The Strategy of Drone Warfare

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On October 7, 2001, an MQ-1 lazily flew circles over Eastern Afghanistan, monitoring Taliban leader Mullah Omar's compound. As people emerged from the compound, the MQ-1 followed a convoy of suspected senior Taliban leaders to a meeting place in Kandahar. Concerns over collateral damage lead to a botched attack that left a few guards dead but failed to bag any leaders. In 2009, the US Navy used a Scan Eagle to assist in the movie-famous rescue of Captain Phillips off of the coast of Somalia. A few years later, the US provided short-range Ravens to provide the African Union Mission in Somalia (AMISOM) a tactical advantage, helping contribute to al-Shabaab's roll-back over the past three years. In 2013, French *Harfangs* and US MQ-1s provided Intelligence, Surveillance, Reconnaissance (ISR) support to the French *Opération Serval* in Mali. The capability to pinpoint enemy positions and track Al Qaida (of the Maghreb) movements provided the French a tremendous operational advantage. Despite the variety of uses, the choice to employ Remotely Piloted Aircraft (RPA) in any manner is a strategic decision.

Normally, the selection of a weapons or ISR platform for a target is a straightforward operational decision. But, the budding controversy with the combat use of RPA has turned this aircraft allocation into a strategic decision. RPAs seem to get the blame for a variety of complaints about policy and employment that have little to do with the airframe or its processes. While all of the military functions of an RPA can and are done by manned aircraft, the RPAs must endure additional scrutiny. *Because of this, the decision to employ RPAs is a strategic decision that makes consider a variety of factors including*: public image of the RPA, political risk, legal considerations, technological capabilities, and military strategy.

Public Image

Perhaps one of the most obvious strategic factors affecting the decision to employ RPAs is its public image. "Drone" is a pejorative term in some circles. It suggests mindless subservience to instinct (or software programming). In the 1930s, the Naval Research Lab coined the military use of the term "drone" during the development of a remote control aircraft for target practice. Regular combat use for RPAs, primarily for ISR, began in the 1960s. Initial datalinks, inadequate precision navigation, line-of-sight range limitations, and susceptibility to electronic warfare jamming limited the usefulness of early RPAs.[1] In an ironic foreshadowing of the future, the US Air Force largely abandoned its RPA programs after the Vietnam War since they were not suitable for conventional warfare in Central Europe against the Soviet Union.[2] The Soviet's mobile surface to air missiles would make short work of RPAs over the Fulda Gap.

Modern-day RPAs began in the mid-1990s with the MQ-1 Predator. Today's RPAs can be loosely classified by groups based upon their weight, operating altitude, and airspeed. While this classification is somewhat useful for differentiating Federal Aviation Administration rules and airspace restrictions, the Group classification has limited utility for operational planning since it fails to consider key factors such as max range, max sortie duration, payload options (intelligence or weapons capabilities), and plug and play variations. Plug and play variations can enable alternative or additional non-standard payloads. In some cases payloads can be swapped out while others require extensive air worthiness testing. Other classification systems are service specific, limiting their usefulness for joint operations. For instance, US Air Force tiers are essentially based upon altitude (low, medium, high) with a special tier for low observable RPA. Conversely, the US Army tier system is based upon range. While altitude and range may imply specific roles for today's RPAs, advances in technology will quickly render these classification systems as obsolete.

The major platforms in the RPA community include (from big to small, long range to short range): Group 5—RQ-4 Global Hawk, MQ-9 Reaper; Group 4—MQ-1 Predator; Group 3— RQ-7 Shadow; Group 2—Scan Eagle; and Group 1—RQ-11 Raven. Of these, only the MQ-1 and

[1] Thomas P. Ehrhard, *Air Force UAVs: the Secret History*, (Arlington, VA: Mitchell Institute for Airpower Studies, July 2010).

[2] *Ehrhard, 45. In 2014, the Chief of Staff of the Air Force stated the intent to downsize the RPA force since it could not survive a high tech conventional threat.*

MQ-9 have a weapons employment capability. The majority have a Full Motion Video (FMV) capability. The oddity in this platform community is the RQ-4 which is more of a U-2 style snap and shoot imagery aircraft. In fact, there is no stick or yoke for the Global Hawk. It is flown by mouse clicks and keyboard instructions which severely reduces its dynamism and flexibility.

