 the Air Force was designated the “service lead” for Predator flight operations while the Navy kept control of development and procurement.<sup>23</sup> That same year the Navy program manager along with Army representatives briefed the Commander of Air Combat Command (COMACC) General Richard Hawley. Hawley was straightforward with his disdain for the Predator and made it clear that he “was the new owner of the Predator . . . because the Air Force Chief of Staff wanted it that way.”<sup>24</sup> During the briefing Hawley’s staff consisting of fighter, bomber, and U-2 pilots, were openly contemptuous with “scoffing laughs . . . wisecracks and snorts . . . audible,” as the Predator’s picture, speed, range, and capabilities were presented.<sup>25</sup> It was in this caustic environment that on October 1, 1997 the Air Force gained control of the entire Predator program.<sup>26</sup>

It took another forward thinking four-star general and former Vietnam-era fighter pilot, General John Jumper as COMACC, to ensure the Predator took the next step in its evolution as an unmanned killer scout.<sup>27</sup> By May 2000 Air Combat Command (ACC) significantly changed the paradigm and announced it was considering a weaponized version of the Predator.<sup>28</sup> Deploying on September 12, 2001 the Predator was the first U.S. aircraft over Afghanistan – the first Predator Hellfire combat strike followed on October 7, 2001 and it has been there ever since; the demand seemingly never ending.<sup>29</sup>

The demand for RPAs quickly outstripped the supply of airframes, pilots, sensor operators, and associated aircraft generation equipment required to conduct combat lines (CL). Between 2007 and 2015 CLs grew by an incredible 800% placing tremendous pressure on the Air Force.<sup>30</sup> In the face of high demand and increasing scrutiny the Air Force took several measures, some controversial, to address pilot shortages to include extending non-volunteers, mobilization, and closing Undergraduate RPA Training (URT) for a short period.<sup>31</sup> A 2014 General Accounting Office (GAO) report stated Headquarters Air Force (HAF) officials, due to concerns over low crew ratios, had on several occasion denied coverage requests by CCDRs only to be overridden by the Joint Staff.<sup>32</sup> This resulted in the continued overworking of the crews, further plummeting morale to a new low.

The character of warfare at the dawn of this century introduced a host of war fighter demands of which the Air Force found itself unprepared. For over a decade institutional impediments intensified the Air Force's struggle to resource a fully developed RPA fleet in both machine and human capital to adequately source CCDRs. Former Secretary of Defense Robert Gates believed "the Air Force has enduring institutional preferences for human-inhabited air vehicles and an unwritten hierarchy among its core competencies."<sup>33</sup> He further stated that, "ISR (Intelligence, Surveillance, and Reconnaissance) demand continues to grow unchecked, and yet the Air Force's top acquisition priorities ... (are) intended to recapitalize well-understood missions around which the service has organized itself."<sup>34</sup> Unless the Air Force learns to adapt, its credibility among DoD senior leaders and civilian policy makers will be questioned.

## Institutional Challenges

The root causes lending themselves to Air Force institutional lag in fielding adequately organized, trained, and equipped RPA units are many. Because pilot shortages were a major contributing factor the Air Force, by 2016, increased the total force pilot inventory to approximately 1,650, a more than 300% increase from 2008 levels.<sup>35</sup> However, by Fiscal Year 2017 (FY17) it estimated an active duty RPA pilot end-strength of 1,350 pilots would fall short of the 1,650 pilots necessary to execute 60 CLs, a requirement not expected to change through 2023.<sup>36</sup> The Air Force also projects its active duty RPA pilot requirements will level off at 1,736 by 2018, enabling it to staff headquarters positions that would otherwise go unfilled as its projected pilot inventory increases to 2,219 by 2023.<sup>37</sup> These projections are based on an Undergraduate RPA Training (URT) throughput of approximately 300 per year and follow on total force Flight Training Unit (FTU) throughput of approximately 400 per year.<sup>38</sup> However, URT is currently operating at its maximum capacity and any associated increase in training capacity requires drawing from the existing pool of experienced pilots already committed to operational CLs.

Undergraduate Pilot Training (UPT) faces a similar situation where it operates at maximum capacity. Congress assumed that by incorporating enlisted pilot candidates into URT, the Air Force could redirect RPA officer student pilot candidates to UPT and alleviate both manned and RPA pilot shortfalls. However, other than a small monetary savings, the incorporation of enlisted personnel into URT, as the RPA enterprise and pilot training capacities exist today, does nothing to achieve what Congress is attempting to fix.<sup>39</sup>

A 10:1 crew staffing ratio, or 10 pilots for every one CL, in both MQ-1 and MQ-9

Mission Design Series (MDS) has been the historical norm.<sup>40</sup> This ratio, although universally thought to be too low, was based upon a 2008 Air Force Manpower Agency study for MQ-1 squadrons. However, the Air Force did not account for all flying and administrative tasks that are required at the squadron level.<sup>41</sup> Crew ratios fluctuated between 6:1 and 8.5:1 making the 10:1 ratio largely unachievable.<sup>42</sup> By March 2017 the Air Force published a new Manpower Standards Memorandum increasing the crew ratio for one CL to 18:1 taking into account workload and the manpower overhead to support flying operations (that ratio lowers with each successive CL due to assumed efficiencies).<sup>43</sup> Beyond this memorandum, the task of recruiting, training, and retaining adequate force strength remained elusive as the balance of accessions and attrition tipped in the direction of the latter, further straining pilot training and combat operations.

Low staffing and high demand in the RPA force has created an enduring cycle of longer hours and higher workloads resulting in burnout and low morale in many corners of the community. A 2015 *Air and Space Power Journal* article, "Dark Horizon", by Captain Michael Byrnes stated that this was only part of the issue related to the historical pilot exodus and morale problems experienced in the community.<sup>44</sup> Byrnes suggested that "cultural resistance" and a "perceived powerlessness to take charge and improve their circumstances" also added significantly to their desire to leave.<sup>45</sup> Personnel still feel as if the institution treats them as second-class citizens by the nature of its fighter-centric service culture.

