

Perception is Everything: Repairing the Image of American Drone Warfare

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Abstract

This thesis will trace the United States' development of unmanned warfare from its initial use in the World Wars through the Cold War to its final maturation in the War on Terror. The examination will provide a summary of unmanned warfare's history, its gradual adoption, and concerns regarding the proliferation of drones use to understand the emphasis on unmanned weapons in the American Military. In each phase of development, a single program will be focused on to highlight special areas of interest in the modern day. Finally, the modern era of unmanned systems will focus on the growing integration of new weapon systems which no longer fulfill niche roles in the armory but act as fully vetted frontline combatants. Brought together, this examination will show drones have earned their place as integral tools in the American military inventory as faithful defenders of democracy.

Perception is Everything: Repairing the Image of American Drone Warfare

The future of American military supremacy is growing increasingly dependent on the continued dominance of unmanned warfare. The flagship of this rapidly expanding arena is the Unmanned Aerial Vehicle (UAV), which has taken center stage in the Global War on Terror under the internationally popular Obama Administration.¹ The inherent risk of deploying UAVs in combat is that the global perception will turn against them if they are seen as intelligent killing machines capable of taking life without the input of human morality. This fear is already taking shape with some policy commentators who believe the adoption of these faceless terminators will disconnect the American military from the “painful exercise” of taking human life while decision makers are shielded from “the inevitability of death and destruction” of their own forces, which has long been a motivating factor in bringing conflicts to a conclusion.² On the home-front, a majority of Americans (approximately 65%) remain supportive of the technology due to its protection of American lives.³ However, other countries are largely opposed to the increasing use of drones and have begun to act on their fears to counter American interests.⁴ To maintain the security of the American people, the history of UAVs in

¹ Richard Wike, Jacob Poushter, and Hani Zainulbhai, "As Obama Years Draw to Close, President and U.S. Seen Favorably in Europe and Asia," Pew Research Center's Global Attitudes Project, June 29, 2016.

² Pam Bailey, "Assassination Drones: A New Type of Warfare," *The Washington Report on Middle East Affairs* 32, no. 1 (Jan. & Feb. 2013): 1.

³ Jacquelyn Schneider and Julia Macdonald, "U.S. Public Support for Drone Strikes," Center for a New American Security, September 20, 2016.

⁴ "Global Opposition to U.S. Surveillance and Drones, but Limited Harm to America's Image," Pew Research Center's Global Attitudes Project, July 14, 2014.

combat must be taught to the global community to normalize their use and ensure the continued growth of the weapons in the future.

Much of the consternation in the world is due to a lack of information about the history of their new defenders, naturally leading to their fear of the unknown. Yet the perceived reality could not be further from the truth of the U.S. military's long tradition of unmanned warfare. While the creation of a solution to the world's concerns will be an arduous journey, a foundation of trust must be laid before drones' current involvement in modern conflicts can be evaluated with any certainty. Once accomplished, the discussion on current events can be made with an eye bent towards improving their use rather than deciding if drones must still fight to earn their place on the battlefield.

Flyover of the Past

UAVs have been developing nearly as long as mankind has flown the skies, with the first attempts at creating radio-controlled airplanes starting in the late 1910s.⁵ From these humble beginnings as little more than guided bombs attempting to prove the viability of the concept, UAVs faced a winding road to adoption by the U.S. military as the promise of the technology competed against economic realities demanding tangible breakthroughs. Yet in the late 1930s, when the clouds of war gathered over Europe once more, America again turned to UAVs to save the lives of its pilots as they struggled to break through Nazi Germany's air defenses. While not a great strategic success, the fruits of this labor paid off in World War II with Operation Aphrodite solidifying the place of drones as a viable area of research within the minds of military elite and bought

⁵ Paul J. Springer, *Military Robots and Drones: A Reference Handbook* (Santa Barbara, CA: ABC-CLIO, 2013), 9.

the concept time to mature through the opening years of the Cold War.⁶ By the time of the Vietnam War, when American forces were caught between a tenacious enemy and an unsupportive homeland, drones were able to provide vital reconnaissance to the Air Force by taking the place of vulnerable manned aircraft on dangerous missions.⁷ However, with the withdrawal of American forces from Southeast Asia, Congressional budget committees once again closed drone research until the conflicts of the 1990s “placed an increased importance on aerial surveillance and dynamic forms of targeting.”⁸

Not until the Gulf War showcased the power of precision guided munitions (PGMs) did the idea of machines fighting side-by-side the living earn a stable place in the inventory of the U.S. military. With this most recent piece of the modern combat drone’s evolution securing a place for them in active combat zones, UAVs have entered a golden age in their history, with systems operating in every sector of the battlespace.⁹ The current issues faced by the drone force are no longer focused on preserving its right to survive. Rather, there are now a host of questions regarding the creation of a robust logistical chain to sustain them, and a great debate rages on how to properly utilize the weapons in the 21st century. These twin problems of how to properly integrate this “disruptive technology” into the arsenal of democracy have left the military searching for

⁶ Paul G. Gillespie, *Weapons of Choice: The Development of Precision Guided Munitions* (Tuscaloosa: Univ. of Alabama Press, 2006), 28-29.