Despite this wide variety in capabilities, the media use of the term "drone" has become synonymous with all remote controlled military aircraft. But, in military parlance, a US Air Force drone is a target. While a drone technically is a remotely piloted vehicle, drones are specifically designed to be destroyed during target practice. Economic prudence means that drones do not have the communications architecture and ISR capabilities of a combat RPA. And yet, from a strategic decision making perspective, the fact that all RPAs will receive the "drone" label in the media must be considered. Regardless of the actual capability being considered, planners and decision makers should assume that the employment of any RPAs will be publicly perceived as armed drones.

The term "RPA" is a relatively new phrase in Air Force jargon that replaced Unmanned Aerial Vehicle (UAV) and the slightly more ambiguous Unmanned Aerial System (which includes the vehicle and the ground support architecture). The term falsely implies that humans are not involved in its operation; that this is some type of autonomous robotic killing machine. Arguably, the "piloted" in RPA is a not-so-subtle reminder that a qualified pilot is flying the aircraft which is not necessarily true to the small aircraft (e.g. Raven) flown by the US Army and the Special Forces community. Though it is not a foregone conclusion that the term RPA will fully replace its competitors, this article will use the term RPA to describe the entire military community of remotely controlled combat aircraft.

Political and Legal Issues

The political risk associated with the employment of RPAs is a double-edged sword. Compared to manned aircraft, the RPA reduces the political risk for involvement in a conflict because of the limited ramifications of a crash. For the casualty-averse public, there is no risk to the operator. During NATO's Operation Unified Protector in Libya, which maintained a no-fly zone over the country, manned ISRs were often required to stay "feet wet" (over the Mediterranean Sea) to

minimize the risk to personnel. This created a dependency upon RPAs to provide time critical intelligence to NATO forces.

For the cost-conscious Congress, there is no need for a massive and expensive rescue and recovery operation over areas where personnel recovery is difficult. From a strategic communications perspective, there is no risk of a humiliating "Blackhawk Down scenario" which will force the US to reconsider its intervention policy. Of course, whether or not reduced political risk is a good thing largely depends upon one's opinion about military interventions in general. Arguably, the reduced political risk could encourage the United States and other countries with RPAs to use the military arm more often than in the past.[3] Again, whether or not this is a good thing depends upon an individual's assessment on the role of the military, under what conditions the military should be used, and the efficiency and effectiveness of the military to conduct certain missions.

Beyond risk to the pilot, RPAs also represent reduced political risk in footprint size and cost. The requirement for deployed personnel, equipment, supporting logistics, and ramp space for an RPA is significantly less than that of its fighter or manned ISR counterpart. That means that deployments to austere locations such as the Sahel Desert (just south of the Sahara) or a remote island in the Philippines are comparatively lower profile and less of a burden on the local infrastructure. While not stealthy, RPAs are considerably less obvious than the majority of manned ISR aircraft such as the P-3, RC-135, MC-12, and U-28.

In all, this equates to a higher probability of approval by the host government and less resistance from the local US Ambassador who is the de facto responsible agent for the security of the Americans in-country. While a concern over local infrastructure may seem petty, even small military deployments can quickly overwhelm a small economy. During one of this author's business trips to Dakar, Senegal, travel dates had to be rearranged since the US Presidential detail had taken up every respectable hotel room in the city.

Arguably, RPAs cost less than their fighter or U-28 counterparts. However, cost comparisons of military aircraft are extremely tricky. The Pilatus PC-12, the civilian version of the U-28, costs about the same as an MQ-1. But, this fails to account for the equipment upgrades that the U-28

[3] Daniel Byman, "Why Drones Work," *Foreign Affairs,* July / August 2013.

has over the PC-12. Plus, the U-28's loiter time pales in comparison with the MQ-1, making a per-airframe cost comparison somewhat misleading. A cost per flight hour comparison might be more reasonable, but it fails to properly account for time that truly matters: on station time. An MQ-9 costs about the same as an F-16 and about half as much as an F-15. Unfortunately, this cost comparison lost meaning when the production lines were halted for the F-16 and F-15. An M-9 costs about one tenth of an F-22. But, the roles of the two aircraft differ so significantly that the comparison no longer makes sense. Meanwhile, there is no manned aircraft equivalent to the smaller RPAs such as the Raven and the Scan Eagle. While risk and cost are primary considerations for military planners, critics of US foreign policy tend to ignore these factors and focus upon the legality of RPA strikes.