Further adding to the disenchantment was the below average promotion rates for RPA pilots compared to all line-of-the Air Force officers on 20 of 24 boards from 2006 to 2013.<sup>46</sup> In fact RPA pilots were promoted at the lowest rate compared to line-of-the Air

Force population on 9 of the 24 boards while on 21 of 24 boards they were promoted below the average rate of manned aircraft pilots.<sup>47</sup> These lower promotion rates can likely be tied to high operations tempo and professional encumbrances related to niche communities in addition to sub-cultural biases at installations where the leadership might favor other communities.<sup>48</sup>

RPA basing is a major factor driving additional grievances related to low quality of life and low morale. Rather than dedicated basing, the Air Force activated RPA units in isolation, as tenants (except Creech Air Force Base, Nevada (AFB)), or on air bases “dominated by other aircraft.”<sup>49</sup> In 2008 the Air Force organized RPA units under wings of traditional Air Force mainstays: Holloman AFB, New Mexico (at the time F-22); Cannon AFB, New Mexico (special operations wing); Ellsworth AFB, South Dakota (B-1B); and Whiteman AFB, Missouri (B-2A). With the exception of squadrons at Ellsworth and Whiteman, the preponderance of personnel are assigned to isolated desert bases where they will spend most of their operational Air Force careers. Creech, Cannon, and Holloman AFBs are derisively referred to as the “Triangle of Doom” by RPA personnel and their families; and it goes without saying, morale is very low at these installations.<sup>50</sup>

In 2015 ACC conducted a Culture and Process Improvement Program (CPIP) to investigate challenges and stressors that were negatively affecting RPA mission effectiveness and morale.<sup>51</sup> It found that the “overall perception from the field” was a “theme” of a “lack of professional respect.”<sup>52</sup> The sense that the institution viewed the MQ-1/9 as “inferior to manned platforms,” especially at bases with other MDSs, and that the Air Force does not place a “commensurate level of importance on RPAs as it does other airframes” amplified their sentiment.<sup>53</sup>

## Air Force Progress

The Air Force has taken a number of positive steps to address some of the challenges faced in its RPA enterprise. As recently as 2014-2015 the Air Force failed to meet its RPA pilot recruiting goals because it lacked recruiters with RPA experience and found that officer candidates had a limited understanding of the field.<sup>54</sup> As a result, the Air Force increased emphasis on educating officer candidates about the RPA mission during training at their commissioning sources.<sup>55</sup> The Air Force placed experienced personnel at the Academy, removed age restrictions, and began relaxing certain medical requirements.<sup>56</sup> These initiatives appear to be working because (according to HAF) today, available RPA candidates have surpassed training vacancies, a trend that suggests an RPA pilot surplus by FY 2019.<sup>57</sup>

The fact that pilots were involuntarily redirected from their manned aircraft contributed greatly to retention challenges.<sup>58</sup> This trend did not slow until the Air Force created the 18X RPA pilot career field in 2010, separating the specialty from the traditional UPT product. It is too early to determine if this trend will continue because the majority of 18X pilots are still in their initial six-year contract period and it remains to be seen if 18X pilots can be retained beyond their initial service commitment. By fiscal year 2022 the Air Force projects 90 percent of the RPA pilot workforce will be coded 18X pilots.<sup>59</sup> The Air Force has also increased their Aviation Incentive Pay to \$1,500 per month as a “bridge” toward “long-term” compensation plans and has increased the annual retention bonus from \$25,000 per year to \$35,000 per year starting in FY16.<sup>60</sup>

In 2015 the Air Force succeeded in convincing the DoD to temporarily reduce the CL requirement from 65 to 60.<sup>61</sup> The 60 CLs, 31 ACC, 14 ANG, 10 Air Force Special Operations Command (AFSOC), and 5 Air Force Reserve Command (AFRC) was

accomplished mainly through the allocation of 10 contractor, ISR-only CLs – but not without a price.<sup>62</sup>

These temporary Government Owned Contractor Operated (GOCO) ISR-only CLs were contracted for Fiscal Years 2017-2019 to reduce the strain on Air Force CLs.<sup>63</sup> This approach enabled the Air Force to take experienced instructor pilots from Air Force CLs and more fully staff FTUs for the MQ-1 and MQ-9 at Holloman AFB. Though well intended, there is near universal agreement among commanders that this initiative has exacerbated an already severe pilot staffing shortage.<sup>64</sup> Because GOCO's primary source of pilots comes from the military, the initiative perversely incentivized an exodus of experienced Air Force pilots seeking contractor positions offering higher rates of pay and improved quality of life.<sup>65</sup>

Of note, the Air Force has made great progress in normalizing promotion rates for RPA pilots to “commensurate” levels of rated and line-of-the Air Force officers, writ large.<sup>66</sup> From 2008-2011 promotion rates to major were 11 percentage points in favor of manned platform communities and dropped to four percent by 2012-2015.<sup>67</sup> It remains to be seen if this near parity will effectively recruit and retain personnel.

In December 2015 COMACC directed the CPIP working group to:

(1) double the number of RPA flying squadrons, (2) create a new wing to normalize organizational command and control structures, (3) standardize the squadron, group, and wing structures, (4) assign RPA units in new locations, (5) increase RPA manning and resources by 2,500 to 3,500 airmen, (6) study the promotion and professional military education selection rates for RPA officers, (7) study the feasibility of a single specialty code for RPA maintenance personnel, and (8) streamline processes to better enable reserve component forces to support RPA operations.<sup>68</sup>

A team of 50 MQ-1/9 operators and support personnel made 166 recommendations to improve conditions for the Air Force RPA enterprise.

While many of these initiatives may be underway, they are not well publicized. The CPIP Facebook site, announced with great fanfare, has little information in reference to new initiatives being announced or progress being made.<sup>69</sup>

Culture, titles, and nomenclature mean things in the military which is a primary reason the Air Force opted for Remotely *Piloted* Aircraft, replacing the outmoded designation UAV, or the public idiom, “drone.” It also chose to use the term *pilot* for the MQ-1/9, RQ-4, and RQ-170 RPAs versus *operator* to denote the fact that they are piloted. This was to highlight not only the Air Force doctrinal application of airpower, but also to accentuate the requirement for rated pilots to fly this platform with all its complexity and levels of execution. While this was a gesture of inclusion for RPA professionals, it was also based upon findings from a 1998 Air Force Research Laboratory study that identified “UAVs” should be flown by rated officers preferably with previous flying experience.<sup>70</sup>

The Air Force also labels RPA squadron, groups, or wings with the “attack” designation; one that is zealously protected by the community though the predominance of the missions performed consist of ISR. This is revealing of the Air Force’s and the enterprise’s insecurities and apparent identity crisis – caused by a number of slights and institutional missteps over the years – that need to be reconciled. As it stands, the Air Force institution and the RPA enterprise struggle with how best to meld traditional archetypes and contemporary models.