⁷ R. C. Hall, "Reconnaissance Drones: Their First Use in the Cold War," *Air Power History* 61, no. 3 (2014): 23.

⁸ Ian G. R. Shaw, "Scorched Atmospheres: The Violent Geographies of the Vietnam War and the Rise of Drone Warfare," *Annals of the American Association of Geographers* 106, no. 3 (2016): 700

⁹ Member 30091762, "Marines Test New Futuristic Equipment," *Military.com*, July 18, 2016.

the best means of securing continued public support, so it may fully exploit the advantages of unmanned aircraft in the defense of the nation.¹⁰

As drones continue to draw more of the global community's attention during military action and America's armed forces find new ways to benefit from the ever-increasing capabilities of UAVs, the consensus on drone warfare will likely continue to polarize giving rise to further calls for the curtailing their use. To preserve the unmatched potential of these weapons and ameliorate the public's fear of their dangers, an era-by-era analysis is necessary to acquaint both the American people and global community with UAVs historic service alongside the U.S. military.

Drones Search for a Home

First World War: Aerial Torpedoes

As the United States was drawn into the First World War, the federal government attempted to catch up the fledging military to those of Europe by harnessing the scientific and intellectual capabilities that had propelled America through the Industrial Revolution. Formed into a series of war boards which directed the production of military equipment, titans of research and industry became critical members of the fight to make the world safe for democracy. Among these early twentieth century warriors was Charles Kettering, the head of industrial research at General Motors.¹¹ In an effort to overcome the heavily fortified static defenses of the Western Front, Kettering began developing the

¹⁰ Bernard Rostker, *Building Toward an Unmanned Air System Training Strategy* (Santa Monica, CA: RAND, 2014), 7.

¹¹ Jimmy Stamp, "Unmanned Drone have been Around since World War I," *Smithsonian Magazine: World War I: 100 Years Later*, February 12, 2013.

first UAVs, affectionately nicknamed the “Kettering Bug,” for the U.S. military.

Designed to be a simple, cheap, and precise alternative to increasingly dangerous manned bombing raids, the most basic materials were used as a cost saving measure due to the intentional design of the Aerial Torpedoes’ mission demanding the sacrifice of the aircraft as it crashed into the enemy.¹²

Equipped with hand-wound control systems to keep them on a pre-planned flight path and an explosive payload of 180 pounds, the research program showed the promise needed for full production to be approved. However, the end of the Great War came before the Bugs could reach the front lines, and America returned to her isolationist tradition bringing many of its wartime projects to an end, including the Aerial Torpedo.¹³ However, this early drone program opened the door for future UAV research and soon the U.S. military sought to test more innovative designs. Through the early years of the inter-war period, the quest for a reliable remotely piloted vehicle (RPV) continued, but “one technological bottle neck after another emerged” to stand in the way of progress.¹⁴ Eventually, the Great Depression forced budget cuts to developmental programs that were failing to meet their goals on time. The Aerial Torpedo project found itself in the crosshairs of these budget saving measures pushing unmanned research to the side until the economy recovered and the rise of Nazi Germany triggered renewed interest in war preparation.¹⁵

¹² Ibid.

¹³ Ibid.

¹⁴ Gillespie, *Weapons of Choice*, 21.

¹⁵ Ibid., 15-21.

Second World War: Project Aphrodite

In 1938, RPVs finally broke through the technological bottlenecks with the first successful landing of an unmanned monoplane and captured the attentions, and pocketbooks, of the military once again.¹⁶ This revived development began to pay dividends during the Second World War and finally advanced RPVs to the point of combat viability. Under the guidance of General Carl Spaatz, the “overall commander of U.S. Army Strategic Air Forces,” and General James “Jimmy” Doolittle created a more advanced version of aerial torpedoes to augment the bombing efforts of manned units. Called Operation Aphrodite, the program took “war-weary” B-17s and repurposed them as high-tech descendants of the Kettering Bug. Piloted through take-off by a volunteer crew who would bail as soon as the aircraft reached a sustainable altitude, a chaser airplane would follow the Aphrodite remotely guiding the plane on a terminal impact course with potential targets.¹⁷

However, when used in its intended role of striking hardened targets too dangerous for manned missions, the drone strike craft were abject failures, with only a handful of the RPVs actually reaching their target and even fewer achieving meaningful impacts. In response to this failure, General Doolittle advocated for the remaining planes to be turned “loose to land all over Germany so that the Germans would be just as afraid of our war weary planes on account of not knowing just where they are going to hit, as are the people in England from the buzz bombs and rockets.”¹⁸ This shift from a

¹⁶ Ibid., 24-25.

¹⁷ Ibid., 28-29.

¹⁸ Ibid.

precision strike tool to general destructive weapon system marked a terrifying but necessary conclusion to the military's outlook on RPVs. Although it did not benefit the overall strategy for the bombing campaign in Europe, drones were no longer looked at as wonder weapons augmenting a larger mission.¹⁹ They were now positioned to develop into an independent system of weapons capable of undertaking a great host of missions, tailor-made to their specific strengths without worrying about the need to fill the same roles as manned systems.