Legal factors that shape strategic decision to employ RPAs primarily focus on lethality and sovereignty. A variety of authors present an anti-RPA bias because they are opposed to the targeting of individual non-state actors outside of conflict zones.[4] This opposition is rooted in a legal debate about the use of lethal force against non-state actors.[5] The disagreement centers around whether or not a country can be at war with a loosely-defined organization (vice a formally recognized country). While this is an important intellectual debate on just war theory, it is only tangentially related to RPAs.

From a military perspective, the legal framework for lethal action against non-state actors is based upon the Authorized Use of Military Force (AUMF).[6] Under the AUMF, the decision making process about whether or not an individual can legally be killed is independent from the platform used to deliver the killing blow. Throughout the Global War on Terror, a wide variety of ground-based and air-based methods were used to kill or capture terrorists. Of course, air-centric methods tend to lack a capture component. Even so, air methods are not limited to RPAs. F-16s, F-15Es, F-18s, and B-52s have delivered ordnance upon key terrorists. There is little

[4] For example, Nick Turse and Tom Engelhardt, *Terminator Planet* (San Bernadino: Dispatch Books, 2012).
[5] For example, Steven Groves, "Drone Strikes: The Legality of U.S. Targeting Terrorists Abroad, " *Heritage Foundation Backgrounder on Terrorism,* April 10, 2013, at http://www.heritage.org/research/reports/2013/04/drone-strikes-the-legality-of-us-targeting-terrorists-abroad#_ftnref22 and Mary Ellen O'Connell, "Unlawful Killing with Combat Drones: A Case Study of Pakistan, 2004–2009," Notre Dame *Legal Studies Research Paper* No. 09-43, July 2010, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1501144
[6] Authorization for Use of Military Force, Public Law 107–40, September 14, 2001.

ethical justification to argue that killing someone with a fighter jet is morally different than killing someone with a Remotely Piloted Aircraft.[7]

Closely related to the issue of lethality is the issue of sovereignty. Normally, the use of lethal force upon another sovereign country's territory without its permission is considered an act of war under international law. Certainly, not all legally-defined acts of war actually lead to war; however, they can be the cause of prickly international incidents and unwanted tensions between otherwise friendly countries. Considering the media perception of RPAs, the decision to request RPA over-flight (either armed or unarmed) of another country is not a task considered lightly. While sovereignty was never a serious concern for RPA operations over Afghanistan, an ongoing war zone, sovereignty is a major concern for operations conducted in Pakistan, Yemen, Mali, and since the US departure in 2011, Iraq.

The approving sovereign country has a variety of approval options. It may choose to grant approval publicly or privately. In the case of a private or secret approval, it is possible that many of the country's government workers are not aware of the unconfirmed official approval. The sovereign country has the option to require permission be requested for each individual strike or can grant blanket permission for all strikes. In the case of a private approval, the sovereign could follow a "don't ask, don't tell" relationship. In such a case, the striking country does not ask for specific permissions, does not acknowledge the strikes publicly, and the targeted country can publicly express outrage at the violation of its sovereignty. Of course, the private approval route has some negative secondary effects that play into the propaganda of the enemy organization under attack.

Even the non-lethal employment of RPAs requires legal considerations. Current legal interpretations of the US Conventional Arms Transfer Process, the Arms Export Control Act, the International Traffic in Arms Regulations, and the Missile Technology Control Regime restrict the ability of the US military to sell or give RPAs to its allies. In those rare cases where such security cooperation is allowed, legal considerations often prevent those RPAs from being armed. For example, during military operations in Afghanistan and Libya, NATO contributed US-produced RPAs. The quality and skill level was similar to that of the US operated RPAs.

[7] Bradley Jay Strawser, ed., *Killing by Remote Control* (Oxford: Oxford University Press, 2013), 7-17.

The unarmed NATO RPAs were valuable ISR platforms. But, the lack of weapons hindered the overall operational flexibility of the air campaign.