#### Enter Congress

Over several years Congress observed the practices of other services using enlisted personnel to fly UASs/RPAs and employ weapons, albeit under the authority of an officer; no matter the differences, Air Force reasoning for using rated officers still

rang hollow. A 2014 GAO report recommended the Air Force investigate “alternative personnel populations such as enlisted” and cited a House Permanent Select Committee on Intelligence report that “urged the Air Force to study the other military services’ experiences with using enlisted personnel as RPA operators and evaluate whether this approach would degrade mission performance.”<sup>71</sup> The Air Force resisted due to a belief that “such populations would negatively affect the ability of the Air Force to carry out its missions” while Congress and the Office of the Secretary of Defense (OSD) became increasingly dissatisfied.<sup>72</sup>

Frustrated with continued Air Force resistance to enlisted pilots and its RPA program writ large, the 114<sup>th</sup> Congress inserted its own downward directed fix into the 2017 NDAA giving the Air Force until 2020, and the Air Reserve Component (ARC) until 2023, to implement an enlisted RPA pilot program per the law.<sup>73</sup> This statute was a Congressional fix to both alleviate RPA pilot shortages through a larger accessions demographic and improve the manned pilot shortage by redirecting 18X officer candidates to UPT.<sup>74</sup>

When drafting the law, a frustrated Senate Subcommittee stated:

...the committee believes the Air Force’s rationale for rejecting enlisted RPA operators does not *comport* with the organizational construct used by the Army in their unmanned aircraft systems operations, where enlisted personnel operate RPAs during both ISR and live-fire strike missions under the supervision of warrant officers and commissioned officers.<sup>75</sup>

It is clear that the Air Force’s defense of its construct did not pass Congressional muster.

Predictably there was near universal concern, resistance, and condemnation of this law among commanders and those in the Air Force RPA enterprise. The Air Force

interpreted the Congressional language to mean that one organizational model, implemented in the RQ-4 Global Hawk enterprise, will suffice for now through 2020.

In December 2015 the Secretary of the Air Force directed the integration of enlisted pilots to the RQ-4 enterprise. With 200 officer pilots currently assigned to the RQ-4, the Air Force projects to produce 100 enlisted pilots by 2020.<sup>76</sup> The apparent goals of this initiative intend to both source additional personnel to fly ISR platforms and increase “agility in addressing the ISR needs of the warfighter.”<sup>77</sup> Since the Global Hawk enterprise is currently overstaffed with officer pilots it is neither evident what problem the Air Force is addressing, nor suggestive of the complexities revolving around the RPA issue in its entirety.<sup>78</sup> Nonetheless, Air Force leadership desires to learn from the implementation of the RQ-4 model through 2020, before further implementing a model across the entire RPA enterprise.<sup>79</sup>

#### Compare and Contrasting Service Approaches to RPAs

The services employ enlisted personnel in varying degrees as sensor operators, pilots, or both. For instance, the Army uses non-commissioned officers and warrant officers to fly RPAs. The Navy on the other hand, having a long history of diverse unmanned aviation development, uses a mix of enlisted and officer personnel to man its RPAs depending on the category of RPA. The Marine Corps uses RPAs similar to the Army’s concept because of its tactical level focus but uses a mix of officer and enlisted.<sup>80</sup>

Commanders in the Army use RPA platforms as organic fires and maneuver assets, meaning that they are tied to specific units and take direction from individual unit commanders. This method of centralized control, decentralized execution ensures commander’s intent while still permitting the operator “ability to dynamically re-task” as

situations warrant.<sup>81</sup> Additionally, the Army flies its RPAs tactically, typically via line-of-sight (LOS) with point-and-click software, usually outside of controlled airspace.

Marine Corps RPA operators remain integrated with the Marine Air Ground Task Force (MAGTF) and are controlled via LOS at present but with expectations of beyond line-of-site (BLOS) capability in the future.<sup>82</sup> Though Marine RPAs were initially employed primarily by enlisted personnel and supervised by Marine aviators, more officers have been employed in the leadership structure as requirements increased. Marine officers are all initially qualified in the RPA as an aircraft commander and later upgraded to mission commander (MCC) as their responsibilities increase. This position allows the officer both the capability and authority to command multiple, simultaneous RPA missions of which the aircraft are piloted by enlisted Marines.<sup>83</sup> “In cases where the risk may prove too high (complex weapons employment in an urban scenario) the Marine officer is qualified and capable of operating the aircraft himself/herself.”<sup>84</sup>

With regard to operations, the Air Force maintains its missions are more complex, global, theater wide, beyond line-of-site, and focused on “command and execution.”<sup>85</sup> Air Force RPAs fly longer durations, many times at higher altitudes, in controlled airspaces, and can be called upon to perform multiple and different profiles on any one mission. Therefore it is argued the cognition, authority, responsibility, and accountability required for flying RPAs is compatible only with the training, education, and leadership commensurate to years of officer development.