End of an Era: Beginning of the Cold War

After World War II came to a close, the attention of military procurement shifted to the task of containing the Soviet Union. Knowing it could not match the Soviets in a direct confrontation on the ground, the U.S. military worked to build force multipliers which would allow them to match the overwhelming numbers of the Warsaw Pact's armies.²⁰ A primary focus of this development was the creation of precision guided munitions to replace the imprecise carpet bombardments of World War II. This provided two benefits to the development of the automated force. The first being the additional need for aerial photography to provide better targeting information for the new weapons. The second further refined the radio control systems which guided unmanned flight.

Through this embryonic era of drone warfare, the primary concern of the program was ensuring drones had a place on the battlefield. The initial goals for the new UAV were low and only sought to bring the technology onto the battlefield as one-shot

¹⁹ Gillespie, *Weapons of Choice*, 29.

²⁰ Seymour J. Deitchman "Weapons, Platforms, and the New Armed Services," *Issues in Science and Technology* 1, no. 3 (1985): 83.

solutions to temporary problems. However, the precision needed to turn the suicidal devices into effective weapons was long in development. Once the technology had caught up to the dreams of the military, research quickly turned to shaping the new weapons into sustainable platforms to manage a wider range of missions, many which served as the precursors to the modern drone's mission of Intelligence, Surveillance, and Reconnaissance (ISR). These developments would be given opportunity to mature during the Vietnam War.

Southeast Asian Containment: Lightning Bugs

In the initial stages of American involvement in Southeast Asia in the 1960s, the U.S. government's first priority was the containment of hostilities, leading to limits on the amounts of boots on the ground. Yet the Air Force still needed to know how the Communist North planned to defend itself from incoming air strikes. Strategic Air Command (SAC) provided an answer for this issue in the form of the 4080th Strategic Wing, a hybrid unit of unmanned surveillance systems and the venerable U-2 Dragonlady.²¹ Freshly equipped with the unmanned Ryan Model 147 Lightning Bug and its human controlled DC-130 motherships, the men and machines of the 4080th were deployed to Kadena Air Base, Okinawa and Bien Hoa Air Base, South Vietnam.²² As the newest model of unmanned aerial vehicle, the 147s were equipped for a host of mission profiles. The most common included a camera suite designed to capture the positions of anti-air defenses or document the damage caused by an airstrike. Other versions actively

²¹ Hall, "Reconnaissance Drones," 24.

²² William Wagner, *Lightning Bugs and Other Reconnaissance Drones* (Fallbrook, CA: Aero Publishers, Inc., 1982), 54.

hunted surface-to-air missile (SAM) sites with “‘sniffer’ payloads,” ran interference with “electronic countermeasure (ECM) packages that actively jammed SAM radars, or [carried] pods that dispensed metallic chaff to passively jam radars.” Later wartime developments would see 147s “transmit real-time TV images to a DC-130 mother ship that loitered off the coast.”²³

Set loose from their motherships, the eclectic swarm of 147s scoured the skies of Vietnam, Laos, and China successfully completing thousands of missions against the communist forces. Despite being the first *en masse* deployment of unmanned vehicles to the battlefield, the 4080th was able to perform at exceptionally high level, recovering about 85% of all drones sent out, including those shot down by enemy defenses.²⁴ This success was built on the foundations laid by Kettering’s Bugs and Aphrodite. Much like the Bugs, the 147 was launched from a rail, albeit a flying one mounted beneath the wings of its mothership, and was preprogrammed with a flight path over hostile airspace.²⁵ Upon completion of its task, the 147 was able to improve over its predecessors’ terminal recovery program with a secondary remote piloting function which would activate once a 147 was over friendly airspace. Rather than the simple point-and-shoot controls of Aphrodite, the fine tuning of the intervening decades enabled great enough control of the now remotely piloted vehicle to bring the intelligence collected safely to the ground. As the war progressed, and more of Southern Vietnamese territory became compromised, additional precautions were taken to ensure the safe

²³ Ibid., 23-24.

²⁴ Ibid., 27.

²⁵ Wagner, *Lightning Bugs*, 129.

recovery of the 147s' precious cargo. The 4080th's aircraft inventory was expanded to include heavily modified CH-3 helicopters which acted as a flying arrestor cable, snatching the parachute of the 147 before it ever touched the ground.²⁶

Building Trust

With these combined improvements, the U.S. Air Force began to rely more heavily on the unmanned aircraft program for surveillance of enemy positions and the sheer volume of the required sortie rate could not be met by the small force of the 4080th. In the summer of 1966, the Air Force reorganized the 4080th Strategic Wing as the 100th Strategic Reconnaissance Wing to better integrate the aforementioned trio of flying systems into an effective fighting unit.²⁷ Now split into two separate squadrons, the 349th Strategic Reconnaissance Squadron (SRS) dedicated to manned U-2 operations and the 350th SRS strictly to unmanned operations, the 100th was ready and able to meet the increasing demands of the East Asian theater, with peak performance coming in 1969, flying 437 missions of all kinds.²⁸ Much of this increase could be credited to activity on the tense Korean Peninsula which threatened to open a second front in the Asian theater. In April of 1969, North Korean fighters shot down an EC-121 in international waters over the East China Sea killing all 31 crewmembers in an attempt to blind American surveillance of their territory.²⁹

²⁶ Hall, "Reconnaissance Drones," 25.

