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Remote-Split Operations and Virtual Presence: Why the Air Force Uses Officer Pilots to Fly RPAS

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Since the advent of Remote-Split Operations (RSO) for MQ-1/9 remotely-pilot aircraft (RPA), where pilots fly aircraft that are thousands of miles away, a popular view is that this distance instills a psychological gap, making it easy to carry out lethal actions. A common further assumption is that RPAs are automated and don't require traditional aviation or leadership skills to operate. But 20 years of combat RPA experience has led practitioners to a different view—that the effective employment of RPAs has been improved by using pilots with previous experience in manned aircraft and undergraduate training where pilot candidates received a foundation of manned flying skills. Furthermore the USAF experience has been that leadership, character, and decision-making qualities needed for effective RPA employment are nearly identical to those required for the effective and efficient employment of manned weapons system.

10,000 feet above Sadr City, an Air Force pilot maneuvers her bomb- and sensor-laden aircraft into position. She's just spent an hour scanning up and down a route as a US Army construction crew erects a wall on the west side of a main thoroughfare. The aim is to seal off the city in order to isolate insurgents as part of an on-going effort to pacify Baghdad.

From the beginning of this effort, enemy snipers had set up positions on the roofs of houses in order to shoot at the construction teams. It was up to the Air Force to support these teams by using armed ISR aircraft to find and engage the snipers.

After an hour of scanning the main route, the pilot and her crew identify a sniper's nest. Thanks to a video downlink, the Joint Terminal Attack Controller (JTAC) in the battalion operations center views the target in real time. The JTAC confers with the Army Battle Captain, does a quick assessment of possible collateral damage, and accounts for the locations of nearby friendly troops. The Battle Captain decides to take the sniper out.

The JTAC coordinates the strike with the pilot via secure radio. He passes target information and instructions, directs the pilot to de-conflict with other aircraft in the area, and tells her to start her attack run.

The pilot coordinates with the airspace controller, notices an aircraft between her and the target, and determines that she has to shoot from a lower altitude. After receiving clearance, she pickles off the auto-pilot to quickly turn the aircraft to the north and heads for a block of airspace where she can safely descend. At 8,000 feet, she turns her aircraft back to the south, and sets herself up for a west-to-east target run. She briefs her crew and arms her missiles.

Once set up, the pilot hand-flying the aircraft turns inbound and announces "in from the west" over the radio. The JTAC responds with: "Type II control, cleared hot." When the pilot reaches the optimal slant range in the heart of the engagement zone, she rifles the laser-guided missile, which strikes the sniper's nest 19 seconds later. There's an incredible explosion, and the sniper's nest (with the sniper inside) is destroyed. The house next door is untouched.

The sniper fire halts. The construction crews are able to continue their work.

This combat action, and many others like it, took place in Iraq in 2007. Was this an application of airpower that Billy Mitchell or Guillot Douhet would recognize? Was the pilot on board the aircraft or in a ground control station 7,000 miles away? And if the pilot *wasn't* on board, is she even a pilot? And was she psychologically connected to the operation in the same manner as pilots of manned aircraft?

The Air Force is changing. The above scenario will happen many more times in future conflicts. RPAs are growing in number, complexity, capability, and prominence as an unparalleled example of the kind of world-class airpower that is the pride of the USAF. And while the rest of the world struggles to understand the role and psychology of remote piloting, the Air Force is drawing on 100 years of airpower lessons to build the RPA pilot of the future—and she looks a lot like the manned aircraft pilot of the past.

Previous Experience and Rapid Growth

In 2003 when the Air Force first employed the RSO model of operations in Iraq and Afghanistan, they had to the ability to fly three aircraft 24/7. This amounted to about 60 hours of flight time per day. Today the Air Force can fly 65 of these Combat Air Patrols (CAPs) at a time, for a total of about 1,300 flight hours *per day.* And while in 2004 the Air Force required an RPA pilot force of only 50 or so, at the end of 2013 the Air Force had 1,366 MQ-1/9 pilots (GAO, 2014), and is now training over 400 more per year. (Drew, 2014). This rate of growth was possible only because until 2010, the Air Force used only previously experienced manned aircraft pilots to fly the MQ-1 and MQ-9. This allowed them to minimize the training needed to produce new crews and focus only on the transition from manned flying to RPAs.

Prior to this it was clear that aviation skills were directly transferable to the employment of the MQ-1 as a weapons system. Several Air Force Research Lab studies (Hall, 1998; Schreiber, 2002; and Chappelle et. Al 2011) concluded that not only did previous and recent experience in aircraft similar to the MQ-1 improve the performance of test subjects in both basic maneuvering and mission tasks, but that pilots with MQ-1 experience overwhelmingly agreed that manned flying experience was necessary for success in flying the MQ-1.