Consensus exists among the services with respect to precision guided munitions (PGM) and release authority requiring the “leadership and authority our nation entrusts with military officers.”<sup>86</sup> Because the Army views its RPAs as an integrated part of the

maneuver force, PGM release authority is routed through the ground force commander or from the “warrant officers within the larger RPA program.”<sup>87</sup> The Marines have addressed PGM release authorities through their RPA officer corps operating as MCC in charge of several RPAs at once.<sup>88</sup> The Air Force, which operates the majority of PGM capable RPAs, maintains “release authority might not always come from the ground commander.”<sup>89</sup>

Senior leaders within the Air Force RPA enterprise argue that for cases in which the pilot is responsible for interpreting the commander’s intent, it is necessary to balance the tactical objectives against strategic implications rather than simply follow orders to employ. “The Air Force contends for its assigned missions that this decision increases the level of responsibility commensurate with that of an officer.”<sup>90</sup> An even more compelling argument is the Air Force delegates the assumption of risk more frequently than the other services in regards to RPA mission execution and weapons release authority, notwithstanding the “frequency of need” demanded by CCDRs.<sup>91</sup>

### Congressional Mandate Implementation

Assuming the Air Force will need to train enlisted personnel as pilots in all airframes, a starting point might be to determine the differences between what an officer and enlisted Airman’s roles and responsibilities would be. With rank comes authority, accountability, and the requisite education that underpins the trust and confidence in granting commissioned responsibilities to those who will operate by the tenets of decentralized execution and mission command. It is arguable that the same special trust and confidence placed on officers can be applied to a vetted number of enlisted personnel.

Since the creation of the all-volunteer military in 1974, the qualifications of U.S. military personnel continue to improve. The current force is “the most qualified in U.S. military history” characterized by “high aptitude, well educated, more experienced, well compensated, and very motivated” personnel.<sup>92</sup> Today, more than half of the highest enlisted ranks possess an associate’s degree compared to one in four 20 years ago.<sup>93</sup>

A 2010 RAND report that studied options for filling officer positions with enlisted personnel stated that “requiring an officer with a bachelor’s degree to fulfill certain positions may be an outdated practice that fails to recognize both the experience and capabilities of the enlisted force and the value of having that force undertake new and evolving positions”...going on to recommend that enlisted and non-rated officers could possibly pilot an RPA while using rated officers in the role of MCCs in remote split operations.<sup>94</sup>

Today the RPA pilot flies a single aircraft and exercises full authority as the “Pilot in Command” of the aircraft and all aspects of the flying portion of the RPA mission.<sup>95</sup> Thus, there are two distinguishable aspects to the RPA mission, “skill task execution” and “authority/accountability.”<sup>96</sup> So long as command authorities, doctrine, policies, and procedures for operations are codified in detail, today’s operating model could be supported by a cadre of enlisted pilots regardless of how distasteful, simplistic, and imperfect the approach may appear to those pessimistic of the idea. Another model which may be considered is one similar to the Marine Corps construct which allows the officer both the capability and authority to command multiple, simultaneous RPA missions of which the aircraft are piloted by enlisted personnel. Since the majority of RPA missions consist of ISR with small percentages of strike, the Air Force could

consider protocols that differentiate who pilots the aircraft during specific phases of flight and categorizes officer and enlisted duties for mission command, launch, transit, recovery, weapons release authority, and terminal guidance of weapons.

### The Near Future

In view of rapid technological advancements, the Air Force must shed its existing paradigms and aggressively develop new ways and means enabled by the potential of emerging technologies. Paul Scharre, Director of the 20YY Warfare Initiative at the Center for a New American Security (CNAS) believes the U.S. is very close to a revolution in artificial intelligence that will lead to semi-autonomous technologies using sophisticated, human-like logic. With this technology, Scharre envisions an ability to employ “swarms” of low cost small RPAs performing in tandem and in absence of human physical control. These swarms of Small Unmanned Aerial Systems (SUAS) could penetrate highly contested spaces, saturate enemy radars, present targeting problems to air defenses (tenet of mass), and employ countless numbers of precision weapons. Human-machine collaboration would involve directing flight routes, monitoring performance, and programming logic – less physically flying the aircraft.

Artificial intelligence, robotics, and autonomous systems technologies widen the aperture in ways yet to be realized and the implications of this shifting paradigm are many. One of which involves deeper discussions on the pilot and operator demographic in which an enlisted pilot majority could become the new norm.

Scharre states “cultural resistance to multi-aircraft control in the Air Force has hindered progress” alleging that both the Army and Navy are well ahead of the Air Force in this area.<sup>97</sup> In 2010 the Air Force received \$50 million to further develop multi-vehicle control and “never developed the technology” stating it is a “decade after next”

technology, even though it exists today and has been “demonstrated” by a number of private businesses.<sup>98</sup> The paradigm is shifting from existing models where humans directly control a vehicle’s movements to one where “human controllers supervise the mission at the command level and uninhabited systems maneuver and perform various tasks on their own.”<sup>99</sup>

The Air Force does have a SUAS Flight Plan published in April 2016 that states,

SUASs are now mature enough to assume Air Force operations with strategic and tactical impact . . . the Air Force finds itself behind the power curve having forgone the opportunity to embrace and operationalize these developments through a dedicated acquisition program, let alone an independent line of funding.<sup>100</sup>

The Air Force has “no strategic programming actions to acquire new SUASs” with AFSOC being the only Air Force “acquisition activity dedicated to the SUAS.”<sup>101</sup> The Air Force has no equivalent SUAS airframe to the Navy, its programs tend to be limited to lab simulations and stove piped.<sup>102</sup> While it appears that history is repeating itself, the world’s premier Air Force should be leading the way in this revolutionary approach to flying, cutting across several domains.

### Conclusion and Recommendations

The pilots in the Air Force RPA enterprise are still developing their own institutional culture but have a collective chip on their shoulders from years of operational stress and perceptions of being undervalued. Attempting to solve the manpower issue by injecting potential candidates from other career fields does not address the latent problems and even more so, how might it be perceived by a group of officers whose positions will be assumed by enlisted airmen who may be granted the same authorities and responsibilities?

Air Force culture, biases, and a lack of forethought have stunted its ability to build, maintain, and sustain an adequately resourced RPA enterprise. It brought about a Congressional mandate which solves little and fails to understand the greater issue. The cultural and emotional tumult of implementing this mandate for the enlisted pilot candidates and the officers already within the RPA enterprise cannot be ignored. These are the primary reasons why an enlisted RPA pilot core should not be implemented today in the MQ-9.