²⁷ Ibid., 24-25.

²⁸ Wagner, *Lightning Bugs*, 190.

²⁹ Mobley, Richard A. "EC-121 Down!" *United States Naval Institute Proceedings* 127, no. 8 (08, 2001): N/A.

Unwilling to lose any more lives or further antagonize another communist power in the East, the Pentagon ordered the cessation of all manned operations in the area.³⁰ However, the Korean Peninsula could not be left unmonitored and the battle tested unmanned machines were brought forth once again to augment the forces in the region. Under the operational name Combat Dawn, the men of the 350th modified some of their Lightning Bugs from their boom-and-zoom raid configuration into long endurance platforms capable of maintaining lasting orbits around the East China Sea.³¹ This drastic shift in operational capacity was accomplished by jerry-rigging the 147s with additional drop-off fuel tanks and installing more efficient engines, allowing the newly christened 147TE/TFs to effectively operate in their expanded area of operations.³²

Through this continual trial by fire, the Lightning Bugs met every challenge that was thrown at them and passed with flying colors.³³ The successes on the strategic level of operations even paved the way for the recognition of unmanned vehicles' potential in the Tactical Air Command (TAC) to support its air superiority missions. The primary desire of TAC was to provide a "loyal wingman" for their reconnaissance planes scouting ahead of incoming strike groups. To this end, in late 1968 sixty-seven 147s equipped with electronic counter measure pods and chaff dispensers were purchased by TAC.³⁴ The intended purpose of these distractions was to fly directly into the teeth of enemy

³⁰ Hall, "Reconnaissance Drones," 25.

³¹ Wagner, *Lightning Bugs*, 166-172.

³² Hall, "Reconnaissance Drones," 25.

³³ Shaw, *Scorched Atmospheres*, 700.

³⁴ Hall, "Reconnaissance Drones," 26.

defenses, triggering their activation and drawing the first salvos of missile fire away from the manned fighters. Once the enemy positions had revealed themselves, manned Suppression of Enemy Air Defenses (SEAD) fighters were to follow and eliminate the now vulnerable and unarmed launch vehicles. However, this potentially revolutionary breakthrough of manned and unmanned aircraft flying side-by-side into combat proved to be too technically demanding to impact the rapidly concluding war in Vietnam in a meaningful manner. With repeated setbacks during training that prevented the new unit from entering the South East Asian Theater, the combat deployment of drones was once again the target of post war budget cuts.³⁵

Unwilling to risk the total loss of their drone program that occurred with the cessation of previous wars, the budgetary rivals in SAC and TAC found themselves reaching a mutually beneficial compromise.³⁶ TAC adopted the SAC's remaining squadrons of Lightning Bugs and reformed them as the 11th Tactical Drone Squadron. This provided justification for continued funding of experimental research in support of the politically more attractive air superiority mission, while still allowing the Air Force to retain the experience of its Intelligence, Surveillance, and Reconnaissance (ISR) personnel in case the SAC missions would need to be reactivated. Yet even through this agreement, the Air Force was only able to sustain unmanned research until 1979 when the stresses of the fractured political climate forced the military into soul-searching downsizing.³⁷ The failure of technology to produce high-profile results in the "loss" to a

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ibid., 27

technically inferior North Vietnam brought the final chapter of early drone history to an ignominious end with the shuttering of “all Defense Department drone activity until late 1981” when Congress reallocated funding to basic unmanned research once again as the promise of drones taking the place of human beings in dangerous situations proved too tempting to let rest for long.³⁸

Drones Reborn

Humans Lead the Way

While the lessons learned through the first sixty years of drone warfare were critical to the development of drone systems as a whole, one additional element was needed for unmanned aircraft to make the jump from being a useful tool under forgiving circumstances to a fully armed and operational weapons platform. While drones could be piloted remotely, the distance created a communication delay which prevented the effective use of unguided weapons, necessitating the development of a weapon which could track a target on its own. The first major use of Precision Guided Munitions (PGMs) was in Vietnam and the systems came into prominence during the First Gulf War.³⁹ But due to the lack of deliberate development, the U.S. military only had a limited number of drones in experimental squadrons, with none ready for operational use leaving manned systems to carry the risk of demonstrating the uses of the new smart weapons.⁴⁰

³⁸ Ibid.

³⁹ Gillespie, *Weapons of Choice*, 96.

⁴⁰ Rostker, *Unmanned Air System Training Strategy*, 1.

