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SEND IN THE DRONES!

ARE REMOTELY PILOTED AIRCRAFT CHANGING AMERICA'S
THRESHOLD FOR TURNING TO VIOLENCE?

by

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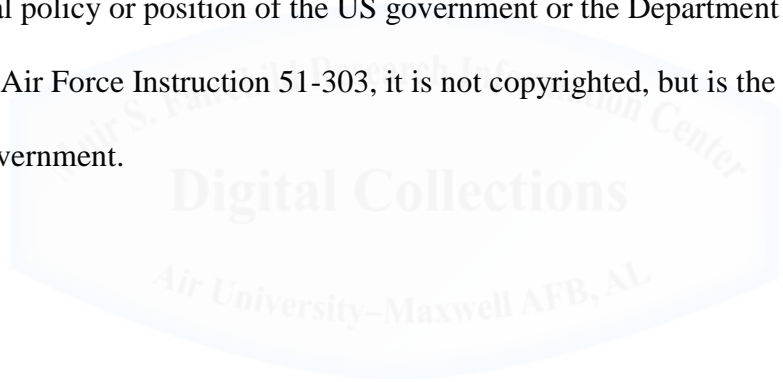


Table of Contents

Disclaimer	ii
Preface.....	iv
Abstract.....	v
Section 1: Introduction.....	1
Section 2: A Brief History of RPAs.....	2
Section 3: The Cases	6
Case Study Method.....	6
Case Summary: Cold War through Jan 2001 (Before armed RPAs).....	7
Case Summary: Feb 2001 through 2011 (After armed RPAs)	12
Section 4: Analysis	18
Case Analysis.....	18
Finding	21
Consequences.....	22
Recommendations.....	25
Section 5: Conclusion	28
Endnotes.....	29
Appendix A.....	32
Bibliography	33

Preface

As an Air Force pilot, I have flown combat missions in both fighter aircraft and remotely piloted aircraft (RPA). From an execution standpoint, both types employ lethal force in similar ways, looking through a very expensive digital camera at targets that disappear in a silent puff of smoke and debris. What is the difference, then, that motivates protestors to regularly pace outside the front gate of my RPA base while there were none at my fighter base? They hold signs that say things like “The Drones Can’t Hear the Groans” and “When Drones Attack, Civilians Die” insinuating that war is less personal and less precise when fought from thousands of miles away. In reality, based on my experience, warfare via RPAs is much more personal.

From the ground control station flying a remotely piloted aircraft I can watch the enemy wake up and make breakfast, play with his children, get into his car and shoot at coalition forces, die in a violent explosion, and be buried surrounded by mourners, all without running out of fuel. In a fighter I would show up after they had started shooting, bomb the enemy, and leave before their bodies were pulled from the rubble. In fact, I killed over twenty times more enemy fighters per combat hour in a fighter than I have in RPAs, so my initial impression was that the protestors were either uninformed or uncomfortable with this new form of warfare.

Over time, I began to wonder what differences there were, and through reading reports on RPAs I discovered a common concern that flying remotely somehow dehumanizes war, making leaders more likely to use military force as a means to achieve national policy. Many sources share this concern but none had studied recent conflicts to assess whether it is true, so I chose to find the answer for myself.

Abstract

RPAs have been in use for many years, but rarely made headlines until the US began using them in multiple countries to target individuals deemed to be threats. Media reports claim that RPAs make the US more likely to go to war because it seems easier and less messy, like a video game. Based on the comparison of US use of force abroad before and after RPAs were armed, the media have the answer, if not the reason, correct. The US is more likely to resort to violence now that leaders can call upon RPAs. The increased likelihood of turning to violence is not because RPAs are less messy, but because they can strike a target set that previous weapons were incapable of servicing, making more targets available and therefore more targets struck. The ease and low-visibility with which targets can be attacked has led to the US being less likely to exhaust all non-violent instruments of power before turning to violence. This reduced threshold for engaging in violent conflict has not gone unnoticed internationally, and RPA technology is now coveted by foreign armed forces. The threat of other countries developing RPAs and using them to counter US interests necessitates the protection of US RPA technology and the development of international agreements on acceptable use of RPAs.

Section 1: Introduction

It is well that war is so terrible – otherwise we would grow too fond of it.

--Gen Robert E Lee, Battle of Fredericksburg, 1862¹

Throughout human history, leaders have had to grapple with the question, “is it worth risking their lives,” when deciding whether to mount a military operation. Now, for the first time, leaders can project precise violence with little collateral damage, watch it all on a big-screen television, and complete the mission without an American getting closer than 1000 miles from the target. The game-changing invention to allow this was the remotely piloted aircraft (RPA). Rather than risking lives when considering a military response, American leaders can reach around the world and kill an enemy with impunity. At first glance this sounds ideal, but the ease with which violence can now be dealt can make it the most appealing solution in cases where diplomacy would have been the choice of the past. As the United Kingdom (UK) Ministry of Defense puts it:

It is essential that, before unmanned systems become ubiquitous (if it is not already too late) that we consider this issue and ensure that, by removing some of the horror, or at least keeping it at a distance, that we do not risk losing our controlling humanity and make war more likely.²

RPAs have changed the American threshold for engaging in violent combat. By allowing Americans to eliminate threats at arms length, the arming of RPAs has made violence a more likely response to threats than was the case when they were unarmed. This research used the exploratory case-study method to determine the threshold required to drive the US to violence before armed RPAs and compared it with the threshold required after armed RPAs. The cases referenced included initiation of violence, including the start of wars, from the end of the Cold War until the present.

Section 2: A Brief History of Remotely Piloted Aircraft

Unmanned aircraft are not a new invention. Although they rarely made headlines until recent years, there have been pilotless aircraft since the Wright brothers tested their gliders prior to climbing aboard. In the US civil war, both sides attempted to deliver explosive-laden unmanned balloons to the enemy. The Japanese revived this technique during World War II, when Japanese forces attempted to send similar balloons across the Atlantic to cause destruction in the United States.³

As aircraft technology developed, so did the technology related to unmanned aircraft, though usually in secret. In one of the first attempts at a precision strike RPA, the United States Army Air Forces (USAAF) modified B-17 bombers that had reached the end of their service life. The missions, dubbed Operation Aphrodite, involved stripping the B-17s of all excess parts such as seats, guns, and even canopies to save weight and then loading them with explosives. These aircraft could carry significantly more explosives than manned B-17s and could precisely strike heavily defended targets with reduced risk to pilots. The rudimentary remote control system was not precise enough for takeoff so the bombers, referred to as "Weary Willies," would take off with pilots aboard and the two-man launch crew would hand over control to the mother ship, another modified B-17 before bailing out.⁴ The crew aboard the mother ship then remotely piloted the RPA via a radio link that sent television images of the instrument panel and ground to the pilot, allowing it to be flown to the target. Based on the technological limitations present during World War II, these aircraft were not very successful, but they did pave the way for future remotely piloted aircraft. As General Henry "Hap" Arnold realized at the time: "If you can get mechanical machines to do this, you are saving lives."⁵

There were additional reasons to avoid sending manned aircraft over enemy airspace, even when not at war. In 1960 the Soviets shot down Francis Gary Powers in his U-2 on a reconnaissance mission over Russia.⁶ The ensuing international incident led to the end of U-2 flights over Russia and China and necessitated a different intelligence collection method. For a time, unmanned aircraft were the answer.

The Air Force contracted Teledyne Ryan to modify the design of the Q-2 (later called AQM-34) drones for reconnaissance use. The Air Force had used the drones, referred to as Firebees, since 1951 when they initially ordered them as aerial targets. Teledyne Ryan upgraded the Firebees with new navigation systems, cameras, increased fuel, and in some cases, electronic and signals intelligence collection packages.⁷ These aircraft were designated the Ryan model 147 or Lightning Bug. The modified aircraft flew more than 160 missions over China in the mid-1960s to assess their military capability. In 1964, a Fire Fly (a Lightning Bug relative) was shot down by China and made the front page of *The New York Times* but quickly faded out of public light, confirming that RPAs were a low-risk, high-payoff method of collection.⁸

Lightning Bugs once again proved useful in Vietnam by flying the missions deemed too hazardous for manned aircraft. The AQM-34 series was further modified to allow low altitude navigation and became one of the only means available for bomb damage assessment on poor weather days.⁹ The Lightning Bugs flew more than 3,400 sorties over Vietnam and China and are still in use today.¹⁰

As technology progressed, RPA programs came and went. Some were too complicated to make effective, others were plagued by cost overruns trying to reach unrealistic expectations. The AQM-34 program remained in development and progressed to the BQM-34, a multi-mission variant with a strike capability. The strike portion eventually ended in 1977 after multiple cost

overruns when the Strategic Arms Limitation Treaty II counted it against US cruise missile numbers; other versions are still flying.¹¹ Of note, before its cancellation, the BQM-34C successfully test-fired AGM-65 Maverick air-to-surface missiles nearly 30 years before the first employment of an AGM-114 Hellfire from a Predator.¹²