The law can only be effective if:

- Congressional language offers greater specificity with regard to: (1) what problem the law aims to fix, (2) implementation expectations, and (3) codifying authorities of the Air Force, officer, and enlisted personnel.
- Congress collaborates with the Air Force to provide the necessary URT/UPT resources and capacities so that they better align with warfighter requirements and can fulfill the law's intent. The law must reflect the realities that once resources are provided it will take the Air Force several years to increase URT/UPT capacities.
- Air Force culture and thinking transcends existing paradigms and the value of RPA professionals is truly recognized. Bonuses and flight pay will not likely fix the many endemic issues, but completed CPIP initiatives and equal treatment with the manned flying community would offer a starting point.

Author Jeffrey Smith and former Commandant of the School of Advanced Air and Space Studies (SAASS) said

The greatest challenge that the USAF (United States Air Force) must overcome is its inability to focus on the ends rather than on the means . . .

when the USAF finally realizes that its greatest strength comes from its ability to take advantage of all elements within the airpower domain (air, space, and cyber) . . . that is when the USAF will have obtained a level of maturity capable of sustaining its operations without fear of continual, periodic change.<sup>103</sup>

The good news is that the Air Force is changing and is slowly getting there, yet the nation cannot afford another Sputnik....it won't have the luxury of time....the Air Force can and has to get this right. Nonetheless, the Air Force must be cautious of lagging behind the Army and Navy yet again with new concepts of unmanned flight such as appears to be the case with the SUAS. Assuredly, when it involves the air domain, it should be the Air Force leading the way towards the advancement of airpower.

## Endnotes

<sup>1</sup> U.S. Government Accountability Office, *GAO-14-316, Actions Needed to Strengthen Management of Unmanned Aerial System Pilots* (Washington, DC: U.S. Government Accountability Office, April 2014), 1.

<sup>2</sup> Company News, "Chronology, Air Force Tanker Award Will Cap A Long Saga," *Reuters*, February 25, 2008, <http://www.reuters.com/article/usa-airforce-tanker-idUSN2527239720080225> (accessed January 25, 2017); Anne Tyson and Scott White, "Gates Fires Air Force Top Brass," *Seattle Times*, June 5, 2008, <http://www.seattletimes.com/nation-world/gates-fires-air-forces-top-brass/> (accessed January 25, 2017); Newsweek Staff, "The Death of the F-22 Fighter Plane," *Newsweek Online*, September 18, 2009, <http://www.newsweek.com/death-f-22-fighter-plane-79281> (accessed January 26, 2017); Richard Sisk, "The GAO Rejects Air Force Arguments to Retire A-10 Fleet," *Military.Com*, June 25, 2015, <http://www.military.com/daily-news/2015/06/25/gao-rejects-air-force-arguments-to-retire-a10-warhog-fleet.html> (accessed January 27, 2017).

<sup>3</sup> Paul Scharre, *Robotics on the Battlefield Part II, The Coming Swarm* (Washington, DC: Center for New American Security, October 15, 2014), 37-38, <https://www.cnas.org/publications/reports/robotics-on-the-battlefield-part-ii-the-coming-swarm> (accessed February 5, 2017); Carl H. Builder, *The Icarus Syndrome* (New Brunswick: Transaction Publishers, 1994), 173-177.

<sup>4</sup> *National Defense Authorization Act for Fiscal Year 2017*, Public Law 2943, 114<sup>th</sup> Cong., 2<sup>nd</sup> sess. (December 23, 2016), 398-399.

<sup>5</sup> Lieutenant General Robert P. Otto, *Small Unmanned Aircraft Systems (SUAS) Flight Plan: 2016-2036: Bridging the Gap between Tactical and Strategic* (Arlington, VA: Headquarters Air Force, AF/A2CU, April 2016), Executive Summary.

<sup>6</sup> U.S. Department of the Air Force, *Basic Doctrine*, Volume I (Washington, DC: U.S. Department of the Air Force), 1, 3, <https://doctrine.af.mil/download.jsp?filename=V1-D81-CC-DE.pdf> (accessed January 14, 2017).

<sup>7</sup> AFI 51-604, states “only line of the Air Force officers with a current aeronautical rating, as defined in AFI 11-402, Aviation and Parachutist Service, Aeronautical Ratings and Aviation badges except flight surgeons, may command flying units.” U.S. Department of the Air Force, *Appointment to and Assumption of Command*, Air Force Instruction 51-604 (Washington, DC: U.S. Department of the Air Force, February 11, 2016), [http://static.e-publishing.af.mil/production/1/af\\_ja/publication/afi51-604/afi51-604.pdf](http://static.e-publishing.af.mil/production/1/af_ja/publication/afi51-604/afi51-604.pdf) (accessed February 5, 2017). The Air Corps Act was the result of a lively debate over national air policy designed to make air power more independent. Where the Army ultimately controlled the employment of the preponderance of aircraft in the U.S. arsenal of that day, the act was intended to ensure senior service officials were focused on the application of airpower. The concern was that this new way of warfare had yet undiscovered employment methods that were being stifled by land warfare focused leadership. The Air Corps Act renamed the then “Air Service” the “Air Corps,” kept it under Army control, yet stated that “ninety percent of the officers must be flyers, and that flying units in all cases by commanded by flying officers.” Harry H. Ransom, *The Air Corps Act of 1926, A Study of the Legislative Process*, Dissertation (Princeton NJ: Princeton University, August 1953), 339.

<sup>8</sup> Builder, *The Icarus Syndrome*, 30.

<sup>9</sup> Ibid., 32.

<sup>10</sup> Ibid., 33.

<sup>11</sup> Neil Sheehan, *A Fiery Peace in a Cold War* (New York: Random House, 2009), 212-220.

<sup>12</sup> “During the period 1945-1954, an Air Force attitude of “neglect and indifference” toward the development of ICBMs permitted the Soviet Union to gain an early lead . . . until the OSD . . . including the President, intervened to impose . . . new management organizations and procedures that in effect removed the ICBM’s development from normal USAF channels, “cultural resistance” within the Air Force to a new weapon that promised to displace the manned bomber restricted USAF interest in the ICBM largely to situations in which it “perceived a threat from . . . a sister service.” Builder, *The Icarus Syndrome*, 171.

<sup>13</sup> Ibid., 33, 165; Sheehan, *A Fiery Peace In A Cold War*, 219.

<sup>14</sup> Sheehan, *A Fiery Peace In A Cold War*, 212-219.