The first opportunity to implement the lessons of Vietnam was in the First Gulf War. The Iraqi army which chose to present itself for battle against the newly equipped U.S. military was ranked fourth in the world for raw manpower, well-equipped with Soviet surplus armament, and hardened in battle during the recent Iraq-Iran conflict. The expectation was for a bloody tank duel in the deserts of Kuwait.⁴¹ In truth, the war proved to be a total rout of the Iraqi military. Before the coalition's tanks raced across the open deserts of Iraq, the US Air Force and its allies obliterated any potential for organized resistance through a torrential forty days and nights of aerial bombardment. Systematically, the coalition air strikes cut through the "five centers of gravity" which a modern state relies upon to endure as a functioning entity. Destroying these five centers, "leadership... infrastructure and supplies... transportation... the enemy population, [and] the fielded military forces," left the Iraqi state a broken husk unable to defend itself against the advance of the coalition ground forces.⁴²

The miniaturization of global positioning technology and maneuvering systems cheap enough to mount on standard issue gravity bombs enabled this catastrophic campaign. Combined, these new technologies permitted "remarkably few" instances of civilian casualties despite the enormous weight of fire poured into the Iraqi positions.⁴³ Learning from the lessons of Vietnam, the coalition air forces first targeted the command and control networks of the Iraqi's integrated air defense system (IADS), allowing their

⁴¹ Gillespie, *Weapons of Choice*, 123.

⁴² Martin L. Cook, "Applied Just War Theory: Moral Implications of New Weapons for Air War," *The Annual of the Society of Christian Ethics* 18 (1998): 207-208.

⁴³ *Ibid.*, 210

strike groups to operate freely in enemy airspace.⁴⁴ Without the unmanned drones of Vietnam which could trick the missile batteries into lighting up their positions with no threat to human pilots, the US Air Force relied on F-117 stealth bombers and Wild Weasel SEAD fighters to slip past the radar screen and knock out the command posts with improved laser-guided bombs (LGBs) and high-speed anti-radiation missiles (HARMs).

Next, came wave after wave of strike aircraft laden with PGMs guided by software programmed to lock onto pilot designated targets and adjust their glide path until impact, finally delivering on the potential the aerial torpedoes foretold. These waves worked their way up the “concentric circles” of targets, destroying the Iraqi forces in the field piece-by-piece. As more and more of the logistical arm backing the Iraqi military was torn away, the increasingly exposed troops on the ground began to face their own reckoning at the hands of the Coalition’s angels of death. Primarily targeting the backbone of the Iraqi Army, the elite Republican Guard, air strikes again focused on command and control elements of their targets, sowing confusion among the enlisted ranks which hampered the deployment of highly concentrated armored elements. This campaign served to shatter the morale of Iraqi forces and made the unfortunate survivors easy prey for the onrushing liberation army.⁴⁵

⁴⁴ United States, GAO, *Operation Desert Storm: Evaluation of the Air Campaign*, N/A, 205-206.

⁴⁵ *Ibid.*, 194-204.

Potential Realized

From this stunning victory, elements of the American military drew two conclusions. First, that air power had at last matured to the point of being able to win wars “cleanly” by bombing the enemy into submission and requiring only a limited number of ground forces for short-term mop-up operations. Second, that *this* kind of war was what the American military was meant to fight. American soldiers did not need to spend a decade far from home trying to fight another government’s war which its own people did not support. Furthermore, America’s soldiers could be shielded from the horrors of combat by wrapping them in a cloak of technology evermore removed from the battlefield. Rather than the repeated drawdowns seen after previous conflicts, the United States renewed its interventionist policies on the world stage as it searched to use its new restrained form of warfare to usher in a new age of peace. However, this promise of true peace through human action was soon cast into the dust bin of history with the fall of the Twin Towers and the commencement of the ongoing War on Terror.⁴⁶

Between the 1991 Gulf War and the opening of the War on Terror in 2001, drones became a prominent thought piece with several concurrent programs being developed to enter the fighting force. Largely seen by procurement officers as a successor to the Lighting Bug ISR role, limits to the initial procurement plans left few unmanned aircraft ready to serve in the opening years of Afghanistan through the drive to Baghdad.⁴⁷ However, as the demands of ongoing counter-insurgency operations began to grow ever

⁴⁶ Springer, *Military Robots and Drones*, 28.

⁴⁷ Rostker, *Unmanned Air System Training Strategy*, 1-3.

higher, the U.S. military began to act on its revived fondness for technological solutions to human problems.

Rapid Equipping Force: Rushing a Solution

As the primary service on the ground, the Army took the lead in securing new equipment for the occupation forces in the Middle East. By activating the “Rapid Equipping Force” and endowing it with the power to answer the needs of field commanders with purchases of immense quantities of experimental gear directly from defense contractors, the Army hoped to provide their forces in combat zones with advanced technologies to hold the line against insurgents.⁴⁸ One of the more common requests was for more drone support. Requests of all types poured in, for small hand-held units to serve individual platoons in need of an eye in the sky, to battalion requests for consistent loitering scouts and artillery observers. The Air Force even requested independent strike aircraft which could accompany larger units beyond the secured green zones.⁴⁹ Through this rapid purchase of drones directly by field commanders, the military was able to field an effective force of ISR and strike aircraft in a timely fashion by side-stepping the long procurement process traditionally associated with the adoption of new systems.⁵⁰ Rather than suffer the issues of repeated reorganization, inactivation, and testing which delayed previous generations of drones from making it to the battlefield, the commander in theater reported their needs directly to weapons manufacturers who could craft solutions from preexisting equipment tailored to emerging

⁴⁸ Ibid., 11.

⁴⁹ Ibid., 7-13.