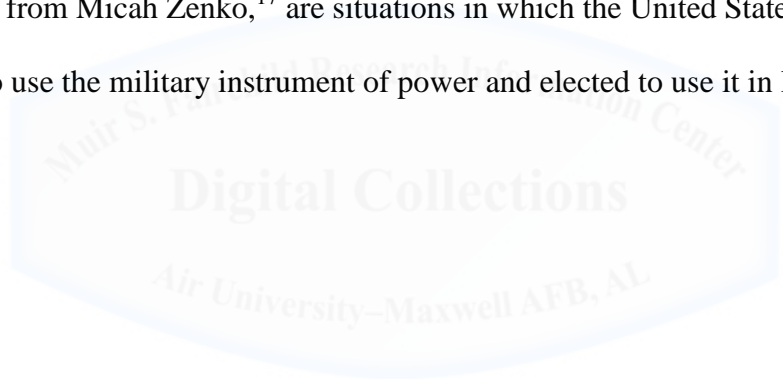
The 1980s brought a lull in US RPA development as the advent of stealth technologies reduced the risk to pilots on manned missions. During this time, the services went from desiring a “perfect” RPA that could do everything to wanting an “ok” RPA that could do some missions cheaply and well. The program meant to achieve this was called Amber and before it was cancelled it developed armed and unarmed predecessors to what is now the MQ-1B Predator. Following Amber’s cancellation the designer, Abraham Karem, continued marketing a runway-launched version and eventually sold his designs to a defense contractor who produced it as the Gnat 750 and sold it to foreign governments.¹³

When the US became involved in Bosnia, the Gnat 750 was funded and fielded as a quick reaction capability because it’s support infrastructure had already been established in foreign military sales to Turkey. As a result of that acquisition, the US upgraded the system to include synthetic aperture radar and satellite control allowing true over-the-horizon capability.^{14,15} The Air Force designated the new aircraft the RQ-1 Predator.

The RQ-1 was not perfect, but it provided the military and intelligence community persistent full motion video (FMV) coverage of targets that could be broadcast to commanders. Recognizing the utility of a persistent intelligence, surveillance, and reconnaissance (ISR) aircraft over potential targets, the RQ-1s were soon fitted with laser designators to lase targets for strike aircraft and used synthetic aperture radar (SAR) to image targets through clouds. After demonstrating their utility in Bosnia and Yugoslavia, the RQ-1 was again used in Afghanistan,

where it first had the opportunity to strike targets using the AGM-114 Hellfire missile.¹⁶ The success of the strikes and an insatiable demand for FMV on the battlefield led to the procurement of many more Predators and a fleet of its predecessor, the MQ-9 Reaper. The Reaper brought with it the capability to carry 500-pound bombs making RPAs capable of delivering the same firepower traditionally expected of manned aircraft.

RPAs have been involved in every major war since their inception, but the advent and widespread use of a reliable, precise, low-risk strike capability has led to a marked increase in their employment. This research analyzed their use in situations where the application of force was exacted for the purpose of achieving a political objective. These discreet military operations, to borrow a term from Micah Zenko,¹⁷ are situations in which the United States had the choice whether or not to use the military instrument of power and elected to use it in lieu of other means.



Section 3: The Cases

Case Study Method

This research used an exploratory case study methodology to analyze discreet military operations over two periods to determine whether a change in the threshold for the use of violence to achieve American objectives has occurred. The first time period was from the end of the cold war until February 2001, when RPAs were first armed.¹⁸ The second period was from February 2001 to December 2011 during which the use of armed RPAs became a hallmark of the United States' battle against transnational terrorist organizations. The analysis included the impetus for each military operation, the objective, the response, and the result. After determining these attributes for each operation, this research quantified the threshold that, when crossed, drove the United States to a violent response and to what degree that response was successful. By using many examples, this generalization offers insight into whether our threshold for violent conflict as changed, whether our objectives have shifted, and whether the likely response has changed.

Each case was analyzed using metrics summarizing specific attributes of the operation. The cases' metrics combine to form a generalized threshold that led to the US using violent force by providing a measurable comparison of each operation. Each metric was measured as "yes" if the following criteria were true:

Civilian Population Suffering: The local civilian population was suffering based on a problem that could have been mitigated through a military strike. For instance, a famine cause by militants preventing the dispersal of humanitarian aid.

UNSC Resolution: The operation was supported, mandated, or sanctioned by a United Nations Security Council (UNSC) resolution.

Individual Targeted Person: The operation was directed towards the capture or killing of an identified individual.

Direct Threat to US: The operation was intended to counter an immediate threat to the United States or United States citizens.

Diplomacy Failed: Diplomacy had been tried as a method to resolve the situation non-violently but failed.

Multinational Coalition: The operation was executed with the cooperation of another country other than the country in which the action took place.

US Casualties: The operation was a response to the death of US citizens.

Immediate Threat to US/Coalition Forces: The operation was intended to counter an immediate threat to US or Coalition forces.

Future US Threat: The operation was intended to preempt a potential long-term or general threat to the United States rather than a specific immediate threat.

RPA Weapon Employment: A remotely piloted aircraft employed weapons while conducting the operation.

RPA Required: Using a tool other than an RPA would or could have resulted in unacceptable consequences and therefore an RPA was required for the operation.

Case Summary: End of the Cold War through February 2001 (Before armed RPAs)

The following cases were instances of the use of violence by the United States from the end of the Cold war until the MQ-1B Predator was armed.

1991-2001, Iraq. On multiple occasions, US aircraft struck Iraqi targets in response to hostile actions taken by Iraqi forces. The impetus for these attacks was actions taken by Iraqi forces against US aircraft enforcing the Northern and Southern no-fly zones over Iraq. The

response included a range of tactics from engaging the location from which the threat emerged to striking pre-planned targets in response to a threat that met the rules-of-engagement for a violent response. The objective was to deter the Iraqi military from threatening coalition aircraft and to simultaneously degrade the Iraqi military; the degradation happened through attrition but the threatening actions continued in spite of the military response.¹⁹

1992, Somalia. Under the auspices of UNSC resolution 794, the United States led Operation Restore Hope with the objective of using “all necessary means to establish a secure environment for humanitarian relief operations in Somalia as soon as possible.”²⁰ The impetus for this operation was the death of 500,000 Somalis from famine, the threat of 1.5-million additional hunger-related deaths, and the inability to deliver them aid due to the civil war.²¹ The US military response to this situation was to send nearly 30,000 US military personnel along with 10,000 coalition personnel, which resulted in an end to the immediate threat of continued large-scale deaths due to famine.²²

1993, Somalia. In accordance with UNSC resolution 837, the US sent a 1,000-man Quick Reaction Force (QRF) and 3,000-man support force to Somalia to “take all necessary measures against those responsible for [attacks on UN forces] and to establish the effective authority of United Nations Operation in Somalia II (UNOSOM II) throughout Somalia.”²³ The impetus for the resolution was when Somali forces loyal to Aidid, a faction leader, killed 24 Pakistani peacekeepers investigating a suspected arms depot and inhibited the UN forces from accomplishing their mission of creating an environment suitable for peace. The objective of the actions was the capture or death of Aidid and his forces but when an operation went wrong resulting in 18 US soldiers dead and 78 wounded, the US ended the action leaving the mission incomplete.²⁴

June 1993, Iraq. The United States launched 23 Tomahawk cruise missiles at the Iraqi Intelligence Headquarters building in response to a plot to assassinate former President George H. W. Bush during his visit to Kuwait in April 1993. The impetus for this operation was the attempted assassination and the objective was to send three messages to Iraq: "We will combat terrorism. We will deter aggression. We will protect our people."²⁵ The attack resulted in significant damage to the Iraqi Intelligence headquarters.²⁶

February 1994, Bosnia. US aircraft participating in Operation Deny Flight in accordance with UNSC resolution 816 shot down four out of six aircraft that were bombing Bosnian targets. The impetus for the engagement was the violation of a UN sanctioned no-fly zone and the hostile activities of the opposing aircraft. The objective was to deter aggression and enforce the no-fly zone and the result was the remaining aircraft left the no-fly zone.²⁷

April 1994, Bosnia. United States aircraft bombed and strafed targets engaging UN forces in the city of Gorazde. The impetus for this operation was the threat to UN forces on the ground. It was carried out using a UN forward air controller and resulted in multiple enemy positions destroyed, unfortunately the overall threat remained.²⁸

August 1994, Bosnia. United States aircraft attacked Bosnian Serb Army troops who had stolen heavy weapons from a military exclusion zone. The impetus for the operation was the violation of the exclusion zone (and resulting threat to UN forces and civilians). The operation was executed using A-10s strafing armored vehicles with the objective of compelling the forces to return the seized weapons. As a result of the engagement, the weapons were returned to their original collection site.²⁹

September 1994, Haiti. The United States led a multinational coalition under the authority of UNSC resolution 940, which authorized "member states to use force to free Haiti of

military dictatorship and return Jean-Bertrand Aristide to power.”³⁰ The impetus for the operation included the military coup that overthrew the elected leader of Haiti, his use of violence to subdue the Haitian public, and the constant flow of Haitian refugees to US borders via boat. The response was the execution of Operational Plan (OPLAN) 2370, a military offensive to invade and secure Haiti through overwhelming force.³¹ This operation resulted in the military rulers of Haiti agreeing to a peaceful transition once US forces were airborne and about to commence the invasion.