Despite the lack of an ethical or legal difference between using an RPA and a fighter to conduct an airstrike, the media has come to closely associate RPAs with killing individual terrorists. In part, this perception is driven by the highly publicized, though supposedly sensitive, CIA operations over Pakistan. Of course, since the CIA lacks fighters and bombers, the RPA is their only weapon of choice for an airstrike unless it wants to request help from the Department of Defense. This is possible, of course, but the process is subject to bureaucratic politics.

On the other hand, the perception of RPAs as terrorist killers is driven by military practicality. RPAs are the optimum platforms for the mission. Advancements in technology, improved capabilities for target discrimination, and limited risk of collateral damage have simply made RPAs the weapon of choice for targeting High Value Individuals (HVI). Since 2004, RPAs conducted approximately 400 strikes between Pakistan and Yemen.[8] While the number of strikes per year is on a downward trend, this is more likely caused by a diminishing target set than by a perceived decreased utility in the RPA.

Technology, Target Discrimination, and Collateral Damage

There are several classic anti-drone stories that are used to point out the technological evils of RPAs. One incident was the accidental killing of two dozen Pakistani soldiers. On patrol in the Federally Administered Tribal Areas of Pakistan (FATA), the Pakistanis were somehow misidentified as extremist militants. Another example involved an RPA conducting surveillance along the Iraq-Turkey border. The RPA noted the suspicious activity of a group transiting from Iraq into Turkey. While the RPA did not identify the group, the Turkish Air Force attacked, assuming that they were Kurdish PKK militants infiltrating into Turkey. After the strike, it turned out that the group was simply low level criminals smuggling gasoline. Both of these anecdotes demonstrate the prospect of RPA strikes turning into collateral damage disasters.

[8] New American Foundation, "Drone Wars Pakistan: Analysis," (updated 2014) available at http://natsec.newamerica.net/drones/pakistan/analysis

These illustrations imply that the US military is willing to accept a high risk of mission failure in order to reduce the risk to military forces. The reality is that technology has made RPAs the premium platform for both optimum target discrimination and minimum risk of collateral damage. Dynamic targeting is an inherently complex process used against time-sensitive targets. By definition, dynamic targeting means that there is a compressed timeline to locate and prosecute the target. Arguably, ground forces have even better target discrimination capabilities. However, ground forces have much less ability to respond to compressed timelines and typically involve significantly more risk for the force involved. While the relatively slow speed of RPAs can often be an operational hindrance, it provides a significant advantage to target discrimination relative to fast-moving jet fighters. In the case of fighters, target discrimination is often the judgment of a single individual. Ironically, most "unmanned" aircraft require a significant amount of manpower: a pilot, a sensor operator, and one or more sensor analysts. However, the decision to employ weapons is generally not delegated to any of these individuals. The sensor analyst is generally an intelligence expert with insights into cultural nuances and access to collaborating (or refuting) intelligence sources. While this individual may have primary responsibility for target discrimination, the authority directing target engagement is typically a third party monitoring a live video feed. Target engagement authority typically resides at the Air Operations Center (AOC), Brigade Tactical Operations Center (TOC) or the Joint Special Air Operations Center (JSAOC). In some tactical situations, forward ground forces can monitor the live video via a remotely operated video-enhanced receiver (ROVER) or similar device.

Armed RPAs also have significantly less risk of collateral damage. This does not necessarily mean that they rarely cause collateral damage. But, RPAs are less likely to cause collateral damage than other combat aircraft. The Hellfire missile carried by various RPAs is a smaller warhead than many alternative air-to-ground munitions. It contains a mere 20 pound explosive charge, tiny in comparison to the US's other most common air-to-ground missile, the AGM-65 Maverick, which houses a 126 pound warhead.