⁵⁰ Ibid., 9.

needs. However, this rapid increase in the number and importance of UAVs created two unfamiliar problems for the drone force.

The first issue is how the sudden growth can be maintained as the ever-increasing numbers of systems strain the ability of the airframes to operate at the tempo needed to meet the needs of the ground forces. Previous generations of drones had always been short term solutions to specific problems, such as the Lightning Bugs in Southeast Asia, and their lifespans cut short before the drone fleet was in need of an overhaul. Now, drones had been moved to the forefront of military planning and need to be sustained for much longer periods. The second issue is that drones are not only at the forefront of the military's attentions, but they are drawing the attention of the public for the first time in their long history and face the piercing questions of public perception; subjecting their use to a great debate over their ethical implications.

Burden of Success

Sustaining the Mission

The simpler of the two issues is the lack of a dedicated support structure for the increasingly complex and valuable UAVs. Whereas most new weapons system replace or augment already extant equipment allowing for funds to be reallocated to the new more capable system, drones are filling roles that are only met by "good enough" solutions forcing the creation of a new set of logistical networks to maintain a fully functioning and independent weapon, leading to the view that drones are a "disruptive technology."⁵¹ Much of this disruption is caused by the sheer scale of their integration on

⁵¹ Ibid., 7.

the battlefield. In 2000, the Department of Defense operated less than fifty UAVs. By 2012 there were more than 7,100 fighting alongside American men and women.⁵² As each of these systems comes online, the required logistical footprint of a unit goes up. New maintenance staff are needed to keep the drones in the air; the unit must go through additional training to understand the proper employment of the system; and the actual pilots must be recruited and trained to operate it.⁵³

Both the doctrine of the military and the increasing importance of aerial warfare have adjusted the mindset of procurement planners to see UAVs as an absolutely vital aspect of future warfare. But, there is a distinct lack of development in the support structure off the field of battle. As one “senior civilian in the Department of the Air Force” bluntly put it “when asked about the plan for all the personnel pouring into the Air Force’s Predator and Reaper programs when the wars [Iraq and Afghanistan] wound down, [he replied] ‘there is no plan.’”⁵⁴ This admission reveals no plan for meeting basing requirements of the airmen, nor integrating the aircraft into existing units, nor the sustainment of an entire new class of equipment.

This lack of future planning has already begun to negatively impact the forces being deployed. Even with the swarms of UAVs being purchased, the supply cannot keep up with the demands of combatant commanders, forcing individual UAVs to fly

⁵² Ibid., 1.

⁵³ Ibid., 15-23.

⁵⁴ M. Shane. Riza, *Killing Without Heart: Limits on Robotic Warfare in an Age of Persistent Conflict* (Washington, DC: Potomac Books, 2013), 9.

double or even triple their planned sortie hours as standard practice.⁵⁵ Without proper support staff, this is burning through the lifespan of the airframes⁵⁶. Furthermore, in a survey of commanders asking for needed improvements for air bases operating drones, the two common factors across the force were simple requests for the right to operate their aircraft in their own airspace without filing for special permission just because it is an unmanned flight and adequate storage space to house the drones during maintenance times.⁵⁷ The solution to this lack of material support requires extensive work in construction programs, bureaucratic streamlining, and personnel recruitment. These issues have already been highlighted and significant funding redirected to swiftly bring answers. Far more damaging to the status of UAVs in the military is the media war being waged against drone operations by insurgent forces and members of the global community outraged by the sudden bursts of destruction unleashed in recent counter-insurgency (COIN) operations.

Targeted Killings

Without the general knowledge of the long history which has given UAVs the ability to emerge onto the world stage today, the common view of drone warfare is slowly turning against their continuing use. In the midst of the convoluted War on Terror, this has resulted in an overabundance of coverage, but not for the primary, uninteresting, mission of ISR. Rather, focus is on the far more clandestine role they have played in the elimination of terrorist combatants outside of declared war zones. The first

⁵⁵ Rotsker, *Training Strategy*, 13.

⁵⁶ *Ibid.*, 13-14.

⁵⁷ *Ibid.*, 32-34.

publicly avowed “killing by armed drones occurred in November 2001,” with the death of Mohammed Ater, the top Al-Qaida military commander in Afghanistan at the hands of a newly weaponized MQ-9 Predator.⁵⁸ This action was not taken by a military drone but by a secondary drone force under the direction of the CIA. Such paramilitary operations act as the clandestine backstop for terrorists who escape the reach of the military forces authorized to act within combat zones.

By reaching beyond the permitted range of the military, these drones perform a vital task of denying terrorist groups precious time to regroup in safe havens outside the bounds of a civilized government’s control. While it is difficult to get clear numbers (as the official policy of the U.S. government is to deny any comment on the program), the degradation of terrorist groups’ combat ability these strikes achieve cannot be denied. From 2004-2012 the CIA executed about 350 drone strikes in Pakistan, killing about 9 people per strike, in Yemen 40-50 strikes eliminated somewhere between 300-1000 targets, and 3-9 strikes in Somalia resulted in 58-170 kills.⁵⁹ In these totals, the vast majority of dead were reported to be known terrorists and their associates.⁶⁰ However, to maintain a constant application of pressure on the fluid command chain prevalent among the groups, less restrictive rules of engagement were adopted by the CIA. Called

⁵⁸ Kenneth R. Himes, *Drones and the Ethics of Targeted Killing* (Lanham, Maryland: Rowman & Littlefield, 2016), 11.