November 1994, Bosnia. United States aircraft engaged the Serb-held Croatian base of Udbina as a response to attacks launched from that airfield on the Bihac area of Bosnia. The impetus for the operation was the attack on Bosnia in violation of UNSC resolution 958. The objective was to deter further violations from the Serbian forces. As a result of the operation, the airfield was damaged but hostilities continued.³²

September 1996, Iraq. As part of Operation Desert Strike, the US and UK attacked Iraq with 44 Tomahawks and extended the post-Gulf War no-fly zones to include parts of Baghdad. The impetus for this operation was the Iraqi seizure of the city of Irbil in the Kurdish safe area in support of one side of the ongoing Kurdish civil war, a clear violation of UN restrictions placed on Iraq following the Gulf War. The objective was to send a message that violations would not be tolerated and to force an Iraqi withdrawal from the Kurdish region. As a result of the airstrikes, the Iraqi forces withdrew.³³

August 1998, Afghanistan and Sudan. In Operation Infinite Reach the US used cruise missiles to attack camps in Afghanistan associated with Osama bin Laden’s terrorist organization and to attack a pharmaceutical plant in Sudan allegedly involved in producing precursors to VX nerve gas. The impetus was the bombing of the US Embassies in Tanzania and Kenya in which

12 Americans and more than 300 foreigners were killed. The stated objective was to disrupt further attacks against free people and the result was a destroyed pharmaceuticals plant and damaged terrorist camps in Afghanistan with the threat not eliminated.³⁴

December 1998, Iraq. Operation Desert Fox struck Iraqi Targets using aircraft and cruise missiles. The impetus for these attacks was the refusal of Iraq to allow UN weapons inspectors access to sites believed to be concealing weapons of mass destruction and the UN weapons inspectors inability to account for more than 32,000 chemical weapons.³⁵ As a result of Iraq's continued violation of agreements from the end of the Persian Gulf War, the US and UK executed airstrikes on targets within Iraq. The objective was to degrade Iraq's ability to make and use weapons of mass destruction and demonstrate the consequences of violating international obligations.³⁶ The operation set back the Iraqi weapons programs 1-2 years and killed 1400 Iraqi soldiers.³⁷

March 1999, Yugoslavia. NATO conducted an air campaign against Serbian forces engaged in violence against Kosovar Albanians. The impetus for this action was the use of disproportionate force by Serbian forces against the Kosovar Albanians in a conflict over governance of the region. Serbian actions caused 1.5-million Kosovars to be expelled from their homes with at least 5,000 being executed. NATO responded with a three-month air campaign that eventually forced a Serbian withdrawal from Kosovo and led to the introduction of an international peacekeeping force that remains in place today.³⁸

Generalization. Comparing the attributes mentioned in the Case Study Method section for the thirteen cases in which the US used violence before armed RPAs results in the data depicted in Figure 1. Visually, the attributes are weighted towards the left columns, indicating

the US typically engaged in multinational operations to alleviate civilian suffering in support of a UNSC resolution after diplomacy failed.

Event	UNSC Resolution	Multinational Coalition (not host-nation)	Diplomacy Failed	Civilian Population Suffering	US Casualties	Direct Threat to US	Immediate Threat to Coalition Forces	Immediate Threat to US Forces	Individual Targeted Person	RPA Required	RPA Weapon Employment	Future Threat to US
PRE-ARMED												
1991-2001, Iraq	1	1	1				1	1				
1992, Somalia	1	1	1	1								
1993, Somalia	1	1	1	1			1	1	1			
June 1993, Iraq						1						
Feb 1994, Bosnia	1	1	1	1								
April 1994, Bosnia	1	1	1				1					
Aug 1994, Bosnia	1	1	1	1			1					
Sept 1994, Haiti	1	1	1	1					1			
Nov 1994, Bosnia	1	1	1	1			1					
Sept 1996, Iraq	1	1	1	1								
Aug 1998, Afg & Sudan					1	1		1				1
Dec 1998, Iraq	1	1	1									
March 1999, Yugoslavia	1	1	1	1								
PRE-ARMED SUM	11	11	11	8	1	2	5	3	2	0	0	1
PERCENTAGE	85%	85%	85%	62%	8%	15%	38%	23%	15%	0%	0%	8%

Figure 1: Attributes of US Violent Conflict (Cold War through Feb 2001)

Case Summary: February 2001 through December 2011 (After armed RPAs)

The following cases were instances of the use of violence by the United States from the time when the MQ-1B Predator was first armed until December 2011.

2001-2003, Iraq. No-fly zone strikes continued similar to the previous time period.

November 2002, Yemen. A United States Predator aircraft struck a vehicle carrying Abu Ali Al-Harithi, the mastermind of the USS Cole bombing.³⁹ The impetus for this attack was the death of 17 US sailors and injury of 37 others in the bombing of the USS Cole while it refueled in the Port of Aden, Yemen.⁴⁰ The objective of this attack was to kill the mastermind of the bombing to prevent repeated attacks in the future. The president delayed the response in an effort to stop “swatting flies” in favor of a concerted strategy aimed at the overall defeat of al-Qaeda.⁴¹ The strike resulted in Harithi’s and several associates’ deaths but the threat persisted.⁴²

October 2001, Afghanistan. The United States sent forces under Operation Enduring Freedom (OEF) – Afghanistan with the objective of disrupting the use of Afghanistan as a terrorist base of operations and attacking the military capability of the Taliban regime.⁴³ The

impetus for this operation was the terrorist attacks of 11 Sept 2001 in New York, NY and Washington, DC. The results of this operation have yet to be seen since it is an ongoing operation at the time of this research, however the country is no longer a safe-haven for terrorist training camps.

January 2002, Philippines. The US sent special operations troops from all services as part of OEF-Philippines to form Joint Special Operations Task Force – Philippines whose mission was to defeat terrorists, eliminate safe havens and create the conditions necessary for peace, stability and prosperity in the southern Philippines.⁴⁴ Several terrorist organizations thrived in the jungles of the Southern Philippines and their ties to Al Qaeda led to this operation in the aftermath of the 11 September 2001 terrorist attacks.⁴⁵ The resulting force, while officially a non-combat deployment, accompanied the Armed Forces of the Philippines on missions, engaged enemy forces and sustained casualties.⁴⁶ The final results have yet to be determined due to the ongoing nature of the operation at the time of this research; however the jihadist groups' influence in the region is waning. In order to completely eliminate the group, a larger US effort would be required.⁴⁷

March 2003, Iraq. United States forces invaded Iraq, toppling the regime of Saddam Hussein. The impetus for this attack was that Iraq was developing weapons of mass destruction (WMD) and was tied to Al Qaeda, with whom they might share the WMDs. That is now known to be false and the actual motivation for war is debated, ranging from a personal vendetta to the US need to control the oil market or coerce other Middle Eastern countries to help us in our counterterrorism operations.⁴⁸ The actual objective is unclear from a political perspective, but militarily it was the removal of the existing regime and installation of a democratic replacement. The military objective was achieved but took much longer than expected.

August 2003, Liberia. US Marines secured the international airport in Monrovia and cleared the port to pave the way for humanitarian aid and supplies to be brought in via boat and aircraft. The impetus for the operation was the population's suffering due to the effects of the ongoing civil war. The objective was to ease the suffering and force warring parties to adhere to a previously signed peace agreement. US forces handed over control to Nigerian peacekeepers and the mission was considered an unqualified success.⁴⁹

June 2004, Pakistan. A United States Predator aircraft targeted a pro-Al Qaeda Pakistani militant, Nek Mohammad.⁵⁰ The impetus for this attack was Nek Mohammad's assistance of Al-Qaeda operatives in avoiding a Pakistani military operation intended to detain them. The objective of the attack was to kill Nek Mohammad and deter future local assistance to Al Qaeda. The operation itself was a success in that the target was killed, but yielded no additional gains in the area.⁵¹

May 2008, Somalia. United States forces attacked a house in Somalia killing Aden Hashi Ayro, a leader in the same organization that executed the 1998 US embassy bombings in Kenya and Tanzania. The impetus for the operation was Ayro's planning of terrorist operations, some successful and others not. The objective was to deter and disrupt future attacks on US interests and to assist the Ethiopian troops engaged in the area. The operation was a success with Ayro and another militant killed by four Tomahawk cruise missiles.⁵²

October 2008, Syria. A United States helicopter raid entered Syria to kill a suspected Al Qaeda-linked smuggler of foreign fighters, Abu Ghadiyah.⁵³ The impetus for the attack was intelligence indicating an imminent attack in Iraq under the leadership of Ghadiyah combined with high-confidence knowledge of his location. The objective was to kill Ghadiyah and

encourage Syria to better control the flow of fighters and supplies into Iraq. Ghadiyah was killed, but the flow into Iraq did not decrease.⁵⁴

April 2009, Somalia. United States Navy commandos attacked Somali pirates holding a US citizen hostage off the coast of Somalia. The impetus for the operation was the pirates' demonstration of intent to hurt the US citizen, a shipping boat captain who was taken hostage following a failed hijacking attempt. The objective was to free the American captive and it was a success.⁵⁵

2005-2011, Pakistan. From 2005 through 2011, news media has reported hundreds of airstrikes in Pakistan targeting militants who attack US targets in Afghanistan.⁵⁶ According to the Long War Journal website, as of 28 October 2011 these attacks have killed 70 Senior Al-Qaeda and Taliban leaders.⁵⁷ The impetus for these attacks was continuous cross-border attacks in Afghanistan and a steady stream of terror plots against the West.⁵⁸ The objective was to deter and disrupt Taliban operations against US troops in Afghanistan and to deter and disrupt Al-Qaeda operations. As of this research, the war in Afghanistan and global counterterrorism operations are still in progress so the outcome has yet to be determined.