<sup>15</sup> Ibid.; Mike Worden, *Rise of the Fighter Generals* (Maxwell AFB, AL: Air University Press, 1998), 82.

<sup>16</sup> Builder, *The Icarus Syndrome*, 165.

<sup>17</sup> Ibid., 33; Worden, *Rise of the Fighter Generals*, 83-84. The Air Force leadership viewed missiles as a threat to the acquisition of more B-52 and B-70 bombers with then Vice Chief of

Staff of the Air Force, General Curtis LeMay famously stating the Air Force would not be reduced to being, “the silent silo-sitters of the sixties.” Builder, *The Icarus Syndrome*, 184.

<sup>18</sup> Builder, *The Icarus Syndrome*, 166.

<sup>19</sup> Richard Whittle, *Predator* (New York: Henry Holt and Company, 2014), 79-100.

<sup>20</sup> *Ibid.*, 101.

<sup>21</sup> *Ibid.*, 83, 101.

<sup>22</sup> *Ibid.*, 108-112.

<sup>23</sup> *Ibid.*, 111.

<sup>24</sup> *Ibid.*, 111-112.

<sup>25</sup> *Ibid.*

<sup>26</sup> *Ibid.*, 125.

<sup>27</sup> *Ibid.*, 163, 168-169.

<sup>28</sup> *Ibid.*, 169, 299.

<sup>29</sup> *Ibid.*, 310.

<sup>30</sup> General Herbert J. Carlisle, “Hearing on Army Unmanned Aircraft Vehicle and Air Force Remotely Piloted Aircraft Enterprises,” *Senate Committee on Armed Services, Subcommittee on Airland* (March 16, 2016), <http://www.armed-services.senate.gov/hearings/16-03-16-army-unmanned-aircraft-vehicle-and-air-force-remotely-piloted-aircraft-enterprises> (accessed September 30, 2016).

<sup>31</sup> The enterprise possessed one CL in 2001, increased to seven CLs in 2007, and without pause increased to 65 CLs by 2015. To meet demand the Air Force (1) extended manned aircraft pilots who had already been redirected to UAS assignments, known as “alpha tours,” (2) mobilized manned aircraft pilots from the Air National Guard (ANG) and Air Force Reserve (AFRC), (3) Undergraduate Pilot Training (UPT) graduates were directed to UAS units for first assignments, (4) established a Remotely Piloted Aircraft (RPA)/UAS pilot career field called 18X, and (5) permanently re-categorized 475 manned aircraft pilots as UAS pilots (6) closing of its UAS pilot training school house in 2007 to use instructor pilots in an all in effort that, though short lived, had long lasting negative effects. Government Accountability Office, *GAO-14-316, Actions Needed*, 10-12; Officer at Headquarters Air Force (HAF), telephone interview by the author, January 4, 2017; General Herbert J. Carlisle, “Hearing on Army Unmanned Aircraft Vehicle and Air Force Remotely Piloted Aircraft Enterprises.”

<sup>32</sup> Government Accountability Office, *GAO-14-316, Actions Needed*, 15.

<sup>33</sup> Michael W. Byrnes, “Dark Horizon, Airpower Revolution on a Razor’s Edge—Part Two of the Nightfall Series,” *Air and Space Power Journal*, September-October 2015, 33.

<sup>34</sup> *Ibid.*

<sup>35</sup> Government Accountability Office, *GAO-14-316, Actions Needed*, 1; Officer at Headquarters Air Force (HAF), telephone interview by the author, January 4, 2017. Author's note: The Regular Air Force (RegAF) today is short ~547 RPA pilots (1639 authorized/1092 assigned), the ANG is short 229 RPA pilots (741 authorized/442 assigned), and the AFRC is short 42 RPA pilots (177 authorized/135 assigned).

<sup>36</sup> Officer at Headquarters Air Force (HAF), telephone interview by the author, January 4, 2017.

<sup>37</sup> Officer at Headquarters Air Force (HAF), telephone interview by the author, January 4, 2017. Author's note: The Air Force has plans to increase staff billets from today's 111, many of which are manned by non-RPA pilots or empty, to 300 by 2023.

<sup>38</sup> Officers at the 174<sup>th</sup> Attack Wing, Syracuse NY, interview by author, January 5, 2017; Officer at NGB/A2/3/6, telephone interview by the author, January 12, 2017. Author's note: Though the ANG received nearly the same percentage of training slots for URT from the RegAF as the ANG's 13 of 60 CL commitment, some in the ANG the author spoke with were not thrilled with the ANG being allocated 70 of the 300 URT FY17 training positions. The recurring theme is 70 slots are not enough for a healthy roster and does not account for the five converting ANG RPA units or manning percentages hovering at 40-50%.

<sup>39</sup> Author's note: The Air Reserve Component's (ARC's) struggles are a bit different as it relates to training, traditionally attracting larger numbers of prior enlisted personnel who qualify as officers, recruiting officers from other Air Force Specialties (AFSs), and recruiting RegAF pilots. The ARC struggles to obtain enough URT or FTU slots and with timeliness of training school waivers.

<sup>40</sup> U.S. Department of the Air Force, *Air Force Cost Planning Factors*, (table A36-1, 23 Jan 15), *Authorized Aircrew Composition-Active Forces*, Air Force Instruction 65-503 (Washington, DC: U.S. Department of the Air Force, February 4, 1994), [http://static.e-publishing.af.mil/production/1/saf\\_fm/publication/afi65-503/afi65-503.pdf](http://static.e-publishing.af.mil/production/1/saf_fm/publication/afi65-503/afi65-503.pdf) (accessed February 5, 2017). Author's note: The ANG operates at a 13:1 ratio.

<sup>41</sup> Government Accountability Office, *GAO-14-316, Actions Needed*, 14; In person interviews by author with several personnel at the 111<sup>th</sup> Attack Wing, Willow Grove, PA and the 174<sup>th</sup> Attack Wing, Syracuse, NY, and HAF.

<sup>42</sup> *Ibid.*, 15; Officers at the 174<sup>th</sup> Attack Wing, Syracuse, NY, and the 111<sup>th</sup> Attack Wing, Willow Grove, PA, interview by author.