⁵⁹ Michael J. Boyle, "The Costs and Consequences of Drone Warfare," *International Affairs* 89, no. 1 (2013): 5.

⁶⁰ *Ibid.*

“signature strikes,” the policy targeted “patterns of life” which gave the appearance of terrorist activity rather than acting on concrete intelligence.⁶¹

Though this tactic is undoubtedly effective at killing, the tradeoff for this increased killing potential is that there are no friendly ground troops in the area to explain the need for the strike to the local populace. The U.S. Army’s counterinsurgency field manual warns “if military forces remain in their compounds, they lose touch with the people, appear to be running scared, and cede the initiative to the insurgents.”⁶² This is occurring with the unsupported targeted killings and has allowed insurgent forces to shape the narrative in the immediate area and around the world through increasingly accessible internet media systems, turning many formerly complacent civilians into active insurgents in response to the drone bombings.⁶³ The end goal of these targeted killings is to impair the operational capacity of insurgencies and strengthen the governments of allied powers within the region, but it is becoming increasingly difficult to convince populaces under the constant threat of an unseen enemy disrupting daily life with bouts of random violence that there is any difference between American tactics and the local warlords.⁶⁴ There is no easy solution for this dilemma. If the targeted killings are halted wholesale, the enemy is given opportunity to regroup and handed additional legitimacy for their actions by being acknowledged victims of a newly disavowed unjust

⁶¹ Bailey, "Assassination Drones," 2.

⁶² Ensign Samuel Lacinski, “Unmanned Ethics”. *U.S. Naval Institute Proceedings* 141, no. 9 (September 2015): 37.

⁶³ Boyle, “Cost and Consequences,” 11.

⁶⁴ Azmat Khan and Anand Gopal, "The Uncounted," *The New York Times*, November 16, 2017.

practice. If the strikes continue, it will promote “a feeling of anger that coalesces the population around the extremists,” invalidating the entire operation and prolonging the conflict.⁶⁵

Search for Answers

Price of Impunity

The lack of clarity in the strategic picture gives room for anti-drone analysts to argue against the expanding reliance on UAVs ever increasing operational capabilities. While the opposition does not argue against technology in war at large, they are worried that technology is advancing to the point where it is possible to create a UAV with the processing power to remove humans from the decision processes governing its lethal duties, essentially dehumanizing warfare and leading to a further disconnect between the warfighter and the situation developing on the ground.⁶⁶ A potential paradigm shift of such magnitude is not around the corner of future UAV development, but it is on the horizon and drawing closer with every advancement in computing technology. Despite its relative distance from the present, this fear of humanity allowing technology to hold the power of life and death over the living is an exceptionally real issue which is a focal point for questioning the morality of killing with impunity and the effects it has on the decision process in the use of force.⁶⁷

⁶⁵ Lacinski, “Unmanned Ethics,” 35.

⁶⁶ Riza, *Killing Without Heart*, 5.

⁶⁷ Megan Braun and Daniel R. Brunstetter. "Rethinking the Criterion for Assessing CIA-Targeted Killings: Drones, Proportionality and Jus Ad Vim." *Journal Of Military Ethics* 12, no. 4 (December 2013): 305.

This line of questioning does not dispute drones are an absolutely lethal military solution. Yet, the consistent sentiment behind every account speaking against the unrestricted use of drones in the American arsenal does not focus on the technical aspects of drones. The main thrust of the arguments showcases the loss of humanity both on the battlefield and within the decision-making process. Traditionally, the humans directly involved in the killing blow have always had final say in the execution of the order, always providing a built-in accountability for the decisions of policy makers and a human face to show the cost of victory or warn of defeat. A retired colonel writing about his service in Operation Northern Watch recounted the story of the first time he had to fire a missile in anger as an example of the continued need to for a human to remain “on the loop” for command decisions.⁶⁸ After being fired upon by an Iraqi SAM site, his years of combat training took over and he swiftly prepared to return fire and eliminate the future threat to his fellow pilots. Yet before he made the final and irrevocable choice to let a missile loose, he hesitated to pull the trigger as a “momentary flash of the consequences that lay under my right thumb and the red button it was tensely resting on” passed through his mind.⁶⁹ As drones have increased the distance between the battlespace and combatants, this clear symbol of humanity’s struggle to contain its self-made demons cannot be allowed to fade from the minds of decision makers preparing to place the lives of others at risk.

⁶⁸ Riza, *Killing Without Heart*, 9.

⁶⁹ *Ibid.*, 32.

The fear is that the use of drones will reduce the moment of hesitation across the whole chain of command leading to the final kill decision as they provide the American military an overwhelming advantage in protecting its own citizens from harm's way.⁷⁰ While this seems like it should universally be treated as a point in favor of their increased use, the opposition sees it as a grave threat precisely because of the sheer disparity of risk this introduces between warring factions. This "doctrine of double effect" which "argues the pursuit of a good end tends to be less acceptable when a resulting harm is directly intended rather than merely foreseen."⁷¹ Essentially, the argument sees the removal of the pilot from the battlespace as tipping the scales firmly in the favor of the aggressor in any risk/reward calculation for conducting an air strike.