Based on this conclusion, and under pressure to increase both the number of CAPs and the range of MQ-1 support (reconnaissance, special operations, close air support, and air interdiction) to ongoing operations, the Air Force tailored the MQ-1 initial qualification course to provide a bare minimum of training with the expectation that previous manned operational experience will carry the day. And it did. Between 2003 and the US withdrawal from Iraq in 2011

not only did USAF MQ-1/9 CAPs grow by a whopping 1,403%, but they became the critical enabling capability for US counter-insurgency operations (McCaffrey, 2007).

This approach is evident in the Initial Qualification Training (IQT) syllabus for MQ-1 at the height of the surge. In 2007, the syllabus contained 101.5 hours of academics, 39.5 hours of part-task trainer time, and 31 hours of flying (USAF, 2002). In 2008, the flying hours were *reduced* in a new syllabus of 84 academic, 40.5 simulator, and 20 flying hours. To do this the Air Interdiction phase and the Combat Search and rescue phase were eliminated (USAF, 2008). Both of these syllabi specified that previous operational experience in manned aircraft or graduation from USAF Undergraduate Pilot Training were required to enter the course. It was not until the creation of a true Basic Course for MQ-9 pilot candidates with no previous manned operational experience that the training was increased to 105.5 academic, 61 simulator, and 40 flying hours. (USAF, 2010). This period also saw the introduction of the first hi-fidelity simulator for IQT.

At the same time, the Air Force created the RPA Pilot Training course to prepare officers with no previous flying experience to enter MQ-1/9 IQT. After some testing and adjustment, this undergraduate pipeline now includes 35 hours of manned light aircraft flying (the equivalent of a FAA Private Pilot License), 40 hours of instrument time in a T-6 simulator (for a basic level of instrument flying skill), and 135 hours of academics (Jean, 2010). This move established the model of transference of manned flying skills as the foundation for USAF RPA training.

Why Officer Pilots?

There is a popular notion that flying RPAs is fundamentally different than flying manned aircraft. To quote a prominent researcher: "The Shadow (and Hunter) can effectively do the same mission as the Predator [but using enlisted operators] because Army operators leverage higher levels of autonomy onboard the Shadow than do their Air Force counterparts." (Cummings). But this doesn't capture the difference between the control aircraft and the application of airpower. The ease or difficulty with which an operator can control an aircraft is not the issue.

Obviously technology has made it possible to automate almost every task needed to control an RPA. Tasks can be automated. Judgment cannot. It is the fact of the complexity of the aircraft, the airspace, the mission, and the desired effects that demand the judgment of a trained and mature aviator to employ these aircraft as weapons systems. In exactly the same manner as manned fighter and bomber pilots, MQ-1 and MQ-9 pilots must be prepared to employ weapons and provide target guidance across the entire spectrum of conflict—from major combat ops to counterinsurgency—in every possible type of terrain from open, rural areas, to dense, urban environments—both in the vicinity of and independent of ground forces. In Libya during Operation Unified Protector, MQ-1 conducted suppression of air defenses as well as air interdiction and strike coordination (Etchells, 2011). Right now in Iraq and Syria MQ-1s and MQ-9s are identifying ISIS elements and engaging them both independently and in support of Kurdish forces on the ground (Cole, 2014). It's in those types of scenarios—strategic scenarios in phases 0 through 4 of a conflict—where a mistake can have strategic consequences. In a heavy air-only battle, or when employing weapons within close proximity to friendly forces and non-combatants, making the proper split-second decisions can be a matter of life or death.

The reason the Army is able to use enlisted troops with much less training in a weapons employment role is the fact that they shift the decision-making responsibility away from the crew. A senior NCO or Warrant Officer inside the Tactical Operations Center (TOC) always supervises Army crews. The decision to employ ordinance always rests with the Battle Captain—a field-grade officer who's in charge of the entire operation (Martin, 2014). So while the Army may save on manpower expenses for its aircrew, it still has to pay a bill in the form of supervisory personnel located elsewhere.

This concept highlights the key difference between Army and Air Force employment of similar capabilities. The Army might put a junior NCO in charge of a 60-ton tank, but it wouldn't then send that NCO 1,000 miles behind enemy alone lines to employ it. The Army does everything big, organic, and with lots of supervision. The Air Force on the other hand must retain the flexibility to conduct global interdiction as well as close air support.

And the evidence can be found in the rate of employment. The Army has had the ability to launch the Viper Strike missile off of the Hunter for over several years. But so far there are only been two engagements—both in September '07. That's two engagements in over 200,000 hours of combat time (Harper, 2007). Since the Army always teams unmanned aircraft with manned assets, they typically bring in dedicated shooters to finish engage targets.