<sup>43</sup> U.S. Department of the Air Force, *MQ-1/MQ-9 Remotely Piloted Aircraft Operations 31R000*, AFMS 31R000 (Washington, DC: U.S. Department of the Air Force, March 1, 2017), <https://cs3.eis.af.mil/sites/AF-DP-0053/ManpowerStandards/AFMS/MQ1%20%29%20Remotely%20Piloted%20Aircraft%20Operations%2031R000%20AFMS.pdf> (accessed March 7, 2017).

<sup>44</sup> Byrnes, "Dark Horizon," 35.

<sup>45</sup> *Ibid.*

<sup>46</sup> Government Accountability Office, *GAO-14-316, Actions Needed*, 28, 33.

<sup>47</sup> The Air Force did analyze factors related to promotion rates for Line of the Air Force officers but not for RPA pilots specifically and has yet to take any steps to implement a GAO recommendation to do so. The Air Force reported to the GAO that the lower promotion rates were due to: (1) a lower than average in-residence professional military education completion rate, (2) a lower advanced degree completion rate, and (3) that “lower quality pilots are generally sent to RPA squadrons.” Government Accountability Office, *GAO-14-316, Actions Needed*, 33.

<sup>48</sup> Lt Col Lawrence Spinetta, “The Glass Ceiling for Remotely Piloted Aircraft,” *Air and Space Power Journal*, July-August 2013, 102, <http://www.au.af.mil/au/afri/aspi/digital/pdf/articles/Jul-Aug-2013/V-Spinetta.pdf> (accessed February 2, 2017). Author’s note: Senator Harry Reid and Carl Levin called for an investigation over the low promotion rates to major for RPA officers that had dropped over five years from 96 to 78 percent, while the rest of the Air Force was in the range of 91 to 96 percent. ANG and AFRes promotions are handled significantly different than RegAF promotions and have not been subject to the same challenges as those cited in this report.

<sup>49</sup> *Ibid.*, 106.

<sup>50</sup> Air Combat Command, *MQ-1/9 CPIP Trip Summary Report* (Langley AFB, VA: ACC Culture and Process Improvement Program Office, January 2016), 36; U.S. Department of the Air Force personnel, telephone interview by author, January 4, 2017.

<sup>51</sup> Air Combat Command, *MQ-1/9 CPIP Trip Summary*, 6.

<sup>52</sup> *Ibid.*, 13.

<sup>53</sup> *Ibid.*, 17-18.

<sup>54</sup> U.S. Government Accountability Office, *GAO-16-527T, Unmanned Aerial Systems, Further Actions Needed to Fully Address Air Force and Army Pilot Workforce Challenges* (Washington, DC: U.S. Government Accountability Office, March 2016), 5.

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

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

<sup>57</sup> U.S. Department of the Air Force personnel, telephone interview by author, January 4, 2017.

<sup>58</sup> *Ibid.* Author’s note: Today there are approximately 508 18X RPA pilots (meaning URT trained), approximately 539 re-categorized (meaning retrained to 11U RPA pilot from another airframe), and approximately 500 alpha tour pilots (meaning on loan from other manned airframes and slated to return).

<sup>59</sup> *Ibid.* Author’s note: The Air Force plan is to allow the phased return of alpha tour pilots to manned platforms by replacing them with 18X pilots and to replace re-categorized pilots through attrition. Though purely anecdotal, several sources the author spoke with in the field stated that retention would be a problem in the near future because personnel would elect to leave due to being overworked, continued low morale, and lucrative outside employment opportunities.

<sup>60</sup> U.S. Department of the Air Force, *Report to Congressional Committees: USAF Remotely Piloted Aircraft Enterprise* (Washington, DC: U.S. Department of the Air Force, April 2016), 13; TSgt Bryan Franks, "RPA Pilots Set to Receive \$35,000 Annual Bonus," August 11, 2016, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/911383/rpa-pilots-set-to-receive-35000-annual-bonus.aspx> (accessed February 4, 2017).

<sup>61</sup> Government Accountability Office, *GAO-14-316, Actions Needed*, 13. Author's note: This was so the Air Force could work to achieve: (1) healthy flying training unit (FTU) instructor levels, (2) healthier crew ratios, (3) conversion of ANG MQ-1 RPAs to MQ-9s, (4) stand-ups of new ANG MQ-9 units, (5) conversion to a more advanced ground control stations (GCS), (6) better optimization of the launch and recovery element (LRE) to meet COCOM requirements, and (7) increased presence at the Air Force Weapons School.

<sup>62</sup> U.S. Department of the Air Force personnel, telephone interview by author, January 4, 2017.

<sup>63</sup> Air Force Lessons Learned (AFL) Lemay Center, e-mail from AFL analyst to author, August 2, 2016.

<sup>64</sup> ANG RPA Wing and Group Commanders, Andrews AFB, MD, interview by author, November 2, 2016.

<sup>65</sup> Officers at the 174<sup>th</sup> Attack Wing, Syracuse NY, interview by author, January 5, 2017; Officers at the 111<sup>th</sup> Attack Wing, Horsham ANGB, PA, interview by author, December 7, 2017. Author's note: One ANG group commander informed the author that GOCO pilots earn nearly \$30,000 per month, with a rotation that keeps them at home in the US for three months and deployed for the fourth. This commander cited several instances where pilots electing to leave active duty are now bypassing the ANG for the GOCO alternative, thus damaging a traditionally important form of recruitment for the reserve components.

<sup>66</sup> U.S. Department of the Air Force, *Report to Congressional Committees: USAF Remotely Piloted Aircraft Enterprise* (Washington, DC: U.S. Department of the Air Force, April 2016), 13.

<sup>67</sup> *Ibid.*, 14. Author's Note: ANG and AFRC promotions are handled significantly differently than RegAF promotions and have not been subject to the same challenges as those cited in this report.

<sup>68</sup> Headquarters Air Combat Command Public Affairs, "ACC Charts Path for Remote Aircrews, Units," December 10, 2015, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/633740/acc-charts-path-for-remote-aircrews-units.aspx> (accessed February 4, 2017).