In the total war of previous generations, this would be little cause for debate as the only combatants involved would be uniformed and clearly delineated as legitimate targets, forcing any unfortunate instances of collateral damage into the realm of acceptable risks. 21st century battlefields offer no such clarity. Every home is a potential pillbox. Every citizen a potential combatant. A simple pile of trash could hide an IED and every corner hides another set of eyes with an instant communication device calling in fire support. In such a chaotic and lethal battlespace, there is no efficient way for the warfighter to sort through all this information before making a snap decision to save their unit or slay an innocent bystander. Combined with the instant connection of the battlespace to the world's news outlets through social media, this creates an incredibly

⁷⁰ Braun, "Rethinking the Critetrium," 306-311.

⁷¹ Riza, *Killing Without Heart*, 54.

dangerous situation for the warfighter to navigate as every choice will be analyzed and judged by prying eyes safely out of combat.

Drones' promise of a detached observer granting the warfighter insight into the murky waters of the 21st century warfare is a double-edged sword which risks creating a false sense of security which will only promote conflict. Rather than limiting the damage of such situations by making it easier for warfighters to analyze the situation, the fear is that these situations will become more and more common, increasing the amount of collateral damage even as weapons become more precise. With a drone's ability to loiter over target areas and confirm the targets without risk to the lives of its pilot, the age-old considerations that go into the decision to use military force may begin to fade into the background of the all-important political debate. Instead of exhausting all reasonable options before making the fateful decision to engage in combat operations, the simplicity of unmanned warfare risks being too alluring for policy makers seeking to secure their own nation's interests without working towards a peaceful compromise which may be more difficult but will preserve lives.⁷²

Finding the Humanity in Robotic Warriors

An Approximate Reality

When presented with the choice between protecting her own citizens with a next-generation technology or exposing them to danger in order to preserve the lives of an enemy's own citizens, America's position was made clear most dramatically on August 6, 1945 with the bombing of Hiroshima and reaffirmed with deployment of stealth planes

⁷² Ibid., Chap. 4-7.

into the heart of downtown Baghdad. The solution will never be the abandonment of technological progress, that “genie has been let out of the bottle.”⁷³ The chief concern of the American people must now be focused on ensuring the decision to use military force is the last resort. Not only for the sake of her own people, but as the leader of the Free World, the United States must be the model for future drone operations in an ever more unstable world. The most common exposure for the rapidly automating force being COIN operations run to maintain stability across the far reaches of the world.

The key factor to consider is the scope of a twenty-first century COIN operations. The battlefield will not be restricted by lines on a map and wars will not be won by killing radicalized farmers who have never even seen the outside of their villages. Changing the perception of the local populace to view the insurgent forces as the agents which brought the wrath of the civilized world down upon them is a necessary component to achieving a lasting peace. To do this, there must be a greater visible commitment on the part of the American military to support the local populace in the aftermath of a drone strike.⁷⁴ By seizing the initiative and delivering a strong message of strength against lawless action, it will delegitimize the insurgent narrative that senseless violence is the only holy path to victory. To accomplish this, the U.S. must be willing to commit to a long-term military and economic presence in unstable regions with the end-goal of tying the local government’s interests to those shared by the United States such as integration into the global economy and ensuring regional security. A clean fast conflict,

⁷³ Boyle, “Cost and Consequences,” 28.

⁷⁴ Lacinski, “Unmanned Ethics,” 37.

like the first Gulf War, is not the norm and should not be assumed to be the outcome of a global superpower's operations against non-state actors and failing states. The role of drones in this style of generational conflict should be to act as the iron fist within the velvet glove of human interaction, reaching out to destroy threats when peaceful discourse fails.

The one definitive aspect of Unmanned Aerial Vehicles' future is they have finally secured for themselves an irrevocable place as a vital piece in America's military inventory. Though the path was fraught with pitfalls, setbacks, and defeat, no sword can be used in battle unless it is first tempered by fire. The aerial torpedoes of the World Wars paved the way for the coming revolution in aerial technology with early attempts at unmanned guided bombardment, ultimately developing into the Aphrodite bombers which earned the attentions of U.S. Army Air Force high command. Through hard won lessons and tedious research, drones were developed further in their fight alongside American forces over the skies of Southeast Asia, proving their worth as viable alternatives to manned aircraft on dangerous reconnaissance missions. After yet another military drawdown and interruption of unmanned research, UAVs had to patiently wait on another rebirth with the demonstration of complementary technologies in the Gulf War finally bringing about an unmanned weapon which could distance the living from the battlespace. Now entering the global stage as a rapidly maturing weapon system, the eyes of the world are fixed on UAV operations, fearfully scrutinizing their actions, expecting drones will live up to the high moral standards to which Americans hold their military forces. All indications from history show drones have earned their place as

integral tools in the ever-vigilant arsenal of democracy and will faithfully carryout this sacred duty.

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