By contrast, the MQ-1 and MQ-9 have flown over two million combat hours and conducted thousands of successful weapons engagements since 2003 as independent assets. For instance, during the Surge in Iraq, the MQ-1 fired 112 Hellfire missiles averaging 18 per month **(**Johnson, 2013**).** To date, there has only been a single documented instance of friendly fire incident against US troops from an Air Force MQ-1 or MQ-9 **(**Zucchino and Cloud, 2011**).**

The success of the MQ-1 and MQ-9 across the spectrum of combat continues to drive demand for this capability, and the Air Force now plans to maintain the current 65 CAPs and transition to an all-MQ-9 fleet (Schogol, 2015). The sheer size of this enterprise means that the majority of hardware and manpower resources must be devoted to operations, leaving minimum residual forces for training, supervision, and management. Of the 1,366 pilots on hand in 2013, only 179 were assigned to training duties. 111 more serve in leadership and staff positions. While a small number of pilots within a flying squadron are available for in-unit instruction and supervision, the vast major of squadron pilots fly combat missions as their primary duty. This means that they must operate with minimal direct supervision and must be able to exercise a wide latitude of responsibility and judgment—the very definition of officership.

The Psychology of Remote Combat

Another popular notion of remote combat is that the physical distance between a target and the pilot of an RPA means that the pilot has no emotional or psychological connection with the target. Journalist Mark Bowden wrote that RPA piloting is "like a video game; it's like Call of Duty." (Bowden, 2012). Professor Brennan-Marquez asserts that the "numbness that results from using machines rather than soldiers to carry out our dirty work" produces "the nightmarish image of an 18-year-old drone operator basically playing video games from the detached safety of a Nevada bunker." These attitudes are evidence of a widespread suspicion that RPA pilots

might casually cause collateral damage or otherwise employ these aircraft in a reckless manner. But these attitudes are wrong. And the evidence at hand along with the and experience of RPA pilots leads us to the opposite conclusion.

In fact the psychological connection between the pilot and her target is not a function of distance, it's a function of cognition. Anyone who has ever felt empathy for a fictional character in whatever form (literature, film, etc.) understands that it's very easy for people develop emotional bonds with those they observe—even if the subject of observation doesn't actually exist. As one researcher put it, "The experiences with fictional characters resonate with us because of the fact that we've had deep experiences with people throughout our lives." (Nuwer, 2013).

This phenomenon emerging in long-distance operations is further evidenced by the chronic stress suffered by air traffic controllers (Martindale, 1977), the guilt that some B-17 bombardiers felt during World War II (AP, 1987), and the fact that RPA pilots are just as prone to stress disorders as their manned fighter and bomber counterparts (Dao, 2013). It's clear that no amount of electronic removal or distance between RPA pilots and the targets of their efforts is enough to overcome a lifetime of human empathy and emotional experience.

The strongest evidence of all is the experience of the MQ-1 and MQ-9 pilots themselves. In a multitude of studies and interviews, RPA pilots again and again stress the psychological connection and urgency they experience during operational flying. As one study found: "SMEs also noted the ability to control emotions during urgent situations (e.g., aerial strikes or reconnaissance of enemy combatants, interaction with ground forces, targeting of high-value assets) as especially critical. The attribute of emotional composure is also considered critical to the selection of successful military pilots and high-demand, high-operational military personnel." (Chappelle, 2011). Emotional control and the ability to stay focused on the task at hand in the face of emotional distress simply wouldn't be important if remote piloting by its nature removed the RPA pilot for the human realities of combat.

Conclusion

Since the early days of the RPA experiment, the United States Air Force has made the conscience decision to leverage a century of experience employing airpower to guide the organization, training, equipment, and employment of RPA forces. Indeed, the Air Force approach has been to treat MQ-1s and MQ-9 as much like manned multi-role combat aircraft as possible. By leveraging the manned flying experience of seasoned aviators, the Air Force has been able to expand combat capability at a rate that simply wouldn't have been possible if they had taken a blank-sheet approach. And once the manned flying model was established, it followed as a matter of course to use manned flying as the foundation for the creation of a dedicated RPA career field that trains officers first to fly manned aircraft, and then RPAs, before setting them on a dedicated RPA career track. And despite popular notions that RPAs don't need pilots or that they place a psychological distance between the operator and the target, the Air Force and its RPA practitioners have found that these assumptions don't hold up in combat. And that the use of officers trained as manned pilots is the best approach to building and sustaining a massive MQ-1/9 enterprise in an efficient, effective, and ultimately humane manner.

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