March 2011, Libya. The United States, in concert with forces from France, United Kingdom, Italy, and Canada launched Operation Odyssey Dawn in accordance with UNSC Resolution 1970 to "protect civilians and civilian populated areas under threat of attack" in Libya.⁵⁹ The impetus for the operation was Libyan military action against civilians resulting in significant casualties and suffering. The objective was to stop the attacks on civilians but had the added effect of helping the rebellion to overthrow the Gadhafi regime. The operation was a success with the regime falling after 7 months. US combat operations were limited to initial pacification of the integrated air defense system (IADS) and support of foreign aircraft (via

tankers and command and control) with the exception of RPAs, which struck regime targets throughout the operation.⁶⁰

May 2011, Yemen. United States airstrikes attributed to RPAs attacked a vehicle and killed two members of Al Qaeda in the Arabian Peninsula (AQAP),⁶¹ a branch of Al Qaeda described as the greatest threat to the US at the time.⁶² The impetus for the attack was the possibility of the terrorists planning an attack on US interests, and the objective was to deter and disrupt terrorist operations. The success of the operation at achieving this objective is unknown but there have been several more RPA airstrikes on AQAP targets.⁶³

June 2011, Somalia. United States RPAs fired missiles at two Somali Al-Shabab militants with ties to al-Qaeda. The impetus for the attack was intelligence indicating the group was preparing to conduct increased operations outside Somalia, potentially targeting US interests.⁶⁴ The objective was to prevent operations outside Somalia and the success is unknown. This strike was one of a number of US airstrikes carried out inside in Somalia against Al-Qaeda affiliates.⁶⁵

Generalization. Comparing the attributes mentioned in the Case Study Method section for the fourteen cases in which the US used violence after armed RPAs results in the data depicted in Figure 2. Visually, the attributes are weighted towards the right columns, indicating the US typically engaged targets preemptively, often with RPAs and targeting a specific person. There were still multinational and humanitarian operations, though not a majority, and RPA capabilities were required in six of the fourteen cases.

Event	UNSC Resolution	Multinational Coalition (not host-nation)	Diplomacy Failed	Civilian Population Suffering	US Casualties	Direct Threat to US	Immediate Threat to Coalition Forces	Immediate Threat to US Forces	Individual Targeted Person	RPA Required	RPA Weapon Employment	Future Threat to US
POST-ARMED												
2001-2003, Iraq	1	1	1				1	1				
Nov 2002, Yemen									1	1	1	1
Oct 2001, Afghanistan		1		1	1	1					1	1
Jan 2002, Philippines												1
March 2003, Iraq		1	1								1	1
August 2003, Liberia	1	1	1	1								
June 2004, Pakistan							1	1	1	1	1	1
May 2008, Somalia		1	1	1			1		1			1
Oct 2008, Syria							1	1	1			1
April 2009, Somalia			1			1						
March 2011, Libya	1	1	1	1						1	1	
2005-2011, Pakistan							1	1	1	1	1	1
May 2011, Yemen									1	1	1	1
June 2011, Somalia		1	1	1					1	1	1	1
POST-ARMED SUM	3	7	7	5	1	2	6	4	7	6	8	10
PERCENTAGE	21%	50%	50%	36%	7%	14%	43%	29%	50%	43%	57%	71%

Figure 2: Attributes of US Violent Conflict (Feb 2001 through Dec 2011)

Section 4: Analysis

Case Analysis

The Case Summaries established attributes with which to compare cases of the use of violence by the United States to accomplish political goals since the end of the cold war. Using the arming of RPAs in February 2001 as the cutoff point and the data discussed previously, this research generalized the impetus driving the United States to violent conflict in the two time periods, from the end of the Cold War through February 2001 when RPAs were first armed, and from February 2001 through December 2011.

From the end of the Cold War until the first armed RPAs, the United States can be generally described as a team player out to make the world a better place as the last remaining superpower. In nearly all cases the US sought UNSC resolutions supporting the use of violence and assembled a multinational coalition to accomplish the objective. In over half of the cases the local population was suffering and there was no threat to the US. The few cases involving unilateral action on the part of the United States were as a result of a strike on Americans, or in the case of the Bush assassination, an attempted strike. The US almost never attacked pre-emptively and the long-range responses that could not be launched by manned assets relied on cruise missiles, resulting in imprecise destruction and collateral damage,⁶⁶ necessitating a very significant event or threat as motivation to strike due to the potential for negative consequences.

After RPAs were armed, the United States was much more inclined to take unilateral action, assembling a multinational coalition only half of the time. With armed RPAs available, operations were more than three times as likely to target a specific person and the United States was much more likely to conduct a pre-emptive strike on a non-immediate threat to reduce the risk of a future attack. The US almost never had UNSC resolutions in support of violent

operations after 2001 and typically undertook missions in the interest of the US itself, rather than using force to alleviate civilian suffering.

Figure 3 compares the percentage in which particular attributes were present in cases in each time period. It is arranged in order of from left to right by the difference in percentage of occurrence. The leftmost group represents the largest difference in favor of cases before armed RPAs while the rightmost group represents the largest difference in favor of cases after RPAs were armed. To compare the two time periods, a simple explanation is to say that the threshold to lead the United States to violence has shifted to the right on the chart.

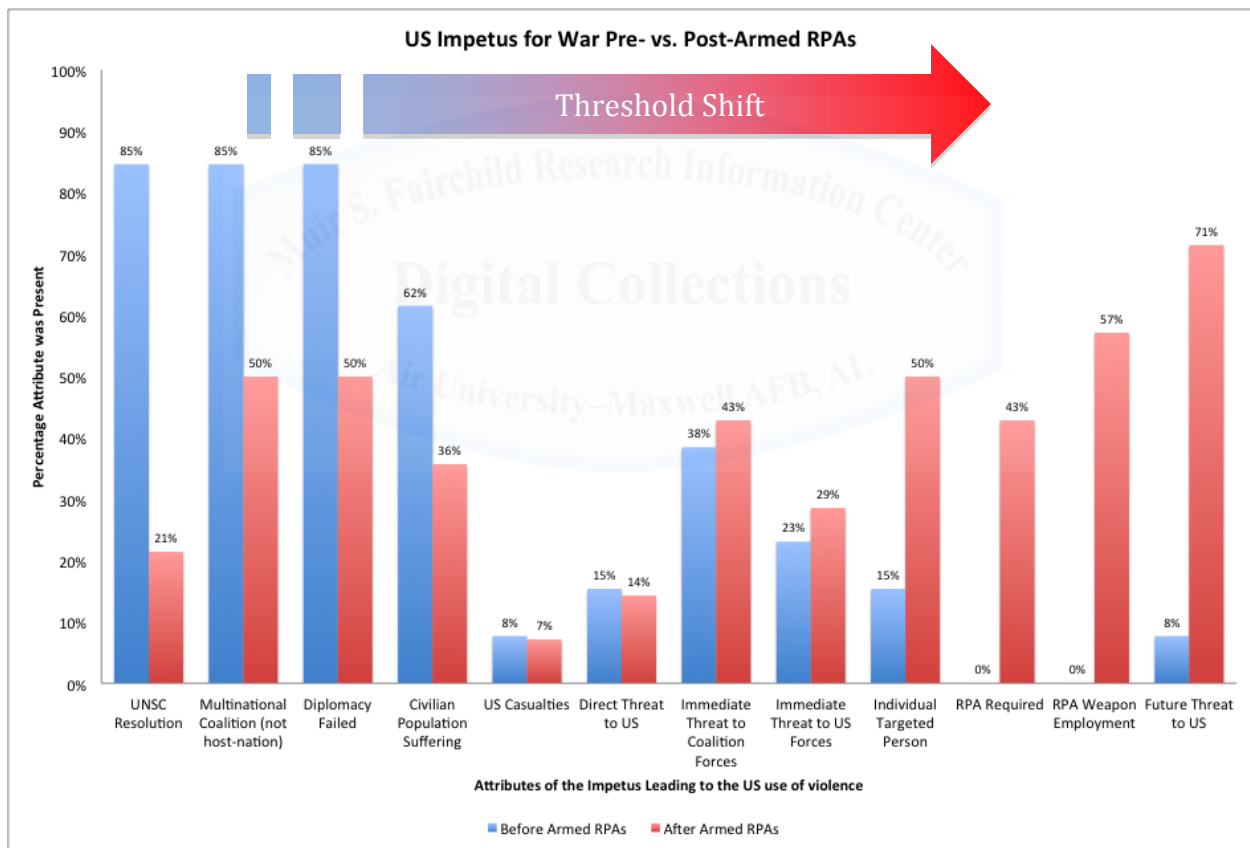


Figure 3: Comparison of US Violent Conflict (Before and After Armed RPAs)