The concept that you can mathematically compare the collateral damage caused by RPAs versus other strike aircraft is something of a chimera. Many RPA strikes occur in remote areas in which it is not practical to have a ground team to confirm the identity of the target post-strike. In some cases, Al Qaida or one of its affiliates does have forces on the ground in proximity to the strike

site. It is not unusual for terrorist organizations to "stage" the site before journalists show up. "Staging" can vary from removing weapons to planting previously dead women and children. When these photos hit the media, the US tends to remain mute. The desire to protect intelligence sources often outweighs the desire to show proof that the target was indeed affiliated with extremist groups. In military circles, stories abound about Taliban efforts to avoid airstrikes. One anecdotal story involved the simulation of a funeral procession. But, instead of bodies, the coffins were loaded with weapons. Of course, there are cases in which RPAs have inadvertently killed civilians. Al Qaida and other terrorist group propaganda encourages the false assumption that RPAs are somehow omnipotent. Among the locals, the death of civilians appears to be some sort of evil conspiracy to kill the innocent. Even so, the ability for social scientists to study the attitudes of the local population is limited at best.[9]

One of the major challenges of conducting RPA strikes in countries such as Pakistan, Yemen, and Somalia is an inability to obtain information dominance over the terrorist enemy. If Al Qaida et al can convince the local citizens that RPAs are robots, the US's lack of access to the local information network makes it extremely difficult to counter the terror narrative. Accidental civilian casualties plays into the terrorist propaganda narrative that the United States views civilian deaths as "acceptable losses" to ensure the death of a terrorist and that the United States is not taking appropriate precautions to ensure that the "robots" do not kill civilians. In Iraq and Afghanistan, ground forces could conduct in-person apologies and provide monetary indemnification in an attempt to mitigate the potential backlash caused from collateral damage. But, in those countries in which the US lacks a physical presence and media injects, Al Qaida et al is able to gain the upper hand with propaganda, convincing the locals of a portrait of America as "immoral bullies" that carry out "indiscriminate violence against Muslims."[10]

Military Strategy

At the operational level of war, the employment of RPAs is a microcosm of strategic decisions on how to best run an air campaign. The choice of aircraft apportionment is often between close air support (CAS) and adversary leadership. While weapons capabilities vary greatly among the

[9] C. Christine Fair, Karl Kaltenthaler, and William Miller, "The Drone War: Public Opposition to American Drone Strikes in Pakistan," *Political Science Quarterly,* 129, no. 1 (Spring 2014), 1-33.
[10] Audrey Kurth Cronin, "Why Drones Fail," *Foreign Affairs*, July / August 2013.

RPA community, the MQ-9 can carry two 500 pound bombs [11] and four AGM-114 Hellfire air-to-ground missiles. This gives the MQ-9 the equivalent firepower of an F-16 fighter when targeting support targets such as vehicles and troops, though it is at a comparative disadvantage when targeting facilities.

RPA support to CAS places emphasis on winning today's battles and minimizing friendly casualties by supporting troops in contact. This concept fits the classic airpower arguments of J.C. Slessor and Robert Pape.[12] In this role, the RPA can act as both a CAS platform and as a Forward Air Controller-Airborne (FAC-C). On the other end of the airpower spectrum is John Warden's argument that airpower should focus on the enemy leadership with the goal of winning the campaign via decapitation, vice tactical battles in support of ground troops.[13] Of course, military operations attempt to find a balance between these two extremes, typically apportioning aircraft between strategic leadership (or other central rings of Warden's theory, including lines of communication and infrastructure) and tactical targets closer to the front lines of battle, by a weight-of-effort percentage. However, this choice becomes especially problematic for those operations in which RPAs are in short supply.

Surprisingly, the majority of military operations are conducted with RPAs in short supply. During the heyday of the wars in Iraq and Afghanistan, the military relied heavily upon Overseas Contingency Operations (OCO) Funds to ramp up additional wartime capabilities that far exceeded its annual budget. This allowed the military to temporarily fund additional ISR aircraft including RPAs. Sustainment (primarily operations and maintenance costs) of the additional RPAs was entirely dependent upon continuation of the OCO funds in future budgets. Starting in 2001, the USAF cannibalized its test and training equipment and crews in order to maximize the availability to RPAs for combat operations. This reduced training capability equated to additional strain on existing crews. The USAF began to unwind this decade-long knot in 2011 despite the insatiable appetites of the Combatant Commanders for this valuable asset. As the US government budget got tighter, DOD re-planned its force structure based upon a future with no

[11] Typically either the laser guided GBU-12 or the GPS-assisted GBU-38 Joint Direct Attach Munition.
[12] J.C. Slessor, *Air Power and* Armies (London: Oxford University Press, 1936); Robert Pape, *Bombing to Win: Air Power and Coercion in War* (Cornell: Cornell University Press, 1996).
[13] John A. Warden III, "The Enemy as a System," *Airpower Journal*, (Spring 1995): 40-55.