<sup>69</sup> U.S. Department of the Air Force personnel, telephone interview by author, January 4, 2017. Author's note: One initiative being pursued aggressively is the locations for new RPA units to improve quality of life by offering other than desert locations. Shaw AFB was announced recently as the location of a new RPA group. A new RPA Wing location will be announced during the summer of 2017.

<sup>70</sup> Ellen M. Hall and William C. Tirre, *USAF Air Vehicle Operator Training Requirements Study* (Brooks AFB Air Force, TX: Air Force Research Laboratory, January 1998).

<sup>71</sup> Government Accountability Office, *GAO-14-316, Actions Needed*, 19.

<sup>72</sup> Ibid. A follow up 2016 GAO report found that the Air Force had “made progress toward implementing” the GAO recommendation to incorporate alternative populations besides officers, because of an Air Force announcement in December 2015 that enlisted personnel would start to be integrated as pilots into the RQ-4 Global Hawk flight operations. Government Accountability Office, *GAO-16-527T, Unmanned Aerial Systems*, 7.

<sup>73</sup> *National Defense Authorization Act for Fiscal Year 2017*, Public Law 2943, 114<sup>th</sup> Cong., 2<sup>nd</sup> sess. (December 23, 2016), 398-399.

<sup>74</sup> The original draft Congressional language stated that a “preponderance” of RPA pilots be enlisted personnel. It was quite clear that number was something greater than 50 percent. The new language contains the word “significant” in place of preponderance and most personnel the author talked with believe the Air Force will do the absolute minimum possible to implement. U.S. Congress, Senate Armed Services Committee, *Transition of Air Force to Operation of Remotely Piloted Aircraft by Enlisted Personnel (sec. 1046)*, Committee Report, 114<sup>th</sup> Cong., 2<sup>nd</sup> sess., (Washington, DC: May 18, 2016), <https://www.congress.gov/congressional-report/114th-congress/senatereport/255/1?q=%7B%22search%22%3A%5B%22%5C%22The+committee+is+concerned+that+the+Air+Force+has+struggled+for+nearly+a+decade%5C%22%22%5D%7D&r=1> (accessed February 5, 2017).

<sup>75</sup> U.S. Congress, Senate Armed Services Committee, *Transition of Air Force to Operation of Remotely Piloted Aircraft by Enlisted Personnel*, (accessed February 5, 2017).

<sup>76</sup> Stephen Losey, “Air Force Plans 100 Enlisted Drone Pilots by 2020,” *Air Force Times Online*, July 6, 2016, <https://www.airforcetimes.com/articles/air-force-plans-100-enlisted-drone-pilots-by-2020> (accessed February 4, 2016).

<sup>77</sup> Tony Carr, “The Real Story on Enlisted RQ-4 Pilots,” *John Q. Public Blog*, blog entry posted January 13, 2016, <https://www.jqpublicblog.com/the-real-story-on-enlisted-rq-4-pilots/> (accessed February 4, 2017).

<sup>78</sup> The Air Force states that the RQ-4 enterprise is small and healthy and not operating at a “critical capacity” like the MQ-1/9 pipeline. This allows it to take a “deliberate” approach to incorporating enlisted pilots into the mix while enabling the Air Force to adequately “measure” the results while keeping the effort in the realm of the “feasible.” U.S. Department of the Air Force, *Report to Congressional Committees: USAF Remotely Piloted Aircraft Enterprise* (Washington, DC: U.S. Department of the Air Force, April 2016), 20.

<sup>79</sup> Officer at HAF, telephone interview by author, January 19, 2017.

<sup>80</sup> LtCol Travis L. Norton, “Air Force, Staffing for Unmanned Aircraft Systems (UAS) Operations,” *Institute for Defense Analyses (IDA)*, June 2016, 40.

<sup>81</sup> Ibid., 33.

<sup>82</sup> Ibid., 40.

<sup>83</sup> Ibid., 42.

<sup>84</sup> Ibid., 64.

<sup>85</sup> Ibid., 55.

<sup>86</sup> Ibid., 52.

<sup>87</sup> Ibid., 53.

<sup>88</sup> Ibid.

<sup>89</sup> Ibid.

<sup>90</sup> Ibid.

<sup>91</sup> Ibid., 61.

<sup>92</sup> Roland J. Yardley et al., *Options for Filling Vacant Officer Positions* (Santa Monica, CA: RAND, 2010): xi, 1.

<sup>93</sup> Ibid., xii.

<sup>94</sup> Ibid., 7, 36.

<sup>95</sup> Headquarters Air Combat Command, *Flying Operations, General Flight Rules*, Air Force Instruction 11-202, Vol 3, ACC Supplemental (Langley AFB, VA: Headquarters Air Combat Command, November 28, 2012), 9, [http://static.epublishing.af.mil/production/1/acc/publication/afi11202v3\\_accsup\\_i/afi11202v3\\_accsup\\_i.pdf](http://static.epublishing.af.mil/production/1/acc/publication/afi11202v3_accsup_i/afi11202v3_accsup_i.pdf) (accessed February 5, 2017).

<sup>96</sup> Major Dillon Patterson, *Enlisted RPA Pilots: The Path to Air Mission Command*, Research Paper (Alexandria, VA: Director's Action Group (DAG), Air National Guard, November 9, 2016), 5.

<sup>97</sup> Scharre, *Robotics on the Battlefield Part II, The Coming Swarm*, 37.

<sup>98</sup> Ibid.

<sup>99</sup> Ibid., 6.

<sup>100</sup> Otto, *Small Unmanned Aircraft Systems*, 7, 22.

<sup>101</sup> Ibid. Author's note: The Author viewed a (January 2017) 60-Minutes episode highlighting the advances that the DoD Strategic Capabilities Office (SCO) in coordination with the U.S. Navy is making with miniature Unmanned Aerial Systems (UASs). In the segment the Navy released 100 miniature UASs from F-18s, which were flown utilizing artificial intelligence (AI). The demonstration was an enormous success-absent was the Air Force.

<sup>102</sup> U.S. Department of the Air Force personnel, telephone interview by author, February 17, 2017.

<sup>103</sup> Jeffrey J. Smith, *Tomorrow's Air Force* (Indianapolis: Indiana University Press, 2014), 221.