Some of this shift can be explained by the change in perspective of the US government and general public brought about by the terrorist attacks of 11 September 2001 in New York, NY and Washington, DC. The change in motivation is obvious with 63% more preemptive attacks in

the period after armed RPAs. In addition, over half of the operations that occurred after armed RPAs were available utilized them, indicating that US leadership was clearly comfortable employing them. Most importantly, over one-third of cases studied during the later period required armed RPAs to achieve the intent.

In order to understand how an RPA can be required, consider Francis Gary Powers, and the perilous situation in which US intelligence gathering found itself after he was shot down. The United States could no longer risk American lives over foreign soil because of the media spectacle that resulted if the pilot was captured. The solution to the problem was the RPA, and confirming the ease with which the public dismissed an RPA shoot down, the Fire Fly shot down in 1964 over China made the front page of *The New York Times* but was quickly forgotten;⁶⁷ the same is true today. In the initial phase of US operations in Libya, an F-15E crashed behind enemy lines. The unharmed crew was recovered quickly, but the crash made headlines worldwide.⁶⁸ In comparison, a North Atlantic Treaty Organization (NATO) RPA crashed months later and was hardly mentioned.⁶⁹

The requirement of an RPA in operations after February 2001 was typically driven by the fact that the US was not “at war” with the countries in which many of these operations took place. Of the six countries believed to have had US RPA strikes, Afghanistan, Pakistan, Libya, Iraq, Yemen, and Somalia, only two were home to major US combat operations at the time of this research.⁷⁰ The lack of an official conflict and the necessity for the US to appear not heavily involved is one of the key features that make RPAs so attractive. One example is Libya, where the US needed to appear as if it was not conducting combat operations and was only in a support role.⁷¹ Although manned US strike aircraft stopped flying after the initial IADS bombardment, RPAs continued to strike targets and even expanded operations with little public notice.⁷²

Another example is Somalia, where politicians were hesitant to send American troops based on sensitivities that remain from the 1993 operation. RPA strikes in Somalia have precisely eliminated militants with little public concern for US operations in the country.

The precision that RPAs offer over other unmanned options such as cruise missiles has also contributed to the explosion in RPA operations. Before February 2001, attacking a country without committing troops meant cruise missiles with 1,000-pound warheads on targets that must be stationary.⁷³ That tactic is not ideal because anyone near the explosion dies and it is difficult to verify that the targeted individual, if that is the intent, is still in the building when the missile arrives and that his children are not. Significant collateral damage (CD) typically results in negative public reaction so a weapon with less CD has obvious appeal. An AGM-114 Hellfire fired from an RPA takes approximately 30 seconds to arrive at the target (versus more than an hour for a Tomahawk⁷⁴) contains less than 25 pounds of explosive, can be guided onto a moving vehicle when the target is collateral-free, and costs less than one-tenth of the price of a Tomahawk.⁷⁵ The appeal of armed RPAs is clear and they offer a means of striking targets that were not attackable before they were available.

Finding

The availability of RPAs has changed the threshold required to drive the US to using lethal force. The use of RPAs for missions allows the US to send aircraft to deliver lethal force quietly and out of public discussion. The availability of a low-cost, low-risk, high-payoff method to target enemies of the United States has motivated American leaders to turn to that option when in the past they might have coordinated with host nations to detain the individuals or found another solution due to a lack of alternatives. In addition, RPAs have the capability to strike with

extremely limited collateral damage, making them seem more humane because typically only those who are targeted are killed.

Consequences

This shift in threshold, from attempting to detain individual enemies to reaching out and killing them with precision has consequences, both good and bad. Some of these consequences may be delayed based on the US technological superiority over the rest of the war-fighting world, but will likely appear as the rest of the world catches up. Positive consequences include the timely demise of enemy fighters and success in counterterrorism operations leading to less overall threat to the United States. Negative consequences generally stem from the proliferation of RPA technology to non-friendly forces.

One positive result of the change in threshold is that enemies of the US are targeted when they might otherwise have been allowed to continue operations that would eventually lead to a threat to the US or its interests. In addition, the changed threshold allows for the utilization of new technology, such as RPAs, in situations where cruise missiles and raids, the old standard, would not have been feasible. The changed threshold results in fewer persistent threats to the US because the threats are eliminated when they are located.

Another positive result of the changed threshold has been the elimination of Al-Qaeda leadership where local governments will not accomplish the job themselves.⁷⁶ According to media reports, most of the leadership structure of Al-Qaeda that was in place on 11 September 2001 is now dead, reducing the threat to US interests.⁷⁷ With low-visibility RPA capabilities, US leadership has been able to reach places previously untouchable with enough precision to limit collateral damage and avoid a significant public backlash. The availability of the option and the corresponding US willingness to use it has reduced the threat to US interests.

Armed RPAs as a tool for leaders, and the lower threshold required to spur leaders to use them, has made the US a safer place, but along with the obvious positive consequences that armed RPAs bring to the table are some potentially negative consequences. These include the future use of RPAs against US interests, our lack of control over who uses RPA technology once on the global market, other countries' threshold for violent conflict changing as ours has and the possibility of an RPA arms race.

When the US first developed and used nuclear weapons, the US was the only country that possessed them. That was not to say that we would always be the only nuclear power and, as expected, following their wartime debut other countries expended great efforts to ensure that they also possessed the weapons that ended the war.⁷⁸ The race to develop nuclear weapons and the corresponding Cold War that followed was the perfect example of a negative effect of a revolutionary new type of weapon appearing on the battlefield. Nuclear weapons offered a new option to political leaders, the threat of total military destruction, as something to wield in international relations. RPAs are, in many technical ways, the opposite of nuclear weapons. They are small, generate very limited destruction, are not very public, and are unlikely to result in the destruction of an entire nation. The thing that RPAs offer making them similar to nuclear weapons is a previously unavailable option for international force projection. Politicians can now choose to kill enemies on foreign soil with little risk.

The recent worldwide surge in RPA development demonstrates the desire of foreign governments to operate fleets of RPAs against their enemies. China revealed 25 different new models of RPAs at the Zhuhai Air Show in 2010 including some which the manufacturer claimed are capable of firing a missile more than 1,200 miles.⁷⁹ Israel Aerospace industries (IAI) has sold more RPAs than any other company in the world, including the armed Heron, and Israel

has used RPAs for more than 40 years. RPA technology is available and progressing as other countries scramble to match the US lead in the field. The effort has the potential to grow into an arms race where developed countries will hold vast fleets of RPAs to use against one another. The availability of large numbers of RPAs on all sides of international conflict has the potential to lower each players' threshold for resorting to violence in the same way that RPAs have changed the US threshold in the war on terror and could result in future wars starting before politicians have exhausted all other instruments of power.

The US currently operates the most technically advanced RPAs in the world, driving other countries to covet them as they keep tabs on RPA successes. The US has control over where American RPA technology goes through export agreements and arms controls. Israel, China, Iran, Pakistan, Turkey, and India are all striving to build RPAs as capable as those in the US and over 43 countries have military robotics programs.⁸⁰ As countries with fewer scruples about their exports reach technological parity with the US, the risk of RPA use against US interests will rise. What would the US response be if an adversary, especially a non-state actor, were to use RPAs against US citizens abroad? Even worse, what would the US do to counter a threat of small RPAs within the continental United States? There have already been RPA threats within the US; in September 2011, an American was arrested for planning to crash an explosive-laden remote controlled aircraft into a US government building in Washington, DC.⁸¹ As RPA technology proliferates and progresses, the cost of small platforms will decrease and the likelihood of the technology falling into the hands of US adversaries will increase.