OCO funds. The easy solution was to off-ramp anything that was not in the original (non-OCO funded) budget. The RPA community took a significant hit.

Prospects for the immediate future of RPAs look dim as "the Air Force is signaling a strategic choice, consistent with its budget, to sacrifice 'lower-end' capabilities like Predators and Reapers for stealthy aircraft able to operate in contested air environments against sophisticated air-defense threats."[14] Arguably, the decision is reminiscent of the post-Vietnam military backlash against all things counterinsurgency, and a refocus on the only potential existential threats to the United States: China and Russia. But, the Air Staff perceives its future force structure under tightening budgets as a dichotomous decision: either prepare for the most likely, but least direct threat to the United States (e.g. small wars and counterinsurgencies) or prepare for the less likely, but most dangerous scenario. The choice was to focus on the most dangerous: win an air war against a peer competitor with advanced air defenses and a robust air force. Since RPAs cannot survive in such an environment, the Air Staff decision to reduce RPAs was a seemingly-logical strategic decision.

To determine which military operations get the shrinking pool of RPAs, the Joint Staff runs a decision-making process known as Global Force Management Allocation Process (GFMAP). The decision is often a myriad of apparently dichotomous choices: specific near-term threats versus long-term ambiguous threats, counter-terrorism (CT) versus counterinsurgency (COIN), and the global war on terror versus other operational missions. This decision can be portrayed in terms of protecting American soldiers under fire today, versus hunting terrorists like Al Qaida (and more recently, ISIS) in remote parts of the world that present a long-term, non-specific threat to the United States. Special Operations Command's (SOCOM) role as the leader of the war against terrorists naturally puts them in competition with more conventional missions owned by the regional Combatant Commanders.

From an RPA perspective, the CT versus COIN debate is a mirror image of the Warden versus Pape debate for air campaign planning. While the COIN mission must find a balance between Warden and Pape, the CT mission has the luxury of ignoring Pape altogether and focusing on enemy commanders. George Mason University Professor Audrey Kurth Cronin argues that

[14] Paul Scharre, "Is the U.S. Air Force Set for a 'Crash Landing?,'" *The National Interest*, September 11, 2014.

drones are a strategic failure, in part, due to a misunderstanding of the nuanced difference between CT and COIN. A deep reading of Cronin indicates that she is arguing that Al Qaida should be handled as a COIN problem, not a CT problem, because decapitation is not working; emphasis should be placed on countering individual recruitment, not targeting senior leadership. This is a bold, though not unique, argument. Still, the crux of the problem is that RPAs cannot conduct COIN without friendly ground forces in the vicinity of the enemy. In those cases where the United States is unwilling to commit ground forces or unable to find a willing third party, CT will remain the de facto strategy.

Of course, Remotely Piloted Aircraft are not the perfect choice for every mission. RPAs have a number of drawbacks that must be considered before selecting them for employment. There are a variety of missions for which the RPA may not be the best choice. When an RPA reaches beyond line-of-sight from a ground controller or satellite, a lost link occurs, which means the RPA is no longer under the control of the operator. Similarly, many RPAs have more restrictive weather limitations than their manned counterparts. While these factors are often considered acceptable risk for most operations, high stakes missions may need to consider a back-up plan.

Conclusion

It is interesting to note that military strategy is only one component of many that goes into the decision-making process to employ Remotely Piloted Aircraft. Arguably, military strategy is probably the least important factor compared to political risk, legal considerations, and technological capabilities. Of course, a good military strategist will consider these factors when requesting an RPA asset for a particular operation or mission. While certainly not the perfect tool in every situation requiring airpower, RPAs are the weapon of choice for hunting and killing terrorists. Their technological capabilities provide them with superior target discrimination and minimal collateral damage. They present less political risk than alternative platforms and operate within the same legal constraints as manned aircraft. But unlike its manned counterpart, the public image of the RPA makes its employment a strategic decision that must be carefully evaluated to ensure that the benefits outweigh the costs.