RPA technology falling into the hands of our direct adversaries is the most obvious threat caused by the worldwide surge in RPA acquisition started by the US, but there are other, non-technical, consequences that could arise as a result of the US' status as a global leader. The US

threshold shift from striking in retaliation to striking preemptively could lead other countries to do the same. Scott Shane, national security correspondent for *The New York Times*, wrote:

If China, for instance, sends killer drones into Kazakhstan to hunt minority Uighur Muslims it accuses of plotting terrorism, what will the United States say? What if India uses remotely controlled craft to hit terrorism suspects in Kashmir, or Russia sends drones after militants in the Caucasus? American officials who protest will likely find their own example thrown back at them.⁸²

Terrorism threats and insurgencies have existed worldwide for many years. When they were brought into the US via the attacks of 11 September 2001 the US responded by resorting to preemptive strikes on enemies who were suspected of planning to attack in the future. Other countries could follow the lead of the US and start eliminating leaders of insurgencies or political movements by labeling them as terrorists leading to a world where it is suicide to challenge the status quo. The inability of oppressed peoples to challenge the oppressors goes against the founding principles of the US. Were it to actually happen, it would be a terrible and ironic consequence of our attempts to quash those who use terror to force their beliefs on others. There is no guarantee that as RPA technology spreads, others will use it with as much precision and restraint as has been the case in the US-led global counterterrorism effort.

From a safer planet for freedom now, to a new avenue for oppression later, RPAs are sure to have a lasting impact on the international landscape. The benefits are obvious, US enemies eliminated and terrorist plots averted. The negatives are harder to measure because they will most likely occur in the future and could include a worldwide buildup of RPA fleets potentially used in localized conflicts to suppress opposing viewpoints.

Recommendations

Based on the positive and negative consequences mentioned above, these recommendations provide a way forward, or initial vector. Through a layered approach of protection, prevention, and negotiation, the US can mitigate the negative consequences of armed

RPAs. The US should continue the use of armed RPAs to continue to reap the benefits gained thus far in global counterterrorism operations. Simultaneously, the US should continue to strictly control RPA-related technology and deter and disrupt foreign attempts to acquire it while developing counter-RPA capabilities. On the international stage, US diplomats should engage with other countries to develop international standards for employing RPAs to deter misuse.

Since the first armed RPAs, the US has utilized them with success in at least six different countries. Their availability allowed counterterrorism forces to strike targets that would have, in the past, required committing ground forces or accepting a level of collateral damage that is not viable in today's political environment. Having eliminated these targets successfully thus far, it would be unwise to cease operations and prudent to continue to develop RPA and counter-RPA technology.

The US currently uses RPAs in permissive air environments, meaning there is minimal threat to the aircraft. The US must develop the capability to deny enemies the use of RPAs in environments where it is counter to American interests. As other countries strive to duplicate the success of the US using RPAs, it is essential that the US have the capability to maintain superiority over other countries' improving technologies.

The quickest path to replicating US technology is to steal it. "The Defense Security Service, which protects the Pentagon and its contractors from espionage, warned in a report [in 2010] that American drone technology had become a prime target for foreign spies."⁸³ The Director of National Intelligence identifies RPAs as a target of aggressive espionage against private contractors.⁸⁴ The US government must work with defense contractors who develop RPA technology to ensure their networks and facilities are secure and that all personnel with access have been properly vetted.

In addition to limiting unlawful access to critical technologies, the US government must ensure that they do not fall into the hands of unfriendly organizations through legal means. The US Department of Commerce must keep export restrictions up to date on components from RPAs and dual-use technologies to prevent them from being exported to international buyers without US consent. Eventually, even with these protections in place, the rest of the world will have RPA technology, so the US should also work internationally to develop RPA norms.

Similar to the way the Nuclear Non-Proliferation Treaty addressed the issue of a new weapon that could change warfare, an RPA treaty could set international expectations for countries that have the technology. Understandably, it will probably not be against the development of lethal unmanned technology, but could define acceptable uses for the capability as a method to deter use that inhibits personal freedoms and the values that most developed countries share. US diplomats should investigate the possibility of developing international agreements on acceptable use of RPAs to deliver lethal force without sacrificing capabilities critical to counterterrorism operations.

The US should continue to use RPAs while addressing security vulnerabilities in development and production processes and engaging internationally to set a global standard for the use of RPAs. By doing this, the US can protect sensitive technology, prevent other countries from surreptitiously obtaining it, and prevent or deter misuse of RPAs in the future.

Section 5: Conclusion

RPAs have been in use for many years, but rarely made headlines until the US began using them in multiple countries to target individuals deemed to be threats. Media reports claim that RPAs make the US more likely to go to war because it seems easier and less messy, like a video game. Based on the comparison of US use of force abroad before and after RPAs were armed, the media have the answer, if not the reason, correct. The US is more likely to resort to violence now that leaders can call upon RPAs. The increased likelihood of turning to violence is not because RPAs are less messy, but because they can strike a target set that previous weapons were incapable of servicing, making more targets available and therefore more targets struck. The ease and low-visibility with which targets can now be attacked has led to the US being less likely to exhaust all non-violent instruments of power before turning to violence. The reduced threshold for engaging in violent conflict has not gone unnoticed internationally, and RPA technology is now coveted by most armed forces. The threat of other countries developing RPAs and using them in ways counter to US interests necessitates the protection of US RPA technology and the development of international agreements on acceptable use of RPAs.

Endnotes

1. McPherson J, *Battle Cry of Freedom*, 551.
2. UK Ministry of Defense, *The UK Approach to Unmanned Aircraft Systems*, 5-9.
3. Garamone, Jim, "From US Civil War to Afghanistan: A Short History of UAVs."
4. Ibid.
5. Ehrhard, Thomas P, *Air Force UAVs: The Secret History*, 2.
6. Ibid, 6.
7. Goebel, Greg, "Lightning Bug Reconnaissance Drone."
8. Ehrhard, Thomas P, *Air Force UAVs: The Secret History*, 9.
9. Ibid.
10. Goebel, Greg, "Lightning Bug Reconnaissance Drone."
11. Ehrhard, Thomas P, *Air Force UAVs: The Secret History*, 39.
12. Parsch, Andreas, "Teledyne Ryan Q-2/KDA/xQM-34/BGM-34 Firebee."
13. Ehrhard, Thomas P, *Air Force UAVs: The Secret History*, 21.
14. Ibid.
15. Goebel, Greg, "Modern US Endurance UAVs."
16. Ibid.
17. Zenko, Micah, *Between Threats and War*.
18. Bone, Elizabeth, "Unmanned Aerial Vehicles: Background and Issues for Congress," 23.
19. Historyguy.com, "The No-Fly Zone War."
20. GlobalSecurity.org, "Operation Restore Hope."
21. UN.org, "Somalia – UNISOM II: Background."
22. GlobalSecurity.org, "Operation Restore Hope."
23. Mayall, James, *The New Interventionism 1991-1994*, 110.
24. GlobalSecurity.org, "Operation Continue Hope."
25. Von Drehle, David, "U.S. Strikes Iraq for Plot to Kill Bush," A01.
26. GlobalSecurity.org, "Iraqi Intelligence Service Headquarters-Baghdad BDA."
27. NATO, "AFSOUTH Fact Sheet."
28. Ibid.
29. Ibid.
30. Friedman, Herbert A, "U.S. PSYOP in Haiti (Operation UPHOLD DEMOCRACY)."
31. Ibid.
32. Zenko, Micah, *Between Threats and War*, 135.
33. GlobalSecurity.org, "Operation DESERT STRIKE."
34. Clinton, Bill, "Address to the Nation by the President."
35. Conversino, Mark J, "Operation DESERT FOX: Effectiveness with Unintended Effects."
36. Defense.gov, "Operation DESERT FOX."
37. Conversino, Mark J, "Operation DESERT FOX: Effectiveness with Unintended Effects."
38. NATO.int, "NATO's role in Kosovo."
39. Bolkom, Christopher, "Military Aviation: Issues and Options for Combating Terrorism and Counterinsurgency, 12.
40. Lorenz, Akiva J, "Analyzing the USS Cole Bombing."
41. Rice, Condoleezza, "National Commission on Terrorist Attacks Upon the United States, Ninth Public Hearing."

-
42. Priest, Dana, "US Citizen Among Those Killed in Yemen Predator Missile Strike."
 43. Bush, George W, "President Bush Announces Military Strikes in Afghanistan."
 44. JSOTF-P. "JSOTF-P Fact Sheet."
 45. Thomas, Gary, "US Maintains Quiet Counterterrorism Effort in Philippines."
 46. Ibid.
 47. Ibid.
 48. Hinnebusch, Raymond, "THE AMERICAN INVASION OF IRAQ: CAUSES AND CONSEQUENCES," 13.
 49. CNN, "Thousands cheer U.S. troops in Liberia."
 50. Bolkom, Christopher, "Military Aviation: Issues and Options for Combating Terrorism and Counterinsurgency, 12.
 51. Ibid.
 52. Perry, Alex, "U.S. Kills Bin Laden's Man in Somalia."
 53. BBC, "Syria raid 'killed major target.'"
 54. Zenko, Micah, *Between Threats and War*, 153.
 55. Rice, Xan, "US navy commandos free hostage captain in dramatic raid on Somali pirate boat."
 56. LA Times, "Haqqani network suspected in suicide attack on Afghan office."
 57. Roggio, Bill, "Senior al Qaeda and Taliban leaders killed in US airstrikes in Pakistan, 2004 - 2011."
 58. AFP, "Panetta, Mullen hammer Pakistan over Haqqani network."
 59. GlobalSecurity.org, "Operation Odyssey Dawn."
 60. Cloud, David S, "US begins using Predator drones in Libya."
 61. Boone, Jeb, "U.S. drone strike in Yemen is first since 2002."
 62. Walcott, John, "CIA Drone Strike in Yemen Silences al-Qaeda's Most-Effective English Voice."
 63. Mann, Ted, "Another US Droen Strike Kills Militants in Yemen."
 64. Jaffe, Greg, "U.S. drone targets two leaders of Somali group allied with al-Qaeda, official says."
 65. Ibid.
 66. GlobalSecurity.org, "Iraqi Intelligence Service HQ-Baghdad Battle Damage Assessment."
 67. Ehrhard, Thomas P, *Air Force UAVs: The Secret History*, 9.
 68. Fontaine, Scott, "F-15 crashes in Libya; crew rescued."
 69. DailyMail, "US Navy drone missing over Libya was 'shot down' by Gadhafi's forces."
 70. Jaffe Greg, "US drone targets Somali militants."
 71. FOX News, "Obama Approves Use of Predator Drones in Libya."
 72. Kube, Courtney, "US sends more Predator drones to Libya."
 73. US Navy, "Tomahawk® Cruise Missile."
 74. Federation of American Scientists, "BGM-109 Tomahawk."
 75. US Navy, "Tomahawk® Cruise Missile."
 76. AFP, "Panetta, Mullen hammer Pakistan over Haqqani network."
 77. Stewart, Scott, "Why al Qaeda Is Unlikely To Execute Another 9/11."
 78. Sanger, David, interviewed by Neal Conan on NPR's "Talk of the Nation."
 79. Lorenz, Andreas, "'Messengers of Death': Are Drones Creating a New Global Arms Race?"

80. Singer, Peter, testimony before Congress, "Rise of the Drones: Unmanned Systems and the Future of War."

81. Shane, Scott, "Coming Soon: The Drone Arms Race."

82. Ibid.

83. Ibid.

84. Office of the National Counterintelligence Executive, "Foreign Spies Stealing US Economic Secrets in Cyberspace."



Appendix A

The following is the combined data from all examined cases.

Event	UNSC Resolution	Multinational Coalition (not host-nation)	Diplomacy Failed	Civilian Population Suffering	US Casualties	Direct Threat to US	Immediate Threat to Coalition Forces	Immediate Threat to US Forces	Individual Targeted Person	RPA Required	RPA Weapon Employment	Future Threat to US
PRE-ARMED												
1991-2001, Iraq	1	1	1				1	1				
1992, Somalia	1	1	1	1								
1993, Somalia	1	1	1	1					1			
June 1993, Iraq						1		1				
Feb 1994, Bosnia	1	1	1	1								
April 1994, Bosnia	1	1	1				1					
Aug 1994, Bosnia	1	1	1	1			1					
Sept 1994, Haiti	1	1	1	1					1			
Nov 1994, Bosnia	1	1	1	1								
Sept 1996, Iraq	1	1	1	1			1					
Aug 1998, Afg & Sudan					1	1		1				1
Dec 1998, Iraq	1	1	1									
March 1999, Yugoslavia	1	1	1	1								
PRE-ARMED SUM	11	11	11	8	1	2	5	3	2	0	0	1
PERCENTAGE	85%	85%	85%	62%	8%	15%	38%	23%	15%	0%	0%	8%
POST-ARMED												
2001-2003, Iraq	1	1	1				1	1				
Nov 2002, Yemen									1	1	1	1
Oct 2001, Afghanistan		1		1	1	1					1	1
Jan 2002, Phillipines												1
March 2003, Iraq		1	1								1	1
August 2003, Liberia	1	1	1	1								
June 2004, Pakistan							1	1	1	1	1	1
May 2008, Somalia		1	1	1			1	1	1			1
Oct 2008, Syria							1		1			1
April 2009, Somalia			1			1						
March 2011, Libya	1	1	1	1						1	1	
2005-2011, Pakistan							1	1	1	1	1	1
May 2011, Yemen									1	1	1	1
June 2011, Somalia		1	1	1			1		1	1	1	1
POST-ARMED SUM	3	7	7	5	1	2	6	4	7	6	8	10
PERCENTAGE	21%	50%	50%	36%	7%	14%	43%	29%	50%	43%	57%	71%

Figure 4: Combined Data from US Conflicts from the end of the Cold War through December 2011

Bibliography

- AFP. "Panetta, Mullen hammer Pakistan over Haqqani network." *DAWN.com*, 21 Sept 2011. <http://www.dawn.com/2011/09/21/panetta-mullen-hammer-pakistan-over-haqqani-network.html/print/> (accessed 18 Nov 2011).
- BBC. "Syria raid 'killed major target.'" *British Broadcasting Company*, 28 Oct 2008. <http://news.bbc.co.uk/2/hi/7694528.stm> (accessed 16 Nov 2011).
- Bolkom, Christopher. *Military Aviation: Issues and Options for Combating Terrorism and Counterinsurgency*. Congressional Research Service (CRS) Report RL32737. Washington, DC: CRS, 2005.
- Bone, Elizabeth. *Unmanned Aerial Vehicles: Background and Issues for Congress*. CRS report RL31872. Washington, DC: Congressional Research Service, 2003.
- Boone, Jeb. "U.S. drone strike in Yemen is first since 2002." *The Washington Post*, 5 May 2011. http://www.washingtonpost.com/world/middle-east/yemeni-official-us-drone-strike-kills-2-al-qaeda-operatives/2011/05/05/AF7HrxF_print.html (accessed 18 Nov 2011)
- Bush, George W. "President Bush Announces Military Strikes in Afghanistan" text of Presidential speech on 7 Oct 2001. Globalsecurity.org website <http://www.globalsecurity.org/military/library/news/2001/10/mil-011007-usia01.htm> (accessed 9 Nov 2011).
- Clinton, Bill, President of the United States. Address. Office of the Press Secretary, Washington, DC, 20 Aug 1998. At <http://clinton6.nara.gov/1998/08/1998-08-20-president-address-to-the-nation.html> (accessed 9 Nov 2011).
- Cloud, David S. "US begins using Predator drones in Libya." *Los Angeles Times*, 22 April 2011. <http://articles.latimes.com/print/2011/apr/22/world/la-fg-gates-libya-20110422> (accessed 18 Nov 2011).
- CNN. "Thousands cheer U.S. troops in Liberia." *Cable News Network (CNN)*, 14 Aug 2003. http://articles.cnn.com/2003-08-14/world/us.liberia_1_west-african-peacekeeping-force-festus-okonkwo-norton-schwartz?_s=PM:WORLD (accessed 16 Nov 2011).
- Conversino, Mark J. "Operation DESERT FOX: Effectiveness with Unintended Effects." *Air and Space Power Journal*, 13 July 2005. <http://www.airpower.au.af.mil/airchronicles/cc/conversino.html> (accessed 9 Nov 2011).
- DailyMail. "US Navy drone missing over Libya was 'shot down' by Gadhafi's forces." *Daily Mail* website, 6 August 2011. <http://www.dailymail.co.uk/news/article-2023069/U-S-Navy-drone-missing-Libya-shot-Gaddafis-forces.html> (accessed 19 Nov 2011).
- Defense.gov. "Operation DESERT FOX" Department of Defense website. http://www.defense.gov/specials/desert_fox/ (accessed 9 Nov 2011).
- Ehrhard, Thomas P. *Air Force UAVs: The Secret History*. Portland ME: Mitchell Institute Press, 2010.
- Federation of American Scientists. "BGM-109 Tomahawk." FAS Military Analysis Network website, <http://www.fas.org/man/dod-101/sys/smart/bgm-109.htm> (accessed 29 Nov 2011).
- Fontaine, Scott. "F-15 crashes in Libya; crew rescued." *Air Force Times*, 22 March 2011, <http://www.airforcetimes.com/news/2011/03/military-f15-crashes-in-libya-032211/> (accessed 19 Nov 2011).

- FOX News. "Obama Approves Use of Predator Drones in Libya." *FOX News*, 21 April 2011. <http://www.foxnews.com/politics/2011/04/21/obama-approves-use-predator-drones-libya/> (accessed 29 Nov 2011).
- Friedman, Herbert A. "U.S. PSYOP in Haiti (Operation UPHOLD DEMOCRACY)." PsyWarrior website. <http://www.psywarrior.com/HerbHaiti.html> (accessed 14 Nov 2011).
- Garamone, Jim. "From US Civil War to Afghanistan: A Short History of UAVs." *Armed Forces Press Service*, 16 April 2002. <http://www.defense.gov/utility/printitem.aspx?print=http://www.defense.gov/news/newswire/article.aspx?id=44164> (accessed 1 Nov 2011).
- GlobalSecurity.org. "Iraqi Intelligence Service Headquarters-Baghdad Battle Damage Assessment." GlobalSecurity.org website. <http://www.globalsecurity.org/intell/library/imint/iis2.htm> (accessed 9 Nov 2011).
- GlobalSecurity.org. "Operation DESERT STRIKE." GlobalSecurity.org website. http://www.globalsecurity.org/military/ops/desert_strike.htm (accessed 9 Nov 2011).
- GlobalSecurity.org. "Operation Continue Hope." GlobalSecurity.org website. http://www.globalsecurity.org/military/ops/continue_hope.htm (accessed 9 Nov 2011).
- GlobalSecurity.org. "Operation Odyssey Dawn." GlobalSecurity.org website. <http://www.globalsecurity.org/military/ops/odyssey-dawn.htm> (accessed 17 Nov 2011).
- GlobalSecurity.org. "Operation Restore Hope." GlobalSecurity.org website. http://www.globalsecurity.org/military/ops/restore_hope.htm (accessed 9 Nov 2011).
- Goebel, Greg. "Modern US Endurance UAVs." The Public Domain website. http://www.vectorsite.net/twuav_13.html (accessed 2 Nov 2011).
- Goebel, Greg. "The Lightning Bug Reconnaissance Drones." The Public Domain website. http://www.vectorsite.net/twuav_04.html (accessed 2 Nov 2011).
- Hinnebusch, Raymond. *The American Invasion of Iraq: Causes and Consequences*. St Andrews, Scotland: University of St Andrews, 2007.
- Historyguy.com. "The No-Fly Zone War." Historyguy.com website. http://www.historyguy.com/no-fly_zone_war.html (accessed 9 Nov 2011).
- Jaffe, Greg. "U.S. drone targets two leaders of Somali group allied with al-Qaeda, official says." *The Washington Post*, 29 June 2011. http://www.washingtonpost.com/national/national-security/us-drones-target-two-leaders-of-somali-group-allied-with-al-qaeda/2011/06/29/AGJFxZrH_print.html (accessed 23 Nov 2011).
- JSOTF-P. "JSOTF-P Fact Sheet." JSOTF-P website, 1 July 2011. http://jsotf-p.blogspot.com/2011/09/type-your-summary-here_20.html (accessed 14 Nov 2011).
- Kube, Courtney. "US sends more Predator drones to Libya." *NBC News*, 16 Sept 2001. http://www.msnbc.msn.com/id/44166967/ns/world_news-mideast_n_africa/t/nbc-us-sends-more-predator-drones-libya (accessed 7 Dec 2011).
- LA Times. "Haqqani network suspected in suicide attack on Afghan office." *Los Angeles Times*, 10 Nov 2011. http://latimesblogs.latimes.com/world_now/2011/11/afghanistan-suicide-attack.html (accessed 16 Nov 2011).
- Lorenz, Akiva J. "Analyzing the USS Cole Bombing." Maritime Terrorism Research Center website, 27 Dec 2007. <http://maritimeterrorism.com/2007/12/27/analyzing-the-uss-cole-incident/> (accessed 9 Nov 2011).
- Lorenz, Andreas. "'Messengers of Death': Are Drones Creating a New Global Arms Race?" *ABC News*, 23 Oct 2011. <http://abcnews.go.com/International/drones-creating-global->

- arms-race/story?id=14788147&singlePage=true#.TtBB2GCKZ8w (accessed 25 Nov 2011).
- Mann, Ted. "Another US Drone Strike Kills Militants in Yemen." *The Atlantic Wire*, 15 Oct 2011. <http://www.theatlanticwire.com/global/2011/10/another-us-drone-strike-kills-yemeni-militants/43724/> (accessed 18 Nov 2011).
- Mayall, James. *The New Interventionism 1991-1994: United Nations Experience in Cambodia, Former Yugoslavia and Somalia*. Cambridge, UK: Cambridge University Press, 1996.
- McPherson, J. *Battle Cry of Freedom*. Oxford, England: Oxford University Press, 1988.
- NATO. "AFSOUTH Fact Sheet." NATO website, 18 Jul 2003. <http://www.afsouth.nato.int/archives/operations/DenyFlight/DenyFlightFactSheet.htm> (accessed 9 Nov 2011).
- NATO. "NATO's role in Kosovo." NATO website. <http://www.nato.int/kosovo/history.htm> (accessed 9 Nov 2011).
- Office of the National Counterintelligence Executive. "Foreign Spies Stealing US Economic Secrets in Cyberspace." Director of National Intelligence website, October 2011, http://www.dni.gov/reports/20111103_report_fecie.pdf (accessed 30 Nov 2011).
- Parsch, Andreas. "Teledyne Ryan Q-2/KDA/xQM-34/BGM-34 Firebee." Directory of US Military Rockets and Missiles. http://www.designation-systems.net/dusrm/m-34.html#_BGM (accessed 2 Nov 2011).
- Perry, Alex. "U.S. Kills Bin Laden's Man in Somalia." *TIME World*, 1 May 2008. <http://www.time.com/time/world/article/0,8599,1736736,00.html> (accessed 16 Nov 2011).
- Priest, Dana. "US Citizen Among Those Killed in Yemen Predator Missile Strike." *The Washington Post* reprinted in *The Tech* Issue 54, 8 Nov 2002. <http://tech.mit.edu/V122/N54/lon4-54.54w.html> (accessed 9 Nov 2011).
- Rice, Condoleezza. "National Commission on Terrorist Attacks Upon the United States, Ninth Public Hearing," 8 April 2004. http://www.9-11commission.gov/archive/hearing9/9-11Commission_Hearing_2004-04-08.htm (accessed 9 Nov 2011).
- Rice, Xan. "US navy commandos free hostage captain in dramatic raid on Somali pirate boat." *the guardian*, 12 April 2009. <http://www.guardian.co.uk/world/2009/apr/12/hostage-captain-freed-somali-pirates> (accessed 16 Nov 2011).
- Roggio, Bill. "Senior al Qaeda and Taliban leaders killed in US airstrikes in Pakistan, 2004 - 2011." *Long War Journal*, 28 Oct 2011. <http://www.longwarjournal.org/pakistan-strikes-hvts.php> (accessed 16 Nov 2011).
- Sanger, David. interviewed by Neal Conan on "Talk of the Nation" on National Public Radio, 26 Sept 2011. Online transcript at <http://www.npr.org/2011/09/26/140812779/as-drones-evolve-more-countries-want-their-own> (accessed 19 Nov 2011).
- Shane, Scott. "Coming Soon: The Drone Arms Race." *The New York Times*, 8 Oct 2011. <http://www.nytimes.com/2011/10/09/sunday-review/coming-soon-the-drone-arms-race.html?scp=1&sq=coming%20soon%20the%20drone%20arms%20race&st=cse> (accessed 23 Oct 2011).
- Singer, Peter. Testimony before Congress. "Rise of the Drones: Unmanned Systems and the Future of War" 23 March 2010. 2nd session of the 111th congress.
- Stewart, Scott. "Why al Qaeda Is Unlikely To Execute Another 9/11." *STRATFOR*, 1 Sept 2011, <http://www.stratfor.com/weekly/20110831-why-al-qaeda-unlikely-execute-another-911> (accessed 2 Dec 2011).

- Thomas, Gary. "US Maintains Quiet Counterterrorism Effort in Philippines." *Voice of America*, 28 July 2011. <http://www.voanews.com/english/news/asia/US-Maintains-Quiet-Counterterrorism-Effort-in-Philippines-126348218.html> (accessed 14 Nov 2011).
- UN.org. "Somalia – UNISOM II: Background." United Nations website. <http://www.un.org/en/peacekeeping/missions/past/unosom2backgr1.html> (accessed 9 Nov 2011).
- United Kingdom Ministry of Defense Joint Doctrine Note 2/11. *The UK Approach to Unmanned Aircraft Systems*. London, UK: Office of the Chiefs of Staff, 30 March 2011.
- US Navy. "Tomahawk® Cruise Missile." US Navy Fact File, 23 April 2010. http://www.navy.mil/navydata/fact_display.asp?cid=2200&tid=1300&ct=2 (accessed 23 Nov 2011).
- Von Drehle, David. "U.S. Strikes Iraq for Plot to Kill Bush." *Washington Post* 27 June 1993.
- Walcott, John. "CIA Drone Strike in Yemen Silences al-Qaeda's Most-Effective English Voice." *Bloomberg*, 1 Oct 2011. <http://mobile.bloomberg.com/news/2011-09-30/cia-drone-strike-in-yemen-silences-al-qaeda-s-most-effective-english-voice> (accessed 19 Nov 2011).
- Zenko, Micah. *Between Threats and War: US Discrete Military Operations in the Post-Cold War World*. Stanford, CA: Stanford University Press, 2010.

